

Mazda6 Workshop Manual

FOREWORD

This manual contains on-vehicle service and diagnosis for the Mazda6.

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers. This manual should be kept up-to-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

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Mazda Motor Corporation
HIROSHIMA, JAPAN

APPLICATION:

This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN), and related materials shown on the following page.

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VEHICLE IDENTIFICATION NUMBERS (VIN)

U.K. specs.

JMZ	GG12820#	100001—
JMZ	GG14320#	100001—
JMZ	GG14820#	100001—
JMZ	GG12F20#	100001—
JMZ	GG12F50#	100001—
JMZ	GG14F20#	100001—
JMZ	GG14F50#	100001—

European (L.H.D.) specs.

JMZ	GG1232*#	100001—
JMZ	GG1282*#	100001—
JMZ	GG1432*#	100001—
JMZ	GG1482*#	100001—
JMZ	GG12F2*#	100001—
JMZ	GG12F5*#	100001—
JMZ	GG14F2*#	100001—
JMZ	GG14F5*#	100001—

GCC specs.

JM7	GG32F**#	100001—
JM7	GG34F**#	100001—
JM7	GG42F**#	100001—
JM7	GG44F**#	100001—

RELATED MATERIALS

Mazda6 Training Manual (European (L.H.D.), GCC Specs.)	3359-1*-02C
Engine Workshop Manual L8, LF, L3	1731-1*-02C
Manual Transaxle Workshop Manual G35M-R	1732-1*-02C
Automatic Transaxle Workshop Manual FN4A-EL	1623-10-98E
Automatic Transaxle Workshop Manual Supplement FN4A-EL	1746-1*-02C
Mazda6 Wiring Diagram (European (L.H.D.), GCC specs.)	5539-1*-02C
Mazda6 Wirinig Diagram (U.K. specs.)	5540-1*-02C
Mazda6 Bodyshop Manual (European (L.H.D. U.K.), GCC specs.)	3360-1*-02C
* : Indicates the printing location	
E: Europe	
0: Japan	

WARNING

Servicing a vehicle can be dangerous. If you have not received service-related training, the risks of injury, property damage, and failure of servicing increase. The recommended servicing procedures for the vehicle in this workshop manual were developed with Mazda-trained technicians in mind. This manual may be useful to non-Mazda trained technicians, but a technician with our service-related training and experience will be at less risk when performing service operations. However, all users of this manual are expected to at least know general safety procedures.

This manual contains "Warnings" and "Cautions" applicable to risks not normally encountered in a general technician's experience. They should be followed to reduce the risk of injury and the risk that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that the "Warnings" and "Cautions" are not exhaustive. It is impossible to warn of all the hazardous consequences that might result from failure to follow the procedures.

The procedures recommended and described in this manual are effective methods of performing service and repair. Some require tools specifically designed for a specific purpose. Persons using procedures and tools which are not recommended by Mazda Motor Corporation must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

The contents of this manual, including drawings and specifications, are the latest available at the time of printing, and Mazda Motor Corporation reserves the right to change the vehicle designs and alter the contents of this manual without notice and without incurring obligation.

Parts should be replaced with genuine Mazda replacement parts or with parts which match the quality of genuine Mazda replacement parts. Persons using replacement parts of lesser quality than that of genuine Mazda replacement parts must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

Mazda Motor Corporation is not responsible for any problems which may arise from the use of this manual. The cause of such problems includes but is not limited to insufficient service-related training, use of improper tools, use of replacement parts of lesser quality than that of genuine Mazda replacement parts, or not being aware of any revision of this manual.

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HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

RANGE OF TOPICS

A6E201000001W01

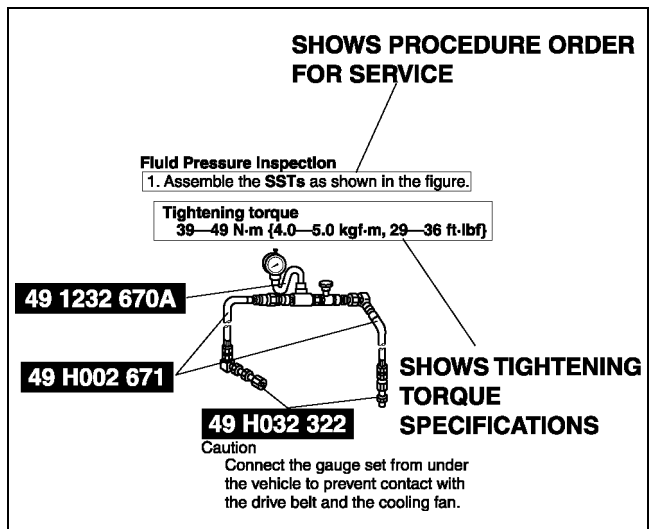
- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
 - Removal/Installation
 - Disassembly/Assembly
 - Replacement
 - Inspection
 - Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts and visual inspection) have been omitted.

SERVICE PROCEDURE

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Inspection, adjustment

- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.

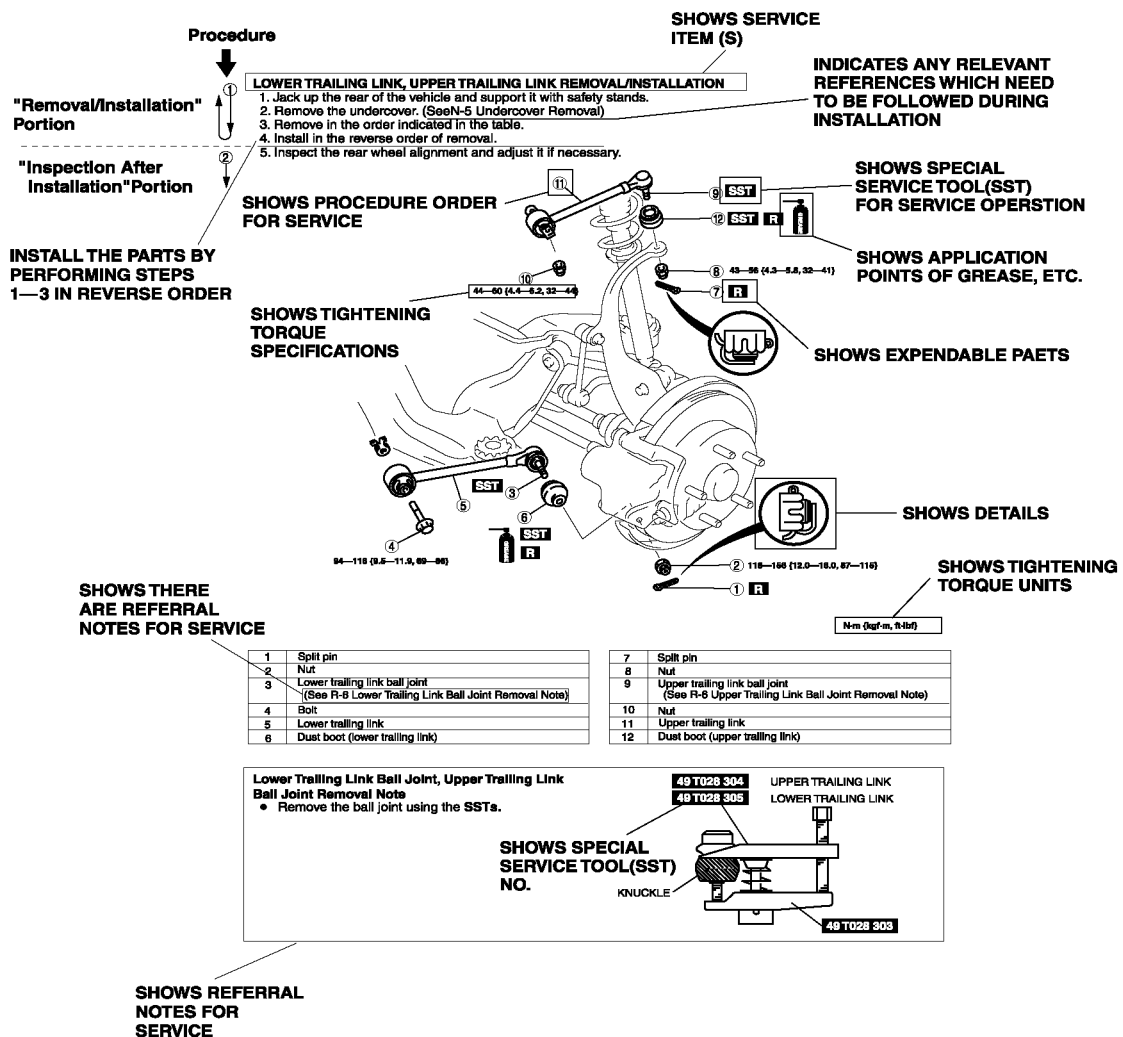


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HOW TO USE THIS MANUAL

Repair procedure

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.



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HOW TO USE THIS MANUAL

SYMBOLS

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- There are eight symbols indicating oil, grease, fluids, sealant, and **SST** or equivalent use. These symbols show application points or use of these materials during service.

Symbol	Meaning	Kind
	Apply oil	New appropriate engine oil or gear oil
	Apply brake fluid	New appropriate brake fluid
	Apply automatic transaxle/transmission fluid	New appropriate automatic transaxle/transmission fluid
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly
	Replace part	O-ring, gasket, etc.
	Use SST or equivalent	Appropriate tools

ADVISORY MESSAGES

A6E201000001W04

- You'll find several **Warnings**, **Cautions**, **Notes**, **Specifications** and **Upper and Lower Limits** in this manual.

Warning

- A Warning indicates a situation in which serious injury or death could result if the warning is ignored.

Caution

- A Caution indicates a situation in which damage to the vehicle or parts could result if the caution is ignored.

Note

- A Note provides added information that will help you to complete a particular procedure.

Specification

- The values indicate the allowable range when performing inspections or adjustments.

Upper and lower limits

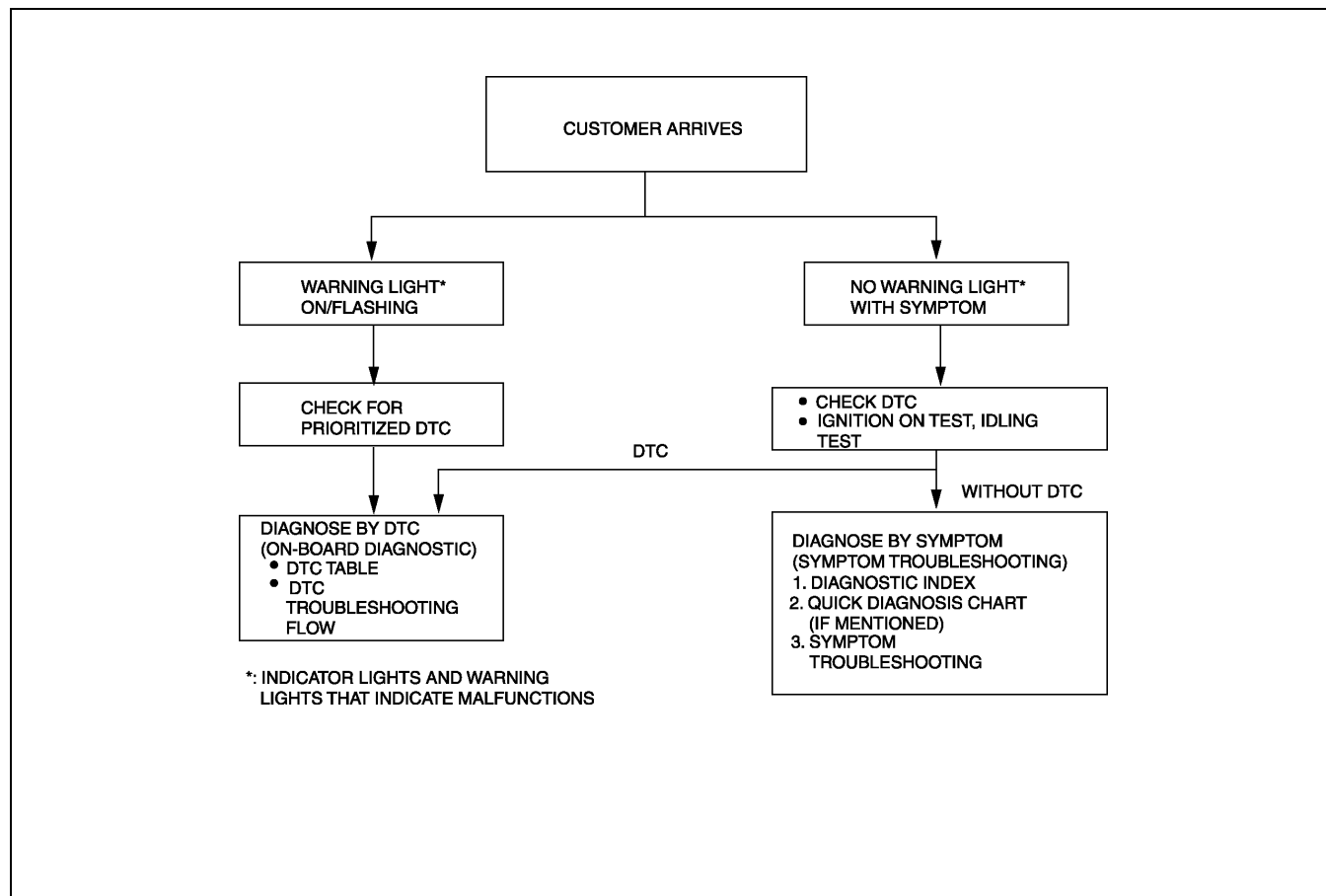
- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

HOW TO USE THIS MANUAL

TROUBLESHOOTING PROCEDURE

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Basic flow of troubleshooting



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DTC troubleshooting flow (on-board diagnostic)

- Diagnostic trouble codes (DTCs) are important hints for repairing malfunctions that are difficult to simulate. Perform the specific DTC diagnostic inspection to quickly and accurately diagnose the malfunction.
- The on-board diagnostic function is used during inspection. When a DTC is shown specifying the cause of a malfunction, continue the diagnostic inspection according to the items indicated by the on-board diagnostic function.

Diagnostic index

- The diagnostic index lists the symptoms of specific malfunctions. Select the symptoms related or most closely relating to the malfunction.

Quick diagnosis chart (If mentioned)

- The quick diagnosis chart lists diagnosis and inspection procedures to be performed specifically relating to the cause of the malfunction.

Symptom troubleshooting

- Symptom troubleshooting quickly determines the location of the malfunction according to symptom type.

HOW TO USE THIS MANUAL

Procedures for Use

Using the basic inspection (section K)

- Perform the basic inspection procedure before symptom troubleshooting.
- Perform each step in the order shown.
- The reference column lists the location of the detailed procedure for each basic inspection.
- Although inspections and adjustments are performed according to the reference column procedures, if the cause of the malfunction is discovered during basic inspection, continue the procedures as indicated in the remarks column.

SHOWS INSPECTION ORDER

SHOWS ITEM NAMES FOR DETAILED PROCEDURES

SHOW POINTS REQUIRING ATTENTION BASED ON INSPECTION RESULTS

AUTOMATIC TRANSAXLE BASIC INSPECTION

STEP	INSPECTION		ACTION
1	• Turn ignition switch is on. • Does O/D OFF indicator light (illuminate/go out) correspond to O/D OFF switch position (on/off)?	Yes	Go to next step.
		No	Perform symptom troubleshooting No.26 "O/D OFF indicator light does not illuminate when O/D OFF switch is turned to on", or No.27 "O/D OFF indicator light illuminates when O/D OFF switch is not turned to on"
2	• Turn ignition switch is on. • When selector lever is moved, are selector lever position and indicator aligned? Also, when other ranges are selected from N or P during idling, does vehicle creep within 1 to 2 seconds?	Yes	Go to next step.
		No	Inspect selector lever. Repair or replace defective areas.
3	• Inspect the ATF color condition. • Are ATF color and odor normal?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	• Perform line pressure test. See K-2 Line Pressure Test • Is line pressure okay?	Yes	Go to next step.
		No	Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	• Perform stall test. See K-2 Stall Speed Test • Is stall speed is okay?	Yes	Go to next step.
		No	Repair or replace defective parts according to inspection result.

REFERENCE COLUMN

XME2010003

HOW TO USE THIS MANUAL

Using the DTC troubleshooting flow

- DTC troubleshooting flow shows diagnostic procedures, inspection methods, and proper action to take for each DTC.

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DETECTION CONDITION
describes the condition under which the DTC is detected.

TROUBLE CONDITION

DTC PO103

POSSIBLE CAUSE describes possible point(s) of malfunction

DTC PO103	MAF circuit high input
DETECTION CONDITION	PCM monitors input voltage from TP sensor after ignition key is turned on. If input voltage at PCM terminal 88 is above 8.25 V, PCM determines that TP circuit has malfunction.
POSSIBLE CAUSE	Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction during first drive cycle. Therefore, PENDING CODE is not available. - FREEZE FRAME DATE is available. - DTC is stored in the PCM memory. - MAF sensor malfunction - Connector or terminal malfunction - Open circuit in wiring between MAF sensor terminal D and PCM terminal 36 - Open circuit in MAF sensor ground circuit

Indicates the inspection step No. to be performed (F, K and P section)

MAF SENSOR
HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

PCM
HARNESS SIDE CONNECTOR
(VIEW FROM HARNESS SIDE)

STEP shows the order of troubleshooting

STEP	INSPECTION	YES	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY Are related Service Bulletins and/or on-line repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, then go to next step.
3	VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT - Connect NGS tester to DLC-2. - Start engine. - Access MAF V PID using NGS tester. - Is MAF V PID within 0.2 - 8.3 V?	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. See F1-33 INTERMITTENT CONCERN TROUBLESHOOTING
4	INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR - Turn ignition key to OFF. - Disconnect MAF sensor connector. - Check for poor connection (damaged, pulled-out terminals, corrosion etc.). - Are there any malfunctions?	Yes	Repair or replace terminals, then go to Step 8.

Indicates the connector related to the inspection

INSPECTION describes the method to quickly determine the failed part(s).

ACTION describes the appropriate action to take as according to the result (Yes/No). Reference item(s) to perform ACTION.

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HOW TO USE THIS MANUAL

Using the diagnosis index

- The symptoms of the malfunctions are listed in the diagnostic index for symptom troubleshooting.
- The exact malfunction symptoms can be selected by following the index.

No.	TROUBLESHOOTING ITEM		DESCRIPTION	Page
1	Melting of main or other fuses		—	See F2-6 MELT NO.1 MAIN OR OTHER FUSE
2	Will not crank		Starter does not work.	See F2-7 NO.2 MIL COMES ON
3	Hard start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	See F2-8 NO. 3 WILL NOT CRANK
4	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle and/or after start.	See F2-9 NO. 4 HARD START/ LONG CRANK/ERRATIC CRANK
5	Crank normally but will not start		Starter cranks engine at normal speed but engine will not run.	See F2-11 NO. 5 ENGINE-STALLS AFTER START/AT IDLE
6	Slow return to idle		Engine takes more time than normal to return to idle speed.	See F2-15 NO.6 CRANKS NORMALLY BUT WILL NOT START
7	Engine runs rough/rotling		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	See F2-19 NO. 7 SLOW RERUN TO IDLE
8	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition key is turned to OFF.	See F2-20 NO. 8 ENGINE RUNS ROUGH/ROLLING IDLE
9	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	See F2-23 NO. 9 FAST IDLE/RUNS ON

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HOW TO USE THIS MANUAL

Using the quick diagnosis chart

- The chart lists the relation between the symptom and the cause of the malfunction.
- The chart is effective in quickly narrowing down the relation between symptom and cause of the malfunction. It also specifies the area of the common cause when multiple malfunction symptoms occur.
- The appropriate diagnostic inspection relating to malfunction cause as specified by the symptoms can be selected by looking down the diagnostic inspection column of the chart.

GI

PART WHICH MAY BE THE SYMPTOM		PARTS WHICH MAY BE THE CAUSE OF PROBLEMS														
		QUICK DIAGNOSIS CHART														
Trouble shooting item		Possible factor	Cooling fan seated improperly	Accelerator cable free play misadjustment	Fuel quality	Engine overheating	Air cleaner element clogged or restriction	Air leakage from intake-air system (Loose tubes, cracks,broken gaskets)	IAC valve improper operation	Throttle body malfunction	Vacuum leakage (Vacuum hose damage,misrouting)	Ignition coil malfunction (e.g.open,short or cracks)	Initial Ignition timing misadjustment (CMP&crankshaft pulley misadjustment)	Spark plug malfunction	High-tension leads malfunction (Cracks,open,low resistance)	CMP sensor damaged (e.g open or short circuits)
1	Melting of main or other fuses															
2	Will not crank															
3	Hard to start/long crank/erratic start/erratic crank				x		x	x			x			x	x	x
4	Engine stalls. After start/at Idle				x	x	x	x	x		x	x	x	x	x	x
5	Cranks normally but will not start				x	x		x	x		x	x	x	x	x	x
6	Slow return to idle									x						
7	Engine runs rough/rolling idle				x	x		x	x		x		x	x	x	x
8	Fast idle/runs on			x												
9	Low idle/stalls during deceleration							x	x							
10	Engine stalls/quits.	Acceleration/cruise			x	x	x	x		x	x			x		x
	Engine runs rough.	Acceleration/cruise			x	x	x	x		x	x			x		x
	Misses	Acceleration/cruise			x	x	x	x		x	x			x		x
	Buck/jerk	Acceleration/cruise/ deceleration			x	x	x	x		x	x			x		x
	Hesitation/stumble	Acceleration			x	x	x	x		x	x			x		x
	Surges	Acceleration/cruise			x	x	x	x		x	x			x		x
11	Lack/loss of power	Acceleration/cruise			x	x	x	x		x				x		x
12	Knocking/pinging	Acceleration/cruise					x									
13	Poor fuel economy				x		x							x	x	
14	Emissions compliance						x	x		x				x	x	
15	High oil consumption/leakage															
16	Cooling system concerns	Overheating														
17	Cooling system concerns	Runs cold														
18	Exhaust smoke						x							x	x	
19	Fuel odor (In engine compartment)															
20	Engine noise							x			x					
21	Vibration concerns (engine)		x													
22	A/C does not work sufficiently.															
23	A/C is always on or A/C compressor runs continuously.															
24	A/C is not cut off under WOT conditions .															
25	Exhaust sulphur smell				x											
26	Intermittent concerns								x		x	x		x	x	x
27	Constant voltage															
28	Automatic transmission (AT) concerns	Upshift/downshift/ engagement														
See Section K TROUBLESHOOTING																

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HOW TO USE THIS MANUAL

Using the symptom troubleshooting

- Symptom troubleshooting shows diagnostic procedures, inspection methods, and proper action to take for each trouble symptom.

DESCRIPTION
describes what kind of TROUBLE SYMPTOM

POSSIBLE CAUSE
describes possible point of malfunction

STEP shows the order of troubleshooting.

Reference item (s) for additional information to perform INSPECTION.

INSPECTION describes the method to quickly determine the failed part.

14		TROUBLE SYMPTOM	
DESCRIPTION		Engine flares up or slips when upshifting or down shifting - When accelerator pedal is depressed for driveway, engine speed increase but vehicle speed increase slowly. - When accelerator is depressed while driving, engine speed increases but vehicle not.	
POSSIBLE CAUSE		- There is clutch slip because clutch is stuck or line pressure is low. - Clutch stuck, slippage (forward clutch, 3-4 clutch, 2-4 brake band, one-way clutch 1, one-way clutch 2) - Line pressure low - Malfunction or mis-adjustment of TP sensor - Malfunction of VSS - Malfunction of input/turbine speed sensor - Malfunction of sensor ground - Malfunction of shift solenoid A, B or C - Malfunction of TCC solenoid valve - Malfunction of body ground - Malfunction of throttle cable - Malfunction of throttle valve body - Poor operating of mechanical pressure - Selector lever position disparity - TR switch position disparity Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-board Diagnostic and Automatic Transaxle Basic Inspection are conducted.	

Diagnostic procedure			
STEP	INSPECTION		ACTION
1	Is line pressure okay?	Yes No	Yes Go to next step. No Repair or replace any defective parts according to inspection results.
2	Is shift point okay? See K-5 Road Test Preparation	Yes No	Yes Go to next step No Go to symptom troubleshooting No.9 "Abnormal shift".
3	- Stop engine and turn Ignition switch on. - Connect NGS tester to DLC-2. - Simulate SHIFT A, SHIFT B and SHIFT C PIDs for ON. - Is operating sound of shift solenoids heard?	Yes No	Yes - Overhaul control valve body and repair or replace any defective parts. See ATX Workshop Manual GF4A-EL (1666-1A-99F) No - If problem remains, replace or overhaul transaxle and repair or replace defective parts. - Inspect for bend, damage, corrosion or loose connection if shift solenoid A, B, or C terminal on ATX. - Inspect for shift solenoid mechanical stuck. - See K-14 Inspection of Operation - If shift solenoids are okay, inspect for open or short circuit between PCM connector terminal A, B or C.
4	- Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. - If vehicle is repaired, troubleshooting completed. - If vehicle is not repaired or additional diagnostic information is not available, replace or reprogram PCM.		

ACTION describes the appropriate action to take as a result (YES/NO) of INSPECTION.

How to perform ACTION is described in the relative material shown.

Reference item(s) to perform ACTION.

XME2010007

UNITS

UNITS

UNITS

A6E201200002W01

Electrical current	A (ampere)
Electric power	W (watt)
Electric resistance	Ω (ohm)
Electric voltage	V (volt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Positive pressure	kPa (kilo pascal)
	kgf/cm ² (kilogram force per square centimeter)
	psi (pounds per square inch)
Torque	N·m (Newton meter)
	kgf·m (kilogram force meter)
	kgf·cm (kilogram force centimeter)
	ft·lbf (foot pound force)
	in·lbf (inch pound force)
Volume	L (liter)
	US qt (U.S. quart)
	Imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
	fl oz (fluid ounce)
Weight	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm² in the following specifications:

210—260 kPa {2.1—2.7 kgf/cm², 30—38 psi}

270—310 kPa {2.7—3.2 kgf/cm², 39—45 psi}

- The actual converted values for 2.7 kgf/cm² are 264 kPa and 38.4 psi. In the first specification, 2.7 is used as an upper limit, so the converted values are rounded down to 260 and 38. In the second specification, 2.7 is used as a lower limit, so the converted values are rounded up to 270 and 39.

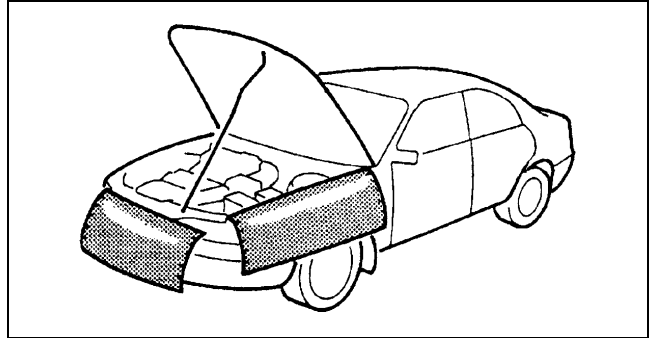
FUNDAMENTAL PROCEDURES

FUNDAMENTAL PROCEDURES

PROTECTION OF VEHICLE

- Always be sure to cover fenders, seats and floor areas before starting work.

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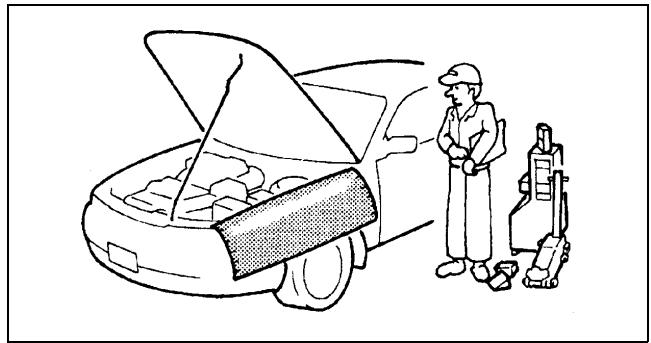


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PREPARATION OF TOOLS AND MEASURING EQUIPMENT

- Be sure that all necessary tools and measuring equipment are available before starting any work.

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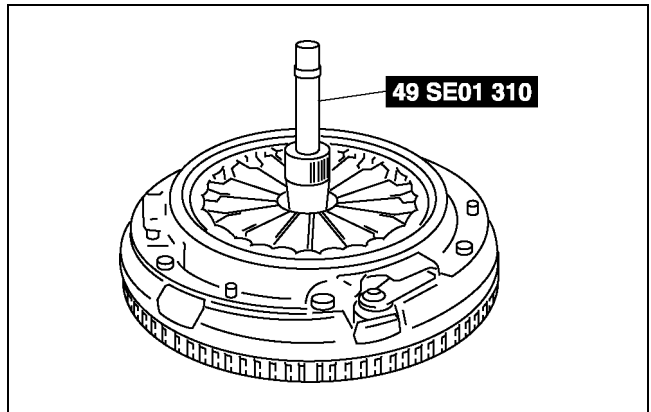


X3U000WAH

SPECIAL SERVICE TOOLS

- Use special service tools or equivalent when they are required.

A6E201400004W03



X3U000WAJ

OIL LEAKAGE INSPECTION

- Use either of the following procedures to identify the type of oil that is leaking:

A6E201400004W04

Using UV Light (Black Light)

1. Remove on the engine or transaxle.

Note

- Referring to the fluorescent dye instruction manual, mix the specified amount of dye into the engine oil or ATF (or transaxle oil).
2. Pour the fluorescent dye into the engine oil or ATF (or transaxle oil).
 3. Allow the engine to run for 30 minutes.
 4. Inspect for dye leakage by irradiating with UV light (black light), and identify the type of oil that is leaking.

FUNDAMENTAL PROCEDURES

GI

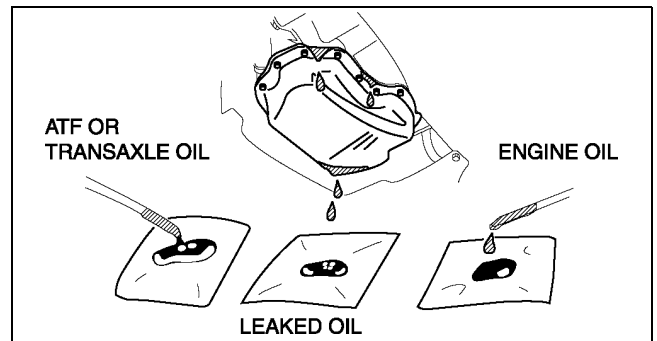
5. If no dye leakage is found, allow the engine to run for another 30 minutes or drive the vehicle then reinspect.
6. Find where the oil is leaking from, then make necessary repairs.

Note

- To determine whether it is necessary to replace the oil after adding the fluorescent dye, refer to the fluorescent dye instruction manual.

Not Using UV Light (Black Light)

1. Gather some of the leaking oil using an absorbent white tissue.
2. Take samples of engine oil and ATF (or transaxle oil), both from the dipstick, and place them next to the leaked oil already gathered on the tissue.
3. Compare the appearance and smell, and identify the type of oil that is leaking.
4. Remove any oil on the engine or transaxle/transmission.
5. Allow the engine to run for 30 minutes.
6. Check the area where the oil is leaking, then make necessary repairs.



XME2014003

DISCONNECTION OF THE NEGATIVE BATTERY CABLE

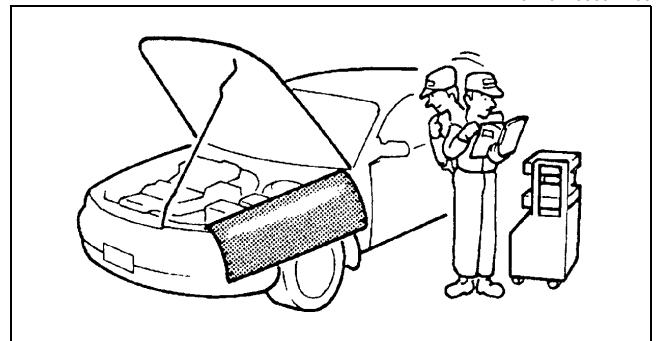
A6E201400004W05

- Before beginning any work, turn the ignition switch to LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS unit to deplete its stored power. Disconnecting the battery cable will delete the memories of the clock, audio, and DTCs, etc. Therefore, it is necessary to verify those memories before disconnecting the cable.
- If the battery had been disconnected during vehicle maintenance or for other reasons, the window will not fully close automatically. Carry out the power window main switch initial setting. (See [S-23 INITIAL SETTING.](#))

REMOVAL OF PARTS

A6E201400004W06

- While correcting a problem, also try to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair. After removing the part, plug all holes and ports to prevent foreign material from entering.

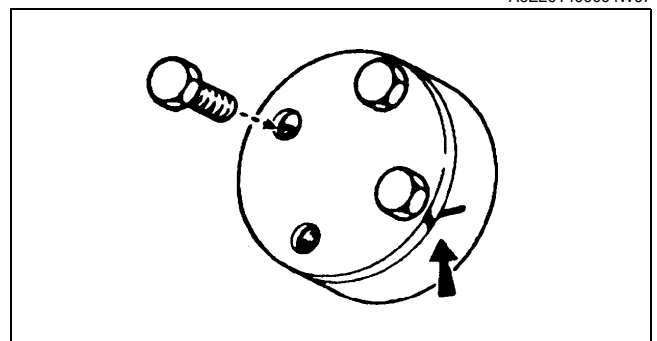


X3U000WAK

DISASSEMBLY

A6E201400004W07

- If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be marked in a place that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



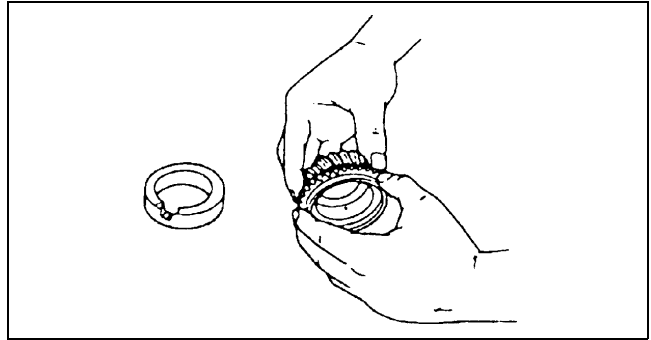
X3U000WAL

FUNDAMENTAL PROCEDURES

INSPECTION DURING REMOVAL, DISASSEMBLY

- When removed, each part should be carefully inspected for malfunction, deformation, damage, and other problems.

A6E201400004W08

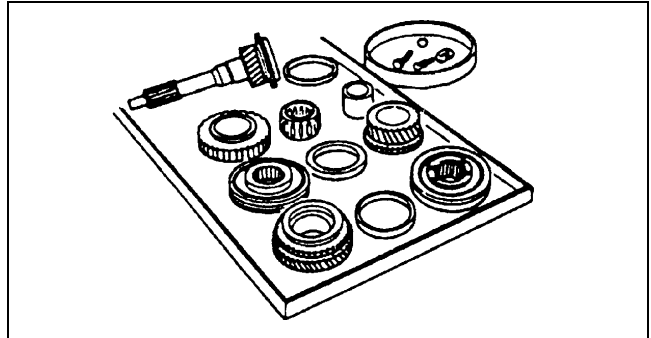


X3U000WAM

ARRANGEMENT OF PARTS

- All disassembled parts should be carefully arranged for reassembly.
- Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.

A6E201400004W09



X3U000WAN

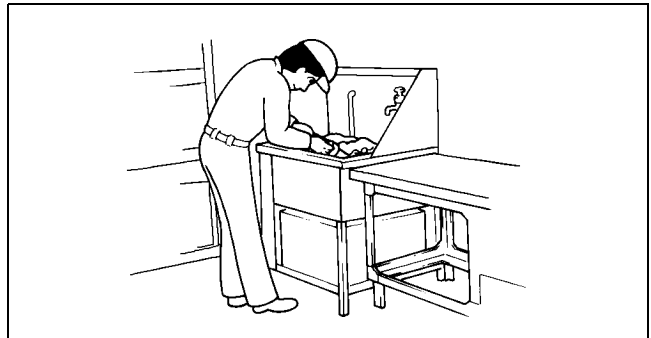
CLEANING OF PARTS

- All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.

A6E201400004W10

Warning

- **Using compressed air can cause dirt and other particles to fly out causing injury to the eyes. Wear protective eye wear whenever using compressed air.**

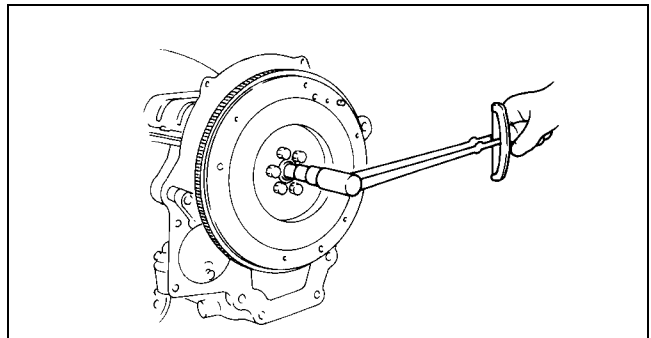


WGIWXX0030J

REASSEMBLY

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.

A6E201400004W11

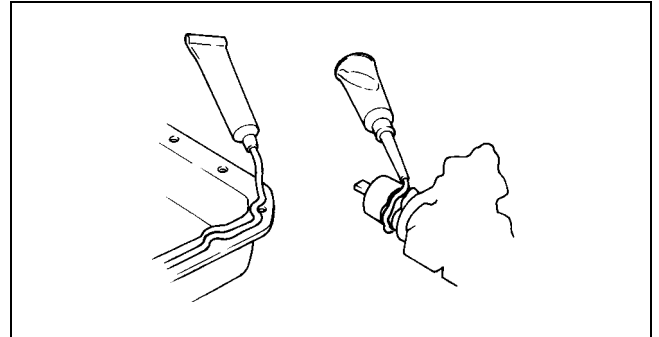


WGIWXX0031J

FUNDAMENTAL PROCEDURES

GI

- If removed, these parts should be replaced with new ones:
 - Oil seals
 - Gaskets
 - O-rings
 - Lockwashers
 - Cotter pins
 - Nylon nuts
- Depending on location:
 - Sealant and gaskets, or both, should be applied to specified locations. When sealant is applied, parts should be installed before sealant hardens to prevent leakage.
 - Oil should be applied to the moving components of parts.
 - Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.

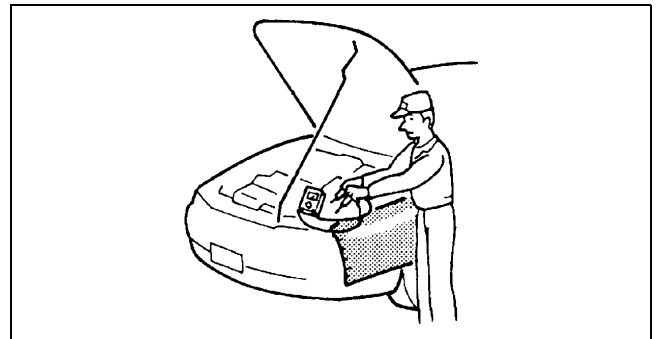


WGIWXX0032J

ADJUSTMENT

- Use suitable gauges and/or testers when making adjustments.

A6E201400004W12

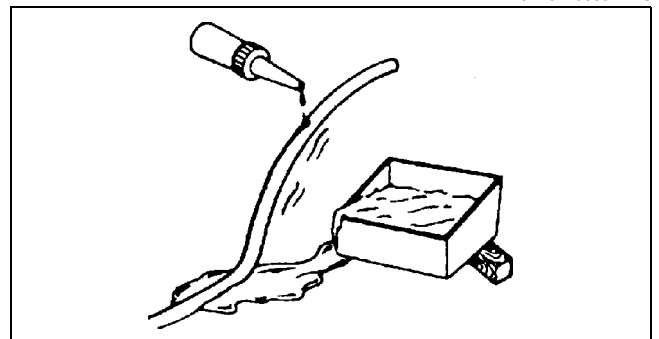


X3U000WAS

RUBBER PARTS AND TUBING

- Prevent gasoline or oil from getting on rubber parts or tubing.

A6E201400004W13

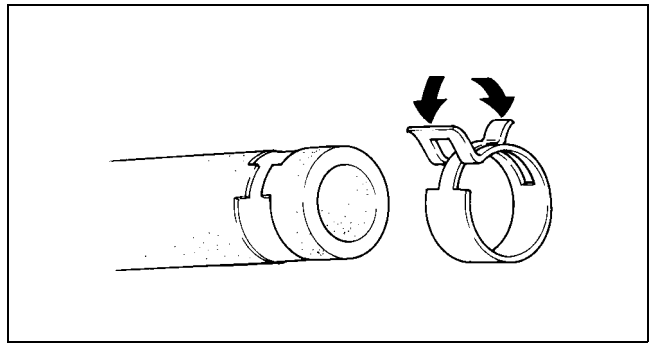


WGIWXX0034E

FUNDAMENTAL PROCEDURES

HOSE CLAMPS

- When reinstalling, position the hose clamp in the original location on the hose and squeeze the clamp lightly with large pliers to ensure a good fit.



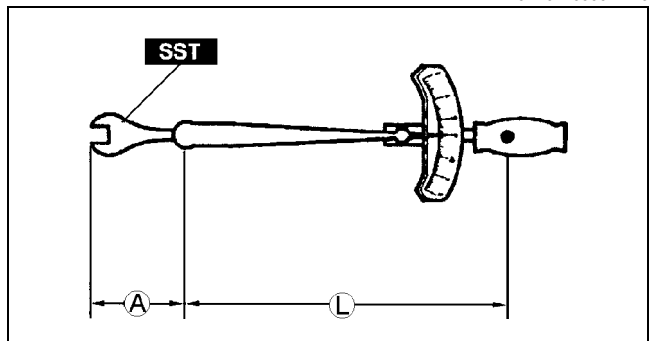
A6E201400004W14

WGIWXX0035J

TORQUE FORMULAS

- When using a torque wrench-**SST** or equivalent combination, the written torque must be recalculated due to the extra length that the **SST** or equivalent adds to the torque wrench. Recalculate the torque using the following formulas. Choose the formula that applies to you.

Torque Unit	Formula
N·m	$N \cdot m \times [L / (L + A)]$
kgf·m	$kgf \cdot m \times [L / (L + A)]$
kgf·cm	$kgf \cdot cm \times [L / (L + A)]$
ft·lbf	$ft \cdot lbf \times [L / (L + A)]$
in·lbf	$in \cdot lbf \times [L / (L + A)]$



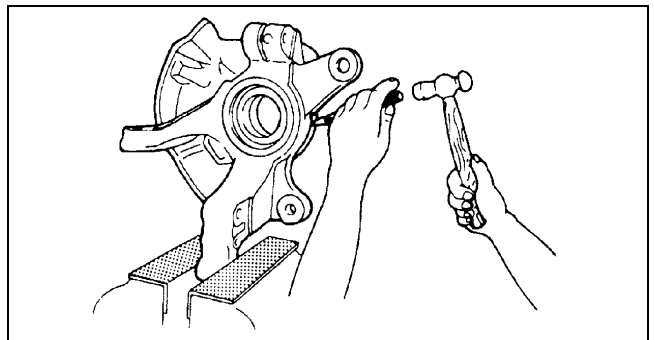
A6E201400004W19

WGIWXX0036E

A : The length of the **SST** past the torque wrench drive
L : The length of the torque wrench

WISE

- When using a vise, put protective plates in the jaws of the vise to prevent damage to parts.



A6E201400004W16

X3U000WAW

FUNDAMENTAL PROCEDURES, INSTALLATION OF RADIO SYSTEM

DYNAMOMETER

A6E201400004W17

GI

- When inspecting and servicing the power train on the dynamometer or speed meter tester, pay attention to the following:
 - Place a fan, preferably a vehicle-speed proportional type, in front of the vehicle.
 - Make sure the vehicle is in a facility with an exhaust gas ventilation system.
 - Since the rear bumper might deform from the heat, cool the rear with a fan. (Surface of the bumper must be below **70 degrees**.)
 - Keep the area around the vehicle uncluttered so that heat does not build up.
 - Watch the water temperature gauge and don't overheat the engine.
 - Avoid added load to the engine and maintain normal driving conditions as much as possible.

Note

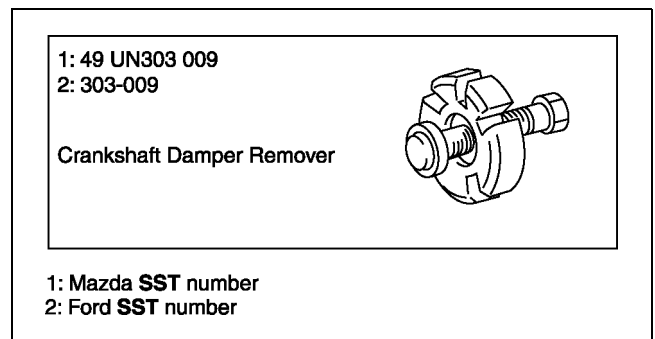
- When only the front wheels are being rotated on the dynamometer, the ABS warning light could illuminate. If the ABS warning light illuminates, turn the ignition switch to the LOCK position, then turn it back to the ON position, run the vehicle at **10km/h** and check that the ABS warning light goes off. (In this case, a DTC will be stored in the memory. To delete this data from the memory, follow the procedure for deleting DTCs (ABS) from memory.) (See **P-6 PRECAUTION (BRAKES)**) to turn off the warning light.)

SST

A6E201400004W18

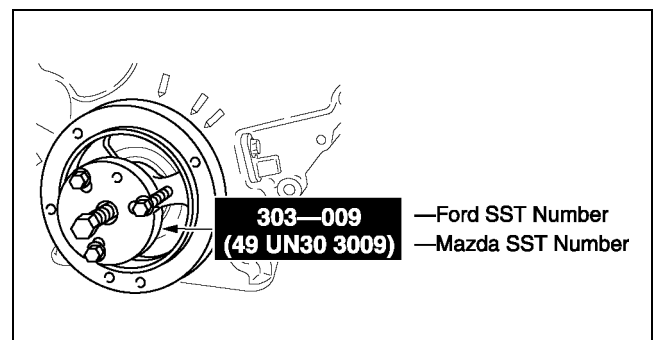
- Some Ford **SST** or equivalent are used as **SSTs** necessary for engine repair. Note that these **SSTs** are marked with Ford **SST** numbers.
- Note that a Ford **SST** number is written together with a corresponding Mazda **SST** number as shown below.

Example (section ST)



XME2014002

Example (except section ST)



XME2014001

INSTALLATION OF RADIO SYSTEM

INSTALLATION OF RADIO SYSTEM

A6E201600005W01

If a radio system is installed improperly or if a high-powered type is used, the CIS and other systems may be affected. When the vehicle is to be equipped with a radio, observe the following precautions:

- Install the antenna at the farthest point from control modules.
- Install the antenna feeder as far as possible from the control module harnesses.
- Ensure that the antenna and feeder are properly adjusted.
- Do not install a high-powered radio system.

ELECTRICAL SYSTEM

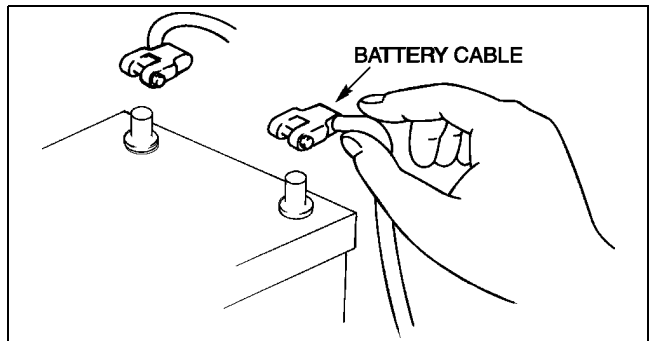
ELECTRICAL SYSTEM

ELECTRICAL PARTS

A6E201700006W01

Battery cable

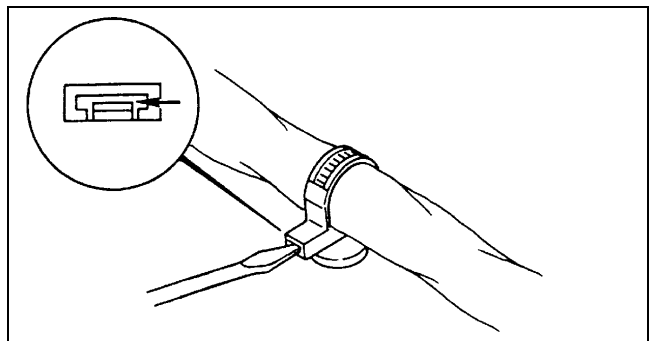
- Before disconnecting connectors or removing electrical parts, disconnect the negative battery cable.



WGIWXX0007E

Wiring Harness

- To remove the wiring harness from the clip in the engine room, pry up the hook of the clip using a flathead screwdriver.



X3U000WBU

CONNECTORS

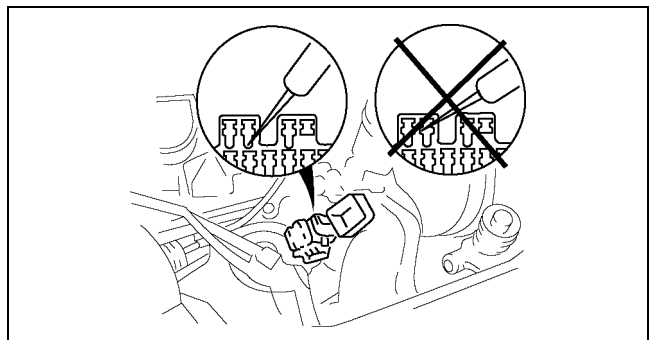
Data link connector

A6E201700006W02

- Insert the probe into the terminal when connecting a jumper wire to the data link connector.

Caution

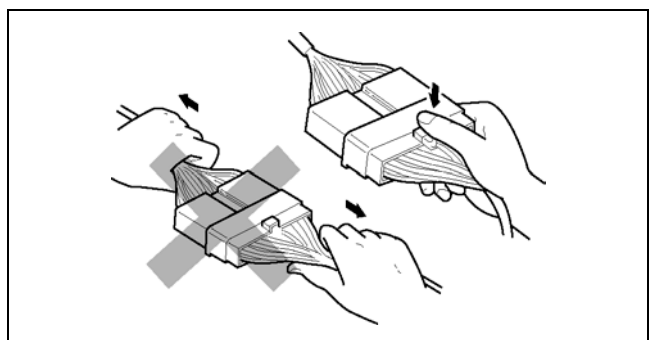
- Inserting a jumper wire probe into the data link connector terminal may damage the terminal.



X3U000WAY

Disconnecting connectors

- When disconnecting connector, grasp the connectors, not the wires.

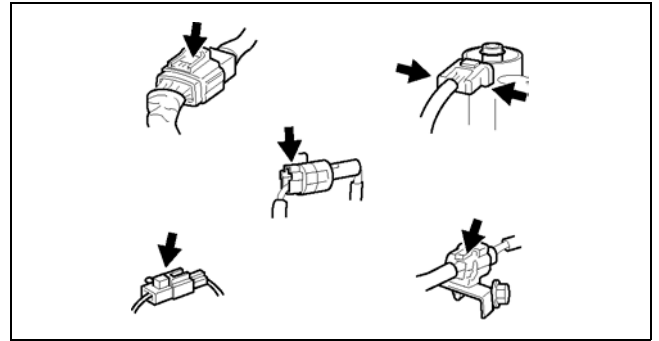


WGIWXX0041E

ELECTRICAL SYSTEM

GI

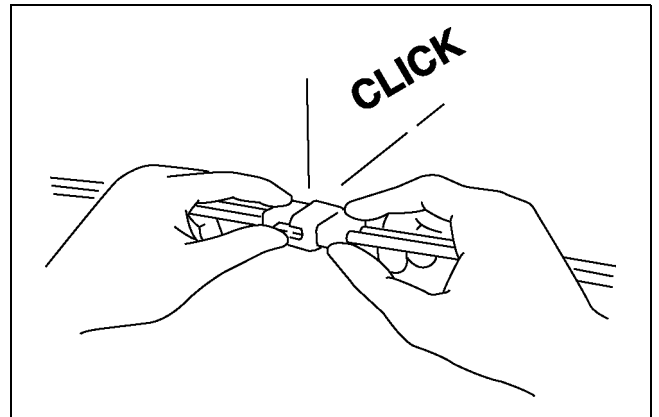
- Connectors can be disconnected by pressing or pulling the lock lever as shown.



WGIWXX0042E

Locking connector

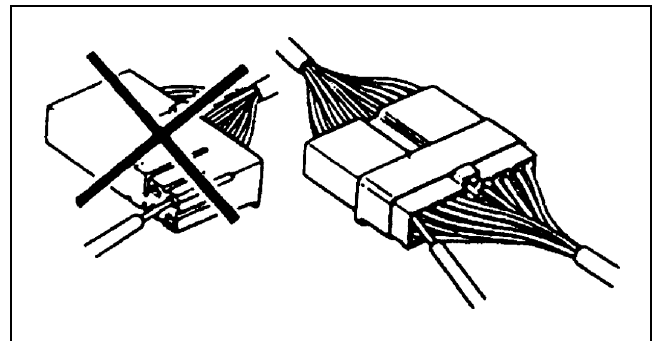
- When locking connectors, listen for a click indicating they are securely locked.



X3U000WB1

Inspection

- When a tester is used to inspect for continuity or measuring voltage, insert the tester probe from the wiring harness side.

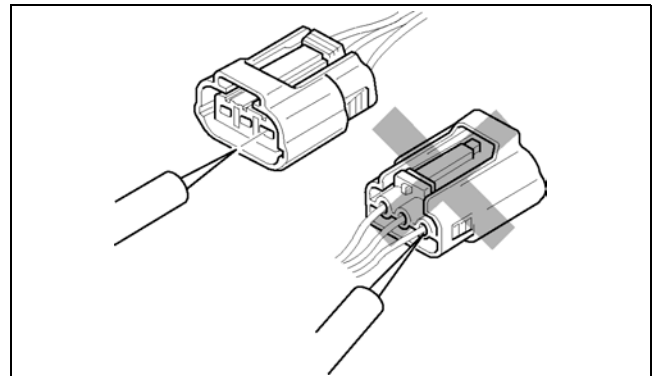


X3U000WB2

- Inspect the terminals of waterproof connectors from the connector side since they cannot be accessed from the wiring harness side.

Caution

- To prevent damage to the terminal, wrap a thin wire around the tester probe before inserting into terminal.



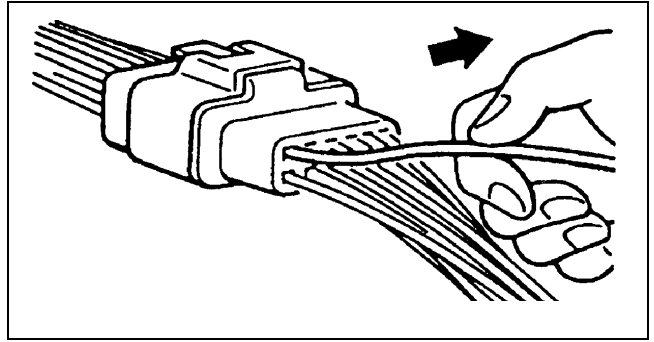
WGIWXX0045E

ELECTRICAL SYSTEM

Terminals

Inspection

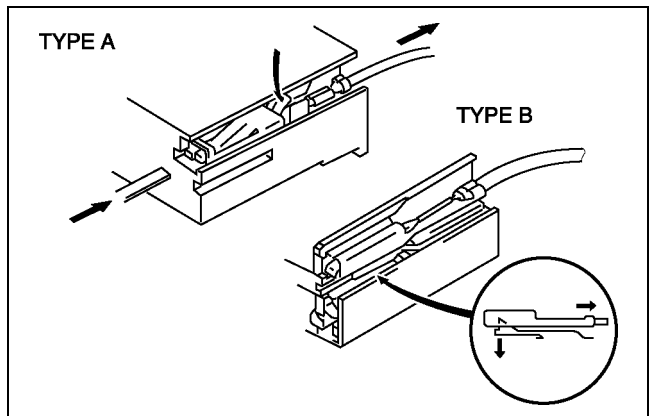
- Pull lightly on individual wires to verify that they are secured in the terminal.



X3U000WB4

Replacement

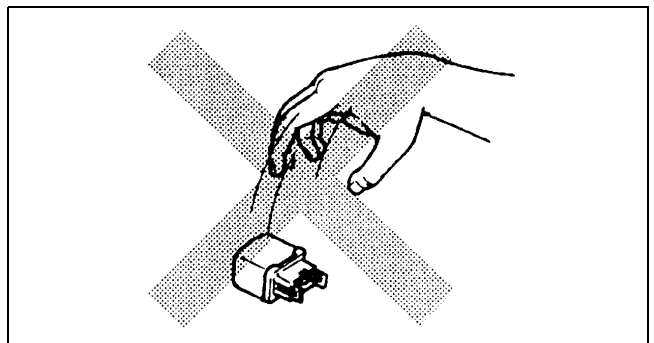
- Use the appropriate tools to remove a terminal as shown. When installing a terminal, be sure to insert it until it locks securely.
- Insert a thin piece of metal from the terminal side of the connector and with the terminal locking tab pressed down, pull the terminal out from the connector.



X3U000WB5

Sensors, Switches, and Relays

- Handle sensors, switches, and relays carefully. Do not drop them or strike them against other objects.



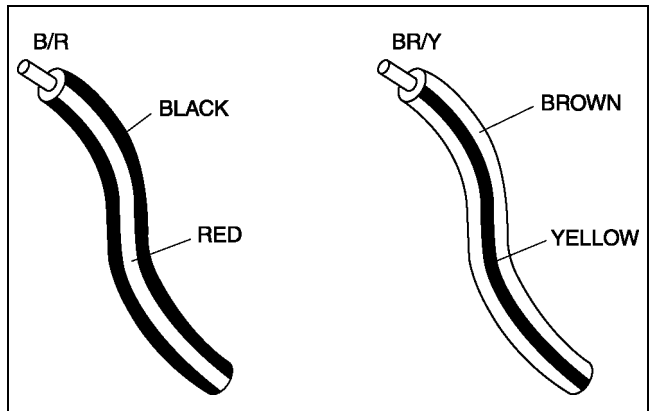
X3U000WB6

Wiring Harness

Wiring color codes

- Two-color wires are indicated by a two-color code symbol.
- The first letter indicates the base color of the wire and the second the color of the stripe.

CODE	COLOR	CODE	COLOR
B	Black	O	Orange
BR	Brown	P	Pink
G	Green	R	Red
GY	Gray	V	Violet
L	Blue	W	White
LB	Light Blue	Y	Yellow
LG	Light Green		

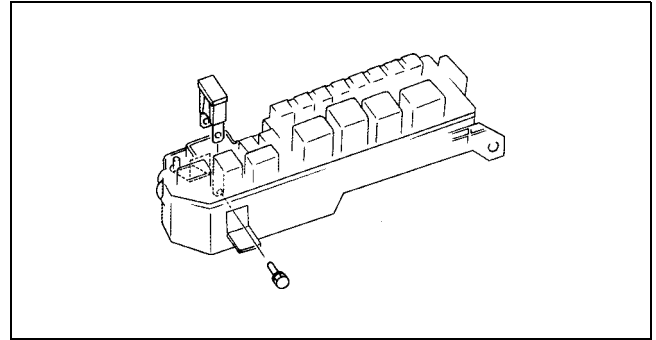


X3U000WB7

ELECTRICAL SYSTEM

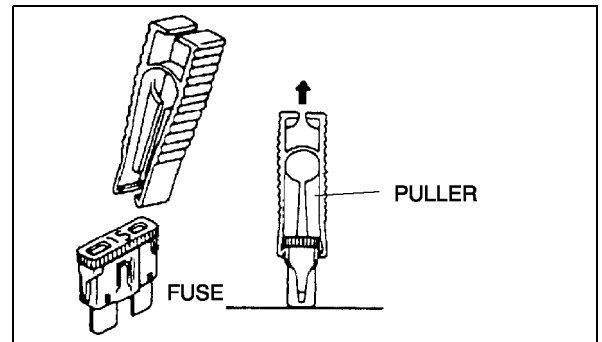
Fuse Replacement

- When replacing a fuse, be sure to replace it with one of the same capacity. If a fuse fails again, the circuit probably has a short and the wiring should be inspected.
- Be sure the negative battery terminal is disconnected before replacing a main fuse.



YMU000WA1

- When replacing a pullout fuse, use the fuse puller.



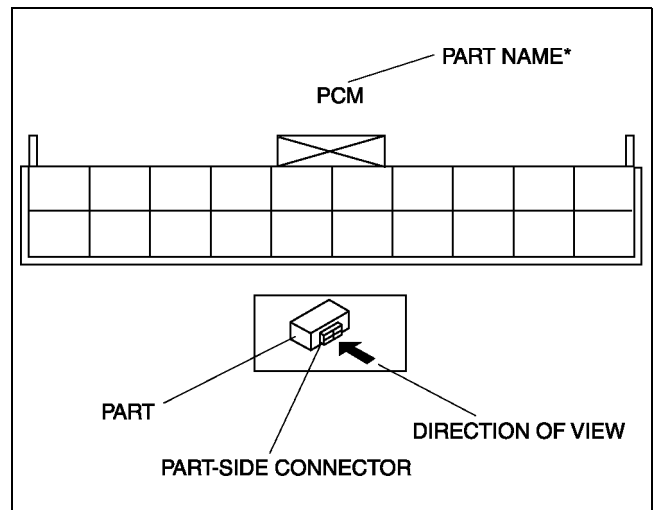
YMU000WAK

Direction of View for Connector

Part-side connector

Direction of view is from the terminal side.

- * : Part names are shown only when there are multiple connector drawings.



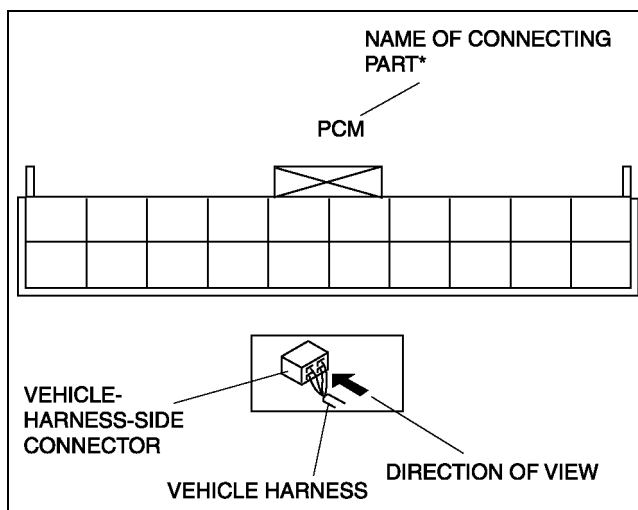
WGIWXX0100E

ELECTRICAL SYSTEM

Vehicle-harness-side connector

Direction of view is from the harness side.

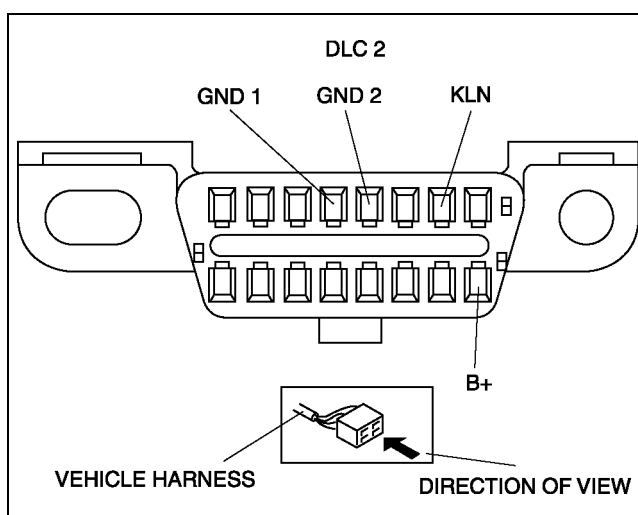
- * : Part names are shown only when there are multiple connector drawings.



WGIWXX0101E

Other

Because vehicle-harness-side connectors, such as the DLC 2, have to be viewed from the terminal side, the direction of view is from the terminal side.



WGIWXX0102E

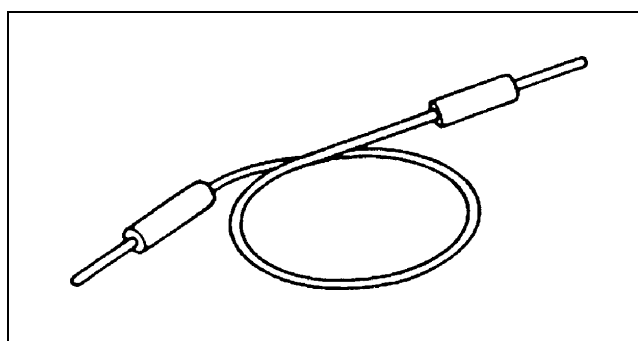
ELECTRICAL TROUBLESHOOTING TOOLS

Jumper wire

- A jumper wire is used to create a temporary circuit. Connect the jumper wire between the terminals of a circuit to bypass a switch.

Caution

- **Do not connect a jumper wire from the power source line to a body ground. This may cause burning or other damage to wiring harnesses or electronic components.**

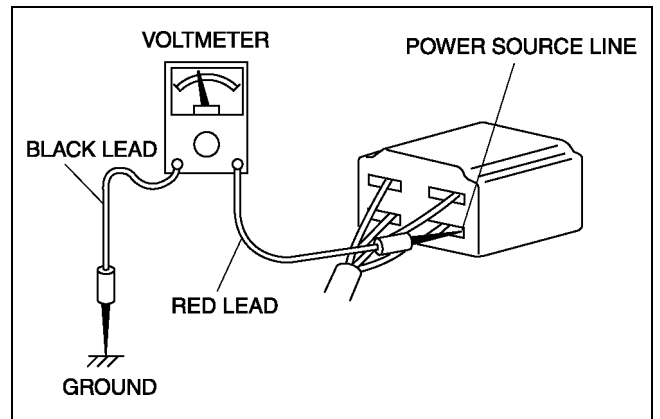


X3U000WBB

ELECTRICAL SYSTEM

Voltmeter

- The DC voltmeter is used to measure circuit voltage. A voltmeter with a range of **15 V or more** is used by connecting the positive (+) probe (red lead wire) to the point where voltage will be measured and the negative (-) probe (black lead wire) to a body ground.



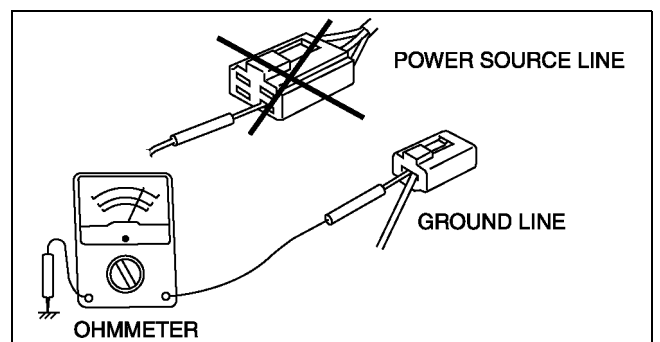
X3U000WBC

Ohmmeter

- The ohmmeter is used to measure the resistance between two points in a circuit and to inspect for continuity and short circuits.

Caution

- Do not connect the ohmmeter to any circuit where voltage is applied. This will damage the ohmmeter.**



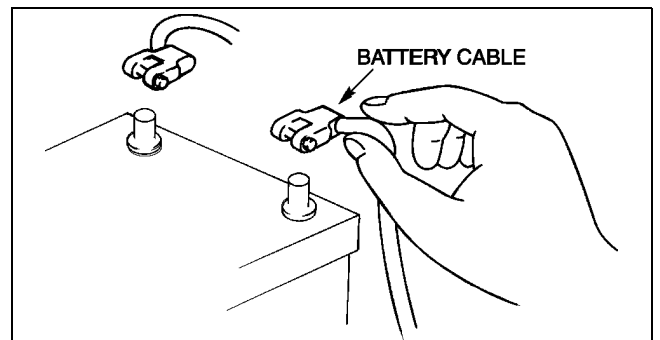
YMU000WAL

PRECAUTIONS BEFORE WELDING

Vehicles have various electrical parts. To protect the parts from excessive current generated when welding, be sure to perform the following procedure.

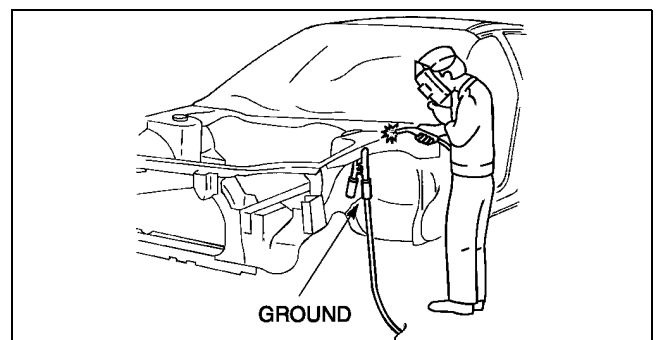
A6E201700006W04

1. Turn the ignition switch to the LOCK position.
2. Disconnect the battery cables.



WGIWXX0007E

3. Securely connect the welding machine to the ground near the welding area.
4. Cover the peripheral parts of the welding area to protect them from weld spatter.



WGIWXX0008E

JACKING POSITIONS, VEHICLE LIFT (2 SUPPORTS), SAFETY STANDS (RIGID RACK) POSITIONS

JACKING POSITIONS ,VEHICLE LIFT (2 SUPPORTS), SAFETY STANDS (RIGID RACK) POSITIONS

JACKING POSITIONS, VEHICLE LIFT (2 SUPPORTS) AND SAFETY STAND (RIGID RACK) POSITIONS

A6E202200019W01

Jacking Positions

Warning

- Improperly jacking a vehicle is dangerous. The vehicle can slip off the jack and cause serious injury. Use only the correct front and rear jacking points and block the wheels.
- Use safety stands to support the vehicle after it has been lifted.

Front

- At the jacking plate of the engine support member.

Rear

- At the center of torsion beam axle.

Vehicle Lift Positions

Front and rear

Warning

- Unstably lifting a vehicle is dangerous. The vehicle can slip off the lift and cause serious injury and/or vehicle damage. Make sure that the vehicle is on the lift horizontally by adjusting the height of support at the end of the arm of the lift.

Safety Stand Positions

Front

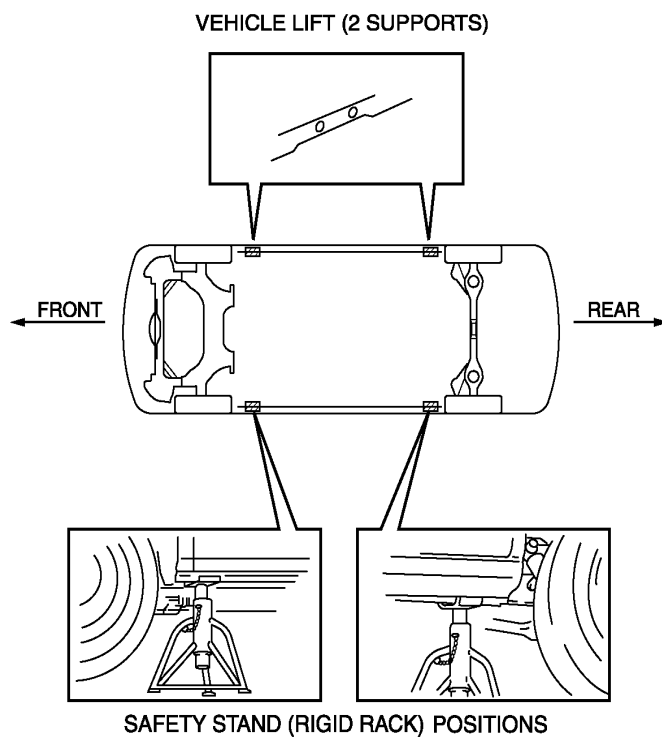
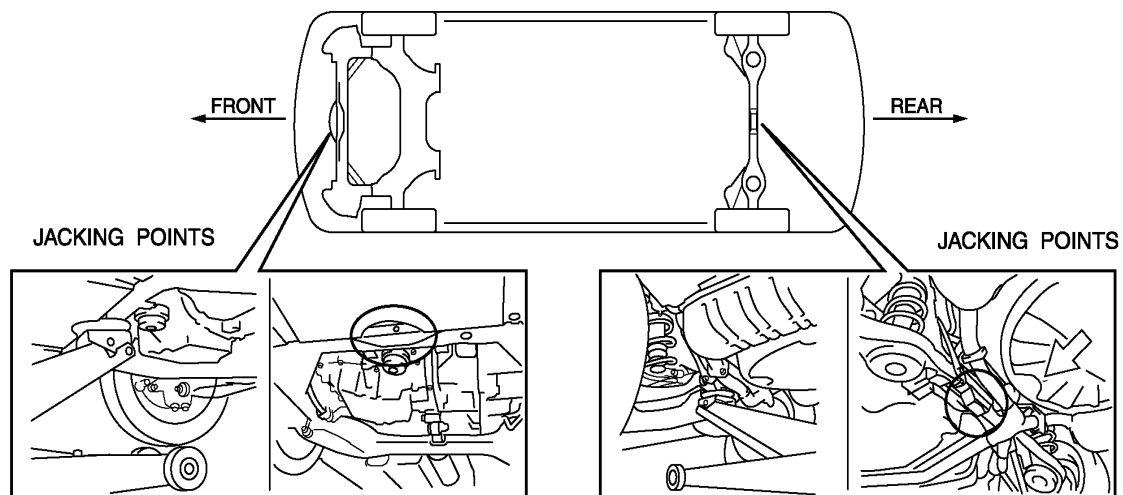
- Both sides of the vehicle, on side sills.

Rear

- Both sides of the vehicle, on side sills.

JACKING POSITIONS ,VEHICLE LIFT (2 SUPPORTS), SAFETY STANDS (RIGID

Jacking positions, vehicle lift (2 supports) and safety stand (rigid rack) positions view



A6E2021W001

TOWING

TOWING

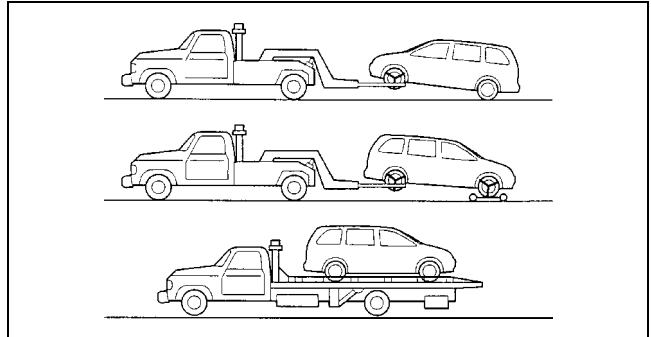
TOWING

A6E202400009W01

- Proper lifting and towing are necessary to prevent damage to the vehicle. Government and local laws must be followed.
- A towed vehicle should have its front wheels off the ground. If excessive damage or other conditions prevent this, use wheel dollies.
- When towing with the rear wheels on the ground, release the parking brake.

Caution

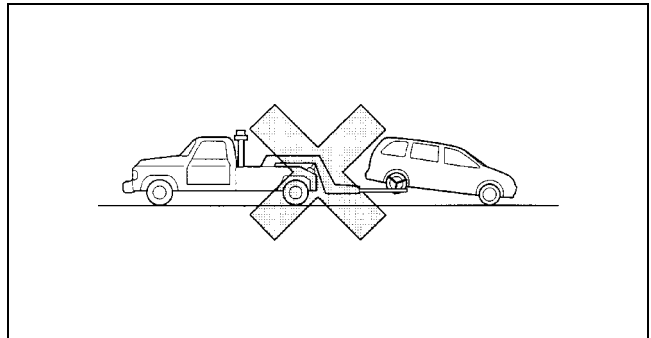
- **Do not tow the vehicle backward with driving wheels on the ground. This may cause internal damage to the transaxle.**



YMU000WA3

Caution

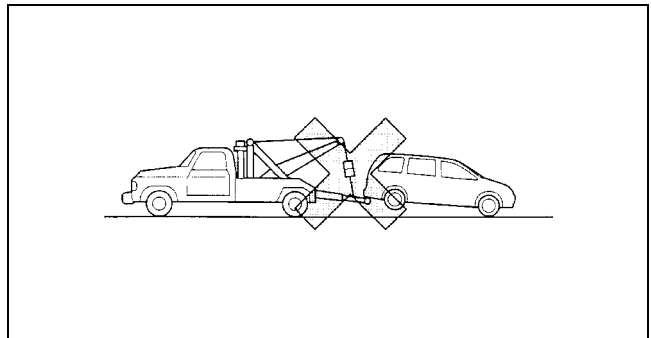
- **Do not tow with sling-type equipment. This could damage your vehicle. Use wheel-lift or flatbed equipment.**



YMU000WA4

Caution

- **Do not use the hook loops under the front and rear for towing. They are designed ONLY for tying down the vehicle when it is being transported. Using them for towing will damage the bumper.**



YMU000WA5

TOWING HOOKS

A6E202400009W02

Caution

- The towing hooks should be used only in an emergency (to get the vehicle out of a ditch or a snow bank, for example).
- When using the towing hooks, always pull the cable or chain in a straight direction with respect to the hook. Apply no sideways force.

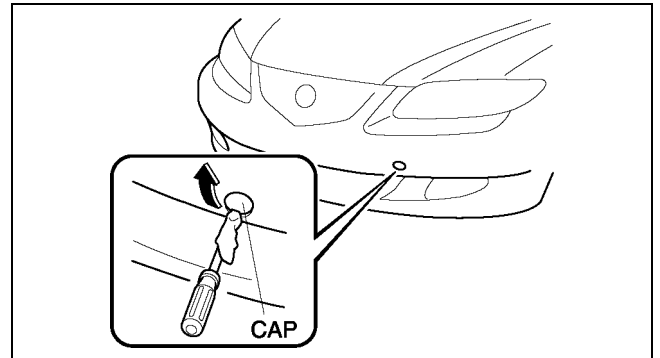
TOWING

FRONT

1. Remove the towing eyelet and the lug wrench from the trunk.
2. Wrap a screwdriver or similar tool with a soft cloth to prevent damage to the painted bumper and open the cap located on the front bumper, below the left headlight.

Caution

- The cap cannot be completely removed. Do not use excessive force as it may damage the cap or scratch the painted bumper surface.

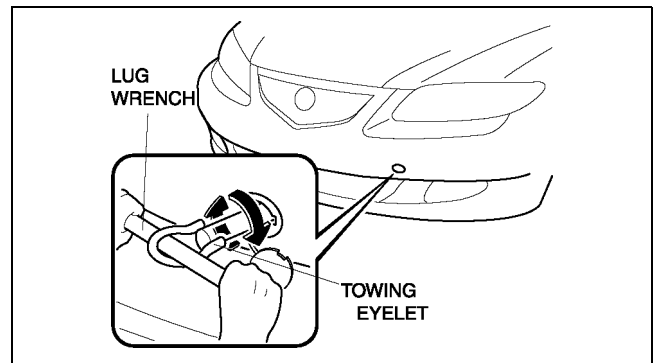


A6E2024W004

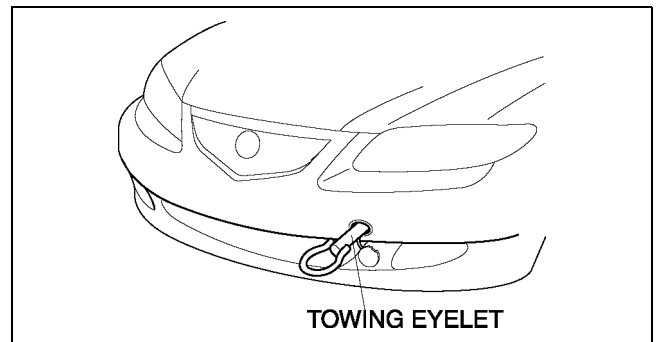
3. Securely install the towing eyelet using the lug wrench.
4. Hook the towing rope to the towing eyelet.

Caution

- If the towing eyelet is not securely tightened, it may loosen or disengage from the bumper when towing the vehicle. Make sure that the towing eyelet is securely tightened to the bumper.

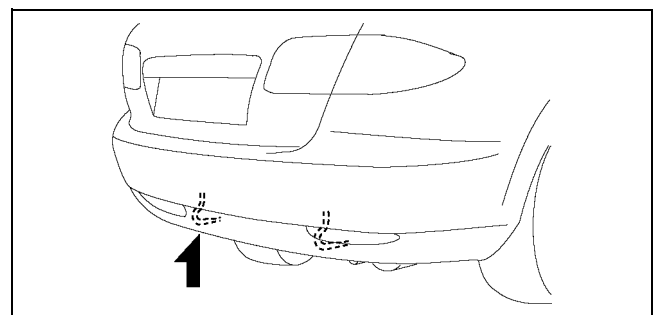


A6E2024W002



A6E2024W003

REAR

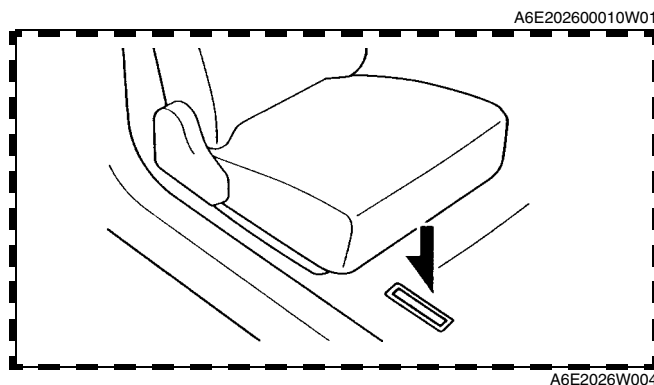


A6E2024W001

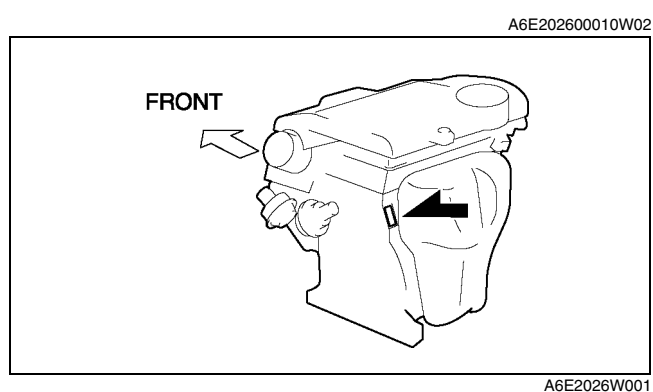
IDENTIFICATION NUMBER LOCATIONS

IDENTIFICATION NUMBER LOCATIONS

VEHICLE IDENTIFICATION NUMBER(VIN)



ENGINE IDENTIFICATION NUMBER



NEW STANDARDS

NEW STANDARDS

NEW STANDARDS

A6E202800020W01

GI

- Following is a comparison of the previous standard and the new standard.

New Standard		Previous Standard		Remark
Abbreviation	Name	Abbreviation	Name	
AP	Accelerator Pedal	—	Accelerator Pedal	
ACL	Air Cleaner	—	Air Cleaner	
A/C	Air Conditioning	—	Air Conditioning	
BARO	Barometric Pressure	—	Atmospheric Pressure	
B+	Battery Positive Voltage	Vb	Battery Voltage	
—	Brake Switch	—	Stoplight Switch	
—	Calibration Resistor	—	Corrected Resistance	#6
CMP sensor	Camshaft Position Sensor	—	Crank Angle Sensor	
CAC	Charge Air Cooler	—	Intercooler	
CLS	Closed Loop System	—	Feedback System	
CTP	Closed Throttle Position	—	Fully Closed	
CPP	Clutch Pedal Position	—	Idle Switch	
CIS	Continuous Fuel Injection System	—	Clutch Position	
CS sensor	Control Sleeve Sensor	CSP sensor	Control Sleeve Position Sensor	#6
CKP sensor	Crankshaft Position Sensor	—	Crank Angle Sensor 2	
DLC	Data Link Connector	—	Diagnosis Connector	
DTM	Diagnostic Test Mode	—	Test Mode	#1
DTC	Diagnostic Trouble Code(s)	—	Service Code(s)	
DI	Distributor Ignition	—	Spark Ignition	
DLI	Distributorless Ignition	—	Direct Ignition	
EI	Electronic Ignition	—	Electronic Spark Ignition	#2
ECT	Engine Coolant Temperature	—	Water Thermo	
EM	Engine Modification	—	Engine Modification	
—	Engine Speed Input Signal	—	Engine RPM Signal	
EVAP	Evaporative Emission	—	Evaporative Emission	
EGR	Exhaust Gas Recirculation	—	Exhaust Gas Recirculation	
FC	Fan Control	—	Fan Control	
FF	Flexible Fuel	—	Flexible Fuel	
4GR	Fourth Gear	—	Overdrive	
—	Fuel Pump Relay	—	Circuit Opening Relay	#3
FSO solenoid	Fuel Shut Off Solenoid	FCV	Fuel Cut Valve	#6
GEN	Generator	—	Alternator	
GND	Ground	—	Ground/Earth	
HO2S	Heated Oxygen Sensor	—	Oxygen Sensor	With heater
IAC	Idle Air control	—	Idle Speed Control	
—	IDM Relay	—	Spill Valve Relay	#6
—	Incorrect Gear Ratio	—	—	
—	Injection Pump	FIP	Fuel Injection Pump	#6
—	Input/Turbine Speed Sensor	—	Pulse Generator	
IAT	Intake Air Temperature	—	Intake Air Thermo	
KS	Knock Sensor	—	Knock Sensor	
MIL	Malfunction Indicator Lamp	—	Malfunction Indicator Light	
MAP	Manifold Absolute Pressure	—	Intake Air Pressure	
MAF sensor	Mass Air Flow Sensor	—	Airflow Sensor	
MFL	Multiport Fuel Injection	—	Multiport Fuel Injection	
OBD	On-Board Diagnostic	—	Diagnosis/SelfDiagnosis	
OL	Open Loop	—	Open Loop	

NEW STANDARDS

New Standard		Previous Standard		Remark
Abbreviation	Name	Abbreviation	Name	
—	Output Speed Sensor	—	Vehicle Speed Sensor 1	
OC	Oxidation Catalytic Converter	—	Catalytic Converter	
O2S	Oxygen Sensor	—	Oxygen Sensor	
PNP	Park/Neutral Position	—	Park/Neutral Range	
—	PCM Control Relay	—	Main Relay	#6
PSP	Power Steering Pressure	—	Power Steering Pressure	
PCM	Powertrain Control Module	ECU	Engine Control Unit	#4
—	Pressure Control Solenoid	—	Line Pressure Solenoid Valve	
PAIR	Pulsed Secondary Air Injection	—	Secondary Air Injection System	Pulsed injection
—	Pump Speed Sensor	—	NE Sensor	#6
AIR	Secondary Air Injection	—	Secondary Air Injection System	Injection with air pump
SAPV	Secondary Air Pulse Valve	—	Reed Valve	
SFI	Sequential Multipoint Fuel Injection	—	Sequential Fuel Injection	
—	Shift Solenoid A	—	12 Shift Solenoid Valve	
		—	Shift A Solenoid Valve	
—	Shift Solenoid B	—	23 Shift Solenoid Valve	
		—	Shift B Solenoid Valve	
—	Shift Solenoid C	—	34 Shift Solenoid Valve	
3GR	Third Gear	—	3rd Gear	
TWC	Three Way Catalytic Converter	—	Catalytic Converter	
TB	Throttle Body	—	Throttle Body	
TP sensor	Throttle Position Sensor	—	Throttle Sensor	
TCV	Timer Control Valve	TCV	Timing Control Valve	#6
TCC	Torque Converter Clutch	—	Lockup Position	
TCM	Transmission (Transaxle) Control Module	—	ECAT Control Unit	
—	Transmission (Transaxle) Fluid Temperature Sensor	—	ATF Thermosensor	
TR	Transmission (Transaxle) Range	—	Inhibitor Position	
TC	Turbocharger	—	Turbocharger	
VSS	Vehicle Speed Sensor	—	Vehicle Speed Sensor	
VR	Voltage Regulator	—	IC Regulator	
VAF sensor	Volume Air Flow Sensor	—	Air flow Sensor	
WUTWC	Warm Up Three Way Catalytic Converter	—	Catalytic Converter	#5
WOT	Wide Open Throttle	—	Fully Open	

#1 : Diagnostic trouble codes depend on the diagnostic test mode

#2 : Controlled by the PCM

#3 : In some models, there is a fuel pump relay that controls pump speed. That relay is now called the fuel pump relay (speed).

#4 : Device that controls engine and powertrain

#5 : Directly connected to exhaust manifold

#6 : Part name of diesel engine

ABBREVIATIONS

ABBREVIATIONS

ABBREVIATIONS

A6E203000011W01

A/C	Air conditioner
ABS	Antilock brake system
ACC	Accessories
ALR	Automatic locking retractor
ATF	Automatic transaxle fluid
ATX	Automatic transaxle
CAN	Controller area network
CM	Control module
DIS	Drive information system
DSC	Dynamic stability control
ELR	Emergency locking retractor
ESA	Electronic spark advance
EX	Exhaust
GPS	Global positioning system
HI	High
IAC	Idle air control
IG	Ignition
IN	Intake
INT	Intermittent
KOEO	Key on engine off
KOER	Key off engine running
LCD	Liquid crystal display
LED	Light emitting diode
LF	Left front
LH	Left hand
L.H.D.	Left hand drive
LO	Low
LR	Left rear
M	Motor
MAX	Maximum
MTX	Manual transaxle

O/D	Overdrive
OCV	Oil control valve
OFF	Switch off
ON	Switch on
P/S	Power steering
P/W CM	Power window control module
PATS	Passive anti-theft system
PCV	Positive crankcase ventilation
PID	Parameter identification
REC	Recirculate
RF	Right front
RH	Right hand
R.H.D.	Right hand drive
RR	Right rear
SAS	Sophisticated air bag sensor
SST	Special service tool
SW	Switch
TDC	Top dead center
TFT	Transaxle fluid temperature
TNS	Tail number side lights
TP	Throttle position
TR	Transaxle range
TWC	Three way catalytic converter
VAD	Variable air duct
VIS	Variable intake-air system
VTCS	Variable tumble control system
VVT	Variable valve timing
WDS	Worldwide diagnostic system
4SD	4 door sedan
5HB	5 door hatchback

PRE-DELIVERY INSPECTION

PRE-DELIVERY INSPECTION

PRE-DELIVERY INSPECTION

A6E203200012W01

PRE-DELIVERY INSPECTION TABLE

EXTERIOR

- **INSPECT** and **ADJUST**, if necessary, the following items to specification:
 - ☐ Glass, exterior bright metal and paint for damage
 - ☐ All weatherstrips for damage or detachment
 - ☐ Door operation and alignment including side door and back door
 - ☐ Wheel lug nuts
 - ☐ Tire pressures
 - ☐ Headlight aiming
 - ☐ Headlight cleaner and fluid level (if equipped)
 - ☐ Operation of bonnet release and lock
 - ☐ Operation of liftgate and fuel lid opener
 - **INSTALL** the following parts:
 - ☐ Flap (front and rear)
 - ☐ Wheel caps or rings (if equipped)

UNDER BONNET—ENGINE OFF

- **INSPECT** and **ADJUST**, if necessary, the following items to specification:
 - ☐ Fuel, engine coolant, and hydraulic lines, fittings, connections, and components for leaks
 - ☐ Accelerator cable and linkage for free movement
 - ☐ Tension of drive belts
 - ☐ Tightness of water hose clamps
 - ☐ Tightness of battery terminals, electrolyte level and specific gravity
 - ☐ Radiator coolant level and specific gravity
 - ☐ Engine oil level
 - ☐ Oil level in steering gearbox
 - ☐ Windshield washer tank fluid level
 - ☐ Brake master cylinder fluid level
 - ☐ Clutch master cylinder fluid level (MTX only)
 - ☐ Power steering fluid level
 - ☐ Manual transaxle oil level (MTX only)
- CLEAN** the spark plugs

INTERIOR

- **INSTALL** the following parts:
 - ☐ Fuse for accessories
 - **CHECK** the operations of the following items:
 - ☐ All lights including warning, and indicator lights
 - ☐ Cigarette lighter and clock
 - ☐ Ignition switch and steering lock
 - ☐ Transaxle range switch (ATX only)
 - ☐ Warning buzzers
 - ☐ Seat belts warning system
 - ☐ Ignition key reminder alarm
 - ☐ Seat controls (sliding and reclining) and headrests

- ☐ Seat belt warning system
- ☐ Door locks, including childproof door locks
- ☐ Power door lock
- ☐ Power windows (if equipped)
- ☐ Horn, wipers, and washers
- ☐ Wiper blades performance
 - Clean the wiper blades and windshield, if necessary
- ☐ Antenna
 - **CHECK** the following items:
 - ☐ Presence of spare fuse
 - ☐ Upholstery and interior finish
 - **CHECK** and **ADJUST**, if necessary, the following items:
 - ☐ Operation and fit of windows
 - ☐ Parking brake
 - ☐ Pedal height and free play of brake pedal

UNDER BONNET—ENGINE RUNNING AT OPERATING TEMPERATURE

- **CHECK** the following items:
 - ☐ Operation of idle-up system for electrical load, air conditioner
 - ☐ Idle speed
 - ☐ Automatic transaxle fluid level (ATX only)
 - ☐ Initial ignition timing
 - ☐ Operation of throttle position sensor
 - ☐ Operation of EGR valve

ON HOIST

- **CHECK** the following items:
 - ☐ Underside fuel, coolant and hydraulic lines, fittings, connections, and components for leaks
 - ☐ Tires for cuts or bruises
 - ☐ Steering linkage, suspension, exhaust system, and all underside hardware for looseness or damage

ROAD TEST

- **CHECK** the following items:
 - ☐ Brake operation
 - ☐ Clutch operation
 - ☐ Steering control
 - ☐ Operation of meters and gauges, squeaks, rattles, and abnormal noises
 - ☐ Engine general performance
 - ☐ Emergency locking retractors

AFTER ROAD TEST

- **REMOVE** the seat and floor mat protective covers
- CHECK** for the necessary owner information materials, tools, and spare tire in vehicle

SCHEDULED MAINTENANCE

SCHEDULED MAINTENANCE

SCHEDULED MAINTENANCE TABLE

A6E203400013W01

For Europe (L.H.D. U.K.)

Chart symbols:

- I : Inspect and repair, clean, adjust, or replace if necessary. (Oil-permeated air cleaner elements cannot be cleaned using the air-blow method.)
 R : Replace
 T : Tighten
 L : Lubricate

Remarks:

- To ensure efficient operation of the engine and all systems related to emission control, the ignition and fuel systems must be serviced regularly. It is strongly recommended that all servicing related to these systems be done by an authorized Mazda Dealer.
- After the described period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.
- *1: Also inspect and adjust the power steering and air conditioner drive belts, if installed.
- *2: If the vehicle is operated under any of the following conditions, change the engine oil and oil filter every 10,000 km (6,250 miles) or shorter.
 - Driving in dusty conditions.
 - Extended periods of idling or low speed operation.
 - Driving for long period in cold temperatures or driving regularly at short distance only.
- *3: If the vehicle is operated in very dusty or sandy areas, clean and if necessary, replace the air cleaner element more often than the recommended intervals.
- *4: If the brakes are used extensively (for example, continuous hard driving or mountain driving) or if the vehicle is operated in extremely humid climates, change the brake fluid annually.

Maintenance Item	Maintenance Interval (Number of months or km (miles), whichever comes first)									
	Months	12	24	36	48	60	72	84	96	108
	×1000 km	20	40	60	80	100	120	140	160	180
	×1000 miles	12.5	25	37.5	50	62.5	75	87.5	100	112.5
ENGINE										
Drive belts	*1			I			I			I
Engine oil	*2	R	R	R	R	R	R	R	R	R
Oil filter	*2	R	R	R	R	R	R	R	R	R
COOLING SYSTEM										
Cooling system (including coolant level adjustment)			I		I		I		I	
Engine coolant		Replace at first 4 years or 100,000 km (62,500 miles); after that, every 2 years								
FUEL SYSTEM										
Air cleaner element	*3			R			R			R
Fuel lines & hoses			I		I		I		I	
IGNITION SYSTEM										
Spark plugs		Replace every 100,000 km (62,500 miles)								
EMISSION CONTROL SYSTEM										
E.G.R. system					I				I	
ELECTRICAL SYSTEM										
Battery electrolyte level & specific gravity		I	I	I	I	I	I	I	I	I
CHASSIS & BODY										
Brake lines, hoses & connections		I	I	I	I	I	I	I		I
Brake fluid	*4		R		R		R		R	
Parking brake		I	I	I	I	I	I	I	I	I
Power brake unit & hoses		I	I	I	I	I	I	I	I	I
Disc brakes		I	I	I	I	I	I	I	I	I
Power steering fluid, lines, hoses, and connections		I	I	I	I	I	I	I	I	I
Steering operation & linkages			I		I		I		I	
Manual transaxle oil						R				

SCHEDULED MAINTENANCE

Maintenance Item	Maintenance Interval (Number of months or km (miles), whichever comes first)									
	Months	12	24	36	48	60	72	84	96	108
	×1000 km	20	40	60	80	100	120	140	160	180
	×1000 miles	12.5	25	37.5	50	62.5	75	87.5	100	112.5
Automatic transaxle/transmission fluid level				I			I			I
Front & rear suspension & ball joints			I		I		I		I	
Driveshaft dust boots			I		I		I		I	
bolts & nuts on seats			I		I		I		I	
Exhaust system heat shields			I		I		I		I	
Cabin air filter (if installed) (aldehyde filter)	R	R	R	R	R	R	R	R	R	R
Cabin air filter (if installed)(pollen filter)		R		R		R		R		
Body condition (for rust, corrosion & perforation)	Inspect annually									

For Israel

Chart symbols:

I : Inspect and clean, repair, adjust, or replace if necessary. (Oil-permeated air cleaner elements cannot be cleaned using the air-blow method.)

R : Replace

L : Lubricate

C : Clean

Remarks:

- To ensure efficient operation of the engine and all systems related to emission control, the ignition and fuel systems must be serviced regularly. It is strongly recommended that all servicing related to these systems be done by an authorized Mazda Dealer.
- After the described period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked* in the maintenance chart.

*1: Also inspect and adjust the power steering and air conditioner drive belts, if installed.

*2: If the vehicle is operated under any of the following conditions, change the engine oil and oil filter every 10,000 km (6,000 miles) or shorter.

- Driving in dusty conditions.
- Extended periods of idling or low speed operation.
- Driving for long period in cold temperatures or driving regularly at short distance only.

*3: If the vehicle is operated in very dusty or sandy areas, inspect and if necessary, clean or replace the air cleaner element more often than the recommended intervals.

*4: This is a full function check of electrical systems such as lights, wiper and washer systems (including wiper blades), and power windows.

*5: If the brakes are used extensively (for example, continuous hard driving or mountain driving) or if the vehicle is operated in extremely humid climates, change the brake fluid annually.

Maintenance Item	Maintenance Interval (Number of months or km (miles), whichever comes first)												
	Months	12	24	36	48	60	72	84	96	108	120	132	144
	×1000 km	15	30	45	60	75	90	105	120	135	150	165	180
	×1000 miles	9	18	27	36	45	54	63	72	81	90	99	108
ENGINE													
Drive belts	*1	I	I	I	I	I	I	I	I	I	I	I	I
Engine oil	*2	R	R	R	R	R	R	R	R	R	R	R	R
Oil filter	*2	R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM													
Cooling system (Including coolant level adjustment)		I		I		I		I		I		I	
Engine coolant	Replace at first 4 years or 90,000 km; after that, every 2 years												
FUEL SYSTEM													
Air cleaner element	*3	C	C	C	R	C	C	C	R	C	C	C	R
Fuel filter						R					R		
Fuel lines & hoses		I		I		I		I		I		I	
IGNITION SYSTEM													
Spark plugs	Replace every 90,000 km (54,000 miles)												

SCHEDULED MAINTENANCE

Maintenance Item	Maintenance Interval (Number of months or km (miles), whichever comes first)												
	Months	12	24	36	48	60	72	84	96	108	120	132	144
	×1000 km	15	30	45	60	75	90	105	120	135	150	165	180
	×1000 miles	9	18	27	36	45	54	63	72	81	90	99	108
EMISSION CONTROL SYSTEM													
Evaporative system					I				I				I
E.G.R. system (if installed)					I				I				I
ELECTRICAL SYSTEM													
Battery electrolyte level & specific gravity		I	I	I	I	I	I	I	I	I	I	I	I
All electrical system	*4	I	I	I	I	I	I	I	I	I	I	I	I
CHASSIS & BODY													
Brake & clutch pedals		I	I	I	I	I	I	I	I	I	I	I	I
Brake lines, hoses & connections		I	I	I	I	I	I	I	I	I	I	I	I
Brake fluid	*5	I	R	I	R	I	R	I	R	I	R	I	R
Parking brake		I	I	I	I	I	I	I	I	I	I	I	I
Power brake unit & hoses		I	I	I	I	I	I	I	I	I	I	I	I
Disc brakes		I	I	I	I	I	I	I	I	I	I	I	I
Power steering fluid, lines, hoses, and connections		I	I	I	I	I	I	I	I	I	I	I	I
Steering operation & linkages			I		I		I		I		I		I
Manual transaxle oil							R						R
Automatic transaxle/transmission fluid level			I		I		I		I		I		I
Front & rear suspension & ball joints				I		I		I		I		I	
Driveshaft dust boots				I		I		I		I		I	
Exhaust system & heat shields			I		I		I		I		I		I
Bolts & nuts on seats			I		I		I		I		I		I
Body condition (for rust, corrosion & perforation)		Inspect annually											
Cabin air filter (if installed)		R	R	R	R	R	R	R	R	R	R	R	R

For GCC

Chart symbols:

- I : Inspect and repair, clean, adjust, or replace if necessary. (Oil-permeated air cleaner elements cannot be cleaned using the air-blow method.)
 R : Replace
 T : Tighten
 C : Clean

Remarks:

- To ensure efficient operation of the engine and all systems related to emission control, the ignition and fuel systems must be serviced regularly. It is strongly recommended that all servicing related to these systems be done by an authorized Mazda Dealer.
 - After the described period, continue to follow the described maintenance at the recommended intervals.
 - Refer below for a description of items marked* in the maintenance chart.
- *1: Also inspect and adjust the power steering and air conditioner drive belts, if installed.
 *2: If the vehicle is operated under any of the following conditions, change the engine oil and oil filter more often than recommended intervals.
 a. Driving in dusty conditions.
 b. Extended periods of idling or low speed operation.
 c. Driving for long period in cold temperatures or driving regularly at short distance only.
 *3: If the vehicle is operated in very dusty or sandy areas, inspect and if necessary, clean or replace the air cleaner element more often than the recommended intervals.
 *4: This is a full function check of electrical systems such as lights, wiper and washer systems (including wiper blades), and power windows.
 *5: If the brakes are used extensively (for example, continuous hard driving or mountain driving) or if the vehicle is operated in extremely humid climates, change the brake fluid annually.

SCHEDULED MAINTENANCE

Maintenance Item	Maintenance Interval (Number of months or km (miles), whichever comes first)																	
	Months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	
	×1000 km	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	
	×1000 miles	6.25	12.5	18.75	25	31.25	37.5	43.75	50	56.25	62.5	68.75	75	81.25	87.5	93.75	100	
ENGINE																		
Drive belts	*1	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
Engine oil	*2	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
Oil filter	*2	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
COOLING SYSTEM																		
Cooling system			I		I		I		I		I		I		I		I	
Engine coolant		Replace every 2 years																
FUEL SYSTEM																		
Air cleaner element	*3		C		C		R		C		C		R		C		C	
Fuel filter					R				R				R				R	
Fuel lines & hoses			I		I		I		I		I		I		I		I	
IGNITION SYSTEM																		
Spark plugs		Replace every 100,000 km (62,500 miles)																
EMISSION CONTROL SYSTEM																		
Evaporative system (if intalled)			I		I		I		I		I		I		I		I	
E.G.R. system (if installed)			I		I		I		I		I		I		I		I	
ELECTRICAL SYSTEM																		
Battery electrolyte level & specific gravity			I		I		I		I		I		I		I		I	
All electrical system	*4		I		I		I		I		I		I		I		I	
CHASSIS & BODY																		
Brake & clutch pedal		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
Brake lines, hoses & connections			I		I		I		I		I		I		I		I	
Brake fluid	*5	I	I	I	R	I	I	I	R	I	I	I	R	I	I	I	R	
Parking brake		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
Power brake unit & hoses			I		I		I		I		I		I		I		I	
Disc brakes		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
Power steering fluid, lines, hoses and connections		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
Steering operation & linkages			I		I		I		I		I		I		I		I	
Manual transaxle oil											R							
Automatic transmission / transaxle fluid level			I		I		I		I				I		I		I	
Automatic transmission / transaxle fluid						R					R					R		
Front & rear suspension & ball joints					I				I				I				I	
Driveshaft dust boots					I				I				I				I	
Bolts & nuts on chassis & body			T		T		T		T		T		T		T		T	
Exhaust system heat shields					I				I				I				I	
Cabin air filter (if installed)			R		R		R		R		R		R		R		R	
Body condition (for rust, corrosion & perforation)		Inspect annually																

SCHEDULED MAINTENANCE

Scheduled Maintenance Service (Specific Work Required) For Europe (L.H.D. U.K.)

Maintenance Item	Specific Work Required
ENGINE	
Engine valve clearance	Measure clearance.
Drive belts	Inspect for wear, cracks and fraying, and check tension. Replace drive belt.
Engine timing belt	Replace engine timing belt.
Engine oil	Replace engine oil and inspect for leakage.
Oil filter	Replace oil filter and inspect for leakage.
Oil by-pass filter	Replace oil by-pass filter and inspect for leakage.
COOLING SYSTEM	
Cooling system (including coolant level adjustment)	Check coolant level and quality, and inspect for leakage.
Engine coolant	Replace coolant.
FUEL SYSTEM	
Idle speed	Check engine idle rpm.
Idle mixture (for CIS & carburetor leaded fuel)	Check the CO and HC concentrations (see W/M).
Choke system (for carburetor)	Check system operation.
Air cleaner element	Inspect for dirt, oil and damage. Clean air cleaner element (by blowing air). Replace air cleaner element.
Fuel filter	Replace fuel filter.
Fuel lines & hoses	Inspect for cracks, leakage and loose connection.
IGNITION SYSTEM (FOR GASOLINE)	
Initial ignition timing	Check initial ignition timing.
Spark plugs	Inspect for wear, damage, carbon, high-tension lead condition and measure plug gap. Replace spark plugs.
EMISSION CONTROL SYSTEM (FOR GASOLINE)	
Evaporative system	Check system operation (see W/M), vapor lines, vacuum fitting hoses and connection.
Throttle positioner system	Check the diaphragm and system operation, vacuum fitting hoses and connection.
Dash pot (for carburetor)	Check system operation.
E.G.R. system	Check system operation (see W/M), vacuum fitting hoses and connection.
ELECTRICAL SYSTEM	
Battery electrolyte level & specific gravity	Check level and specific gravity.
Battery condition	Check the battery for corroded or loose connections and cracks in the case (for maintenance free type).
All electrical system	Check function of lighting system, windshield wiper (including wiper blade condition) and washer and power windows.
Headlight alignment	Check headlight alignment
CHASSIS & BODY	
Brake & clutch pedals	Check pedal height and free play.
Brake fluid	Check fluid level and inspect for leakage. Replace brake fluid.
Clutch fluid	Check fluid level and inspect for leakage.
Brake lines, hoses & connections	Inspect for cracks, damage, chafing, corrosion, scars, swelling and fluid leakage.
Parking brake	Check lever stroke.
Power brake unit & hoses	Check vacuum lines, connections and check valve for improper attachment, air tightness, cracks chafing and deterioration.
Disc brakes	Test for judder and noise. Inspect caliper for correct operation and fluid leakage, brake pads for wear. Check disc plate condition and thickness.
Drum brakes	Test for judder and noise. Inspect brake drum for wear and scratches; brake lining for wear, peeling and cracks; and wheel cylinder for fluid leakage.
Manual steering gear oil	Check gear oil level.
Power steering fluid, lines, hoses & connections	Check fluid level and condition. Inspect for loose connection, routing, damage, and leaks.

SCHEDULED MAINTENANCE

Maintenance Item	Specific Work Required
Steering operation & linkages	Check steering wheel free play, hard steering, and operation noise. Check linkages, boots and ball joints condition. Check grease or gear oil.
Power steering fluid & lines	Check fluid level and lines for improper attachment, leakage, cracks, damage, loose connections, chafing and deterioration.
Power steering fluid	Check fluid level.
Power steering system & hoses	Check lines for improper attachment, leakage, cracks, damage, loose connections, chafing and deterioration.
Steering & front suspension	Check free play of steering system, inspect shock absorbers for correct damping force, oil leakage, damage and looseness, and inspect coil springs, arms, links and stabilizer for damage and looseness.
Steering operation & gear housing	Check that the steering wheel has the specified play. Be sure to check for changes, such as excessive play, hard steering or strange noises. Check gear housing and boots for looseness, damage and grease/gear oil leakage.
Steering linkages tie rod ends & arms	Check ball joint, dust cover and other components for looseness, wear, damage and grease leakage.
Front & rear suspension ball joints	Inspect for grease leakage, cracks, damage and looseness.
Manual transmission/transaxle oil	Check oil level and inspect for leakage. Replace manual transmission/transaxle oil.
Automatic transaxle oil level	Check oil level.
Automatic transmission/transaxle fluid level	Check fluid level.
Automatic transmission/transaxle fluid	Replace automatic transmission/transaxle fluid.
Front & rear differential oil	Check oil level and inspect for leakage. Replace front & rear differential oil.
Rear differential oil	Check oil level and inspect for leakage. Replace rear differential oil.
Transfer oil	Check oil level and inspect for leakage. Replace transfer oil.
Upper arm shafts (for B-Series)	Lubricate the upper arm shafts for looseness or damage.
Front & rear wheel bearing grease	Remove wheel bearing and replace the grease.
Propeller shaft joints (with grease nipple)	Lubricate propeller shaft joints.
Driveshaft dust boots	Inspect for grease leakage, cracks, damage and looseness.
Wheel nuts	Tighten wheel nuts.
Bolts & nuts on chassis & body	Tighten bolts and nuts fastening suspension components, members and seat frames.
Bolts & nuts on seats	Move the seat back and forth and side to side to check for squeaking or rattling. If there is any squeaking or rattling, retorque bolts and nuts fastening seat frames.
Body condition (for rust, corrosion & perforation)	Inspect body surface for paint damage, rust, corrosion and perforation.
Exhaust system heat shields	Inspect for damage, corrosion, looseness of connections and gas leakage.
Tires (including spare tire) (with inflation pressure adjustment)	Check air pressure and inspect tires for tread wear, damage and cracks; and wheels for damage and corrosion.
Hinges & catches	Lubricate hinges and catches of doors, trunk lid and hood.
Seat belts	Inspect seat belt webbing for scratches, tears and wear, and check anchor bolt tightness.
Rear suspension uni-ball & sliding rubber bushing (for RX-7)	Inspect for cracks, damage and looseness.
Underside of vehicle	Inspect underside of vehicle (floor pans, frames, fuel lines, around exhaust system, etc.) for damage and corrosion.
Road test	Check brake operation/clutch operation/steering control/operation of meters and gauges/squeaks, rattles or unusual noises/engine general performance/emergency locking retractors.
AIR CONDITIONER SYSTEM	
Refrigerant amount	Check refrigerant amount.
Compressor operation	Check compressor operation, and inspect for noise, oil leakage, cracks and refrigerant leakage.
Cabin air filter	Replace cabin air filter.

ENGINE

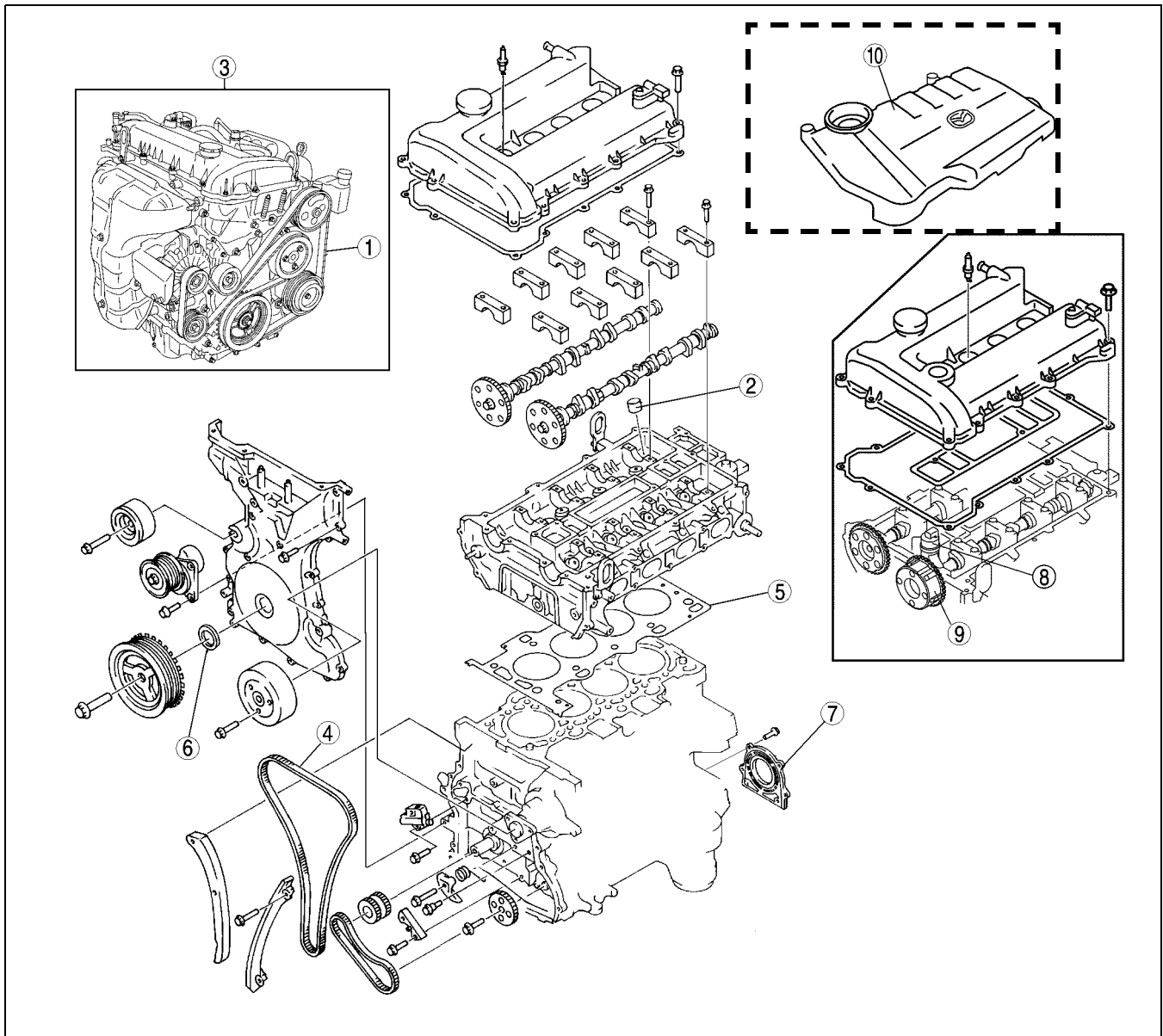
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LOCATION INDEX

LOCATION INDEX

MECHANICAL LOCATION INDEX

A6E220001002W01



A6E2200W300

1	Drive belt (See B-3 DRIVE BELT INSPECTION) (See B-3 DRIVE BELT REPLACEMENT) (See B-4 DRIVE BELT AUTO TENSIONER INSPECTION)
2	Tappet (See B-4 VALVE CLEARANCE INSPECTION)
3	Engine (See B-9 COMPRESSION INSPECTION) (See B-26 ENGINE REMOVAL/INSTALLATION) (See B-31 ENGINE DISASSEMBLY/ASSEMBLY)
4	Timing Chain (See B-10 TIMING CHAIN REMOVAL/INSTALLATION)
5	Cylinder head gasket (See B-18 CYLINDER HEAD GASKET REPLACEMENT)

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7	Rear oil seal (See B-25 REAR OIL SEAL REPLACEMENT)
8	Oil control valve (OCV) (L3) (See B-33 OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION) (See B-33 OIL CONTROL VALVE (OCV) INSPECTION)
9	Variable valve timing actuator (L3) (See B-32 VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION) (See B-32 VARIABLE VALVE TIMING ACTUATOR INSPECTION)
10	Plug hole plate (See G-10 SPARK PLUG REMOVAL/INSTALLATION)

DRIVE BELT

DRIVE BELT

DRIVE BELT INSPECTION

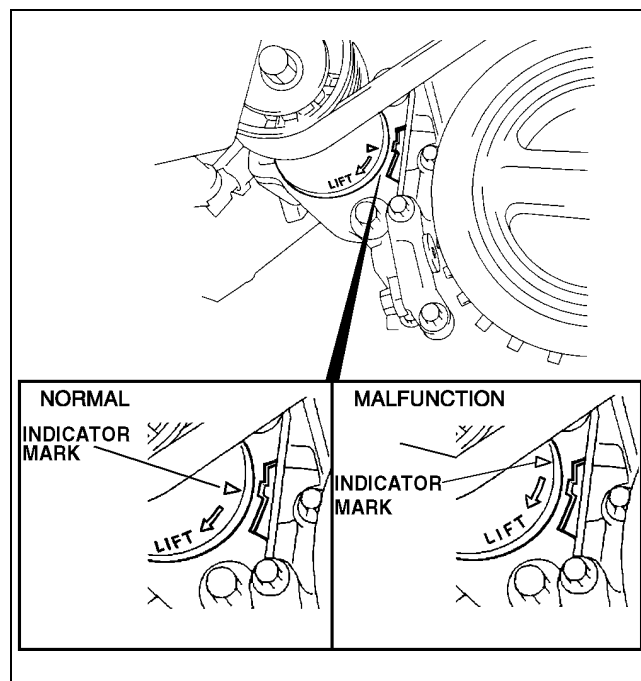
A6E221015800W01

Note

- Front and water pump drive belt deflection/tension inspection is not necessary because of the use of the front drive belt auto tensioner.

Front Drive Belt

1. Verify that the drive belt auto tensioner indicator mark does not exceeds the limit.
 - If it exceeds the limit, replace the drive belt.
(See [B-3 DRIVE BELT REPLACEMENT](#).)

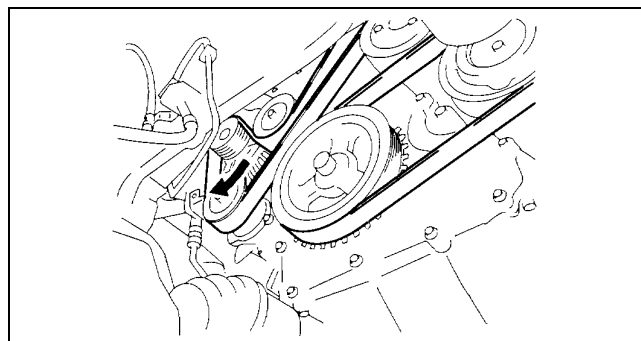


AME2210W001

DRIVE BELT REPLACEMENT

A6E221015800W03

1. Remove the splash shield (RH).
2. Turn the center of the tensioner pulley clockwise to release tension to the drive belt.
3. Remove the drive belt.
4. Reinstall the drive belt or install a new drive belt.
5. Verify that the drive belt auto tensioner indicator mark does not exceeds the limit. (See [B-3 DRIVE BELT INSPECTION](#).)
 - If it exceeds the limit, replace the drive belt.
6. Install the splash shield (RH).



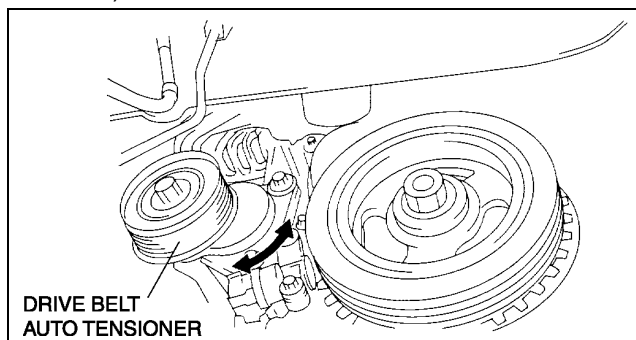
AME2210W002

DRIVE BELT, VALVE CLEARANCE

DRIVE BELT AUTO TENSIONER INSPECTION

A6E221015980W01

1. Remove the drive belt. (See [B-3 DRIVE BELT REPLACEMENT.](#))
2. Verify that the drive belt auto tensioner moves smoothly in the operational direction.
 - Replace the drive belt auto tensioner if necessary.
3. Turn the drive belt auto tensioner pulley by hand and verify that it rotates smoothly.
 - Replace the drive belt auto tensioner if necessary.
4. Install the drive belt. (See [B-3 DRIVE BELT REPLACEMENT.](#))



AME2210W003

VALVE CLEARANCE

VALVE CLEARANCE INSPECTION

A6E221212111W01

1. Disconnect the negative battery cable.
2. Remove the tire (RH).
3. Remove the splash shield (RH).
4. Remove the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION.](#))
5. Remove the high-tension lead.
6. Remove the oil control valve (OCV) connector.
7. Remove the ventilation hose.
8. Remove the cylinder head cover.
9. Verify that the engine is in cold condition.
10. Measure the valve clearance.
 - (1) Turn the crankshaft clockwise so that the No.1 piston is at TDC of the compression stroke.
 - (2) Measure the valve clearance at A in the figure.
 - If the valve clearance exceeds the space the tappet. (See [B-5 VALVE CLEARANCE ADJUSTMENT.](#))

Note

- Make sure to note the measured values for choosing the suitable replacement tappets.

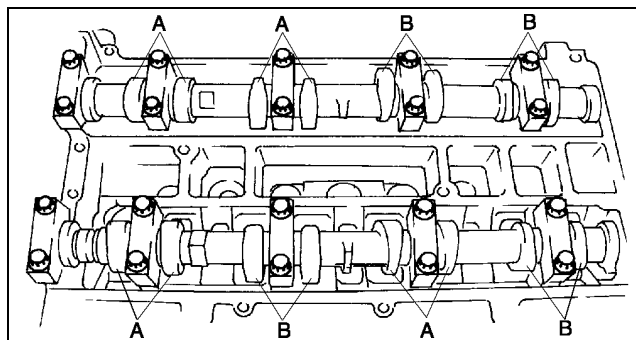
Standard [Engine cold]

IN: 0.22—0.28 mm {0.0087—0.0110 in}

(0.25±0.03 mm {0.0098±0.0011 in})

EX: 0.27—0.33 mm {0.0106—0.0130 in}

(0.30±0.03 mm {0.0118±0.0011 in})



AME2212W001

- (3) Turn the crankshaft 360° clockwise so that the No.4 piston is at TDC of the compression stroke.
- (4) Measure the valve clearance at B in the figure.
 - If the valve clearance exceeds the standard, replace the tappet. (See [B-5 VALVE CLEARANCE ADJUSTMENT.](#))

Note

- Make sure to note the measured values for choosing the suitable replacement tappets.

Standard [Engine cold]

IN: 0.22—0.28 mm {0.0087—0.0110 in} (0.25±0.03 mm {0.0098±0.0011 in})

EX: 0.27—0.33 mm {0.0106—0.0130 in} (0.30±0.03 mm {0.0118±0.0011 in})

11. Install the cylinder head cover. (See [B-17 Cylinder Head Cover Installation Note.](#))
12. Install the ventilation hose.
13. Install the oil control valve connector.
14. Install the high-tension lead. (See [G-11 HIGH-TENSION LEAD REMOVAL/INSTALLATION.](#))
15. Install the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION.](#))

VALVE CLEARANCE

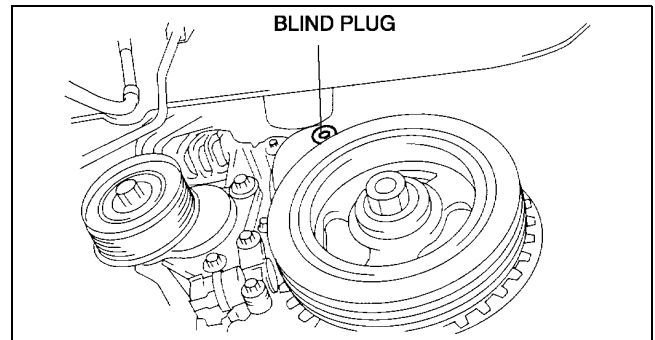
16. Install the splash shield (RH).
17. Install the tire (RH).

VALVE CLEARANCE ADJUSTMENT

A6E221212111W02

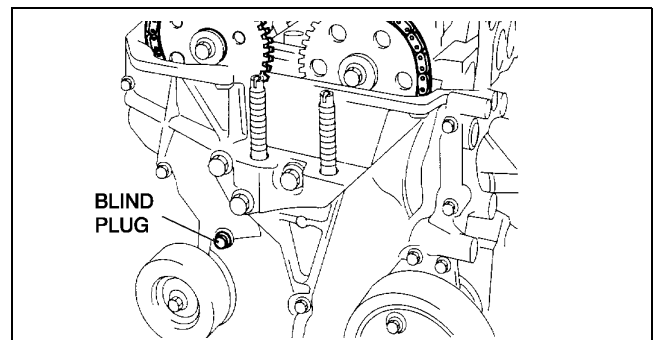
B

1. Disconnect the negative battery cable.
2. Remove the tire (RH).
3. Remove the splash shield (RH).
4. Remove the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION.](#))
5. Remove the high-tension lead.
6. Remove the oil control valve (OCV) connector.
7. Remove the ventilation hose.
8. Remove the cylinder head cover.
9. Remove the drive belt. (See [B-3 DRIVE BELT REPLACEMENT.](#))
10. Remove the joint shaft from the front drive shaft (RH). (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION.](#))
11. Remove the engine front cover lower blind plug.



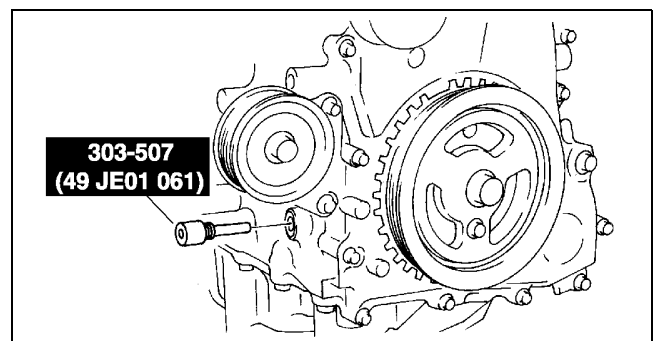
AME2212W002

12. Remove the engine front cover upper blind plug.
13. Remove the cylinder block lower blind plug.



AME2212W003

14. Install the **SST** as shown.
15. Turn the crankshaft clockwise the crankshaft is in the No.1 cylinder TDC position.

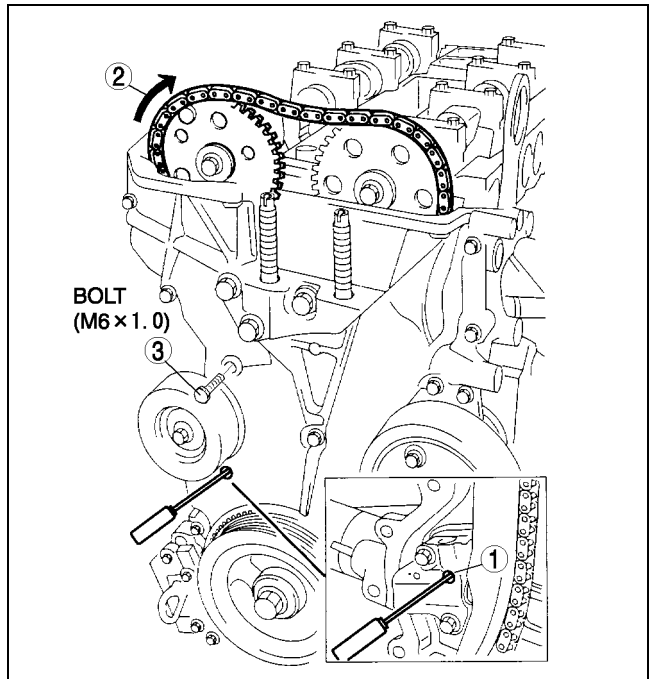


AME2212W004

VALVE CLEARANCE

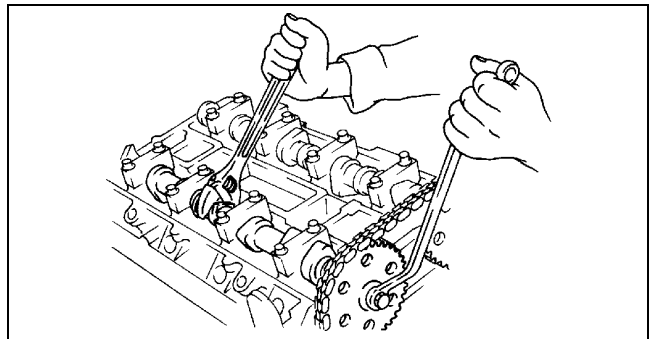
16. Loosen the timing chain.

- (1) Using a suitable screwdriver or equivalent tool, unlock the chain tensioner ratchet.
- (2) Turn the exhaust camshaft clockwise using a suitable wrench on the cast hexagon and loosen the timing chain.
- (3) Placing the suitable bolt (**M6 X 1.0 length 25mm—35mm {0.99in—1.37in}**) at the engine front cover upper blind plug, secure the chain guide at the position where the tension is released.



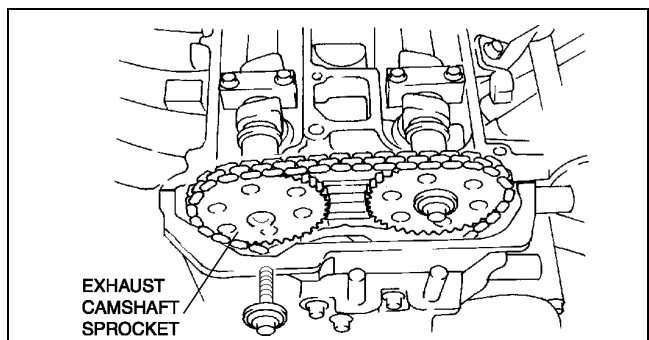
AME2212W005

17. Hold the exhaust camshaft using a suitable wrench on the cast hexagon as shown.



AME2212W006

18. Remove the exhaust camshaft sprocket.

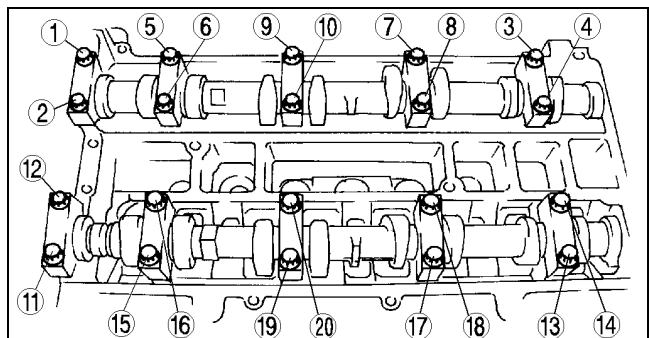


AME2212W007

19. Loosen the camshaft cap bolts in several passes in the order shown.

Note

- The cylinder head and the camshaft caps are numbered to make sure they are reassembled in their original position. When removed, keep the caps with the cylinder head they were removed from. Do not mix the caps.



AME2212W008

20. Remove the camshaft.

21. Remove the tappet.

22. Select proper adjustment shim.

VALVE CLEARANCE

New adjustment shim

= Removed shim thickness + Measured valve clearance - Standard valve clearance (IN: 0.25 mm {0.0098 in}, EX: 0.30 mm {0.0118 in})

Standard [Engine cold]

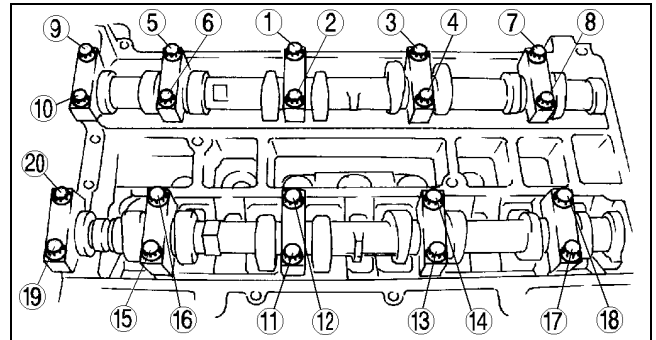
IN: 0.22—0.28 mm {0.0087—0.0110 in} (0.25±0.03 mm {0.0098±0.0011 in})

EX: 0.27—0.33 mm {0.0106—0.0130 in} (0.30±0.03 mm {0.0118±0.0011 in})

23. Install the camshaft with No.1 cylinder aligned with the TDC position.

24. Tighten the camshaft cap bolt using the following two steps.

- (1) Tighten to 5.0—9.0 N·m {51.0—91.7 kgf·cm, 44.3—79.5 in·lbf}.
- (2) Tighten to 14.0—17.0 N·m {1.5—1.7 kgf·m, 10.4—12.5 ft·lbf}.



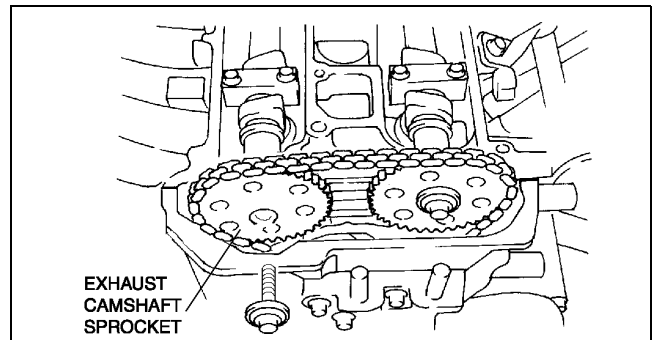
AME2212W009

25. Install the exhaust camshaft sprocket.

Note

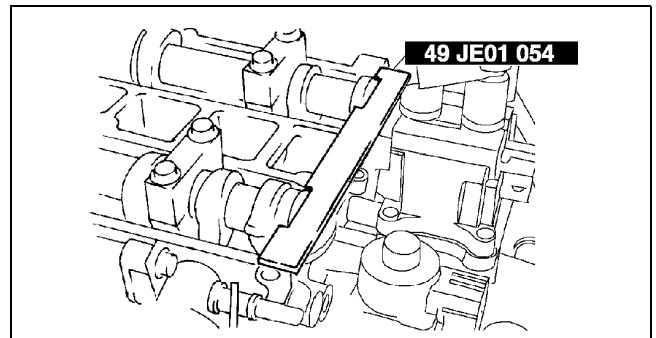
- Do not tighten the bolt for the camshaft sprocket during this step. First confirm the valve timing, then tighten the bolt.

26. Install the **SST** to the camshaft as shown.



AME2212W007

European countries



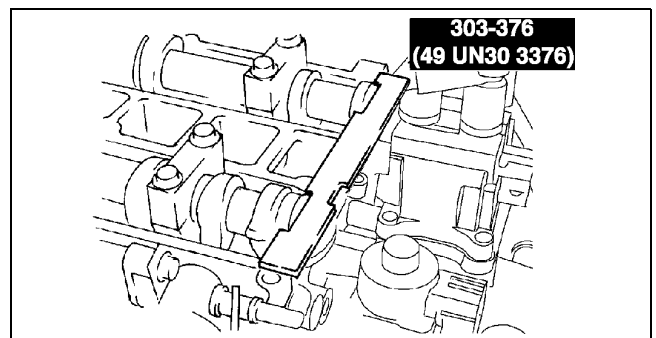
AME2212W010

Except European countries

27. Remove the M6 x 1.0 bolt (length 25mm—

35mm {0.99in—1.37in}) from the engine front cover to apply tension to the timing chain.

28. Turn the crankshaft clockwise the crankshaft is in the No.1 cylinder TDC position.



AME2212W011

VALVE CLEARANCE

29. Hold the exhaust camshaft using a suitable wrench on the cast hexagon as shown.
30. Tighten the exhaust camshaft sprocket lock bolt.

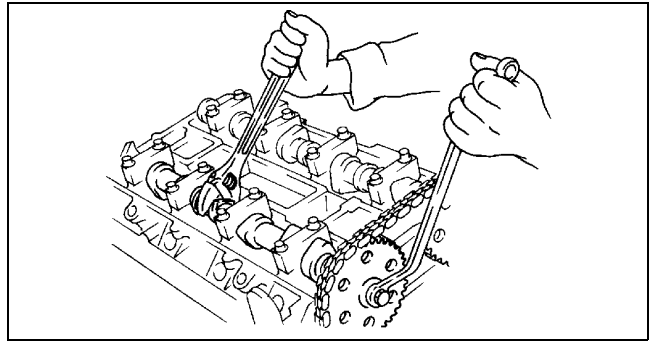
Tightening torque:

69—75 N·m {7.10—7.6 kgf·m, 50.9—55.3 ft·lbf}

31. Remove the **SST** from the camshaft.
32. Remove the **SST** from the block lower blind plug.
33. Rotate the crankshaft clockwise two turns until the TDC position.
 - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 14.
34. Apply silicone sealant to the engine front cover upper blind plug.
35. Install the engine front cover upper blind plug.

Tightening torque:

10 N·m {1.0 kgf·m, 7.4 ft·lbf}

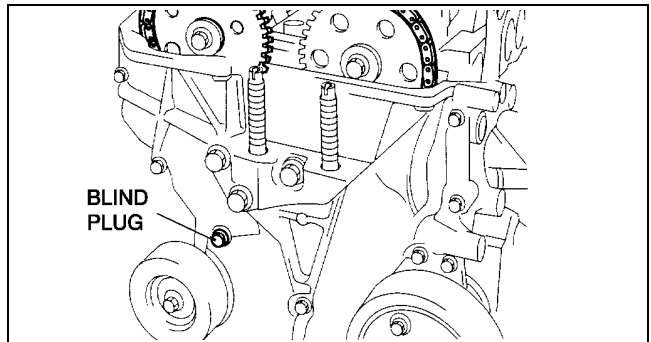


AME2212W006

36. Install the cylinder block lower blind plug.

Tightening torque:

18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}

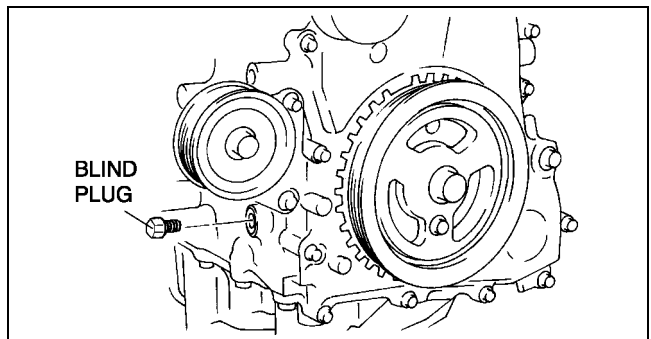


AME2212W003

37. Install the new engine front cover lower blind plug.

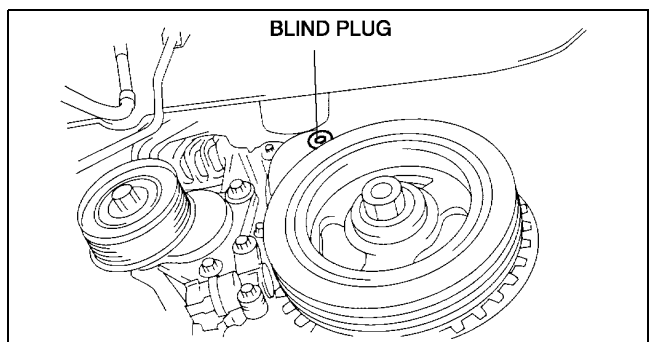
Tightening torque:

12 N·m {1.2 kgf·m, 8.9 ft·lbf}



AME2212W012

38. Connect the front drive shaft (RH) and the joint shaft. (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION](#))
39. Install the drive belt. (See [B-3 DRIVE BELT REPLACEMENT](#).)
40. Install the cylinder head cover. (See [B-17 Cylinder Head Cover Installation Note](#).)
41. Install the ventilation hose.
42. Install the oil control valve (OCV) connector.
43. Install the high-tension lead. (See [G-11 HIGH-TENSION LEAD REMOVAL/INSTALLATION](#).)
44. Install the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION](#).)
45. Install the splash shield (RH).
46. Install the tire (RH).



AME2212W002

COMPRESSION PRESSURE

COMPRESSION PRESSURE

COMPRESSION INSPECTION

A6E221402000W01

B

Warning

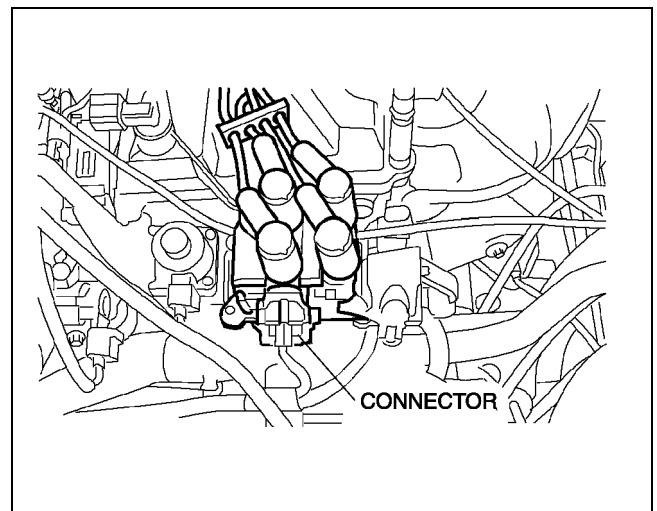
- Hot engines and oil can cause severe burns. Be careful not to burn yourself during removal/installation of each component.

- Verify that the battery is fully charged.
 - Recharge it if necessary. (See [G-4 BATTERY INSPECTION](#).)
- Warm up the engine to the normal operating temperature.
- Stop the engine and allow it to cool off for **about 10 min**.
- Perform "Fuel Line Safety Procedures". Leave the fuel pump relay removed. (See [F-17 BEFORE REPAIR PROCEDURE](#).)

Warning

- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See [F-17 Fuel Line Safety Procedure](#).)

- Remove the ignition coil connector.
- Remove the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION](#).)
- Connect a compression gauge into the spark plug hole.
- Fully depress the accelerator pedal and crank the engine.
- Note the maximum gauge reading.
- Inspect each cylinder as above.
 - If the measured value is less than the limited value, or there is a cylinder whose compression value varies from that of other cylinders by **196.1 kPa {1.999 kgf/cm², 28.44 psi}** or more, add a small amount of engine oil through the spark plug hole. Then measure the compression pressure and perform the respective operations for the following cases.
 - If the compression increases, the piston, the piston rings, or cylinder wall may be worn and overhaul is required.
 - If the compression stays low, a valve may be stuck or improperly seated and overhaul is required.
 - If the compression in adjacent cylinders stays low, the cylinder head gasket may be damaged or the cylinder head distorted and overhaul is required.



AME2214W001

Compression

kPa {kgf/cm², psi} [rpm]

Item	Engine type
	L8
Standard	1,750 {17.845, 253.816} [300]
Minimum	1,225 {12.492, 177.64} [300]
Maximum difference between cylinders	196.1 {1.999, 28.44}

kPa {kgf/cm², psi} [rpm]

Item	Engine type
	LF
Standard	1,720 {17.5391, 249.465} [300]
Minimum	1,204 {12.277, 174.58} [300]
Maximum difference between cylinders	196.1 {1.999, 28.44}

COMPRESSION PRESSURE, TIMING CHAIN

kPa {kgf/cm², psi} [rpm]

Item	Engine type
	L3
Standard	1,430 {14.5819, 207.404} [290]
Minimum	1,000 {10.197, 145.00} [290]
Maximum difference between cylinders	196.1 {1.999, 28.44}

11. Disconnect the compression gauge.
12. Install the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION](#).)
13. Connect the ignition coil connector.
14. Install the fuel pump relay. (See [F-17 BEFORE REPAIR PROCEDURE](#).)

TIMING CHAIN

TIMING CHAIN REMOVAL/INSTALLATION

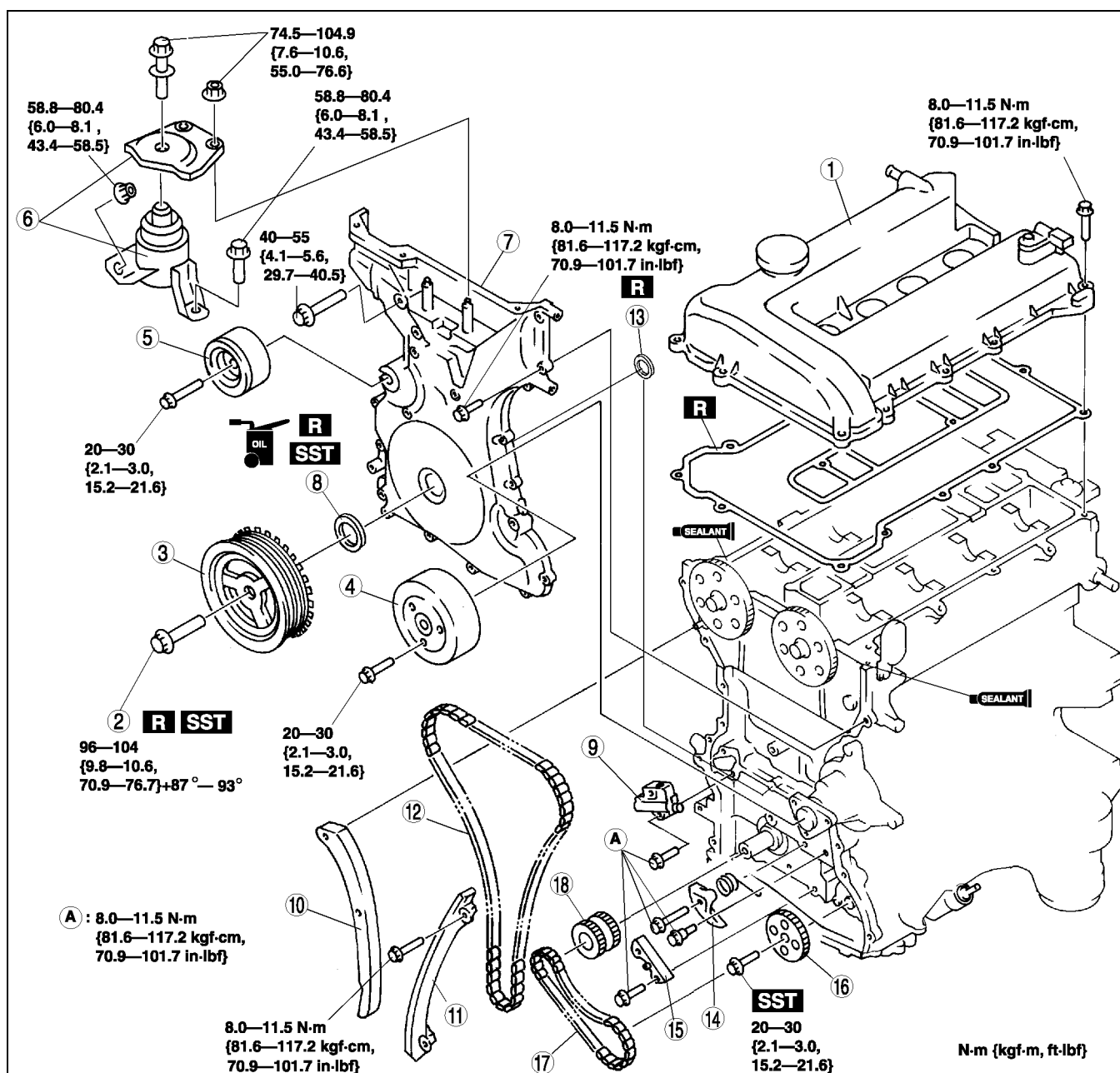
A6E221512201W01

Warning

- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See [F-17 Fuel Line Safety Procedure](#).)

1. Disconnect the negative battery cable.
2. Remove the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION](#).)
3. Remove the tire (RH).
4. Remove the under cover.
5. Loosen the water pump pulley bolt and removal the drive belt. (See [B-3 DRIVE BELT REPLACEMENT](#).)
6. Remove the CKP sensor. (See [F-54 CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION](#).)
7. Drain the engine oil. (See [D-4 ENGINE OIL REPLACEMENT](#).)
8. Remove the P/S oil pump with the oil hose still connected and position the P/S oil pump so that it is out of the way. (See [N-22 POWER STEERING OIL PUMP REMOVAL/INSTALLATION](#).)
9. Remove the front drive shaft (RH) from the joint shaft. (See [M-12 JOINT SHAFT REMOVAL/INSTALLATION](#).)
10. Remove in the order indicated in the table.
11. Install in the reverse order of removal.
12. Start the engine and:
 - Inspect for the engine oil, engine coolant, transaxle oil and fuel leakage.
 - Verify the ignition timing, idle speed and idle mixture. (See [F-8 IGNITION TIMING INSPECTION](#).) (See [F-9 IDLE MIXTURE INSPECTION](#).)
13. Perform a road test.

TIMING CHAIN



AME2215W001

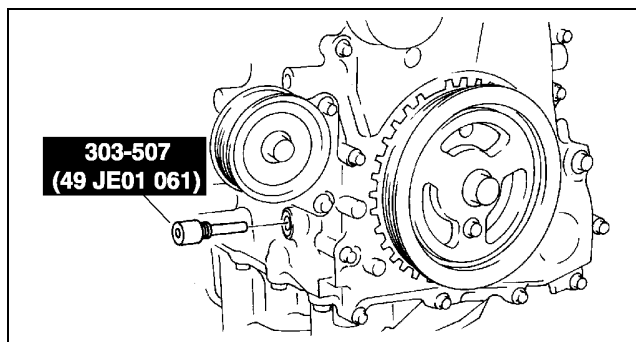
1	Cylinder head cover (See B-17 Cylinder Head Cover Installation Note)
2	Crankshaft pulley lock bolt (See B-12 Crankshaft Pulley Lock Bolt Removal Note) (See B-16 Crankshaft Pulley Lock Bolt Installation Note)
3	Crankshaft pulley
4	Water pump pulley
5	Drive belt idler pulley
6	No.3 engine mount rubber and No.3 engine joint bracket (See B-12 No.3 Engine Mount Rubber and No.3 Engine Joint Bracket Removal Note) (See B-16 No.3 Engine Mount Rubber and No.3 Engine Joint Bracket Installation Note)
7	Engine front cover (See B-14 Engine Front Cover Installation Note)

8	Front oil seal (See B-13 Engine Front Cover Removal Note) (See B-15 Front Oil Seal Installation Note)
9	Chain tensioner (See B-12 Chain Tensioner Removal Note)
10	Tensioner arm
11	Chain guide
12	Timing chain (See B-14 Timing Chain Installation Note)
13	Seal
14	Oil pump chain tensioner
15	Oil pump chain guide
16	Oil pump sprocket (See B-13 Oil Pump Sprocket Removal Note) (See B-13 Oil Pump Sprocket Installation Note)
17	Oil pump chain
18	Camshaft sprocket

TIMING CHAIN

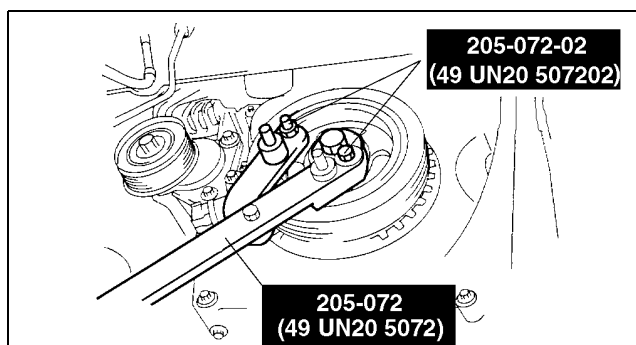
Crankshaft Pulley Lock Bolt Removal Note

1. Remove the cylinder block lower blind plug.
2. Install the **SST**.
3. Turn the crankshaft clockwise the crankshaft is in the No.1 cylinder TDC position.



AME2212W004

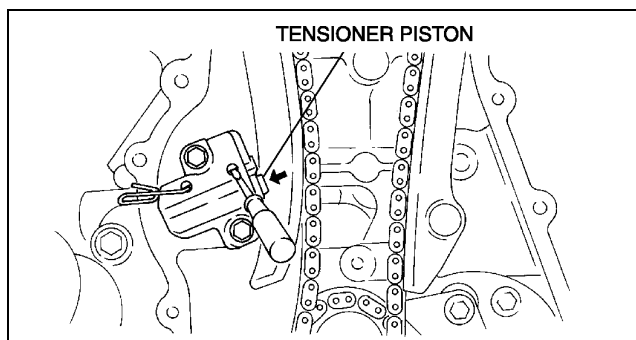
4. Hold the crankshaft pulley by using the **SSTs**.



AME2215W002

Chain Tensioner Removal Note

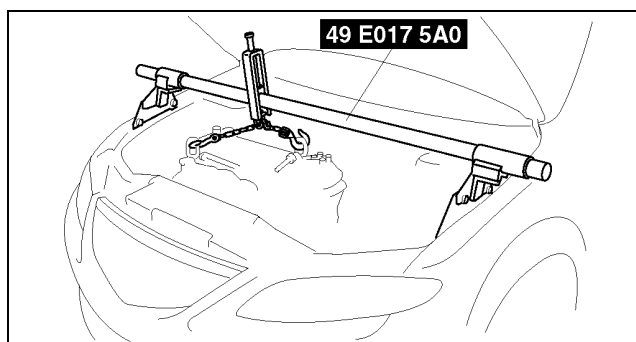
1. Using a thin screwdriver, hold the chain tensioner ratchet lock mechanism away from the ratchet stem.
2. Slowly compress the tensioner piston.
3. Hold the tensioner piston using a 1.5 mm {0.059 in} wire or paper clip.



AME2215W003

No.3 Engine Mount Rubber and No.3 Engine Joint Bracket Removal Note

1. Suspend the engine using the **SSTs**.

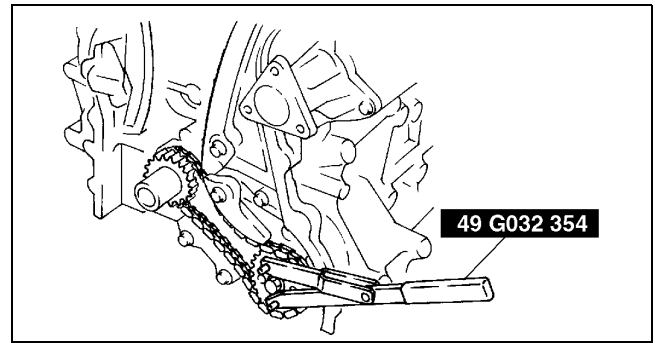


AME2215W004

TIMING CHAIN

Oil Pump Sprocket Removal Note

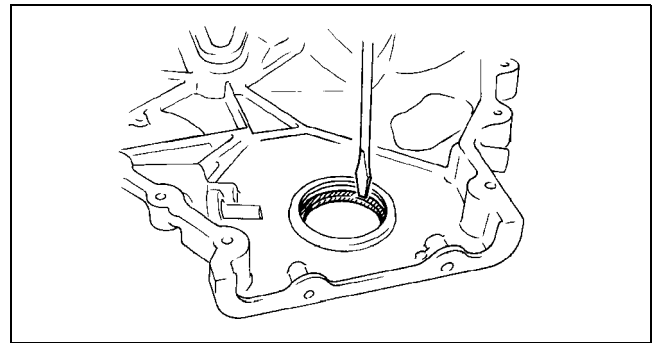
1. Hold the oil pump sprocket by using the SST.



AME2215W005

Engine Front Cover Removal Note

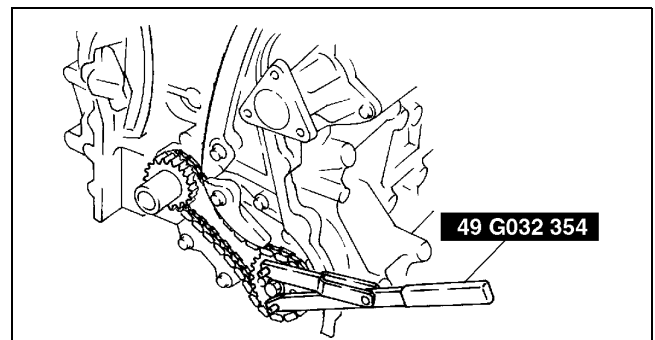
1. Remove the oil seal using a screwdriver as shown.



AME2215W006

Oil Pump Sprocket Installation Note

1. Hold the oil pump sprocket by using the SST.



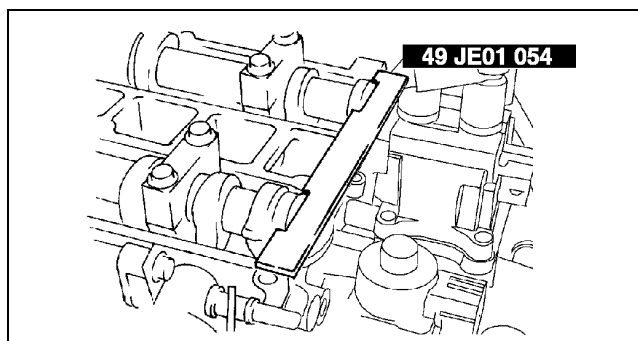
AME2215W005

TIMING CHAIN

Timing Chain Installation Note

1. Install the **SST** to the camshaft as shown.

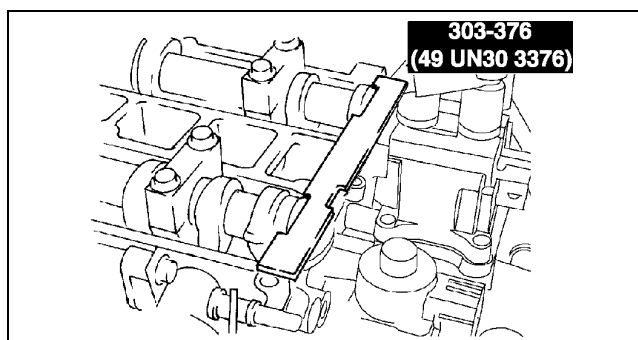
European countries



AME2212W010

Except European countries

2. Install the timing chain.
3. Remove the retaining wire or paper clip from the auto tensioner to apply tension to the timing chain.



AME2212W011

Engine Front Cover Installation Note

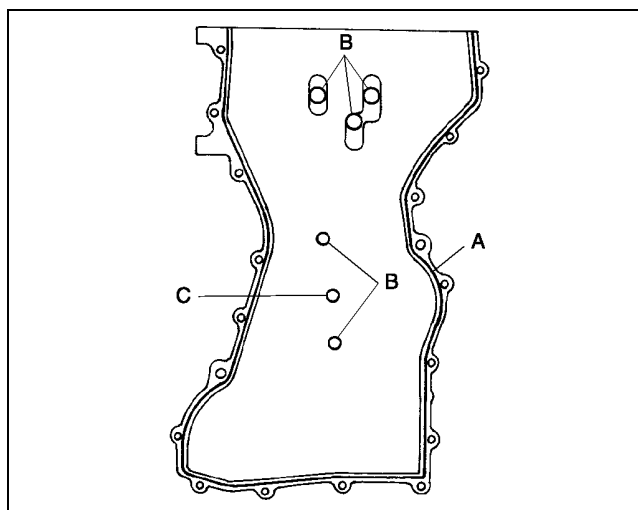
1. Apply silicone sealant to the engine front cover as shown.

Caution

- Install the cylinder head cover within 10 minutes of applying the silicone sealant.
- Silicone sealant is not need in area C as indicated below due to an existing. (L3)

Thickness

- A: 2.0—3.0 mm {0.079—0.118 in}
B: 1.5—2.5 mm {0.059—0.098 in}

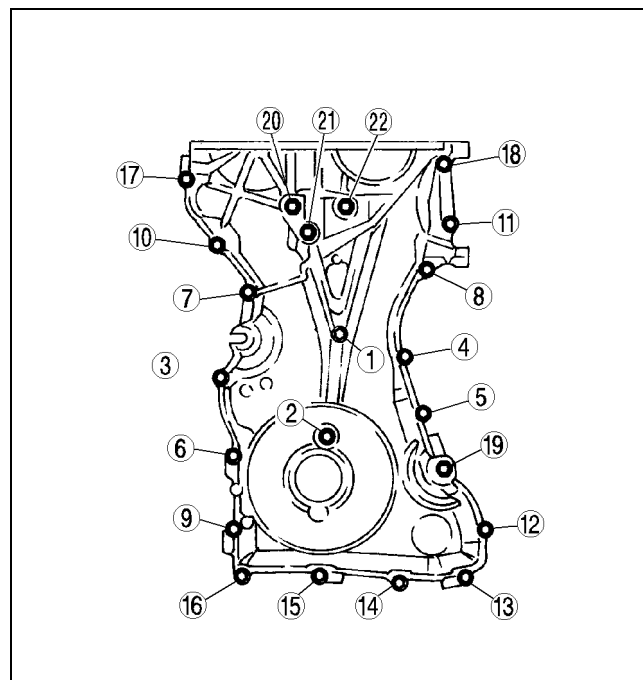


AME2215W007

TIMING CHAIN

2. Install the cylinder head cover bolts in the order as shown.

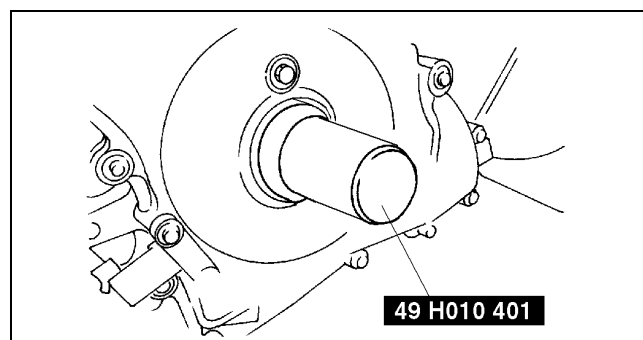
Bolt No.	Tightening torque
1—18	8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}
19—22	40—55 N·m {4.1—5.6 kgf·m, 29.7—40.5 ft·lbf}



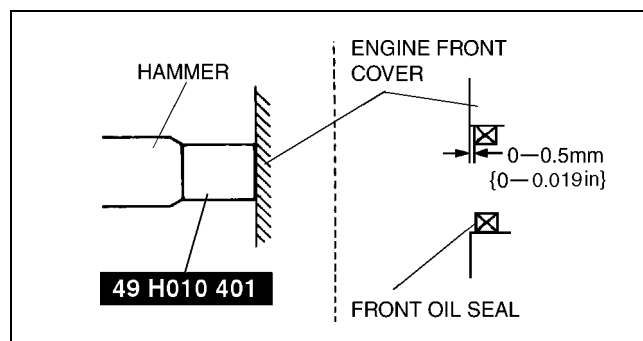
AME2215W008

Front Oil Seal Installation Note

1. Apply clean engine oil to the oil seal.
2. Push the oil seal slightly in by hand.
3. Compress the oil seal using the **SST** and a hammer.



AME2215W009



AME2215W010

TIMING CHAIN

No.3 Engine Mount Rubber and No.3 Engine Joint Bracket Installation Note

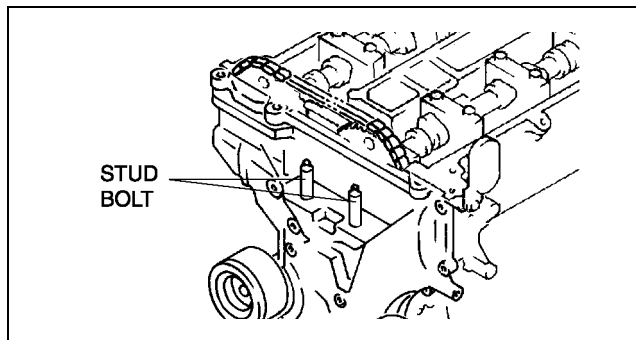
1. Tighten the stud bolt of the No.3 engine mount bracket.

Tightening torque:

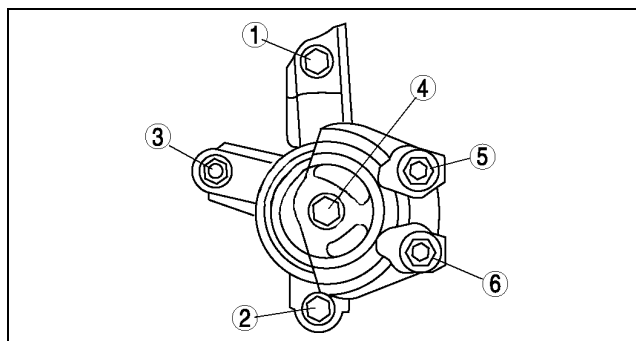
7.0—13 N·m {71.4—132.5 kgf·cm, 62.0—115.0 in·lbf}

2. Install the No.3 engine mount rubber hand-tighten.

3. Tighten the No.3 engine joint bracket is attached and bolts, nuts in the order shown.



AME2215W011

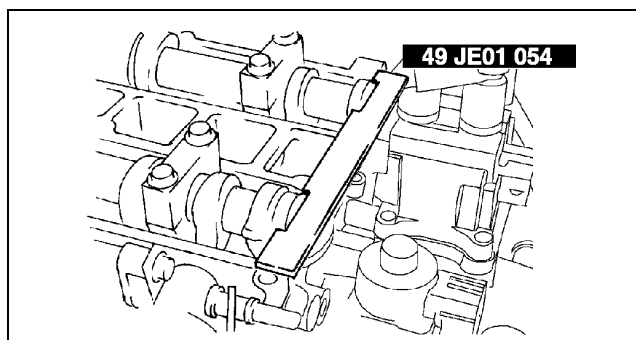


AME2215W012

Crankshaft Pulley Lock Bolt Installation Note

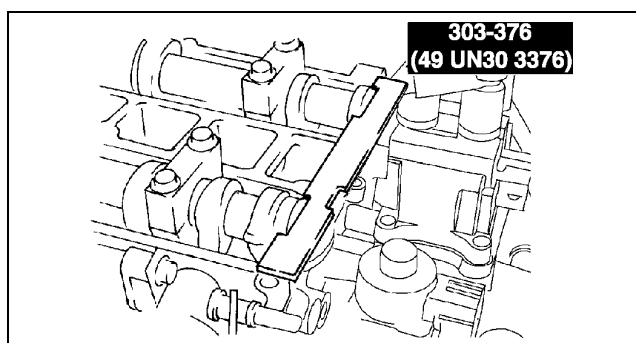
1. Install the **SST** to the camshaft as shown.

European countries



AME2212W010

Except European countries

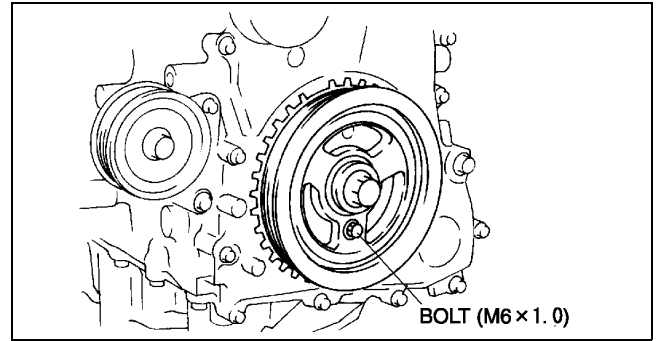


AME2212W011

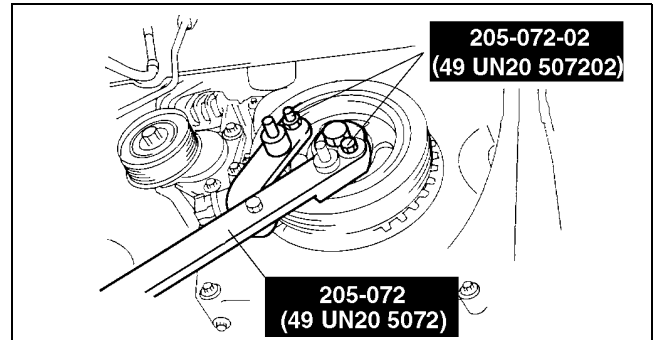
TIMING CHAIN

B

2. Install the **M6 x 1.0 bolt** in by hand.
3. Turn the crankshaft clockwise the crankshaft is in the No.1 cylinder TDC position.

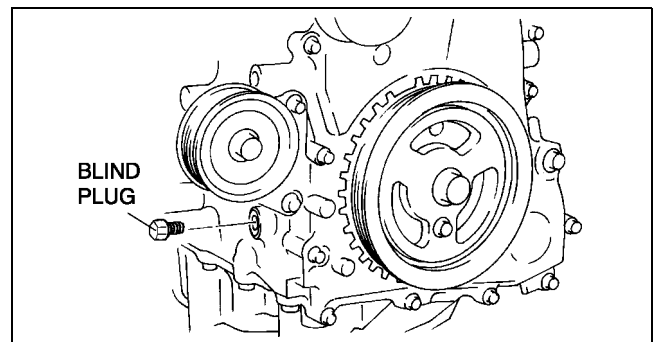


4. Hold the crankshaft pulley by using the **SST**.
5. Tighten the crankshaft pulley lock bolt using the following two steps.
 - (1) Tighten to **96—104 N·m {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}**
 - (2) Tighten **87°—93°**
6. Remove the M6 x 1.0 bolt.
7. Remove the **SST** from the camshaft.
8. Remove the **SST** from the cylinder block lower blind plug.
9. Rotate the crankshaft clockwise two turns until the TDC position.
 - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.
10. Install the cylinder block lower blind plug.



Tightening torque:

18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



Cylinder Head Cover Installation Note

1. Apply silicone sealant to the mating faces as shown.

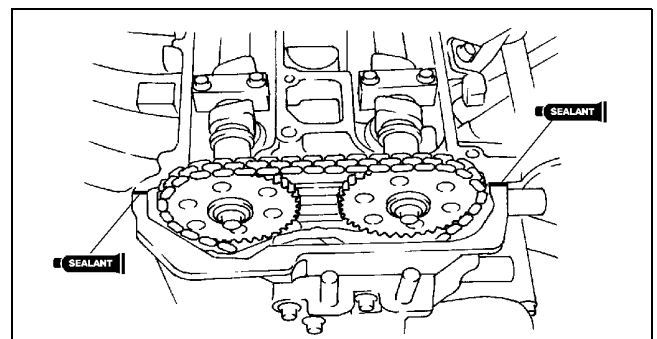
Caution

- Install the cylinder head cover within 10 minutes of applying the silicone sealant.

Dot diameter:

4.0—6.0 mm {0.16—0.23 in}

2. Install the cylinder head cover with a new gasket.

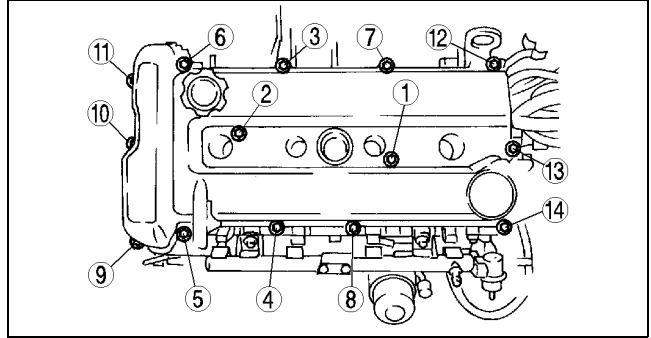


TIMING CHAIN, CYLINDER HEAD GASKET

3. Tighten the bolts in the order shown.

Tightening torque:

8.0—11.5 N·m {81.6—122.3 kgf·cm, 70.9—
106.2 in·lbf}



AME2215W015

CYLINDER HEAD GASKET

CYLINDER HEAD GASKET REPLACEMENT

A6E221810271W01

Warning

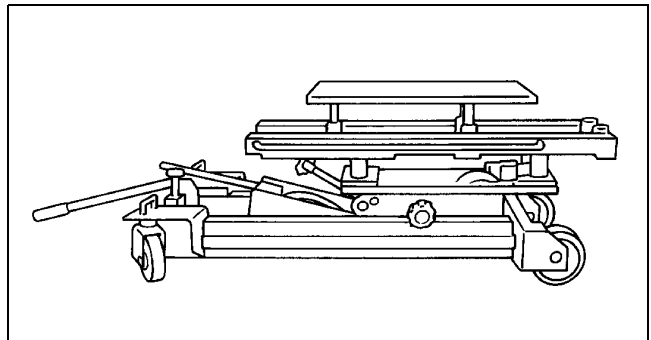
- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the “Fuel Line Safety Procedure”. (See [F-17 Fuel Line Safety Procedure](#).)

1. Remove the timing chain. (See [B-10 TIMING CHAIN REMOVAL/INSTALLATION](#).)
2. Remove the ignition coil. (See [G-8 IGNITION COIL REMOVAL/INSTALLATION](#).)
3. Remove the high-tension lead. (See [G-11 HIGH-TENSION LEAD REMOVAL/INSTALLATION](#).)
4. Disconnect the generator, but do not remove it from the vehicle. After disconnection, fix the generator using a rope to prevent it from falling. (See [G-6 GENERATOR REMOVAL/INSTALLATION](#).)
5. Remove the front pipe. (See [F-35 EXHAUST SYSTEM REMOVAL/INSTALLATION](#).)
6. Remove the intake manifold. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#).)
7. Disconnect the heater hose, bypass hose, radiator hose.
8. To firmly support the engine, first set the engine jack and attachment to the oil pan.

Note

- A: MA-1
- B: M18MA

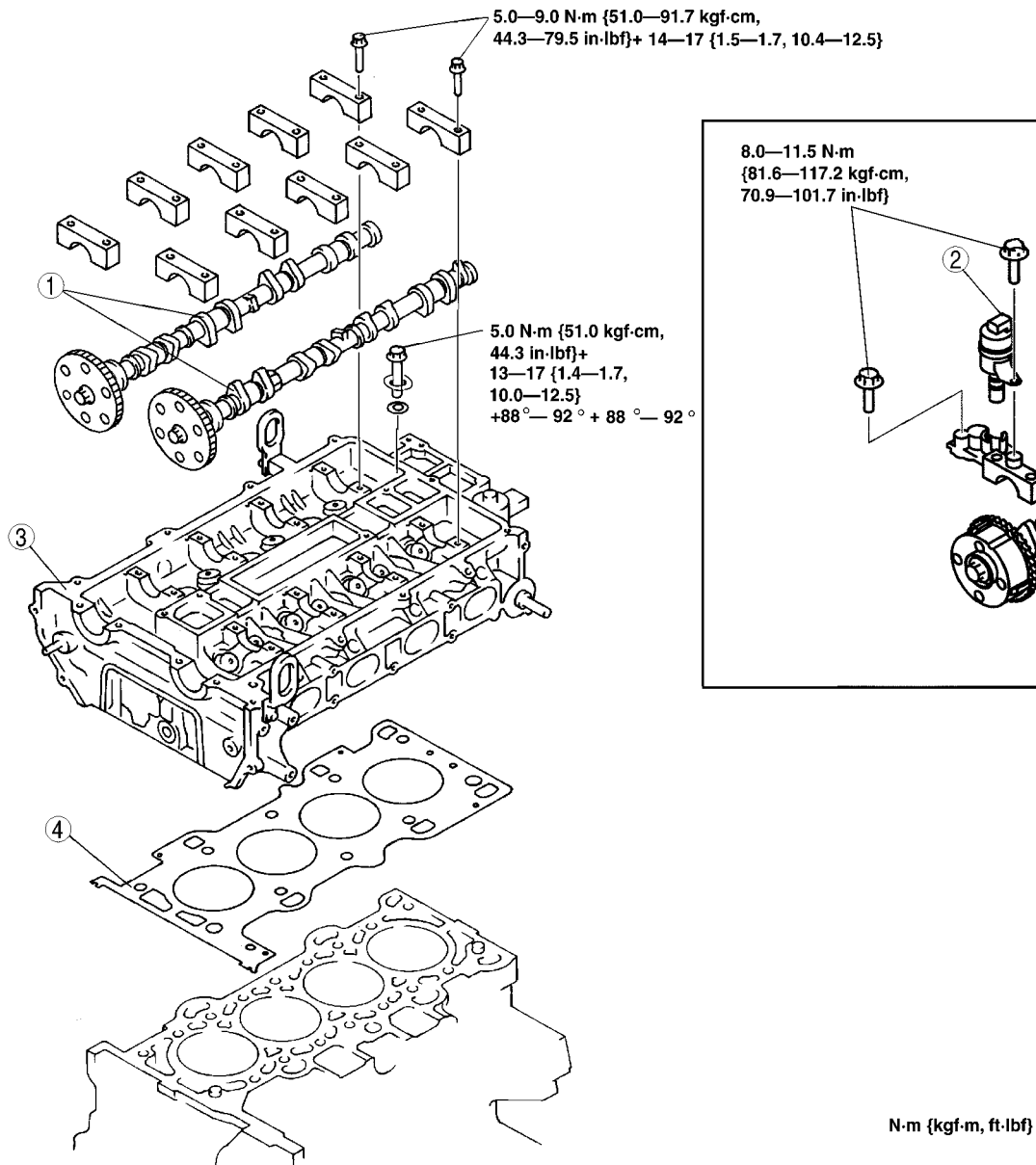
9. Remove in the order indicated in the table.
10. Install in the reverse order of removal.
11. Inspect the compression. (See [B-9 COMPRESSION INSPECTION](#).)



AME2218W001

CYLINDER HEAD GASKET

B



AME2218W002

1	Camshaft (See B-19 Camshaft Removal Note) (See B-21 Camshaft Installation Note)
2	Oil control valve (OCV) (L3)

3	Cylinder head (See B-20 Cylinder Head Removal Note) (See B-20 Cylinder Head Installation Note)
4	Cylinder head gasket

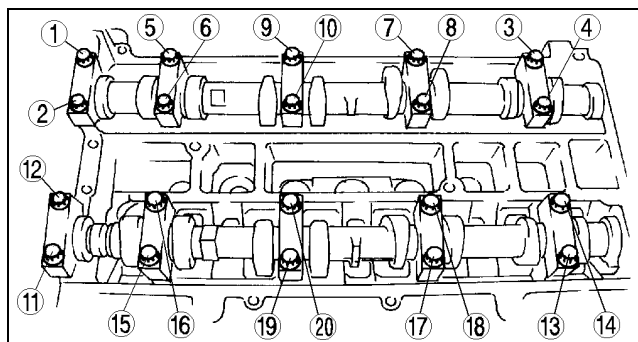
Camshaft Removal Note

Note

- The cylinder head and the camshaft caps are numbered to make sure they are reassembled in their original position. When removed, keep the caps with the cylinder head they were removed from. Do not mix the caps.

CYLINDER HEAD GASKET

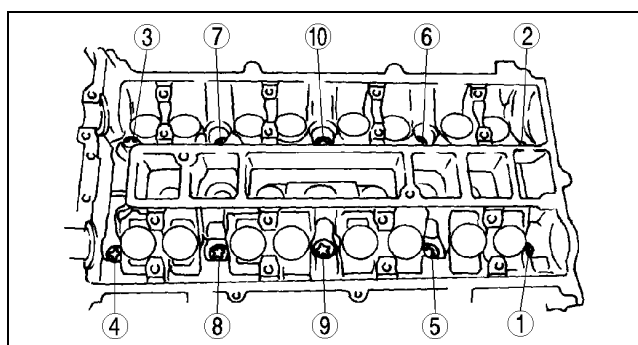
1. Loosen the camshaft cap bolts in several passes in the order shown.



AME2212W008

Cylinder Head Removal Note

1. Loosen the cylinder head bolts in several passes in the order shown.



AME2218W003

Cylinder Head Installation Note

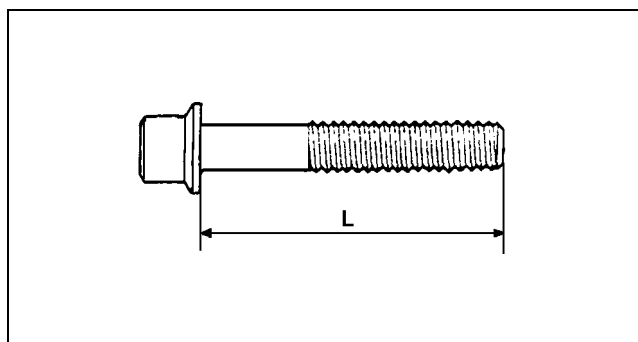
1. Measure the length of each cylinder head bolt.
 - Replace any that exceed maximum length.

Length L:

149.0—150.0 mm {5.867—5.905 in}

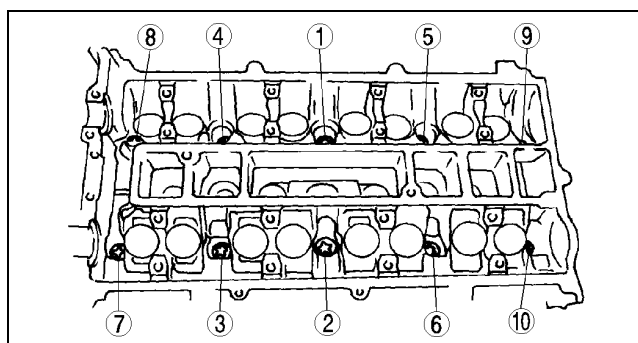
Maximum:

150.5 mm {5.965 in}



AME2218W004

2. Tighten the cylinder head bolts in the order shown using the following 5 steps.
 - (1) Tighten to **5.0 N·m {51.0 kgf·cm, 44.2 in·lbf}**
 - (2) Tighten **13—17 N·m {1.4—1.7 kgf·m, 10.0—12.5 ft·lbf}**
 - (3) Tighten **44—46 N·m {4.5—4.6 kgf·m, 32.5—33.9 ft·lbf}**
 - (4) Tighten **88°—92°**
 - (5) Tighten **88°—92°**

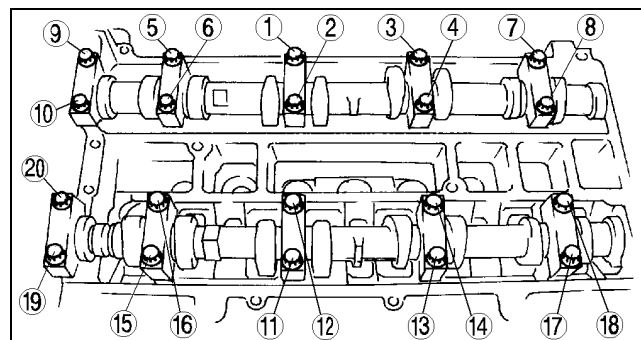


AME2218W005

CYLINDER HEAD GASKET, FRONT OIL SEAL

Camshaft Installation Note

1. Set the cam position of the No.1 cylinder at the top dead center (TDC) and install the camshaft.
2. Temporarily tighten the camshaft bearing caps in two or three even movements.
3. Tighten the camshaft cap bolts in the order shown using the following two steps.
 - (1) Tighten to **5.0—9.0 N·m {51.0—91.7 kgf·cm, 44.6—79.5 in·lbf}**
 - (2) Tighten to **14.0—17.0 N·m {1.5—1.7 kgf·m, 10.4—12.5 ft·lbf}**



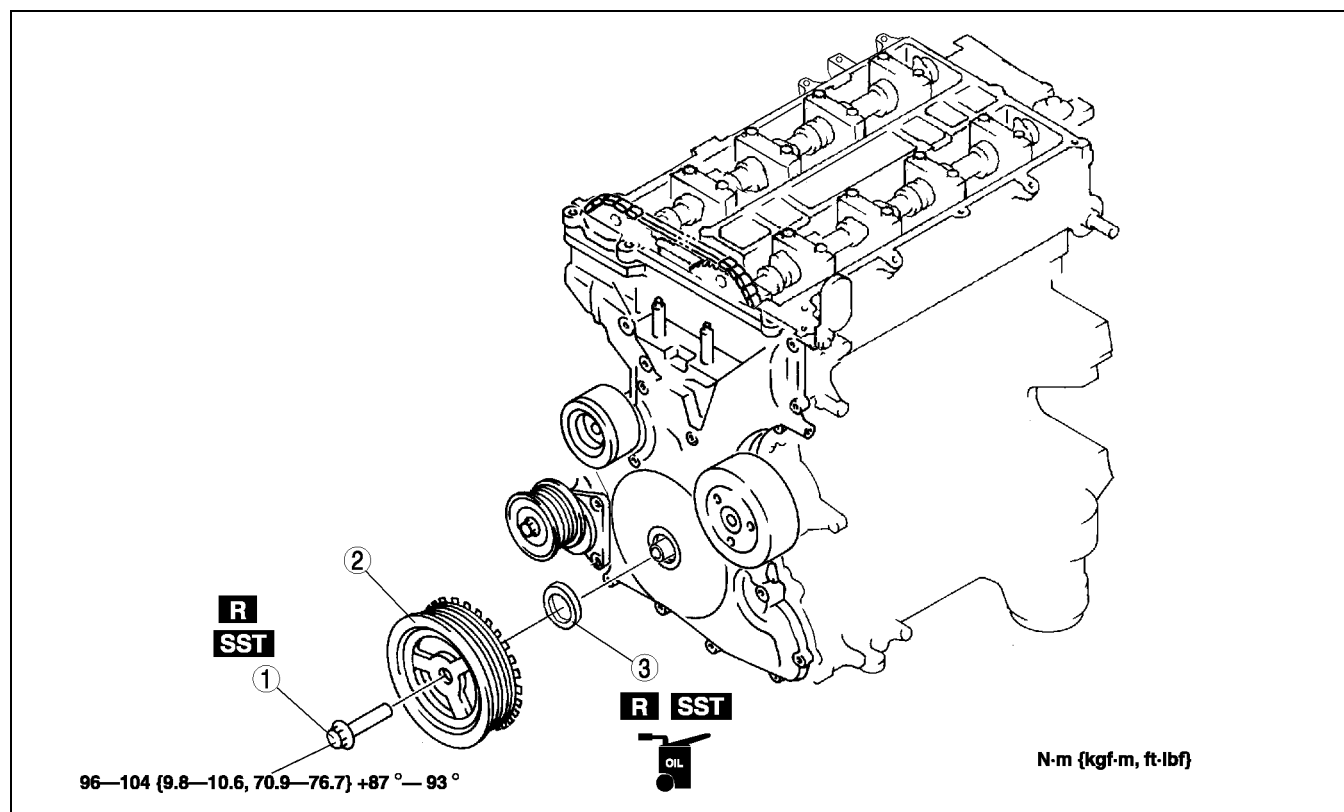
AME2212W009

FRONT OIL SEAL

FRONT OIL SEAL REPLACEMENT

A6E222010602W01

1. Disconnect the negative battery cable.
2. Remove the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION.](#))
3. Remove the Cylinder head cover. (See [B-17 Cylinder Head Cover Installation Note.](#))
4. Remove the drive belt. (See [B-3 DRIVE BELT REPLACEMENT.](#))
5. Remove the front drive shaft (RH) from the joint shaft. (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION.](#))
6. Remove the CKP sensor. (See [F-54 CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION.](#))
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.



AME2220W001

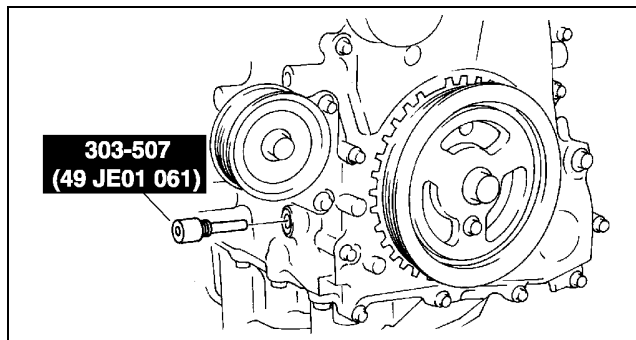
1	Crankshaft pulley lock bolt (See B-22 Crankshaft Pulley Lock Bolt Removal Note) (See B-23 Crankshaft Pulley Lock Bolt Installation Note)

2	Crankshaft pulley
3	Front oil seal (See B-22 Front Oil Seal Removal Note) (See B-23 Front Oil Seal Installation Note)

FRONT OIL SEAL

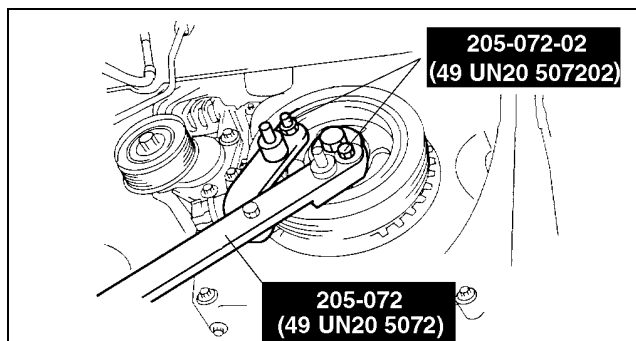
Crankshaft Pulley Lock Bolt Removal Note

1. Remove the cylinder block lower blind plug.
2. Install the **SST**.
3. Turn the crankshaft clockwise the crankshaft is in the No.1 cylinder TDC position.



AME2212W004

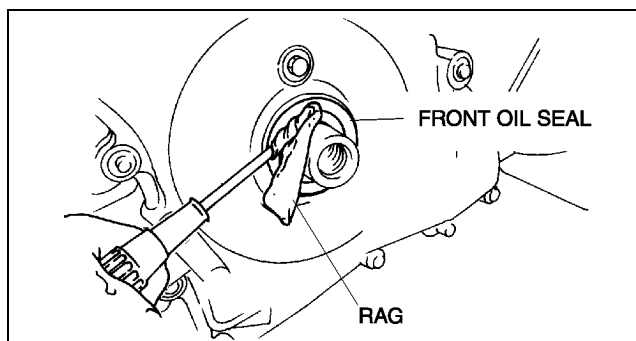
4. Hold the crankshaft pulley by using the **SSTs**.



AME2215W002

Front Oil Seal Removal Note

1. Cut the oil seal lip using a razor knife.
2. Remove the oil seal using a screwdriver protected with a rag.

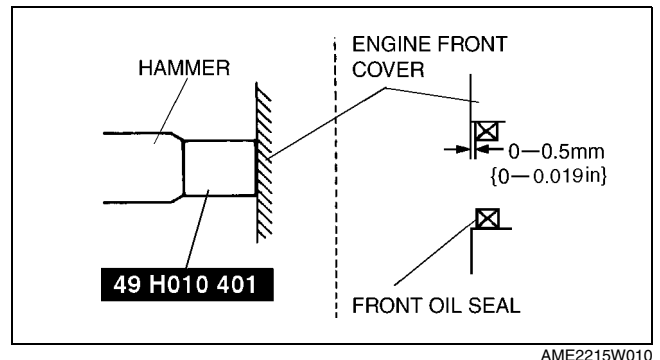
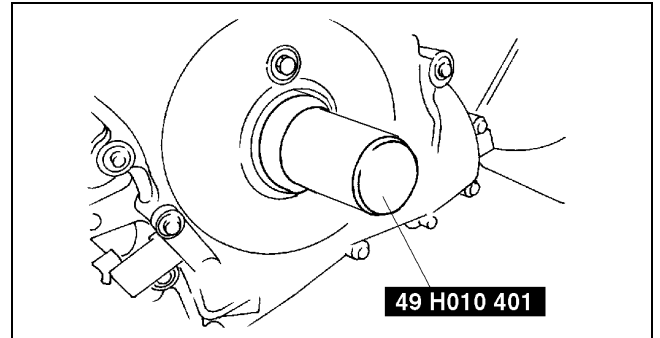


AME2220W002

FRONT OIL SEAL

Front Oil Seal Installation Note

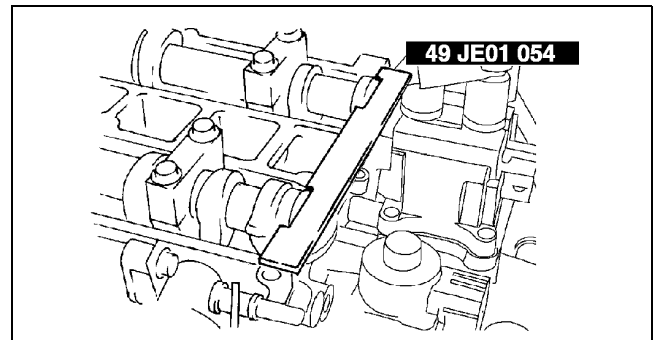
1. Apply clean engine oil to the oil seal lip.
2. Push the oil seal slightly in by hand.
3. Tap the oil seal in evenly using the **SST** and a hammer.



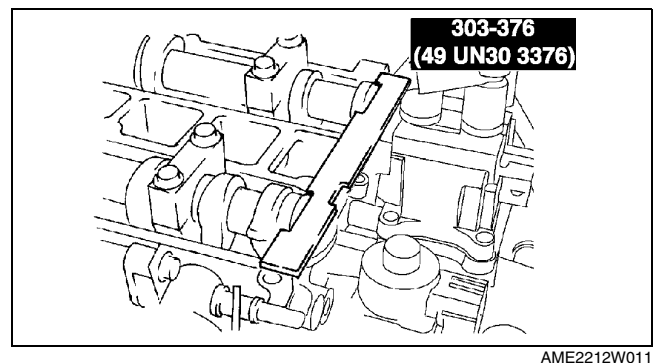
Crankshaft Pulley Lock Bolt Installation Note

1. Install the **SST** to the camshaft as shown.

European countries

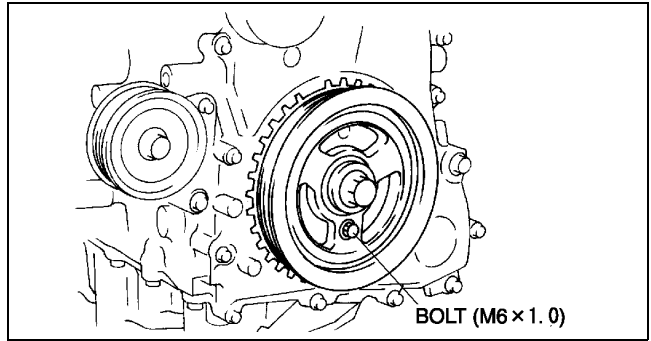


Except European countries

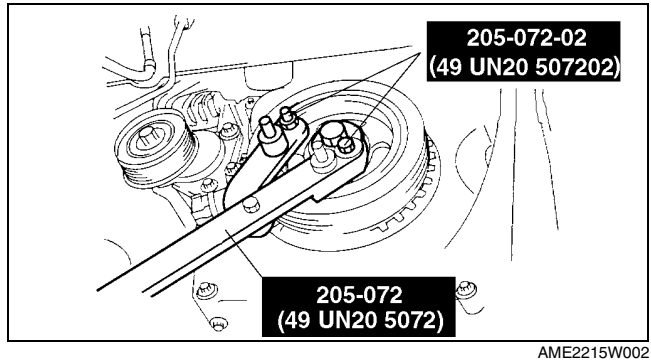


FRONT OIL SEAL

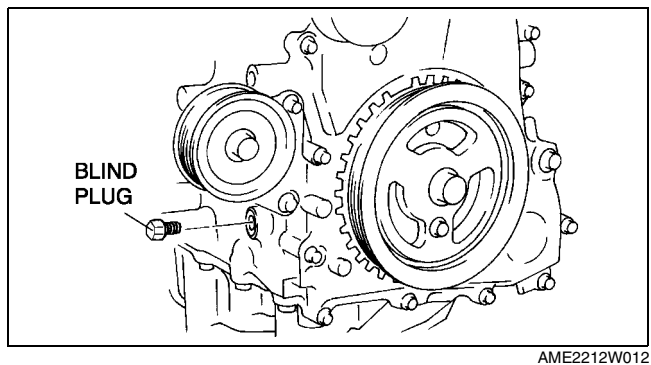
2. Install the **M6 x 1.0 bolt** in by hand.
3. Turn the crankshaft clockwise the crankshaft is in the No.1 cylinder TDC position.



4. Hold the crankshaft pulley by using the **SSTs**.
5. Tighten the crankshaft pulley lock bolt in the order shown using the following two steps.
 - (1) Tighten to **96—104 N·m {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}**
 - (2) Tighten **87°—93°**
6. Remove the M6 x 1.0 bolt.
7. Remove the **SST** from the camshaft.
8. Remove the **SST** from the cylinder block lower blind plug.
9. Rotate the crankshaft clockwise two turns until the TDC position.
 - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.
10. Install the cylinder block lower blind plug.



Tightening torque:
18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



REAR OIL SEAL

REAR OIL SEAL

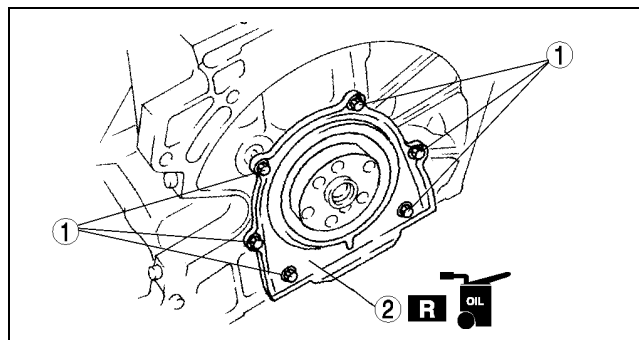
REAR OIL SEAL REPLACEMENT

A6E22211399W01

B

1. Remove the flywheel. (MTX) (See [H-11 CLUTCH UNIT REMOVAL/INSTALLATION](#))
2. Remove the drive plate. (ATX) (See [K-43 DRIVE PLATE REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

1	Bolt
2	Rear oil seal (See B-25 Rear Oil Seal Installation Note)



AME2222W001

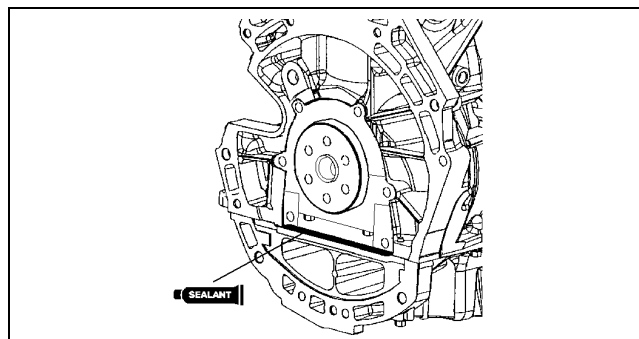
Rear Oil Seal Installation Note

1. Apply silicone sealant to the mating faces as shown.

Dot diameter:

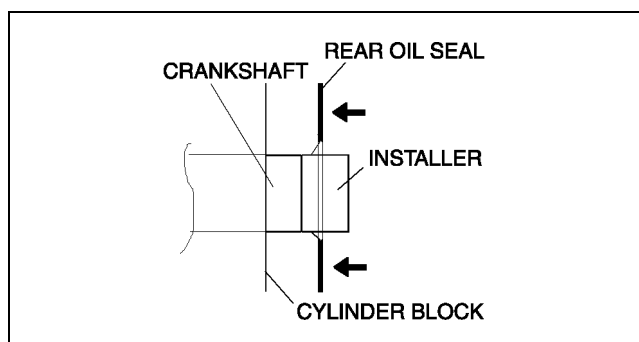
4.0—6.0 mm {0.16—0.23 in}

2. Apply clean engine oil to the new oil seal lip.



AME2222W002

3. Install the rear oil seal using the installer as shown.

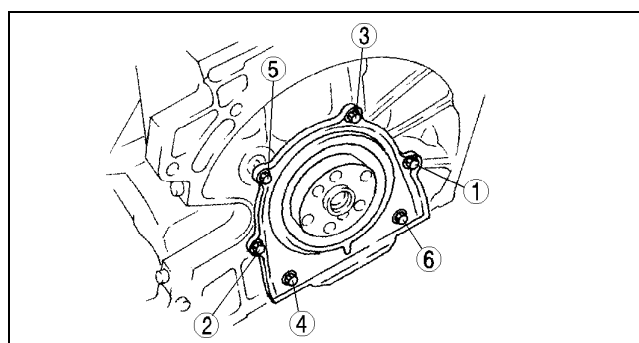


AME2224E326

4. Tighten the rear oil seal bolts in the order as shown.

Tightening torque:

8.0—11.5 N·m {81.6—117.2 kgf·m, 70.9—101.7 in·lbf}



AME2222W004

ENGINE

ENGINE

ENGINE REMOVAL/INSTALLATION

A6E222401001W01

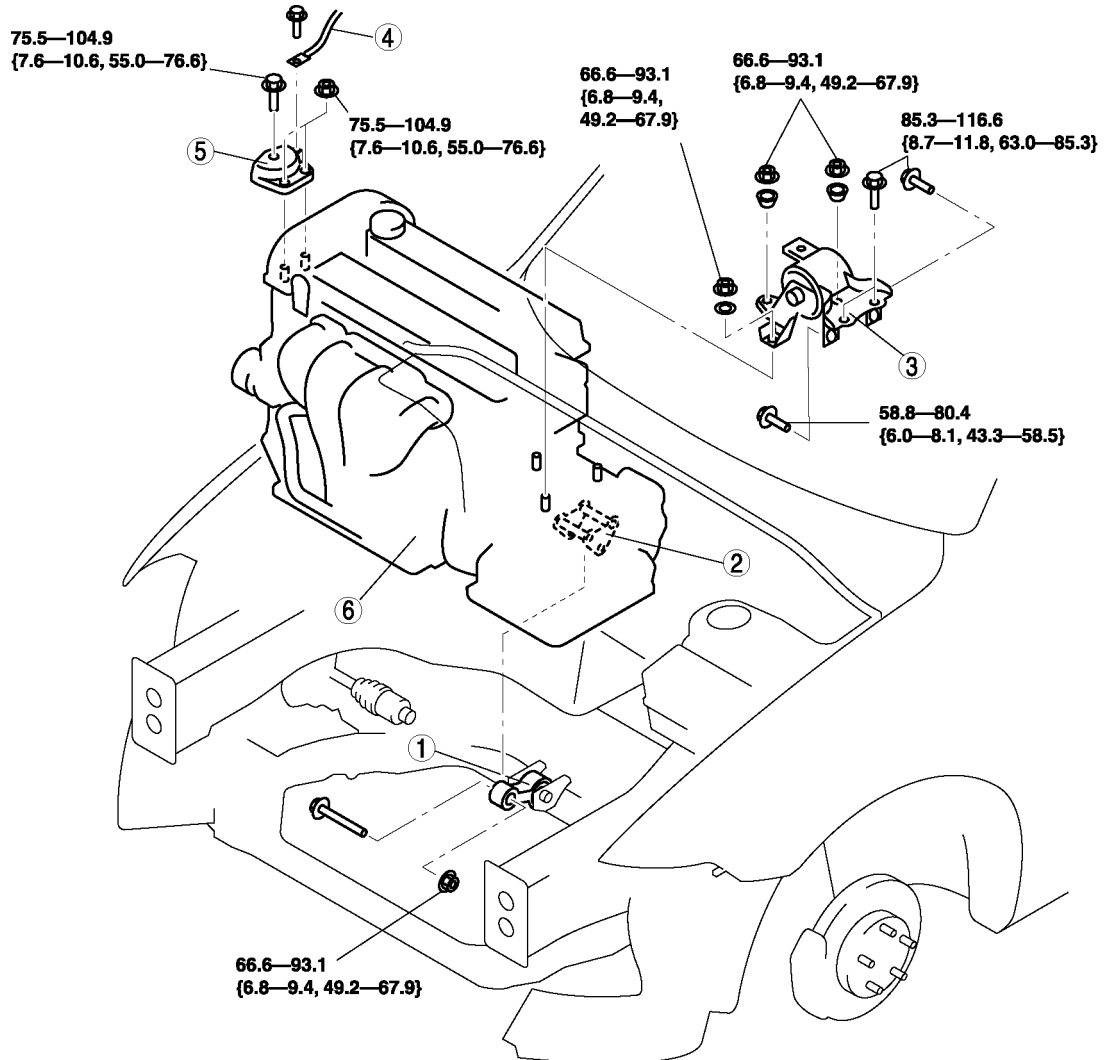
Warning

- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See [F-17 Fuel Line Safety Procedure](#).)

1. Remove the battery. (See [G-3 BATTERY REMOVAL/INSTALLATION](#).)
2. Remove the battery tray. (See [G-3 BATTERY REMOVAL/INSTALLATION](#).)
3. Remove the radiator. (See [E-6 RADIATOR REMOVAL/INSTALLATION](#).)
4. Drain the missions oil.
5. Remove the P/S oil pump with the oil hose still connected and position the P/S oil pump so that it is out of the way. (See [N-22 POWER STEERING OIL PUMP REMOVAL/INSTALLATION](#).)
6. Remove the A/C compressor with the pipes still connected. Position the A/C compressor so that it is out of the way. Use wire or rope to secure.
7. Remove the joint shaft from the front drive shaft. (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION](#).)
8. Remove the air cleaner, intake air duct, accelerator cable and bracket, and vacuum hose. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#).)
9. Remove the ATF filter and selector cable. (ATX) (See [K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION](#).)
10. Remove the vacuum hose and heater hose.
11. Remove the release cylinder and control cable. (MTX) (See [J-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION](#).)
12. Remove the plastic fuel hose. (See [F-23 Plastic Fuel Hose Removal Note](#).) (See [F-24 Plastic Fuel Hose Installation Note](#).)
13. Disconnect the wiring harness from the engine side.
14. Remove the front pipe. (See [F-35 EXHAUST SYSTEM REMOVAL/INSTALLATION](#).)
15. Remove in the order indicated in the table.
16. Install in the reverse order of removal.
17. Start the engine and:
 - Inspect for the engine oil, engine coolant, transaxle oil and fuel leakage.
 - Verify the ignition timing, idle speed and idle mixture. (See [F-8 IGNITION TIMING INSPECTION](#).) (See [F-9 IDLE MIXTURE INSPECTION](#).)
18. Perform a road test.

ENGINE

B



N·m {kgf·m, ft·lbf}

AME2213W001

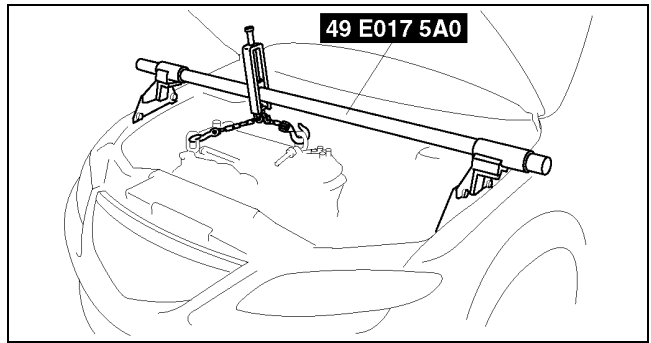
1	No.1 Engine mount rubber (See B-28 No.1 Engine Mount Rubber Removal Note) (See B-31 No.1 Engine Mount Rubber Installation Note)
2	No.1 Engine mount bracket (See B-31 No.1 Engine Mount Bracket Installation Note)

3	No.4 Engine mount bracket and No.4 Engine mount rubber (See B-28 No.4 Engine Mount Bracket and No.4 Engine Mount Rubber Removal Note) (See B-30 No.4 Engine Mount Bracket and No.4 Engine Mount Rubber Installation Note)
4	Engine ground
5	No.3 Engine joint bracket (See B-29 No.3 Engine Joint Bracket Installation Note)
6	Engine, transaxle

ENGINE

No.1 Engine Mount Rubber Removal Note

1. Suspend the engine using the **SSTs**.
2. Remove the through bolt A on the No.1 engine mount bracket side.

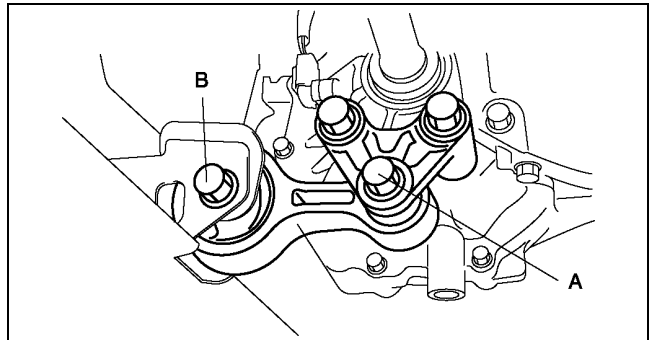


AME2215W004

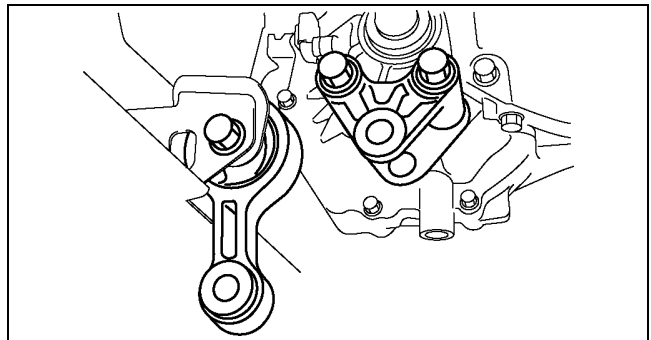
3. Loosen the through bolt B on the chassis side until approximately three pitches are showing.

Note

- Do not remove the No.1 engine mount rubber from the vehicle.



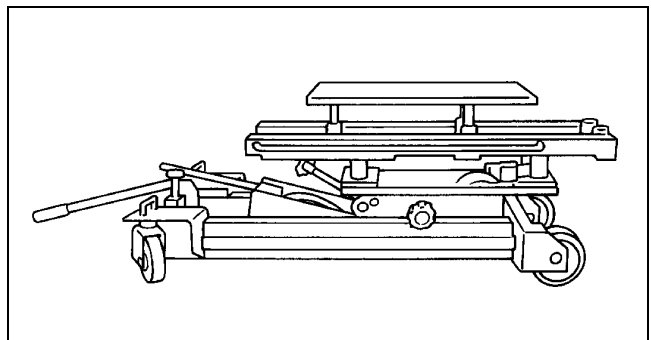
AME2213W002



AME2213W003

No.4 Engine Mount Bracket and No.4 Engine Mount Rubber Removal Note

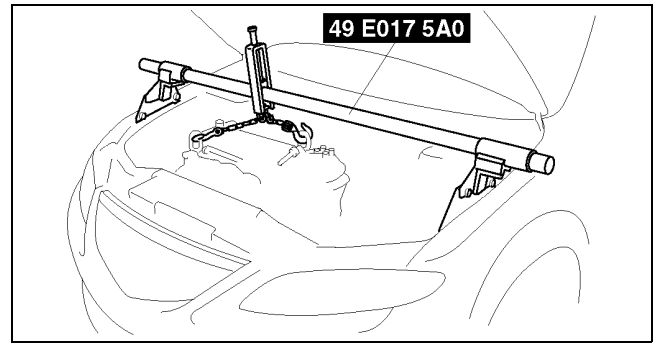
1. Secure the engine and the transaxle using an engine jack and attachment as shown.



AME2218W001

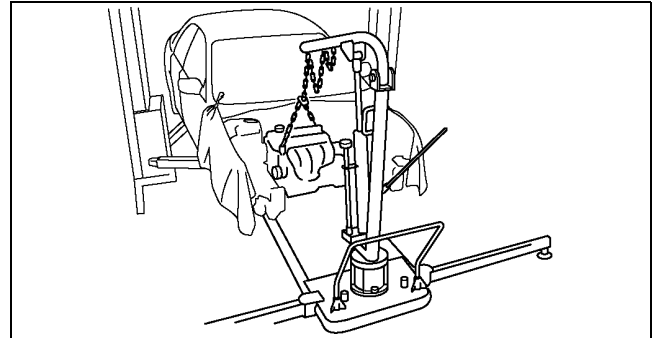
ENGINE

2. Remove the SST.



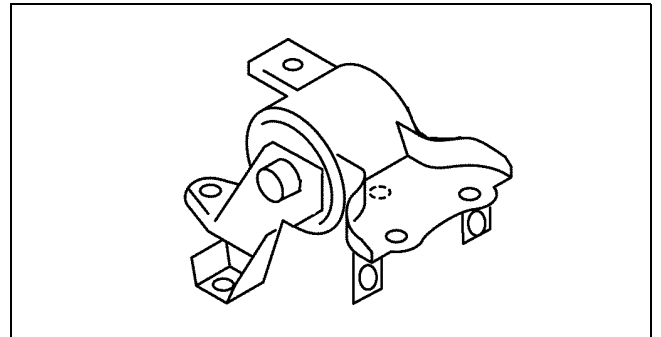
AME2215W004

3. Secure the engine and the transaxle using a hoist.



AME2213W004

4. No.4 engine mount bracket and engine mount rubber together in one piece.



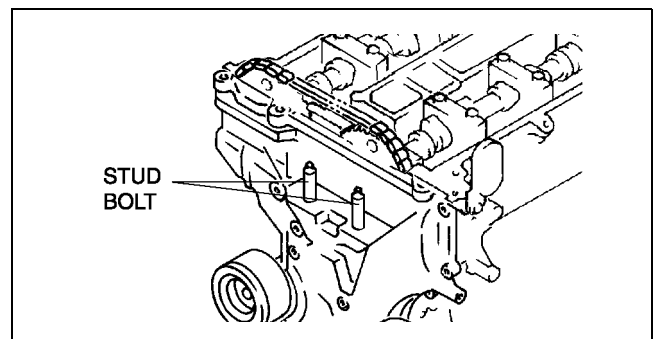
AME2213W005

No.3 Engine Joint Bracket Installation Note

1. Tighten the No.3 engine mount bracket stud bolt.

Tightening torque:

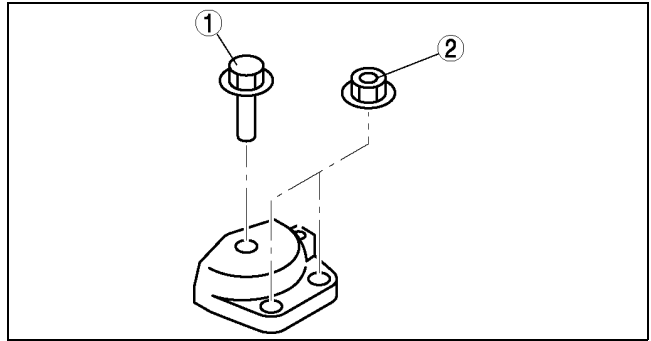
7.0—13 N·m {71.4—132.5 kgf·cm, 62.0—115.0 in·lbf}



AME2215W011

ENGINE

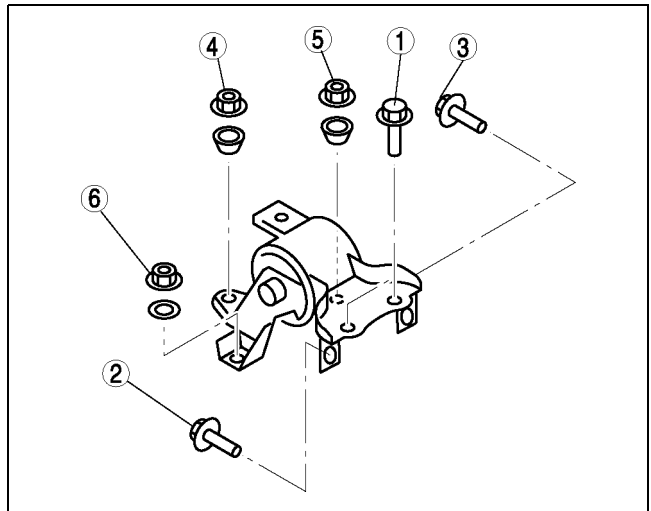
2. Tighten the No.3 engine joint bracket bolt and nut in the order shown.



AME2213W010

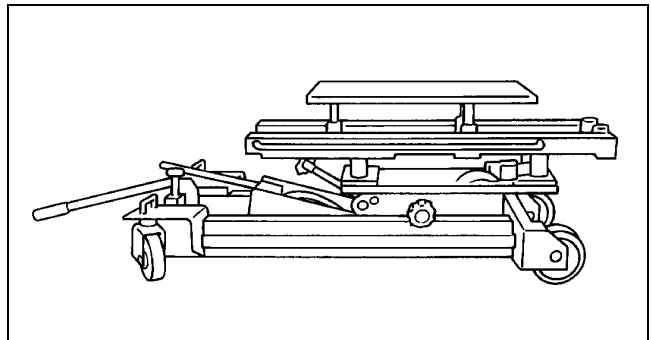
No.4 Engine Mount Bracket and No.4 Engine Mount Rubber Installation Note

1. Tighten the No.4 engine mount bracket and No.4 engine mount rubber bolt and nut in the order as shown.



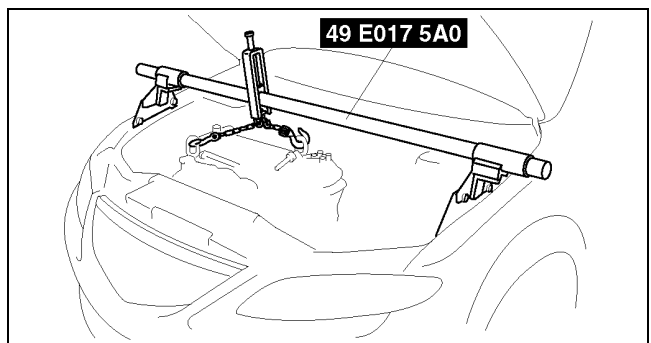
AME2213W011

2. Secure the engine and the transaxle using an engine jack and attachment as shown.



AME2218W001

3. Remove the hoist and secure the engine and transaxle using **SST**.



AME2215W004

ENGINE

No.1 Engine Mount Bracket Installation Note

1. Tighten No.1 engine mount bracket bolt A.

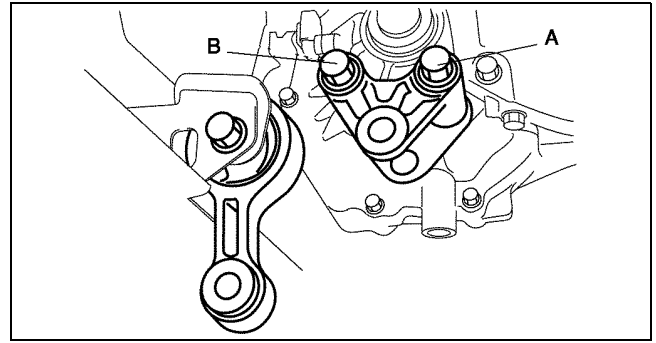
Tightening torque:

93.1—116.6 N·m {9.50—11.88 kgf·m, 68.72—85.92 ft·lbf}

2. Tighten No.1 engine mount bracket bolt B.

Tightening torque:

93.1—116.6 N·m {9.50—11.88 kgf·m, 68.72—85.92 ft·lbf}



AME2213W008

B

No.1 Engine Mount Rubber Installation Note

1. Tighten through bolt A on No.1 engine mount bracket.

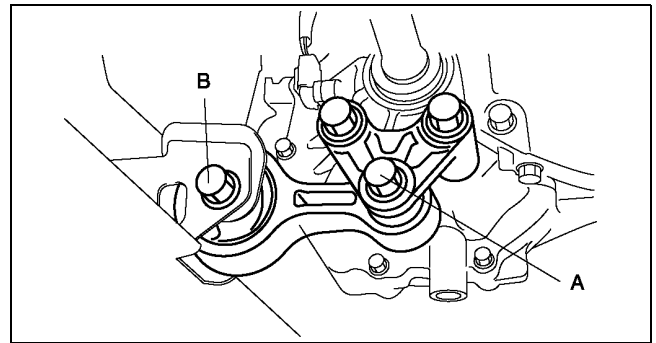
Tightening torque:

85.3—116.6 N·m {8.7—11.88 kgf·m, 62.93—85.92 ft·lbf}

2. Tighten through bolt B on chassis side.

Tightening torque:

93.1—116.6 N·m {9.50—11.88 kgf·m, 68.72—85.92 ft·lbf}



AME2213W009

ENGINE DISASSEMBLY/ASSEMBLY

A6E222401001W02

1. Disconnect the engine and automatic transaxle. (ATX) (See [K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.](#))
2. Disconnect the engine and manual transaxle. (MTX) (See [J-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION.](#))
3. Remove the intake-air system. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
4. Remove the exhaust system. (See [F-35 EXHAUST SYSTEM REMOVAL/INSTALLATION.](#))
5. Remove the generator.
6. Remove the ignition coils. (See [G-8 IGNITION COIL REMOVAL/INSTALLATION.](#))
7. Remove the CKP sensor. (See [F-54 CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION.](#))
8. Assemble in the reverse order of disassembly.

VARIABLE VALVE TIMING

VARIABLE VALVE TIMING

VARIABLE VALVE TIMING ACTUATOR INSPECTION

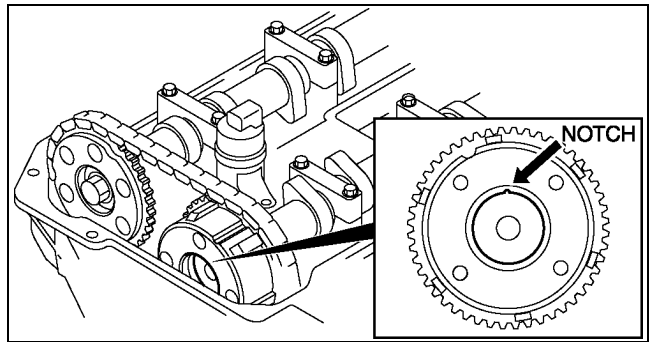
A6E222500142W01

L3

Caution

- Variable valve timing actuator can not be disassembled it is a precision unit.

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.
3. Remove the high-tension lead.
4. Remove the oil control valve connector.
5. Remove the ventilation hose.
6. Remove the cylinder head cover.
7. Confirm that notch of the rotor and bump of the cover at the variable valve timing actuator are aligned and fitted.
 - If the notch and the bump are not aligned, turn the crankshaft clockwise two rotations. Verify that the bump and the notch are aligned.
 - If the bump and notch are still not aligned, replace the variable valve timing actuator.
 - If, when turning the crankshaft, there is a hitting noise from the variable valve timing actuator each time the cam passes the fully lifted position, it means that the actuator is not secured. Replace the actuator.
8. Install the cylinder head cover. (See [B-17 Cylinder Head Cover Installation Note](#).)
9. Install the ventilation hose.
10. Install the oil control valve connector.
11. Install the high-tension lead. (See [G-11 HIGH-TENSION LEAD REMOVAL/INSTALLATION](#).)
12. Install the spark plugs. (See [G-10 SPARK PLUG REMOVAL/INSTALLATION](#).)
13. Install the plug hole plate.



AME2225W002

VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION

A6E222500142W02

L3

Caution

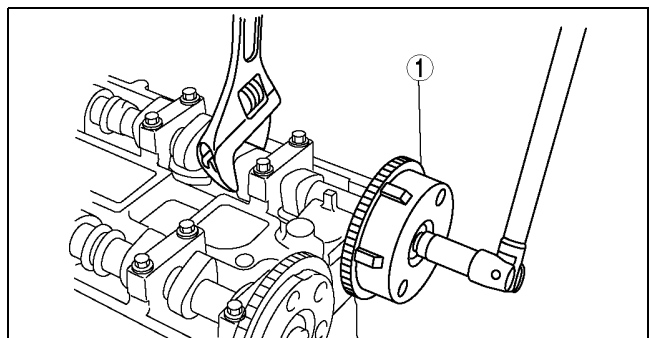
- Variable valve timing actuator can not be disassembled because it is a precision unit.

Note

- Variable valve timing actuator camshaft sprocket is integrated with the variable valve timing actuator and cannot be disassembled.

1. Follow the timing chain removal/installation procedure from 1 to 13 and remove the timing chain. (See [B-10 TIMING CHAIN REMOVAL/INSTALLATION](#).)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

1	Variable valve timing actuator (See B-33 Variable Valve Timing Actuator Removal Note) (See B-33 Variable Valve Timing Actuator Installation Note)



AME2225W001

VARIABLE VALVE TIMING, OIL CONTROL VALVE (OCV)

Variable Valve Timing Actuator Removal Note

1. Set a wrench or equivalent tool at the hexagonal part of the camshaft to prevent rotation.
2. Loosen the variable valve timing actuator tightening bolts.

Variable Valve Timing Actuator Installation Note

1. Set a wrench or equivalent tool at the hexagonal part of the camshaft to prevent rotation.
2. Tighten variable valve timing actuator tightening bolts.

Tightening torque

69—75N·m {7.10—7.6 kgf·m, 50.9—55.3 ft·lbf}

B

OIL CONTROL VALVE (OCV)

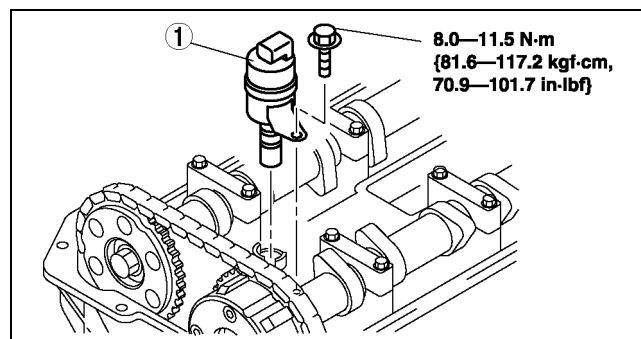
OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION

A6E222614420W01

L3

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.
3. Remove the high-tension lead. (See [G-11 HIGH-TENSION LEAD REMOVAL/INSTALLATION.](#))
4. Remove the oil control valve (OCV) connector.
5. Remove the ventilation hose.
6. Remove the cylinder head cover. (See [B-17 Cylinder Head Cover Installation Note.](#))
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.

1	Oil control valve (OCV)



AME2226W001

OIL CONTROL VALVE (OCV) INSPECTION

A6E222614420W02

L3

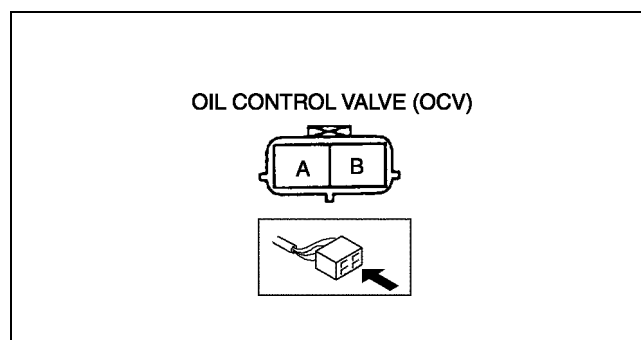
Coil Resistance Inspection

1. Disconnect the negative battery cable.
2. Disconnect the oil control valve connector.
3. Measure the resistance between terminals A and B using an ohmmeter.
 - If not as specified, replace the oil control valve.

Specification

6.9—7.9 ohms

4. Connect the oil control valve connector.

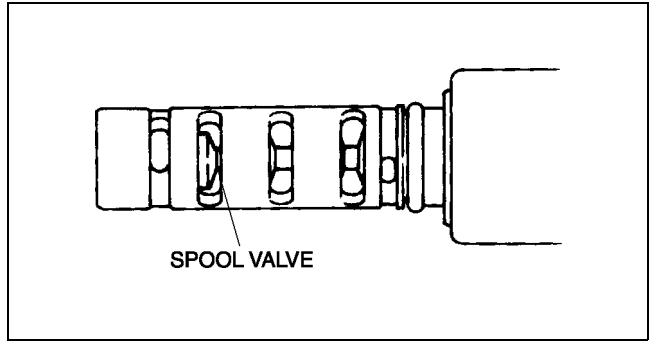


AME2226W002

OIL CONTROL VALVE (OCV)

Spool Valve Operation Inspection

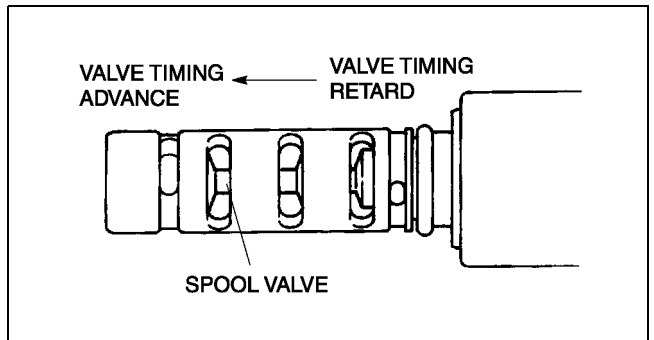
1. Disconnect the negative battery cable.
2. Remove the oil control valve.
3. Verify that the spool valve in the oil control valve is in the maximum valve timing retard position as indicated in the figure.
 - If not as specified, replace the oil control valve.
4. Verify that the battery is fully charged.
 - If not as specified, recharge the battery.
5. Apply battery positive voltage between the oil control valve terminals and verify that the spool valve operates and moves to the maximum valve timing advance position.
 - If not as specified, replace the oil control valve.



AME2226W003

Note

- When applying battery positive voltage between the oil control valve terminals, the connection can be either of the following:
 - Positive battery cable to terminal A, negative battery cable to terminal B
 - Positive battery cable to terminal B, negative battery cable to terminal A
6. Stop applying battery positive voltage and verify that the spool valve returns to the maximum valve timing retard position.
 - If not as specified, replace the oil control valve.



AME2226W004

LUBRICATION SYSTEM

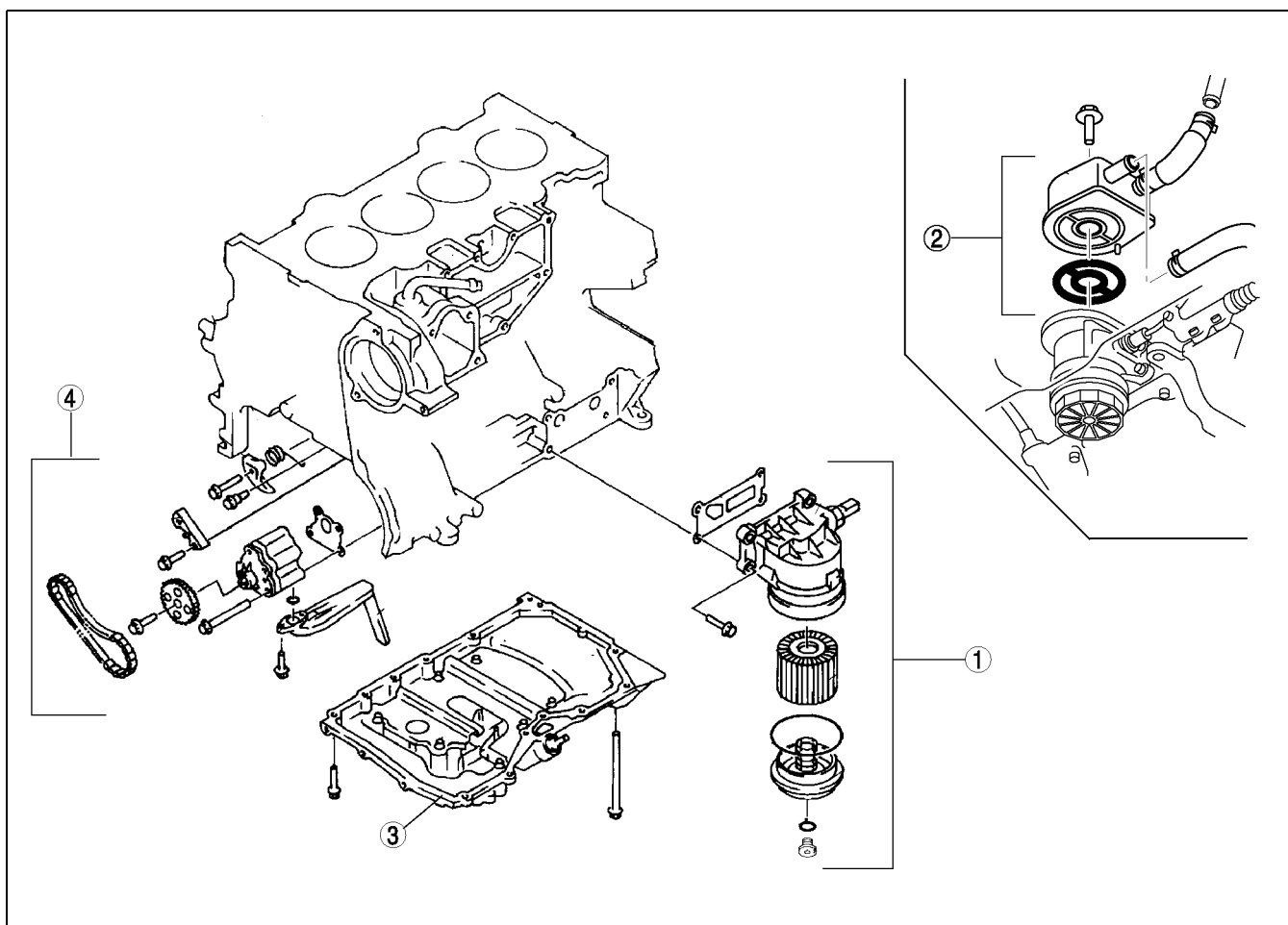
LOCATION INDEX	D-2
LOCATION INDEX	D-2
OIL PRESSURE INSPECTION	D-3
OIL PRESSURE INSPECTION	D-3
ENGINE OIL	D-4
ENGINE OIL INSPECTION	D-4
ENGINE OIL REPLACEMENT	D-4
OIL FILTER	D-6
OIL FILTER REPLACEMENT	D-6
OIL COOLER	D-7
OIL COOLER REMOVAL/INSTALLATION	D-7
OIL PAN	D-8
OIL PAN REMOVAL/INSTALLATION	D-8
OIL PUMP	D-10
OIL PUMP REMOVAL/INSTALLATION	D-10

LOCATION INDEX

LOCATION INDEX

LOCATION INDEX

A6E330001002W01



AME3300W001

1	Oil filter (See D-6 OIL FILTER REPLACEMENT)
2	Oil cooler (LF and L3 engine models) (See D-7 OIL COOLER REMOVAL/INSTALLATION)

3	Oil pan (See D-8 OIL PAN REMOVAL/INSTALLATION)
4	Oil pump (See D-10 OIL PUMP REMOVAL/INSTALLATION)

OIL PRESSURE INSPECTION

OIL PRESSURE INSPECTION

OIL PRESSURE INSPECTION

A6E331001003W01

Warning

- Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.
- Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.

D

1. Remove the under cover.
2. Remove the oil pressure switch.
3. Screw the **SST** into the oil pressure switch installation hole.
4. Warm up the engine to normal operating temperature.
5. Run the engine at the specified speed, and note the gauge readings.
 - If the pressure is not as specified, inspect for the cause and repair or replace as necessary.

Note

- The oil pressure can vary with oil viscosity and temperature.

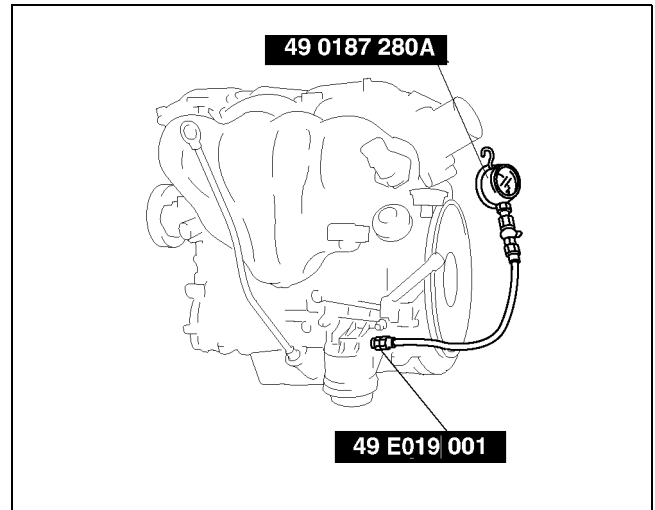
Oil pressure [Oil temperature: 100 °C{212°F}]:

L8, LF :

234—521 kPa {2.39—5.31 kgf/cm², 33.9—75.5 psi} min. [3,000rpm]

L3 :

395—649 kPa {4.03—6.61 kgf/cm², 57.3—94.1 psi} min. [3,000rpm]



AME3310W001

6. Stop the engine and wait until it is cool.
7. Remove the **SST**.

Caution

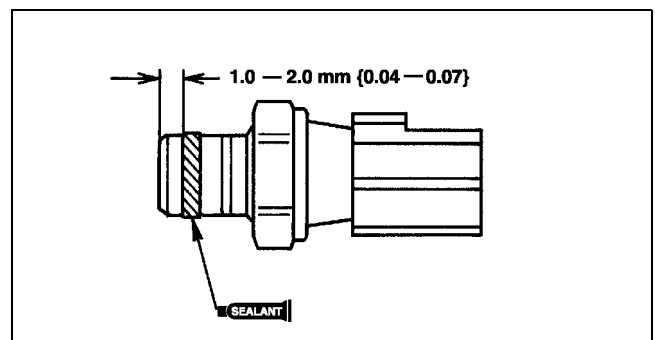
- Any sealant stuck at the end of the oil pressure switch can cause operation malfunction of the oil pressure switch.
Be sure there is no sealant at the end of the oil pressure switch.

8. Apply silicone sealant to the oil pressure switch threads as shown.
9. Install the oil pressure switch.

Tightening torque:

12—18 N·m {1.2—1.8 kgf·m, 9—13 ft·lbf}

10. Install the under cover.
11. Start the engine and inspect for oil leakage.
 - If the oil leaks, specify the faulty part and repair or replace it.



AME3310W002

ENGINE OIL

ENGINE OIL

ENGINE OIL INSPECTION

A6E331214001W01

1. Position the vehicle on level ground.
2. Warm up the engine to normal operating temperature.
3. Stop the engine and wait for **5 min.**
4. Remove the dipstick.
5. Verify that the oil level is between the F and L marks on the dipstick and check the engine oil condition.
 - If the oil level is below the L mark, add the oil.

ENGINE OIL REPLACEMENT

A6E331214001W02

Warning

- Hot engines and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil has cooled.
- A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.
- Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.

Caution

- In case you spill engine oil on the front pipe, wipe it off completely. If you fail to wipe the spilled oil, it will produce a white smoke because of the heat.

1. Position the vehicle on level ground.
2. Remove the oil filler cap and the oil pan drain plug and oil filter drain.
3. Drain the engine oil into a container.
4. Install the oil filter drain plug with the new O-ring.

Tightening torque (oil filter drain plug):

9—10 N·m {91.8—101.9 kgf·cm, 79.7—88.4 in·lbf}

5. Clean the flange surface (seal rubber) of the oil pan drain plug, then install the oil pan drain plug.

Tightening torque (oil pan drain plug):

25—30 N·m {2.6—3.0 kgf·m, 18.8—21.6 ft·lbf}

Note

- The amount of residual oil in the engine can vary according to the replacement method, oil temperature, etc. Verify the oil level after engine oil replacement.

6. Refill the engine with the specified type and amount of engine oil.

Oil capacity (Approximate quantity)

L {US qt, Imp qt}

Item	Engine		
	L8	LF	L3
Total (dry engine)	4.6 {4.8, 4.0}	4.6 {4.8, 4.0}	4.2 {4.4, 3.6}
Oil replacement	3.9 {4.0, 3.4}	3.9 {4.0, 3.0}	3.1 {3.3, 2.7}
Oil and oil filter replacement	4.3 {4.5, 3.8}	4.3 {4.5, 3.8}	3.5 {3.7, 3.1}

Note

- The maintenance intervals on scheduled maintenance table (See [GI-33 SCHEDULED MAINTENANCE TABLE](#)) can only be supported by the use of following oils.

ENGINE OIL

Recommended engine oil

Item	Market		
	Europe		Except Europe
Grade	API SJ ACEA A1 or A3	API SL ILSAC GF-3	API SG, SH, SJ, SL ILSAC GF-2, GF-3
Viscosity (SAE)	5W-30	5W-20	40, 30, 20, 20W-20, 10W-30, 10W-40, 10W-50, 20W-40, 15W-40, 20W-50, 15W-50, 5W-20, 5W-30
Remarks	Mazda genuine DEXELIA oil	—	—

7. Refit the oil filler cap.
8. Run the engine and inspect for oil leakage.
9. Inspect the oil level.
 - If necessary, add oil. (See [D-4 ENGINE OIL INSPECTION.](#))
10. Start the engine and inspect for oil leakage.
 - If the oil leaks, specify the faulty part and repair or replace it.

D

OIL FILTER

OIL FILTER

OIL FILTER REPLACEMENT

For Europe (LF and L3 engine models)

A6E331414300W01

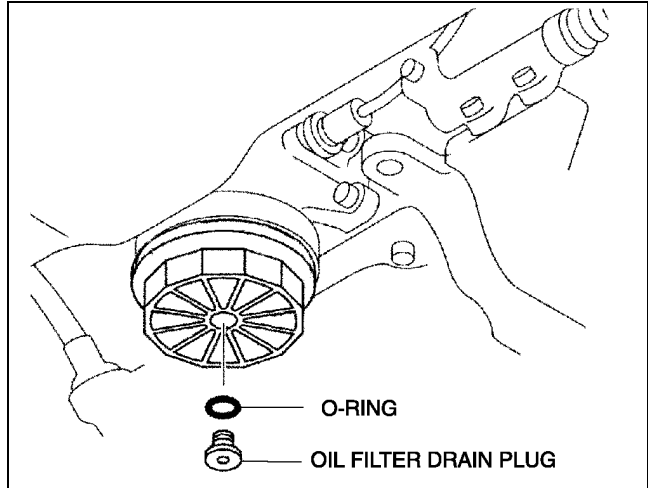
Caution

- To avoid damage to the oil filter, use only specified oil filter.

1. Remove the oil filter drain plug.
2. Untighten the oil filter cover for 2 turns and drain the engine oil.

Note

- Oil could be easily drained when the air is in the filter.



AME3314W001

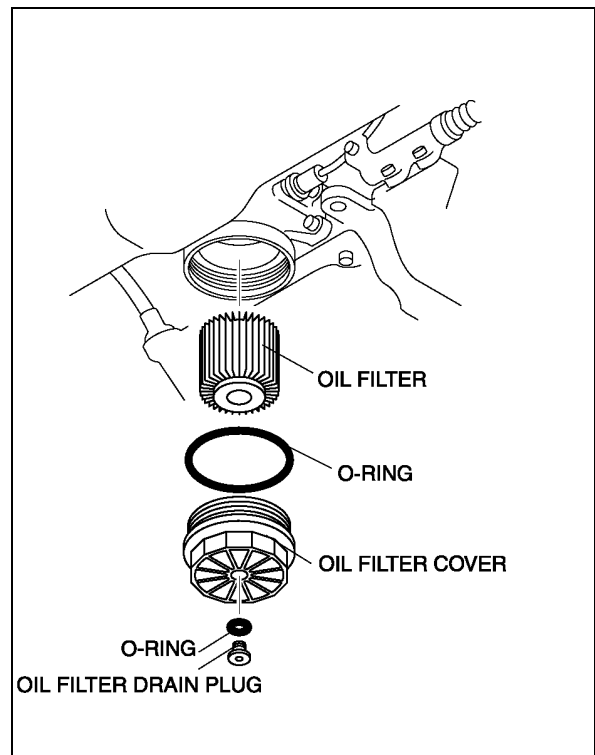
3. Remove the oil filter.
4. Use a clean rag to wipe off the mounting surface on the oil filter adapter and the oil filter cover.
5. Apply clean oil to new O-ring of a new oil filter and a new oil filter drain plug.
6. Install the oil filter, oil filter drain plug, and oil filter cover.
7. Tighten the oil filter cover and oil filter drain plug.

Tightening torque:

Oil filter cover: 30—35 N·m {30.5—3.56 kgf·cm, 22.2—25.8 in·lbf}

Oil filter drain plug: 9.0—11 N·m {91.8—112.1 kgf·cm, 79.6—97.3 in·lbf}

8. Start the engine and inspect for oil leakage.
9. Inspect the oil level.
 - If necessary, add oil. (See [D-4 ENGINE OIL INSPECTION](#).)



AME3314W002

OIL COOLER

OIL COOLER

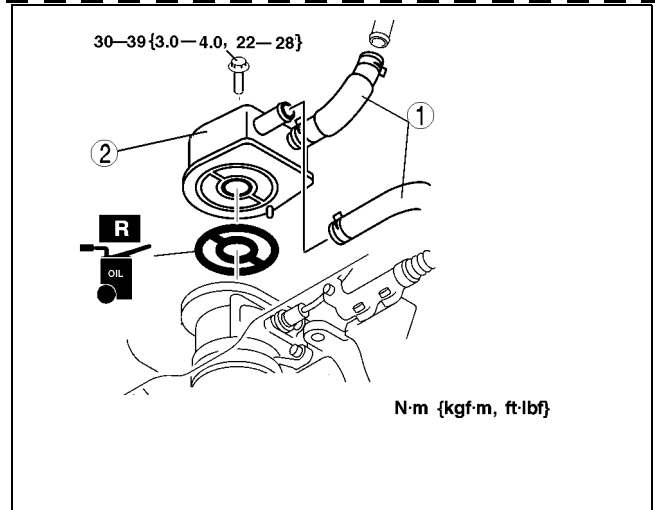
OIL COOLER REMOVAL/INSTALLATION

A6E331819900W01

LF, L3

1. Remove the under cover.
2. Drain the engine coolant. (See [E-3 ENGINE COOLANT REPLACEMENT](#).)
3. Remove the oil filter cover, and drain the engine oil into a container. (See [D-6 OIL FILTER REPLACEMENT](#).)
4. Remove in the order indicated in the table.
5. Use a clean rag to wipe off the mounting surface on the oil cooler.
6. Install in the reverse order of removal.
7. Inspect the oil level.
 - If necessary, add oil. (See [D-4 ENGINE OIL INSPECTION](#).)
8. Start the engine and inspect for oil leakage.
 - If the oil leaks, specify the faulty part and repair or replace it.

1	Water hose
2	Oil cooler



AME3318W002

OIL PAN

OIL PAN

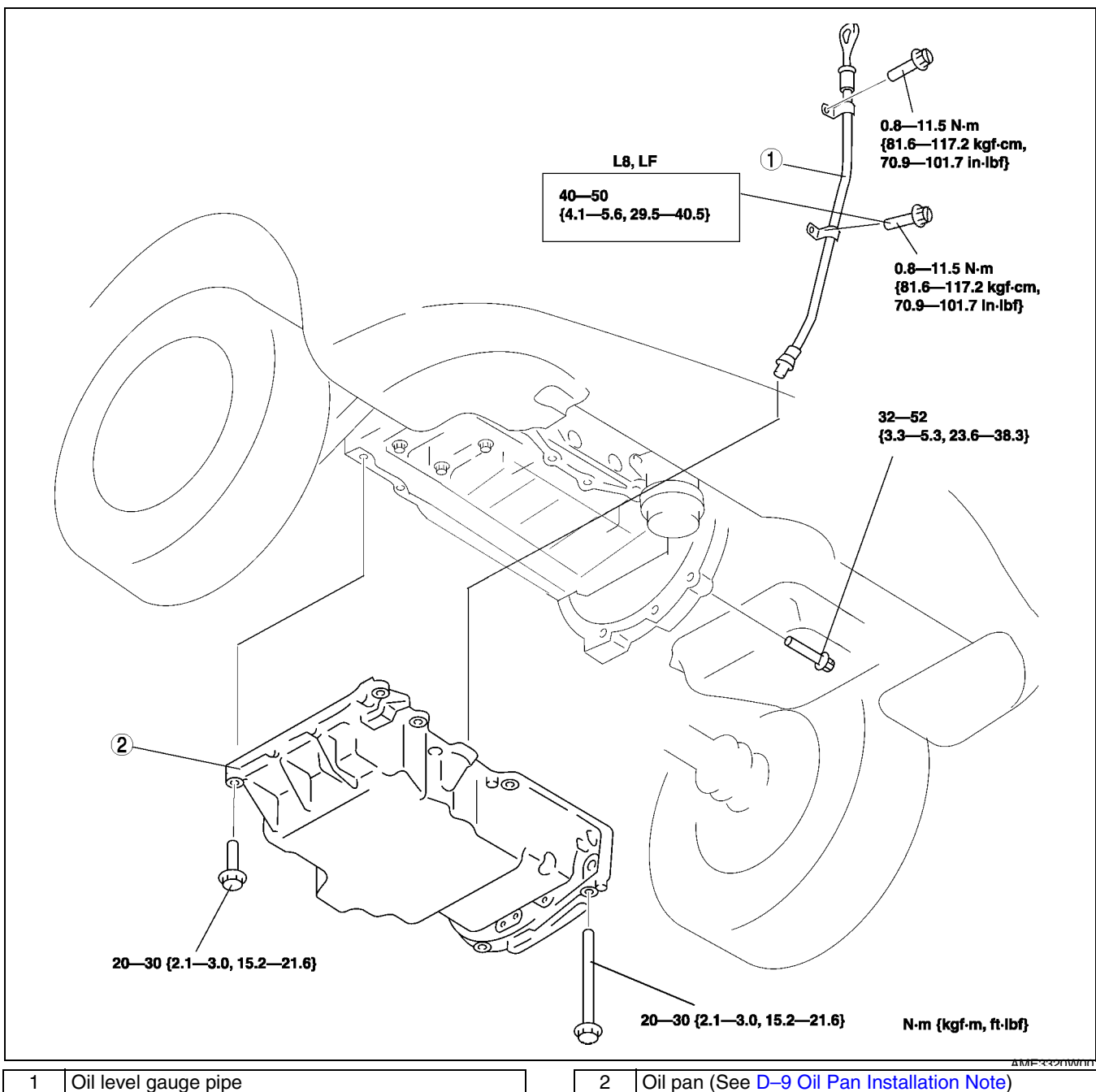
OIL PAN REMOVAL/INSTALLATION

A6E332010040W01

Warning

- Hot engine and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.

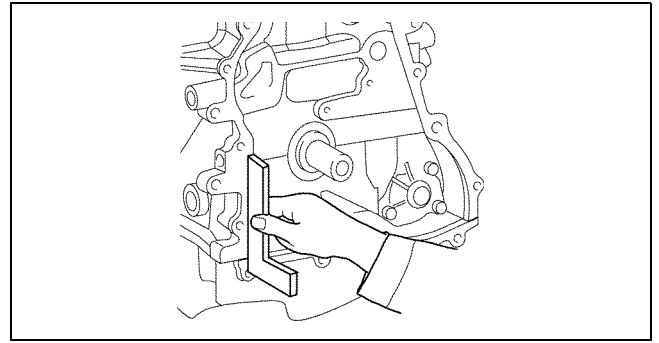
1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Drain the engine oil. (See [D-4 ENGINE OIL REPLACEMENT](#).)
4. Remove the engine front cover. (See [B-10 TIMING CHAIN REMOVAL/INSTALLATION](#).)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Inspect the oil level. (See [D-4 ENGINE OIL INSPECTION](#).)
8. Start the engine and inspect for oil leakage.
 - If the oil leaks, specify the faulty part and repair or replace it.



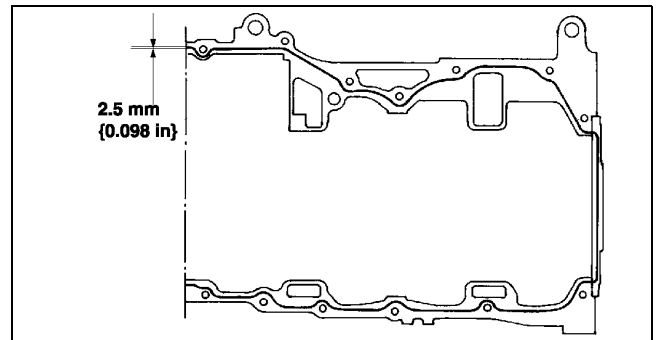
OIL PAN

Oil Pan Installation Note

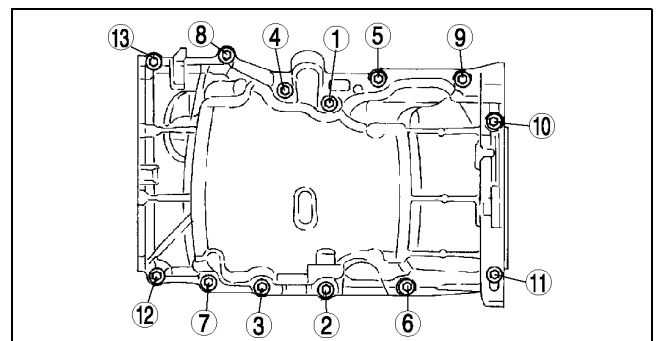
1. Use a square ruler to unite the oil pan and the cylinder block junction side on the engine front cover side.
2. Apply silicone sealant to the oil pressure switch threads as shown.
3. Tighten the bolts in the order shown.



AME3320W002



AME3320W003



AME3320W004

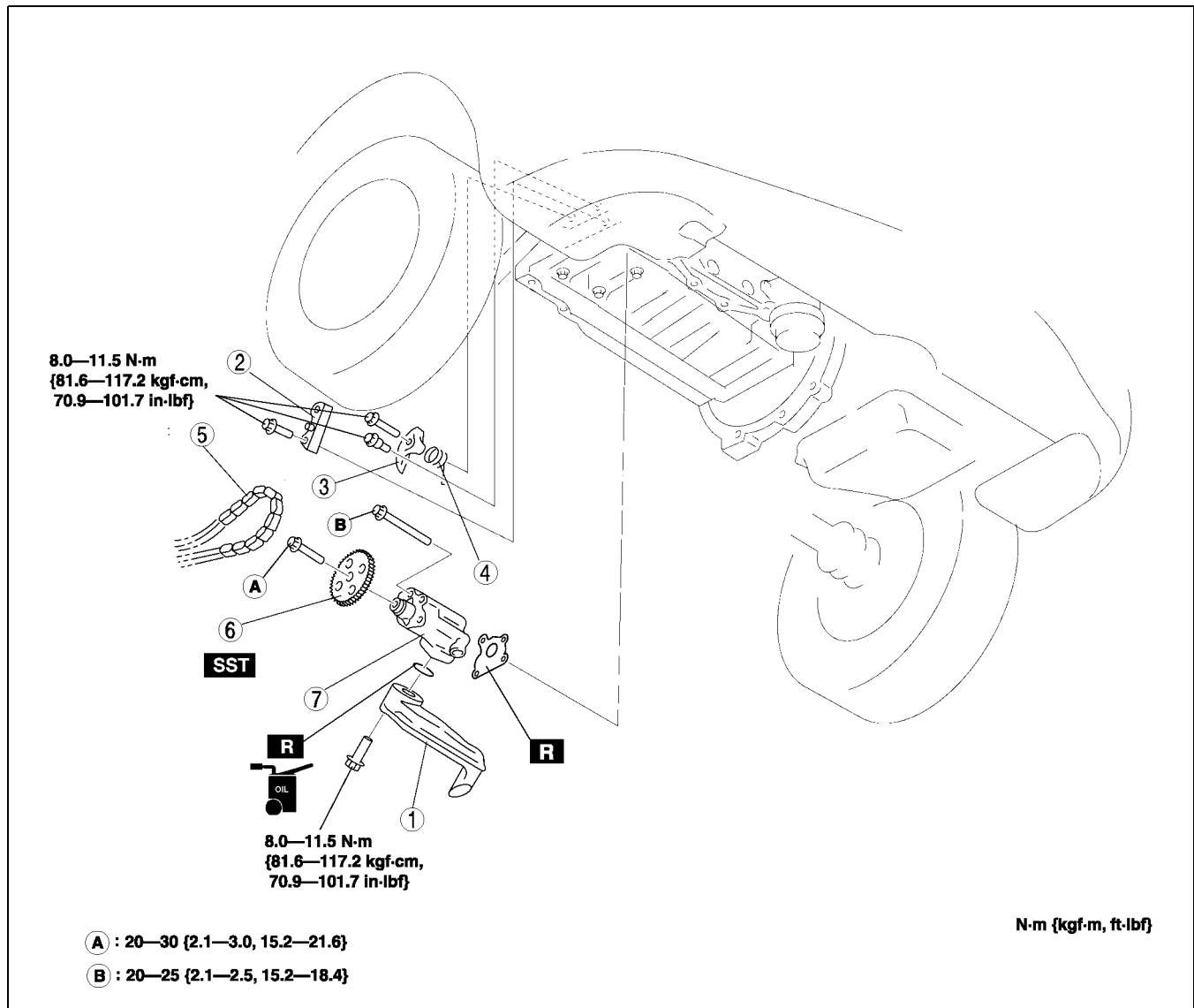
OIL PUMP

OIL PUMP

OIL PUMP REMOVAL/INSTALLATION

A6E332214100W01

1. Disconnect the negative battery cable.
2. Drain the engine oil. (See [D-4 ENGINE OIL REPLACEMENT](#).)
3. Remove the oil pan. (See [D-8 OIL PAN REMOVAL/INSTALLATION](#).)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Inspect the engine oil level. (See [D-4 ENGINE OIL INSPECTION](#).)
7. Start the engine and inspect for oil leakage.
 - If the oil leaks, specify the faulty part and repair or replace it.
8. Inspect the oil pressure. (See [D-3 OIL PRESSURE INSPECTION](#).)



AME3322W001

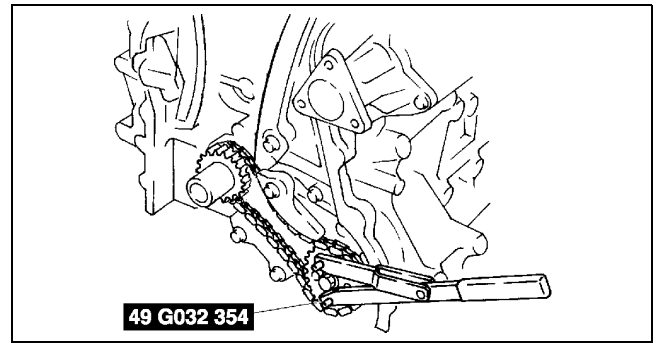
1	Oil strainer
2	Oil pump chain guide
3	Oil pump chain tensioner
4	Oil pump chain tensioner spring

5	Oil pump chain
6	Oil pump sprocket (See D-11 Oil Pump Sprocket Removal / Installation Note)
7	Oil pump

OIL PUMP

Oil Pump Sprocket Removal / Installation Note

1. Install the **SST** to the oil pump sprocket to stop the oil pump from turn in.



AME3322W002

D

COOLING SYSTEM

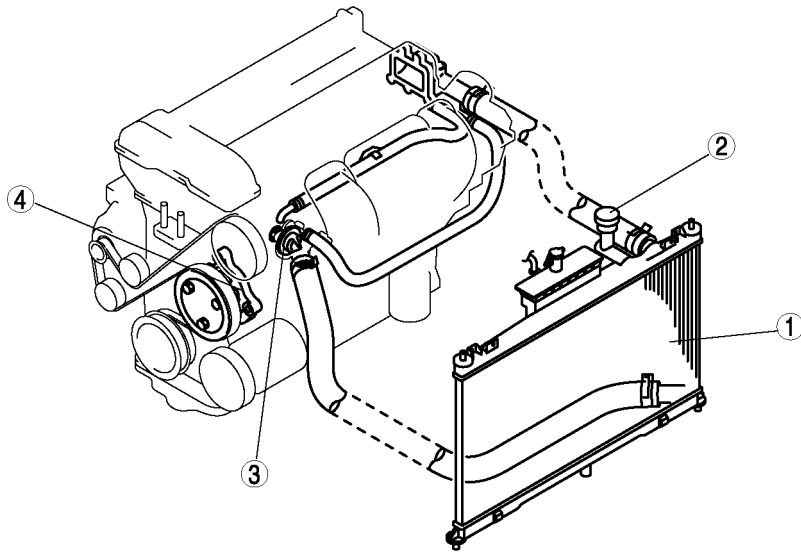
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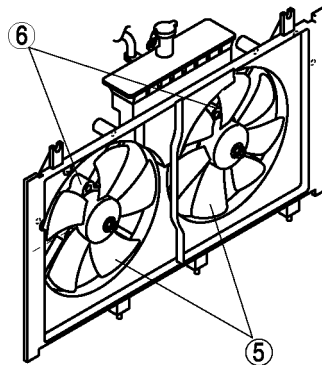
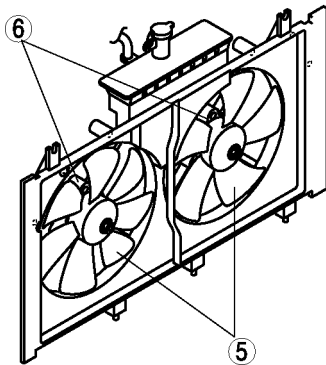
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A6E360001002W01



LF (EXCEPT FOR ISRAEL), L8

FOR ISRAEL, L3



AME3602N001

1	Radiator (See E-6 RADIATOR REMOVAL/INSTALLATION)
2	Radiator cap (See E-5 RADIATOR CAP INSPECTION)
3	Thermostat (See E-7 THERMOSTAT REMOVAL/INSTALLATION) (See E-8 THERMOSTAT INSPECTION)

4	Water pump (See E-8 WATER PUMP REMOVAL/INSTALLATION)
5	Cooling fan (See E-9 COOLING FAN REMOVAL/INSTALLATION)
6	Cooling fan motor (See E-10 COOLING FAN MOTOR REMOVAL/INSTALLATION) (See E-11 COOLING FAN MOTOR INSPECTION)

COOLING SYSTEM SERVICE WARNINGS , ENGINE COOLANT

COOLING SYSTEM SERVICE WARNINGS

COOLING SYSTEM SERVICE WARNINGS

A6E361001004W01

Warning

- Never remove the radiator cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

E

ENGINE COOLANT

ENGINE COOLANT LEVEL INSPECTION

A6E361215001W01

1. Verify that the coolant level in the coolant reservoir is between the F and L marks.
 - If the engine coolant level is below L, remove the radiator cap and add coolant. (See [E-3 COOLING SYSTEM SERVICE WARNINGS](#).)

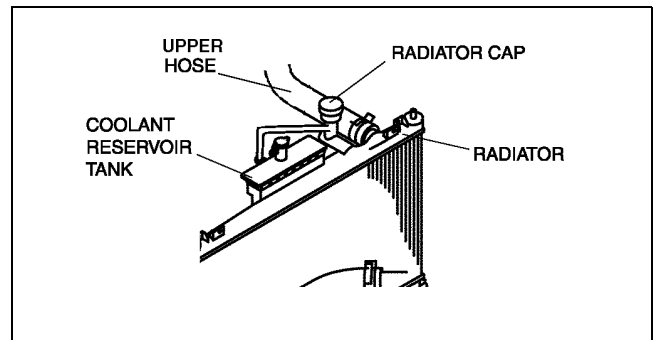
ENGINE COOLANT REPLACEMENT

A6E361215001W03

Warning

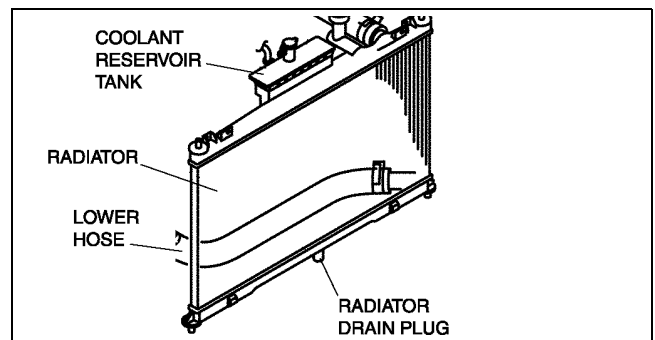
- Drain the engine coolant while the engine is cold, otherwise it may burn you and cause serious injury.

1. Remove the radiator cap.



AME3612W001

2. Remove the radiator drain plug.
3. Drain the coolant into a container.
4. Flush the cooling system with water until all traces of color are gone.
5. Let the system drain completely.
6. Tighten the radiator drain plug.
7. Fill the coolant into the reservoir up to the FULL mark on the coolant reservoir.
8. Fully install the radiator cap.



AME3612W002

Caution

- If the coolant temperature becomes too high, stop the engine to prevent it from overheating.

ENGINE COOLANT

9. Start the engine and let it idle until the cooling fan operates.
10. After engine warms up, perform the following steps.
 - (1) Run the engine at **2,500 rpm** for **5 min.**
 - (2) Run the engine at **3,000 rpm** for **5 s**, then return to idling.
 - (3) Repeat Step (2) several times.
 - (4) Run the engine at idle for **1 min.**
11. Stop the engine and wait until it is cool.
12. Remove the radiator cap.
13. Check the coolant level.
 - If it is low, repeat Steps 6—9.
14. Install the radiator cap.
15. Inspect for coolant leakage.
 - If not as specified, repair or replace the radiator cap.

ENGINE COOLANT LEAKAGE INSPECTION

A6E361215001W04

Warning

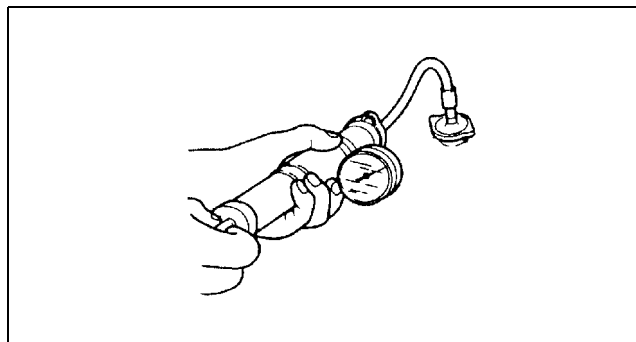
- **Never remove the radiator cap while the engine is running, or when the engine and radiator are hot. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.**
- **When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.**

1. Inspect the coolant level.
2. Remove the radiator cap.
3. Clean the mounting surface of the radiator cap and the upper radiator hose.
4. Connect a radiator cap tester and the **radiator cap tester** to the reservoir filler port.
5. Apply specified pressure to the radiator.

Pressure

127 kPa { 1.3 kgf/cm², 18 psi }

6. Verify that the pressure is held.
 - If not, inspect the system for coolant leakage.
 - If the coolant leaks from the upper hose attachment part, replace the upper hose and the clamp.
 - If the coolant leaks from the main body of the radiator (caulking part), replace the radiator.



AME3612W003

RADIATOR CAP

RADIATOR CAP

RADIATOR CAP INSPECTION

A6E361415201W01

Warning

- Never remove the radiator cap while the engine is running, or when the engine and radiator are hot. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

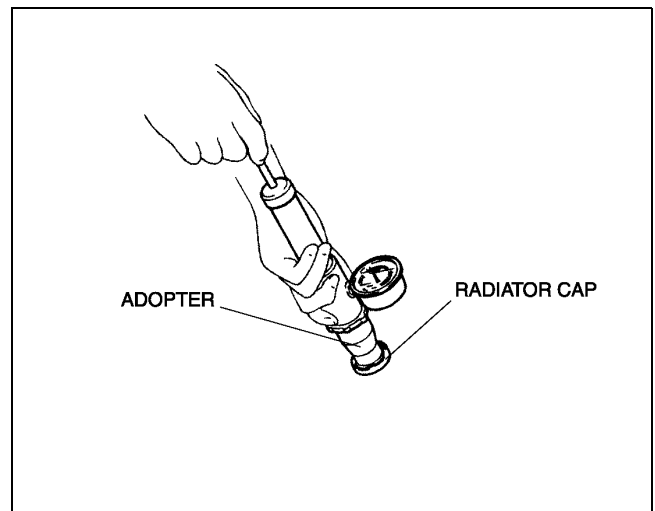
E

1. Clean the radiator cap negative pressure valve and the sealed part.
2. Inspect the crack or turn over on sealed of the radiator cap.
 - If not as specified, replace the radiator cap.
3. Fill the radiator cap test adopter with the water or the engine coolant to the full level and attach the radiator cap to the adapter.
4. Hold the radiator cap downward and apply pressure gradually. Verify that the pressure become held for **10 s** within the specification.
 - If the pressure will not stable within the specification, replace the radiator cap.

Pressure

113—142 kPa

{ 1.1—1.4 kgf/cm², 15—20 psi }



AME3614W001

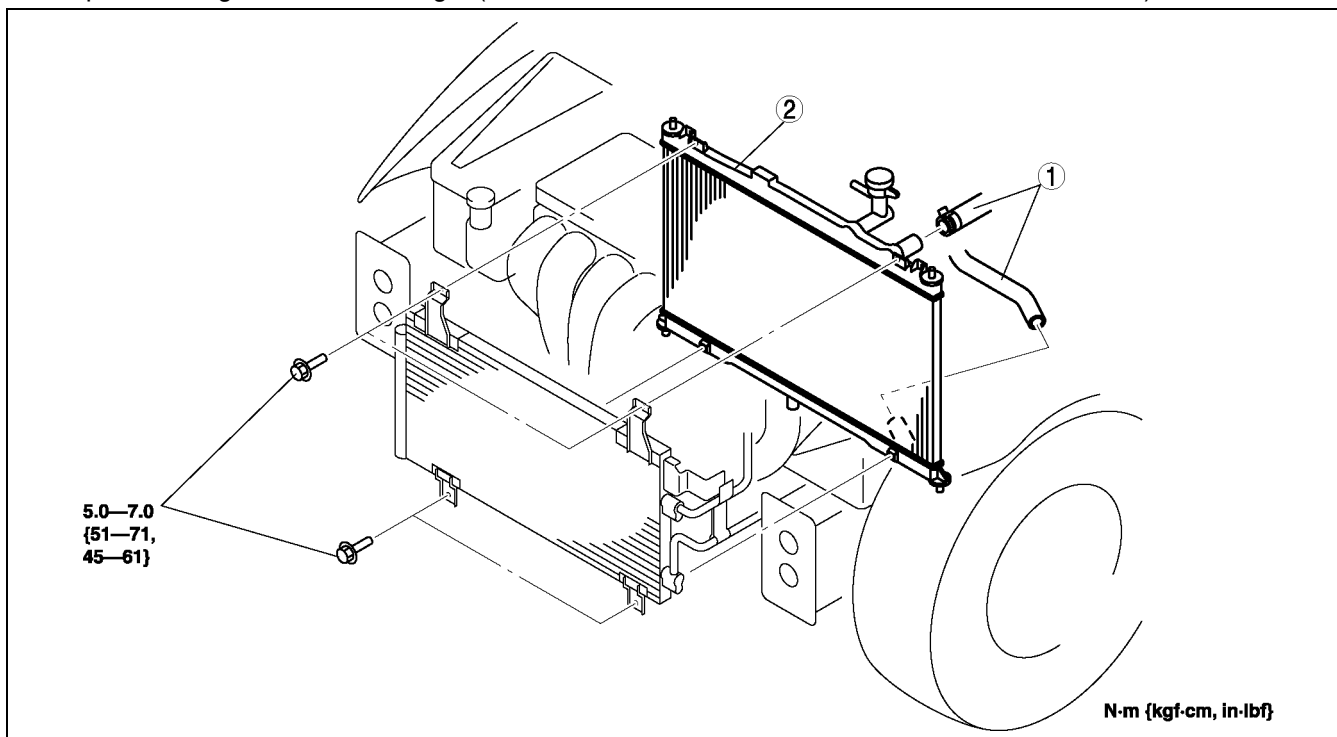
RADIATOR

RADIATOR

RADIATOR REMOVAL/INSTALLATION

A6E361615200W01

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (See [E-3 ENGINE COOLANT REPLACEMENT.](#))
3. Remove the cooling fan. (See [E-9 COOLING FAN REMOVAL/INSTALLATION.](#))
4. Remove the oil hose. (ATX)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Refill the engine coolant. (See [E-3 ENGINE COOLANT REPLACEMENT.](#))
8. Inspect the engine coolant leakage. (See [E-4 ENGINE COOLANT LEAKAGE INSPECTION.](#))



AME3616W001

1	Water hose

2	Radiator

THERMOSTAT

THERMOSTAT

THERMOSTAT REMOVAL/INSTALLATION

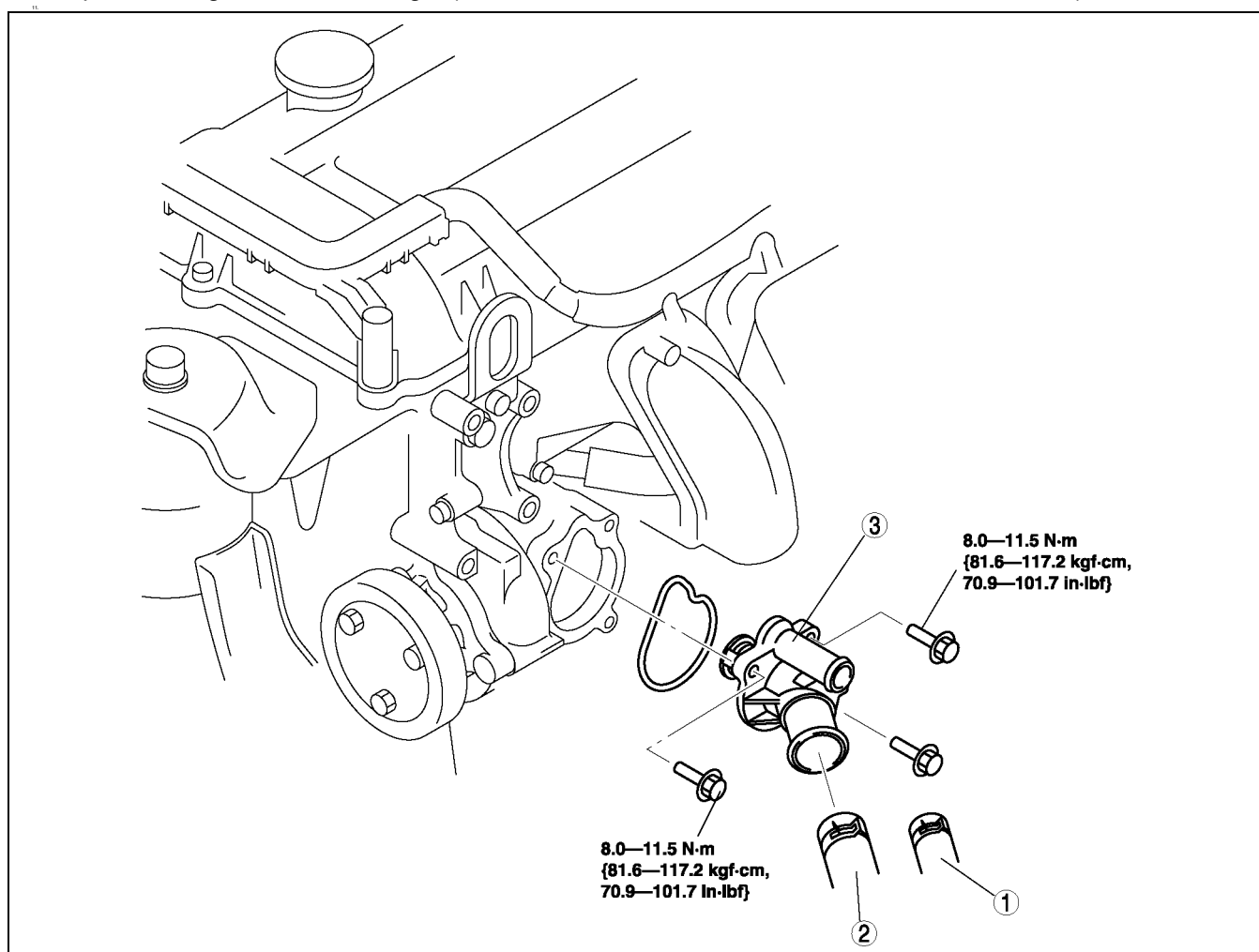
A6E361815171W01

1. Remove the plug hole plate.
2. Disconnect the negative battery cable.
3. Drain the engine coolant. (See [E-3 COOLING SYSTEM SERVICE WARNINGS.](#))
4. Remove the drive belt. (See [B-3 DRIVE BELT REPLACEMENT.](#))
5. Remove the washer tank.
6. Remove the P/S oil pump.

Note

- Remove the P/S oil pump with hoses and pipe still connected.

7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. Refill the engine coolant. (See [E-3 ENGINE COOLANT REPLACEMENT.](#))
10. Inspect the engine coolant leakage. (See [E-4 ENGINE COOLANT LEAKAGE INSPECTION.](#))



AME3618W001

1	Bypass hose
2	Lower hose

3	Thermostat assembly

THERMOSTAT, WATER PUMP

THERMOSTAT INSPECTION

A6E361815171W02

1. Inspect the thermostat for the following.
 - Closed valve in room temperature
 - Opening temperature and lift of the valve— If not as specified, replace the thermostat.

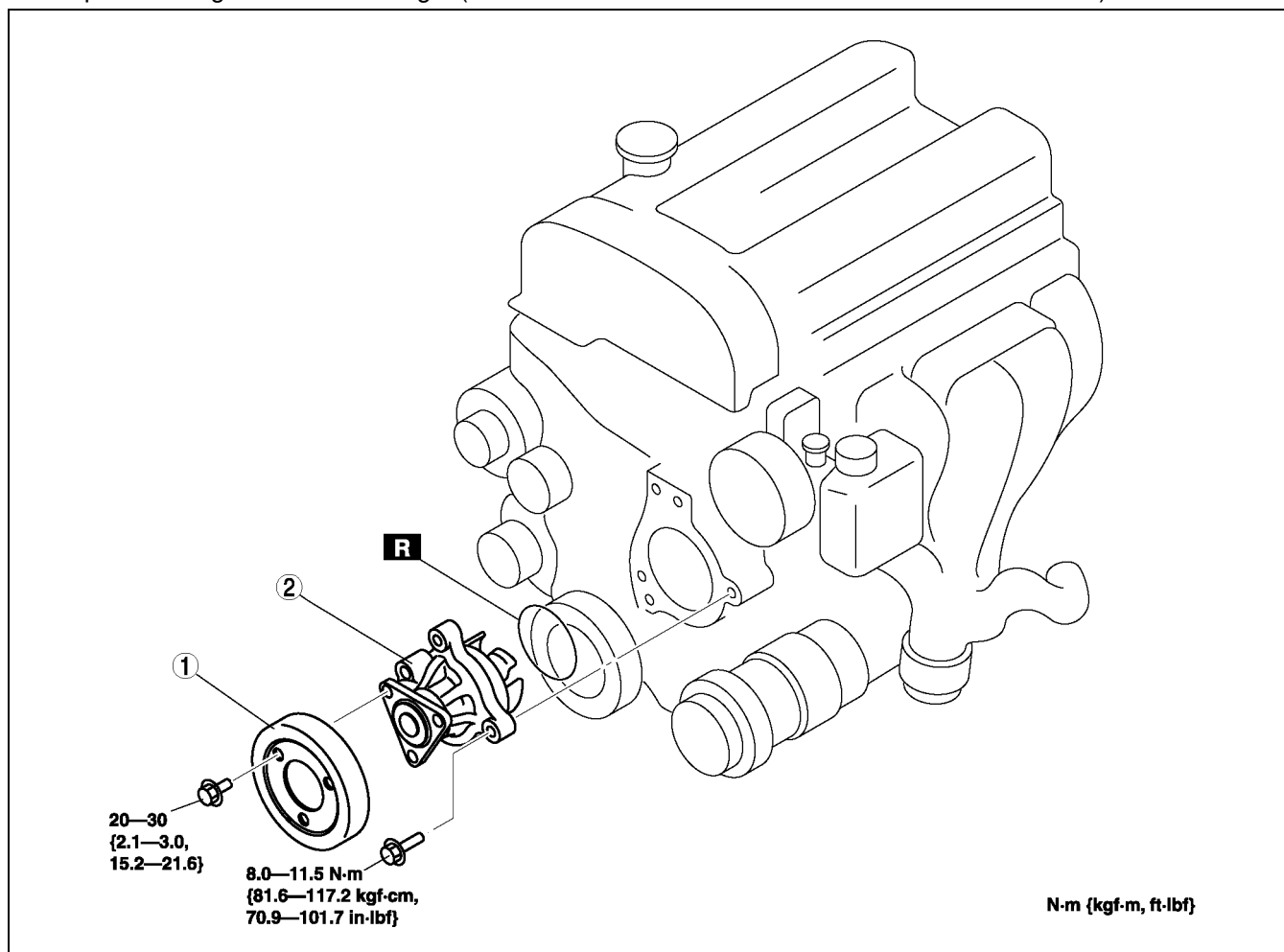
Initial-opening temperature (°C {°F})	80.0—84.0 {176—183.2}
Full-open temperature (°C {°F})	97 {206.6}
Full-open lift (mm {in})	More than 8.0 {0.31}

WATER PUMP

WATER PUMP REMOVAL/INSTALLATION

A6E362015010W01

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (See [E-3 COOLING SYSTEM SERVICE WARNINGS.](#)) (See [E-3 ENGINE COOLANT REPLACEMENT.](#))
3. Loosen the water pump pulley bolt to remove the drive belt. (See [B-3 DRIVE BELT REPLACEMENT.](#))
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Refill the engine coolant. (See [E-3 ENGINE COOLANT REPLACEMENT.](#))
7. Inspect the engine coolant leakage. (See [E-4 ENGINE COOLANT LEAKAGE INSPECTION.](#))



AME3620W001

1	Water pump pulley

2	Water pump

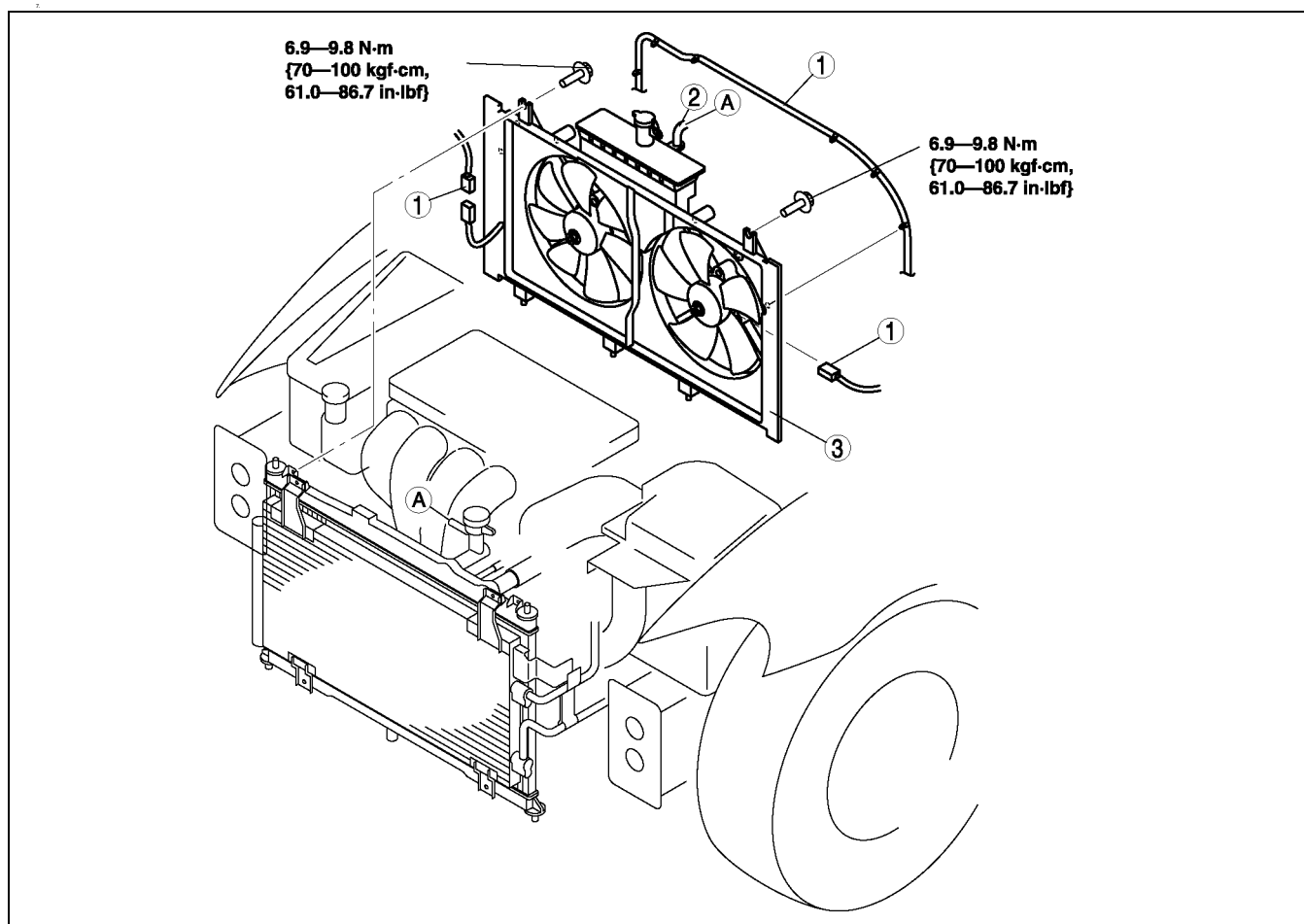
FAN MOTOR

FAN MOTOR

COOLING FAN REMOVAL/INSTALLATION

A6E362215025W01

1. Disconnect the negative battery cable.
2. Remove the shroud panel. (See [S-119 SHROUD PANEL REMOVAL/INSTALLATION.](#))
3. Remove the A/C pipe stay.
4. Remove the ATX pipe stay (ATX).
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.



AME3621W001

1	Cooling fan harness, connector
2	Coolant reservoir hose

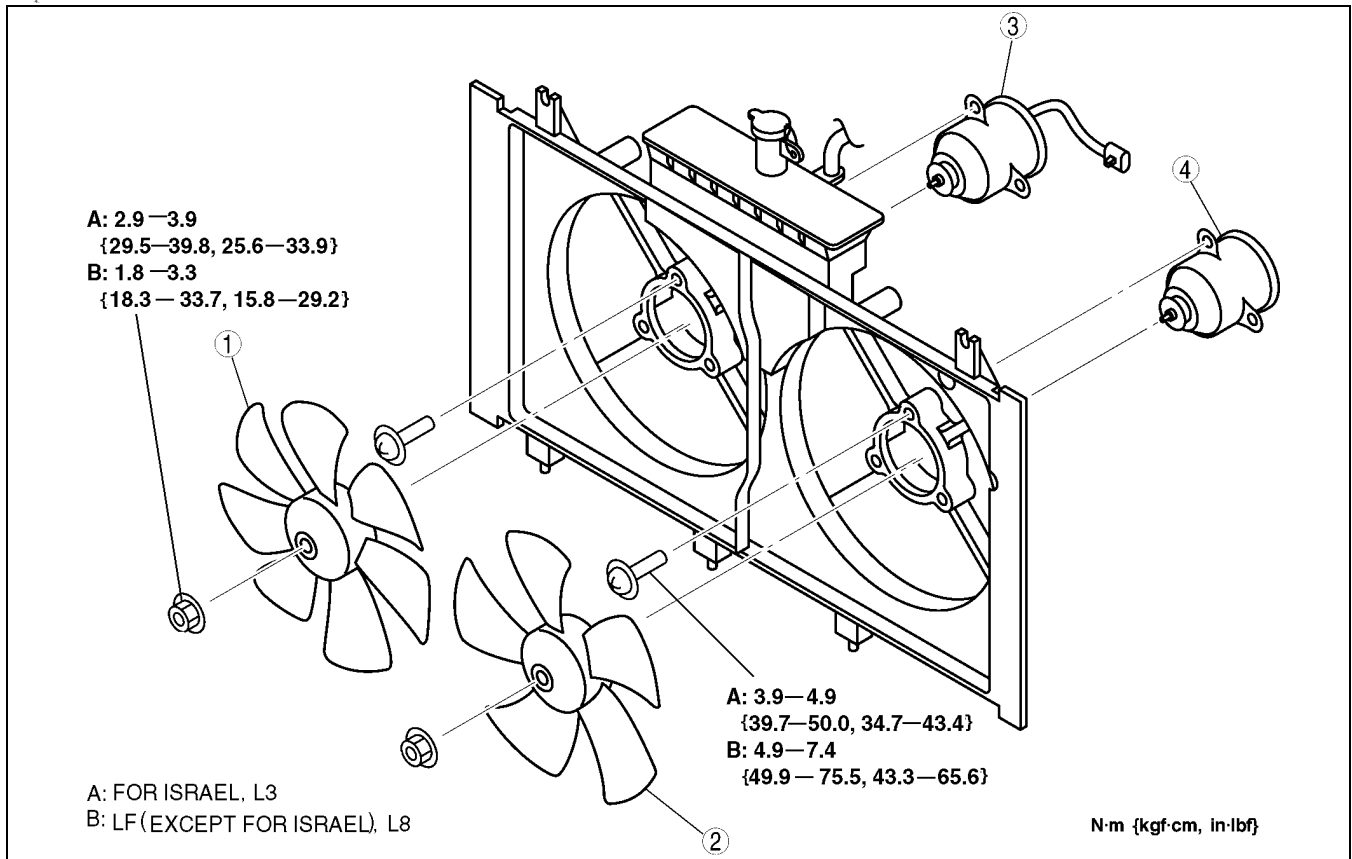
3	Cooling fan assembly

FAN MOTOR

COOLING FAN MOTOR REMOVAL/INSTALLATION

A6E362215025W02

1. Remove the cooling fan. (See [E-9 COOLING FAN REMOVAL/INSTALLATION](#).)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



AME3621W002

1	Cooling fan No.2
2	Cooling fan No.1

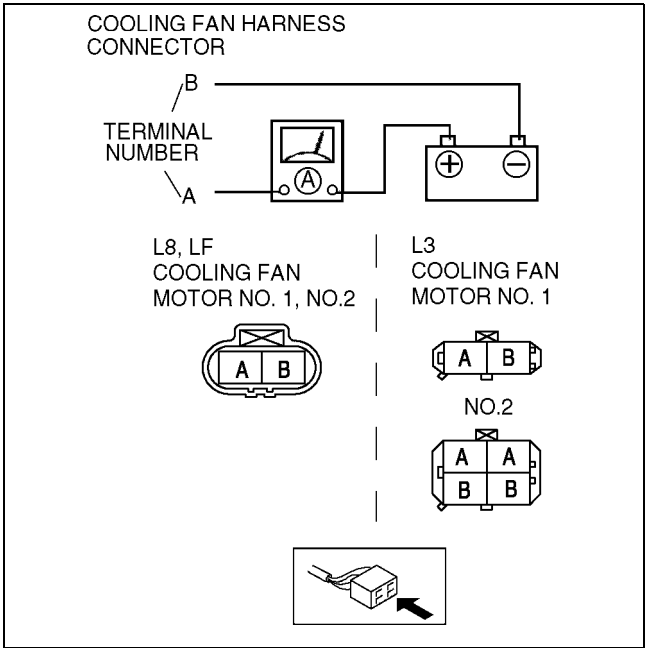
3	Cooling fan motor No.2
4	Cooling fan motor No.1

FAN MOTOR

COOLING FAN MOTOR INSPECTION

A6E362215025W03

1. Verify that the battery is fully charged.
2. Connect battery positive voltage and an ammeter to the fan motor connector.
3. Verify that the fan motor operates smoothly at the standard current draw.
 - If not as spcificid, replace the fan motor.



E

Part name	Current (A)		
	L8	LF	L3
Cooling fan motor No.1	6.6	6.6 (Except Israel) 10 (For Israel)	5.9 (Except Israel) 10 (For Israel)
Cooling fan motor No.2	6.6	6.6(Except Israel) 10 (For Israel)	10

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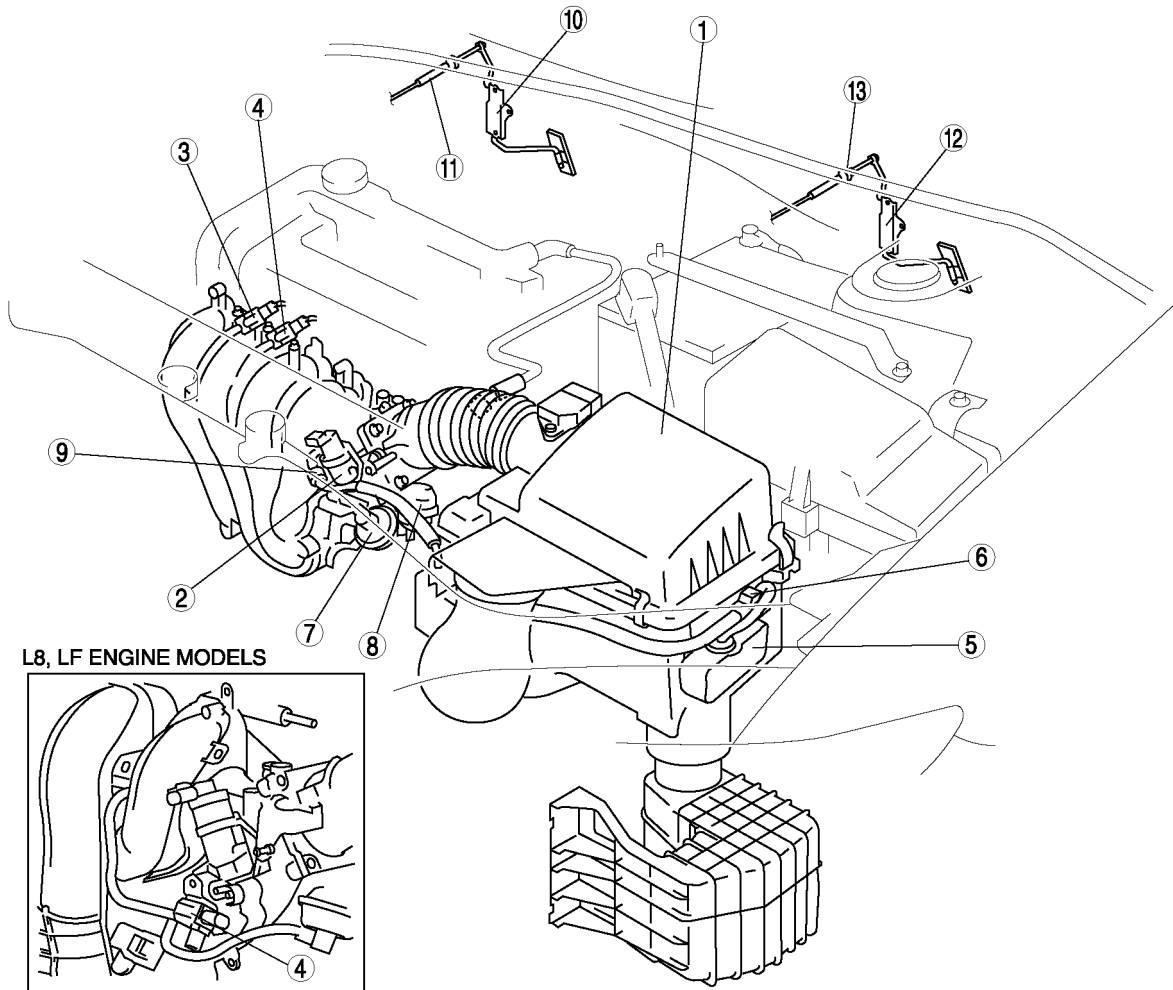
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INTAKE-AIR SYSTEM

A6E390013000W01



A6E3910W018

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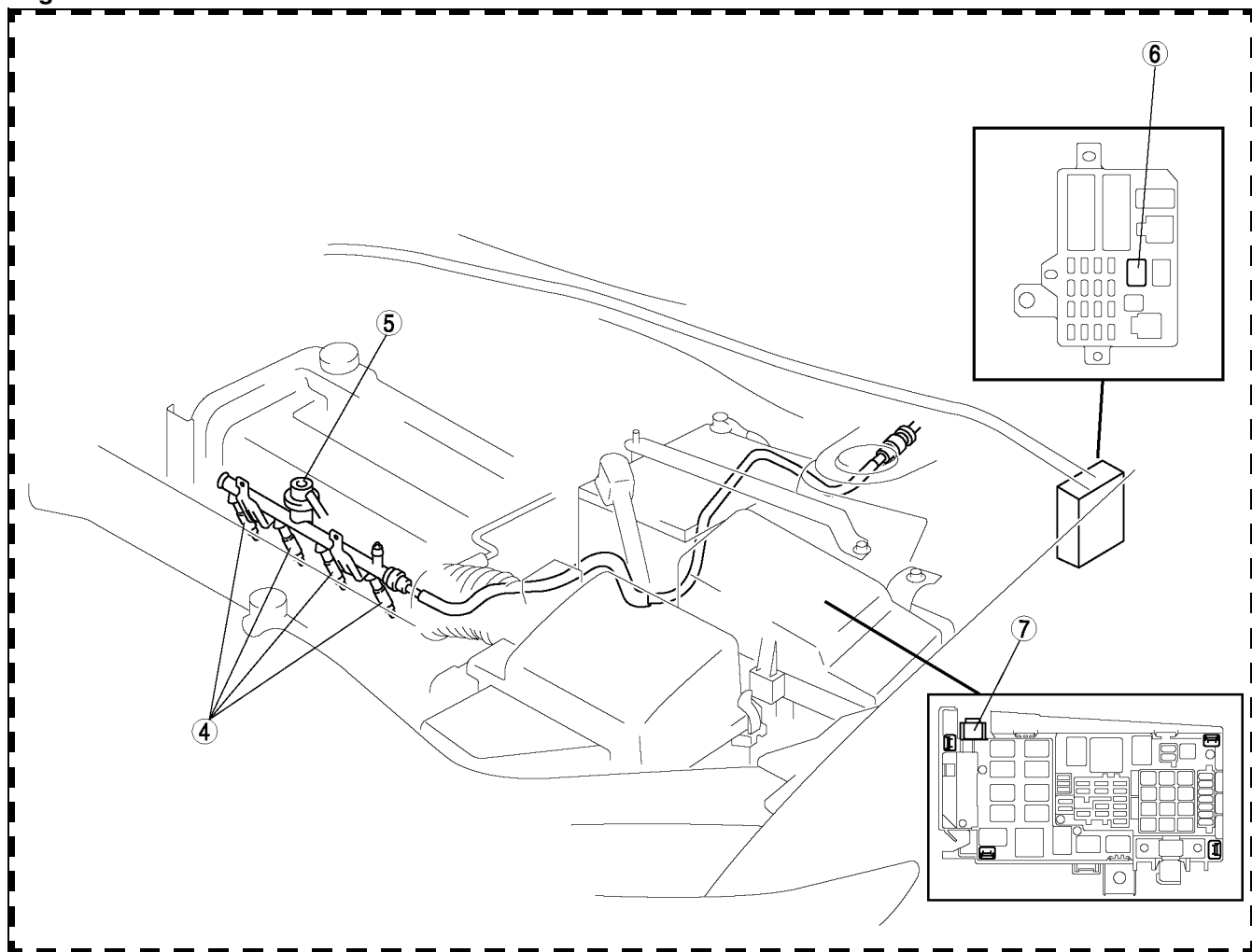
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13	Accelerator cable (L.H.D.) (See F-16 ACCELERATOR PEDAL REMOVAL/INSTALLATION)

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FUEL SYSTEM

Engine Room Side

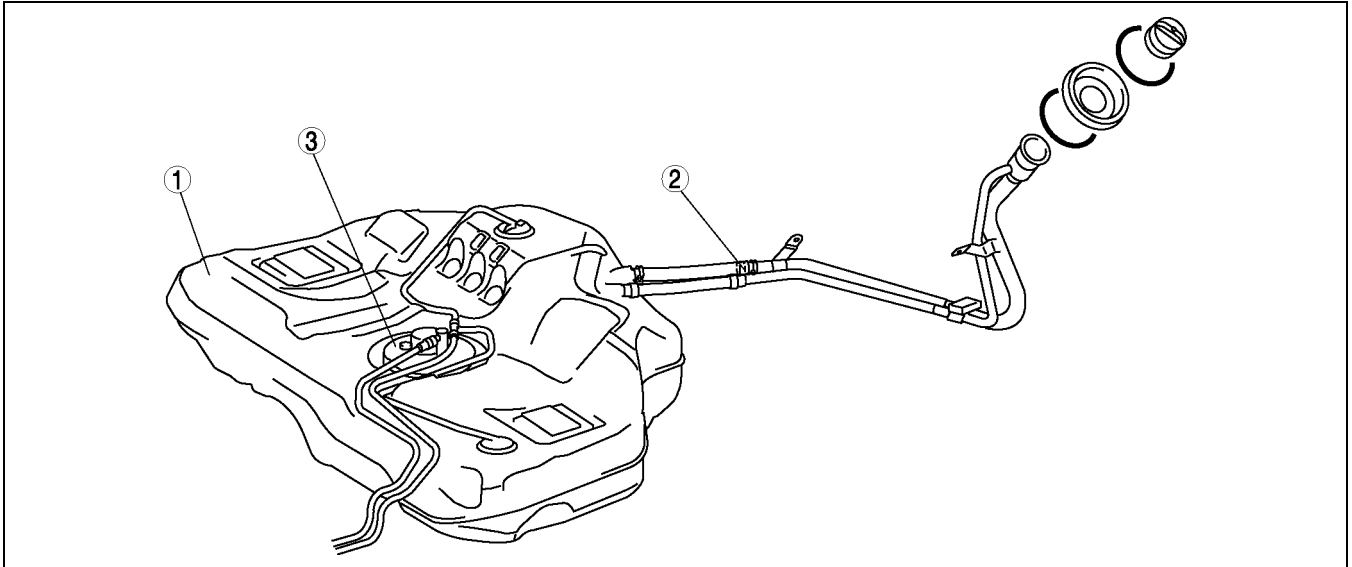
A6E390001006W01



A6E3912W015

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Fuel tank side



A6E3912W045

1	Fuel tank (See F-18 FUEL TANK REMOVAL/INSTALLATION) (See F-19 FUEL TANK INSPECTION)
2	Nonreturn valve (See F-20 NONRETURN VALVE INSPECTION)
3	Fuel pump unit (See F-22 FUEL PUMP UNIT REMOVAL/INSTALLATION) (See F-24 FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY) (See F-25 FUEL PUMP UNIT INSPECTION)

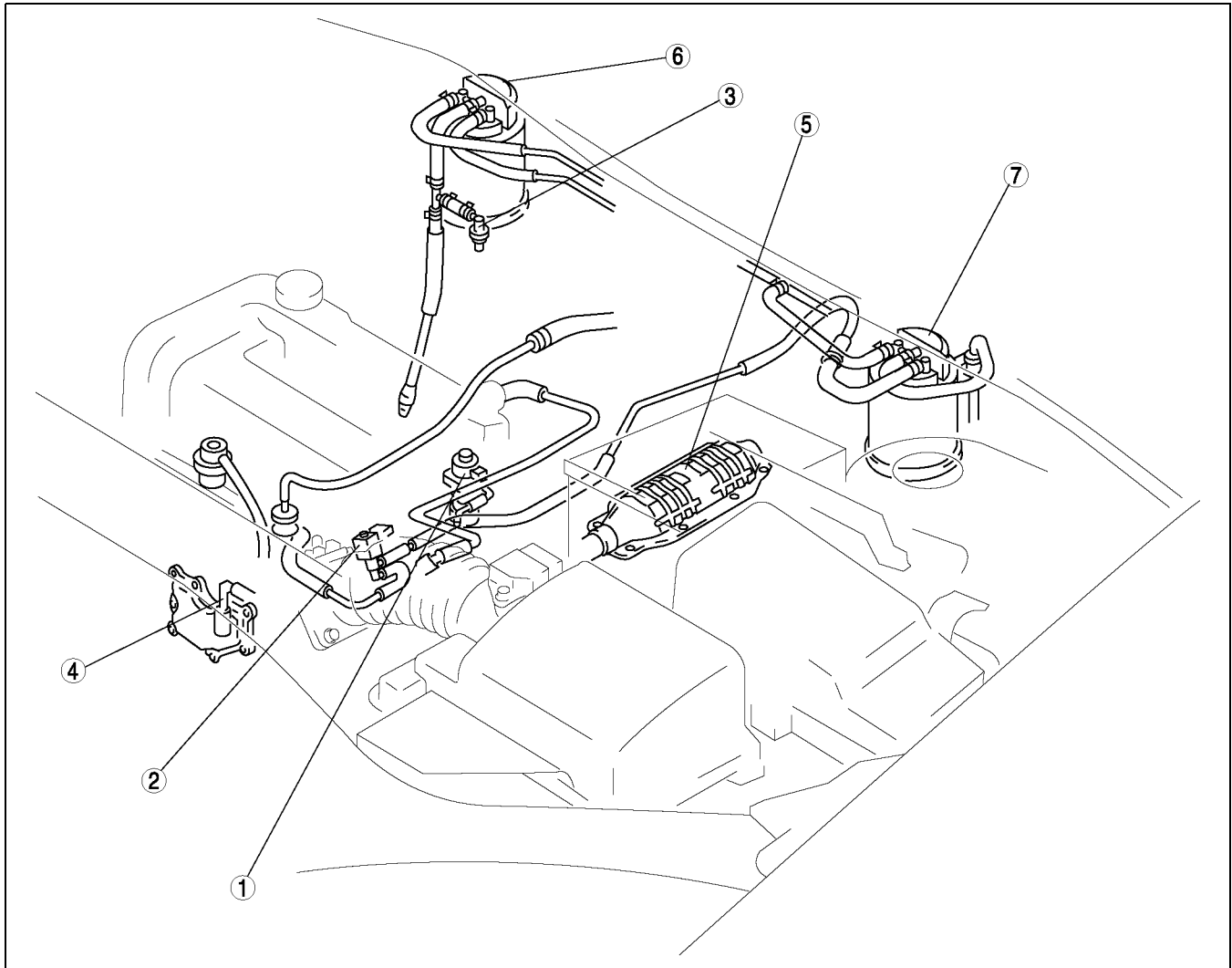
4	Fuel injector (See F-28 FUEL INJECTOR REMOVAL/INSTALLATION) (See F-31 FUEL INJECTOR INSPECTION)
5	Pulsation damper (See F-34 PULSATION DAMPER REMOVAL/INSTALLATION) (See F-34 PULSATION DAMPER INSPECTION)
6	Fuel pump relay (See T-24 RELAY INSPECTION)
7	Check connector

LOCATION INDEX

EMISSION SYSTEM

A6E390001074W01

Engine room side



A6E3916W017

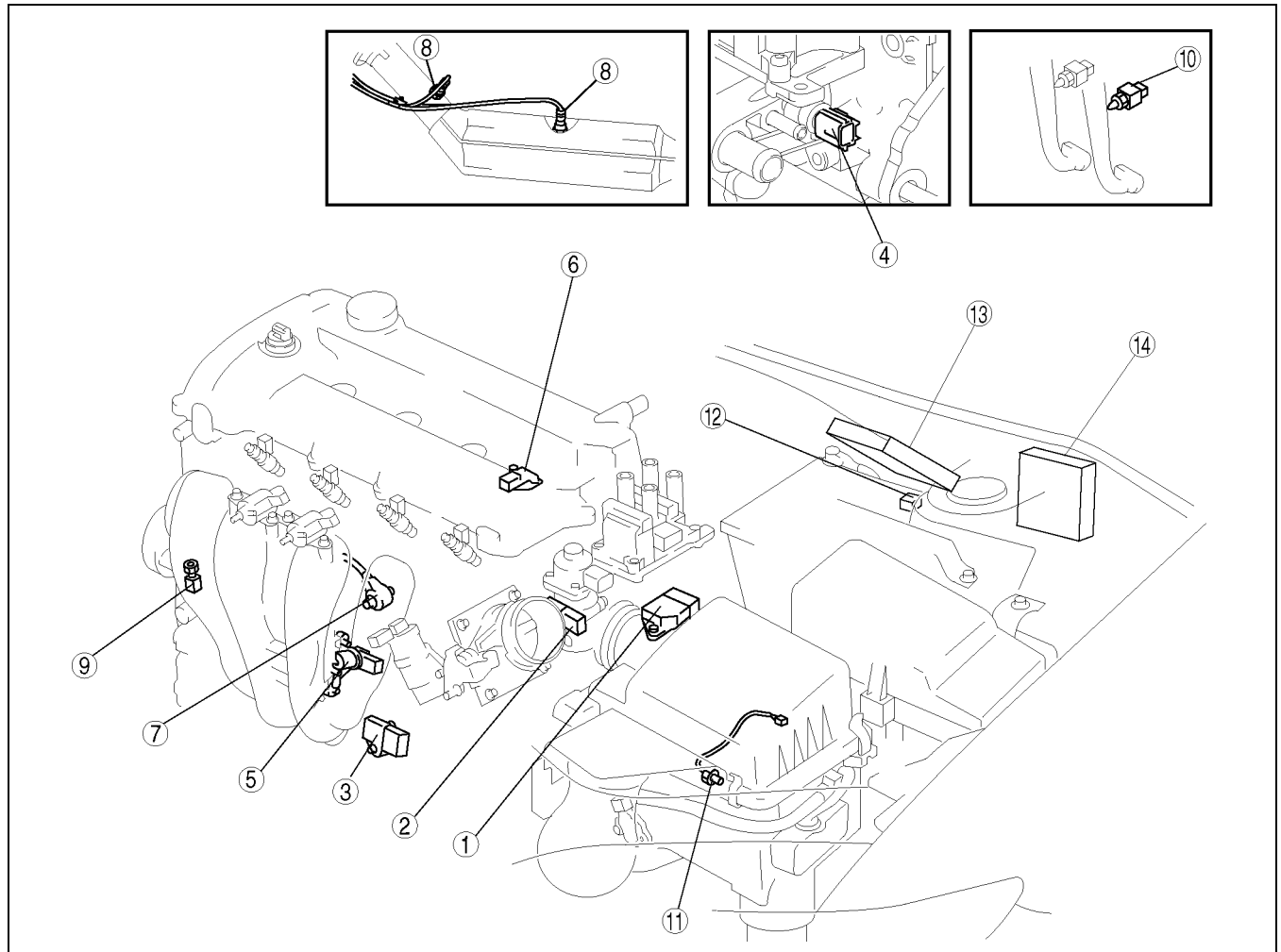
1	EGR valve (See F-39 EGR VALVE REMOVAL/INSTALLATION) (See F-40 EGR VALVE INSPECTION)
2	Purge solenoid valve (See F-38 PURGE SOLENOID VALVE REMOVAL/INSTALLATION) (See F-39 PURGE SOLENOID VALVE INSPECTION)
3	Evaporative gas check valve (one-way) (L.H.D.) (See F-38 EVAPORATIVE GAS CHECK VALVE (ONE-WAY) INSPECTION (L.H.D.))

4	PCV valve (See F-41 PCV VALVE INSPECTION)
5	TWC (See F-41 THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION)
6	Charcoal canister (L.H.D.) (See F-38 CHARCOAL CANISTER INSPECTION)
7	Charcoal canister (R.H.D.) (See F-38 CHARCOAL CANISTER INSPECTION)

LOCATION INDEX

CONTROL SYSTEM

A6E390001074W02



A6E3940W500

1	MAF/IAT sensor (See F-50 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION) (See F-51 MASS AIR FLOW (MAF) SENSOR INSPECTION)
2	TP sensor (See F-51 THROTTLE POSITION (TP) SENSOR INSPECTION)
3	MAP sensor (See F-52 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION)
4	ECT sensor (See F-53 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION) (See F-53 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION)
5	CKP sensor (See F-54 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION) (See F-54 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION)
6	CMP sensor (See F-55 CAMSHAFT POSITION (CMP) SENSOR INSPECTION)

7	Knock sensor (See F-56 KNOCK SENSOR INSPECTION) (See F-56 KNOCK SENSOR REMOVAL/INSTALLATION)
8	Heated oxygen sensor (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION)
9	PSP switch (See F-58 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION)
10	Clutch switch (See F-59 CLUTCH SWITCH INSPECTION)
11	Neutral switch (See F-59 NEUTRAL SWITCH INSPECTION)
12	BARO sensor (See F-60 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION)
13	PCM (U.K. specs.) (See F-43 PCM REMOVAL/INSTALLATION) (See F-45 PCM INSPECTION) (See F-50 PCM CONFIGURATION)
14	PCM (L.H.D.) (See F-43 PCM REMOVAL/INSTALLATION) (See F-45 PCM INSPECTION) (See F-50 PCM CONFIGURATION)

ENGINE TUNE-UP

ENGINE TUNE-UP

IGNITION TIMING INSPECTION

A6E390802000W01

Note

- Ignition timing is not adjustable.
- Ignition timing verification requires WDS or equivalent.

1. Turn off the electrical loads.
2. Warm up the engine as follows.
 - (1) Start the engine.
 - (2) Maintain the engine speed at **approx. 3,000 rpm** until the cooling fans start to operate.
 - (3) Release the accelerator pedal.
 - (4) Wait until the cooling fans stop.
3. Verify that the ignition timing (WDS: SPARKADV PID) is within the specification using WDS or equivalent.

Ignition timing

Approx. BTDC 10 degree

4. Verify that ingestion timing advances when the engine speed increases gradually.

IDLE SPEED INSPECTION

A6E390802000W02

Note

- Ignition timing is not adjustable.
- Ignition timing verification requires WDS or equivalent.

1. Turn off the electrical loads.
2. Warm up the engine as follows.
 - (1) Start the engine.
 - (2) Maintain the engine speed at **approx. 3,000 rpm** until the cooling fans start to operate.
 - (3) Release the accelerator pedal.
 - (4) Wait until the cooling fans stop.
3. Verify that the idle speed (WDS: RPM PID) is within the specification using WDS or equivalent.

Idle speed (L8 engine model)

Condition	Engine speed (rpm)* ¹
No load	650—750
Electrical loads* ² ON	650—750
P/S ON	700—800
A/C ON and refrigerant pressure switch (middle) OFF	700—800
A/C ON and refrigerant pressure switch (middle) ON	700—800

Idle speed (LF engine MTX model)

Condition	Engine speed (rpm)* ¹
No load	600—700
Electrical loads* ² ON	650—750
P/S ON	650—750
A/C ON and refrigerant pressure switch (middle) OFF	700—800
A/C ON and refrigerant pressure switch (middle) ON	700—800

ENGINE TUNE-UP

Idle speed (LF engine ATX model)

Condition	Engine speed (rpm)* ¹
No load	650—750
Electrical loads* ² ON	650—750
P/S ON	650—750
A/C ON and refrigerant pressure switch (middle) OFF	650—750
A/C ON and refrigerant pressure switch (middle) ON	700—800

Idle speed (L3 engine model)

Condition	Engine speed (rpm)* ¹
No load	600—700
Electrical loads* ² ON	650—750
P/S ON	650—750
A/C ON and refrigerant pressure switch (middle) OFF	700—800
A/C ON and refrigerant pressure switch (middle) ON	700—800

*1 : Excludes temporary idle speed drop just after the electrical loads are turned on.

*2 : Blower motor is operating at high speed. Headlight switch is turned on. Rear window defroster switch is turned on. Cooling fans are operating.

IDLE MIXTURE INSPECTION

A6E390802000W03

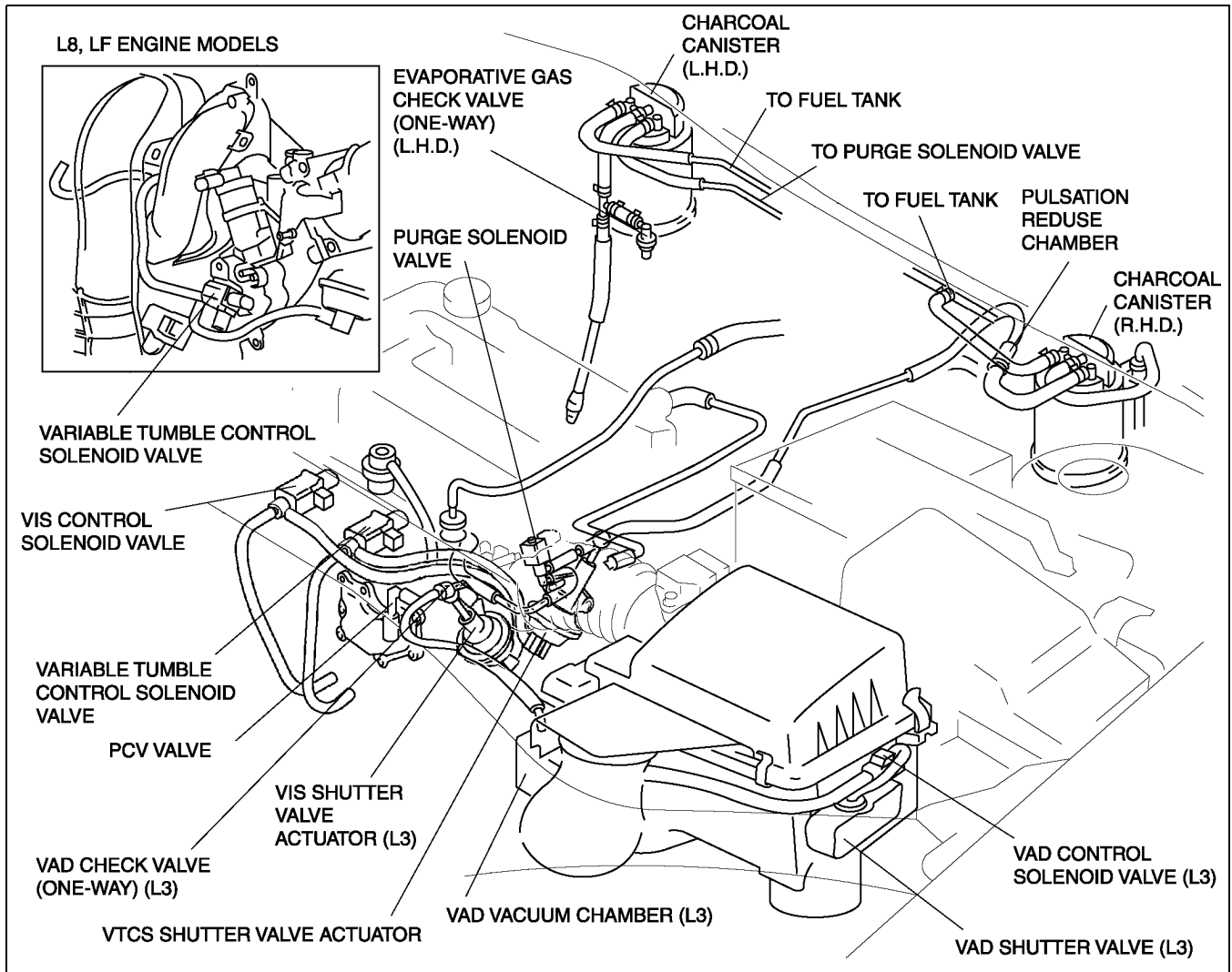
1. Turn off the electrical loads.
2. Warm up the engine as follows.
 - (1) Start the engine.
 - (2) Maintain the engine speed at **approx. 3,000 rpm** until the cooling fans start to operate.
 - (3) Release the accelerator pedal.
 - (4) Wait until the cooling fans stop.
3. Verify that the idle speed and ignition timing are within the specification. (See [F-8 IDLE SPEED INSPECTION](#).) (See [F-8 IGNITION TIMING INSPECTION](#).)
4. Insert an exhaust gas analyzer to the tailpipe.
5. Verify that the CO and HC concentrations are within the regulation.

INTAKE-AIR SYSTEM

INTAKE-AIR SYSTEM

VACUUM HOSE ROUTING DIAGRAM

A6E391020030W01



A6E3910W034

INTAKE-AIR SYSTEM REMOVAL/INSTALLATION

A6E391013000W01

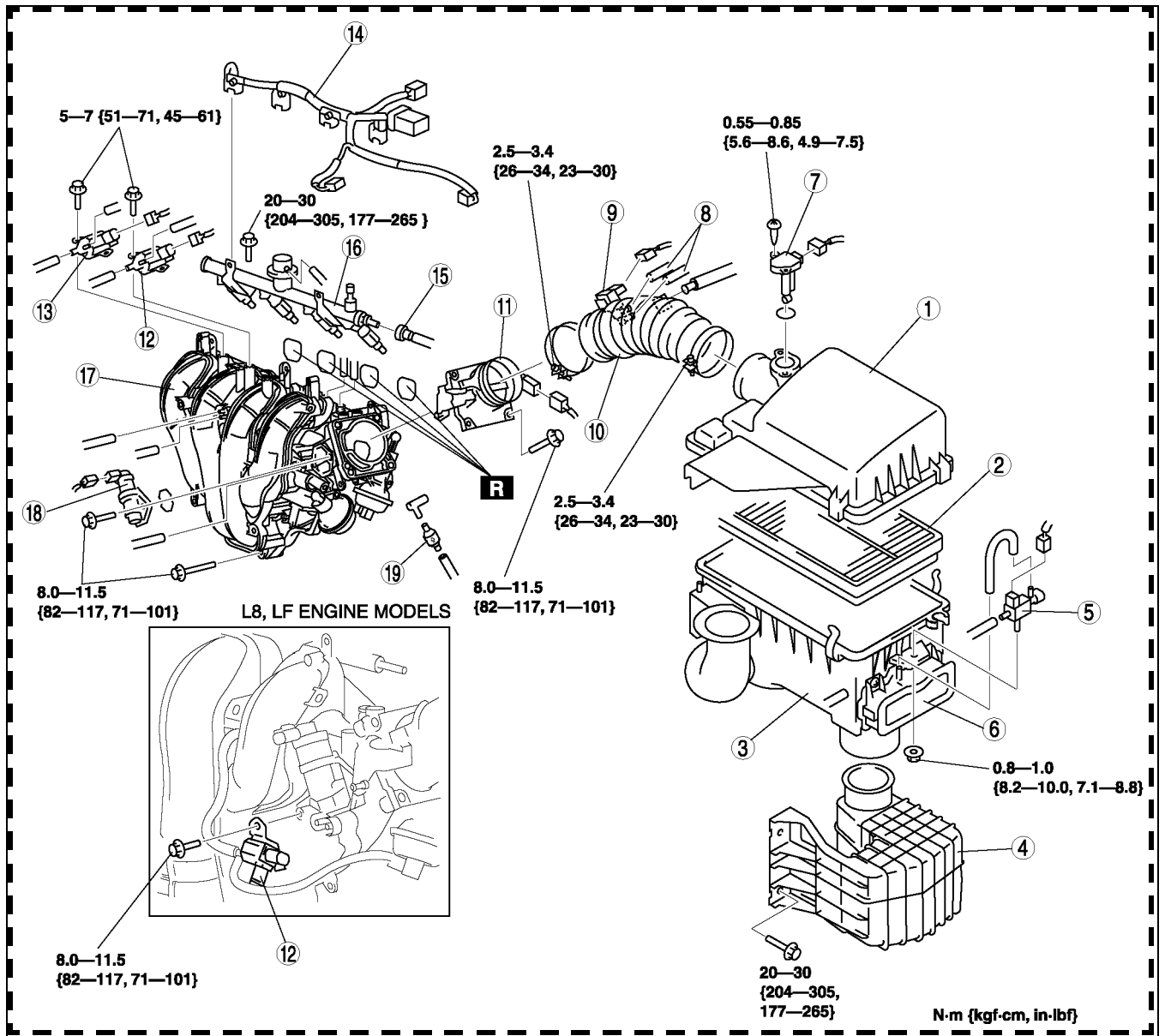
Warning

- When the engine and intake-air system are hot, they can badly burn. Turn off the engine and wait until they are cool before removing the intake-air system.
- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See **F-17 BEFORE REPAIR PROCEDURE.**)

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

INTAKE-AIR SYSTEM

4. Complete the "AFTER REPAIR PROCEDURE". (See [F-17 AFTER REPAIR PROCEDURE](#).)



A6E3910W019

1	Air cleaner cover
2	Air cleaner element
3	Air cleaner case
4	Resonance chamber (See F-12 Resonance Chamber Removal Note)
5	VAD control solenoid valve (L3)
6	VAD shutter valve (L3)
7	Mass air flow sensor
8	Vacuum hose (purge solenoid valve) (See F-12 Vacuum Hose (Purge Solenoid Valve) Installation Note)
9	Purge solenoid valve

10	Air hose
11	Throttle body
12	Variable tumble control solenoid valve
13	VIS control solenoid valve (L3)
14	Fuel injector connector
15	Plastic fuel hose (See F-28 Plastic Fuel Hose Removal Note) (See F-30 Plastic Fuel Hose Installation Note)
16	Fuel distributor
17	Intake manifold
18	IAC valve
19	VAD check valve (L3)

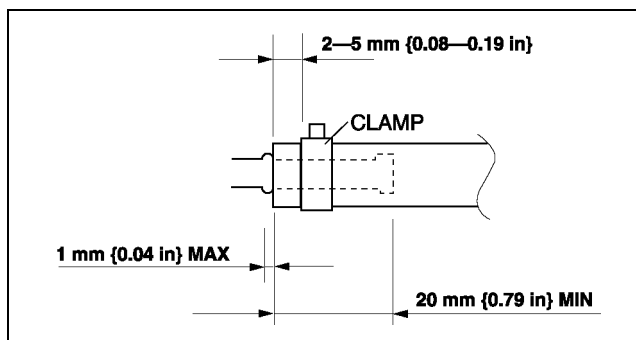
INTAKE-AIR SYSTEM

Resonance Chamber Removal Note

1. Remove the front mudguard (LH) before removing the resonance chamber.

Vacuum Hose (Purge Solenoid Valve) Installation Note

1. Fit the vacuum hose (purge solenoid valve) onto the respective fittings, and install clamps as shown.

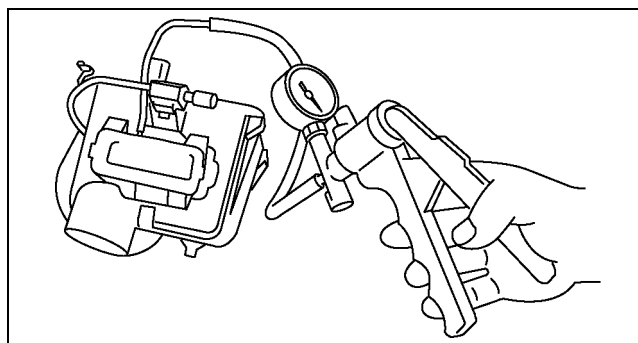


A6E3910W021

VARIABLE AIR DUCT (VAD) SHUTTER VALVE INSPECTION (L3)

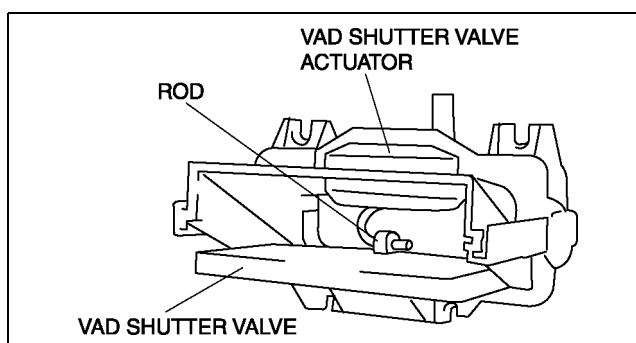
A6E391013000W02

1. Remove the air cleaner case. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
2. Disconnect the vacuum hose from the VAD shutter valve actuator.
3. Connect a vacuum pump to the VAD shutter valve actuator.
4. Apply vacuum and verify that the rod moves.
 - If the rod does not move, replace the air cleaner.



A6E3910W031

Vacuum kPa {mmHg, inHg}	Rod movement
Below -10 {-75, -3.0}	Starts to move
Above -35 {-263, -10.4}	Fully pulled



A6E3910W032

INTAKE-AIR SYSTEM

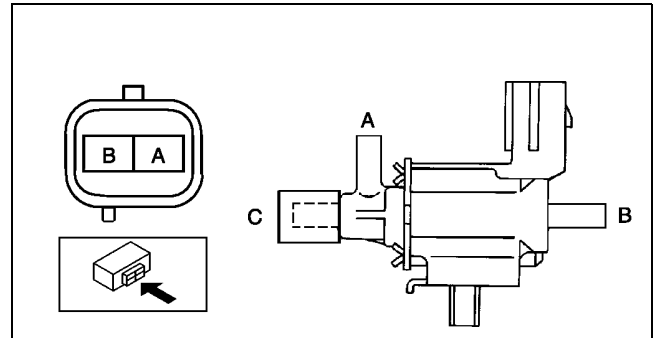
VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION (L3)

A6E391013000W03

1. Remove the VAD control solenoid valve. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#).)
2. Inspect airflow between the ports under the following conditions.
 - If not as specified, replace the VAD control solenoid valve.
 - If as specified, carry out the "Circuit Open/Short Inspection".

○—○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1			○—○	○—○	
2	B+	GND	○—○	○—○	○—○



A6E3910W036

Circuit Open/Short Inspection

A6E3910W037

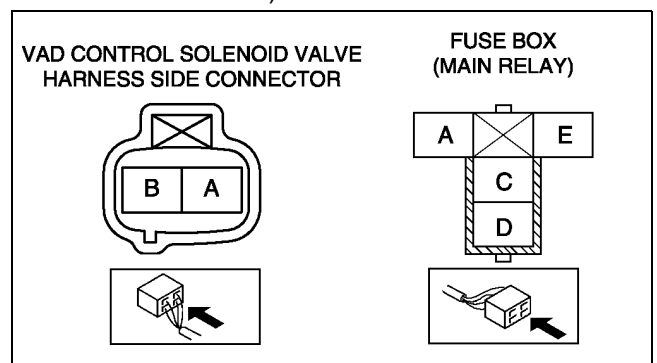
1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION](#).)
2. Inspect the following wiring harness for open or short (continuity check).

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - VAD control solenoid valve terminal B (harness-side) and PCM terminal 4C
 - VAD control solenoid valve terminal A (harness-side) and main relay terminal C (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - VAD control solenoid valve terminal B (harness-side) and body GND
 - VAD control solenoid valve terminal A (harness-side) and power supply

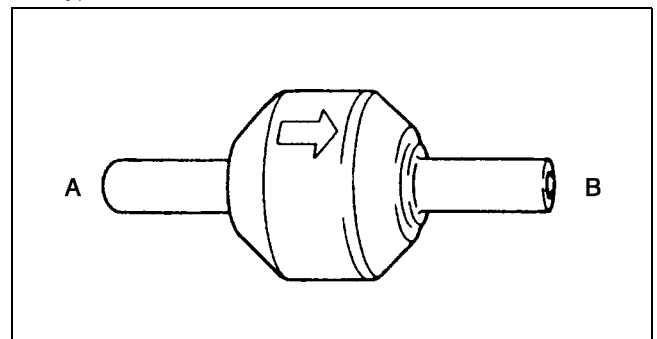


A6E3910W038

VARIABLE AIR DUCT (VAD) CHECK VALVE (ONE-WAY) INSPECTION (L3)

A6E391013000W04

1. Remove the VAD check valve (one-way). (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#).)
2. Blow through A and verify that air flows from B.
3. Blow through B and verify that air does not flow from A.
 - If not as specified, replace the VAD check valve (one-way).



A6E3910W039

IDLE AIR CONTROL (IAC) VALVE INSPECTION

A6E391020661W01

Note

- Perform the following inspection only when directed.

Operation Test

1. Carry out the "Idle Air Control Inspection". (See [F-229 Idle Air Control System Inspection](#).)
 - If not as specified, perform the further inspection for the IAC valve.

Resistance Inspection

1. Disconnect the negative battery cable.

INTAKE-AIR SYSTEM

2. Disconnect the IAC valve connector.
3. Measure the resistance between the IAC valve terminals using an ohmmeter.
 - If not as specified, replace the IAC valve. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
 - If as specified but the Operation Test is failed, carry out the "Circuit Open/Short Inspection".

Specification

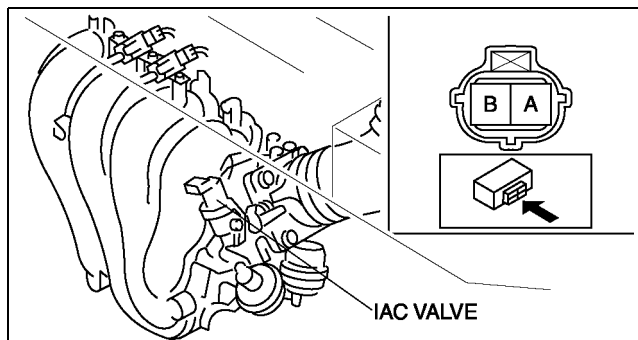
Ambient temperature (°C {°F})	Resistance (ohms)
23 {73}	8.8—10.6

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harnesses for open or short (continuity check).

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - IAC valve terminal A (harness-side) and PCM terminal 4G
 - IAC valve terminal B (harness-side) and PCM terminal 4J



A6E3910W003

Short circuit

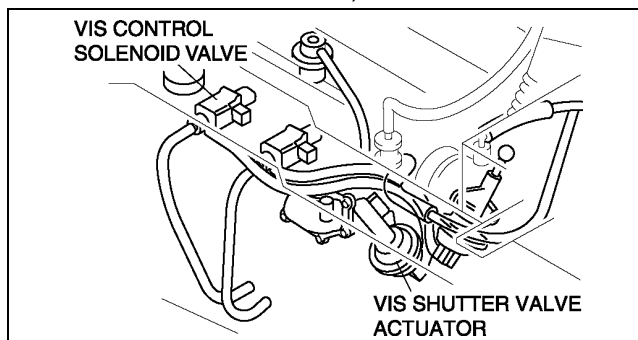
- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - IAC valve terminal A (harness-side) and power supply
 - IAC valve terminal A (harness-side) and GND
 - IAC valve terminal B (harness-side) and power supply
 - IAC valve terminal B (harness-side) and GND

VARIABLE INTAKE-AIR SYSTEM (VIS) SHUTTER VALVE ACTUATOR INSPECTION (L3)

A6E391013000W05

1. Remove the air hose. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
2. Disconnect the vacuum hose from the VIS shutter valve actuator.
3. Connect a vacuum pump to the VIS shutter valve actuator.
4. Apply vacuum and verify that the rod moves.
 - If the rod does not move, replace the intake manifold.

Vacuum kPa {mmHg, inHg}	Rod movement
Below -2.7 {-20, -0.7}	Starts to move
Above -34.7 {-260, -10.2}	Fully pulled



A6E3910W008

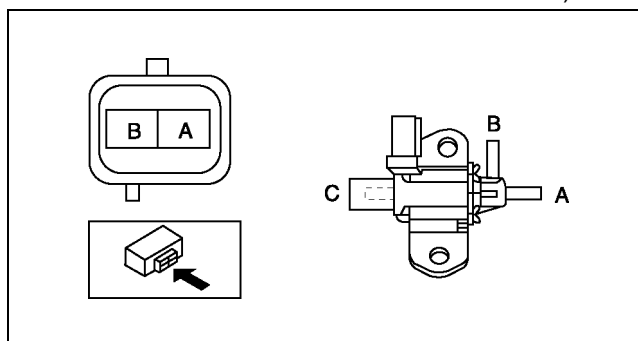
VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION (L3)

A6E391013000W06

1. Remove the VIS control solenoid valve. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
2. Inspect airflow between the ports under the following conditions.
 - If not as specified, replace the VIS control solenoid valve.
 - If as specified, carry out the "Circuit Open/Short Inspection".

○—○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1				○—○	
2	B+	GND	○—○		



A6E3910W010

A6E3910W009

INTAKE-AIR SYSTEM

Circuit Open/Short Inspection

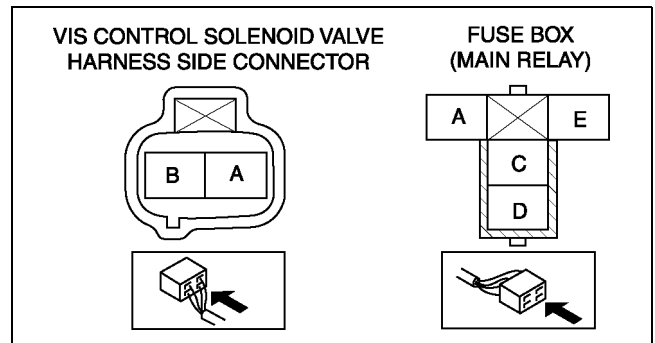
1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harness for open or short (continuity check).

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - VIS control solenoid valve terminal A (harness-side) and PCM terminal 4R
 - VIS control solenoid valve terminal B (harness-side) and main relay terminal C (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - VIS control solenoid valve terminal A (harness-side) and body GND
 - VIS control solenoid valve terminal B (harness-side) and power supply



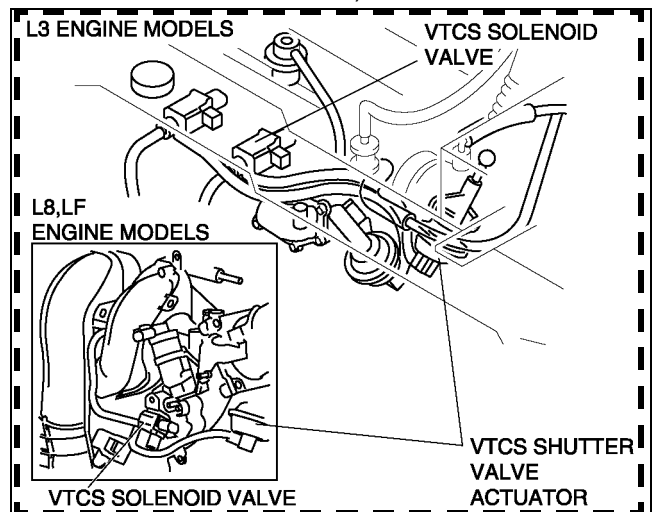
A6E3910W011

VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR INSPECTION

A6E391013000W07

1. Remove the air hose. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
2. Disconnect the vacuum hose from the VTCS shutter valve actuator.
3. Connect a vacuum pump to the VTCS shutter valve actuator.
4. Apply vacuum and verify that the rod moves.
 - If the rod does not move, replace the intake manifold.

Vacuum kPa {mmHg, inHg}	Rod movement
Below -2.7 {-20, -0.7 }	Starts to move
Above -34.7 {-260, -10.2 }	Fully pulled



A6E3910W015

VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION

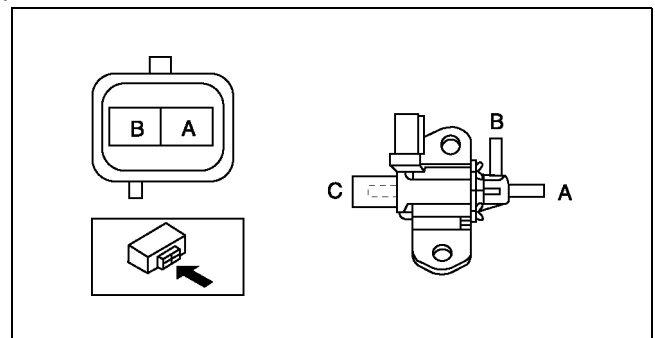
A6E391013000W08

1. Remove the variable tumble control solenoid valve. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
2. Inspect airflow between the ports under the following conditions.
 - If not as specified, replace the variable tumble control solenoid valve.
 - If as specified, carry out the "Circuit Open/Short Inspection".

○—○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1				○—○	
2	B+	GND	○—○		

A6E3910W009



A6E3910W016

Circuit Open/Short Inspection

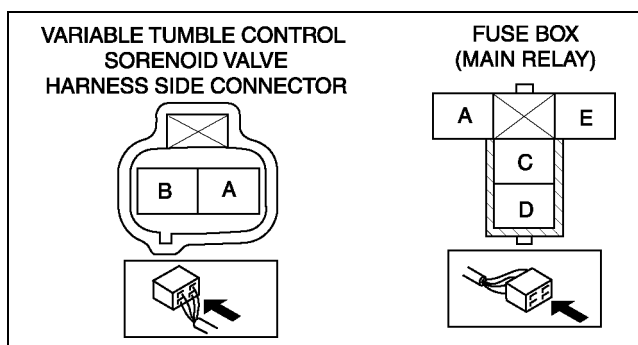
1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))

INTAKE-AIR SYSTEM

- Inspect the following wiring harness for open or short (continuity check).

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - Variable tumble control solenoid valve terminal B (harness-side) and PCM terminal 4T
 - Variable tumble control solenoid valve terminal A (harness-side) and main relay terminal C (harness-side)



Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - Variable tumble control solenoid valve terminal B (harness-side) and body GND
 - Variable tumble control solenoid valve terminal A (harness-side) and power supply

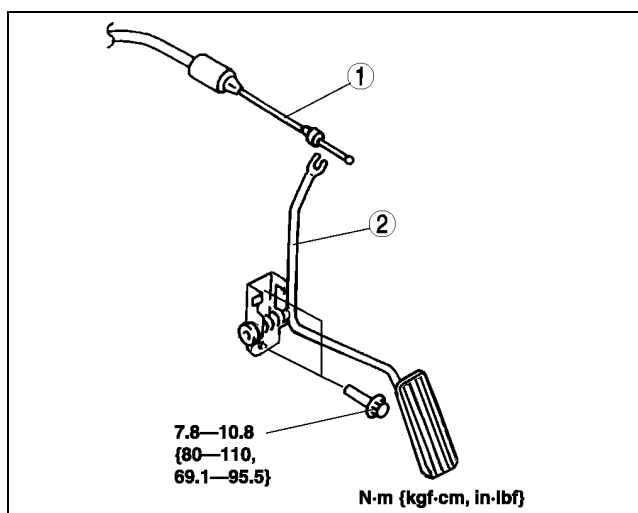
ACCELERATOR PEDAL REMOVAL/INSTALLATION

- Remove in the order indicated in the table.
- Install in the reverse order of removal.

1	Accelerator cable F-16 Accelerator Cable Installation Note
2	Accelerator pedal

Accelerator Cable Installation Note

- Carry out the "ACCELERATOR CABLE INSTALLATION/ADJUSTMENT" procedure after installing the accelerator cable. (See [F-16 ACCELERATOR CABLE INSPECTION/ADJUSTMENT](#).)



ACCELERATOR CABLE INSPECTION/ADJUSTMENT

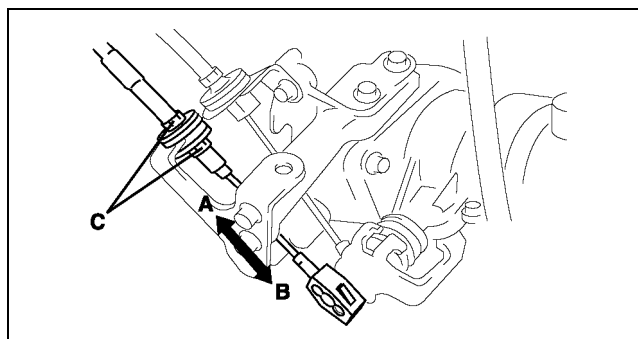
- Verify that the throttle valve is closed.
- Pull the accelerator cable in the directions of A and B, and measure the free play.
 - If not as specified, adjust by turning locknut C.

Free play

1.0–3.0 mm {0.04–0.11 in}

Tightening torque

9.8–14.7 N·m {100–150 kgf·cm, 87–130 in·lbf}



FUEL SYSTEM

FUEL SYSTEM

BEFORE REPAIR PROCEDURE

A6E391201006W01

Warning

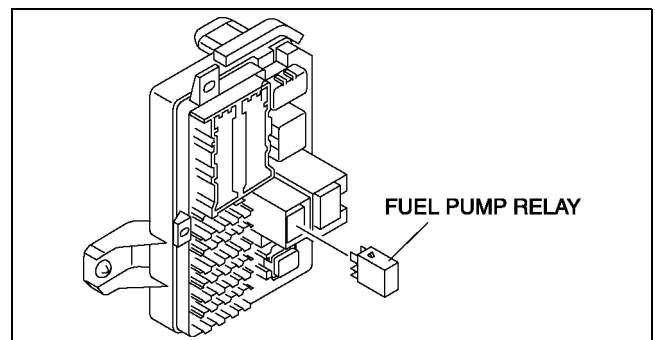
- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the following “Fuel Line Safety Procedure”.

Fuel Line Safety Procedure

Note

- Fuel in the fuel system is under high pressure also when the engine is not running.

1. Remove the fuel-filler cap and release the pressure in the fuel tank.
2. Remove the fuel pump relay.
3. Start the engine.
4. After the engine stalls, crank the engine several times.
5. Turn the ignition switch to LOCK position.
6. Install the fuel pump relay.



A6E3912W014

AFTER REPAIR PROCEDURE

A6E391201006W02

Warning

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. When installing the fuel hose, observe “Fuel Leakage Inspection” described below.

Fuel Leakage Inspection

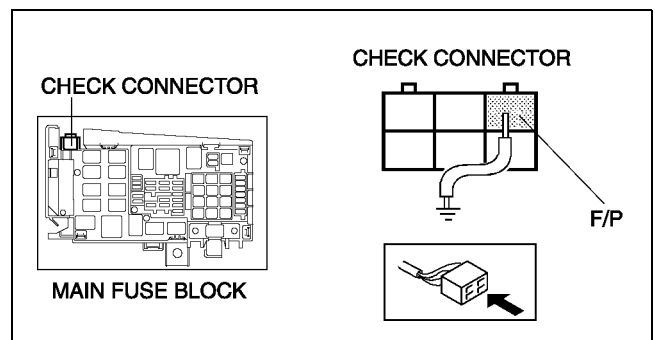
Warning

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.

Caution

- Connecting the wrong check connector terminal may possibly cause malfunction. Carefully connect the specified terminal only.

1. Short the check connector terminal F/P to body GND using a jumper wire.
2. Turn the ignition switch to ON position to operate the fuel pump.
3. Pressurize the system in this way for **at least 5 minutes** to be sure of no leakage.
 - If there is fuel leakage, inspect the fuel hoses, hose clamps, and fuel pipe sealing surface, and replace as necessary.
4. After repair, assemble the system and repeat Steps 1 to 3.



A6E3912W037

FUEL SYSTEM

FUEL TANK REMOVAL/INSTALLATION

A6E391242110W01

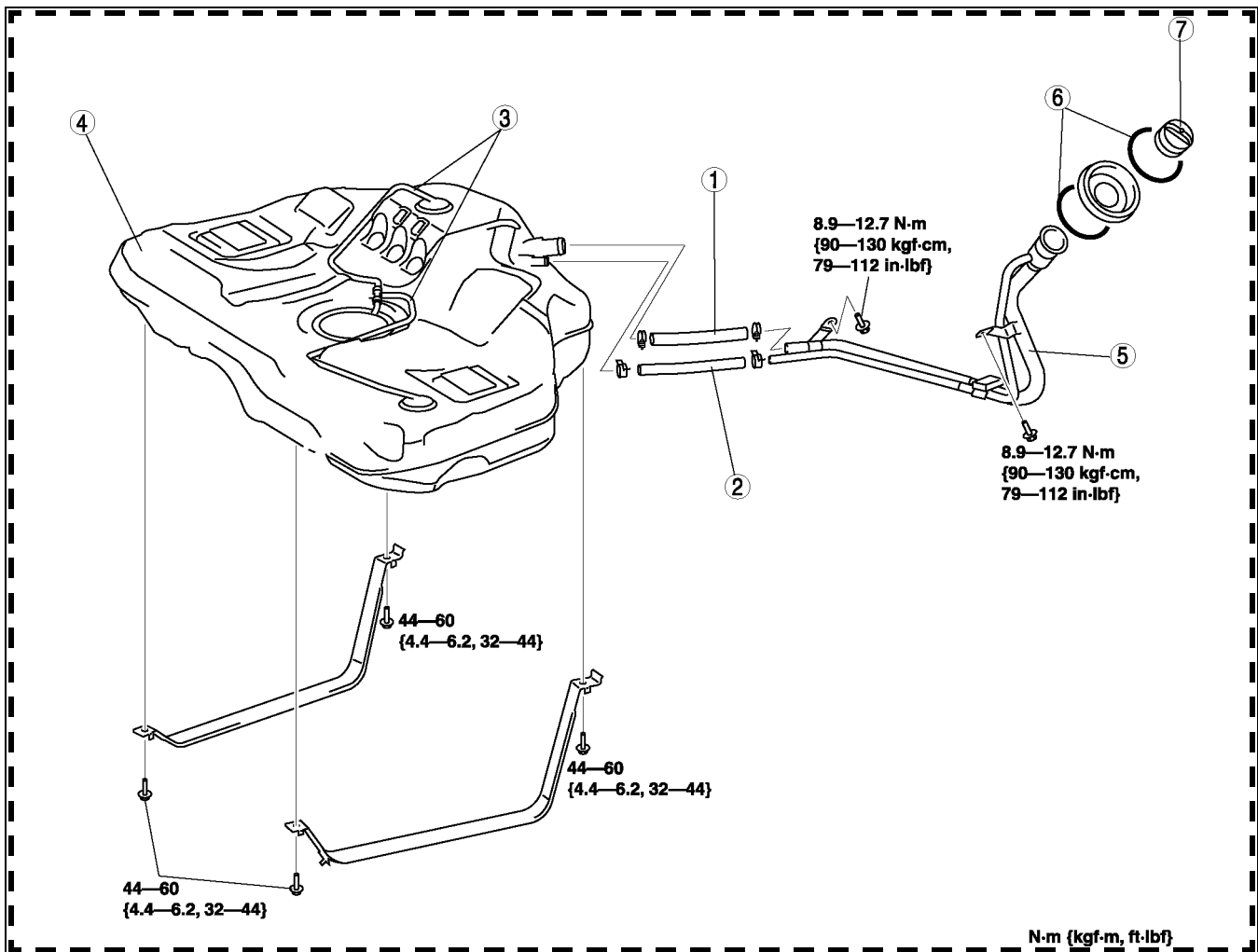
Warning

- Repairing a fuel tank that has not been properly steam cleaned can be dangerous. Explosion or fire may cause death or serious injury. Always properly steam clean a fuel tank before repairing it.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.

Caution

- Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.

1. Level the vehicle.
2. Complete the "BEFORE REPAIR PROCEDURE". (See [F-17 BEFORE REPAIR PROCEDURE.](#))
3. Disconnect the negative battery cable.
4. Remove the fuel pump unit. (See [F-22 FUEL PUMP UNIT REMOVAL/INSTALLATION.](#))
5. Siphon the fuel from the fuel tank.
6. Remove the middle pipe. (See [F-35 EXHAUST SYSTEM REMOVAL/INSTALLATION.](#))
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. Complete the "AFTER REPAIR PROCEDURE". (See [F-17 AFTER REPAIR PROCEDURE.](#))



A6E3912W013

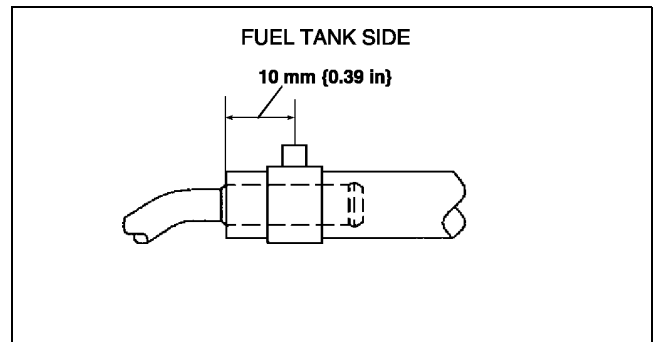
1	Joint hose (See F-19 Joint Hose Installation Note)
2	Breather hose (See F-19 Breather Hose Installation Note)
3	Evaporative hose

4	Fuel tank
5	Fuel-filler pipe
6	C-ring
7	Filler cap

FUEL SYSTEM

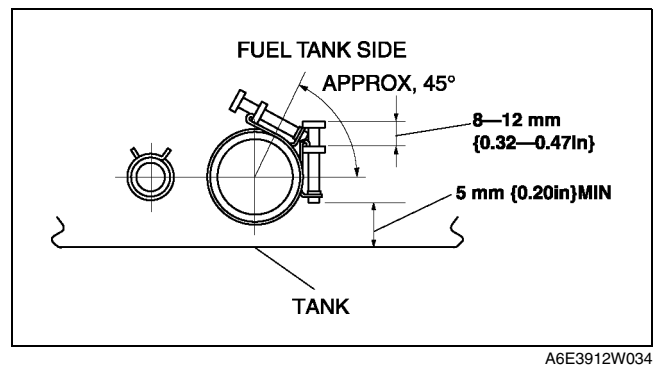
Breather Hose Installation Note

1. Fit the breather hose onto the respective fittings, and install clamps as shown.



Joint Hose Installation Note

1. Fit the joint hose onto the respective fittings, and install clamps as shown.



FUEL TANK INSPECTION

A6E391242110W02

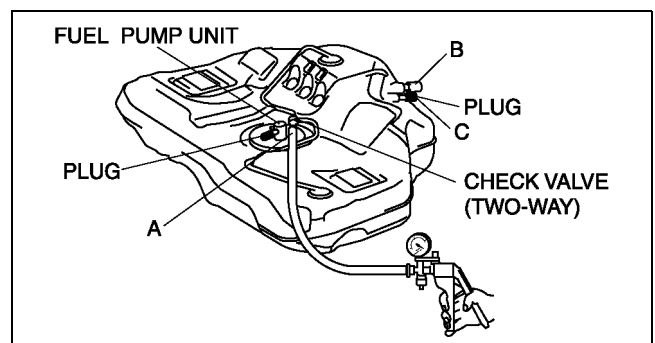
Caution

- Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.

Note

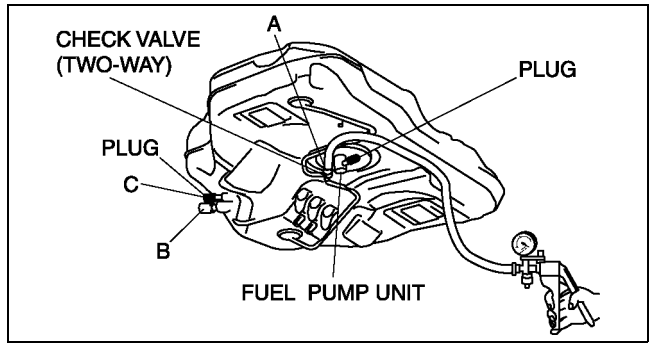
- This inspection is for two rollover valves integrated in the fuel tank.

1. Disconnect the plastic fuel hose and the fuel pump unit connector. (See [F-22 FUEL PUMP UNIT REMOVAL/INSTALLATION](#).)
2. Remove the fuel tank with the fuel pump unit. (See [F-18 FUEL TANK REMOVAL/INSTALLATION](#).)
3. Plug the fuel pipe of the fuel pump unit.
4. Connect the pump to port A.
5. Level the fuel tank.
6. Apply pressure of **-2.0 kPa {-34 mmHg, -1.3 inHg}** to port A.
 - (1) Plug port C and verify there is vacuum from port B.
 - If there is no vacuum, replace the fuel tank.
7. Apply pressure of **+5.9 kPa {+44 mmHg, +1.7 inHg}** to port A.
 - If there is no airflow, replace the fuel tank.
 - If there is airflow, turn the fuel tank upside-down and proceed to next step.



FUEL SYSTEM

8. Turn the fuel tank upside-down and apply pressure of **-2.0 kPa {-15 mmHg, -0.6 inHg}** to port A.
 - (1) Plug port C and verify there is no vacuum from port B.
 - If there is vacuum, replace the fuel tank.



A6E3912W046

NONRETURN VALVE INSPECTION

A6E391242270W01

1. Remove the fuel pump unit. (See [F-22 FUEL PUMP UNIT REMOVAL/INSTALLATION.](#))
2. Siphon the fuel from the fuel tank.

Note

- Nonreturn valve is integrated in the fuel tank.
 - The nonreturn valve is normally closed by the spring force.
3. Verify that the nonreturn valve is closed.
 - If the nonreturn valve is stuck open and does not open even when pulled up by a finger, replace the fuel tank.

FUEL LINE PRESSURE INSPECTION

A6E391201006W03

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death. Fuel can also irritate skin and eyes. To prevent this, always complete the "BEFORE REPAIR PROCEDURE". (See [F-17 BEFORE REPAIR PROCEDURE.](#))**

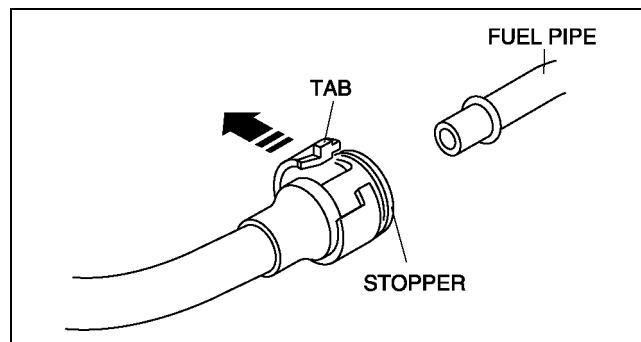
Caution

- **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using cloth or soft brush, and make sure that it is free of foreign material.**
1. Complete the "BEFORE REPAIR PROCEDURE".
(See [F-17 BEFORE REPAIR PROCEDURE](#))
 2. Disconnect the negative battery cable.
- #### Caution
- **The quick release connector may be damaged if the tab is turned too far. Do not turn the tab over the stopper.**
3. Disconnect the quick release connector from the fuel tank as follows:
 - (1) Push the tab on the locking coupler **90 degrees** until it stops.
 - (2) Pull the fuel hose straight back.

FUEL SYSTEM

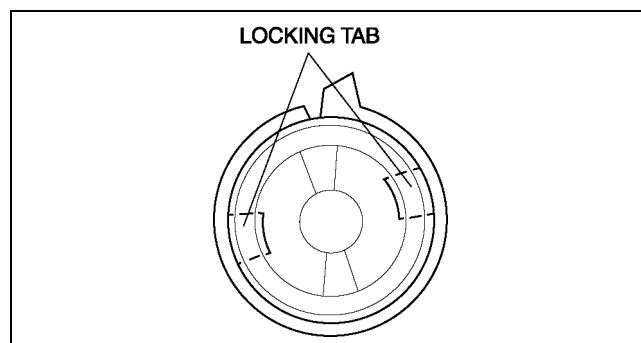
Note

- The stopper may be removed from the quick connector. Take care not to lose it. Reinstall it to the quick release connector before reconnecting the fuel line.



A6E3912W001

- The locking coupler has two internal locking tabs which retain the pulsation damper pipe. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.



A6E3912W002

- Push the **SST** quick release connector into the fuel pipe and plastic fuel hose into the **SST** until a click is heard.

- Turn the lever parallel to the hose of the **SST** as shown.

- Connect the negative battery cable.

- Verify that the vehicles for AT is at N range and MT is at neutral position.

- Start the engine and let it idle. Measure the fuel line pressure.

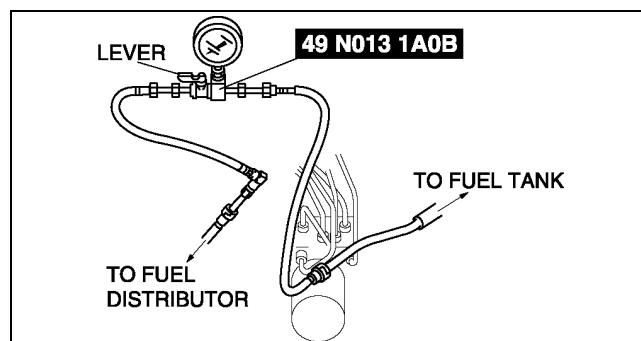
- If not as specified, inspect the following:

Zero or low

- FP circuit
- FP
- Fuel line (clogged)
- Fuel leakage inside pressure regulator

High

- Pressure regulator for high pressure cause



A6E3912W003

Fuel line pressure

375—450 kPa {3.9—4.5 kgf/cm², 55—65 psi}

- Observe the fuel pressure gauge indicator during heavy acceleration.
- Verify that the fuel pressure fluctuation is within the specification during the test.

- If not as specified, inspect the following:

- PCM
- FP
- Pulsation damper
- Fuel line for improper routing, kinks or leakage

Fuel pressure fluctuation

365—450 kPa {3.8—4.5 kgf/cm², 53—65 psi}

- Turn the ignition switch to the LOCK position.

- Measure the fuel hold pressure **after 5 min.**

- If not as specified, inspect the following:

- FP hold pressure
- Fuel injector for leakage
- Fuel line for improper routing, kinks or leakage

Fuel hold pressure

More than 200 kPa {2.0 kgf/cm², 29 psi}

FUEL SYSTEM

13. Complete the "BEFORE REPAIR PROCEDURE".
(See [F-17 BEFORE REPAIR PROCEDURE](#))
14. Disconnect the **SST**.

Note

- A checker tab is integrated with quick release connector for new plastic fuel hoses. The checker tab will be released from the quick release connector after it is completely engaged with the fuel pipe.

15. Inspect the plastic fuel hose and fuel pipe sealing surface for damage and deformation, and replace as necessary.

- If the quick release connector O-ring is damaged or has slipped, replace the plastic fuel hose.

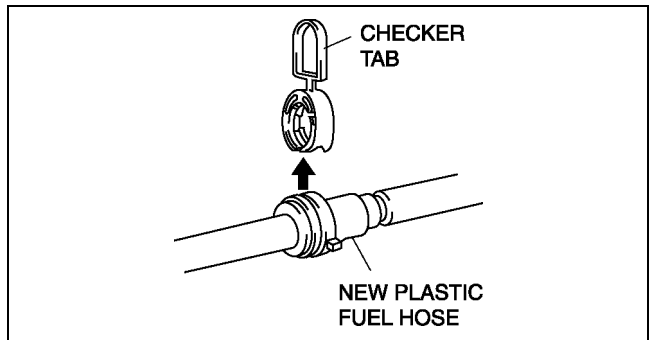
16. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.

17. Reconnect the fuel main hose to the fuel distributor until a click is heard.

18. Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.

- If quick release connector does not move at all, verify that O-ring is not damaged and slipped, and reconnect the quick release connector.

19. Complete the "AFTER REPAIR PROCEDURE". (See [F-17 AFTER REPAIR PROCEDURE](#).)



A6E3912W004

FUEL PUMP UNIT REMOVAL/INSTALLATION

A6E391213350W01

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.**

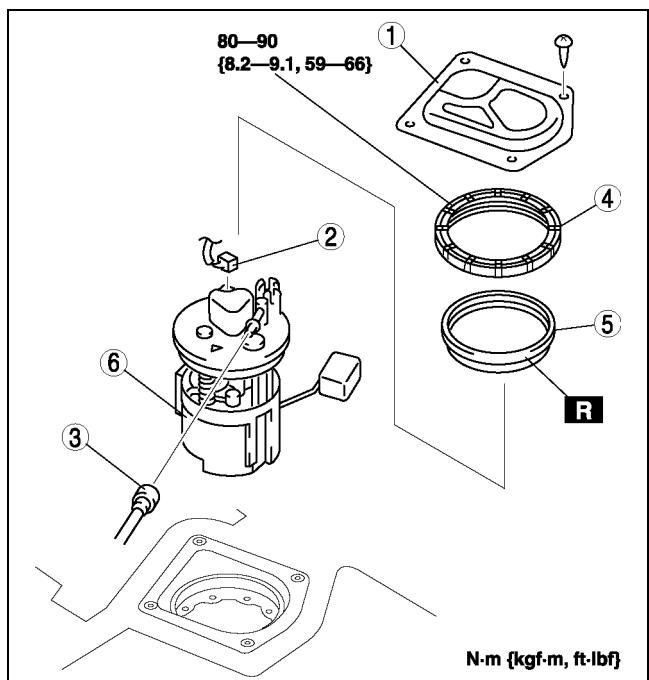
Caution

- **Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

1. Complete the "BEFORE REPAIR PROCEDURE". (See [F-17 BEFORE REPAIR PROCEDURE](#).)
2. Disconnect the negative battery cable.
3. Remove the rear seat cushion.
4. Remove in the order indicated in the table.

1	Service hole cover
2	Connector
3	Plastic fuel hose (See F-23 Plastic Fuel Hose Removal Note) (See F-24 Plastic Fuel Hose Installation Note)
4	Fuel pump cap (See F-23 Fuel Pump Cap Removal Note)
5	Packing
6	Fuel pump unit (See F-24 Fuel Pump Unit Installation Note)

5. Install in the reverse order of removal.
6. Complete the "AFTER REPAIR PROCEDURE".
(See [F-17 AFTER REPAIR PROCEDURE](#).)



A6E3912W030

FUEL SYSTEM

Plastic Fuel Hose Removal Note

Caution

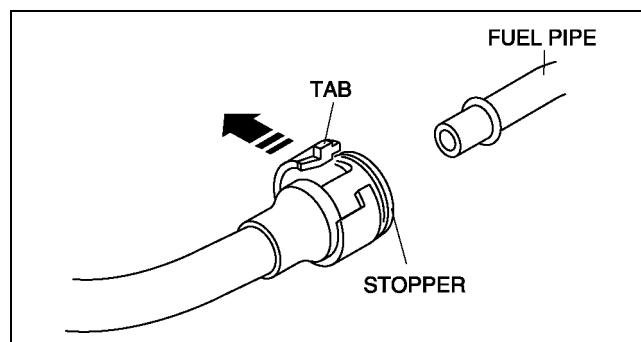
- The quick release connector may be damaged if the tab is bent excessively. Do not expand the tab over the stopper.

1. Disconnect the quick release connector.

- (1) Push the tab on the locking coupler **90 degrees** until it stops.
- (2) Pull the fuel hose straight back.

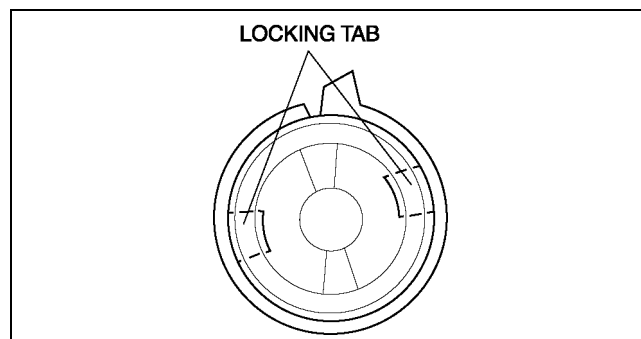
Note

- The stopper may be removed from the quick connector. Take care not to lose it. Reinstall it to the quick release connector before reconnecting the fuel line.



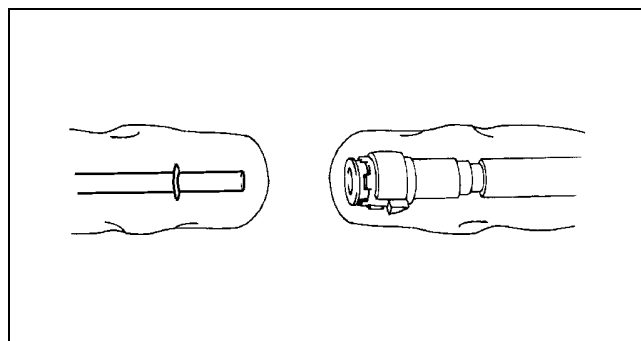
A6E3912W001

- The locking coupler has two internal locking tabs which retain the fuel pipe. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.



A6E3912W002

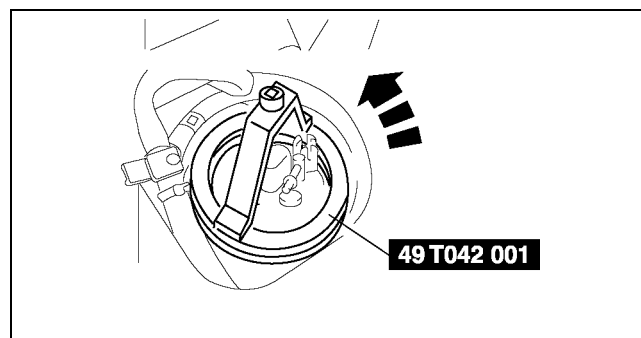
2. Cover the disconnected quick release connector and fuel pipe with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.



A6E3912W039

Fuel Pump Cap Removal Note

1. Using the SST, remove the fuel pump unit.

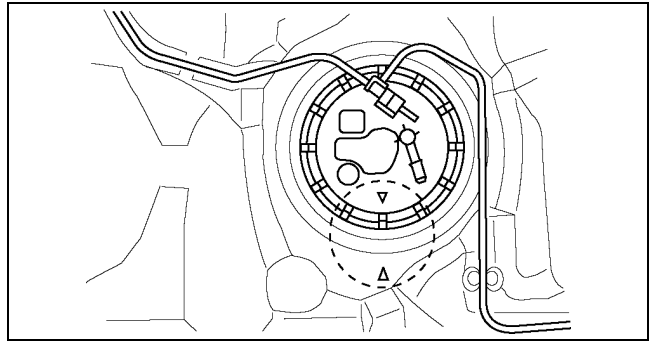


A6E3912W036

FUEL SYSTEM

Fuel Pump Unit Installation Note

1. Verify that the fuel tank mark is aligned with the fuel pump mark as shown.



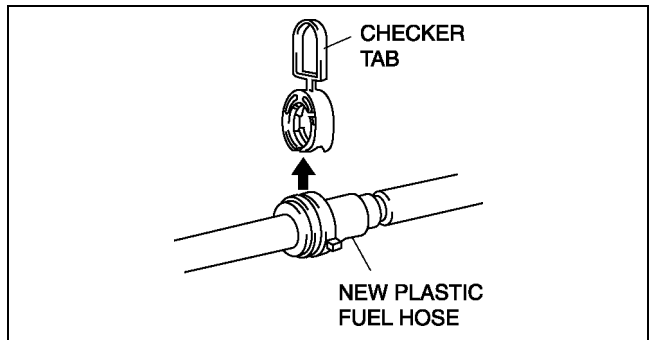
A6E3912W026

Plastic Fuel Hose Installation Note

Note

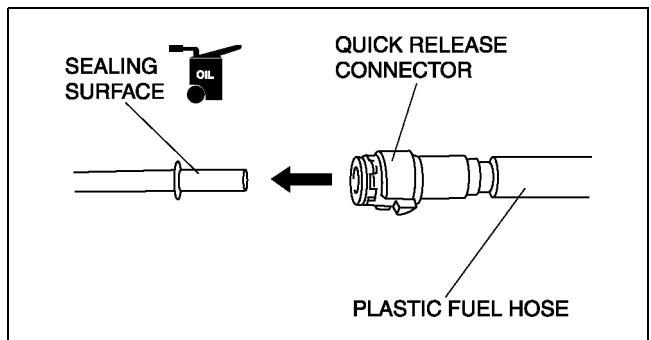
- A checker tab is integrated with quick release connector for new plastic fuel hoses. The checker tab will be released from the quick release connector after it is completely engaged with the fuel pipe.

1. When the retainer is not removed, perform the following procedure.
 - (1) Inspect the fuel pump unit sealing surface for damage and deformation, and replace as necessary.
 - If the quick release connector O-ring is damaged, replace the plastic fuel hose.



A6E3912W004

- (2) Slightly apply clean engine oil to the sealing surface of the fuel pump unit.
 - (3) Align the fuel pipe on the fuel pump unit and quick release connector so that the tabs of the retainer are correctly fitted into the quick release connector. Push the quick release connector straight into the retainer until a click is heard.
 - (4) Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.
 - If quick release connector does not move at all, verify that O-ring is not damaged and slipped, and reconnect the quick release connector.
2. When the retainer is removed, perform the following procedure.



A6E3912W006

FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY

A6E391213350W02

Warning

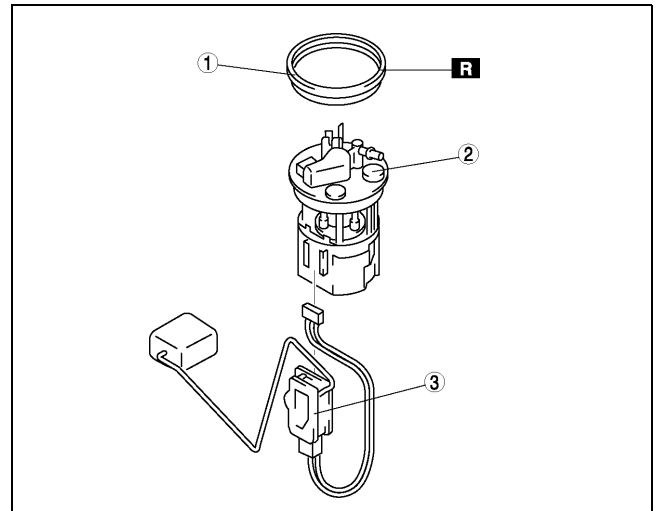
- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.**

1. Disassemble in the order indicated in the table.

FUEL SYSTEM

2. Assemble in the reverse order of disassembly.

1	Packing
2	Fuel pump unit
3	Fuel gauge sender unit



A6E3912W025

FUEL PUMP UNIT INSPECTION

A6E391213350W03

Caution

- It is normal to hear the fuel pump operating when the ignition switch is turned to the ON position.

Note

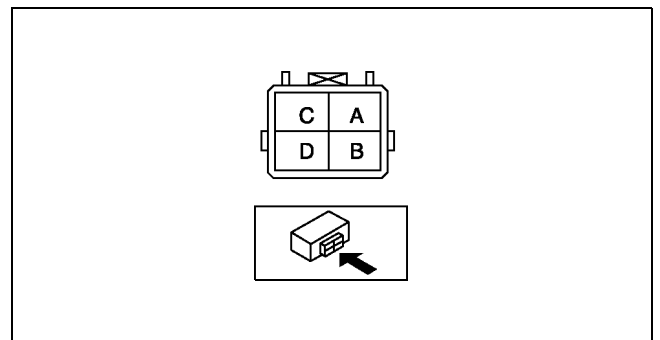
- To improve startability, the fuel pump control operates the fuel pump unit when the ignition switch is turned to the ON position. Due to this, fuel pressure is rapidly increased and fuel control is stabilized.

Continuity Inspection

Note

- Perform the following inspection only when directed.

- Disconnect the negative battery cable.
- Remove the service hole cover. (See [F-22 FUEL PUMP UNIT REMOVAL/INSTALLATION.](#))
- Disconnect the fuel pump unit connector.
- Inspect for continuity between fuel pump unit connector terminals B and D.
 - If there is no continuity, replace the fuel pump body.
 - If as specified carry out the "Circuit Open/Short Inspection".



A6E3912W018

Circuit Open/Short Inspection

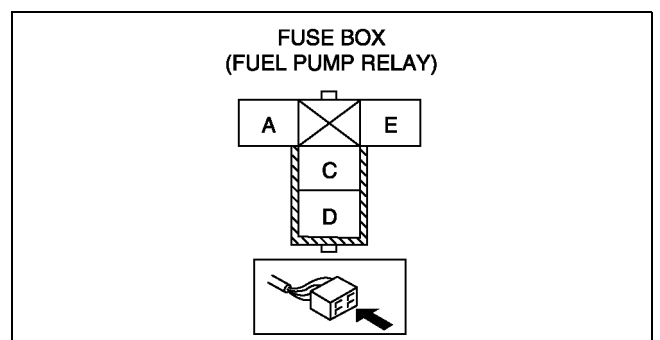
- Inspect the following wiring harnesses for open or short circuit (continuity check).

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - Fuel pump unit terminal D (harness-side) and body GND.
 - Fuel pump relay terminal D (harness-side) and fuel pump unit terminal B (harness-side).

Short circuit

- If there is continuity, the circuit is short. Repair or replace the harness.
 - Fuel pump unit terminal D (harness-side) and power supply.
 - Fuel pump unit terminal B (harness-side) and body GND.



A6E3912W019

FUEL SYSTEM

Fuel Pump Hold Pressure Inspection

Warning

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.

Caution

- Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.

Note

- Perform the following test only when directed.

- Complete the "BEFORE REPAIR PROCEDURE". (See [F-17 BEFORE REPAIR PROCEDURE](#).)
- Disconnect the negative battery cable.
- Remove the air cleaner.

Caution

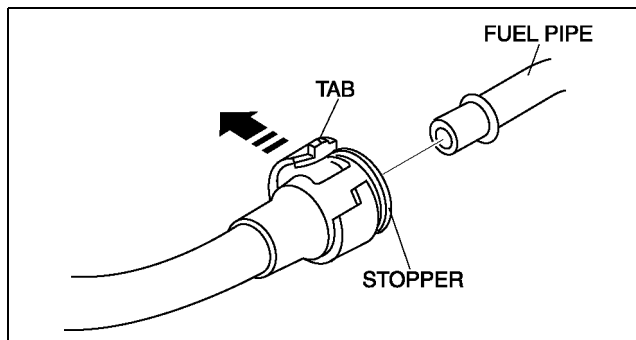
- The quick release connector may be damaged if the tab is turned too far. Do not turn the tab over the stopper.

- Disconnect the quick release connector from the fuel tank as follows:

- (1) Push the tab on the locking coupler **90°** until it stops.
- (2) Pull the fuel hose straight back.

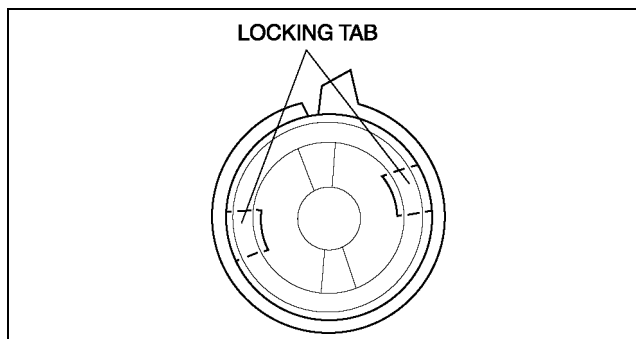
Note

- The stopper may be removed from the quick connector. Take care not to loose it. Reinstall it to the quick release connector before reconnecting the fuel line.



A6E3912W020

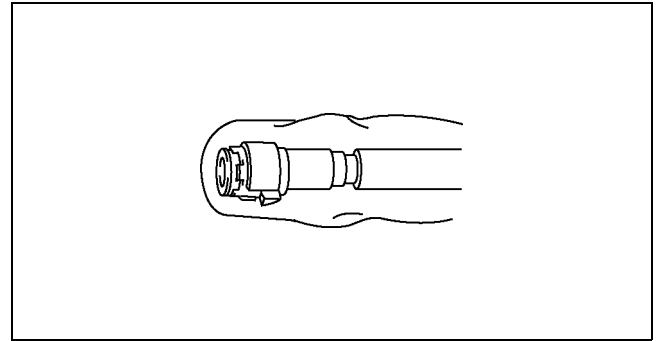
- The locking coupler has two internal locking tabs which retain the pulsation damper pipe. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.



A6E3912W002

FUEL SYSTEM

5. Cover the disconnected quick release connector with vinyl sheet or the like to prevent it from being scratched or contaminated with foreign material.

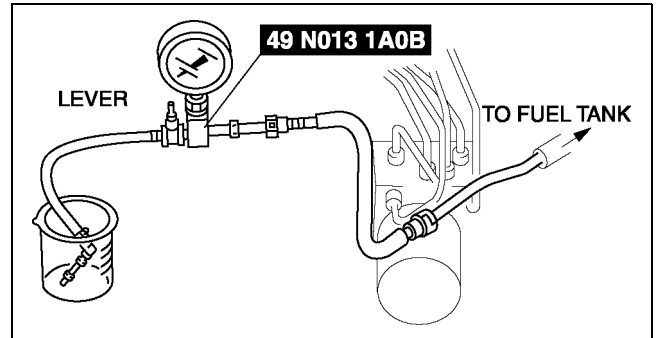


A6E3912W021

6. Turn the lever **90 degrees** against the hose of the **SST** to plug the **SST** outlet.
7. Push the **SST** quick release connector into the fuel pipe until a click is heard.
8. Set the fuel hose into a container to avoid fuel spills.
9. Connect the negative battery cable.

Caution

- **Connecting to the wrong check connector terminal may possibly cause malfunction. Carefully connect to the specified terminal only.**

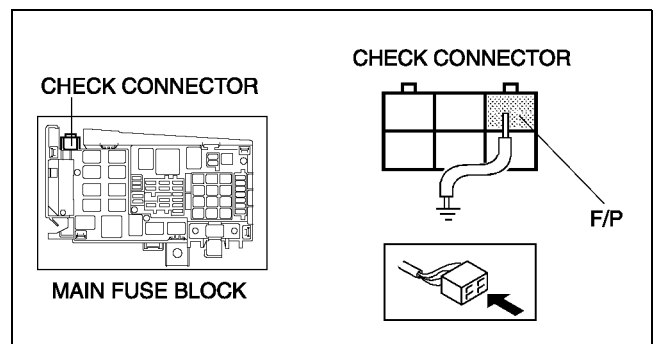


A6E3912W022

10. Short the check connector terminal F/P to body GND using a jumper wire.
11. Turn the ignition switch to ON to operate the fuel pump.
12. Turn the ignition switch to LOCK position.
13. Measure the fuel pump hold pressure **after 5 minutes**.
 - If not as specified, replace the fuel pump after inspecting the following:
 - Fuel line for clogging or leakage

Fuel pump hold pressure

More than 200 kPa {2.0 kgf/cm², 29 psi}



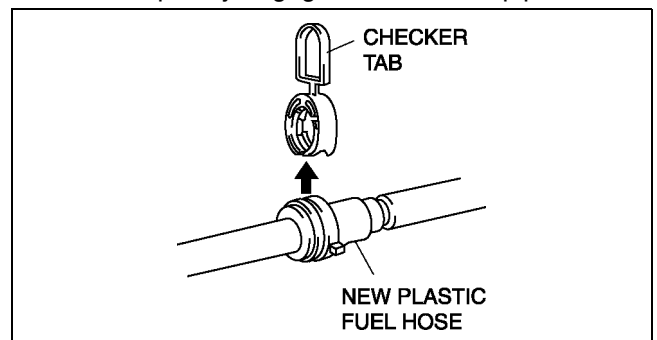
A6E3912W037

14. Disconnect the jumper wire.
15. Disconnect the **SST**.

Note

- A checker tab is integrated with the quick release connector for new plastic fuel hoses. The checker tab will be released from the quick release connector after it is completely engaged with the fuel pipe.

16. Inspect the plastic fuel hose and fuel pipe sealing surface for damage and deformation, and replace as necessary.
 - If the quick release connector O-ring is damaged or has slipped, replace the plastic fuel hose.
17. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
18. Reconnect the plastic fuel hose straight to the fuel pipe until a click is heard.
19. Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.



A6E3912W004

- If quick release connector does not move at all, verify that O-ring is not damaged and slipped, and reconnect the quick release connector.

20. Complete the "AFTER REPAIR PROCEDURE". (See [F-17 AFTER REPAIR PROCEDURE](#).)

FUEL SYSTEM

FUEL INJECTOR REMOVAL/INSTALLATION

A6E391213250W01

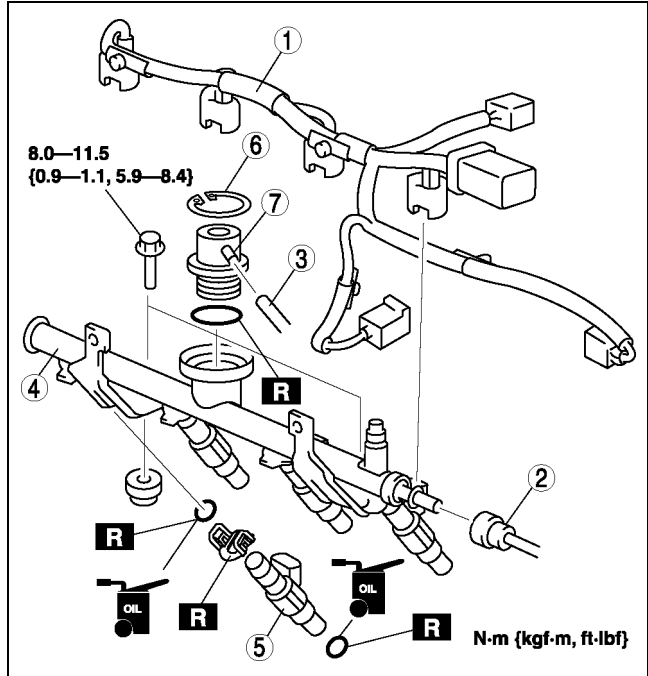
Caution

- Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.

1. Complete the "BEFORE REPAIR PROCEDURE". (See [F-17 BEFORE REPAIR PROCEDURE](#).)
2. Disconnect the negative battery cable.
3. Remove in the order indicated in the table.

1	Fuel injector connectors
2	Plastic fuel hose (See F-28 Plastic Fuel Hose Removal Note) (See F-30 Plastic Fuel Hose Installation Note)
2	Hose
4	Fuel distributor
5	Fuel injector (See F-29 Fuel Injector Removal Note) (See F-30 Fuel Injector Installation Note)
6	Snap ring
7	Pulsation damper

4. Install in the reverse order of removal.
5. Complete the "AFTER REPAIR PROCEDURE". (See [F-17 AFTER REPAIR PROCEDURE](#).)



A6E3912W005

Plastic Fuel Hose Removal Note

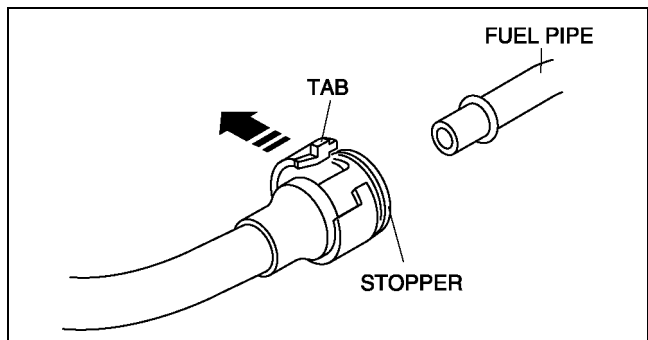
Caution

- The quick release connector may be damaged if the tab is bent excessively. Do not expand the tab over the stopper.

1. Disconnect the quick release connector.
 - (1) Push the tab on the locking coupler **90 degrees** until it stops.
 - (2) Pull the fuel hose straight back.

Note

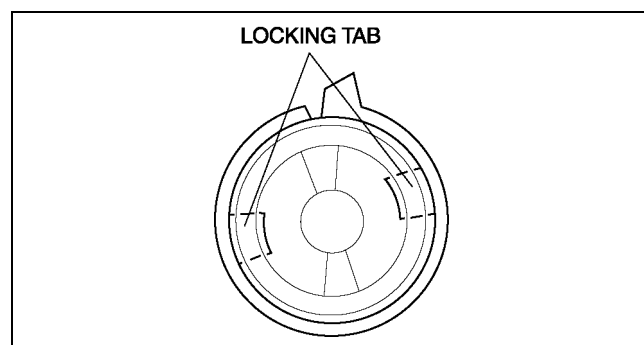
- The stopper may be removed from the quick connector. Take care not to lose it. Reinstall it to the quick release connector before reconnecting the fuel line.



A6E3912W001

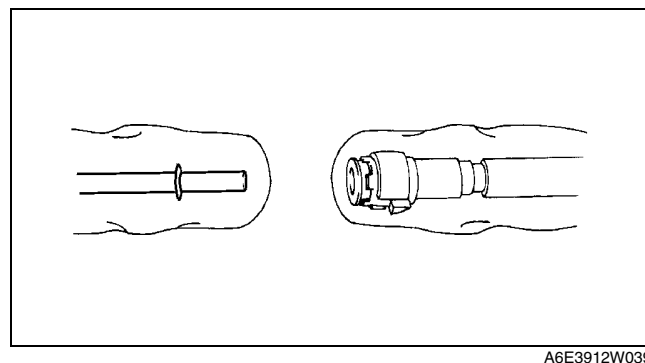
FUEL SYSTEM

- The locking coupler has two internal locking tabs which retain the fuel pipe. Be sure that the tab on the locking coupler is rotated until it stops to release two internal locking tabs.



F

2. Cover the disconnected quick release connector and fuel pipe with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.

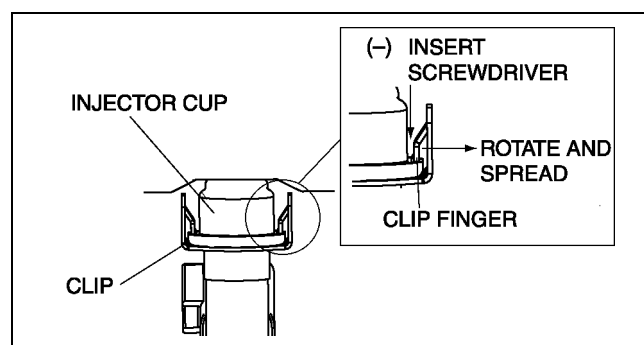


Fuel Injector Removal Note

Caution

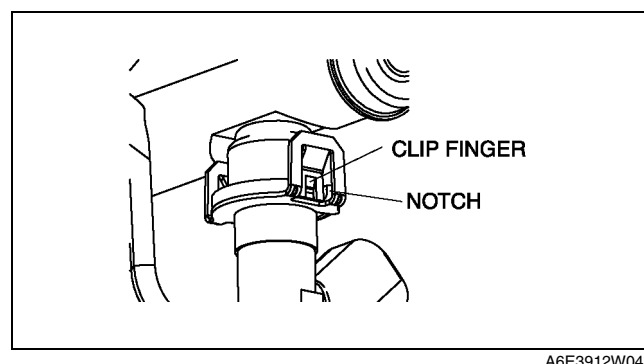
- Use of a deformed injector retaining clip will cause the injector to not engage correctly. Always use a new clip when reattaching the injector, otherwise it may cause the injector to rotate.

1. Insert a screwdriver between the injector cup and the clip fingers.



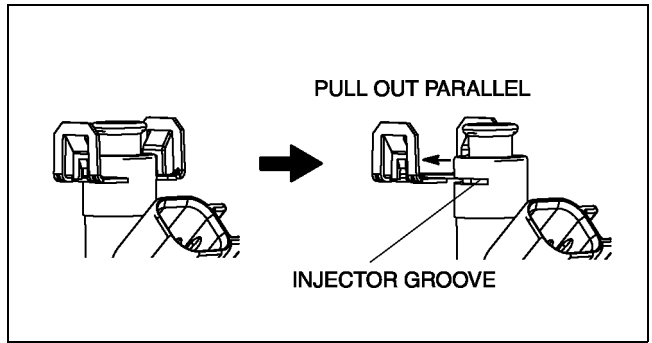
Note

- When rotating the screwdriver to spread the clip fingers, deform them sufficiently to make sure they release from the notched edge of the injector cup.
2. Rotate the screwdriver to spread the clip fingers and remove them from the injector cup.
 3. Pull the injector and clip out of the rail.
 4. Remove the clip from the injector according to the following:
 - (1) Grasp the clip with a pair of pliers.



FUEL SYSTEM

- (2) Pull the clip parallel to the injector groove, and remove it from the injector.
- (3) Discard the clip.



A6E3912W042

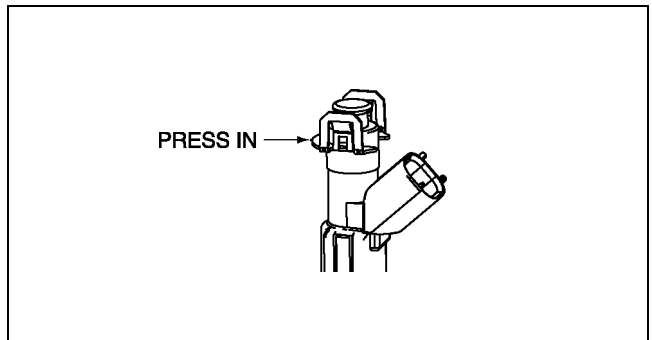
Fuel Injector Installation Note

1. Lightly lubricate the injector groove and O-ring.
2. Pre-attach a new clip in the injector groove.

Note

- When the clip is attached correctly, the central area of the injector and the clip finger positions are aligned.

3. Hold the injector firmly, push the clip into the injector until the clip stops sliding.
4. Verify that the injector connector position is correct, and press the injector and clip into the injector cup. Continue pressing until the clip contacts the lower surface of the injector cup.
5. Verify that the injector and clip are correctly attached with the clip locked onto the injector cup notch.



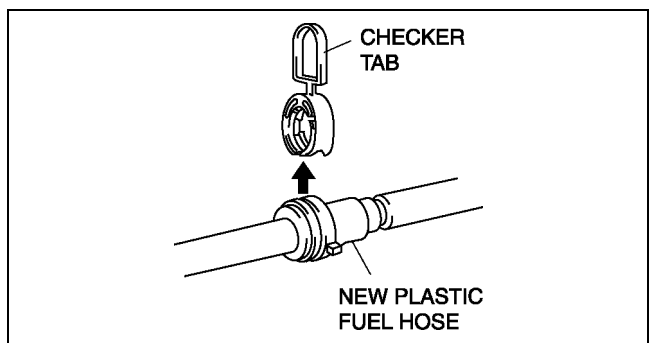
A6E3912W043

Plastic Fuel Hose Installation Note

Note

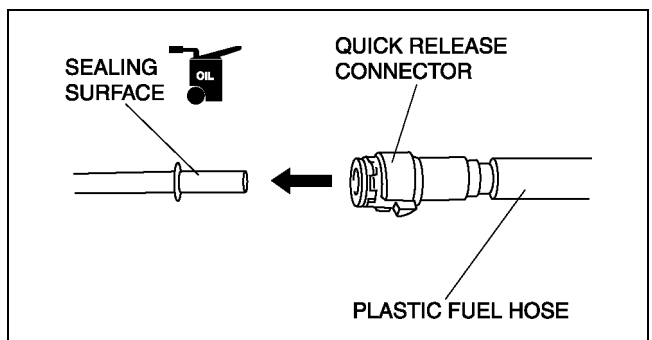
- A checker tab is integrated with quick release connector for new plastic fuel hoses. The checker tab will be released from the quick release connector after it is completely engaged with the fuel pipe.

1. When the retainer is not removed, perform the following procedure.
 - (1) Inspect the fuel pump unit sealing surface for damage and deformation, and replace as necessary.
 - If the quick release connector O-ring is damaged, replace the plastic fuel hose.



A6E3912W004

- (2) Slightly apply clean engine oil to the sealing surface of the fuel pump unit.
- (3) Align the fuel pipe on the fuel pump unit and quick release connector so that the tabs of the retainer are correctly fitted into the quick release connector. Push the quick release connector straight into the retainer until a click is heard.



A6E3912W006

FUEL SYSTEM

- (4) Lightly pull and push the quick release connector a few times by hand and verify that it can move **2.0—3.0 mm {0.08—0.11 in}** and it is connected securely.
 - If quick release connector does not move at all, verify that O-ring is not damaged and slipped, and reconnect the quick release connector.
2. When the retainer is removed, perform the following procedure.

FUEL INJECTOR INSPECTION

A6E391213250W02

Operation Test

1. Carry out the “Fuel Injector Operation Inspection”. (See [F-231 Fuel Injector Operation Inspection.](#))
 - If not as specified, perform the further inspection for the fuel injectors.

Resistance Inspection

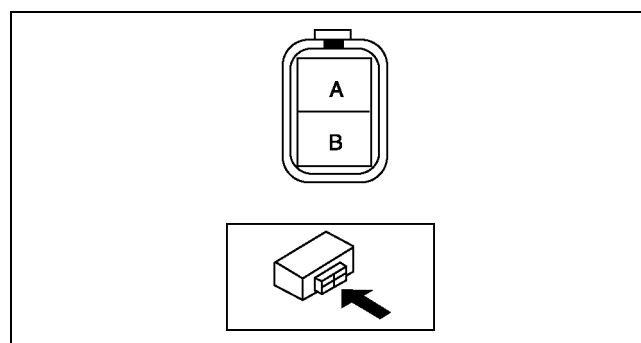
Note

- Perform the following test only when directed.

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable.
3. Disconnect the fuel injector connectors.
4. Measure the resistance of the fuel injector using an ohmmeter.
 - If not as specified, replace the fuel injector. (See [F-28 FUEL INJECTOR REMOVAL/INSTALLATION.](#))
 - If as specified but “Operation Test” is failed, carry out the “Circuit Open/Short Inspection”. Inspect for open or short circuit.

Resistance

11.4—12.6 ohms [20 °C {68 °F}]



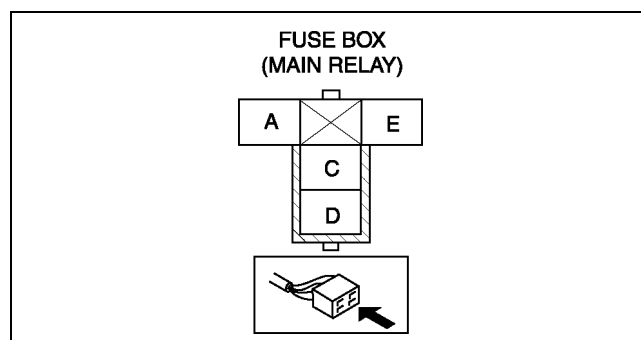
A6E3912W007

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harness for open or short (continuity check).

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - No.1 cylinder fuel injector terminal B (harness-side) and PCM terminal 4Z.
 - No.2 cylinder fuel injector terminal B (harness-side) and PCM terminal 4W.
 - No.3 cylinder fuel injector terminal B (harness-side) and PCM terminal 4AD.
 - No.4 cylinder fuel injector terminal B (harness-side) and PCM terminal 4AA.
 - No.1 cylinder fuel injector terminal A (harness-side) and main relay (harness-side) terminal C through common connector.
 - No.2 cylinder fuel injector terminal A (harness-side) and main relay (harness-side) terminal C through common connector.
 - No.3 cylinder fuel injector terminal A (harness-side) and main relay (harness-side) terminal C through common connector.
 - No.4 cylinder fuel injector terminal A (harness-side) and main relay (harness-side) terminal C through common connector.



A6E3912W008

Short circuit

- If there is continuity, the circuit is short. Repair or replace the harness.
 - No.1 cylinder fuel injector terminal B (harness-side) and body GND.
 - No.2 cylinder fuel injector terminal B (harness-side) and body GND.
 - No.3 cylinder fuel injector terminal B (harness-side) and body GND.
 - No.4 cylinder fuel injector terminal B (harness-side) and body GND.
 - No.1 cylinder fuel injector terminal A (harness-side) and power supply.

FUEL SYSTEM

- No.2 cylinder fuel injector terminal A (harness-side) and power supply.
- No.3 cylinder fuel injector terminal A (harness-side) and power supply.
- No.4 cylinder fuel injector terminal A (harness-side) and power supply.

Fuel Leakage Inspection

Warning

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

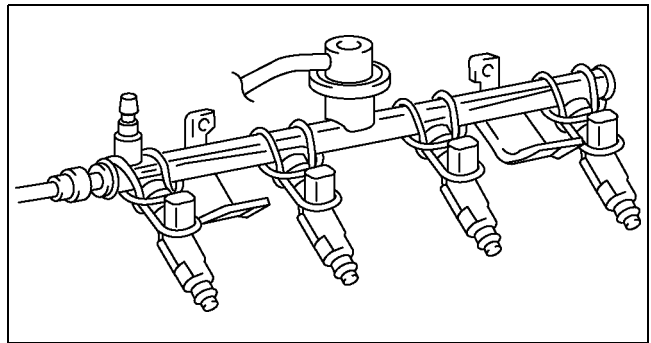
Note

- Perform the following test only when directed.

1. Complete the "BEFORE REPAIR PROCEDURE". (See [F-17 BEFORE REPAIR PROCEDURE.](#))
2. Disconnect the negative battery cable.
3. Remove the fuel injectors together with the fuel distributor with the fuel hose connected. (See [F-28 FUEL INJECTOR REMOVAL/INSTALLATION.](#))
4. Fasten the fuel injectors firmly to the fuel distributor with wire.
5. Connect the negative battery cable.

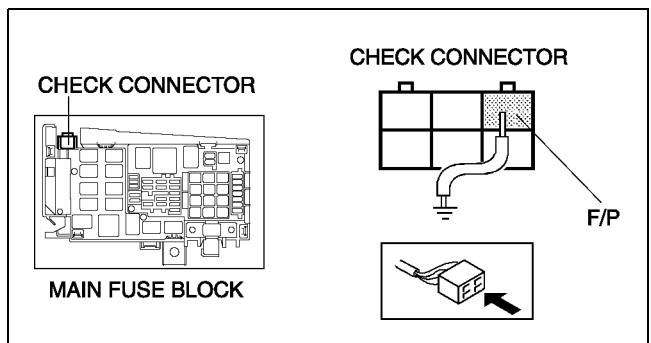
Caution

- **Connecting the wrong check connector terminal may possibly cause malfunction. Carefully connect the specified terminal only.**



A6E3912W009

6. Short the check connector terminal F/P to body GND using a jumper wire.
7. Turn the ignition switch to ON position to operate the fuel pump.



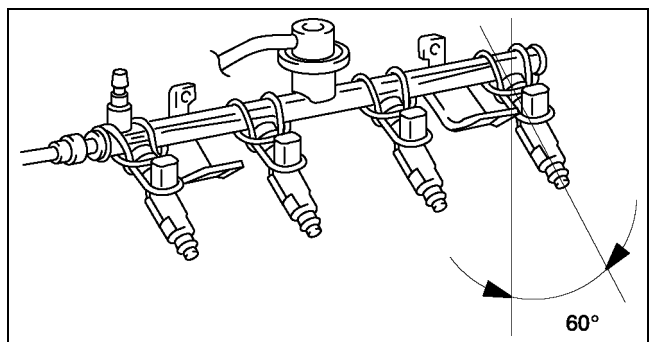
A6E3912W037

8. Tilt the fuel injectors **approx. 60 degrees**.
9. Verify that fuel leakage from the fuel injector nozzles is within the specification.
 - If not as specified, replace the fuel injector.

Fuel leakage

Less than 1 drop/2 minutes

10. Turn the ignition switch to LOCK position and remove the jumper wire.
11. Complete the "AFTER REPAIR PROCEDURE". (See [F-17 AFTER REPAIR PROCEDURE.](#))



A6E3912W010

FUEL SYSTEM

Volume Inspection

Warning

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.

Note

- If there is an after market fuel injector tester, perform the following test.
- If there is no an after market fuel injector tester, perform "Operation Test", "Resistance Inspection", and "Fuel Leakage Test" to verify the fuel injector is okay or not.

1. Complete the "BEFORE REPAIR PROCEDURE". (See [F-17 BEFORE REPAIR PROCEDURE.](#))
2. Disconnect the negative battery cable.
3. Remove the fuel injectors. (See [F-28 FUEL INJECTOR REMOVAL/INSTALLATION.](#))
4. Connect the fuel injector to the fuel injector tester.
5. Measure the injection volume of each fuel injector using a graduated container.
 - If not as specified, replace the fuel injector.

Injection volume

L3: 61—71 ml {61—79 cc, 2.2—2.7 fl oz}/15 sec.

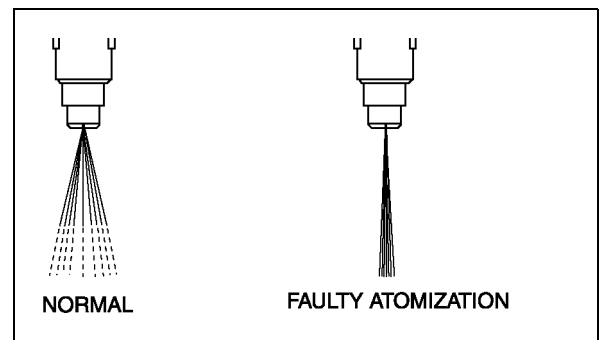
LF: 53—69 ml {53—69 cc, 1.9—2.4 fl oz}/15 sec.

L8: 48—63 ml {48—63 cc, 1.7—2.2 fl oz}/15 sec.

6. Turn the ignition switch to LOCK position and disconnect the jumper wire.
7. Complete the "AFTER REPAIR PROCEDURE". (See [F-17 AFTER REPAIR PROCEDURE.](#))

Atomization

1. Inspect atomization pattern.
 - If the atomization is faulty, replace the fuel injector.



A6E3912W011

FUEL SYSTEM

PRESSURE REGULATOR INSPECTION

A6E391213280W01

Note

- Due to the adoption of the mechanical returnless fuel system, the pressure regulator cannot be inspected separately.

1. Perform "FUEL LINE PRESSURE INSPECTION". (See [F-20 FUEL LINE PRESSURE INSPECTION.](#))

PULSATION DAMPER REMOVAL/INSTALLATION

A6E391220180W01

1. Remove and install the pressure regulator. (See [F-28 FUEL INJECTOR REMOVAL/INSTALLATION.](#))

PULSATION DAMPER INSPECTION

A6E391220180W02

1. Complete the "BEFORE REPAIR PROCEDURE". (See [F-17 BEFORE REPAIR PROCEDURE.](#))
2. Remove the pulsation damper. (See [F-34 PULSATION DAMPER REMOVAL/INSTALLATION.](#))
3. Visually inspect the pulsation damper for damage and cracks. Also verify that there is no extreme rust which will cause fuel leakage.
 - If either is observed, replace the pulsation damper.
4. Complete the "AFTER REPAIR PROCEDURE". (See [F-17 AFTER REPAIR PROCEDURE.](#))

EXHAUST SYSTEM

EXHAUST SYSTEM

EXHAUST SYSTEM INSPECTION

A6E391440000W01

1. Start the engine and inspect each exhaust system component for exhaust gas leakage.
 - If leakage is found, repair or replace as necessary.

EXHAUST SYSTEM REMOVAL/INSTALLATION

A6E391440000W02

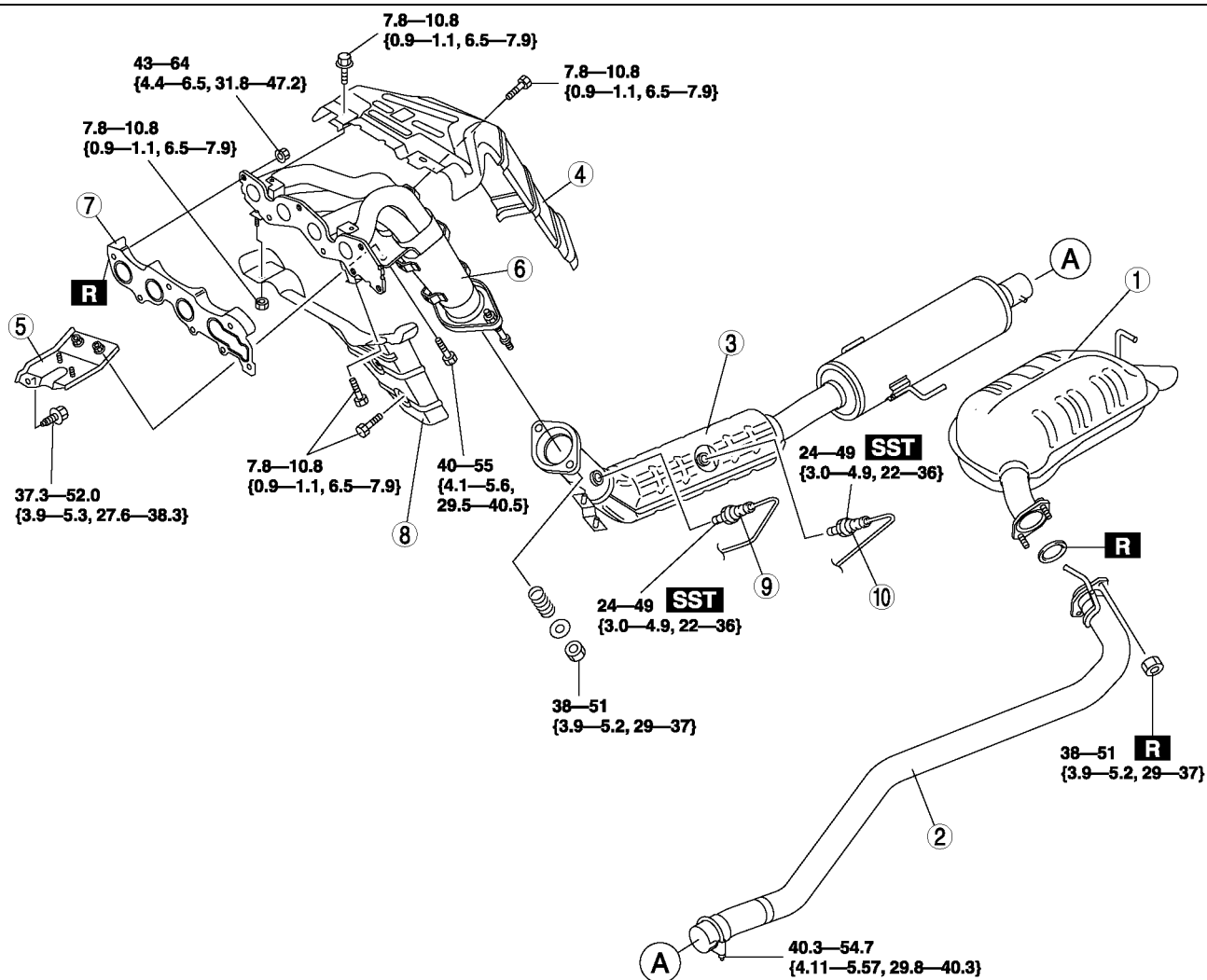
Warning

- **When the engine and exhaust system are hot, they can badly burn. Turn off the engine and wait until they are cool before removing the exhaust system.**

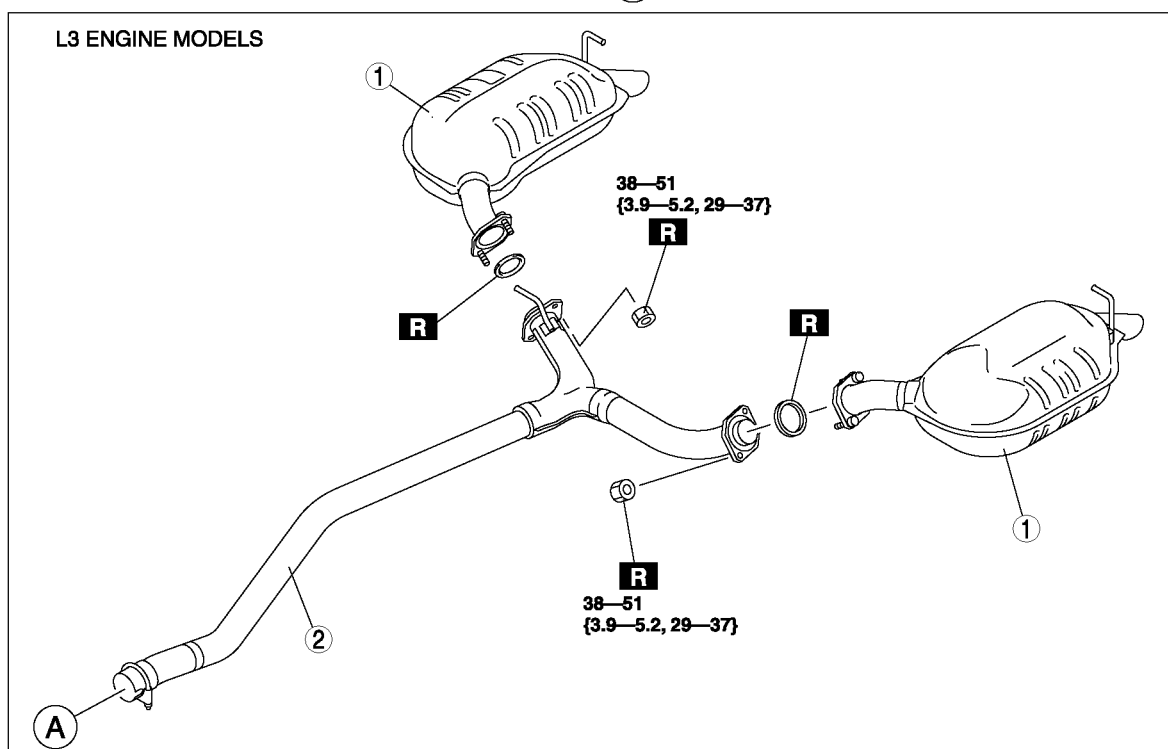
F

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

EXHAUST SYSTEM



L3 ENGINE MODELS



N·m {kgf·m, ft·lbf}

A6E3914W002

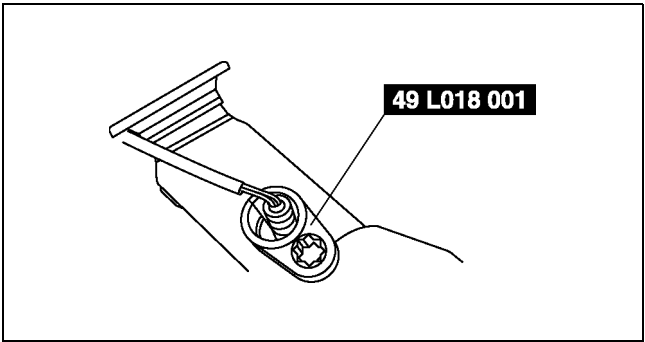
EXHAUST SYSTEM

1	Main silencer
2	Middle pipe
3	TWC
4	Exhaust manifold insulator (upper)
5	Bracket
6	Exhaust manifold (See F-37 Exhaust Manifold Installation Note)

7	Exhaust manifold gasket
8	Exhaust manifold insulator (lower)
9	HO2S (front) (See F-37 HO2S Removal Note)
10	HO2S (rear) (See F-37 HO2S Removal Note)

HO2S Removal Note

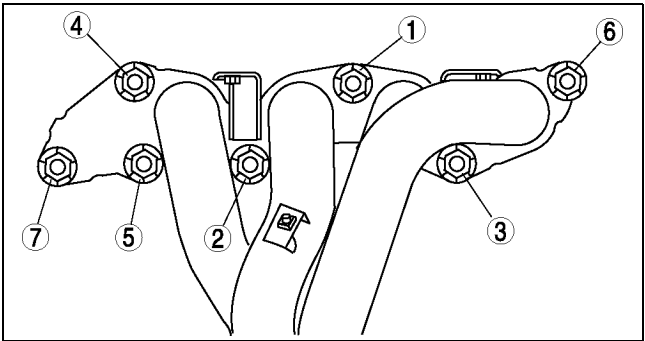
1. Remove the HO2S using the **SST** before removing the exhaust manifold.



A6J3914W004

Exhaust Manifold Installation Note

1. Tighten the exhaust manifold installation nuts in the order shown.



A6E3914W003

F

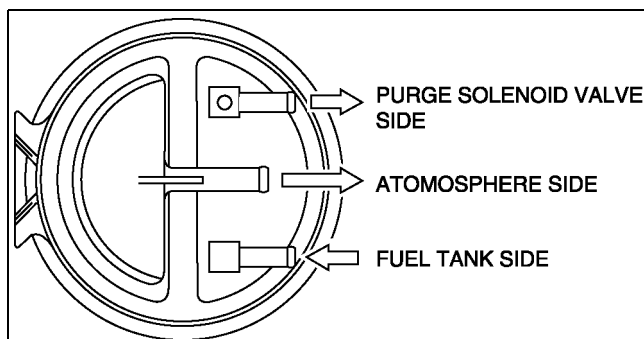
EMISSION SYSTEM

EMISSION SYSTEM

CHARCOAL CANISTER INSPECTION

A6E391613970W01

1. Remove the charcoal canister.
2. Plug the atmosphere side port and purge solenoid valve side port of the charcoal canister.
3. Blow air into the charcoal canister from the fuel tank side port and verify that there is no air leakage.
 - If there is air leakage, replace the charcoal canister.

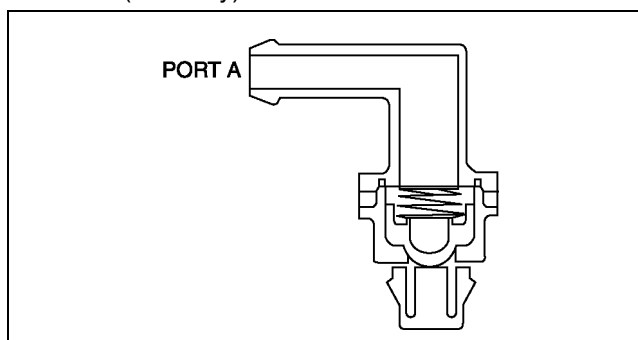


A6E3916W002

EVAPORATIVE GAS CHECK VALVE (ONE-WAY) INSPECTION (L.H.D.)

A6E391613988W01

1. Remove the evaporative gas check valve (one-way).
2. Apply pressure to port A, and verify that there is no airflow.
 - If there is airflow, replace the evaporative gas check valve (one-way).
3. Apply negative pressure to port A, and verify that there is air flow.
 - If there is no airflow, replace the evaporative gas check valve (one-way).



A6E3916W001

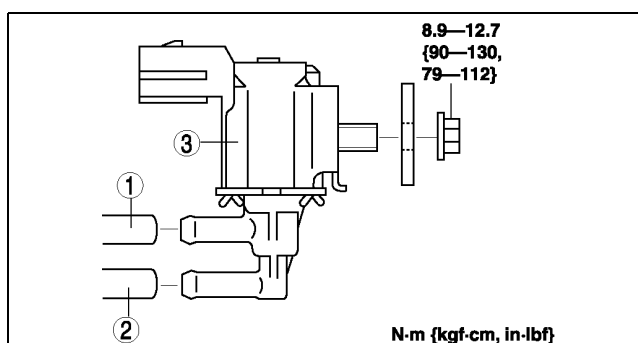
PURGE SOLENOID VALVE REMOVAL/INSTALLATION

A6E391618740W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Evaporative hose (to charcoal canister) (See F-38 Evaporative Hose Installation Note)
2	Vacuum hose (to intake manifold) (See F-38 Vacuum Hose Installation Note)
3	Purge solenoid valve

3. Install in the reverse order of removal.



A6E3916W024

Vacuum Hose Installation Note

1. Attach the vacuum hose onto the purge solenoid valve until it contacts the stopper.

Evaporative Hose Installation Note

1. Attach the evaporative hose onto the purge solenoid valve until it contacts the stopper.

EMISSION SYSTEM

PURGE SOLENOID VALVE INSPECTION

A6E391618740W02

Airflow Inspection

Note

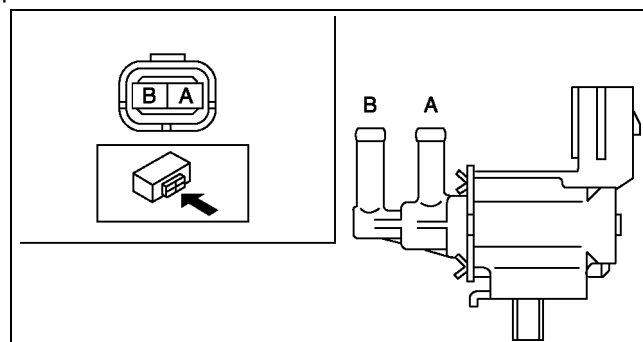
- Perform the following test only when directed.

- Disconnect the negative battery cable.
- Remove the purge solenoid valve. (See [F-38 PURGE SOLENOID VALVE REMOVAL/INSTALLATION.](#))
- Inspect airflow between the ports under the following conditions.
 - If not as specified, replace the purge solenoid valve.
 - If as specified, carry out the "Circuit Open/Short Inspection".

○—○ : Continuity ○—○ : Airflow

Step	Terminal		Port	
	A	B	A	B
1	○—○	○—○		
2	B+	GND	○—○	○—○

A6E3916W004



A6E3916W005

Circuit Open/Short Inspection

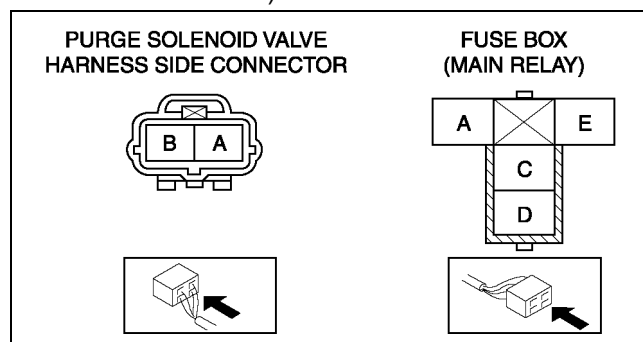
- Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
- Inspect the following wiring harness for open or short (continuity check).

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - Purge solenoid valve terminal A (harness-side) and PCM terminal 4U
 - Purge solenoid valve terminal B (harness-side) and main relay terminal C (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - Purge solenoid valve terminal A (harness-side) and body GND
 - Purge solenoid valve terminal B (harness-side) and power supply



A6E3916W006

EGR VALVE REMOVAL/INSTALLATION

A6E391620300W01

- Disconnect the negative battery cable.
- Disconnect the EGR valve connector.
- Remove in the order indicated in the table.

1	Water hose (See F-39 Water Hose Removal Note)
2	EGR valve (See F-39 EGR Valve Removal Note)

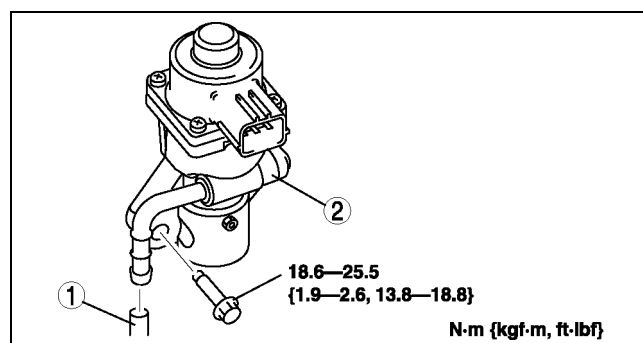
- Install in the reverse order of removal.

Water Hose Removal Note

- Drain the engine coolant. (See [E-3 ENGINE COOLANT REPLACEMENT.](#))

EGR Valve Removal Note

- Remove the air hose. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#))
- Remove the upper radiator hose. (See [E-6 RADIATOR REMOVAL/INSTALLATION.](#))



A6E3916W008

EMISSION SYSTEM

EGR VALVE INSPECTION

A6E391620300W02

Operation Test

1. Carry out the "EGR Control Inspection". (See [F-233 EGR Control System Inspection](#).)
 - If not as specified, perform the further inspection for the EGR valve.

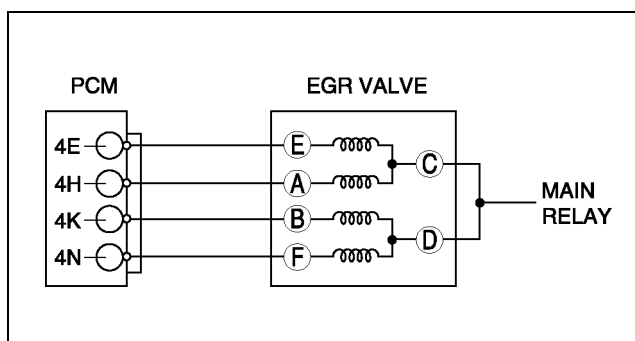
Resistance Inspection

Note

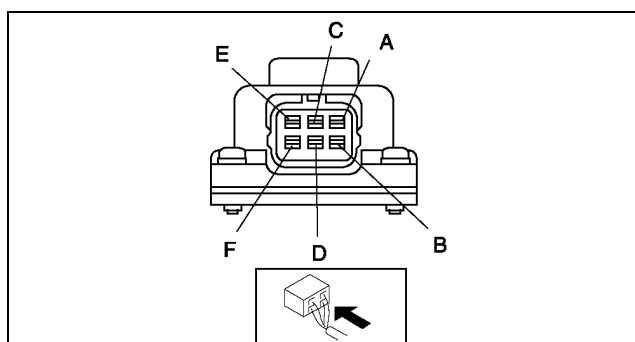
- Perform the following test only when directed.

1. Disconnect the negative battery cable.
2. Inspect resistance of the EGR valve coils.
 - If not as specified, replace the EGR valve.
 - If as specified, carry out the "Circuit Open/Short Inspection".

Terminals	Resistance (ohms)
C—E	12—16
C—A	
D—B	
D—F	



A6E3916W009



A6E3916W011

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION](#).)
2. Inspect the following wiring harness for open or short (continuity check).

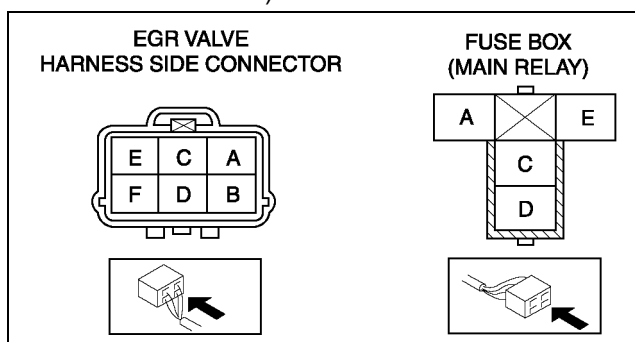
Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - EGR valve terminal E (harness-side) and PCM terminal 4E
 - EGR valve terminal A (harness-side) and PCM terminal 4H
 - EGR valve terminal B (harness-side) and PCM terminal 4K
 - EGR valve terminal F (harness-side) and PCM terminal 4N
 - EGR valve terminal C or D (harness-side) and main relay terminal C (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - EGR valve terminal E (harness-side) and GND
 - EGR valve terminal A (harness-side) and GND
 - EGR valve terminal B (harness-side) and GND
 - EGR valve terminal F (harness-side) and GND
 - EGR valve terminal C or D (harness-side) and power supply

3. Remove the EGR valve, and inspect for any damage or clogging.
 - If there is no damage or no clogging, replace the EGR valve.



A6E3916W010

EMISSION SYSTEM

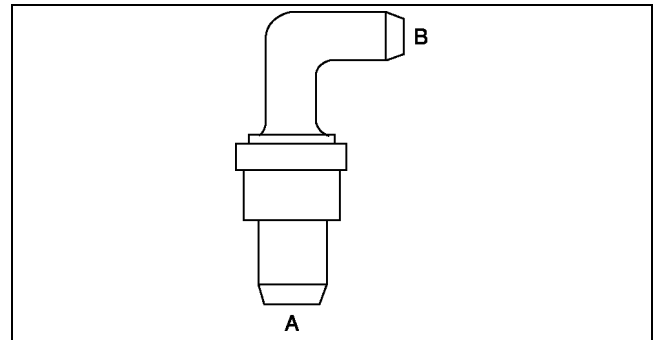
PCV VALVE INSPECTION

A6E391613890W01

1. Disconnect the negative battery cable.
2. Remove the intake manifold.(see [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
3. Remove the PCV valve.
4. Blow through the valve and verify that air flows as specified.
 - If not as specified, replace the PCV valve.

Specification

Condition	Airflow
Air applied from port A to B	Yes
Air applied from port B to A	No



A6E3916W007

THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION

A6E391620500W01

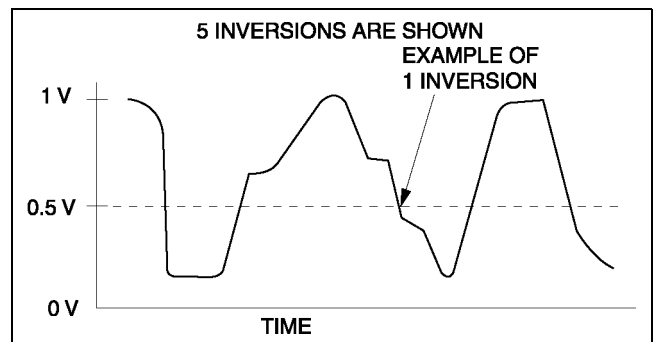
Note

- Make sure that no HO2S DTCs have been detected. If detected, this inspection is not applicable for TWC inspection.

1. Connect the WDS or equivalent and monitor PIDs as following.
 - Monitor the right TWC using O2S11 PID for upstream HO2S and O2S12 PID for downstream HO2S.
2. Begin to monitor the appropriate PIDs.
3. Drive the vehicle for **10 min** at **65—96 km/h {40—60 mph}** to allow the front catalytic converter to reach operating temperature.
4. Stop the vehicle and leave it in a safe place.
5. Let the engine idle.
6. Record PIDs for **1 min**.
7. Select the appropriate PIDs and read the graph.
8. Count the number of times (inversions) that the upstream HO2S graph line actually crosses the **0.5 V** line.
9. Count the number of times (inversions) that the downstream HO2S graph line actually crosses the **0.5 V** line.

Note

- Do not count the number of peaks. Refer to the graph.



A6E3916W013

10. Using the following equation, calculate the value of ratio.

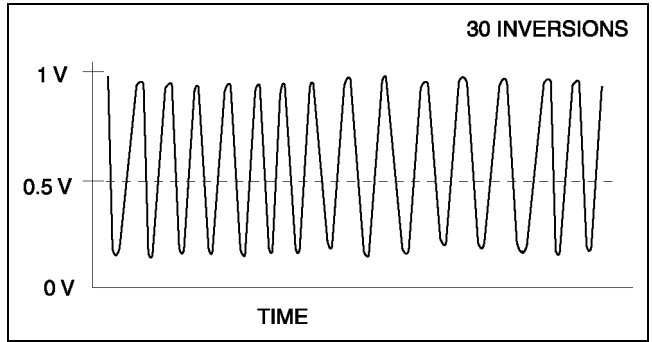
Equation

$$\text{RATIO} = \text{Upstream HO2S inversion} \div \text{downstream HO2S inversion}$$

- If the ratio is **5.5** or more or there is no downstream HO2S inversion, the TWC is functioning properly.
- If the ratio is **less than 1.125**, the TWC is not functioning properly. Replace the TWC.

EMISSION SYSTEM

Upstream HO2S graph line example

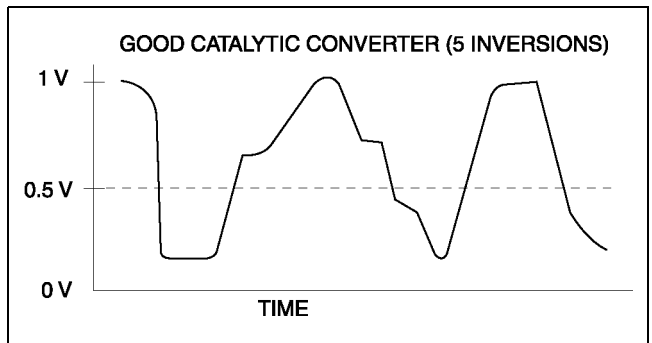


A6E3916W021

Downstream HO2S graph line example 1

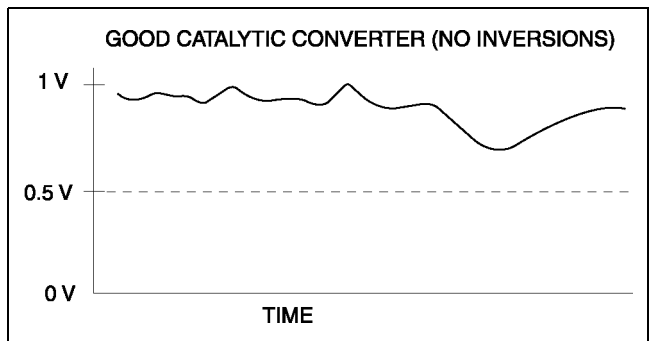
Equation

$$\text{RATIO} = \frac{30 \text{ inversions (upstream HO2S inversions)}}{5 \text{ inversions (downstream HO2S inversions)}} = 6.0 \text{ (good WU-TWC)}$$



A6E3916W012

Downstream HO2S graph line example 2

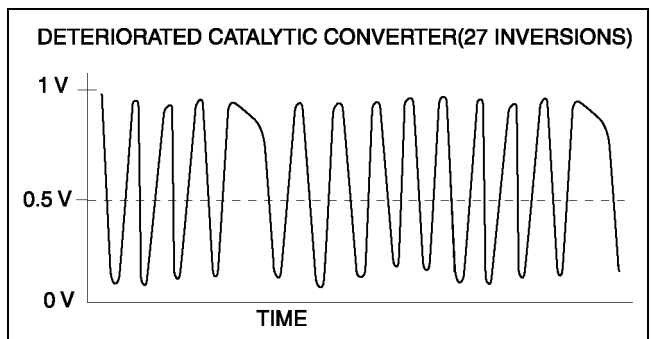


A6E3916W014

Downstream HO2S graph line example 3

Equation

$$\text{RATIO} = \frac{30 \text{ inversions (upstream HO2S inversions)}}{27 \text{ inversions (downstream HO2S inversions)}} = 1.1 \text{ (bad converter)}$$



A6E3916W015

CONTROL SYSTEM

CONTROL SYSTEM

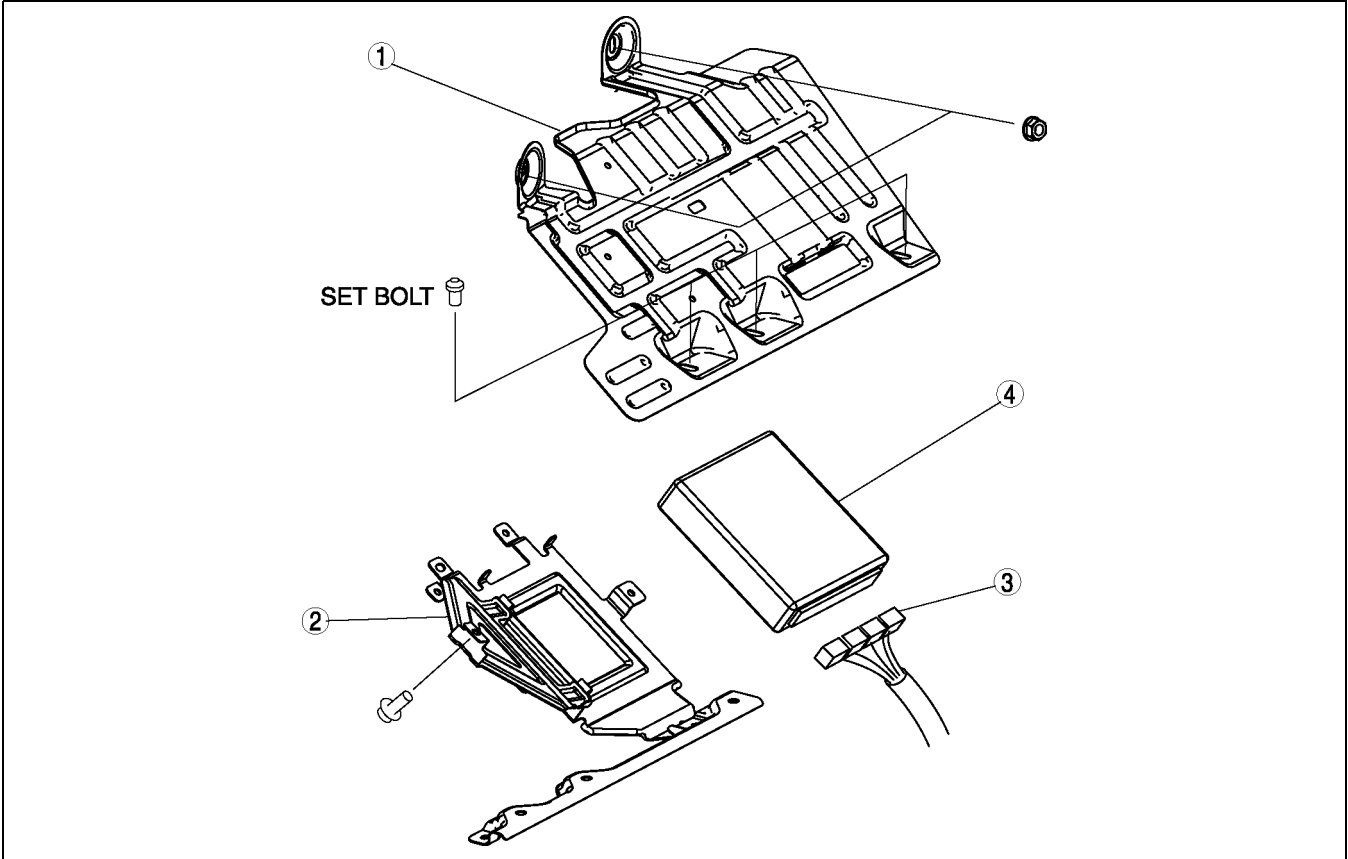
PCM REMOVAL/INSTALLATION

A6E394018880W01

- Note**
- For replace the PCM, Setup the WDS and perform the PCM configuration. (See [F-50 PCM CONFIGURATION](#).)

1. Disconnect the negative battery cable.
2. For R.H.D, perform the following procedures.
 - (1) Remove the front side trim (left-side).
 - (2) Partially peel back the flower covering.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

U.K. specs.



A6E3940W002

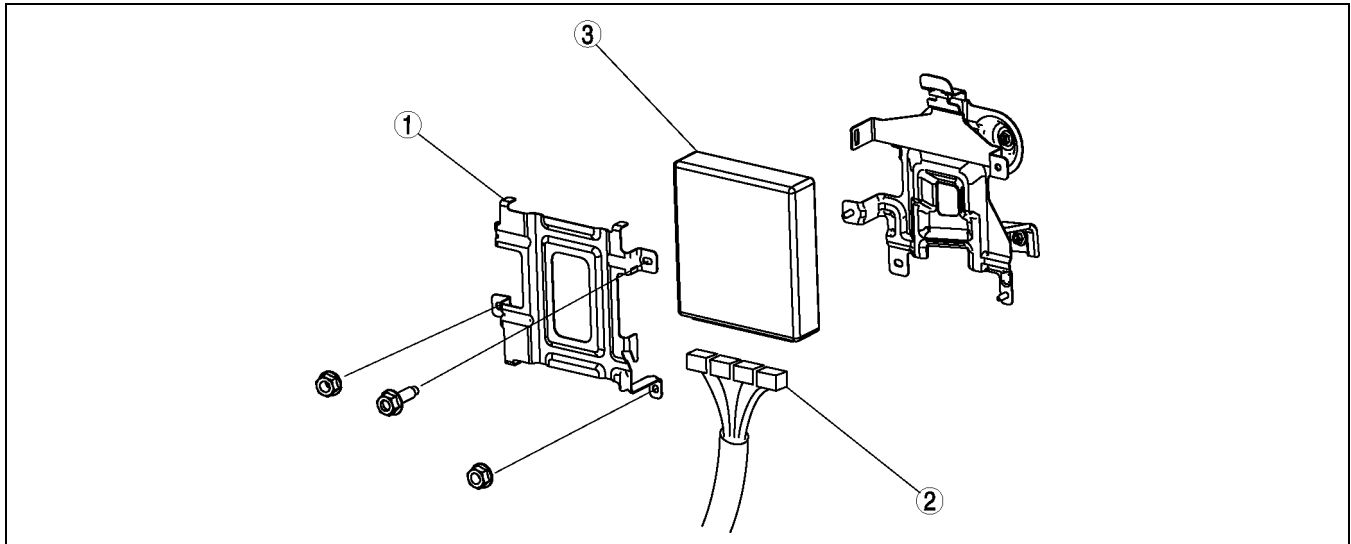
1	PCM cover No. 1 (See F-44 Set Nut/bolt Removal Note) (See F-44 Set Nut/bolt Installation Note)

2	PCM cover No. 2
3	PCM connector
4	PCM

F

CONTROL SYSTEM

European (L.H.D.) specs.



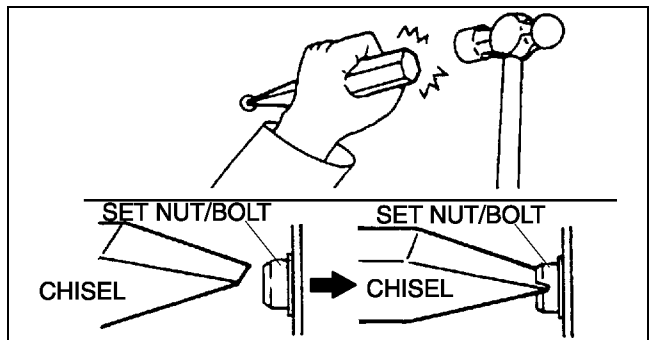
A6E3940W001

1	PCM cover
2	PCM connector

3	PCM

Set Nut/bolt Removal Note

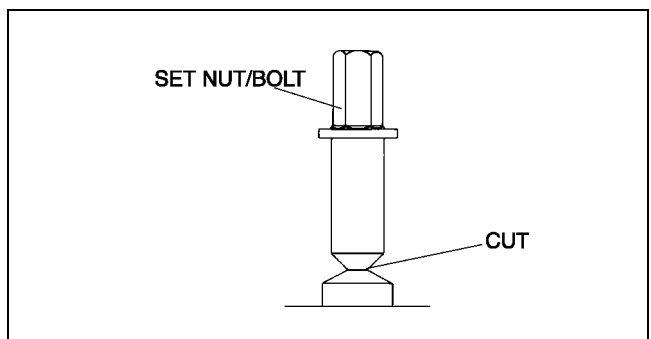
1. Using a chisel and a hammer, cut a groove on the head of the set nut/bolt so that a screwdriver can be inserted.
2. Loose the set nut/bolt using an impact screwdriver or pliers.



A6E3940W003

Set Nut/bolt Installation Note

1. Install a new set nut/bolt and tighten it until the neck of the nut/bolt is cut.



A6E3940W004

CONTROL SYSTEM

PCM INSPECTION

A6E394018880W02

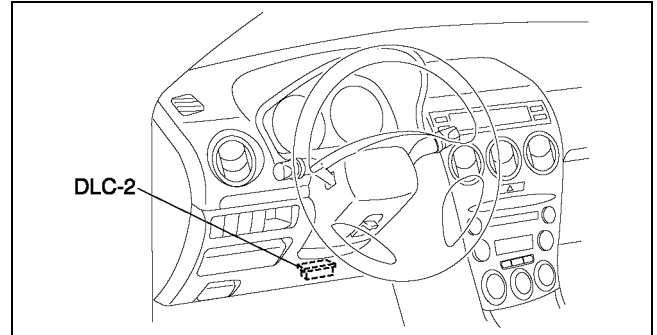
Note

- PIDs for the following parts are not available on this model. Go to the appropriate part inspection page.
 - CMP sensor (See [F-55 CAMSHAFT POSITION \(CMP\) SENSOR INSPECTION.](#))
 - Main relay (See [T-24 RELAY INSPECTION.](#))

1. Connect the **SST** (WDS or equivalent) to the DLC-2.
2. Turn the ignition switch to ON position.
3. Measure the PID value.
 - If PID value is not within the specification, follow the instructions in Action column.

Note

- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.
- For input/output signals except those of the monitoring items, use a voltmeter to measure the PCM terminal voltage.
- The simulation items that are used in the ENGINE CONTROL SYSTEM OPERATION INSPECTION are as follows.
 - ACCS
 - ALTF
 - EVAPCP
 - FAN1
 - FAN2
 - FAN3
 - FP
 - HTR11
 - HTR12
 - IAC
 - IASV
 - IMRC
 - IMTV
 - VT DUTY1



A6E3970W002

PID/DATA monitor table (reference)

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Action	PCM terminal
ACCS (A/C relay)	ON/OFF	Ignition switch ON: OFF A/C switch ON and fan switch ON at idle: ON	Inspect following PIDs: RPM, TP, ECT, ACSW, TR. Inspect A/C relay. (See U-47 CLIMATE CONTROL UNIT INSPECTION)	4O
ACSW (A/C switch)	ON/OFF	A/C switch and fan switch ON at ignition switch ON: OFF A/C switch OFF at ignition switch ON: OFF	Inspect A/C switch. (See U-47 CLIMATE CONTROL UNIT INSPECTION)	1AC
ALTF (Generator field coil control duty value)	%	Ignition switch ON: 0% Idle: 0—100% Just after A/C switch ON and fan switch ON at idle: Duty value rises	Inspect following PIDs: IAT, ECT, RPM, VPWR, ALTT V. Inspect generator. (See G-7 GENERATOR INSPECTION)	1AD
ALTT V (Generator output voltage)	V	Ignition switch ON: 0 V Idle: Approx. 14.9 V*1 (E/L not operating)	Inspect generator. (See G-7 GENERATOR INSPECTION)	1AA

CONTROL SYSTEM

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Action	PCM terminal
ARPMDES (Target engine speed)	RPM		L8 No load: 700 rpm E/L operating: 700 rpm P/S operating: 750 rpm A/C ON: 750 rpm LF MTX and L3 MTX No load: 650 rpm E/L operating: 700 rpm P/S operating: 700 rpm A/C ON: 750 rpm LF ATX No load: 700 rpm E/L operating: 700 rpm P/S operating: 700 rpm A/C ON: 700 rpm* ² , 750 rpm* ³	Inspect following PIDs: IAT, RPM, MAP, ECT, MAF, TP, INGEAR, ACSW, TR, PSP, ALTT V. Inspect IAC valve. (See F-13 IDLE AIR CONTROL (IAC) VALVE INSPECTION) Inspect CKP sensor. (See F-54 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION)	—
AST (After start timer)	Time		—	—	—
BARO (Barometric pressure)	Pressure		Ignition switch ON (at sea level): approx 101 kPa	Inspect BARO sensor. (See F-60 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION)	1G
	V		Ignition switch ON (at sea level): approx 4.1 V		
BOO (Brake switch)	ON/OFF		Brake pedal depressed: ON Brake pedal released: OFF	Inspect brake switch. (See P-8 BRAKE SWITCH INSPECTION)	1K
CHRG LMP (Generator warning light)	ON/OFF		Ignition switch ON: ON Idle: OFF	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
COLP (Refrigerant pressure switch (middle))* ⁴	ON/OFF		Refrigerant pressure switch (middle) ON * ² at idle: ON Refrigerant pressure switch (middle) OFF * ³ at idle: OFF	Inspect refrigerant pressure switch. (See U-43 REFRIGERANT PRESSURE SWITCH INSPECTION)	1Q
CPP (Clutch pedal position)	ON/OFF		Clutch pedal depressed: ON Clutch pedal released: OFF	Inspect clutch switch. (See F-59 CLUTCH SWITCH INSPECTION)	1R
CPP/PNP (Shift lever position)	ON/OFF		Neutral position: ON Others: OFF	Inspect neutral switch. (See F-59 NEUTRAL SWITCH INSPECTION)	1W
DTCCNT (Number of DTC detected)	—		—	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
ECT (Engine coolant temperature)	°C	°F	ECT 20 °C {68 °F}: 20 °C {68 °F} ECT 60 °C {140 °F}: 60 °C {140 °F}	Inspect ECT sensor. (See F-53 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION)	1M
	V		ECT 20 °C {68 °F}: 3.04—3.14 V ECT 60 °C {140 °F}: 1.29—1.39 V		
EVAPCP (Purge solenoid valve duty value)	%		Ignition switch ON: 0% Idle: 0%	Inspect following PIDs: IAT, RPM, ECT, MAF, O2S11, BARO, INGEAR, TR, VPWR. (See F-39 PURGE SOLENOID VALVE INSPECTION)	4U
FAN1 (Cooling fan control)	ON/OFF		ECT below 100 °C {212 °F}: OFF Others: ON	Inspect following PIDs: RPM, TP, ECT, ACSW, COLP, TEST. Inspect cooling fan relay. (See T-24 RELAY INSPECTION)	4L
FAN2 (Cooling fan control)	ON/OFF		ECT below 108 °C {226 °F}: OFF A/C operating, refrigerant pressure switch (middle) is OFF, and ECT below 108 °C {226 °F}: OFF Others: ON	Inspect following PIDs: RPM, TP, ECT, ACSW, COLP, TEST. Inspect cooling fan relay. (See T-24 RELAY INSPECTION)	4F
FAN3 (Cooling fan control)	ON/OFF		ECT below 100 °C {212 °F}: OFF A/C operating, refrigerant pressure switch (middle) is ON, and ECT below 108 °C {226 °F}: OFF Other: ON	Inspect following PIDs: RPM, TP, ECT, ACSW, COLP, TEST. Inspect cooling fan relay. (See T-24 RELAY INSPECTION)	4B

CONTROL SYSTEM

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Action	PCM terminal
FDPDTC (Pending code caused FFD storage)	—		—	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
FP (Fuel pump relay)	ON/OFF		Ignition switch ON: OFF Idle: ON Cranking: ON	Inspect following PIDs: RPM. Inspect fuel pump relay. (See T-24 RELAY INSPECTION)	4P* ⁵ 4Q* ⁶
FUELPW (Fuel injector duration)	TIME		Ignition switch ON: 0 ms Idle (after warm up): approx. 2.5 ms	Inspect following PIDs: IAT, MAF, TP, MAP, ECT, RPM, O2S11, O2S12, INGEAR, TR, PSP, ACSW, VPWR, ALTT V. Inspect fuel injector. (See T-24 RELAY INSPECTION)	4W, 4Z, 4AA, 4AD
FUELSYS (Fuel system status)	Open loop/ Closed loop		Ignition switch ON: Open loop Idle (after warm up): Closed loop	Inspect following PIDs: IAT, MAF, TP, MAP, ECT, RPM, O2S11, O2S12, INGEAR, TR, PSP, ACSW, VPWR, ALTT V. Inspect fuel injector. (See T-24 RELAY INSPECTION)	—
GENVDSD (Generator voltage desired)	V		Ignition switch ON: 0 V Idle: Approx. 14.9 V* ¹ (E/L not operating)	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
HTR11 (HO2S heater (front))	ON/OFF		Idle (after warm up): ON⇔OFF	Inspect following PIDs: IAT, MAF, TP, ECT, RPM, ACSW. (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION)	4A
HTR12 (HO2S heater (rear))	ON/OFF		Ignition switch ON: OFF (HO2S heater not operating) Idle: ON (HO2S heater operating)	Inspect following PIDs: IAT, MAF, ECT, RPM, ACSW. (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION)	4D
IAC (IAC valve)	%		Ignition switch ON: 0% Idle: Approx. 60% (ECT 90°C {194 °F} and E/L not operating)	Inspect following PIDs: IAT, RPM, MAP, ECT, MAF, TP, INGEAR, TR, PSP, ACSW. Inspect IAC valve. (See F-13 IDLE AIR CONTROL (IAC) VALVE INSPECTION)	4G 4J
IASV (Variable air duct control solenoid valve)	ON/OFF		ECT is above 70 °C {158 °F}, engine speed is above 5,800 rpm, and TP opening angle is above 50%: ON Others: OFF	Inspect following PIDs: ECT, RPM, TP. Inspect VAD control solenoid valve. (See F-13 VARIABLE AIR DUCT (VAD) CONTROL SOLENOID VALVE INSPECTION (L3))	4C
IAT (Intake air temperature)	°C	°F	IAT 20 °C {68 °F}: 20 °C {68 °F} IAT 30 °C {86 °F}: 30 °C {86 °F}	Inspect IAT sensor. (See F-50 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION)	2E
	V		IAT 20 °C {68 °F}: 2.4—2.6 V IAT 30 °C {86 °F}: 1.7—1.9 V		
IMRC (Variable tumble control solenoid valve)	ON/OFF		Engine speed is below approx. 3,750 rpm: ON Others: OFF	Inspect following PIDs: TP, ECT, RPM. Inspect VTCS solenoid valve. (See F-15 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION)	4T
IMTV (Variable Intake- air control solenoid valve)	ON/OFF		Engine speed is below approx. 4,500 rpm: ON Others: OFF	Inspect following PIDs: RPM. Inspect VIS control solenoid valve. (See F-14 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION (L3))	4R
INGEAR (Load/no load condition)	ON/OFF		CPP or CPP/PNP is ON: OFF Others: ON	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	1R, 1W
IVS (CTP condition)	ON/OFF		CTP: ON Others: OFF	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	2A

CONTROL SYSTEM

Monitor item (Definition)	Unit/ Condition	Condition/Specification (Reference)	Action	PCM terminal
KNOCKR (Knocking retard)	ANGLE	Ignition switch ON: 0 DEG Idle: 0 DEG	Inspect knock sensor. (See F-56 KNOCK SENSOR INSPECTION)	2P, 2S
LOAD (Engine load)	%	Ignition switch ON: 0% Idle (after warm up): approx.19%	Inspect MAF sensor. (See F-51 MASS AIR FLOW (MAF) SENSOR INSPECTION)	—
LONGFT1 (long term fuel trim)	%	Idle (after warm up): approx.-14—14%	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
MAF (Mass airflow)	g/s	Ignition switch ON: approx. 0 g/s Idle (after warm up): 1.5 g/s	Inspect MAF sensor. (See F-51 MASS AIR FLOW (MAF) SENSOR INSPECTION)	1P
	V	Ignition switch ON: approx. 0.7 V Idle (after warm up): 1.3 V		
MAP (Manifold absolute pressure)	Pressure	Ignition switch ON (at sea level): approx 101 kPa	Inspect MAP sensor. (See F-52 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION)	1J
	V	Ignition switch ON (at sea level): approx 4.1 V		
MIL (Malfunction indicator lamp)	ON/OFF	Ignition switch ON: ON Idle: OFF	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
MIL_DIS (Trabelled distance since the MIL illuminated)	Distance	No DTC: 0 km {0 mph} DTC detected: Not 0 km {0 mph}	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
O2S11 (Front oxygen sensor)	V	Ignition switch ON: 0—1.0 V Idle (After warm up): 0—1.0 V Acceleration (After warm up): 0.5—1.0 V Deceleration (After warm up): 0—0.5 V	Inspect HO2S (front). (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION)	1AB
O2S12 (Rear oxygen sensor)	V	Idle (After warm up): approx 0.6 V	Inspect HO2S (rear). (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION)	1Y
PSP (Power steering pressure switch)	ON/OFF	Steering wheel in straight ahead position: OFF Others: ON	Inspect PSP switch. (See F-58 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION)	1Z
RFCFLAG (Readness function code)	ON/OFF	Before running PCM adaptive memory procedure drive mode: ON After running PCM adaptive memory procedure drive mode: OFF	Run PCM adaptive memory procedure drive mode. (See F-67 DTC TABLE)	—
RO2FT1 (Rear oxygen sensor fuel trim)	%	Idle (after warm up): approx.-14—14%	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
RPM (Engine speed)	rpm	L8 No load: 650—750 rpm E/L operating: 650—750 rpm P/S operating: 700—800 rpm A/C ON: 700—800 rpm LF MTX and L3 MTX No load: 600—700 rpm E/L operating: 650—750 rpm P/S operating: 650—750 rpm A/C ON: 700—800 rpm LF ATX No load: 650—750 rpm E/L operating: 650—750 rpm P/S operating: 650—750 rpm A/C ON: 650—750 rpm* ² , 700—800 rpm* ³	Inspect CKP sensor. (See F-54 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION)	2D, 2G

CONTROL SYSTEM

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Action	PCM terminal
SEGRP (EGR valve (stepping motor) position)	STP		Ignition switch ON: 0 step Idle: 0 step Cranking: 0—60 steps	Inspect following PIDs: MAF, TP, ECT, RPM, VSS. Inspect EGR valve. (See F-40 EGR VALVE INSPECTION)	4E 4H 4K 4N
SHRTFT1 (Short term fuel trim)	%		Idle (after warm up): approx.—30— 25%	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
SPARKADV (Ignition timing)	BTC		Ignition switch ON: BTDC 0° Idle: BTDC approx. 10°	Inspect following PIDs: MAF, TP, ECT, RPM, INGEAR, TR, PSP, ACSW, VPWR. Inspect ignition timing. (See F-8 IGNITION TIMING INSPECTION)	2J 2M
TEST (Test mode)	ON/OFF		—	—	—
TP (TP)	%		CTP: 13—23% WOT: 86—96%	Inspect TP sensor. (See F-51 THROTTLE POSITION (TP) SENSOR INSPECTION)	2A
	V		CTP: 0.65—1.15 V WOT: 4.3—4.8 V		
TPCT (TP sensor voltage at CTP)	V		0.65—1.15 V	Inspect TP sensor. (See F-51 THROTTLE POSITION (TP) SENSOR INSPECTION)	2A
VPWR (Battery positive voltage)	V		Ignition switch ON: B+	Inspect main relay. (See T-24 RELAY INSPECTION) Inspect battery. (See G-4 BATTERY INSPECTION)	2Y, 2Z
VSS (Vehicle speed)	km/h	MPH	Vehicle speed 20 km/h {12 mph}: 20 km/h {12 mph} Vehicle speed 40 km/h {25 mph}: 20 km/h {12 mph}	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE)	—
VT DUTY1	ANGLE		Idle: 0°	Inspect following PIDs: TP, ECT, RPM. Inspect OCV. (See B-33 OIL CONTROL VALVE (OCV) INSPECTION)	2I, 2L
	%		Idle: 0%		

*1 : Calculated value; differs from terminal voltage

*2 : Refrigerant pressure switch (middle) turns on when the refrigerant pressure is 1.69—1.84 MPa {17.3—18.7 kgf/cm², 247—265 psi}

*3 : Refrigerant pressure switch (middle) turns off when the refrigerant pressure is 1.26—1.49 MPa {12.9—15.1 kgf/cm², 184—214 psi}

*4 : L3 and L8, LF (Intensely hot area) models

*5 : Immobilizer system equipped

*6 : Immobilizer system not equipped

- Following PIDs are for the ATX models. If inspects for following PIDs, see [K-110 PID/DATA MONITOR INSPECTION](#).

PIDs for the ATX models

- GEAR
- LINEDES
- LPS
- OP_SW_B
- SSA/SS1
- SSB/SS2
- SSC/SS3
- TCS
- TFT
- TFTV
- THOP
- TR
- TR_SENS
- TSS

CONTROL SYSTEM

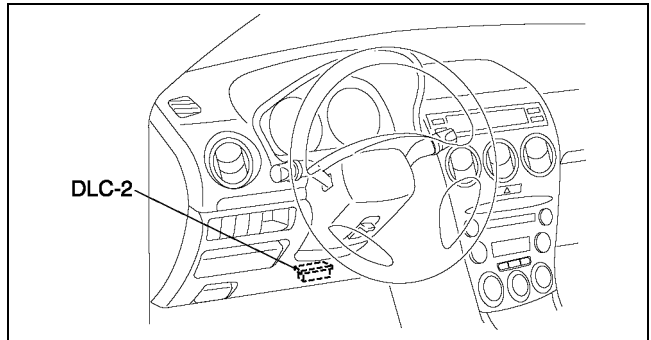
PCM CONFIGURATION

A6E394018880W03

1. Connect the WDS to DLC-2.
2. Set up the WDS (including the vehicle recognition.)
3. Select "Module programming."
4. Select "Programmable module installation."
5. Select "PCM" and perform procedures according to directions on the WDS screen.

Note

- If "PCM CONFIGURATION" is successful, the PCM stores the DTC P0602 and illuminates the MIL. (System is normal.) Clear the DTC P0602 using WDS or equivalent after "PCM CONFIGURATION."



A6E3970W002

Note

- MIL goes off after three drive cycles with no failure. (DTCs remain in PCM.)

6. Retrieve DTC's by the WDS or equivalent, then verify that there is no DTC present.
 - If DTC is present, perform applicable DTC inspection.

INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION

A6E394018845W01

Resistance Inspection

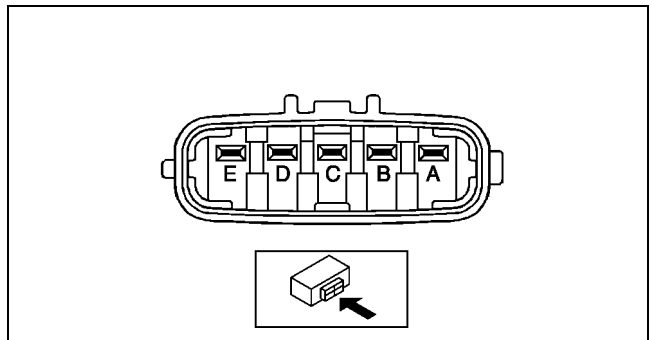
Note

- Perform the following inspection only when directed.

1. Disconnect MAF/IAT sensor.
2. Measure the resistance between the MAF/IAT sensor terminals D and E using an ohmmeter.
 - If not as specified, replace the MAF/IAT sensor.
 - If the MAF/IAT sensor is okay, but the IAT PID are out of specification, perform the "Circuit Open/Short Inspection".

Specification

Ambient temperature (°C {°F})	Resistance (kilohm)
-20 {-4}	13.6—18.4
20 {68}	2.21—2.69
60 {140}	0.493—0.667



A6E3940W005

Circuit Open/Short Inspection

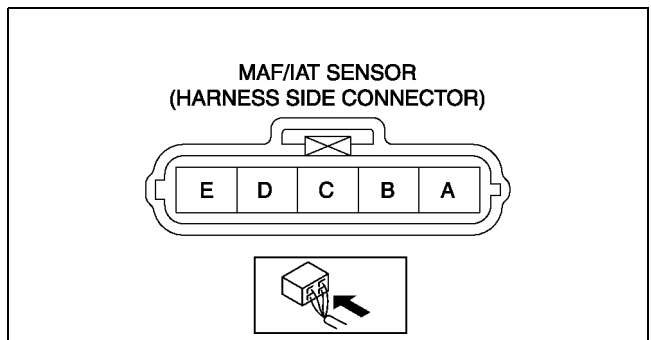
1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION](#).)
2. Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - MAF/IAT sensor terminal D (harness-side) and PCM terminal 2E (harness-side)
 - MAF/IAT sensor terminal E (harness-side) and PCM terminal 2H (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - MAF/IAT sensor terminal E (harness-side) and power supply
 - MAF/IAT sensor terminal D (harness-side) and power supply
 - MAF/IAT sensor terminal D (harness-side) and body GND



A6E3940W006

MASS AIR FLOW (MAF) SENSOR INSPECTION

A6E394013210W01

Voltage Inspection

Note

- Perform the following inspection only when directed.

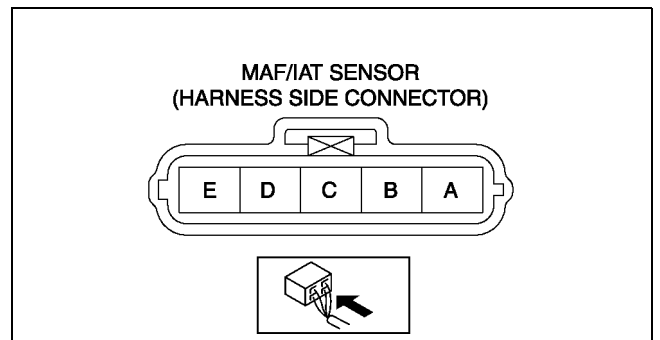
1. Visually inspect for the following on the MAF sensor.
 - Damage
 - Cracks
 - Terminal bends
 - Terminal rust
 - If any of the above are found, replace the MAF sensor.
 - If the MAF PID value is out of specification, carry out the "Circuit Open/Short Inspection".

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Disconnect the MAF sensor connector.
3. Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - MAF sensor terminal A (harness-side) and main relay terminal C (harness-side)
 - MAF sensor terminal B (harness-side) and PCM terminal 2AC (harness-side)
 - MAF sensor terminal C (harness-side) and PCM terminal 1P (harness-side)



A6E3940W006

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - MAF sensor terminal A (harness-side) and body GND
 - MAF sensor terminal C (harness-side) and power supply
 - MAF sensor terminal C (harness-side) and body GND
 - MAF sensor terminal B (harness-side) and power supply

THROTTLE POSITION (TP) SENSOR INSPECTION

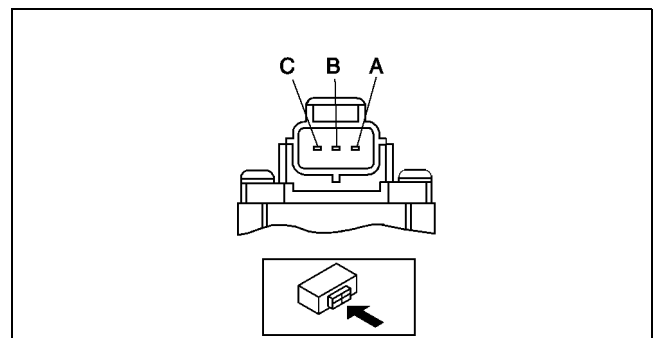
A6E394018910W01

Note

- Perform the following inspection only when directed.

Resistance Inspection

1. Perform the following test only when directed.
 - If as specified but TP PID value is out of specification, inspect resistance of TP sensor.
 - If not as specified, inspect the following:
 - Accelerator cable free play (See [F-16 ACCELERATOR CABLE INSPECTION/ADJUSTMENT.](#))
2. Disconnect the TP sensor connector.
3. Verify that the resistance between TP sensor terminals A and B changes smoothly while opened and closed the throttle valve slowly.
 - If not verified, replace TP sensor.
4. Measure the resistance between TP sensor terminals A and C using an ohmmeter.
 - If not as specified, replace the TP sensor.
 - If as specified, but TP PID value is out of specification, perform the "Circuit Open/Short Inspection".



A6E3940W007

Specification

3.2—4.8 kilohms

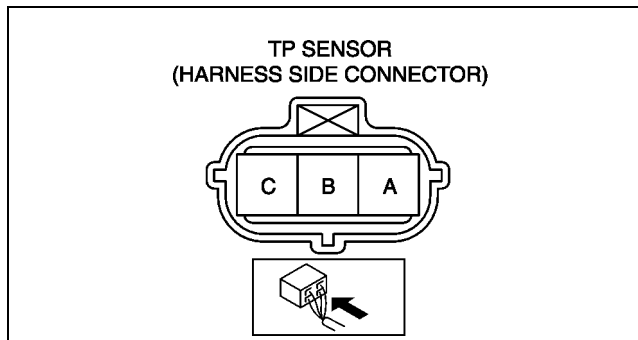
CONTROL SYSTEM

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - TP sensor terminal A (harness-side) and PCM terminal 2H (harness-side)
 - TP sensor terminal B (harness-side) and PCM terminal 2A (harness-side)
 - TP sensor terminal C (harness-side) and PCM terminal 2K (harness-side)



A6E3940W008

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - TP sensor terminal C (harness-side) and power supply
 - TP sensor terminal C (harness-side) and body GND
 - TP sensor terminal B (harness-side) and power supply
 - TP sensor terminal B (harness-side) and body GND
 - TP sensor terminal A (harness-side) and power supply

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION

A6E394018211W01

Note

- Perform the following inspection only when directed.
- The following vacuum values are indicated by relative pressure from the MAP sensor.

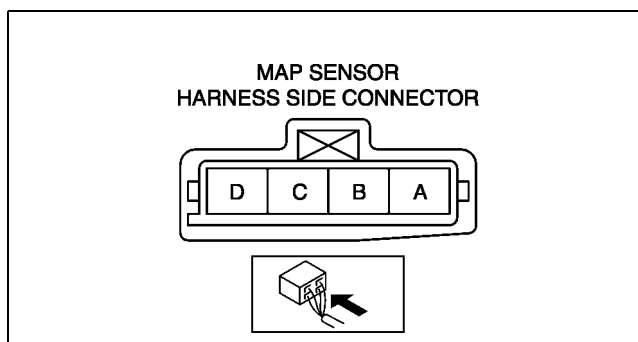
1. Connect the **SSTs** (WDS or equivalent) to the DLC-2.
2. Turn the ignition switch to ON (Engine OFF).
3. Select MAP PID on the **SSTs** (WDS or equivalent).
4. Verify that the MAP PID (pressure) and barometric pressure are practically equal.
 - If not as verified, perform the "Circuit Open/Short Inspection".
 - If there is no open or short circuit, replace the MAP sensor.
 - If as verified, go to next step.
5. Apply vacuum of **-25.0 kPa {-187 mmHg, -7.38 inHg}** to the MAP sensor, and verify that the MAP variation from that of Step 4 is approx. **25.0 kPa {187 mmHg, 7.38 inHg}**.
 - If not as verified, perform the "Circuit Open/Short inspection".
 - If there is no open or short circuit, replace the barometric pressure sensor.

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harness for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - MAP sensor terminal A (harness-side) and PCM terminal 2H
 - MAP sensor terminal D (harness-side) and PCM terminal 1J
 - MAP sensor terminal C (harness-side) and PCM terminal 2K



A6E3940W009

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - MAP sensor terminal C (harness-side) and power supply.
 - MAP sensor terminal C (harness-side) and body GND.
 - MAP sensor terminal D (harness-side) and power supply.
 - MAP sensor terminal D (harness-side) and body GND

CONTROL SYSTEM

ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION

A6E394018840W01

Warning

- When the engine is hot, it can badly burn. Turn off the engine and wait until it is cool before removing the ECT sensor.

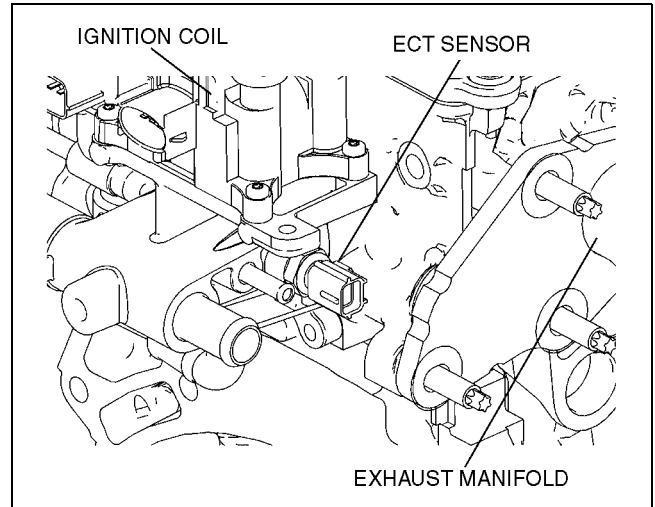
1. Drain the engine coolant. (See [E-3 COOLING SYSTEM SERVICE WARNINGS.](#))
2. Disconnect the ECT sensor connector.
3. Remove the ECT sensor.
4. Install in the reverse order of removal.

Tightening torque

10—14 N·m

{1.02—1.42 kgf·m, 7.38—10.32 ft·lbf}

5. Refill the engine coolant. (See [E-3 COOLING SYSTEM SERVICE WARNINGS.](#))



A6E3940W010

ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION

A6E394018840W02

Note

- Perform the following inspection only when directed.

ECT Sensor Resistance Inspection

1. Drain the engine coolant. (See [E-3 COOLING SYSTEM SERVICE WARNINGS.](#))
2. Remove the ECT sensor (located above the starter).
3. Place the ECT sensor in water with a thermometer, and heat the water gradually.
4. Measure the resistance between the ECT sensor terminals A and B using an ohmmeter.
 - If not as specified, replace the ECT sensor.
 - If the ECT sensor is okay, but ECT PID value is out of specification, perform the “Circuit Open/Short Inspection”.

Specification

Water temperature (°C {°F})	Resistance (kilohms)
20 {68}	35.48—39.20
70 {158}	5.07—5.60
80 {176}	3.65—4.02

Circuit Open/Short Inspection

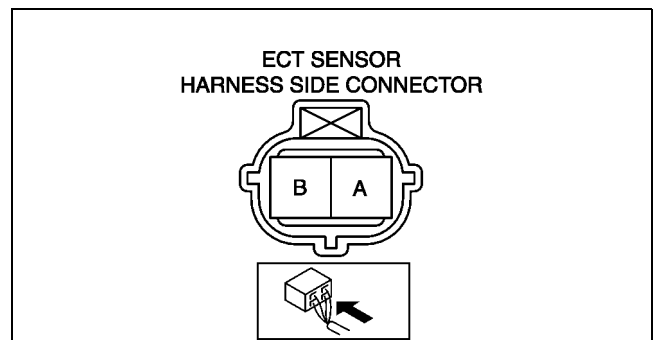
1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - ECT sensor terminal A (harness-side) and PCM terminal 1M (harness-side)
 - ECT sensor terminal B (harness-side) and PCM terminal 2H (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - ECT sensor terminal A (harness-side) and power supply
 - ECT sensor terminal A (harness-side) and body GND



A6E3940W011

CONTROL SYSTEM

- ECT sensor terminal B (harness-side) and power supply

CRANKSHAFT POSITION (CKP) SENSOR INSPECTION

A6E394018230W01

Note

- Perform the following inspection only when directed.

Resistance Inspection

1. Disconnect the CKP sensor connector.
2. Measure the resistance between CKP sensor terminals A and B using an ohmmeter.
 - If not as specified, replace the CKP sensor.
 - If CKP sensor resistance is okay, but RPM PID value is out of specification, perform the "Circuit Open/Short Inspection".

Specification

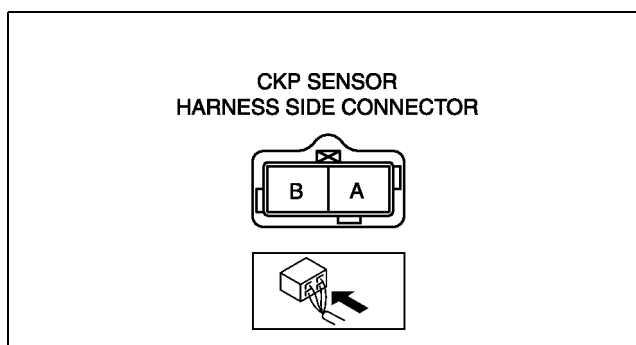
400—550 ohms

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - CKP sensor terminal A (harness-side) and PCM terminal 2D (harness-side)
 - CKP sensor terminal B (harness-side) and PCM terminal 2G (harness-side)



A6E3940W012

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - CKP sensor terminal A (harness-side) and power supply
 - CKP sensor terminal A (harness-side) and body GND
 - CKP sensor terminal B (harness-side) and power supply
 - CKP sensor terminal B (harness-side) and body GND

CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION

A6E394018230W02

Removal

1. Perform the following procedure to making the working space.
 - (1) Remove the Front wheel (RH).
 - (2) Remove the splash shield.
2. Disconnect the CKP sensor connector.
3. Remove the installation bolts to remove the CKP sensor.

Installation

Caution

- When foreign material such as an iron chip is on the CKP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect the engine control. Be sure there is no foreign material on the CKP sensor when replacing.

1. Perform the following procedure so that piston No.1 is at the top dead center.
 - (1) Remove the front driveshaft (RH). (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION.](#))

CONTROL SYSTEM

- (2) Remove the cylinder block lower blind plug and install the **SST**.
- (3) Turn the crankshaft pulley to the clockwise until it stops.
2. Install the CKP sensor to the CKP sensor installer.
3. Fit the forked part of the CKP sensor installer with the ninth tooth (counting counterclockwise from the empty space) of the pulse wheel.
4. Install the CKP sensor fitting bolts.

Tightening torque

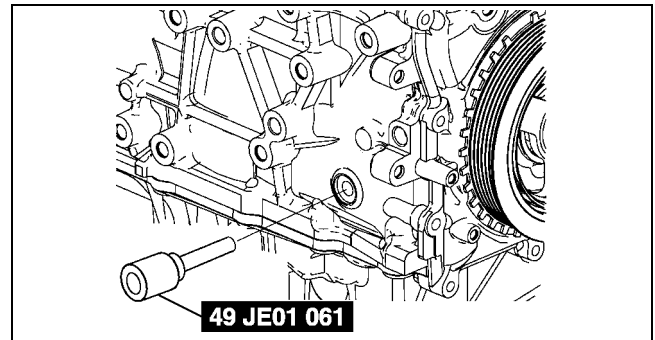
5.5—7.5 N·m {56—76 kgf·cm, 4.1—5.5 ft·lbf}

5. Remove the CKP sensor installer
6. Remove the **SST** then install the cylinder block lower blind plug.

Tightening torque

20 N·m {2.0 kgf·m, 15 ft·lbf}

7. Install the front driveshaft (RH). (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION](#).)



A6E3940W013

F

CAMSHAFT POSITION (CMP) SENSOR INSPECTION

A6E394018200W01

Caution

- When foreign material such as an iron chip is on the **CMP sensor**, it can cause abnormal output from the sensor because of flux turbulence and adversely affect the engine control. Be sure there is no foreign material on the **CMP sensor** when replacing.

Note

- Perform the following inspection only when directed.

Resistance Inspection

1. Disconnect the CMP sensor connector.
2. Measure the resistance between CMP sensor terminals A and B using an ohmmeter.
 - If not as specified, replace the CMP sensor.
 - If CMP sensor resistance is okay, perform the "Circuit Open/Short Inspection".

Specification

400—550 ohms

Circuit Open/Short Inspection

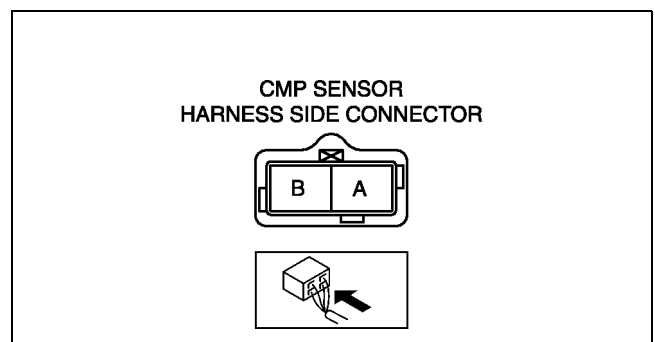
1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION](#).)
2. Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - CMP sensor terminal A (harness-side) and PCM terminal 2M (harness-side)
 - CMP sensor terminal B (harness-side) and PCM terminal 2J (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - CMP sensor terminal A (harness-side) and power supply
 - CMP sensor terminal A (harness-side) and body GND
 - CMP sensor terminal B (harness-side) and power supply
 - CMP sensor terminal B (harness-side) and body GND



A6E3940W014

CONTROL SYSTEM

KNOCK SENSOR INSPECTION

A6E394018921W01

Note

- Perform the following test only when directed.

Resistance Inspection

1. Turn the ignition switch to LOCK.
2. Disconnect the knock sensor connector.
3. Measure the resistance between the knock sensor terminals A and B using an ohmmeter.
 - If not as specified, replace the knock sensor.
 - If the knock sensor is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

Specification

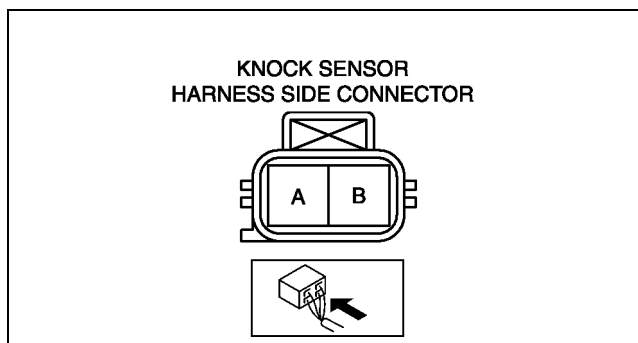
Approx. 4.87 megohms

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - Knock sensor terminal A (harness-side) and PCM terminal 2S (harness-side)
 - Knock sensor terminal B (harness-side) and PCM terminal 2P (harness-side)



A6E3940W015

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - Knock sensor terminal A (harness-side) and power supply
 - Knock sensor terminal A (harness-side) and body GND
 - Knock sensor terminal B (harness-side) and power supply
 - Knock sensor terminal B (harness-side) and body GND

KNOCK SENSOR REMOVAL/INSTALLATION

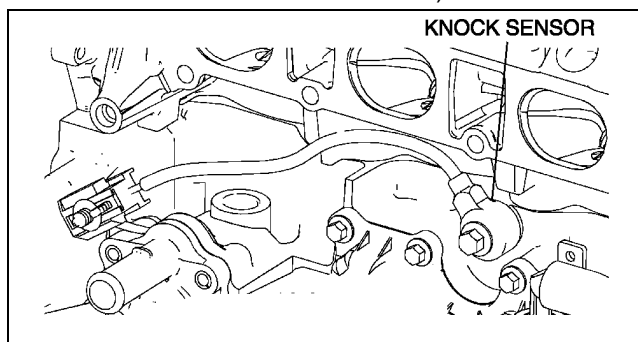
A6E394018921W02

1. Remove the intake manifold. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
2. Remove the knock sensor attachment bolt to remove the knock sensor.
3. Install in the reverse order of removal.

Tightening torque

16.2—23.8 N·m

{1.66—2.42 kgf·m, 12.0—17.5 ft·lbf}



A6E3940W016

HEATED OXYGEN SENSOR (HO2S) INSPECTION

A6E394018861W01

HO2S Voltage Inspection

Note

- Perform the following inspection only when directed.

1. Warm up the engine and run it at idle.
2. Disconnect the HO2S connector.

CONTROL SYSTEM

- Connect the voltmeter test leads to the following HO2S terminals:
 - HO2S (front and rear)
 - (+) lead—terminal A
 - (-) lead—terminal B
- With the vehicle stopped, run the engine at **3,000 rpm** until the voltmeter moves between **0.5 and 0.7 V**.
- Verify that the measurement voltage changes when the engine speed increases and decreases suddenly several times.
 - If not as specified, replace the HO2S.
 - If the HO2S is okay, but O2S11 or O2S12 PID value is out of specification, perform the "Circuit Open/Short Inspection".

Specification

Engine speed	Voltage (V)
Acceleration	0.5—1.0
Deceleration	0—0.5

Circuit Open/Short Inspection (Sensor)

- Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION](#).)
- Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.

Front

- HO2S terminal A (harness-side) and PCM terminal 1AB (harness-side)
- HO2S terminal B (harness-side) and PCM terminal 2H (harness-side)

Rear

- HO2S terminal A (harness-side) and PCM terminal 1Y (harness-side)
- HO2S terminal B (harness-side) and PCM terminal 2H (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.

Front and Rear

- HO2S terminal A (harness-side) and body GND
- HO2S terminal A (harness-side) and power supply
- HO2S terminal B (harness-side) and power supply

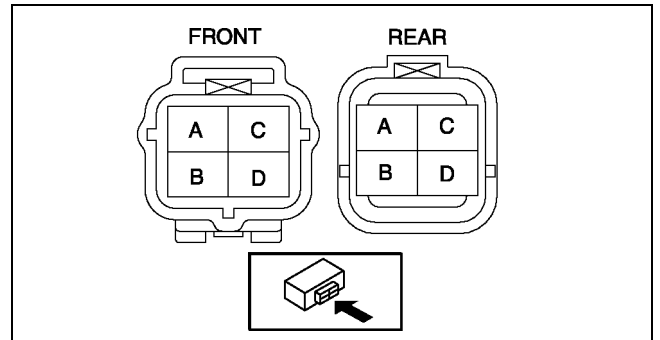
HO2S Heater Resistance Inspection

- Disconnect the HO2S connector.
- Measure the resistance between the HO2S terminals C and D.
 - If not as specified, replace the HO2S.
 - If the HO2S heater is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

Specification

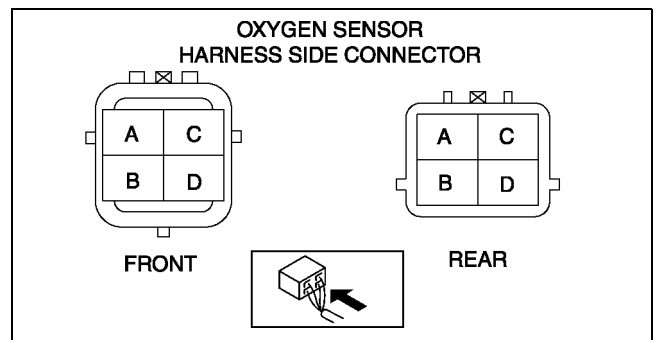
Front : 3.0—3.6 ohms

Rear : 5—7 ohms

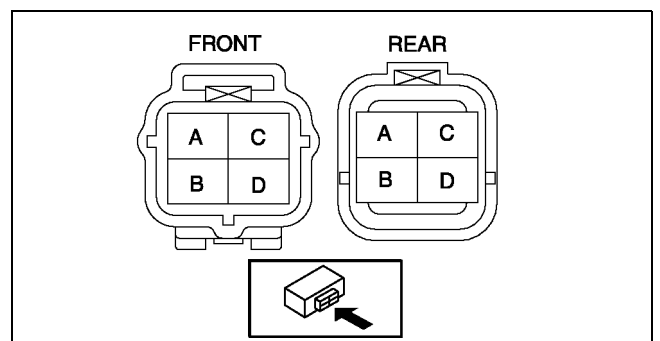


A6E3940W017

F



A6E3940W018



A6E3940W017

CONTROL SYSTEM

Circuit Open/Short Inspection (Heater)

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harnesses for open or short. (Continuity check)

Open circuit

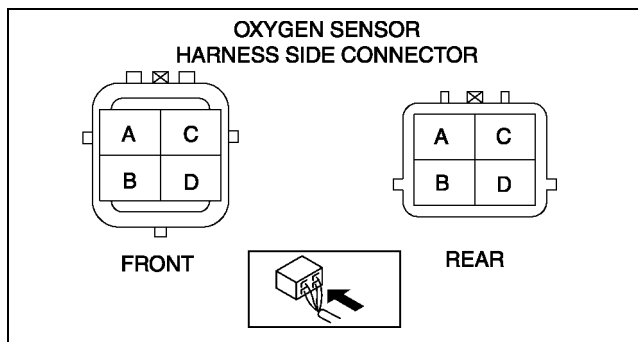
- If there is no continuity, the circuit is open. Repair or replace the harness.

Front

- HO2S terminal C (harness-side) and ignition switch
- HO2S terminal D (harness-side) and PCM terminal 4A (harness-side)

Rear

- HO2S terminal C (harness-side) and ignition switch
- HO2S terminal D (harness-side) and PCM terminal 4D (harness-side)



A6E3940W018

Short circuit

- If there is no continuity, the circuit is shorted. Repair or replace the harness.

Front and rear

- HO2S terminal C (harness-side) and body GND
- HO2S terminal D (harness-side) and power supply
- HO2S terminal D (harness-side) and body GND

POWER STEERING PRESSURE (PSP) SWITCH INSPECTION

A6E394032230W01

Note

- Perform the following inspection only when directed.

Continuity Inspection

1. Inspect the following if the power steering is inoperative (See [N-4 POWER STEERING FLUID INSPECTION.](#)):
 - Power steering fluid level
 - Power steering fluid leakage
 - Power steering fluid pressure
2. Disconnect the PSP switch connector.
3. Start the engine.
4. Inspect for continuity between the PSP switch terminal and GND using an ohmmeter.
 - If not as specified, replace the PSP switch.
 - If the PSP switch is okay, but PSP PID value is out of specification, perform the "Circuit Open Inspection".

Specification

○—○ :Continuity

	Terminal	GND
Steering wheel in straight ahead position		
While turning steering wheel	○—○	○—○

A6E3940W019

Circuit Open Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following harness for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - PSP switch terminal (harness-side) and PCM terminal 1Z (harness-side)

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - PSP switch terminal (harness-side) and body GND

CONTROL SYSTEM

CLUTCH SWITCH INSPECTION

A6E394018660W01

Note

- Perform the following inspection only when directed.

Continuity Inspection

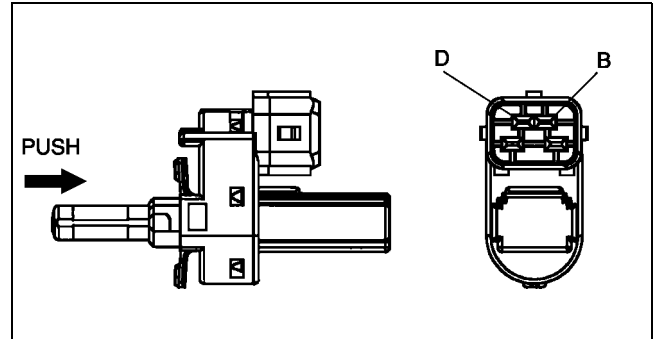
- Verify that the clutch switch is installed properly.
- Disconnect the negative battery cable.
- Remove the clutch switch.
- Inspect for continuity between the clutch switch terminals using an ohmmeter.
 - If the clutch switch is okay, but CPP PID value is out of specification, carry out of the "Clutch Switch Circuit Open/Short Inspection".
 - If not as specified, replace the clutch switch.

Specification

Condition	Terminal	
	B	D
Rod pushed	○ — ○	○ — ○
Except above		

○ — ○ : Continuity

A6E3940W022



A6E3940W020

Circuit Open/Short Inspection

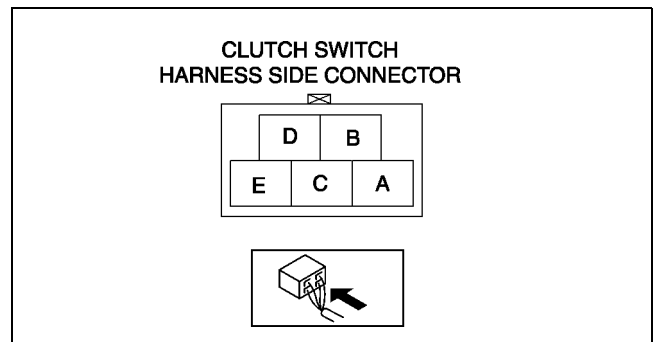
- Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION](#).)
- Inspect the following harness for open or short. (Continuity check)

Open circuit

- Clutch switch terminal B (harness-side) and PCM terminal 1R
- Clutch switch terminal D and body GND

Short circuit

- Clutch switch terminal B (harness-side) and power supply
- Clutch switch terminal B (harness-side) and body GND



A6E3940W021

NEUTRAL SWITCH INSPECTION

A6E394017640W01

Note

- Perform the following inspection only when directed.

Continuity Inspection

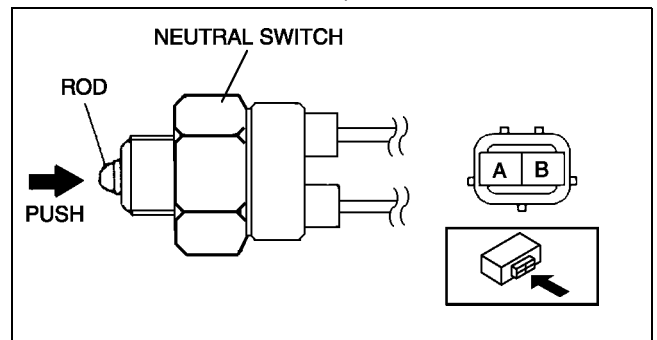
- Disconnect the negative battery cable.
- Remove the neutral switch. [J-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION](#).)
- Inspect for continuity between the neutral switch terminals using an ohmmeter.
 - If the neutral switch is okay, but CPP/PNP PID value is out of specification, carry out of the "Circuit Open/Short Inspection".
 - If not as specified, replace the neutral switch.

Specification

Condition	Terminal	
	A	B
Rod pushed	○ — ○	○ — ○
Except above		

○ — ○ : Continuity

A6E3940W025



A6E3940W023

CONTROL SYSTEM

Circuit Open/Short Inspection

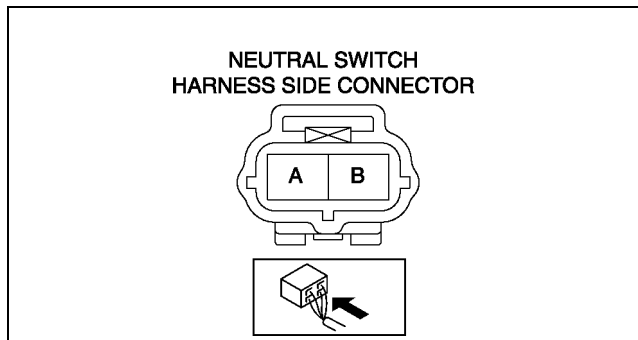
1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following harness for open or short. (Continuity check)

Open circuit

- Neutral switch terminal B (harness-side) and PCM terminal 1W (harness-side)
- Neutral switch terminal A (harness-side) and body GND

Short circuit

- Neutral switch terminal B (harness-side) and body GND



A6E3940W024

BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION

A6E394018211W02

Note

- Perform the following inspection only when directed.
- The following vacuum values are indicated by relative pressure from the barometric pressure sensor.

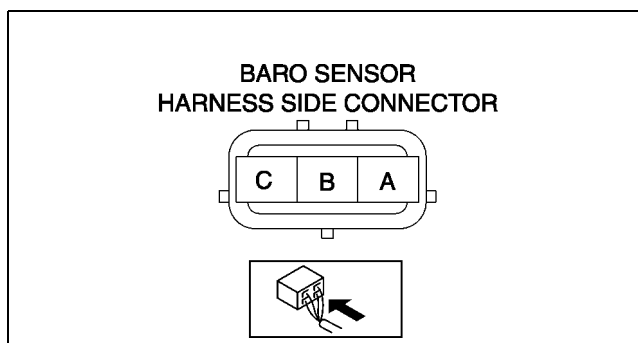
1. Connect the **SSTs** (WDS or equivalent) to the DLC-2.
2. Turn the ignition switch to ON.
3. Select BARO on the **SSTs** (WDS or equivalent).
4. Verify that the BARO PID (pressure) and barometric pressure are practically equal.
 - If not as verified, perform the "Circuit Open/Short Inspection".
 - If there is no open or short circuit, replace the barometric pressure sensor.
 - If as verified, go to next step.
5. Apply vacuum of **-25.0 kPa {-187 mmHg, -7.38 inHg}** to the barometric pressure sensor, and verify that the BARO variation from that of Step 4 is approx. **25.0 kPa {187 mmHg, 7.38 inHg}**.
 - If not as verified, perform the "Circuit Open/Short inspection".
 - If there is no open or short circuit, replace the barometric pressure sensor.

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Inspect the following wiring harness for open or short. (Continuity check)

Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - Barometric pressure sensor terminal A (harness-side) and PCM terminal 1G
 - Barometric pressure sensor terminal B (harness-side) and PCM terminal 2H
 - Barometric pressure sensor terminal C (harness-side) and PCM terminal 2K



A6E3940W026

Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
 - Barometric pressure sensor terminal C (harness-side) and power supply.
 - Barometric pressure sensor terminal C (harness-side) and body GND.
 - Barometric pressure sensor terminal A (harness-side) and power supply.
 - Barometric pressure sensor terminal A (harness-side) and body GND

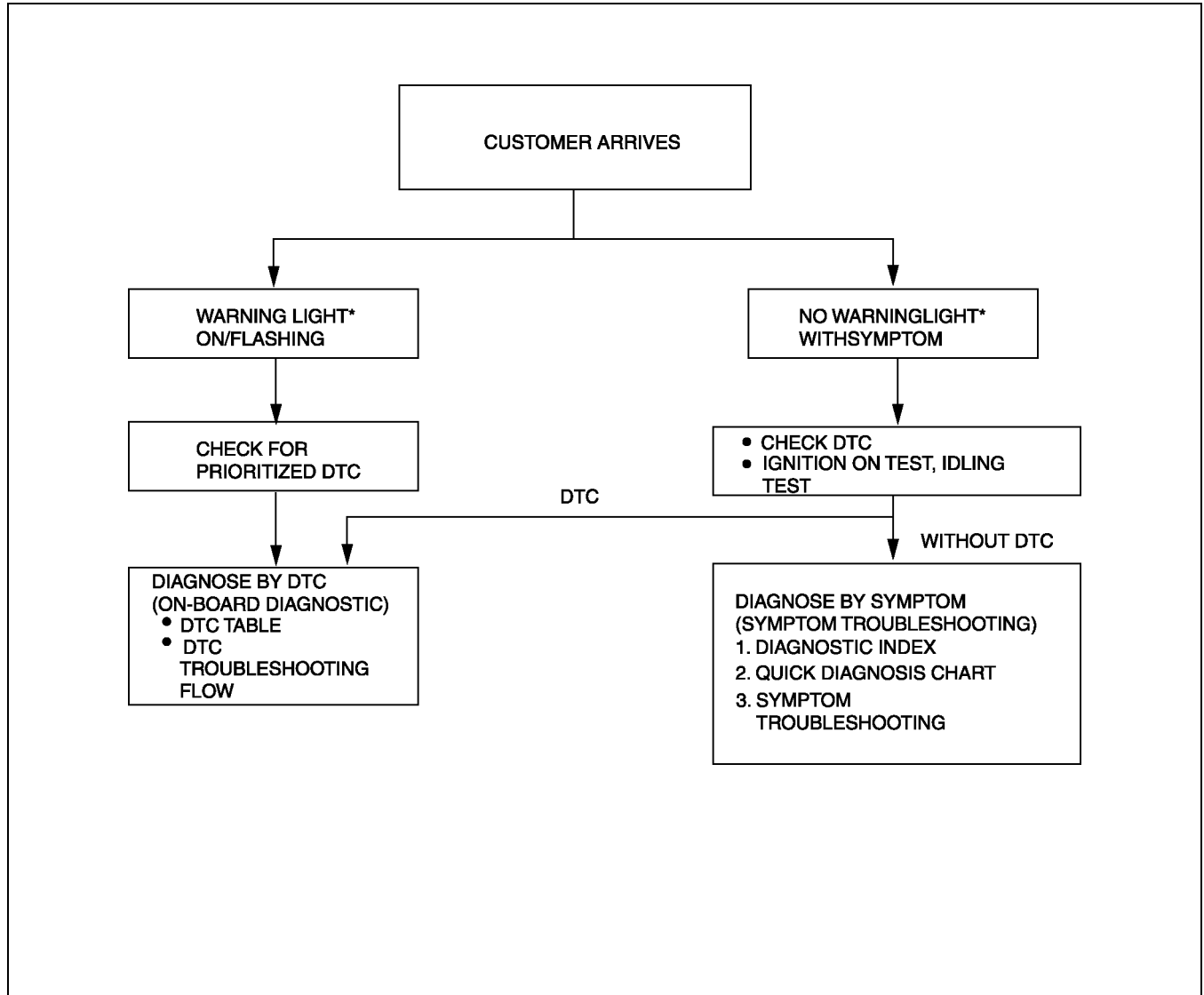
ON-BOARD DIAGNOSTIC

ON-BOARD DIAGNOSTIC

FOREWORD

A6E397018881W01

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
 - If a DTC exists, diagnose the applicable DTC inspection. (See [F-67 DTC TABLE](#).)
 - If no DTC exists and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See [F-181 ENGINE SYMPTOM TROUBLESHOOTING](#).)



A6E3970W001

* : Malfunction Indicator lamp (MIL), Generator Warning Light, Security Light

ON-BOARD DIAGNOSTIC

OBD PENDING TROUBLE CODES

A6E397018881W02

- These appear when a problem is detected in a monitored system.

2 Drive Cycle Type

- The code for a failed system is stored in the PCM memory in the first drive cycle. If the problem is not found in the second drive cycle, the PCM judges that the system returned to normal or the problem was mistakenly detected, and deletes the pending code. If the problem is found in the second drive cycle too, the PCM judges that the system has failed, and stores the pending codes, and the DTCs.
- After pending codes are stored, if the PCM judges that the system is normal in any future drive cycle, the PCM deletes the pending codes.

1 Drive Cycle Type

- If any problems are detected in the first drive cycle, pending codes will be stored in the PCM memory, as well as DTCs.
- After pending codes are stored, if the PCM judges that the system is normal in any future drive cycle, the PCM deletes the pending codes.

OBD FREEZE FRAME DATA

A6E397018881W03

- This is the technical data which indicates the engine condition at the time of the first malfunction. This data will remain in the memory even if another emission-related DTC is stored, with the exception of the Misfire or Fuel System DTCs. Once freeze frame data for the Misfire or Fuel System DTC is stored, it will overwrite any previous data and the freeze frame will not be overwritten again.

OBD ON-BOARD SYSTEM READINESS TEST

A6E397018881W04

- This shows OBD system operating status. If any monitor function is incomplete, WDS or equivalent will identify which monitor function has not been completed. Misfires, Fuel System and Comprehensive Components (CCM) are continuous monitoring-type functions. The catalyst, EGR system and oxygen sensor will be monitored under drive cycles. The OBD diagnostic system is initialized by performing the DTC cancellation procedure or disconnecting the negative battery cable.

OBD DIAGNOSTIC MONITORING TEST RESULTS

A6E397018881W05

- These results from the intermittent monitor system's technical data, which are used to determine whether the system is normal or not. They also display the system thresholds and diagnostic results. The intermittent monitor system monitors the oxygen sensor and the catalyst.

OBD READ/CLEAR DIAGNOSTIC TEST RESULTS

A6E397018881W06

- This retrieves all stored DTCs in the PCM and clears the DTCs, Freeze Frame Data, On-Board Readiness Test Results, Diagnostic Monitoring Test Results and Pending Trouble Codes.

OBD PARAMETER IDENTIFICATION (PID) ACCESS

A6E397018881W07

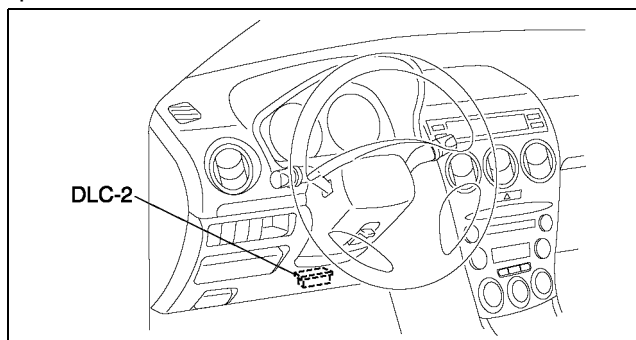
- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since PID values for output devices are PCM internal data values, inspect each device to identify which output devices are malfunctioning.

ON-BOARD DIAGNOSTIC TEST

A6E397018881W08

DTCs Reading Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located as shown in the figure.
3. Retrieve DTCs by WDS or equivalent.

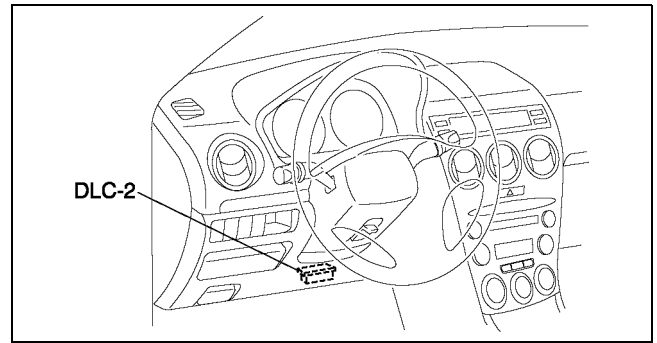


A6E3970W002

ON-BOARD DIAGNOSTIC

Pending Trouble Code Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located as shown in the figure.
3. Retrieve **PENDING TROUBLE CODES** by WDS or equivalent.

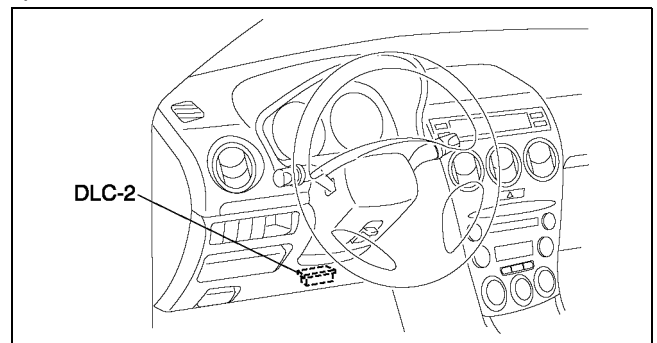


A6E3970W002

F

Freeze Frame PID Data Access Procedure

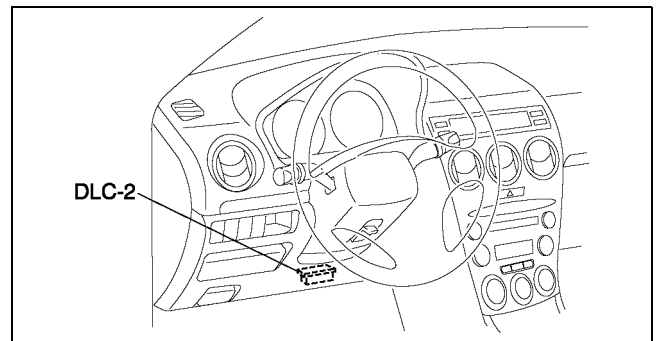
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located as shown in the figure.
3. Record the **FREEZE FRAME DATA** by WDS or equivalent.



A6E3970W002

On-Board System Readiness Tests Access Procedure

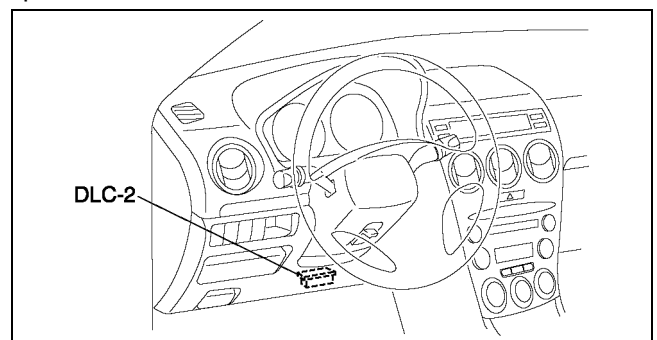
1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located as shown in the figure.
3. Monitor the OBD systems operating status by WDS or equivalent.



A6E3970W002

Diagnostic Monitoring Test Results Access Procedure

1. Perform the necessary vehicle preparation and visual inspection.
2. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located as shown in the figure.
3. Access to the **DIAGNOSTIC MONITORING TEST RESULTS** and read the test results by WDS or equivalent.



A6E3970W002

ON-BOARD DIAGNOSTIC

OBD DRIVE MODE

A6E397018881W09

- Performing the Drive Mode inspects the OBD system for proper operation. The Drive Mode must be performed to ensure that no additional DTCs are present.
- During Drive Mode, the following systems are inspected:
 - Oxygen sensor (HO2S)
 - Oxygen sensor heater
 - Catalytic converter (TWC)

Caution

- While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.
- When the WDS or equivalent is used to observe monitor system condition while driving, be sure to have another technician with you, or record the data in the WDS or equivalent using the PID/DATA MONITOR AND RECORD function and inspect later.

Note

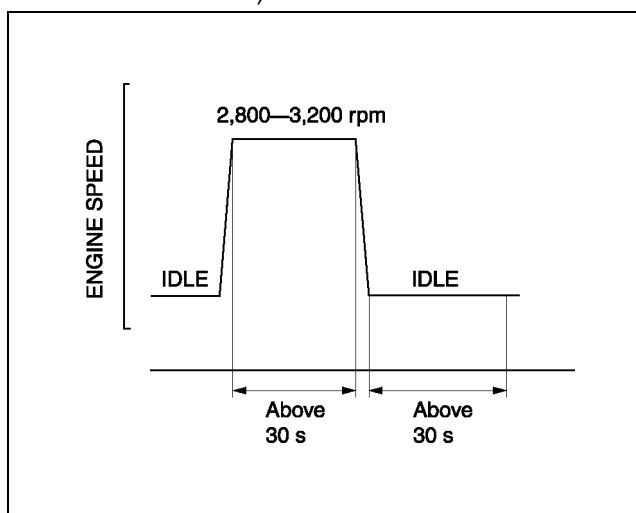
- Vehicle speed and engine speed detected by the PCM may differ from that indicated by the speedometer and tachometer. Use the WDS or equivalent to monitor vehicle speed.
- If the OBD system inspection is not completed during the Drive Mode, the following causes are considered:
 1. The OBD system detects the malfunction.
 2. The Drive Mode procedure is not completed correctly.
- Disconnecting the battery will reset the memory. Do not disconnect the battery during and after Drive Mode.
- The WDS or equivalent can be used at anytime through the course of Drive Mode to monitor the completion condition. Monitoring can be done by viewing the ON-BOARD SYSTEM READINESS menu.

PCM Adaptive Memory Procedure Drive Mode

Note

- The PCM adaptive memory condition can be confirmed with RFCFLAG PID.
- If RFCFLAG PID is ON, PCM Adaptive Memory Procedure Drive Mode is not necessary, because PCM already has adaptive memory.
- If RFCFLAG PID is OFF, PCM Adaptive Memory Procedure Drive should be performed before HO2S Heater, HO2S, and TWC Repair Verification Drive Mode.

1. Start the engine and warm it up completely.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Perform no load racing at the engine speed shown in the graph, then idle the engine for **more than 30 s** after the cooling fan is stopped. If possible, monitor RPM PID for engine speed and FAN1 PID for cooling fan condition during this procedure.
4. Turn ignition key off then on again.
5. Access to RFC FLAG PID to confirm PCM adaptive memory condition. If RFCFLAG PID is ON, PCM Adaptive Memory Procedure Drive is completed.
6. If RFCFLAGPID is still OFF, go back to Step 1.



A6E3970W003

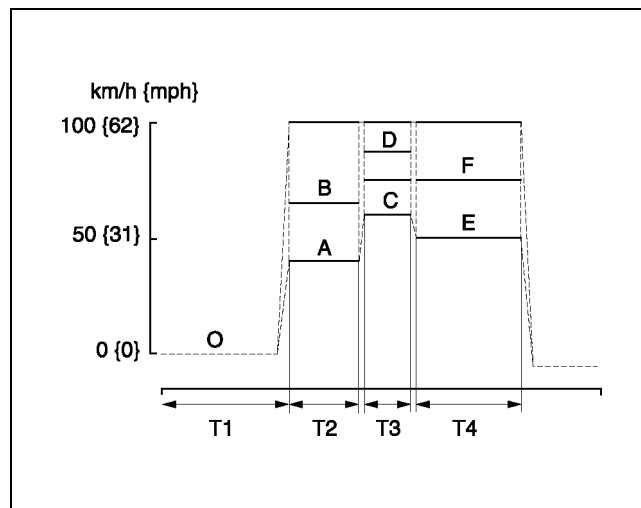
HO2S Heater, HO2S, and TWC Repair Verification Drive Mode

1. Access to RFCFLAG PID to confirm PCM adaptive memory condition. If RFCFLAG PID is OFF, perform PCM Adaptive Memory Procedure Drive first.
2. If RFCFLAG PID is ON, start the engine and warm it up completely.
3. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
4. Drive the vehicle as shown in the graph; first drive in zone O, then A or B, followed by C or D, finally E or F. Driving condition before the constant speed driving is not specified.

ON-BOARD DIAGNOSTIC

For MTX

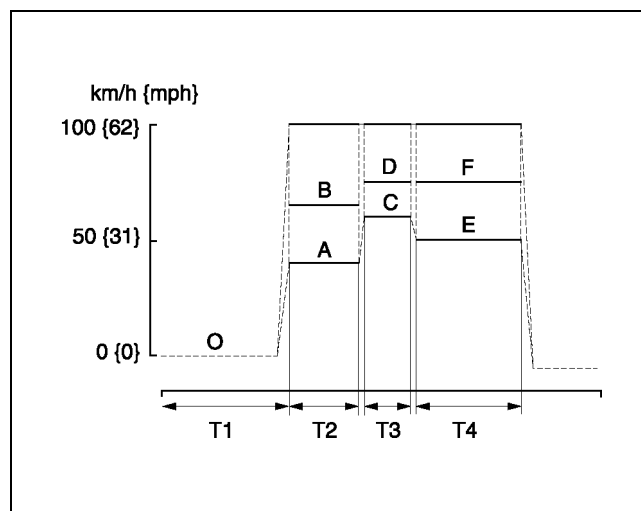
Zone	Shift Position	Vehicle Speed km/h {mph}	Time Sec.
O	Neutral	0 {0}	T1: Above 455
A	2nd	40—50 {25—32}	T2: Above 30
B	3rd	65—75 {41—47}	
C	2nd	60—75 {38—46}	T3: Above 20
D	3rd	75—100 {47—62}	
E	4th	50—75 {31—46}	T4: Above 120
F	5th	75—100 {47—62}	



A6E3970W004

For ATX

Zone	Range	Vehicle Speed km/h {mph}	Time Sec.
O	P or N	0 {0}	T1: Above 455
A	S (HOLD)	40—65 {25—41}	T2: Above 30
B	D (HOLD)	65—100 {40—62}	
C	S (HOLD)	60—75 {38—46}	T3: Above 20
D	D (HOLD)	85—100 {52—62}	
E	D (HOLD)	50—75 {31—47}	T4: Above 120
F	D	75—100 {46—62}	



A6E3970W005

- Stop vehicle and access to ON BOARD SYSTEM READINESS menu of GENERIC OBD FUNCTION to inspect the Drive Mode completion condition. If completed, RFC changes from NO to YES.
- If not completed, turn the ignition key to OFF, then go back to Step 4.
- Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD FUNCTIONS to inspect the monitor results. If MEAS are not within the specification, repair has not completed.
- Verify no DTC is available.

DIAGNOSTIC MONITORING TEST RESULTS

- The purpose of this test mode is to confirm the result of OBD monitor diagnostic test results. The result values stored when particular monitor is completed are displayed. If the monitor is not completed, initial value is displayed.

A6E397018881W10

TEST ID	Description	Related system
10:01:0A	Rich to lean sensor threshold voltage	HO2S
10:02:0A	Lean to rich sensor threshold voltage	
10:03:0A	Low sensor voltage for switching time calculation	
10:04:0A	High sensor voltage for switching time calculation	
10:05:10	Rich to lean sensor switching time	
10:06:10	Lean to rich sensor switching time	
10:0A:10	Sensor period	
10:80:20	Front and rear HO2S switching time ratio	TWC

ON-BOARD DIAGNOSTIC

DTC CONFIRMATION PROCEDURE

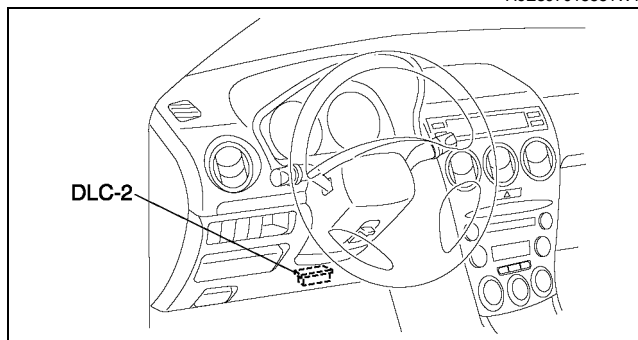
A6E397018881W11

STEP	INSPECTION	ACTION
1	RECORD CONTINUOUS MEMORY DTC AND FREEZE FRAME DATA - Turn ignition key to ON (Engine OFF). - Connect WDS or equivalent to DLC. - Retrieve all stored DTCs. - Are there any DTCs present?	Yes Record all stored DTCs (Continuous Memory DTC) and Freeze Frame Data on repair order, then go to next step.
		No Go to next step.
2	VERIFY RELATED REPAIR INFORMATION - Check for related Service information availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available Service information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	PERFORM KEY ON ENGINE OFF (KOEO) SELF-TEST - Start engine. - Warm up engine completely. - Turn off all electrical loads. - Perform KOEO SELF-TEST PROCEDURE. (See F-66 KOEO/KOER SELF-TEST) - Are there any KOEO DTCs present?	Yes Repair KOEO DTC. (See F-67 DTC TABLE)
		No Go to next step.
4	PERFORM KEY ON ENGINE RUNNING (KOER) SELF-TEST - Start engine. - Perform KOER SELF-TEST PROCEDURE. (See F-66 KOEO/KOER SELF-TEST) - Are there any KOER DTCs present?	Yes Repair KOER DTC. (See F-67 DTC TABLE)
		No - If Continuous Memory DTC is present at Step 1, return to applicable DTC troubleshooting procedure step. - If Continuous Memory DTC is not present at Step 1, go to symptom troubleshooting.

KOEO/KOER SELF-TEST

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located as shown in the figure.
2. Perform KOEO/KOER self-test.

A6E397018881W12

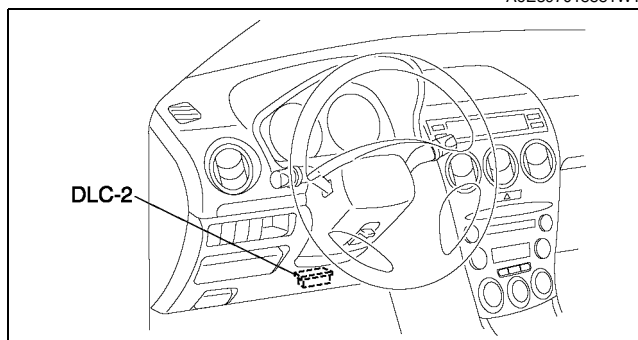


A6E3970W002

AFTER REPAIR PROCEDURE

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located as shown in the figure.
2. Turn the ignition key from OFF to ON.
3. Record DTC if retrieved.
4. Erase all diagnostic data by WDS or equivalent.

A6E397018881W13



A6E3970W002

ON-BOARD DIAGNOSTIC

DTC TABLE

DTC table

A6E397018881W14

×: Applicable
—: Not applicable

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0010	CMP actuator circuit malfunction	ON	1	CCM	×	(See F-70 DTC P0010)
P0011	CMP timing over-advanced	ON	1	CCM	×	(See F-72 DTC P0011)
P0012	CMP timing over-retarded	ON	1	CCM	×	(See F-73 DTC P0012)
P0031	Front HO2S heater circuit low input	ON	2	O ₂ sensor heater	×	(See F-74 DTC P0031)
P0032	Front HO2S heater circuit high input	ON	2	O ₂ sensor heater	×	(See F-76 DTC P0032)
P0037	Rear HO2S heater circuit low input	ON	2	O ₂ sensor heater	×	(See F-78 DTC P0037)
P0038	Rear HO2S heater circuit high input	ON	2	O ₂ sensor heater	×	(See F-80 DTC P0038)
P0101	MAF sensor inconsistent with TP sensor	ON	2	CCM	×	(See F-81 DTC P0101)
P0102	MAF circuit low input	ON	1	CCM	×	(See F-83 DTC P0102)
P0103	MAF circuit high input	ON	1	CCM	×	(See F-85 DTC P0103)
P0107	MAP sensor circuit low input	ON	1	CCM	×	(See F-86 DTC P0107)
P0108	MAP sensor circuit high input	ON	1	CCM	×	(See F-88 DTC P0108)
P0111	IAT circuit performance problem	ON	2	CCM	×	(See F-90 DTC P0111)
P0112	IAT circuit low input	ON	1	CCM	×	(See F-91 DTC P0112)
P0113	IAT circuit high input	ON	1	CCM	×	(See F-92 DTC P0113)
P0117	ECT circuit low input	ON	1	CCM	×	(See F-94 DTC P0117)
P0118	ECT circuit high input	ON	1	CCM	×	(See F-96 DTC P0118)
P0121	TP stuck closed	ON	2	CCM	×	(See F-98 DTC P0121)
P0122	TP circuit low input	ON	1	CCM	×	(See F-100 DTC P0122)
P0123	TP circuit high input	ON	1	CCM	×	(See F-102 DTC P0123)
P0125	Excessive time to enter closed loop fuel control	ON	2	CCM	×	(See F-104 DTC P0125)
P0131	Front HO2S no inversion (stuck low)	ON	2	CCM	×	(See F-105 DTC P0131, P0132)
P0132	Front HO2S no inversion (stuck high)	ON	2	CCM	×	(See F-105 DTC P0131, P0132)
P0133	Front HO2S circuit malfunction	ON	2	O ₂ sensor	×	(See F-108 DTC P0133)
P0134	Front HO2S circuit no activity detected	ON	2	CCM	×	(See F-110 DTC P0134)
P0138	Rear HO2S circuit high input	ON	2	CCM	×	(See F-112 DTC P0138)
P0140	Rear HO2S circuit no activity detected	ON	2	CCM	×	(See F-114 DTC P0140)
P0171	Fuel trim system too lean	ON	2	Fuel	×	(See F-116 DTC P0171)
P0172	Fuel trim system too rich	ON	2	Fuel	×	(See F-119 DTC P0172)
P0300	Random misfire detected	Flash / ON	1 or 2	Misfire	×	(See F-121 DTC P0300)
P0301	Cylinder No.1 misfire detected	Flash / ON	1 or 2	Misfire	×	(See F-124 DTC P0301, P0302, P0303, P0304)
P0302	Cylinder No.2 misfire detected	Flash / ON	1 or 2	Misfire	×	
P0303	Cylinder No.3 misfire detected	Flash / ON	1 or 2	Misfire	×	
P0304	Cylinder No.4 misfire detected	Flash / ON	1 or 2	Misfire	×	
P0327	Knock sensor circuit low input	ON	1	CCM	×	(See F-126 DTC P0327)
P0328	Knock sensor circuit high input	ON	1	CCM	×	(See F-128 DTC P0328)
P0335	CKP sensor circuit malfunction	ON	1	CCM	×	(See F-130 DTC P0335)
P0340	CMP sensor circuit malfunction	ON	1	CCM	×	(See F-132 DTC P0340)
P0403	EGR valve motor coils open or short	ON	2	CCM	×	(See F-134 DTC P0403)
P0420	Catalyst system efficiency below threshold	ON	2	Catalyst	×	(See F-137 DTC P0420)

F

ON-BOARD DIAGNOSTIC

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0443	Evaporative emission control system purge control valve circuit malfunction	ON	2	CCM	×	(See F-138 DTC P0443)
P0480	Fan relay control circuit malfunction	OFF	2	Other	×	(See F-140 DTC P0480)
P0500	Vehicle speed sensor (VSS) circuit malfunction (MTX)	ON	2	CCM	×	(See F-142 DTC P0500)
	Vehicle speed sensor (VSS) circuit malfunction (ATX)	(See K-53 DTC TABLE)				
P0505	Idle control system malfunction	OFF	—	Other	—	(See F-144 DTC P0505)
P0506	Idle control system RPM lower than expected	ON	2	CCM	×	(See F-145 DTC P0506)
P0507	Idle control system RPM higher than expected	ON	2	CCM	×	(See F-147 DTC P0507)
P0511	Idle control system circuit malfunction	ON	1	CCM	×	(See F-148 DTC P0511)
P0550	PSP switch circuit malfunction	ON	2	CCM	×	(See F-150 DTC P0550)
P0602	PCM programming error	ON	1	CCM	×	(See F-152 DTC P0602)
P0610	Control module vehicle options error	ON	1	CCM	×	(See F-152 DTC P0610)
P0661	VIS control circuit low input	OFF	2	Other	×	(See F-153 DTC P0661)
P0662	VIS control circuit high input	OFF	2	Other	×	(See F-154 DTC P0662)
P0703	Brake switch input malfunction	ON	2	CCM	×	(See F-156 DTC P0703)
P0704	Clutch switch input malfunction	ON	2	CCM	×	(See F-158 DTC P0704)
P0706	Transaxle range (TR) switch circuit range/performance	(See K-53 DTC TABLE)				
P0707	Transaxle range (TR) switch circuit low input	(See K-53 DTC TABLE)				
P0708	Transaxle range (TR) switch circuit high input	(See K-53 DTC TABLE)				
P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (Stuck)	(See K-53 DTC TABLE)				
P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)	(See K-53 DTC TABLE)				
P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	(See K-53 DTC TABLE)				
P0715	Input/turbine speed sensor circuit malfunction	(See K-53 DTC TABLE)				
P0731	Gear 1 incorrect (Incorrect Gear Ratio Detected)	(See K-53 DTC TABLE)				
P0732	Gear 2 incorrect (Incorrect Gear Ratio Detected)	(See K-53 DTC TABLE)				
P0733	Gear 3 incorrect (Incorrect Gear Ratio Detected)	(See K-53 DTC TABLE)				
P0734	Gear 4 incorrect (Incorrect Gear Ratio Detected)	(See K-53 DTC TABLE)				
P0741	Torque converter clutch (TCC) (stuck OFF)	(See K-53 DTC TABLE)				
P0742	Torque converter clutch (TCC) (stuck ON)	(See K-53 DTC TABLE)				
P0745	Pressure control solenoid malfunction	(See K-53 DTC TABLE)				
P0751	Shift solenoid A stuck OFF	(See K-53 DTC TABLE)				
P0752	Shift solenoid A stuck ON	(See K-53 DTC TABLE)				
P0753	Shift solenoid A malfunction (electrical)	(See K-53 DTC TABLE)				
P0756	Shift solenoid B stuck OFF	(See K-53 DTC TABLE)				

ON-BOARD DIAGNOSTIC

DTC No.	Condition	MIL	DC	Monitor item	Memory function	Page
P0757	Shift solenoid B stuck ON	(See K-53 DTC TABLE)				
P0758	Shift solenoid B malfunction (electrical)	(See K-53 DTC TABLE)				
P0761	Shift solenoid C stuck OFF	(See K-53 DTC TABLE)				
P0762	Shift solenoid C stuck ON	(See K-53 DTC TABLE)				
P0763	Shift solenoid C malfunction (electrical)	(See K-53 DTC TABLE)				
P0766	Shift solenoid D stuck OFF	(See K-53 DTC TABLE)				
P0767	Shift solenoid D stuck ON	(See K-53 DTC TABLE)				
P0768	Shift solenoid D malfunction (electrical)	(See K-53 DTC TABLE)				
P0771	Shift solenoid E stuck OFF	(See K-53 DTC TABLE)				
P0772	Shift solenoid E stuck ON	(See K-53 DTC TABLE)				
P0773	Shift solenoid E malfunction (electrical)	(See K-53 DTC TABLE)				
P0841	Oil pressure switch circuit malfunction	(See K-53 DTC TABLE)				
P0850	Neutral switch input malfunction	ON	2	CCM	×	(See F-160 DTC P0850)
P1410	Variable air duct valve circuit malfunction	OFF	2	Other	×	(See F-162 DTC P1410)
P1562	PCM +BB voltage low	ON	1	CCM	×	(See F-164 DTC P1562)
P2006	Variable tumble control system shutter valve stuck closed	ON	2	CCM	×	(See F-166 DTC P2006)
P2009	Variable tumble control solenoid valve circuit low input	ON	2	CCM	×	(See F-168 DTC P2009)
P2010	Variable tumble control solenoid valve circuit high input	ON	2	CCM	×	(See F-170 DTC P2010)
P2228	BARO sensor circuit low input	ON	1	CCM	×	(See F-172 DTC P2228)
P2229	BARO sensor circuit high input	ON	1	CCM	×	(See F-174 DTC P2229)
P2502	Generator output voltage signal no electricity	OFF	1	Other	—	(See F-176 DTC P2502)
P2503	Battery overcharge	OFF	1	Other	—	(See F-177 DTC P2503)
P2504	Generator terminal B circuit open	OFF	1	Other	—	(See F-178 DTC P2504)
U0073	CAN bus off	OFF	1	Other	—	(See T-141 MULTIPLEX COMMUNICATION SYSTEM)
U0121	PCM cannot receive any signals from ABS, ABS/TCS or DSC HU/CM	ON	1	Other	×	(See T-141 MULTIPLEX COMMUNICATION SYSTEM)
U0155	PCM cannot receive any signals from combination meter	ON	1	Other	×	(See T-141 MULTIPLEX COMMUNICATION SYSTEM)

ON-BOARD DIAGNOSTIC

DTC P0010

A6E397001084W01

DTC P0010	CMP actuator circuit
DETECTION CONDITION - PCM monitors OCV voltage. If PCM detects OCV control voltage (calculated from OCV) is above or below the threshold voltage (calculated from battery positive voltage), PCM determines that OCV circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.	POSSIBLE CAUSE - OCV circuit malfunction - Open circuit between OCV terminal B and main relay - Short to GND between OCV terminal A and PCM terminal 4M - Short to power between OCV terminal A and PCM terminal 4M - Open circuit between OCV terminal A and PCM terminal 4M - Poor connection of OCV connector or PCM connector - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT OCV CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect OCV connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes Repair or replace terminal, then go to Step 9.
		No Go to next step.
3	INSPECT OCV (OIL CONTROL VALVE) ELECTRICAL MALFUNCTION - Inspect OCV. (See B-33 OIL CONTROL VALVE (OCV) INSPECTION.) - Is OCV okay?	Yes Go to next step.
		No Replace OCV, then go to Step 9.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
4	CLASSIFY MALFUNCTION AT POWER SUPPLY CIRCUIT OR CONTROL CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage between OCV terminal B (harness-side) and body GND. - Is voltage B+?	Yes	Malfunction at control circuit. Go to next step.
		No	Malfunction at power supply circuit. Repair or replace harness for open circuit, then go to Step 9.
5	INSPECT CONTROL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (Engine OFF). - Measure voltage between OCV terminal A (harness-side) and body GND. - Is voltage B+?	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to next step.
6	INSPECT CONTROL CIRCUIT FOR SHORT TO GND - Turn ignition key to OFF. - Inspect for continuity between OCV terminal A (harness-side) and body GND. - Is there continuity?	Yes	Repair or replace harness for short to GND, then go to Step 9.
		No	Go to next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection at terminal 4M (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes	Repair terminal, then go to Step 9.
		No	Go to next step.
8	INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Inspect for continuity between OCV (oil control valve) terminal A (harness-side) and PCM terminal 4M (harness-side). - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0010 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0011

A6E397001084W02

DTC P0011	CMP - Timing over-advanced
DETECTION CONDITION	- Actual valve timing is over-advanced by 30 deg. from target valve timing when the OCV is controlled in the maximum valve timing retard condition. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycles. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- OCV malfunction - Spool valve in OCV is stuck in advance position. - Variable valve timing actuator is stuck in advance position. - Loose timing belt or improper valve timing due to timing belt slippage - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT OCV FOR MALFUNCTION - Start engine. - Increase engine speed. - Stop engine. - Remove the OCV. - Inspect the position of spool valve in OCV. - Is spool valve located at valve retard position?	Yes Go to next step.
		No Replace OCV, then go to Step 5.
3	INSPECT STOPPER PIN MECHANISM - Remove timing belt. - Inspect stopper pin. (See B-32 VARIABLE VALVE TIMING ACTUATOR INSPECTION.) - Is stopper pin mechanism okay?	Yes Go to next step.
		No Replace variable valve timing actuator, then go to Step 5.
4	INSPECT ROTOR POSITION - Remove variable valve timing actuator. - Is rotor position at maximum valve timing retard?	Yes VARIABLE VALVE TIMING MECHANISM IS NORMAL Note - This DTC detected by intermittent concern. - Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No Replace variable valve timing actuator, go to next step.
5	VERIFY TROUBLESHOOTING OF DTC P0011 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOER/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
6	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0012

A6E397001084W03

DTC P0012	CMP - Timing over-retarded
DETECTION CONDITION	- Actual valve timing is over-retarded by 5 deg. from target valve timing for 5 s when the OCV system control is within feed-back range. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycles. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- OCV (oil control valve) malfunction - Low engine oil pressure - Spool valve in OCV (oil control valve) is stuck in retard position. - Variable valve timing actuator is stuck in retard position. - Following oil runners are clogged or have leakage. Oil runners - Between oil pressure switch and OCV (oil control valve) - Between OCV (oil control valve) and variable valve timing actuator - In variable valve timing actuator - Loose timing belt or improper valve timing due to timing belt slippage - PCM malfunction

F

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	VERIFY RELATED PENDING CODE OR STORED DTCS Is DTC P0010 present?	Yes Go to DTC P0010 troubleshooting procedure. (See F-70 DTC P0010)
		No Go to next step.
3	VERIFY ENGINE OIL PRESSURE - Start engine. - Does oil pressure warning light illuminate?	Yes Inspect engine oil pressure. (See D-3 OIL PRESSURE INSPECTION)
		No Go to next step.
4	VERIFY TIMING BELT INSTALLATION - Stop engine. - Remove timing belt cover. - Is camshaft timing mark at correct point? (See B-10 TIMING CHAIN REMOVAL/INSTALLATION.)	Yes Go to next step.
		No Reinstall timing belt, then go to Step 7.
5	INSPECT OCV FOR MALFUNCTION - Stop engine. - Remove OCV. - Inspect position of spool valve in OCV. - Is spool valve located at valve retard position?	Yes VARIABLE VALVE TIMING MECHANISM IS NORMAL Note - This DTC detected by intermittent concern. - Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.
		No Replace OCV, then go to Step 7.
6	INSPECT ENGINE OIL RUNNER - Inspect following engine oil runners for clogging or leakage. - Between oil pressure switch and OCV - Between OCV and variable valve timing actuator - In variable valve timing actuator - Is there any clogging or leakage?	Yes Repair or replace suspected runner, then go to next step.
		No VARIABLE VALVE TIMING MECHANISM IS NORMAL Note - This DTC is detected by intermittent concern. - Intermittent concern might be removed by cleaning mode of variable valve timing control function. Go to next step.

ON-BOARD DIAGNOSTIC

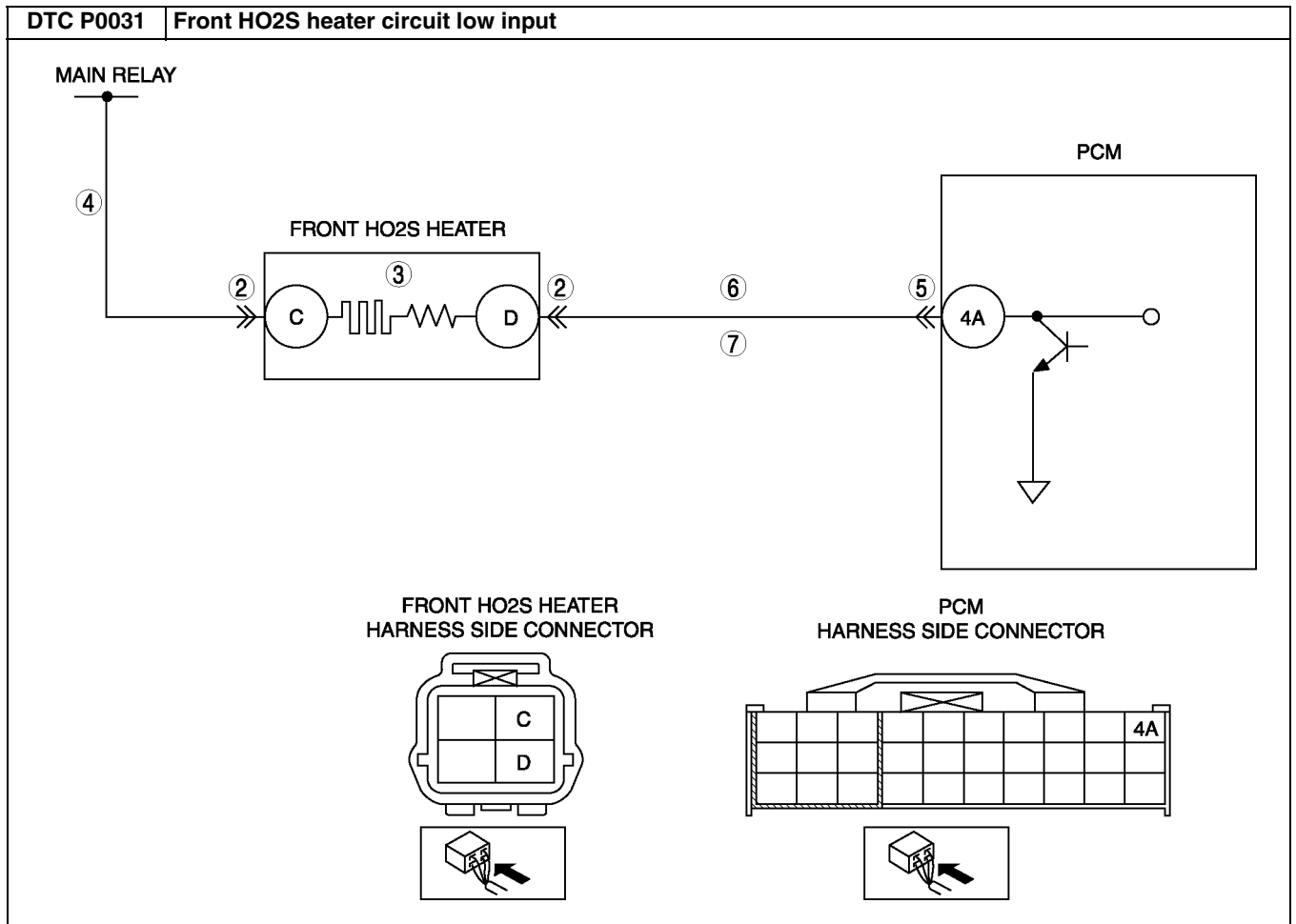
STEP	INSPECTION		ACTION
7	VERIFY TROUBLESHOOTING OF DTC P0012 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0031

A6E397001084W04

DTC P0031	Front HO2S heater circuit low input
DETECTION CONDITION	- PCM monitors front HO2S heater control signal at PCM terminal 4A. If PCM turns front HO2S heater off but front HO2S heater circuit has low voltage, PCM determines that front HO2S heater circuit has malfunction. Note - Front HO2S heater is controlled by duty signal. Diagnostic support note - This is a continuous monitor (O₂ sensor heater). - MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. - PENDING CODE is available if PCM detects above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
	POSSIBLE CAUSE - Front HO2S malfunction - Open circuit between ignition switch and front HO2S terminal C - Open circuit between front HO2S terminal D and PCM terminal 4A - Short to ground circuit between front HO2S terminal D and PCM terminal 4A - Poor connection at front HO2S or PCM connector - PCM malfunction

ON-BOARD DIAGNOSTIC



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT POOR CONNECTION OF FRONT HO2S CONNECTOR - Turn ignition key to OFF. - Disconnect front HO2S connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
3	INSPECT FRONT HO2S HEATER - Inspect front HO2S heater. (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION.) - Is front HO2S heater okay?	Yes	Go to next step.
		No	Replace front HO2S, then go to Step 8.
4	INSPECT POWER CIRCUIT OF FRONT HO2S HEATER FOR OPEN CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage between front HO2S terminal C (harness-side) and body ground. - Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 8.
5	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

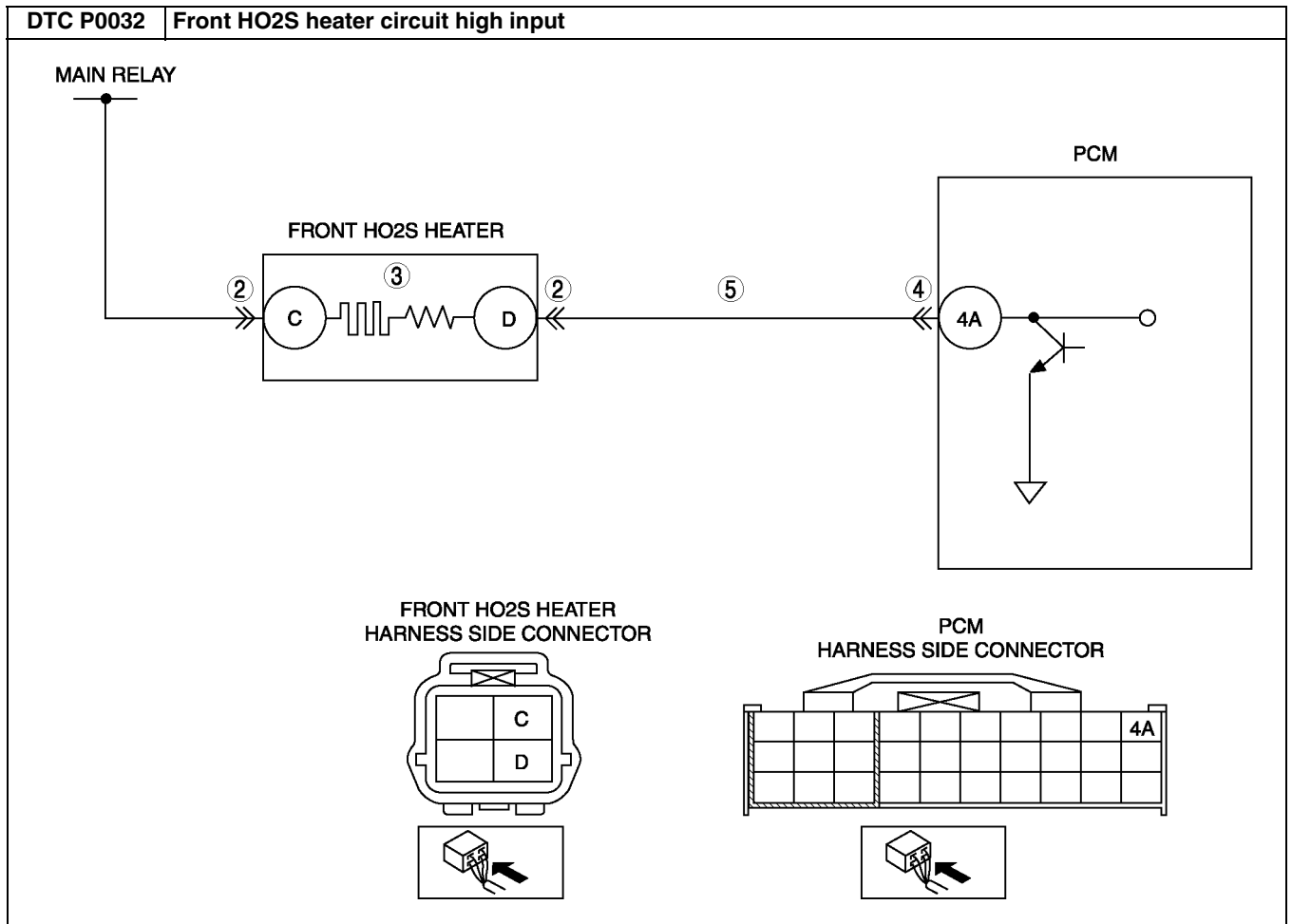
STEP	INSPECTION		ACTION
6	INSPECT CONTROL CIRCUIT OF FRONT HO2S HEATER FOR SHORT TO GROUND - Inspect continuity between front HO2S terminal D (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 8.
		No	Go to next step.
7	INSPECT CONTROL CIRCUIT OF FRONT HO2S HEATER FOR OPEN CIRCUIT - Remove PCM with PCM connector connected. - Inspect continuity between front HO2S terminal D (harness-side) and PCM terminal 4A. - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 8.
8	VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0032

A6E397001084W05

DTC P0032	Front HO2S heater circuit high input
DETECTION CONDITION	- PCM monitors front HO2S heater control signal at PCM terminal 4A. If PCM turns front HO2S heater on but front HO2S heater circuit has high voltage, PCM determines that front HO2S heater circuit has malfunction. Note - Front HO2S heater is controlled by a duty signal. Diagnostic support note - This is a continuous monitor (O₂ sensor heater). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
	POSSIBLE CAUSE - Short to power circuit between front HO2S terminal D and PCM terminal 4A - Front HO2S or PCM terminal is shorted - Front HO2S heater malfunction - PCM malfunction

ON-BOARD DIAGNOSTIC



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT FRONT HO2S TERMINALS - Turn ignition key to OFF. - Disconnect front HO2S connector. - Inspect for bent terminals. - Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
3	INSPECT FRONT HO2S HEATER - Inspect front HO2S heater. (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION.) - Is front HO2S heater okay?	Yes	Go to next step.
		No	Replace the front HO2S, then go to Step 6.
4	INSPECT PCM TERMINAL - Disconnect PCM connector. - Inspect for bent terminals. - Are there any malfunctions?	Yes	Repair terminal, then go to Step 6.
		No	Go to next step.
5	INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage between front HO2S terminal D (harness-side) and body ground. - Is there voltage B+?	Yes	Repair or replace harness for short to power circuit, then go to next step.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
6	VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P0037

A6E397001084W06

DTC P0037	Rear HO2S heater circuit low input
DETECTION CONDITION	- PCM monitors rear HO2S heater control signal at PCM terminal 4D. If PCM turns rear HO2S heater off but rear HO2S heater circuit has low voltage, PCM determines that rear HO2S heater circuit has malfunction. Diagnostic support note - This is a continuous monitor (O₂ sensor heater). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- Rear HO2S malfunction - Open circuit between the ignition switch and rear HO2S terminal C - Open circuit between the rear HO2S terminal D and PCM terminal 4D - Short to ground circuit between rear HO2S terminal D and PCM terminal 4D - Poor connection at rear HO2S or PCM connector - PCM malfunction

MAIN RELAY

④

REAR HO2S HEATER

②

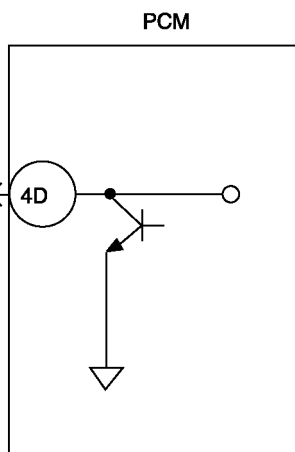
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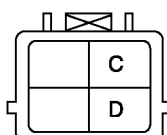
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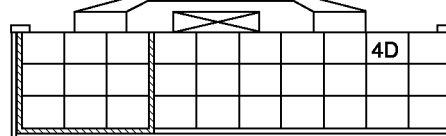
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REAR HO2S HEATER
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION		ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT POOR CONNECTION OF REAR HO2S CONNECTOR - Turn ignition key to OFF. - Disconnect rear HO2S connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
3	INSPECT REAR HO2S HEATER - Inspect rear HO2S heater. (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION.) - Is rear HO2S heater okay?	Yes	Go to next step.
		No	Replace rear HO2S, then go to Step 8.
4	INSPECT REAR HO2S HEATER POWER CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage between rear HO2S terminal C (harness-side) and body ground. - Is there voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 8.
5	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
6	INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND - Inspect continuity between rear HO2S terminal D (harness-side) and body ground. - Is there any continuity?	Yes	Repair or replace harness for short to ground, then go to Step 8.
		No	Go to next step.
7	INSPECT HREAR HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT - Remove PCM with PCM connector connected. - Inspect continuity between rear HO2S terminal D (harness-side) and PCM terminal 4D. - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to Step 8.
8	VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

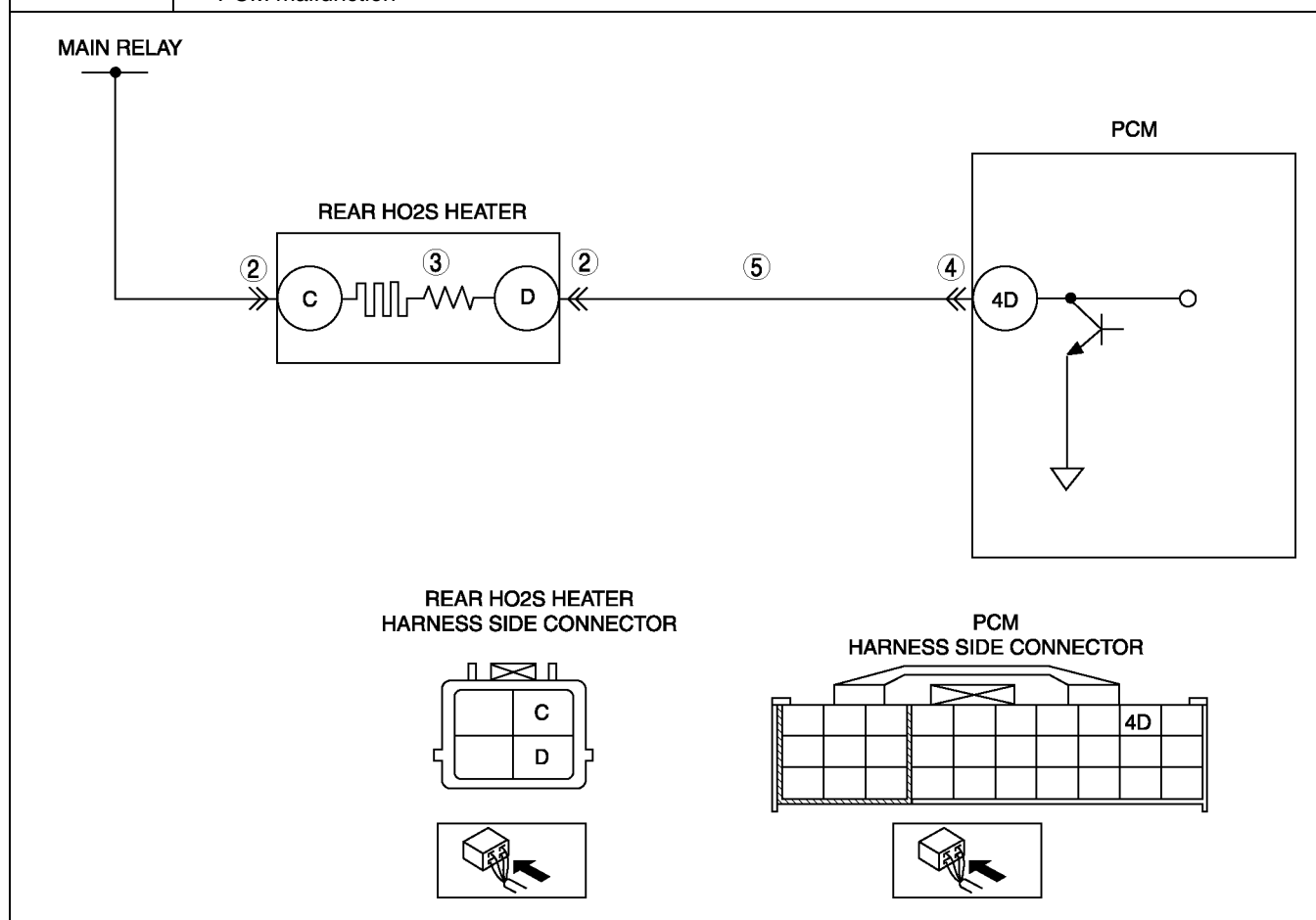
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ON-BOARD DIAGNOSTIC

DTC P0038

A6E397001084W07

DTC P0038	Rear HO2S heater circuit high input
DETECTION CONDITION	- PCM monitors rear HO2S heater control signal at PCM terminal 4D. If PCM turns rear HO2S heater on but rear HO2S heater circuit has high voltage, PCM determines that rear HO2S heater circuit has malfunction. Diagnostic support note - This is a continuous monitor (O₂ sensor heater). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- Short to power circuit between rear HO2S terminal D and PCM terminal 4D - Rear HO2S or PCM terminal is shorted - Rear HO2S heater malfunction - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT REAR HO2S TERMINAL - Turn ignition key to OFF. - Disconnect rear HO2S connector. - Inspect for bent terminals - Is there any malfunction?	Yes Repair or replace terminal, then go to Step 6.
		No Go to next step.
3	INSPECT REAR HO2S HEATER - Inspect rear HO2S heater. (See F-56 HEATED OXYGEN SENSOR (HO2S) INSPECTION.) - Is rear HO2S heater okay?	Yes Go to next step.
		No Replace the rear HO2S, then go to Step 6.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
4	INSPECT PCM TERMINAL - Disconnect PCM connector. - Inspect for bent terminals. - Is there any malfunctions?	Yes	Repair terminal, then go to Step 6.
		No	Go to next step.
5	INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (Engine OFF). - Measure voltage between rear HO2S terminal D (harness-side) and body ground. - Is there voltage B+?	Yes	Repair or replace harness for shot to power circuit, then go to next step.
		No	Go to next step.
6	VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0101

A6E397001084W08

DTC P0101	MAF sensor inconsistent with TP sensor (lower than expected) or engine speed (greater than expected)
DETECTION CONDITION	- The PCM compares actual input signal from MAF sensor with expected input signal from MAF sensor (calculated by input voltage from throttle position sensor or engine speed). - If mass intake air flow amount is below 5.0 g/sec. {0.66 lb/min.} for 5 s and throttle opening angle is above 50% with engine running, the PCM determines that detected mass intake air flow amount is too low. - If mass intake air flow amount is above 96.0 g/sec. {12.7 lb/min.} for 5 s and engine speed is below 2,000 rpm with engine running, the PCM determines that detected mass intake air flow amount is too high. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- MAF sensor malfunction - TP sensor malfunction - Electrical corrosion in MAF signal circuit - Electrical corrosion in MAF RETURN circuit - Voltage drops in MAF signal circuit - Voltage drops in ground circuit

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT - Connect WDS or equivalent to DLC-2. - Start the engine. - Access ECT, TP and MAF PIDs. - Warm up the engine until ECT PID is above 80 °C {176 °F}. - Drive the vehicle. - Read MAF PID while TP PID is above 50%. - Is MAF PID reading below 4.8 g/s {0.63 lb/min.}?	Yes	Make sure that throttle position sensor resistance changes smoothly while gradually opening throttle valve. - If not, replace throttle position sensor and go to Step 7. - For others, go to next step.
		No	Go to next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT - Connect WDS or equivalent to DLC-2. - Start the engine. - Access ECT, MAF and RPM PIDs. - Warm up engine until ECT PID is above 80°C {176 °F}. - Read MAF PID while RPM PID is below 1,000 rpm. - Is MAF PID reading above 66.5 g/s {8.8 lb/min.}?	Yes	Go to Step 8.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
5	INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR - Turn ignition key to OFF. - Disconnect MAF/IAT sensor connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair or replace suspected terminal or MAF/IAT sensor, then go to Step 7.
		No	Go to next step.
6	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to next step.
		No	Replace MAF/IAT sensor, then go to next step.
7	VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Start the engine. - Access ECT, TP and RPM PIDs. - Warm up the engine until ECT PID is reading above 80°C {176°F}. - Drive the vehicle while TP PID above 50% for 50 s. - Is same DTC present?	Yes	Replace PCM, then go to Step 11.
		No	Go to Step 11.
8	INSPECT MAF SENSOR TERMINALS FOR ELECTRICAL CORROSION - Turn ignition key to OFF. - Disconnect MAF/IAT sensor connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is any problem corrosion found?	Yes	Repair or replace suspected terminal or MAF/IAT sensor, then go to Step 10.
		No	Go to next step.
9	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to next step.
		No	Go to next step.

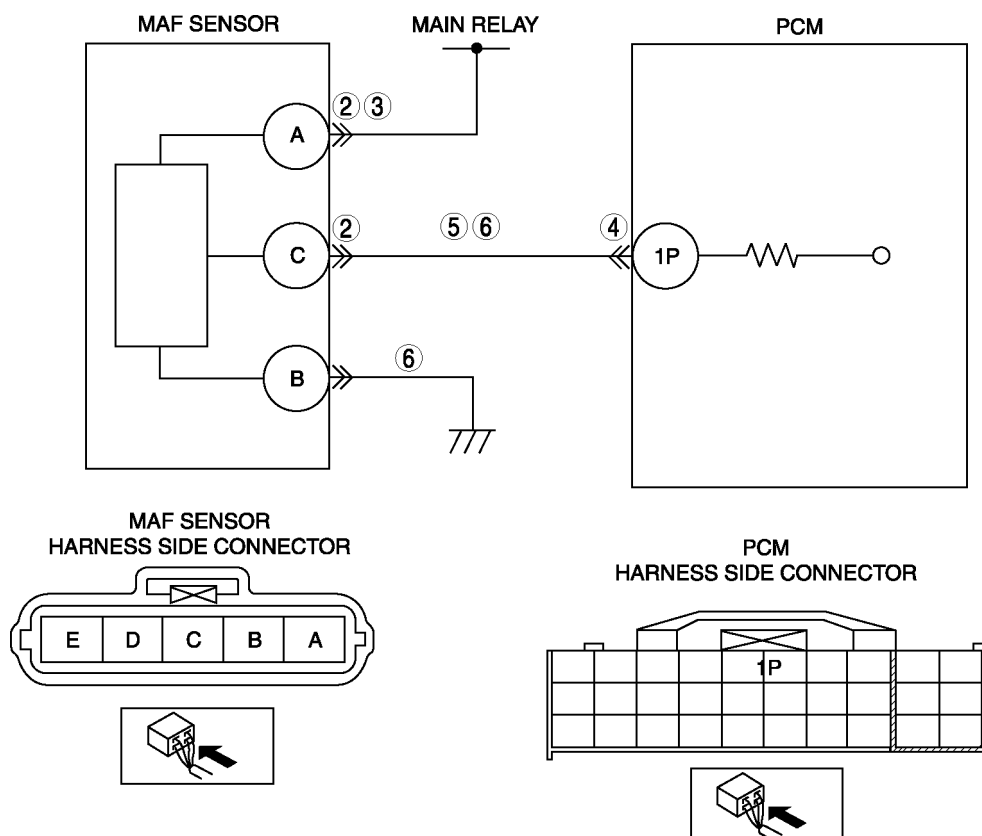
ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
10	VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Start the engine. - Warm up engine until ECT PID is above 80 °C {176 °F}. - Drive the vehicle while RPM PID 2,000 rpm for 50 s. - Is pending code the same as DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
11	VERIFY AFTER REPAIR PROCEDURE Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P0102

A6E397001084W09

DTC P0102	MAF circuit low input
DETECTION CONDITION	- PCM monitors input voltage from MAF sensor when engine running. If input voltage at PCM terminal 1P is below 0.21 V, PCM determines that MAF circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- MAF sensor malfunction - Connector or terminal malfunction - Short to ground in wiring between MAF/IAT sensor terminal C and PCM terminal 1P - Open circuit in wiring between MAF/IAT sensor terminal C and PCM terminal 1P - Open circuit in wiring between main relay and MAF/IAT sensor terminal A



ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR - Turn ignition key to OFF. - Disconnect the MAF/IAT sensor connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair or replace terminals, then go to Step 7.
		No	Go to next step.
3	INSPECT POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to ON (Engine OFF). - Inspect voltage at MAF/IAT sensor terminal B (harness-side). - Is there voltage B+?	Yes	Go to next step.
		No	Inspect for open circuit in wiring harness between MAF/IAT sensor terminal B (harness-side) and main relay. Repair or replace harness, then go to Step 7.
4	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to Step 7.
		No	Go to next step.
5	INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT - Remove PCM with PCM connector connected. - Inspect for continuity between MAF/IAT sensor terminal C (harness-side) and PCM terminal 1P (harness-side). - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 7.
6	INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORTS - Inspect continuity between following circuits: - MAF/IAT sensor terminal C (harness-side) and body ground - MAF/IAT sensor connector terminal C (harness-side) and B (harness-side) - Are there any continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Replace MAF/IAT sensor, then go to next step.
7	VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

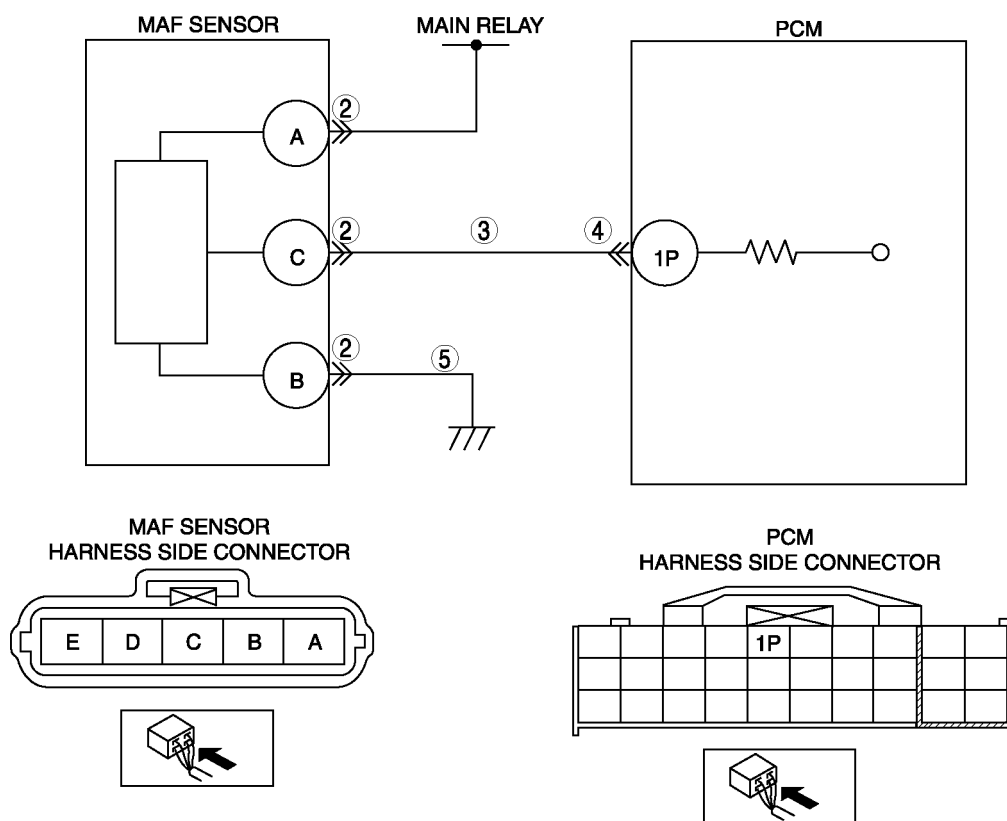
ON-BOARD DIAGNOSTIC

DTC P0103

A6E397001084W10

DTC P0103	MAF circuit high input
DETECTION CONDITION	- PCM monitors input voltage from MAF sensor when engine running. If input voltage at PCM terminal 1P is above 4.9 V, PCM determines that MAF circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- MAF sensor malfunction - Connector or terminal malfunction - Short to power in wiring between MAF/IAT sensor terminal C and PCM terminal 1P. - Open circuit in MAF/IAT sensor ground circuit

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes: Go to next step. No: Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR - Turn ignition key to OFF. - Disconnect the MAF/IAT sensor connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes: Repair or replace terminals, then go to Step 6. No: Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	INSPECT MAF SIGNAL CIRCUIT FOR SHORT TO POWER CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage between MAF/IAT sensor terminal C (harness-side) and body ground. - Is there voltage 0 V?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 6.
4	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to Step 6.
		No	Go to next step.
5	INSPECT MAF SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT - Remove PCM with PCM connector connected. - Inspect for continuity between MAF/IAT sensor terminal B (harness-side) and GND. - Is there any continuity?	Yes	Replace MAF/IAT sensor, then go to next step.
		No	Repair or replace suspected harness, then go to next step.
6	VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

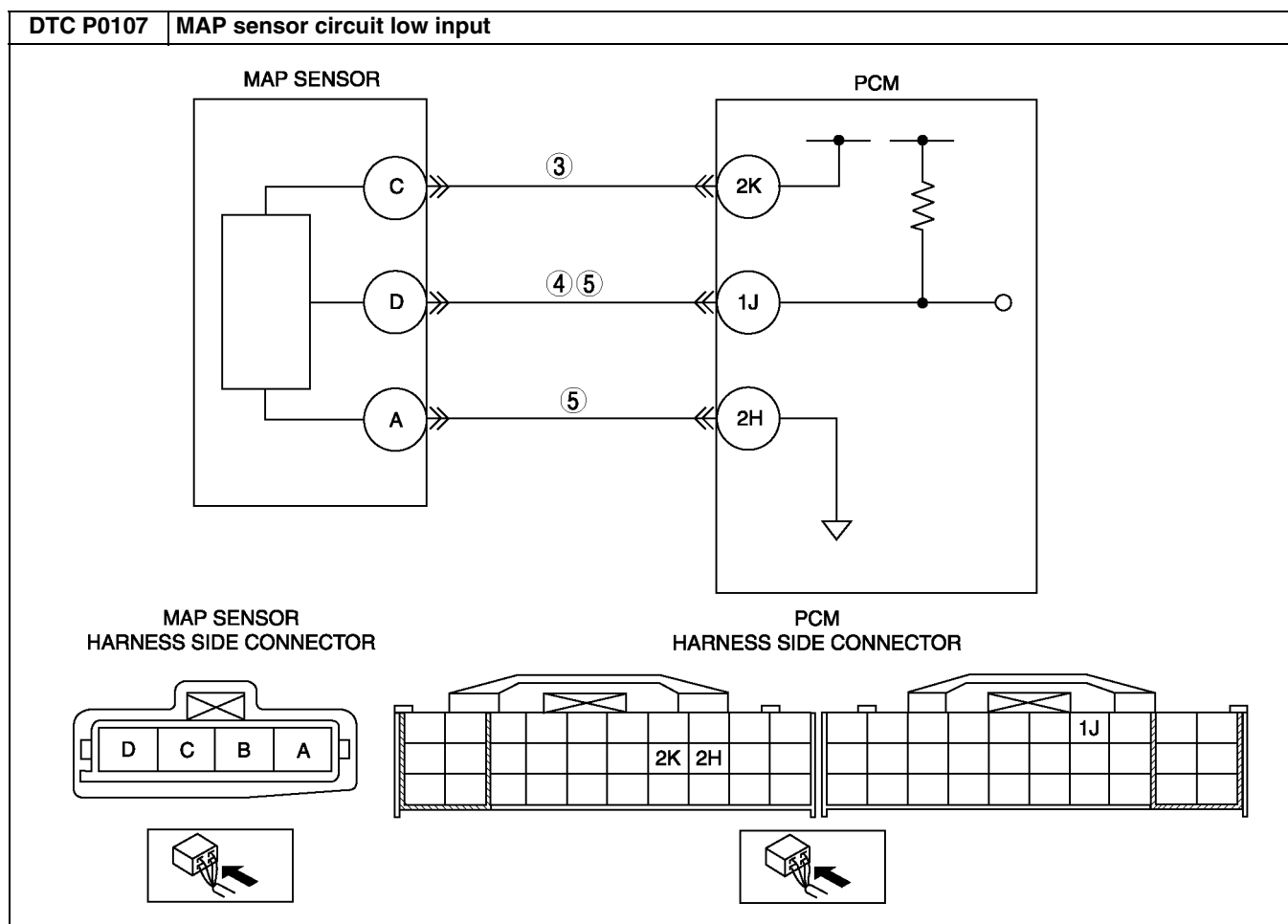
DTC P0107

A6E397001084W11

DTC P0107	MAP sensor circuit low input
DETECTION CONDITION	- PCM monitors input voltage from MAP sensor when intake air temperature is above 10 °C {50 °F}. If input voltage at PCM terminal 1J is below 0.1V, PCM determines that MAP sensor circuit has a malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- MAP sensor malfunction - Connector or terminal malfunction - Short to ground in wiring between MAP sensor terminal D and PCM terminal 1J - Open circuit in wiring between MAP sensor terminal C and PCM terminal 2K - MAP sensor signal circuit and MAP sensor ground circuit are shorted each other - PCM malfunction

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	VERIFY MAP PID WHEN MAP SENSOR CONNECTOR IS DISCONNECTED - Disconnect MAP sensor connector. - Is voltage above 4.9 V?	Yes Go to next step.
		No Go to step 4.
3	INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT MAP SENSOR CONNECTOR Note - If DTC P0122 and P2228 are also retrieved with P0107, go to CONSTANT VOLTAGE troubleshooting procedure. - Turn ignition key to ON (Engine OFF). - Measure voltage between MAP sensor terminal C (harness-side) and body ground. - Is voltage within 4.5—5.5 V?	Yes Check for poor connection of MAP sensor terminal C (harness-side). - Repair or replace terminal if necessary. - If okay, replace MAP sensor. Then go to Step 6.
		No Check for open circuit between PCM terminal 2K (harness-side) and MAP sensor terminal C (harness-side). Repair or replace suspected harness, then go to Step 6.
4	INSPECT MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect continuity between MAP sensor terminal D (harness-side) and body ground. - Is there continuity?	Yes Repair or replace suspected harness, then go to Step 6.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
5	INSPECT MAP SENSOR SIGNAL AND GROUND CIRCUIT FOR SHORT EACH OTHER - Check continuity between MAP sensor terminals D and A (harness-side). - Is there continuity?	Yes	Repair or replace suspected harness, then go to next step.
		No	Go to next step.
6	VERIFY TROUBLESHOOTING OF DTC P0107 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

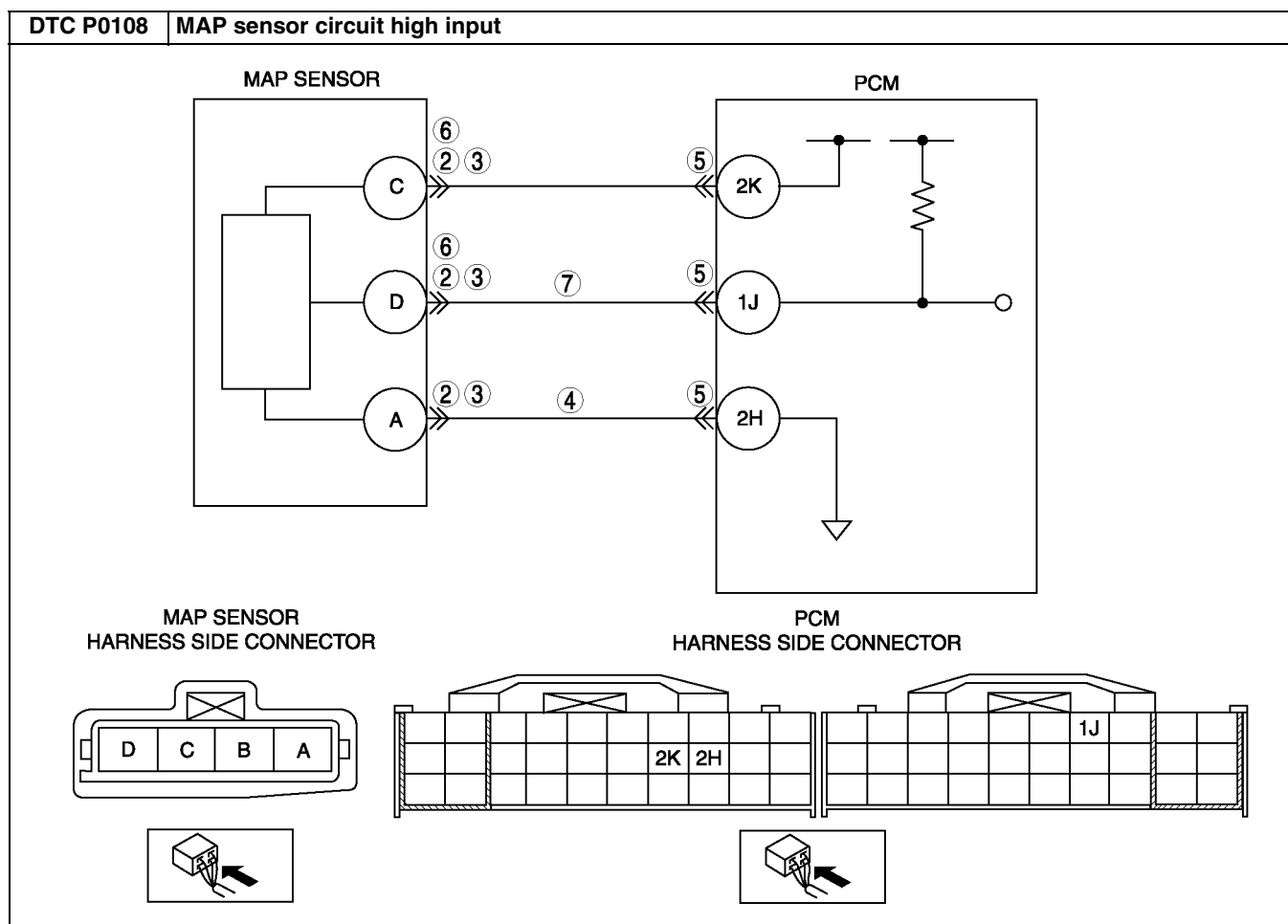
DTC P0108

A6E397001084W12

DTC P0108	MAP sensor circuit high input
DETECTION CONDITION	- PCM monitors input voltage from MAP sensor when intake air temperature is above 10 °C {50 °F}. If input voltage at PCM terminal 1J is above 4.9V, PCM determines that MAP sensor circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- MAP sensor malfunction - Connector or terminal malfunction - Open circuit in wiring between MAP sensor terminal A and PCM terminal 2H - Open circuit in wiring between MAP sensor terminal D and PCM terminal 1J - MAP sensor signal circuit shorts to constant voltage supply circuit - PCM malfunction

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT CONNECTION OF MAP SENSOR CONNECTOR - Turn ignition key to OFF. - Verify that the MAP sensor connector is connected securely. - Is connection okay?	Yes Go to next step.
		No Reconnect the connector, then go to Step 8.
3	INSPECT POOR CONNECTION OF MAP SENSOR CONNECTOR - Disconnect the MAP sensor connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Is there any malfunction?	Yes Repair or replace suspected terminal, then go to Step 8.
		No Go to next step.
4	VERIFY MAP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between MAP sensor terminal A (harness-side) and body ground. - Is there continuity?	Yes Go to next step.
		No Inspect for open circuit between PCM terminal 2H (harness-side) and MAP sensor terminal A (harness-side). Repair or replace suspected harness, then go to Step 8.
5	INSPECT PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection at terminal 2H (damaged, pulled-out pins, corrosion, etc.). - Is there any malfunction?	Yes Repair terminal, then go to Step 8.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
6	VERIFY MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT - Inspect for continuity between MAP sensor terminal D and C (harness-side). - Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 8.
		No	Go to next step.
7	VERIFY MAP SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between MAP sensor terminal D (harness-side) and PCM terminal 1J (harness-side). - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P0108 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0111

A6E397001084W13

DTC P0111	IAT circuit performance problem
DETECTION CONDITION	- If intake air temperature is higher than engine coolant temperature by 40 °C {104 °F} with ignition key on, the PCM determines that there is a IAT sensor performance problem. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- IAT sensor malfunction - Poor connection at MAF/IAT sensor or PCM connector - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	INSPECT POOR CONNECTION OF MAF/IAT SENSOR CONNECTOR - Turn ignition key to OFF. - Disconnect MAF/IAT sensor connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
4	INSPECT IAT SENSOR - Inspect IAT sensor. (See F-50 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION) - Is IAT sensor okay?	Yes	Replace MAF/IAT sensor, then go to Step 6.
		No	Go to next step.

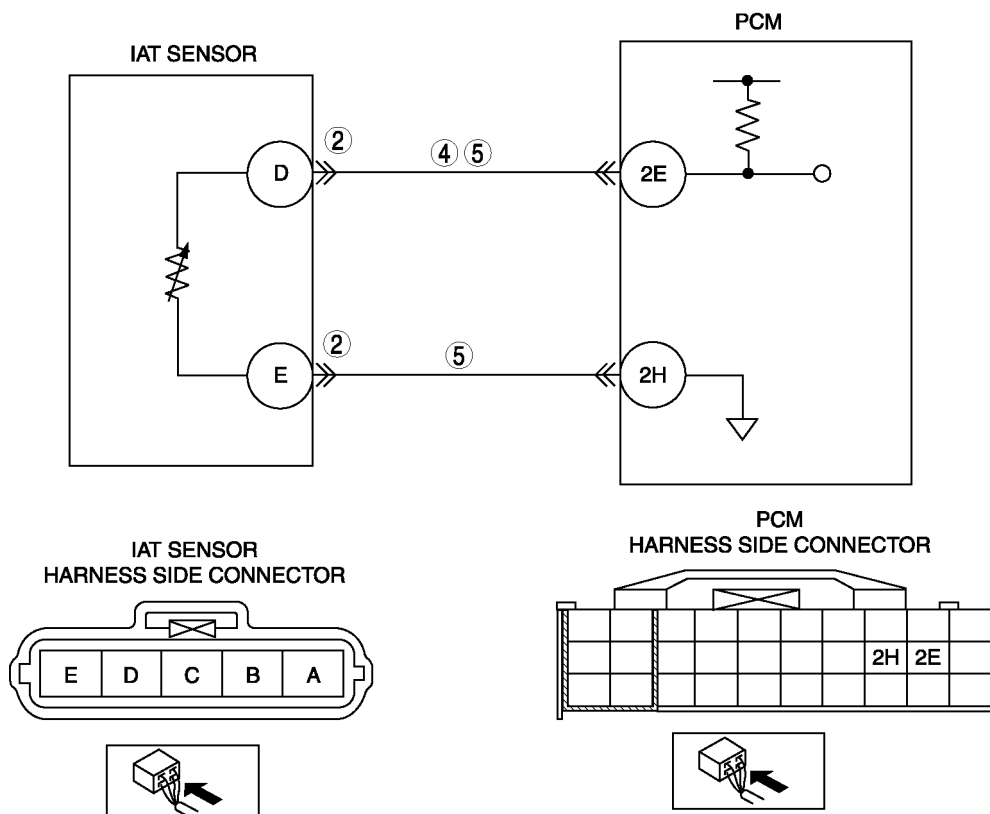
ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
6	VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Start engine and run engine under FREEZE FRAME DATA condition. - Is PENDING CODE the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE .)
		No	Troubleshooting completed.

DTC P0112

A6E397001084W14

DTC P0112	IAT circuit low input
DETECTION CONDITION	- PCM monitors IAT sensor signal at PCM terminal 2E. If PCM detects IAT sensor voltage below 0.15 V, PCM determines that IAT sensor circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- IAT sensor malfunction - Short to ground circuit between MAF/IAT sensor terminal D and PCM terminal 2E - Short each harness IAT signal circuit and IAT ground circuit. - PCM malfunction



ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION		ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT IAT SENSOR TERMINAL - Turn ignition key to OFF. - Disconnect MAF/IAT sensor connector. - Inspect for bent terminal of MAF/IAT sensor terminals D and E (part-side). - Is there any malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
3	CLASSIFY IAT SENSOR MALFUNCTION OR HARNESS MALFUNCTION - Connect WDS or equivalent to DLC-2. - Access IAT PID. - Verify IAT value when disconnecting MAF/IAT sensor connector. - Does IAT value change?	Yes	Replace MAF/IAT sensor, then go to Step 6.
		No	Go to next step.
4	INSPECT IAT SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect continuity between MAF/IAT sensor terminal D (harness-side) and body ground. - Is there any continuity?	Yes	Repair or replace harness for short to ground, then go to Step 6.
		No	Go to next step.
5	INSPECT IAT CIRCUITS FOR SHORT - Inspect continuity between MAF/IAT sensor terminals D and E (harness-side). - Is there continuity?	Yes	Repair or replace harness for short, then go to Step 6.
		No	Go to next step.
6	VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

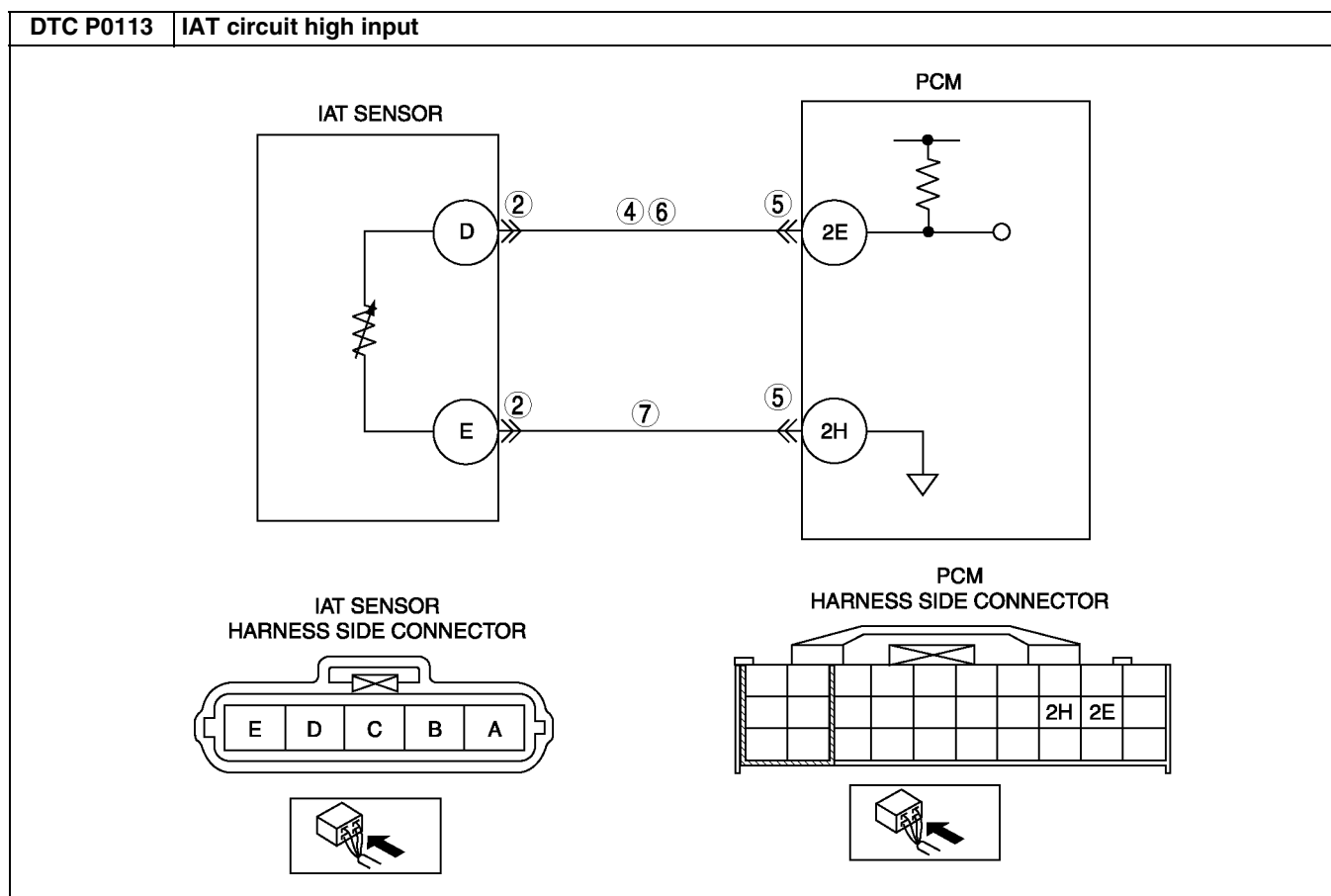
DTC P0113

A6E397001084W15

DTC P0113	IAT circuit high input
DETECTION CONDITION	- PCM monitors input voltage from IAT sensor. If input voltage at PCM terminal 2E is above 4.9 V, PCM determines that IAT sensor circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- IAT sensor malfunction - Open circuit between MAF/IAT sensor terminal D and PCM terminal 2E - Short to power circuit between MAF/IAT sensor terminal D and PCM terminal 2E - Open circuit between MAF/IAT sensor terminal E and PCM terminal 2H - Poor connection at MAF/IAT sensor or PCM connector. - PCM malfunction

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	INSPECT POOR CONNECTION OF IAT SENSOR CONNECTOR - Turn ignition key to OFF. - Disconnect MAF/IAT sensor connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
3	CLASSIFY IAT SENSOR MALFUNCTION OR HARNESS MALFUNCTION - Connect WDS or equivalent to DLC-2. - Access IAT PID. - Connect a jumper wire between MAF/IAT sensor terminals D and E. - Verify IAT value - Is voltage below 4.9 V?	Yes	Replace MAF/IAT sensor, then go to Step 8.
		No	Go to next step.
4	INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (Engine OFF). - Measure voltage between MAF/IAT sensor terminal D (harness-side) and body ground. - Is voltage B+?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect PCM terminals 2E and 2H (harness-side) for tightness using feeler tool. - Are there any malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
6	INSPECT IAT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between MAF/IAT sensor terminal D (harness-side) and PCM terminal 2E. - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
7	INSPECT IAT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between MAF/IAT sensor terminal E (harness-side) and PCM terminal 2H. - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

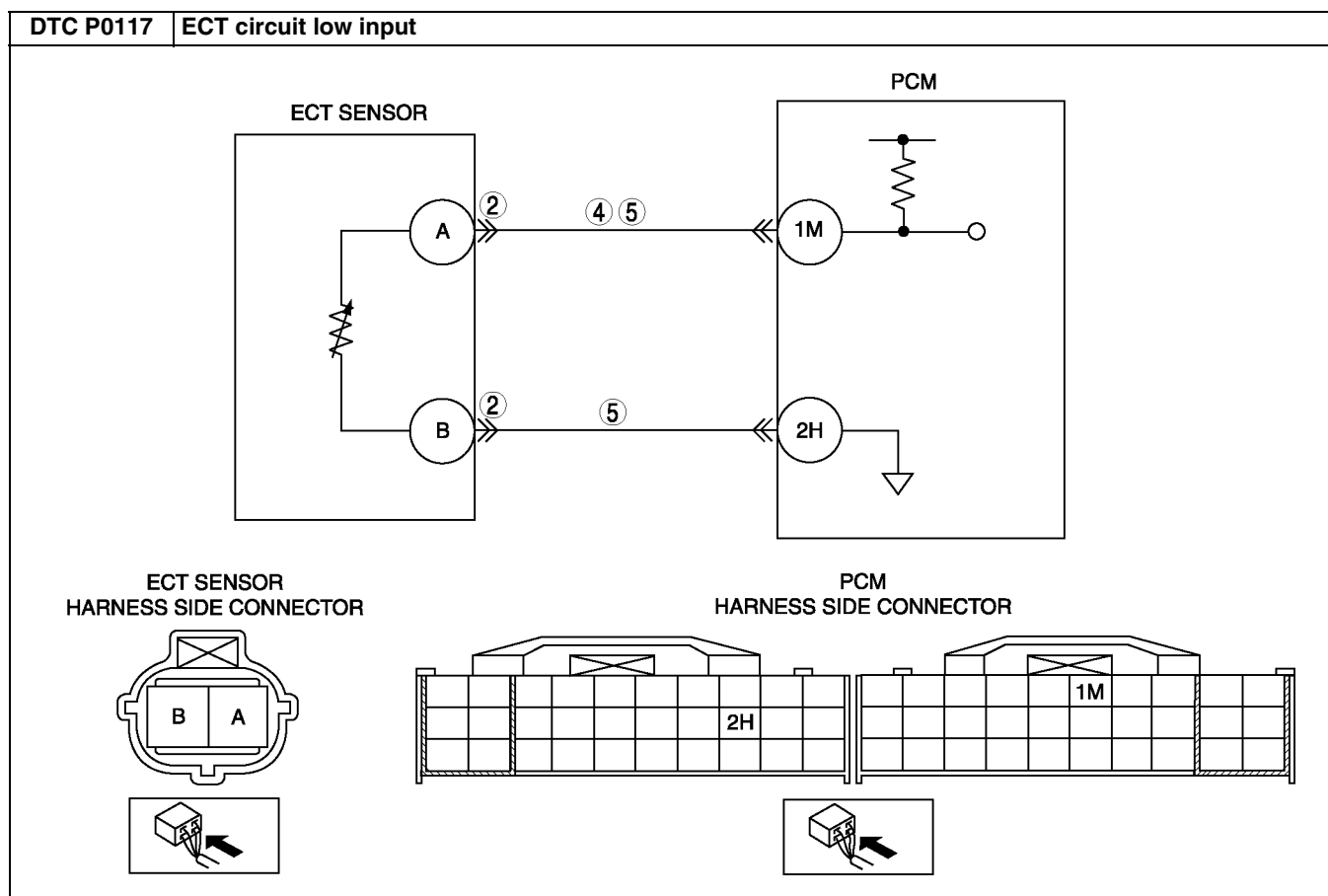
DTC P0117

A6E397001084W16

DTC P0117	ECT circuit low input
DETECTION CONDITION	- PCM monitors ECT sensor signal at PCM terminal 1M. If PCM detects ECT sensor voltage below 0.2 V, PCM determines that the ECT sensor circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ECT sensor malfunction - Connect or terminal malfunction - Short to ground circuit between ECT sensor terminal A and PCM connector terminal 1M. - Short each harness ECT signal circuit and ECT ground circuit. - PCM malfunction

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT TERMINAL BENT - Turn ignition key to OFF. - Disconnect ECT sensor connector. - Inspect for bent of ECT sensor terminals A and B (part-side). - Is there any malfunction?	Yes Repair or replace terminal, then go to Step 6.
		No Go to next step.
3	CLASSIFY ECT SENSOR MALFUNCTION OR HARNESS MALFUNCTION - Connect WDS or equivalent to DLC-2. - Access ECT PID. - Verify ECT value when disconnecting ECT sensor connector. - Does ECT value change?	Yes Replace ECT sensor, then go to Step 6.
		No Go to next step.
4	INSPECT ECT SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between ECT sensor terminal A (harness-side) and body ground. - Is there any continuity?	Yes Repair or replace harness for short to ground, then go to Step 6.
		No Go to next step.
5	INSPECT IAT CIRCUIT FOR SHORT HARNESSES - Inspect continuity between ECT sensor terminal A and B (harness-side). - Is there any continuity?	Yes Repair or replace harness for short, then go to next step.
		No Go to next step.

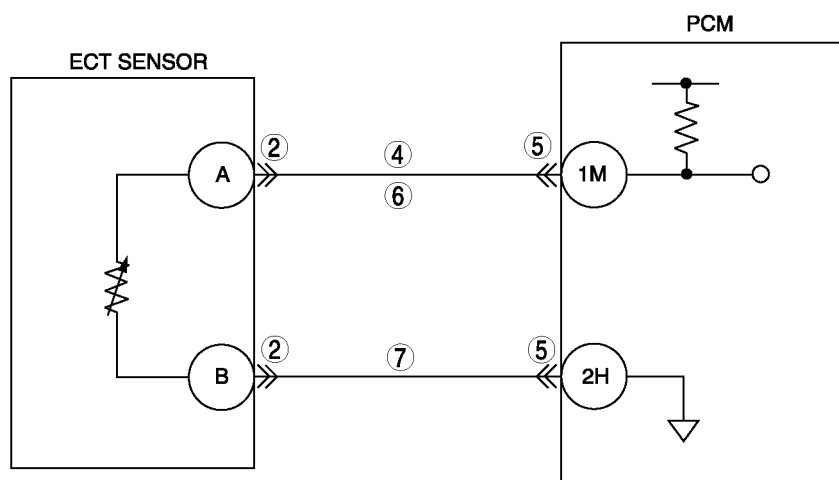
ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
6	VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

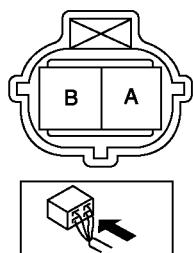
DTC P0118

A6E397001084W17

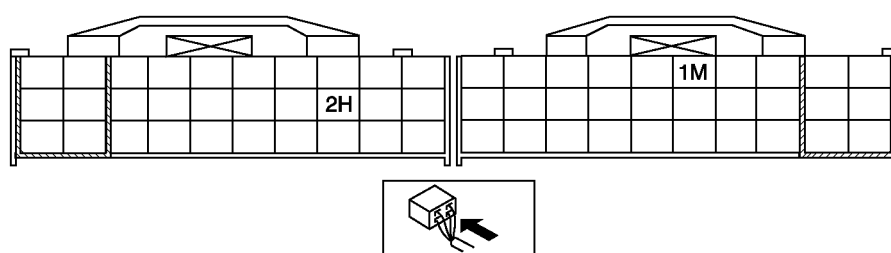
DTC P0118	ECT circuit high input
DETECTION CONDITION	PCM monitors ECT sensor signal at PCM terminal 1M. If PCM detects ECT sensor voltage above 4.6 V, PCM determines that ECT sensor circuit has malfunction.
	Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ECT sensor malfunction - Open circuit between ECT sensor terminal A and PCM terminal 1M - Short to power circuit between ECT sensor terminal A and PCM terminal 1M - Open circuit between ECT sensor terminal B and PCM terminal 2H - Poor connection of ECT sensor or PCM connectors - PCM malfunction



ECT SENSOR
HARNESS SIDE CONNECTOR



PCM
HARNESS SIDE CONNECTOR



ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT POOR CONNECTION OF ECT SENSOR CONNECTOR - Turn ignition key to OFF. - Disconnect ECT sensor connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
3	CLASSIFY ECT SENSOR MALFUNCTION OR HARNESS MALFUNCTION - Connect WDS or equivalent to DLC-2. - Access ECT PID. - Connect a jumper wire between ECT sensor terminals A and B. - Verify ECT value - Is voltage below 4.5 V?	Yes	Replace ECT sensor, then go to Step 8.
		No	Go to next step.
4	INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (Engine OFF). - Measure voltage between ECT sensor terminal A (harness-side) and body ground. - Is there voltage B+?	Yes	Repair or replace harness for short to power, then go to Step 8.
		No	Go to next step.
5	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunction?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
6	INSPECT ECT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between ECT sensor terminal A (harness-side) and PCM terminal 1M. - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 8.
7	INSPECT ECT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between ECT sensor terminal B (harness-side) and PCM terminal 2H. - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0121

A6E397001084W18

DTC P0121	Throttle position stuck close (lower than expected)/open (higher than expected)
DETECTION CONDITION	- If PCM detects that throttle valve opening angle is below 12.5% for 5 s after following conditions are met, PCM determines that TP is stuck closed: MONITORING CONDITION - Engine coolant temperature above 80 °C {176 °F} - MAF sensor signal above 32.0 g/s {4.2 lb/minutes} - If PCM detects that throttle valve opening angle is above 50% for 5 seconds after following conditions are met, the PCM determines that TP is stuck open: MONITORING CONDITION - Engine speed above 500 rpm - MAF sensor signal 5 g/s {0.7 lb/min.} Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- TP sensor malfunction - Electrical corrosion in TP signal circuit - Voltage drops in constant voltage supply circuit - Voltage drops in ground circuit - MAF sensor malfunction - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED PENDING CODE OR STORED DTC - Turn ignition key to ON (Engine OFF). - Retrieve pending or stored DTC using WDS or equivalent. - Is DTC P0101 also retrieved?	Yes Go to DTC P0101 troubleshooting procedure.
		No Go to next step.
3	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT - Start the engine. - Access ECT, TP and MAF PIDs using WDS or equivalent. - Warm up the engine until ECT PID is above 80 °C {176 °F} - Drive the vehicle. - Read TP PID while MAF PID is above 32.0 g/s {4.2 lb/min.} - Is TP PID reading above 12.5%?	Yes Go to Step 7.
		No Go to next step.
5	VERIFY TP PID - Start engine. - Access TP, MAF and RPM PIDs using WDS or equivalent. - Read TP PID while MAF PID is below 4.8 g/s {0.6 lb/min.} and RPM PID is above 500 rpm. - Is TP PID reading above 50%?	Yes Go to Step 12.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
6	VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT - Drive the vehicle and read MAF PID. - Does MAF PID change in compliance with driving condition?	Yes Intermittent concern exists. Go to INTERMITTENT CONCERNS troubleshooting procedure.
		No Inspect Mass airflow sensor and related circuits and terminals. (See F-51 MASS AIR FLOW (MAF) SENSOR INSPECTION.) Repair or replace as necessary, then go to Step 16.
7	INSPECT TP SENSOR TERMINALS FOR ELECTRICAL CORROSION - Turn ignition key to OFF. - Disconnect TP sensor connector - Inspect for electrical corrosion on male and female TP sensor terminals. - Is any electrical corrosion found?	Yes Repair or replace suspected terminal or TP sensor, then go to Step 11.
		No Go to next step.
8	VERIFY TP SENSOR Does TP sensor resistance smoothly change while gradually opening throttle valve?	Yes Go to next step.
		No Replace TP sensor, then go to Step 11.
9	INSPECT PCM TERMINALS FOR ELECTRICAL CORROSION - Disconnect PCM connector. - Inspect for electrical corrosion on PCM male and female terminals. - Is any electrical corrosion found?	Yes Repair terminal, then go to Step 11.
		No Go to next step.
10	INSPECT CONSTANT VOLTAGE SUPPLY AND TP SIGNAL CIRCUITS FOR VOLTAGE DROP - Turn ignition key to ON (Engine OFF). - Inspect voltage between following terminals: - TP sensor connector terminal C (harness-side) and PCM terminal 2K - TP sensor connector terminal B (harness-side) and PCM terminal 2A - Is voltage approx. 0 V?	Yes Go to next step.
		No Inspect for rust or corrosion on PCM terminals 2A and 2K (harness-side). Repair or replace suspected terminal then go to next step.
11	VERIFY TROUBLESHOOTING OF DTC P0121 COMPLETED - Make sure to reconnect all disconnected connectors. - Start the engine. - Clear DTC from PCM memory using WDS or equivalent. - Access ECT, TP and MAF PIDs using WDS or equivalent. - Warm up the engine until ECT PID is reading above 80 °C {176°F}. - Drive the vehicle and read TP and MAF PIDs. - Verify PIDs reading are within specifications MAF PID: above 32.0 g/s {4.2 lb/min.} TP PID: above 12.5% above 5 s - Is PENDING CODE of same DTC present?	Yes Replace PCM, then go to Step 17.
		No Go to Step 17.
12	INSPECT TP SENSOR TERMINALS FOR ELECTRICAL CORROSION - Turn ignition key to OFF. - Disconnect TP sensor connector. - Inspect for electrical corrosion on male and female TP sensor terminals. - Is any electrical corrosion found?	Yes Repair or replace suspected terminal or TP sensor, then go to Step 16.
		No Go to next step.
13	INSPECT GROUND CIRCUIT FOR VOLTAGE DROP - Inspect resistance between TP sensor terminal A (harness-side) and body ground. - Is resistance approx. 0 ohm?	Yes Go to next step.
		No Repair or replace for rust or corrosion on PCM terminal 2H (harness-side). Repair or replace suspected terminal. Go to Step 16.
14	VERIFY TP SENSOR Does resistance smoothly change while gradually opening throttle valve?	Yes Go to next step.
		No Replace TP sensor, then go to Step 16.

ON-BOARD DIAGNOSTIC

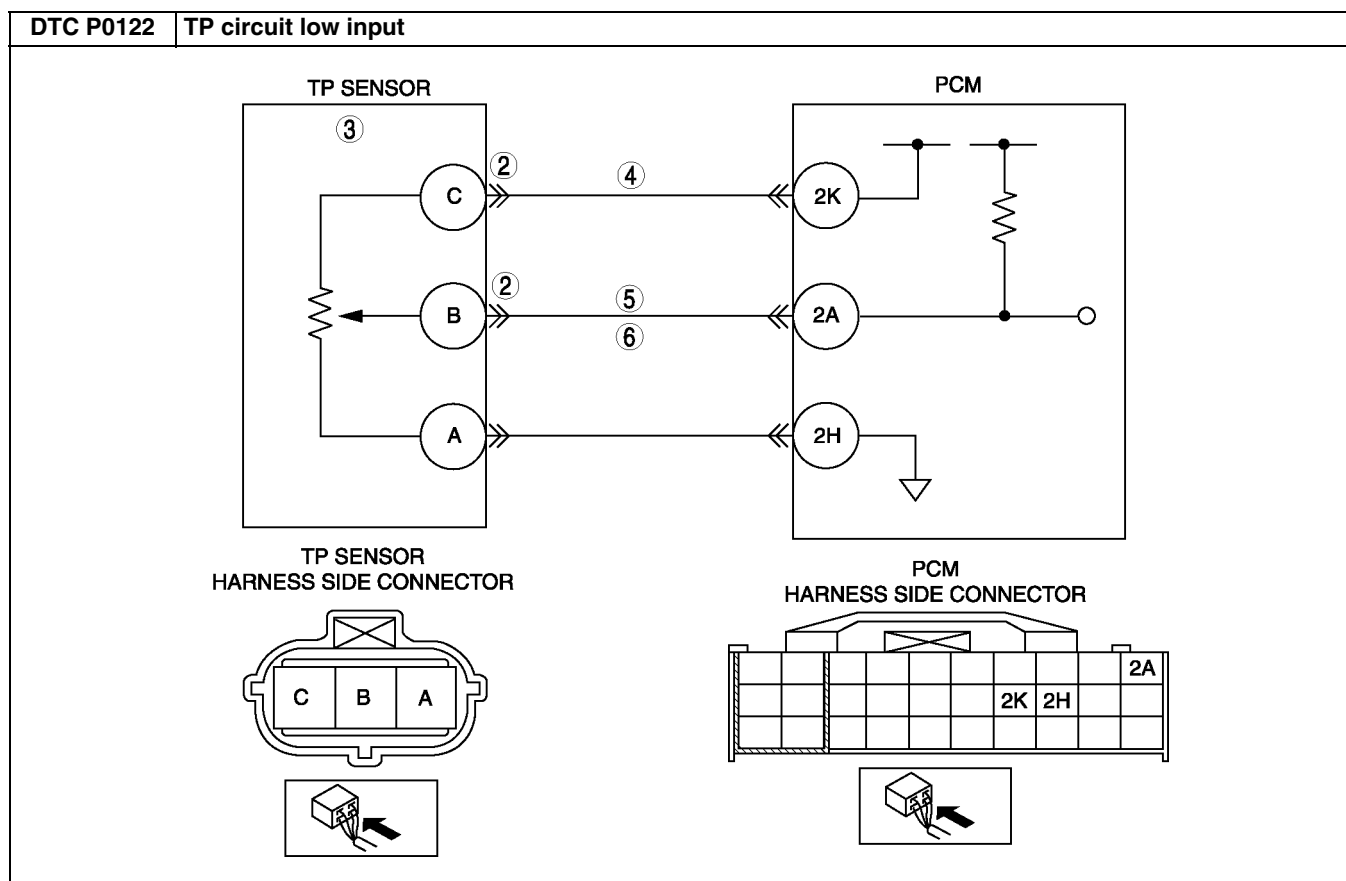
STEP	INSPECTION	ACTION	
15	INSPECT PCM TERMINALS FOR ELECTRICAL CORROSION - Disconnect PCM connector. - Inspect for electrical corrosion on PCM and PCM connector male and female terminals. - Is any electrical corrosion found?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
16	VERIFY TROUBLESHOOTING OF DTC P0121 COMPLETED - Make sure to reconnect all disconnected connectors. - Start engine. - Clear DTC from PCM memory using WDS or equivalent. - Access RPM, TP and MAF PIDs using WDS or equivalent. - Verify TP PID is reading below 50% while MAF PID is below 4.8 g/s {0.6 lb/min.} and RPM PID is above 500 rpm. - Is pending code the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
17	VERIFY AFTER REPAIR PROCEDURE Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0122

A6E397001084W19

DTC P0122	TP circuit low input
DETECTION CONDITION	- If PCM detects TP sensor voltage at PCM terminal 2A is below 0.1 V while engine running, PCM determines that TP circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions in first drive cycles. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- TP sensor malfunction - Connector or terminal malfunction - Open circuit between TP sensor terminal B and PCM terminal 2A - Short to ground circuit between TP sensor terminal B and PCM terminal 2A - Open circuit between TP sensor terminal C and PCM terminal 2K

ON-BOARD DIAGNOSTIC



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	CLASSIFY TP SENSOR OR HARNESS MALFUNCTION - Connect WDS or equivalent. - Access TP PID. - Disconnect TP sensor connector. - Connect a jumper wire between TP sensor terminals B and C (harness-side). - Is voltage above 4.9 V?	Yes	Go to next step.
		No	Go to step 4.
3	INSPECT TP SENSOR - Perform TP sensor inspection. (See F-51 THROTTLE POSITION (TP) SENSOR INSPECTION.) - Is TP sensor okay?	Yes	Inspect for poor TP sensor connector terminal C connection. Repair or replace as necessary, then go to Step 7.
		No	Replace TP sensor, then go to Step 7.
4	INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT TP SENSOR CONNECTOR Note - If DTC P0107 and P2228 are also retrieved with P0122, go to CONSTANT VOLTAGE troubleshooting procedure. - Turn ignition key to ON (Engine OFF). - Inspect voltage at TP sensor terminal 2k (harness-side). - Is there voltage within 4.5—5.5 V?	Yes	Go to next step.
		No	Repair or replace open circuit between TP sensor connector terminal C and PCM connector terminal 2K (harness-side). Then, then go to Step 7.

ON-BOARD DIAGNOSTIC

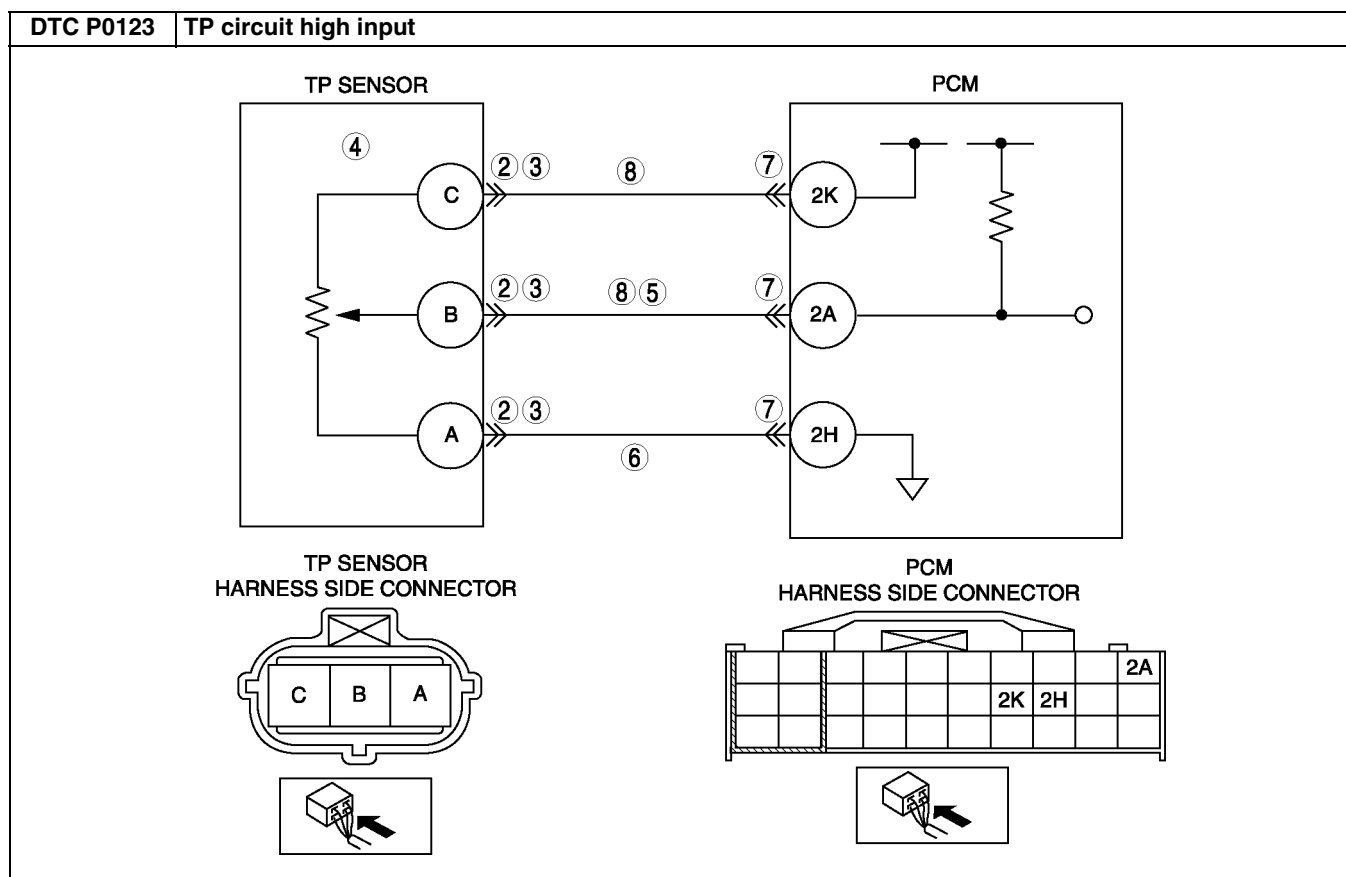
STEP	INSPECTION	ACTION	
5	VERIFY TP SIGNAL CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Inspect continuity between TP sensor terminal B (harness-side) and PCM terminal 2A. - Is there continuity?	Yes	Go to next step.
		No	Repair or replace suspected harness, then go to Step 7.
6	VERIFY TP SIGNAL CIRCUIT FOR SHORT TO GROUND - Inspect continuity between TP sensor terminal B (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 7.
		No	Go to next step.
7	VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0123

A6E397001084W20

DTC P0123	TP circuit high input
DETECTION CONDITION	- If PCM detects TP sensor voltage at PCM terminal 2A is above 4.9 V after ignition key to on, the PCM determines that TP circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in first drive cycles. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- TP sensor malfunction - Connector or terminal malfunction - Open circuit between TP sensor terminal A and PCM terminal 2H - Short to constant voltage supply circuit between TP sensor terminal B and PCM terminal 2A

ON-BOARD DIAGNOSTIC



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	INSPECT TP SENSOR CONNECTOR - Turn ignition key to OFF. - Verify that the TP sensor connector is connected securely. - Is connector okay?	Yes	Go to next step.
		No	Connect the connector securely, then go to Step 9.
3	INSPECT POOR CONNECTION OF TP SENSOR CONNECTOR - Disconnect TP sensor connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair or replace suspected terminal, then go to Step 9.
		No	Go to next step.
4	INSPECT TP SENSOR - Perform TP sensor inspection. (See F-51 THROTTLE POSITION (TP) SENSOR INSPECTION.) - Is TP sensor okay?	Yes	Go to next step.
		No	Replace TP sensor, then go to Step 9.
5	INSPECT TP SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (Engine OFF). - Measure voltage between terminal B and body ground. - Is voltage above 4.9?	Yes	Repair or replace short to power circuit. Then, go to Step 9.
		No	Go to next step.
6	VERIFY TP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between TP sensor connector terminal A and body ground. - Is there continuity?	Yes	Repair or replace open circuit between TP sensor connector terminal A (harness-side) and PCM connector terminal 2H (harness-side). Then, go to Step 9.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
7	INSPECT PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes Repair terminal, then go to Step 9.
		No Go to Step 9.
8	VERIFY TP SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT - Inspect continuity between TP sensor connector terminals B and C. - Is there continuity?	Yes Repair or replace suspected harness, then go to next step.
		No Go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P0125

A6E397001084W21

DTC P0125	Excessive time to enter closed loop fuel control
DETECTION CONDITION	- PCM monitors ECT sensor signal at PCM terminal 1M after engine is started while engine is cold. If engine coolant temperature does not reach the expected temperature for specified period, PCM determines that it has taken an excessive amount of time for the engine coolant temperature to reach the temperature necessary to start closed-loop fuel control. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- ECT sensor malfunction - Poor connection of connectors - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT - Start engine. - Warm up engine completely. - Access ECT PID using WDS or equivalent. - Is ECT PID above 60 °C {140 °F}?	Yes Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
		No Go to next step.
4	INSPECT POOR CONNECTION OF ECT SENSOR CONNECTOR - Turn ignition key to OFF. - Disconnect ECT sensor connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes Repair or replace terminal, then go to Step 7.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT ECT SENSOR - Inspect ECT sensor. (See F-53 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION.) - Is it okay?	Yes	Go to next step.
		No	Replace ECT sensor, then go to Step 7.
6	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out pins, corrosion, etc.). - Are there any malfunctions?	Yes	Repair or replace terminal, then go to next step.
		No	Go to next step.
7	VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Turn ignition key to ON (Engine OFF). - Access ECT PID using WDS or equivalent. - Wait until ECT PID below 20 °C {68 °F}. - Start engine and warm it up completely. - Is PENDING CODE the same as DTC stored?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0131, P0132

A6E397001084W22

DTC P0131 DTC P0132	Front HO2S stuck low Front HO2S stuck high
DETECTION CONDITION	- PCM monitors input voltage from front HO2S when the following monitoring conditions are met. If input voltage from sensor remains below or above 0.45 V for 41.2 s, PCM determines that there is no front HO2S inversion. MONITORING CONDITIONS - Engine speed is above 1,500 rpm. - Engine coolant temperature is above 80 °C {176°F}. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Front HO2S malfunction - Front HO2S heater malfunction - Fuel injector malfunction - Pressure regulator malfunction - Fuel pump malfunction - Fuel delivery hose clogging or leakage - Fuel filter clogging - Fuel return hose clogging or leakage - Air suction or leakage - PCV valve malfunction - Purge solenoid valve malfunction - Purge solenoid hoses are hooked up incorrectly. - Ignition coil malfunction - Insufficient compression - Engine malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	VERIFY RELATED PENDING AND STORED DTCs - Turn ignition key to OFF, then ON (Engine OFF). - Verify pending and stored DTCs using WDS or equivalent. - Is other DTC present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA Is DTC P0131 and P0132 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	VERIFY CURRENT INPUT SIGNAL STATUS - IS CONCERN INTERMITTENT OR CONSTANT - Warm-up engine. - Access O2S11 for P0131 and P0132 PID using WDS or equivalent. - Verify PID while racing engine (in PARK (ATX) or NEUTRAL (MTX)). - Is PID reading okay? More than 0.45 V when suddenly depress accelerator pedal (rich condition) Less than 0.45 V just after release of accelerator pedal (lean condition)	Yes	Go to next step.
		No	Replace front HO2S, then go to Step 19.
6	INSPECT LONG TERM FUEL TRIM - Access LONGFT1 for P0131 and P0132 PID using WDS or equivalent. - Compare it with FREEZE FRAME DATA recorded at Step1. - Was it decreased?	Yes	Engine is driven under rich condition. Go to next step.
		No	Engine is driven under lean condition. Go to step 9.
7	INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE) - Turn ignition key to OFF. - Inspect fuel line pressure. (See F-20 FUEL LINE PRESSURE INSPECTION.) - Is fuel line pressure okay?	Yes	Go to next step.
		No	Inspect following parts and repair or replace if necessary: - Fuel pump maximum pressure - Fuel return pipe for clogged - If all items above are okay, replace pressure regulator. Then, go to Step 19.
8	INSPECT PURGE SOLENOID VALVE FOR STUCK OPEN - Turn ignition key to OFF. - Disconnect both hoses from purge solenoid valve. - Blow air through purge solenoid valve. - Does air blow through?	Yes	Replace purge solenoid valve.
		No	Go to Step 13.
9	INSPECT PCV VALVE OPERATION - Inspect PCV valve operation. (See F-41 PCV VALVE INSPECTION.) - Is PCV valve okay?	Yes	Go to next step.
		No	Replace PCV, then go to Step 19.
10	INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE) - Turn ignition key to OFF. - Inspect fuel line pressure. (See F-20 FUEL LINE PRESSURE INSPECTION.) - Is fuel line pressure okay?	Yes	Go to step 13.
		No	Go to next step.
11	INSPECT FUEL PUMP MAXIMUM PRESSURE - Stop engine. - Turn ignition key to ON (Engine OFF). - Perform fuel pump maximum pressure test. (See F-20 FUEL LINE PRESSURE INSPECTION.) - Is fuel pump maximum pressure okay?	Yes	Go to next step.
		No	Inspect fuel pump circuit for open or poor connection. - Repair or replace suspected circuit. - If circuit is okay, replace fuel pump. Then go to Step 19.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
12	INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PUMP - Visually inspect fuel line for any leakage. - Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 19.
		No	Inspect fuel filters for following: - Restriction or clogging at fuel filter (high-pressure side). - Foreign materials or stain inside fuel filter (low-pressure side) - If restriction or clogging is found at fuel filter (high-pressure side), replace fuel filter. - If foreign materials or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. - If all items above are okay, replace pressure regulator. Then, go to Step 19.
13	CHECK IGNITION COIL OPERATION - Perform spark test. (See F-232 Spark Test) - Do all cylinders show blinking condition?	Yes	Go to step 16.
		No	Go to next step.
14	INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR - Disconnect ignition coil connector. - Turn ignition key to ON (Engine OFF). - Measure voltage between ignition coil connector terminal D (harness-side) and body ground. - Is the voltage reading B+?	Yes	Go to next step.
		No	Check for open circuit between ignition coil connector and ignition switch. Repair or replace wiring harness, then go to Step 19.
15	INSPECT IGNITION COIL RESISTANCE - Check ignition coil resistance. (See G-9 IGNITION COIL INSPECTION.) - Is coil resistance okay?	Yes	Go to next step.
		No	Replace ignition coil, then go to Step 19.
16	INSPECT ENGINE COMPRESSION - Inspect engine compression. (See B-9 COMPRESSION INSPECTION.) - Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
17	INSPECT FUEL INJECTOR OPERATION - Turn ignition key to OFF. - Inspect injector. (See F-31 FUEL INJECTOR INSPECTION.) - Is injector okay?	Yes	Go to next step.
		No	Replace injector, then go to Step 19.
18	INSPECT SEALING OF ENGINE COOLANT PASSAGE Warning Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. When removing radiator cap, wrap a thick cloth around and turn it slowly. - Remove radiator cap. - Implement procedure to bleed air from engine coolant, then run engine at idle. - Is there any small bubble, which makes engine coolant white at filling opening? Note - Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing to head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.

F

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
19	VERIFY TROUBLESHOOTING OF DTC P0131 or P0132 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Start engine. - Access ECT and RPM PIDs using WDS or equivalent. - Make sure that ECT PID is above 80 °C {176 °F}. - Increase and keep engine speed above 1,500 rpm for at least 1 min. - Is pending code the same as DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
20	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P0133

A6E397001084W23

DTC P0133	Front HO2S circuit malfunction
DETECTION CONDITION	- PCM monitors inversion cycle period, lean-to-rich response time and rich-to-lean response time of the sensor. PCM calculates the average of the inversion cycle period-specified inversion cycles, average response time from lean-to-rich, and from rich-to-lean when following conditions are met. If any exceeds threshold, PCM determines that circuit has malfunction. MONITORING CONDITIONS - Drive mode 3 - Following conditions are met: - Calculation load 14.8—59.4 % (at 2,000 rpm). - Engine speed 1,410—4,000 rpm (MTX) - Engine speed 1,190—4,000 rpm (ATX) - Vehicle speed is above 3.76 km/h - Engine coolant temperature is above -10 °C {14 °F} - Front HO2S signal inversion cycle is above 10 cycles Diagnostic support note - This is an intermittent monitor. (OXYGEN SENSOR) - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - DIAGNOSTIC MONITORING TEST RESULTS is available. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Front HO2S deterioration - Front HO2S heater malfunction - Pressure regulator malfunction - Fuel pump malfunction - Fuel filter clogged or restricted - Fuel leakage on fuel line from fuel distribution pipe and fuel pump - Leakage exhaust system - Purge solenoid valve malfunction - Purge solenoid hoses improper connection - Insufficient compression - Engine malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
3	VERIFY RELATED PENDING AND STORED DTCs - Turn ignition key to OFF, then ON (Engine OFF). - Verify pending and/or stored DTCs using WDS or equivalent. - Is DTC P0443 also present?	Yes Go to DTC P0443 troubleshooting procedures, then go to Step 13.
		No Go to next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA Is DTC P0133 on FREEZE FRAME DATA?	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See F-67 DTC TABLE .)
5	VERIFY CURRENT INPUT SIGNAL STATUS - Warm up engine. - Access O2S11 PID using WDS or equivalent. - Inspect PID under following accelerator pedal conditions (in PARK (ATX) or NEUTRAL (MTX)). - Is PID reading okay? More than 0.55 V when suddenly depress accelerator pedal (rich condition). Less than 0.55 V just after release of accelerator pedal (lean condition).	Yes Go to step 8.
		No Go to next step.
6	INSPECT INSTALLATION OF FRONT HO2S - Inspect if front HO2S is loosely installed. - Is sensor installed securely?	Yes Go to next step.
		No Retighten sensor, then go to Step 13.
7	INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM - Visually check if any gas leakage is found between exhaust manifold and front HO2S. - Is there any gas leakage?	Yes Repair or replace any faulty exhaust parts, then go to Step 13.
		No Replace sensor, then go to Step 13.
8	INSPECT LONG TERM FUEL TRIM - Access LONGFT1 PIDs - Compare it with FREEZE FRAME DATA recorded at Step 1. - Is it below FFD value?	Yes Engine is driven under rich condition. Go to next step.
		No Engine is driven under lean condition. Go to step 10.
9	INSPECT FUEL LINE PRESSURE (Excessive fuel line pressure) - Turn ignition key to OFF. - Inspect fuel line pressure while engine running. (See F-20 FUEL LINE PRESSURE INSPECTION.) - Is fuel line pressure okay?	Yes Go to next step.
		No Inspect fuel pump maximum pressure and fuel return pipe for clogging. (See F-25 FUEL PUMP UNIT INSPECTION .) - If any problem is found, repair or replace suspected parts. - If all items above are okay, replace fuel pump unit. Then go to Step 13.
10	INSPECT FUEL LINE PRESSURE (Low fuel line pressure) - Turn ignition key to OFF. - Inspect fuel line pressure while engine running. (See F-20 FUEL LINE PRESSURE INSPECTION.) - Is fuel line pressure okay?	Yes Go to step 13.
		No Go to next step.
11	INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE - Visually inspect fuel line for any leakage. - Is any fuel leakage found?	Yes Replace suspected fuel line, then go to Step 13.
		No Inspect fuel filters for following: - Restriction or clogging at fuel filter (high-pressure side) - Foreign materials or stain inside fuel filter (low-pressure side) Perform following actions according to result. - If restriction or clogging is found at fuel filter (high-pressure side), replace fuel filter. - If foreign material or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. - If all items above are okay, replace pressure regulator. Then go to Step 13.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
12	INSPECT SEALING OF ENGINE COOLANT PASSAGE Warning - Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. - When removing radiator cap, wrap a thick cloth around and turn it slowly. - Remove radiator cap. - Implement procedure to bleed air from engine coolant, then run engine at idle. - Is there any small bubble, which makes engine coolant white at filling opening? Note - Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes	Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.
13	VERIFY TROUBLESHOOTING OF DTC P0133 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition switch to ON (Engine OFF) - Clear DTC from memory using WDS or equivalent generic OBD function. - Run OBD drive mode. - Is PENDING CODE the same as DTC present?.	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
14	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

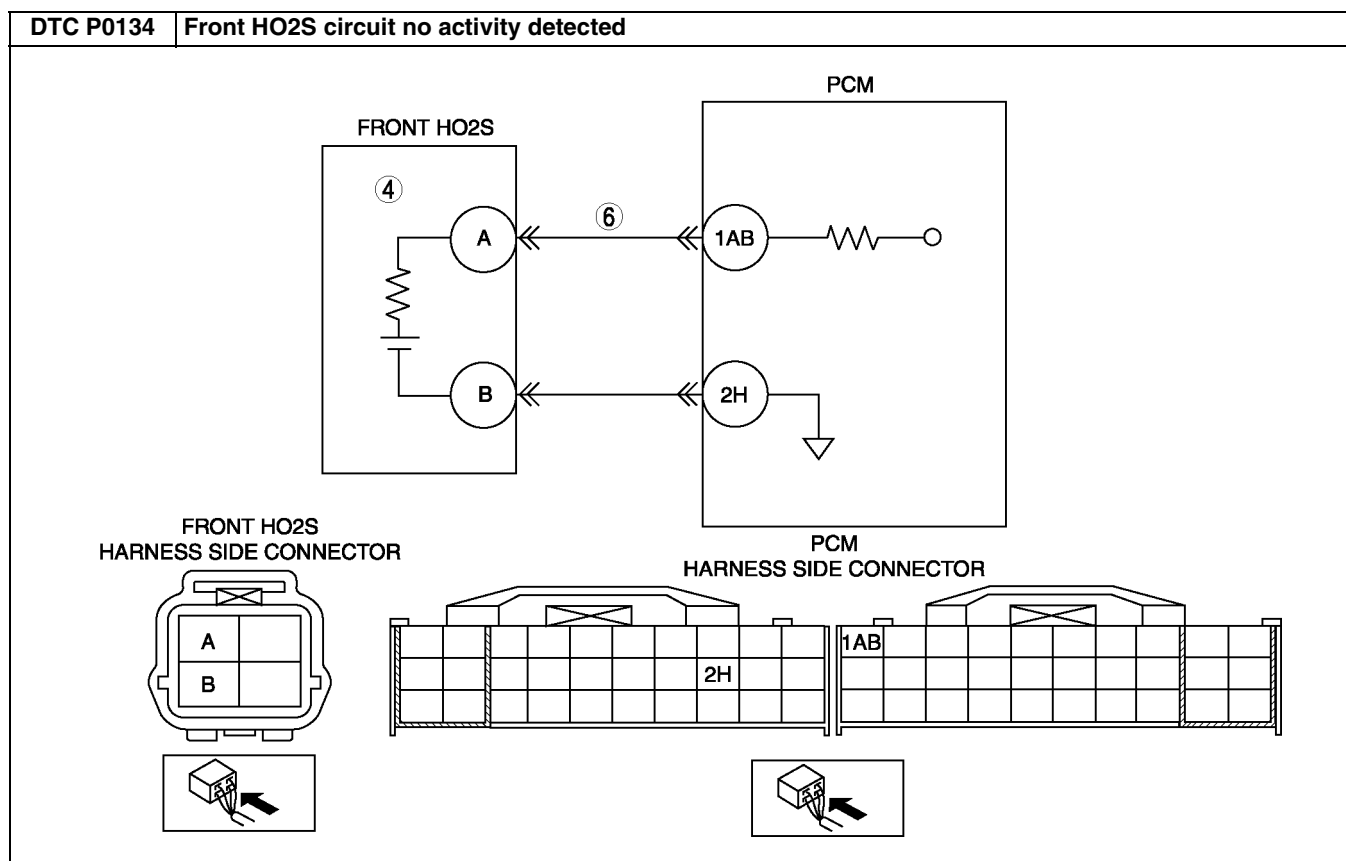
DTC P0134

A6E397001084W24

DTC P0134	Front HO2S circuit no activity detected
DETECTION CONDITION	- PCM monitors input voltage from front HO2S when the following conditions are met. If input voltage from sensor never exceed 0.55 V for 83.2 s, PCM determines that sensor circuit is not activated. MONITORING CONDITIONS - HO2S, HO2S heater and TWC repair verification drive mode - Following conditions are met - Engine speed is above 1,500 rpm. - Engine coolant temperature is above 80 °C {176 °F}. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Front HO2S deterioration - Front HO2S heater malfunction - Leakage exhaust system - Open or short to ground circuit between front HO2S terminal A and PCM terminal 1AB - Insufficient compression - Engine malfunction

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	VERIFY RELATED PENDING AND STORED DTCS Note - If fuel monitor DTC, DTC P0131or P0132 is retrieved, ignore it until P0134 is fixed. - Turn ignition key to OFF, then ON (Engine OFF). - Verify pending and stored DTCs using WDS or equivalent. - Is other DTC present?	Yes Go to appropriate DTC troubleshooting procedures.
		No Go to next step.
3	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA Is DTC P0134 on FREEZE FRAME DATA?	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See F-67 DTC TABLE.)
4	VERIFY CURRENT INPUT SIGNAL STATUS - Warm up engine. - Access O2S11 PID using WDS or equivalent. - Verify PID while racing engine (in NEUTRAL (MTX) or PARK (ATX)). - Is PID reading okay? More than 0.55 V when suddenly depress accelerator pedal (rich condition). Less than 0.55 V just after release of accelerator pedal (lean condition)	Yes Go to step 7.
		No Go to next step.
5	INSPECT INSTALLATION OF FRONT HO2S - Check if front HO2S is loosely installed. - Is sensor installed securely?	Yes Go to next step.
		No Install sensor securely, then go to Step 9.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
6	INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM - Visually check if any gas leakage is found between exhaust manifold and front HO2S. - Is there any gas leakage?	Yes Repair or replace any faulty exhaust parts, then go to Step 9.
		No - Inspect the following harnesses for open or short to ground circuit, repair or replace harness if necessary — Front HO2S terminal A (harness-side) to PCM terminal 1AB (harness-side) - Repair or replace harness if necessary. - If all items above are okay, replace faulty sensor. Then go to Step 9.
7	INSPECT SEALING OF ENGINE COOLANT PASSAGE Warning - Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. - When removing radiator cap, wrap a thick cloth around and turn it slowly. - Remove radiator cap. - Implement procedure to bleed air from engine coolant, then run engine at idle. - Is there any small bubble, which makes engine coolant white at filling opening? Note - Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 9.
		No Go to next step.
8	INSPECT ENGINE COMPRESSION - Inspect engine compression. (See B-9 COMPRESSION INSPECTION.) - Is it okay?	Yes Go to next step.
		No Implement engine overhaul for repairs, then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0134 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

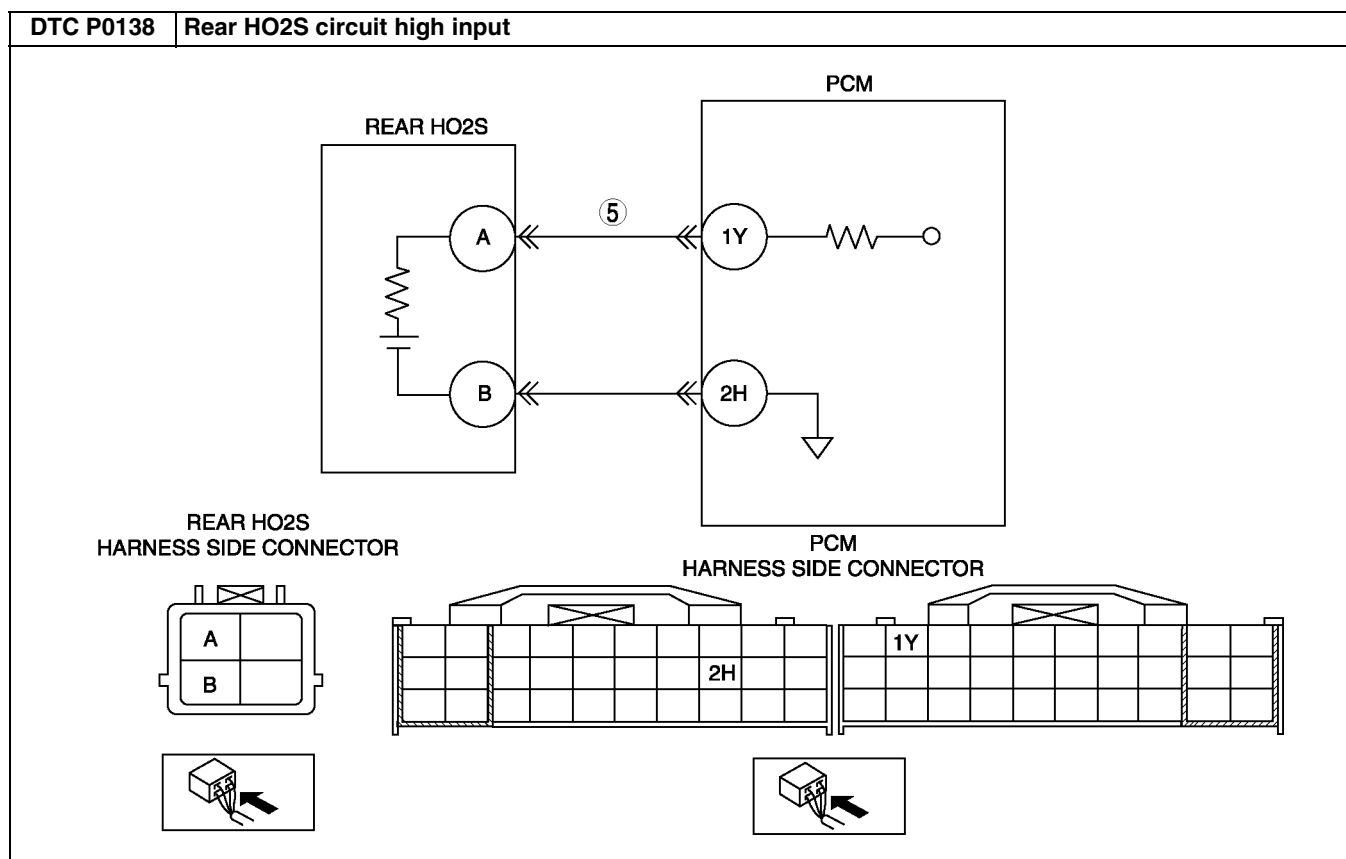
DTC P0138

A6E397001084W25

DTC P0138	Rear HO2S circuit high input
DETECTION CONDITION	- PCM monitors input voltage from rear HO2S. If input voltage from rear HO2S sensor is above 0.45 V for 7 s during deceleration fuel cut, PCM determines that circuit input is high. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Rear HO2S malfunction - Short to power circuit in wiring between rear HO2S terminal A and PCM terminal 1Y

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	VERIFY RELATED PENDING OR STORED DTCs - Turn ignition key to OFF, then ON (Engine OFF). - Verify pending code or stored DTCs using WDS or equivalent. - Is other DTC present?	Yes Go to appropriate DTC troubleshooting procedures. (See F-67 DTC TABLE.)
		No Go to next step.
4	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA Is DTC P0138 on FREEZE FRAME DATA?	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See F-67 DTC TABLE.)
5	INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY CIRCUIT - Turn ignition key to OFF. - Disconnect rear HO2S connector. - Turn ignition key to ON (Engine OFF). - Measure voltage between rear HO2S terminal A (harness-side) and body ground. - Is any voltage reading?	Yes Replace short to power supply circuit, then go to Step 7.
		No Go to next step.
6	VERIFY CURRENT INPUT SIGNAL STATUS - Start engine. - Access O2S12 PID using WDS or equivalent. - Verify PID while racing engine at least 10 times (in NEUTRAL (MTX) or PARK (ATX)). - Does PID reading stay above 0.45 V?	Yes Repair or replace sensor, then go to next step.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
7	VERIFY TROUBLESHOOTING OF DTC P0138 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Run PCM adaptive memory procedure drive mode and HO2S heater, HO2S, and TWC repair verification drive mode. (See F-64 OBD DRIVE MODE.) - Is PENDING CODE the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE .)
		No	Troubleshooting completed.

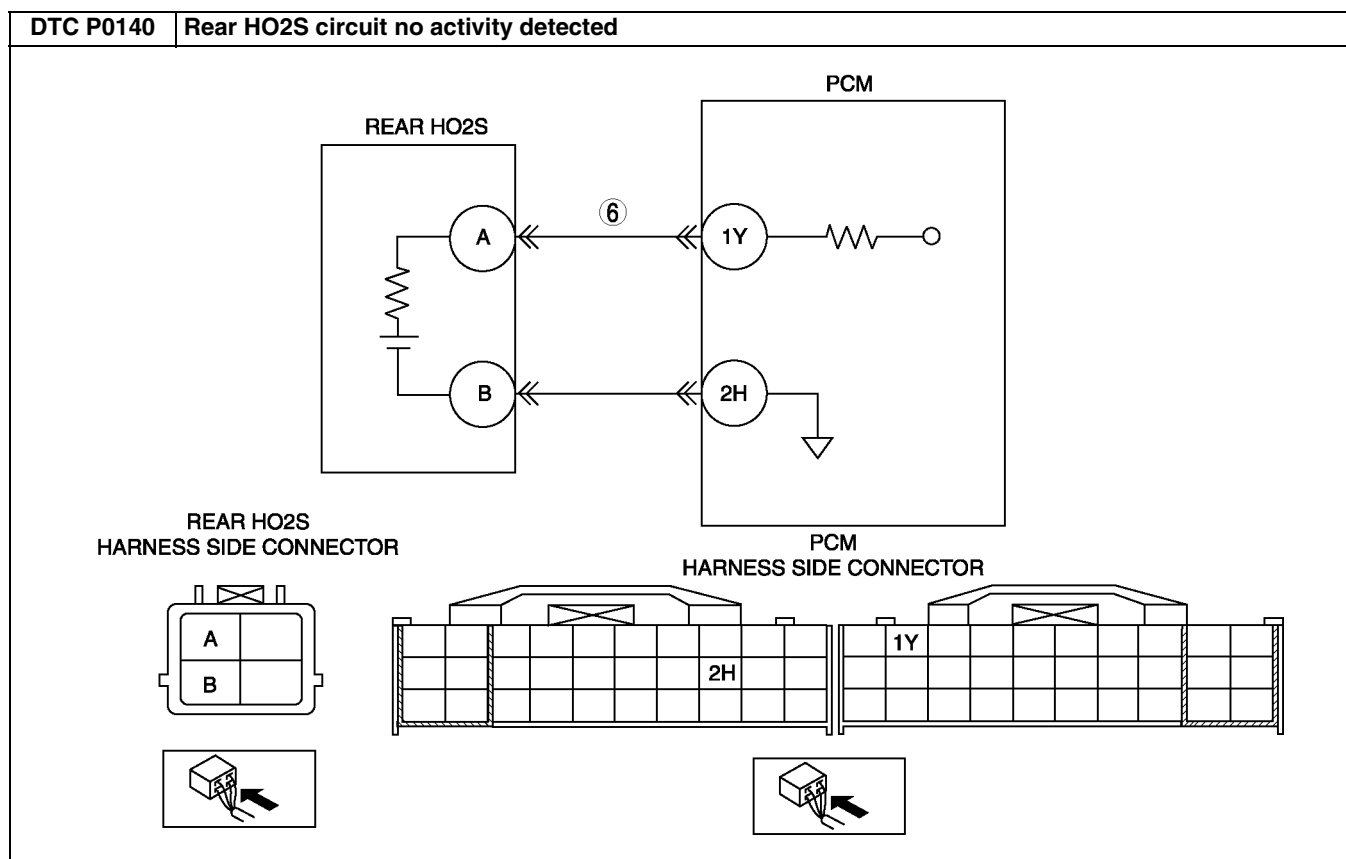
DTC P0140

A6E397001084W26

DTC P0140	Rear HO2S circuit no activity detected
DETECTION CONDITION	- PCM monitors input voltage from rear HO2S when the following conditions are met. If input voltage from sensor never exceed 0.55 V for 30.4 s, PCM determines that sensor circuit is not activated. MONITORING CONDITIONS - HO2S, HO2S heater and TWC repair verification drive mode - Following conditions are met: - Engine speed is above 1,500 rpm. - Engine coolant temperature is above 80 °C {158 °F}. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Rear HO2S deterioration - Rear HO2S heater malfunction - Leakage exhaust system - Open or short to ground circuit between rear HO2S terminal A and PCM terminal 1Y - Insufficient compression - Engine malfunction

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	VERIFY RELATED PENDING AND STORED DTCs Note - If fuel monitor DTC, DTC P0131 or P0132 is retrieved, ignore it until P0140 is fixed. - Turn ignition key to OFF, then ON (Engine OFF). - Verify pending and stored DTCs using WDS or equivalent. - Is other DTC present?	Yes Go to appropriate DTC troubleshooting procedures. (See F-67 DTC TABLE.)
		No Go to next step.
3	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA Is DTC P0140 on FREEZE FRAME DATA?	Yes Go to next step.
		No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See F-67 DTC TABLE.)
4	VERIFY CURRENT INPUT SIGNAL STATUS - Warm up engine. - Access O2S12 for P0140 or O2S22 for P0160 PID using WDS or equivalent. - Verify PID while racing engine at least 10 times (in NEUTRAL (MTX) or PARK (ATX)). - Is PID reading okay? More than 0.55 V at least once during engine racing.	Yes Go to step 7.
		No Go to next step.
5	INSPECT INSTALLATION OF REAR HO2S - Check if rear HO2S is loosely installed. - Is sensor installed securely?	Yes Go to next step.
		No Install sensor securely, then go to Step 9.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
6	INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM - Visually check if any gas leakage is found between exhaust pipe and rear HO2S. - Is there any gas leakage?	Yes Repair or replace any faulty exhaust parts, then go to Step 9.
		No - Inspect the following harnesses for open or short to ground circuit, repair or replace harness if necessary. — Rear HO2S terminal A (harness-side) to PCM terminal 1Y (harness-side) - Repair or replace harness if necessary. - If all items above are okay, replace faulty sensor. Then go to Step 9.
7	INSPECT SEALING OF ENGINE COOLANT PASSAGE Warning - Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. - When removing radiator cap, wrap a thick cloth around and turn it slowly. - Remove radiator cap. - Implement procedure to bleed air from engine coolant, then run engine at idle. - Is there any small bubble, which makes engine coolant white at filling opening? Note - Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 9.
		No Go to next step.
8	INSPECT ENGINE COMPRESSION - Inspect engine compression. (See B-9 COMPRESSION INSPECTION.) - Is it okay?	Yes Go to next step.
		No Implement engine overhaul for repairs, then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0140 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P0171

A6E397001084W27

DTC P0171	Fuel trim system too lean
DETECTION CONDITION	- PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) values during closed loop fuel control. If fuel trim exceeds preprogrammed criteria, PCM determines that fuel system is too lean. Diagnostic support note - This is a continuous monitor. (FUEL SYSTEM) - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction conditions during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.

ON-BOARD DIAGNOSTIC

DTC P0171	Fuel trim system too lean
POSSIBLE CAUSE	• Misfire • Front HO2S deterioration • Front HO2S heater malfunction • Pressure regulator malfunction • Fuel pump malfunction • Fuel filter clogged or restricted • Fuel leakage on fuel line from fuel delivery pipe and fuel pump • Fuel return hose clogged • Leakage exhaust system • Purge solenoid valve malfunction • Purge solenoid hoses improper connection • Insufficient compression • Variable valve timing control system improper operation (L3-VE)

F

Diagnostic procedure

STEP	INSPECTION		ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE • Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) • Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	VERIFY RELATED PENDING CODE OR STORED DTCs • Turn ignition key to OFF, then ON (Engine OFF). • Verify related PENDING CODE or stored DTCs. • Is other DTCs present?	Yes	If misfire DTC is present, go to step 7. If other DTC is present, go to appropriate DTC troubleshooting procedures. (See F-67 DTC TABLE.)
		No	If drive ability concern is present, go to Step 7. If not, go to next step.
3	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Is DTC P0171 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
4	VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE) • Access ECT, MAF, TP and VSS PIDs using WDS or equivalent. (See F-45 PCM INSPECTION.) • Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 18.
		No	Go to next step.
5	VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION • Inspect same PIDs as Step 4 while simulating FREEZE FRAME DATA condition. • Is there any input signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, and repair or replace it. Then go to Step 18.
		No	Go to next step.
6	VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S • Access O2S11 for P0171 PID using WDS or equivalent. • Check PID under following accelerator pedal condition (in PARK (ATX) or NEUTRAL (MTX)). • Is PID reading okay? — Above 0.55 V when accelerator pedal is suddenly depressed (rich condition). — Below 0.55 V just after release of accelerator pedal (lean condition)	Yes	Inspect for air suction at followings due to cracks, damages and loosening parts: • From air cleaner to throttle body • From throttle body to dynamic chamber • From dynamic chamber to intake manifold • Vacuum hoses Note • Engine speed may change when rust penetrating agent is sprayed on the air suction area. Repair or replace any faulty part, then go to Step 18.
		No	Visually inspect for any gas leakage between exhaust manifold and front HO2S. • If there is no leakage, replace FRONT HO2S. Then go to Step 18.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
7	INSPECT MAF PID - Start engine. - Access MAF PID using WDS or equivalent. - Verify that MAF PID changes quickly according to race engine RPM. - Is MAF PID response okay?	Yes	Go to next step.
		No	Replace Mass air flow sensor, then go to Step 18.
8	INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM - Visually inspect for loosen, cracks or damages hoses on intake air system. - Is there any malfunction?	Yes	Repair or replace source of air suction, then go to Step 18.
		No	Go to next step.
9	INSPECT FUEL LINE PRESSURE - Turn ignition key to OFF. Note - If engine won't start, inspect fuel line pressure with ignition key ON. - Inspect fuel line pressure while engine running. (See F-20 FUEL LINE PRESSURE INSPECTION.) - Is fuel line pressure okay?	Yes	Go to step 11.
		No	- If fuel line pressure is too high: Replace fuel pump unit, then go to Step 18. - If fuel line pressure is too low: Go to next step.
10	INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE - Visually inspect fuel line for any leakage. - Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 18.
		No	Inspect fuel filters for follows: - Restriction or clogging at fuel filter (high-pressure side). - Foreign materials or stain inside fuel filter (low-pressure side) Perform following actions as result. - If restriction or clogging is found at fuel filter (high-pressure side), replace fuel pump unit. - If foreign materials or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter. - If all items above are okay, replace fuel pump unit. Then go to Step 18.
11	CHECK IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT - Verify blinking condition on each cylinders using timing light at idle. - Do all cylinders show blinking condition?	Yes	Go to Step 15.
		No	Go to next step.
12	CHECK HIGH-TENSION LEADS OF NO BLINKING CYLINDER - Turn ignition key to OFF. - Inspect high-tension leads for installation condition, corrosion on terminal, open lead and damaged cover. - Is condition of high-tension lead okay?	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 18.
13	INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR - Disconnect ignition coil connector. - Turn ignition key to ON (Engine OFF). - Check voltage at ignition coil connector terminal B (harness-side) and body ground. - Is voltage B+?	Yes	Go to next step.
		No	Check for open circuit between ignition coil connector and ignition switch. Repair or replace wiring harness, then go to Step 18.
14	INSPECT IGNITION COIL RESISTANCE - Check ignition coil resistance. (See G-9 IGNITION COIL INSPECTION.) - Is coil resistance okay?	Yes	Go to next step.
		No	Replace ignition coil, then go to Step 18.
15	INSPECT ENGINE COMPRESSION - Inspect engine compression. (See B-9 COMPRESSION INSPECTION.) - Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to Step 18.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
16	INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION Note - The following test should be performed for variable valve timing control system. Go to next step for vehicles without variable valve timing control system. - Inspect variable valve timing control system operation. (See F-239 Variable Valve Timing Control System Operation Inspection.) - Does variable valve timing control system work properly?	Yes Go to next step.
		No Repair or replace malfunctioning part according to variable valve timing control system inspection results, then go to Step 18.
17	INSPECT FUEL INJECTOR OPERATION - Remove fuel injector. - Inspect injector operation. - Is fuel injector okay?	Yes Go to next step.
		No Replace injector, then go to next step.
18	VERIFY TROUBLESHOOTING OF DTC P0171 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
19	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P0172

A6E397001084W28

DTC P0172	Fuel trim system too rich
DETECTION CONDITION	- PCM monitors short fuel trim (SHRTFT) and long fuel trim (LONGFT) values during closed loop fuel control. If fuel trim exceeds preprogrammed criteria, PCM determines that fuel system is too rich. Diagnostic support note - This is a continuous monitor. (FUEL SYSTEM) - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Misfire - Front HO2S deterioration - Front HO2S heater malfunction - Pressure regulator malfunction - Fuel pump malfunction - Fuel return hose clogged - Purge solenoid valve malfunction - Purge solenoid hoses improper connection - PCV valve malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
2	VERIFY RELATED PENDING CODE OR STORED DTCs - Turn ignition key to OFF, then ON (Engine OFF). - Verify related pending code or stored DTCs. - Is other DTCs present?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	If drive ability concern is present, go to Step 8. If not, go to next step.
3	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA Is DTC P0172 on FREEZE FRAME DATA?	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
4	VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE) - Access ECT, MAF, TP and VSS PIDs using WDS or equivalent. - Is there any signal that is far out of specification when ignition key is ON and engine runs?	Yes	Inspect suspected sensor and excessive resistance in related wiring harnesses. Repair or replace if necessary. Then go to Step 10.
		No	Go to next step.
5	VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION - Inspect PID data while simulating FREEZE FRAME DATA condition. - Is there any input signal which causes drastic changes?	Yes	Inspect suspected sensor and related wiring harnesses, and repair or replace it. Then go to Step 10.
		No	Go to next step.
6	VERIFY CURRENT INPUT SIGNAL STATUS OF FRONT HO2S - Access O2S11 PID using WDS or equivalent. - Verify PID while racing engine (in PARK (ATX) or NEUTRAL (MTX)). - Is PID reading okay? Above 0.55 V when accelerator pedal is suddenly depress (rich condition). Below 0.55 V just after release of accelerator pedal (lean condition)	Yes	Go to next step.
		No	Replace suspected front HO2S. Then go to Step 10.
7	INSPECT FUEL LINE PRESSURE - Turn ignition key to OFF. - Inspect fuel line pressure while engine running. (See F-20 FUEL LINE PRESSURE INSPECTION.) - Is fuel line pressure okay?	Yes	Go to next step.
		No	Replace fuel pump unit, then go to Step 10.
8	INSPECT PURGE SOLENOID VALVE FOR STUCK OPEN - Turn ignition key to OFF. - Disconnect both hoses from purge solenoid valve. - Blow air through purge solenoid valve. - Does air blow through?	Yes	Replace purge solenoid valve. Then go to Step 10.
		No	Go to next step.
9	INSPECT PCV VALVE OPERATION - Inspect PCV valve operation. (See F-41 PCV VALVE INSPECTION.) - Is PCV valve okay?	Yes	Go to next step.
		No	Replace PCV valve, then go to next step.
10	VERIFY TROUBLESHOOTING OF DTC P0172 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
11	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0300

A6E397001085W01

DTC P0300	Random misfire detection
DETECTION CONDITION	- PCM monitors CKP sensor input signal interval time. PCM calculates change of interval time for each cylinder. If change of interval time exceeds preprogrammed criteria, PCM detects misfire in the corresponding cylinder. While the engine is running, the PCM counts number of misfires that occurred at 200 crankshaft revolutions and 1,000 crankshaft revolutions and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, PCM determines that a misfire, which can damage catalytic converter or affect emission performance, has occurred. Diagnostic support note - This is a continuous monitor (MISFIRE). - MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - MIL flashes if PCM detects the misfire which can damage the catalytic converter during first drive cycle. Therefore, PENDING CODE is not available while MIL flashes. - PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- CKP sensor malfunction - CMP sensor malfunction - Ignition coil malfunction - High-tension lead malfunction - MAF sensor contamination - Excess air suction in intake air system (between MAF sensor and intake manifold) - Fuel pump malfunction - Fuel pressure regulator malfunction - Fuel line clogged - Fuel filter clogged - Fuel leakage in fuel line - Fuel runout - Poor quality fuel - Purge control solenoid valve malfunction - PCV valve malfunction - EGR valve malfunction - Vacuum hoses damages or improper connection - Related connector and terminal malfunction - Related wiring harness malfunction - Insufficient compression - Variable valve timing control system improper (L3-VE)

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
	No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
	No	Go to next step.
3	VERIFY RELATED PENDING CODE OR STORED DTCs - Turn ignition key to OFF then ON (Engine OFF). - Verify related pending code or stored DTCs. - Are other DTCs present?	Yes Go to appropriate DTC troubleshooting. (See F-67 DTC TABLE .)
	No	Go to next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON/IDLE) - Access BOO, ECT, IAT, MAF, RPM, TP, and VSS PIDs using WDS or equivalent. (See F-45 PCM INSPECTION.) - Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?	Yes Inspect suspected circuit and/or part according to inspection results. (See F-45 PCM INSPECTION .) Then go to Step 22.
	No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
5	VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION - Inspect same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. - Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit and/or part according to inspection results. (See F-45 PCM INSPECTION.) Then go to Step 22.
		No	Go to next step.
6	INSPECT CMP SENSOR - Inspect CMP sensor. (See F-55 CAMSHAFT POSITION (CMP) SENSOR INSPECTION.) - Is CMP sensor okay?	Yes	Go to next step.
		No	Inspect installation condition and damages on timing belt and gears, repair faulty parts. If it is okay, replace CMP sensor. Then go to Step 22.
7	VERIFY CKP SENSOR INSTALLATION CONDITION - Inspect for CKP sensor looseness. - Is CKP sensor loosen?	Yes	Retighten CKP sensor, then go to Step 22.
		No	Go to next step.
8	INSPECT IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT - Verify blinking condition on each cylinders using timing light at idle. - Do all cylinders show blinking condition?	Yes	Go to Step 12.
		No	Go to next step.
9	INSPECT HIGH-TENSION LEADS OF NO BLINKING CYLINDER - Turn ignition key to OFF. - Inspect high-tension leads for improper installation, corrosion on terminal, open lead and damaged cover. - Is condition of high-tension lead okay?	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 22.
10	INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR - Disconnect ignition coil connector. - Turn ignition key to ON (Engine OFF). - Measure voltage between ignition coil terminal B (harness-side) and body ground. - Is there voltage reading B+?	Yes	Go to next step.
		No	Inspect for open circuit between ignition coil connector and ignition switch. Repair or replace wiring harness, then go to Step 22.
11	INSPECT IGNITION COIL RESISTANCE - Inspect ignition coil resistance. (See G-9 IGNITION COIL INSPECTION.) - Is coil resistance okay?	Yes	Go to step 22.
		No	Replace ignition coil, then go to Step 22.
12	INSPECT MAF PID - Start engine. - Access MAF PID using WDS or equivalent. - Verify that MAF PID changes quickly according to race engine RPM. - Is MAF PID response okay?	Yes	Go to next step.
		No	Replace MAF sensor, then go to Step 22.
13	INSPECT EXCESSIVE AIR SUCTION IN INTAKE AIR SYSTEM - Inspect for air leakage at following: - Between MAF sensor and throttle body - Between throttle body and intake manifold - Is there any malfunction?	Yes	Repair or replace suspected part, then go to Step 22.
		No	Go to next step.
14	INSPECT FUEL LINE PRESSURE - Inspect fuel line pressure. (See F-20 FUEL LINE PRESSURE INSPECTION.) - Is fuel line pressure okay?	Yes	Go to step 16.
		No	If fuel line pressure is too low, go to next step. If fuel line pressure is excess high, replace fuel pump unit, then go to Step 22.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
15	INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE - Visually inspect for fuel leakage in fuel line for any leakage. - Is any fuel leakage found?	Yes	Replace suspected fuel line, then go to Step 22.
		No	Inspect fuel filters for following: - Restriction or clogging at fuel filter (high-pressure side). - Foreign materials or stain inside fuel filter (low-pressure side) Perform following actions depend on the result above. - If restriction or clogging is found at fuel filter (high-pressure side), replace fuel pump unit. - If foreign materials or stain is found inside fuel filter (low-pressure side), clean of fuel tank and filter (low-pressure side). - If all items above are okay, replace fuel pump unit. Then, go to Step 22.
16	INSPECT ENGINE COMPRESSION - Inspect engine compression. (See B-9 COMPRESSION INSPECTION.) - Is it okay?	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to Step 22.
17	INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION Note - The following test should be performed for variable valve timing control system. Go to next step for vehicles without variable valve timing control system. - Inspect variable valve timing control system operation. - Does variable valve timing control system?	Yes	Go to next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system inspection results, then go to Step 22.
18	INSPECT OPERATION OF PURGE CONTROL SOLENOID VALVE - Turn ignition key to OFF. - Connect vacuum pump to purge control solenoid valve and apply vacuum to solenoid. - Verify that solenoid holds vacuum. - Turn ignition key to ON (Engine OFF). - Access EVAPCP PID in SIMULATION TEST using WDS or equivalent. - Set duty value to 100% for EVAPCP PID. - Apply vacuum while turning solenoid from OFF to ON and simulating EVAPCP PID with 100% duty value. - Verify that solenoid releases vacuum while solenoid is turned ON. - Is purge control solenoid valve operation okay?	Yes	Go to next step.
		No	Replace purge control solenoid valve, then go to Step 22.
19	INSPECT PCV VALVE OPERATION - Turn ignition key to OFF. - Remove PCV valve and inspect valve operation. (See F-41 PCV VALVE INSPECTION.) - Is PCV valve operation okay?	Yes	Replace PCV valve, then go to Step 22.
		No	Go to next step.
20	INSPECT OPERATION OF EGR VALVE - Remove EGR valve. - Visually inspect for stuck to open. - Does EGR valve stuck to open?	Yes	Repair or replace EGR valve, then go to Step 22.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
21	INSPECT SEALING OF ENGINE COOLANT PASSAGE Warning - Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. - When removing radiator cap, wrap thick cloth around and turn it slowly. - Remove radiator cap. - Implement procedure to bleed air from engine coolant, then run engine at idle. - Is there any small bubble which makes engine coolant white at filling opening? Note - Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No Go to next step.
22	VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Run PCM adaptive memory procedure drive mode. (See F-64 OBD DRIVE MODE.) - Is PENDING CODE the same as DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No Go to next step.
23	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE .)
		No Troubleshooting completed.

DTC P0301, P0302, P0303, P0304

A6E397001085W02

DTC P0301 DTC P0302 DTC P0303 DTC P0304	Cylinder No.1 misfire detection Cylinder No.2 misfire detection Cylinder No.3 misfire detection Cylinder No.4 misfire detection
DETECTION CONDITION	- PCM monitors CKP sensor input signal interval time. PCM calculates the change of interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, PCM detects a misfire in the corresponding cylinder. While the engine is running, PCM counts number of misfires that occurred at 200 crankshaft revolutions and 1,000 crankshaft revolutions and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, PCM determines that a misfire, which can damage catalytic converter or affect emission performance, has occurred. Diagnostic support note - This is a continuous monitor (MISFIRE). - MIL illuminates if PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - MIL flashes if PCM detects the misfire which can damage the catalytic converter during first drive cycle. Therefore, PENDING CODE is not available while MIL flashes. - PENDING CODE is available if PCM detects the misfire which affects emission performance during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Spark plug malfunction - High-tension lead malfunction - Fuel injector malfunction - Air suction in intake air system (between dynamic chamber and cylinder head) - Inadequate engine compression due to engine internal malfunction - Related connector or terminal malfunction - Related wiring harness malfunction

ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	VERIFY RELATED PENDING CODE OR STORED DTCs - Turn ignition key to OFF then ON (Engine OFF). - Verify related pending code or stored DTCs. - Is other DTCs present?	Yes	Go to appropriate DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Go to next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION KEY TO ON /IDLE) - Access BOO, ECT, IAT, MAF, RPM, TP and VSS PIDs using WDS or equivalent. (See F-45 PCM INSPECTION.) - Is there any signal that is far out of specification when ignition switch is ON and engine runs at idle?	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 12. (See F-45 PCM INSPECTION.)
		No	Go to next step.
5	VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION - Inspect same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition. - Is there any signal which causes drastic changes?	Yes	Inspect suspected circuit and/or part according to inspection results. Then go to Step 12. (See F-45 PCM INSPECTION.)
		No	Go to next step.
6	INSPECT SPARK PLUG CONDITION - Turn ignition key to OFF. - Remove spark plug from suspected cylinder. - Inspect spark plug condition: - Cracks - Excess wear - Gap - Wet - Is any problem found on spark plug?	Yes	- If spark plug is wet, fuel flooding is suspected. Go to step 12. - If spark plug has a cracks, excessive wear or improper gap, replace faulty spark plug. Then go to Step 12.
		No	Go to next step.
7	VERIFY HIGH-TENSION LEAD CONDITION - Remove high-tension lead. - Inspect high-tension lead condition and resistance. - Cracks - Spark shorts to cylinder head through high-tension lead insulator - Is high-tension lead okay?	Yes	Go to next step.
		No	Replace high-tension lead, then go to Step 12.
8	INSPECT FOR AIR SUCTION AT INTAKE-AIR SYSTEM - Inspect for air leakage at following: - Around connection of dynamic chamber and intake manifold - Around connection of intake manifold and cylinder head - Is air leakage found?	Yes	Repair or replace suspected part, then go to Step 12.
		No	Go to next step.
9	INSPECT FUEL INJECTOR HARNESS - Remove intake air system parts. - Disconnect fuel injector connector on suspected cylinder. - Connect NOID LIGHT to fuel injector connector terminals. - Inspect dim of light during cranking. - Does noid light illuminate?	Yes	Go to next step.
		No	Inspect for fuel injector harnesses. Repair or replace it if necessary, then go to Step 12.

F

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
10	INSPECT SEALING OF ENGINE COOLANT PASSAGE Warning - Removing radiator cap when radiator is hot is dangerous, Scalding coolant and steam may shoot out and cause serious injury. - When removing radiator cap, wrap thick cloth around and turn it slowly. - Remove radiator cap. - Implement procedure to bleed air from engine coolant, then run engine at idle. - Is there any small bubble which makes engine coolant white at filling opening? Note - Large bubbles are normal since they are remaining air coming out from engine coolant passage.	Yes Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to Step 12.
		No Go to next step.
11	INSPECT ENGINE COMPRESSION - Inspect engine compression. (See B-9 COMPRESSION INSPECTION.) - Is engine compression okay?	Yes Go to next step.
		No Overhaul the engine, then go to next step.
12	INSPECT FUEL INJECTOR OPERATION - Remove fuel injector from suspected cylinder. - Swap injector with injector on other cylinder. - Start engine and run it at idle. - Is misfire DTC for cylinder which has a suspected fuel injector?	Yes Replace injector, then go to step 13.
		No Go to next step.
13	VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED - Make sure to reconnect all disconnected connectors. - Start engine. - Clear DTC from PCM memory using WDS or equivalent. - Run PCM adaptive memory procedure drive mode. (See F-64 OBD DRIVE MODE.) - Is same PENDING CODE or stored code the same as DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
14	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

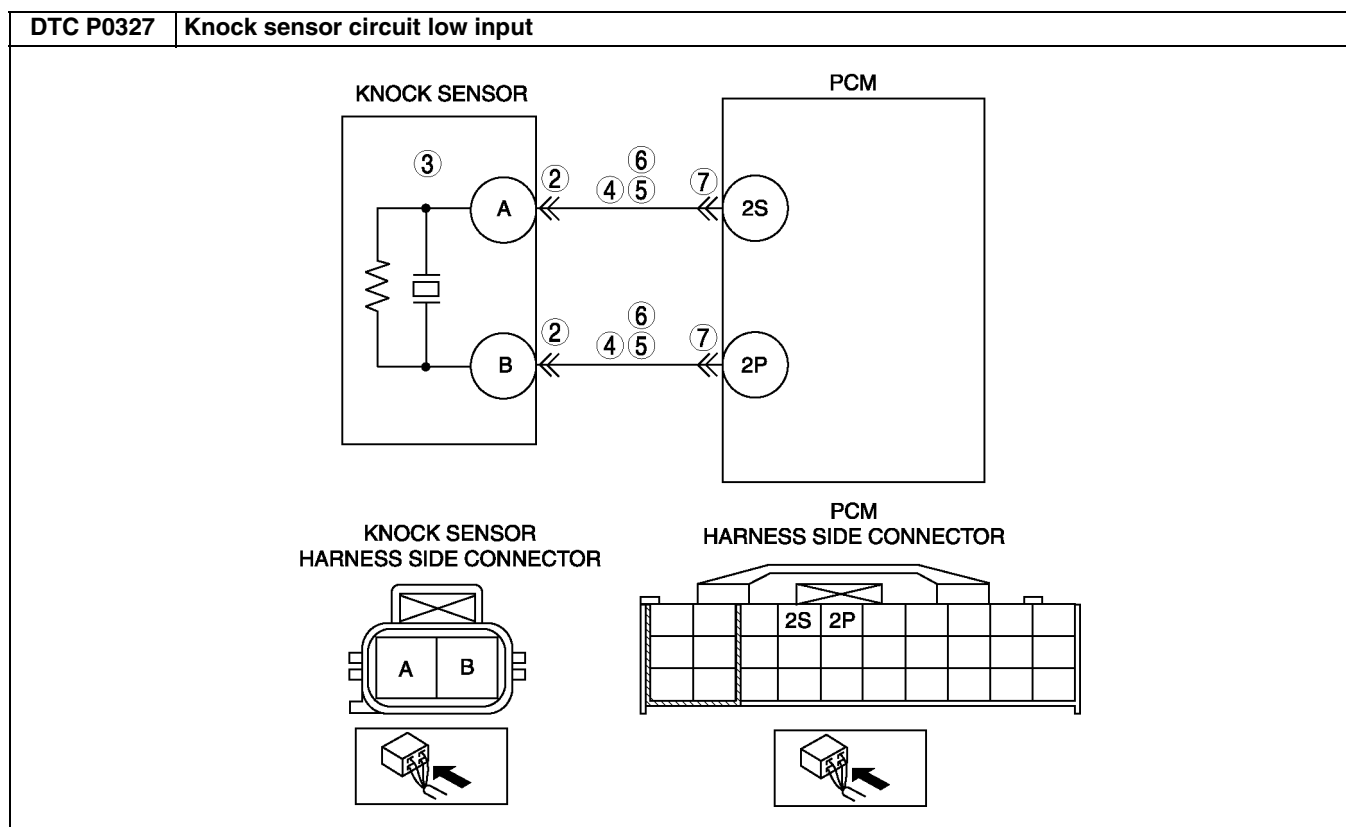
DTC P0327

A6E397001085W03

DTC P0327	Knock sensor circuit low input
DETECTION CONDITION	- PCM monitors input signal from knock sensor when engine is running. If input voltage at PCM terminals between 2P and 2S is below 0.9 V, PCM determines that knock sensor circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Knock sensor malfunction - Connector or terminal malfunction - Open or short to ground circuit between knock sensor connector terminal A and PCM terminal 2S - Open or short to ground circuit between knock sensor connector terminal B and PCM terminal 2P - Short knock sensor two wires

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT KNOCK SENSOR CONNECTOR TERMINAL - Turn ignition key to OFF. - Disconnect knock sensor connector. - Check for poor connection at terminals A and B (damaged, pulled-out pins, corrosion, etc.). - Is there any malfunction?	Yes Repair terminal, then go to Step 8.
		No Go to next step.
3	INSPECT KNOCK SENSOR - Perform knock sensor inspection. (See F-56 KNOCK SENSOR INSPECTION) - Is knock sensor okay?	Yes Go to next step.
		No Replace knock sensor, then go to next step.
4	INSPECT KNOCK SENSOR CIRCUITS FOR OPEN CIRCUIT - Disconnect knock sensor connector. - Inspect continuity between the following circuits: - Knock sensor female terminal A (harness-side) and PCM terminal 2S (harness-side) - Knock sensor female terminal B (harness-side) and PCM terminal 2P (harness-side) - Are there continuities?	Yes Go to next step.
		No Repair or replace suspected wiring harness, then go to Step 8.
5	INSPECT KNOCK SENSOR CIRCUITS FOR SHORT TO GROUND - Inspect continuity between following circuits: - Knock sensor female terminal A (harness-side) and body ground - Knock sensor female terminal B (harness-side) and body ground - Are there continuities?	Yes Repair or replace suspected wiring harness, then go to Step 8.
		No Go to next step.

ON-BOARD DIAGNOSTIC

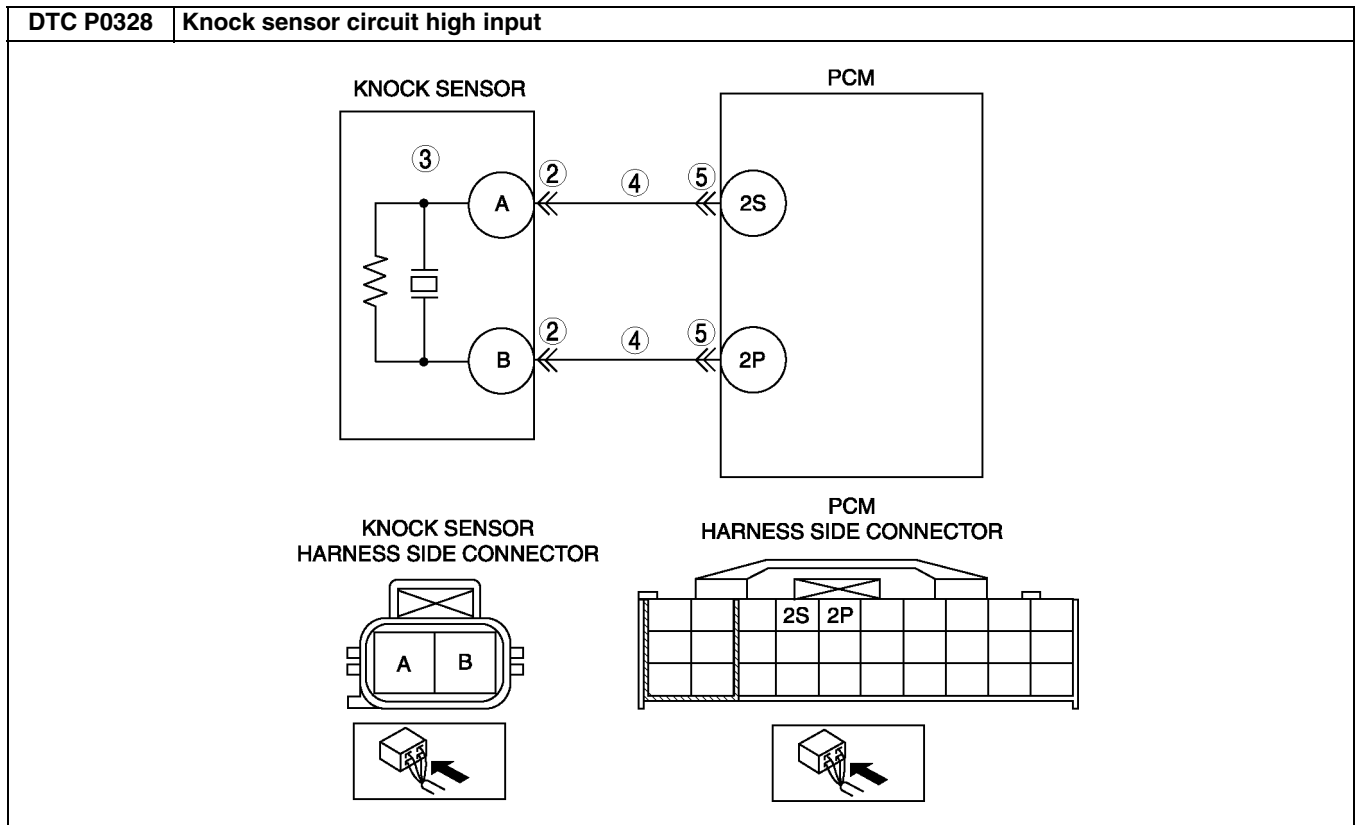
STEP	INSPECTION		ACTION
6	INSPECT FOR SHORT CIRCUITS - Inspect continuity between knock sensor female terminals A and B (harness-side). - Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 8.
		No	Go to next step.
7	INSPECT PCM CONNECTOR TERMINAL - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection at terminals 2P and 2S (damaged, pulled-out pins, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P0327 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0328

A6E397001085W04

DTC P0328	Knock sensor circuit high input
DETECTION CONDITION	- PCM monitors input signal from knock sensor when engine is running. If input voltage at PCM terminals between 2P and 2S is above 4.9 V, PCM determines that knock sensor circuit has a malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- Knock sensor malfunction - Connector or terminal malfunction - Short to power circuit in wiring between knock sensor terminal A and PCM terminal 2S - Short to power circuit in wiring between knock sensor terminal B and PCM terminal 2P

ON-BOARD DIAGNOSTIC



F

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT KNOCK SENSOR CONNECTOR TERMINAL - Turn ignition key to OFF. - Disconnect knock sensor connector. - Inspect for poor connection at terminals A and B (damaged, pulled-out pins, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to step 6.
		No	Go to next step.
3	INSPECT KNOCK SENSOR - Perform knock sensor inspection. (See F-56 KNOCK SENSOR INSPECTION) - Is knock sensor okay?	Yes	Go to next step.
		No	Replace knock sensor, then go to step 6.
4	INSPECT KNOCK SIGNAL CIRCUIT FOR SHORT TO POWER - Turn ignition key ON (Engine OFF). - Measure voltage between knock sensor terminal A (harness-side) and body GND and knock sensor terminal B (harness-side) and body GND.? - Is any voltage reading?	Yes	Repair or replace harness for short to power, then go to step 6.
		No	Go to next step.
5	INSPECT PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair or replace terminal, then go to step 6.
		No	Go to next step.

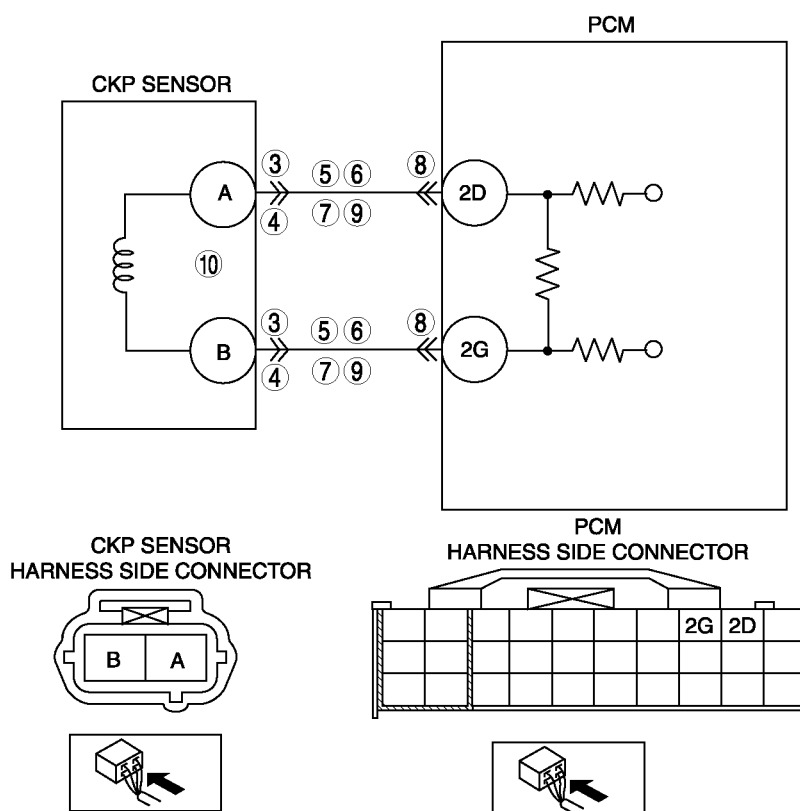
ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
6	VERIFY TROUBLESHOOTING OF DTC P0328 COMPLETED - Make sure to connect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P0335

A6E397001085W05

DTC P0335	CKP sensor circuit malfunction
DETECTION CONDITION	- If PCM does not receive input voltage from CKP sensor for 4.2 s while MAF is 2.0 g/s {0.26 lb/min.} or above, PCM determines that CKP sensor circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- CKP sensor malfunction - Connector or terminal malfunction - CKP sensor is dirty. - Short to power between CKP sensor terminal A to PCM terminal 2D - Short to power between CKP sensor terminal B to PCM terminal 2G - Short to ground between CKP sensor terminal A to PCM terminal 2D - Short to ground between CKP sensor terminal B to PCM terminal 2G - Open circuit between CKP sensor terminal A to PCM terminal 2D - Open circuit between CKP sensor terminal B to PCM terminal 2G - CKP sensor pulse wheel malfunction - Both CKP sensor wires are shorted each other



ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	VERIFY CKP SENSOR VOLTAGE - Disconnect CKP sensor connector. - Connect voltmeter between CKP sensor connector terminals A and B (sensor-side). - Inspect the voltage in AC range while cranking the engine. - Is any voltage reading?	Yes	Go to next step.
		No	Go to step 10.
4	INSPECT POOR CONNECTION OF CKP SENSOR CONNECTOR - Verify that the CKP sensor connector is connected securely. - Is connector okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 11.
5	INSPECT CKP CIRCUIT FOR SHORT TO POWER - Turn ignition key OFF - Disconnect CKP sensor connector. - Turn ignition key ON (Engine OFF). - Measure voltage between following terminals — CKP sensor terminal A — CKP sensor terminal B - Is any voltage reading?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
6	INSPECT CKP CIRCUIT FOR SHORT TO GROUND - Inspect continuity between following terminal and body ground: — CKP sensor connector terminal A (harness-side) — CKP sensor connector terminal B (harness-side) - Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
7	INSPECT CKP CIRCUITS FOR SHORTS - Inspect continuity between CKP sensor connector terminals A and B (harness-side). - Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
8	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	INSPECT CKP CIRCUIT FOR OPEN - Inspect continuity between following circuits: — CKP sensor terminal A (harness-side) and PCM terminal 2D (harness-side) — CKP sensor terminal B (harness-side) and PCM terminal 2G (harness-side) - Is there continuity?	Yes	Go to Step 11.
		No	Repair or replace suspected harness, then go to Step 11.
10	INSPECT CKP SENSOR - Turn ignition key to OFF. - Perform CKP sensor inspection. (See F-54 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION) - Is CKP sensor okay?	Yes	Go to next step.
		No	Inspect CKP sensor pulse wheel for damage. Replace CKP sensor pulse wheel and go to next step.

F

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
11	VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from PCM memory using WDS or equivalent. - Start engine. - Access MAF PID using WDS or equivalent. Note - MAF PID should indicate 2.0 g/s {0.26 lb/min.} or above during this test - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

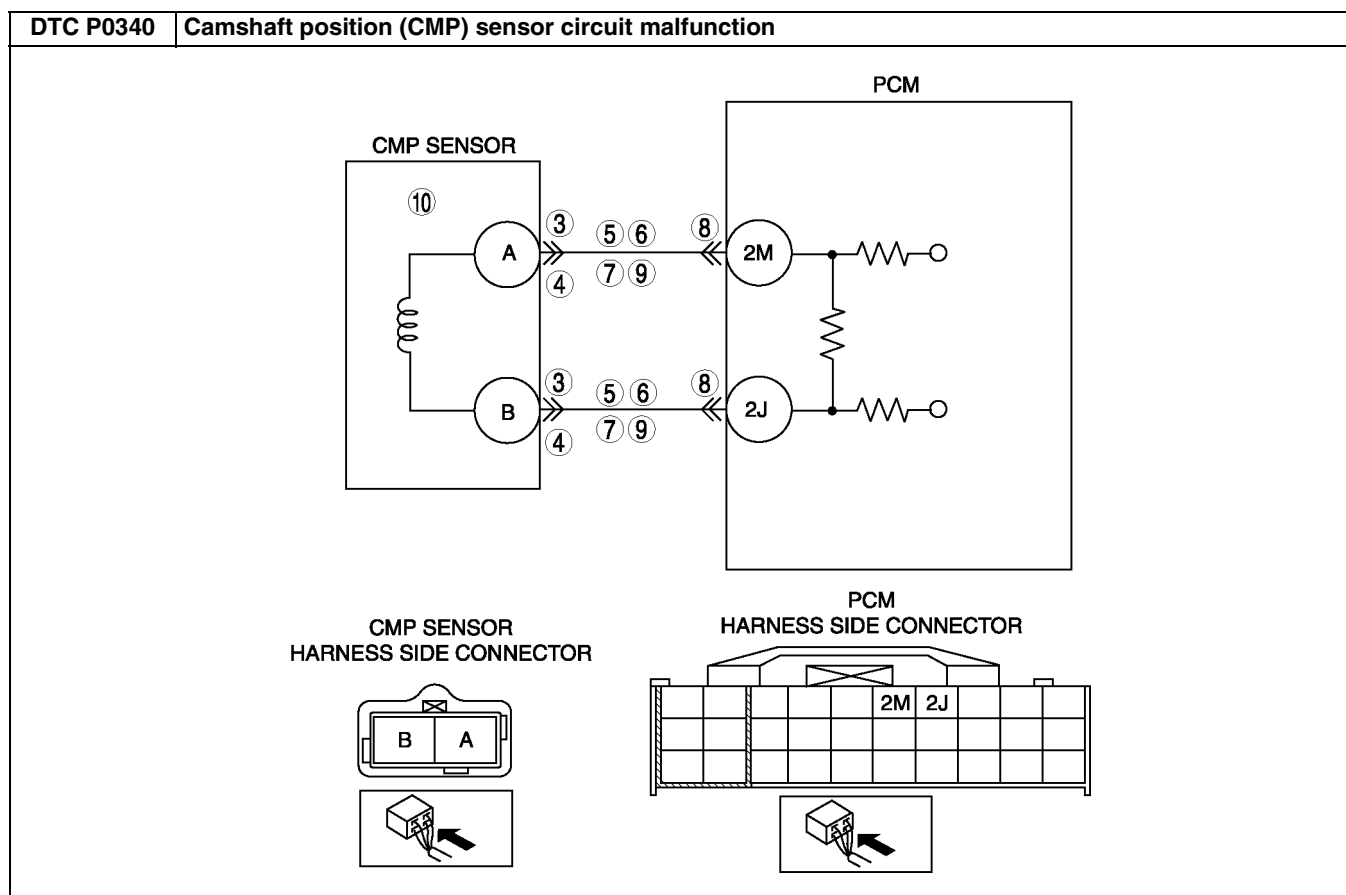
DTC P0340

A6E397001085W06

DTC P0340	Camshaft position (CMP) sensor circuit malfunction
DETECTION CONDITION	- PCM monitors input voltage from CMP sensor when engine is running. If PCM does not receive input voltage from CMP sensor while PCM receives input signal from CKP sensor, PCM determines that CMP circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- CMP sensor malfunction - Connector or terminal malfunction - CMP sensor is dirty - Short to power circuit between CMP sensor terminal A and PCM terminal 2M - Short to power circuit between CMP sensor terminal B and PCM terminal 2J - Short to ground circuit between CMP sensor terminal A and PCM terminal 2M - Short to ground circuit between CMP sensor terminal B and PCM terminal 2J - Open circuit between CMP sensor terminal A and PCM terminal 2M - Open circuit between CMP sensor terminal B and PCM terminal 2J - CKP sensor pulse wheel malfunction - Both CMP sensor wires are shorted each other

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	VERIFY CMP SENSOR VOLTAGE - Disconnect CMP sensor connector. - Connect voltmeter between CMP sensor connector terminals A and B (sensor-side). - Inspect the voltage in AC range while cranking the engine. - Is any voltage reading?	Yes Go to next step.
		No Go to step 10.
4	INSPECT POOR CONNECTION OF CMP SENSOR CONNECTOR - Verify that the CMP sensor connector is connected securely. - Is connector okay?	Yes Go to next step.
		No Reconnect the connector, then go to Step 11.
5	INSPECT CMP CIRCUIT FOR SHORT TO POWER - Turn ignition key OFF. - Disconnect CMP sensor connector. - Turn ignition key ON (Engine OFF) - Measure voltage at CMP sensor terminals A and B. - Is any voltage reading?	Yes Repair or replace suspected harness, then go to Step 11.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
6	INSPECT CMP CIRCUIT FOR SHORT TO GROUND - Inspect continuity between following terminal and body ground: — CMP sensor connector terminal A (harness-side) — CMP sensor connector terminal B (harness-side) - Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
7	INSPECT CMP CIRCUITS FOR SHORTS - Inspect continuity between CMP sensor connector terminals A and B (harness-side). - Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
8	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
9	INSPECT CMP CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between following circuits: — CMP sensor terminal A (harness-side) and PCM terminal 2M (harness-side) — CMP sensor terminal B (harness-side) and PCM terminal 2J (harness-side) - Is there continuity?	Yes	Go to Step 11.
		No	Repair or replace suspected harness, then go to Step 11.
10	INSPECT CMP SENSOR - Turn ignition key to OFF. - Perform CMP sensor inspection. (See F-55 CAMSHAFT POSITION (CMP) SENSOR INSPECTION.) - Is CMP sensor okay?	Yes	Go to next step.
		No	Inspect CMP sensor pulse wheel for damage. Replace CMP sensor pulse wheel and go to step 10.
11	VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from PCM memory using WDS or equivalent. - Start engine. - Access MAF PID using WDS or equivalent. Note - MAF PID should indicate 1.95 g/s {0.25 lb/min.} or above during this test - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0403

A6E397001086W01

DTC P0403	EGR valve (stepper motor) circuit malfunction
DETECTION CONDITION	- PCM monitors input voltage from EGR valve. If voltage at PCM terminals 4E, 4H, 4K and/or 4N remain low or high, PCM determines that EGR valve circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.

ON-BOARD DIAGNOSTIC

DTC P0403	EGR valve (stepper motor) circuit malfunction
POSSIBLE CAUSE	• EGR valve malfunction • Connector or terminal malfunction • Short to power circuit in wiring between EGR valve terminal E and PCM terminal 4E • Short to power circuit in wiring between EGR valve terminal A and PCM terminal 4H • Short to power circuit in wiring between EGR valve terminal B and PCM terminal 4K • Short to power circuit in wiring between EGR valve terminal F and PCM terminal 4N • Short to ground circuit in wiring between EGR valve terminal E and PCM terminal 4E • Short to ground circuit in wiring between EGR valve terminal A and PCM terminal 4H • Short to ground circuit in wiring between EGR valve terminal B and PCM terminal 4K • Short to ground circuit in wiring between EGR valve terminal F and PCM terminal 4N • Open circuit in wiring between EGR valve terminal E and PCM terminal 4E • Open circuit in wiring between EGR valve terminal A and PCM terminal 4H • Open circuit in wiring between EGR valve terminal B and PCM terminal 4K • Open circuit in wiring between EGR valve terminal F and PCM terminal 4N • Open circuit in wiring between main relay terminal D and EGR valve terminal C • Open circuit in wiring between main relay terminal D and EGR valve terminal D • PCM malfunction
MAIN RELAY EGR VALVE HARNESS SIDE CONNECTOR PCM HARNESS SIDE CONNECTOR	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE • Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) • Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	INSPECT POOR CONNECTION OF EGR VALVE • Turn ignition key to OFF. • Disconnect EGR valve connector. • Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). • Is there any malfunctions?	Yes Repair or replace terminals and/or connector, then go to Step 9.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	INSPECT POWER CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage following terminal and body ground. — EGR valve terminal C — EGR valve terminal D - Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open circuit then go to Step 9.
4	INSPECT EGR VALVE - Perform EGR valve inspection. (See F-40 EGR VALVE INSPECTION.) - Is EGR valve okay?	Yes	Go to next step.
		No	Replace EGR valve, then go to Step 9.
5	INSPECT FOR CONTROL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity following terminal and body ground: — EGR valve terminal E — EGR valve terminal A — EGR valve terminal B — EGR valve terminal F - is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Go to next step.
6	INSPECT FOR CONTROL CIRCUIT FOR SHORT TO POWER - Turn ignition switch key to ON (Engine OFF). - Measure voltage following terminal and body ground: — EGR valve terminal E — EGR valve terminal A — EGR valve terminal B — EGR valve terminal F - Is voltage B+?	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to next step.
7	INSPECT POOR CONNECTION OF PCM - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunctions?	Yes	Repair or replace terminals and/or connector, then go to Step 9.
		No	Go to next step.
8	INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT - Remove PCM with PCM connector connected. - Inspect continuity following terminals: — Between EGR valve terminal E and PCM terminal 4E — Between EGR valve terminal A and PCM terminal 4H — Between EGR valve terminal B and PCM terminal 4K — Between EGR valve terminal F and PCM terminal 4N - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0403 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0420

A6E397001086W02

DTC P0420	Catalyst system efficiency below threshold
DETECTION CONDITION	- PCM compares number of front HO2S and rear HO2S inversions for a predetermined time. PCM monitors number of inversions rear side performs while front side inverts for a specified number of times when the following monitoring conditions are met. PCM detects inversion ratio. If inversion ratio is below threshold, PCM determines that catalyst system has deteriorated. MONITORING CONDITION - Engine speed 1,410—3,000 rpm (MTX) - Engine speed 1,281—3,000 rpm (ATX) - Calculated load 15—50%(*1) *1: Maximum calculated load value varies depending on engine speed. Diagnostic support note - This is a intermittent monitor. (CATALYST) - MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - DIAGNOSTIC MONITORING TEST RESULTS and PENDING CODE are stored if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- TWC deterioration or malfunction - Exhaust gas leakage - Looseness of front HO2S - Looseness of rear HO2S - Front HO2S malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	VERIFY RELATED PENDING CODE OR STORED DTCs - Turn ignition key to OFF then ON (Engine OFF). - Verify related pending code or stored DTCs. - Are other DTCs present?	Yes Go to appropriate DTC troubleshooting.
		No Go to next step.
4	INSPECT GAS LEAKAGE OF EXHAUST SYSTEM - Visually inspect exhaust gas leakage in exhaust system. - Is there any gas leakage?	Yes Repair or replace faulty exhaust parts, then go to Step 7.
		No Go to next step.
5	INSPECT INSTALLATION OF FRONT AND REAR OXYGEN SENSORS - Inspect for looseness of front and rear oxygen sensors. - Is it okay?	Yes Go to next step.
		No Retighten sensor, then go to Step 7.
6	INSPECT TWC - Clear DTC using WDS or equivalent generic OBD function. - Cycle ignition key to OFF then back to ON. - Inspect TWC. (See F-41 THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION) - Is it okay?	Yes Replace suspected oxygen sensor, then go to next step.
		No Replace TWC, then go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
7	VERIFY TROUBLESHOOTING OF DTC P0420 OR P0431 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Run PCM adaptive memory procedure drive mode and HO2S heater, HO2S, and EGR system repair verification drive mode. (See F-64 OBD DRIVE MODE.) - Is PENDING CODE the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE .)
		No	Troubleshooting completed.

DTC P0443

A6E397001086W03

DTC P0443	Evaporative emission control system purge control valve circuit malfunction
DETECTION CONDITION	- PCM monitors input voltages from purge solenoid valve. If voltage at PCM terminal 4U remains low or high, PCM determines that purge solenoid valve circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Purge solenoid valve malfunction - Connector or terminal malfunction - Short to ground in wiring between purge solenoid valve terminal A and PCM terminal 4U - Open circuit in wiring between main relay and purge solenoid valve terminal B - Open circuit in wiring between purge solenoid valve terminal A and PCM terminal 4U - Short to power circuit between purge solenoid valve terminal A and PCM terminal 4U - PCM malfunction
The diagram illustrates the electrical circuit for the Purge Solenoid Valve. It shows the Main Relay connected to the Purge Solenoid Valve (terminals B and A) and the PCM (terminal 4U). The Purge Solenoid Valve is shown with terminals B and A. The PCM is shown with terminal 4U. Below the diagram are two connector views: the Purge Solenoid Valve Harness Side Connector and the PCM Harness Side Connector. The Purge Solenoid Valve Harness Side Connector shows terminals B and A. The PCM Harness Side Connector shows terminal 4U.	

ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION - Disconnect purge solenoid valve tube that is connected to intake manifold. - Connect vacuum pump to purge solenoid valve. - Pump vacuum pump several times and stop. - Wait a few seconds. - Is vacuum maintained?	Yes	Go to Step 4.
		No	Go to next step.
3	INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE - Turn ignition key to OFF. - Disconnect purge solenoid valve connector. - Pump vacuum pump several times and wait a few seconds. - Is vacuum maintained?	Yes	Repair or replace harness for short to ground, then go to Step 9.
		No	Replace purge solenoid valve, then go to Step 9.
4	INSPECT PURGE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
5	INSPECT PURGE SOLENOID VALVE - Perform purge solenoid valve inspection. (See F-39 PURGE SOLENOID VALVE INSPECTION) - Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 9.
6	INSPECT PURGE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage between purge solenoid valve connector terminal B and body ground. - Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 9.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then go to Step 9.
		No	Go to next step.
8	INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage between purge solenoid valve terminal A (harness-side) and body ground. - Is voltage B+?	Yes	Repair or replace harness for short to power, then go to next step.
		No	Inspect for continuity between purge solenoid valve terminal A (harness-side) and PCM terminal 4U (harness-side). - If there is continuity, go to next step. - If there is no continuity, repair or replace harness for open, then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED - Make sure to reconnect all disconnected connectors. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

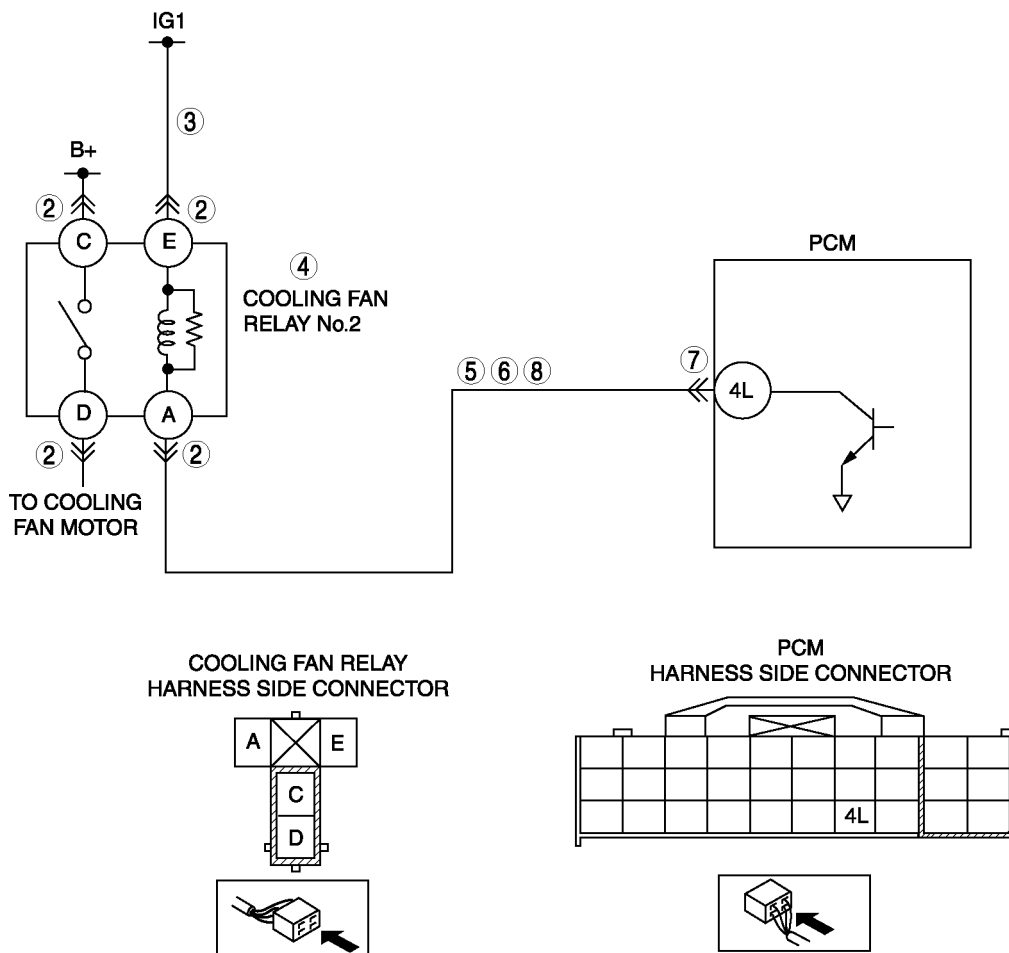
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ON-BOARD DIAGNOSTIC

DTC P0480

A6E397001086W04

DTC P0480	Fan relay control circuit malfunction
DETECTION CONDITION	PCM monitors cooling fan relay No.2 control signal at PCM terminal 4L. If PCM detects cooling fan relay No.2 control signal does not change coolant temperature above 100 °C {212 °F}, PCM determines that cooling fan relay No.2 control has malfunction.
POSSIBLE CAUSE	- cooling fan relay No.2 malfunction - Connector or terminal malfunction - Open circuit in wiring between METER fuse and cooling fan relay No.2 terminal E - Open circuit in wiring between cooling fan relay No.2 terminal A and PCM terminal 4L - Short to ground in wiring between cooling fan relay No.2 terminal A and PCM terminal 4L - Short to power circuit between cooling fan relay No.2 terminal A and PCM terminal 4L - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	INSPECT COOLING FAN RELAY NO.2 CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect cooling fan relay No.2 connector. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes Repair or replace terminal and/or connector, then go to Step 9.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	INSPECT COOLING FAN RELAY NO.2 POWER CIRCUIT FOR OPEN - Turn ignition switch to ON (Engine OFF). - Measure voltage between cooling fan relay No.2 terminal E (harness side) and body ground. - Is voltage B+?	Yes	Go to next step.
		No	Replace or replace harness for open, then go to Step 9.
4	INSPECT COOLING FAN RELAY NO.2 - Inspect cooling fan relay No.2. (See T-24 RELAY INSPECTION) - Is cooling fan relay No.2 okay?	Yes	Go to next step.
		No	Replace cooling fan relay No.2, then go to Step 9.
5	INSPECT COOLING FAN RELAY NO.2 CONTROL CIRCUIT FOR SHORT TO POWER - Measure voltage between cooling fan relay No.2 terminal A (harness side) and body ground. - Is voltage B+?	Yes	Repair or replace harness for short to power, then go to Step 9.
		No	Go to next step.
6	INSPECT COOLING FAN RELAY NO.2 CONTROL CIRCUIT FOR SHORT TO GROUND - Inspect continuity between cooling fan relay No.2 terminal A (harness side) and body ground. - Is there continuity?	Yes	Repair or replace harness for open, then go to Step 9.
		No	Go to next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal and/or connector, then go to Step 9.
		No	Go to next step.
8	INSPECT COOLING FAN RELAY NO.2 CONTROL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between cooling fan relay No.2 terminal A and PCM terminal 4L. - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE .)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0500

A6E397001087W01

DTC P0500	Vehicle speed sensor (VSS) circuit malfunction (MTX vehicles without ABS)
DETECTION CONDITION	- Vehicle speed signal does not input after following conditions are met: — Gear is in other than neutral position — Load is above 40% — Engine speed is 2,000 rpm or above Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- VSS malfunction - ABS/TCS/DCS malfunction - Connector or terminal malfunction - Open circuit between PCM terminal 2I and VSS terminal A - Open circuit between PCM terminal 2L and VSS terminal B - Short to ground between PCM terminal 2I and VSS terminal A - Short to ground between PCM terminal 2L and VSS terminal B - Short to power between PCM terminal 2I and VSS terminal A - Short to power between PCM terminal 2L and VSS terminal B - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT - Connect WDS or equivalent to DLC-2. - Start engine. - Access VSS PID using WDS or equivalent. - Vehicle speed 20 km/h {12.4 mph}: 20km/h {12.4 mph} - Vehicle speed 40 km/h {24.8 mph}: 40km/h {24.8 mph} - Are PID readings within specification?	Yes	Go to intermittent concern troubleshooting procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
		No	Go to next step.
4	INSPECT POOR CONNECTION OF VSS CONNECTOR - Verify that the VSS connector is connected securely. - Is connector okay?	Yes	Go to next step.
		No	Reconnect the connector, then go to Step 11.
5	INSPECT VSS - Perform VSS inspection. (See J-5 VEHICLE SPEEDOMETER SENSOR INSPECTION) - Is VSS okay?	Yes	Go to next step.
		No	Replace VSS, then go to Step 11.
6	INSPECT VSS CIRCUIT FOR SHORT TO POWER - Turn ignition key OFF - Disconnect VSS connector. - Turn ignition key ON (Engine OFF) - Measure voltage following terminals: - VSS terminal A - VSS terminal B - Is any voltage reading?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
7	INSPECT VSS CIRCUIT FOR SHORT TO GROUND - Inspect continuity between following terminal and body ground: - VSS terminal A - VSS terminal B - Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
8	INSPECT VSS CIRCUITS FOR SHORTS - Inspect continuity between VSS connector terminals A and B. - Is there any continuity?	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to next step.
9	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there any malfunction?	Yes	Repair terminal, then go to Step 11.
		No	Go to next step.
10	INSPECT VSS CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between following circuits: - VSS terminal A and PCM terminal 2I - VSS terminal B and PCM terminal 2L - Is there continuity?	Yes	Inspect VSS pulse wheel for damage. Replace VSS pulse wheel and go to next step.
		No	Repair or replace suspected harness, then go to next step.

F

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
11	VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from PCM memory using WDS or equivalent. - Warm up engine. - Access RPM and LOAD PID using WDS or equivalent. - Drive vehicle under following conditions for 18s. - Engine speed: 2,000 rpm or above - Gear: Gear is in other than NEUTRAL - Load: 40% or above - Is PENDING CODE the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0505

A6E397001087W02

DTC P0505	IAC valve circuit malfunction
DETECTION CONDITION	PCM cannot control idle speed toward target idle speed while KOER self test.
POSSIBLE CAUSE	- IAC valve circuit malfunction - Air cleaner element clogged - Air intake passage clogged - A/C relay control circuit malfunction - Generator control circuit malfunction - Low engine compression (Over capacity of blow-by gas) - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No	Go to next step.
2	VERIFY RELATED PENDING OR STORED DTCS - Turn ignition switch to OFF, then ON. (Engine OFF) - verify pending code or stored DTCs using WDS or equivalent. - Does DTC P0511, P2502, P2503 or P2504 present?	Yes	Perform applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Go to next step.
3	INSPECT IAC VALVE MALFUNCTION - Start engine. - Disconnect IAC valve connector. - Is engine speed decreased?	Yes	Go to next step.
		No	Repair IAC valve, then go to Step 9.
4	INSPECT A/C MAGNETIC CLUTCH OPERATION Note - The following test should be performed for A/C. go to next step for vehicles without A/C - Turn blower motor switch to off. - Is magnetic clutch still on?	Yes	Go to "A/C ALWAYS ON / A/C COMPRESSOR RUNS CONTINUOUSLY." of ENGINE SYMPTOM TROUBLESHOOTING then go to step 9. (See F-181 ENGINE SYMPTOM TROUBLESHOOTING.)
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
5	INSPECT GENERATOR CONTROL CIRCUIT MALFUNCTION - Apply electrical load. - Is engine speed increased?	Yes Go to next step.
		No Repair short to power circuit in generator control circuit, then go to Step 9.
6	INSPECT AIR CLEANER ELEMENT - remove air cleaner element with engine running. - Is engine speed increased?	Yes Clean or replace air cleaner element, then go to Step 9.
		No Go to next step.
7	INSPECT THROTTLE BODY PASSAGE Is throttle body clogged?	Yes Clean or replace throttle body passage, then go to Step 9.
		No Go to next step.
8	INSPECT ENGINE COMPRESSION - Inspect engine compression. (See B-9 COMPRESSION INSPECTION.) - Is engine compression okay?	Yes Go to next step.
		No Overhaul engine, then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0505 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P0506

A6E397001087W03

DTC P0506	Idle control system RPM lower than expected
DETECTION CONDITION	- Actual idle speed is lower than expected by 100 rpm for 14 s, when brake pedal is depressed (brake switch is on) and steering wheel is held straight ahead (power steering pressure switch is off). Note - If atmospheric pressure is less than 72.3 kPa {542 mmHg, 21.3 inHg} or intake air temperature is below -10 °C {14 °F}, PCM cancels diagnosis of P0506. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
	POSSIBLE CAUSE - IAC valve malfunction - Air cleaner element clogged - Air intake passage clogged - A/C relay control circuit malfunction - Generator malfunction - Purge solenoid valve malfunction - Low engine compression (Over capacity of blow-by gas) - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	VERIFY RELATED PENDING OR STORED DTCs - Turn ignition key to OFF, then ON (Engine OFF). - Verify pending code or stored DTCs using WDS or equivalent. - Is other DTC present?	Yes	Repair applicable DTCs. (See F-67 DTC TABLE.)
		No	Go to next step.
4	INSPECT IAC VALVE MALFUNCTION - Perform IAC valve inspection. (See F-13 IDLE AIR CONTROL (IAC) VALVE INSPECTION.) - Is IAC valve okay?	Yes	Go to next step.
		No	Replace IAC valve, then go to Step 11.
5	INSPECT A/C MAGNET CLUTCH OPERATION - Turn blower motor switch off. - Is magnet clutch still on?	Yes	Refer to "A/C is always on or A/C compressor runs continuously." of ENGINE SYMPTOM TROUBLESHOOTING, then go to Step 11. (See F-181 ENGINE SYMPTOM TROUBLESHOOTING.)
		No	Go to next step.
6	INSPECT PURGE SOLENOID VALVE MALFUNCTION - Perform purge solenoid valve inspection. (See F-39 PURGE SOLENOID VALVE INSPECTION.) - Is purge solenoid valve okay?	Yes	Go to next step.
		No	Replace purge solenoid valve, then go to Step 11.
7	INSPECT AIR CLEANER ELEMENT - Remove air cleaner element with engine running. - Is engine speed increased?	Yes	Replace air cleaner element, then go to Step 11.
		No	Go to next step.
8	INSPECT THROTTLE BODY PASSAGE Is throttle body clogged?	Yes	Clean or replace throttle body passage, then go to Step 11.
		No	Go to next step.
9	INSPECT ENGINE COMPRESSION - Inspect engine compression. (See B-9 COMPRESSION INSPECTION.) - Is engine compression okay?	Yes	Go to next step.
		No	Overhaul engine, then go to Step 11.
10	INSPECT GENERATOR - Perform generator inspection. (See G-7 GENERATOR INSPECTION.) - Is generator okay?	Yes	Go to next step.
		No	Repair or replace related part, then go to next step.
11	VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED - Make sure to reconnect all disconnected connectors. - Start engine. - Clear DTC from PCM memory using WDS or equivalent. - Depress brake pedal for 14 s or more. - Is PENDING CODE the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0507

A6E397001087W04

DTC P0507	Idle control system RPM higher than expected
DETECTION CONDITION	- Actual idle speed is higher than expected by 200 rpm for 14 s, when brake pedal is depressed (brake switch is on) and steering wheel is held straight ahead (power steering pressure switch is off). Note - If atmospheric pressure is less than 72.3 kPa {542 mmHg, 21.3 inHg} or intake air temperature is below -10 °C {14 °F}, PCM cancels diagnosis of P0507. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- IAC valve malfunction - Accelerator cable misadjusting - Actuator cable misadjusting - Throttle valve malfunction - Vacuum hose misconnection - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	VERIFY RELATED PENDING OR STORED DTCs - Turn ignition key to OFF, then ON (Engine OFF). - Verify pending code or stored DTCs using WDS or equivalent. - Is other DTC present?	Yes Repair applicable DTCs. (See F-67 DTC TABLE .)
		No Go to next step.
4	INSPECT IAC VALVE MALFUNCTION - Perform IAC valve inspection. (See F-13 IDLE AIR CONTROL (IAC) VALVE INSPECTION.) - Is IAC valve okay?	Yes Go to next step.
		No Replace IAC valve, then go to Step 9.
5	INSPECT ACCELERATOR CABLE FREE PLAY - Turn ignition key to OFF. - Is accelerator cable free play okay? (See F-16 ACCELERATOR CABLE INSPECTION/ADJUSTMENT.)	Yes Go to next step.
		No Adjust accelerator cable free play, then go to Step 9. (See F-16 ACCELERATOR CABLE INSPECTION/ADJUSTMENT .)
6	INSPECT ACTUATOR CABLE FREE PLAY Is actuator cable adjustments okay?	Yes Go to next step.
		No Adjust actuator cable free play, then go to Step 9.
7	INSPECT VACUUM HOSE CONNECTION Are vacuum hoses connecting accurately? (See F-10 VACUUM HOSE ROUTING DIAGRAM.)	Yes Go to next step.
		No Reconnect vacuum hose accurately, then go to step 9.
8	VISUAL INSPECT THROTTLE VALVE - Remove throttle body. - Is throttle valve fully closed?	Yes Go to next step.
		No Clean or replace throttle body, then go to next step.

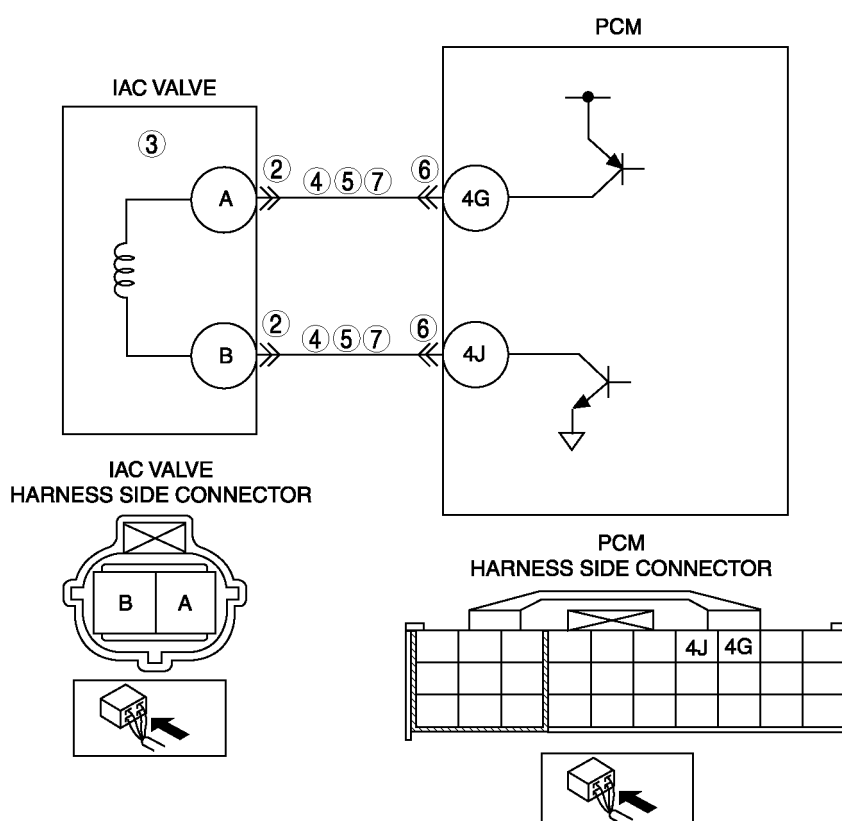
ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
9	VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED - Make sure to reconnect all disconnected connectors. - Start engine. - Clear DTC from PCM memory using WDS or equivalent. - Depress brake pedal for 14 s or more. - Is PENDING CODE the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0511

A6E397001087W05

DTC P0511	IAC valve circuit malfunction
DETECTION CONDITION	- If PCM detects that PCM terminal 4G voltage is above or below threshold* when IAC control duty target is within 16—70%, PCM determines that IAC valve circuit has malfunction. *: Detected threshold value depends on battery voltage and IAC control signal duty value. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions in first consecutive drive cycles. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- IAC valve circuit malfunction - Short to ground between IAC valve terminal A (harness-side) and PCM terminal 4G (harness-side) - Short to ground between IAC valve terminal B (harness-side) and PCM terminal 4J (harness-side) - Open circuit between IAC valve terminal A (harness-side) and PCM terminal 4G (harness-side) - Open circuit between IAC valve terminal B (harness-side) and PCM terminal 4J (harness-side) - Short to power between IAC valve terminal A (harness-side) and PCM terminal 4G (harness-side) - Short to power between IAC valve terminal B (harness-side) and PCM terminal 4J (harness-side) - Poor connection of IAC valve connector or PCM connector - PCM malfunction



ON-BOARD DIAGNOSTIC

Diagnostic procedure

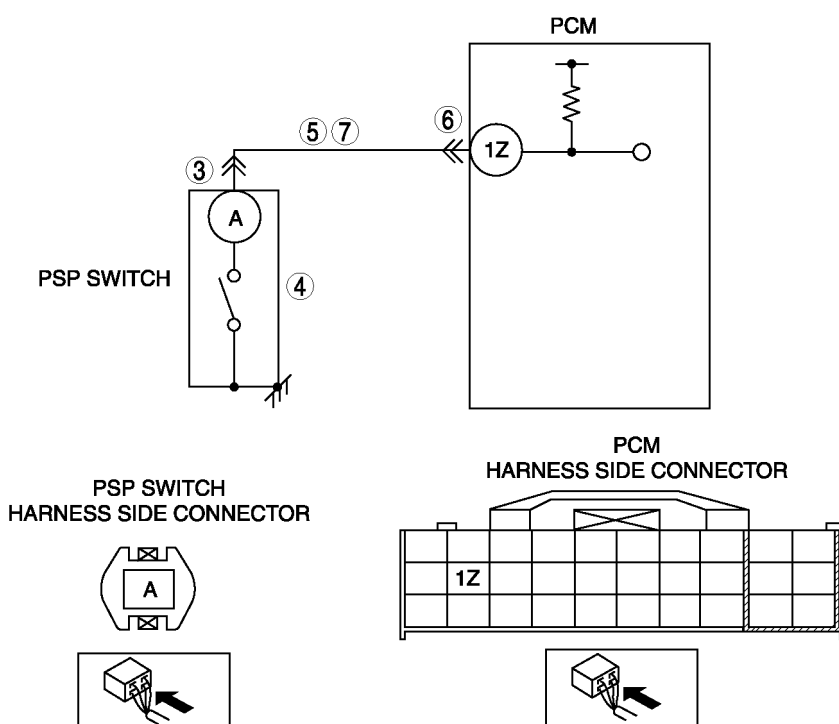
STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT POOR CONNECTION OF IAC VALVE CONNECTOR - Turn ignition key to OFF. - Disconnect IAC valve connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes	Repair or replace terminal, then go to Step 8.
		No	Go to next step.
3	INSPECT IAC VALVE ELECTRICAL MALFUNCTION - Inspect IAC valve. (See F-13 IDLE AIR CONTROL (IAC) VALVE INSPECTION.) - Is IAC valve okay?	Yes	Go to next step.
		No	Replace IAC valve, then go to Step 8.
4	INSPECT CONTROL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (Engine OFF). - Measure voltage between following terminal and body ground: - IAC valve terminal A - IAC valve terminal B - Is there voltage B+?	Yes	Repair or replace harness, then go to Step 8.
		No	Go to next step.
5	INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between following terminals and body ground: - IAC valve terminal A - IAC valve terminal B - Is there any continuity?	Yes	Repair or replace harness, then go to Step 8.
		No	Go to next step.
6	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
7	INSPECT CONTROL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT - Inspect continuity following terminals: - Between IAC valve terminal A and PCM terminal 4G - Between IAC valve terminal B and PCM terminal 4J - Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P0511 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0550

A6E397001087W06

DTC P0550	PSP switch circuit malfunction
DETECTION CONDITION - PCM monitors PSP switch signal at PCM terminal 1Z. If input voltage is low (switch stays on) for 1 minute when VSS is above 60 km/h {37.3 mph} and ECT is above 60 °C {140 °F}, PCM determines that PSP switch circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.	POSSIBLE CAUSE - PSP switch malfunction - Connector or terminal malfunction - Short to ground in wiring between PSP switch terminal and PCM terminal 1Z - Open circuit in wiring between PSP switch terminal and PCM terminal 1Z - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	INSPECT POOR CONNECTION OF PSP CONNECTOR - Turn ignition key to OFF. - Disconnect PSP connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes Repair or replace terminal, then go to Step 8.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
4	INSPECT PSP SWITCH - Perform PSP switch inspection. (See F-58 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION.) - Is PSP switch okay?	Yes	Go to next step.
		No	Replace PSP switch, then go to Step 8.
5	INSPECT PSP SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND - Disconnect PCM connector. - Inspect continuity between PSP switch terminal (harness-side) and body ground. - Is there any continuity?	Yes	Repair or replace harness for short to ground, then go to Step 8.
		No	Go to next step.
6	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
7	INSPECT SIGNAL CIRCUIT MALFUNCTION FOR OPEN CIRCUIT - Inspect continuity between PSP terminal A (harness-side) and PCM terminal 1Z. - Is there any continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P0550 COMPLETED - Make sure to reconnect all disconnected connectors. - Start engine. - Clear DTC from PCM memory using WDS or equivalent. - Drive vehicle above 60 km/h {37.3 mph} for 1 min. - Verify that ECT PID above 60 °C {140 °F} using WDS or equivalent. - Is PENDING CODE the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

F

ON-BOARD DIAGNOSTIC

DTC P0602

A6E397001088W01

DTC P0602	PCM programming error
DETECTION CONDITION	- No configuration data in PCM Note - If "PCM CONFIGURATION" is successful, the PCM stored DTC P0602 and illuminates the MIL (System is normal). Clear the DTC P0602 using WDS or equivalent after "PCM CONFIGURATION". - MIL goes off after three drive cycles with no failure (DTCs remain in PCM).
POSSIBLE CAUSE	- Complete configuration has not been completed. - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Perform PCM configuration procedure, then go to next step. (See F-50 PCM CONFIGURATION .)
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	VERIFY TROUBLESHOOTING OF DTC P0602 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No Go to next step.
3	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE .)
		No Troubleshooting completed.

DTC P0610

A6E397001088W02

DTC P0610	Control module vehicle options error
DETECTION CONDITION	PCM data configuration error
POSSIBLE CAUSE	- Configuration procedure has not been completed - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Perform PCM configuration procedure, then go to next step. (See F-50 PCM CONFIGURATION .)
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	VERIFY TROUBLESHOOTING OF DTC P0610 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No Go to next step.
3	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE .)
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0661

A6E397001088W03

DTC P0661	Variable intake-air system (VIS) control solenoid valve circuit low input
DETECTION CONDITION	PCM monitors VIS control solenoid valve control signal at PCM terminal 4R. If PCM turns VIS control solenoid valve off but voltage at PCM terminal 4R still remains low, PCM determines that VIS control solenoid valve circuit has malfunction.
POSSIBLE CAUSE	- VIS control solenoid valve malfunction - Open circuit in wiring between main relay and VIS control solenoid valve terminal B - Open circuit in wiring between VIS control solenoid valve terminal A and PCM terminal 4R - Short to ground in wiring between VIS control solenoid valve terminal A and PCM terminal 4R - Connector or terminal malfunction - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes: Go to next step. No: Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT VIS CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect VIS control solenoid valve connector. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes: Repair or replace terminal, then go to Step 8. No: Go to next step.
3	INSPECT VIS CONTROL SOLENOID VALVE MALFUNCTION - Perform VIS control solenoid valve inspection. (See F-14 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION (L3).) - Is VIS solenoid valve okay?	Yes: Go to next step. No: Replace VIS control solenoid valve, then go to step 8.
4	INSPECT VIS CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to ON (Engine OFF). - Measure voltage between VIS control solenoid valve terminal B (harness-side) and body ground. - Is voltage B+?	Yes: Go to next step. No: Repair or replace harness for open, then go to Step 8.

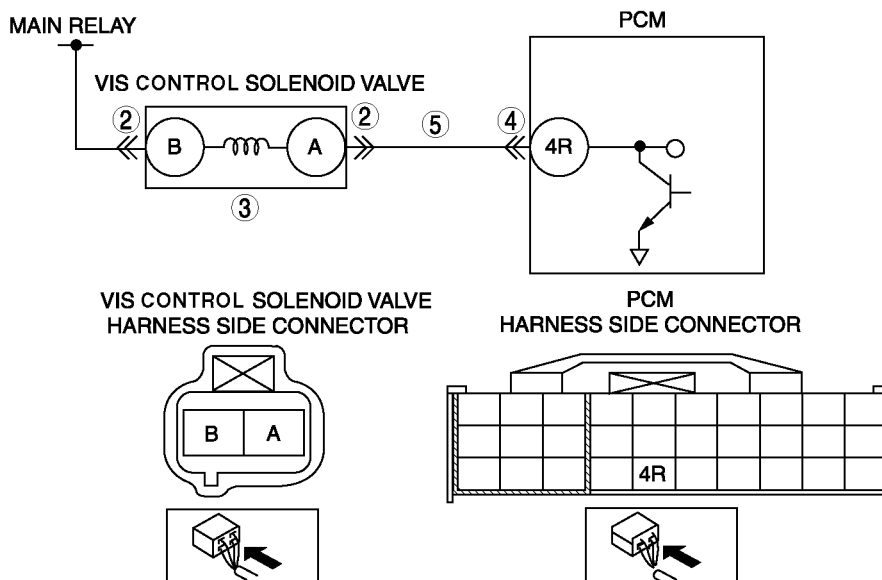
ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT VIS CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND - Inspect continuity between VIS control solenoid valve terminal A (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 8.
		No	Go to next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Inspect for poor connection at terminal 4R. (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
7	INSPECT VIS CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR OPEN - Inspect for continuity between VIS control solenoid valve terminal B (harness-side) and PCM terminal 4R (harness-side). - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P0661 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0662

A6E397001088W04

DTC P0662	Variable intake-air system (VIS) control solenoid valve circuit high input
DETECTION CONDITION	PCM monitors VIS control solenoid valve control signal at PCM terminal 4R. If PCM turns VIS control solenoid valve on but voltage at PCM terminal 4R still remains high, PCM determines that VIS control solenoid valve circuit has malfunction.
POSSIBLE CAUSE	- VIS control solenoid valve malfunction - Short to power circuit between VIS control solenoid valve terminal B and PCM terminal 4R - Shorted VIS control solenoid valve or PCM connector - PCM malfunction



ON-BOARD DIAGNOSTIC

Diagnostic procedure

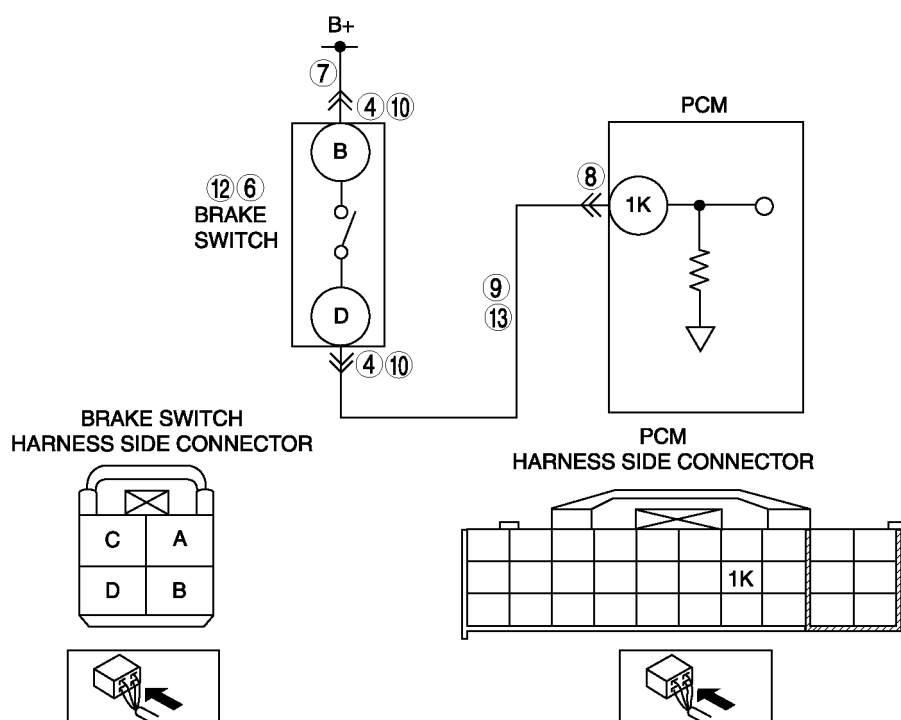
STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT VIS CONTROL SOLENOID VALVE CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect VIS control solenoid valve connector. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then go to Step 6.
		No	Go to next step.
3	INSPECT VIS CONTROL SOLENOID VALVE MALFUNCTION - Perform VIS control solenoid valve inspection. (See F-14 VARIABLE INTAKE-AIR SYSTEM (VIS) CONTROL SOLENOID VALVE INSPECTION (L3)) - Is VIS solenoid valve okay?	Yes	Go to next step.
		No	Replace VIS control solenoid valve, then go to Step 6.
4	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection at terminal 4R. (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair terminal, then go to Step 6.
		No	Go to next step.
5	INSPECT VIS CONTROL SOLENOID VALVE CONTROL CIRCUIT SHORT TO POWER - Turn ignition key to ON (Engine OFF). - Measure voltage between VIS control solenoid valve terminal B (harness-side) and body ground. - Is voltage B+?	Yes	Repair or replace harness for open, then go to next step.
		No	Go to next step.
6	VERIFY TROUBLESHOOTING OF DTC P0662 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0703

A6E397001089W01

DTC P0703	Brake switch input malfunction
DETECTION CONDITION	- PCM monitors changes in input voltage from brake switch. If PCM does not detect PCM terminal 1K voltage changes while alternately accelerating and decelerating 8 times, PCM determines that neutral switch circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- Brake switch malfunction - Poor connection of brake switch connector or PCM connector. - Short to power between brake switch terminal D and PCM connector terminal 1K. - Open harness between brake switch terminal D and PCM connector terminal 1K. - Open harness between battery positive terminal and brake switch terminal B. - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
	No Record FREEZE FRAME DATA on repair order, then go to next step.	
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
	No Go to next step.	
3	CLASSIFY HIGH INPUT OR LOW INPUT - Connect WDS or equivalent to DLC-2. - Access BOO PID. - Verify BOO PID during brake pedal operation. - Is BOO PID always OFF?	Yes Go to Next step.
	No Go to Step 10.	

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
4	INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION • Turn ignition switch to OFF. • Disconnect brake switch connector. • Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	CLASSIFY BRAKE SWITCH OR CIRCUIT • Connect WDS or equivalent to DLC-2. • Access BOO PID. • Connect a jumper wire between brake switch terminal A and B. • Is BOO PID on?	Yes	Go to next step.
		No	Go to Step 7.
6	INSPECT BRAKE SWITCH • Perform brake switch inspection. (See P-8 BRAKE SWITCH INSPECTION.) • Is brake switch okay?	Yes	Go to Step 14.
		No	Replace brake switch, then go to Step 14.
7	INSPECT BRAKE SWITCH POWER CIRCUIT FOR OPEN CIRCUIT • Measure voltage between brake switch connector terminal B and body ground. • Is voltage B+?	Yes	Go to next step.
		No	Repair or replace brake switch power circuit for open, then Go to Step 14.
8	INSPECT PCM CONNECTOR FOR POOR CONNECTION • Turn ignition switch to OFF. • Disconnect PCM connector. • Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
9	INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT • Inspect continuity between brake switch terminal D and PCM terminal 1K. • Is there any continuity?	Yes	Repair or replace harness for open, then go to Step 14.
		No	Go to Step 14.
10	INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION • Turn ignition switch to OFF. • Disconnect brake switch connector. • Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). • Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
11	CLASSIFY BRAKE SWITCH OR CIRCUIT • Connect WDS or equivalent to DLC-2. • Access BOO PID. • Verify that BOO PID changes from ON to OFF when brake switch connector disconnected. • Does BOO PID change from ON to OFF?	Yes	Go to next step.
		No	Go to Step 13.
12	INSPECT BRAKE SWITCH • Perform brake switch inspection. (See P-8 BRAKE SWITCH INSPECTION.) • Is brake switch okay?	Yes	Go to Step 14.
		No	Replace brake switch, then go to Step 14.
13	INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER • Measure voltage between brake switch connector terminal D and body ground. • Is voltage B+?	Yes	Repair or replace harness for short to power, then go to Step 14.
		No	Go to next step.

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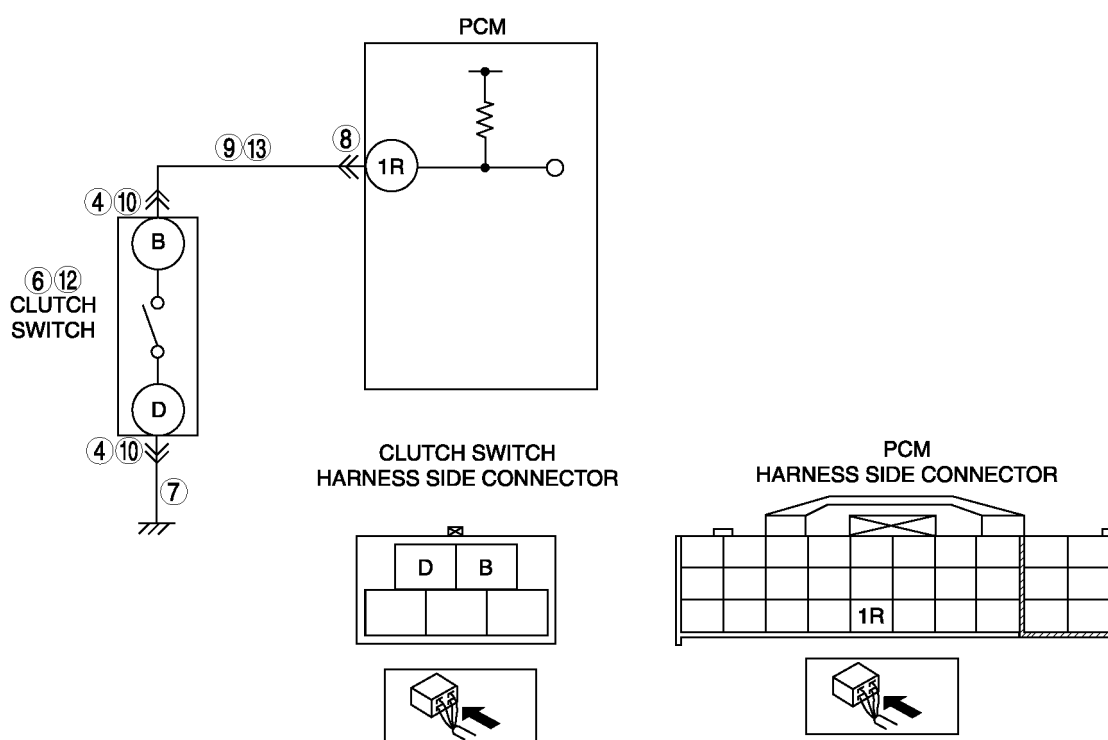
ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
14	VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle 30 km/h {18.6 mph} or more. - Depress and release brake pedal more than 8 times while driving vehicle. - Is PENDING CODE the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
15	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P0704

A6E397001089W02

DTC P0704	Clutch switch circuit malfunction
DETECTION CONDITION	- PCM monitors changes in input voltage from clutch switch. If PCM does not detect PCM terminal 1R voltage changes while running vehicle with vehicle speed below 30 km/h {19mph} 8 times alternately, PCM determines that clutch switch circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- Clutch switch malfunction - Poor connection of clutch switch connector or PCM connector. - Short to ground between clutch switch terminal B and PCM connector terminal 1R. - Open harness between clutch switch terminal B and PCM connector terminal 1R. - Open harness between ground and clutch switch terminal D. - PCM malfunction



ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service information availability. - Is any related Service information available?	Yes	Perform repair or diagnosis according to available Service information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	CLASSIFY HIGH INPUT OR LOW INPUT - Connect WDS or equivalent to DLC-2. - Access CPP PID. - Verify CPP PID during clutch pedal operation. - Is CPP PID always OFF?	Yes	Go to Next step.
		No	Go to Step 10.
4	INSPECT CLUTCH SWITCH CONNECTOR FOR POOR CONNECTION - Turn ignition switch to OFF. - Disconnect clutch switch connector. - Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
5	CLASSIFY CLUTCH SWITCH OR CIRCUIT - Connect WDS or equivalent to DLC-2. - Access CPP PID. - Connect a jumper wire between clutch switch terminal B and D. - Is CPP PID on?	Yes	Go to next step.
		No	Go to Step 7.
6	INSPECT CLUTCH SWITCH - Perform clutch switch inspection. (See F-59 CLUTCH SWITCH INSPECTION.) - Is clutch switch okay?	Yes	Go to Step 14.
		No	Replace clutch switch, then go to Step 14.
7	INSPECT CLUTCH SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between clutch switch terminal D and ground. - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace clutch switch power circuit for open, then Go to Step 14.
8	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition switch to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
9	INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between clutch switch terminal B and PCM terminal 1R. - Is there any continuity?	Yes	Repair or replace harness for open, then go to Step 14.
		No	Go to Step 14.
10	INSPECT CLUTCH SWITCH CONNECTOR FOR POOR CONNECTION - Turn ignition switch to OFF. - Disconnect clutch switch connector. - Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
11	CLASSIFY CLUTCH SWITCH OR CIRCUIT - Connect WDS or equivalent to DLC-2. - Access CPP PID. - Verify that CPP PID changes from ON to OFF when clutch switch connector disconnected. - Does CPP PID change from ON to OFF?	Yes	Go to next step.
		No	Go to Step 13.
12	INSPECT CLUTCH SWITCH - Perform clutch switch inspection. (See F-59 CLUTCH SWITCH INSPECTION.) - Is clutch switch okay?	Yes	Go to Step 14.
		No	Replace clutch switch, then go to Step 14.

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ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
13	INSPECT CLUTCH SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND - Inspect continuity between clutch switch terminal B and ground. - Is there any continuity?	Yes	Repair or replace harness for short to ground, then go to Step 14.
		No	Go to Next step.
14	VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED - Make sure to reconnect all disconnected connectors. - Start engine. - Clear DTC from PCM memory using WDS or equivalent. - Operate clutch pedal during drive vehicle below 30 km/h {19 mph} 8 times alternately. - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
15	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

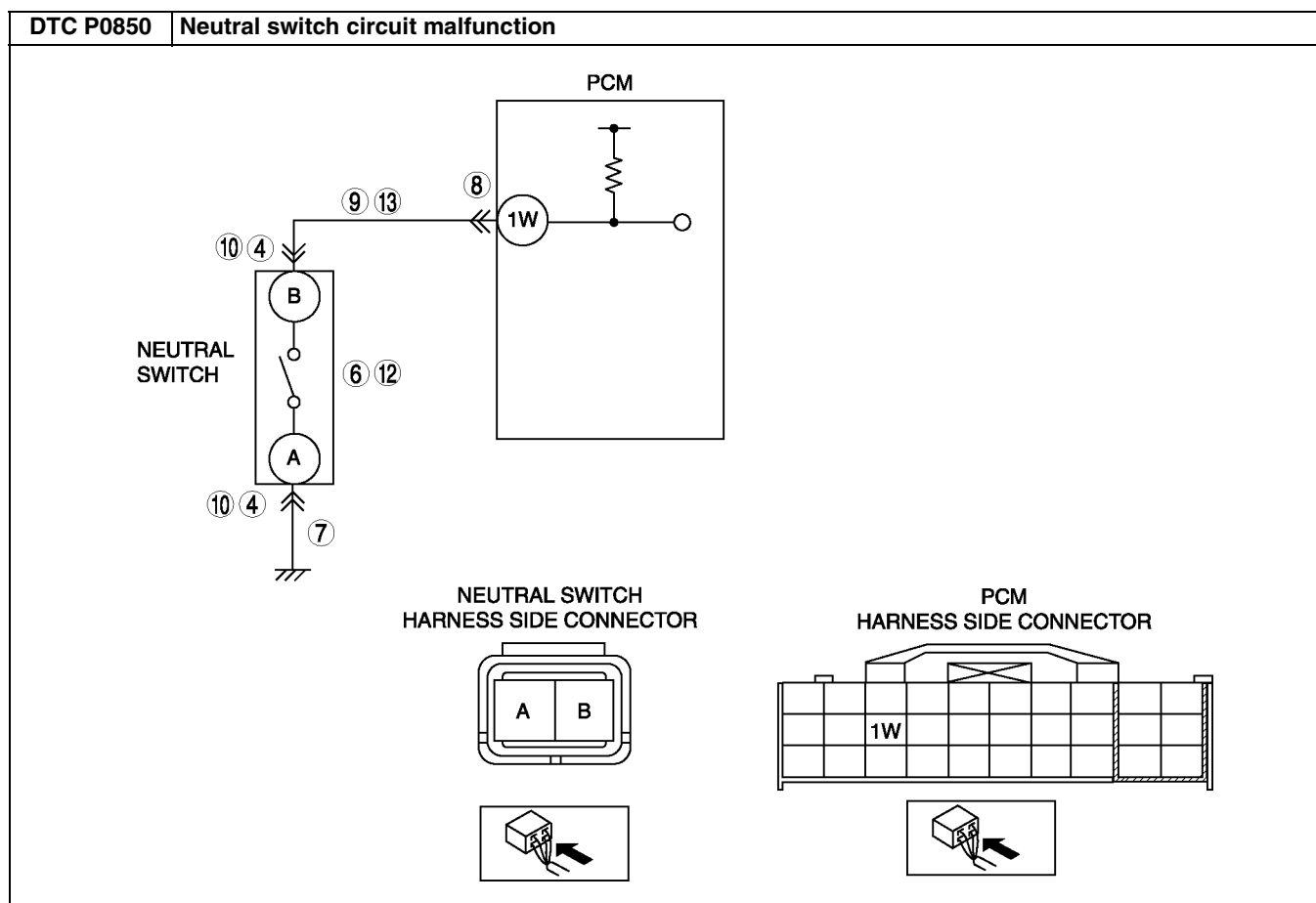
DTC P0850

A6E397001089W03

DTC P0850	Neutral switch circuit malfunction
DETECTION CONDITION	- PCM monitors changes in input voltage from neutral switch. If PCM does not detect PCM terminal 1W voltage changes while running vehicle with vehicle speed above 30 km/h {19 mph} and clutch pedal turns press and depress 10 times repeatedly, PCM determines that neutral switch circuit has malfunction Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- Neutral switch malfunction - Poor connection of neutral switch connector or PCM connector. - Short to ground between neutral switch terminal B and PCM connector terminal 1W. - Open harness between neutral switch terminal B and PCM connector terminal 1W. - Open harness between ground and brake switch terminal A. - PCM malfunction

ON-BOARD DIAGNOSTIC

F



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	CLASSIFY HIGH INPUT OR LOW INPUT - Connect WDS or equivalent to DLC-2. - Access CPP/PNP PID. - Verify CPP/PNP PID when gear is neutral position. - Is CPP/PNP PID always OFF?	Yes Go to Next step.
		No Go to Step 10.
4	INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION - Turn ignition switch to OFF. - Disconnect neutral switch connector. - Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is there malfunction?	Yes Repair or replace terminal, then go to Step 14.
		No Go to next step.
5	CLASSIFY NEUTRAL SWITCH OR CIRCUIT - Connect WDS or equivalent to DLC-2. - Access CPP/PNP PID. - Connect a jumper wire between neutral switch terminal A and B. - Is CPP/PNP PID on?	Yes Go to next step.
		No Go to Step 7.
6	INSPECT NEUTRAL SWITCH - Perform neutral switch inspection. (See F-59 NEUTRAL SWITCH INSPECTION.) - Is neutral switch okay?	Yes Go to Step 14.
		No Replace neutral switch, then go to Step 14.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
7	INSPECT NEUTRAL SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between neutral switch terminal A and ground. - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace neutral switch power circuit for open, then Go to Step 14.
8	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition switch to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
9	INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between neutral switch terminal B and PCM terminal 1W. - Is there any continuity?	Yes	Repair or replace harness for open, then go to Step 14.
		No	Go to Step 14.
10	INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION - Turn ignition switch to OFF. - Disconnect neutral switch connector. - Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then go to Step 14.
		No	Go to next step.
11	CLASSIFY NEUTRAL SWITCH OR CIRCUIT - Connect WDS or equivalent to DLC-2. - Access CPP/PNP PID. - Verify that CPP/PNP PID changes from ON to OFF when neutral switch connector disconnected. - Does CPP/PNP PID change from ON to OFF?	Yes	Go to next step.
		No	Go to Step 13.
12	INSPECT NEUTRAL SWITCH - Perform neutral switch inspection. (See F-59 NEUTRAL SWITCH INSPECTION.) - Is neutral switch okay?	Yes	Go to Step 14.
		No	Replace neutral switch, then go to Step 14.
13	INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND - Inspect continuity between neutral switch terminal B and ground. - Is there any continuity?	Yes	Repair or replace harness for short to ground, then go to Step 14.
		No	Go to Next step.
14	VERIFY TROUBLESHOOTING OF DTC P0850 COMPLETED - Make sure to reconnect all disconnected connectors. - Start engine. - Clear DTC from PCM memory using WDS or equivalent. - Drive vehicle above 30 km/h {19 mph} and stop vehicle. - Depress and release clutch pedal more than 10 times during drive cycle. - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
15	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P1410

A6E397001083W01

DTC P1410	Variable air duct (VAD) control system circuit malfunction
DETECTION CONDITION	PCM monitors VAD solenoid control signal at PCM terminal 4C. If PCM detects VAD solenoid control signal does not change when VAD solenoid valve is switched to ON or OFF, PCM determines that VAD solenoid control circuit has malfunction.

ON-BOARD DIAGNOSTIC

DTC P1410	Variable air duct (VAD) control system circuit malfunction
POSSIBLE CAUSE	- VAD solenoid valve malfunction. - Connector or terminal malfunction. - Short to ground in wiring between VAD solenoid valve terminal B and PCM terminal 4C - Open circuit in wiring between main relay and VAD solenoid valve terminal A - Open circuit in wiring between VAD solenoid valve terminal B and PCM terminal 4C - Short to power in wiring between VAD solenoid valve terminal B and PCM terminal 4C - PCM malfunction
MAIN RELAY VAD SOLENOID VALVE VAD SOLENOID VALVE HARNESS SIDE CONNECTOR PCM PCM HARNESS SIDE CONNECTOR	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	CLASSIFY POWER CIRCUIT OR CONTROL CIRCUIT MALFUNCTION Is the same DTC and P0102, P0103, P0403, P0661, P0662, P2009 or P2010 present?	Yes Malfunction at power circuit, then go to next step
		No Malfunction at VAD solenoid valve or control circuit, then go to Step 5
3	INSPECT POOR CONNECTION OF VAD SOLENOID VALVE CONNECTOR - Disconnect VAD solenoid valve connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes Repair terminals, then go to Step 11.
		No Go to next step.
4	INSPECT VAD SOLENOID VALVE POWER CIRCUIT FOR OPEN CIRCUIT - Turn ignition switch to ON (Engine OFF). - Measure voltage between VAD solenoid valve connector terminal A and body ground. - Is voltage B+?	Yes Inspect VAD solenoid valve. - If there is a malfunction, replace VAD solenoid valve, then go to Step 11 - If there is no malfunction, go to Step 12
		No Repair or replace VAD solenoid valve power circuit for open, then Go to Step 11.
5	INSPECT POOR CONNECTION OF VAD SOLENOID VALVE CONNECTOR - Disconnect connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes Repair or replace terminals, then go to Step 11.
		No Go to next step.
6	INSPECT VAD SOLENOID VALVE - Perform VAD solenoid valve inspection. (See F-12 VARIABLE AIR DUCT (VAD) SHUTTER VALVE INSPECTION (L3).) - Is clutch switch okay?	Yes Go to Step 11.
		No Replace VAD solenoid valve, then go to Step 11.

ON-BOARD DIAGNOSTIC

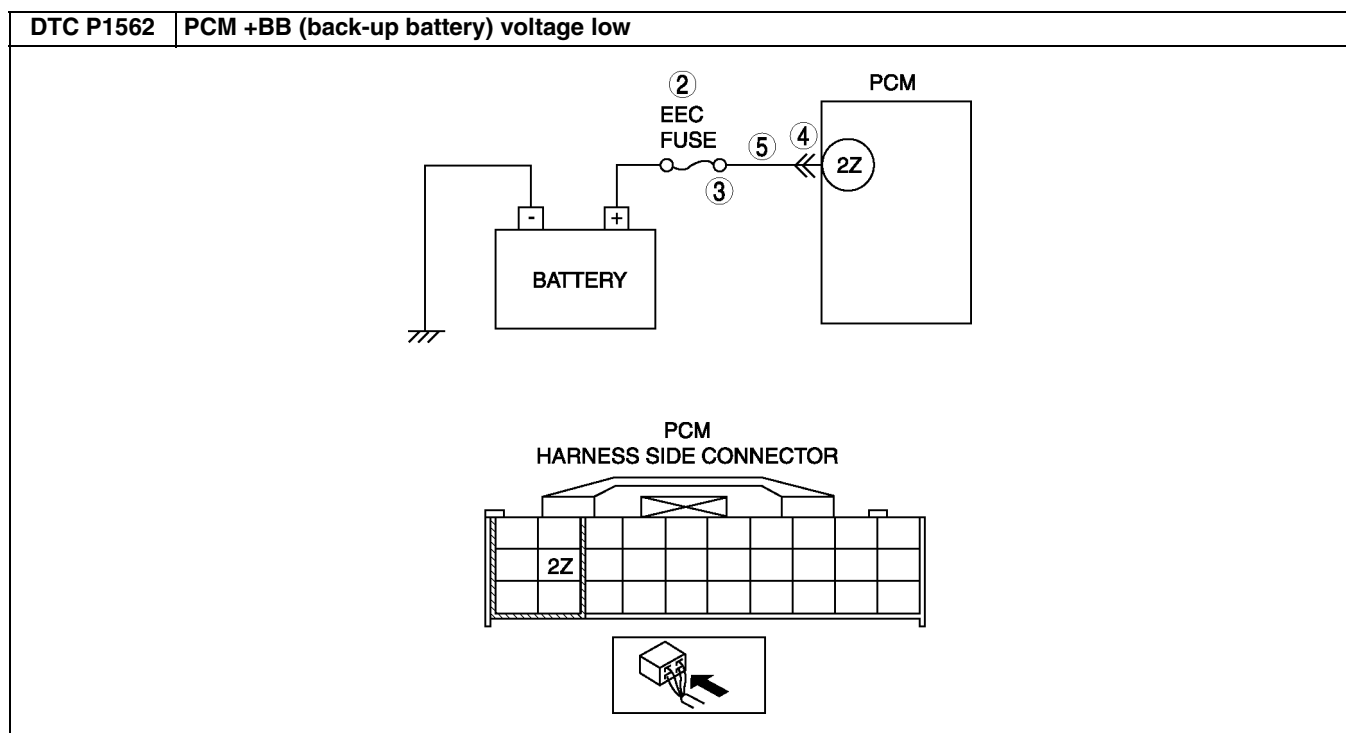
STEP	INSPECTION	ACTION
7	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes Repair terminals, then go to Step 11.
		No Go to next step.
8	INSPECT CONTROL CIRCUIT FOR SHORT TO GROUND - Disconnect battery cables. - Inspect continuity between VAD solenoid valve terminal B and body ground. - Is there continuity?	Yes Repair or replace harness for short to ground, then go to Step 11.
		No Go to next Step.
9	INSPECT VAD SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER - Measure voltage between brake switch connector terminal B and body ground. - Is voltage B+?	Yes Repair or replace harness for short to power, then go to Step 11.
		No Go to next step.
10	INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between VAD solenoid valve terminal B and PCM terminal 4C. - Is there any continuity?	Yes Go to next step.
		No Repair or replace harness for open, then go to next step.
11	VERIFY TROUBLESHOOTING OF DTC P1410 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P1562

A6E397001083W02

DTC P1562	PCM +BB (back-up battery) voltage low
DETECTION CONDITION	- PCM monitors voltage of back-up battery positive at PCM terminal 2Z. If PCM detects battery positive terminal voltage below 2.5V for 2 s, PCM determines that backup voltage circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in the PCM memory.
	POSSIBLE CAUSE - Melt down EEC fuse. - Open circuit in wiring between EEC fuse and PCM terminal 2Z - Short to ground between EEC fuse and PCM terminal 2Z - Poor connection of PCM connector. - PCM malfunction

ON-BOARD DIAGNOSTIC



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT EEC FUSE - Turn ignition key to OFF. - Inspect EEC fuse for failure and proper. - Is it okay?	Yes	Go to step 5.
		No	- If EEC fuse has been melted down, then go to next step. - If EEC fuse is not installed correctly, install it correctly then go to Step 6.
3	INSPECT MONITOR CIRCUIT FOR SHORT TO GROUND - Disconnect battery cables. - Inspect continuity between EEC fuse terminal and body ground. - Is there continuity?	Yes	Repair or replace harness for short to ground and install new fuse, then go to Step 6.
		No	Go to step 6.
4	INSPECT POOR CONNECTION OF PCM CONNECTOR - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Are there any malfunctions?	Yes	Repair terminals, then go to Step 6.
		No	Go to next step.
5	INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT - Disconnect battery cables. - Inspect continuity between EEC fuse terminal and PCM terminal 2Z (harness side). - Is there any continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
6	VERIFY TROUBLESHOOTING OF DTC P1562 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P2006

A6E397001083W03

DTC P2006	Variable tumble control system (VTCS) shutter valve stuck closed
DETECTION CONDITION	- PCM monitors mass air amount. If actual air flow amount is below estimated air flow amount when the following monitoring conditions are met. PCM determines that VTCS shutter valve has been stuck closed. MONITORING CONDITIONS - Engine coolant temperature is above 63 °C {145 °F}. - Engine speed is below 3,750 rpm. - Throttle valve opening angle is above threshold*. *: Maximum calculated load valve varies depending on engine speed. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- ECT sensor malfunction - TP sensor malfunction - CKP sensor malfunction - Variable tumble control solenoid valve malfunction - VTCS shutter valve malfunction (stuck closed) - VTCS shutter valve actuator malfunction (stuck closed). - Short to ground circuit between variable tumble control solenoid valve terminal B and PCM terminal 4T - PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Information availability. - Is any related Service Information available?	Yes	Perform repair or diagnosis according to available Service Information. If vehicle is not repaired, go to next step.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN - Clear DTC from PCM memory using WDS or equipment. - Drive vehicle under following conditions: - Engine coolant temperature is above 63 °C {145 °F}. - Engine speed: below 3,750 rpm - Throttle opening angle is below as followings - Engine speed below 1,500 rpm: above 35 % - Engine speed between 1,500–2,500 rpm: between 25–35% - Engine speed above 2,500: below 25 % - Is pending code the same as DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
4	VERIFY STORED OTHER DTCS - Verify stored DTCs using WDS or equipment. - Is other DTC present except P0117, P0118, P0121, P0122, P0123 and/or P0335?	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
5	INSPECT VTCS SHUTTER VALVE ACTUATOR - Carry out "VTCS operation inspection". (See F-231 Variable Tumble Control System (VTCS) Operation Inspection.) - Is VTCS shutter valve actuator okay?	Yes	Go to next step.
		No	Replace VTCS shutter valve actuator, then go to Step 8.
6	INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE - Carry out "Variable tumble control solenoid valve airflow inspection". (See F-15 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION.) - Is variable tumble control solenoid valve okay?	Yes	Go to next step.
		No	Replace variable tumble control solenoid valve, then go to Step 8.
7	INSPECT PCM FOR POOR CONNECTION - Inspect for poor connection at PCM terminal 4T (damaged/pulled-out terminals, corrosion, etc.). - Is there malfunction?	Yes	Repair terminal, then go to next step.
		No	Go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P2006 COMPLETED - Make sure to reconnect all disconnected connectors. - Start engine. - Clear DTC from PCM memory using WDS or equipment. - Start engine. - Drive vehicle under following conditions: - Engine coolant temperature is above 63 °C {145 °F}. - Engine speed: below 3,750 rpm - Throttle opening angle is below as followings - Engine speed below 1,500 rpm: above 35 % - Engine speed between 1,500–2,500 rpm: between 25–35% - Engine speed above 2,500: below 25 % - Is pending code the same as DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE .)
		No	Troubleshooting completed.

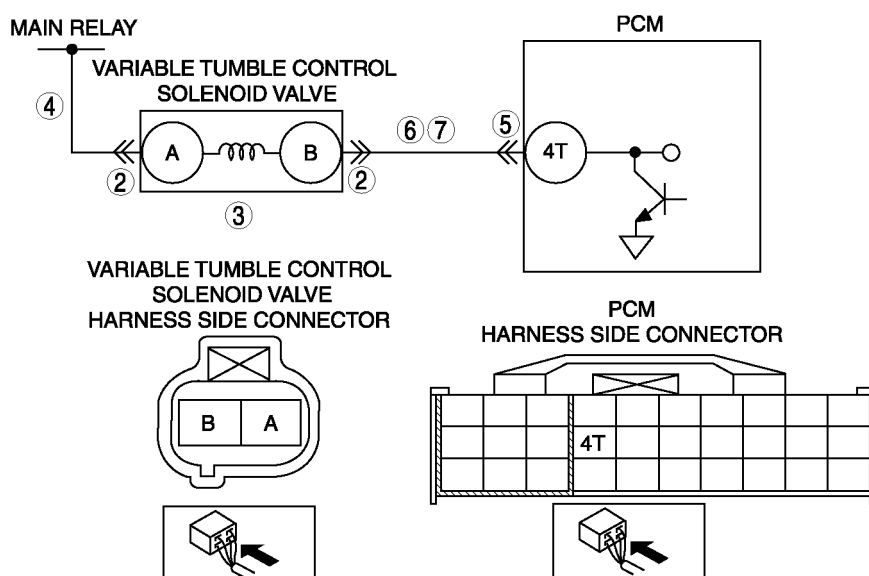
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ON-BOARD DIAGNOSTIC

DTC P2009

A6E397001083W04

DTC P2009	Variable tumble control solenoid valve circuit low input
DETECTION CONDITION	- PCM monitors variable tumble control solenoid valve control signal at PCM terminal 4T. If PCM turns variable tumble control solenoid valve off but voltage at PCM terminal 4T still remains low, PCM determines that VTCS solenoid valve circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- Poor connection of connectors at PCM and/or variable tumble control solenoid valve - Short to ground in wiring between variable tumble control solenoid valve terminal B and PCM terminal 4T - Open circuit in wiring between main relay and variable tumble control solenoid valve terminal A - Open circuit in wiring between variable tumble control solenoid valve terminal B and PCM terminal 4T - Variable tumble control solenoid valve malfunction - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE	Yes
	- Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	No
2	INSPECT VTCS SOLENOID VALVE CONNECTOR FOR POOR CONNECTION	Yes
	- Turn ignition key to OFF. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	No
3	INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE	Yes
	- Perform variable tumble control solenoid valve inspection. (See F-15 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION.) - Is variable tumble control solenoid valve okay?	No

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
4	INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Disconnect variable tumble control solenoid valve connector. - Turn ignition key to ON (Engine OFF). - Measure voltage between variable tumble control solenoid valve terminal A (harness-side) and body ground. - Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to Step 8.
5	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection at PCM terminal 4T. (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
6	INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND - Inspect continuity between variable tumble control solenoid valve terminal B (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness for short to ground, then go to Step 8.
		No	Go to next step.
7	INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT - Connect variable tumble control solenoid valve connector. - Turn ignition key to ON (Engine OFF). - Measure voltage between PCM terminal 4T (harness side) and body ground. - Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open or short to ground circuit, then go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P2009 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equipment. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

F

ON-BOARD DIAGNOSTIC

DTC P2010

A6E397001083W05

DTC P2010	Variable tumble control solenoid valve circuit high input
DETECTION CONDITION	- PCM monitors variable tumble control solenoid valve control signal at PCM terminal 4T. If PCM turns variable tumble control solenoid valve on but voltage at PCM terminal 4T still remains high, PCM determines that variable tumble control solenoid valve circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- Poor connection of connectors at PCM and/or variable tumble control solenoid valve - Short to power circuit in wiring between variable tumble control solenoid valve terminal B and PCM terminal 4T - Variable tumble control solenoid valve malfunction - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	INSPECT POOR CONNECTION OF VARIABLE TUMBLE CONTROL SOLENOID VALVE CONNECTOR - Turn ignition key to OFF. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes Repair or replace terminal, then go to Step 6.
		No Go to next step.
3	INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE - Perform variable tumble control solenoid valve inspection. (See F-15 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION.) - Is variable tumble control solenoid valve okay?	Yes Go to next step.
		No Replace variable tumble control solenoid valve, then go to Step 6.

ON-BOARD DIAGNOSTIC

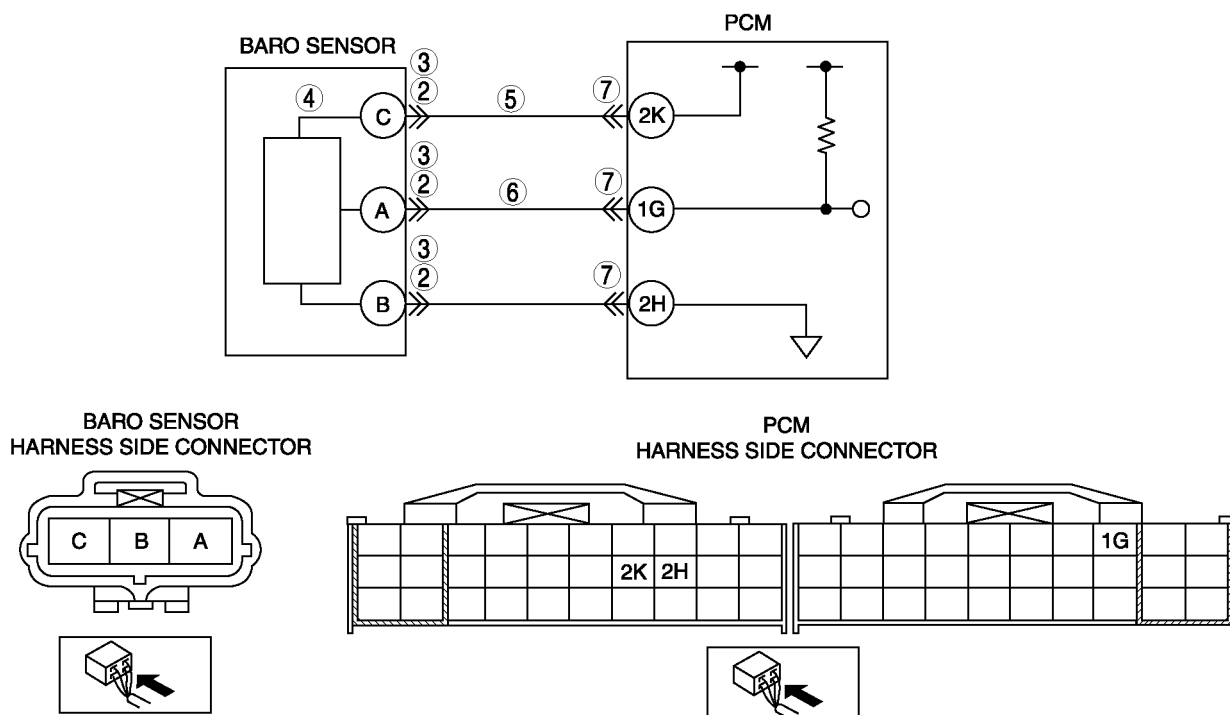
STEP	INSPECTION	ACTION	
4	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection at PCM terminal 4T. (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair terminal, then go to Step 6.
		No	Go to next step.
5	INSPECT VARIABLE TUMBLE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER - Remove variable tumble control solenoid valve. - Turn ignition key to ON (Engine OFF). - Measure voltage between PCM terminal 4T and body ground. - Is voltage B+?	Yes	Repair or replace harness for short to power circuit, then go to next step.
		No	Go to next step.
6	VERIFY TROUBLESHOOTING OF DTC P2010 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from PCM memory using WDS or equipment. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.)	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P2228

A6E397001083W06

DTC P2228	BARO sensor circuit low input
DETECTION CONDITION	- PCM monitors input voltage from BARO sensor. If input voltage at PCM terminal 1G is below 0.35 V, PCM determines that BARO sensor circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- BARO sensor malfunction - Connector or terminal malfunction - Short to ground in wiring between BARO sensor terminal A and PCM terminal 1G - Open circuit in wiring between BARO sensor terminal C and PCM terminal 2K - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE	Yes
	- Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	No
2	INSPECT CONNECTION OF BARO SENSOR CONNECTOR	Yes
	- Turn ignition key to OFF. - Verify that BARO sensor connector is connected securely. - Is connection okay?	No
3	INSPECT BARO SENSOR CONNECTOR FOR POOR CONNECTION	Yes
	- Disconnect the BARO sensor connector. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	No

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
4	INSPECT BARO SENSOR MALFUNCTION - Perform BARO sensor inspection. (See F-60 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION.) - Is BARO sensor okay?	Yes	Go to next step.
		No	Replace BARO sensor, then go to Step 8.
5	INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT BARO SENSOR CONNECTOR Note - If DTCs P0107 and P0122 are also retrieved with P2228, go to REFERENCE VOLTAGE troubleshooting procedure. - Measure voltage between BARO sensor terminal C (harness-side) and body ground. - Is voltage within 4.5—5.5 V?	Yes	Go to next step.
		No	Inspect for open circuit between PCM terminal 2K (harness-side) and BARO sensor terminal C (harness-side). Repair or replace suspected harness, then go to Step 8.
6	INSPECT BARO SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for continuity between BARO sensor terminal B (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace suspected harness, then go to Step 8.
		No	Go to next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Inspect for poor connection at terminal 2H (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P2228 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	No concern is detected. Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

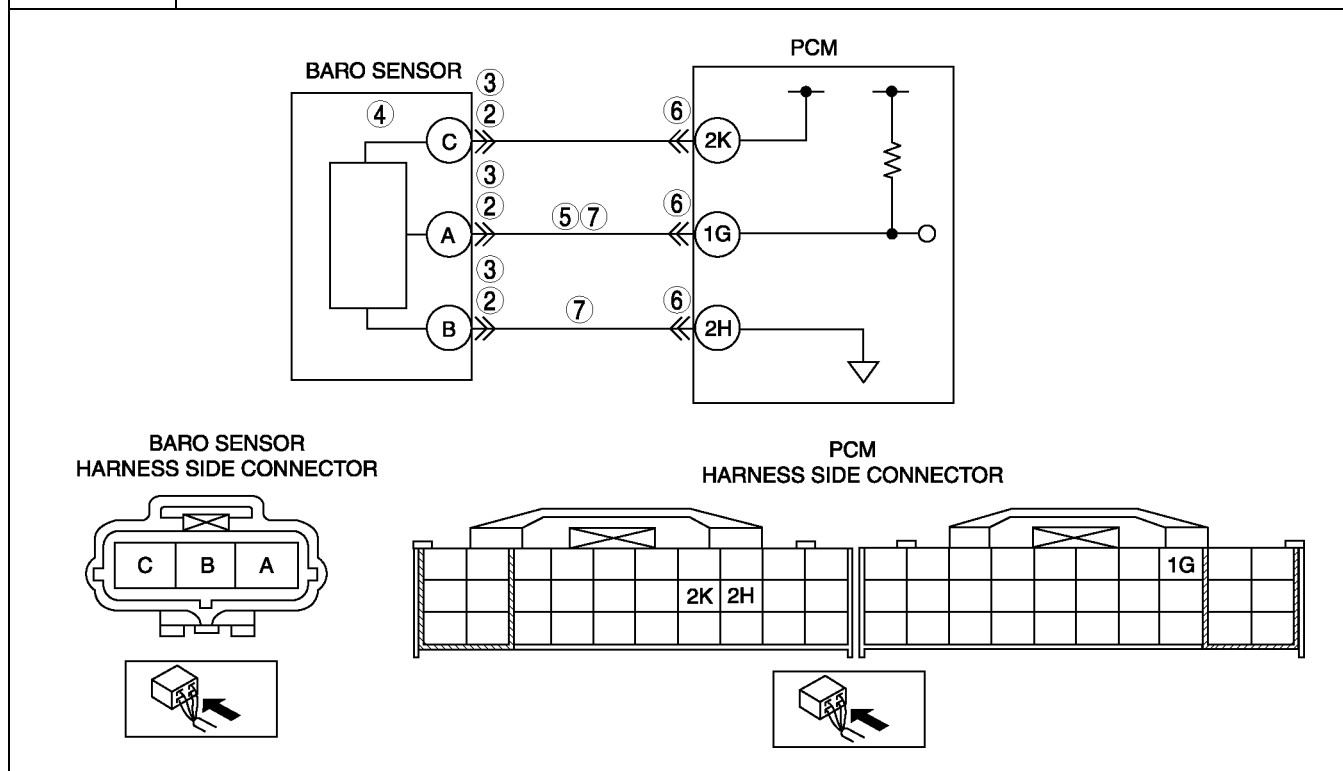
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ON-BOARD DIAGNOSTIC

DTC P2229

A6E397001083W07

DTC P2229	BARO sensor circuit high input
DETECTION CONDITION	- PCM monitors input voltage from BARO sensor. If input voltage at PCM terminal 1G is above 4.92 V, PCM determines that BARO sensor circuit has malfunction. Diagnostic support note - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is available if PCM detects the above malfunction condition. - FREEZE FRAME DATA is available. - DTC is stored in PCM memory.
POSSIBLE CAUSE	- BARO sensor malfunction - Connector or terminal malfunction - Open circuit in wiring between BARO sensor terminal A and PCM terminal 1G - Open circuit in wiring between BARO sensor terminal B and PCM terminal 2H - Short to power circuit in wiring between BARO sensor terminal A and PCM terminal 1G - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	INSPECT CONNECTION OF BARO SENSOR CONNECTOR - Turn ignition key to OFF. - Verify that BARO sensor connector is connected securely. - Is connection okay?	Yes Go to next step.
		No Reconnect the connector, then go to Step 8.
3	INSPECT BARO SENSOR CONNECTOR FOR POOR CONNECTION - Disconnect the BARO sensor connector. - Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes Repair or replace suspected terminal, then go to Step 8.
		No Go to next step.

ON-BOARD DIAGNOSTIC

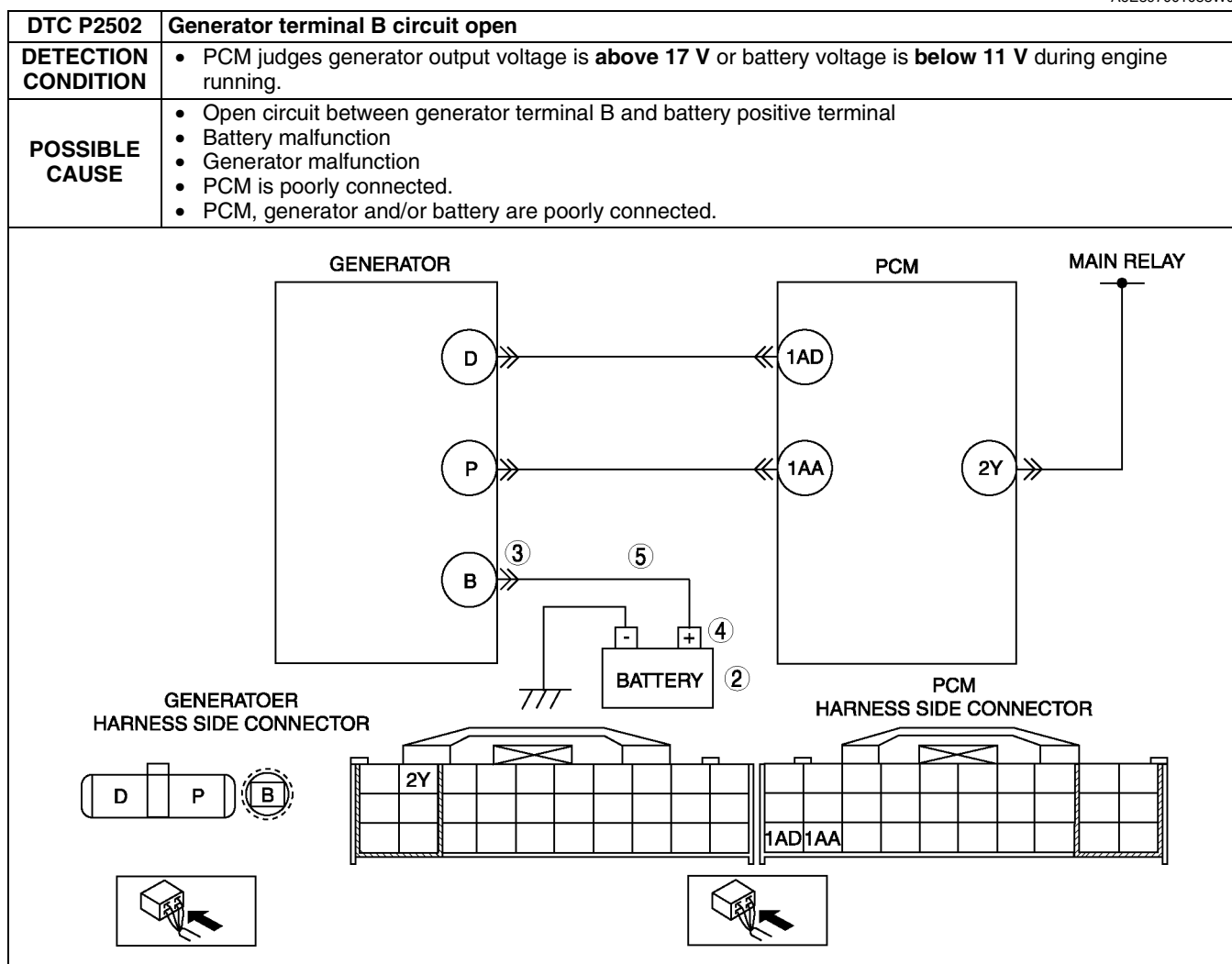
STEP	INSPECTION	ACTION	
4	INSPECT BARO SENSOR MALFUNCTION - Perform BARO sensor inspection. (See F-60 BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION.) - Is BARO sensor okay?	Yes	Go to next step.
		No	Replace BARO sensor, then go to Step 8.
5	VERIFY BARO SENSOR SIGNAL CIRCUIT FOR SHORT TO REFERENCE VOLTAGE CIRCUIT - Measure voltage between BARO sensor terminal A and body ground. - Is voltage above 4.92 V?	Yes	Repair or replace short to power harness, then go to Step 8.
		No	Go to next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Inspect for poor connection at terminal 2H (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair terminal, then go to Step 8.
		No	Go to next step.
7	VERIFY BARO SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT - Inspect for continuity following terminals: - Between BARO sensor terminal A and PCM terminal 1G - Between BARO sensor terminal B and PCM terminal 2H - Is there continuity?	Yes	Go to next step.
		No	Repair or replace open harness, then go to Step 8.
8	VERIFY TROUBLESHOOTING OF DTC P2229 COMPLETED - Make sure to reconnect all disconnected connectors. - Turn ignition key to ON (Engine OFF). - Clear DTC from memory using WDS or equivalent. - Perform KOEO/KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	No concern is detected. Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

F

ON-BOARD DIAGNOSTIC

DTC P2502

A6E397001083W08



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING .)
2	INSPECT BATTERY - Turn ignition key to OFF. - Inspect battery. - Is battery okay?	Yes Replace battery, then go to Step 6.
		No Go to next step.
3	INSPECT POOR INSTALLATION OF GENERATOR TERMINAL - Turn ignition key to OFF. - Inspect for looseness of generator terminal B installation nut. - Is nut loose?	Yes Tighten generator terminal B installation nut, then go to Step 6.
		No Go to next step.
4	INSPECT POOR INSTALLATION OF BATTERY POSITIVE TERMINAL - Inspect for looseness of battery positive terminal. - Is terminal loose?	Yes Connect battery positive terminal correctly, then go to Step 6.
		No Go to next step.
5	INSPECT BATTERY CHARGING CIRCUIT - Start engine. - Disconnect battery positive terminal. - Does engine stall?	Yes Repair or replace harness between generator terminal B and battery positive terminal, then go to next step.
		No Go to next step.

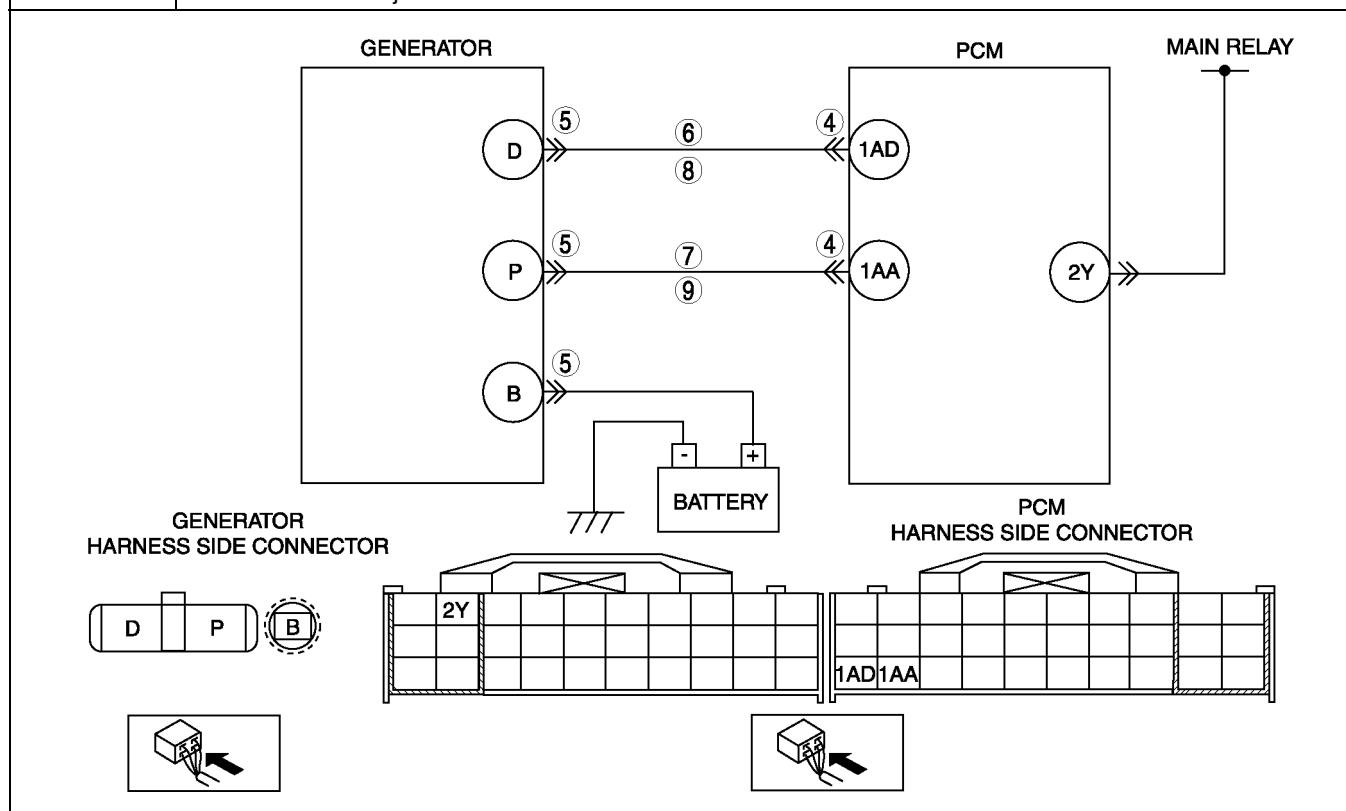
ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
6	VERIFY TROUBLESHOOTING OF DTC P2502 COMPLETED - Make sure to reconnect all connectors. - Clear DTC from memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

DTC P2503

A6E397001083W09

DTC P2503	Generator output voltage signal no electricity
DETECTION CONDITION	PCM needs more than 20 A from generator, and judges generator output voltage to be below 8.5 V during engine running.
POSSIBLE CAUSE	- Generator malfunction - PCM and/or generator are poorly connected. - Open and/or short to GND in wiring from between generator terminal P and PCM terminal 1AA - Open and/or short to GND in wiring from between generator terminal D and PCM terminal 1AD - Drive belt misadjustment



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes	Go to next step.
		No	Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT DRIVE BELT CONDITION - Verify that drive belt auto tensioner indicator mark does not exceed limit. - Is front drive belt okay?	Yes	Go to next step.
		No	Replace and/or adjust drive belt, then go to Step 9.

ON-BOARD DIAGNOSTIC

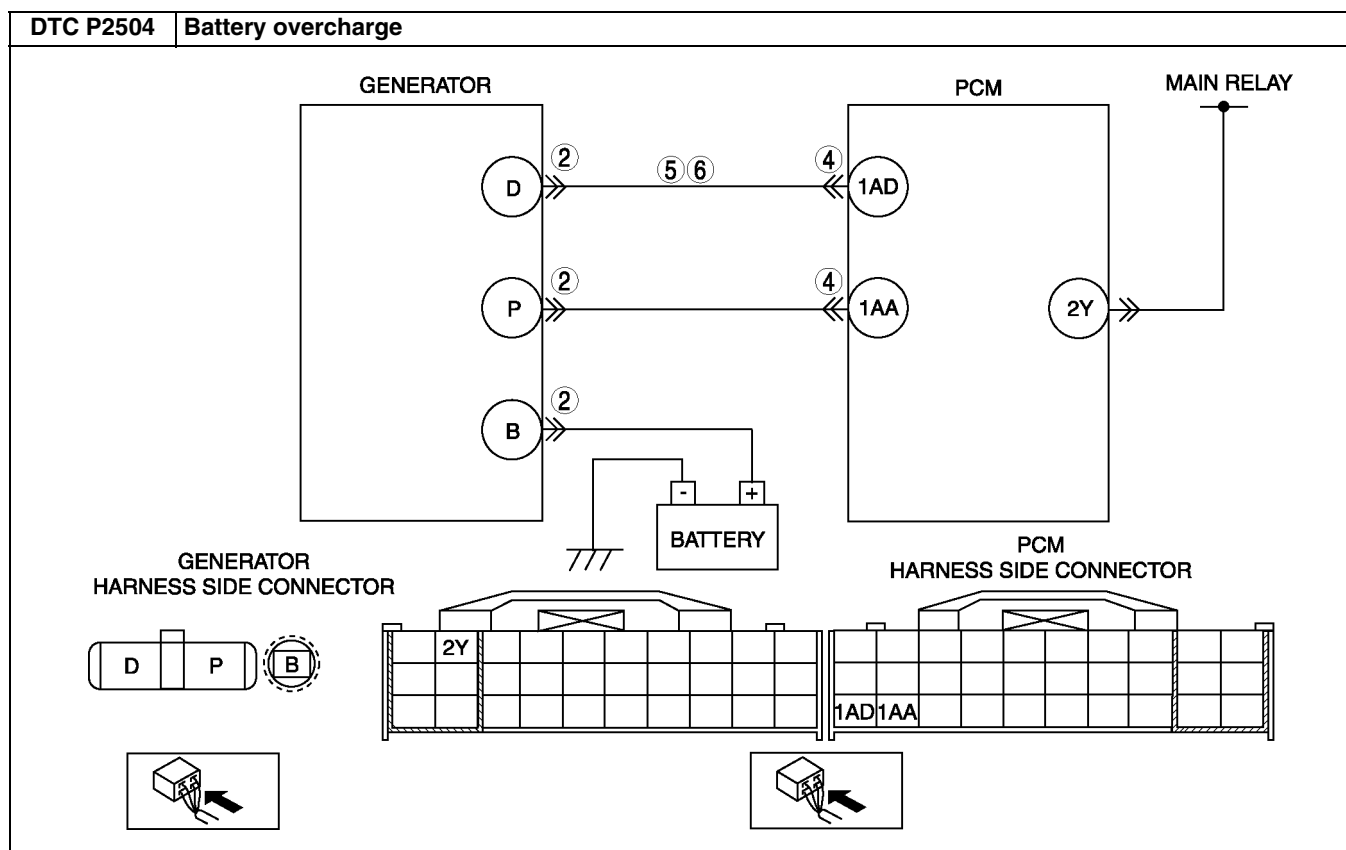
STEP	INSPECTION	ACTION
3	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there a malfunction?	Yes Repair terminals, then go to Step 9.
		No Go to next step.
4	INSPECT POOR CONNECTION OF GENERATOR CONNECTOR - Disconnect generator connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there a malfunction?	Yes Repair or replace terminals, then go to Step 9.
		No Go to next step.
5	INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO GROUND - Inspect for continuity between generator terminal D (harness-side) and body ground. - Is there continuity?	Yes Repair or replace harness for short to ground, then go to Step 9.
		No Go to next step.
6	INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR SHORT TO GROUND - Inspect for continuity between generator terminal P (harness-side) and body ground. - Is there continuity?	Yes Repair or replace harness for short to ground, then go to Step 9.
		No Go to next step.
7	INSPECT GENERATOR CONTROL CIRCUIT FOR OPEN - Measure resistance between generator terminal D (harness-side) and PCM terminal 1AD (harness-side). - Is there continuity?	Yes Go to next step.
		No Repair or replace harness for open circuit, then go to Step 9.
8	INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR OPEN CIRCUIT - Measure resistance between generator terminal P (harness-side) and PCM terminal 1AA (harness-side). - Is there continuity?	Yes Repair or replace generator, then go to next step.
		No Repair or replace harness for open, then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P2503 COMPLETED - Make sure to reconnect all connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is the same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No Troubleshooting completed.

DTC P2504

A6E397001083W10

DTC P2504	Battery overcharge
DETECTION CONDITION	PCM judges generator output voltage is above 18.5 V or battery voltage is above 16.0 V during engine running.
POSSIBLE CAUSE	- Short to power circuit between generator connector terminal D and PCM connector terminal 1AD - Generator malfunction - PCM and/or generator are poorly connected.

ON-BOARD DIAGNOSTIC



Diagnostic procedure

STEP	INSPECTION	ACTION
1	PERFORM DTC CONFIRMATION PROCEDURE - Perform DTC CONFIRMATION PROCEDURE. (See F-66 DTC CONFIRMATION PROCEDURE.) - Is same DTC present?	Yes Go to next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
2	INSPECT POOR CONNECTION OF GENERATOR CONNECTOR - Turn ignition key to OFF. - Disconnect generator connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there a malfunction?	Yes Repair or replace terminals, then go to Step 7.
		No Go to next step.
3	CLASSIFY GENERATOR MALFUNCTION OR OTHER MALFUNCTION - Turn ignition key to ON (Engine OFF). - Measure voltage between generator terminal D (harness-side) and body ground. - Is voltage B+?	Yes Go to next step.
		No Malfunction at generator. Go to Step 6.
4	INSPECT POOR CONNECTION OF PCM CONNECTOR - Turn ignition key to OFF. - Disconnect PCM connector. - Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.). - Is there a malfunction?	Yes Repair or replace pins, then go to Step 7.
		No Go to next step.
5	INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Measure voltage between generator terminal D (harness-side) and body ground. - Is voltage B+?	Yes Repair or replace harness for short to power, then go to Step 7.
		No Go to Step 7.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
6	INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER - Measure resistance between generator terminal D (part-side) and body ground. - Is voltage B+?	Yes	Repair or replace generator, then go to Step 7.
		No	Go to next step.
7	VERIFY TROUBLESHOOTING OF DTC P2504 COMPLETED - Make sure to reconnect all connectors. - Clear DTC from PCM memory using WDS or equivalent. - Perform KOER self-test. (See F-66 KOEO/KOER SELF-TEST.) - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See F-66 AFTER REPAIR PROCEDURE.) - Is there any DTC present?	Yes	Go to applicable DTC troubleshooting. (See F-67 DTC TABLE.)
		No	Troubleshooting completed.

TROUBLESHOOTING

TROUBLESHOOTING

ENGINE SYMPTOM TROUBLESHOOTING

A6E398018881W01

- Confirm trouble symptom using the following diagnostic index, then go to appropriate troubleshooting chart.

Diagnostic Index

No.	TROUBLESHOOTING ITEM		DESCRIPTION
1	Melting of main or other fuses		—
2	MIL illuminates		MIL is illuminated incorrectly.
3	Will not crank		Starter does not work.
4	Hard to start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.
5	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle and/or after start.
6	Crank normally but will not start		Starter cranks engine at normal speed but engine will not run.
7	Slow return to idle		Engine takes more time than normal to return to idle speed.
8	Engine runs rough/rolling idle		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.
9	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition switch is turned to off.
10	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.
11	Engine stalls/quits.	Acceleration/cruise	Engine stops unexpectedly at beginning of acceleration or during acceleration. Engine stops unexpectedly while cruising.
	Engine runs rough.	Acceleration/cruise	Engine speed fluctuates during acceleration or cruising.
	Misses	Acceleration/cruise	Engine misses during acceleration or cruising.
	Buck/jerk	Acceleration/cruise/ deceleration	Vehicle bucks/jerks during acceleration, cruising, or deceleration.
	Hesitation/stumble	Acceleration	Momentary pause at beginning of acceleration or during acceleration
	Surges	Acceleration/cruise	Momentary minor irregularity in engine output
12	Lack/loss of power	Acceleration/cruise	Performance is poor under load. (e.g., power down when climbing hills)
13	Knocking/pinging	Acceleration/cruise	Sound is produced when air/fuel mixture is ignited by something other than spark plug. (e.g., hot spot in combustion chamber)
14	Poor fuel economy		Fuel economy is unsatisfactory.
15	Emission compliance		Fails emissions test.
16	High oil consumption/leakage		Oil consumption is excessive.
17	Cooling system concerns	Overheating	Engine runs at higher than normal temperature/overheats.
18	Cooling system concerns	Runs cold	Engine does not reach normal operating temperature.
19	Exhaust smoke		Blue, black, or white smoke from exhaust system
20	Fuel odor (in engine compartment)		Gasoline fuel smell or visible leakage
21	Engine noise		Engine noise from under hood
22	Vibration concerns (engine)		Vibration from under hood or driveline
23	A/C does not work sufficiently.		A/C compressor magnetic clutch does not engage when A/C is turned on.
24	A/C is always on or A/C compressor runs continuously.		A/C compressor magnetic clutch does not disengage.
25	A/C is not cut off under WOT conditions.		A/C compressor magnetic clutch does not disengage under WOT.
26	Exhaust sulphur smell		Rotten egg smell (sulphur) from exhaust
27	Constant voltage		Incorrect constant voltage
28	Spark plug condition		Incorrect spark plug condition
29	ATX concerns	Upshift/downshift/ engagement	ATX concerns not related to engine performance

F

TROUBLESHOOTING

QUICK DIAGNOSTIC CHART

A6E398018881W02

x Applied

Possible factor		Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch is open.	Starter interlock switch malfunction (MTX with starter interlock system)	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel are seized.	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture is improper.	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts are improperly installed.	Cooling fan or condenser fan seat are improper.	Accelerator cable free play misadjustment	Cruise control cable misadjustment	Fuel quality
Troubleshooting item																								
1	Melting of main or other fuses																							
2	MIL illuminates	x	x	x		x	x			x				x										
3	Will not crank																							
4	Hard to start/long crank/erratic start/erratic crank																							x
5	Engine stalls. After start/at idle							x	x	x														x
6	Cranks normally but will not start							x	x	x														x
7	Slow return to idle																		x					
8	Engine runs rough/rolling idle							x	x															x
9	Fast idle/runs on																					x	x	
10	Low idle/stalls during deceleration																							
11	Engine stalls/quits.	Acceleration/cruise						x	x															x
	Engine runs rough.	Acceleration/cruise						x	x															x
	Misses	Acceleration/cruise						x	x															x
	Buck/jerk	Acceleration/cruise/ deceleration						x	x															x
	Hesitation/stumble	Acceleration						x	x															x
	Surges	Acceleration/cruise						x	x															x
12	Lack/loss of power	Acceleration/cruise						x	x															x
13	Knocking/pinging	Acceleration/cruise						x										x						
14	Poor fuel economy							x	x							x		x	x					x
15	Emission compliance							x	x				x					x						
16	High oil consumption/leakage										x	x	x					x						
17	Cooling system concerns Overheating														x	x	x	x	x					
18	Cooling system concerns Runs cold																	x	x					
19	Exhaust smoke							x					x					x						
20	Fuel odor (in engine compartment)																							
21	Engine noise				x								x		x									
22	Vibration concerns (engine)														x					x	x			
23	A/C does not work sufficiently.																							
24	A/C is always on or A/C compressor runs continuously.																							
25	A/C is not cut off under WOT conditions.																							
26	Exhaust sulfur smell																							x
27	Constant voltage																							
28	Spark plug condition							x					x											
29	ATX concerns Upshift/downshift engagement																							
See Section K, TROUBLESHOOTING																								

See Section K, TROUBLESHOOTING

A6E3980W001

TROUBLESHOOTING

x Applied

Possible factor		Variable valve timing system malfunction (L3 engine model)	VICS malfunction	Engine overheating	Air cleaner element clogging or restriction	Air leakage from intake-air system (Loose tubes, cracks, gaskets breakage)	IAC valve improper operation	Throttle body malfunction	VICS malfunction (L3 engine model)	VACS malfunction (L3 engine model)	Vacuum leakage (Vacuum hose damage, misrouting)	Ignition coil malfunction (e.g. open, short or cracks)	Initial ignition timing misadjustment (CKP sensor & crankshaft pulley misadjustment)	Spark plug malfunction	High-tension leads malfunction (Cracks, open, low resistance)	CKP sensor is damaged. (e.g. open or short circuits)	Crankshaft pulley is damaged	Improper gap between CKP sensor and crankshaft	Fuel pump malfunction (Mechanically or electrically)	Pressure regulator malfunction	Fuel hoses restriction or clogging
Troubleshooting item																					
1	Melting of main or other fuses																				
2	MIL illuminates		x	x			x		x							x					
3	Will not crank																				
4	Hard to start/long crank/erratic start/erratic crank					x	x	x				x			x	x	x	x	x	x	x
5	Engine stalls.		x		x	x	x	x				x	x	x	x	x	x	x	x	x	x
6	Cranks normally but will not start				x	x	x	x				x	x	x	x	x	x	x	x	x	x
7	Slow return to idle							x													
8	Engine runs rough/rolling idle		x		x	x	x	x				x		x	x	x	x	x	x	x	x
9	Fast idle/runs on						x	x					x								
10	Low idle/stalls during deceleration						x	x				x									
11	Engine stalls/quits.	Acceleration/cruise		x	x	x	x	x	x			x			x	x	x	x	x	x	x
	Engine runs rough.	Acceleration/cruise		x	x	x	x	x	x			x			x	x	x	x	x	x	x
	Misses	Acceleration/cruise		x	x	x	x	x	x			x			x	x	x	x	x	x	x
	Buck/jerk	Acceleration/cruise/deceleration		x	x	x	x	x	x			x			x	x	x	x	x	x	x
	Hesitation/stumble	Acceleration		x	x	x	x	x	x			x			x	x	x	x	x	x	x
	Surges	Acceleration/cruise		x	x	x	x	x	x			x			x	x	x	x	x	x	x
12	Lack/loss of power	Acceleration/cruise	x	x	x	x	x		x	x	x				x		x	x	x	x	x
13	Knocking/pinging	Acceleration/cruise			x															x	x
14	Poor fuel economy		x	x		x				x					x	x					x
15	Emission compliance					x	x		x			x			x	x				x	x
16	High oil consumption/leakage																				
17	Cooling system concerns	Overheating																			
18	Cooling system concerns	Runs cold																			
19	Exhaust smoke					x									x	x				x	x
20	Fuel odor (in engine compartment)																			x	
21	Engine noise						x				x	x									
22	Vibration concerns (engine)																				
23	A/C does not work sufficiently.																				
24	A/C is always on or A/C compressor runs continuously.																				
25	A/C is not cut off under WOT conditions.																				
26	Exhaust sulfur smell											x								x	x
27	Constant voltage																				
28	Spark plug condition					x									x		x			x	x
29	ATX concerns	Upshift/downshift engagement	See Section K, TROUBLESHOOTING																		

A6E3980W002

TROUBLESHOOTING

x Applied

Possible factor			Injectors malfunction (Leakage or clogging, inoperative injector O-ring)	Fuel leakage from fuel system (including insulator, injector O-ring)	Fuel filters restriction or clogging	CMP sensor is damaged. (e.g. open or short circuit)	Camshaft is damaged..	Improper air/fuel mixture ratio control	Exhaust system restriction or clogging	Catalytic converter malfunction	EGR system malfunction	EVAP control system malfunction	PCV valve malfunction	Constant voltage supply circuit malfunction	Main relay malfunction (Mechanically or electrically)	ECT sensor malfunction	TR sensor misadjustment (ATX)	TR sensor malfunction (ATX)	Break switch and related circuit malfunction	Manifold absolute pressure sensor and related circuit malfunction	HO2S and related circuit malfunction
Troubleshooting item																					
1	Melting of main or other fuses																				
2	MIL illuminates					x		x								x	x				
3	Will not crank																	x			
4	Hard to start/long crank/erratic start/erratic crank				x			x	x		x	x	x								x
5	Engine stalls.	After start/at idle	x	x				x	x		x	x	x		x						x
6	Cranks normally but will not start		x	x				x	x		x	x	x	x	x						x
7	Slow return to idle															x					
8	Engine runs rough/rolling idle		x		x	x	x	x	x		x	x	x								x
9	Fast idle/runs on															x					
10	Low idle/stalls during deceleration							x				x					x		x		x
11	Engine stalls/quits.	Acceleration/cruise	x		x	x	x	x	x		x	x	x	x	x						x
	Engine runs rough.	Acceleration/cruise	x		x	x	x	x	x		x	x	x	x	x						x
	Misses	Acceleration/cruise	x		x	x	x	x	x		x	x	x	x	x						x
	Buck/jerk	Acceleration/cruise/ deceleration	x		x	x	x	x	x		x	x	x	x	x						x
	Hesitation/stumble	Acceleration	x		x	x	x	x	x		x	x	x	x	x						x
	Surges	Acceleration/cruise	x		x	x	x	x	x		x	x	x	x	x						x
12	Lack/loss of power	Acceleration/cruise	x			x	x		x		x	x	x			x					
13	Knocking/pinging	Acceleration/cruise				x															
14	Poor fuel economy				x	x	x		x				x								
15	Emission compliance				x	x	x	x	x	x	x	x	x								x
16	High oil consumption/leakage												x								
17	Cooling system concerns	Overheating																			
18	Cooling system concerns	Runs cold																			
19	Exhaust smoke		x										x								
20	Fuel odor (in engine compartment)			x								x									
21	Engine noise																				
22	Vibration concerns (engine)																				
23	A/C does not work sufficiently.																				
24	A/C is always on or A/C compressor runs continuously.																				
25	A/C is not cut off under WOT conditions.																				
26	Exhaust sulfur smell				x							x									
27	Constant voltage													x		x		x		x	x
28	Spark plug condition		x	x				x								x					
29	ATX concerns	Upshift/downshift/engagement	See Section K, TROUBLESHOOTING																		

A6E3980W003

TROUBLESHOOTING

x Applied

Possible factor		IAT sensor and related circuit malfunction	Barometric pressure sensor malfunction	Neutral or clutch switch and related circuit malfunction (MTX)	MAF sensor and related circuit malfunction	Knock sensor and related circuit malfunction	TP sensor and related circuit malfunction	TP sensor misadjustment (including looseness)	P/S pressure switch and related circuit malfunction	Improper refrigerant charging amount	A/C relay (A/C control signal circuit malfunction)	A/C compressor magnetic clutch malfunction	Condenser fan system malfunction	Improper load signal input	Clutch slippage	ATX related parts malfunction	VSS and related circuit malfunction	Improper ATF level	Brake dragging	Loose parts	Improper balance of wheels and tires	Drive line malfunction	Suspension malfunction	PATS operating (if equipped)
Troubleshooting item																								
1	Melting of main or other fuses																							
2	MIL illuminates	x	x	x	x	x	x		x								x							
3	Will not crank																							x
4	Hard to start/long crank/erratic start/erratic crank				x																			
5	Engine stalls. After start/at idle		x							x	x													x
6	Cranks normally but will not start																							x
7	Slow return to idle																							
8	Engine runs rough/rolling idle		x						x	x	x		x	x										
9	Fast idle/runs on													x										
10	Low idle/stalls during deceleration		x	x	x		x	x			x													
11	Engine stalls/quits. Acceleration/cruise		x		x		x	x		x	x				x	x	x							
	Engine runs rough. Acceleration/cruise		x		x		x	x		x	x				x	x	x							
	Misses Acceleration/cruise				x		x	x		x	x				x	x	x							
	Buck/jerk Acceleration/cruise /deceleration				x		x	x		x	x				x	x	x							
	Hesitation/stumble Acceleration		x		x		x	x		x	x				x	x	x							
	Surges Acceleration/cruise				x		x	x		x	x				x	x	x							
12	Lack/loss of power Acceleration/cruise				x		x			x	x				x	x	x		x					
13	Knocking/pinging Acceleration/cruise	x			x	x																		
14	Poor fuel economy				x								x		x			x	x					
15	Emission compliance		x																					
16	High oil consumption/leakage																							
17	Cooling system concerns Overheating									x	x		x											
18	Cooling system concerns Runs cold												x											
19	Exhaust smoke																							
20	Fuel odor (in engine compartment)																							
21	Engine noise																			x				
22	Vibration concerns (engine)																			x	x	x	x	
23	A/C does not work sufficiently.									x	x	x												
24	A/C is always on or A/C compressor runs continuously.										x	x												
25	A/C is not cut off under WOT conditions.						x	x																
26	Exhaust sulfur smell																							
27	Constant voltage	x	x		x		x				x					x								
28	Spark plug condition			x	x																			
29	ATX concerns Upshift/downshift/engagement	See Section K, TROUBLESHOOTING																						

A6E3980W004

TROUBLESHOOTING

NO.1 MELTING OF MAIN OR OTHER FUSES

A6E398018881W03

1	MELTING OF MAIN OR OTHER FUSES
[TROUBLESHOOTING HINTS] Inspect condition of fuse.	

Damaged fuse	Related wiring harness
MAIN	- IG KEY2 fuse - AD FAN fuse - FAN fuse
ENG +B	PCM
IG KEY1	- Ignition switch — ENGINE IG fuse — METER IG fuse
IG KEY2	Ignition switch
AD FAN	- Cooling fan relay — Cooling fan motor
FAN	- Cooling fan relay (L8-DE, LF-DE (except G.C.C. specs.) — Cooling fan motor
ENGINE IG	- Main relay — PCM - Ignition coil - Condenser
METER IG	- Cooling fan relay — PCM
ENG BAR	- VSS (ATX) - OCV - VIS solenoid valve - VAD control solenoid valve - Purge solenoid valve - EGR valve - MAF/IAT sensor
ENG BAR2	Heated oxygen sensor heater
INJ	- PCM - Fuel pump relay — PCM - Fuel injector
FUEL PUMP	- Fuel pump relay — Fuel pump

NO.2 MIL ILLUMINATES

A6E398018881W04

2	MIL ILLUMITATES
DESCRIPTION	MIL is illuminated incorrectly.
POSSIBLE CAUSE	- PCM illuminates for emission-related concern (DTC is stored in PCM) - Instrument cluster malfunction Note - If MIL blinks at steady rate, misfire condition could possibly exist.

TROUBLESHOOTING

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Retrieve any DTC. Are there DTC displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Inspect instrument cluster operation. See Section T.
2	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.3 WILL NOT CRANK

A6E398018881W05

F

3	WILL NOT CRANK
DESCRIPTION	Starter does not work.
POSSIBLE CAUSE	- Open starter circuit between ignition switch and starter - TR switch malfunction (ATX) - TR switch misadjustment (ATX) - Low or dead battery. - Charging system malfunction. - Starter interlock switch malfunction (MTX with starter interlock system). - Starter malfunction - Seized/hydrolocked engine, flywheel or drive plate - Immobilizer system (PATS) and/or circuit malfunction (if equipped).

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Note - The following test should be perform for vehicles with immobilizer system. Go to Step 10 for vehicles without immobilizer system. Connect WDS or equivalent to DLC-2. Do following conditions appear? - Engine is not completely started. - DTC B1681 is displayed.	Yes	Both conditions appear: Go to Step 4.
		No	Either or other condition appears: Go to next step.
2	Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to Step 1.
3	Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness.
4	Connect WDS or equivalent to DLC-2 and retrieve DTC. DTC B1213, B1342, B1600, B1601, B1602, B1681, B2103, B2431	Yes	Go to appropriate DTC test.
		No	Go to next step.
5	Is there continuity between PCM GND terminals 4X, 2AB, 2AC and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
6	Measure voltage between PCM GND terminals 4X, 2AB, 2AC and coil terminal C. Is the voltage below 1.0?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	Turn ignition switch ON position. Access VPWR PID. Is VPWR PID okay? Specification Battery voltage	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	Disconnect coil connector. Turn ignition switch to ON position. Is there battery voltage at coil connector terminal D (harness-side)?	Yes	Inspect for following: - Open or short circuit between coil terminal A and PCM terminal 2Q. - Open or short circuit between coil terminal B and PCM terminal 2T.
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
9	Is there continuity between PCM terminal 4I and starter relay with clutch pedal depressed (MTX with starter interlock system), P or N position (ATX)?	Yes	Go to next step.
		No	Repair replace wiring harness.
10	Inspect following: - Battery connection - Battery condition - Transaxle is in Park or Neutral. (ATX) - Clutch is fully depressed. (MTX with starter interlock system) - Fuses Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 10.
11	Is clicking sound heard from starter when ignition switch is turned to START?	Yes	Go to next step.
		No	Go to Step 13.
12	Inspect starting system. (See G-13 STARTER INSPECTION.) Is starting system okay?	Yes	Inspect for seized/hydrolocked engine, flywheel or drive plate. (See H-15 FLYWHEEL INSPECTION.)
		No	Repair or replace components as required.
13	Do any other electrical accessories work?	Yes	Go to next step.
		No	Inspect charging system. (See G-4 BATTERY INSPECTION.) (See G-7 GENERATOR INSPECTION.)
14	Note Following test should be performed on ATX only. For MTX, go to next step. Connect WDS or equivalent to DLC-2. Access TR PID. Turn ignition switch to ON position. Is TR PID indicated P/N when selecting P or N position?	Yes	Go to next step.
		No	Inspect adjustment of TR switch. If TR switch is adjusted properly, inspect for open circuit between TR switch and PCM terminal 1W or starter.
15	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory DTCs. Are there any continuous memory DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test. Communication error message is displayed: Inspect for following: - Open circuit between main relay and PCM terminal 2Y or 4V - Open circuit between main relay terminal E and PCM terminal 2X - Main relay is stuck open. - Open or poor GND circuit (PCM terminal 4X, 2AB or 2AC) - Poor connection of vehicle body GND
		No	No DTC is displayed: Inspect following: - START circuit in ignition switch - Open circuit between ignition switch and starter - Starter interlock switch (MTX with starter interlock system)
16	Retrieve any KOEO DTCs. Are there DTCs displayed during KOEO inspection?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Inspect following: - START circuit in ignition switch - Open circuit between ignition switch and starter - Starter interlock switch (MTX with starter interlock system)
17	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK

A6E398018881W06

4	HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK
DESCRIPTION	- Starter cranks engine at normal speed but engine requires excessive cranking time before starting. - Battery is in normal condition.
POSSIBLE CAUSE	- Spark leakage from high-tension leads - Vacuum leakage - Poor fuel quality - Starting system malfunction - Spark plug malfunction - Air leakage from intake-air system - Erratic signal from CKP sensor - Erratic signal from CMP sensor - Improper air/fuel mixture ratio control - Air cleaner restriction - IAC valve malfunction - PCV valve malfunction - Inadequate fuel pressure - Purge solenoid valve malfunction - MAF sensor contamination - Restriction in exhaust system - EGR valve malfunction - Pressure regulator malfunction Warning The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for following: - Vacuum leakage - Proper fuel quality (e.g. proper octane, contamination, winter/summer blend) - Loose bands on intake-air system - Cracks on intake-air system parts - Air cleaner restriction Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Retrieve any KOEO and KOER DTC. Is any KOEO or KOER DTC displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns – Overheating".
		No	Go to next step.
4	Inspect for cracks on high-tension leads. Are there any cracks on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
5	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: Inspect for fuel leakage from fuel injector. Spark plug is grayish white: Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
6	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
7	Measure gap between CKP sensor and teeth of crankshaft pulley. Specification 0.5—1.9 mm {0.020—0.75 in} Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
8	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
9	Install fuel pressure gauge between fuel pipe and fuel distributor. Connect a jumper wire between F/P terminal at DLC-2 in engine compartment and GND. Turn ignition switch to ON position. Is fuel line pressure correct with ignition switch ON? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
10	Is fuel line pressure held after ignition switch is turned off? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.
11	Disconnect a vacuum hose from purge solenoid valve and plug opening end of vacuum hose. Attempt to start engine. Is starting condition improved?	Yes	Inspect if purge solenoid valve sticks open.
		No	Go to next step.
12	Inspect MAF sensor for contamination. Is there any contamination?	Yes	Replace MAF sensor.
		No	Go to next step.
13	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Go to next step.
14	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
15	Inspect starting system. (See G-13 STARTER INSPECTION .) Is starting system normal?	Yes	Inspect for loose connectors or poor terminal contact. If okay, remove EGR valve and visually inspect for mechanically stuck EGR valve.
		No	Repair or replace components as required.
16	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.5 ENGINE STALLS-AFTER START/AT IDLE

A6E398018881W07

5	ENGINE STALLS—AFTER START/AT IDLE
DESCRIPTION	Engine stops unexpectedly.
POSSIBLE CAUSE	- A/C system operation is improper - Air leakage from intake-air system parts - Purge solenoid valve malfunction - Improper operation of IAC valve - EGR valve malfunction - No signal from CKP sensor due to sensor, related wire or wrong installation - Vacuum leakage - Engine overheating - Low engine compression - Spark leakage from high-tension leads - Poor fuel quality - PCV valve malfunction - Air cleaner restriction - Restriction in exhaust system - Electrical connector disconnection - Open or short circuit in fuel pump body and related harness - No battery power supply to PCM or poor GND - Inadequate fuel pressure - Fuel pump body mechanical malfunction - Fuel leakage from fuel injector - Fuel injector clogging - Ignition coil malfunction - Improper air/fuel mixture ratio control - Improper valve timing - Improper operation variable valve timing control system (L3-VE) - Immobilizer system (PATS) and/or circuit malfunction (if equipped) - Pressure regulator malfunction Warning The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete “BEFORE REPAIR PROCEDURE” and “AFTER REPAIR PROCEDURE” described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Note - The following test should be performed for vehicles with immobilizer system. Go to Step 10 for vehicles without immobilizer system. Connect WDS or equivalent to DLC-2. Do following conditions appear? - Engine is not completely started. - DTC B1681 is displayed.	Yes	Both conditions appear: Go to Step 3.
		No	Either or other condition appears: Go to next step.
2	Does engine stall after approx. 2 seconds since engine is started?	Yes	Go to next step.
		No	Immobilizer system is okay. Go to Step 10.
3	Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to Step 2.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
4	Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness.
5	Connect WDS or equivalent to DLC-2 and retrieve DTC. Are any of following DTCs displayed? DTC B1213, B1342, B1600, B1602, B1681, B2103, B2431	Yes	Go to appropriate DTC test.
		No	Go to next step.
6	Is there continuity between PCM GND terminals 4X, 2AB, 2AC and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	Measure voltage between PCM GND terminals 4X, 2AB, 2AC and coil terminal C. Is voltage below 1.0 V ?	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	Turn ignition switch to ON position. Access VPWR PID. Is VPWR PID okay? VPWR PID Battery voltage	Yes	Go to next step.
		No	Repair or replace wiring harness.
9	Disconnect coil connector. Turn ignition switch to ON position. Is there battery voltage at coil connector terminal D?	Yes	Inspection for following: • Open or short circuit between coil terminal A and PCM terminal 2Q. • Open or short circuit between coil terminal B and PCM terminal 2T.
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.
10	Verify following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold: EGR valve, IAC valve • Ignition wiring • Fuel quality: proper octane, contamination, winter/summer blend • Electrical connections • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 10.
11	Turn ignition switch to ON position. Disconnect TP sensor connector. Measure voltage at TP sensor connector VREF terminal with ignition switch ON. Voltage 4.5—5.5 V Is voltage okay?	Yes	Go to next step.
		No	Go to troubleshooting "No.27 Constant voltage".
12	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. If engine stalls, retrieve continuous memory and KOEO DTCs. Are there any DTC displayed?	Yes	DTC is displayed: Go to appropriate DTC test. Communication error message is displayed: Inspect for following: • Open circuit between main relay and PCM terminal 2Y or 4V • Open main relay GND circuit • Main relay is stuck open. • Open or poor GND circuit (PCM terminal 4X, 2AB or 2AC) • Poor connection of vehicle body GND
		No	No DTC is displayed: Go to next step.
13	Attempt to start engine at part throttle. Does engine run smoothly at part throttle?	Yes	Inspect IAC valve and wiring harness.
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
14	Connect WDS or equivalent to DLC-2. Access RPM PID. Is RPM PID indicating engine speed during engine cranking?	Yes	Go to next step.
		No	Inspect for following: • Open or short circuit in CKP sensor • Open or short circuit between CKP sensor and PCM terminal 2C or 2D • Open or short circuit in CKP sensor harnesses If CKP sensor and harness are okay, go to next step.
15	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
16	Measure gap between CKP sensor and teeth of crankshaft pulley. Specification 0.5—1.9 mm {0.020—0.075 in} Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
17	Inspect for cracks on high-tension leads. Are there any cracks on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
18	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Go to next step. If symptom occurs with A/C on, go to Step 24.
		No	Inspect for following: • Open or short circuit in ignition coil • Open circuit in high-tension leads • Open circuit between ignition coil connector GND terminal and body GND • Open circuit between ignition switch and ignition coil • Open circuit between ignition coil and PCM terminal 1A or 1B
19	Inspect spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: Inspect for fuel leakage from injector. Spark plug is grayish white: Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
20	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
21	Inspect for restriction in the exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
22	Install fuel pressure gauge between fuel pipe and fuel distributor. Connect jumper wire between F/P terminal at DLC-2 in engine compartment and GND. Turn ignition switch to ON position. Is fuel line pressure correct with ignition switch ON? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
23	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service as necessary. Is fuel line pressure held after ignition switch is turned off? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
24	Note Following test is for stall concerns with A/C on. If other symptoms exist, go to next step. Connect pressure gauges to A/C low and high pressure side lines. Turn A/C on and measure low side and high side pressures. Are pressures within specifications? (See U-12 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect following: - Refrigerant charging amount - Condenser fan operation
25	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid side. Plug opening end of vacuum hose. Start engine. Is engine stall now eliminated?	Yes	Inspect if purge solenoid valve sticks open. Inspect evaporative emission control system.
		No	Go to next step.
26	Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace.
		No	Go to next step.
27	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
28	Note The following test should be performed for vehicles with variable valve timing control system. Go to next step for vehicles without variable valve timing control system. Inspect variable valve timing control system operation. (See F-239 Variable Valve Timing Control System Operation Inspection.) Does variable valve timing control work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
29	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for cause.
30	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.6 CRANKS NORMALLY BUT WILL NOT START

A6E398018881W08

6	CRANKS NORMALLY BUT WILL NOT START
DESCRIPTION	- Starter cranks engine at normal speed but engine will not run. - Refer to symptom troubleshooting "No.5 Engine stalls" if this symptom appears after engine stall. - Fuel is in tank. - Battery is in normal condition.
POSSIBLE CAUSE	- No battery power supply to PCM - Air leakage from intake-air system - Open PCM GND or vehicle body GND - Improper operation of IAC valve - EGR valve malfunction - No signal from CKP sensor due to sensor, related wire or incorrect installation - No signal from CMP sensor due to sensor, related wire or incorrect installation - Low engine compression - Engine overheating - Vacuum leakage - Spark leakage from high-tension leads - Improper air/fuel mixture ratio control - Poor fuel quality - PCV valve malfunction - Air cleaner restriction - Restriction in exhaust system - Disconnected electrical connector - Open or short circuit in fuel pump body and related harness - Inadequate fuel pressure - Fuel pump mechanical malfunction - Fuel leakage from injector - Fuel injector is clogged. - Purge solenoid valve malfunction - Spark plug malfunction - Ignition coil malfunction - Improper variable valve timing control system operation (L3) - Improper valve timing - Immobilizer system (PATS) and/or circuit malfunction (if equipped) - Pressure regulator malfunction Warning The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Note - Following test should be performed for vehicles with immobilizer system. Go to Step 10 for vehicles without immobilizer system. Connect WDS or equivalent to DLC-2. Do any of following conditions appear? - Engine is not completely started. - DTC B1681 is displayed.	Yes	Both conditions appear: Go to Step 3.
		No	Either or other condition appears: Go to next step.
2	Does engine stall after approx. 2 seconds since engine is started?	Yes	Go to next step.
		No	Immobilizer system is okay. Go to Step 10.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
3	Is coil connector securely connected to coil?	Yes	Go to next step.
		No	Connect coil connector securely. Return to Step 2.
4	Does security light illuminate?	Yes	Go to next step.
		No	Inspect instrument cluster and wiring harness.
5	Connect WDS equivalent to DLC-2 and retrieve DTC. Are any of following DTCs displayed? DTC B1213, B1342, B1600, B1601, B1602, B1681, B2103, B2431	Yes	Go to appropriate DTC test.
		No	Go to next step.
6	Is there continuity between PCM GND terminals 4X, 2AB, 2AC and GND?	Yes	Go to next step.
		No	Repair or replace wiring harness.
7	Measure voltage between PCM GND terminals 4X, 2AB, 2AC and coil terminal C. Is voltage below 1.0 V ?	Yes	Go to next step.
		No	Repair or replace wiring harness.
8	Turn ignition switch to ON position. Access VPWR PID. Is VPWR PID okay? VPWR PID Battery voltage	Yes	Go to next step.
		No	Repair or replace wiring harness.
9	Disconnect coil connector. Turn ignition switch to ON position. Is there battery voltage at coil connector terminal D?	Yes	Inspect for following: • Open or short circuit between coil terminal A and PCM terminal 2Q • Open or short circuit between coil terminal B and PCM terminal 2T
		No	Repair or replace wiring harness between coil connector terminal D and fuse panel.
10	Verify following: • Vacuum connection • External fuel shut off or accessory (kill switch, alarm etc.) • Fuel quality: proper octane, contamination, winter/summer blend • No air leakage from intake-air system • Proper sealing of intake manifold and components attached to intake manifold: EGR valve, IAC valve • Ignition wiring • Electrical connections • Fuses • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 10.
11	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory and KOEO DTC. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test. Communication error message is displayed: Inspect for following: • Open circuit between main relay and PCM terminal 2Y or 4V • Open main relay GND circuit • Main relay is stuck open. • Open or poor GND circuit (PCM terminal 4X, 2AB, or 2AC) • Poor connection of vehicle body GND
		No	No DTC is displayed: Go to next step.
12	Turn ignition switch to ON position. Disconnect TP sensor connector. Measure voltage at TP sensor connector VREF terminal with ignition switch to ON position. Voltage 4.5—5.5 V Is voltage okay?	Yes	Go to next step.
		No	Go to troubleshooting "No.27 Constant voltage".
13	Does engine start with throttle closed?	Yes	Go to Step 29.
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
14	Will engine start and run smoothly at part throttle?	Yes	Inspect IAC valve and wiring harness.
		No	Go to next step.
15	Connect WDS or equivalent to DLC-2. Access RPM PID. Is RPM PID indicating engine speed when cranking engine?	Yes	Go to next step.
		No	Inspect for following: • Open or short circuit in CKP sensor • Open or short circuit between CKP sensor and PCM terminal 1A or 1B • Open or short circuit in CKP sensor harnesses If CKP sensor and harness are okay, go to next step.
16	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	Measure gap between CKP sensor and teeth of crankshaft pulley. Specification 0.5—1.9 mm {0.020—0.075 in} Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
18	Inspect for cranks on high-tension leads. Is there any crank on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
19	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Go to next step.
		No	Inspect for following: • Open or short circuit in ignition coil • Open circuit in high-tension leads • Open circuit between ignition coil connector GND terminal and GND • Open circuit between ignition switch and ignition coil • Open circuit between ignition coil and PCM terminal 1A or 1B
20	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: Inspect for fuel leakage from injector. Spark plug is grayish white: Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
21	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
22	Inspect for restriction in exhaust system.	Yes	Inspect exhaust system.
		No	Go to next step.
23	Install fuel pressure gauge between fuel pipe and fuel distributor. Connect a jumper wire between F/P terminal at DLC-2 in engine compartment and GND. Turn ignition switch to ON position. Is fuel line pressure correct when ignition switch is turned on/off five times ? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
24	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service as necessary. Is fuel line pressure held after ignition switch is turned off? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.
25	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Attempt to start engine. Is starting condition improved?	Yes	Inspect if purge solenoid valve sticks open mechanically. Inspect evaporative emission control system.
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
26	Is air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace.
		No	Go to next step.
27	Inspect engine condition while tapping EGR valve housing. Is engine condition improved?	Yes	Replace EGR valve.
		No	Go to next step.
28	Note The following test should be performed for vehicles with variable valve timing control system. Go to next step for vehicles without variable valve timing control system. Inspect variable valve timing control system operation. (See F-239 Variable Valve Timing Control System Operation Inspection .) Does variable valve timing control work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
29	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for causes.
30	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.7 SLOW RETURN TO IDLE

A6E398018881W09

7	SLOW RETURN TO IDLE
DESCRIPTION	Engine takes more time than normal to return to idle speed.
POSSIBLE CAUSE	- ECT sensor malfunction - Thermostat is stuck open. - Throttle body malfunction - Air leakage from intake-air system

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
2	Remove thermostat and inspect operation. (See E-7 THERMOSTAT REMOVAL/INSTALLATION .) (See E-8 THERMOSTAT INSPECTION .) Is thermostat okay?	Yes	ECT and thermostat are okay. Go to next step.
		No	Access ECT PID on WDS or equivalent. Inspect for both ECT PID and temperature gauge on instrument cluster readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates cold range but ECT PID is normal, inspect temperature gauge and heat gauge unit.
3	Is throttle body free of contaminations?	Yes	Inspect for air leakage from intake-air system components while racing engine to higher speed.
		No	Clean or replace throttle body.
4	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.8 ENGINE RUNS ROUGH/ROLLING IDLE

A6E398018881W10

8	ENGINE RUNS ROUGH/ROLLING IDLE
DESCRIPTION	- Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively. - Idle speed is too slow and engine shakes excessively.
POSSIBLE CAUSE	- Air leakage from intake-air system parts - A/C system operation is improper - Spark leakage from high-tension leads - Spark plug malfunction - Purge solenoid valve malfunction - IAC valve improper operation - EGR valve malfunction - Erratic or no signal from CMP sensor - Low engine compression - Improper valve timing - Improper variable valve timing control system operation (L3-VE) - Erratic signal from CKP sensor - Poor fuel quality - PCV valve malfunction - Air cleaner restriction - Restriction in exhaust system - Disconnected electrical connectors - Inadequate fuel pressure - Fuel pump body mechanical malfunction - Improper load signal input - Fuel line restriction or clogging - Improper fuel injection control operation - Fuel leakage from fuel injector - Fuel injector clogging - Engine overheating - Vacuum leakage - Pressure regulator malfunction Warning The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing the fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify following: - External fuel shut off or accessory (kill switch, alarm etc.) - Fuel quality (e.g. proper octane, contamination, winter/summer blend) - No air leakage from intake-air system - Proper sealing of intake manifold and components attached to intake manifold: EGR valve, IAC valve - Ignition wiring - Electrical connections - Fuses - Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
2	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to next step.
4	Note Following test is for engine running rough idle with A/C on concerns. If other symptoms exist, go to next step. Connect pressure gauge to A/C low and high pressure side lines. Start engine and run it at idle. Turn A/C switch on. Measure low side and high side pressures. Are pressures within specifications? (See U-12 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect following: - Refrigerant charging amount - Condenser fan operation
5	Note Following test is for engine running rough with P/S on. If other symptoms exist, go to next step. Start engine and run it at idle. Access PSP PID. Inspect if PSP PID is on while turning steering wheel right to left. Is PSP PID okay?	Yes	Inspect power steering pressure switch operation and wiring harness between P/S pressure switch connector and PCM connector terminal 1Z.
		No	Go to next step.
6	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
7	Measure gap between CKP sensor and teeth of crankshaft pulley. Specification 0.5—1.5 mm {0.020—0.075 in} Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
8	Inspect for cracks on high-tension leads. Are there any cracks on high-tension leads?	Yes	Repair suspected high-tension leads.
		No	Go to next step.
9	Inspect spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: Inspect for fuel leakage from injector. Spark plug is grayish white: Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
10	Start engine and disconnect IAC valve connector. Does rpm drop or engine stall?	Yes	Go to next step.
		No	Inspect IAC valve and wiring harness.
11	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
12	Visually inspect for fuel leakage at fuel injector, O-ring, and fuel line. Service as necessary. Does fuel line pressure hold after ignition switch is turned off? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
13	Connect WDS or equivalent to DLC-2. Start the engine and run it at idle. Access O2S11 PID. Is O2S11 PID okay? • More than 0.45 V when accelerator pedal is suddenly depressed: rich condition • Less than 0.45 V during fuel cut: lean condition	Yes	Go to next step.
		No	Inspect and repair or replace faulty HO2S, harness, connector or terminal, then go to next step.
14	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Start engine. Does engine condition improve?	Yes	Inspect if purge solenoid valve sticks open mechanically. Inspect EVAP control system.
		No	Go to next step.
15	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
16	Inspect for restriction in exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
17	Visually inspect CMP sensor and teeth of camshaft. Are CMP sensor and teeth of camshaft okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
18	Inspect engine condition while tapping EGR valve housing. Does engine condition improve?	Yes	Replace EGR valve.
		No	Go to next step.
19	Note • The following test should be performed for vehicles with variable valve timing control system. Go to next step for vehicles without variable valve timing control system. Inspect variable valve timing control system operation. (See F-239 Variable Valve Timing Control System Operation Inspection .) Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
20	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for causes.
21	Verify test results. • If okay, return to diagnostic index to service any additional symptoms. • If malfunction remains, replace PCM.		

NO.9 FAST IDLE/RUNS ON

A6E398018881W11

9	FAST IDLE/RUNS ON
DESCRIPTION	• Engine speed continues at fast idle after warm-up. • Engine runs after ignition switch is turned off.
POSSIBLE CAUSE	• ECT sensor malfunction • Air leakage from intake-air system • Throttle body malfunction • Accelerator cable free play misadjustment • Cruise control cable misadjustment • Improper load signal input

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Access ECT PID. Start and warm up engine to normal operating temperature. Is ECT PID reading between 82—112°C {180—234°F} ?	Yes	Go to next step.
		No	ECT PID is higher than 112°C {234°F}: Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating". ECT PID is less than 82°C {180°F}: Go to symptom troubleshooting "No.18 Cooling system concerns - Runs cold".

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
2	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
3	Connect WDS or equivalent to DLC-2. Access ACSW, COLP, CPP, CPP/PNP, TR and PSP PIDs. Monitor each PID. (See F-45 PCM INSPECTION.) Are PIDs okay?	Yes	Go to next step.
		No	ACSW PID: Inspect A/C switch, refrigerant pressure switch and fan switch. COLP PID: Inspect refrigerant pressure switch (middle pressure). CPP PID: Inspect clutch switch (MTX). CPP/PNP PID: Inspect neutral switch (MTX) TR PID: TR switch (ATX). PSP PID: Inspect P/S pressure switch.
4	Is there air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace parts if necessary.
		No	Verify accelerator cable free play. (See F-16 ACCELERATOR CABLE INSPECTION/ADJUSTMENT.)
5	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.10 LOW IDLE/STALLS DURING DECELERATION

A6E398018881W12

10	LOW IDLE/STALLS DURING DECELERATION
DESCRIPTION	Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.
POSSIBLE CAUSE	- Vacuum leakage - IAC valve malfunction - Air leakage from intake-air system - Improper air/fuel mixture ratio control - Evaporative emission control system malfunction - TP sensor misadjustment - TP sensor or related circuit malfunction - MAF sensor or related circuit malfunction - Brake switch or related circuit malfunction - Neutral/clutch switch or related circuit malfunction (MTX) - TR switch or related circuit malfunction (ATX) - Improper A/C magnetic clutch operation

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does engine idle rough?	Yes	Go to symptom troubleshooting "No.8 Engine runs rough/rolling idle".
		No	Go to next step.
2	Turn off A/C switch and fan switch. Does A/C magnetic clutch engage?	Yes	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously."
		No	Go to next step.
3	Verify following: - Proper routing and no damage of vacuum lines - IAC valve is connected properly. - No air leakage from intake-air system Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 3.
4	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
5	Does idle speed drop or stall when disconnecting IAC valve?	Yes	Go to next step.
		No	Inspect following: - Circuit from IAC valve to PCM connector terminal 4G or 4J for open and short - IAC valve for sticking If okay, go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
6	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Inspect evaporative emission control system.
		No	Go to next step.
7	Connect WDS or equivalent to DLC-2. Access TP, MAF, VSS, BOO, CPP, CPP/PNP and TR PIDs. Monitor each PID while driving vehicle. (See F-45 PCM INSPECTION .) Are PIDs okay?	Yes	Intermittent concern exists. (See INTERMITTENT CONCERN TROUBLESHOOTING.)
		No	TP PID: Inspect TP sensor. MAF PID: Inspect MAF sensor. VSS PID: Inspect VSS. BOO PID: Inspect brake switch. CPP PID: Inspect clutch switch (MTX). CPP/PNP PID: Inspect neutral switch (MTX). TR PID: Inspect TR switch (ATX) switch.
8	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES

A6E398018881W13

11	ENGINE STALLS/QUITS — ACCELERATION/CRUISE ENGINE RUNS ROUGH — ACCELERATION/CRUISE MISSES — ACCELERATION/CRUISE BUCK/JERK — ACCELERATION/CRUISE/DECELERATION HESITATION/STUMBLE — ACCELERATION SURGES — ACCELERATION/CRUISE
DESCRIPTION	• Engine stops unexpectedly at beginning of acceleration or during acceleration. • Engine stops unexpectedly while cruising. • Engine speed fluctuates during acceleration or cruising. • Engine misses during acceleration or cruising. • Vehicle bucks/jerks during acceleration, cruising, or deceleration. • Momentary pause at beginning of acceleration or during acceleration • Momentary minor irregularity in engine output
POSSIBLE CAUSE	• A/C system operation is improper. • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Purge solenoid valve malfunction • IAC valve improper operation • EGR valve malfunction • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Main relay intermittent malfunction • Throttle body malfunction • Engine overheating • Spark plug malfunction • Improper air/fuel mixture ratio control operation • Improper VTCS operation • Spark leakage from high-tension leads • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out timing belt • Restriction in exhaust system • Intermittent open or short in fuel body pump circuit • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel leakage from fuel injector • Fuel injector clogging • Fuel line restriction or clogging • Pressure regulator malfunction • TP sensor misadjustment • Intermittent open or short of MAF sensor, TP sensor and VSS • ATX malfunction (ATX) • Clutch slippage (MTX) • Improper VTCS operation Warning The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services: • Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. • Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution • Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

TROUBLESHOOTING

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify for following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold: such as EGR valve, IAC valve • Ignition wiring • Fuel quality (e.g. proper octane, contamination, winter/summer blend) • Electrical connections • Smooth operation of throttle valve Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. If stall, condition exists retrieve continuous memory and KOEO DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to next step.
4	Connect WDS or equivalent to DLC-2. Access RPM, VPWR, MAF, TP and VSS PIDs. Drive vehicle with monitoring PIDs. Are PIDs within specifications? (See F-45 PCM INSPECTION.)	Yes	Go to next step.
		No	RPM PID: Inspect CKP sensor and related harness for such as vibration, intermittent open/short circuit. VPWR PID: Inspect for open circuit intermittently. MAF PID: Inspect for open circuit of MAF sensor and related wire harness intermittently. TP PID: Inspect if output signal from TP sensor changes smoothly. VSS PID: Inspect for open circuit of VSS and related wire harness intermittently.
5	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
6	Measure gap between CKP sensor and teeth of crankshaft pulley. Specification 0.5—1.9 mm {0.020—0.075 in} Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
7	Inspect spark plug conditions. Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: Inspect for fuel leakage from fuel injector. Spark plug is grayish white: Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
8	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
9	Verify that throttle lever is resting on throttle valve stop screw and/or throttle valve orifice plug. Is lever in correct position?	Yes	Go to next step.
		No	Adjust if necessary.
10	Inspect for restriction in the exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
11	Install fuel pressure gauge between fuel pipe and fuel distributor. Connect jumper wire between F/P terminal at DLC-2 in engine compartment and GND. Turn ignition switch to ON position. Is fuel line pressure correct with ignition switch to ON position? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
12	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service as necessary. Is fuel line pressure held after ignition switch is turned off? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Inspect fuel injector. If fuel injector is okay, replace fuel pump unit.
13	Note Following test is for engine stalling with A/C on. If other symptom exists, go to next step. Connect a pressure gauge to A/C low and high pressure side lines. Turn A/C on and measure low side and high side pressure. Are pressure within specifications? (See U-12 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect following: - Refrigerant charging amount - Condenser fan operation
14	Note The following test should be performed for symptom with cruise control ON. If other symptoms exist, go to next step. Inspect cruise control system. Is cruise control system okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
15	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Go to next step. Inspect if purge solenoid valve sticks open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
16	Visually inspect CMP sensor and projections of camshaft pulley. Are CMP sensor and projections of camshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	Inspect VTCS operation. (See F-231 Variable Tumble Control System (VTCS) Operation Inspection.) Is VTCS okay?	Yes	Go to next step.
		No	Replace or replace malfunctioning parts.
18	Inspect EGR system. (See F-233 EGR Control System Inspection.) Is EGR system okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
19	Is engine compression correct?	Yes	Inspect following: - Valve timing - Internal transaxle part (ATX) - Clutch (MTX)
		No	Inspect for cause.
20	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE

A6E398018881W14

12	LACK/LOSS OF POWER — ACCELERATION/CRUISE
DESCRIPTION	Performance is poor under load (e.g., power down when climbing hills).
POSSIBLE CAUSE	• Improper A/C system operation • Erratic signal or no signal from CMP sensor • Air leakage from intake-air system parts • Improper VIS operation (if equipped) • Improper VTCS operation • Purge control solenoid malfunction • EGR valve malfunction • Brake dragging • Erratic signal from CKP sensor • Low engine compression • Vacuum leakage • Poor fuel quality • Spark leakage from high-tension leads • Engine overheating • Throttle body malfunction • Spark plug malfunction • Air cleaner restriction • PCV valve malfunction • Improper valve timing due to jumping out of timing belt • Improper variable valve timing control operation (if equipped) • Restriction in exhaust system • Intermittent open or short in fuel pump related circuit • Inadequate fuel pressure • Fuel pump mechanical malfunction • Fuel line restriction or clogging • Fuel leakage from fuel injector • Fuel injector clogging • Intermittent open or short of MAF sensor, TP sensor and VSS • ATX malfunction (ATX) • Clutch slippage (MTX) Warning The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services: • Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. • Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution • Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify following: • Vacuum connection • Air cleaner element • No air leakage from intake-air system • No restriction of intake-air system • Proper sealing of intake manifold and components attached to intake manifold; such as EGR valve, IAC valve • Fuel quality (e.g. proper octane, contamination, winter/summer blend) Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
2	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. If engine stall condition exists, retrieve continuous memory and KOEO DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".
		No	Go to next step.
4	Connect WDS or equivalent to DLC-2. Access RPM, MAF, TP and VSS PIDs. Drive vehicle while monitoring PIDs. Are PIDs within specifications? (See F-45 PCM INSPECTION .)	Yes	Go to next step.
		No	RPM PID: Inspect CKP sensor and related wiring harness for vibration and/or intermittent open/short circuit. MAF PID: Inspect for intermittent open circuit of MAF sensor and related wiring harness. TP PID: Inspect if TP sensor output increases smoothly. VSS PID: Inspect for intermittent open circuit of VSS and related wiring harness.
5	Visually inspect CKP sensor and teeth of crankshaft pulley. Are CKP sensor and teeth of crankshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
6	Measure gap between CKP sensor and teeth of crankshaft pulley. Specification 0.5—1.9 mm {0.020—0.075 in} Is gap within specification?	Yes	Go to next step.
		No	Adjust CKP sensor.
7	Inspect spark plug condition. Is spark plug wet, covered with carbon or grayish white?	Yes	Spark plug is wet or covered with carbon: Inspect for fuel leakage from fuel injector. Spark plug is grayish white: Inspect for clogged fuel injector.
		No	Install spark plugs on original cylinders. Go to next step.
8	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
9	Inspect for restriction in exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
10	Install fuel pressure gauge between fuel pipe and fuel distributor. Connect jumper wire between F/P terminal at DLC-2 in engine compartment and GND. Turn ignition switch to ON position. Is fuel line pressure correct with ignition switch to ON position? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
11	Inspect VTCS operation. (See F-231 Variable Tumble Control System (VTCS) Operation Inspection .) Does VTCS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
12	Note • The following test should be performed for vehicles with VIS. Go to next step for vehicles without VIS. Inspect VIS operation. (See F-230 VIS Operation Inspection .) Does VIS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
13	Note Following test is for engine stalling with A/C on concern. If other symptoms exist, go to next step. Connect pressure gauge to A/C low and high side pressure lines. Turn A/C on and measure low side and high side pressures. Are pressures within specifications? (See U-12 REFRIGERANT PRESSURE CHECK.)	Yes	Go to next step.
		No	If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously". For other symptoms, inspect following: - Refrigerant charging amount - Condenser fan operation
14	Inspect for A/C cut-off operation. (See F-234 A/C Cut-off Control System Inspection.) Does A/C cut-off work properly?	Yes	Go to next step.
		No	Inspect A/C cut-off system components.
15	Disconnect vacuum hose between purge solenoid valve and intake manifold from purge solenoid valve side. Plug opening end of vacuum hose. Drive vehicle. Does engine condition improve?	Yes	Inspect if purge solenoid valve is sticks open mechanically. Inspect evaporative emission control system.
		No	Go to next step.
16	Visually inspect CMP sensor and projections of camshaft pulley. Are CMP sensor and projections of camshaft pulley okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
17	Inspect EGR system. (See F-233 EGR Control System Inspection.) Is EGR system okay?	Yes	Go to next step.
		No	Replace malfunctioning parts.
18	Note The following test should be performed for vehicles with variable valve timing control system. Go to next step for vehicles without variable valve timing control system. Inspect variable valve timing control system operation. (See F-239 Variable Valve Timing Control System Operation Inspection.) Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
19	Is engine compression correct?	Yes	Inspect following: - Valve timing - Internal transaxle components (ATX) - Clutch (MTX) - Brake system for dragging
		No	Inspect for cause.
20	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.13 KNOCKING/PINGING-ACCELERATION/CRUISE

A6E398018881W15

13	KNOCKING/PINGING - ACCELERATION/CRUISE
DESCRIPTION	Sound is produced when air/fuel mixture is ignited by something other than spark plug (e.g., hot spot in combustion chamber).
POSSIBLE CAUSE	• Engine overheating due to cooling system malfunction • ECT sensor malfunction • IAT sensor malfunction • MAF sensor malfunction • Knock sensor malfunction • Erratic signal from CMP sensor • Inadequate engine compression • Inadequate fuel pressure Warning The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services: • Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. • Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution • Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Access ECT PID. Verify ECT PID is less than 116°C {241°F} during driving. Is ECT PID less than specification?	Yes	Go to next step.
		No	Inspect cooling system for cause of overheating.
2	Connect WDS or equivalent to DLC-2. Access IAT, MAF and SPARKADV PIDs. Monitor each PID. (See F-45 PCM INSPECTION.) Are PIDs okay?	Yes	Go to next step.
		No	IAT PID: Inspect IAT sensor MAF PID: Inspect MAF sensor SPARKADV PID: Inspect CMP sensor and knock sensor.
3	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
4	Is engine compression correct?	Yes	Go to next step.
		No	Inspect for cause.
5	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Inspect ignition timing.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
6	Verify test results. • If okay, return to diagnostic index to service any additional symptoms. • If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.14 POOR FUEL ECONOMY

A6E398018881W16

14	POOR FUEL ECONOMY
DESCRIPTION	Fuel economy is unsatisfactory.
POSSIBLE CAUSE	- Contaminated air cleaner element - VIS malfunction (if equipped) - Engine cooling system malfunction - Improper ATF level (ATX) - Weak spark - Poor fuel quality - Erratic or no signal from CMP sensor - Clutch slippage (MTX) - VTCS malfunction - Improper variable valve timing control system operation (if equipped) - Improper coolant level - Inadequate fuel pressure - Spark plug malfunction - PCV valve malfunction - Brake dragging - Improper valve timing due to jumping out of timing belt - Contaminated MAF sensor - Improper engine compression - Exhaust system clogging Warning The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for following: - Air cleaner element for contamination - ATF level - Fuel quality - Coolant level - Brake dragging - Clutch slippage Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
3	Access ECT PID. Drive vehicle while monitoring PID. (See F-45 PCM INSPECTION.) Is PID within specification?	Yes	Go to next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operations or thermostat operation.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
4	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect for following: - Spark plugs malfunction - CMP sensor is improperly installed. - Trigger wheel damage on camshaft - Open or short circuit on CMP sensor - Open or short circuit between CMP sensor and PCM terminal 2J or 2M Repair or replace malfunctioning parts. If okay, go to next step.
		No	Inspect following: - High-tension leads - Ignition coil and connector
5	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit High: Replace fuel pump unit.
6	Inspect for VTCS operation. (See F-231 Variable Tumble Control System (VTCS) Operation Inspection.) Does VTCS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
7	Note The following test should be performed for vehicles with variable valve timing control system. Go to next step for vehicles without variable valve timing control system. Inspect for variable valve timing control system operation. (See F-239 Variable Valve Timing Control System Operation Inspection.) Does variable valve timing control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
8	Note The following test should be performed for vehicles with VIS. Go to next step for vehicles without VIS. Inspect for VIS operation. (See F-230 VIS Operation Inspection.) Does VIS work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
9	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
10	Inspect for restriction in the exhaust system. Is there any restriction?	Yes	Inspect exhaust system.
		No	Go to next step.
11	Inspect for contaminated MAF sensor. Is there any contamination?	Yes	Go to next step.
		No	Inspect for cause.
12	Inspect MAF sensor for contamination. Is there any contamination?	Yes	Replace MAF sensor.
		No	Go to next step.
13	Is engine compression correct?	Yes	Inspect valve timing.
		No	Inspect for cause.
14	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.15 EMISSION COMPLIANCE

A6E398018881W17

15	EMISSION COMPLIANCE
DESCRIPTION	Fails emissions test.
POSSIBLE CAUSE	• Vacuum lines leakage or blockage • Cooling system malfunction • Spark plug malfunction • Leakage from intake manifold • Erratic or no signal from CMP sensor • Inadequate fuel pressure • PCV valve malfunction or incorrect valve installation • EGR valve malfunction • Exhaust system clogging • Fuel tank ventilation system malfunction • Charcoal canister damage • Air cleaner element clogging or restriction • Throttle body malfunction • Spark leakage from high-tension leads • Improper air/fuel mixture ratio control operation • Catalyst converter malfunction • Engine internal parts malfunction • Excessive carbon is built up in combustion chamber • Improper engine compression • Improper valve timing Warning The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system services: • Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. • Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution • Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for following: • Vacuum lines for leakage or blockage • Electrical connections • Proper maintenance schedule followed • Intake-air system and air cleaner element concerns: obstructions, leakage or dirtiness Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
3	Is any other drivability concern present?	Yes	Go to appropriate symptom troubleshooting.
		No	Go to next step.
4	Connect WDS or equivalent to DLC-2. Access ECT PID. Warm up engine and run it at idle. Verify ECT PID is correct. (See F-45 PCM INSPECTION.) Is ECT PID correct?	Yes	Go to next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operation or thermostat operation.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
5	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect for following: - Spark plugs malfunction - Improperly installed CMP sensor - Damage of trigger wheel on camshaft - Open or short circuit on CMP sensor - Open or short circuit between CMP sensor and PCM terminal 2J or 2M Repair or replace malfunctioning parts. If okay, go to next step.
		No	Inspect following: - High-tension leads - Ignition coil and connector
6	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
7	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
8	Inspect for fuel saturation inside charcoal canister. Is excess amount of liquid fuel present in canister?	Yes	Replace charcoal canister.
		No	Inspect fuel tank vent system. Then, go to next step.
9	Is there restriction in exhaust system?	Yes	Inspect exhaust system.
		No	Inspect EGR system. (See F-233 EGR Control System Inspection.)
10	Inspect threeway catalytic converter. (See F-41 THREE-WAY CATALYTIC CONVERTER (TWC) INSPECTION.) Is threeway catalytic converter okay?	Yes	Inspect EGR system. (See F-233 EGR Control System Inspection.)
		No	Replace threeway catalytic converter.
11	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.16 HIGH OIL CONSUMPTION/LEAKAGE

A6E398018881W18

16	HIGH OIL CONSUMPTION/LEAKAGE
DESCRIPTION	Oil consumption is excessive.
POSSIBLE CAUSE	- PCV valve malfunction - Improper dipstick - Improper engine oil viscosity - Engine internal parts malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Go to next step.
		No	Replace PCV valve.
2	Inspect for following: - External leakage - Proper dipstick - Proper engine oil viscosity Are all items okay?	Yes	Inspect internal engine parts such as valves, valve guides, valve stem seals, cylinder head drain passage, and piston rings.
		No	Service as necessary. Repeat Step 2.
3	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.17 COOLING SYSTEM CONCERNS-OVERHEATING

A6E398018881W19

17	COOLING SYSTEM CONCERNS -OVERHEATING
DESCRIPTION	Engine runs at higher than normal temperature/overheats.
POSSIBLE CAUSE	• Improper coolant level • Blown fuses • Coolant leakage • Excessive A/C system pressure • A/C system operation is improper • Improper water/anti-freeze mixture • Fans reverse rotation • Poor radiator condition • Thermostat malfunction • Radiator hoses damage • Condenser fan is inoperative. • Improper or damaged radiator cap • Cooling fan is inoperative. • Coolant overflow system malfunction • Improper tension of drive belt • Drive belt damage

F

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect following: • Engine coolant level • Coolant leakage • Water and anti-freeze mixture • Radiator condition • Collapsed or restricted radiator hoses • Radiator pressure cap • Overflow system • Fan rotational direction • Fuses Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 1.
2	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
3	Start engine and run it at idle speed. Turn A/C switch on. Does A/C compressor engage?	Yes	Go to Step 5.
		No	Inspect for following and repair or replace as necessary: • Refrigerant charging amount • Open circuit between A/C relay and PCM terminal 4O • Seized A/C magnetic clutch • A/C magnetic clutch malfunction If all items are okay, go to next step.
4	Connect WDS or equivalent to DLC-2. Access ACSW PID. Start engine and run it at idle speed. Turn A/C switch on. Does ACSW PID read ON?	Yes	Go to next step.
		No	Inspect following: • Refrigerant pressure switch operation • A/C switch is stuck open. • Open or short circuit between refrigerant pressure switch and PCM terminal 1AC • Open circuit of blower motor fan switch and resistor (if blower motor does not operate) • Evaporator temperature sensor and A/C amplifier
5	Inspect cooling fan control system operation. (See F-234 Cooling Fan Control System Inspection.) Does cooling fan control system work properly?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
6	Is drive belt okay?	Yes	Go to next step.
		No	Replace drive belt.
7	Is there any leakage around heater unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to next step.
8	Is there any leakage at coolant hoses and/or radiator?	Yes	Replace malfunctioning part.
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
9	Cool down the engine. Remove thermostat and inspect operation. (See E-7 THERMOSTAT REMOVAL/INSTALLATION.) (See E-8 THERMOSTAT INSPECTION.) Is thermostat okay?	Yes	Engine coolant temperature and thermostat are okay, inspect engine block for leakage or blockage.
		No	Access ECT PID. Inspect for both ECT PID and temperature gauge readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates overheating but ECT PID is normal, inspect temperature gauge and heat gauge unit.
10	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.18 COOLING SYSTEM CONCERNS-RUNS COLD

A6E398018881W20

18	COOLING SYSTEM CONCERNS -RUNS COLD
DESCRIPTION	Engine takes excessive period for reaching normal operating temperature.
POSSIBLE CAUSE	- Thermostat malfunction - Condenser fan system malfunction - Cooling fan system malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is customer complaint "Lack of passenger compartment heat" only?	Yes	Inspect A/C and heater system.
		No	Go to next step.
2	Does engine speed continue at fast idle?	Yes	Go to symptom troubleshooting "No.9 Fast idle/runs on".
		No	Go to next step.
3	Remove thermostat and inspect operation. (See E-7 THERMOSTAT REMOVAL/INSTALLATION.) (See E-8 THERMOSTAT INSPECTION.) Is thermostat okay?	Yes	Go to next step.
		No	Replace thermostat.
4	Inspect cooling fan control system operation. (See F-234 Cooling Fan Control System Inspection.) Does cooling fan control system work properly?	Yes	Access ECT PID. Inspect for both ECT PID and temperature gauge on instrument cluster readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates cold range but ECT PID is normal, inspect temperature gauge and heat gauge unit.
		No	Repair or replace malfunctioning part.
5	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.19 EXHAUST SMOKE

A6E398018881W21

19	EXHAUST SMOKE
DESCRIPTION	Blue, black, or white smoke from exhaust system
POSSIBLE CAUSE	Blue smoke (Burning oil): - PCV valve malfunction - Engine internal oil leakage White smoke (Water in combustion): - Cooling system malfunction (coolant loss) - Engine internal coolant leakage Black smoke (Rich fuel mixture): - Air cleaner restriction - Intake-air system is collapsed or restricted. - Fuel return line is restricted. - Excessive fuel pressure - Improper engine compression - Injector fuel leakage - Ignition system malfunction Warning The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	What color is smoke coming from exhaust system?	Blue	Burning oil is indicated. Go to next step.
		White	Water in combustion is indicated. Go to Step 3.
		Black	Rich fuel mixture is indicated. Go to Step 4.
2	Remove and shake PCV valve. Does PCV valve rattle?	Yes	Inspect for following: - Damaged valve guide, stems or valve seals - Blocked oil drain passage in cylinder head - Piston ring is not seated, seized or worn. - Damaged cylinder bore If other drivability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Replace PCV valve.
3	Does cooling system hold pressure?	Yes	Inspect for following: - Cylinder head gasket leakage - Intake manifold gasket leakage - Cracked or porous engine block If other drivability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Inspect for cause.
4	Inspect for following: - Air cleaner restriction - Collapsed or restricted intake-air system - Restricted fuel return line Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 4.
5	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
6	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: - Inspect for clogged fuel line. - If okay, replace fuel pump unit. High: - Replace fuel pump unit.
7	Is strong blue spark visible at each disconnected high-tension lead while cranking engine?	Yes	Inspect spark plugs and CMP sensor.
		No	Inspect following: - High-tension leads - Ignition coil and connector
8	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.20 FUEL ODOR (IN ENGINE COMPARTMENT)

A6E398018881W22

20	FUEL ODOR (IN ENGINE COMPARTMENT)
DESCRIPTION	Gasoline fuel smell or visible leakage
POSSIBLE CAUSE	- Excessive fuel pressure - Purge solenoid valve malfunction - Fuel tank vent system blockage - Charcoal canister malfunction - Fuel leakage from fuel system
	Warning The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Visually inspect for fuel leakage at fuel injector O-ring and fuel line. Service as necessary. Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and run it at idle. Measure fuel line pressure at idle. Is fuel line pressure correct at idle? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Replace fuel pump unit.
2	Inspect for blockage/restriction or open between engine vacuum port and charcoal canister. Inspect for blockage in fuel tank vent system. Is fault indicated?	Yes	Replace vacuum hose.
		No	Go to next step.
3	Inspect purge solenoid valve. (See F-39 PURGE SOLENOID VALVE INSPECTION.) Is solenoid operating properly?	Yes	Go to next step.
		No	Replace purge solenoid valve.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
4	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Inspect charcoal canister for fuel saturation. If excess amount of liquid fuel is present, replace charcoal canister.
5	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.21 ENGINE NOISE

A6E398018881W23

F

21	ENGINE NOISE
DESCRIPTION	Engine noise from under hood
POSSIBLE CAUSE	Squeal, click or chirp noise: - Improper engine oil level - Improper drive belt tension Rattle sound noise: - Loose parts Hiss sound noise: - Vacuum leakage - Loose spark plug - Air leakage from intake-air system - Improper variable air duct (VAD) control system operation Rumble or grind noise: - Improper drive belt tension Rap or roar sound noise: - Exhaust system looseness Other noise: - Camshaft friction gear noise or MLA noise - Timing chain noise

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is squeal, click or chirp sound present?	Yes	Inspect engine oil level or drive belts.
		No	Go to next step.
2	Is rumble or grind sound present?	Yes	Inspect drive belts.
		No	Go to next step.
3	Is rattle sound present?	Yes	Inspect location of rattle for loose parts.
		No	Go to next step.
4	Is hiss sound present?	Yes	Inspect for following: - Vacuum leakage - Spark plug looseness - Intake-air system leakage - Variable air duct (VAD) control system operation (See F-238 Variable Air Duct (VAD) Control System Operation Inspection (L3 Engine Models).)
		No	Go to next step.
5	Is rap or roar sound present?	Yes	Inspect exhaust system for loose parts.
		No	Go to next step.
6	Is knock sound present?	Yes	Go to symptom troubleshooting "No.11 Knocking/pinging".
		No	If noise comes from engine internal, inspect for friction gear, timing chain or MLA noise.
7	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.22 VIBRATION CONCERNS (ENGINE)

A6E398018881W24

22	VIBRATION CONCERNS (ENGINE)
DESCRIPTION	Vibration from under hood or driveline
POSSIBLE CAUSE	- Loose attaching bolts or worn parts - Components malfunction such as worn parts

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect following components for loose attaching bolts or worn parts: - Cooling fan - Condenser fan - Drive belt and pulleys - Engine mounts All items okay?	Yes	Inspect following systems: - Wheels - ATX - Driveline - Suspension
		No	Readjust or retighten engine mount installation position. Service if necessary for other parts.
2	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.23 A/C DOES NOT WORK SUFFICIENTLY

A6E398018881W25

23	A/C DOES NOT WORK SUFFICIENTLY.
DESCRIPTION	A/C compressor magnetic clutch does not engage when A/C switch is turned on.
POSSIBLE CAUSE	- Improper refrigerant charging amount - Open A/C magnetic clutch - Open circuit between A/C relay and A/C magnetic clutch - Poor GND of A/C magnetic clutch - Refrigerant pressure switch is stuck open. - A/C relay is stuck open. - Seized A/C compressor - Open circuit between A/C switch and PCM through both refrigerant pressure switch and A/C amplifier

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
2	Disconnect A/C compressor connector. Start engine and turn A/C switch on. Is there correct voltage at terminal of A/C compressor magnetic clutch connector? Specification More than 10.5 V	Yes	Inspect for GND condition of magnetic clutch on A/C compressor. If GND condition is okay, inspect for open circuit magnetic clutch coil.
		No	Go to next step.
3	Disconnect refrigerant pressure switch connector. Connect jumper wire between terminals of A/C high pressure switch connector. Connect jumper wires between terminals of refrigerant pressure switch connector. Connect WDS or equivalent to DLC-2. Access ACSW PID. Turn ignition switch to ON position. Turn A/C switch on and set blower fan at any speed. Does ACSW PID read ON?	Yes	Inspect refrigerant pressure switch operation. If switch is okay, go to next step.
		No	Inspect for following: - A/C switch is stuck open. - Open circuit between refrigerant pressure switch and PCM terminal 1AC - Open circuit of blower motor fan switch and resistor (if blower motor does not operate) - Evaporator temperature sensor and A/C amplifier
4	Remove jumper wire from switch connector. Reconnect connector to refrigerant pressure switch. Start engine and turn A/C switch on. Does fan operate?	Yes	Inspect for stuck open A/C relay. Replace if necessary.
		No	Inspect following and repair or replace as necessary: - Refrigerant charging amount - A/C compressor for being seized
5	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.24 A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY

A6E398018881W26

24	A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.
DESCRIPTION	A/C compressor magnetic clutch does not disengage.
POSSIBLE CAUSE	- Stuck engagement A/C compressor magnetic clutch - A/C relay is stuck closed. - Short to GND between A/C switch and PCM - Short to GND circuit between A/C relay and PCM - A/C relay to magnetic clutch circuit shorted to battery power

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
2	Start engine and run it at idle. Turn A/C switch on. Remove A/C relay. Does A/C magnetic clutch disengage?	Yes	Inspect for following: - A/C relay is stuck closed. - Short to GND circuit between A/C relay and PCM terminal 4O. If both items okay, go to next step.
		No	Inspect if circuit between A/C relay and magnetic clutch shorts to battery power circuit. If circuit is okay, inspect magnetic clutch stuck engagement or clearance.
3	Connect WDS or equivalent to DLC-2. Access ACSW PID. Start engine and turn A/C switch on. Read ACSW PID while disconnecting refrigerant pressure switch connector. Note ACSW PID should read OFF when disconnecting connector. If ACSW PID reading remains ON, short to GND circuit may be present. Does ACSW PID reading remain ON?	Yes	Inspect for short to GND circuit between refrigerant pressure switch and PCM terminal 1AC.
		No	Go to next step.
4	Reconnect refrigerant pressure switch connector. Read ACSW PID while turning off A/C switch. Note ACSW PID should read OFF when turning A/C switch off. If ACSW PID reading remains ON, short to GND circuit may be present. Does ACSW PID reading remain ON?	Yes	Inspect following: - Short to GND circuit between A/C switch and A/C amplifier - Short to GND circuit between A/C amplifier and refrigerant pressure switch
		No	Inspect for stuck closed A/C switch.
5	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.25 A/C IS NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS

A6E398018881W27

25	A/C IS NOT CUT OFF UNDER WOT CONDITIONS.
DESCRIPTION	A/C compressor magnetic clutch does not disengage under WOT.
POSSIBLE CAUSE	- TP sensor malfunction - TP sensor misadjustment - Loosely installed TP sensor.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does A/C compressor disengage when A/C switch is turned off?	Yes	Go to next step.
		No	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously".

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
2	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Inspect TP sensor for proper adjustment.
3	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

NO.26 EXHAUST SULPHUR SMELL

A6E398018881W28

26	EXHAUST SULPHUR SMELL
DESCRIPTION	Rotten egg smell (sulphur) from exhaust
POSSIBLE CAUSE	- Electrical connectors are disconnected or connected poorly - Charcoal canister malfunction - Vacuum lines are disconnected or connected improperly. - Improper fuel pressure - Poor fuel quality
	Warning The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before performing fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE REPAIR PROCEDURE" and "AFTER REPAIR PROCEDURE" described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Are any driveability or exhaust smoke concerns present?	Yes	Go to appropriate flow chart.
		No	Go to next step.
2	Inspect following: - Electrical connections - Vacuum lines - Fuel quality Are all items okay?	Yes	Go to next step.
		No	Service as necessary. Repeat Step 2.
3	Connect WDS or equivalent to DLC-2. Retrieve any continuous memory, KOEO and KOER DTCs. Are there any DTCs displayed?	Yes	DTC is displayed: Go to appropriate DTC test.
		No	No DTC is displayed: Go to next step.
4	Install fuel pressure gauge between fuel pipe and fuel distributor. Start engine and run it at idle. Is fuel line pressure correct at idle? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
5	Inspect charcoal canister for fuel saturation. Is excess amount of liquid fuel present in canister?	Yes	Replace charcoal canister.
		No	Inspect fuel tank vent system. If fuel tank vent system is okay, since sulfur content can vary in different fuels, suggest trying a different brand. If fuel tank vent system is not okay, repair or replace malfunctioning parts.
6	Verify test results. - If okay, return to diagnostic index to service any additional symptoms. - If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.27 CONSTANT VOLTAGE

A6E398018881W29

27	CONSTANT VOLTAGE
DESCRIPTION	Incorrect constant voltage
POSSIBLE CAUSE	- Constant voltage circuit malfunction Note - TP sensor uses constant voltage.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Disconnect TP sensor connector where constant voltage circuit inspection failed. Turn ignition switch to ON position. Measure voltage between following TP sensor connector terminals: Constant voltage terminal - GND terminal Is constant voltage greater than 6.0 V ?	Yes	Go to Step 13.
		No	Go to next step.
2	Is voltage across battery terminals greater than 10.5 V ?	Yes	Go to next step.
		No	Inspect charging system.
3	Turn ignition switch off. Leave TP sensor connector disconnected. Measure voltage between battery positive terminal and GND (between PCM and TP sensor) circuit at appropriate sensor connector. Is voltage greater than 10.5 V and within 1.0 V of battery voltage?	Yes	Go to next step.
		No	Go to Step 8.
4	Note Purpose of this step is to determine if WDS or equivalent is communicating with PCM. Turn ignition switch to ON position. Attempt to access ECT PID. Can ECT PID be accessed?	Yes	Go to Step 7.
		No	Go to next step.
5	Turn ignition switch off. Disconnect TP sensor and PCM connectors. Turn ignition switch to ON position. Measure voltage between PCM connector terminals 2Y and 2AB. Is voltage greater than 10.5 V ?	Yes	Go to next step.
		No	Repair open circuit between PCM terminal 2Y and main relay.
6	Leave TP sensor and PCM connectors disconnected. Measure resistance between PCM connector terminals 2Y and 2AB. Is resistance greater than 10,000 ohms ?	Yes	Inspect for constant voltage at suspect sensor connector again.
		No	Repair constant voltage circuit short to GND.
7	Turn ignition switch off. Leave TP sensor disconnected. Disconnect PCM connector. Measure resistance between PCM connector terminal 2K and constant voltage circuit at appropriate sensor connector. Is resistance less than 5.0 ohms ?	Yes	Inspect for constant voltage at suspect sensor connector again.
		No	Repair open constant voltage circuit.
8	Note Purpose of this step is to determine if WDS or equivalent is communicating with PCM. Reconnect TP sensor connector. Turn ignition switch to ON position. Attempt to access ECT PID. Can ECT PID be accessed?	Yes	Go to next step.
		No	Go to Step 11.

F

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
9	Are DTCs present for two or more sensors connected to PCM terminal 2H? Sensor connected to PCM terminal 2H: • IAT sensor (P0112, P0113) • FHO2S (P0131, P0132) • RHO2S (P0138) • Barometric pressure sensor (P2228, P2229) • Manifold absolute pressure sensor (P0107, P0108) • ECT sensor (P0117, P0118) • TP sensor (P0122, P0123) • TR switch (P0707, P0708) • TFT sensor (P0712, P0713)	Yes	Go to next step.
		No	Repair open GND circuit to sensor where constant voltage circuit inspection failed.
10	Turn ignition switch off. Disconnect WDS or equivalent from DLC-2. Disconnect PCM connector. Measure resistance between GND circuit at appropriate sensor connector and PCM connector terminal 2H. Is resistance less than 5.0 ohms ?	Yes	Reconnect sensor connector. Go to appropriate DTC test.
		No	Repair open GND circuit.
11	Turn ignition switch off. Disconnect PCM connector. Measure resistance between battery negative terminal and PCM terminals 4X, 2AB, and 2AC. Is each resistance less than 5.0 ohms ?	Yes	Go to next step.
		No	Repair open GND circuit.
12	Turn ignition switch off. Measure resistance between GND circuit at following sensor connector and GND: • IAT sensor (integrated in MAF sensor) • FHO2S • RHO2S • Barometric pressure sensor • Manifold absolute pressure sensor • ECT sensor • TP sensor • TR switch • TFT sensor	Yes	GND circuits are okay. Inspect for constant voltage at suspect sensor connector again.
		No	Inspect for open GND circuit.
13	Turn ignition switch off. Disconnect TP sensor and PCM connectors. Turn ignition switch to ON position. Measure voltage between constant voltage circuit at TP sensor connector and battery negative terminal. Is voltage less than 0.5 V ?	Yes	Inspect for constant voltage at suspect sensor connector again.
		No	Repair constant voltage circuit shorted to power in harness.
14	Verify test results. • If okay, return to diagnostic index to service any additional symptoms. • If malfunction remains, replace PCM.		

TROUBLESHOOTING

NO.28 SPARK PLUG CONDITION

A6E398018881W30

28	SPARK PLUG CONDITION
DESCRIPTION	Incorrect spark plug condition
POSSIBLE CAUSE	Note - Inspecting spark plugs condition can determine whether problem is related to a specific cylinder possibly all cylinders. Wet/carbon stuck on specific plug: - Spark—Weak, not visible - Air/fuel mixture—Excessive fuel injection volume - Compression—No compression, low compression - Faulty spark plug Grayish white with specific plug: - Air/fuel mixture—Insufficient fuel injection volume - Faulty spark plug Wet/carbon is stuck on all plugs: - Spark—Spark weak - Air/fuel mixture—Too rich - Compression—Low compression - Clogging in intake/exhaust system Grayish white with all plugs: - Air/fuel mixture—Too lean Warning The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services: - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel. - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete “BEFORE REPAIR PROCEDURE” and “AFTER REPAIR PROCEDURE” described in this manual. (See F-17 BEFORE REPAIR PROCEDURE.) (See F-17 AFTER REPAIR PROCEDURE.) Caution - Disconnecting/connecting quick release connector without cleaning it may possibly cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove all spark plugs. Inspect spark plug condition. Is spark plug condition okay?	Yes	Troubleshooting completed.
		No	Specific plug is wet or covered with carbon: Go to next step. Specific plug looks grayish white: Go to Step 7. All plugs are wet or covered with carbon: Go to Step 9. All plugs look grayish white: Go to Step 15.
2	Is spark plug wet/covered with carbon by engine oil?	Yes	Working up and down inspect all areas related to oil.
		No	Go to next step.
3	Inspect spark plug for following: - Cracked insulator - Heat range - Air gap - Worn electrode Is spark plug okay?	Yes	Go to next step.
		No	Replace spark plug.
4	Inspect compression pressure at suspected faulty cylinder. Is compression pressure correct? (See B-9 COMPRESSION INSPECTION.)	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
5	Install all spark plugs. Carry out spark test at suspected faulty cylinder. Is strong blue spark visible? (Compare with normal cylinder.)	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
6	Carry out fuel line pressure inspection. Is fuel line pressure correct?	Yes	Inspect fuel injector for following: • Open or short in injector • Leakage • Injection volume
		No	Zero or low: Inspect fuel pump circuit. Inspect for fuel pump relief valve open. Inspect for fuel leakage inside pressure regulator. Inspect for clogged main fuel line. High: Inspect pressure regulator for high pressure cause. Inspect for clogged fuel return line.
7	Inspect spark plug for following. • Heat range • Air gap Is spark plug okay?	Yes	Go to next step.
		No	Replace spark plug.
8	Remove suspected fuel injector. Inspect following: • Resistance (See F-31 FUEL INJECTOR INSPECTION.) • Fuel injection volume (See F-31 FUEL INJECTOR INSPECTION.) Are all above items okay?	Yes	Inspect for open circuit between suspected fuel injector connector terminal and PCM connector following terminals: • For #1 or #4 cylinder: 1A • For #2 or #3 cylinder: 1B
		No	Replace fuel injector.
9	Is air cleaner element free of restrictions?	Yes	Go to next step.
		No	Replace air cleaner element.
10	Carry out spark test. Is strong blue spark visible at each cylinder?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
11	Carry out fuel line pressure inspection. Is fuel line pressure correct? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Go to next step.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
12	Inspect following PIDs. • ECT • O2S11 (When engine can be started) • MAF (See F-45 PCM INSPECTION.) Are PIDs okay?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
13	Carry out purge control inspection. (When engine can be started) (See F-233 Purge Control System Inspection.) Is purge control correct?	Yes	Go to next step.
		No	Repair or replace malfunctioning parts.
14	Carry out compression inspection. Is compression correct?	Yes	Inspect for clogging in exhaust system.
		No	Repair or replace malfunctioning parts.
15	When engine cannot be started, inspect intake-air system for air leakage. When engine can be started, carry out intake manifold vacuum inspection. Is air sucked in from intake-air system?	Yes	Repair or replace malfunctioning part.
		No	Go to next step.
16	Carry out fuel line pressure inspection. Is fuel line pressure correct? (See F-20 FUEL LINE PRESSURE INSPECTION)	Yes	Inspect following PIDs. • ECT • O2S11 • MAF (See F-45 PCM INSPECTION.) Inspect PCM GND condition.
		No	Zero or low: Inspect for clogged fuel line. If okay, replace fuel pump unit. High: Replace fuel pump unit.
17	Verify test results. • If okay, return to diagnostic index to service any additional symptoms. • If malfunction remains, replace or reprogram PCM.		

TROUBLESHOOTING

INTERMITTENT CONCERN TROUBLESHOOTING

A6E398018881W31

Vibration Method

1. If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

- There are several reasons vehicle or engine vibration could cause an electrical malfunction. Some of the things to check for are:
 - Connectors not fully seated.
 - Wire harnesses not having full play.
 - Wires laying across brackets or moving parts.
 - Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wire harnesses pass through the fire wall, body panels, etc. are the major areas to be checked.

Inspection Method for Switch Connectors or Wires

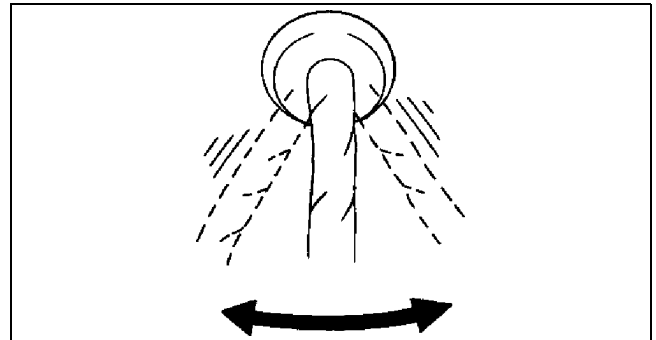
1. Connect WDS or equivalent to DLC-2.
2. Turn ignition key to ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Shake each connector or wire harness a bit vertically and horizontally while monitoring the PID.

- If PID value is unstable, check for poor connection.



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Inspection Method for Sensor Connectors or Wires

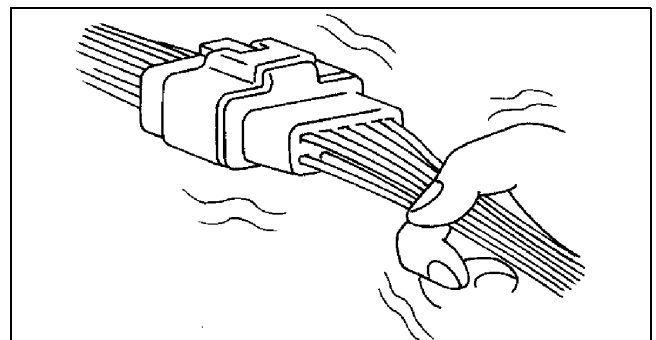
1. Connect WDS or equivalent to DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Shake each connector or wire harness a bit vertically and horizontally while monitoring the PID.

- If PID value is unstable, check for poor connection.



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TROUBLESHOOTING

Inspection Method for Sensors

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
 - If PID value is unstable or malfunction occurs, check for poor connection and/or poorly mounted sensor.

Inspection Method for Actuators or Relays

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition switch to ON position (Engine OFF).

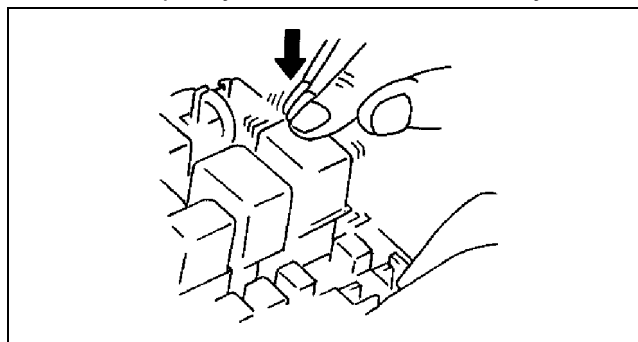
Note

- If engine starts and runs, perform the following steps at idle.

3. Prepare the Output State Control for actuators or relays that you are inspecting.
4. Vibrate the actuator or relay with your finger for **3 seconds** are Output State Control is activated.
 - If variable click sound is heard, check for poor connection and/or poorly mounted actuator or relay.

Note

- Vibrating relays too strongly may result in open relays.



Y3U103WN5

Water Sprinkling Method

Caution

- Indirectly change the temperature and humidity by spraying water onto the front of the radiator.
- If a vehicle is subject to water leakage, the leakage may damage the control module. When testing a vehicle with a water leakage problem, special caution must be used.

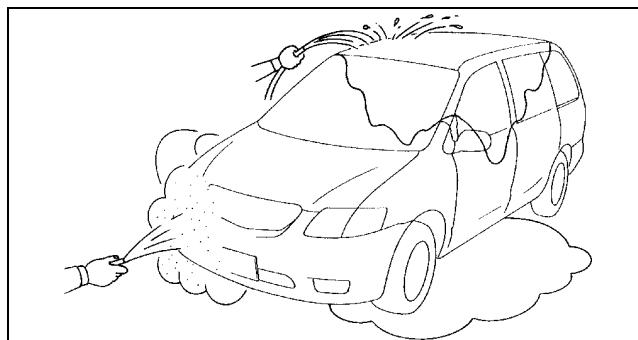
If malfunction occurs only during high humidity or rainy/snowy weather, perform the following steps.

1. Connect WDS or equivalent to DLC-2 if you are inspecting sensors or switches.
2. Turn ignition switch to ON position (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for sensor or switch if you are inspecting sensors or switches.
4. If you are inspecting the switch, turn it on manually.
5. Spray water onto the vehicle or run it through a car wash.
 - If PID value is unstable or malfunction occurs, repair or replace part as necessary.



YMU103WC3

TROUBLESHOOTING

ENGINE CONTROL SYSTEM OPERATION INSPECTION

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Main Relay Operation Inspection

1. Verify that the main relay clicks when the ignition switch is turned to ON position and off.
 - If there is no operation sound, inspect the following.
 - Main relay (See [T-24 RELAY INSPECTION](#).)
 - Harness and connector between ignition switch and main relay terminal A.
 - Harness and connector between PCM terminal 2X and main relay terminal E.

Intake Manifold Vacuum Inspection

1. Verify air intake hoses are installed properly.
2. Start the engine and run it at idle.
3. Disconnect the vacuum hose between the intake manifold and purge solenoid valve from the intake manifold side.
4. Connect a vacuum gauge to the intake manifold and measure the intake manifold vacuum.
 - If not as specified, inspect the following.

Specification

More than 60 kPa {450 mmHg, 18 inHg}

Note

- Air suction can be located by engine speed change when lubricant is sprayed on the area where suction is occurring.
 - Air suction at throttle body, intake manifold and PCV valve installation points
 - Accelerator cable free play
 - Fuel injector insulator
 - Engine compression
(See [B-9 COMPRESSION INSPECTION](#).)

Idle Air Control System Inspection

Engine coolant temperature compensation inspection

1. Connect WDS or equivalent to the DLC-2.
2. Select the following PIDs.
 - ECT
 - IAT
 - RPM
3. Verify that the engine is in cold condition, then start the engine.
4. Verify that the engine speed decreases as the engine warms up.
 - If the engine speed does not decrease or decreases slowly, inspect the following.
 - ECT sensor and related harness
(See [F-53 ENGINE COOLANT TEMPERATURE \(ECT\) SENSOR INSPECTION](#).)
 - IAC valve and related harness
(See [F-13 IDLE AIR CONTROL \(IAC\) VALVE INSPECTION](#).)

Load compensation inspection

1. Start the engine and run it at idle.
2. Connect WDS or equivalent to the DLC-2.
3. Verify that P0506, P0507 or P0511 not displayed.
 - If P0506, P0507 or P0511 shown, carry out DTC inspection.
(See [F-67 DTC TABLE](#).)
4. Change the duty value of the IAC valve to **100%** using the IAC PID.
5. Verify that the idle speed increases.
 - If the idle speed does not change, inspect the following.
 - IAC valve air passage
 - Open or short circuit between IAC valve connector terminals and PCM connector terminals 4G and 4J
6. Select the following PIDs.
 - ACSW
 - IAC
 - PSP
 - RPM

Note

- Excludes temporary idle speed drop just after the loads are turned on.

TROUBLESHOOTING

7. Verify that the engine speed is within the specification under each load condition.
 - If not as specified specific load condition, inspect the following.
 - A/C switch and related harness
(See [U-47 CLIMATE CONTROL UNIT INSPECTION.](#))
 - Fan switch and related harness
(See [U-47 CLIMATE CONTROL UNIT INSPECTION.](#))
 - PSP switch and related harness
(See [F-58 POWER STEERING PRESSURE \(PSP\) SWITCH INSPECTION.](#))

Engine speed

Load condition		Engine speed (rpm) ^{*1}			
		L8	LF		L3
			MTX	ATX	
No load		650—750	600—700	650—750	600—700
E/L operating		650—750	650—750	650—750	650—750
P/S operating		700—800	650—750	650—750	650—750
A/C operating ^{*2}	Refrigerant pressure low ^{*3}	700—800	700—800	650—750	700—800
	Refrigerant pressure high ^{*4}	700—800	700—800	700—800	700—800

^{*1} : Neutral or P position

^{*2} : A/C switch and fan switch are on.

^{*3} : Refrigerant pressure switch (middle pressure) is off.

^{*4} : Refrigerant pressure switch (middle pressure) is on.

VIS Operation Inspection

1. Start the engine.
2. Inspect the rod operation under the following condition.

Rod operation

Engine speed	Approx. 4,400 rpm	
	Below	Above
Shutter valve actuator	Operate	Not operate

- If the rod operation is not as specified, inspect as follows.
 - (1) Stop the engine.
 - (2) Connect WDS or equivalent to the DLC-2.
 - (3) Verify that DTC P0661 or P0662 is not displayed.
 - If DTC P0661 or P0662 is shown, carry out DTC inspection.
(See [F-67 DTC TABLE.](#))
 - (4) Turn ignition switch to ON.
 - (5) Turn the VIS control solenoid valve from on to off using the IVC PID and verify that operation sound of the solenoid valve is heard.
 - If the operation sound is heard, inspect the following.
 - Vacuum hose and vacuum chamber for looseness or damage
 - Shutter valve actuator
(See [F-14 VARIABLE INTAKE-AIR SYSTEM \(VIS\) SHUTTER VALVE ACTUATOR INSPECTION \(L3\).](#))
 - Shutter valve stuck open or close
 - If the operation sound is not heard, inspect the following.
 - VIS control solenoid valve
(See [F-14 VARIABLE INTAKE-AIR SYSTEM \(VIS\) CONTROL SOLENOID VALVE INSPECTION \(L3\).](#))

TROUBLESHOOTING

Variable Tumble Control System (VTCS) Operation Inspection

1. Connect the WDS or equivalent to the DLC-2.
2. Access ECT PID.
3. Verify that ECT PID is **between 63°C {145°F} and 67°C {152°F}**.
4. Start the engine.
5. Inspect rod operation under the following condition.

Rod operation

Engine speed	3,750 rpm	
	Below	Above
Shutter valve actuator	Operate	Not operate

- If the rod operation is not specified, inspect as follows.
 - (1) Verify that DTC No. P2009 or P2010 is not displayed.
 - If DTC No. P2009 or P2010 are shown, carry out DTC inspection.
(See [F-67 DTC TABLE](#).)
 - (2) Turn ignition switch to ON.
 - (3) Turn the VTCS solenoid valve from on to off using the IMRC PID and verify that operation sound of the solenoid valve is heard.
 - If the operation sound is heard, inspect the following.
 - Vacuum hose and vacuum chamber for looseness or damage
 - Shutter valve actuator
(See [F-15 VARIABLE TUMBLE CONTROL SYSTEM \(VTCS\) SHUTTER VALVE ACTUATOR INSPECTION](#).)
 - Shutter valve stuck open or close
 - If the operation sound is not heard, inspect the following.
 - VIS control solenoid valve
(See [F-15 VARIABLE TUMBLE CONTROL SOLENOID VALVE INSPECTION](#).)

Fuel Injector Operation Inspection

STEP	INSPECTION	RESULTS	ACTION
1	While cranking engine, inspect for fuel injector operation sound at each cylinder using a soundscope. Is operation sound heard?	Yes	Fuel injector operation is okay.
		No	All cylinders no heard: Go to next step. Some cylinders no heard: Go to Step 3.
2	Carry out main relay operation inspection. Is main relay operation normal?	Yes	Inspect following: • Fuel injector power system related wiring harness and connectors • PCM connectors • Fuel injector GND and related wiring harness and connectors
		No	Repair or replace malfunctioning parts.
3	Change fuel injector connector of not operating fuel injector and operating fuel injector. Is operation sound heard?	Yes	Go to next step.
		No	Replace fuel injector.
4	Are wiring harness and connectors of not operation fuel injector okay? (Open or short)	Yes	Inspect PCM terminal voltage of fuel injector signal.
		No	Repair or replace malfunctioning parts.

Fuel Cut Control System Inspection

1. Warm up engine and let it idle.
2. Turn off the electrical loads and A/C switch.
3. Connect WDS or equivalent to the DLC-2.
4. Select RPM and FUELPW1 PIDs.
5. Monitor both PIDs while performing the following steps.
 - (1) Depress the accelerator pedal and increase the engine speed to **4,000 rpm**.
 - (2) Release the accelerator pedal (brake pedal is not depressed) and verify that the fuel injector duration time is **0 msec.**, and **2—5 msec.** when the engine speed drops below **1,200 rpm**.
 - If not as specified, inspect the following.
 - ECT sensor and related harness
(See [F-53 ENGINE COOLANT TEMPERATURE \(ECT\) SENSOR INSPECTION](#).)
 - Neutral/clutch switch and related harness (MTX)
(See [F-59 CLUTCH SWITCH INSPECTION](#).)
 - TR switch and related harness (ATX)
(See [K-14 TRANSAXLE RANGE \(TR\) SWITCH INSPECTION](#).)

TROUBLESHOOTING

Fuel Pump Operation Inspection

1. Connect WDS or equivalent to the DLC-2.
2. Remove the fuel-filler cap.
3. Turn the ignition switch to ON position.
4. Turn the fuel pump relay from off to on using the FP PID and inspect if the operation sound is heard.
 - If no operation sounds is heard, proceed to next step.
5. Measure the voltage at harness side fuel pump connector terminal B.

Specification

B+ (Ignition switch is on)

- If the voltage is as specified, inspect the following.
 - Fuel pump continuity
 - Fuel pump GND
 - Wiring harness between fuel pump relay and PCM terminal 4P (without immobilizer system), 4Q (with immobilizer system)
- If not as specified, inspect the following.
 - Fuel pump relay (See [T-24 RELAY INSPECTION.](#))
 - Wiring harness and connector (Main relay-fuel pump relay-fuel pump)

Fuel Pump Control System Inspection

1. Connect WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON position.
3. Select FP PID.
4. Turn the fuel pump relay from off to on and inspect if the operation sound of the fuel pump relay is heard.
 - If no operation sound is heard, inspect the fuel pump relay.
 - If the fuel pump relay is normal, inspect the following.
 - Wiring harnesses and connectors (Main relay-fuel pump relay-PCM)

Spark Test

1. Remove the fuel pump relay.
2. Verify that each high-tension lead and connector is connected properly.
3. Inspect the ignition system in the following procedure.

Warning

- **High voltage in the ignition system can cause strong electrical shock which can result in serious injury. Avoid direct contact to the vehicle body during the following spark test.**

STEP	INSPECTION	RESULTS	ACTION
1	Note • No.1 and No.4 cylinders and No.2 and No.3 cylinders are ignited simultaneously. Disconnect high-tension lead from spark plugs. Remove spark plugs. Reconnect spark plugs to high-tension lead. Ground spark plugs to engine. Is strong blue spark visible at each cylinder while cranking?	Yes	Ignition system is okay.
		No	Some cylinders do not spark: Go to next step. All cylinders do not spark: Go to Step 5.
2	Inspect spark plugs for damage, wear, carbon deposits and proper plug gap. Are spark plugs okay?	Yes	Go to next step.
		No	Replace spark plugs, then go to Step 1.
3	Inspect high-tension leads for insulation damage, looseness, shorting or other damage. Are high-tension leads okay?	Yes	Go to next step.
		No	Replace high-tension leads, then go to Step 1.
4	Inspect following wiring harnesses for open or short: • Ignition coil terminal C-PCM terminal 1A • Ignition coil terminal A-PCM terminal 1B Are wiring harnesses okay?	Yes	Inspect and replace ignition coil. See G-9 IGNITION COIL INSPECTION.
		No	Repair or replace malfunctioning parts, then go to Step 1.
5	Measure voltage at terminal B in ignition coil. Is voltage reading B+?	Yes	Go to next step.
		No	Inspect power supply circuit of ignition coil.
6	Does PCM connector or ignition coil connector have poor connection?	Yes	Repair or replace connector, then go to Step 1.
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	RESULTS	ACTION
7	Are following item okay? • CKP sensor and crankshaft pulley • PCM terminal 1A/1B voltage Specification Approx. 1.5 V	Yes	Inspect for open or short in wiring harness and connector of CKP sensor.
		No	Repair or replace malfunctioning parts, then go to Step 1.

EGR Control System Inspection

1. Verify that EGR valve operation (initial operation) sound is heard when the ignition switch is turned to ON position.
 - If the operation sound is not heard, connect WDS or equivalent to the DLC-2 and verify that the DTC P0403 is shown. Carry out DTC inspection. (See [F-67 DTC TABLE](#).)
2. Start the engine and run it at idle.
3. Increase the step value of EGR valve from 0 to 40 using SEGRP PID.
4. Operate the EGR valve and inspect if the engine speed becomes unstable or the engine stalls.
 - If the engine speed will not change, proceed to following.
 - (1) Stop the engine.
 - (2) Remove the EGR valve.
 - (3) Connect the EGR valve connector.
 - (4) Turn the ignition switch to ON.
 - (5) Increase the step value of EGR valve from 0 to 40 using SEGRP PID.
 - (6) Inspect the EGR operation.
 - If the EGR valve is operated, clean the EGR valve and reinspect from Step 2.
 - If the EGR valve will not operate, replace the EGR valve and reinspect from Step 2.
5. Warm up the engine to normal operating temperature.
6. Select the following PIDs.
 - ECT
 - RPM
 - SEGRP
 - TP
 - VSS
7. Let the vehicle idle and verify that the SEGRP value is 0.
8. Put the vehicle in drive.
9. Depress the accelerator pedal and verify that the SEGRP value is increased.
 - If the SEGRP value will not increase, inspect the VSS, TP and ECT PIDs. (See [F-45 PCM INSPECTION](#).)
10. Stop the vehicle and verify that the SEGRP value is returned 0.

Purge Control System Inspection

1. Start the engine.
2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.
3. Put a finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.
 - If there is a vacuum, inspect the following.
 - Wiring harness and connectors (Purge solenoid valve-PCM terminal 4U)
 - Purge solenoid valve
4. Warm up the engine to the normal operating temperature.
5. Stop the engine.
6. Connect WDS or equivalent to the DLC-2 and verify that the DTC P0443 is shown. Carry out DTC inspection. (See [F-67 DTC TABLE](#).)
7. Turn the ignition switch to ON position.
8. Select ECT PID.
9. Verify that the engine coolant temperature is above **60°C {140°F}**.
 - If WDS or equivalent indicates below **60°C {140°F}**, carry out the ECT sensor inspection.
10. Select EVAPCP PID.
11. Increase the duty value of the purge solenoid valve to **50%** and inspect if the operation sound of the valve is heard.
 - If the operation sound is heard, inspect for the loose or damaged vacuum hose. (Intake manifold-purge solenoid valve-charcoal canister)
 - If the operation sound is not heard, carry out the purge solenoid valve inspection.

TROUBLESHOOTING

A/C Cut-off Control System Inspection

1. Start the engine.
2. Turn the A/C switch and fan switch on.
3. Verify that the A/C compressor magnetic clutch actuates.
 - If it does not actuate, go to symptom troubleshooting "No.23 A/C does not work sufficiently".
4. Fully open the throttle valve and verify that the A/C compressor magnetic clutch does not actuate for **2—5 seconds**.
 - If it actuates, inspect as follows.
 - (1) Connect WDS or equivalent to the DLC-2.
 - (2) Turn the A/C switch off.
 - (3) Turn the ignition switch to ON position.
 - (4) Select ACCS PID.
 - (5) Turn the A/C relay from off to on and inspect if the operation sound of the relay is heard.
 - If the operation sound is heard, inspect TP PID.
 - If the operation sound is not heard, inspect following.
 - A/C relay
 - Open or short to GND circuit in wiring harness and connectors (Ignition switch-A/C relay-PCM terminal 4O)
 - A/C related parts

Cooling Fan Control System Inspection L8, LF (General area) engine model

Cooling fan system operation

Engine condition	Cooling fan relay No.1	Cooling fan relay No.2
ECT below 100°C {212°F}	OFF	OFF
ECT above 100°C {212°F} (until below 97°C {207°F})	ON	OFF
ECT above 108°C {228°F} (until below 105°C {230°F})	ON	ON
A/C and fan switches are on.	ON	ON
ECT sensor malfunction	ON	ON

Cooling fan relay No.1

1. Connect WDS or equivalent to DLC-2.
2. Verify that ECT PID is below cooling fan operating temperature.
3. Verify that A/C switch and fan switch are off.
4. Turn the ignition switch to ON position.
5. Verify that the cooling fan is not operating.
 - If the cooling fan No.1 is operating:
 - (1) Select FAN3 PID.
 - (2) Send OFF and verify the cooling fan is off.
 - If the cooling fan is on, inspect the following.
 - Cooling fan relay stuck in closed position
 - Short to GND circuit between cooling fan relay and PCM terminal 4L
 - Short to power in circuit at cooling fan relay
 - DTC for ECT sensor (P0117, P0118)
 - If the cooling fan is off, inspect the following.
 - Short to GND circuit between refrigerant pressure switch and PCM terminal 1AC
 - DTC for ECT sensor (P0117, P0118)
6. Start the engine.
7. Verify that the cooling fan is operating when engine is hot.
 - If the cooling fan does not operate, perform the following.
 1. Connect WDS or equivalent to the DLC-2.
 2. Select FAN3 PID.
 3. Operate cooling fan by sending ON command.

TROUBLESHOOTING

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4. Inspect if the operation sound is heard from the cooling fan relay.
 - If the operation sound is heard, inspect the wiring harness, connectors and cooling fan motor.
 - If the operation sound is not heard, inspect cooling fan relay and open circuit wiring harness and connectors.
8. Turn the A/C switch and fan switch on.
9. Verify that cooling fan is operating.
 - If fan does not operate, inspect A/C system.

Cooling fan relay No.2

1. Verify that A/C switch and fan switch are off.
2. Start the engine and let it idle.
3. Verify that the cooling fan No.2 is not operating.
 - If condenser fan is operating, inspect for the following.
 - Cooling fan relay No.2 is stuck in closed position.
 - Short to power in circuit between condenser fan relay and condenser fan
 - Short to GND in circuit between refrigerant pressure switch and PCM terminal 1AC
 - Short to GND circuit between condenser fan relay and PCM terminal 4B
4. Turn the A/C switch and fan switch on.
5. Verify that the cooling fan No.2 is operating and operation sound of A/C compressor magnetic clutch is heard.
6. Turn the A/C switch and fan switch off.
 - If the cooling fan No.2 does not operate but operation sound of A/C compressor magnetic clutch is heard, inspect for the following.
 - Open circuit between ignition switch and cooling fan relay No.2
 - Open circuit between battery and cooling fan relay No.2
 - Open circuit between cooling fan relay No.2 and PCM terminal 4B
 - Open circuit between cooling fan relay No.2 and cooling fan motor No.2 or fan motor GND
 - Cooling fan relay No.2 is stuck open.
 - Cooling fan motor No.2
 - If both cooling fan No.2 and A/C compressor do not operate, inspect the following.
 - TP PID
 - A/C system

L3 engine models

Cooling fan system operation (at idle)

Engine condition		Cooling fan relay No.1	Cooling fan relay No.2	Cooling fan relay No.3	Cooling fan relay No.4	Cooling fan motor No.1	Cooling fan motor No.2
Engine coolant temperature below 100°C {212°F}		OFF	OFF	OFF	OFF	OFF	OFF
Engine coolant temperature above 100°C {212°F} (until below 97°C {208°F})		OFF	ON	OFF	OFF	Low speed	Low speed
Engine coolant temperature above 108°C {233°F} (until below 105°C {208°F})		ON	ON	ON	ON	High speed	High speed
A/C and fan switches are on.	Refrigerant pressure switch (middle pressure) is off.	OFF	ON	ON	OFF	Low speed	High speed
	Refrigerant pressure switch (middle pressure) is on.	ON	ON	OFF	ON	High speed	Low speed
ECT sensor malfunction		ON	ON	ON	ON	High speed	High speed

1. Connect WDS or equivalent to DLC-2.
2. Verify that ECT PID is below cooling fan operating temperature.
3. Verify that the A/C switch and fan switch are off.
4. Start the engine and let it at idle.
5. Verify that the cooling fan and condenser fan are not operating.
 - If the cooling fan and condenser fan are operating low speed, inspect for following:
 - Short to GND circuit between PCM terminal 4L and cooling fan relay No.2
 - Cooling fan relay No.2 stuck in closed position
 - If the cooling fan and condenser fan are operating high speed, inspect for following:
 - DTC for ECT sensor (P0117, P0118)

TROUBLESHOOTING

- If the cooling fan is not operating and condenser fan is operating, inspect for following:
 - Short to GND circuit between PCM terminal 4F and transfer relay
 - Transfer relay stuck ON position
 - Short to GND circuit between PCM terminal 4B and cooling fan relay No.3
 - Condenser fan relay stuck ON
- 6. Start the engine.
- 7. Verify that the cooling fan and condenser fan are operating low speed when ECT PID is **above 100°C {212°F}**.
 - If the cooling fans does not operate, perform the following:
 1. Select FAN3 PID.
 2. Operate cooling fan relay No.2 by sending ON command.
 3. Inspect the operation sound is heard from cooling fan relay No.2.
 - If the operation sound is heard, inspect wiring harnesses, connectors, transfer relay and cooling and condenser fan motor.
 - If the operation sound is not heard, inspect cooling fan relay No.2 and open circuit between PCM terminal 4L and cooling fan relay No.2 wiring harness and connectors.
 - Inspect the cooling fan is operating high speed, inspect the following:
 - Short to GND circuit between PCM terminal 4F and cooling fan relay No.4/cooling fan relay No.1.
 - Cooling fan relay stuck closed position
 - If the condenser fan is operating high speed, inspect the following:
 - Short to GND circuit between PCM terminal 4F and cooling fan relay No.4/cooling fan relay No.1
 - cooling fan relay No.1 stuck ON position
- 8. Turn A/C switch and fan switch are on.
- 9. Verify that the ACCS PID is ON.
 - If the ACCS PID is not ON, inspect for following:
 - A/C switch
 - Fan switch
 - Refrigerant pressure switch
 - Open circuit PCM 1AC related harnesses and connectors
- 10. Access the COLP PID.
- 11. Verify that the cooling fan is operating high speed an condenser fan is operating low speed, while the COLP PID is ON.
 - If the cooling fan and condenser fan are operating low speed, perform the following:
 1. Select FAN1 PID.
 2. Operate cooling fan relay No.4 and transfer relay by sending ON command.
 3. Inspect the operation sound is heard from cooling fan relay No.4 and cooling fan relay No.1.
 - If the operation sound is not heard from cooling fan relay No.4, inspect cooling fan relay No.4 and open circuit between PCM 4F and cooling fan relay No.4 wiring harnesses and connectors.
 - If the operation sound is not heard from cooling fan relay No.1, inspect cooling fan relay No.1 and between PCM terminal 4F and cooling fan relay No.1 wiring harnesses and connector.
 - If the operation sound is heard from cooling fan relay No.4 and cooling fan relay No.1, inspect wiring harnesses and connectors.
 - If the cooling fan motor No.2 does not operate, perform the following:
 - Cooling fan motor No.2 and related wiring harnesses and connectors
- 12. Verify that the cooling fan motor No.1 is operating low speed and the cooling fan motor No.1 is operating high speed, while the COLP PID is OFF.
 - If the cooling fan motor No.1 and cooling fan motor No.2 are operating low seed, perform the following:
 1. Select FAN1 PID.
 2. Operate cooling fan relay 3 by sending ON command.
 3. Inspect the operation sound is heard from cooling fan relay No.3.
 - If the operation sound is heard, inspect wiring harnesses and connectors.
 - If the operation sound is not heard, inspect cooling fan relay No.3 and open circuit wiring harnesses and connectors between PCM terminal 4B and cooling fan relay No.3.

TROUBLESHOOTING

L8, LF (Intensely hot area) engine models

Cooling fan system operation (at idle)

Engine condition		Cooling fan relay No.2	Cooling fan relay No.4	Cooling fan relay No.1	Cooling fan relay No.3	Cooling fan motor No.1	Cooling fan motor No.2
Engine coolant temperature below 100°C {212°F}		OFF	OFF	OFF	OFF	OFF	OFF
Engine coolant temperature above 100°C {212°F} (until below 97°C {208°F})		ON	OFF	OFF	OFF	Low speed	OFF
Engine coolant temperature above 108°C {233°F} (until below 105°C {208°F})		ON	ON	ON	ON	High speed	High speed
A/C and fan switches are on.	Refrigerant pressure switch (middle pressure) is off.	ON	OFF	OFF	ON	Low speed	OFF
	Refrigerant pressure switch (middle pressure) is on.	ON	ON	ON	OFF	High speed	Low speed
ECT sensor malfunction		ON	ON	ON	ON	High speed	High speed

1. Connect WDS or equivalent to DLC-2.
2. Verify that ECT PID is below cooling fan operating temperature.
3. Verify that the A/C switch and fan switch are off.
4. Start the engine and let it at idle.
5. Verify that the cooling fans are not operating.
 - If the cooling fan is operating low speed, inspect for following:
 - Short to GND circuit between PCM terminal 4L and cooling fan relay No.2
 - Cooling fan relay No.2 stuck in closed position
 - If the cooling fans are operating high speed, inspect for following:
 - DTC for ECT sensor (P0117, P0118)
 - If the cooling fan motor No.1 is not operating and cooling fan motor No.2 is operating, inspect for following:
 - Short to GND circuit between PCM terminal 4F and cooling fan relay No.1
 - Cooling fan relay No.1 stuck ON
 - Short to GND circuit between PCM terminal 4B and cooling fan relay No.3
 - Cooling fan relay No.3 stuck ON
6. Start the engine.
7. Verify that the cooling fans are operating low speed when ECT PID is **above 100°C {212°F}**.
 - If the cooling fan motor No.1 does not operate, perform the following:
 1. Select FAN3 PID.
 2. Operate cooling fan relay No.2 by sending ON command.
 3. Inspect the operation sound is heard from cooling fan relay No.2.
 - If the operation sound is heard, inspect wiring harnesses, connectors and cooling fan motor No.1.
 - If the operation sound is not heard, inspect cooling fan relay No.2 and open circuit between PCM terminal 4L and cooling fan relay No.2 wiring harness and connectors.
 - Inspect the cooling fan is operating high speed, inspect the following:
 - Short to GND circuit between PCM terminal 4F and cooling fan relay No.1/cooling fan relay No.4.
8. Turn A/C switch and fan switch are on.
9. Verify that the ACCS PID is ON.
 - If the ACCS PID is not ON, inspect for following:
 - A/C switch
 - Fan switch
 - Refrigerant pressure switch
 - Open circuit PCM 1AC related harnesses and connectors
10. Access the COLP PID.
11. Verify that the cooling fan motor No.1 is operating high speed and cooling fan motor No.2 is operating low speed, while the COLP PID is ON.
 - If the cooling fan motor No.1 does not operate high speed, perform the following:
 1. Select FAN1 PID.
 2. Operate cooling fan relay No.1 and cooling fan relay No.4 by sending ON command.

TROUBLESHOOTING

3. Inspect the operation sound is heard from cooling fan relay No.1 and cooling fan relay No.4.
 - If the operation sound is not heard from cooling fan relay No.4, inspect cooling fan relay No.4 and open circuit between PCM 4F and cooling fan relay No.4 wiring harnesses and connectors.
 - If the operation sound is not heard from cooling fan relay No.1, inspect cooling fan relay No.1 and between PCM terminal 4F and cooling fan relay No.1 wiring harnesses and connector.
 - If the operation sound is heard from cooling fan relay No.1 and cooling fan relay No.4, inspect wiring harnesses and connectors.
- If the cooling fan motor No.2 does not operate, perform the following:
 - Inspect cooling fan motor No.2 and related wiring harnesses and connectors
- If the cooling fan motor No.2 does not operate, perform the following:
 1. Select FAN2 PID.
 2. Operate cooling fan relay No.3 by sending ON command.
 3. Inspect the operation sound is heard from cooling fan relay No.3.
 - If the operation sound is heard, inspect wiring harnesses and connectors.
 - If the operation sound is not heard, inspect cooling fan relay No.3 and open circuit wiring harnesses and connectors between PCM terminal 4B and cooling fan relay No.3.

Variable Air Duct (VAD) Control System Operation Inspection (L3 Engine Models)

1. Connect WDS or equivalent to DLC-2.
2. Access ECT, TP and RPM PIDs.
3. Start the engine.
4. Verify ECT PID is **70°C {158°F} or over**.
5. Inspect shutter valve operation following condition.

VAD shutter valve operation

Engine speed	5,800 rpm with TP PID 50% or over	
	Below	Above
Shutter valve	Close	Open

- If the shutter valve operation is not specified, inspect as follows.
- (1) Verify that DTC P1410 is not displayed.
 - If DTC P1410 is shown, carry out DTC inspection.
(See [F-67 DTC TABLE](#).)
 - (2) Turn ignition switch to ON.
 - (3) Turn the VAD control solenoid valve from on to off using the VAD PID and verify that operation sound of the solenoid valve is heard.
 - If the operation sound is heard, inspect the following.
 - Vacuum hose looseness or damage
 - Vacuum chamber crack or damage
 - Shutter valve actuator.
(See [F-12 VARIABLE AIR DUCT \(VAD\) SHUTTER VALVE INSPECTION \(L3\)](#).)
 - Shutter valve stuck open or close
 - If the operation sound is not heard, inspect following.
 - VAD control solenoid valve.
(See [F-13 VARIABLE AIR DUCT \(VAD\) CONTROL SOLENOID VALVE INSPECTION \(L3\)](#).)

TROUBLESHOOTING

Variable Valve Timing Control System Operation Inspection

When idling cannot be continued

1. Remove the oil control valve (OCV) and verify that the spool valve is at maximum retard position.
2. If the spool valve is stuck in advance direction, replace the oil control valve (OCV).
3. Connect the oil control valve (OCV).
4. Turn the ignition switch on.
5. Verify that the spool valve is at maximum retard position.
6. If the spool valve is stuck in advance direction, inspect for the following.
 - Short circuit in harnesses or connectors between the oil control valve (OCV) and the PCM.
7. Inspect the variable valve timing actuator.

When idling can be continued

1. Warm up the engine.
2. Connect WDS or equivalent to DLC-2.
3. Idle the engine.
4. Select VT DUTY1 PID.
5. Set the oil control valve (OCV) duty value to 100% and verify that the engine idles roughly or stalls.
 - If as specified, inspect the timing belt component (valve timing deviation).
 - If not as specified, go to next step.
6. Remove the oil control valve (OCV) and connect the oil control valve (OCV) connector to the oil control valve (OCV).
7. Turn ignition switch to ON.
8. Select VT DUTY1 PID.
9. Set the oil control valve (OCV) duty value to 100% and verify that the spool valve operates in the advance direction.
10. If not as specified, inspect the following.
 - Oil control valve (OCV) operation.
 - Harnesses and connectors between the oil control valve (OCV) and the PCM for open or short.
11. Inspect the following hydraulic passages for clogging and/or leakage.
 - Oil pressure switch—oil control valve (OCV)
 - Oil control valve (OCV)—camshaft
 - Camshaft internal passage
12. If they are okay, replace the intake camshaft pulley (with a built-in variable valve timing actuator).

ENGINE ELECTRICAL SYSTEM

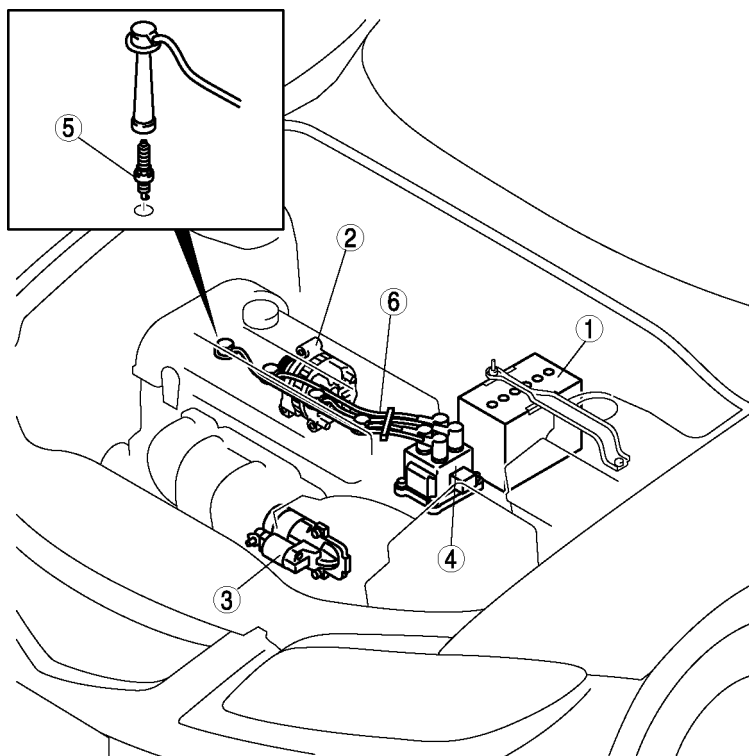
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LOCATION INDEX

LOCATION INDEX

A6E470001002W01



AME4700W001

1	Battery (See G-3 BATTERY REMOVAL/INSTALLATION) (See G-4 BATTERY INSPECTION) (See G-5 BATTERY RECHARGING)
2	Generator (See G-6 GENERATOR REMOVAL/INSTALLATION) (See G-7 GENERATOR INSPECTION)
3	Starter (See G-12 STARTER REMOVAL/INSTALLATION) (See G-13 STARTER INSPECTION)

4	Ignition coil (See G-9 IGNITION COIL INSPECTION)
5	Spark plug (See G-10 SPARK PLUG REMOVAL/INSTALLATION) (See G-11 SPARK PLUG INSPECTION)
6	High-tension lead (See G-11 HIGH-TENSION LEAD REMOVAL/INSTALLATION)

CHARGING SYSTEM

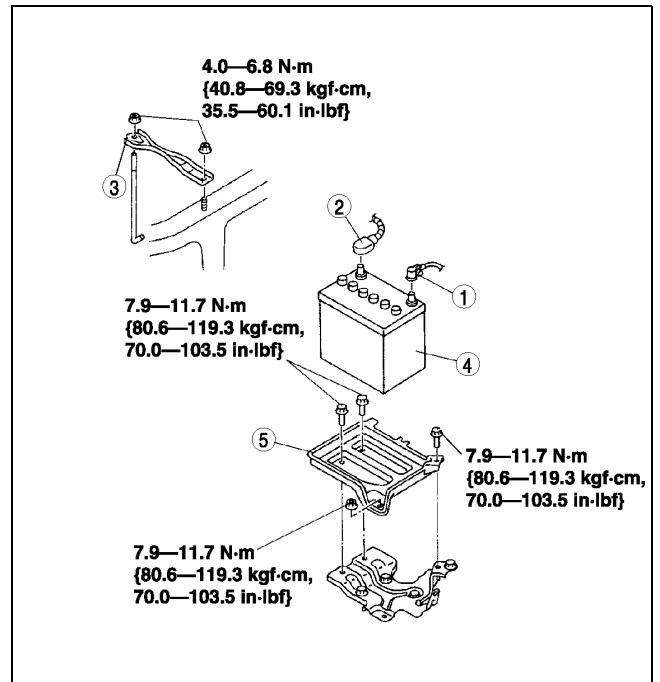
CHARGING SYSTEM

BATTERY REMOVAL/INSTALLATION

A6E471018520W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

1	Negative battery cable
2	Battery cable
3	Battery clamp
4	Battery
5	Battery tray



A6E4710W002

CHARGING SYSTEM

BATTERY INSPECTION

A6E471018520W02

Battery

1. Inspect the battery in the following procedure.

Step	Inspection	Result	Action
1	Measure open circuit voltage of battery.	More than 12.4 V	Go to Step 3.
		Less than 12.4 V	Go to next step.
2	Quick charge for 30 min. and recheck voltage.	More than 12.4 V	Go to next step.
		Less than 12.4 V	Replace battery.
3	Apply load current (see load test chart) to battery using a battery load tester and record battery voltage after 15 s. Is voltage more than specification?	Yes	Battery is okay.
		No	Replace battery.

Test load chart

Battery	Load (A)
46B24DLS	135
50D20L	150
75D26L	195
80D26L	195

Battery positive voltage with load

Approximate battery temperature	Min. voltage (V)
21 °C {70 °F}	9.6
16 °C {61 °F}	9.5
10 °C {50 °F}	9.4
4 °C {39 °F}	9.3
-1 °C {30 °F}	9.1
-7 °C {19 °F}	8.9
-12 °C {10 °F}	8.7
-18 °C {0 °F}	8.5

Back-up Current

1. Verify that the engine switch is at OFF and that the key has been removed.
2. Disconnect the negative battery cable.
3. Measure the back-up current between the negative battery terminal and the negative battery cable.
 - If the current exceeds the maximum, remove the fuses in the main fuse block and the fuse block one by one while measuring the back-up current.
 - Inspect and repair harnesses and connectors of the fuse at which the current decreases.

Back-up current 20 mA max.

Caution

- Operating electrical loads while measuring the back-up current can damage the circuit tester.

CHARGING SYSTEM

BATTERY RECHARGING

A6E471018520W03

Warning

- Keep any flammable away from the battery, otherwise evaporated gas of the battery fluid may catch fire, and cause serious injury or death.

Caution

- When removing the battery, disconnect the negative battery cable first and install it last to prevent damage to electrical components or the battery.

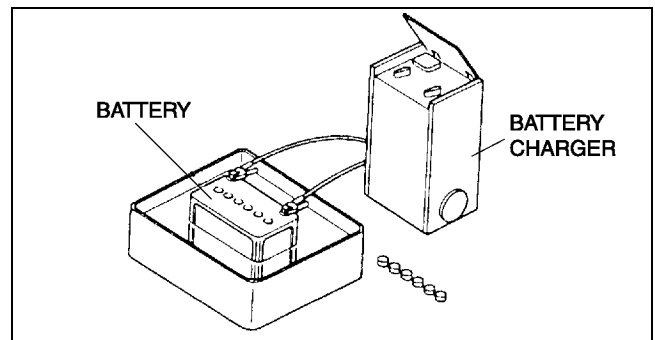
1. Place a battery in a pan of water to prevent it from overheating.
2. The water level should come up about halfway on the battery.
3. Remove the battery plugs while charging the battery.
4. Keep water off the top of the battery.

Caution

- To prevent damage to electrical components or the battery, turn all accessories off and stop the engine before performing maintenance or recharging the battery.

5. Connect a battery charger to the battery.
6. Adjust the charging current as follows.

Battery type (5-hour rate)	Slow charge (A)	Quick charge (A / 30 min.)
46B24LS (36)	3.5—4.5	25
50D20L (40)	4.0—5.0	25
75D26L (52)	5.0—6.0	35
80D26L (55)	5.5—6.5	35



AME4710W001

CHARGING SYSTEM

GENERATOR REMOVAL/INSTALLATION

A6E471018300W01

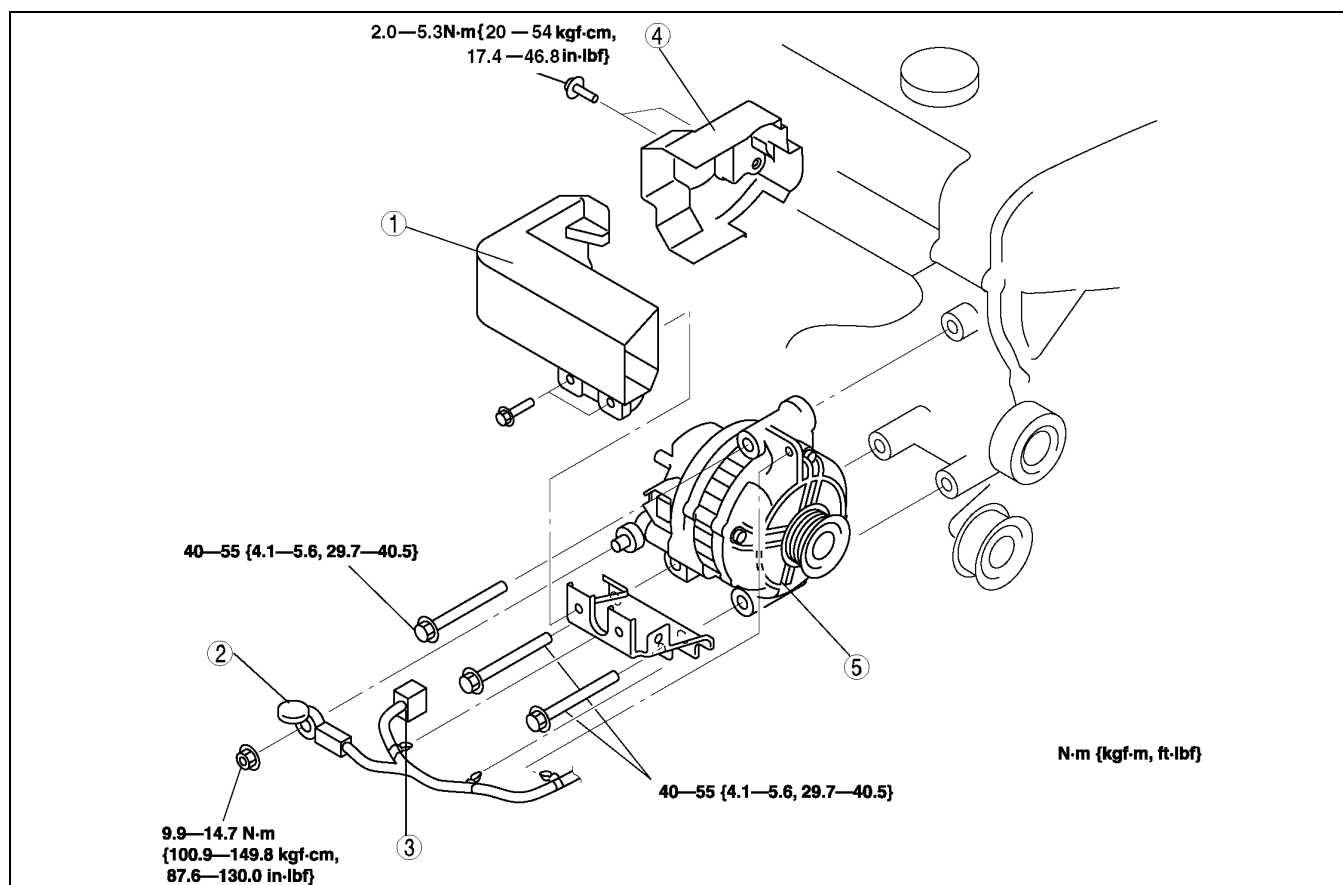
Warning

- When the battery cables are connected, touching the vehicle body with generator terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the battery negative cables before performing the following operation.

Caution

- The generator can be damaged by the heat from the exhaust manifold. Make sure the generator duct and the generator heat insulator are installed securely.

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the drive belt. (See [B-3 DRIVE BELT REPLACEMENT](#).)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.



AME4710W002

1	Generator duct
2	B terminal cable
3	Generator connector

4	Generator heat insulator
5	Generator (See G-6 Generator Removal Note)

Generator Removal Note

1. Remove the generator from above.

CHARGING SYSTEM

GENERATOR INSPECTION

A6E471018300W02

Generator Warning Light

1. Verify that the battery is fully charged.
 - Charge if necessary.
2. Verify that the drive belt deflection/tension is correct. (See [B-3 DRIVE BELT INSPECTION.](#))
 - If not as specified, replace the drive belt.
3. Turn the ignition switch to ON and verify that the generator warning light illuminates.
 - If not as specified, inspect the generator warning light.
4. Verify that the generator warning light turns off after the engine is started. [- - - - -]
 - If not specified, inspect if any of the DTCs are displayed: P0112, P0113, P2502, P2503, P2504.

Generator

Voltage

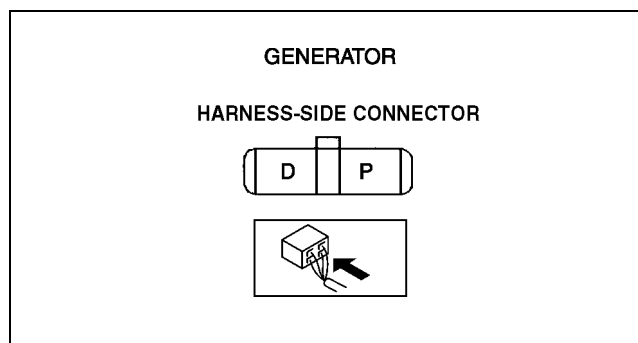
1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See [B-3 DRIVE BELT INSPECTION.](#))
 - If not as specified, replace the drive belt.
3. Turn off all electrical loads.
4. Turn the engine switch to start the engine and verify that the generator rotates smoothly without any noise while the engine is running.
5. Measure the voltage at the terminals shown in the table.
 - If not as specified, repair or replace the generator as necessary.

Standard voltage

Terminal	Ignition switch ON (V)	Idle (V) [20 °C {68 °F}]
B	B+	13—15
P	Approx. 1	Approx. 3—8
D	Approx. 0	*

*: Turn the following electrical loads on and verify that the voltage reading increases.

- Headlights
- Blower motor
- Rear window defroster



A6E4710W003

Current

1. Verify that the battery is fully charged.
 - If the battery is not fully charged, charge the battery.
2. Verify that the drive belt deflection/tension is correct. (See [B-3 DRIVE BELT INSPECTION.](#))
 - If not as specified, replace the drive belt.
3. Disconnect the negative battery cable.
4. Connect an ammeter, capable of reading 120 A or above, between generator terminal B and the wiring harness.
5. Connect the negative battery cable.
6. Turn off all electrical loads.
7. Start the engine and increase the engine speed to **2,000—2,500 rpm.**
8. Turn the following electrical loads on and verify that the current reading increases.
 - Headlights
 - Blower motor
 - Rear window defroster
 - If generator terminal B current will not increase, repair or replace the generator as necessary.

Note

- Current required for generating power varies with electrical loads applied.

CHARGING SYSTEM , IGNITION SYSTEM

Standard current (Reference)

Measuring conditions

Room temperature: 20 °C {68 °F}

Voltage: 13.5 V

Engine hot

Engine speed (rpm)	Terminal B current (A)		
	L8	LF	L3
1,000	0*—80		
2,000	0*—90		

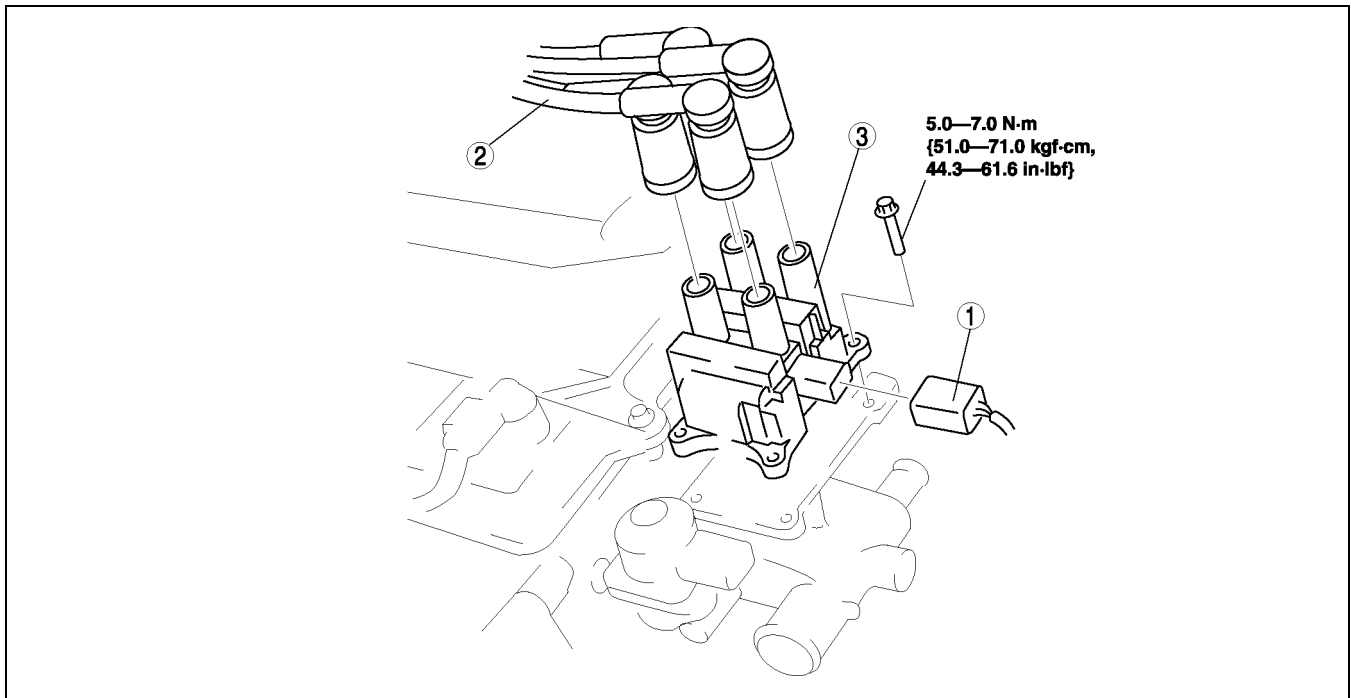
* : Must not be 0 A

IGNITION SYSTEM

IGNITION COIL REMOVAL/INSTALLATION

A6E471218110W01

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.



A6E4712W012

1	Connect
2	High-tension lead (See G-11 HIGH-TENSION LEAD REMOVAL/INSTALLATION)

3	Ignition coil

IGNITION SYSTEM

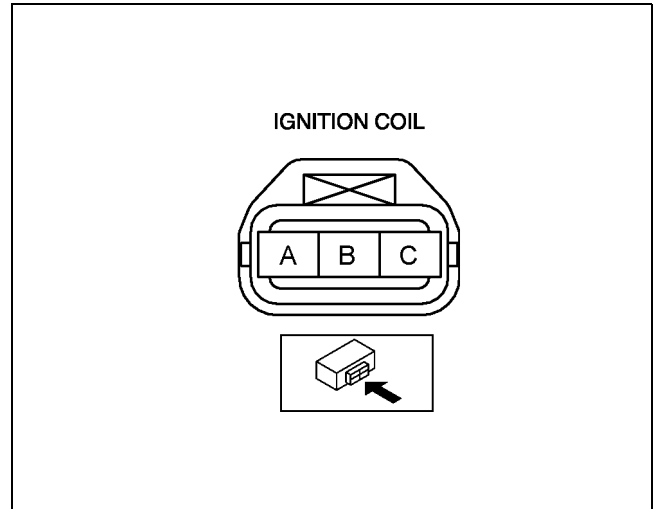
IGNITION COIL INSPECTION

Primary Coil Winding

1. Remove the ignition coil.
2. Measure the resistance between the following lead holes using an ohmmeter.
 - A and B, B and C
 - If not specified, replace the ignition coil.

Specification

0.49—0.57 ohms [20°C {68°F}]



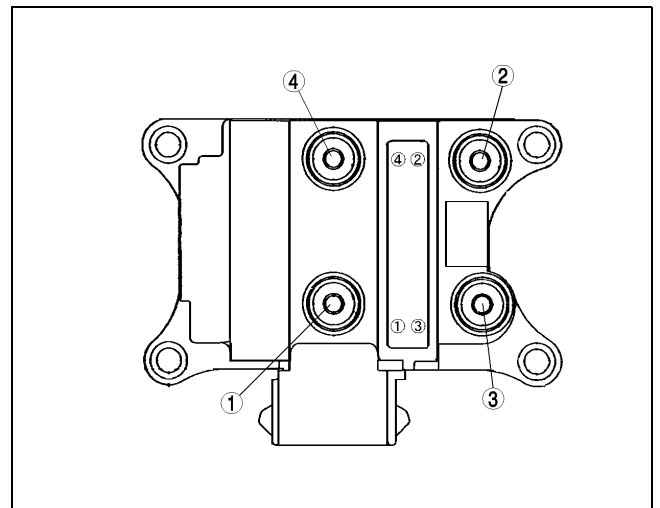
A6E4712W003

Secondary Coil Winding

1. Remove the ignition coil.
 - 1 and 4
 - 2 and 3
 - If not specified, replace the ignition coil.

Specification

9.5—11.1kilohms



A6E4712W001

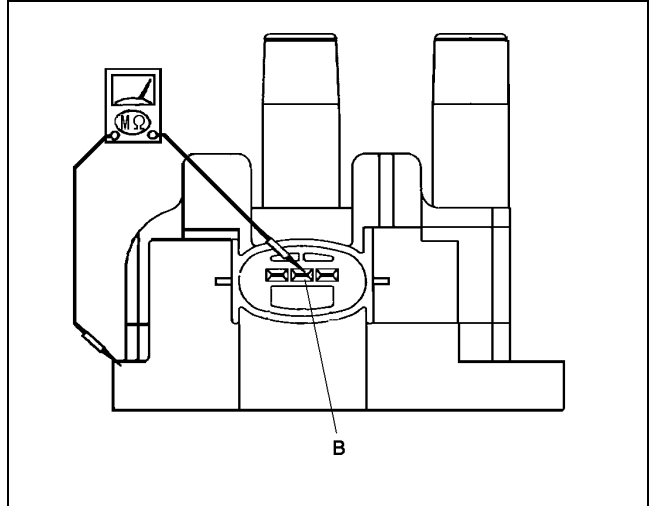
IGNITION SYSTEM

Insulation Resistance of Case

1. Disconnect the high-tension lead.
2. Disconnect the ignition coil connector.
3. Measure the insulation resistance between the following terminals and ignition coil case using an ohmmeter.
 - Terminal B and ignition coil case.
 - If not specified, replace the ignition coil.

Specification

Above 10 Megohm

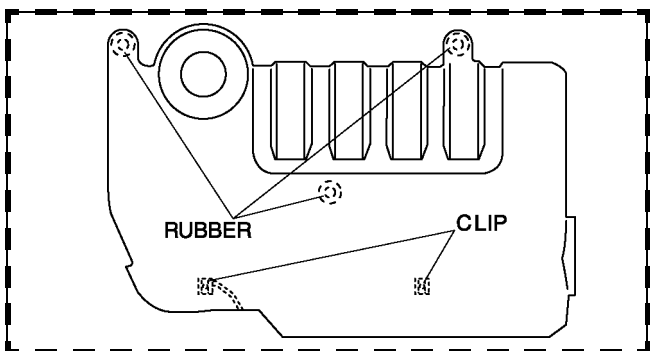


A6E4712W002

SPARK PLUG REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.
 - Lift off and remove the plug hole plate from the installation areas (rubber and clips) as shown in the figure.

A6E471218110W03

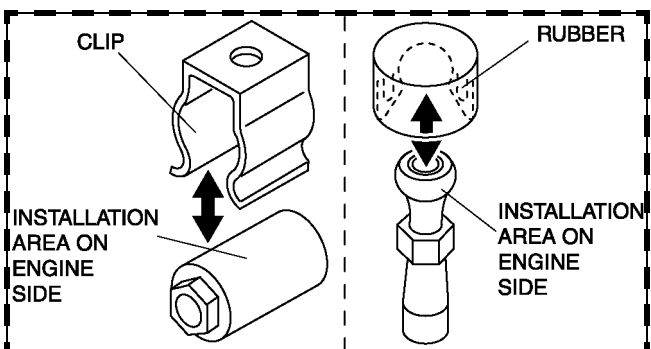


A6E4712W201

3. Disconnect the high-tension lead.
4. Remove the spark plugs using the plug-wrench.
5. Install the spark plugs using a plug-wrench.

Tightening torque:

10—24 N·m {1.1—2.4kgf·m, 8—17ft·lbf}



A6E4712W202

IGNITION SYSTEM

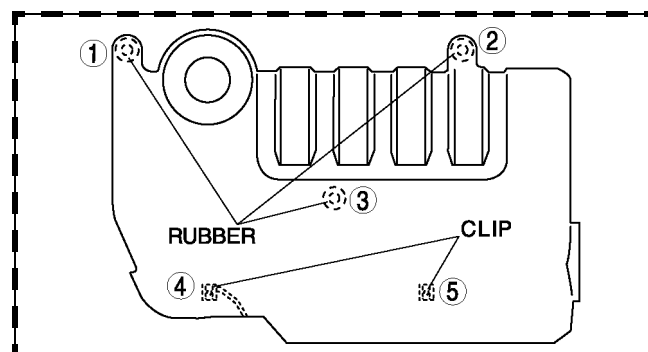
6. Install the plug hole plate.

Caution

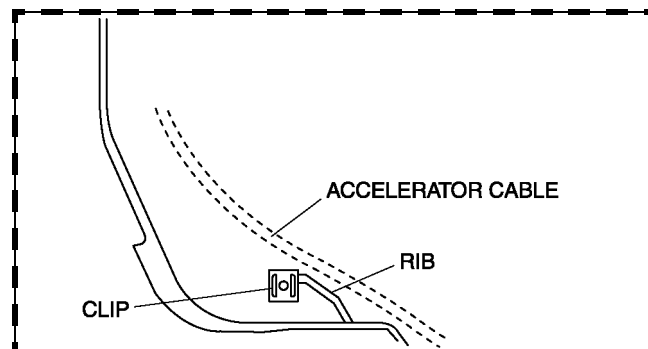
- If the plug hole plate interferes with metal clips and the accelerator cable, the cable could be damaged, so when installing follow the procedure below.

- (1) To position the plug hole plate, grasp the rubber 1 and 2, as shown in the figure, with your hands and press them in.
- (2) Route the accelerator cable more towards the center of the plug hole plate underside to avoid the rib area as shown in the figure.
- (3) Grasp rubber 3 with your hand and press it in.
- (4) Grasp clips 4 and 5 with your hands and press them in.

7. Connect the negative battery cable.



A6E4712W203



A6E4712W204

G

SPARK PLUG INSPECTION

A6E471218110W04

Caution

- Do not inspect, adjust, or clean the plug gap with a wire brush. Doing so can damage the platinum tip.
- When cleaning a spark plug with a plug clear, clean the plug quickly for less than 20 seconds with air pressure below 58.8 kpa {6.0 kgf/cm, 8.5 psi}. Verify that there is no carbon, sand, etc. in the spark plug after cleaning.

HIGH-TENSION LEAD REMOVAL/INSTALLATION

A6E471218110W05

Caution

- The high-tension leads must be reinstalled to their original position. Incorrect installation can damage the leads and cause power loss, and negatively affect the electronic components.

1. Disconnect the negative battery cable.
2. Remove the plug hole plate.
3. Remove the high-tension lead.
4. Install the high-tension lead.

STARTING SYSTEM

STARTING SYSTEM

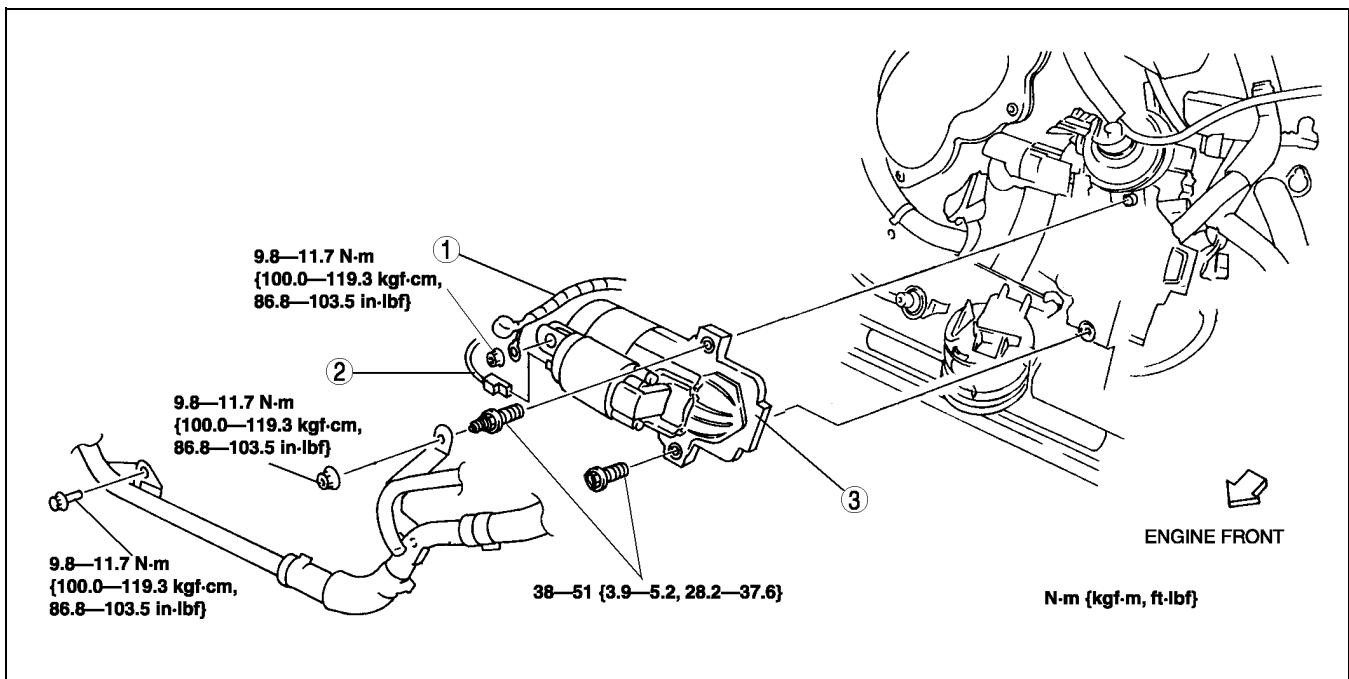
STARTER REMOVAL/INSTALLATION

A6E471418400W01

Warning

- When the battery cables are connected, touching the vehicle body with starter terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the battery negative cables before performing the following operation.

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the air cleaner assembly. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
4. Remove the clutch release cylinder. (MTX) (See [H-9 CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.](#))
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.



AME4714W001

1	Terminal B wire
2	Terminal S wire

3	Starter

STARTING SYSTEM

STARTER INSPECTION

A6E471418400W02

On-vehicle Inspection

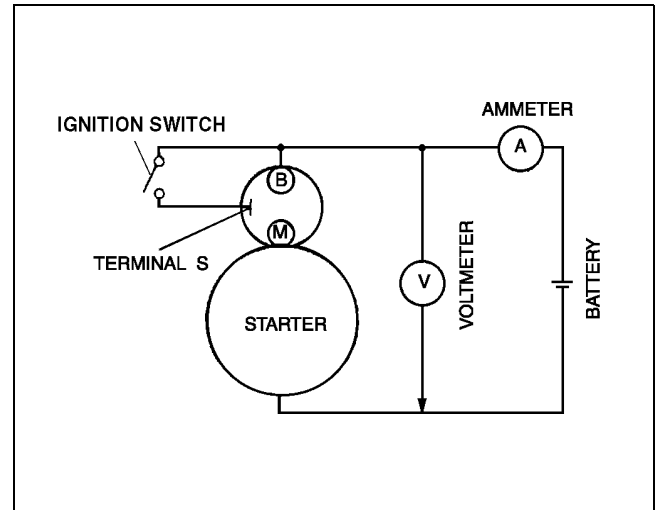
1. Verify that the battery is fully charged.
2. Crank the engine and verify that the starter rotates smoothly without any noise.
 - If not, inspect the following.
 - Remove the starter and inspect the magnetic switch and the starter.
 - Inspect the related wiring harness and the ignition switch.

No Load Test

1. Verify that the battery is fully charged.
2. Connect the starter, battery, voltmeter and ammeter as shown.
3. Operate the starter and verify that it rotates smoothly.
4. Measure the voltage and current while the starter is operating.
 - If not as specified, replace the starter.

Specification

Voltage (V)	Current (A)
11	Less than 90



AME4714W002

CLUTCH

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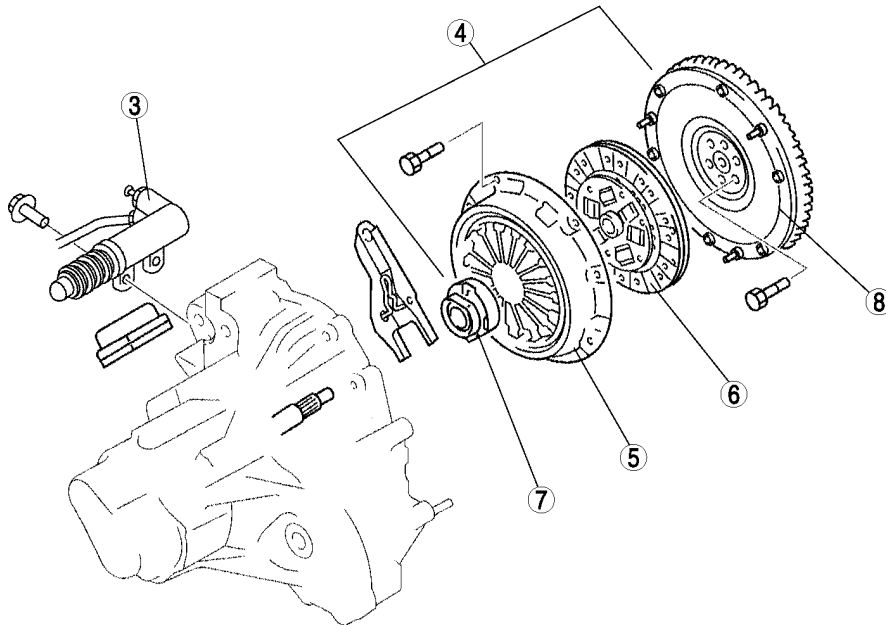
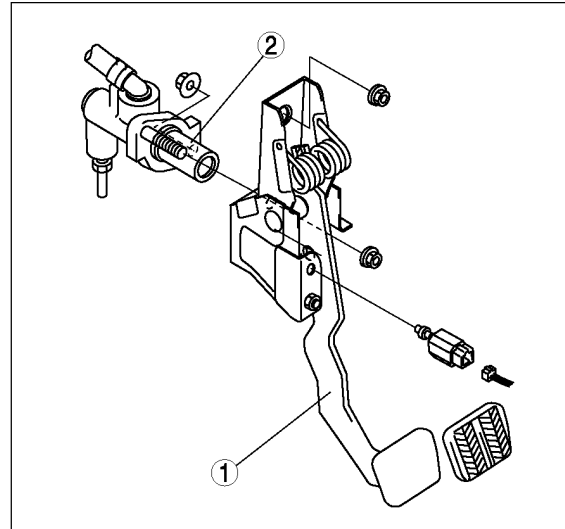
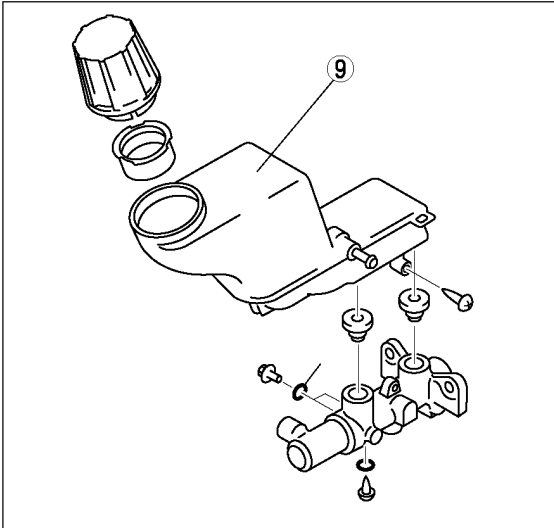
H

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LOCATION INDEX

CLUTCH LOCATION INDEX

A6E490001036W01



A6E4900W001

1	Clutch pedal (See H-5 CLUTCH PEDAL ADJUSTMENT) (See H-6 CLUTCH PEDAL REMOVAL/INSTALLATION)
2	Clutch master cylinder (See H-7 CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION) (See H-8 CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY)

3	Clutch release cylinder (See H-9 CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION) (See H-10 CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY)
4	Clutch unit (See H-11 CLUTCH UNIT REMOVAL/INSTALLATION)
5	Clutch cover (See H-13 CLUTCH COVER INSPECTION)

LOCATION INDEX, GENERAL PROCEDURES

6	Clutch disc (See H-14 CLUTCH DISC INSPECTION)
7	Clutch release collar (See H-14 CLUTCH RELEASE COLLAR INSPECTION)
8	Flywheel (See H-15 FLYWHEEL INSPECTION)
9	Clutch fluid (See H-4 CLUTCH FLUID INSPECTION) (See H-4 CLUTCH FLUID REPLACEMENT)

GENERAL PROCEDURES

PRECAUTION (CLUTCH)

A6E491016003W01

H

Clutch Pipe Removal/Installation

Note

- A common reservoir is used for the clutch and brake system fluid.

1. If clutch pipes have been disconnected any time during the procedure, add clutch fluid (brake fluid), bleed the air, and inspect for leakage after the procedure has been completed.
2. Remove the clutch pipe using the **SST** (49 0259 770B). Install the clutch pipe using torque wrench **SST** combination. (See [GI-16 TORQUE FORMULAS](#).)

CLUTCH FLUID

CLUTCH FLUID

CLUTCH FLUID INSPECTION

A6E491216010W01

Note

- A common reservoir is used for the clutch and brake system fluid.
- The fluid in the reservoir must be maintained between the MIN/MAX level during replacement.

CLUTCH FLUID REPLACEMENT

A6E491216010W02

Caution

- **Be careful not to spill clutch fluid on a painted surface. If this should happen, wash it off immediately.**

Note

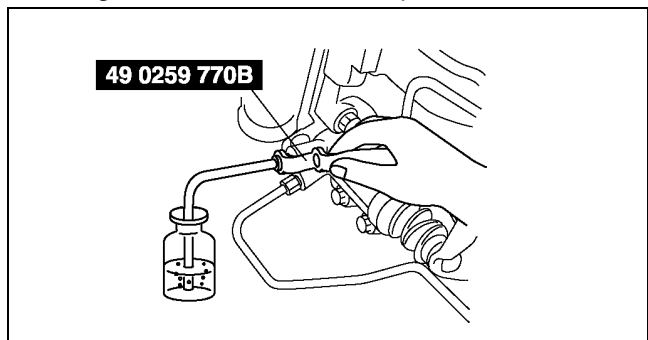
- Do not mix different brands of clutch fluid.
- Do not reuse the clutch fluid that was drained out.

1. Remove the under cover.
2. Draw the fluid from the reservoir with a suction pump.
3. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.
4. Place the other end of the vinyl hose into a container.
5. Slowly pump the clutch pedal several times.
6. With the clutch pedal depressed, loosen the bleeder screw using the **SST** to let fluid escape.
7. Tighten the bleeder screw using the **SST** to stop the fluid.
8. Repeat Steps 4 and 5 until only clean fluid is seen.
9. Tighten the bleeder screw.

Tightening torque

5.9—8.8 N·m {60—90 kgf·cm, 53—78 in·lbf}

10. Add fluid to the MAX mark.
11. Install the under cover.
12. Verify the correct clutch operation.



A6E4912W001

CLUTCH PEDAL

CLUTCH PEDAL

CLUTCH PEDAL ADJUSTMENT

A6E491441030W01

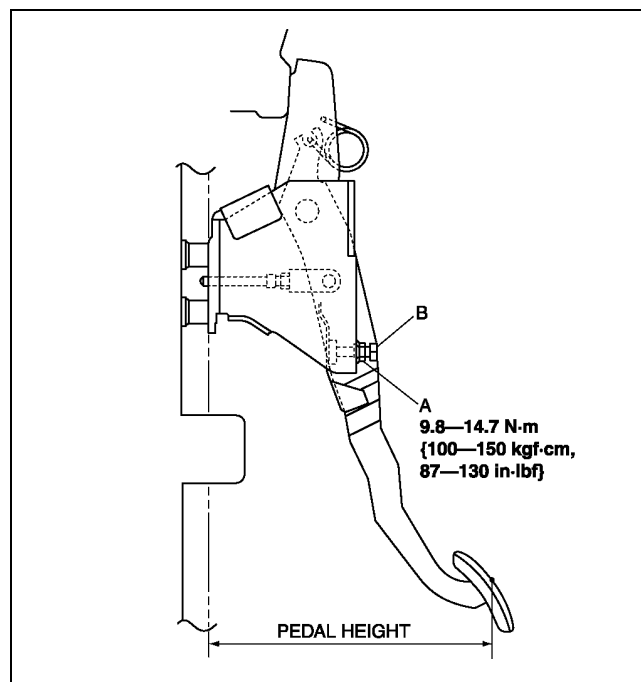
Clutch Pedal Height

1. Measure the distance from the upper surface of the pedal pad to the carpet.
 - If not as specified, adjust the pedal height by turning adjustment bolt B and locknut A.

Pedal height(with carpet)

L.H.D.: 210—216 mm {8.27—8.50 in}

R.H.D.: 209—215 mm {8.23—8.46 in}



A6E4914W001

Clutch Pedal Free Play

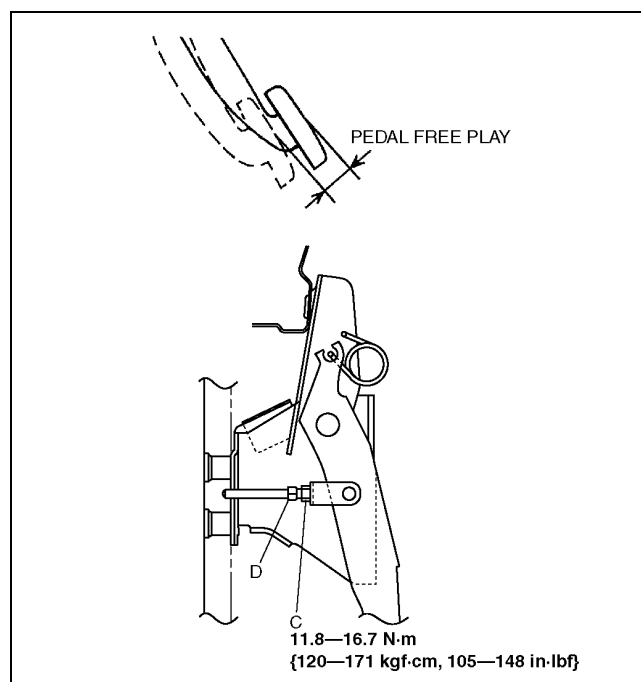
1. Depress the clutch pedal by hand until clutch resistance is felt, and measure the pedal free play.
 - If not as specified, adjust the pedal free play by loosening locknut C and turning push rod D as necessary.

Pedal free play

1.0—3.0 mm {0.04—0.11 in}

Push rod free play at clutch pedal

0.1—0.5 mm {0.004—0.02 in} (Reference value)



A6E4914W002

Clutch Pedal Disengagement Point

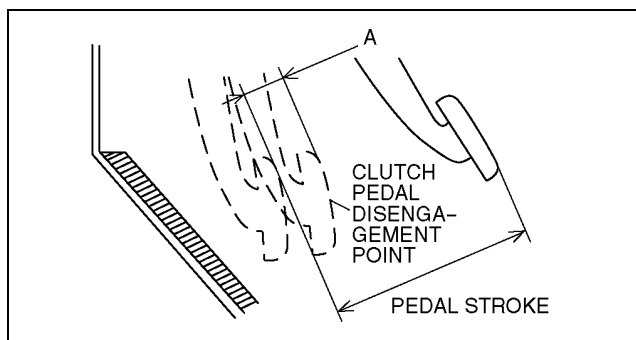
1. Apply the parking brake and fix the front and rear of the wheels with the wheel chocks.
2. Start the engine at idle.
3. Without depressing the clutch pedal, move the shift lever slowly to the reverse position.
4. Hold the lever when the gear noise is heard.
5. Depress the clutch pedal slowly.

CLUTCH PEDAL

6. Hold the pedal when the gear noise stops (clutch pedal disengagement point).
7. Measure distance A (the distance from the clutch pedal disengagement point to the fully depressed position) and the pedal stroke.
8. Verify that they are within specification.
 - If distance A or the pedal stroke is out of specification, adjust the pedal height or the clutch pedal free play to specification.

Clutch pedal disengagement stroke
Minimum: 20 mm {0.79 in} (Reference value)

Pedal stroke
140.0 mm {5.51 in} (Reference value)

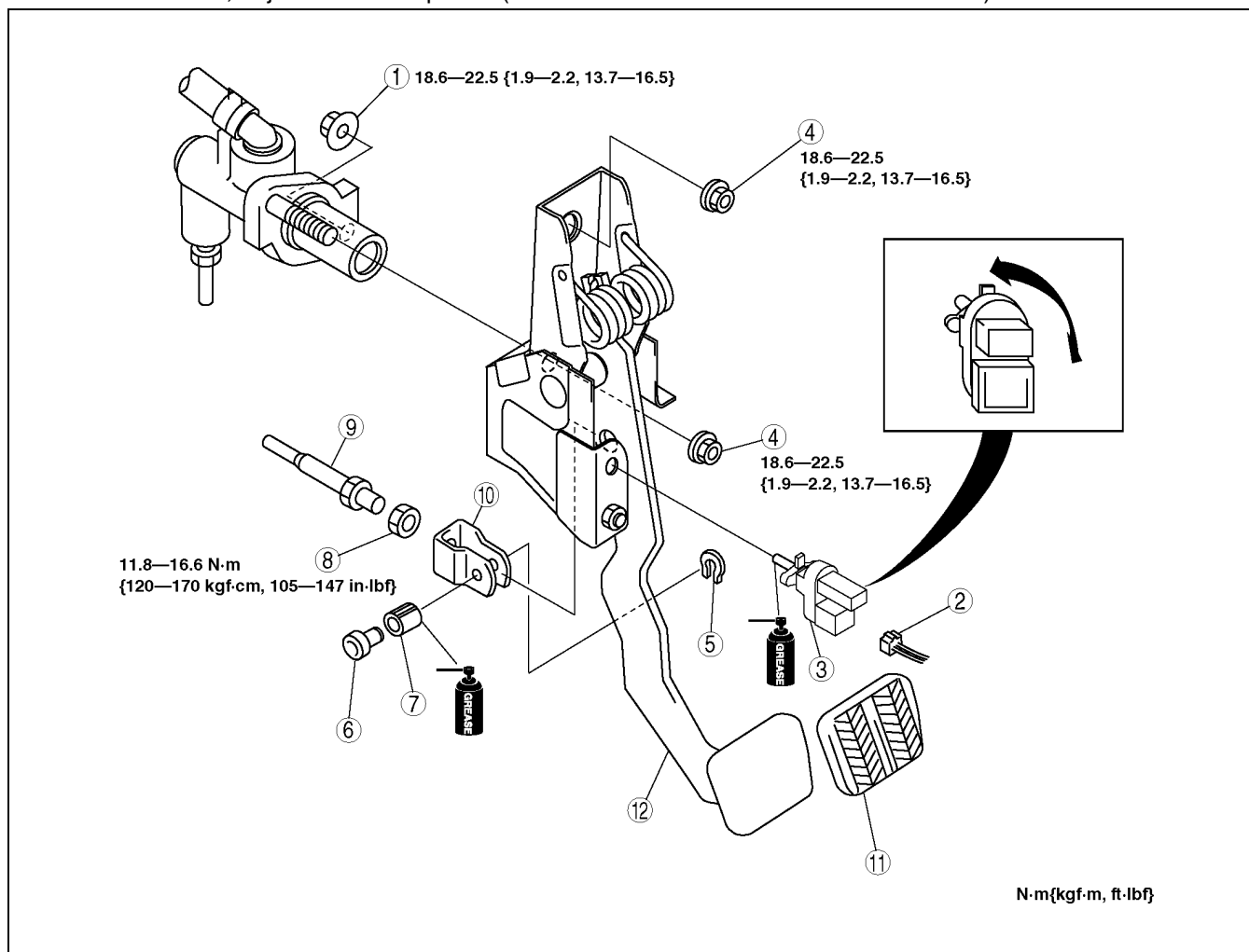


A6E4914W003

CLUTCH PEDAL REMOVAL/INSTALLATION

A6E491441030W02

1. Remove the battery and battery tray. (European (L.H.D.) and GCC specs.)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. After installation, adjust the clutch pedal. (See [H-5 CLUTCH PEDAL ADJUSTMENT](#).)



N·m{kgf·m, ft·lbf}

A6E4914W004

1	Nut
2	Clutch switch connector
3	Clutch switch
4	Nut
5	E-clip

6	Pin
7	Bushing
8	Nut
9	Push rod
10	Clevis

CLUTCH PEDAL, CLUTCH MASTER CYLINDER

11	Pedal pad
12	Clutch pedal (See H-7 Clutch Pedal Installation Note)

Clutch Pedal Installation Note

- After installation, adjust the pedal height and free play. (See [H-5 CLUTCH PEDAL ADJUSTMENT](#).)

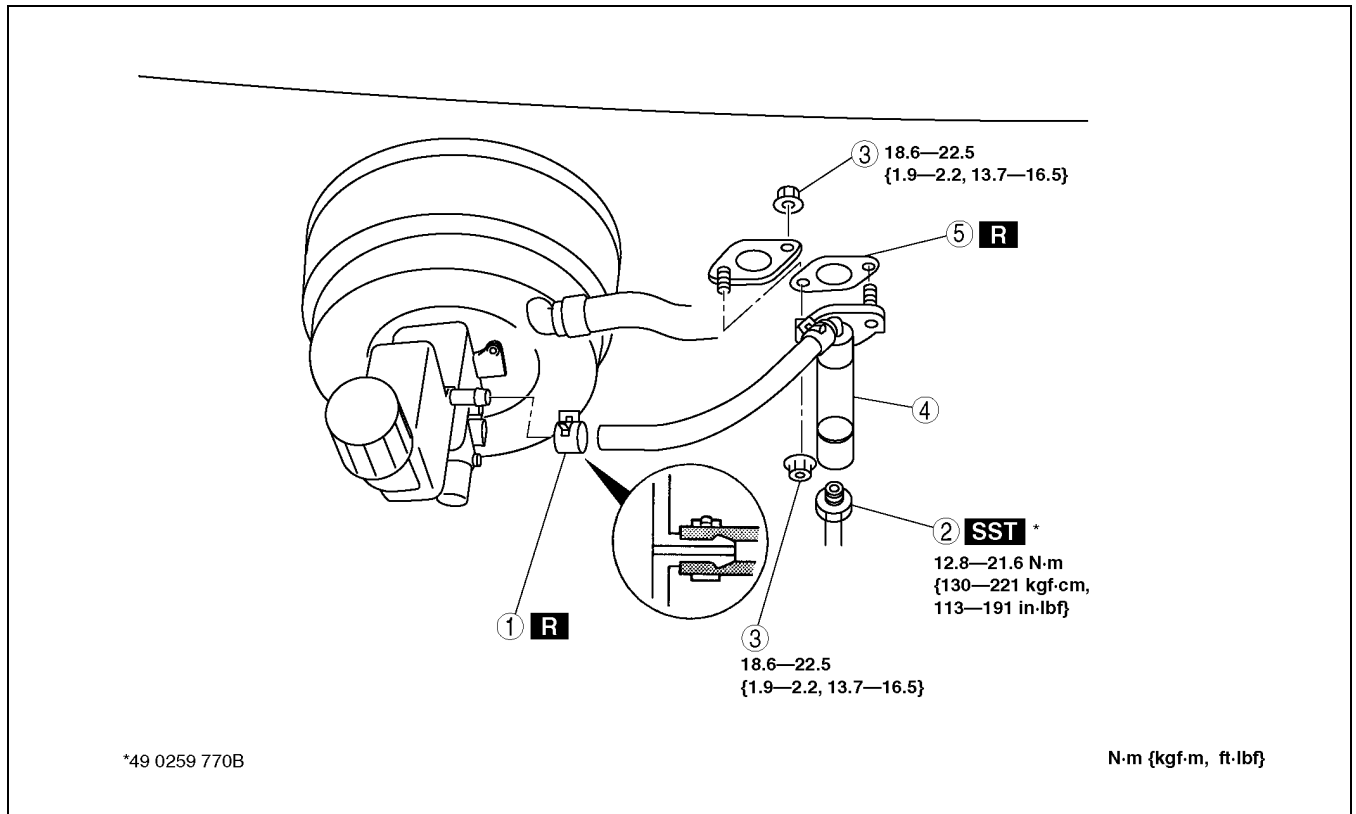
CLUTCH MASTER CYLINDER

CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION

A6E491641990W01

- Remove the battery and battery tray. (European (L.H.D.), GCC. specs.)
- Remove in the order indicated in the table.
- Plug the clutch pipe after removing it to avoid leakage.
- Install in the reverse order of removal.

H



A6E4916W001

1	Clip
2	Clutch pipe
3	Nut

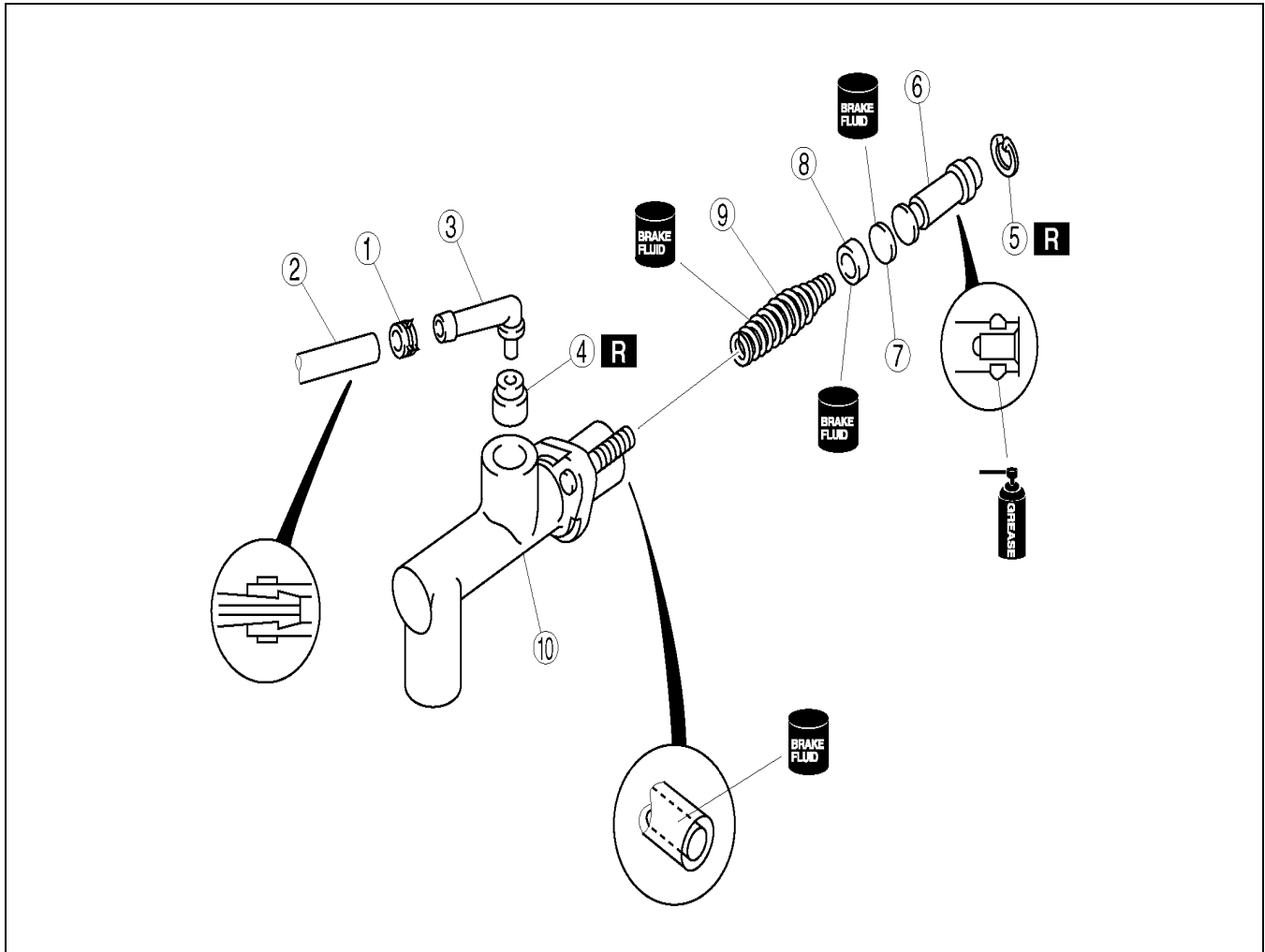
4	Clutch master cylinder
5	Gasket

CLUTCH MASTER CYLINDER

CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY

A6E491641990W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



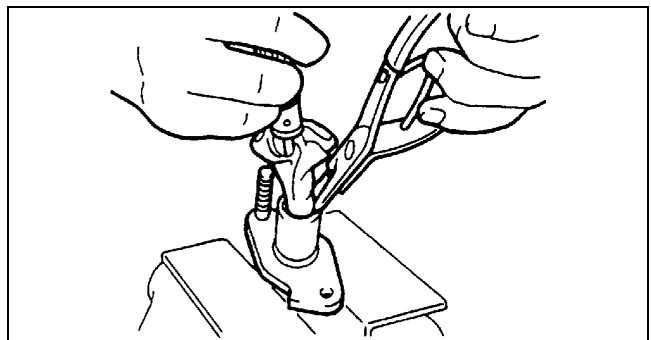
A6E4916W002

1	Clip
2	Hose
3	Joint
4	Bushing
5	Snap ring (See H-8 Snap Ring Disassembly/Assembly Note)

6	Piston and secondary cap component
7	Spacer
8	Primary cap
9	Return spring
10	Clutch master cylinder body

Snap Ring Disassembly/Assembly Note

1. Hold the piston down using a cloth-wrapped pin punch.
 - If disassembling, remove the snap ring; if assembling, install it.



XME4916W003

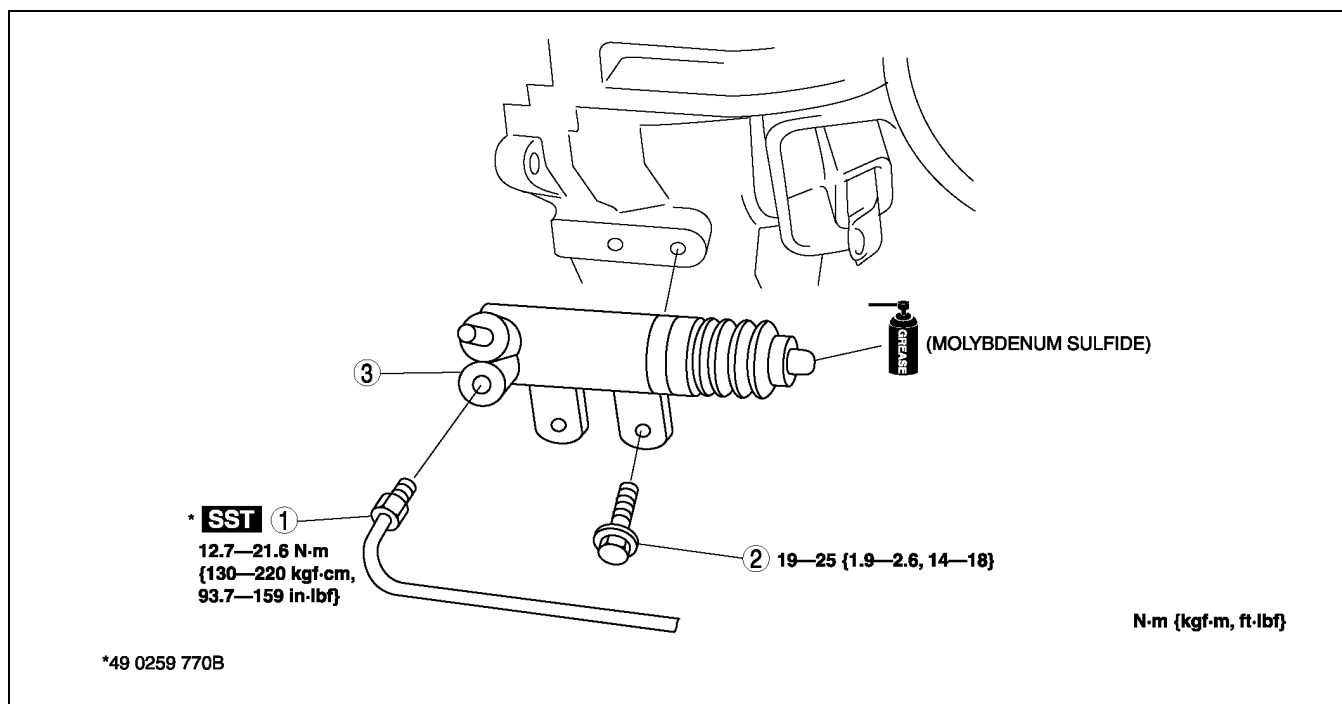
CLUTCH RELEASE CYLINDER

CLUTCH RELEASE CYLINDER

CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION

A6E491841920W01

1. Remove the under cover.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



A6E4918W001

1	Clutch pipe
2	Bolt

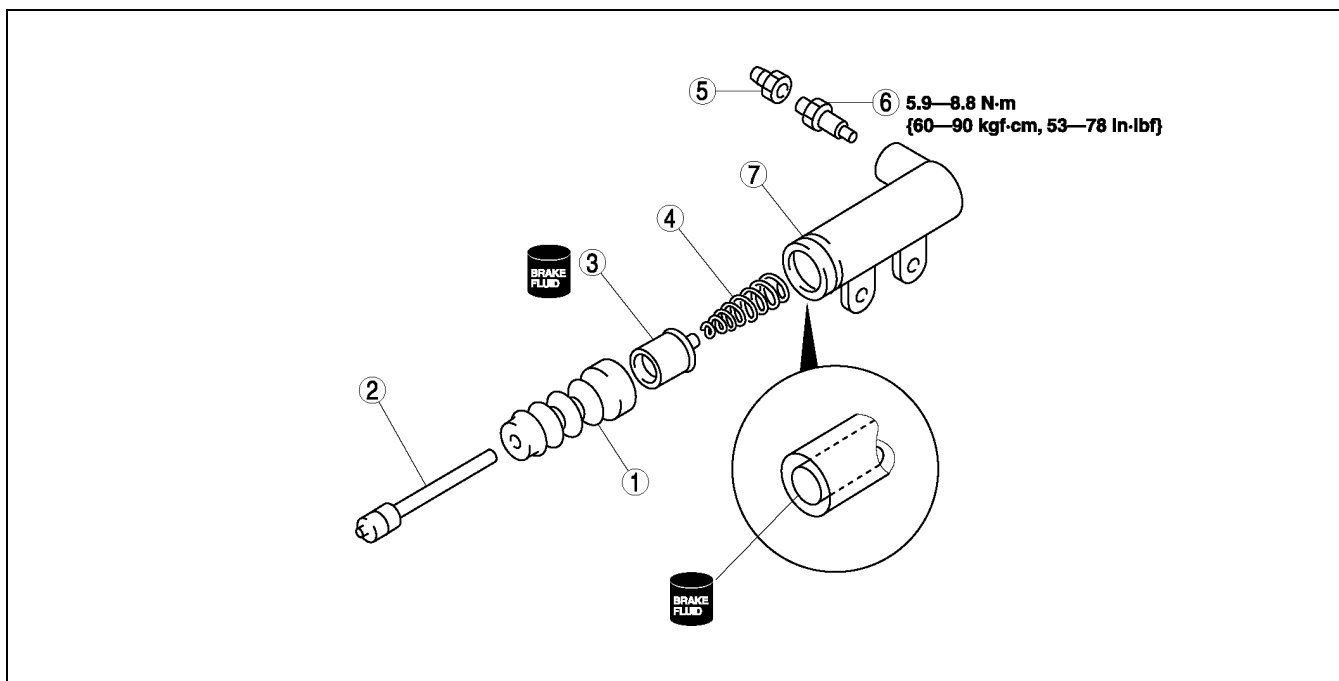
3	Clutch release cylinder

CLUTCH RELEASE CYLINDER

CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY

A6E491841920W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A6E4918W002

1	Boot
2	Push rod
3	Piston and cap
4	Return spring

5	Bleeder cap
6	Bleeder screw
7	Release cylinder body

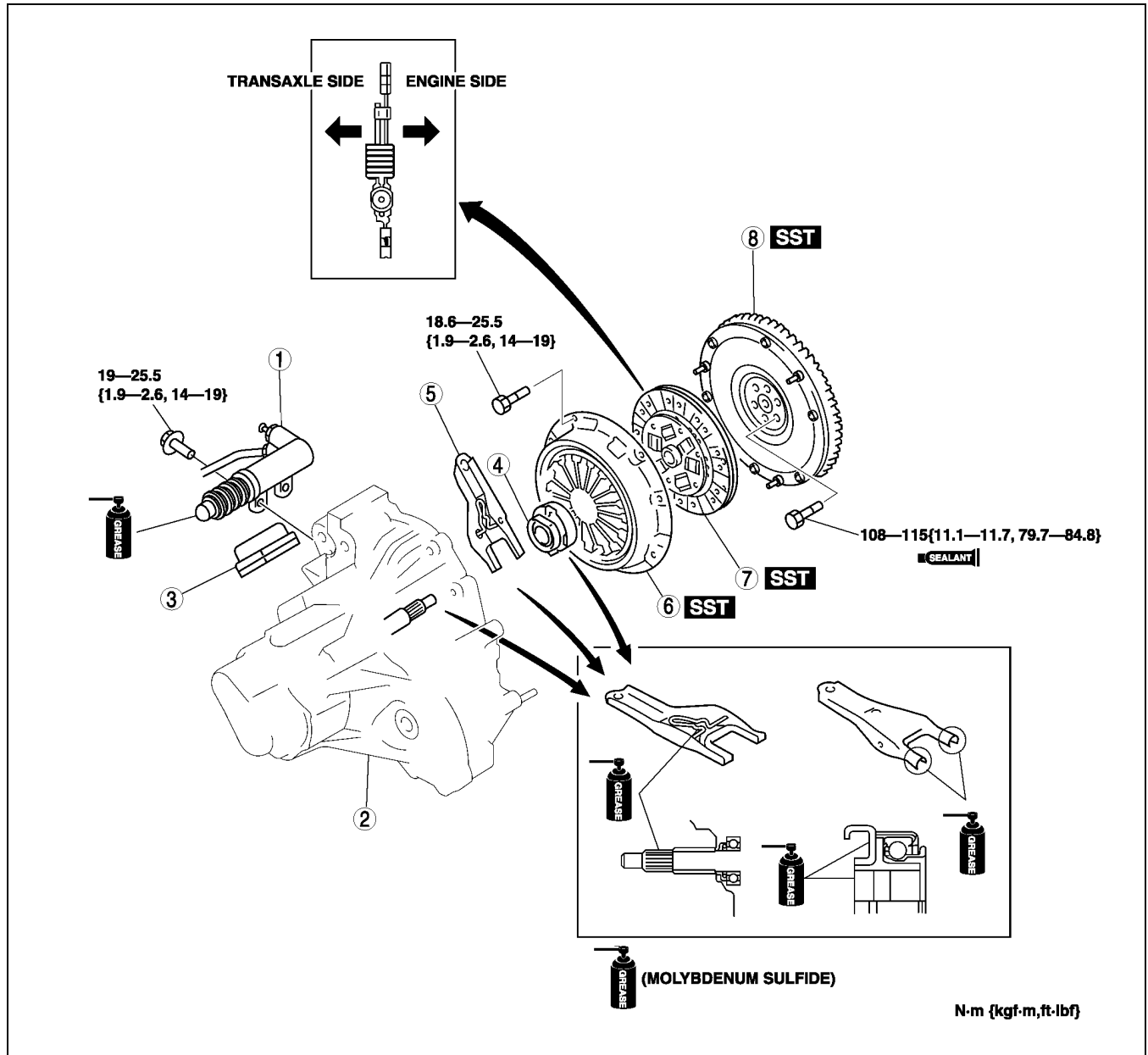
CLUTCH UNIT

CLUTCH UNIT

CLUTCH UNIT REMOVAL/INSTALLATION

A6E492016000W01

1. Remove in the order indicated in the table.
2. Install in the reverse order oremoval.



A6E4920W001

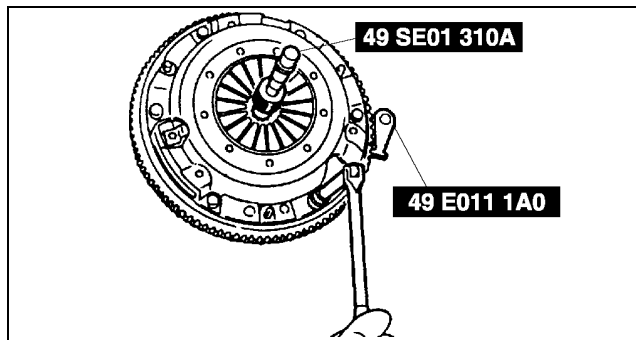
1	Clutch release cylinder
2	Manual transaxle (See J-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION)
3	Boot
4	Clutch release collar
5	Clutch release fork

6	Clutch cover (See H-12 Clutch Cover and Disc Removal Note) (See H-13 Clutch Cover Installation Note)
7	Clutch disc (See H-12 Clutch Cover and Disc Removal Note) (See H-13 Clutch Disc Installation Note)
8	Flywheel (See H-12 Flywheel Removal Note) (See H-12 Flywheel Installation Note)

CLUTCH UNIT

Clutch Cover and Disc Removal Note

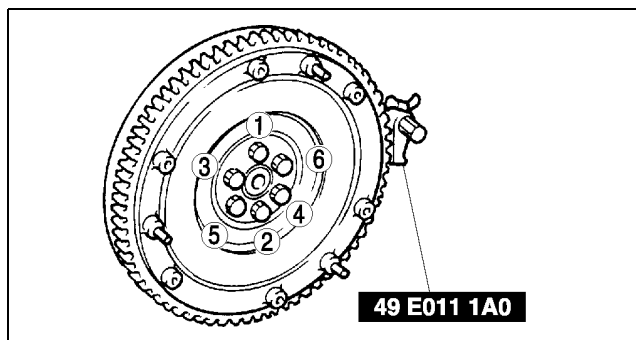
1. Install the SSTs.
2. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released.
3. Remove the clutch cover and disc.



A6E4920W002

Flywheel Removal Note

1. Hold the flywheel using the SST.
2. Remove the bolts evenly and gradually in a crisscross pattern.
3. Remove the flywheel.



A6E4920W003

Flywheel Installation Note

1. Install the flywheel to the crankshaft.
2. When reusing the bolts, clean threads and hole, then apply locking compound to the threads.

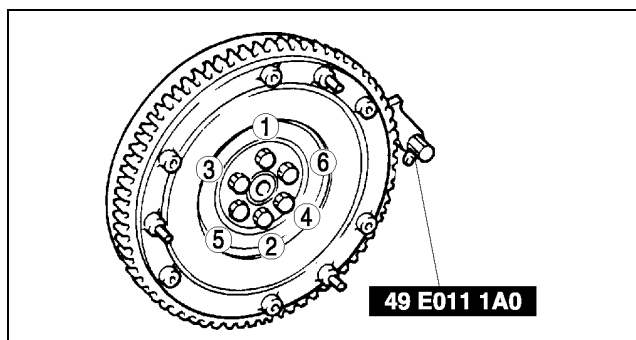
Note

- No locking compound is needed when using new bolts.

3. Hand-tighten the flywheel lock bolts.
4. Install the **SST** to the flywheel.
5. Gradually tighten the flywheel lock bolts in a crisscross pattern.

Tightning torque

108—115 N·m {11.1—11.7 kgf·m, 79.7—84.8 ft·lbf}

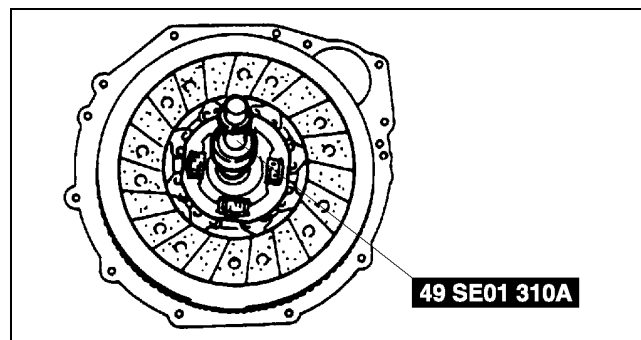


A6E4920W004

CLUTCH UNIT

Clutch Disc Installation Note

1. Hold the clutch disc position using the SST.



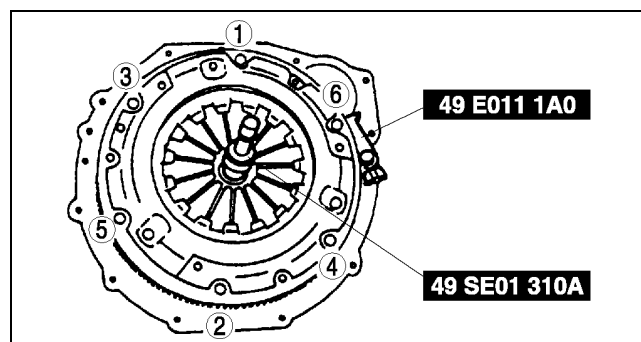
A6E4920W005

Clutch Cover Installation Note

1. Install the SSTs.
2. Tighten the bolts evenly and gradually in a crisscross pattern.

Tightening torque

18.6—25.5 N·m {1.9—2.6 kgf·m, 14—19 ft·lbf}



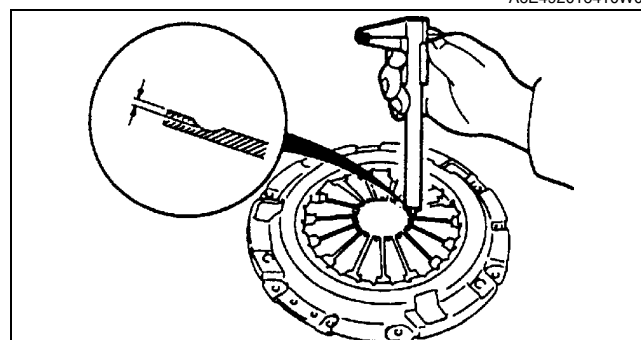
A6E4920W006

CLUTCH COVER INSPECTION

1. Measure the wear of the diaphragm spring fingers.
 - If not as specified, replace the clutch cover.

Depth

0.6 mm {0.024 in} max.



A6E492016410W01

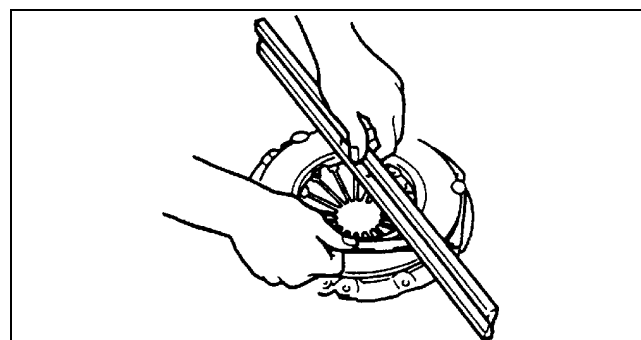
XME4920W010

2. Measure the flatness of the pressure plate with a straight edge and a feeler gauge.
 - If not as specified, replace the clutch cover.

Maximum clearance

0.5 mm {0.020 in}

3. When checking the diaphragm spring fingers, mount a dial indicator on the cylinder block.

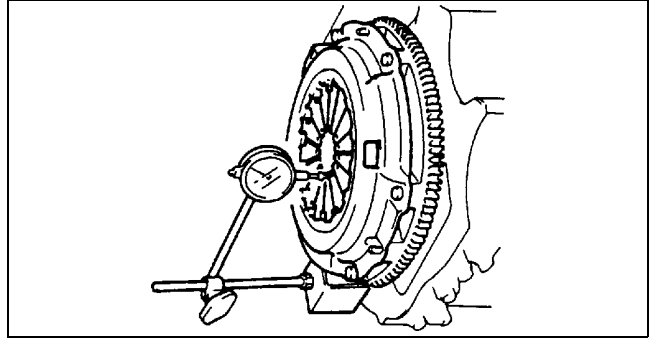


XME4920W011

CLUTCH UNIT

4. Rotate the flywheel and check for misaligned diaphragm spring fingers.
 - If not as specified, replace the clutch cover.

Misalignment
0.6 mm {0.024 in} max.

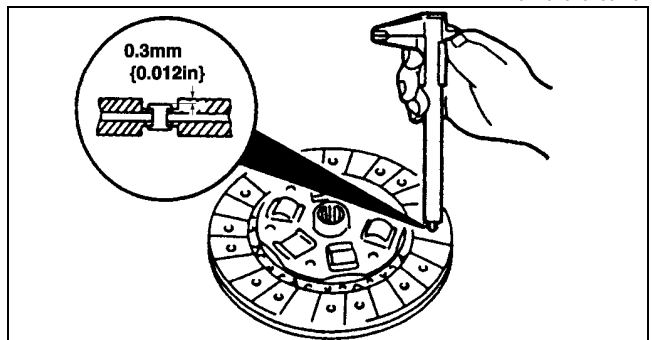


XME4920W012

CLUTCH DISC INSPECTION

1. Using vernier calipers, measure the thickness of the lining at a rivet head on both sides.
 - Replace the clutch disc if its thickness is less than the minimum.

Thickness
0.3 mm {0.012 in} min.

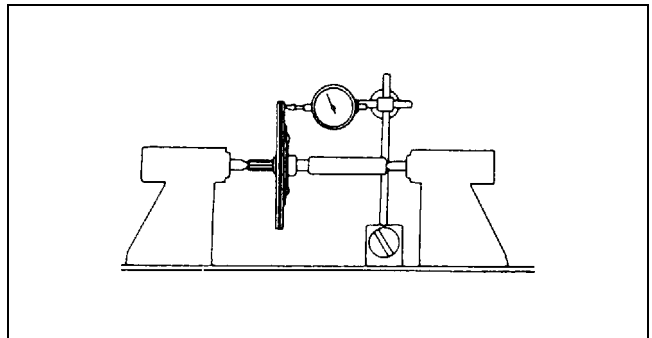


A6E492016460W01

A6E4920W007

2. Measure the clutch disc runout using a dial indicator.
 - If the runout is excessive, replace the clutch disc.

Runout
0.7 mm {0.028 in} max.



XME4920W014

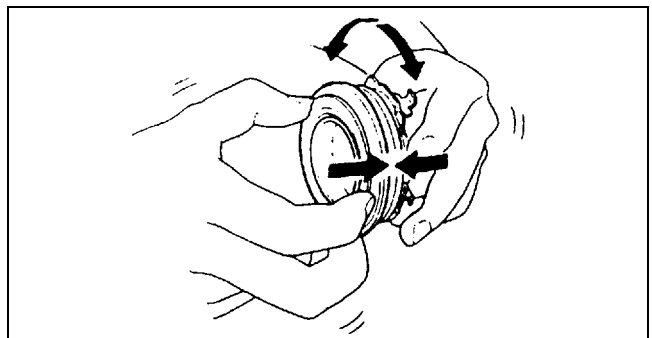
CLUTCH RELEASE COLLAR INSPECTION

A6E492016510W01

Caution

- Cleaning the clutch release collar with cleaning fluids or a steam cleaner can wash the grease out of the sealed bearing.

1. Turn the collar while applying force in the axial direction.
 - If the collar sticks or has excessive resistance, replace the clutch release collar.



XME4920W015

FLYWHEEL

FLYWHEEL

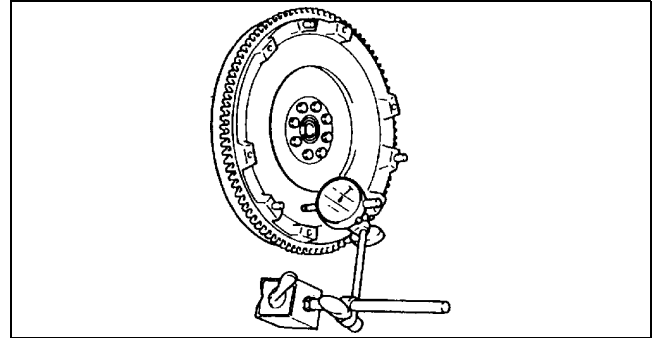
FLYWHEEL INSPECTION

1. Install a dial gauge on the cylinder block.
2. Measure the flywheel runout using a dial indicator.
 - If the runout is excessive, replace the flywheel.

Runout

0.1 mm {0.004 in} max.

A6E492211500W01



XME4922W001

H

MANUAL TRANSAXLE

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MANUAL TRANSAXLE LOCATION INDEX	J-2
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TRANSAXLE OIL REPLACEMENT	J-3
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VEHICLE SPEEDOMETER SENSOR REMOVAL/INSTALLATION	J-4
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SHIFT MECHANISM REMOVAL/INSTALLATION	J-9

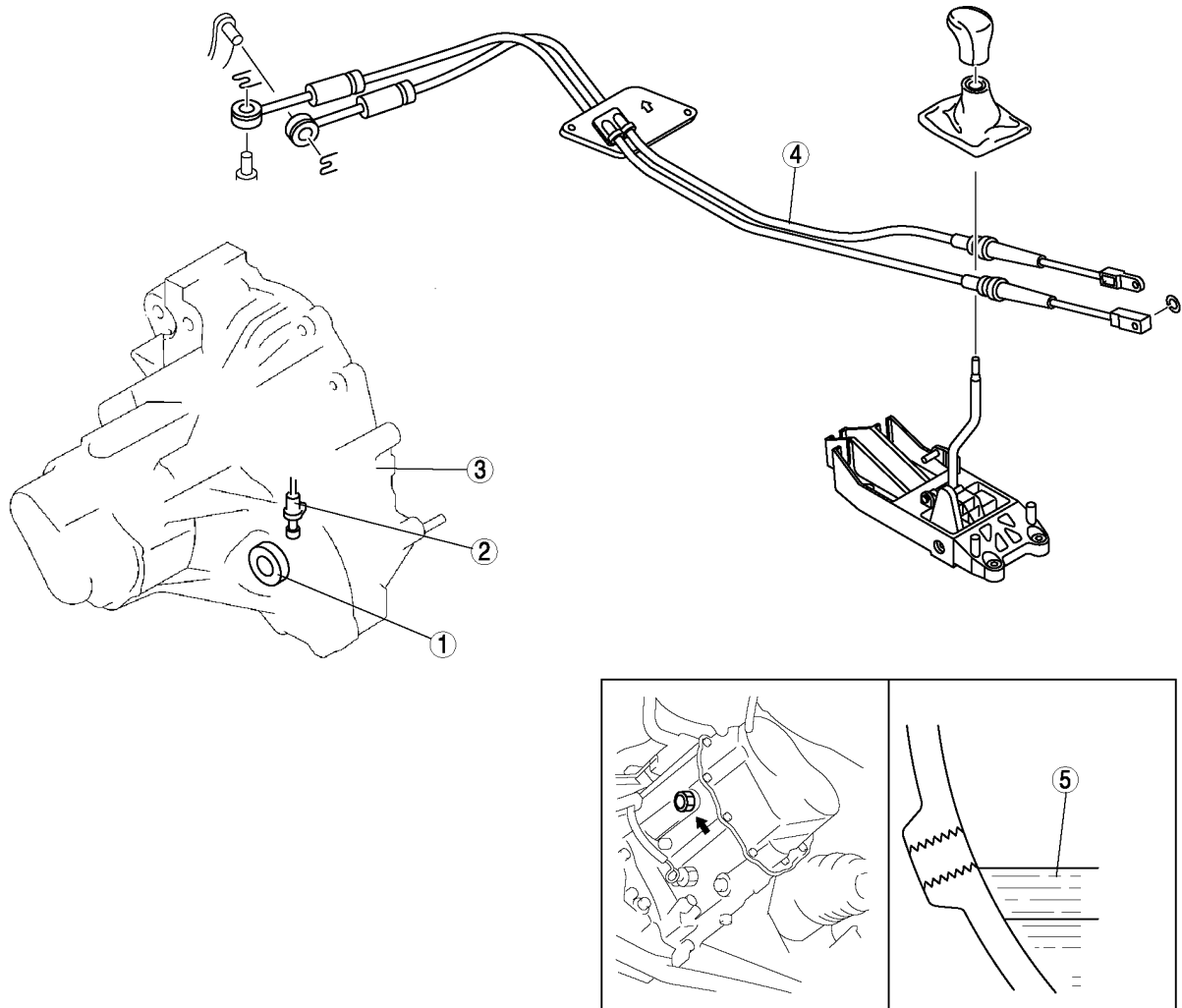
J

LOCATION INDEX

LOCATION INDEX

MANUAL TRANSAXLE LOCATION INDEX

A6E510001036W01



A6E5100W001

1	Oil seal (differential) (See J-4 OIL SEAL (DIFFERENTIAL) REPLACEMENT)
2	Vehicle speedometer sensor (See J-4 VEHICLE SPEEDOMETER SENSOR REMOVAL/INSTALLATION) (See J-5 VEHICLE SPEEDOMETER SENSOR INSPECTION)

3	Manual transaxle (See J-5 MANUAL TRANSAXLE REMOVAL/INSTALLATION)
4	Shift mechanism (See J-9 SHIFT MECHANISM REMOVAL/INSTALLATION)
5	Transaxle oil (See J-3 TRANSAXLE OIL INSPECTION) (See J-3 TRANSAXLE OIL REPLACEMENT)

MANUAL TRANSAXLE

MANUAL TRANSAXLE

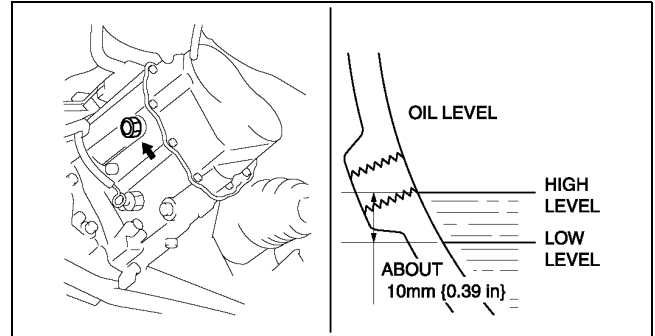
TRANSAXLE OIL INSPECTION

A6E511227001W01

1. Park the vehicle on level ground.
2. Remove the oil level plug and washer.
3. Verify that the oil is near the brim of the plug port.
 - If the oil level is lower than the low level, add the specified amount and type of oil through the oil level plug hole.

Specified oil grade
API Service GL-4 or GL-5

Specified oil viscosity
All-season: SAE 75W-90
Above 10 °C {50 °F}: SAE 80W-90



A6E5112W007

4. Install a new washer and the oil level plug.

Tightening torque
40—58 N·m {4.0—6.0 kgf·m, 29—43 ft·lbf}

TRANSAXLE OIL REPLACEMENT

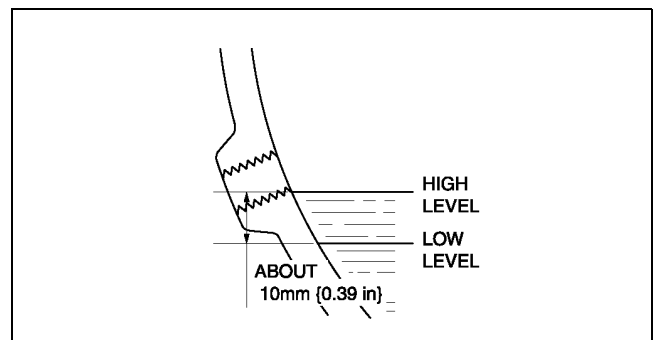
A6E511227001W02

1. Remove the drain plug with the washer.
2. Drain the oil into a suitable container.
3. Install a new washer and the drain plug.

Tightening torque
40—58 N·m {4.0—6.0 kgf·m, 29—43 ft·lbf}

4. Remove the oil level plug with washer and add the specified amount and type of oil through the oil level plug hole until the level reaches the bottom of the oil level plug hole.

Specified oil viscosity
All-season: SAE 75W-90
Above 10 °C {50 °F}: SAE 80W-90
Capacity (approximate quantity)
2.87 L {3.03 US qt, 2.53 Imp qt}



A6E5112W008

5. Install a new washer and the oil level plug.

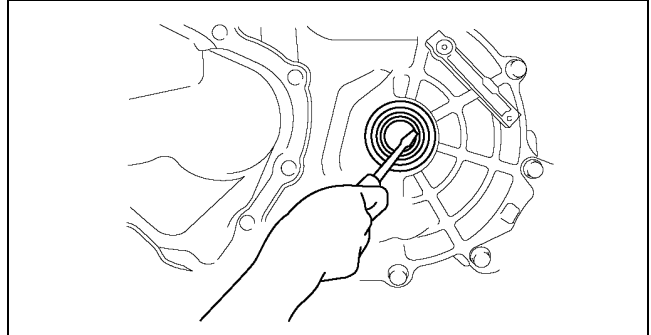
Tightening torque
40—58 N·m {4.0—6.0 kgf·m, 29—43 ft·lbf}

MANUAL TRANSAXLE

OIL SEAL (DIFFERENTIAL) REPLACEMENT

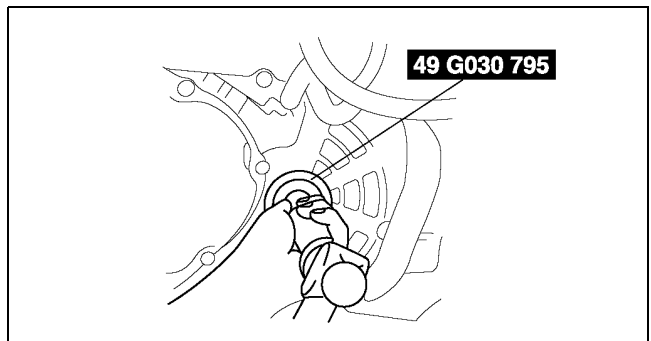
A6E511219240W01

1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Drain the oil from the transaxle.
3. Remove the front wheels and splash shields.
4. Separate the drive shaft and joint shaft from the transaxle. (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION.](#)) (See [M-12 JOINT SHAFT REMOVAL/INSTALLATION.](#))
5. Remove the oil seals using a screwdriver.



A6E5112W009

6. Using the **SST** and a hammer, tap each new oil seal in evenly until the **SST** contacts the transaxle case.
7. Coat the lip of each oil seal with transaxle oil.
8. Insert the drive shaft and joint shaft to the transaxle. (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION.](#)) (See [M-12 JOINT SHAFT REMOVAL/INSTALLATION.](#))
9. Install the wheels and splash shields.
10. Add the specified amount and type of oil. (See [J-3 TRANSAXLE OIL REPLACEMENT.](#))



A6E5112W001

VEHICLE SPEEDOMETER SENSOR REMOVAL/INSTALLATION

A6E511217400W01

Without ABS

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
4. Disconnect the vehicle speedometer sensor connector.
5. Remove the vehicle speedometer sensor.
6. Apply transmission oil to a new O-ring and install it on a vehicle speedometer sensor.
7. Install the vehicle speedometer sensor.

Tightening torque

7.8—11.3 N·m

{80—115 kgf·cm, 57.6—83.3 in·lbf}

8. Connect the vehicle speedometer sensor connector.
9. Install the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
10. Install the battery and battery tray.
11. Connect the negative battery cable.

MANUAL TRANSAXLE

VEHICLE SPEEDOMETER SENSOR INSPECTION

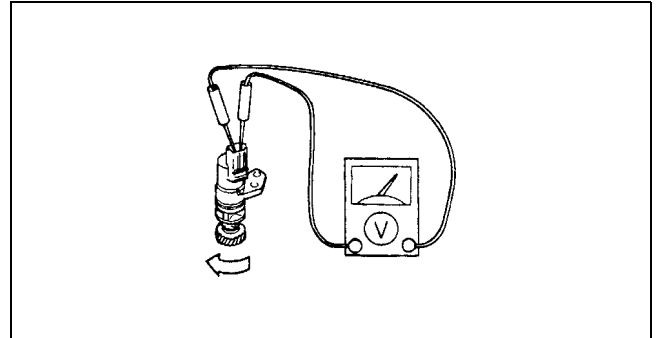
A6E511217400W02

Without ABS

1. Remove the vehicle speedometer sensor.
2. Measure voltage (AC range) between terminals of the vehicle speedometer sensor while the gear is turning.

Meter needle	Action
Moves slightly under 5 V (AC range)	Repair wiring harness between instrument cluster and vehicle speedometer sensor.
Does not move	Replace vehicle speedometer sensor.

3. Install the vehicle speedometer sensor.



W6U515WA4

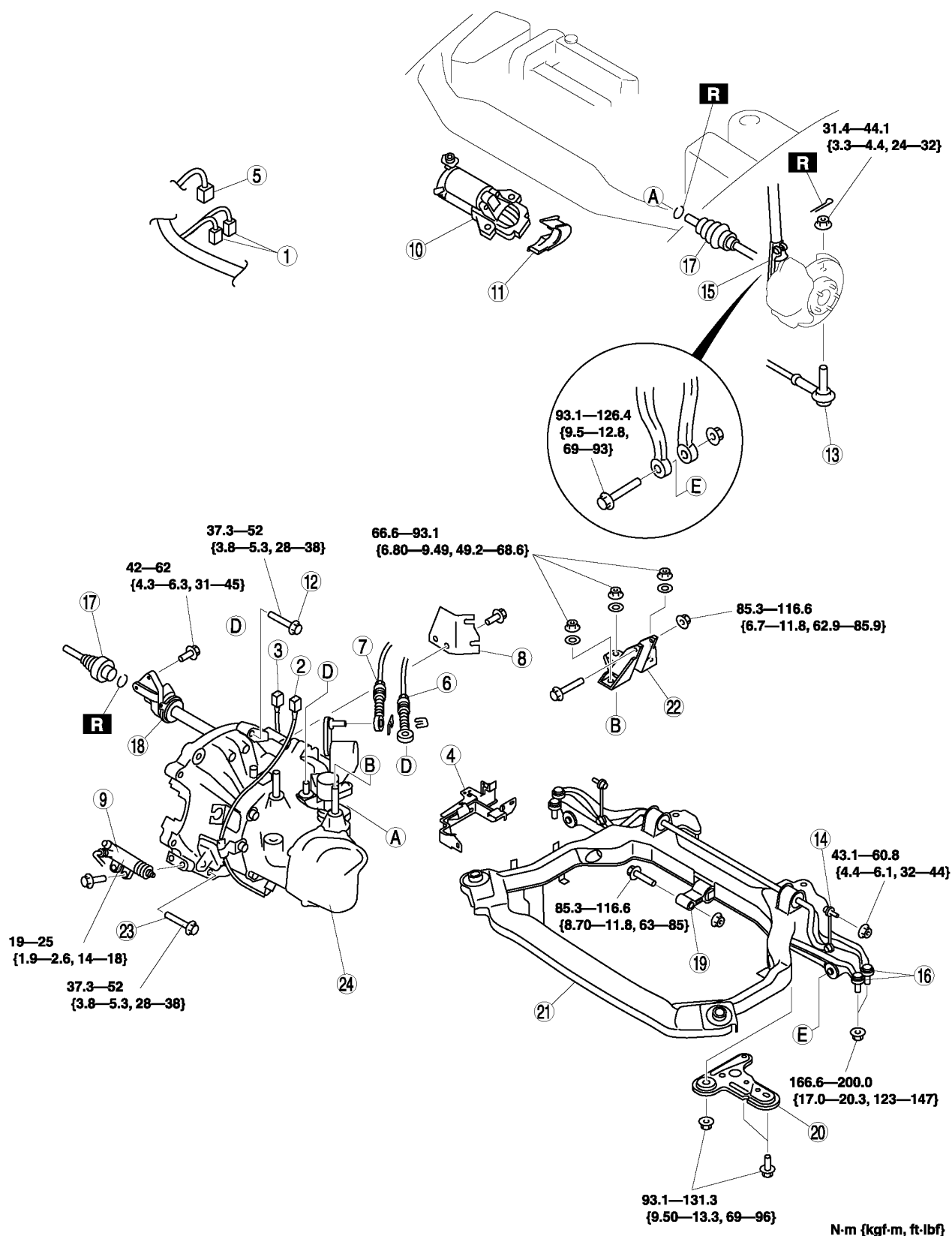
MANUAL TRANSAXLE REMOVAL/INSTALLATION

A6E511201029W01

J

1. Remove the battery, battery tray and battery bracket.
2. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
3. Remove the wheels, tires and splash shields.
4. Remove the under cover.
5. Remove the steering gear and power steering pipe. (See [N-10 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.](#))
6. Remove the front auto leveling sensor. (See [T-32 FRONT AUTO LEVELING SENSOR REMOVAL/INSTALLATION.](#))
7. Drain the transaxle oil into a suitable container.
8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.
10. Adjust the headlight zero set. (See [T-31 HEADLIGHT ZEROSET.](#))
11. Add the specified amount of specified transaxle oil.
12. Install the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
13. Warm up the engine and transaxle, inspect for oil leakage, and inspect the transaxle operation.

MANUAL TRANSAXLE



A6E5112W012

1	O ₂ sensor connector
2	Back-up light switch connector
3	Neutral switch connector

4	Harness bracket
5	Vehicle speedometer sensor connector (GCC specs.)

MANUAL TRANSAXLE

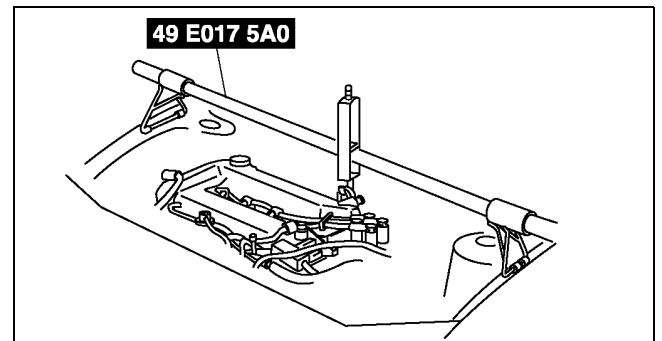
6	Selector cable
7	Shift cable
8	Selector cable bracket
9	Clutch release cylinder
10	Starter
11	Endplate cover
12	Transaxle mounting bolt (upper side)
13	Tie-rod end ball joint (See N-11 Tie-rod End Ball Joint Removal Note)
14	Stabilizer control link
15	Damper fork
16	Lower arm (front, rear) ball joint (See R-19 Front Lower Arm (Rear) Ball Joint Removal Note) (See R-16 Front Lower Arm (Front) Ball Joint Removal Note)
17	Drive shaft (See M-17 DRIVE SHAFT REMOVAL/INSTALLATION.)

18	Joint shaft (See M-12 JOINT SHAFT REMOVAL/INSTALLATION.)
19	No.1 engine mount (See J-7 No.1 Engine Mount Bracket Removal Note) (See J-8 No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note)
20	Crossmember bracket
21	Crossmember component (See R-23 FRONT CROSSMEMBER REMOVAL/INSTALLATION)
22	No.4 engine mount (See J-8 No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note)
23	Transaxle mounting bolt (lower side)
24	Manual transaxle (See J-7 Manual Transaxle Removal Note) (See J-8 Manual Transaxle Installation Note)

J

No.1 Engine Mount Bracket Removal Note

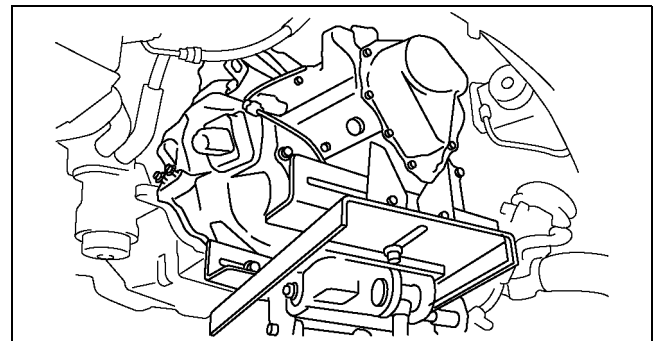
1. Support the engine using the SST before removing the No.1 engine mount.
2. Remove the No.1 engine mount.



A6E5614W049

Manual Transaxle Removal Note

1. Loosen the **SST** (49 E017 5A0) and lean the engine toward the transaxle.
2. Support the transaxle on a jack.
3. Remove the transaxle mounting bolts.
4. Remove the transaxle.

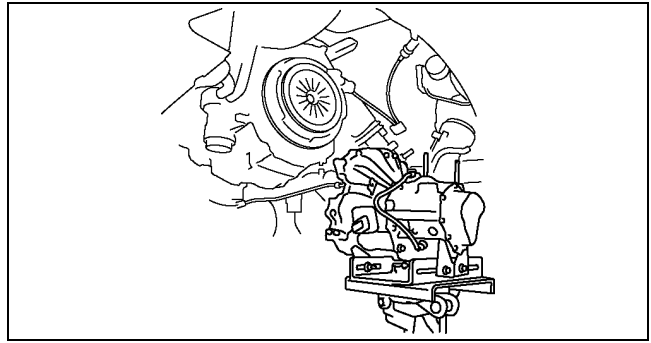


A6E5112W003

MANUAL TRANSAXLE

Manual Transaxle Installation Note

1. Set the transaxle on a jack and lift into place.
2. Install the transaxle mounting bolts.
3. Tighten the **SST** (49 E017 5A0) so that the engine is located at the specified position.



A6E5112W004

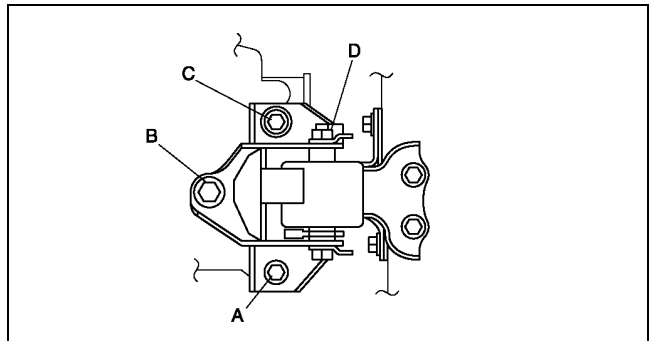
No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note

1. Verify that the engine mount rubbers are installed as shown.
2. By aligning the holes with the stud bolts, install the No.4 engine mount bracket to the transaxle.
3. By aligning the holes with the stud bolts, install the No.1 engine mount to the transaxle.
4. Align the hole of the No.4 engine mount bracket with the No.4 engine mount rubber on vehicle, and temporarily tighten the bolt D.
5. Tighten the nut B,C in order of B→C, then bolt A.
6. Tighten the bolt D.

Tightening torque

A, B, C: 66.6—93.1 N·m {6.8—9.4 kgf·m, 50—68 ft·lbf}

D: 85.3—116.6 N·m {8.7—11.8 kgf·m, 63—85 ft·lbf}



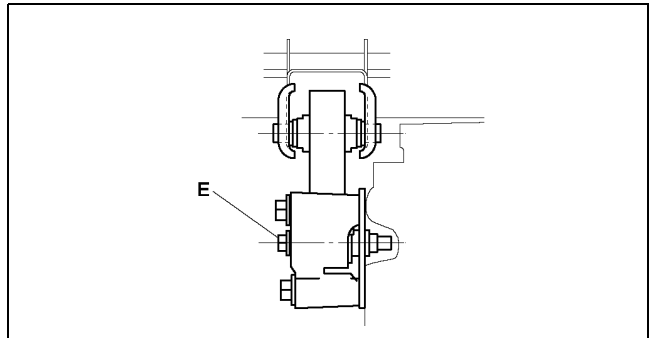
A6E5112W005

8. Tighten the bolt D to the No.1 engine mount.

Tightening torque

E: 85.3—116.6 N·m {8.7—11.8 kgf·m, 63—85 ft·lbf}

9. Remove the **SST** (49 E017 5A0).



A6E5112W006

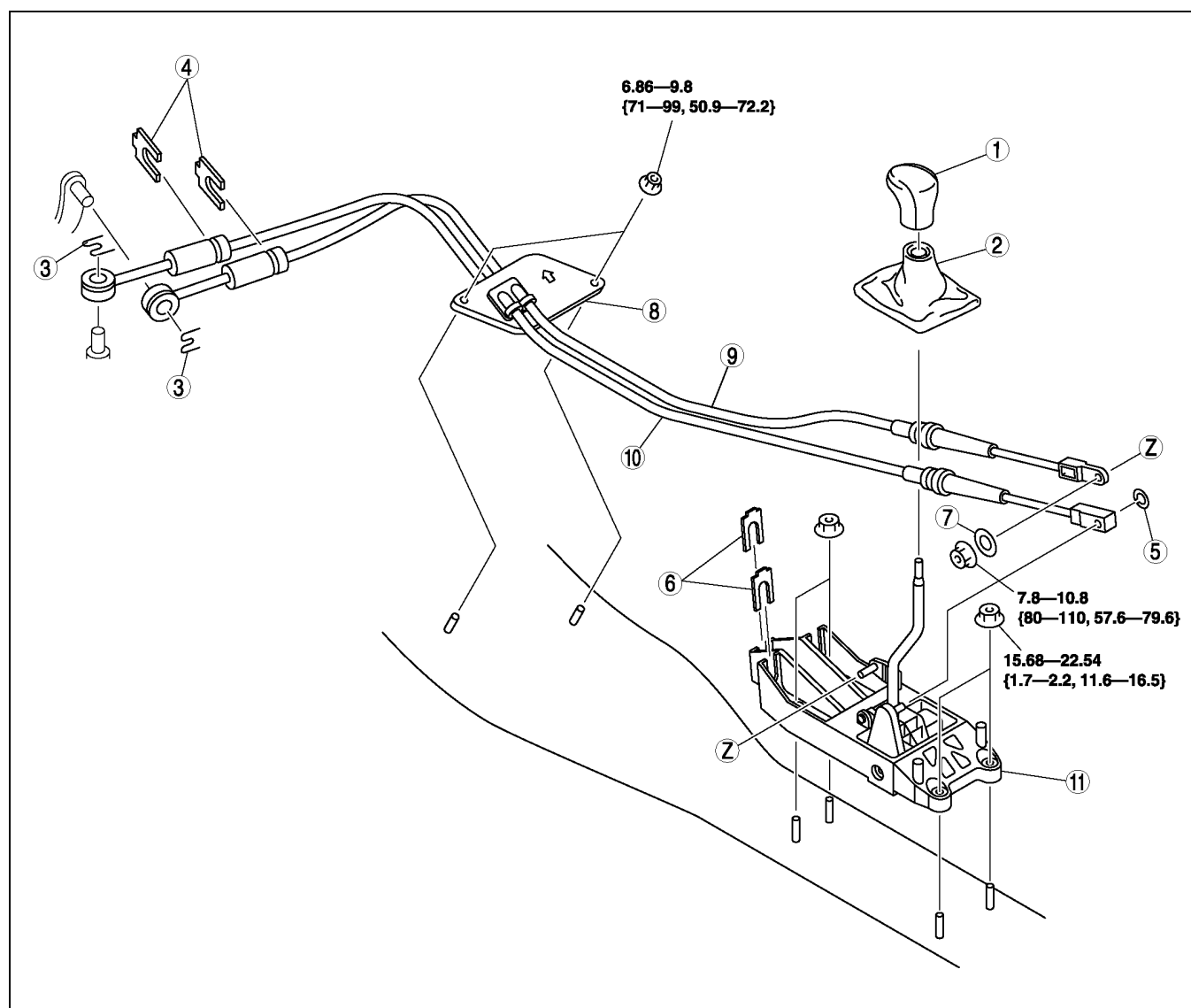
SHIFT MECHANISM

SHIFT MECHANISM

SHIFT MECHANISM REMOVAL/INSTALLATION

A6E511446010W01

1. Remove the battery, battery tray and battery bracket.
2. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
3. Remove the dashboard compleat.
(See [S-82 DASHBOARD REMOVAL/INSTALLATION.](#))
4. Remove the SAS control module.
(See [T-124 SAS UNIT REMOVAL/INSTALLATION.](#))
5. Remove the climate control unit. (See [U-44 CLIMATE CONTROL UNIT REMOVAL.](#)) (See [U-45 CLIMATE CONTROL UNIT INSTALLATION.](#))
6. Remove the rear heat duct. (See [U-23 REAR HEAT DUCT REMOVAL/INSTALLATION.](#))
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. Install the air cleaner component.
10. After installation, verify that the shift lever can be shifted smoothly into each position.



A6E5114W001

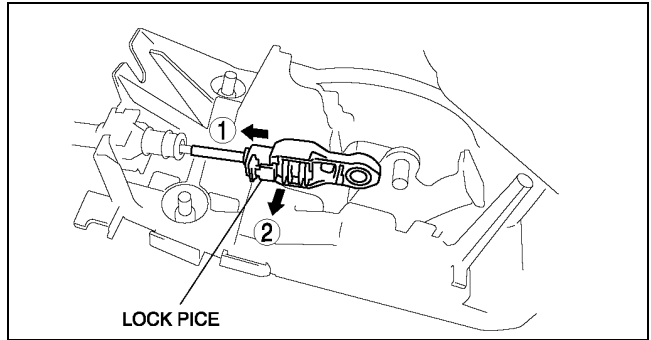
1	Shift lever knob
2	Boot panel
3	Clip
4	Clip
5	Clip
6	Clip

7	Plain Washer
8	Seal plate
9	Main shift cable
10	Main select cable (See J-10 Select Cable Installation Note)
11	Shift lever assembly

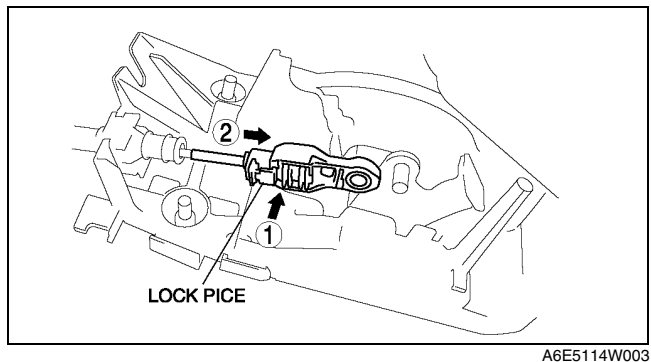
SHIFT MECHANISM

Select Cable Installation Note

1. Remove the center console.
2. Make sure that the shift lever (transaxle side) is in neutral.
3. Unlock the lock pice of the select cable (shift lever side) in the order shown in the figure.
4. Shift the sift lever to neutral.



5. Lock the lock pice of the selector cable (shift cable side) in the order shown in the figure.
6. Install the center console.
7. Shift the shift lever from neutral to other position, and make sure that there are no other components in that area to interfere with the lever.



AUTOMATIC TRANSAXLE

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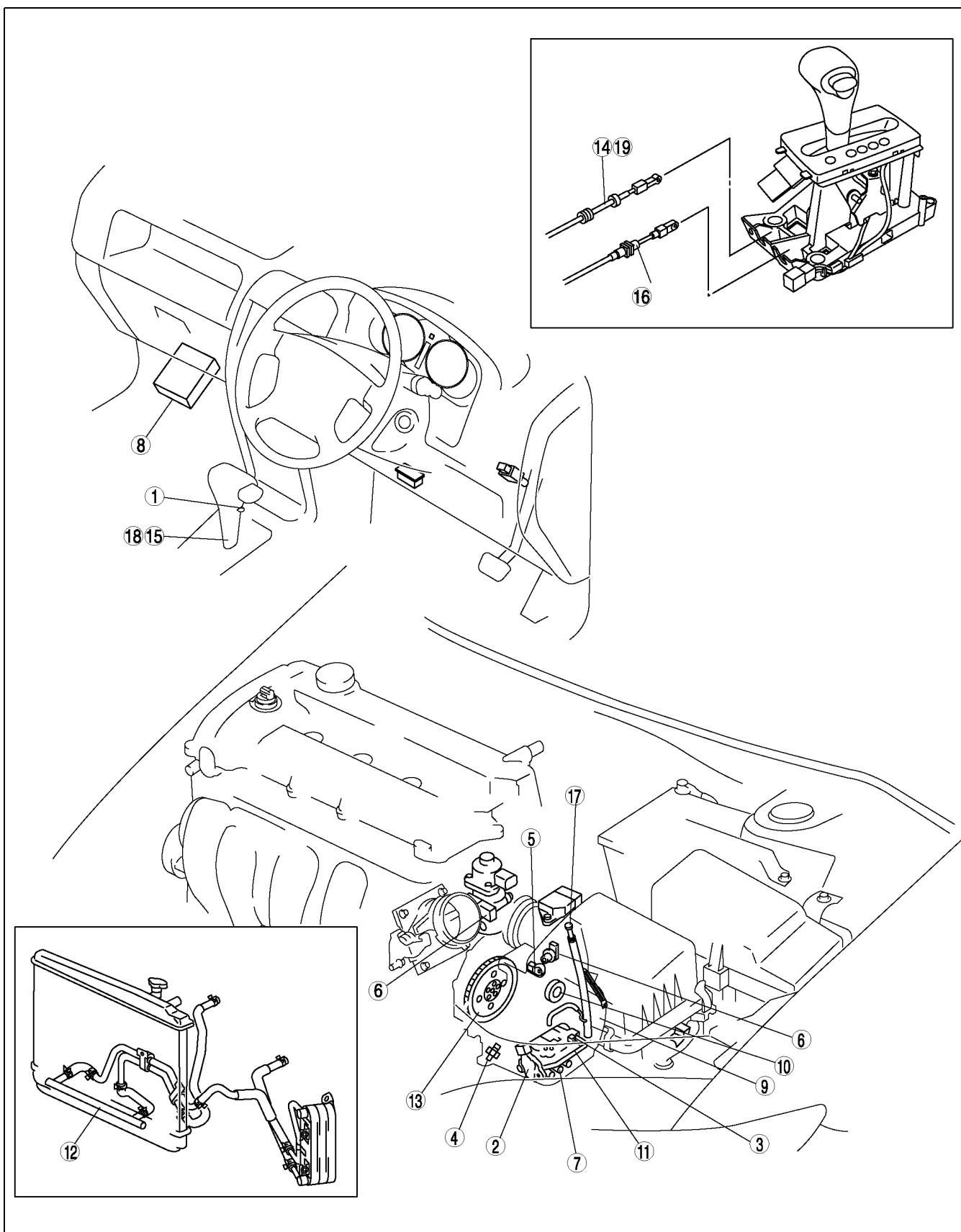
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K

AUTOMATIC TRANSAXLE

AUTOMATIC TRANSAXLE

MECHANICAL SYSTEM TEST

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Mechanical System Test Preparation

1. Engage the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant. (See [E-3 ENGINE COOLANT LEVEL INSPECTION.](#))
3. Inspect the engine oil. (See [D-4 ENGINE OIL INSPECTION.](#))
4. Inspect the ATF levels. (See [K-12 AUTOMATIC TRANSAXLE FLUID \(ATF\) INSPECTION.](#))
5. Inspect the idle speed and ignition timing in P position. (See [F-8 IDLE SPEED INSPECTION.](#))(See [F-8 IGNITION TIMING INSPECTION.](#))
6. Bring up the engine and transaxle to normal operating temperature.

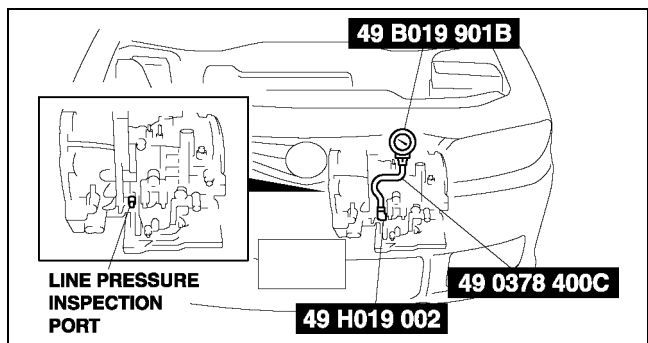
Line Pressure Test

1. Perform mechanical system test preparation. (See [K-6 Mechanical System Test Preparation.](#))

Warning

- Removing the square-head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square-head plug, allow the ATF to cool.

2. Connect the **SSTs** (49 H019 002 and, 49 0378 400C) to the line pressure inspection port, then replace the gauge of the **SST** (49 0378 400C) with the **SST** (49 B019 901B).
3. Start the engine, then warm up the automatic transaxle.
4. Shift the selector lever to D range.
5. Read the line pressure at idle engine speed for the D range.
6. Read the line pressure at idle engine speed for the D (HOLD), S, S (HOLD), L, L (HOLD) ranges and R positions in the same manner as in Steps 4-5.
7. Stop the engine, then replace the **SST** (49 B019 901B) with the gauge of the **SST** (49 0378 400C).
8. Start the engine.
9. Firmly depress the brake pedal with the left foot.
10. Shift the selector lever to D range position.



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Caution

- If the accelerator pedal is pressed for longer than 5 seconds while the brake pedal is pressed, the transaxle could be damaged. Therefore, perform Steps 11 and 12 within 5 seconds each.

11. Gradually depress the accelerator pedal with the right foot.
12. When the engine speed no longer increases, quickly read the line pressure and release the accelerator pedal.
13. Shift the selector lever to N position and let the engine idle for 1 minute or more to cool the ATF.
14. Read the line pressure at the engine stall speed for the D, D (HOLD), S, S (HOLD), L, L (HOLD) ranges and R position in the same manner as in Steps 9-13.

Specified line pressure

Position/Range		Line pressure (kPa {kgf/cm ² , psi})
		LF
D, S, L*	idle	330—470 {3.4—4.8, 48—68}
	Stall	1,160—1,320 {11.8—12.5, 168—191}
R	idle	490—710 {5.0—7.2, 71—102}
	Stall	1,600—1,820 {16.3—18.6, 232—264}

* : Includes each HOLD mode

Warning

- Removing the square-head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square-head plug, allow the ATF to cool.

AUTOMATIC TRANSAXLE

15. Remove the **SSTs**.
16. Install a new square head plug in the inspection port.

Tightening torque

5.0—9.8 N·m {50—100 kgf·cm, 44—86 in·lbf}

Evaluation of line pressure test

Line pressure	Possible cause
Low pressure in all ranges	Worn oil pump Oil leaking from oil pump, control valve body, and/or transaxle case Pressure regulator valve sticking Pressure control solenoid malfunction Pressure modulator valve sticking Solenoid reducing valve sticking
Low pressure in D and S only	Oil leaking from hydraulic circuit of forward clutch
Low pressure in L and R only	Oil leaking from hydraulic circuit of low and reverse brake
Low pressure in R only	Oil leaking from hydraulic circuit of reverse clutch
High pressure in all ranges	Pressure control solenoid malfunction Pressure regulator valve sticking Pressure modulator valve sticking Pressure reducing valve sticking

K

Stall Test

1. Perform mechanical system test preparation. (See [K-6 Mechanical System Test Preparation](#).)
2. Start the engine.
3. Firmly depress the brake pedal with the left foot.
4. Shift the selector lever to D range.

Caution

- **If the accelerator pedal is pressed for longer than 5 seconds while the brake pedal is pressed, the transaxle could be damaged. Therefore, perform Steps 5 and 6 within 5 seconds of each other.**

5. Gently depress the accelerator pedal with the right foot.
6. When the engine speed no longer increases, quickly read the speed and release the accelerator pedal. When the engine speed no longer increases, quickly read the speed and release the accelerator pedal.
7. Shift the selector lever to N position and let the engine idle for 1 minute or more to cool the ATF.
8. Perform a stall test of D (HOLD), S, S (HOLD), L, L (HOLD) and R range positions in the same manner as in Steps 3—7.
9. Turn the ignition switch off.

Engine stall speed

Position/ Range	Engine stall speed (rpm)
	LF
D, S, L*	2,000—2,600
R	

* : Includes each HOLD mode

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Evaluation of stall test

Condition		Possible cause	
Above specification	In all forward ranges and R position	Insufficient line pressure	Worm oil pump Oil leaking from oil pump, control valve, and/or transaxle case Pressure regulator valve sticking Pressure control solenoid malfunction Pressure modulator valve sticking
	In forward ranges	Forward clutch slippage One-way clutch 1 slippage	
	In D ranges	One-way clutch 2 slippage	
	In S ranges	2-4 brake band slippage	
	In L range and R position	Low and reverse brake slippage	
	In R position	Low and reverse brake slippage Reverse clutch slipping Perform road test to determine whether problem is low and reverse brake or reverse clutch • Engine braking felt in L range: Reverse clutch • Engine braking not felt in L range: Low and reverse brake	
	Below specification	Engine out of tune One-way clutch slipping within torque converter	

Time Lag Test

1. Perform mechanical system test preparation. (See [K-6 Mechanical System Test Preparation](#).)
2. Use a stopwatch to measure the time it takes from shifting until shock is felt when shifting the selector lever from N position to D range (non-HOLD mode). Take three measurements for each test and take the average from the results using the following formula.

Formula:

$$\text{Average time lag} = (\text{Time 1} + \text{Time 2} + \text{Time 3}) / 3$$

3. Perform the test for the following shifts in the same manner Step 2.
 - N position → D range (HOLD mode)
 - N position → R position

Time lag

N position → D range ... 0.4—0.7 s

N position → R position ... 0.4—0.7 s

Evaluation of time lag test

Condition		Possible Cause
N → D shift	More than specification	Insufficient line pressure Forward clutch slipping Oil leaking from forward clutch fluid circuit Shift solenoid A not operating properly
	Less than specification	Forward accumulator not operating properly Shift solenoid A not operating properly Excessive line pressure
N → D (HOLD) shift	More than specification	Insufficient line pressure Forward clutch slipping Shift solenoid A not operating properly
	Less than specification	Forward accumulator not operating properly Shift solenoid A not operating properly Excessive line pressure
N → R shift	More than specification	Insufficient line pressure Low and reverse brake slipping Reverse clutch slipping Shift solenoid B not operating properly
	Less than specification	Servo apply accumulator not operating properly Shift solenoid B not operating properly Excessive line pressure

AUTOMATIC TRANSAXLE

ROAD TEST

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Warning

- When performing a road test, be aware of other vehicles, people, impediments, etc. to avoid an accident.

Note

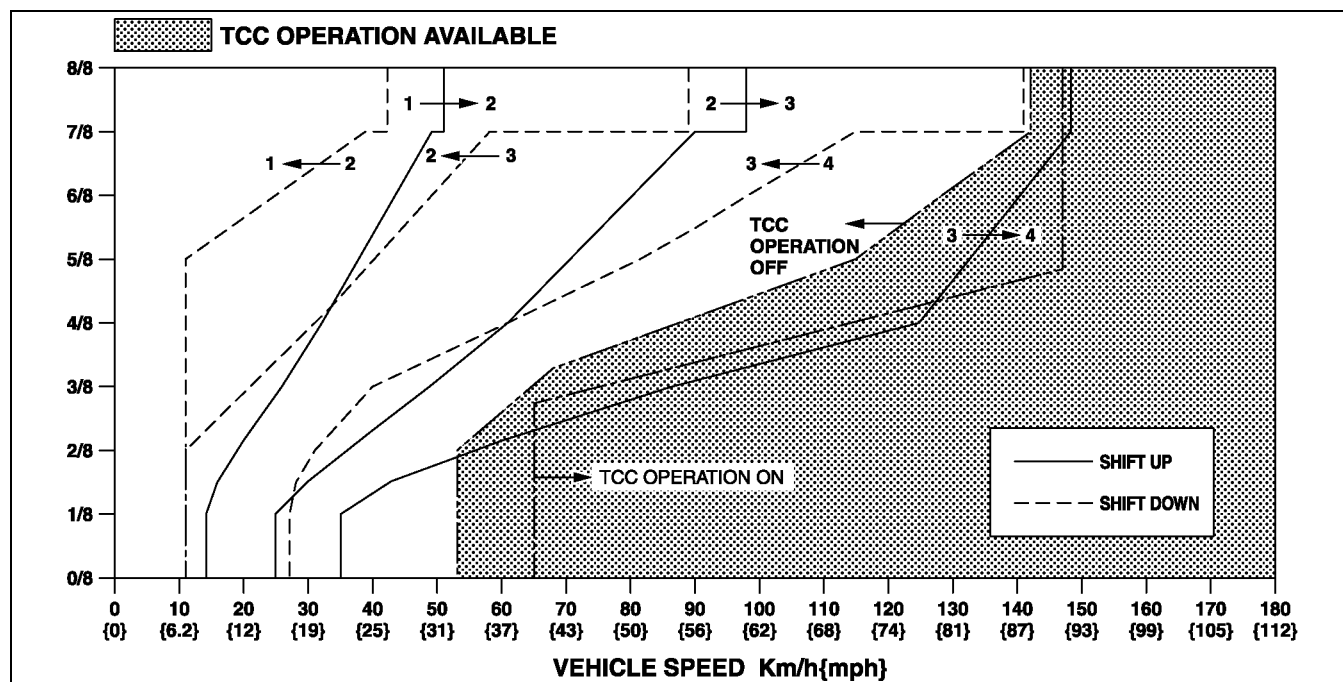
- When the legal speed limit must be exceeded, use a chassis dynamometer instead of performing a road test.

Road Test Preparation

1. Inspect the engine coolant levels. (See [E-3 ENGINE COOLANT LEVEL INSPECTION.](#))
2. Inspect the engine oil levels. (See [D-4 ENGINE OIL INSPECTION.](#))
3. Inspect the ATF levels. (See [K-12 AUTOMATIC TRANSAXLE FLUID \(ATF\) INSPECTION.](#))
4. Inspect the idle speed and ignition timing in P position. (See [F-8 IDLE SPEED INSPECTION.](#))(See [F-8 IGNITION TIMING INSPECTION.](#))
5. Bring up the engine and transaxle to normal operating temperature.

Shift Diagram

D range (normal mode)



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D Range Test

1. Perform road test preparation. (See [K-9 Road Test Preparation.](#))
2. Shift the selector lever to D range.
3. Accelerate the vehicle with half and WOT, then verify that 1→2, 2→3, and 3→4 upshifts can be obtained. The shift points must be as shown in the table below.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE.](#))
4. Drive the vehicle in 4GR, 3GR, and 2GR and verify that kickdown occurs for 4→3, 3→2, 2→1 downshifts, and that the shift points are as shown in the table below.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE.](#))
5. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR, and 4GR.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE.](#))
6. Drive the vehicle and verify that TCC operation is obtained. The operation points must be as shown in the table below.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE.](#))
7. Select HOLD mode.

AUTOMATIC TRANSAXLE

8. Accelerate the vehicle at half throttle and WOT, and verify that 4→3, 3→2, and 2→3 shift can be obtained. The shift points must be as shown in the table below.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
9. Drive the vehicle in 4GR, 3GR, 2GR and verify that kickdown does not occur.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
10. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR, and 4GR.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)

Shift point table

Range/Mode		Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
D	NORMAL	WOT	D ₁ →D ₂	50—56 {31—34}	5,450—6,050
			D ₂ →D ₃	96—104 {60—64}	5,550—5,950
			D ₃ →D ₄	145—155 {90—96}	5,600—5,950
			TCC ON(D ₄)	152—162 {95—100}	4,250—4,500
		Half throttle	D ₁ →D ₂	28—36 {18—22}	3,000—3,900
			D ₂ →D ₃	52—68 {33—42}	2,950—3,950
			D ₃ →D ₄	108—136 {67—84}	4,150—5,200
			TCC ON(D ₄)	95—129 {59—79}	2,650—3,600
		CTP	D ₄ →D ₃	24—30 {15—18}	700—800
			D ₃ →D ₁	8—14 {5—8}	350—500
		Kickdown (WOT)	D ₄ →D ₃	136—146 {85—90}	3,800—4,050
			D ₃ →D ₂	85—93 {53—57}	3,300—3,550
			D ₂ →D ₁	39—45 {25—27}	2,250—2,550
	POWER	WOT	D ₁ →D ₂	50—56 {31—34}	5,450—6,050
			D ₂ →D ₃	96—104 {60—64}	5,550—5,950
			D ₃ →D ₄	145—155 {90—96}	5,600—5,950
		Half throttle	D ₁ →D ₂	35—44 {22—27}	3,800—4,750
			D ₂ →D ₃	73—92 {46—57}	4,200—5,200
			D ₃ →D ₄	111—139 {69—86}	4,250—5,350
		CTP	D ₄ →D ₃	32—38 {20—23}	900—1,050
			D ₃ →D ₁	8—14 {5—8}	350—500
		Kickdown (WOT)	D ₄ →D ₃	136—146 {85—90}	3,800—4,050
			D ₃ →D ₂	85—93 {53—57}	3,300—3,550
			D ₂ →D ₁	39—45 {25—27}	2,250—2,550
	HOLD	ALL round	D ₂ →D ₃	15—25 {10—15}	900—1,400
			D ₄ →D ₃	145—151 {90—93}	4,050—4,200
			D ₃ →D ₂	7—13 {5—8}	300—450

S Range Test

1. Perform road test preparation. (See [K-9 Road Test Preparation](#).)
2. Shift the selector lever to S range.
3. Accelerate the vehicle at half throttle and WOT, then verify that 1→2 and 2→3 upshifts can be obtained. The shift points must be as shown in the table below.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
4. Drive the vehicle in 2GR, 3GR, 4GR and verify that kickdown occurs for 4→3, 3→2, 2→1 downshift, and that the shift point is as shown in the table below.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
5. Decelerate the vehicle and verify that engine braking effect is felt in 2GR, 3GR and 4GR.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
6. Select HOLD mode.

AUTOMATIC TRANSAXLE

7. Accelerate the vehicle in 2GR at half throttle and WOT, and verify that 2GR is held.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
8. Decelerate the vehicle and verify that engine braking effect is felt.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)

Shift point table

Range/Mode		Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
S	NORMAL	WOT	S ₁ →S ₂	50—56 {31—34}	5,450—6,050
			S ₂ →S ₃	96—104 {60—64}	5,550—5,950
		Half throttle	S ₁ →S ₂	35—44 {22—27}	3,800—4,750
			S ₂ →S ₃	73—92 {46—57}	4,200—5,250
		CTP	S ₄ →S ₃	145—151 {90—93}	4,050—4,200
			S ₃ →S ₁	8—14 {5—8}	350—500
		Kickdown (WOT)	S ₃ →S ₂	85—93 {53—57}	3,300—3,550
			S ₂ →S ₁	39—45 {25—27}	2,250—2,550
	HOLD	ALL round	S ₄ →S ₃	145—151 {90—93}	4,050—4,200
			S ₃ →S ₂	95—101 {59—62}	3,650—3,850

L Range Test

1. Perform road test preparation. (See [K-9 Road Test Preparation](#).)
2. Shift the selector lever to L range.
3. Accelerate the vehicle at half throttle and WOT, then verify that 1→2 upshift. The shift points must be as shown in the table below.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
4. Drive the vehicle in 2GR and verify that kickdown occurs for 2→1 downshift, and that the shift point is as shown in the table below.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
5. Decelerate the vehicle and verify that engine braking effect is felt in 1GR, 2GR, 3GR and 4GR.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
6. Select HOLD mode.
7. Accelerate the vehicle in 1GR at half throttle and WOT, and verify that 1GR is held.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)
8. Decelerate the vehicle and verify that engine braking effect is felt.
 - If not as specified, inspect the PCM and ATX. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)

Shift point table

Range/Mode		Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
L	NORMAL	WOT	L ₁ →L ₂	50—56 {31—34}	5,450—6,050
		Half throttle	L ₁ →L ₂	35—44 {22—27}	3,800—4,750
		CTP	L ₄ →L ₃	145—151 {90—93}	4,050—4,200
			L ₃ →L ₂	95—101 {59—62}	3,650—3,850
			L ₂ →L ₁	8—14 {5—8}	500—800
		Kickdown (WOT)	L ₄ →L ₃	143—153 {89—94}	4,000—4,250
	HOLD	ALL round	L ₄ →L ₃	145—151 {90—93}	4,050—4,200
			L ₃ →L ₂	95—101 {59—62}	3,650—3,850
			L ₂ →L ₁	39—45 {25—27}	2,250—2,500

AUTOMATIC TRANSAXLE

P Position Test

- Shift into P position on a gentle slope. Release the brake and verify that the vehicle does not roll.

AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION

A6E561401030W03

Automatic Transaxle Fluid (ATF) Condition Inspection

- One way of determining whether the transaxle should be disassembled is by noting:
 - If the ATF is muddy or varnished.
 - If the ATF smells strange or unusual.

ATF Condition

Condition		Possible cause
Clear red	Normal	—
Light red: pink	Contaminated with water	- Broken oil cooler inside of radiator - Poor filler tube installation: Problem could be occurring to parts inside the transaxle by water contamination. It is necessary to overhaul transaxle and detect defected parts. If necessary, exchange transaxle.
Reddish brown	Has burnt smell and metal specks are found	Defect powertrain components inside of transaxle: Specks cause wide range of problems by plugging up in oil pipe, control valve body and oil cooler in radiator. - When large amount of metal specks are found, overhaul transaxle and detect defected parts. If necessary, exchange transaxle. - Implement flushing operation as there is a possibility to have specks plugging up oil pipe and/or oil cooler inside of radiator.
	Has no burnt smell	• Discoloration by oxidation

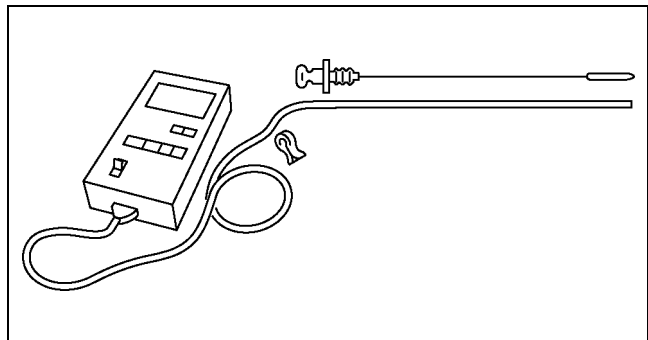
Automatic Transaxle Fluid (ATF) Level Inspection

Caution

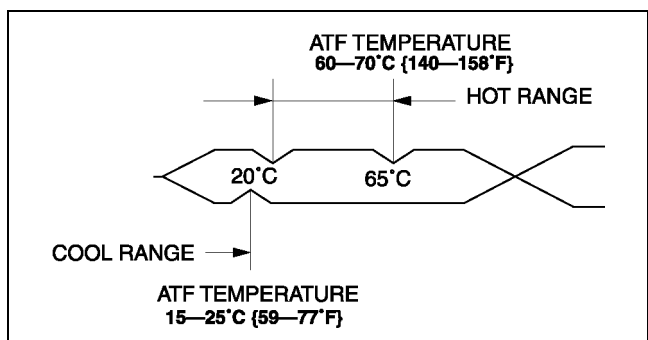
- The ATF amount varies according to ATF's temperature. Therefore, when checking the ATF level or replacing the ATF, use a thermometer to measure the temperature then adjust the ATF amount to the specified level according to the specified temperature.

- Park the vehicle on level ground.
- Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
- Adjust the length or thermistor probe to measure the same depth as the depth gauge and hold the probe with a paper holder. Insert into the filler tube and measure the temperature.
 - If necessary, inspect the ATF before warming up the engine. In this case, use the cool range. **15—25 °C {59—77 °F}**
- Warm up the engine until the ATF reaches **60—70 °C {140—158 °F}**.
- Shift the selector lever and pause momentarily in each range (D—L) while depressing the brake pedal.
- Shift the selector lever to P position.
- Verify that the ATF level is in the HOT range (65 °C {149 °F}) while the engine is idling.
 - If necessary, add ATF to the specification.

ATF type
ATF M-V



A6E5614W003



A6E5614W004

AUTOMATIC TRANSAXLE

AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT

A6E561401030W04

Warning

- When the transaxle and ATF are hot, they can badly burn you. Turn off the engine and wait until they are cool before changing the ATF.

1. Remove the oil dipstick.
2. Remove the oil drain plug and washer.
3. Drain the ATF into a container.
4. Install a new washer and the drain plug.

Tightening torque

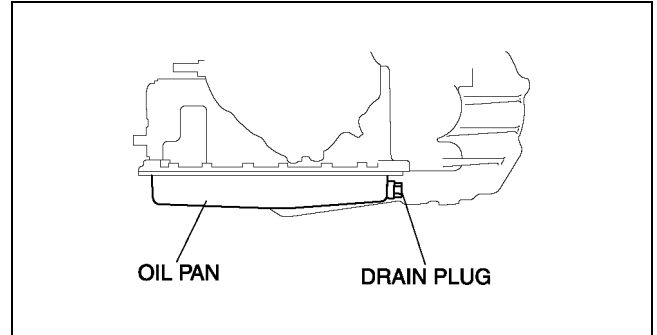
30—41 N·m {3.0—4.2 kgf·m, 22—30 ft·lbf}

5. Add the specified ATF until ATF level reaches lower notch of dipstick type of ATF through the oil filler tube.

ATF type

ATF M-V

6. Ensure that the ATF level is in the HOT range (65 °C{149 °F}).
 - Add ATF to the specified level as necessary.



A6E5614W005

K

HOLD SWITCH INSPECTION

A6E561446030W01

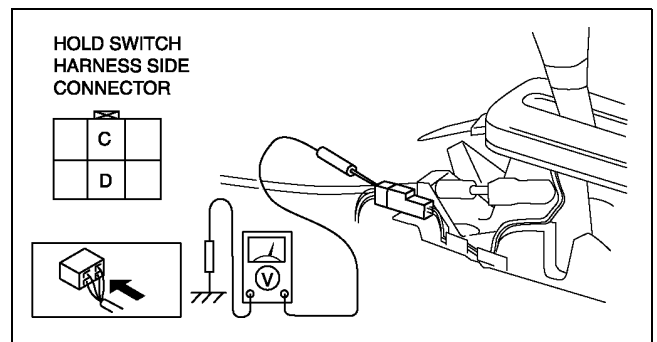
Operating Inspection

1. Turn the ignition switch to ON (engine OFF).
2. Verify that the HOLD indicator light is not illuminated. Depress the HOLD switch and verify that the HOLD indicator light illuminates.
 - If not as specified, inspect the terminal voltage of the HOLD switch.

Voltage Inspection

1. Remove the console.
2. Turn the ignition switch to ON (engine OFF).
3. Measure the voltage at the HOLD switch connector.
 - If not as specified, inspect for continuity at the HOLD switch.

HOLD switch position	Connector terminal	
	C	D
Normal	B+	0
Depressed	0	0

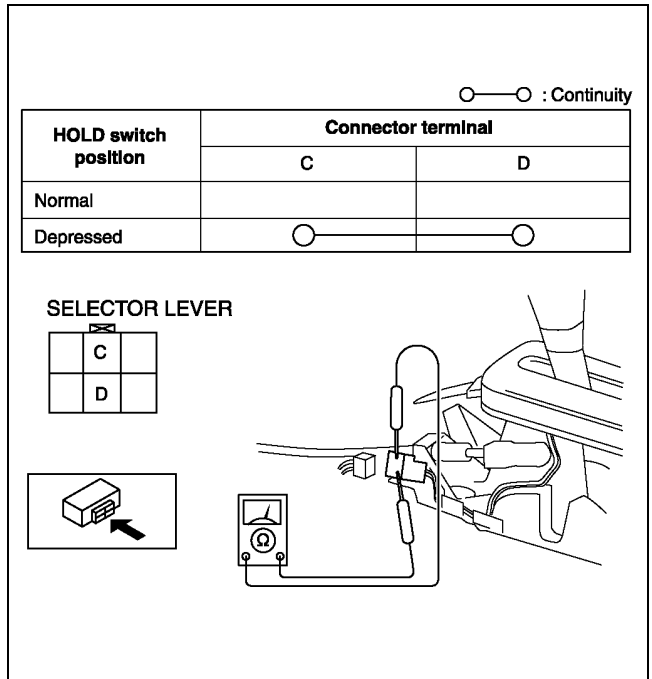


A6E5614W006

AUTOMATIC TRANSAXLE

Continuity Inspection of

1. Disconnect the negative battery cable.
2. Remove the console.
3. Disconnect the HOLD switch connector.
4. Inspect continuity at the HOLD switch.
 - If the switch is okay, inspect the wiring harness. (HOLD switch—PCM, HOLD switch—Body ground)
 - If not as specified, replace the HOLD switch. (See [K-14 HOLD SWITCH REMOVAL/INSTALLATION.](#))
5. Connect the HOLD switch connector.
6. Install the console.
7. Connect the negative battery cable.



HOLD SWITCH REMOVAL/INSTALLATION

A6E561446030W02

1. Disconnect the negative battery cable.
2. Remove the console.
3. Disconnect the connector and remove the HOLD switch terminals. (See [K-51 SELECTOR LEVER DISASSEMBLY/ASSEMBLY.](#))
4. Remove the selector lever knob component.
5. Remove the HOLD switch.
6. Install the HOLD switch to selector lever knob component.
7. Install selector lever knob component.

Tightening torque

15.68—22.54 N·m {1.599—2.298 kgf·m, 12—16 ft·lbf}

8. Install the HOLD switch terminals and connect the connector.
9. Install the console.
10. Connect the negative battery cable.

TRANSAXLE RANGE (TR) SWITCH INSPECTION

A6E561419440W01

Operating Inspection

1. Verify that the starter operates only when the ignition switch is at the START position with the selector lever in P or N position.
 - If not as specified, adjust the TR switch.
2. Verify that the back-up lights illuminate when shifted to R position with the ignition switch at the ON position.
 - If not as specified, adjust the TR switch.

Continuity Inspection

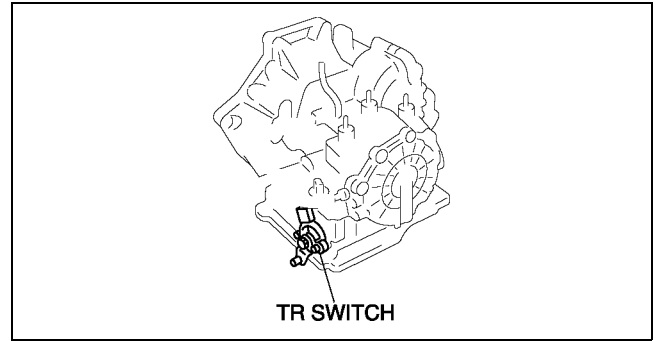
Caution

- Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.

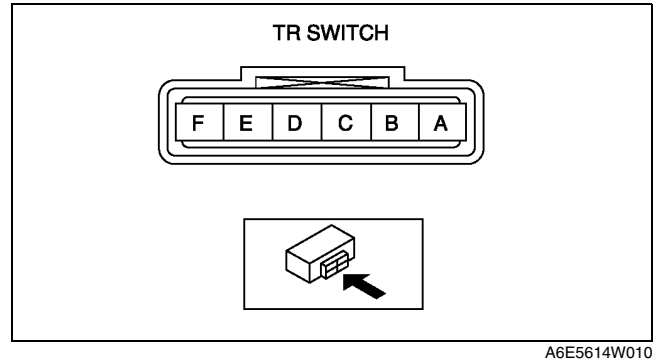
1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))

AUTOMATIC TRANSAXLE

3. Disconnect the TR switch connector.



4. Inspect for continuity at the TR switch.
 - If not as specified, adjust the TR switch and go to Step 4.
5. Reinspect for continuity at TR switch.
 - If not as specified, replace the TR switch.
(See [K-15 TRANSAXLE RANGE \(TR\) SWITCH REMOVAL/INSTALLATION.](#))
6. Connect the TR switch connector.
7. Install the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
8. Connect the negative battery cable.



TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION

A6E561419440W02

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))

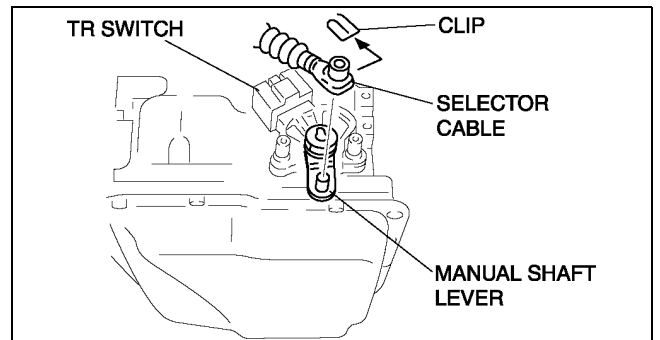
Caution

- Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.

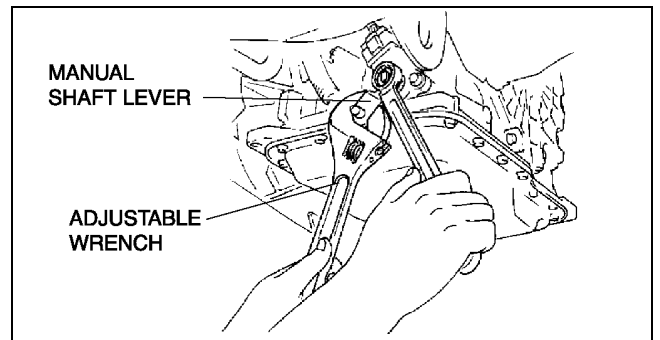
3. Disconnect the TR switch connector.
4. Remove the clip and disconnect the selector cable.

Caution

- Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.

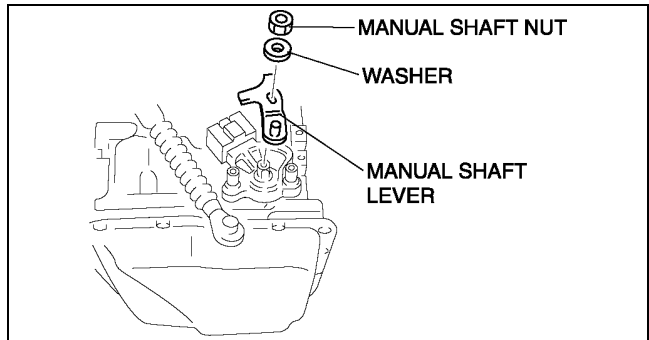


5. Set the adjustable wrench as shown to hold the manual shaft lever.
6. Remove the manual shaft nut and washer.



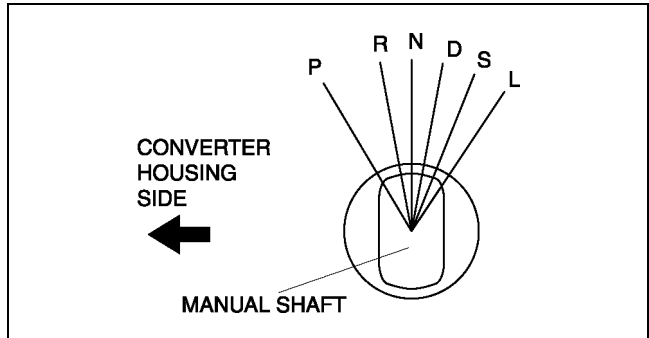
AUTOMATIC TRANSAXLE

7. Remove the manual shaft lever.
8. Remove the TR switch.



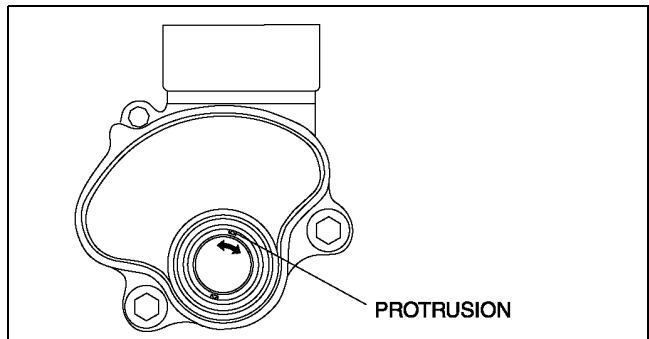
A6E5614W012

9. Rotate the manual shaft to the converter housing side fully, then return 2 notches to set the N position.

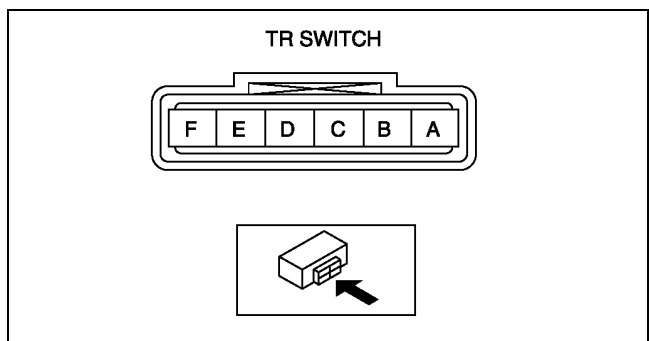


A6E5614W013

10. Turn the protrusion at resistance between the terminals B and C become 750 ohms.

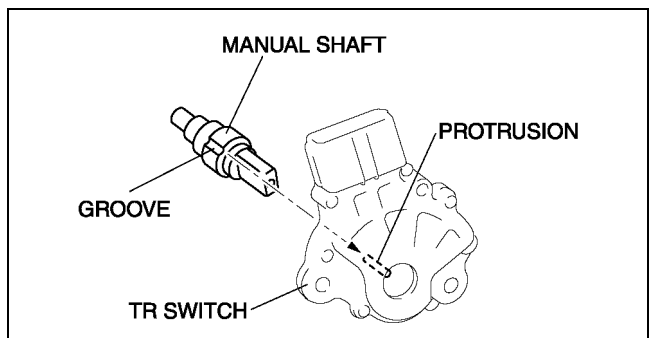


A6E5614W014



A6E5614W010

11. Install the TR switch while aligning the protrusion and groove as shown.
12. Hand-tighten the TR switch mounting bolts.



A6E5614W016

AUTOMATIC TRANSAXLE

13. Inspect the resistance between the terminals B and C.

- If not as specified, readjust the TR switch.
(See [K-18 TRANSAXLE RANGE \(TR\) SWITCH ADJUSTMENT.](#))

Resistance
750 ohms

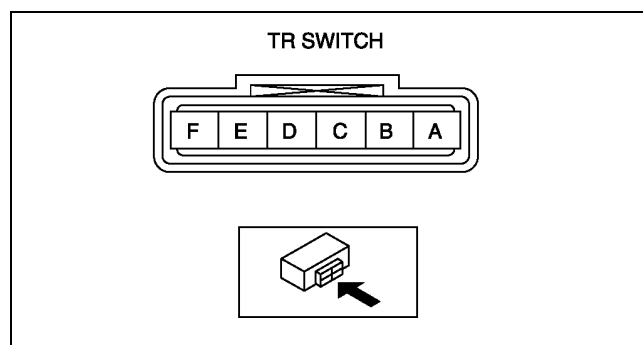
14. Tighten the TR switch mounting bolts.

Tightening torque
8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

Caution

- **Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.**

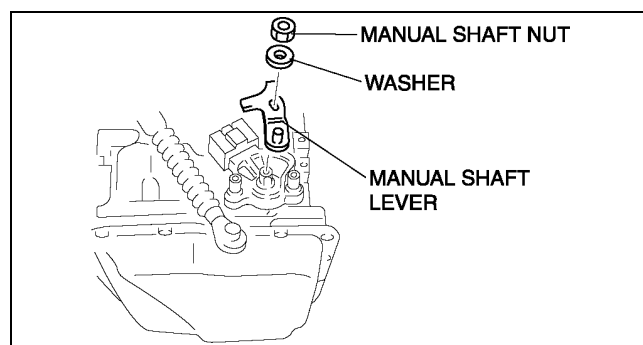
15. Install the manual shaft lever and the washer.



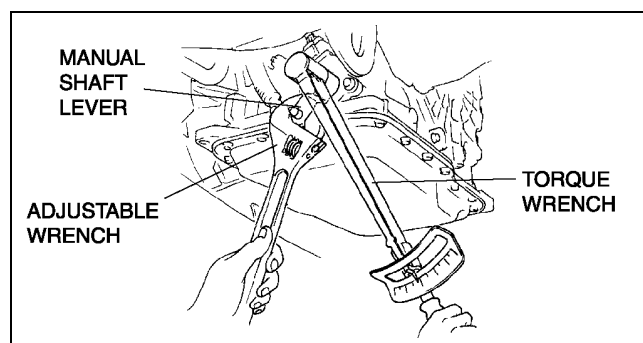
A6E5614W010

16. Set the adjustable wrench as shown to hold the manual shaft lever, and tighten the manual shaft nut.

Tightening torque
32—46 N·m {3.2—4.7 kgf·m, 24—33 ft·lbf}



A6E5614W012

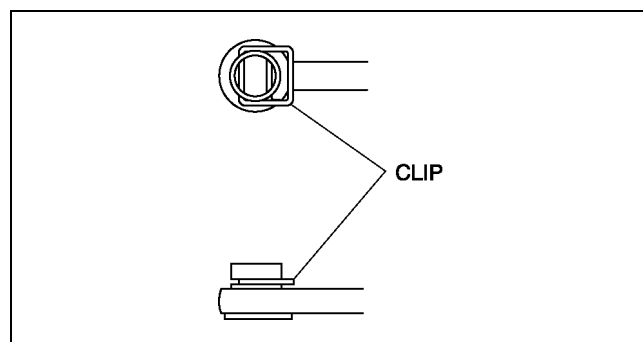


A6E5614W011

17. Install the clip to the SELECTOR CABLE as shown in the figure.

18. Shift the selector lever to P position.

19. Turn the manual shaft lever to P position.



A6E5614W018

AUTOMATIC TRANSAXLE

20. Connect the selector cable.
21. Inspect for continuity at the TR switch. (See [K-14 TRANSAXLE RANGE \(TR\) SWITCH INSPECTION](#).)

- If not as specified, readjust the TR switch. (See [K-18 TRANSAXLE RANGE \(TR\) SWITCH ADJUSTMENT](#).)

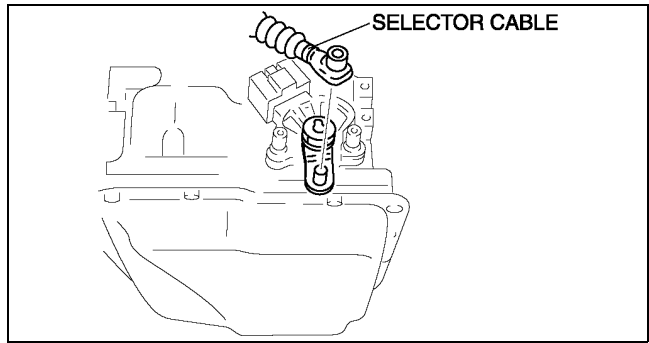
22. Connect the TR switch connector.

23. Install the aircleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#).)

24. Connect the negative battery cable.

25. Inspect operation of the TR switch. (See [K-14 TRANSAXLE RANGE \(TR\) SWITCH INSPECTION](#).)

- If not as specified, readjust the TR switch. (See [K-18 TRANSAXLE RANGE \(TR\) SWITCH ADJUSTMENT](#).)



A6E5614W019

TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT

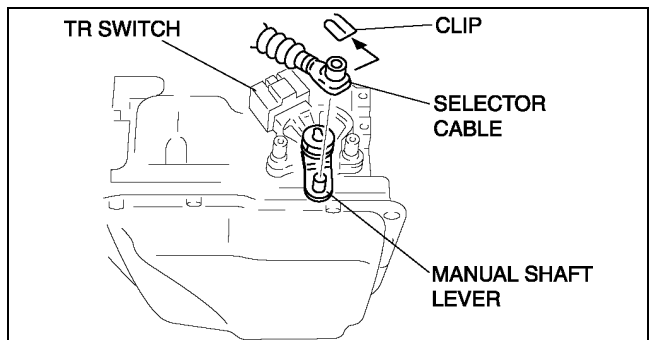
A6E561419440W03

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#).)

Caution

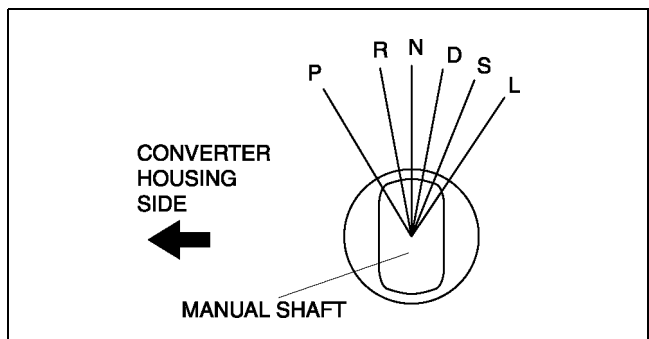
- Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.

3. Remove the clip and disconnect the selector cable.



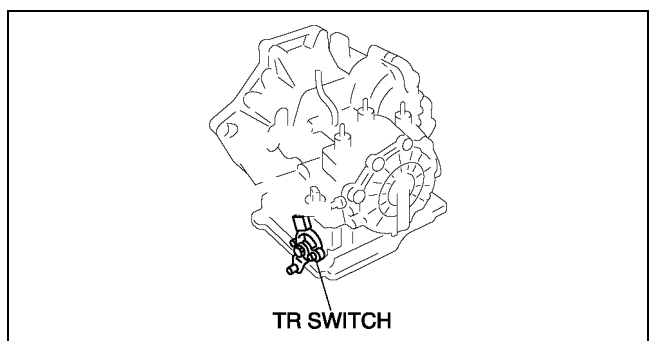
A6E5614W011

4. Rotate the manual shaft to the converter housing side fully, then return 2 notches to set the N position.



A6E5614W013

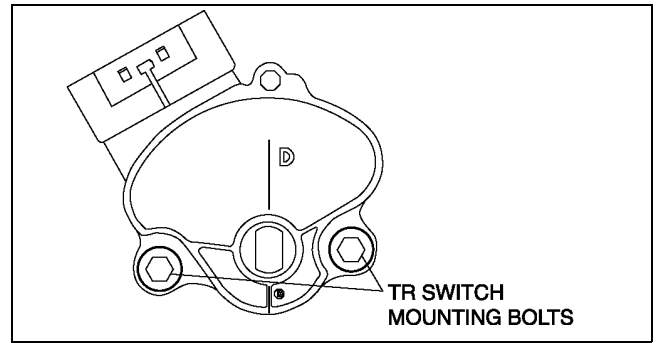
5. Disconnect the TR switch connector.



A6E5614W008

AUTOMATIC TRANSAXLE

6. Loosen the TR switch mounting bolts.

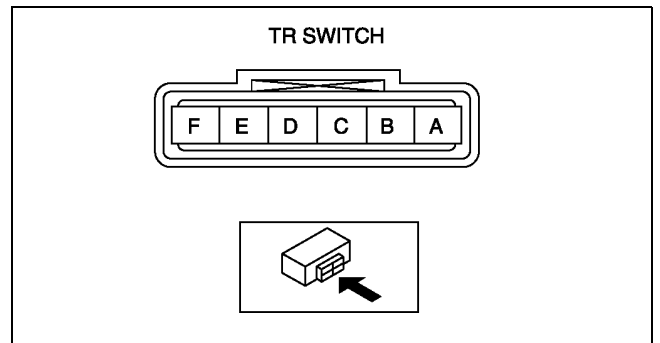


7. Measure the resistance between the terminals B and C.
8. Adjust the switch to the point as follow.

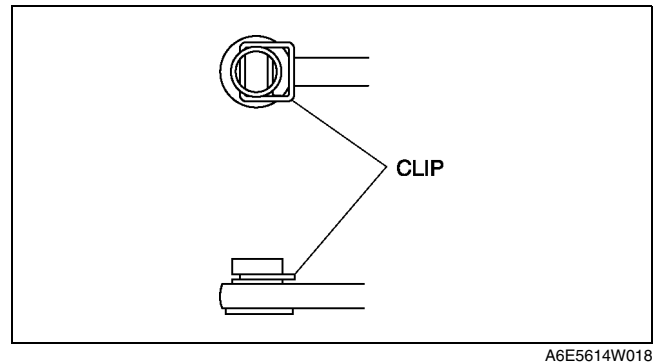
Resistance standard value
750 ohms

9. Tighten the TR switch mounting bolts.

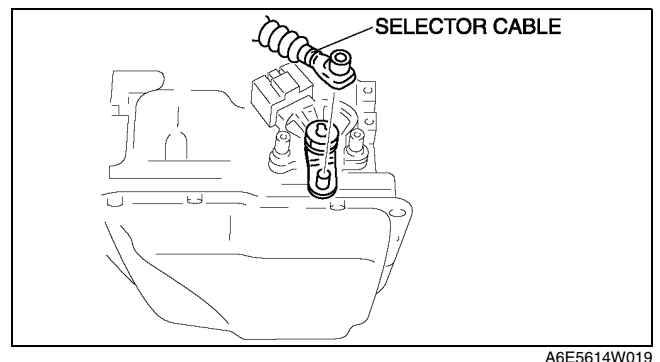
Tightening torque
8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}



10. Move the selector lever to N position.
11. Verify that the TR switch is aligned with N position.
12. Connect the TR switch connector.
13. Install the clip to the selector cable as shown in the figure.



14. Connect the selector cable to the manual shaft lever as shown in the figure.
15. Inspect operation of the TR switch. (See [K-14 TRANSAXLE RANGE \(TR\) SWITCH INSPECTION](#).)
• If not as specified, readjust the TR switch.
16. Install the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#).)
17. Connect the negative battery cable.



TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION

A6E561419010W01

On-Vehicle Inspection

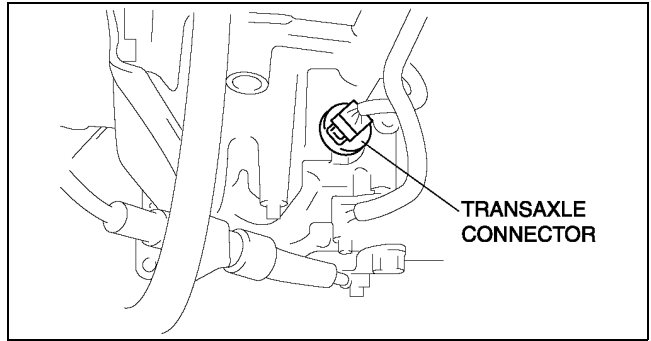
1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION](#).)

Caution

- Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.

AUTOMATIC TRANSAXLE

3. Disconnect the transaxle connector.

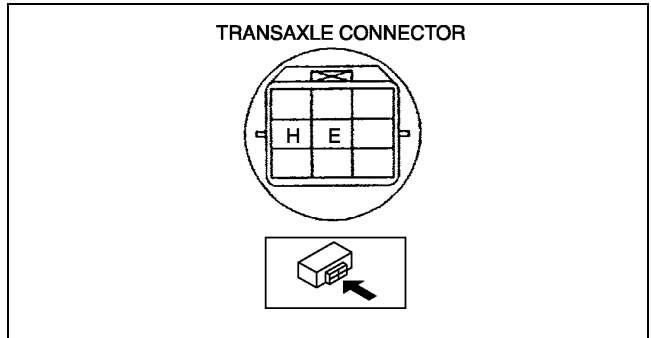


A6E5614W021

4. Measure the resistance between the terminals E and H.

- If it is out of specification, perform the off-vehicle inspection of TFT sensor. (See [K-21 TRANSAXLE FLUID TEMPERATURE \(TFT\) SENSOR REMOVAL/INSTALLATION.](#))

ATF temperature (°C {°F})	Resistance (kilohm)
-20 {-4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98



A6E5614W022

5. Install the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))

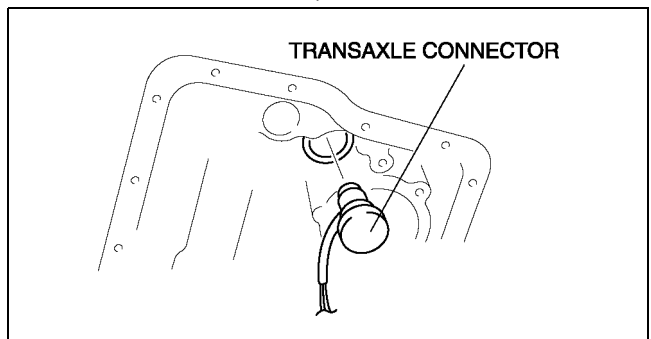
6. Connect the negative battery cable.

Off-Vehicle Inspection

Warning

- When the transaxle and ATF are hot, they can badly burn. Turn off the engine and wait until they are cool before replacing ATF.

1. Remove the control valve body. (See [K-34 CONTROL VALVE BODY REMOVAL.](#))
2. Remove the transaxle connector.
3. Remove the TFT sensor from the strainer, and connect it to the transaxle connector.
4. Place the TFT sensor and a thermometer in ATF as shown, and heat the ATF gradually.



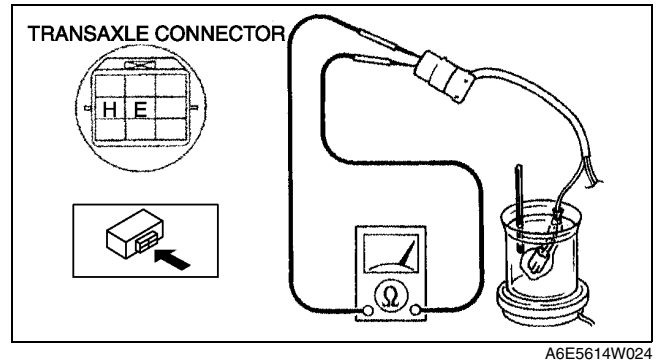
A6E5614W023

AUTOMATIC TRANSAXLE

5. Measure resistance between the terminals of the TFT sensor.

- If not as specified, replace the TFT sensor.
(See [K-21 TRANSAXLE FLUID TEMPERATURE \(TFT\) SENSOR REMOVAL/INSTALLATION.](#))

ATF temperature (°C {°F})	Resistance (kilohm)
-20 {-4}	236—324
0 {32}	84.3—110
20 {68}	33.5—42.0
40 {104}	14.7—17.9
60 {140}	7.08—8.17
80 {176}	3.61—4.15
100 {212}	1.96—2.24
120 {248}	1.13—1.28
130 {266}	0.87—0.98



6. Disconnect the TFT sensor from the transaxle connector, and install it to the oil strainer.
7. Install the transaxle connector.
8. Install the control valve body. (See [K-35 CONTROL VALVE BODY INSTALLATION.](#))

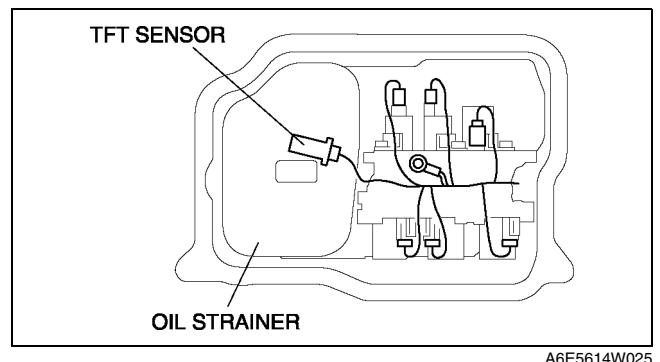
TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION

A6E561419010W02

Warning

- When the transaxle and ATF are hot, they can badly burn. Turn off the engine and wait until they are cool before replacing the ATF.

1. Remove the oil pan. (See [K-34 CONTROL VALVE BODY REMOVAL.](#))
2. Disconnect the TFT sensor connector.
3. Remove the TFT sensor.
4. Install a TFT sensor.
5. Connect the TFT sensor connector.
6. Install the oil pan. (See [K-35 CONTROL VALVE BODY INSTALLATION.](#))
7. Carry out the mechanical system test. (See [K-6 MECHANICAL SYSTEM TEST.](#))



OIL PRESSURE SWITCH INSPECTION

A6E561421550W01

Caution

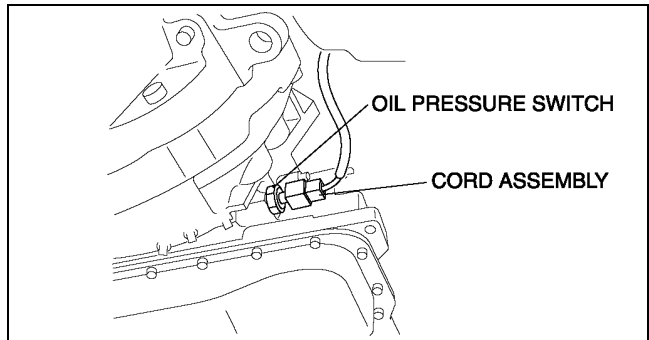
- Water or foreign objects entering the connector can cause poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.

On-vehicle Inspection (harness inspection)

1. Disconnect the negative battery cable.
2. Remove the under cover.

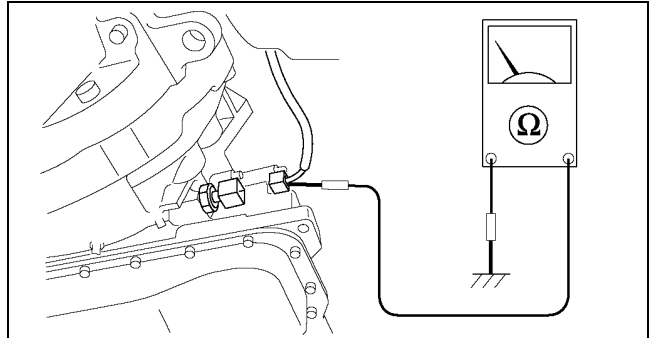
AUTOMATIC TRANSAXLE

3. Disconnect the cord assembly connector.



A6E5614W026

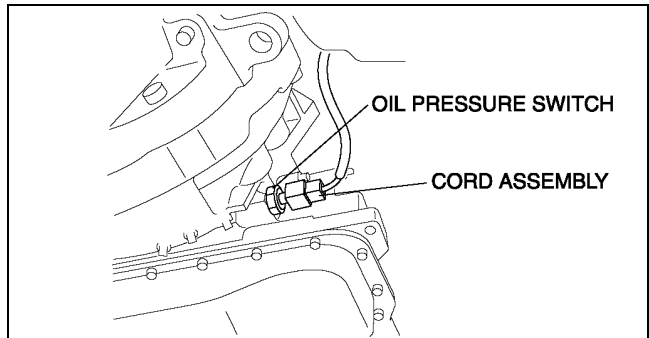
4. Verify that there is no continuity between cord assembly terminal and ground.
 - If as continuity, inspect the cord assembly.
 - If the cord assembly is okay, inspect the oil pressure switch. (See [K-22 On-vehicle Inspection \(oil pressure switch inspection\)](#).)
5. Connect the cord assembly connector.
6. Install the under cover.
7. Connect the negative battery cable.



A6E5614W027

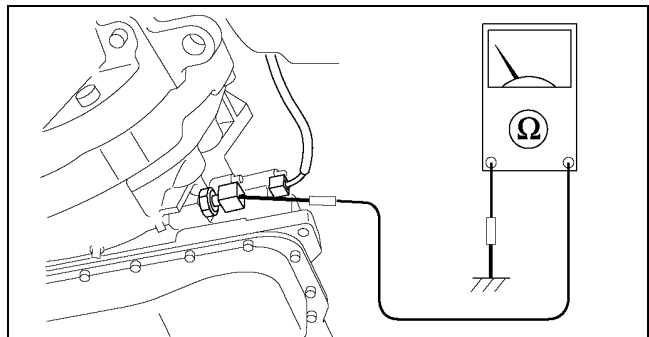
On-vehicle Inspection (oil pressure switch inspection)

1. Remove the under cover.
2. Disconnect the cord assembly connector.
3. Start the engine, with gear position in N or P.
4. Reaffirm that there is no continuity between cord assembly terminal and ground.
5. Firmly depress the brake pedal with the left foot.
6. Shift the selector lever to D range.



A6E5614W026

7. Verify that there is no continuity between cord assembly terminal and ground.
 - If not as specified, replace the oil pressure switch. (See [K-23 OIL PRESSURE SWITCH REMOVAL/INSTALLATION](#).)
8. Connect the oil pressure switch connector.
9. Install the under cover.
10. Connect the negative battery cable.

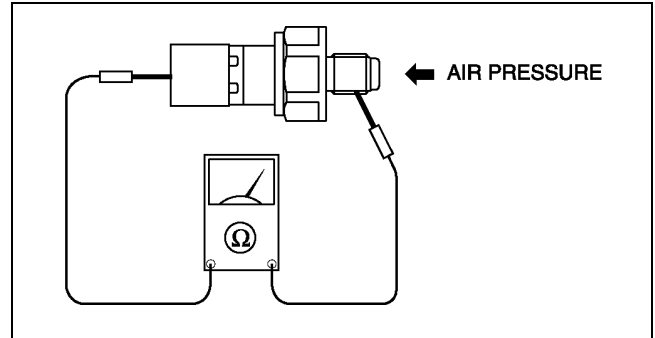


A6E5614W094

AUTOMATIC TRANSAXLE

Off-vehicle inspection

1. Remove the oil pressure switch.
2. Apply air pressure at 400—440 kPa {4.1—4.4kgf/cm², 58—63psi}
3. Inspect continuity the between oil pressure switch terminal and screw part.
 - If not as continuity, replace the oil pressure switch. (See [K-23 OIL PRESSURE SWITCH REMOVAL/INSTALLATION.](#))
4. Install the oil pressure switch.



A6E5614W028

OIL PRESSURE SWITCH REMOVAL/INSTALLATION

A6E561421550W02

Warning

- When the transaxle and ATF are hot, they can badly burn. Turn off the engine and wait until they are cool before replacing ATF.

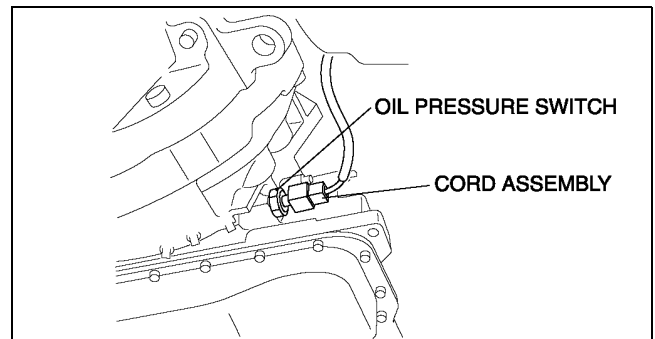
K

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Disconnect the cord assembly connector.
4. Remove the oil pressure switch.
5. Install the oil pressure switch.

Tightening torque

17.1—22.1N·m {1.75—2.25kgf·m, 13—16ft·lbf}

6. Connect the oil pressure switch connector.
7. Install the under cover.
8. Connect the negative battery cable.



A6E5614W026

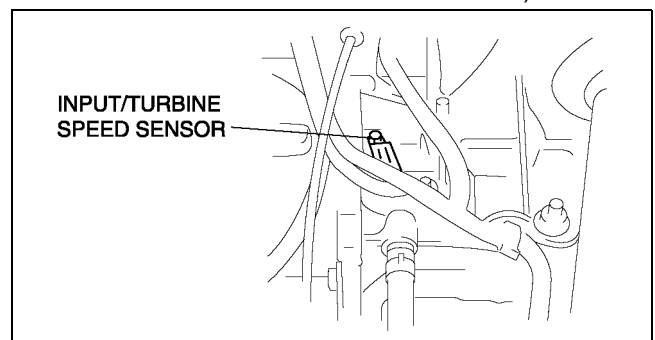
INPUT/TURBINE SPEED SENSOR INSPECTION

A6E561421550W03

Caution

- Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
4. Disconnect the input/turbine speed sensor connector.



A6E5614W030

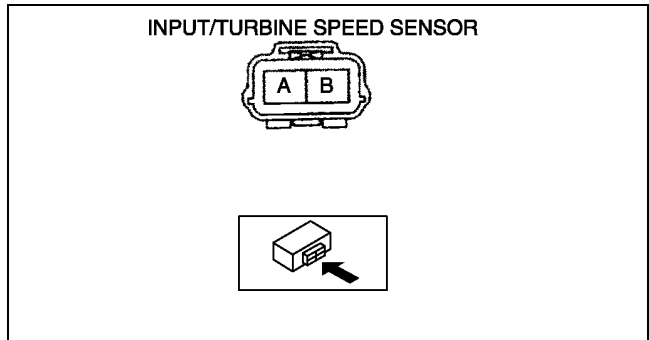
AUTOMATIC TRANSAXLE

5. Measure resistance between the terminals of the input/turbine speed sensor.
 - If not as specified, replace the input/turbine speed sensor.

Resistance

250—600 ohms (ATF temperature: -40—160 °C {-40—320 °F})

6. Connect the input/turbine speed sensor connector.
7. Install the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
8. Install the battery and battery tray.
9. Connect the negative battery cable.



A6E5614W031

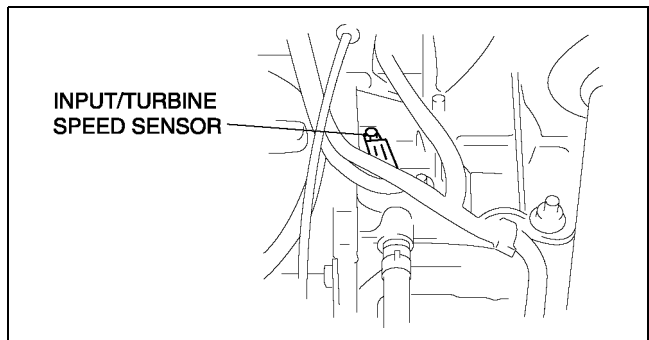
INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION

A6E561421550W04

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
4. Disconnect the input/turbine speed sensor connector.
5. Remove the input/turbine speed sensor.
6. Apply ATF to a new O-ring and install it on a new input/turbine speed sensor.
7. Install the input/turbine speed sensor.

Tightening torque

8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}



A6E5614W030

8. Connect the input/turbine speed sensor connector.
9. Install the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
10. Install the battery and battery tray.
11. Connect the negative battery cable.

VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION

A6E561401030W05

Visual Inspection

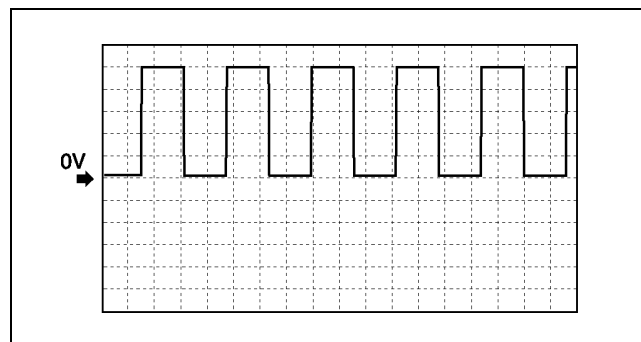
1. Remove the VSS. (See [K-26 VEHICLE SPEEDOMETER SENSOR \(VSS\) REMOVAL/INSTALLATION.](#))
2. Make sure that the sensor is free of any metallic shavings or particles.
 - If any are found on the sensor, clean them off.
3. Install the VSS. (See [K-26 VEHICLE SPEEDOMETER SENSOR \(VSS\) REMOVAL/INSTALLATION.](#))

Wave profile Inspection

1. Remove the PCM. (See [F-43 PCM REMOVAL/INSTALLATION.](#))
2. Connect WDS or equivalent to DLC connector.
3. Connect oscilloscope test leads to the following PCM connector terminals.
 - (+) lead: PCM terminal 3C
 - (-) lead: PCM terminal 1D
4. Start the engine.
5. Monitor VSS PID.

AUTOMATIC TRANSAXLE

6. Inspect wave profile.
 - PCM terminal: 3C (+) - 1D (-)
 - Oscilloscope setting: 1 V/DIV (Y), 2.5 ms/DIV (X), DC range
 - Vehicle condition: drive the vehicle with 32 km/h{20 mph}
 - If wave profile or voltage are out of specifications, carry out the “Open Circuit Inspection” or “Short Circuit Inspection”

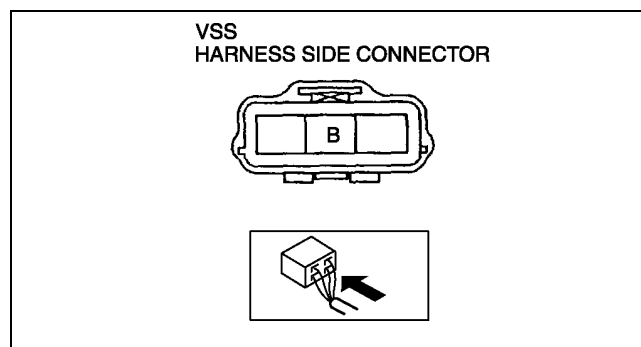


Power Supply Voltage Inspection

1. Disconnect the VSS connector.
2. Turn the ignition switch to ON.
3. Measure voltage at VSS connector terminal B (wiring harness side).

Specification
4.5—5.5 V

- If voltage is okay, go to Open Circuit Inspection and Short Circuit Inspection.
- If voltage is wrong, repair wiring harness between VSS and PCM.



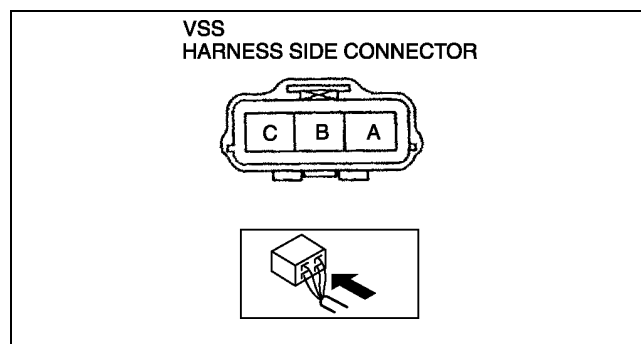
K

Open Circuit Inspection

1. Inspect the following circuit for open.
 - Power circuit (VSS connector terminal A to main relay terminal D)
 - Ground circuit (VSS connector terminal C to GND)
 - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
 - If there are no open or short circuits, perform the sensor rotor inspection.

Short Circuit Inspection

1. Inspect the following circuit for short.
 - Power circuit (VSS connector terminal A to main relay terminal D)
 - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
 - If there are no open or short circuits, perform the sensor rotor inspection.



Sensor Rotor Inspection

1. Remove the VSS. (See [K-26 VEHICLE SPEEDOMETER SENSOR \(VSS\) REMOVAL/INSTALLATION.](#))
2. Shift the selector lever to N position.
3. Inspect sensor rotor surface via VSS installation hole while rotating the front tire manually.
 - (1) Is sensor rotor free of damage and cracks?
 - (2) Is sensor rotor free of any metallic shavings or particles?
 - If sensor rotor is okay, replace the VSS.
 - If there is a problem, clean or replace the sensor rotor.

AUTOMATIC TRANSAXLE

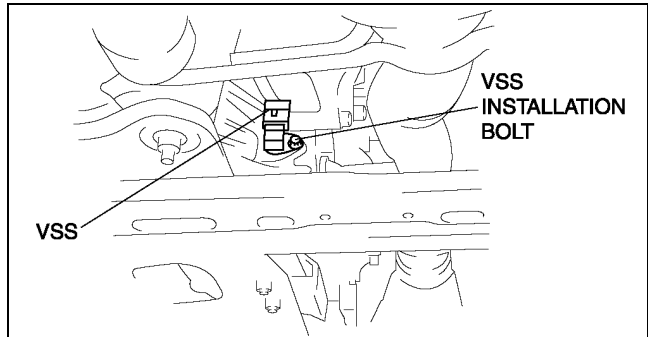
VEHICLE SPEEDOMETER SENSOR (VSS) REMOVAL/INSTALLATION

A6E561401030W06

Caution

- Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.
- If foreign materials are stuck to the VSS, disturbance by magnetic flux can cause sensor output to be abnormal and thereby negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the VSS during installation.

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Disconnect the VSS connector.
4. Remove the VSS.
5. Apply ATF to a new O-ring and install it on a new VSS.

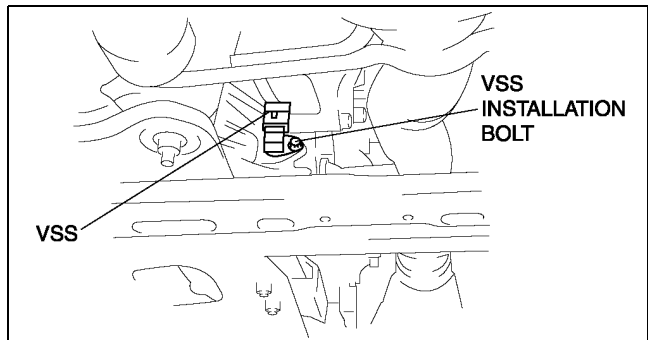


6. Install the VSS.

Tightening torque

8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

7. Connect the VSS connector.
8. Install the under cover.
9. Connect the negative battery cable.



SOLENOID VALVE INSPECTION

Resistance Inspection (On-Vehicle Inspection)

A6E561421280W01

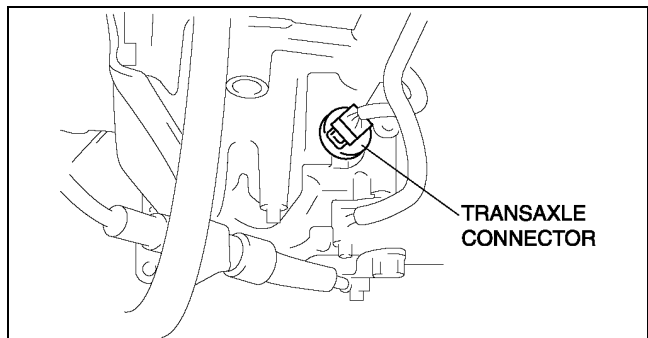
Caution

- Water or foreign objects entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign objects on the connector when disconnecting it.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
3. Disconnect the transaxle connector.

Note

- When inspecting the pressure control solenoid, connect the ground connection to the ground terminal (terminal I) of the pressure control solenoid inside the solenoid valve connector.

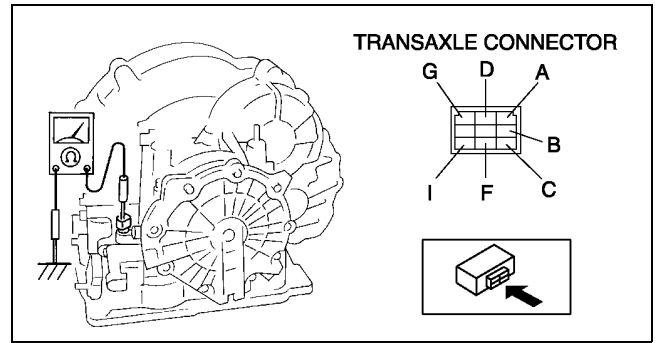


AUTOMATIC TRANSAXLE

4. Measure the resistance between the following terminals.
 - If not as specified, inspect the ground, then perform the operating inspection.

ATF temperature: -40—150 °C {-40—302 °F}

Terminal	Solenoid valve	Resistance (ohm)
A—GND	Shift solenoid A	1.0—4.2
C—GND	Shift solenoid B	1.0—4.2
G—GND	Shift solenoid C	1.0—4.2
B—GND	Shift solenoid D	10.9—26.2
F—GND	Shift solenoid E	10.9—26.2
D—I	Pressure control	2.4—7.3



A6E5614W039

5. Connect the transaxle connector.
6. Install the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
7. Connect the negative battery cable.

Operating Inspection

1. Disconnect the transaxle connector.

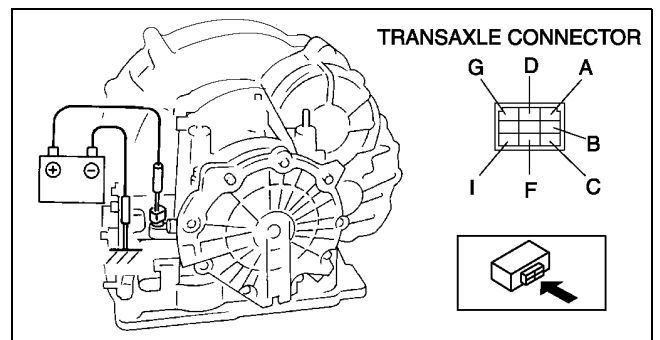
Caution

- Do not apply battery position voltage to terminals A, B, C, D, F and G for more than three seconds.

Note

- Because the operation sound of the valves is small, perform inspection in a quiet place.

2. Apply battery positive voltage to terminals A,B,C, F or G and battery negative voltage to GND, and verify that operating sound is heard from solenoid.
 - If the "click" is not heard, inspect the transaxle harness.
 - If the transaxle harness is okay, perform the resistance inspection (off-vehicle inspection).
 - If there is a problem, repair or replace the transaxle harness.
3. Apply battery positive voltage to terminal D and battery negative voltage to terminal I, and verify that operating sound is heard from solenoid.
 - If the "click" is not heard, inspect the transaxle harness.
 - If transaxle harness is okay, perform the resistance inspection (off-vehicle inspection)
 - If there is a problem, repair or replace the transaxle harness.



A6E5614W040

Resistance Inspection (Off-Vehicle Inspection)

1. Remove the control valve body. (See [K-28 SOLENOID VALVE REMOVAL/INSTALLATION.](#))
2. Measure the resistance of each solenoid valve individually.
 - If not as specified, replace the solenoid valve.
3. Install the control valve body. (See [K-28 SOLENOID VALVE REMOVAL/INSTALLATION.](#))

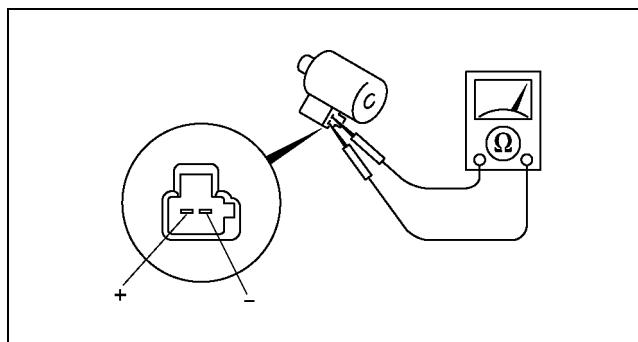
AUTOMATIC TRANSAXLE

Pressure control solenoid

Resistance

2.4—7.3 ohms

(ATF temperature: -40—150 °C {-40—302 °F})



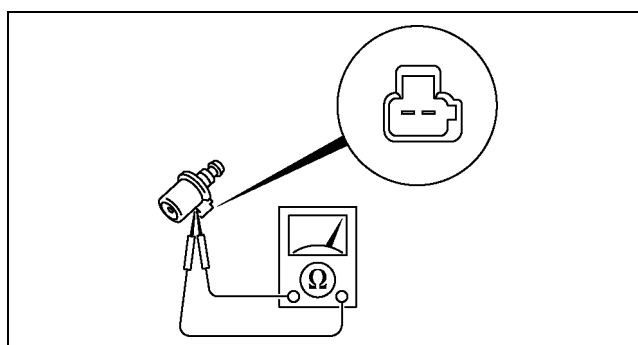
A6E5614W041

Shift solenoid A, B, C

Resistance

1.0—4.2 ohms

(ATF temperature: -40—150 °C {-40—302 °F})



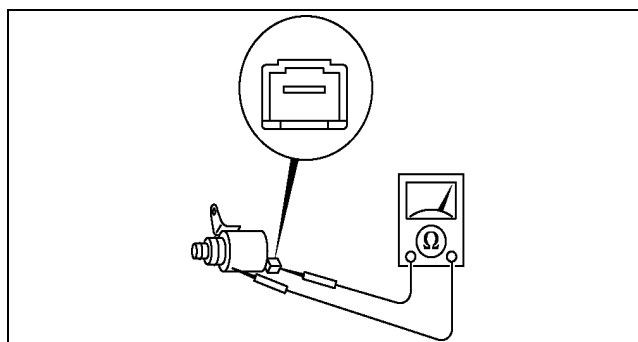
A6E5614W042

Shift solenoid D, E

Resistance

10.9—26.2 ohms

(ATF temperature: -40—150 °C {-40—302 °F})

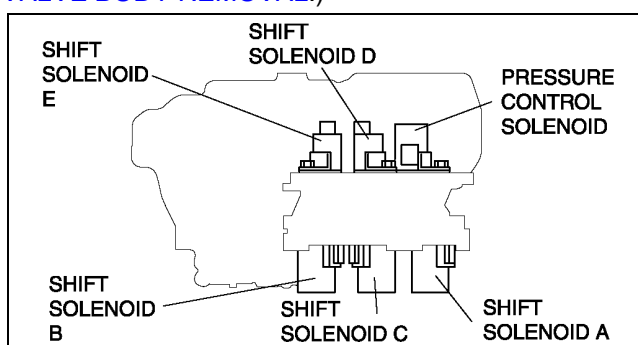


A6E5614W043

SOLENOID VALVE REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the under cover.
3. Remove the control valve body. (See [K-34 CONTROL VALVE BODY REMOVAL.](#))
4. Remove the solenoid valve(s).
5. Apply ATF to a new O-ring and install it on the solenoid valve.

A6E561421280W02



A6E5614W044

AUTOMATIC TRANSAXLE

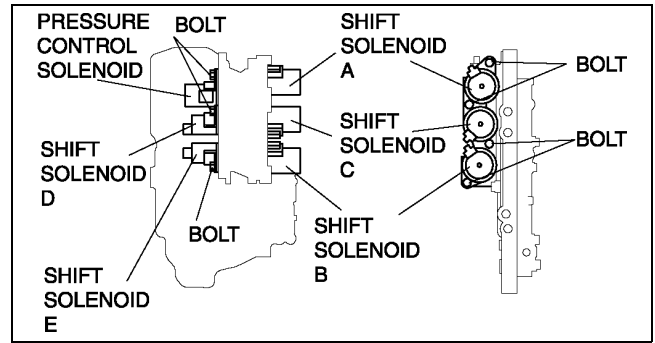
6. Install the solenoid valve in the control valve body.

Tightening torque

7.8—10.8 N·m

{80—110 kgf·cm, 70—95.4 in·lbf}

7. Install the control valve body. (See [K-34 CONTROL VALVE BODY REMOVAL.](#))
8. Install the under cover.
9. Connect the negative battery cable.
10. Add ATF and, with the engine idling, inspect the ATF level and inspect for leakage. (See [K-12 Automatic Transaxle Fluid \(ATF\) Level Inspection.](#))
11. Carry out the mechanical system test. (See [K-6 MECHANICAL SYSTEM TEST.](#))
12. Carry out the road test. (See [K-9 ROAD TEST.](#))



A6E5614W045

PCM INSPECTION

1. Inspect the PCM. (See [F-45 PCM INSPECTION.](#))

A6E561418880W01

K

PCM REMOVAL/INSTALLATION

1. Remove and install the PCM. (See [F-43 PCM REMOVAL/INSTALLATION.](#))

A6E561418880W02

AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION

A6E561401030W07

1. Disconnect the negative battery cable.
2. Remove the battery and battery tray.
3. Remove the aircleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
4. Remove the front tires and splash shield.
5. Remove the under cover.
6. Remove the steering gear and power steering pipe. (See [N-10 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.](#))
7. Remove the front auto leveling sensor. (See [T-32 FRONT AUTO LEVELING SENSOR REMOVAL/INSTALLATION.](#))
8. Drain the ATF. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))

Warning

- Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.

Caution

- To prevent the torque converter and transaxle from separating, remove the transaxle without tilting it toward the torque converter.

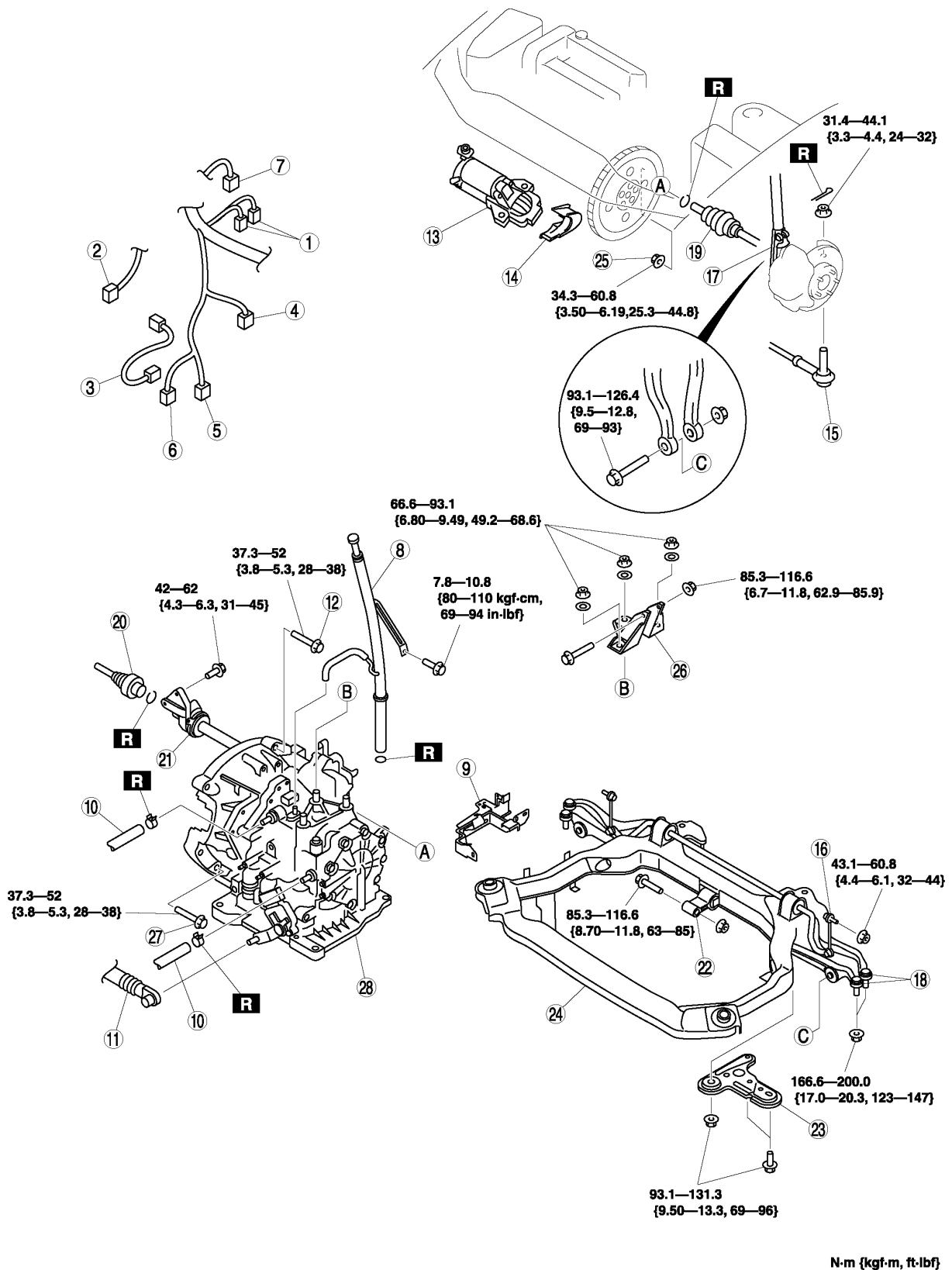
9. Remove in the order shown in the figure.
10. Install in the reverse order of removal.
11. Adjust the headlight zero set. (See [T-31 HEADLIGHT ZEROSET.](#))
12. Add ATF to the specified level. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))
13. Carry out the mechanical system test. (See [K-6 MECHANICAL SYSTEM TEST.](#))

Service item	Test item		
	Line pressure test	Stall test	Time lag test
ATX replacement	×		
ATX overhaul	×	×	×
Torque converter replacement	×	×	
Oil pump replacement	×		
Clutch system replacement	×		×

× : Test to be performed after the service work

14. Carry out the road test. (See [K-9 ROAD TEST.](#))

AUTOMATIC TRANSAXLE



A6E5614W046

1	O ₂ sensor connector
2	Oil pressure switch connector (for oil filter)

3	Oil pressure switch connector (for ATX)
4	Input/turbin speed sensor connector

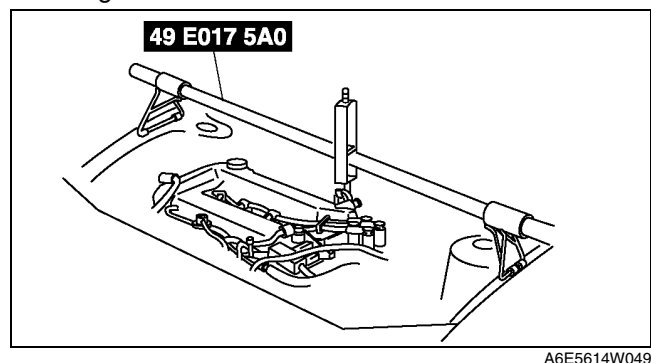
AUTOMATIC TRANSAXLE

5	TR switch connector
6	Transaxle connector
7	VSS connector
8	Oil dipstick and filler tube
9	Harness bracket
10	Oil hose
11	Selector cable
12	Transaxle mounting bolt (upper side)
13	Starter
14	Endplate cover
15	Tie-rod end ball joint (See N-11 Tie-rod End Ball Joint Removal Note)
16	Stabilizer control link
17	Damper fork
18	Lower arm (front, rear) ball joint (See R-19 Front Lower Arm (Rear) Ball Joint Removal Note) (See R-16 Front Lower Arm (Front) Ball Joint Removal Note)
19	Drive shaft (See M-17 DRIVE SHAFT REMOVAL/INSTALLATION)

20	Drive shaft (See M-17 DRIVE SHAFT REMOVAL/INSTALLATION)
21	Joint shaft (See M-12 JOINT SHAFT REMOVAL/INSTALLATION)
22	No.1 engine mount (See K-31 No.1 Engine Mount Bracket Removal Note) (See K-33 No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note)
23	Crossmember bracket
24	Crossmember (See R-23 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)
25	Torque converter installation nuts (See K-32 Torque Converter Nuts Removal Note)(See K-33 Torque Converter Nuts Installation Note)
26	No.4 engine mount (See K-33 No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note)
27	Transaxle mounting bolt (lower side)
28	Transaxle (See K-31 Transaxle Removal Note)(K-32 Transaxle Installation Note)

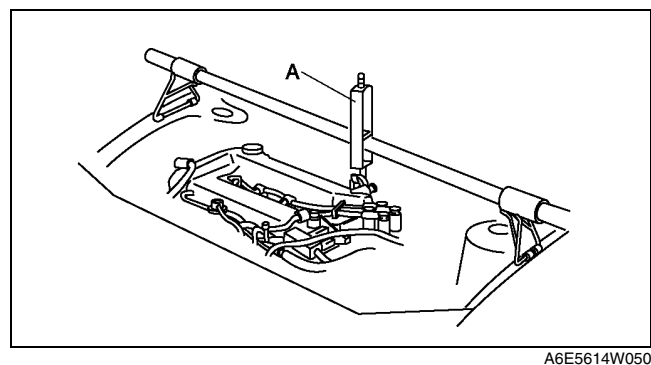
No.1 Engine Mount Bracket Removal Note

1. Support the engine using the **SST** before removing the No.1 engine mount.
2. Remove the No.1 engine mount.



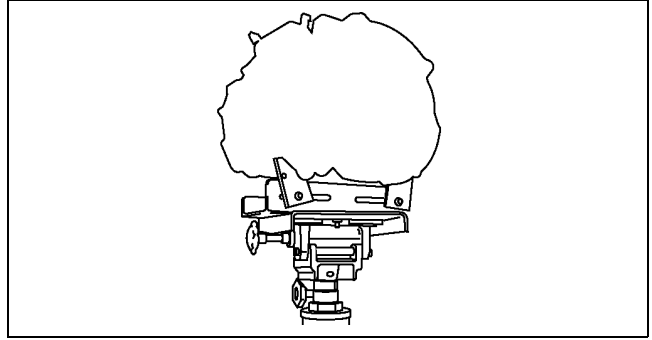
Transaxle Removal Note

1. Loosen the part marked A and lean the engine toward the transaxle.
2. Support the transaxle on a jack.
3. Remove the transaxle mounting bolts.



AUTOMATIC TRANSAXLE

4. Remove the transaxle.



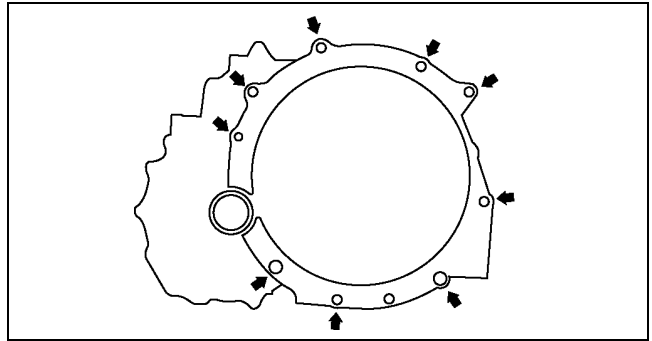
A6E5614W051

Transaxle Installation Note

1. Set the transaxle on a jack and lift it.
2. Install the transaxle mounting bolts.

Tightening torque

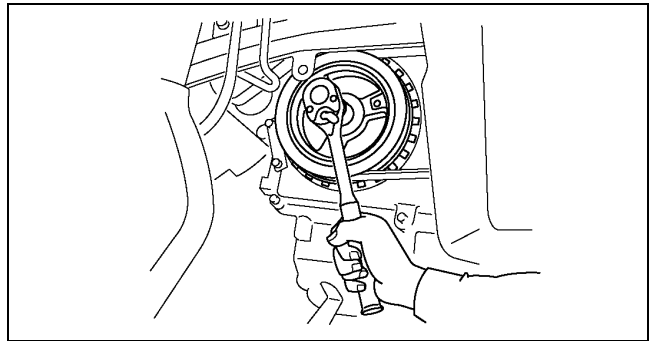
37.3—52 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}



A6E5614W052

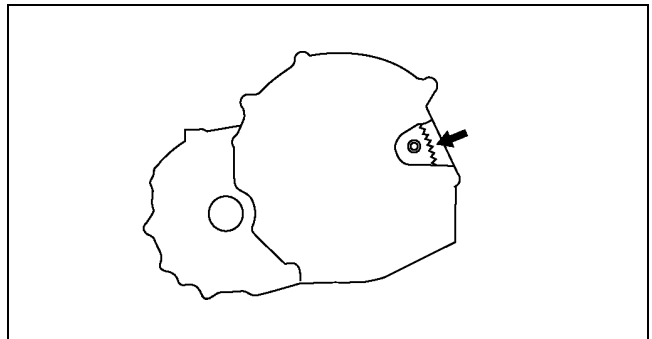
Torque Converter Nuts Removal Note

1. Hold the crankshaft pulley to prevent drive plate from rotating.



A6E5614W091

2. Remove the torque converter nuts from the starter installation hole.



A6E5614W092

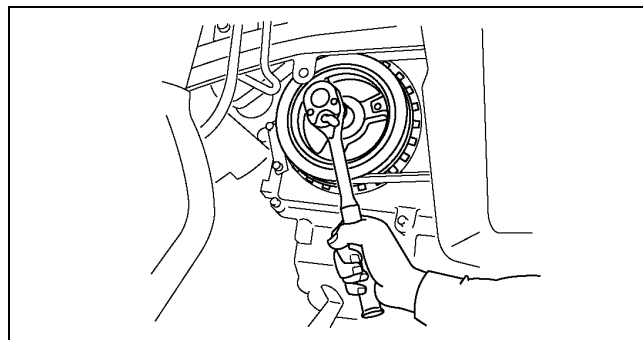
AUTOMATIC TRANSAXLE

Torque Converter Nuts Installation Note

1. Hold the crankshaft pulley to prevent drive plate from rotating.

Caution

- Loosely and equally tighten the torque converter nuts, then further tighten them to the specified tightening torque.

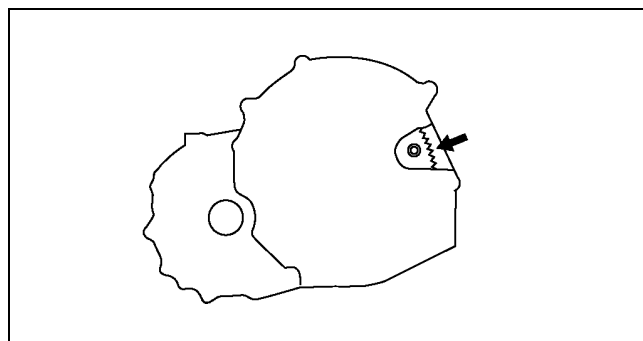


A6E5614W091

2. Tighten the torque converter mounting nuts.

Tightening torque

34.3—60.8 N·m {3.5—6.2 kgf·m, 25—45 ft·lbf}



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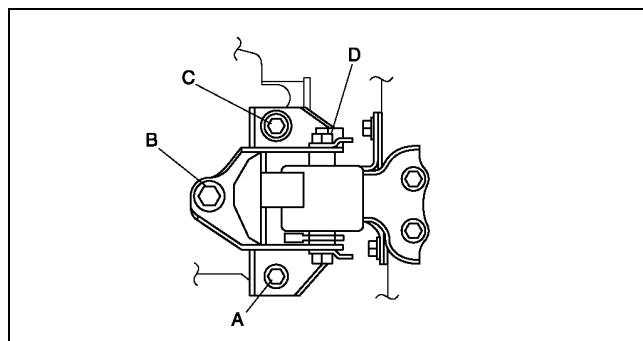
No.1 Engine Mount and No.4 Engine Mount Bracket Installation Note

1. Verify that the engine mount rubbers are installed as shown.
2. By aligning the holes with the stud bolts, install the No.4 engine mount bracket to the transaxle.
3. By aligning the holes with the stud bolts, install the No.1 engine mount to the transaxle.
4. Align the hole of the No.4 engine mount bracket with the No.4 engine mount rubber on vehicle, and temporarily tighten the bolt D.
5. Tighten the nut B,C in order of B→C, then bolt A.
6. Tighten the bolt D.

Tightening torque

A, B, C: 66.6—93.1 N·m {6.8—9.4 kgf·m, 50—68 ft·lbf}

D: 85.3—116.6 N·m {8.7—11.8 kgf·m, 63—85 ft·lbf}



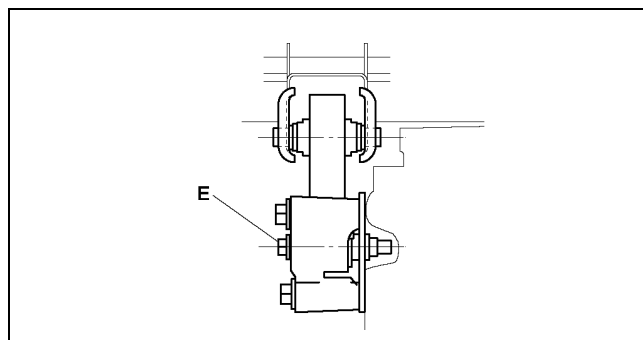
A6E5112W005

8. Tighten the bolt D to the No.1 engine mount.

Tightening torque

E: 85.3—116.6 N·m {8.7—11.8 kgf·m, 63—85 ft·lbf}

9. Remove the SST (49 E017 5A0).



A6E5112W006

OIL SEAL REPLACEMENT

1. Drain the ATF. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))

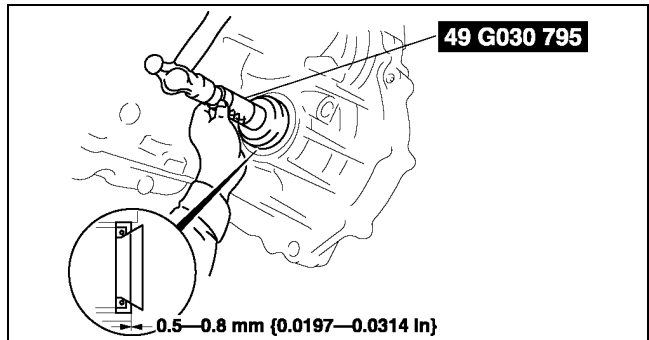
A6E561401032W01

Caution

AUTOMATIC TRANSAXLE

- The oil seal is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the oil seal.

2. Remove the drive shaft. (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION.](#))
3. Remove the oil seal.
4. Using the **SST** and a hammer, tap a new oil seal in evenly until the **SST** contacts the transaxle case.
5. Coat the lip of the oil seal with transaxle oil.
6. Install the drive shaft. (See [M-17 DRIVE SHAFT REMOVAL/INSTALLATION.](#))
7. Add ATF to the specified level. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))
8. Carry out the mechanical system test. (See [K-6 MECHANICAL SYSTEM TEST.](#))



A6E5614W056

CONTROL VALVE BODY REMOVAL

On-Vehicle Removal

A6E561421100W01

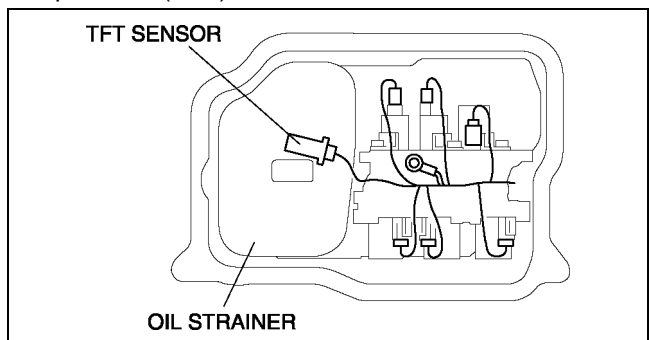
Warning

- Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eyes whenever using compressed air.

Caution

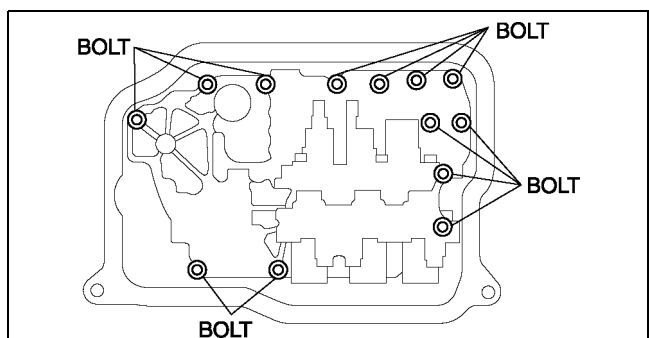
- Clean the transaxle exterior throughout with a steam cleaner or cleaning solvents before removal.
- If any old sealant gets into the transaxle during installation of the oil pan, trouble may occur in the transaxle case and oil pan. Clean with cleaning fluids.

1. Disconnect the negative battery cable.
2. Drain the ATF into a separate suitable container. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))
3. Remove the under cover.
4. Remove the front tires and splash shield.
5. Remove the crossmember. (See [R-23 FRONT CROSSMEMBER REMOVAL/INSTALLATION.](#))
6. Remove the oil pan.
7. Disconnect the transaxle connectors and transaxle fluid temperature (TFT) sensor connector.
8. Remove the oil strainer.



A6E5614W025

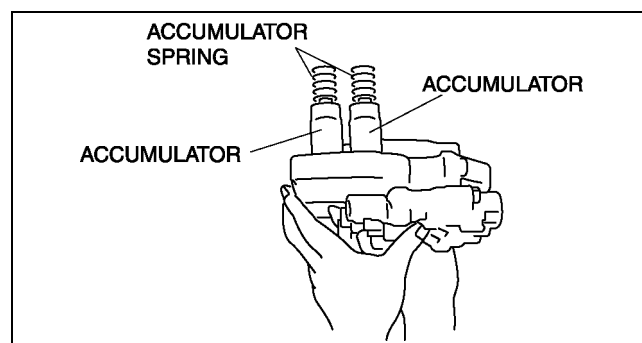
9. Remove the control valve body installation bolts A as shown, then remove the control valve body component as shown.



A6E5614W058

AUTOMATIC TRANSAXLE

10. Remove the accumulators and accumulator springs.



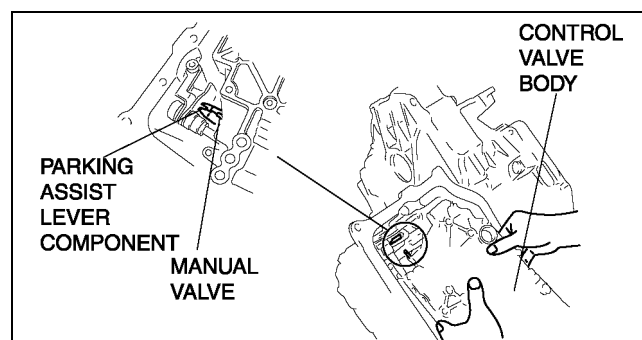
A6E5614W059

CONTROL VALVE BODY INSTALLATION

On-Vehicle Installation

Caution

- Be sure to align the parking rod and the manual valve.

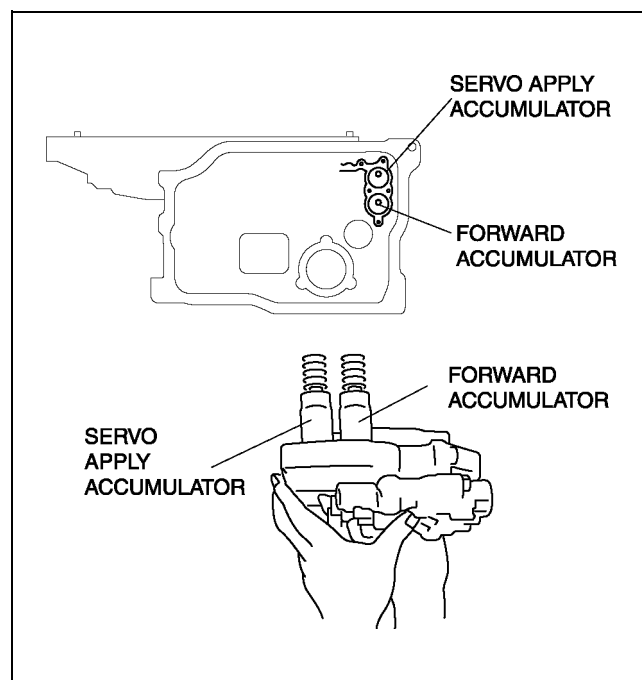


A6E5614W060

K

1. Install the accumulator springs and accumulators into the transaxle case.

Spring	Outer diameter (mm {in})	Free Length (mm {in})	No. of coils	Wire diameter (mm {in})
Servo apply accumulator large spring	21.0 {0.827}	67.8 {2.669}	10.3	3.5 {0.138}
Servo apply accumulator small spring	13.0 {0.512}	67.8 {2.669}	17.1	2.2 {0.087}
Forward accumulator small spring	21.0 {0.827}	75.0 {2.953}	10.7	2.3 {0.091}
Forward accumulator large spring	15.6 {0.614}	49.0 {1.929}	7.7	2.4 {0.094}



A6E5614W061

AUTOMATIC TRANSAXLE

- Install the control valve body component.

Tightening torque

7.8—10.8 N·m

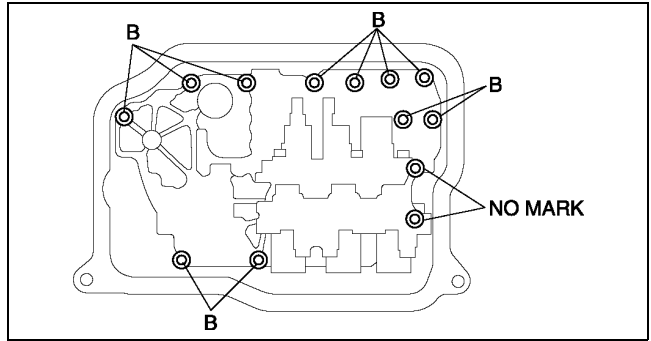
{80—110 kgf·cm, 70—95 in·lbf}

Bolt length (measured from below the head)

B: 40 mm {1.575 in}

No mark: 70 mm {2.756 in}

- Install the oil strainer.
- Match the harness colors, then connect the solenoid connector and TFT sensor connector.



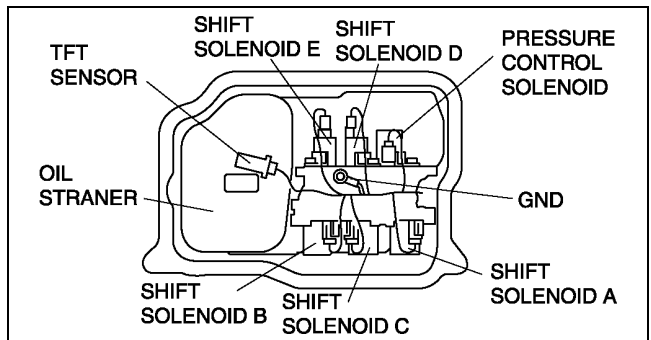
A6E5614W062

Spring	Color of connector (harness side)
Pressure control solenoid	Black
Shift solenoid A	White
Shift solenoid B	Blue
Shift solenoid C	Green
Shift solenoid D	white
Shift solenoid E	Black

- Install the ground.

Tightening torque

7.8—10.8 N·m {80—110 kgf·cm, 70—95 in·lbf}

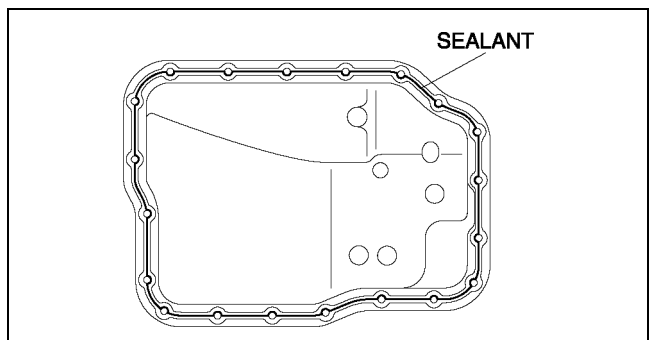


A6E5614W063

- Apply a light coat of silicon sealant to the contact surfaces of the oil pan and transaxle case.
- Install the oil pan.

Tightening torque

6—8 N·m {62—81 kgf·cm, 53—70 in·lbf}



A6E5614W064

- Install the crossmember. (See [R-23 FRONT CROSSMEMBER REMOVAL/INSTALLATION.](#))
- Install the front tires and splash shield.
- Install the under cover.
- Connect the negative battery cable.
- Add ATF and with the engine idling, inspect the ATF level. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))
- Carry out the mechanical system test. (See [K-6 MECHANICAL SYSTEM TEST.](#))
- Carry out the road test. (See [K-9 ROAD TEST.](#))

OIL COOLER FLUSHING

A6E561419900W01

Note

- The contaminated cooler line (oil pipes and hoses) and auxiliary cooler must be flushed completely when ATX is overhauled or replaced.

AUTOMATIC TRANSAXLE

1. Remove the two oil cooler line hoses and apply air pressure of **196 kPa {2.0 kgf/cm², 28 psi}** from the return hose (pipe) side.

Caution

- Power flushing should be performed very carefully when removing the accumulated debris from the fluid baffle, otherwise the debris cannot be removed or the problem becomes even worse.

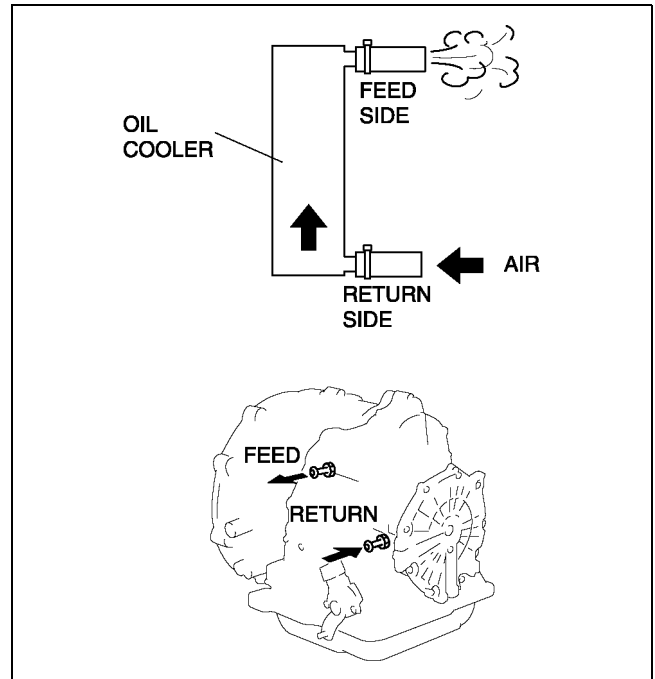
2. If there is no air blown out the feed side, flush the oil cooler lines using the power-flushing tool. (See [K-38 Power Flushing](#))

Recommended power-flushing manufacturer

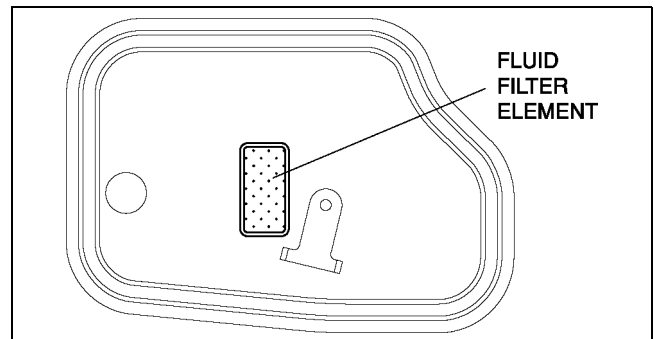
Manufacturer	Part number	Description
Kent Moore	J35944-AMAZ	Flushing kit or equivalent
OTC	60081	Portable torque converter, oil cooler cleaner or equivalent

3. If there is ventilation, carry out the following steps.

- (1) Remove the oil pan and inspect the fluid filter element from the front filter.
- (2) If the element is covered with too much debris or particles and cannot be seen, replace the oil cooler. (See [K-39 OIL COOLER REMOVAL/INSTALLATION.](#)) (See [K-41 OIL COOLER DISASSEMBLY/ASSEMBLY.](#))
- (3) If the element can be seen, flush the oil cooler lines using the power-flushing tool.
 - Performing back and reverse power flushing two times each does not work because debris or particles flow out from the feed pipe side of ATX.



A6E5614W065



A6E5614W066

AUTOMATIC TRANSAXLE

Power Flushing

Repair procedure

1. Before power flushing, inspect the hoses/lines and clamps. Power flushing must begin with back flushing followed by forward flushing to quickly dislodge the restriction. If back flushing is not performed before forward flushing, the restriction could further reduce the ATF flow through the internal mesh type baffle of the cooler and flushing will not be effective or possible.

Inspecting oil lines and clamps

1. Be sure to inspect the lines (hoses/pipes) for cuts, crimps (pinched), cracks or any other damage before reusing them.
 - If any problems exist, replace lines and clamps.

Caution

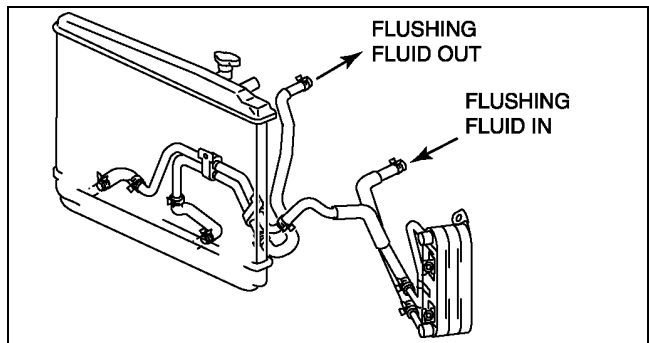
- Always use new clamps when replacing hoses.

Back flushing

1. Using the power flushing equipment manufacturer's instructions, connect equipment so the flushing fluid flows in the opposite direction of normal fluid flow.
2. Flush oil cooler/lines until discharge fluid is clean.

Caution

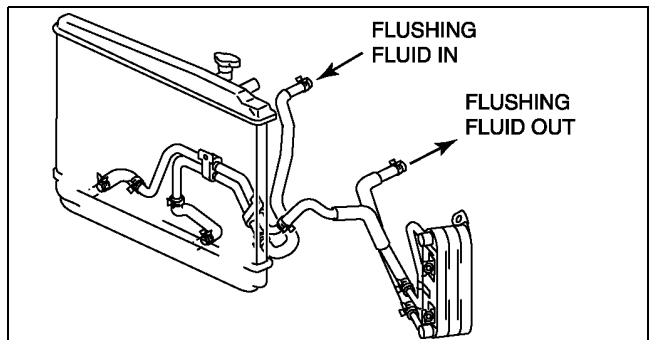
- If the cooler can not be properly flushed using recommended equipment, send the radiator out for sublet cleaning or replace.



A6E5614W067

Forward flushing

1. Connect power flushing equipment so the flushing fluid flows in the direction of normal fluid flow.
2. Flush oil cooler/lines until discharge fluid is clean.



A6E5614W068

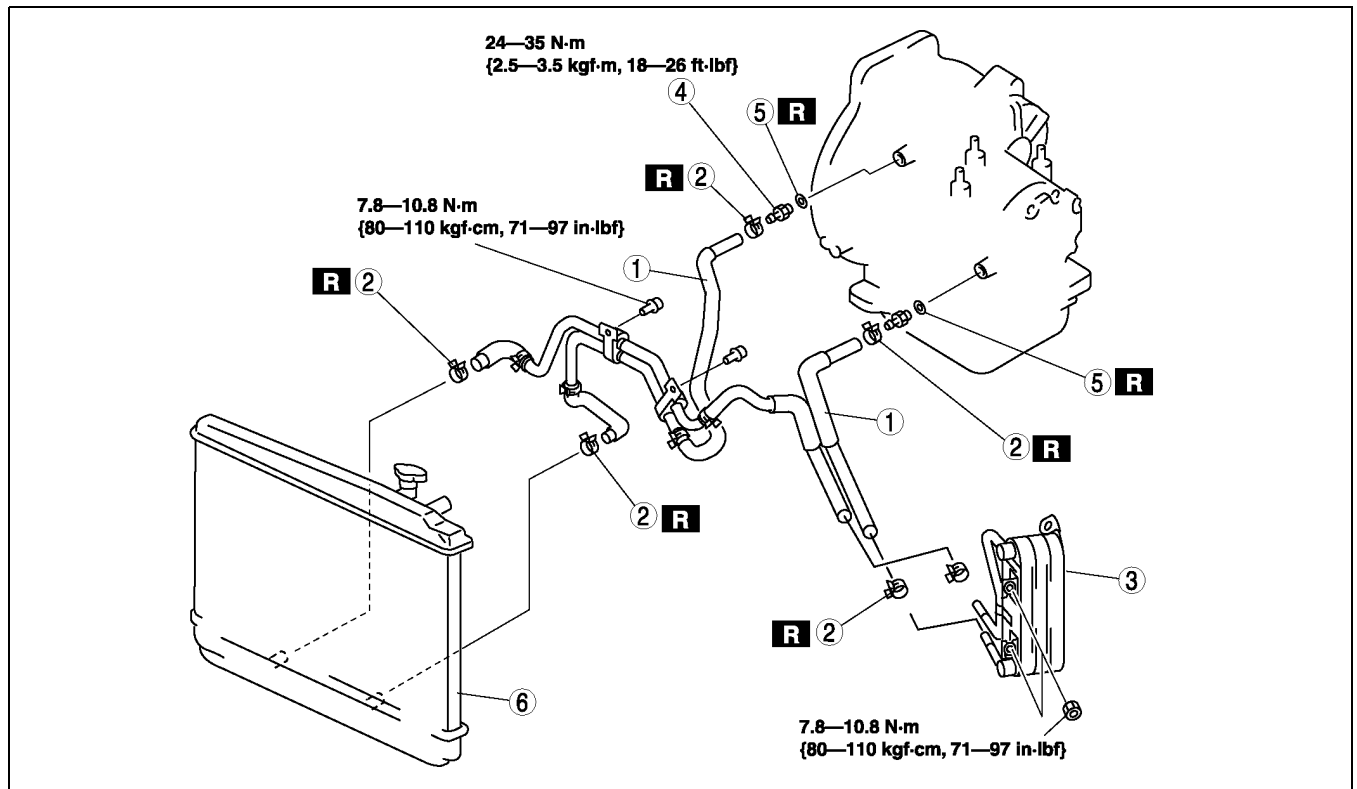
AUTOMATIC TRANSAXLE

A6E561419900W02

OIL COOLER REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Drain the ATF into a container. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))
3. Remove the radiator. (See [E-6 RADIATOR REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Add ATF to the specified level. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))
7. Connect the negative battery cable.
8. Inspect for oil leakage from the oil pipes and oil hoses.
9. Inspect for coolant from the hoses.
10. Inspect the ATF level and condition. (See [K-12 AUTOMATIC TRANSAXLE FLUID \(ATF\) INSPECTION.](#))
11. Carry out the line pressure test. (See [K-6 MECHANICAL SYSTEM TEST.](#))
12. Carry out the road test. (See [K-9 ROAD TEST.](#))

WITH OIL COOLER



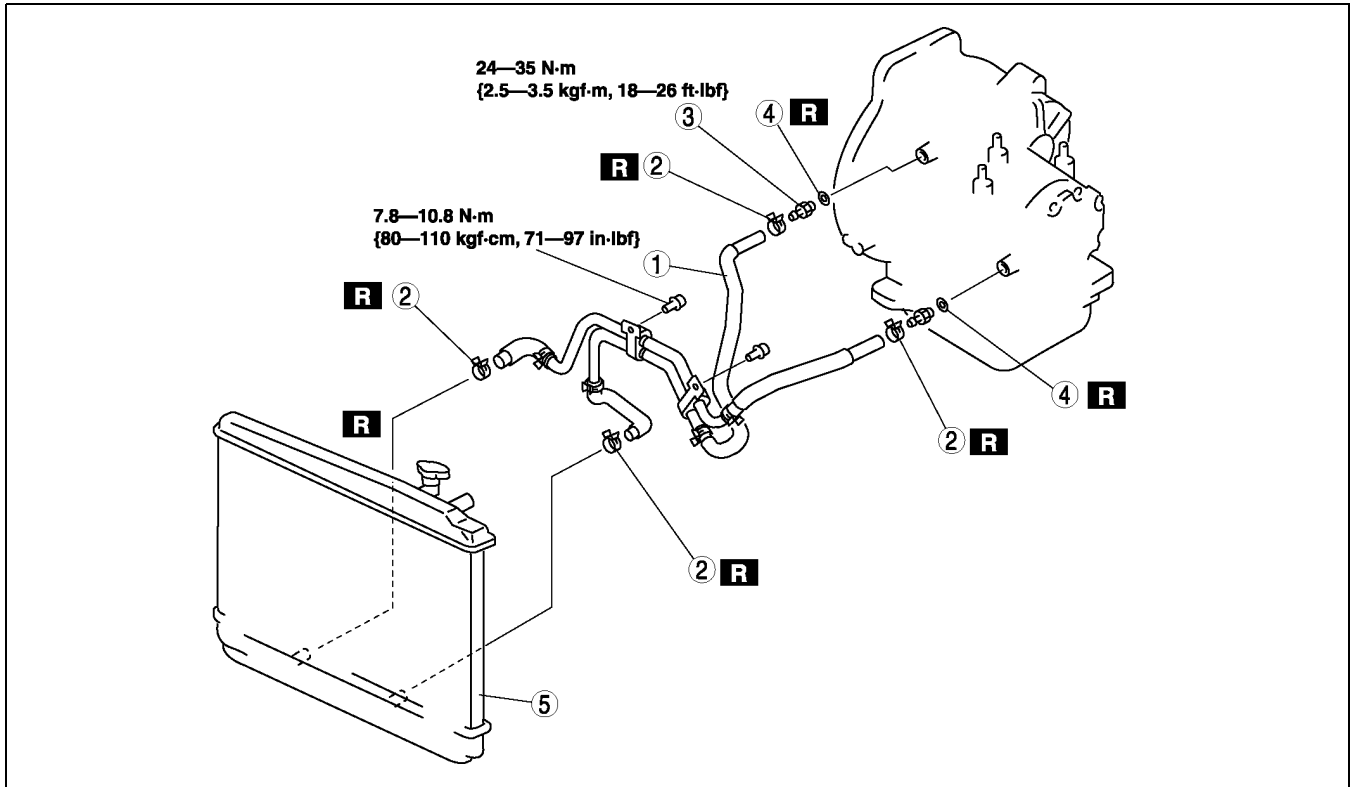
A6E5614W069

1	Oil hose (See K-40 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
2	Hose clamp (See K-40 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)

3	Oil cooler
4	Connector bolt
5	O-ring
6	Radiator (in tank oil cooler) (See K-40 Radiator (In Tank Oil Cooler) Installation Note.)

AUTOMATIC TRANSAXLE

WITHOUT OIL COOLER



A6E5614W080

1	Oil hose (See K-40 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
2	Hose clamp (See K-40 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
3	Connector bolt

4	O-ring
5	Radiator (in tank oil cooler) (See K-40 Radiator (In Tank Oil Cooler) Installation Note.)

Radiator (In Tank Oil Cooler) Installation Note

- The automatic transaxle oil cooler flushing must be performed whenever a transaxle is removed for service because the existing fluid may be contaminated, and to prevent contamination of new fluid.

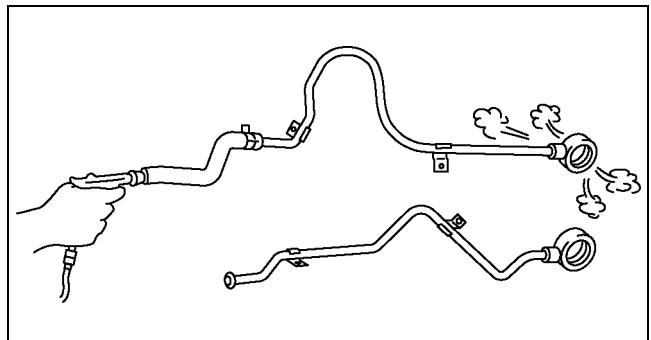
Note

- The flushing must be performed after installation of the overhauled or replacing transaxle.

- Follow the instructions in the manufacturer's publication for flushing operation.

Oil Pipe, Hose Clamp, Oil Hose Installation Note

- Apply compressed air to cooler-side opening, and blow any remaining grime and foreign material from the cooler pipes. Compressed air should be applied for no **less than one minute**.



A6E5614W070

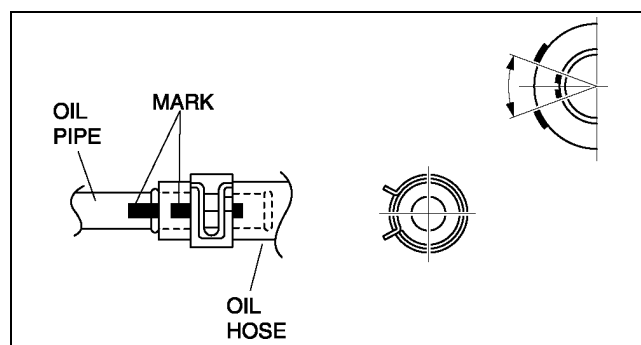
AUTOMATIC TRANSAXLE

- Align the marks, and slide the oil hose onto the oil pipe until it is fully seated as shown.

Note

- If reusing the hose, install the new hose clamp exactly on the mark left by the previous hose clamp. Then apply force to the hose clamp in the direction of the arrow in order to fit the clamp in the place.

- Install the new hose clamp onto the hose.
- Verify that the hose clamp does not interfere with any other components.

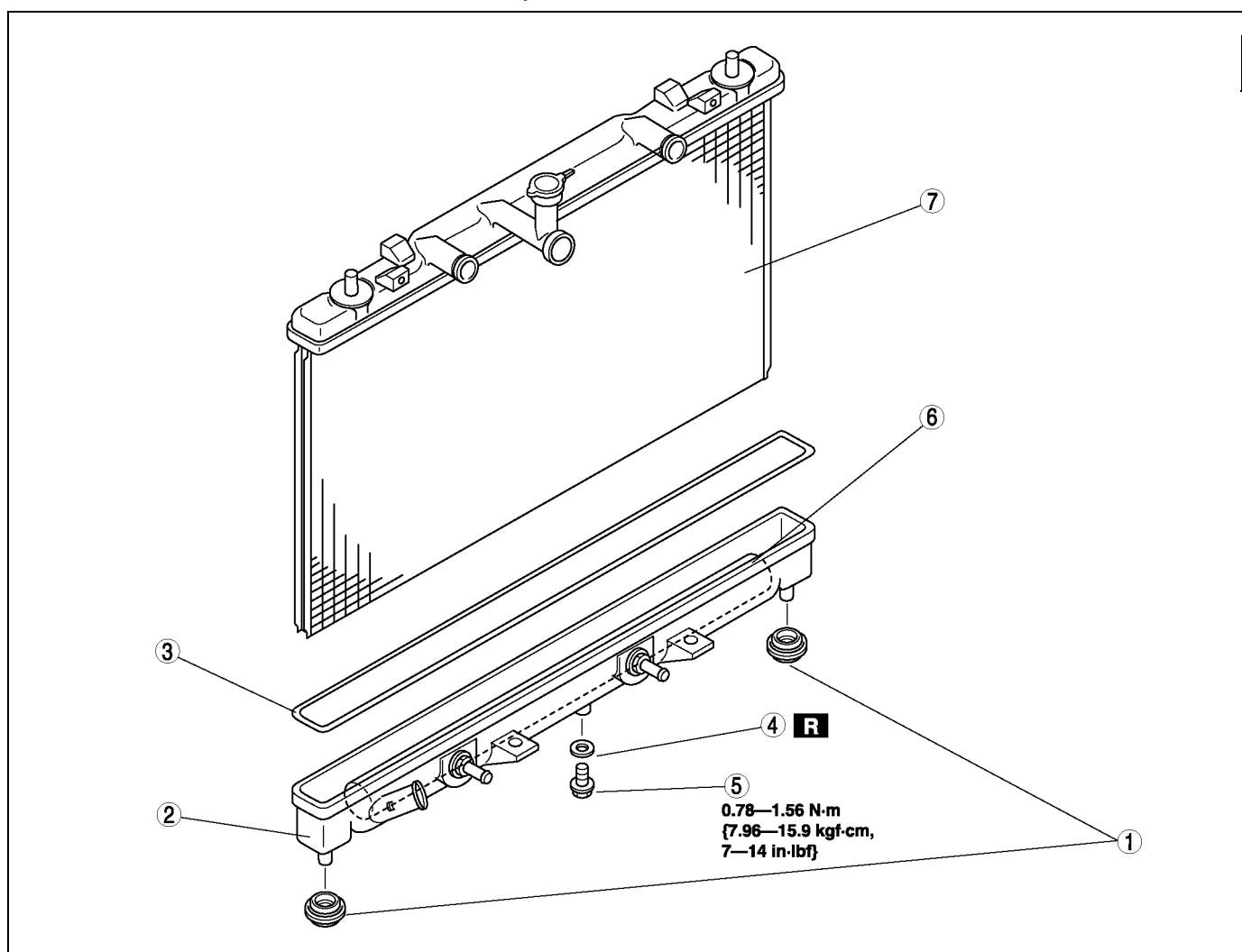


A6E5614W071

OIL COOLER DISASSEMBLY/ASSEMBLY

A6E561419900W03

- Disassemble in the order indicated in the table.
- Assemble in the reverse order of disassembly.



A6E5614W072

1	Mount rubber
2	Radiator outer tank (in tank oil cooler) (See K-42 Radiator Outer Tank (In Tank Oil Cooler) Removal Note.) (See K-42 Radiator Outer Tank (In Tank Oil Cooler) Installation Note.)
3	O-ring
4	Washer

5	Drain plug
6	ATF cooler
7	Radiator

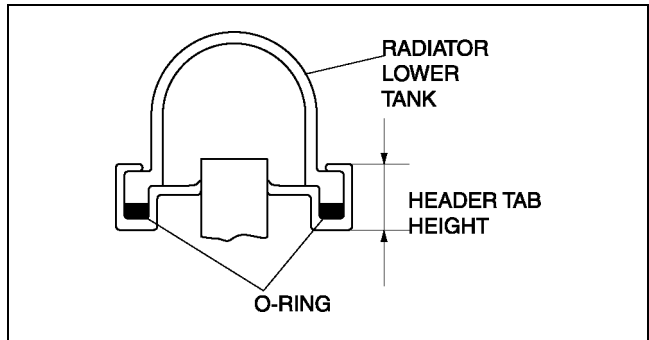
AUTOMATIC TRANSAXLE

Radiator Outer Tank (In Tank Oil Cooler) Removal Note

1. Inspect the height of the header tabs.
2. Insert the end of a medium tip screwdriver between the end of the header tab and the outer tank.

Note

- Do not open more tabs than necessary for tank removal.

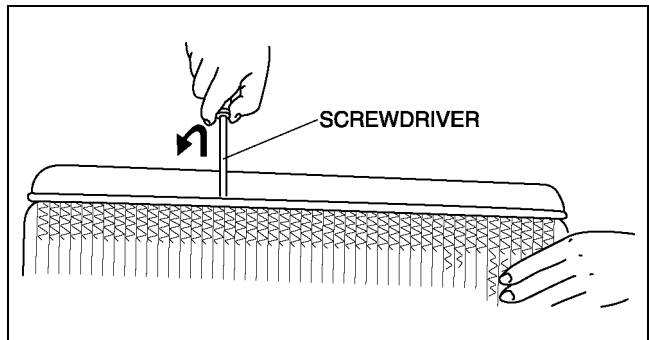


A6E5614W073

3. Pivot the screwdriver to pry the tab away from the tank and repeat the procedure for each tab.
4. Remove the radiator outer tank and O-ring (gasket) from the core header when all of the tabs are opened.

Note

- If any header tabs are missing from the core, replace the radiator.



A6E5614W074

5. Inspect the gasket surface of the radiator core header to ensure it is clean and free of foreign material or damage.
6. Inspect the radiator outer tank for warping. If it is warped, replace radiator tank.

Radiator Outer Tank (In Tank Oil Cooler) Installation Note

1. Install a new O-ring and ensure it is not twisted.

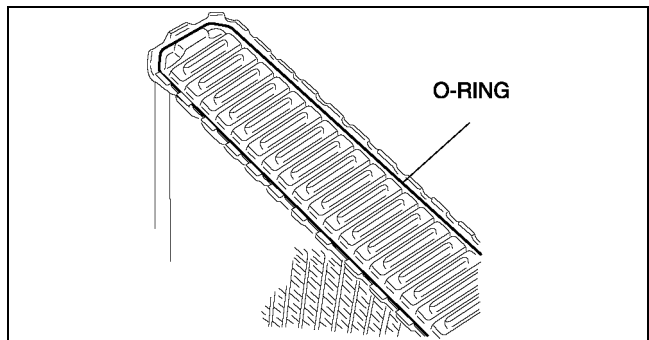
Note

- The old O-ring must be replaced.

2. Position the radiator tank in the original direction to the core using care not to scratch the tank sealing surface with the header tabs.

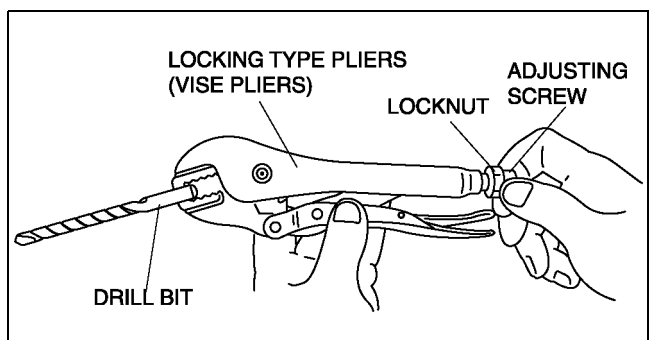
Note

- Step 3 will set jaw opening to the correct specification.



A6E5614W075

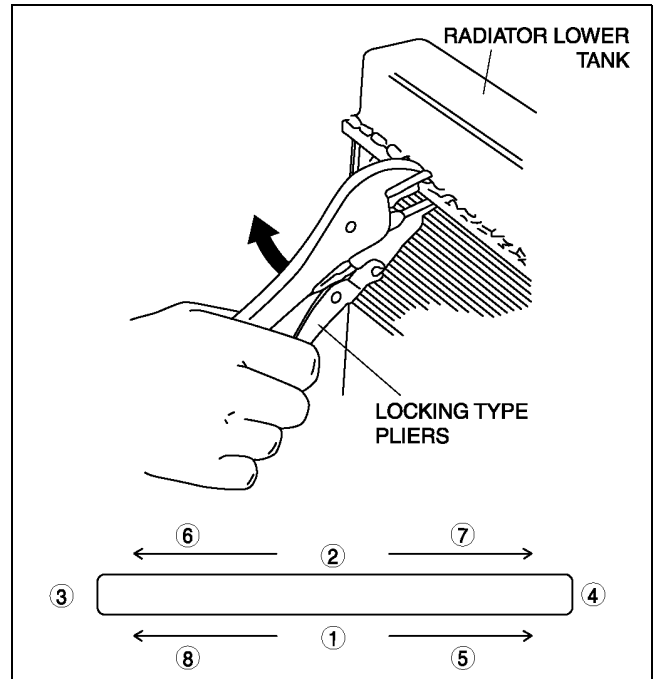
3. With the jaws of locking-type pliers (vise grips) closed and locked, turn the adjusting screw to position the jaws against the drill bit with the diameter measured (height) in removal procedure 1. Tighten the lock nut on the adjusting screw against the handle to lock the adjustment in place.



A6E5614W093

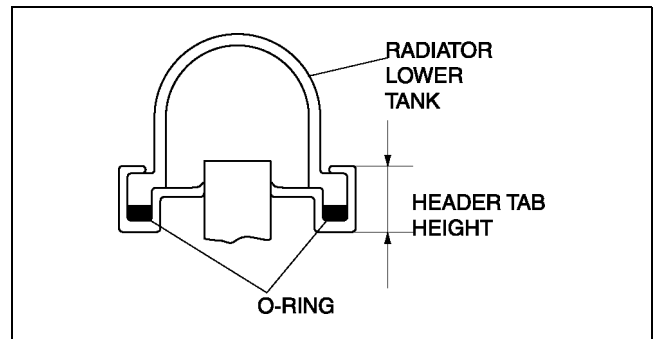
AUTOMATIC TRANSAXLE

4. Squeeze the header tabs down in order as shown against the lip of radiator outer tank base with locking-type pliers while rotating the pliers toward the tank.



A6E5614W076

5. Verify the height of the header tabs is same as the height before removal.
6. Inspect for leakage from radiator. (See [E-4 ENGINE COOLANT LEAKAGE INSPECTION.](#))



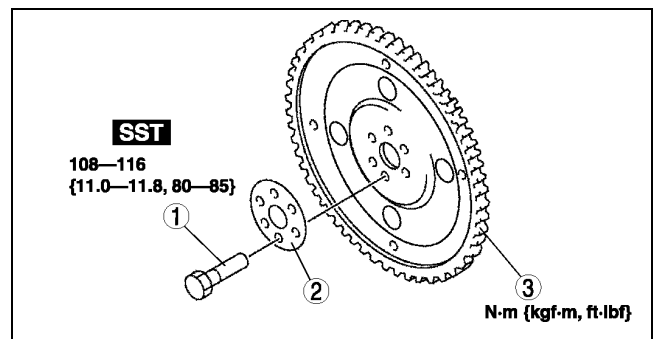
A6E5614W073

DRIVE PLATE REMOVAL/INSTALLATION

A6E561419020W01

1. Remove the transaxle. (See [K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.](#))
2. Remove in the order indicated in the figure.
3. Install in the reverse order of removal.

1	Drive plate mounting bolts (See K-44 Drive Plate Mounting Bolts Removal Note.)
2	Adapter
3	Drive plate (See K-44 Drive Plate Installation Note.)

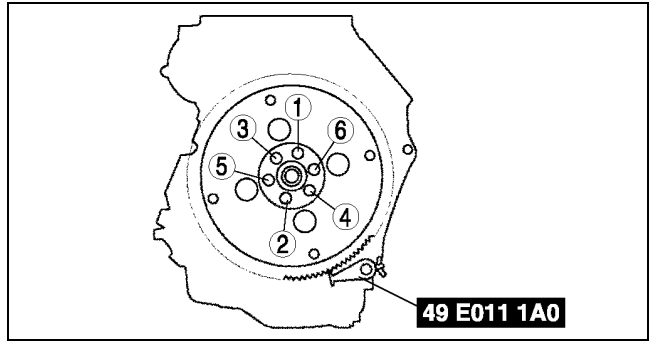


A6E5614W078

AUTOMATIC TRANSAXLE

Drive Plate Mounting Bolts Removal Note

1. Set the **SST** or equivalent against the drive plate.
2. Remove the bolts and the drive plate.



A6E5614W079

Drive Plate Installation Note

Caution

- If the bolts are reused, remove the oil sealant from the bolt threads. Tightening a bolt that has old sealant on it can cause thread damage.

1. Remove the sealant from the bolts hole in the crankshaft and from the drive plate mounting bolts.

Note

- If all the previous sealant cannot be removed from a bolt, replace the bolts.
- Do not apply sealant if a new bolts is used.

2. Install the drive plate.
3. Install the adapter.
4. Apply sealant to the drive plate mounting bolts and install them.
5. Set the **SST** or equivalent against the drive plate.

Caution

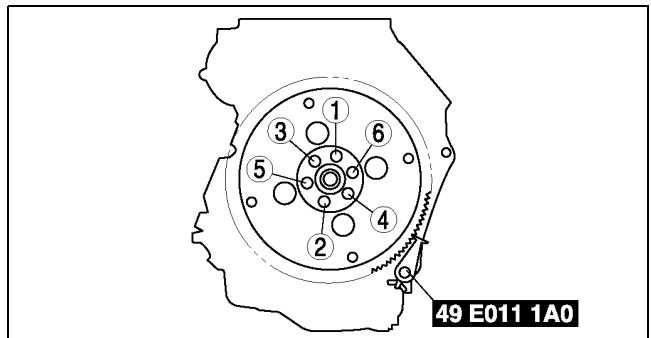
- When installing sealant covered bolts, tighten them immediately. Leaving these bolts in a half installed condition could cause them to be stuck that way, due to the natural hardening or the sealant.

6. Tighten the drive plate mounting bolts in two or three steps in the order shown.

Tightening torque

108—1116 N·m {11.0—11.8 kgf·m, 80—85 ft·lbf}

7. Install the transaxle. (See [K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.](#))



A6E5614W081

AUTOMATIC TRANSAXLE SHIFT MECHANISM

AUTOMATIC TRANSAXLE SHIFT MECHANISM

SHIFT-LOCK INSPECTION

A6E56163000W01

1. Turn the ignition switch to ON position.
2. Verify that the selector lever is in P position.
3. Depress the brake pedal and verify that the selector lever can be shifted from P position.
 - If a malfunction is found, inspect the interlock cable.
(See [K-45 INTERLOCK CABLE INSPECTION](#).)

KEY INTERLOCK INSPECTION

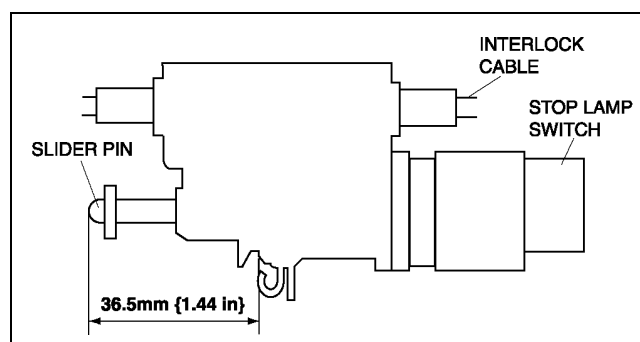
A6E56160900W01

1. Verify that the ignition key cannot be pulled out except in P position.
 - If a malfunction is found, inspect the interlock cable. (See [K-45 INTERLOCK CABLE INSPECTION](#).)

INTERLOCK CABLE INSPECTION

A6E56160900W02

1. Remove the interlock cable.
2. With the slider pin as shown in the figure, verify that the interlock cable moves freely.
 - If a malfunction is found, replace the interlock cable.

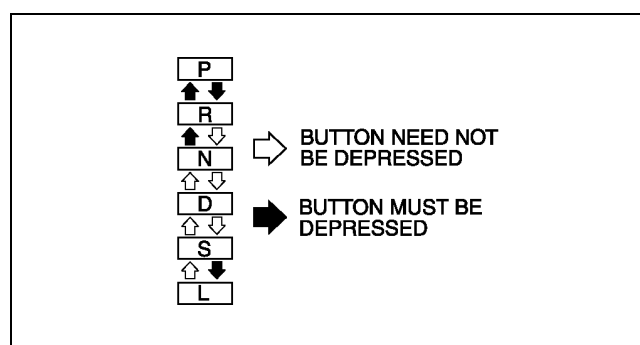


A6E5616W001

SELECTOR LEVER INSPECTION

A6E561646102W01

1. Turn the ignition switch to ON (engine OFF).
2. With the brake pedal depressed, verify that there is a "click" at each range when shifted.
3. Verify that the selector lever can be shifted.
4. Verify that there is a "click" at each position when shifted from P position to L range.
5. Verify that the positions of the selector lever and the indicator are aligned.
 - If not as specified, adjust the TR switch. (See [K-18 TRANSAXLE RANGE \(TR\) SWITCH ADJUSTMENT](#).)
6. Verify that the vehicle operates in each selected range.



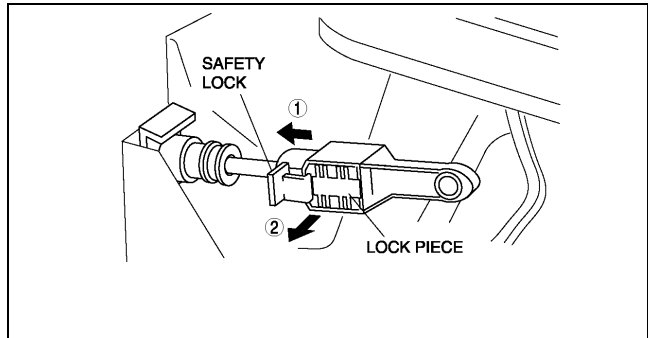
A6E5616W002

AUTOMATIC TRANSAXLE SHIFT MECHANISM

SELECTOR CABLE ADJUSTMENT

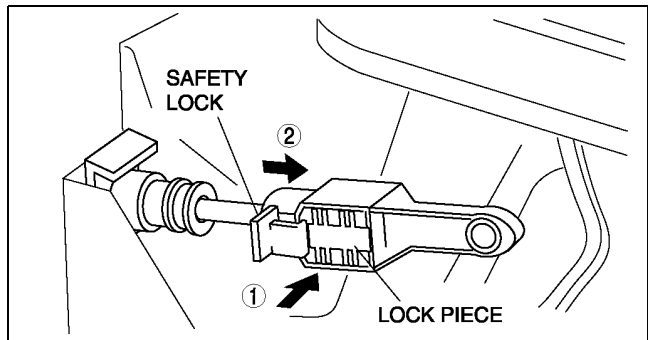
A6E561646102W02

1. Remove the center console.
2. Shift the selector lever to P position.
3. Unlock the lock piece of the selector cable (selector lever side) in the order shown in the figure.
4. Verify that the manual shaft is in P position.



A6E5616W003

5. Lock the lock piece of the selector cable (selector lever side) in the order shown in the figure.
6. Install the center console.
7. Shift the selector lever from P position to L range, and make sure that there are no other components in that area to interfere with the lever.



A6E5616W004

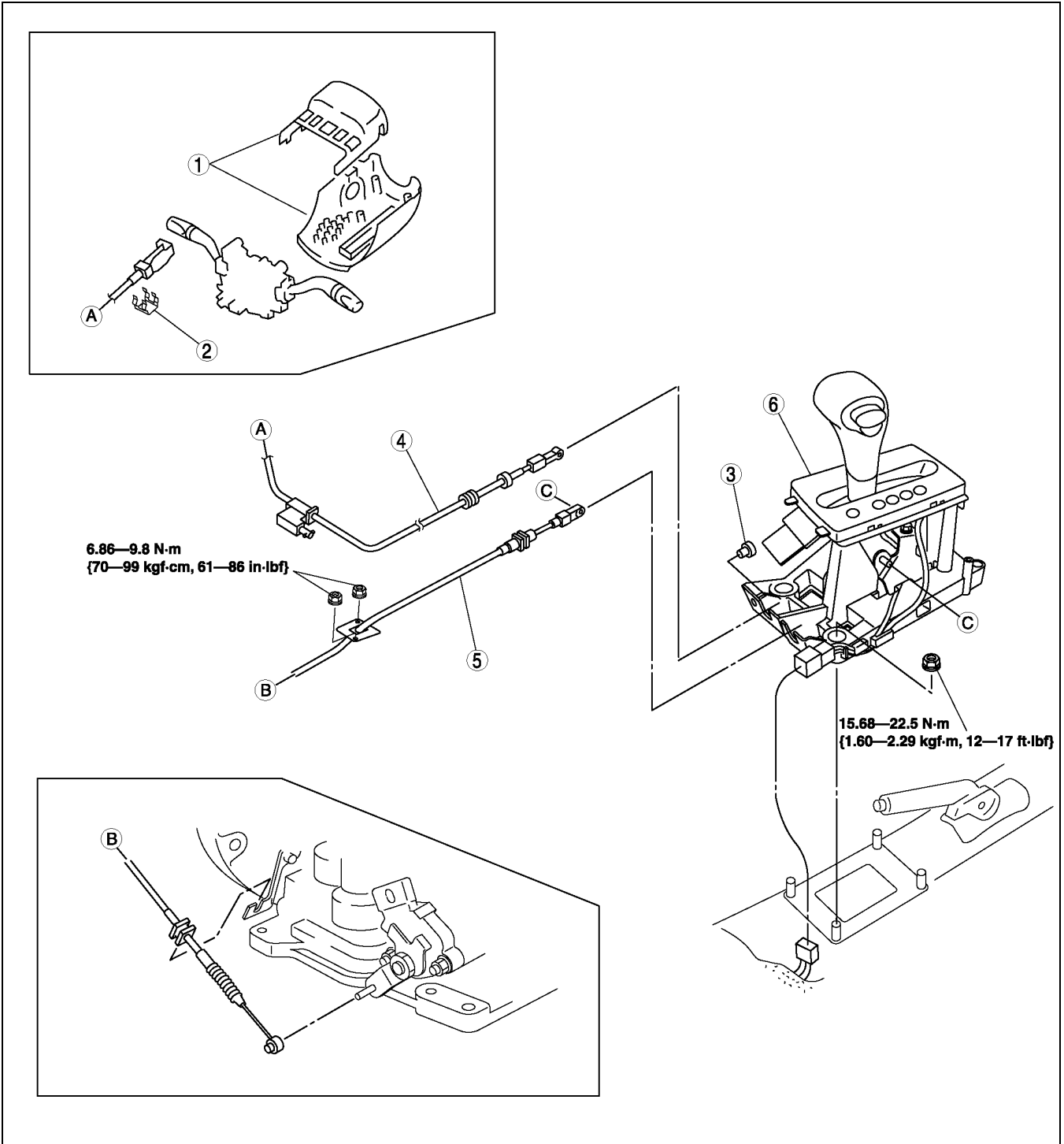
SELECTOR LEVER REMOVAL/INSTALLATION

A6E561646102W03

1. Disconnect the negative battery cable.
2. Remove battery and battery tray.
3. Remove the air cleaner component. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
4. Remove the console.
5. Remove the dashboard compleat.
(See [S-82 DASHBOARD REMOVAL/INSTALLATION.](#))
6. Remove the SAS control module.
(See [T-124 SAS UNIT REMOVAL/INSTALLATION.](#))
7. Remove the climate control unit. (See [U-44 CLIMATE CONTROL UNIT REMOVAL.](#)) (See [U-45 CLIMATE CONTROL UNIT INSTALLATION.](#))
8. Remove the rear heat duct. (See [U-23 REAR HEAT DUCT REMOVAL/INSTALLATION.](#))
9. Remove in the order shown in the figure.
10. Remove the battery, battery tray and battery bracket.

AUTOMATIC TRANSAXLE SHIFT MECHANISM

11. Install in the reverse order of removal.



A6E5616W005

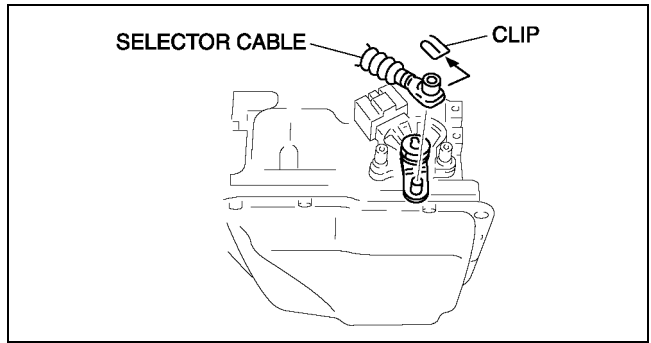
1	Column cover(with key interlock)
2	Clip(with key interlock)
3	Clip(with key interlock)
4	Interlock cable(with key interlock) (See K-49 Interlock Cable Installation Note.)

5	Selector cable (See K-48 Selector Cable Removal Note.) (See K-48 Selector Cable Installation Note.)
6	Selector lever

AUTOMATIC TRANSAXLE SHIFT MECHANISM

Selector Cable Removal Note

1. Remove the clip.
2. Remove the selector cable.



A6E5616W006

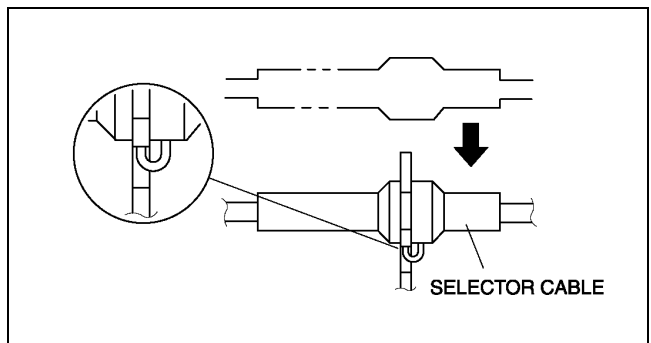
Selector Cable Installation Note

1. Install the selector cable to the selector lever certainly.
2. Install the selector cable to the bracket certainly.

Note

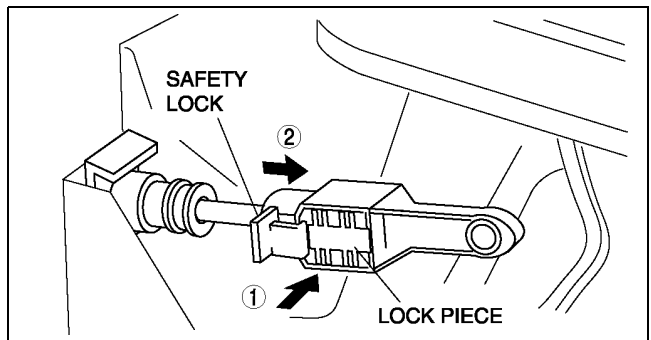
- Step 3, 4 is for the selector cable replacement only.

3. Verify that the selector lever is in P position.



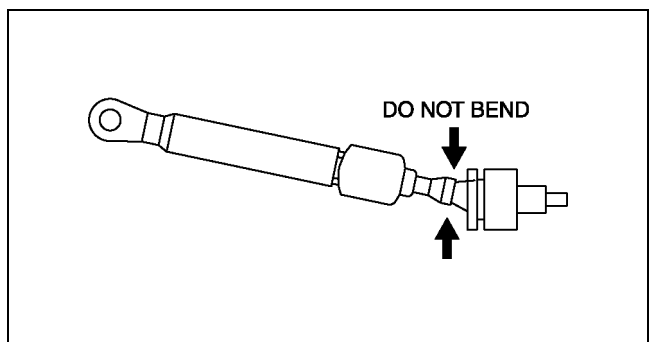
A6E5616W020

4. Lock the lock piece of the selector cable (selector lever side) in the order shown in the figure.



A6E5616W004

5. Verify that the manual shaft is in P position.



A6E5616W007

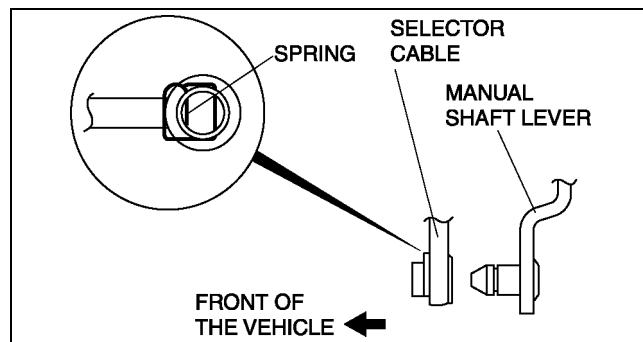
AUTOMATIC TRANSAXLE SHIFT MECHANISM

Caution

- Bending the selector cable in the manner shown in the figure will damage the cable and it may become loose when shifted. When installing the selector cable, hold it straight.

Note

- Install the selector lever to the manual shaft lever with the spring side of the selector cable end facing the front of the vehicle.



A6E5616W008

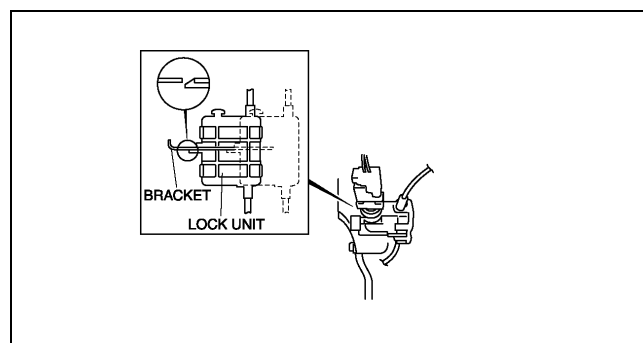
6. Install the selector lever to the manual shaft lever in such a way that the selector cable does not bear a load.
7. Confirm that the end of the manual shift lever sticks out of the end of the selector cable.
8. Install the selector cable to the selector cable secure bracket.

Interlock Cable Installation Note

1. Verify that the shift the selector lever in P position and ignition key is in LOCK position.
2. Press the lock unit onto the brake pedal stopper bracket.
3. From this position, slide the lock unit to fix the lock unit hook into the bracket hole securely as shown in the figure.

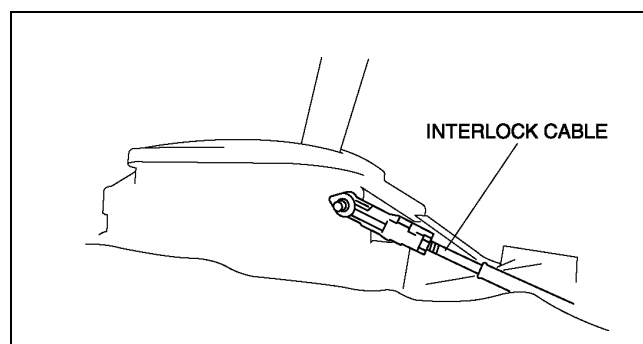
Caution

- Allowing the interlock cable to be bent or twisted during installation can affect the lock unit operation.



A6E5616W009

4. Install the interlock cable end onto the cam pin on the selector lever.

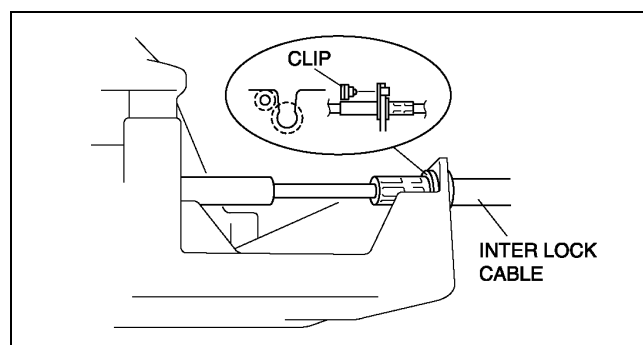


A6E5616W010

5. Fit the interlock cable in the U-groove in the selector lever base plate, and install the clip.

Caution

- Applying a load to the interlock cable while pressing the lock piece in can affect the lock unit operation.



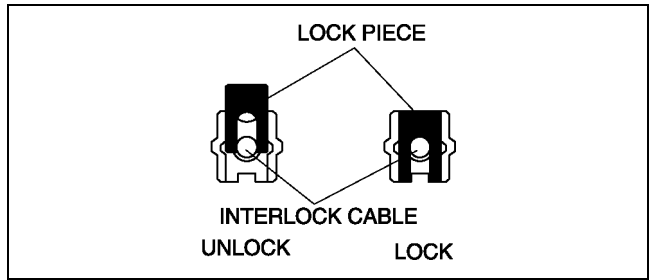
A6E5616W011

AUTOMATIC TRANSAXLE SHIFT MECHANISM

6. Press the interlock cable lock piece in until it is locked.

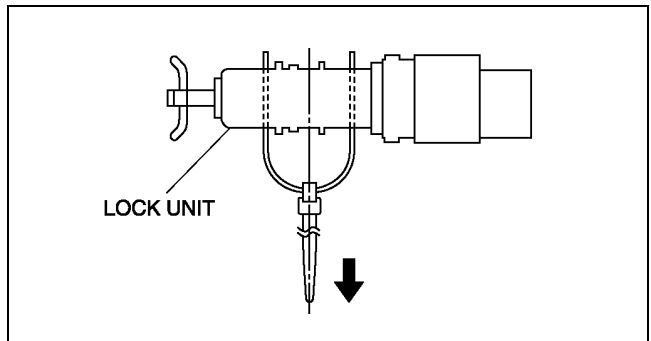
Note

- Step 7 is for the interlock cable replacement only.



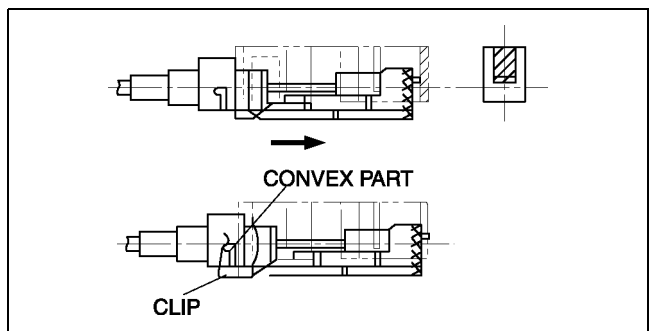
A6E5616W012

7. Remove the lock unit pin as shown in the figure.
8. Turn the ignition key in ACC position.
9. Install the interlock cable to the key cylinder.



A6E5616W013

10. Slide the outer casing to the key cylinder, and insert the clip over the convex part of the outer casing.



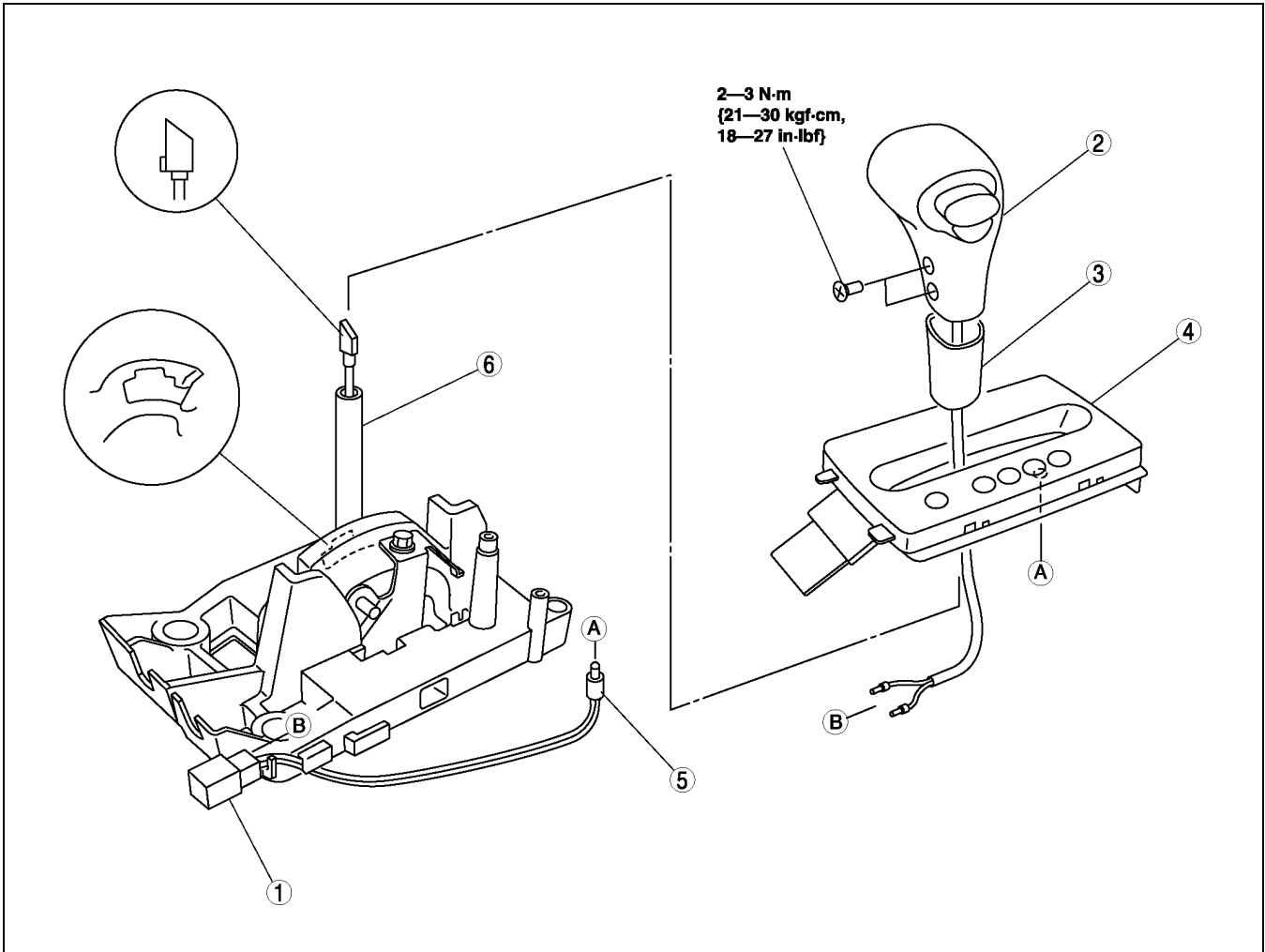
A6E5616W014

AUTOMATIC TRANSAXLE SHIFT MECHANISM

SELECTOR LEVER DISASSEMBLY/ASSEMBLY

A6E561646102W04

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



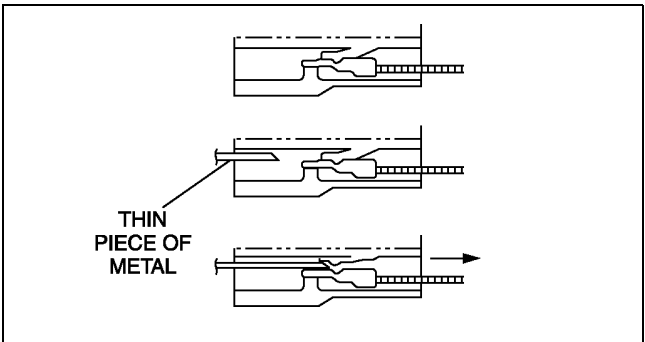
A6E5616W015

1	Connector (See K-51 Connector Disassembly Note.)
2	Selector lever knob component
3	Cover

4	Indicator panel
5	Selector illumination light
6	Selector lever

Connector Disassembly Note

1. Insert a thin piece of metal from the terminal side of the connector, and press down the terminal locking tab.
2. Pull the terminal out of the connector.



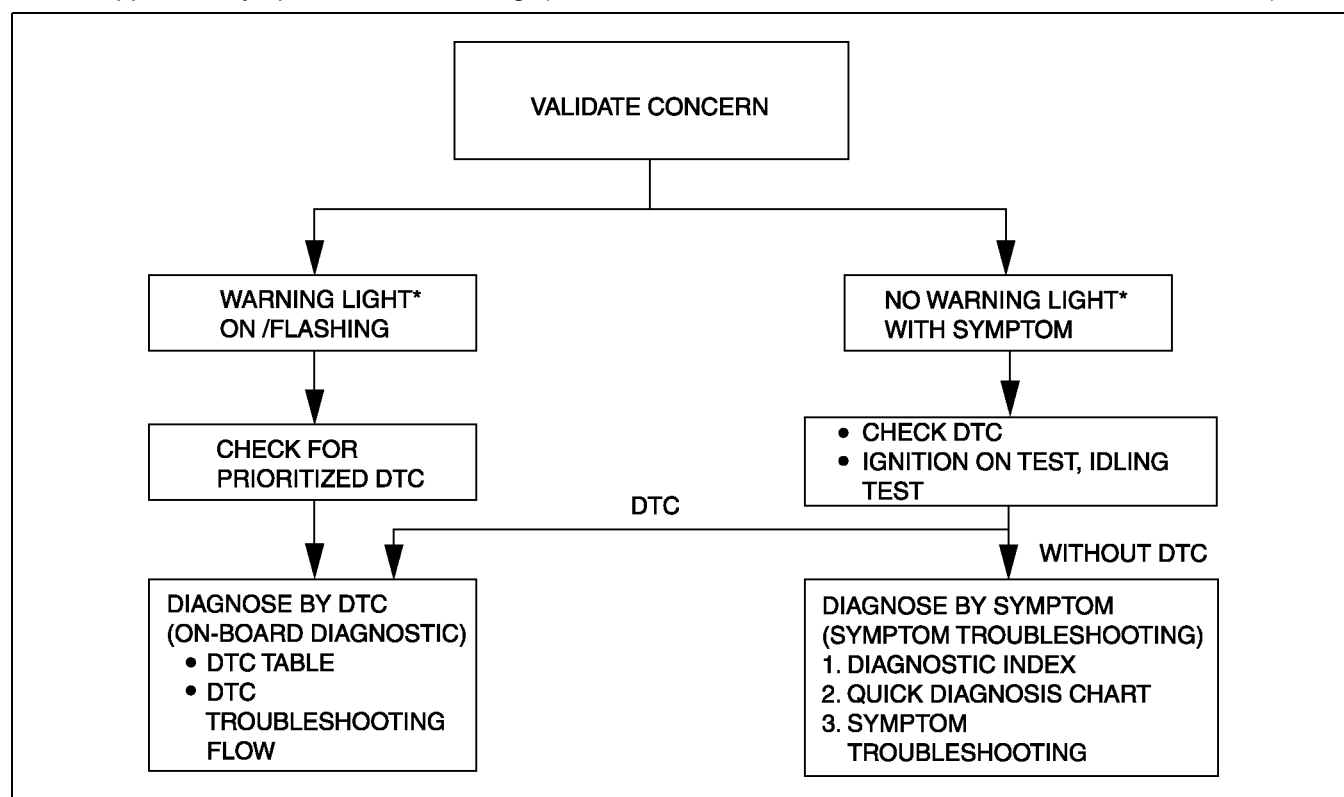
A6E5616W016

ON-BOARD DIAGNOSTIC

ON-BOARD DIAGNOSTIC

FOREWORD

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL), HOLD indicator light flashing, and PCM memory for diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
 - If the DTC exists, diagnose the applicable DTC. (See [K-53 DTC TABLE](#).)
 - If the DTC does not exist, MIL does not illuminate, and HOLD indicator light flashes, diagnose the applicable symptom troubleshooting. (See [K-113 SYMPTOM TROUBLESHOOTING ITEM TABLE](#).)



A6E5670W013

*:Malfunction indicator lamp (MIL), HOLD indicator light

AUTOMATIC TRANSAXLE ON-BOARD DIAGNOSTIC FUNCTION

DTC Reading Procedure

(See [F-62 ON-BOARD DIAGNOSTIC TEST](#).)

A6E567001030W02

AFTER REPAIR PROCEDURE

A6E567001030W03

Caution

- After repairing a malfunction, perform this procedure to verify that the malfunction has been corrected.
- When this procedure is carried out, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.

- Connect the WDS or equivalent to the DLC-2.
- Turn the ignition key to ON (engine OFF).
- Verify that DTCs are cleared from memory.
- Decrease ATF temperature to 20 °C {68 °F} or below.
- Start the engine then wait 180 seconds or more.
- Warm up the engine and ATX.
 - Engine coolant temperature: 60 °C {140 °F} or above.
 - Transaxle fluid temperature: 20 °C {68 °F} or above.
- Shift the selector lever between P position to L range while depressing brake pedal.
- Drive the vehicle for 150 seconds or more at a vehicle speed between 25 and 59 km/h {15 and 36 mph}, then 60 km/h {37 mph} or more for 100 seconds or more.

ON-BOARD DIAGNOSTIC

9. Drive the vehicle in D range and shift gears between 1st and 4th (TCC operation) gear.
10. Gradually slow down and stop the vehicle.
11. Make sure that the repaired DTC does not recur.

DTC TABLE

A6E567001030W04

DTC No.	Condition	MIL	HOLD indicator light flashes	DC	Monitor item	Memory function	Page
P0010	CMP actuator circuit malfunction	(See F-67 DTC TABLE)					
P0011	CMP timing over advanced	(See F-67 DTC TABLE)					
P0012	CMP timing over retarded	(See F-67 DTC TABLE)					
P0031	Front HO2S heater circuit low	(See F-67 DTC TABLE)					
P0032	Front HO2S heater circuit high	(See F-67 DTC TABLE)					
P0037	Rear HO2S heater circuit low	(See F-67 DTC TABLE)					
P0038	Rear HO2S heater circuit high	(See F-67 DTC TABLE)					
P0101	MAF sensor inconsistent with TP sensor	(See F-67 DTC TABLE)					
P0102	MAF circuit low input	(See F-67 DTC TABLE)					
P0103	MAF circuit high input	(See F-67 DTC TABLE)					
P0107	MAP sensor circuit low input	(See F-67 DTC TABLE)					
P0108	MAP sensor circuit high input	(See F-67 DTC TABLE)					
P0111	IAT circuit performance problem	(See F-67 DTC TABLE)					
P0112	IAT circuit low input	(See F-67 DTC TABLE)					
P0113	IAT circuit high input	(See F-67 DTC TABLE)					
P0117	ECT circuit low input	(See F-67 DTC TABLE)					
P0118	ECT circuit high input	(See F-67 DTC TABLE)					
P0121	Throttle position stuck close	(See F-67 DTC TABLE)					
P0122	TP circuit low input	(See F-67 DTC TABLE)					
P0123	TP circuit high input	(See F-67 DTC TABLE)					
P0125	Excessive time to enter closed loop fuel control	(See F-67 DTC TABLE)					
P0131	Front HO2S no inversion (low stuck)	(See F-67 DTC TABLE)					
P0132	Front HO2S no inversion (high stuck)						
P0133	Front HO2S circuit malfunction	(See F-67 DTC TABLE)					
P0134	Front HO2S circuit no activity detected	(See F-67 DTC TABLE)					
P0138	Rear HO2S circuit high input	(See F-67 DTC TABLE)					
P0140	Rear HO2S circuit no activity detected	(See F-67 DTC TABLE)					
P0171	Fuel trim system too lean	(See F-67 DTC TABLE)					
P0172	Fuel trim system too rich	(See F-67 DTC TABLE)					
P0300	Random misfire detected	(See F-67 DTC TABLE)					
P0301	Cylinder No.1 misfire detected	(See F-67 DTC TABLE)					
P0302	Cylinder No.2 misfire detected						
P0303	Cylinder No.3 misfire detected						
P0304	Cylinder No.4 misfire detected						
P0327	Knock sensor circuit low input	(See F-67 DTC TABLE)					
P0328	Knock sensor circuit high input	(See F-67 DTC TABLE)					
P0335	CKP sensor circuit malfunction	(See F-67 DTC TABLE)					
P0340	CMP sensor circuit malfunction	(See F-67 DTC TABLE)					
P0351	Ignition coil (No.1, No.4) circuit malfunction	(See F-67 DTC TABLE)					
P0352	Ignition coil (No.2, No.3) circuit malfunction	(See F-67 DTC TABLE)					
P0401	EGR flow insufficient detected	(See F-67 DTC TABLE)					
P0402	EGR flow excessive detected	(See F-67 DTC TABLE)					
P0403	EGR valve motor coils open or short	(See F-67 DTC TABLE)					
P0420	Catalyst system efficiency below threshold	(See F-67 DTC TABLE)					
P0443	Evaporative emission control system purge control valve circuit malfunction	(See F-67 DTC TABLE)					
P0480	Fan control module circuit malfunction	(See F-67 DTC TABLE)					

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ON-BOARD DIAGNOSTIC

DTC No.	Condition	MIL	HOLD indicator light flashes	DC	Monitor item	Memory function	Page
P0500	VSS circuit malfunction (MTX)	(See F-67 DTC TABLE)					
	VSS circuit malfunction (ATX)	ON	YES	2	CCM	×	(See K-55 DTC P0500)
P0505	Idle control system malfunction	(See F-67 DTC TABLE)					
P0506	Idle control system RPM lower than expected	(See F-67 DTC TABLE)					
P0507	Idle control system RPM higher than expected	(See F-67 DTC TABLE)					
P0511	IAC valve circuit malfunction	(See F-67 DTC TABLE)					
P0550	PSP switch circuit malfunction	(See F-67 DTC TABLE)					
P0602	PCM programming error	(See F-67 DTC TABLE)					
P0610	Control module vehicle options error	(See F-67 DTC TABLE)					
P0661	VICS circuit low input	(See F-67 DTC TABLE)					
P0662	VICS circuit high input	(See F-67 DTC TABLE)					
P0703	Brake switch input malfunction	(See F-67 DTC TABLE)					
P0704	Clutch switch input malfunction	(See F-67 DTC TABLE)					
P0706	Transaxle range (TR) switch circuit range/performance	ON	YES	2	CCM	×	(See K-57 DTC P0706)
P0707	Transaxle range (TR) switch circuit low input	ON	YES	1	CCM	×	(See K-58 DTC P0707)
P0708	Transaxle range (TR) switch circuit high input	ON	YES	2	CCM	×	(See K-60 DTC P0708)
P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (Stuck)	ON	NO	2	CCM	×	(See K-63 DTC P0711)
P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)	ON	YES	1	CCM	×	(See K-64 DTC P0712)
P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)	ON	YES	1	CCM	×	(See K-65 DTC P0713)
P0715	Input/turbine speed sensor circuit malfunction	ON	YES	1	CCM	×	(See K-68 DTC P0715)
P0731	Gear 1 incorrect (Incorrect Gear Ratio Detected)	OFF	YES	1	CCM	×	(See K-70 DTC P0731)
P0732	Gear 2 incorrect (Incorrect Gear Ratio Detected)	OFF	YES	1	CCM	×	(See K-71 DTC P0732)
P0733	Gear 3 incorrect (Incorrect Gear Ratio Detected)	OFF	YES	1	CCM	×	(See K-73 DTC P0733)
P0734	Gear 4 incorrect (Incorrect Gear Ratio Detected)	OFF	YES	1	CCM	×	(See K-75 DTC P0734)
P0741	Torque converter clutch (TCC) (stuck OFF)	OFF	YES	1	CCM	×	(See K-77 DTC P0741)
P0742	Torque converter clutch (TCC) (stuck ON)	OFF	YES	1	CCM	×	(See K-78 DTC P0742)
P0745	Pressure control solenoid malfunction	OFF	YES	1	CCM	×	(See K-80 DTC P0745)
P0751	Shift solenoid A stuck OFF	ON	YES	2	CCM	×	(See K-82 DTC P0751)
P0752	Shift solenoid A stuck ON	ON	YES	2	CCM	×	(See K-83 DTC P0752)
P0753	Shift solenoid A malfunction (electrical)	ON	YES	1	CCM	×	(See K-85 DTC P0753)
P0756	Shift solenoid B stuck OFF	ON	YES	2	CCM	×	(See K-87 DTC P0756)
P0757	Shift solenoid B stuck ON	ON	YES	2	CCM	×	(See K-89 DTC P0757)
P0758	Shift solenoid B malfunction (electrical)	ON	YES	1	CCM	×	(See K-90 DTC P0758)
P0761	Shift solenoid C stuck OFF	ON	YES	2	CCM	×	(See K-93 DTC P0761)

ON-BOARD DIAGNOSTIC

DTC No.	Condition	MIL	HOLD indicator light flashes	DC	Monitor item	Memory function	Page
P0762	Shift solenoid C stuck ON	ON	YES	2	CCM	×	(See K-95 DTC P0762)
P0763	Shift solenoid C malfunction (electrical)	ON	YES	1	CCM	×	(See K-96 DTC P0763)
P0766	Shift solenoid D stuck OFF	ON	YES	2	CCM	×	(See K-99 DTC P0766)
P0767	Shift solenoid D stuck ON	ON	YES	2	CCM	×	(See K-100 DTC P0767)
P0768	Shift solenoid D malfunction (electrical)	ON	YES	1	CCM	×	(See K-102 DTC P0768)
P0771	Shift solenoid E stuck OFF	ON	YES	2	CCM	×	(See K-104 DTC P0771)
P0772	Shift solenoid E stuck ON	ON	YES	2	CCM	×	(See K-105 DTC P0772)
P0773	Shift solenoid E malfunction (electrical)	ON	YES	1	CCM	×	(See K-107 DTC P0773)
P0841	Oil pressure switch circuit malfunction	OFF	NO	2	CCM	×	(See K-109 DTC P0841)
P0850	Neutral switch input malfunction	(See F-67 DTC TABLE)					
P1410	Variable air duct valve circuit malfunction	(See F-67 DTC TABLE)					
P1562	PCM +BB voltage low	(See F-67 DTC TABLE)					
P2006	VTCS stuck close	(See F-67 DTC TABLE)					
P2009	VTCS circuit low input	(See F-67 DTC TABLE)					
P2010	VTCS circuit high input	(See F-67 DTC TABLE)					
P2228	BARO sensor circuit low input	(See F-67 DTC TABLE)					
P2229	BARO sensor circuit high input	(See F-67 DTC TABLE)					
P2502	Generator output voltage signal no electricity	(See F-67 DTC TABLE)					
P2503	Battery overcharge	(See F-67 DTC TABLE)					
P2504	Generator terminal B circuit open	(See F-67 DTC TABLE)					
U0073	CAN bus off	(See F-67 DTC TABLE)					
U0121	PCM cannot receive any signals from ABS, ABS/TCS or DSC HU/CM	(See F-67 DTC TABLE)					
U0155	PCM cannot receive any signals from combination meter	(See F-67 DTC TABLE)					

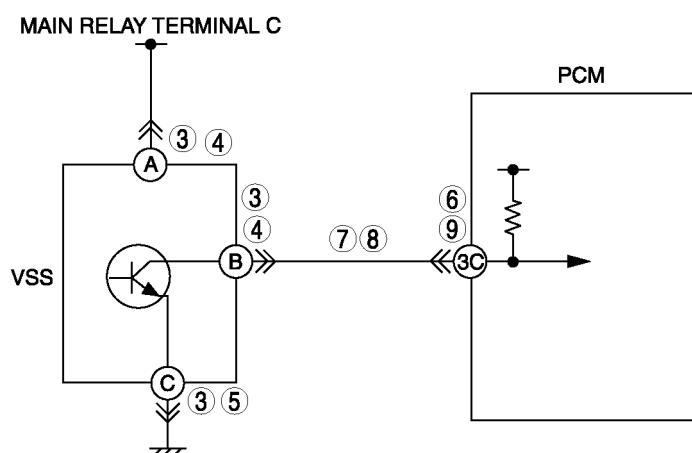
DTC P0500

A6E567001030W05

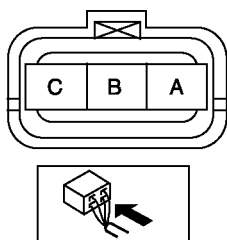
DTC P0500	Vehicle speed sensor (VSS) circuit malfunction
DETECTION CONDITION	- Vehicle speed signal not input after following conditions are met and 4.5 seconds or more have passed - D, L, or S range. - Engine coolant temperature 60 °C {140 °F} or above. - Turbine speed 1,500 rpm or above. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- VSS malfunction - Open circuit between VSS terminal B and PCM terminal 3C - Short to ground between VSS terminal B and PCM terminal 3C - Open circuit between VSS terminal A and fuse block connector (X-01) terminal AJ - Open circuit between VSS terminal C and body ground - Damaged connectors between VSS and PCM - PCM malfunction

ON-BOARD DIAGNOSTIC

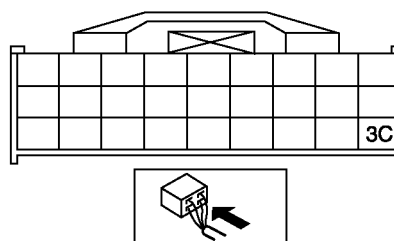
DTC P0500 Vehicle speed sensor (VSS) circuit malfunction



VSS HARNESS SIDE CONNECTOR



PCM HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED SERVICE INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair Information available?	Yes Perform repair or diagnosis according to available repair Information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	INSPECT VSS CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect VSS connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes Go to next step.
		No Repair or replace pin or connector, then go to Step 10.
4	INSPECT VSS POWER CIRCUIT FOR OPEN CIRCUIT - Verify that VSS connector is disconnected. - Turn ignition key to ON (Engine OFF). - Check voltage between VSS terminal A (harness-side) and ground - Is voltage reading B+?	Yes Go to next step.
		No Repair or replace harness, then go to Step 10.
5	INSPECT VSS GROUND CIRCUIT FOR OPEN - Turn ignition key to OFF. - Verify that VSS connector is disconnected. - Check for continuity between VSS terminal C (harness-side) and ground - Is there continuity?	Yes Go to next step.
		No Repair or replace harness, then go to Step 10.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes Go to next step.
		No Repair or replace pin or connector, then go to Step 10.
7	INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR OPEN - Disconnect PCM connector and VSS connector. - Inspect for continuity between VSS terminal B and PCM terminal 3C. - Is there continuity?	Yes Go to next step.
		No Repair or replace harness, then go to Step 10.
8	INSPECT VEHICLE SPEED SIGNAL CIRCUIT FOR SHORT TO GROUND - Verify that VSS connector and PCM connector are disconnected. - Inspect for continuity between PCM terminal 3C and body ground. - Is there continuity?	Yes Repair or replace harness, then go to Step 10.
		No Repair VSS, then go to Step 14.
9	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes Go to next step.
		No Repair or replace pin or connector, then go to Step 10.
10	VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Warm up engine. - Drive vehicle under following conditions for 4.5 seconds or more while monitoring PIDs. - Engine coolant temp: 60 °C {140 °F} or above - Drive in L range - Frequency of input/turbine speed sensor: 800 Hz or above - Is pending code present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No No concern is detected. Go to next step.
11	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC P0706

A6E567001030W06

DTC P0706	Transaxle range (TR) switch range/performance
DETECTION CONDITION	- When all conditions below are satisfied and 100 seconds or more have passed. - Engine speed 530 rpm or above. - Vehicle speed 20 km/h {12 mph} or above. - voltage at PCM terminal 1W is 0.5 V or above. - P, R, N, D, S or L range/position not detected. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- TR switch malfunction - TR switch misadjustment - PCM malfunction

ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	INSPECT TR SWITCH - Turn ignition key to OFF. - Disconnect TR switch connector. - Inspect for resistance between TR switch terminals B and C (part-side). - Is resistance okay? (See K-14 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)	Yes	Go to next step.
		No	Adjust TR switch, then go to next step. (See K-18 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT.)
4	VERIFY TROUBLESHOOTING OF DTC P0706 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle in each range (D, S, L, and R) for 100 seconds or more under following conditions. - Engine speed (RPM PID) 530 rpm or above - Vehicle speed (VSS PID) 20 km/h {12 mph} or above - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	No concern is detected. Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

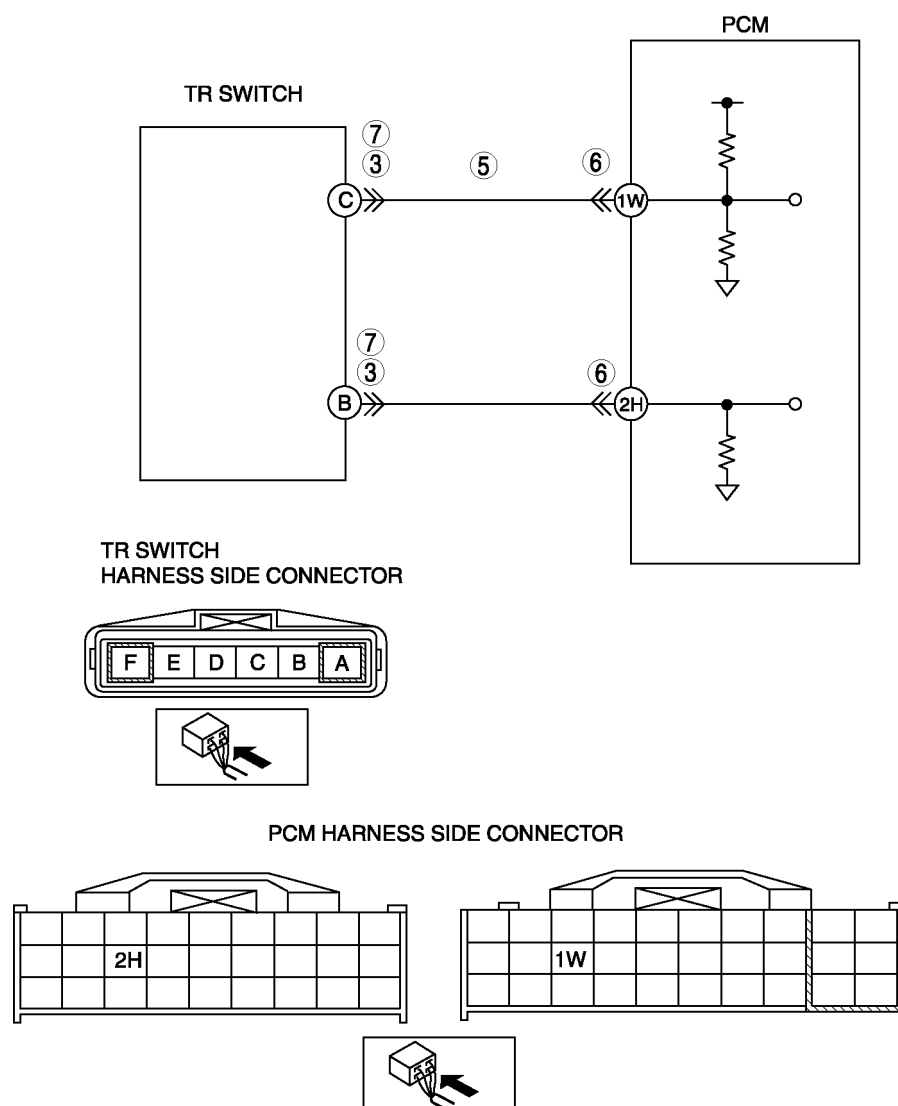
DTC P0707

A6E567001030W07

DTC P0707	Transaxle range (TR) switch circuit low input
DETECTION CONDITION	- When all conditions below satisfied and 100 seconds or more have passed: - Vehicle speed 20 km/h {12 mph} or above. - Engine speed 530 rpm or above. - Voltage at PCM terminal 1W is below 0.5 V. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
	POSSIBLE CAUSE - TR switch malfunction - Short to ground between TR switch terminal C and PCM terminal 1W - TR switch signal and TR switch ground circuits are shorted each other - PCM malfunction

ON-BOARD DIAGNOSTIC

DTC P0707 Transaxle range (TR) switch circuit low input



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	INSPECT TR SWITCH CONNECTOR - Turn ignition key OFF. - Disconnect TR switch connector. - Inspect for bent terminals of TR switch terminals B and C (part-side). - Are TR switch terminals okay?	Yes Go to next step.
		No Repair terminals or replace TR switch, then go to Step 7. (See K-15 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION.)
4	INSPECT TR SWITCH - Turn ignition key to OFF. - Disconnect TR switch connector. - Inspect for resistance between TR switch terminals B and C (part-side). - Is resistance okay? (See K-14 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)	Yes Go to next step.
		No Adjust TR switch, then go to Step 7. (See K-18 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT.)

ON-BOARD DIAGNOSTIC

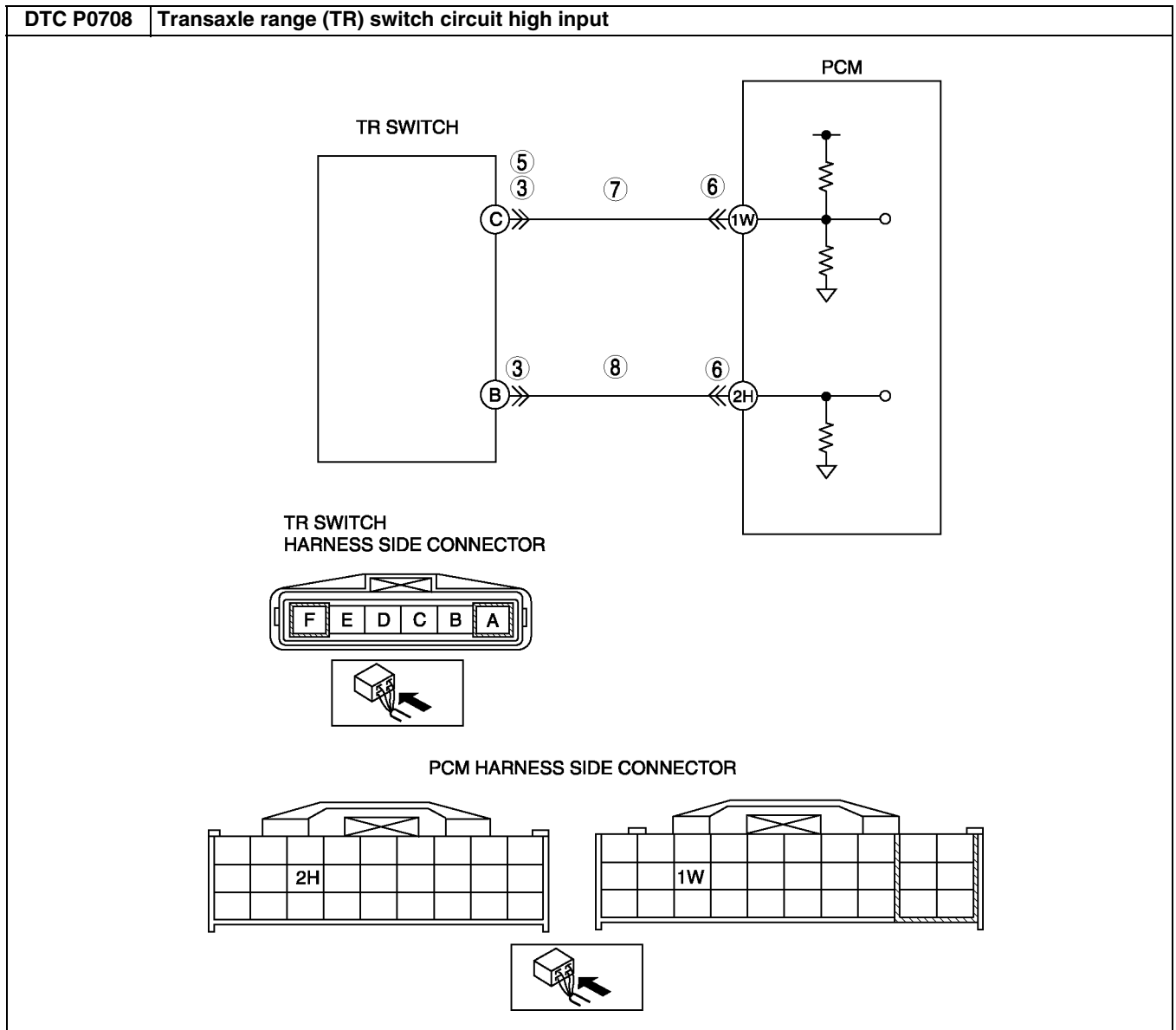
STEP	INSPECTION		ACTION
5	INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Disconnect PCM connector - Check for continuity between TR switch terminal C (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness for short to ground, then Go to step 7.
		No	Go to next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection at terminals 1W and 2H (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then Go to step 9.
		No	Go to next step.
7	INSPECT TR SWITCH CIRCUIT FOR SHORT - Check for continuity between TR switch terminals B and C (harness-side). - Is there continuity?	Yes	Repair or replace harness for short, then go to next step.
		No	Go to next step.
8	VERIFY TROUBLESHOOTING OF DTC P0707 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle for 100 seconds or more under following conditions. - Engine speed (RPM PID) 530 rpm or above - Vehicle speed (VSS PID) 20 km/h {12 mph} or above - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	No concern is detected. Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0708

A6E567001030W08

DTC P0708	Transaxle range (TR) switch circuit high input
DETECTION CONDITION	- When all conditions below satisfied and 100 seconds or more have passed: - Vehicle speed 20 km/h {12 mph} or above. - Engine speed 530 rpm or above. - Voltage at PCM terminal 1W is 4.79 V or above. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
	POSSIBLE CAUSE - TR switch malfunction - Open circuit between TR switch terminal C and PCM terminal 1W - Short to power circuit between TR switch terminal C and PCM terminal 1W - Open circuit between TR switch terminal B and PCM terminal 2H - Poor connection of TR switch or PCM connectors - PCM malfunction

ON-BOARD DIAGNOSTIC



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION - Turn ignition key OFF. - Disconnect TR switch connector. - Check for poor connection (damaged/pulled-out pins, corrosion, etc.). - Are TR switch terminals okay?	Yes	Go to next step.
		No	Repair terminals or replace TR switch, then go to Step 9. (See K-15 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION.)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
4	INSPECT TR SWITCH - Turn ignition key to OFF. - Disconnect TR switch connector. - Inspect for resistance between TR switch terminals B and C (part-side). - Is resistance okay? (See K-14 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)	Yes	Go to next step.
		No	Adjust TR switch, then go to Step 9. (See K-18 TRANSAXLE RANGE (TR) SWITCH ADJUSTMENT.)
5	INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Measure the voltage between TR switch terminal C (harness-side) and body ground. - Is there voltage B+?	Yes	Repair or replace harness for short to power, then go to step 9.
		No	Go to next step.
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection at terminals 1W and 2H (damaged/pulled-out pins, corrosion, etc.). - Is there malfunction?	Yes	Repair or replace terminal, then Go to step 9.
		No	Go to next step.
7	INSPECT TR SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT - Check for continuity between TR switch terminal C (harness-side) and PCM terminal 1W. - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to step 9.
8	INSPECT TR SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT - Check for continuity between TR switch terminal B (harness-side) and PCM terminal 2H. - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open, then go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0708 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle for 100 seconds or more under following conditions. - Engine speed (RPM PID) 530 rpm or above - Vehicle speed (VSS PID) 20 km/h {12 mph} or above - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	No concern is detected. Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0711

A6E567001030W09

DTC P0711	Transaxle fluid temperature (TFT) sensor circuit range/performance (stuck)
DETECTION CONDITION	- When all conditions below are satisfied. - When 180 seconds have passed after engine is started, vehicle is driven for 150 seconds or more at vehicle speed between 25 – 59 km/h {15 – 36 mph}, then 60 km/h {37 mph} or more for 100 seconds or more. - P0712, P0713 not output. - Variation in ATF voltage below 0.06 V. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light does not flash. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- TFT sensor malfunction - Connector corrosion - PCM malfunction

Diagnostic procedure

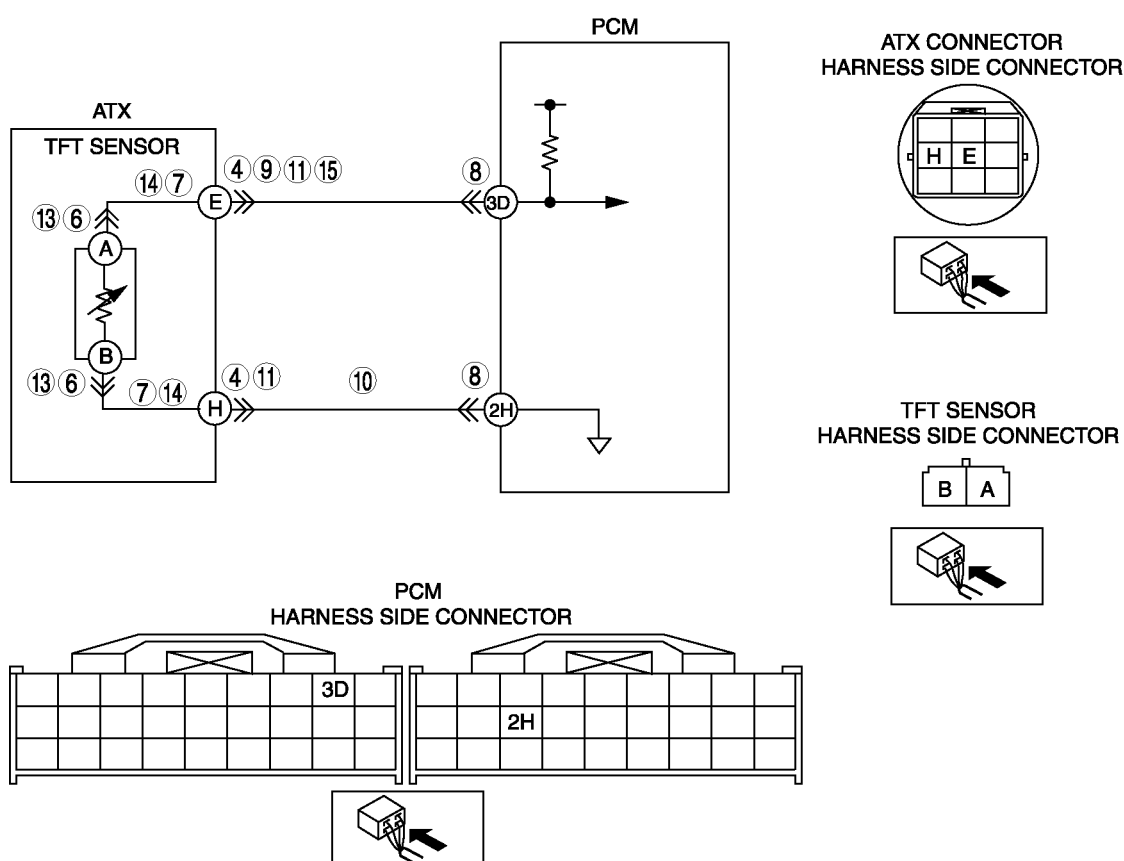
STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	INSPECT TFT SENSOR VOLTAGE - Turn ignition key to OFF. - Connect breakout box to PCM. - Turn ignition key to ON (engine OFF). - Measure the voltage at PCM terminal 3D. - Record terminal 3D voltage. - Start engine. - Drive vehicle at 60 km/h {37 mph} or above for 430 seconds or more. - Record terminal 3D voltage again. - Is variation in voltage 0.06V or above?	Yes Go to Step 5.
		No Go to next step.
4	INSPECT TERMINAL CONDITION - Turn ignition key to OFF. - Disconnect ATX connector. - Inspect terminals for corrosion. - Are terminals okay?	Yes Go to next step.
		No Repair or replace terminals, then go to next step.
5	VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Decrease ATF temperature to 20 °C {68 °F} or below. - Start engine and wait for 180 seconds or more. - Drive vehicle at a vehicle speed between 25 – 59 km/h {15 – 36 mph} for 150 seconds or more. - Drive vehicle at vehicle speed 60 km/h {37 mph} or above for 100 seconds or more. - Is pending code present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No Go to next step.
6	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0712

A6E567001030W10

DTC P0712	Transaxle fluid temperature (TFT) sensor circuit malfunction (short to ground)
DETECTION CONDITION	- If PCM detects either of following conditions for 150 seconds or more, PCM determines that TFT sensor circuit has a malfunction. - TFT sensor voltage is 0.06 V or below and vehicle speed 20 km/h {12 mph} or above. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- TFT sensor malfunction - Short to ground between TFT sensor terminal A and ATX connector terminal E - Short to ground between TFT sensor terminal B and ATX connector terminal H - Short to ground between ATX connector terminal E and PCM terminal 3D - Damaged connectors between TFT sensor and PCM - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED	Yes
	Has FREEZE FRAME PID DATA been recorded?	No
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY	Yes
	- Check for related Service Bulletins availability. - Is any related repair information available?	No

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
3	VERIFY CURRENT INPUT SIGNAL STATUS - Turn ignition key to OFF. - Connect breakout box to PCM. - Turn ignition key to ON (engine OFF). - Measure the voltage at PCM terminal 3D. - Are voltage readings above 0.06 V?	Yes Go to intermittent concern troubleshooting procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
		No Go to next step.
4	INSPECT TERMINAL CONDITION - Turn ignition key to OFF. - Disconnect ATX connector. - Inspect for bent terminals. - Are the terminals bent?	Yes Repair or replace terminals, then go to Step 9. • If terminals cannot be repaired, replace harness, then go to Step 9.
		No Go to next step.
5	INSPECT TFT SENSOR CIRCUIT - Turn ignition key to ON (engine OFF). - Verify if voltage changes to 4.67 V or above at PCM terminal 3D when ATX connector disconnected. - Does voltage change?	Yes Go to next step.
		No Go to Step 8.
6	INSPECT TFT SENSOR TERMINALS CONDITION - Turn ignition key to OFF. - Disconnect TFT sensor connector. - Inspect for bent TFT sensor terminals. - Are the terminals bent?	Yes Repair terminals or replace TFT sensor, then go to Step 9. (See K-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)
		No Go to next step.
7	INSPECT TFT SENSOR CIRCUIT FOR SHORT TO GROUND - Inspect for continuity between TFT sensor terminals (harness-side) and body ground. - A and body ground - B and body ground - Is there continuity?	Yes Repair or replace harness, then go to Step 9.
		No Replace TFT sensor, then go to step 9. (See K-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)
8	INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect for continuity between ATX connector terminal E (vehicle harness-side) and body ground. - Is there continuity?	Yes Repair or replace harness, then go to next step.
		No Go to next step.
9	VERIFY TROUBLESHOOTING OF DTC P0712 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle under following condition for 150 seconds or more. - Vehicle speed (VSS PID) 20 km/h {12 mph} or above. - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC P0713

A6E567001030W11

DTC P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)
DETECTION CONDITION	- If PCM detects either of following conditions for 150 seconds or more, PCM determines that TFT sensor circuit has a malfunction. - TFT sensor voltage is 4.67 V or above and vehicle speed 20 km/h {12 mph} or above. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.

ON-BOARD DIAGNOSTIC

DTC P0713	Transaxle fluid temperature (TFT) sensor circuit malfunction (open circuit)
POSSIBLE CAUSE	• TFT sensor malfunction • Open circuit between TFT sensor terminal A and ATX connector terminal E • Open circuit between TFT sensor terminal B and ATX connector terminal H • Open circuit between ATX connector terminal E and PCM terminal 3D • Open circuit between ATX connector terminal H and PCM terminal 2H • Damaged connectors between TFT sensor and PCM • PCM malfunction
ATX TFT SENSOR PCM ATX CONNECTOR HARNESS SIDE CONNECTOR TFT SENSOR HARNESS SIDE CONNECTOR PCM HARNESS SIDE CONNECTOR ATX CONNECTOR HARNESS SIDE CONNECTOR TFT SENSOR HARNESS SIDE CONNECTOR	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Check for related Service Bulletins availability. • Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	VERIFY CURRENT INPUT SIGNAL STATUS • Turn ignition key to OFF. • Connect breakout box to PCM. • Turn ignition key to ON (engine OFF). • Measure the voltage at PCM terminal 3D. • Are voltage readings below 4.67 V?	Yes Go to intermittent concern troubleshooting procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
		No Go to next step.
4	INSPECT ATX CONNECTOR FOR POOR CONNECTION • Turn ignition key to OFF. • Inspect ATX connector connection. • Disconnect ATX connector. • Check for poor connection (damaged/pulled-out terminals, corrosion etc.). • Is connection okay?	Yes Go to next step.
		No Repair or replace connector and/or terminal, then go to Step 11.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT TFT SENSOR CIRCUIT - Turn ignition key to ON (engine OFF). - Measure the voltage at PCM terminal 3D when connect between ATX connector terminals E and H (vehicle harness-side) using jumper wire. - Verify that voltage changes to 0.06 V or below. - Does voltage change?	Yes	Go to next step.
		No	Go to Step 8.
6	INSPECT TFT SENSOR CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Remove valve body cover. - Disconnect TFT sensor connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal or replace TFT sensor, then go to Step 11. (See K-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)
7	INSPECT TFT SENSOR CIRCUIT FOR OPEN - Check for continuity between TFT sensor terminals (harness-side) and ATX connector terminals (transaxle case side). - ATX connector terminal E and TFT sensor terminal A - ATX connector terminal H and TFT sensor terminal B - Is there continuity?	Yes	Replace TFT sensor, then go to Step 11. (See K-21 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION.)
		No	Repair or replace harness, then go to Step 11.
8	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
9	INSPECT HARNESS FOR OPEN CIRCUIT - Disconnect ATX connector. - Connect the PCM connector. - Turn ignition key to ON (engine OFF). - Inspect voltage at ATX connector terminal E (vehicle harness-side). - Is voltage 5 V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
10	INSPECT ATX CONNECTOR CIRCUIT FOR OPEN - Turn ignition key to OFF. - Inspect continuity between ATX connector terminal H (vehicle harness-side) and body ground. - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness, then go to next step.
11	VERIFY TROUBLESHOOTING OF DTC P0713 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle under following condition for 150 seconds or more. - Vehicle speed (VSS PID) 20 km/h {12 mph} or above. - Is same DTC present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

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ON-BOARD DIAGNOSTIC

DTC P0715

A6E567001030W12

DTC P0715	Input/turbine speed sensor circuit malfunction
DETECTION CONDITION - When all conditions below satisfied and 0.7 second or more have passed. - D, S or L range of TR switch input. - Driving vehicle with vehicle speed 40 km/h {25 mph} or above. - Input/turbine speed sensor signal not input. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.	POSSIBLE CAUSE - Input/turbine speed sensor malfunction - Short to ground between input/turbine speed sensor terminal A and PCM terminal 3J - Short to ground between input/turbine speed sensor terminal B and PCM terminal 3G - Open circuit between input/turbine speed sensor terminal A and PCM terminal 3J - Open circuit between input/turbine speed sensor terminal B and PCM terminal 3G - Damaged connectors between input/turbine speed sensor and PCM - PCM malfunction
The diagram illustrates the electrical connection between the Input/Turbine Speed Sensor and the PCM. The sensor has terminals 5, 6, 4, 8, and 9. The PCM has terminals 7, 3G, and 3J. The sensor's terminal 4 is connected to the PCM's terminal 7. The sensor's terminal 8 is connected to the PCM's terminal 3G. The sensor's terminal 9 is connected to the PCM's terminal 3J. Below the diagram are two connector views: the INPUT/TURBINE SPEED SENSOR HARNESS SIDE CONNECTOR and the PCM HARNESS SIDE CONNECTOR.	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
	No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
	No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
3	VERIFY CURRENT INPUT SIGNAL STATUS - Turn ignition key to OFF. - Start engine. - Measure frequency of input/turbine speed sensor using a oscilloscope. - IG ON: 0 Hz - Idle: Within 320—374 Hz (P, N position) - Are frequency of input/turbine speed sensor readings within specifications?	Yes Go to intermittent concern troubleshooting procedure. (See F-227 INTERMITTENT CONCERN TROUBLESHOOTING.)
		No Go to next step.
4	INSPECT INPUT/TURBINE SPEED SENSOR CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect input/turbine speed sensor connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes Go to next step.
		No Repair or replace connector and/or terminals, then go to Step 10.
5	INSPECT INPUT/TURBINE SPEED SENSOR RESISTANCE - Measure resistance between input/turbine speed sensor terminals (part-side). - Is resistance within 250—600 ohms between input/turbine speed sensor terminals (part-side)? (See K-23 INPUT/TURBINE SPEED SENSOR INSPECTION.)	Yes Go to next step.
		No Replace input/turbine speed sensor, then go to Step 10. (See K-24 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION.)
6	INSPECT INPUT/TURBINE SPEED SENSOR - Remove input/turbine speed sensor. - Is there iron powder stuck on input/turbine speed sensor? (See K-24 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION.)	Yes Clean input/turbine speed sensor, then go to Step 10.
		No Go to next step.
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes Go to next step.
		No Repair or replace connector and/or terminals, then go to Step 10.
8	INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR OPEN - Inspect input/turbine speed sensor terminals (harness-side) and PCM terminals (harness-side). - A and 3J - B and 3G - Is there continuity?	Yes Go to next step.
		No Repair or replace harness, then go to Step 10.
9	INSPECT INPUT/TURBINE SPEED SENSOR CIRCUIT FOR SHORT TO GROUND - Inspect input/turbine speed sensor terminal (harness-side) and body ground. - A and body ground - B and body ground - Is there continuity?	Yes Repair or replace harness, then go to next step.
		No Go to next step.
10	VERIFY TROUBLESHOOTING OF DTC P0715 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle with vehicle speed 40 km/h {25 mph} or above for 0.7 second or more. - Is same DTC present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No Go to next step.
11	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0731

A6E567001030W13

DTC P0731	Gear 1 incorrect (Incorrect Gear Ratio Detected)
DETECTION CONDITION	- PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is below 2.157, PCM determines that there is malfunction. Monitoring condition: - ATF temperature 20 °C {68 °F} or above. - Driving in 1GR in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Throttle opening angle 5.67% or above - Differential gear case (output) revolution speed 35 rpm or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL does not illuminate. - HOLD indicator light flashes if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is not available. - Pending code is not available. - DTC stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid A stuck - Pressure control solenoid stuck - Line pressure low - One-way clutch slipping - Forward clutch slipping - Control valve stuck - Oil pump - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information.
		No Go to next step.
2	CHECK ATF CONDITION - Check ATF condition. (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.) - Is it okay?	Yes Go to next step.
		No Replace ATF, then go to Step 8.
3	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 8.
4	INSPECT SHIFT SOLENOID VALVE A - Perform inspection of operation. (See K-26 SOLENOID VALVE INSPECTION.) - Verify the click sound of shift solenoid A when applying B+ to transaxle connector terminal A. - Was click heard from solenoids?	Yes Go to next step.
		No Replace solenoid that you could not hear click sound, then go to Step 8. (See K-28 SOLENOID VALVE REMOVAL/ INSTALLATION.)
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressures. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,160—1,320 kPa {11.9—13.4 kgf/cm², 170—190 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes Go to next step.
		No All ranges: Replace oil pump, then go to Step 8. Any ranges: Replace control valve body, then go to Step 8. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
6	INSPECT STALL SPEED - Measure stall speed in D range. (See K-7 Stall Test.) Specification 2,000—2,600 rpm - Is stall speed within specification?	Yes	Go to next step.
		No	Replace automatic transaxle, then go to Step8. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.)
7	INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE - Turn ignition key to OFF. - Connect WDS or equivalent. - Start engine. - Measure frequency of input/turbine speed sensor while driving vehicle under the following conditions: - Vehicle speed (VSS PID): 20 km/h {12 mph} - Drive in D range, 1st gear - Throttle opening angle (TP PID): about 25% - Was frequency of input/turbine speed sensor at approx. 1,100 Hz?	Yes	Go to next step.
		No	Replace control valve body, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION.)
8	VERIFY REPAIR OF DTC P0731 - Make sure to reconnect all disconnected connectors. - Clear DTC using WDS or equivalent. - Start engine. - Warm up transaxle. - Drive vehicle under the following conditions at least 4 times for more than 1 second. - ATF temperature: 20 °C {68 °F} or above - Drive in D range, 1st gear - Throttle opening angle (TP PID): 5.67% or above - Vehicle speed (VSS PID): 4 km/h {3 mph} or above - Are any DTCs present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0732

A6E567001030W14

DTC P0732	Gear 2 incorrect (Incorrect Gear Ratio Detected)
DETECTION CONDITION	- PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is below 1.249 or above 2.157, PCM determines that there is malfunction. Monitoring condition: - ATF temperature 20 °C {68 °F} or above. - Driving in 2 GR in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL does not illuminate. - HOLD indicator light flashes if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is not available. - Pending code is not available. - DTC stored in the PCM memory.

ON-BOARD DIAGNOSTIC

DTC P0732	Gear 2 incorrect (Incorrect Gear Ratio Detected)
POSSIBLE CAUSE	• ATF level low • Deteriorated ATF • Shift solenoids A, B or C stuck • Pressure control solenoid stuck • Line pressure low • 2-4 brake band slipping • Forward clutch slipping • Control valve stuck • Oil pump • PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Check for related Service Bulletins availability. • Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information.
		No Go to next step.
2	CHECK ATF CONDITION • Check ATF condition. (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.) • Is it okay?	Yes Go to next step.
		No Replace ATF, then go to Step 8.
3	CHECK ATF LEVEL • Start engine. • Warm up ATX. • Is ATF level within specification? (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 8.
4	INSPECTION SHIFT SOLENOID VALVE A, B AND C FOR CLICK SOUND • Perform inspection of operation. (See K-26 SOLENOID VALVE INSPECTION.) • Verify the click sound of shift solenoid A, B, and C when applying B+ to each transaxle connector terminal. • Was click heard from solenoids?	Yes Go to next step.
		No Replace solenoid that you could not hear click sound, then go to Step 8. (See K-28 SOLENOID VALVE REMOVAL/ INSTALLATION.)
5	INSPECT LINE PRESSURE • Start engine. • Measure line pressures. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,160—1,320 kPa {11.9—13.4 kgf/cm², 170—190 psi} • Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes Go to next step.
		No All ranges: Replace oil pump, then go to Step 8. Any ranges: Replace control valve body, then go to Step 8. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.)
6	INSPECT STALL SPEED • Measure stall speed in D range. (See K-7 Stall Test.) Specification 2,000—2,600 rpm • Is stall speed within specification?	Yes Go to next step.
		No Replace automatic transaxle, then go to Step 8. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION.)
7	INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE • Turn ignition key to OFF. • Connect WDS or equivalent. • Start engine. • Measure frequency of input/turbine speed sensor while driving vehicle under the following conditions: — Vehicle speed: 40 km/h {24 mph} (VSS PID) — Drive in D range, 2nd gear — Throttle opening angle: about 25% (TP PID) • Was frequency of input/turbine speed sensor at approx. 1,156 Hz?	Yes Go to next step.
		No Replace control valve body, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
8	VERIFY REPAIR OF DTC P0732 - Make sure to reconnect all disconnected connectors. - Clear DTC using WDS or equivalent. - Start engine. - Warm up transaxle. - Drive vehicle under the following conditions at least 4 times for more than 1 seconds. - ATF temperature: 20 °C {68 °F} or above - Drive in D range, 2nd gear - Vehicle speed (VSS PID): 3.8 km/h {2.4 mph} or above - Are any DTCs present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0733

A6E567001030W15

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DTC P0733	Gear 3 incorrect (Incorrect Gear Ratio Detected)
DETECTION CONDITION	- PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is below 0.863 or above 1.249, PCM determines that there is malfunction. Monitoring condition: - ATF temperature 20 °C {68 °F} or above. - Driving in 3 GR in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL does not illuminate. - HOLD indicator light flashes if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is not available. - Pending code is not available. - DTC stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoids A or C stuck - Pressure control solenoid stuck - Line pressure low 3-4 clutch slipping - Forward clutch slipping - Control valve stuck (Bypass, TCC or 3-4 shift valve) - Oil pump - PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information.
		No	Go to next step.
2	CHECK ATF CONDITION - Check ATF condition. (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.) - Is it okay?	Yes	Go to next step.
		No	Replace ATF, then go to Step 8.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 8.
4	INSPECTION SHIFT SOLENOID VALVE A AND C FOR CLICK SOUND - Perform inspection of operation. (See K-26 SOLENOID VALVE INSPECTION.) - Verify the click sound of shift solenoid A and C when applying B+ to each transaxle connector terminal. - Was click heard from solenoids?	Yes	Go to next step.
		No	Replace solenoid that you could not hear click sound, then go to Step 8. (See K-28 SOLENOID VALVE REMOVAL/ INSTALLATION.)
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressures. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,160—1,320 kPa {11.9—13.4 kgf/cm², 170—190 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	All ranges: Replace oil pump, then go to Step 8. Any ranges: Replace control valve body, then go to Step 8. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.)
6	INSPECT STALL SPEED - Measure stall speed in D range. (See K-7 Stall Test.) Specification 2,000—2,600 rpm - Is stall speed within specification?	Yes	Go to next step.
		No	Replace automatic transaxle, then go to Step 8. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION.)
7	INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE - Turn ignition key to OFF. - Connect WDS or equivalent. - Start engine. - Measure frequency of input/turbine speed sensor while driving vehicle under the following conditions: - Vehicle speed (VSS PID): 60 km/h {37 mph} - Drive in D range, 3rd gear - Throttle opening angle (TP PID): about 25% - Was frequency of input/turbine speed sensor at approx. 1,200 Hz?	Yes	Go to next step.
		No	Replace control valve body, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.)
8	VERIFY REPAIR OF DTC P0733 - Make sure to reconnect all disconnected connectors. - Clear DTC using WDS or equivalent. - Start engine. - Warm up transaxle. - Drive vehicle under the following conditions for more than 2 seconds. - ATF temperature: 20 °C {68 °F} or above - Drive in D range, 3rd gear - Vehicle speed (VSS PID): 4 km/h {3 mph} or above - Are any DTCs present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0734

A6E567001030W16

DTC P0734	Gear 4 incorrect (Incorrect Gear Ratio Detected)
DETECTION CONDITION	- PCM monitors revolution ratio of forward clutch drum revolution to differential gear case revolution when the following monitoring conditions are met. If revolution ratio is below 0.6 or above 1.249, PCM determines that there is malfunction. Monitoring condition: — ATF temperature 20 °C {68 °F} or above. — Driving in 4 GR in D range. — Engine run. — Turbine speed within 225—4,988 rpm. — Vehicle speed 50 km/h {31 mph} or above. — Closed throttle position. — Differential gear case (output) revolution speed 35 rpm or above. — Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL does not illuminate. - HOLD indicator light flashes if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is not available. - Pending code is not available. - DTC stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoids A, B or C stuck - Pressure control solenoid stuck - Line pressure low 2-4 brake band slipping 3-4 clutch slipping - Forward clutch slipping - Control valve stuck (Bypass or 3-4 shift valve) - Oil pump - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information.
		No Go to next step.
2	CHECK ATF CONDITION - Check ATF condition. (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.) - Is it okay?	Yes Go to next step.
		No Replace ATF, then go to Step 8.
3	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 8.
4	INSPECT SHIFT SOLENOID VALVE A AND D FOR CLICK SOUND - Perform inspection of operation. (See K-26 SOLENOID VALVE INSPECTION.) - Verify the click sound of shift solenoids A and D when applying B+ to each transaxle connector terminal. Note - Click from solenoid D is barely audible. Remove solenoids to correctly inspect if necessary. - Was click heard from solenoids?	Yes Go to next step.
		No Replace solenoid that you could not hear click sound, then go to Step 8. (See K-28 SOLENOID VALVE REMOVAL/INSTALLATION.)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressures. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,160—1,320 kPa {11.9—13.4 kgf/cm², 170—190 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	All ranges: Replace oil pump, then go to Step 8. Any ranges: Replace control valve body, then go to Step 8. (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .)
6	INSPECT STALL SPEED - Measure stall speed in D range. (See K-7 Stall Test.) Specification 2,000—2,600 rpm - Is stall speed within specification?	Yes	Go to next step.
		No	Replace automatic transaxle, then go to Step 8. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .)
7	INSPECT FREQUENCY OF INPUT/TURBINE SPEED SENSOR WHEN DRIVING VEHICLE - Turn ignition key to OFF. - Connect WDS or equivalent. - Start engine. - Measure frequency of input/turbine speed sensor while driving vehicle under the following conditions: - Vehicle speed (VSS PID): 80 km/h {49 mph} - Drive in D range, 4th gear - Throttle opening angle (TP PID): about 25% - Was frequency of input/turbine speed sensor at approx. 1,200 Hz?	Yes	Go to next step.
		No	Replace control valve body, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .)
8	VERIFY REPAIR OF DTC P0734 - Make sure to reconnect all disconnected connectors. - Clear DTC using WDS or equivalent. - Start engine. - Warm up transaxle. - Drive vehicle under the following conditions for more than 5 seconds. - ATF temperature: 20 °C {68 °F} or above - Drive in D range, 4th gear - Throttle opening angle (TP PID): 0% - Vehicle speed (VSS PID): 50 km/h {31 mph} or above - Are any DTCs present?	Yes	Replace PCM, then go to next step.
		No	Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE - Are any DTCs present? - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.)	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0741

A6E567001030W17

DTC P0741	Torque converter clutch (TCC) stuck OFF
DETECTION CONDITION	- When all conditions below satisfied. - ATF temperature 20 °C {68 °F} or above. - Driving in 4GR at D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Vehicle speed within 60—100 km/h {37—62 mph}. - TCC operation - Shift solenoid A duty value exceeds 99% - Power or normal mode - Difference between engine speed and turbine speed more than 100 rpm - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL does not illuminate if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is not available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoids A, B, C, D, E, and pressure control solenoid stuck - Line pressure low 2-4 brake band slipping 3-4 clutch slipping - Control valve stuck. - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step. No Go to next step.
2	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes Go to next step. No If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes Go to next step. No Adjust ATF level, then go to Step 6. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)
4	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,160—1,320 kPa {11.9—13.4 kgf/cm², 170—190 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes Go to next step. No - All ranges: Replace oil pump or control valve body, then go to Step 6. - Any ranges: Replace ATX, then go to Step 6. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	VERIFY TROUBLESHOOTING OF DTC P0741 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up engine and ATX. - Drive vehicle under following conditions for 5 seconds or more. - ATF temperature: 20 °C {68 °F} or above - Drive in D range, 4th gear (TCC operation) - Vehicle speed (VSS PID): within 60—100 km/h {37—62 mph} - Are any DTCs present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0742

A6E567001030W18

DTC P0742	Torque converter clutch (TCC) stuck ON
DETECTION CONDITION	- All of following conditions satisfied under each of following throttle conditions. - ATF temperature 20 °C {68 °F} or above. - Driving in 4GR at D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Vehicle speed below 70 km/h {43 mph}. - Torque converter clutch (TCC) no operation - Difference between engine speed and turbine speed below 50 rpm - DTC P0734 not output - Throttle conditions. - Throttle opening angle (TP PID) above 10.1% and 5 seconds or more have passed. - Throttle opening angle (TP PID) within 3.1—10.1% and 3 seconds or more have passed. - Throttle opening angle at closed throttle position and 5 seconds or more have passed. Diagnostic support note: - This is a continuous monitor (CCM). - MIL does not illuminate if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is not available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoids A, B, C, D, E, and pressure control solenoid stuck - Line pressure low 2-4 brake band slipping 3-4 clutch slipping - Control valve stuck - PCM malfunction

ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
2	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 4. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
3	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 6. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)
4	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,160—1,320 kPa {11.9—13.4 kgf/cm², 170—190 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	- All ranges: Replace oil pump or control valve body, then go to Step 6. - Any ranges: Replace ATX, then go to Step 6. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
5	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	VERIFY TROUBLESHOOTING OF DTC P0742 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up engine and ATX. - Drive vehicle under following. - ATF temperature: 20 °C {68 °F} or above - Drive in D range, 4th gear (TCC not in operation) - Vehicle speed: below 70 km/h {43 mph}. - Throttle conditions - Throttle opening angle (TP PID) above 10.1% and 5 seconds or more have passed. - Throttle opening angle (TP PID) within 3.1—10.1% and 3 seconds or more have passed. - Throttle opening angle at closed throttle position and 5 seconds or more have passed. - Are any DTCs present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.

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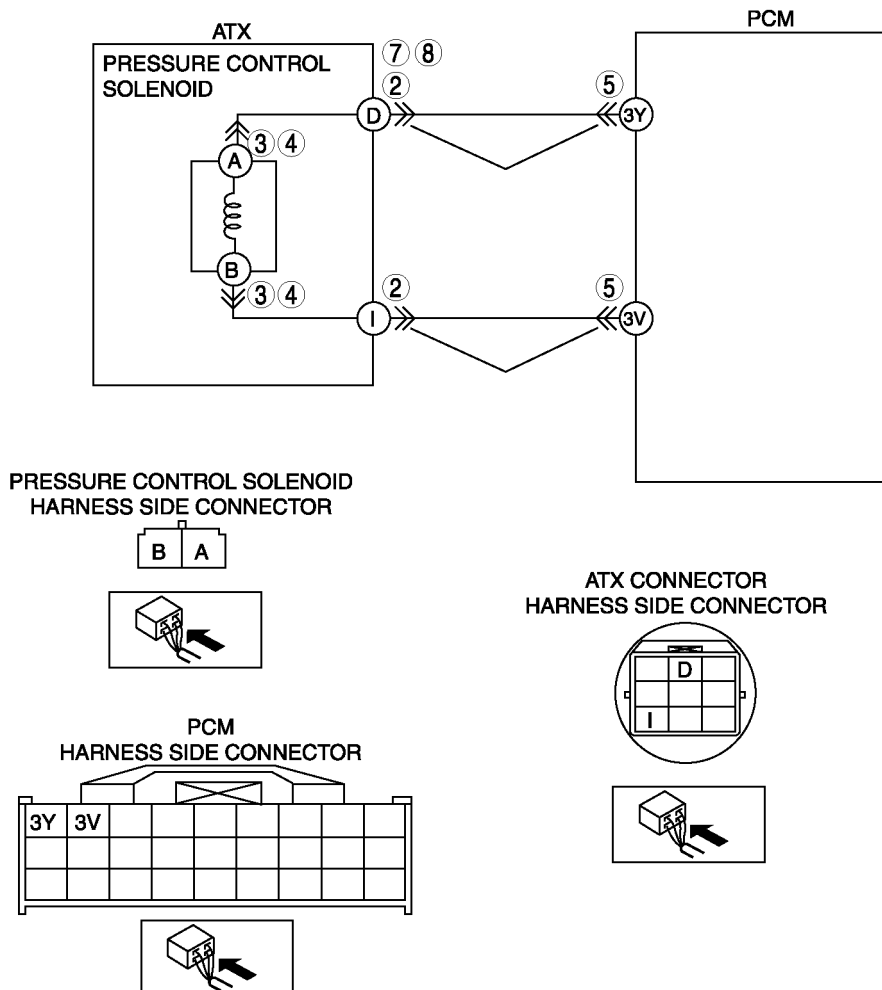
ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
7	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0745

A6E567001030W19

DTC P0745	Pressure control solenoid malfunction
DETECTION CONDITION	- If PCM detects either of following conditions, PCM determines that pressure control solenoid circuit has a malfunction - Pressure control solenoid voltage stuck 0 V after engine start - Pressure control solenoid voltage stuck B+ after engine start Diagnostic support note: - This is a continuous monitor (CCM). - MIL does not illuminate if PCM detects above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is not available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Pressure control solenoid malfunction - Open circuit between pressure control solenoid terminal B and ATX connector terminal I - Open circuit between ATX connector terminal I and PCM terminal 3V - Short to ground between ATX connector terminal D and PCM terminal 3Y - Short to power between ATX connector terminal D and PCM terminal 3Y - Open circuit between pressure control solenoid terminal A and ATX connector terminal D - Open circuit between ATX connector terminal D and PCM terminal 3Y - Damaged connector between pressure control solenoid and PCM - PCM malfunction



ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
2	INSPECT ATX CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect ATX connector. - Check for poor connection (damaged/pulled-out terminal, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 10.
3	INSPECT RESISTANCE - Inspect resistance between ATX connector (transaxle case side) terminals D and I. - Is resistance within 2.4—7.3 ohms? (See K-26 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 6.
		No	Go to next step.
4	INSPECT PRESSURE CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION - Disconnect pressure control solenoid connector. - Check for poor connection (damaged/pulled-out terminal, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 10.
5	INSPECT RESISTANCE - Inspect resistance between pressure control solenoid terminals A and B. - Is resistance within 2.4—7.3 ohms? (See K-27 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace solenoid harness, then go to Step 10.
		No	Verify pressure control solenoid installation. If solenoid installed correctly, replace pressure control solenoid, then go to Step 10. (See K-28 SOLENOID VALVE REMOVAL/INSTALLATION.)
6	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 10.
7	INSPECT ATX CONNECTOR CIRCUIT FOR OPEN - Inspect for continuity between PCM (harness-side) and ATX connector (vehicle harness-side). - PCM terminal 3Y and ATX connector terminal D - PCM terminal 3V and ATX connector terminal I - Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, the go to Step 10.
8	INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Inspect voltage at ATX connector terminal D (vehicle harness-side). - Is voltage 0 V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 10.
9	INSPECT PCM CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect for continuity between ATX connector terminal D (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness, then go to next step.
		No	Go to next step.

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ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
10	VERIFY TROUBLESHOOTING OF DTC P0745 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Make sure to wait more than 1 second after turning ignition key to ON. - Are any DTCs present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	No concern is detected. Go to next step.
11	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0751

A6E567001030W20

DTC P0751	Shift solenoid A stuck OFF
DETECTION CONDITION	- When any of P0731, P0732, and P0733 are not generated, and all conditions below satisfied. - ATF temperature 20 °C {68 °F} or above. - Driving in 4GR at D range. - Engine run. - Turbine speed within 225— 4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Torque converter clutch (TCC) not operating - Revolution ratio of forward clutch drum revolution to differential gear case revolution within 0.91—1.09. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid A stuck - Control valve stuck - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)

K-82

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,160—1,320 kPa {11.9—13.4 kgf/cm², 170—190 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes Go to next step.
		No - All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Is pending code present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC P0752

A6E567001030W21

DTC P0752	Shift solenoid A stuck ON
DETECTION CONDITION	- When P0734 is not generated, and all conditions below satisfied in 1GR and 2GR. - ATF temperature 20 °C {68 °F} or above. - Engine run. - Either of P0705 or P0706 output, or D range is selected. - Brake pedal depressed. - Throttle opening angle closed throttle position. - Vehicle speed 0 km/h {0 mph}. - Input/turbine speed sensor signal 187.5 rpm or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid A stuck - Control valve stuck - PCM malfunction

ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm², 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	- All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

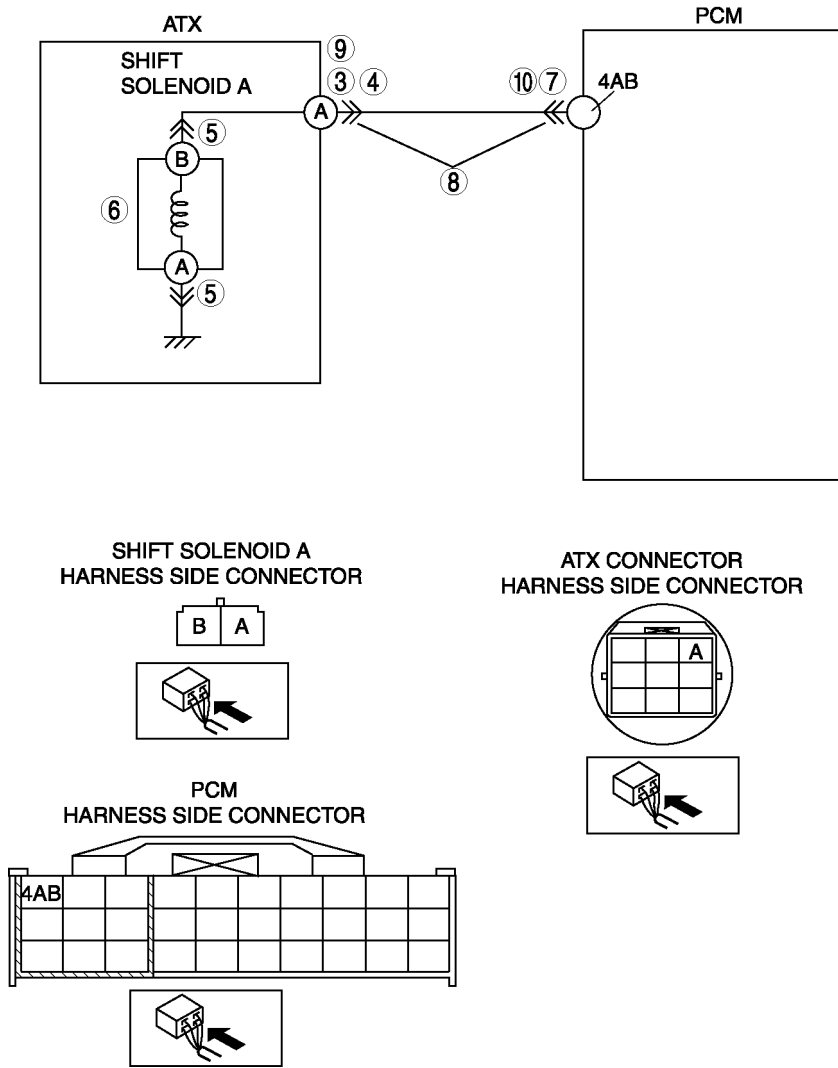
ON-BOARD DIAGNOSTIC

DTC P0753

A6E567001030W22

DTC P0753	Shift solenoid A malfunction (electrical)
DETECTION CONDITION	- If PCM detects either of following conditions, PCM determines that shift solenoid A circuit has a malfunction: - Shift solenoid A voltage is stuck at B+ after engine start. - Shift solenoid A voltage is stuck at 0 V after engine start. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Shift solenoid A malfunction - Short to ground between ATX connector terminal A and PCM terminal 4AB - Short to power between ATX connector terminal A and PCM terminal 4AB - Open circuit between shift solenoid A terminal B and ATX connector terminal A - Open circuit between ATX connector terminal A and PCM terminal 4AB - Open circuit between shift solenoid A terminal A and body ground point - Damaged connector between shift solenoid A and PCM - PCM malfunction

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ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	INSPECT ATX CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect ATX connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	INSPECT RESISTANCE - Check resistance between ATX connector terminal A (transaxle case side) and body ground. - Is resistance within 1.0—4.2 ohms? (See K-26 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to next step.
5	INSPECT SHIFT SOLENOID A CONNECTOR FOR POOR CONNECTION - Disconnect shift solenoid A connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	INSPECT RESISTANCE - Inspect resistance between shift solenoid A terminals A and B (part-side). - Is resistance within 1.0—4.2 ohms? (See K-27 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid A installation. If solenoid installed correctly, replace solenoid, then go to Step 11. (See K-28 SOLENOID VALVE REMOVAL/INSTALLATION .)
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	INSPECT ATX CONNECTOR CIRCUIT FOR OPEN - Inspect for continuity between PCM terminal 4AB (harness-side) and ATX connector terminal A (vehicle harness-side). - Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Inspect voltage at ATX connector terminal A (vehicle harness-side). - Is voltage 0 V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
10	INSPECT PCM CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect for continuity between PCM terminal 4AB (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness, then go to Step 11.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
11	VERIFY TROUBLESHOOTING OF DTC P0753 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. - Are any DTCs present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No No concern is detected. Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC P0756

A6E567001030W23

DTC P0756	Shift solenoid B stuck OFF
DETECTION CONDITION	- When any of DTC P0732, P0733, and P0734 are not generated, and all conditions below satisfied. - ATF temperature 20 °C {68 °F} or above. - Driving in 1GR at D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above - Throttle opening angle (TP PID) 5.67% or above. - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 2.157. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid B stuck - Control valve stuck - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes Go to next step.
		No If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm², 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	- All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0756 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Engine speed: 450 rpm or above (RPM PID) - Throttle opening angle (TP PID): 5.67% or above - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0757

A6E567001030W24

DTC P0757	Shift solenoid B stuck ON
DETECTION CONDITION	- When either of DTC P0731 and P0733 are not generated, and both the following conditions are satisfied. - When all conditions below satisfied while driving in 2GR. - ATF temperature 20 °C {68 °F} or above. - Driving in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 1.249 or more than 2.157. - Any of the following not generated: DTC P0500, P0705, P0706, P0710, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. - When all conditions below satisfied with driving in 4GR. - ATF temperature 20 °C {68 °F} or above. - Driving in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Vehicle speed 50 km/h {31 mph}. - Throttle opening angle closed throttle position. - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 0.6 or 1.249 or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid B stuck - Control valve stuck - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes Go to next step.
		No If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm ² , 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm ² , 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	- All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0757 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Engine speed: 450 rpm or above (RPM PID) - Throttle opening angle (TP PID): 0% (4th gear only) - Vehicle speed (VSS PID): 50 km/h {31 mph} (4th gear only) - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0758

A6E567001030W25

DTC P0758	Shift solenoid B malfunction (electrical)
DETECTION CONDITION	- If PCM detects either of following conditions, PCM determines that shift solenoid B circuit has a malfunction: - Shift solenoid B voltage is stuck at B+ after engine start. - Shift solenoid B voltage is stuck at 0 V after engine start. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.

ON-BOARD DIAGNOSTIC

DTC P0758	Shift solenoid B malfunction (electrical)
POSSIBLE CAUSE	- Shift solenoid B malfunction - Short to ground between ATX connector terminal C and PCM terminal 4AC - Short to power between ATX connector terminal C and PCM terminal 4AC - Open circuit between shift solenoid B terminal B and ATX connector terminal C - Open circuit between ATX connector terminal C and PCM terminal 4AC - Open circuit between shift solenoid B terminal A and body ground point - Damaged connector between shift solenoid B and PCM - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	INSPECT ATX CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect ATX connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes Go to next step.
		No Repair or replace connector and/or terminals, then go to Step 11.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
4	INSPECT RESISTANCE - Inspect resistance between ATX connector terminal C (transaxle case side) and body ground. - Is resistance within 1.0—4.2 ohms? (See K-26 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to next step.
5	INSPECT SHIFT SOLENOID B CONNECTOR FOR POOR CONNECTION - Disconnect shift solenoid B connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	INSPECT RESISTANCE - Inspect resistance between shift solenoid B terminals A and B (part-side). - Is resistance within 1.0—4.2 ohms? (See K-27 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid B installation. If solenoid installed correctly, replace solenoid, then go to Step 11. (See K-28 SOLENOID VALVE REMOVAL/INSTALLATION .)
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	INSPECT ATX CONNECTOR CIRCUIT FOR OPEN - Inspect for continuity between PCM terminal 4AC (harness-side) and ATX connector terminal C (vehicle harness-side). - Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Check for voltage at ATX connector terminal C (vehicle harness-side). - Is voltage 0 V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
10	INSPECT PCM CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Check for continuity between PCM terminal 4AC (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness, then go to Step 11.
		No	Go to next step.
11	VERIFY TROUBLESHOOTING OF DTC P0758 SHIFT SOLENOID B COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. - Are any DTCs present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0761

A6E567001030W26

DTC P0761	Shift solenoid C stuck OFF
DETECTION CONDITION	- When either of DTC P0733 and P0734 are not generated, and both the following conditions are satisfied. - When all conditions below satisfied while driving in 1GR. - ATF temperature 20 °C {68 °F} or above. - Driving in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Throttle opening angle (TP PID) 5.67% or above. - Differential gear case (output) revolution speed 35 rpm or above. - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 2.157. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. - When all conditions below satisfied while driving in 2GR. - ATF temperature 20 °C {68 °F} or above. - Driving in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 1.249 or 2.157 or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid C stuck - Control valve stuck - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes Go to next step.
		No If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm ² , 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm ² , 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test .)	Yes	Go to next step.
		No	- All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0761 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Throttle opening angle (TP PID): 5.67% or above - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE .) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0762

A6E567001030W27

DTC P0762	Shift solenoid C stuck ON
DETECTION CONDITION	- When either of DTC P0731 and P0732 are not generated, and both the following conditions are satisfied. - When all conditions below satisfied while driving in 3GR. - ATF temperature 20 °C {68 °F} or above. - Driving in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 0.863 or 1.249 or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. - When all conditions below satisfied while driving in 4GR. - ATF temperature 20 °C {68 °F} or above. - Driving in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Vehicle speed 50 km/h {31mph} or above. - Differential gear case (output) revolution speed 35 rpm or above. - Throttle opening angle at closed throttle position - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 0.6 or 1.249 or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid C and pressure control solenoid stuck - Control valve stuck - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes Go to next step.
		No If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)

ON-BOARD DIAGNOSTIC

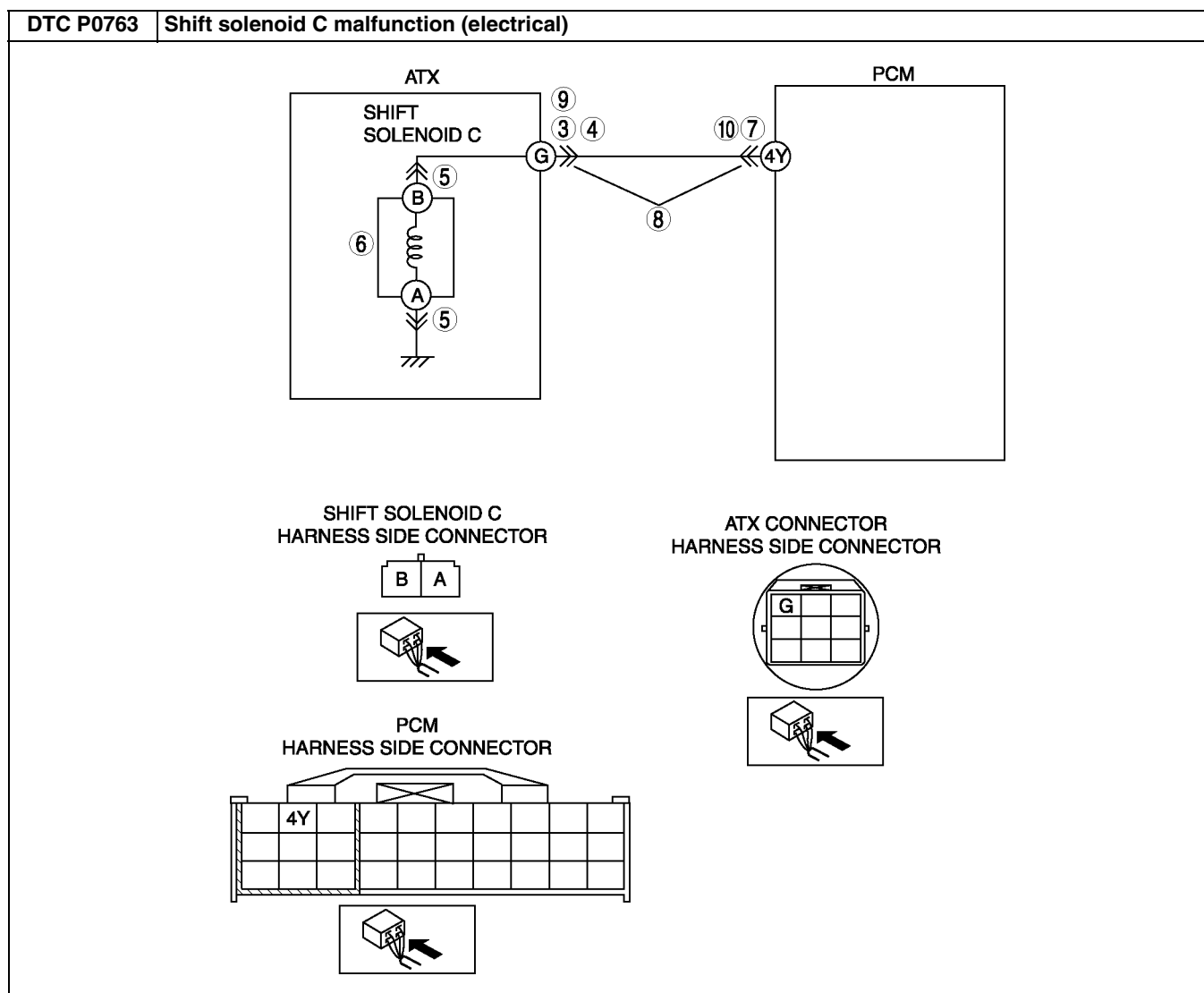
STEP	INSPECTION	ACTION	
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm², 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	- All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0762 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Throttle opening angle (TP PID): 0% (4GR only) - Vehicle speed (VSS PID): 50 km/h {31 mph} or above (4GR only) - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0763

A6E567001030W28

DTC P0763	Shift solenoid C malfunction (electrical)
DETECTION CONDITION	- If PCM detects either of following conditions, PCM determines that shift solenoid C circuit has a malfunction: - Shift solenoid C voltage is stuck at B+ after engine start. - Shift solenoid C voltage is stuck at 0 V after engine start. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Shift solenoid C malfunction - Short to ground between ATX connector terminal G and PCM terminal 4Y - Short to power between ATX connector terminal G and PCM terminal 4Y - Open circuit between shift solenoid C terminal B and ATX connector terminal G - Open circuit between ATX connector terminal G and PCM terminal 4Y - Open circuit between shift solenoid C terminal A and body ground point - Damaged connector between shift solenoid C and PCM. - PCM malfunction.

ON-BOARD DIAGNOSTIC



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	INSPECT ATX CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect ATX connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes Go to next step.
		No Repair or replace connector and/or terminals, then go to Step 11.
4	INSPECT RESISTANCE - Inspect resistance between ATX connector terminal G (transaxle case side) and body ground. - Is resistance within 1.0—4.2 ohms? (See K-26 Resistance Inspection (On-Vehicle Inspection).)	Yes Go to Step 7.
		No Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
5	INSPECT SHIFT SOLENOID C CONNECTOR FOR POOR CONNECTION - Disconnect shift solenoid C connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	INSPECT RESISTANCE - Inspect resistance between shift solenoid C terminals A and B (part-side). - Is resistance within 1.0—4.2 ohms? (See K-27 Resistance Inspection (Off-Vehicle Inspection) .)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid C installation. If solenoid installed correctly, replace solenoid, then go to Step 11. (See K-28 SOLENOID VALVE REMOVAL/INSTALLATION .)
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	INSPECT ATX CONNECTOR CIRCUIT FOR OPEN - inspect for continuity between PCM terminal 4Y (harness-side) and ATX connector terminal G (vehicle harness-side). - Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Check voltage at ATX connector terminal G (vehicle harness-side). - Is voltage 0 V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
10	INSPECT PCM CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect for continuity between PCM terminal 4Y (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness, then go to Step 11.
		No	Go to next step.
11	VERIFY TROUBLESHOOTING OF DTC P0763 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. - Are any DTCs present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	No concern is detected. Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE .) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0766

A6E567001030W29

DTC P0766	Shift solenoid D stuck OFF
DETECTION CONDITION	- When any of DTC P0731, P0732, and P0733 not output (correct judgment), and all conditions below are satisfied. - ATF temperature 20 °C {68 °F} or above. - Driving in 4GR at D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Vehicle speed 50 km/h {31 mph} or above. - Throttle opening angle closed throttle position. - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 0.6 or 1.249 or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid D stuck - Control valve stuck - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. • If vehicle is not repaired, go to next step.
		No Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes Go to next step.
		No If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm², 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes Go to next step.
		No - All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0766 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Throttle opening angle (TP PID): 0% (4GR only) - Vehicle speed: 50 km/h {31 mph} or above. (4GR only) (VSS PID) - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC P0767

A6E567001030W30

DTC P0767	Shift solenoid D stuck ON
DETECTION CONDITION	- When any of DTC P0731, P0732, P0734, and P0741 are not generated, and all conditions below are satisfied. - ATF temperature 20 °C {68 °F} or above. - Driving in D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Differential gear case (output) revolution speed 35 rpm or above. - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 0.863 or 1.249 or above. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid D stuck - Control valve stuck - PCM malfunction

ON-BOARD DIAGNOSTIC

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm², 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	- All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0767 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

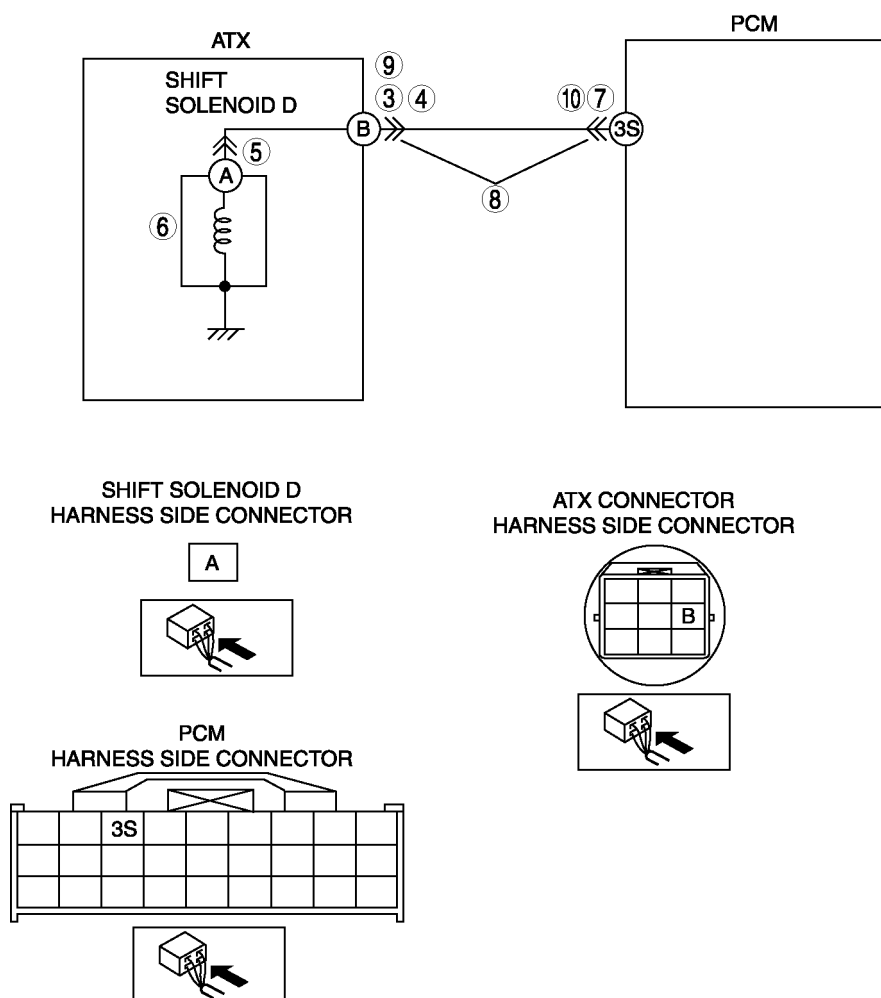
K

ON-BOARD DIAGNOSTIC

DTC P0768

A6E567001030W31

DTC P0768	Shift solenoid D malfunction (electrical)
DETECTION CONDITION	- If PCM detects either of following conditions while driving in 4GR at D range, PCM determines that shift solenoid D circuit has a malfunction: - Shift solenoid D voltage is stuck at B+ after engine start. - Shift solenoid D voltage is stuck at 0 V after engine start. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Shift solenoid D malfunction - Short to ground between ATX connector terminal B and PCM terminal 3S - Short to power between ATX connector terminal B and PCM terminal 3S - Open circuit between shift solenoid D terminal A and ATX connector terminal B - Open circuit between ATX connector terminal B and PCM terminal 3S - Damaged connector between shift solenoid D and PCM - PCM malfunction



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	INSPECT ATX CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect ATX connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	INSPECT RESISTANCE - Inspect resistance between ATX connector terminal B (transaxle case side) and body ground. - Is resistance within 10.9—26.2 ohms? (See K-26 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to next step.
5	INSPECT SHIFT SOLENOID D CONNECTOR FOR POOR CONNECTION - Disconnect shift solenoid D connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	INSPECT RESISTANCE - inspect resistance between shift solenoid D terminal A (part-side) and body ground. - Is resistance within 10.9—26.2 ohms? (See K-26 Resistance Inspection (On-Vehicle Inspection).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid D installation. If solenoid installed correctly, replace solenoid, then go to Step 11. (See K-28 SOLENOID VALVE REMOVAL/INSTALLATION .)
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	INSPECT ATX CONNECTOR CIRCUIT FOR OPEN - Inspect for continuity between PCM terminal 3S (harness-side) and ATX connector terminal B (vehicle harness-side). - Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Inspect voltage at ATX connector terminal B (vehicle harness-side). - Is voltage 0 V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
10	INSPECT PCM CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between PCM terminal 3S (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness, then go to Step 11.
		No	Go to next step.
11	VERIFY TROUBLESHOOTING OF DTC P0768 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. - Are any DTCs present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	No concern is detected. Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

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ON-BOARD DIAGNOSTIC

DTC P0771

A6E567001030W32

DTC P0771	Shift solenoid E stuck OFF
DETECTION CONDITION	- When any of P0731, P0732, and P0734 are not generated, and all conditions below are satisfied. - ATF temperature 20 °C {68 °F} or above. - Driving in 4GR at D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Vehicle speed within 60—100 km/h {37—62 mph}. - TCC operation - Shift solenoid A duty value exceeds 99% - Power or normal mode - Difference between engine speed and turbine speed more than 100 rpm - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid E stuck - Control valve stuck - PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes Go to next step.
		No If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes Go to next step.
		No Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm², 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes Go to next step.
		No - All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/ INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL , K-35 CONTROL VALVE BODY INSTALLATION .) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0771 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Vehicle speed: within 60—100 km/h {37—62 mph} (4th gear only). - Is pending code present?	Yes Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC P0772

A6E567001030W33

DTC P0772	Shift solenoid E stuck ON
DETECTION CONDITION	- When any of DTC P0731, P0733, and P0734 are not generated, and all of following conditions satisfied under each of following throttle conditions. - ATF temperature 20 °C {68 °F} or above. - Driving in 4GR at D range. - Engine run. - Turbine speed within 225—4,988 rpm. - Vehicle speed below 70 km/h {43 mph}. - Torque converter clutch (TCC) no operation - Difference between engine speed and turbine speed below 50 rpm - Throttle conditions. - Throttle opening angle (TP PID) above 10.1% and 5 seconds or more have passed. - Throttle opening angle (TP PID) within 3.1—10.1% and 3 seconds or more have passed. - Throttle opening angle at closed throttle position and 5 seconds or more have passed. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- ATF level low - Deteriorated ATF - Shift solenoid E stuck - Control valve stuck - PCM malfunction

ON-BOARD DIAGNOSTIC

Diagnostic procedure

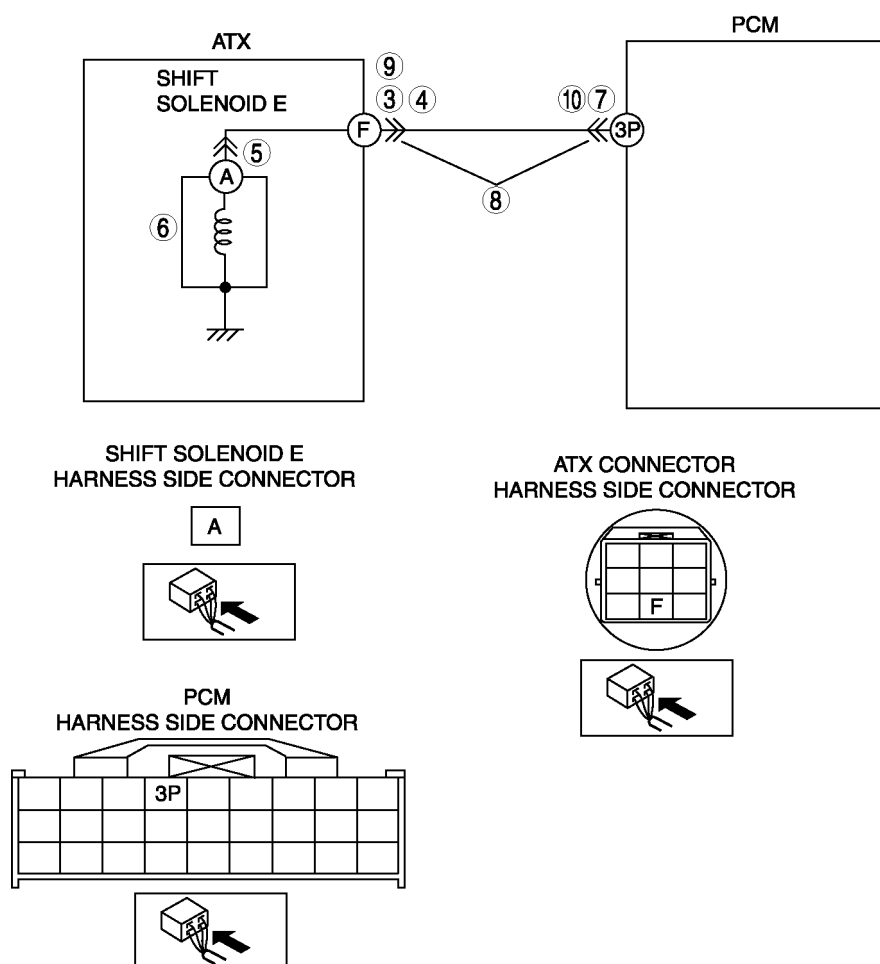
STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes	Go to next step.
		No	Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No	Go to next step.
3	CHECK ATF CONDITION - Turn ignition key to OFF. - Check ATF condition. - Clear red: Normal - Milky: Water mixed in fluid - Reddish brown: Deteriorated ATF - Is it okay? (See K-12 Automatic Transaxle Fluid (ATF) Condition Inspection.)	Yes	Go to next step.
		No	If ATF color milky or reddish brown, replace ATF, then go to Step 5. (See K-13 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT.)
4	CHECK ATF LEVEL - Start engine. - Warm up ATX. - Is ATF level within specification? (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)	Yes	Go to next step.
		No	Adjust ATF level, then go to Step 7. (See K-12 Automatic Transaxle Fluid (ATF) Level Inspection.)
5	INSPECT LINE PRESSURE - Start engine. - Measure line pressure. Specification Idle: 330—470 kPa {3.4—4.7 kgf/cm², 49—66 psi} Stall: 1,200—1,360 kPa {12.3—13.8 kgf/cm², 175—196 psi} - Is line pressure within specification? (See K-6 Line Pressure Test.)	Yes	Go to next step.
		No	- All ranges: Replace oil pump or control valve body, then go to Step 7. - Any ranges: Replace ATX, then go to Step 7. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
6	CHECK OPERATION OF EACH VALVE AND EACH SPRING - Turn ignition key to OFF. - Remove control valve body. - Disassemble control valve body. - Is each valve operation okay and is return spring okay? (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)	Yes	Replace ATX, then go to next step. (See K-29 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
		No	Repair or replace shift valve and return spring, then go to next step. (See K-34 CONTROL VALVE BODY REMOVAL, K-35 CONTROL VALVE BODY INSTALLATION.) (See ATX Workshop Manual FN4A-EL (9999-95-FN4A-99).)
7	VERIFY TROUBLESHOOTING OF DTC P0772 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Start engine. - Warm up ATX. - Drive the vehicle under the following conditions and make sure that gears shift smoothly from 1GR to 4GR. - ATF temperature: 20 °C {68 °F} or above - Drive in D range - Vehicle speed (VSS PID): below 70 km/h {43 mph} (4th gear only) - Is pending code present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0773

A6E567001030W34

DTC P0773	Shift solenoid E malfunction (electrical)
DETECTION CONDITION	- If PCM detects either of following conditions while driving in 4GR at D range with TCC operation, PCM determines that shift solenoid E circuit has a malfunction: - Shift solenoid E voltage is stuck at B+ after engine start. - Shift solenoid E voltage is stuck at 0 V after engine start. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction conditions during first drive cycle. - PENDING CODE is not available. - FREEZE FRAME DATA is available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Shift solenoid E malfunction - Short to ground between ATX connector terminal F and PCM terminal 3P - Short to power between ATX connector terminal F and PCM terminal 3P - Open circuit between shift solenoid E terminal A and ATX connector terminal F - Open circuit between ATX connector terminal F and PCM terminal 3P - Damaged connector between shift solenoid E and PCM - PCM malfunction



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes Go to next step.
		No Record FREEZE FRAME PID DATA on repair order, then go to next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Check for related Service Bulletins availability. - Is any related repair information available?	Yes Perform repair or diagnosis according to available repair information. If vehicle is not repaired, go to next step.
		No Go to next step.

ON-BOARD DIAGNOSTIC

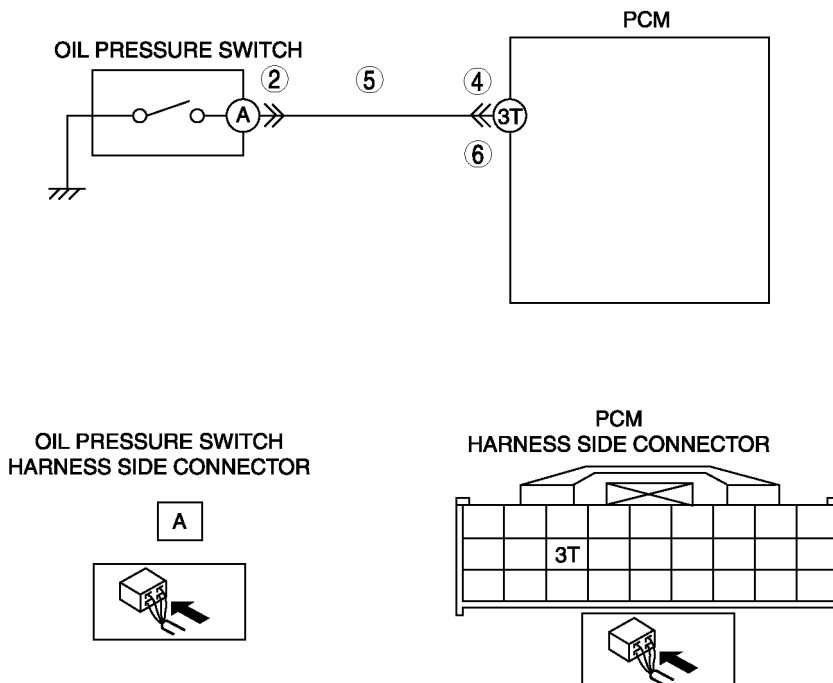
STEP	INSPECTION	ACTION	
3	INSPECT ATX CONNECTOR FOR POOR CONNECTION - Turn ignition key to OFF. - Disconnect ATX connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
4	INSPECT RESISTANCE - Inspect resistance between ATX connector terminal F (transaxle case side) and body ground. - Is resistance within 10.9—26.2 ohms? (See K-26 Resistance Inspection (On-Vehicle Inspection).)	Yes	Go to Step 7.
		No	Go to next step.
5	INSPECT SHIFT SOLENOID E CONNECTOR FOR POOR CONNECTION - Disconnect shift solenoid E connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 11.
6	INSPECT RESISTANCE - Inspect resistance between shift solenoid E terminal A (part-side) and body ground. - Is resistance within 10.9—26.2 ohms? (See K-27 Resistance Inspection (Off-Vehicle Inspection).)	Yes	Replace solenoid harness, then go to Step 11.
		No	Verify shift solenoid E installation. If solenoid installed correctly, replace solenoid, then go to Step 11. (See K-28 SOLENOID VALVE REMOVAL/INSTALLATION .)
7	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 11.
8	INSPECT ATX CONNECTOR CIRCUIT FOR OPEN - Inspect for continuity between PCM terminal 1 (harness-side) and ATX connector terminal F (vehicle harness-side). - Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
9	INSPECT ATX CONNECTOR CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Inspect voltage at ATX connector terminal F (vehicle harness-side). - Is voltage 0 V?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 11.
10	INSPECT PCM CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect for continuity between PCM terminal 1 (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness, then go to Step 11.
		No	Go to next step.
11	VERIFY TROUBLESHOOTING OF DTC P0773 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle in D range and make sure that gears shift smoothly from 1GR to 4GR. - Are any DTCs present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION .)
		No	No concern is detected. Go to next step.
12	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC P0841

A6E567001030W35

DTC P0841	Oil pressure switch circuit malfunction
DETECTION CONDITION	- When each of DTC P0731, P0732, P0733 and P0734 are not generated and 10 seconds or more passed. - When all conditions below satisfied while driving in 1GR, 2GR or 3GR. - ATF temperature 20 °C {68 °F} or above. - Oil pressure switch OFF - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 0.91 or more than 3.08. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. - When all conditions below satisfied with driving in 4GR. - ATF temperature 20 °C {68 °F} or above. - Oil pressure switch ON - Revolution ratio of forward clutch drum revolution to differential gear case revolution below 0.64 or more than 0.82. - Any of the following not generated: DTC P0500, P0706, P0707, P0708, P0712, P0713, P0715, P0751, P0752, P0753, P0756, P0757, P0758, P0761, P0762, P0763, P0766, P0767, P0768, P0771, P0772, P0773. Diagnostic support note: - This is a continuous monitor (CCM). - MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. - PENDING CODE is not available. - FREEZE FRAME DATA is not available. - HOLD indicator light flashes. - DTC is stored in the PCM memory.
POSSIBLE CAUSE	- Oil pressure switch malfunction - Open circuit between oil pressure switch terminal A and PCM terminal 3T - Short to ground between oil pressure switch terminal A and PCM terminal 3T - Damaged connector between oil pressure switch and PCM - PCM malfunction



Diagnostic procedure

INSPECTION PROCEDURE		
STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME PID DATA been recorded?	Yes
		No
		Go to next step.
		Record FREEZE FRAME PID DATA on repair order, then go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
2	INSPECT OIL PRESSURE SWITCH CONNECTOR FOR POOR CONNECTION - Disconnect shift oil pressure switch connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminal, then go to Step 7.
3	INSPECT CONTINUITY - inspect for continuity between oil pressure switch terminal A (part-side) and body ground. - Is there any continuity?	Yes	Replace oil pressure switch, then go to Step 7. (See K-23 OIL PRESSURE SWITCH REMOVAL/INSTALLATION.)
		No	Go to next step.
4	INSPECT PCM CONNECTOR FOR POOR CONNECTION - Disconnect PCM connector. - Check for poor connection (damaged/pulled-out terminals, corrosion, etc.). - Is connection okay?	Yes	Go to next step.
		No	Repair or replace connector and/or terminals, then go to Step 7.
5	INSPECT OIL PRESSURE SWITCH CIRCUIT FOR OPEN - Inspect for continuity between PCM terminal 3T (harness-side) and ATX connector terminal A (harness-side). - Is there continuity between terminals?	Yes	Go to next step.
		No	Repair or replace harness, then go to Step 7.
6	INSPECT PCM CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between PCM terminal 3T (harness-side) and body ground. - Is there continuity?	Yes	Repair or replace harness, then go to next step.
		No	Replace oil pressure switch, then go to next step. (See K-23 OIL PRESSURE SWITCH REMOVAL/INSTALLATION.)
7	VERIFY TROUBLESHOOTING OF DTC P0841 COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory using WDS or equivalent. - Drive vehicle and make sure that gears shift smoothly from 1GR to 4GR. - Are any DTCs present?	Yes	Replace PCM, then go to next step. (See F-43 PCM REMOVAL/INSTALLATION.)
		No	No concern is detected. Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE - Perform "After Repair Procedure". (See K-52 AFTER REPAIR PROCEDURE.) - Are any DTCs present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

PID/DATA MONITOR INSPECTION

A6E567001030W36

1. Connect the WDS or equivalent to the DLC-2.
2. Measure the PID value.

Note

- Perform part inspection for the output device after PCM inspection.
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, if a monitored value of an output device is out of specification, it is necessary to inspect the monitored value of the input device related to the output device control. Since an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device, it is necessary to inspect the output device individually using the simulation function, etc.

ON-BOARD DIAGNOSTIC

PID/DATA MONITOR AND RECORD function table

Monitor item (Definition)	Unit/ Condition		Condition/Specification	Action	PCM terminal
GEAR	—		1GR: 1 2GR: 2 3GR: 3 4GR: 4	Inspect following PIDs: SSA/SS1, SSB/SS2, SSC/SS3, SSD/SS4, SSE/SS5	3P, 3S, 3Y, 4Y, 4AB, 4AC
LINEDES	kPa	inHg	Indicates target line pressure	Inspect following PIDs: TFT, TFT V, VPWR, TP, TSS, VSS, TR	3V, 3Y
LPS (Pressure control solenoid)	%		Change current value according to throttle opening angle	Inspect pressure control solenoid. (See K-26 SOLENOID VALVE INSPECTION.)	3V, 3Y
OP SW B (Oil pressure switch)	ON/OFF		1, 2 or 3GR: ON Other: OFF	Inspect oil pressure switch inspection. (See K-21 OIL PRESSURE SWITCH INSPECTION.)	3T
SSA/SS1 (Shift solenoid A)	%		4GR: 99% others: 0%	Inspect shift solenoid A. (See K-26 SOLENOID VALVE INSPECTION.)	4AB
SSB/SS2 (Shift solenoid B)	%		1GR at D range: 99% Others: 0%	Inspect shift solenoid B. (See K-26 SOLENOID VALVE INSPECTION.)	4AC
SSC/SS3 (Shift solenoid C)	%		1GR/2GR: 99% Others: 0%	Inspect shift solenoid C. (See K-26 SOLENOID VALVE INSPECTION.)	4Y
TCS (HOLD switch)	ON/OFF		HOLD switch pressed: ON HOLD switch released: OFF	Inspect HOLD switch. (See K-13 HOLD SWITCH INSPECTION.)	3Q
TFT (Transaxle fluid temperature)	°C	°F	Indicates transaxle fluid temperature	Inspect TFT sensor. (See K-19 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION.)	3D
TFTV (Transaxle fluid signal voltage)	V		ATF 20 °C {68 °F}: 3.4—3.6 V ATF 130 °C {266 °F}: 0.4—0.5 V	Inspect TFT sensor. (See K-19 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION.)	3D
THOP (Throttle position sensor)	%		CTP: 0% WOT: 100%	Inspect TP sensor. (See F-51 THROTTLE POSITION (TP) SENSOR INSPECTION.)	2A
TP (Throttle position sensor signal voltage)	V		CTP: 0.4—1.5 V WOT: 4.0—5.0 V	Inspect TP sensor. (See F-51 THROTTLE POSITION (TP) SENSOR INSPECTION.)	2A
TR (Transaxle range)	—		P position: P R position: R N position: N D range: D S range: S L range: L	Inspect TR switch. (See K-14 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)	1W
TR SENS (TR switch)	V		P position: 4.34—4.79 V R position: 3.83—4.18 V N position: 3.05—3.50 V D range: 2.23—2.66 V S range: 1.46—1.84 V L range: 0.80—1.09 V	Inspect TR switch. (See K-14 TRANSAXLE RANGE (TR) SWITCH INSPECTION.)	1W
TSS (Input/turbine speed)	rpm		Ignition switch ON: 0 rpm Idle: 700—800 rpm (P, N position) Indicates Input/turbine speed	Inspect input/turbine speed sensor. (See K-23 INPUT/TURBINE SPEED SENSOR INSPECTION.)	3G, 3J
VPWR (Battery positive voltage)	V		Ignition switch ON: B+ Engine running: B+	Inspect main relay. (See T-24 RELAY INSPECTION.) Inspect battery. (See G-4 BATTERY INSPECTION.)	2Y, 2Z
VSS (Vehicle speed)	km/h	mph	Indicates vehicle speed	Inspect VSS. (See K-24 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION.)	3C

K

TROUBLESHOOTING

TROUBLESHOOTING

FOREWORD

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- Refer to Section GI and thoroughly read and understand the basic flow of troubleshooting in order to properly perform the procedures.

BASIC INSPECTION

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STEP	INSPECTION	ACTION	
1	Perform the mechanical system test. (See K-6 MECHANICAL SYSTEM TEST.) Is mechanical system okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result.
2	Turn IG SW to ON. When selector lever is moved, does the selector illumination indicate synchronized position to lever location? Also, when other ranges are selected from N or P during idling, does vehicle moves within 1—2 seconds ?	Yes	Go to next step.
		No	Inspect selector lever and TR switch. Repair or replace defected areas. (See K-45 SELECTOR LEVER INSPECTION.) (See K-14 TRANSAXLE RANGE (TR) SWITCH INSPECTION.) If selector lever and TR switch are okay, go to next step.
3	Inspect ATF color and condition. (See K-12 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION.) Are ATF color and orodor normal?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	Perform line pressure test. (See K-6 Line Pressure Test.) Is line pressure okay?	Yes	Go to next step.
		No	Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	Perform stall test. (See K-7 Stall Test.) Is stall speed okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result.
6	Inspect the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION.) - TFT - TFT V - VPWR - TR - TR SENS - ECT - TCS - RPM - TP - TSS - VSS Is PID value okay?	Yes	Perform symptom troubleshooting and follow procedures.
		No	Repair or replace any defective parts according to inspection result.

TROUBLESHOOTING

SYMPTOM TROUBLESHOOTING ITEM TABLE

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- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Vehicle does not move in D, S, L ranges, or in R position	Vehicle does not move when AP depressed.	(See K-117 NO.1 VEHICLE DOES NOT MOVE IN D, S, L RANGES, OR IN R POSITION.)
2	Vehicle moves in N position	Vehicle creeps in N position. Vehicle creeps if brake pedal is not depressed in N position.	(See K-117 NO.2 VEHICLE MOVES IN N POSITION.)
3	Vehicle moves in P position, or parking gear does not disengage when P position is disengaged	Vehicle rolls when on a downward slope and tires do not lock in P position. Tires locked when P position is disengaged, vehicle does not move in D, S, L ranges, and R position when AP depressed, and engine remains in stall condition.	(See K-118 NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED.)
4	Excessive creep	Vehicle accelerates in D, S, L ranges, and R position without depressing accelerator pedal.	(See K-118 NO.4 EXCESSIVE CREEP.)
5	No creep at all	Vehicle does not move in D, S, L ranges, or R position when idling on flat paved road.	(See K-118 NO.5 NO CREEP AT ALL.)
6	Low maximum speed and poor acceleration	Vehicle acceleration poor at start. Delayed acceleration when accelerator pedal depressed while driving.	(See K-119 NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION.)
7	No shifting	Single shift range only. Sometimes is shifts correctly.	(See K-120 NO.7 NO SHIFTING.)
8	Does not shift to fourth gear (4GR)	Vehicle does not upshift from 3GR to 4GR even though vehicle speed is increased. Vehicle does not shift to 4GR even though accelerator pedal is released in D range at 60 km/h {37 mph} .	(See K-120 NO.8 DOES NOT SHIFT TO FOURTH GEAR (4GR).)
9	Abnormal shifting	Shifts incorrectly (incorrect shift pattern).	(See K-122 NO.9 ABNORMAL SHIFTING.)
10	Frequent shifting	Downshifting occurs immediately even when accelerator pedal depressed slightly in D, S, L ranges except HOLD mode.	(See K-122 NO.10 FREQUENT SHIFTING.)
11	Shift point is high or low	Shift point considerably different from automatic shift diagram. Shift delays when accelerating. Shift occurs quickly when accelerating and engine speed does not increase.	(See K-122 NO.11 SHIFT POINT IS HIGH OR LOW.)
12	Torque converter clutch (TCC) non-operation	TCC does not operate when vehicle reaches TCC operation range.	(See K-123 NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION.)
13	No kickdown	Does not downshift when accelerator pedal fully depressed within kickdown range.	(See K-123 NO.13 NO KICKDOWN.)
14	Engine flares up or slips when upshifting or downshifting	When accelerator pedal is depressed for driveway, engine speed increases but vehicle speed increase slowly. When accelerator pedal is depressed while driving, engine speed increases but vehicle speed does not.	(See K-124 NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING.)
15	Engine flares up or slips when accelerating vehicle	Engine flares up when accelerator pedal is depressed for upshifting. Engine flares up suddenly when accelerator pedal is depressed for downshifting.	(See K-124 NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE.)
16	Judder upon torque converter clutch (TCC) operation	Vehicle jolts when TCC is engaged.	(See K-125 NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION.)
17	Excessive shift shock from N to D or N to R position/range	Strong shock is felt when shifting from N to D or N to R position/range at idle.	(See K-126 NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE.)

TROUBLESHOOTING

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
18	Excessive shift shock is given when upshifting and downshifting	Excessive shift shock is felt when depressing accelerator pedal to accelerate at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.	(See K-127 NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING.)
19	Excessive shift shock on torque converter clutch (TCC)	Strong shock is felt when TCC engaged.	(See K-127 NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC).)
20	Noise occurs at idle when vehicle is stopped in all positions/ranges	Transaxle is noisy in all positions and ranges when vehicle idling.	(See K-128 NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES.)
21	Noise occurs at idle when vehicle is stopped in D, S, L ranges, or in R position	Transaxle is noisy in driving ranges when vehicle idling.	(See K-128 NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D, S, L RANGES, OR IN R POSITION.)
22	No engine braking in HOLD mode	Engine speed drops to idle but vehicle coasts when accelerator pedal is released during cruising at medium to high speeds. Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in L range at low vehicle speed.	(See K-129 NO.22 NO ENGINE BRAKING IN HOLD MODE.)
23	Transaxle overheats	Burnt smell emitted from transaxle. Smoke is emitted from transaxle.	(See K-129 NO.23 TRANSAXLE OVERHEATS.)
24	Engine stalls when shifted to D, S, L ranges, or in R position	Engine stalls when shifting from N or P position to D, S, L ranges or R position at idle.	(See K-130 NO.24 ENGINE STALLS WHEN SHIFTED TO D, S, L RANGES, OR IN R POSITION.)
25	Engine stalls when driving at slow speeds or stopping	Engine stalls when brake pedal is depressed while driving at low speed or stopping.	(See K-130 NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING.)
26	Starter does not work	Starter does not work even when P or N position is selected.	(See K-130 NO.26 STARTER DOES NOT WORK.)
27	HOLD indicator light does not illuminate when HOLD switch is turned ON	HOLD indicator light in dashboard does not illuminate when HOLD switch is turned on and IG SW at ON.	(See K-130 NO.27 HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED TO ON.)
28	HOLD indicator light illuminates when HOLD switch is not turned ON	HOLD indicator light in dashboard illuminates even though HOLD switch turned off and IG SW at ON.	(See K-131 NO.28 HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED TO ON.)

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TROUBLESHOOTING

NO.1 VEHICLE DOES NOT MOVE IN D, S, L RANGES, OR IN R POSITION

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1	Vehicle does not move in D, S, L ranges, or in R position
DESCRIPTION	Vehicle does not move when AP depressed.
POSSIBLE CAUSE	- If the vehicle does not move in D, S, L ranges or R position, basically, the malfunction is in the ATX. (Vehicle will move even with a malfunction in the PCM.) Since a malfunction is in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related harnesses. - Clutch slipped, worn (D, S, L ranges-Forward clutch, R position-Reverse clutch, Low and reverse brake) - Line pressure low - Shift solenoid D malfunction - Shift solenoid E malfunction - Shift solenoid A malfunction - Shift solenoid B malfunction - Pressure control solenoid malfunction - Body GND malfunction - Control valve body malfunction - Selector lever malfunction - Parking mechanism not properly operation - Torque converter malfunction Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	When vehicle is stopped on a flat, level road and engine is off, does vehicle move when pushed? (in D, S ranges or N, R positions and brake is released)	Yes Go to next step.
		No Check for parking mechanism. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
2	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes Go to next step.
		No Repair open ground circuit.
3	Check LPS PID value using WDS or equivalent. Is LPS PID value okay? (See F-45 PCM INSPECTION .)	Yes Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
		No Repair or replace any defective parts.

NO.2 VEHICLE MOVES IN N POSITION

A6E568001030W06

2	Vehicle moves in N position
DESCRIPTION	- Vehicle creeps in N position. - Vehicle creeps if brake pedal is not depressed in N position.
POSSIBLE CAUSE	- If the vehicle moves in N position, basically, the malfunction is in the ATX. Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the ATX, inspect the sensors, output circuit, and the related harnesses. - Clutch burned (Forward clutch) - Control valve body malfunction - Selector lever position disparity (Although the selector indicator shows N position, hydraulic circuit shows D range or R position) Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Does vehicle creep when selector lever is moved slightly in N position?	Yes Go to next step.
		No Adjust selector lever. (See K-46 SELECTOR CABLE ADJUSTMENT .)

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
2	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
3	Check LPS PID value using WDS or equivalent. Is LPS PID value okay? (See F-45 PCM INSPECTION .)	Yes	Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
		No	Repair or replace any defective parts.

NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED

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3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged		
DESCRIPTION	- Vehicle rolls on a downward slope in P position. - Tires are locked when P is disengaged. Vehicle does not move in D, S, L ranges, and R position when AP is depressed, and engine remains in stall condition.		
POSSIBLE CAUSE	1. Parking mechanism malfunction (May have effect on noise or shock from transaxle) 2. Improper adjustment of selector lever 3. If vehicle moves in N position, perform No.2 "Vehicle moves in N position"		

NO.4 EXCESSIVE CREEP

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4	Excessive creep		
DESCRIPTION	Vehicle accelerates in D, S, L ranges, and R position without depressing accelerator pedal.		
POSSIBLE CAUSE	1. Engine idle speed high (transaxle system is not cause of problem) 2. Go to No.7 "Fast idle/runs on" (See F-198 NO.7 SLOW RETURN TO IDLE .)		

NO.5 NO CREEP AT ALL

A6E568001030W09

5	No creep at all		
DESCRIPTION	Either the transaxle is stuck in 3GR position, or there is clutch circuit slippage		
POSSIBLE CAUSE	- Either transaxle is stuck in 3GR or 4GR position, or clutch circuit slippage due to a stuck 3-4 clutch is stuck. - Clutch burned - Line pressure low - Shift solenoid D malfunction - Shift solenoid A malfunction - Shift solenoid B malfunction - Shift solenoid C malfunction - Pressure control solenoid malfunction - Body GND malfunction - Control valve body malfunction - Transaxle fixed in 3GR (Operation of fail-safe function) - Short or open circuit in wiring - Poor connection of connector - The electronic parts of output and input system is malfunction - The engine torque is not start - Torque converter is malfunction Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.		

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	Does vehicle creep in any range/position?	Yes	Go to next step.
		No	Inspect or adjust selector lever. (See K-46 SELECTOR LEVER REMOVAL/INSTALLATION .)

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
2	Check the value at the following PID using the WDS or equivalent. (See F-45 PCM INSPECTION.) • TP Is PID value okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes	Go to next step.
		No	Repair open ground circuit.
4	Check LPS PID value. Is LPS PID value okay? (See F-45 PCM INSPECTION.)	Yes	Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
		No	Repair or replace any defective parts.

NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION

A6E568001030W10

6	Low maximum speed and poor acceleration	
DESCRIPTION	- Vehicle acceleration is poor at start. - Delayed acceleration when accelerator pedal is depressed while driving.	
POSSIBLE CAUSE	- If the clutch is stuck or does not stay in 3GR, the malfunction is in engine circuit. - Clutch slipped, burned - Line pressure low - Shift solenoid D malfunction - Shift solenoid E malfunction - Shift solenoid A malfunction - Shift solenoid B malfunction - Shift solenoid C malfunction - Pressure control solenoid malfunction - Body GND malfunction - Control valve body malfunction - Signal malfunction - Vehicle speed sensor malfunction - Sensor GND malfunction - TP sensor malfunction - Input/turbine speed sensor malfunction - Transaxle fixed in 3GR (Operation of fail-safe function) - Short or open circuit in wiring - Poor connection of connector - The electronic parts of output and input system have malfunction - Insufficient starting torque (Suspected when in-gear condition, shift control and engine circuit are normal) - The torque converter have malfunction (Poor operation, stuck) - Engagement of TCC operation range (Operation of fail-safe function) - Transaxle fluid temperature sensor malfunction (Short or open circuit) - Transaxle fixed in HOLD mode - HOLD switch malfunction - TR switch adjustment incorrect Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	With ignition switch at ON, does HOLD indicator light indication correspond to HOLD switch operation?	Yes	Go to next step.
		No	Go to No.26 "HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED ON.". No.27 "HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED ON."
2	Go to No.12 "Lack/loss of power". (See F-207 NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE.) Does CIS system okay?	Yes	Go to next step.
		No	Repair or replace any defective parts.

TROUBLESHOOTING

STEP	INSPECTION		ACTION
3	Disconnect solenoid connector. Does vehicle operate as follows? D, S ranges: 3GR (fixed) L range: 1GR (fixed) R position: Reverse	Yes	Go to next step.
		No	Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
4	Drive vehicle in D, S, and L ranges except HOLD mode. Does vehicle start from stop in first gear?	Yes	Go to next step.
		No	Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION.) • TP • VSS • TSS • TR Repair or replace any defective parts.
5	Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION.) • SSA/SS1 • SSB/SS2 • SSC/SS3 Are PID values okay?	Yes	Go to next step.
		No	Check the value at the following PIDs using the NGS tester. (See F-45 PCM INSPECTION.) • TP • VSS • TSS Repair or replace any defective parts.
6	Perform the stall test. (See K-7 Stall Test.) Is stall speed okay?	Yes	Reverify symptoms of malfunction.
		No	Overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)

NO.7 NO SHIFTING

A6E568001030W11

7	No shifting
DESCRIPTION	• Single shift range only. • Sometimes it shifts correctly.
POSSIBLE CAUSE	• When the gear position is fixed in 3GR due to the fail-safe operation, the malfunction is in the ATX. • Perform malfunction diagnosis according to No.6 "Low maximum speed and poor acceleration". 1. Clutch slippage, burned • Line pressure low • Shift solenoid D malfunction • Shift solenoid E malfunction • Shift solenoid A malfunction • Shift solenoid B malfunction • Shift solenoid C malfunction • Pressure control solenoid malfunction • Body GND malfunction • Control valve body malfunction 2. Signal malfunction • Vehicle speed sensor malfunction • Sensor GND malfunction • TP sensor malfunction • Input/turbine speed sensor malfunction 3. Transaxle fixed in 3GR (Operation in fail-safe function) • Short or open circuit in wiring • Poor connection of connector • Disconnected shift solenoid connector • Poor ground of shift solenoid 4. Transaxle fixed in HOLD mode • HOLD switch malfunction

NO.8 DOES NOT SHIFT TO FOURTH GEAR (4GR)

A6E568001030W12

8	Does not shift to fourth gear (4GR)
DESCRIPTION	• Vehicle does not upshift from 3GR to 4GR even though vehicle speed increased. • Vehicle does not shift to 4GR even though accelerator pedal is released in D range at 60 km/h {37 mph}.

TROUBLESHOOTING

POSSIBLE CAUSE	- Basically, TCC does not operate when fail-safe is operating. Verify the DTCs first. If the TCC operates when driving at high speeds only, malfunction (improper adjustment) is in the HOLD switch circuit or TR switch circuit. Caution If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF. - TCC piston slipped, burned - Line pressure low - TP sensor malfunction - Engine coolant temperature sensor malfunction - Vehicle speed sensor malfunction - Input/turbine speed sensor malfunction - Sensor GND malfunction - Transaxle fluid temperature sensor malfunction - Short or open circuit in wiring - Poor connection of connector - Sensor malfunction - TR switch malfunction - Short or open circuit in wiring - Poor connection of connector - Sensor malfunction - Selector lever adjustment incorrect - TR switch adjustment incorrect - Shift solenoid A, shift solenoid B, shift solenoid D valve malfunction - Short or open circuit in wiring - Poor connection of connector - Solenoid valve stuck - HOLD switch malfunction - Control valve body malfunction Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	With indicator switch at ON, does HOLD indicator light indication correspond to HOLD switch operation?	Yes Go to next step.
		No Go to No.26 "HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED ON.", No.27 "HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED ON."
2	Check the value at the following PID using the WDS or equivalent. (See F-45 PCM INSPECTION.) • TFT • TFTV Is PID value okay?	Yes Go to next step.
		No Repair or replace any defective parts.
3	Check the value at the following PIDs using the NGS tester. (See F-45 PCM INSPECTION.) • SSA/SS1 • SSB/SS2 • SSC/SS3 Are PID values okay?	Yes Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
		No Go to next step.
4	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION.) • TR • TSS • VSS Repair or replace any defective parts.
		No Repair open ground circuit. Reconnect PCM.

TROUBLESHOOTING

NO.9 ABNORMAL SHIFTING

A6E568001030W13

9	Abnormal shifting
DESCRIPTION	Shift incorrectly (incorrect shift pattern).
POSSIBLE CAUSE	- There is a malfunction in the signal circuit which controls shifting (TP sensor, input/turbine speed sensor, vehicle speed sensor), the control valve is stuck, the accumulator (forward or servo apply) is stuck, or the clutch circuit is stuck. - Clutch slipped, burned - Line pressure low - Control valve body malfunction - Shift solenoid D malfunction - Shift solenoid E malfunction - Shift solenoid A malfunction - Shift solenoid B malfunction - Shift solenoid C malfunction - Body GND malfunction - Accelerator cable misadjustment - Signal malfunction - Vehicle speed sensor malfunction - Sensor GND malfunction - TP sensor malfunction or mis-adjustment - Input/turbine speed sensor malfunction - TR switch malfunction - Selector lever adjustment incorrect - TR sensor adjustment incorrect Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Disconnect PCM Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms?	Yes Go to next step. No Repair open ground circuit. Reconnect PCM.
2	Check the value at the following PIDs using the WDS or equivalent. (See 3940 PCM INSPECTION.) - TP - TSS - VSS Is PID value okay?	Yes Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].) No Repair or replace any defective parts.

NO.10 FREQUENT SHIFTING

A6E568001030W14

10	Frequent shifting
DESCRIPTION	Downshifting occurs immediately even when accelerator pedal is depressed slightly in D, S, L ranges except HOLD mode.
POSSIBLE CAUSE	The circuit which is the cause is basically the same as No.9 "Abnormal shifting". However, a malfunction of the input signal to the TP sensor, input/turbine speed sensor, vehicle speed sensor (including the sensor GND, sensor harness and connector), or clutch slippage (clutch stuck, low pressure in line) may also be the cause.

NO.11 SHIFT POINT IS HIGH OR LOW

A6E568001030W15

11	Shift point is high or low
DESCRIPTION	- Shift point considerably different from automatic shift diagram. - Shift delays when accelerating. - Shift occurs quickly when accelerating and engine speed does not increase.
POSSIBLE CAUSE	- If the transaxle does not shift abnormally, there is a malfunction of the input signal to the TP sensor, input/turbine speed sensor, or vehicle speed sensor (including sensor GND). - If the engine speed is high or low, regardless normal shifting, inspect the tachometer. - Verify that the output signal of the TP sensor changes linearly.

TROUBLESHOOTING

NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION

A6E568001030W16

12	Torque converter clutch (TCC) non-operation
DESCRIPTION	TCC does not operate when vehicle reaches TCC operation range.
POSSIBLE CAUSE	- Basically, the TCC does not operate when the fail-safe is operating. Verify the DTC first. Caution - If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF. - TCC burned - Input sensor system malfunction - Transaxle fluid temperature sensor - Vehicle speed sensor - Input/turbine speed sensor - Sensor GND - Output solenoid valve system malfunction (Sticking) - Shift solenoid E malfunction - Shift solenoid A malfunction - Control valve body malfunction system (Poor operation, stuck) - TCC hydraulic pressure system - TP sensor malfunction (Not operating linear) - Input/turbine speed sensor or vehicle speed sensor malfunction - Brake switch malfunction (Always ON) - ECT sensor malfunction Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	With indicator switch at ON, does HOLD indicator light indication correspond to HOLD switch operation?	Yes Go to next step.
		No Go to No.26 "HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED ON.", No.27 "HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED ON."
2	Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION .) - TP - VSS - TSS Are PID values okay?	Yes Go to next step.
		No Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes Go to next step.
		No Repair open ground circuit.
4	Check resistance between shift solenoid A and E control circuit at PCM connector and control valve body connector. Check resistance between shift solenoid A and E circuit at PCM connector and control valve body connector. Are the resistances less than 5.0 ohms ?	Yes Go to next step.
		No Repair shift solenoid A or E control. Reconnect PCM.
5	Inspect shift solenoid A and E. (See K-26 SOLENOID VALVE INSPECTION .) Are the shift solenoids operating properly?	Yes Replace PCM.
		No Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)

NO.13 NO KICKDOWN

A6E568001030W17

13	No kickdown
DESCRIPTION	Does not downshift when accelerator pedal is fully depressed within kickdown range.
POSSIBLE CAUSE	If transaxle does not downshift though shifting is normal, malfunction is in TP sensor circuit (including sensor GND, sensor harness and connector).

TROUBLESHOOTING

NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING

A6E568001030W18

14	Engine flares up or slips when upshifting or downshifting
DESCRIPTION	- When accelerator pedal is depressed for driveway, engine speed increases but vehicle speed increases slowly. - When accelerator pedal is depressed while driving, engine speed increases but vehicle does not.
POSSIBLE CAUSE	- There is clutch slip because clutch is stuck or line pressure is low. - Clutch stuck, slippage (forward clutch, 3–4 clutch, 2–4 brake band, one-way clutch) - Line pressure low - Shift solenoid D malfunction - Shift solenoid E malfunction - Shift solenoid A malfunction - Shift solenoid B malfunction - Shift solenoid C malfunction - Pressure control solenoid malfunction - Body GND malfunction - Accelerator cable misadjustment - Control valve body malfunction - Signal malfunction - Vehicle speed sensor malfunction - Sensor GND malfunction - TP sensor malfunction or mis-adjustment - Input/turbine speed sensor malfunction - Poor operation of mechanical pressure - Selector lever position disparity - TR switch position disparity Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Is shift point okay?	Yes Go to next step. No Go to No.9 "ABNORMAL SHIFTING"
2	Check the value at the following PID using the WDS or equivalent. (See F-45 PCM INSPECTION .) • TP Is PID value okay?	Yes Go to next step. No Repair or replace any defective parts.
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes Go to next step. No Repair open ground circuit. Reconnect PCM.
4	Check LPS PID value. Is LPS PID value okay? (See F-45 PCM INSPECTION .)	Yes Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].) No Repair or replace any defective parts.

NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE

A6E568001030W19

15	Engine flares up or slips when accelerating vehicle
DESCRIPTION	- Engine flares up when accelerator pedal is depressed for upshifting. - Engine flares up suddenly when accelerator pedal is depressed for downshifting.
POSSIBLE CAUSE	The malfunction is basically the same as for No.14 "Engine flares up or slips when upshifting or downshifting". If conditions for No.14 worsen, the malfunction will develop to No.15.

TROUBLESHOOTING

NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION

A6E568001030W20

16	Judder upon torque converter clutch (TCC) operation
DESCRIPTION	Vehicle jolts when TCC is engaged.
POSSIBLE CAUSE	- Poor TCC engagement due to either slippage because the TCC is stuck or the line pressure is low Caution - If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF. - Torque converter clutch piston slipped, burned - Line pressure high - Shift solenoid A malfunction - Control valve body malfunction - Body GND malfunction - Pressure control solenoid malfunction - Signal malfunction - Vehicle speed sensor malfunction - Sensor GND malfunction - TFT sensor malfunction - TP sensor malfunction or mis-adjustment - Input/turbine speed sensor malfunction - Torque converter malfunction Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION .)	Yes
		No
2	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes
		No
3	Check resistance between shift solenoid A control circuit at PCM connector and control valve body connector. Check resistance between shift solenoid A circuit at PCM connector and control valve body connector. Are the resistance less than 5.0 ohms ?	Yes
		No
4	Inspect Shift solenoid. (See K-26 SOLENOID VALVE INSPECTION .) Is the solenoid valve operating properly?	Yes
		No
5	Check LPS PID value. Is LPS PID value okay? (See F-45 PCM INSPECTION .)	Yes
		No

TROUBLESHOOTING

NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE

A6E568001030W21

17	Excessive shift shock from N to D or N to R position/range
DESCRIPTION	Strong shock felt when shifting from N to D or N to R position/range.
POSSIBLE CAUSE	- Shift shock may worsen when the fail-safe is operating. If no DTC is output, the shift shock may worsen due to poor operation of the control valve body or sticking of the clutch. 1. Clutch burned (N→D: Forward clutch, N→R: Reverse clutch or low and reverse brake) - Line pressure low, high - TP sensor malfunction - Vehicle speed sensor malfunction - Input/turbine speed sensor malfunction - Shift solenoid B malfunction - Shift solenoid D malfunction - Shift solenoid A malfunction - Shift solenoid C malfunction - Pressure control solenoid malfunction - Accelerator cable misadjustment - Control valve body malfunction - Sensor GND malfunction - Body GND malfunction 2. Poor hydraulic operation (Malfunction in range change) - Forward accumulator malfunction - Servo apply accumulator malfunction - Pressure switch malfunction 3. Idle speed high 4. Poor tightening torque of engine mount, exhaust mount 5. Poor operation of mechanical pressure - Selector lever position disparity Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Does shift shock occur only when engine cold?	Yes Go to next step.
		No Go to Step 3.
2	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION.) - TP - TFT - TFTV Repair or replace any defective parts.
		No Repair open ground circuit. Reconnect PCM.
3	Perform the stall test. (See K-7 Stall Test.) Is stall speed okay?	Yes Go to next step.
		No Go to Step 5.
4	Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION.) TR Is PID value okay?	Yes Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
		No Repair or replace any defective parts.
5	Check the value at the following PID using the WDS or equivalent. (See F-45 PCM INSPECTION.) TP Is PID value okay?	Yes Go to next step.
		No Repair or replace any defective parts.
6	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes Go to next step.
		No Repair open ground circuit. Reconnect PCM.
7	Check LPS PID value. Is LPS PID value okay? (See F-45 PCM INSPECTION.)	Yes Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
		No Repair or replace any defective parts.

TROUBLESHOOTING

NO.18 EXCESSIVE SHIFT SHOCK IS FELT WHEN UPSHIFTING AND DOWNSHIFTING

A6E568001030W22

18	Excessive shift shock is felt when upshifting and downshifting
DESCRIPTION	Excessive shift shock felt when depressing accelerator pedal to accelerate at upshifting. During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.
POSSIBLE CAUSE	- Shift shock may worsen when fail-safe is operating. The shift shock has worsened if the TP sensor, input/turbine speed sensor, or vehicle speed sensor signal malfunctions. 1. Clutch slipped, burned (Forward clutch, 2–4 brake band, 3–4 clutch) - Line pressure low, high - Shift solenoid D malfunction - Shift solenoid E malfunction - Shift solenoid A malfunction - Shift solenoid B malfunction - Shift solenoid C malfunction - Pressure control solenoid malfunction - Accelerator cable misadjustment - Control valve body malfunction - Body GND malfunction 2. Signal malfunction - Transaxle temperature sensor malfunction - Vehicle speed sensor malfunction - Sensor GND malfunction - TP sensor malfunction - Input/turbine speed sensor malfunction 3. Poor hydraulic operation (Malfunction in range change) - Pressure switch malfunction - Forward accumulator malfunction - Servo apply accumulator malfunction Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Perform the stall test. (See K-7 Stall Test .) Is stall speed okay?	Yes
		No
2	Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION .) • TP V Is PID value okay?	Yes
		No
3	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes
		No
4	Check LPS PID value. Is LPS PID value okay? (See F-45 PCM INSPECTION .)	Yes
		No

NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC)

A6E568001030W23

19	Excessive shift shock on torque converter clutch (TCC)
DESCRIPTION	Strong shock is felt when TCC engaged.
POSSIBLE CAUSE	The troubleshooting flow is the same as No.16 “Judder upon TCC operation”.

TROUBLESHOOTING

NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES

A6E568001030W24

20	Noise occurs at idle when vehicle is stopped in all positions/ranges
DESCRIPTION	Transaxle noisy in all positions and ranges when vehicle is idling.
POSSIBLE CAUSE	- The malfunction is in the oil pump which causes a high-pitched noise to be emitted from the transaxle at idle. Note - If a noise is emitted during shifting only, the malfunction is in shift solenoid D, E or shift solenoid A, B, C. If a noise is emitted during shifting at certain gears only or during deceleration only, it is gear noise. - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect engine condition. Is any engine concern (i. e. rough idle)?	Yes	Go to appropriate symptom troubleshooting. (See Section F.)
		No	Go to next step.
2	Does noise stop when solenoid connector is disconnected?	Yes	Go to next step.
		No	Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
3	Check the value at the following PIDs using the WDS or equivalent. (See F-45 PCM INSPECTION.)	Yes	Go to next step.
		No	Repair or replace any defective parts.
4	Disconnect PCM. Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms ?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
5	Check LPS PID value. Is LPS PID value okay? (See F-45 PCM INSPECTION.)	Yes	Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
		No	Repair or replace any defective parts.

NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D, S, L RANGES, OR IN R POSITION

A6E568001030W25

21	Noise occurs at idle when vehicle is stopped in D, S, L ranges, or in R position
DESCRIPTION	Transaxle noisy in driving ranges when vehicle idling.
POSSIBLE CAUSE	Although the malfunction is basically the same as No.20 "Noise occurs at idle when vehicle is stopped in all positions/ranges", other causes may be selector lever position disparity or TR switch position disparity.

TROUBLESHOOTING

NO.22 NO ENGINE BRAKING IN HOLD MODE

A6E568001030W26

22	No engine braking in hold mode
DESCRIPTION	- Engine speed drops to idle but vehicle coasts when accelerator pedal is released during cruising at medium to high speeds. - Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in L range at low vehicle speed.
POSSIBLE CAUSE	- Clutch slippage, burned (low and reverse brake) - Line pressure low - Shift solenoid D malfunction - Shift solenoid E malfunction - Shift solenoid C malfunction - Control valve body malfunction - Body GND malfunction - Signal malfunction - TP sensor malfunction - Vehicle speed sensor malfunction - Sensor GND malfunction - Input/turbine speed sensor malfunction - HOLD switch ON not judged by PCM (short, or open circuit, poor operation) - HOLD switch signal malfunction Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	- Do following symptoms concurrently occur? - Engine flares up or slips during acceleration. - Engine flares up or slips when shifting.	Yes Go to symptom troubleshooting NO.14 "Engine flares up or slips when upshifting or downshifting" or No.15 "Engine flares up or slips when accelerating vehicle".
		No Repeat basic inspection and repair or replace any defective parts according to inspection result. (See K-112 BASIC INSPECTION .)

NO.23 TRANSAXLE OVERHEATS

A6E568001030W27

23	Transaxle overheats
DESCRIPTION	- Burnt smell emitted from transaxle. - Smoke emitted from transaxle.
POSSIBLE CAUSE	- The malfunction is restricted to hindrance of coolant at the oil cooler. In addition, overheating of the transaxle may be caused by a malfunction of the transaxle fluid temperature sensor. - Burned (TCC) - Line pressure low - Control valve body malfunction - Accelerator cable misadjustment - Oil cooler malfunction (Foreign material mixed ATF) - Transaxle fluid temperature sensor malfunction - Excessive amount of ATF - Torque converter malfunction Note - Before following troubleshooting steps, make sure that Automatic Transaxle On-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	- Inspect for bent, damage, corrosion or kinks of oil cooler pipes. - Are oil cooler pipes okay?	Yes Go to next step.
		No Replace any defective parts.
2	- Perform the stall test. (See K-7 Stall Test.) - Is stall speed okay?	Yes Go to next step.
		No Repair or replace any defective parts.
3	- Check the value at the following PID using the WDS or equivalent. (See F-45 PCM INSPECTION.) - TP - Is PID value okay?	Yes Go to next step.
		No Repair or replace any defective parts.

TROUBLESHOOTING

STEP	INSPECTION		ACTION
4	- Disconnect PCM. - Is resistance between ground terminal at PCM connector and body ground less than 5.0 ohms?	Yes	Go to next step.
		No	Repair open ground circuit. Reconnect PCM.
5	- Check LPS PID value. - Is LPS PID value okay? (See F-45 PCM INSPECTION.)	Yes	Overhaul control valve body and repair or replace any defective parts. If problem remains, overhaul transaxle and repair or replace any defective parts. (See ATX workshop manual (FN4A-EL) [1623-10-98E].) (See ATX workshop manual supplement (FN4A-EL) [1746-1*-02C].)
		No	Repair or replace any defective parts.

NO.24 ENGINE STALLS WHEN SHIFTED TO D, S, L RANGES, OR IN R POSITION

A6E568001030W28

24	Engine stalls when shifted to D, S, L ranges, or in R position
DESCRIPTION	Engine stalls when shifting from N or P position to D, S, L ranges or R position at idle.
POSSIBLE CAUSE	The malfunction is on the engine control side (i.e. IAC system). Otherwise, the malfunction is in the input/turbine speed sensor (engine sometimes starts) or TCC circuit (engine always stalls).

Diagnostic procedure

STEP	INSPECTION		ACTION
1	- Go to symptom troubleshooting No.10 "Low idle/stalls during deceleration". (See F-202 NO.10 LOW IDLE/STALLS DURING DECELERATION.) - Is engine control system okay?	Yes	Repeat basic inspection and repair or replace any defective parts according to inspection result. (See K-112 BASIC INSPECTION .)
		No	Repair or replace any defective parts according to inspection results.

NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEEDS OR STOPPING

A6E568001030W29

25	Engine stalls when driving at slow speeds or stopping
DESCRIPTION	Engine stalls when brake pedal is depressed while driving at low speed or stopping.
POSSIBLE CAUSE	The malfunction on engine control side (e.g. Fuel injection control, IAC system) Otherwise, the malfunction is in the control valve body, shift solenoid E or TCC.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	- Go to symptom troubleshooting No.9 "Low idle/stalls during deceleration". (See F-201 NO.9 FAST IDLE/RUNS ON.) - Does engine control system okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection results.
2	- Go to symptom troubleshooting No.4 "Engine Stalls." (See F-189 NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK.) - Is engine control system okay?	Yes	Repeat basic inspection and repair or replace any defective parts according to inspection result. (See K-112 BASIC INSPECTION .)
		No	Repair or replace any defective parts according to inspection results.

NO.26 STARTER DOES NOT WORK

A6E568001030W30

26	Starter does not work
DESCRIPTION	Starter does not work even when P or N position.
POSSIBLE CAUSE	- Selector lever misadjustment - TR switch misadjustment - Open or short circuit in TR switch

NO.27 HOLD INDICATOR LIGHT DOES NOT ILLUMINATE WHEN HOLD SWITCH IS TURNED TO ON

A6E568001030W31

27	HOLD indicator light does not illuminate when HOLD switch is turned to ON
DESCRIPTION	HOLD indicator light in dashboard does not illuminate when HOLD switch is turned on and IG SW at ON.
POSSIBLE CAUSE	HOLD switch, HOLD indicator light or related wiring harness malfunction.

TROUBLESHOOTING

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Are other indicator lights illuminated with ignition switch is at ON?	Yes Inspect meter fuse.
		No Go to next step.
2	- Check the HOLD switch (See K-13 HOLD SWITCH INSPECTION.) - Is HOLD switch okay?	Yes Go to next step.
		No Repair or replace any defective parts.
3	- Disconnect PCM. - Turn ignition switch on. - Is voltage between 3Q terminal at the PCM connector and body ground greater than 10.5 V?	Yes Replace PCM.
		No Reconnect PCM. Go to next step.
4	- Check the HOLD indicator light. - Is HOLD indicator light okay?	Yes Inspect for open circuit or disconnected connector in harness between the following: - Ignition switch and HOLD indicator light - HOLD indicator light and PCM
		No Repair or replace any defective parts.

NO.28 HOLD INDICATOR LIGHT ILLUMINATES WHEN HOLD SWITCH IS NOT TURNED TO ON

A6E568001030W32

K

28	HOLD indicator light illuminates when HOLD switch is not turned to ON
DESCRIPTION	HOLD indicator light in dashboard illuminates even though HOLD switch is turned off and IG SW at ON.
POSSIBLE CAUSE	HOLD switch or related wiring harness malfunction.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	- Check the HOLD switch (See K-13 HOLD SWITCH INSPECTION.) - Is HOLD switch okay?	Yes Go to next step.
		No Repair or replace any defective parts.
2	- Disconnect PCM. - Turn ignition switch off. - Is resistance between 3Q terminal at the PCM connector and body ground greater than 10 kilohms?	Yes Replace PCM.
		No Repair short circuit between HOLD indecator light and PCM. Reconnect PCM.

FRONT AND REAR AXLES

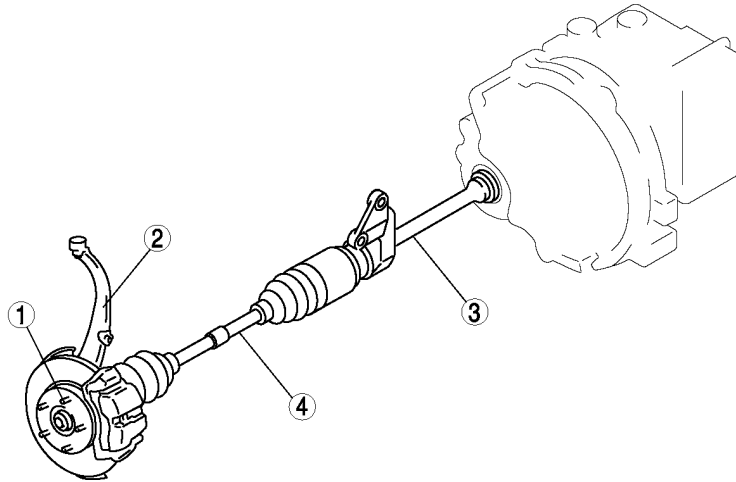
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LOCATION INDEX

FRONT AXLE/DRIVE SHAFT LOCATION INDEX

A6E630004000W01



A6E0612W106

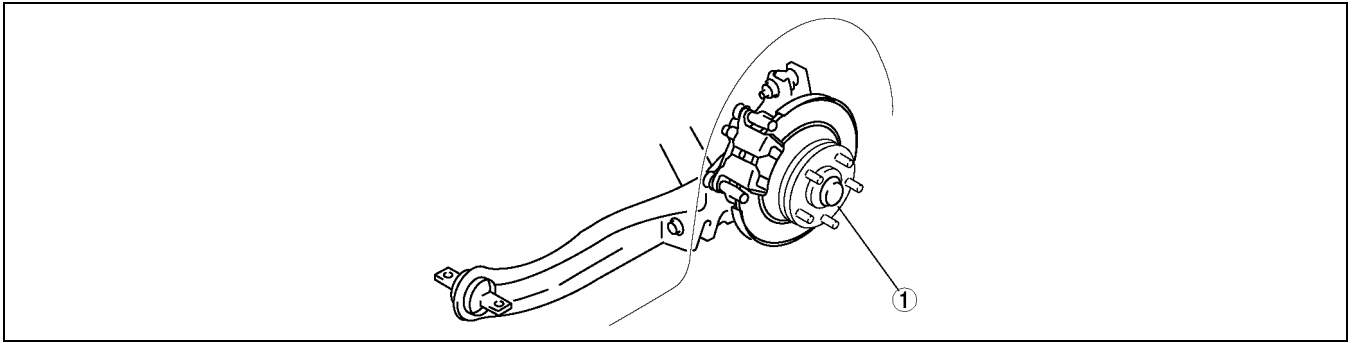
1	Hub bolt (See M-4 WHEEL HUB BOLT REPLACEMENT)
2	Wheel hub, steering knuckle (See M-4 WHEEL HUB, STEERING KNUCKLE PRE-INSPECTION) (See M-5 WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION)
3	Joint shaft (See M-12 JOINT SHAFT PRE-INSPECTION) (See M-12 JOINT SHAFT REMOVAL/INSTALLATION) (See M-14 JOINT SHAFT DISASSEMBLY/ASSEMBLY)

4	Drive shaft (See M-16 DRIVE SHAFT PRE-INSPECTION) (See M-17 DRIVE SHAFT REMOVAL/INSTALLATION) (See M-19 DRIVE SHAFT (ATX) DISASSEMBLY/ASSEMBLY) (See M-24 DRIVE SHAFT (MTX) DISASSEMBLY/ASSEMBLY)

LOCATION INDEX, GENERAL PROCEDURES

REAR AXLE LOCATION INDEX

A6E630005000W01



A6E0312W016

1	Wheel hub, hub spindle (See M-9 WHEEL HUB, HUB SPINDLE PRE-INSPECTION) (See M-10 WHEEL HUB, HUB SPINDLE REMOVAL/INSTALLATION)

GENERAL PROCEDURES

M

PRECAUTION (FRONT AND REAR AXLE)

A6E631001018W01

Wheel and Tire Removal/Installation

1. The removal and installation procedures for the wheels and tires are not mentioned in this section. When a wheel is removed, tighten it to **88—118 N·m {9.0—12.0 kgf·m, 65.0—87.0 ft·lbf}**

Brake Line Disconnection/Connection

Caution

- **Brake fluid will damage painted surfaces. If brake fluid gets on a painted surface, wipe it off immediately.**

1. Tighten the brake pipe flare nut using the **SST** (49 0259 770B). Be sure to modify the brake pipe flare nut tightening torque to allow for use of a torque wrench-**SST** combination. (See [GI-16 TORQUE FORMULAS](#).)
2. If any brake line has been disconnected any time during the procedure, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

Suspension Arm Removal/Installation

1. Tighten any part of the suspension that uses rubber bushings only after vehicle has been lowered and unloaded.

Note

- Unloaded: Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack, and tools are in designated position.

FRONT AXLE

FRONT AXLE

WHEEL HUB, STEERING KNUCKLE PRE-INSPECTION

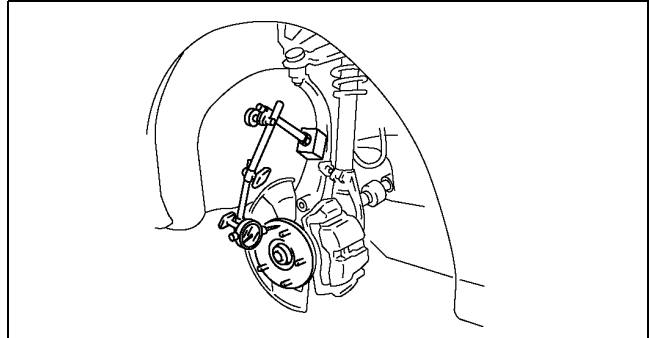
A6E631204000W01

Wheel Bearing Play Inspection

1. Position a dial indicator against the wheel hub.
2. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.

Maximum wheel bearing play
0.05 mm {0.002 in}

3. If the bearing play exceeds the specification, replace and tighten the locknut to the specified torque and retest.
 - Replace the wheel bearing as necessary.



A6E0311W010

WHEEL HUB BOLT REPLACEMENT

1. Remove the hub bolt using the **SSTs**.

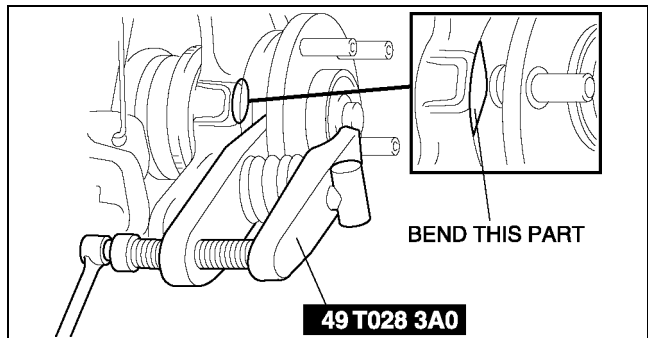
Note

- If the dust cover interferes with the wheel hub bolt and the wheel hub bolt cannot be removed, tap the part shown in the figure with a chisel lightly and bend the processing point back to the steering knuckle side.

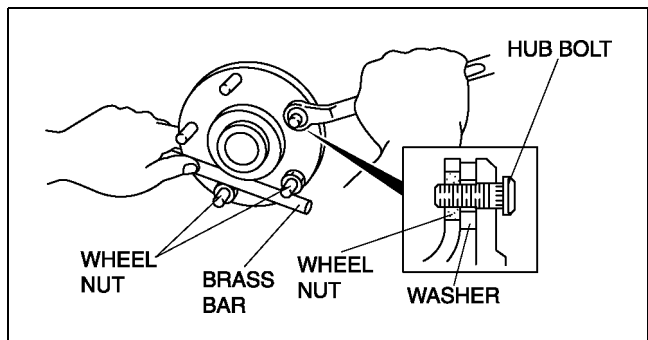
2. Install the hub bolt into the wheel hub and install a washer and hub nut on the hub bolt.

3. Tighten the hub nut while holding the wheel hub using a brass bar.

A6E631233060W01



A6E0311W011



A6E0311W012

FRONT AXLE

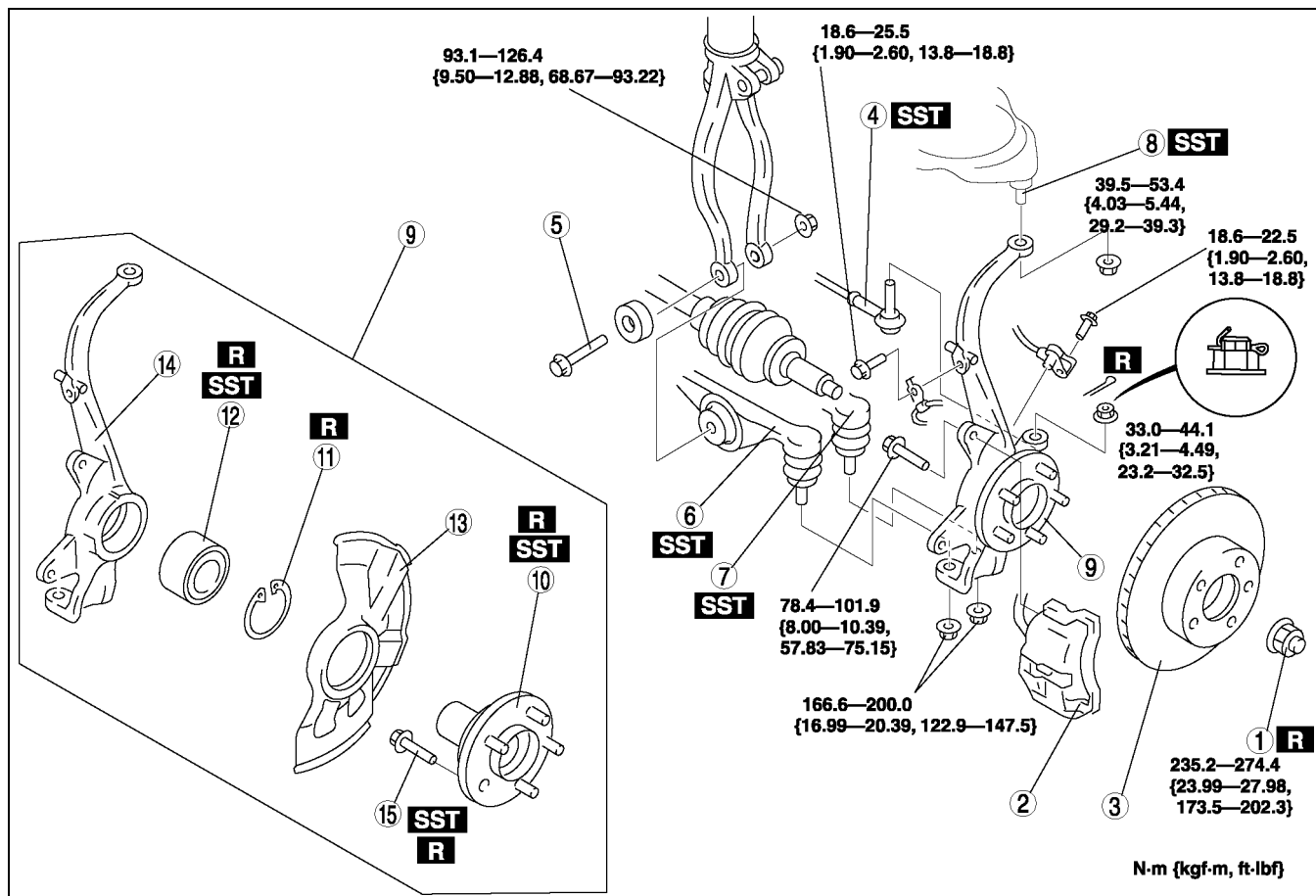
WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION

A6E63120400W02

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.

- Remove in the order indicated in the table.
- Install in the reverse order of removal.
- After installation, inspect the front wheel alignment. (See [R-5 FRONT WHEEL ALIGNMENT](#).)



A6E0612W075

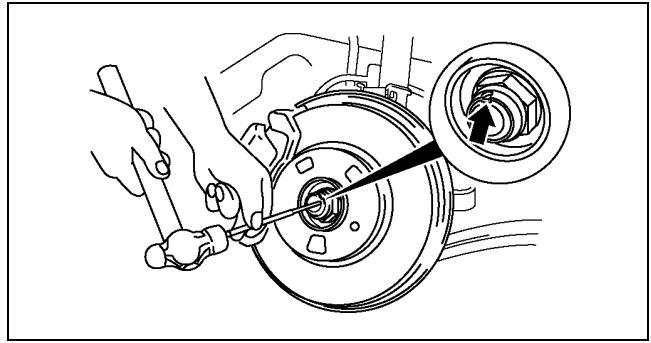
1	Locknut (See M-6 Locknut Removal Note) (See M-9 Locknut Installation Note)
2	Brake caliper component
3	Disc plate (See P-20 Disc Plate Removal Note)
4	Tie-rod end ball joint (See N-11 Tie-rod End Ball Joint Removal Note)
5	Bolt
6	Front lower arm (front) ball joint (See R-16 Front Lower Arm (Front) Ball Joint Removal Note)
7	Front lower arm (rear) ball joint (See R-19 Front Lower Arm (Rear) Ball Joint Removal Note)
8	Front upper arm ball joint (See R-13 Front Upper Arm Ball Joint Removal Note)

9	Wheel hub, steering knuckle, dust cover
10	Wheel hub component (See M-6 Wheel Hub Component Removal Note) (See M-8 Wheel Hub Component Installation Note)
11	Retaining ring
12	Wheel bearing (See M-6 Wheel Bearing Removal Note) (See M-8 Wheel Bearing Installation Note)
13	Dust cover (See M-7 Dust Cover Removal Note) (See M-8 Dust Cover Installation Note)
14	Steering knuckle
15	Hub bolt (See M-7 Hub Bolt Removal Note) (See M-7 Hub Bolt Installation Note)

FRONT AXLE

Locknut Removal Note

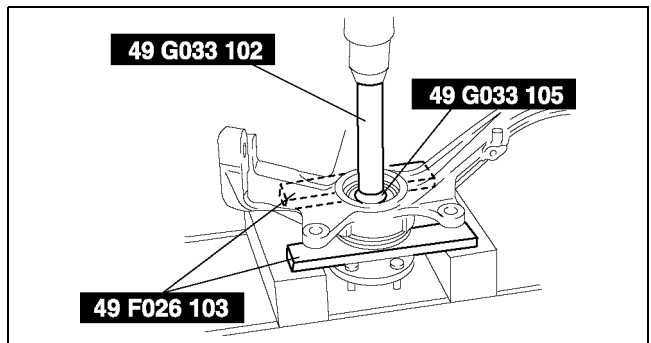
1. Knock the crimped portion of the locknut outward using a small chisel and a hammer.
2. Lock the hub by applying the brakes.
3. Remove the locknut.



A6E6321W001

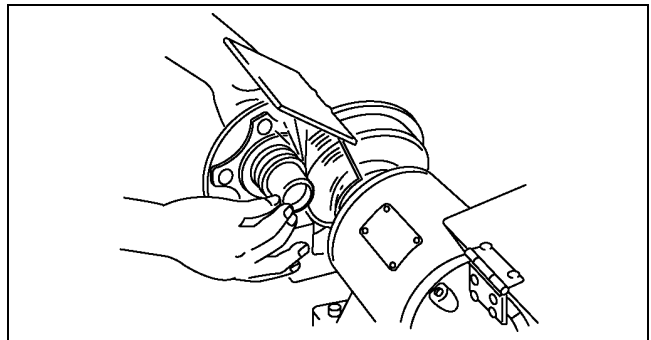
Wheel Hub Component Removal Note

1. Remove the wheel hub component using the SSTs.



A6E0311W015

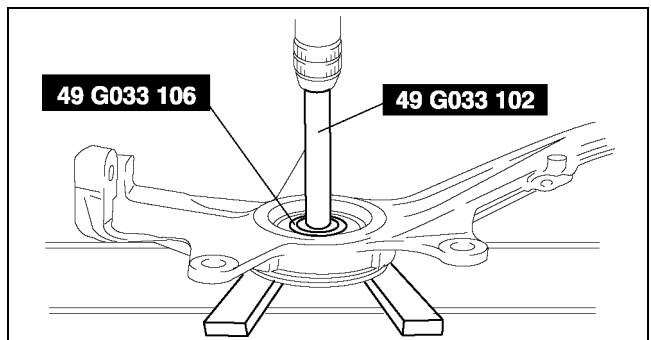
2. If the bearing inner race remains on the front wheel hub component, grind a section of the bearing inner race until **approx. 0.5 mm {0.02 in}** remains. Then remove it using a chisel.



A6E6312W002

Wheel Bearing Removal Note

1. Remove the wheel bearing using the SSTs.



A6E0311W017

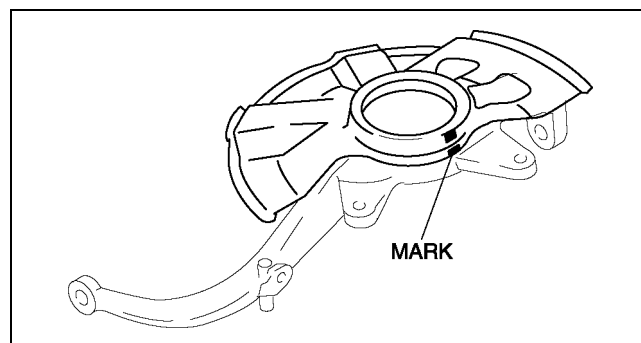
FRONT AXLE

Dust Cover Removal Note

Note

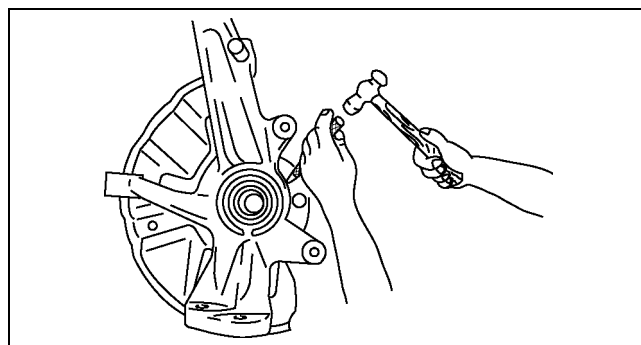
- The dust cover does not need to be removed unless it is being replaced.

1. Mark the dust cover and steering knuckle for proper installation.



A6E0311W018

2. Remove the dust cover using a chisel.



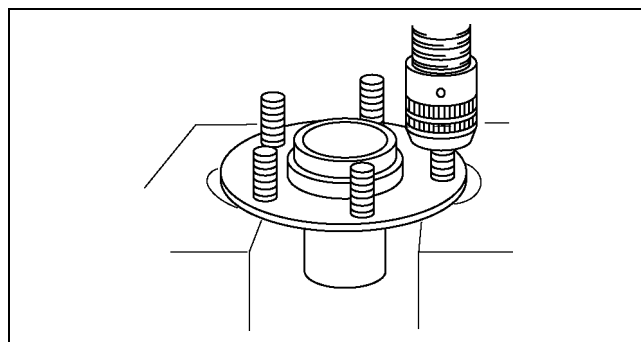
A6E0311W019

Hub Bolt Removal Note

Note

- The hub bolts do not need to be removed unless they are being replaced.

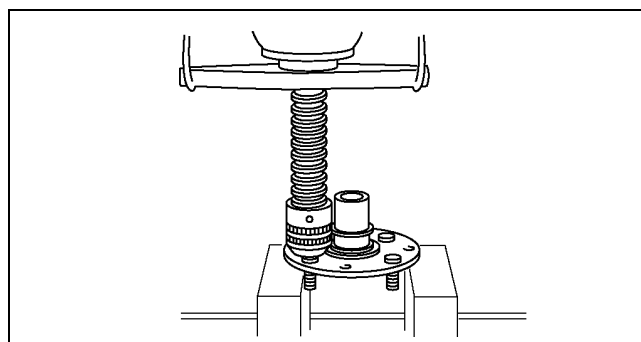
1. Remove the hub bolts using a press.



A6E6312W003

Hub Bolt Installation Note

1. Install the new hub bolts using a press.

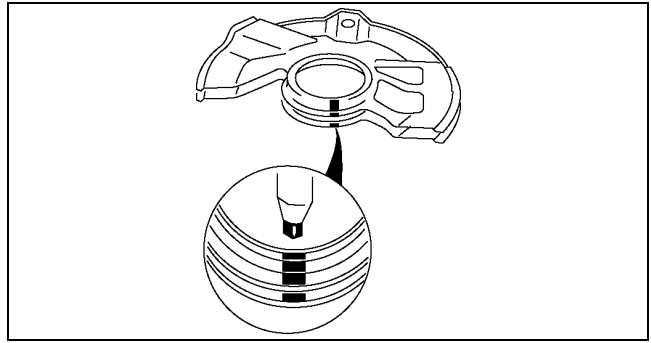


A6E6312W004

FRONT AXLE

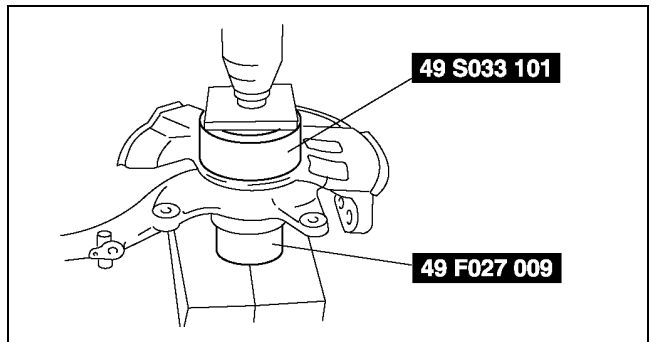
Dust Cover Installation Note

1. Mark the new dust cover in the same way as the removed one.
2. Align the marks of the new dust cover and the knuckle.



A6E0312W010

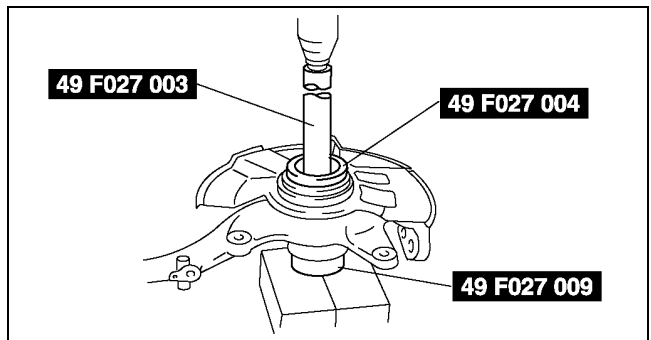
3. Install the new dust cover using the **SSTs**.



A6E0312W011

Wheel Bearing Installation Note

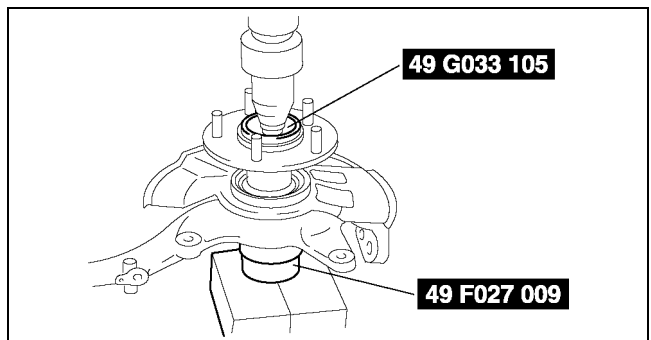
1. Install the new wheel bearing using the **SSTs**.



A6E0312W012

Wheel Hub Component Installation Note

1. Install the wheel hub component using the **SSTs**.

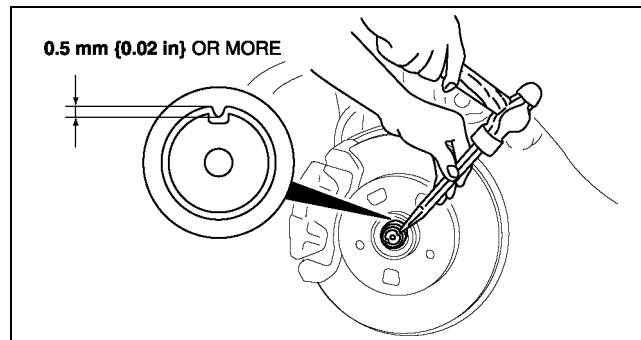


A6E0312W013

FRONT AXLE, REAR AXLE

Locknut Installation Note

1. Install a new locknut and stake it as shown.



A6E0312W015

REAR AXLE

WHEEL HUB, HUB SPINDLE PRE-INSPECTION

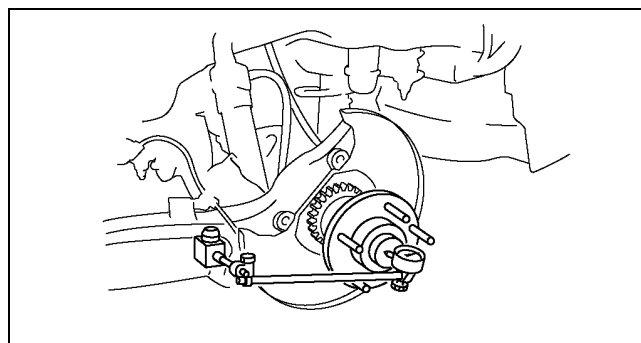
A6E631405000W01

Wheel Bearing Play Inspection

1. Position a dial indicator against the wheel hub.
2. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.

Maximum wheel bearing play
0.05 mm {0.002 in}

3. If the bearing play exceeds the specification, replace and tighten the locknut to the specified torque and retest.
 - Replace the wheel hub component as necessary.



M

REAR AXLE

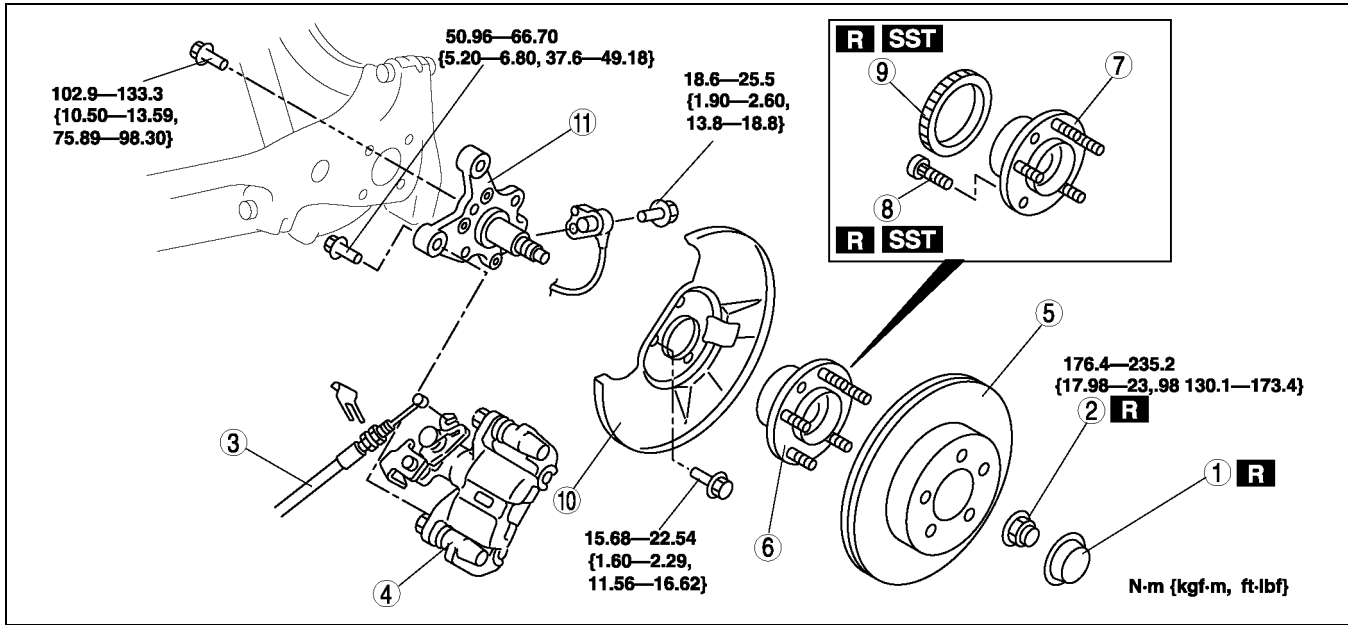
WHEEL HUB, HUB SPINDLE REMOVAL/INSTALLATION

A6E631405000W02

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (body side) and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.

- Remove in the order indicated in the table.
- Install in the reverse order of removal.



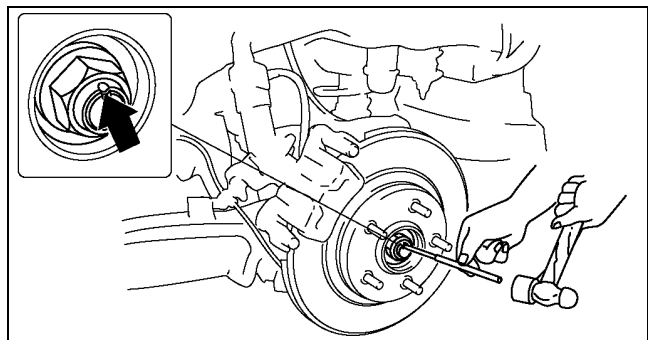
A6E0312W078

1	Hub cap
2	Locknut (See M-10 Locknut Removal Note) (See M-11 Locknut Installation Note)
3	Parking brake cable
4	Brake caliper component
5	Disc plate (See P-20 Disc Plate Removal Note)
6	Wheel hub component

7	Wheel hub
8	Hub bolt (See M-7 Hub Bolt Removal Note) (See M-7 Hub Bolt Installation Note)
9	ABS sensor rotor (with ABS) (See M-11 ABS Sensor Rotor Removal Note) (See M-11 ABS Sensor Rotor Installation Note)
10	Dust cover
11	Hub spindle

Locknut Removal Note

- Knock the crimped portion of the locknut outward using a small cape chisel and a hammer.
- Lock the hub by applying the brakes.
- Remove the locknut.



A6E0312W021

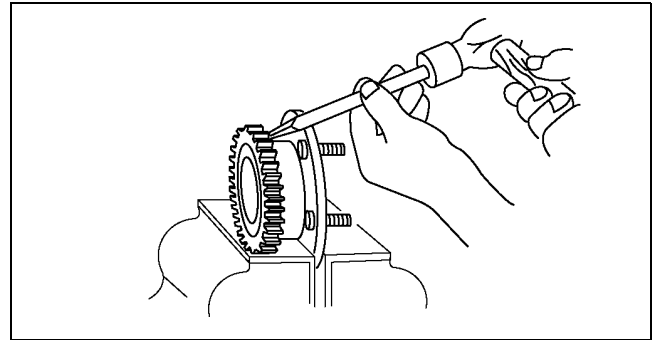
REAR AXLE

ABS Sensor Rotor Removal Note

Note

- The sensor rotor does not need to be removed unless it is being replaced.

1. Remove the sensor rotor using a chisel.



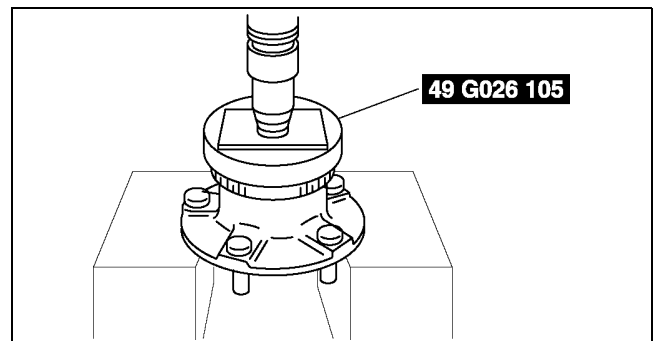
A6E6314W001

ABS Sensor Rotor Installation Note

Caution

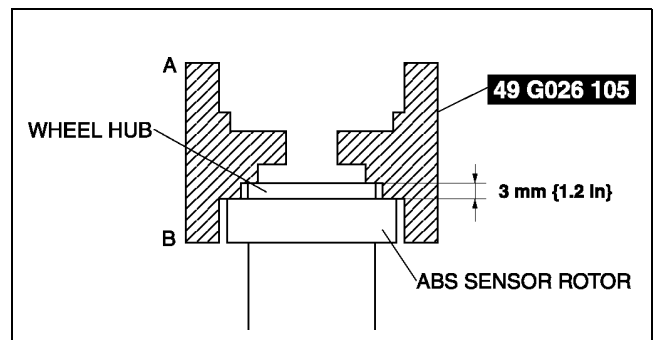
- Position the SST so that marking B faces the bottom.

1. Set the **SST** as shown in the figure.



A6E0313W011

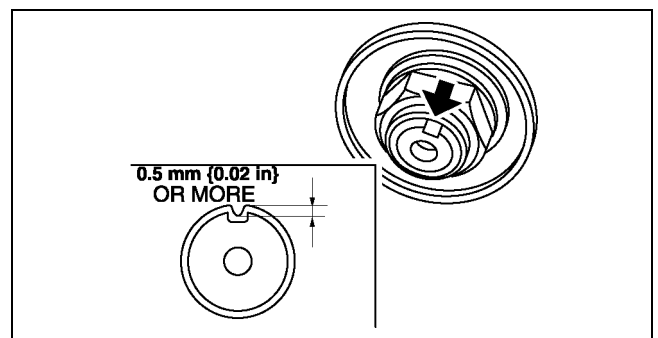
2. Press on the new sensor rotor using the **SST** and a press.



A6E0313W012

Locknut Installation Note

1. Install a new locknut and stake it as shown.



A6E0313W013

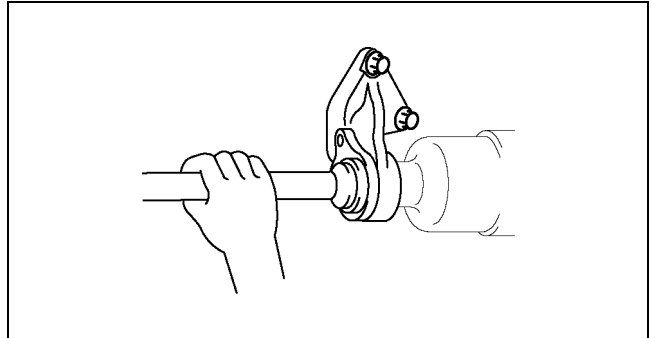
DRIVE SHAFT

DRIVE SHAFT

JOINT SHAFT PRE-INSPECTION

A6E631625700W01

1. Verify that the joint shaft is not twisted or cracked.
 - Replace it as necessary.
2. Turn the joint shaft by hand and verify that the bearing rotates smoothly and freely.
 - Replace it as necessary.



A6E0313W015

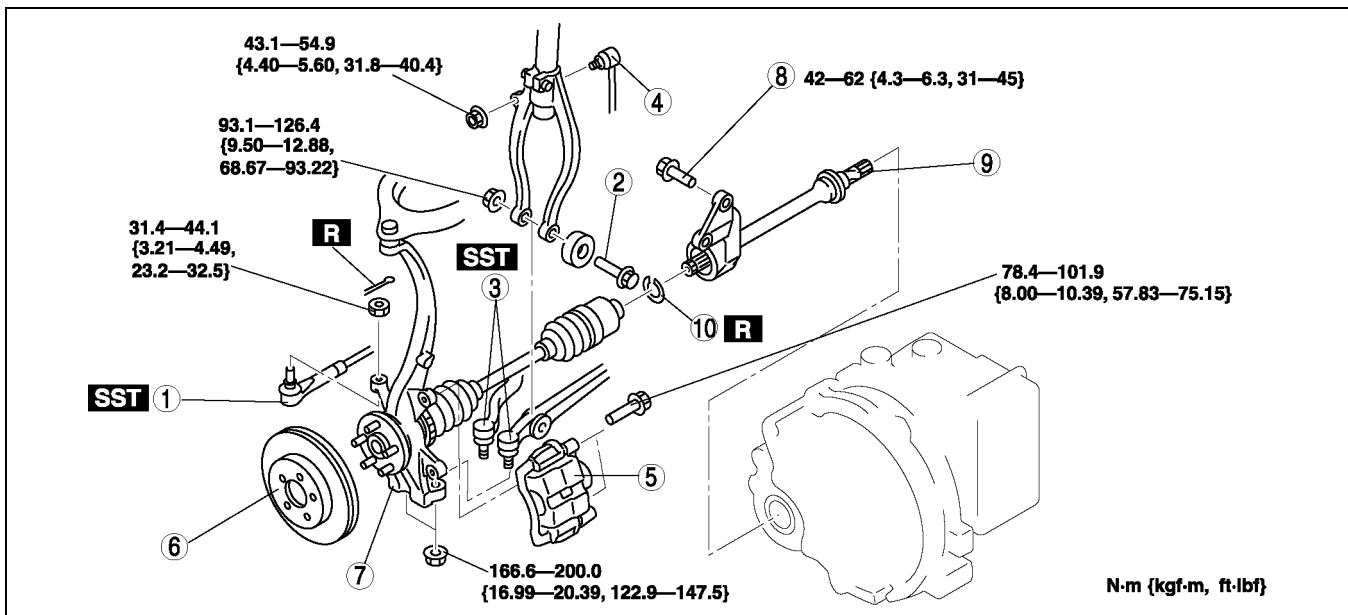
JOINT SHAFT REMOVAL/INSTALLATION

A6E631625700W02

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.

1. Drain the transaxle oil. (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT.](#))
(See [J-3 TRANSAXLE OIL REPLACEMENT.](#))
2. Remove the ABS sensor. (See [P-32 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.](#))
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



A6E0313W016

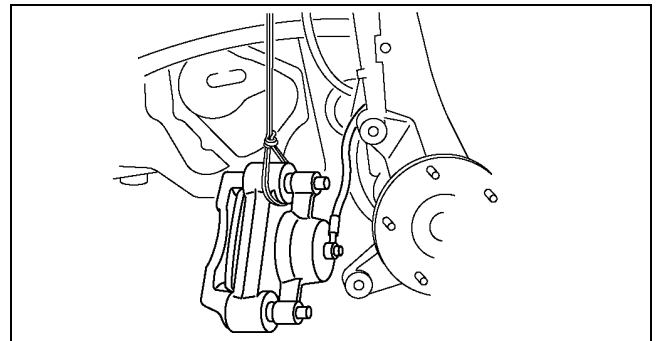
DRIVE SHAFT

1	Tie-rod end ball joint (See N-11 Tie-rod End Ball Joint Removal Note)
2	bolt
3	Lower arm (front, rear) ball joint (See R-15 FRONT LOWER ARM (FRONT) REMOVAL/INSTALLATION) (See R-19 FRONT LOWER ARM (REAR) REMOVAL/INSTALLATION)
4	Stabilizer control link
5	Brake caliper component (See M-13 Brake Caliper Component Removal Note)

6	Disk plate (See P-20 Disc Plate Removal Note)
7	Wheel hub, steering knuckle and drive shaft (See M-13 Wheel Hub, Steering Knuckle and Drive Shaft Removal Note)
8	Joint shaft bracket bolt
9	Joint shaft
10	Clip (See M-14 Clip Installation Note)

Brake Caliper Component Removal Note

1. Suspend the caliper aside with wire.



A6E0313W056

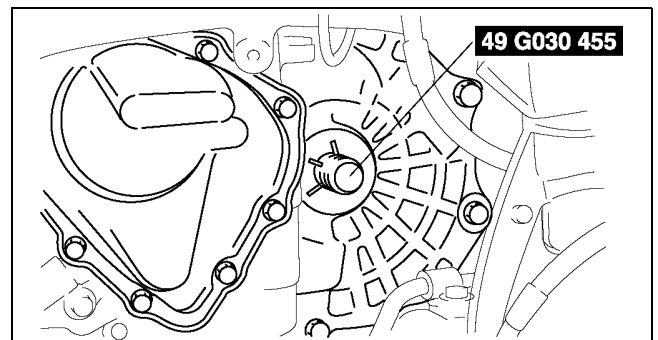
M

Wheel Hub, Steering Knuckle and Drive Shaft Removal Note

Caution

- The sharp edges of the joint shaft can slice or puncture the oil seal. Be careful when removing the joint shaft from the transaxle.

1. Pull the joint shaft straight out.
2. Install the **SST** into the transaxle to hold the side gears after the joint shaft is removed.



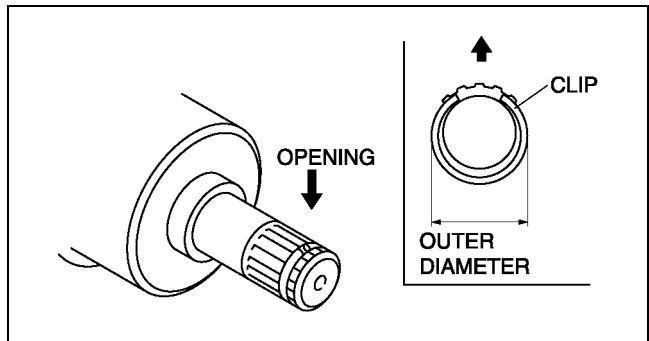
A6E0313W019

DRIVE SHAFT

Clip Installation Note

1. Install a new clip onto the joint shaft with the opening facing upward. Ensure that the diameter of the clip does not exceed the specification on installation.
2. After installation, measure the outer diameter. If it exceeds the specification, repeat Step 1 using a new clip.

Outer diameter specification
31.2 mm {1.23 in} max.

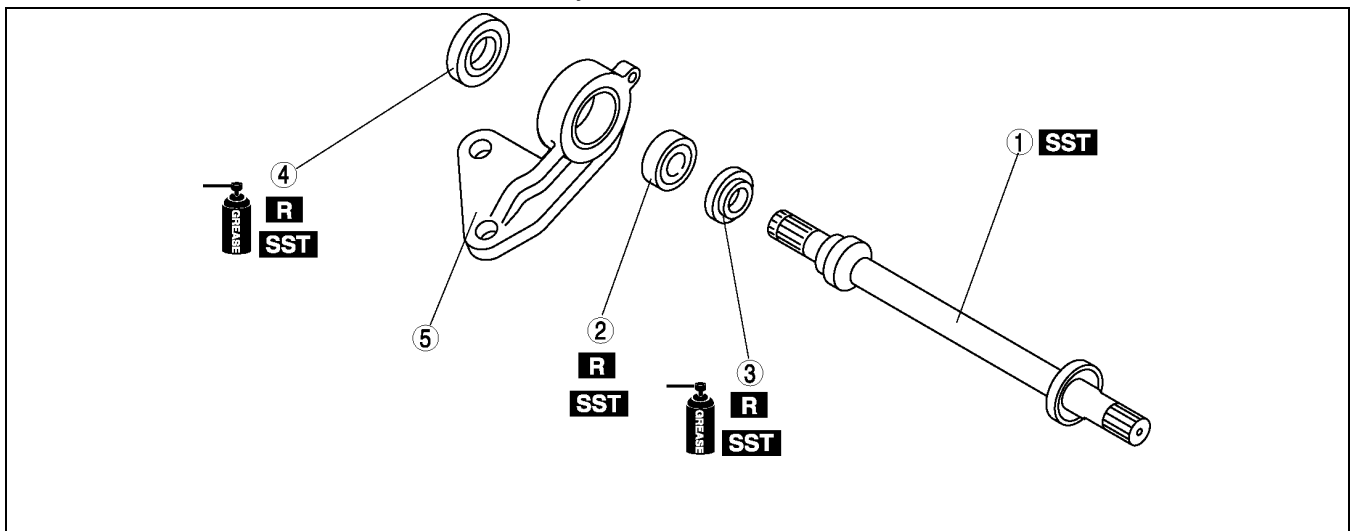


A6E0313W021

JOINT SHAFT DISASSEMBLY/ASSEMBLY

A6E631625700W03

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



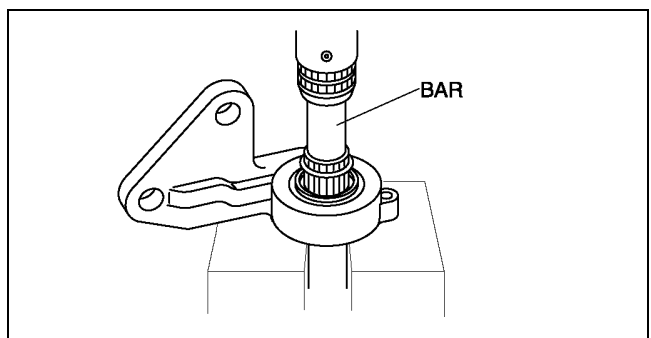
A6E0313W026

1	Joint shaft (See M-14 Joint Shaft Disassembly Note) (See M-16 Joint Shaft Assembly Note)
2	Bearing (See M-15 Bearing Disassembly Note) (See M-15 Bearing Assembly Note)

3	Dust seal (Left) (See M-16 Dust Seal (Left) Assembly Note)
4	Dust seal (Right) (See M-15 Dust Seal (Right) Assembly Note)
5	Bracket

Joint Shaft Disassembly Note

1. Disassemble the joint shaft.

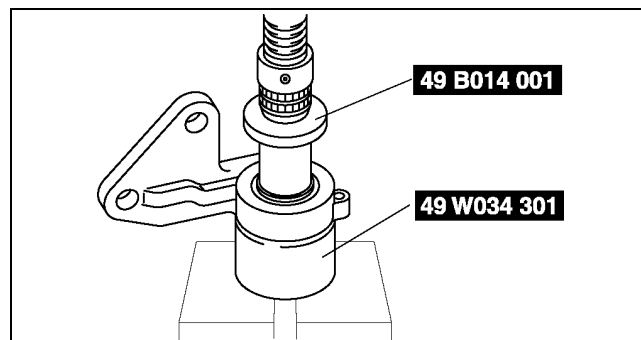


A6E0313W052

DRIVE SHAFT

Bearing Disassembly Note

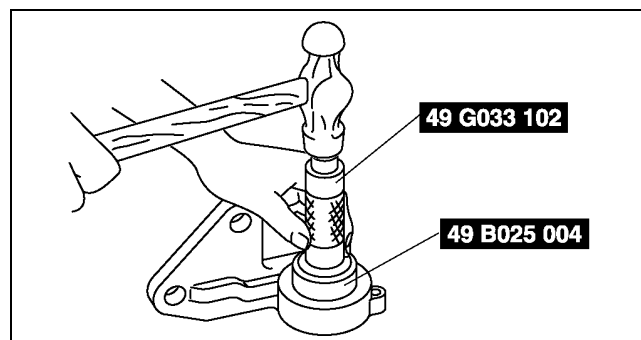
1. Remove the bearing using the **SSTs**.



A6E0313W053

Dust Seal (Right) Assembly Note

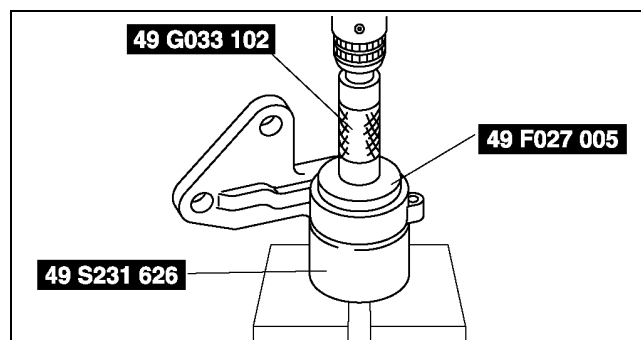
1. Apply grease to the new dust seal lip.
2. Install the new right side dust seal using the **SSTs**.



A6E0313W028

Bearing Assembly Note

1. Install the new bearing using the **SSTs**.



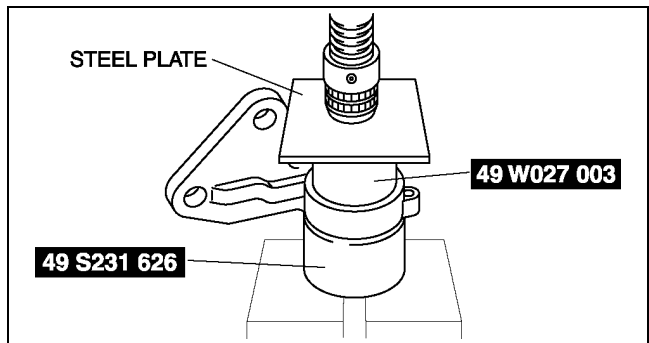
A6E0313W027

M

DRIVE SHAFT

Dust Seal (Left) Assembly Note

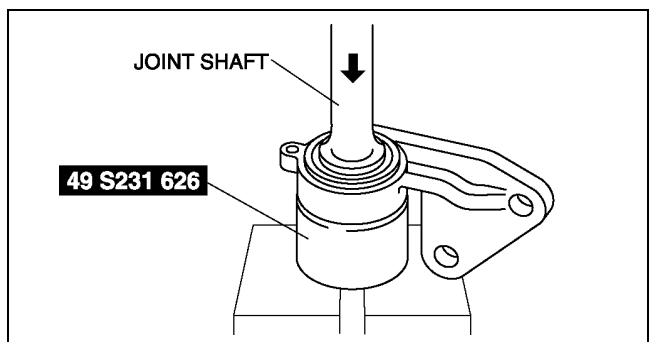
1. Apply grease to the new dust seal lip.
2. Install the new left side dust seal using a steel plate and the **SSTs**.



A6E0313W030

Joint Shaft Assembly Note

1. Assemble the joint shaft using a press and the **SST**.

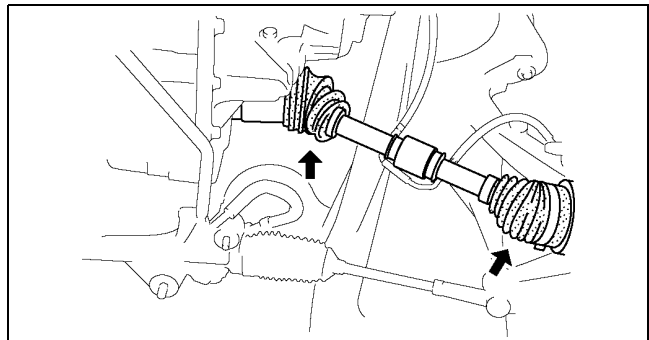


A6E0313W029

DRIVE SHAFT PRE-INSPECTION

1. Inspect the dust boot on the drive shaft for cracks, damage, leaking grease, and looseness in the boot band.
2. Inspect the drive shaft for bends, cracks, and wear in the joint or splines.
 - Repair or replace the drive shaft or boot/band as necessary.

A6E631625500W01



DRIVE SHAFT

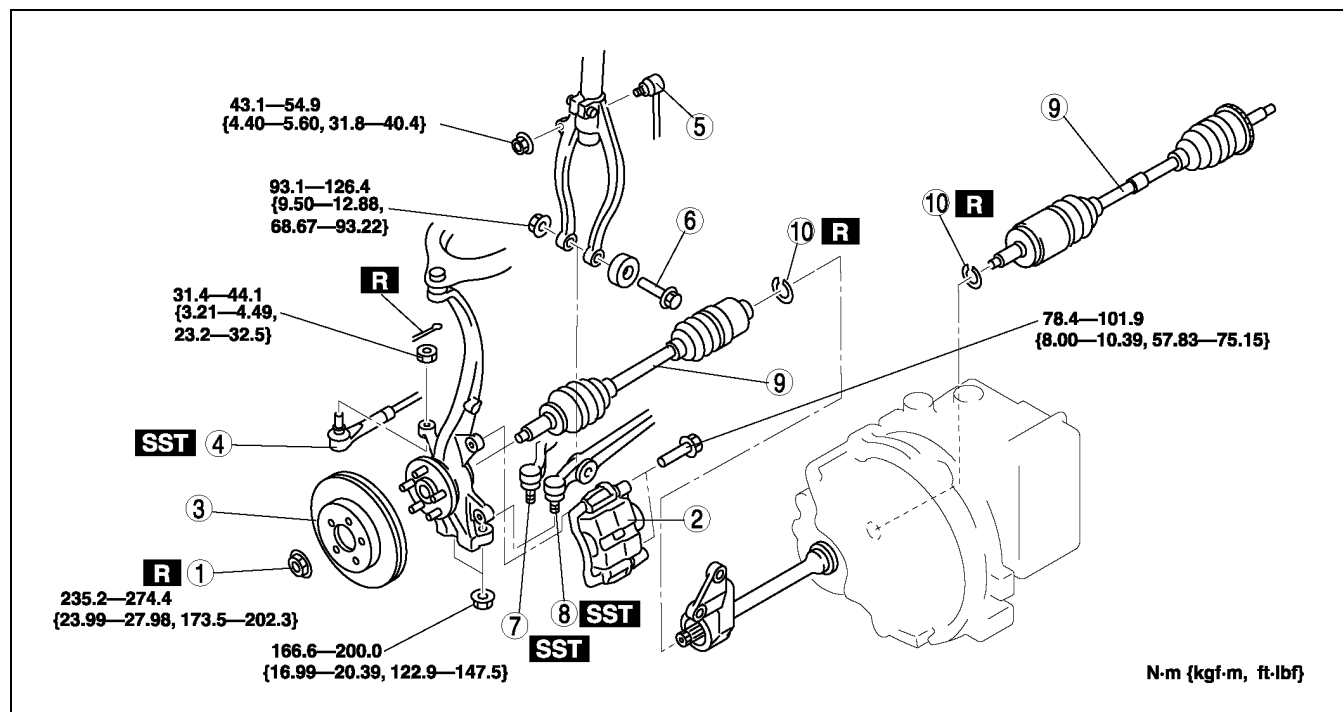
DRIVE SHAFT REMOVAL/INSTALLATION

A6E631625500W02

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while the vehicle is being serviced.

- Drain the transaxle oil (left side). (See [K-13 AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT](#).) (See [J-3 TRANSAXLE OIL REPLACEMENT](#).)
- Remove in the order indicated in the table.
- Install in the reverse order of removal.



A6E0313W055

1	Locknut (See M-6 Locknut Removal Note) (See M-9 Locknut Installation Note)
2	Brake caliper component (See M-13 Brake Caliper Component Removal Note)
3	Disc plate (See P-20 Disc Plate Removal Note)
4	Tie-rod end ball joint (See N-11 Tie-rod End Ball Joint Removal Note)
5	Front stabilizer control link (See R-22 FRONT STABILIZER REMOVAL/INSTALLATION)

6	Bolt
7	Front lower arm (rear) ball joint (See R-19 Front Lower Arm (Rear) Ball Joint Removal Note)
8	Front lower arm (front) ball joint (See R-16 Front Lower Arm (Front) Ball Joint Removal Note)
9	Drive shaft (See M-18 Drive Shaft Removal Note) (See M-19 Drive Shaft Installation Note)
10	Clip (See M-18 Clip Installation Note)

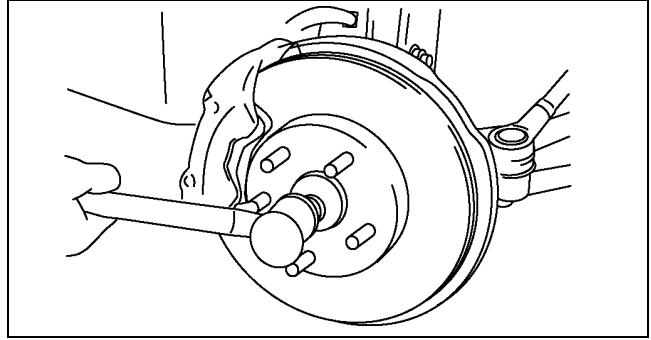
DRIVE SHAFT

Drive Shaft Removal Note

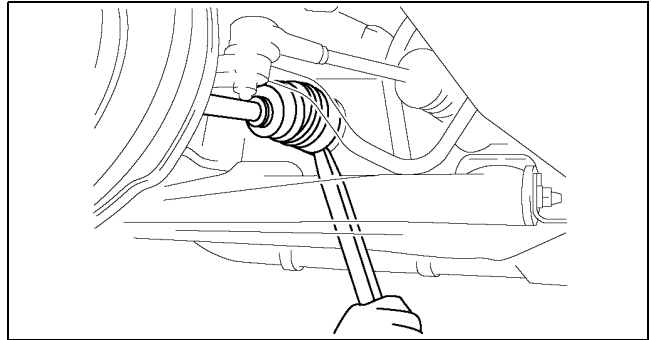
1. Install a spare nut onto the drive shaft so that the nut is flush with the end of the drive shaft.
2. Tap the nut with a copper hammer to loosen the drive shaft from the front wheel hub.
3. Separate the drive shaft from the wheel hub.

Caution

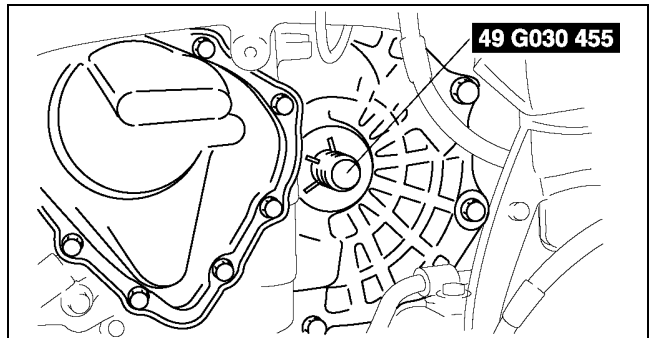
- The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when removing the drive shaft from the transaxle.



4. Separate the left side drive shaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle, as shown in the figure.



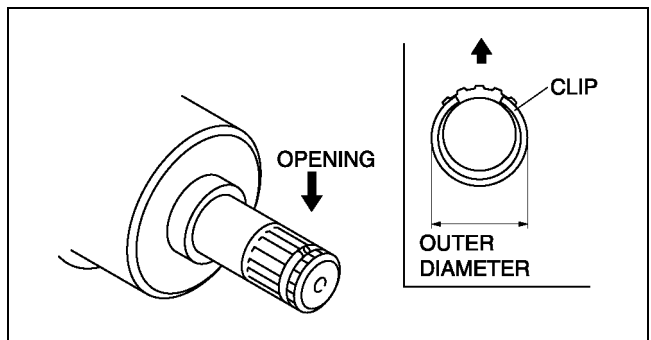
5. Install the **SST** into the transaxle to hold the side gears after the drive shaft is removed.



Clip Installation Note

1. Install a new clip onto the joint shaft with the opening facing upward. Ensure that the diameter of the clip does not exceed the specification on installation.
2. After installation, measure the outer diameter. If it exceeds the specification, repeat Steps 1—2 using a new clip.

Outer diameter specification
31.2 mm {1.23 in} max.



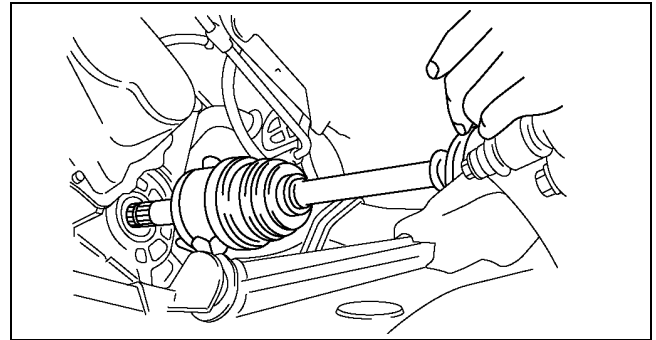
DRIVE SHAFT

Drive Shaft Installation Note

Caution

- The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when installing the drive shaft to the transaxle.
- The oil seals are damaged easily if this procedure is not done correctly.

1. Insert the drive shaft into the wheel hub.
2. Apply transaxle oil to the oil seal lip.
3. Push the drive shaft into the transaxle.
4. After installation, pull the transaxle side outer ring forward to confirm that the drive shaft is securely held by the clip.

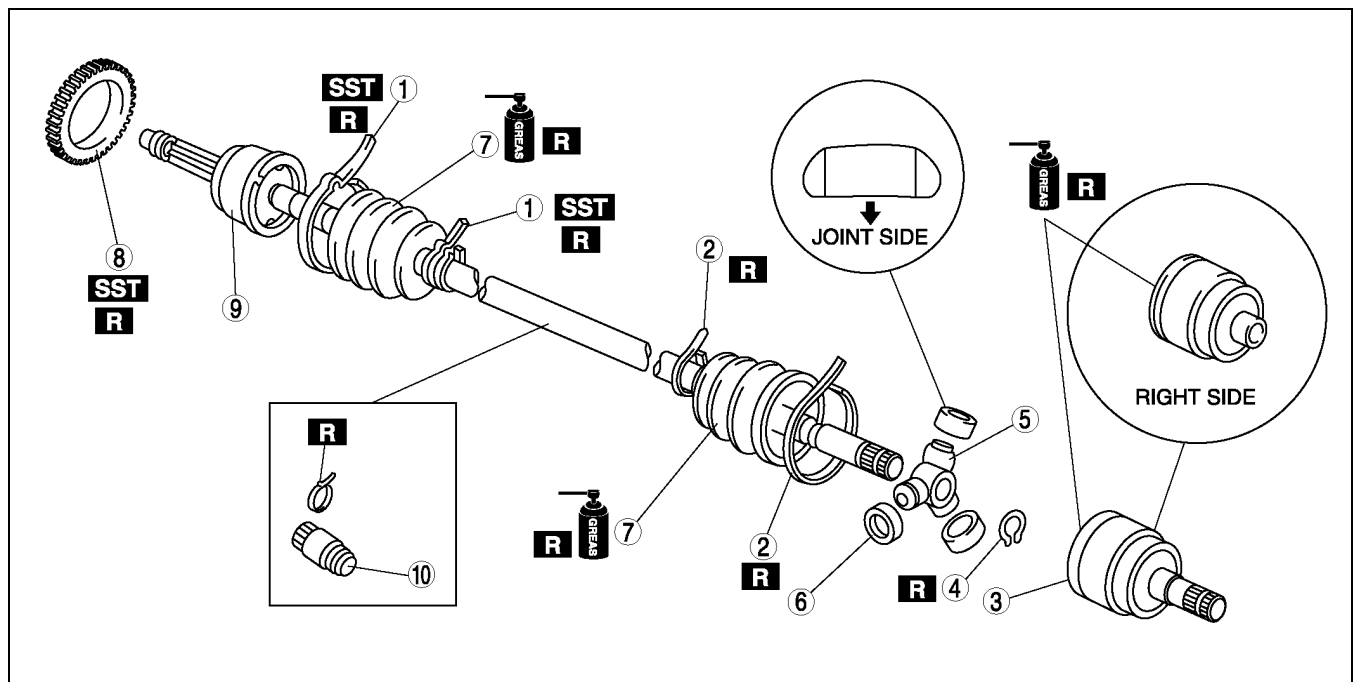


A6E6316W003

DRIVE SHAFT (ATX) DISASSEMBLY/ASSEMBLY

A6E631625500W03

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A6E0313W043

1	Boot band (wheel side) (See M-20 Boot Band (Wheel Side) Disassembly Note) (See M-23 Boot Band (Wheel Side) Assembly Note)
2	Boot band (transaxle side) (See M-20 Boot Band (Transaxle Side) Disassembly Note) (See M-23 Boot Band (Transaxle Side) Assembly Note)
3	Outer ring (See M-20 Outer Ring Disassembly Note) (See M-22 Outer Ring Assembly Note)
4	Snap ring (See M-20 Snap Ring, Tripod Joint Disassembly Note) (See M-22 Tripod Joint, Snap Ring Assembly Note)

5	Tripod joint (See M-20 Snap Ring, Tripod Joint Disassembly Note) (See M-22 Tripod Joint, Snap Ring Assembly Note)
6	Free ring
7	Boot (See M-21 Boot Disassembly Note) (See M-22 Boot Assembly Note)
8	ABS sensor rotor (with ABS) (See M-21 ABS Sensor Rotor (With ABS) Disassembly Note) (See M-22 ABS Sensor Rotor (With ABS) Assembly Note)
9	Shaft and ball joint component
10	Dynamic damper (See M-21 Dynamic Damper Assembly Note)

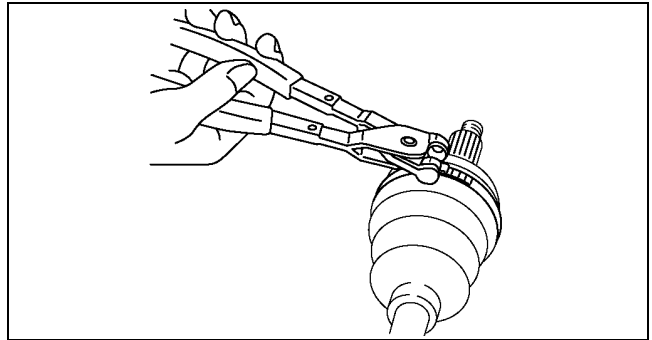
DRIVE SHAFT

Boot Band (Wheel Side) Disassembly Note

Note

- The boot band does not need to be removed unless it is being replaced.

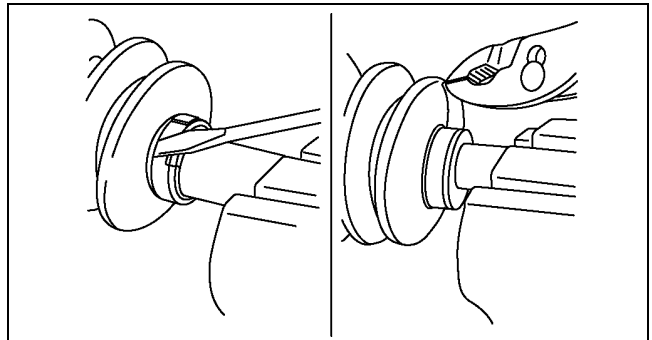
1. Remove the boot clamp with end clamp pliers as shown and discard the clamp.



A6E6316W004

Boot Band (Transaxle Side) Disassembly Note

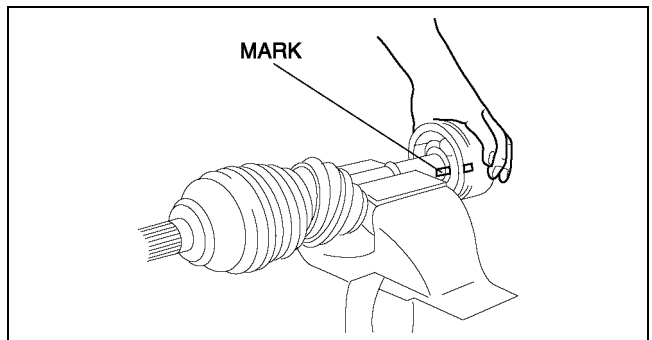
1. Pry up the locking clips using a screwdriver.
2. Pull back the end of the band.



A6E6316W005

Outer Ring Disassembly Note

1. Mark the outer ring and the shaft for proper assembly.
2. Remove the outer ring.



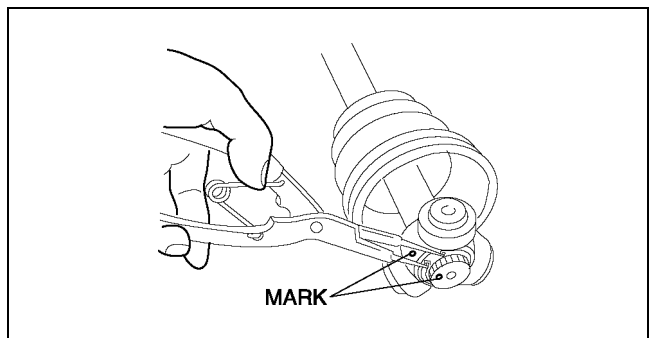
A6E0313W046

Snap Ring, Tripod Joint Disassembly Note

1. Mark the shaft and tripod joint for proper assembly.
2. Remove the snap ring using snap-ring pliers.
3. Remove the tripod joint from the shaft.

Caution

- Do not tap the tripod joint with a hammer.



A6E0313W047

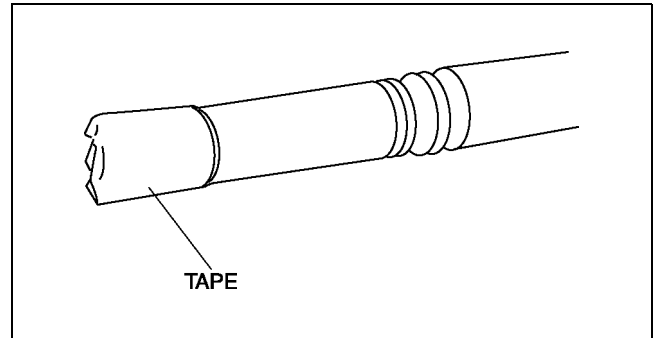
DRIVE SHAFT

Boot Disassembly Note

Note

- The wheel side boot does not need to be removed unless replacing it or the ball joint and shaft component.
- Do not strip the tape until the boot is assembled.

1. Wrap the shaft splines with tape.
2. Remove the boot.



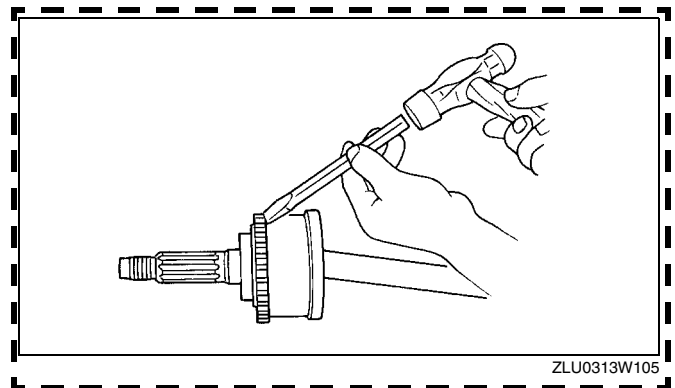
A6E0313W048

ABS Sensor Rotor (With ABS) Disassembly Note

Caution

- Do not remove the sensor rotor unless it is necessary.
- Do not reuse the sensor rotor if removed.

1. Tap the ABS sensor rotor off the drive shaft using a chisel.



ZLU0313W105

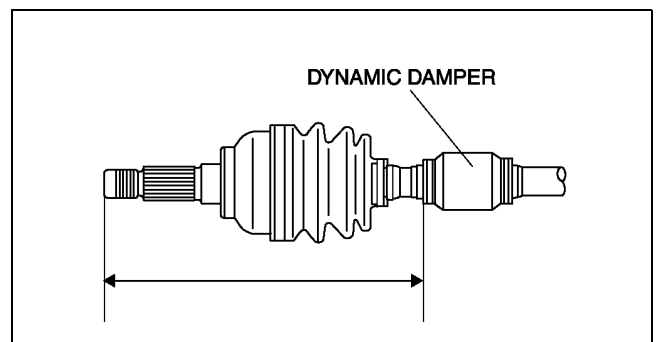
Dynamic Damper Assembly Note

1. Install the dynamic damper as shown in the figure.

Standard length

334.7—340.7 mm {13.2—13.4 in}

2. Install the new boot band onto the dynamic damper.

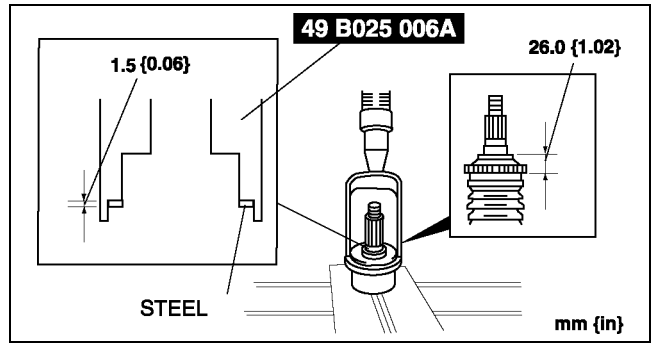


A6E6316W006

DRIVE SHAFT

ABS Sensor Rotor (With ABS) Assembly Note

- Set a new ABS sensor rotor on the drive shaft and press it on using the **SSTs**.



A6E0313W050

Boot Assembly Note

Note

- The wheel side and transaxle side boots are different.

- Fill the boot (wheel side) with the specified grease.

Caution

- Do not touch grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.**

Grease amount

90—110 g {3.18—3.88 oz}

- With the splines of the shaft still wrapped in tape from disassembly, install the boot.
- Remove the tape.

Tripod Joint, Snap Ring Assembly Note

- Align the marks and install the tripod joint using a bar and a hammer.

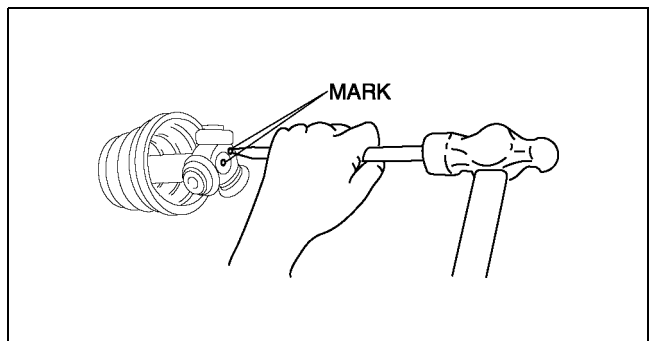
Caution

- Do not damage the roller.**

- Install the new snap ring using snap-ring pliers.

Caution

- Be sure the snap ring engages correctly in the groove of the shaft.**



A6E0313W051

Outer Ring Assembly Note

- Fill the outer ring and boot (transaxle side) with the specified grease.

Caution

- Do not touch grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.**

Grease amount

195—215 g {6.88—7.58 oz}

- Install the outer ring.
- Set the drive shaft to the standard length.

Standard length

mm {in}

Left side	Right side
674.5—684.5 {26.56—26.94}	631.2—641.2 {24.86—25.24}

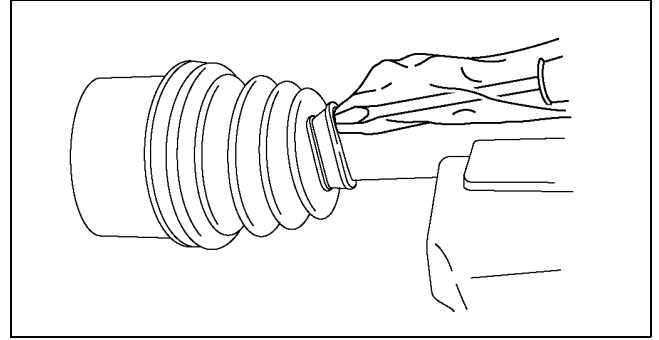
DRIVE SHAFT

- Release any trapped air from the boots by carefully lifting up the small end of each boot with a cloth wrapped screwdriver.

Caution

- Do not let grease leak.
- Do not damage the boot.

- Verify that the drive shaft length is within the standard.



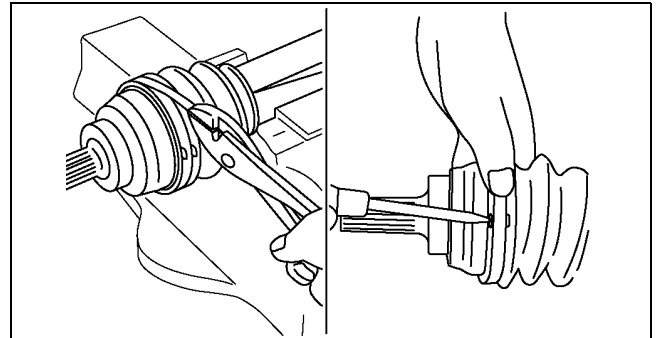
A6E6316W007

Boot Band (Transaxle Side) Assembly Note

- Fold the band in the direction opposite to the forward revolving direction of the drive shaft and use pliers to pull it tight.
- Lock the end of the band by bending the locking clips.

Caution

- Install the band into the groove securely.



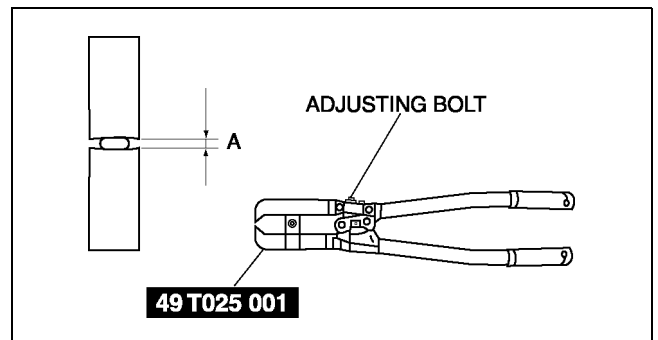
A6E6316W008

Boot Band (Wheel Side) Assembly Note

- Adjust clearance A by turning the adjusting bolt of the SST.

Clearance A

2.9 mm {0.11 in}

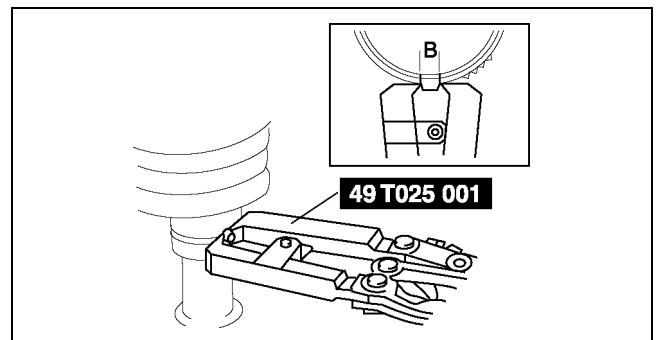


A6E0350W012

- Crimp the wheel side small boot band using the SST. Verify that clearance B is within the specification.
 - If clearance B is more than the specification, reduce clearance A of the SST and crimp the boot again.
 - If clearance B is less than the specification, replace the boot band, increase clearance A of the SST, and crimp the new boot.

Clearance B

2.4—2.8 mm {0.095—0.110 in}



A6E0350W013

- Verify that the boot band does not protrude from the boot band installation area.
 - If it does, replace the boot band and repeat Steps 2 and 3.
- Fill the boot with the repair kit grease.
- Adjust clearance A by turning the adjusting bolt of the SST.

Clearance A

3.2 mm {0.13 in}

DRIVE SHAFT

6. Crimp the wheel side big boot band using the **SST**.
7. Verify that clearance B is within the specification.
 - If clearance B is more than the specification, reduce clearance A of the **SST** and crimp the boot again.
 - If clearance B is less than the specification, replace the boot band, increase clearance A of the **SST** and crimp the new boot.

Clearance B

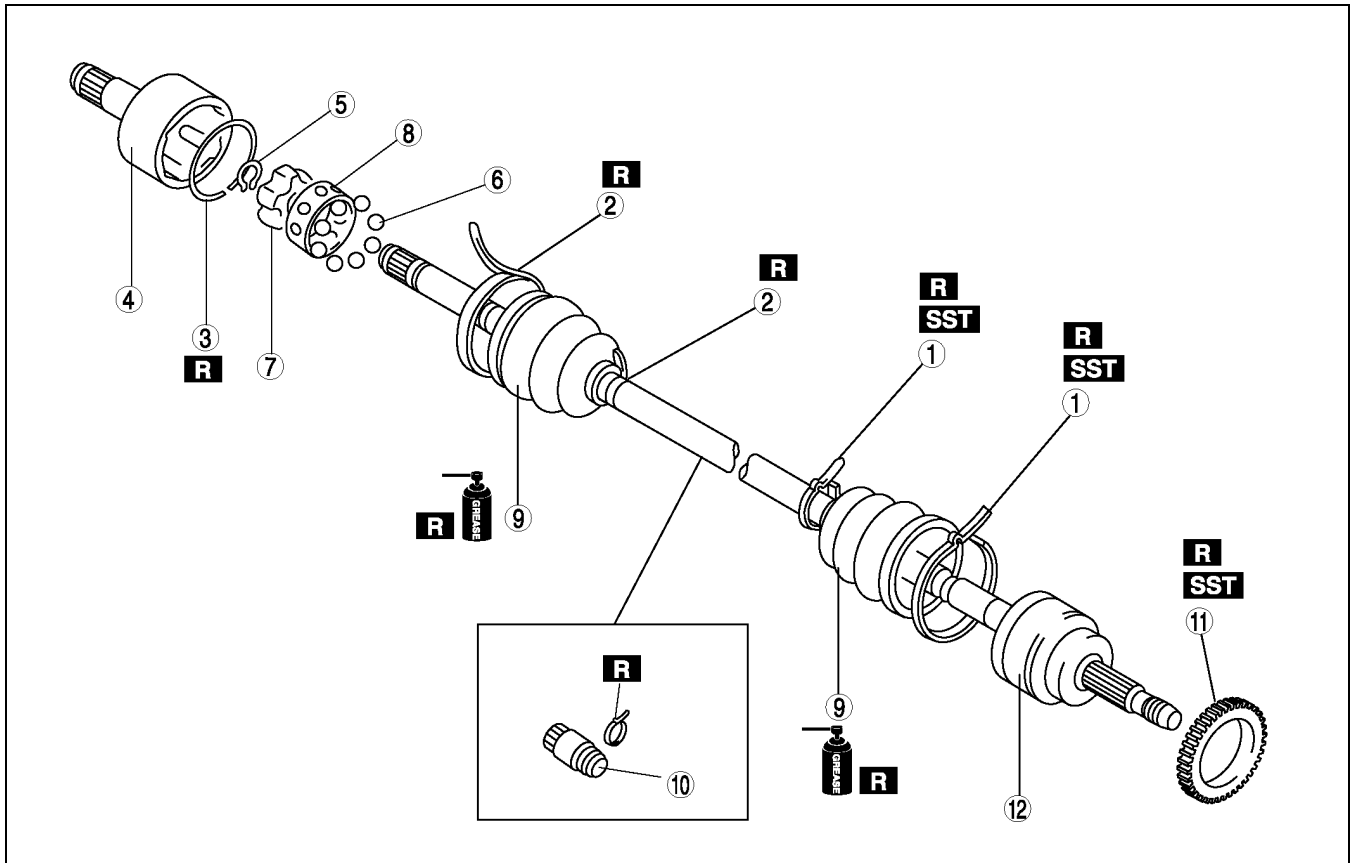
2.4—2.8 mm {0.095—0.110 in}

8. Verify that the boot band does not protrude from the boot band installation area.
 - If it does, replace the boot band and repeat Steps 7 and 8.

DRIVE SHAFT (MTX) DISASSEMBLY/ASSEMBLY

A6E631625500W04

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A6E6316W009

DRIVE SHAFT

1	Boot band (wheel side) (See M-20 Boot Band (Wheel Side) Disassembly Note) (See M-23 Boot Band (Wheel Side) Assembly Note)
2	Boot band (transaxle side) See M-20 Boot Band (Transaxle Side) Disassembly Note See M-23 Boot Band (Transaxle Side) Assembly Note
3	Clip See M-25 Clip Disassembly Note See M-26 Outer Ring, Clip Assembly Note
4	Outer ring (See M-26 Outer Ring, Clip Assembly Note)
5	Snap ring (See M-26 Cage, Inner Ring, Balls, Snap Ring Assembly Note)
6	Balls (See M-25 Balls, Inner Ring, Cage Disassembly Note) (See M-26 Cage, Inner Ring, Balls, Snap Ring Assembly Note)

7	Inner Ring (See M-25 Balls, Inner Ring, Cage Disassembly Note) (See M-26 Cage, Inner Ring, Balls, Snap Ring Assembly Note)
8	Cage (See M-25 Balls, Inner Ring, Cage Disassembly Note) (See M-26 Cage, Inner Ring, Balls, Snap Ring Assembly Note)
9	Boot (See M-26 Boot Assembly Note)
10	Dynamic damper (See M-26 Dynamic Damper Assembly Note)
11	ABS sensor rotor (See M-21 ABS Sensor Rotor (With ABS) Disassembly Note) (See M-22 ABS Sensor Rotor (With ABS) Assembly Note)
12	Shaft and ball joint component

M

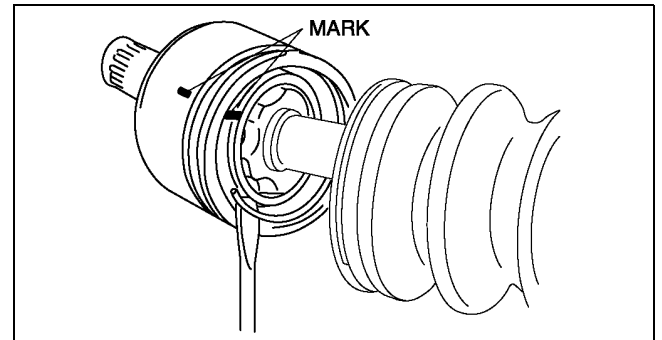
Clip Disassembly Note

1. Mark the drive shaft and outer ring for proper assembly.

Caution

- Mark with paint; do not use a punch.

2. Remove the clip.



A6E6316W010

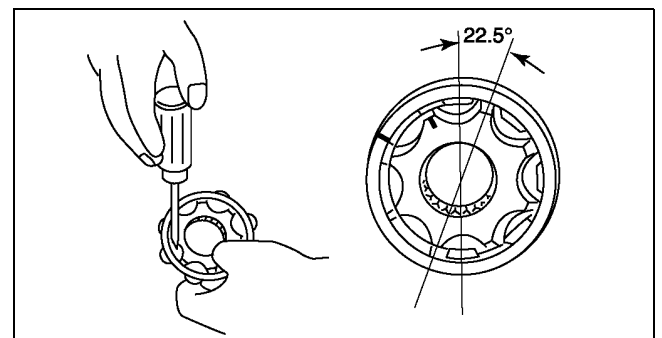
Balls, Inner Ring, Cage Disassembly Note

1. Mark the inner ring and cage.

Caution

- Mark with paint; do not use a punch.

2. Remove the snap ring using snap-ring pliers.
3. Turn the cage **approximately 30 degree** and pull the cage and balls away from the inner ring.



A6E6316W015

DRIVE SHAFT

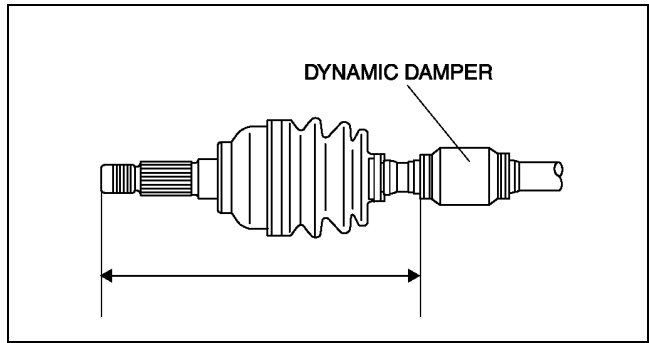
Dynamic Damper Assembly Note

1. Install the dynamic damper as shown in the figure.

Standard length

334.7—340.7 mm {13.2—13.4 in}

2. Install the new boot band onto the dynamic damper.



A6E6316W006

Boot Assembly Note

Note

- The wheel side and transaxle side boots are different.

1. Fill the boot (wheel side) with the specified grease.

Caution

- Do not touch grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.

Grease amount

90—110 g {3.18—3.88 oz} (L8, LF left side)

105—125 g {3.71—4.40 oz} (L8, LF right side and L3)

2. With the splines of the shaft still wrapped in tape from disassembly, install the boot.
3. Remove the tape.

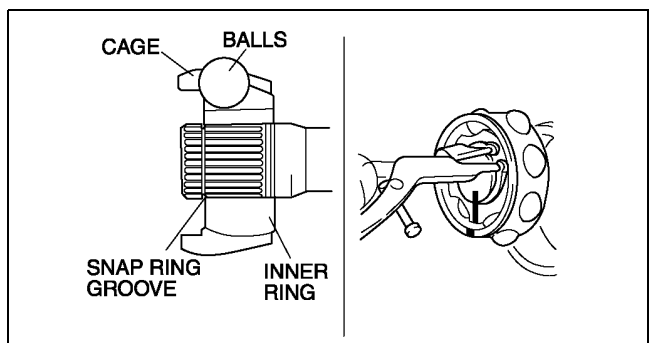
Cage, Inner Ring, Balls, Snap Ring Assembly Note

1. Align the marks and install the balls and cage to the inner ring in the direction shown in the figure.

Caution

- Install the cage with the offset facing the snap ring groove. If incorrectly installed, the drive shaft may become disengaged.

2. Install a new snap ring.



A6E6316W011

Outer Ring, Clip Assembly Note

1. Fill the outer ring and boot (transaxle side) with the specified grease.

Caution

- Do not touch grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.

Grease amount

105—125 g {3.71—4.40 oz} (L8, LF left side),

120—140 g {4.24—4.93 oz} (L8, LF right side and L3)

2. Align the marks, and install the outer ring on to the shaft.
3. Install a new clip.
4. Install the boot.
5. Set the drive shaft to the standard length.

DRIVE SHAFT

Standard length

mm {in}

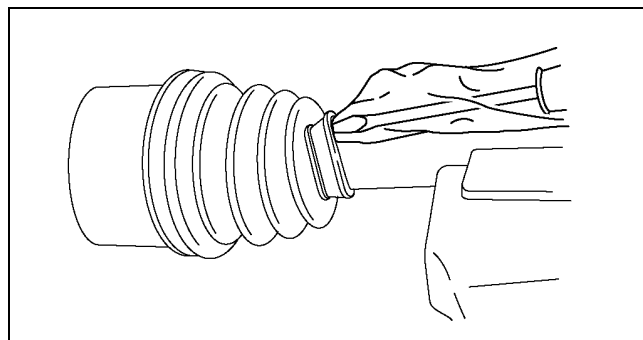
	Left side	Right side
L8, LF	677.7—687.7 {26.69—27.07}	628.6—638.6 {24.75—25.14}
L3	676.6—686.6 {26.64—27.03}	

6. Release any trapped air from the boots by carefully lifting up the small end of each boot with a cloth wrapped screwdriver.

Caution

- Be careful not to allow the grease to leak.
- Do not damage the boot.

7. Verify that the drive shaft length is within the specification.



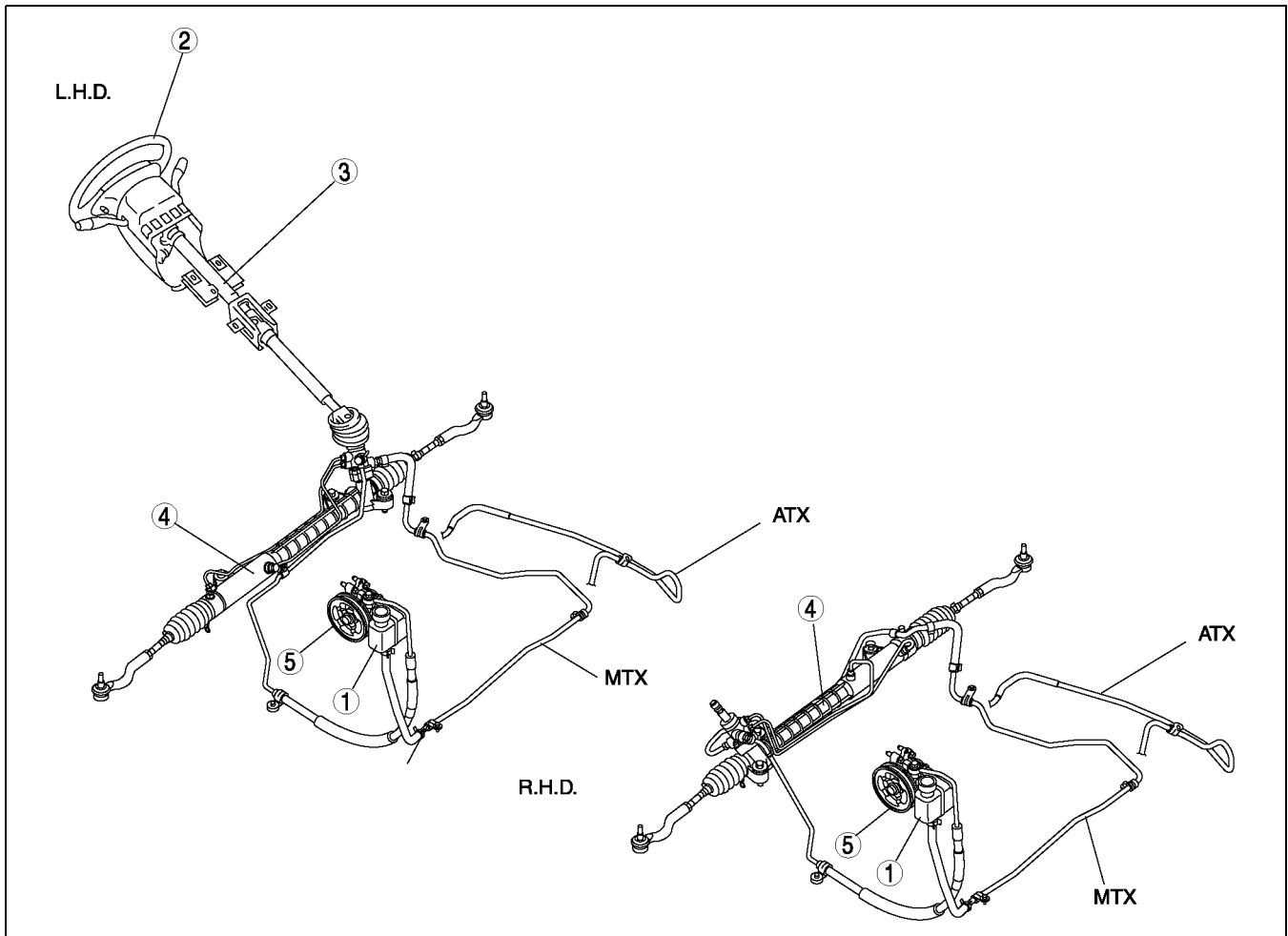
A6E6316W007

STEERING SYSTEM

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LOCATION INDEX

A6E660001036W01



A6E0610W010

1	Power steering fluid (See N-4 POWER STEERING FLUID INSPECTION)
2	Steering wheel and column (See N-6 STEERING WHEEL AND COLUMN INSPECTION) (See N-7 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION)
3	Steering shaft (See N-9 STEERING SHAFT INSPECTION)

4	Steering gear and linkage (See N-10 STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION) (See N-12 STEERING GEAR AND LINKAGE DISASSEMBLY) (See N-16 STEERING GEAR AND LINKAGE INSPECTION) (See N-16 STEERING GEAR AND LINKAGE ASSEMBLY)
5	Power steering oil pump (See N-22 POWER STEERING OIL PUMP REMOVAL/INSTALLATION) (See N-22 POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY)

GENERAL PROCEDURES

PRECAUTION (STEERING)

A6E661001036W01

Wheels and Tires Removal/Installation

1. The removal and installation procedures for the wheels and tires are not mentioned in this section. When a wheel is removed, tighten it to **88—118 N·m {9.0—12.0 kgf·m, 65.0—87.0 ft·lbf}**.

Power Steering Components Removal/Installation

1. If any power steering fluid line has been disconnected anytime during the procedure, add ATF M-III or equivalent (e.g. Dexron®II), bleed the fluid lines, and inspect for leakage after the procedure has been completed.

Connectors Disconnection/Connection

1. Disconnect the negative battery cable before doing any work that requires handling of connectors. Reconnect the negative battery cable only after the work is completed.

Suspension Arm Removal/Installation

1. Tighten any part of the suspension that uses rubber bushings only after vehicle has been lowered and unloaded.

Note

- Unloaded: Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack, and tools are in designated position.

N

ENGINE SPEED SENSING POWER STEERING

AIR BLEEDING

A6E661401036W01

1. Inspect the fluid level. (See [N-4 POWER STEERING FLUID INSPECTION](#).)
2. Jack up the front of the vehicle and support it on safety stands.
3. Turn the steering wheel fully to the left and right several times with the engine not running.
4. Reinspect the fluid level.
 - If it has dropped, add fluid.
5. Repeat Steps 3 and 4 until the fluid level stabilizes.
6. Lower the vehicle.
7. Start the engine and let it idle.
8. Turn the steering wheel fully to the left and right several times.
9. Verify that the fluid is not foamy and that the fluid level has not dropped.
 - If the fluid level has dropped, add fluid as necessary and repeat Steps 8 and 9.

ENGINE SPEED SENSING POWER STEERING

POWER STEERING FLUID INSPECTION

A6E661432040W01

Fluid Level Inspection

1. Inspect the power steering fluid level.
 - Add fluid to the specified level as necessary.

Fluid specification

ATF M-III or equivalent (e.g. Dexron® II)

Fluid Leakage Inspection

1. Start the engine and let it idle.
2. Turn the steering wheel fully to the left and right to apply fluid pressure.

Caution

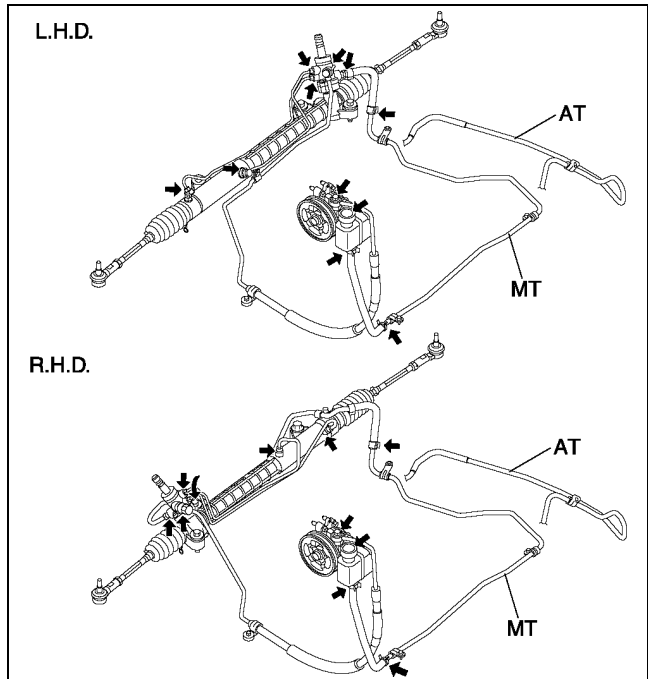
- If the steering wheel is kept in the fully turned position for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.

3. Inspect for fluid leakage.

- If fluid leakage is found, replace related pipe or hose.

Note

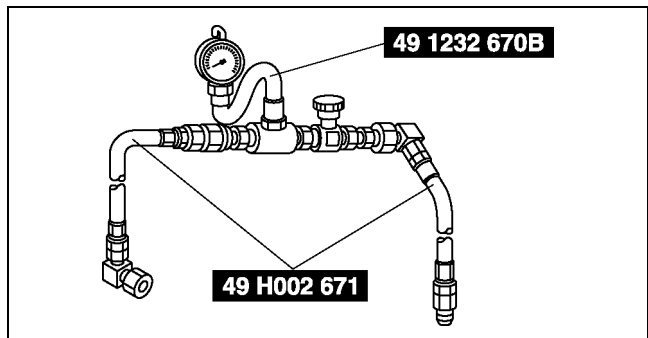
- The points where fluid leakage may occur are indicated in the figure.



A6E0612W094

Fluid Pressure Inspection

1. Assemble the SSTs as shown in the figure.



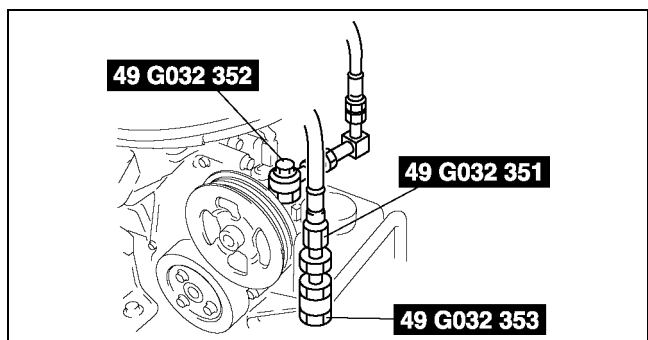
A6E0612W101

2. Disconnect the pressure pipe from the oil pump, and connect the SSTs.

Tightening torque

29.4—44.1 N·m {3.0—4.4 kgf·m, 22—32 ft·lbf}

3. Bleed the air from the system.
4. Open the gauge valve fully.
5. Start the engine and turn the steering wheel fully left and right to raise the fluid temperature to 50—60 °C {122—140 °F}.



A6E0612W102

ENGINE SPEED SENSING POWER STEERING

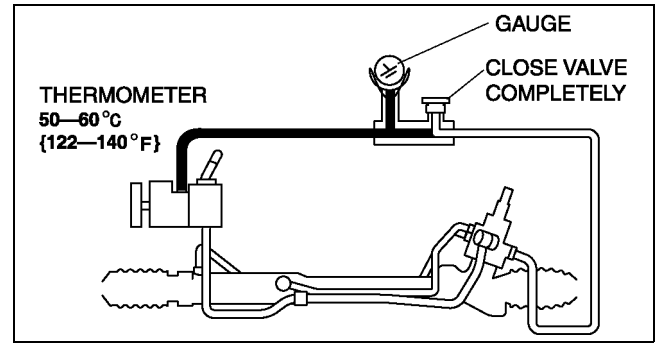
6. Close the gauge valve completely.
7. Increase the engine speed to **1,000—1,500 rpm** and measure the fluid pressure generated by the oil pump.
 - If the pressure is not within the specification, repair or replace the oil pump component.

Caution

- If the valve is left closed for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.

Oil pump fluid pressure

10.80—11.29 MPa {110.2—115.2 kgf/cm², 1567—1637 psi}

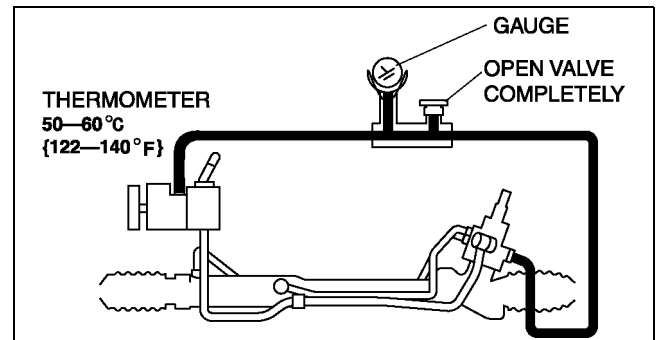


A6E0612W081

8. Open the gauge valve fully and increase the engine speed to **1,000—1,500 rpm**.
9. Turn the steering wheel fully to the left and right, then measure the fluid pressure generated at the gear housing.
 - If the pressure is not within the specification, repair or replace the steering gear component.

Caution

- If the steering wheel is kept in the fully turned position for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.



A6E0612W080

Gear housing fluid pressure

10.80—11.29 MPa {110.2—115.2 kgf/cm², 1567—1637 psi}

10. Remove the **SSTs**. Install and tighten the pressure pipe to the specified torque.

Tightening torque

29.4—44.1 N·m {3.0—4.4 kgf·m, 22—32 ft·lbf}

11. Bleed the air from the system.

ENGINE SPEED SENSING POWER STEERING

STEERING WHEEL AND COLUMN INSPECTION

A6E661432010W01

Steering Wheel Play Inspection

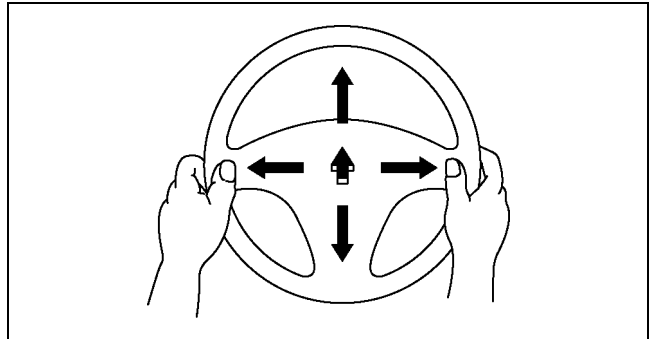
1. With the wheels in the straight-ahead position, gently turn the steering wheel to the left and right and verify that the play is within the specification.
 - If the play exceeds the specification, either the steering joints are worn or the backlash of the steering gear is excessive. Correct as necessary.

Play

0—30 mm {0—1.18 in}

Steering Wheel Looseness Inspection

1. Move the steering wheel as shown in the figure to inspect for column bearing wear, steering shaft joint play, steering wheel looseness, and column looseness.
 - Repair or replace as necessary.



A6E0612W015

Steering Wheel Effort Inspection

1. Inspect the following points:
 - Tire size and tire pressure
 - Fluid level
 - Drive belt deflection
2. With the vehicle on a hard, level surface, put the wheels in the straight-ahead position.
3. Remove the air bag module.

Warning

- See **DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION** for removal/installation of the air bag module after inspection.

4. Start the engine and warm the power steering fluid to 50—60 °C {122—140 °F}.
5. Measure the steering wheel effort using a torque wrench.

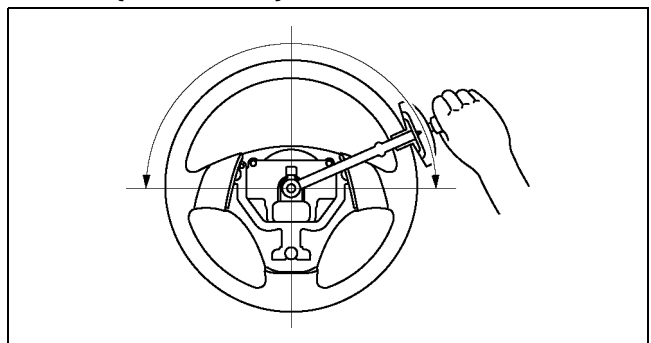
- If not within the specification, verify the following:
 - No air in steering system
 - No fluid leakage at hose or connectors
 - Function of oil pump and steering gear

Steering wheel effort

7.8 N·m {80 kgf·cm, 58 in·lbf} max.

Note

- To determine whether the steering effort is satisfactory or not, perform the inspection on another vehicle of the same model and under the same conditions, and compare the results.
- The steering wheel effort varies with conditions as shown below.
 - Road conditions, such as dry or wet, and asphalt or concrete.
 - Tire conditions, such as brand, wear, and tire pressure.



A6E0612W016

ENGINE SPEED SENSING POWER STEERING

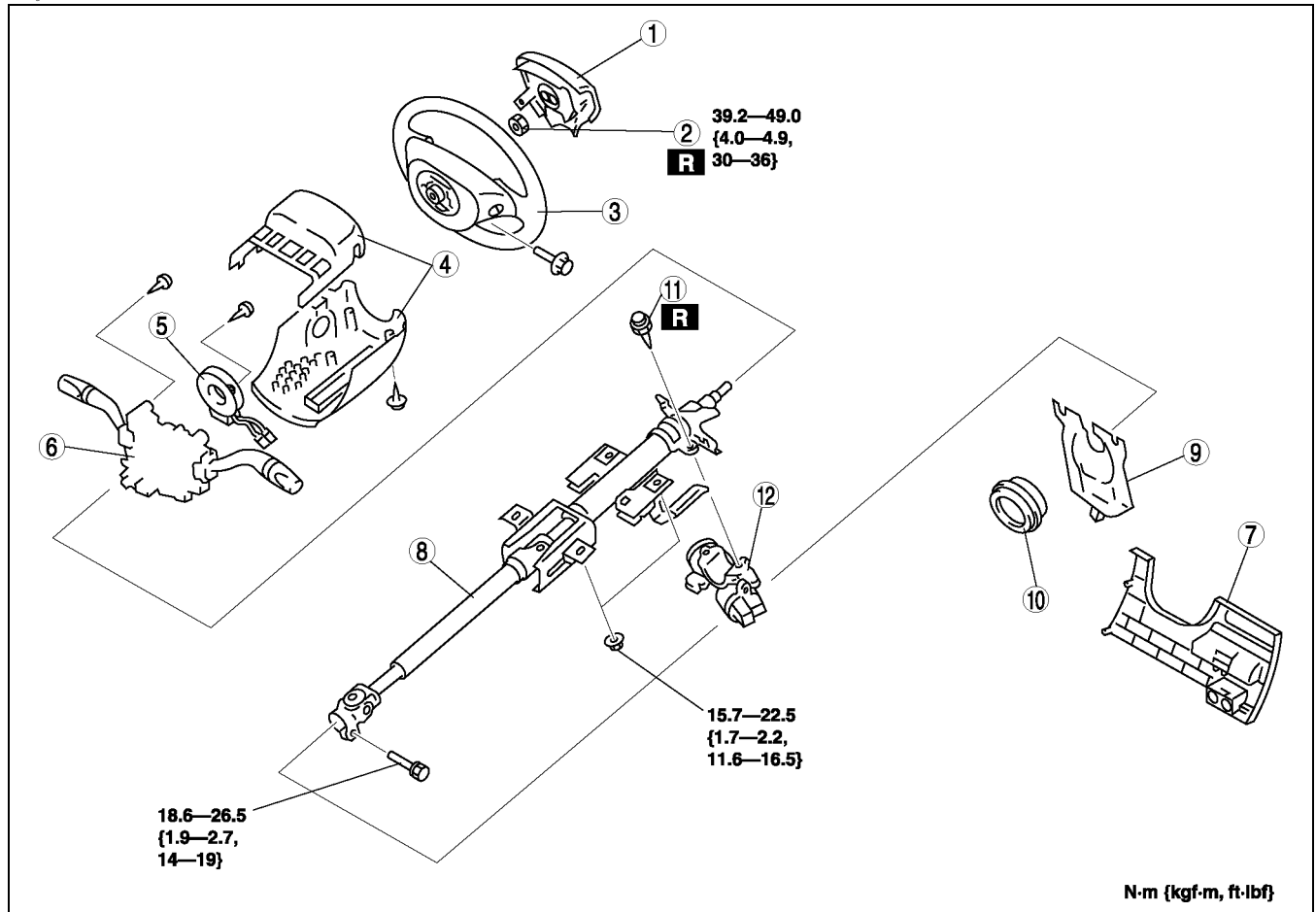
STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION

A6E661432010W02

Warning

- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM WARNINGS before handling the air bag module. (See [T-117 SERVICE WARNINGS](#).)

- Remove in the order indicated in the table.
- Install in the reverse order of removal.



A6E0612W017

1	Air bag module (See T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
2	Locknut
3	Steering wheel (See N-8 Steering Wheel Removal Note) (See N-8 Steering Wheel Installation Note)
4	Column cover
5	Clock spring (See T-125 CLOCK SPRING REMOVAL/INSTALLATION)
6	Combination switch

7	Lower panel
8	Steering shaft (See N-8 Steering Shaft Installation Note)
9	Joint cover
10	Dust cover
11	Steering lock mounting bolts (See N-8 Steering Lock Mounting Bolts Removal Note) (See N-8 Steering Lock Mounting Bolts Installation Note)
12	Steering lock component

ENGINE SPEED SENSING POWER STEERING

Steering Wheel Removal Note

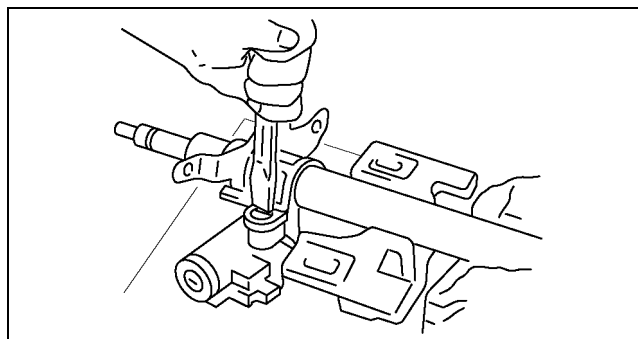
Caution

- Do not try to remove the steering wheel by hitting the shaft with a hammer. The column will collapse.

1. Set the vehicle in the straight-ahead position.
2. Remove the steering wheel using a suitable puller.

Steering Lock Mounting Bolts Removal Note

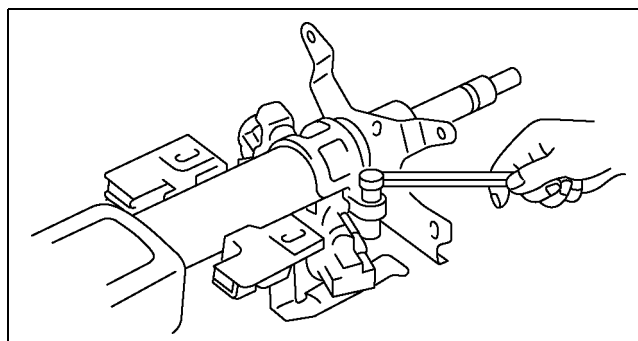
1. Make a groove in the heads of the steering lock mounting bolts using a chisel and a hammer.
2. Remove the bolts using a screwdriver.
3. Disassemble the steering lock component.



A6E0612W018

Steering Lock Mounting Bolts Installation Note

1. Assemble the steering lock component to the steering shaft.
2. Verify that the lock operates correctly.
3. Install new steering lock mounting bolts.
4. Tighten the bolts until the heads break off.



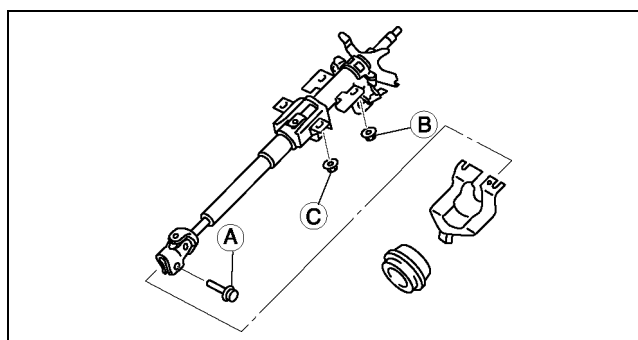
A6E0612W020

Steering Shaft Installation Note

Caution

- Do not apply a shock in the axial direction of the shaft.

1. Lock the tilt lever.
2. Tighten bolt A.
3. Tighten nut B.
4. Tighten nut C.



A6E0612W103

Steering Wheel Installation Note

1. Set the wheels in the straight-ahead position, and install the steering wheel.

ENGINE SPEED SENSING POWER STEERING

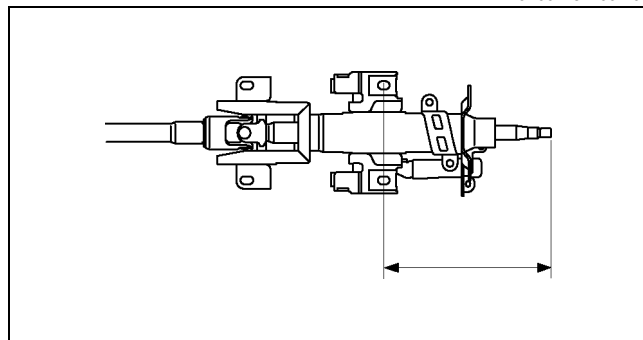
STEERING SHAFT INSPECTION

1. Inspect the following.
 - (1) Column bearing for damage
 - (2) Steering shaft length
 - Replace the steering shaft component as necessary.

Length

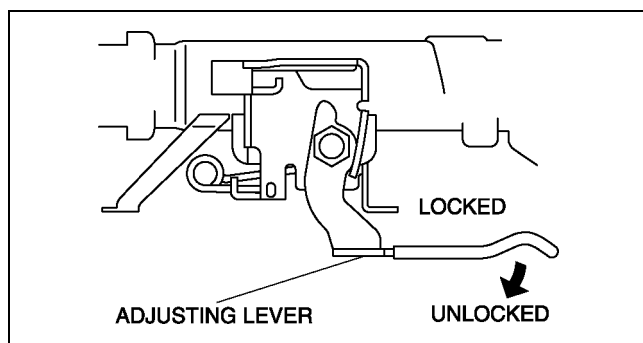
211.6 mm {8.3 in}

A6E661432100W01



A6E0612W022

2. Inspect the tilt and telescope operation
 - (1) Verify that the adjusting lever moves smoothly from unlock position to lock position.
 - (2) Verify that the steering shaft is fixed firmly when the adjusting lever is locked.
 - Replace the steering shaft component as necessary.



A6E0612W023

N

ENGINE SPEED SENSING POWER STEERING

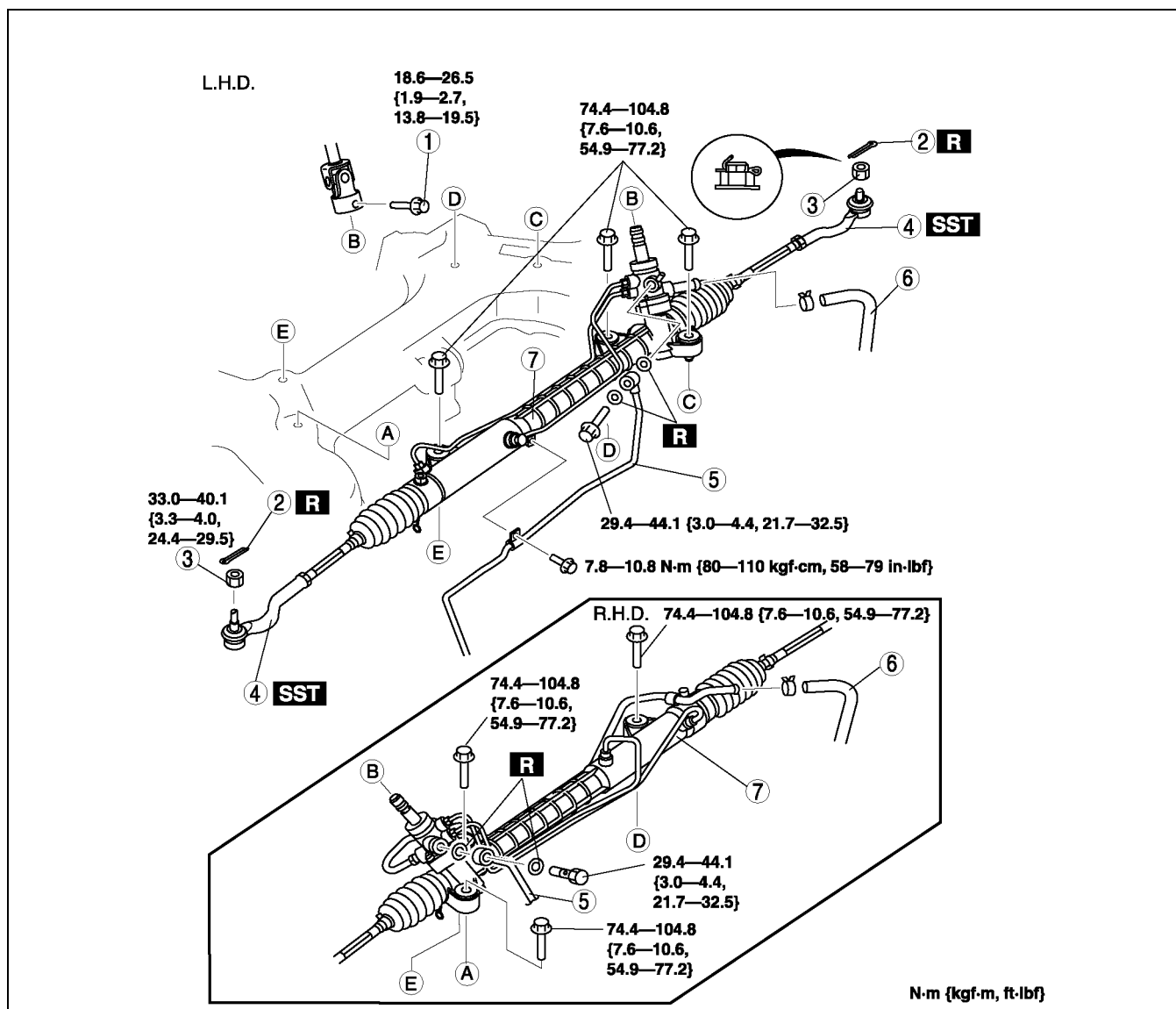
STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION

A6E661432960W01

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

- Remove in the order indicated in the table.
- Install in the reverse order of removal.
- After installation, inspect the toe-in. (See [R-5 FRONT WHEEL ALIGNMENT](#).)



A6E0612W108

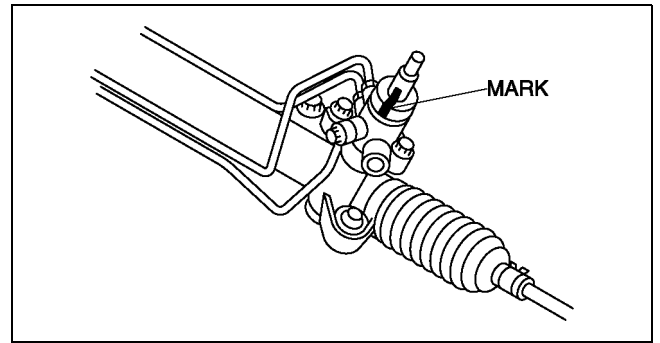
1	Bolt (intermediate shaft) (See N-11 Bolt (Intermediate Shaft) Removal Note) (See N-12 Bolt (Intermediate Shaft) Installation Note)
2	Cotter pin
3	Nuts (tie-rod end ball joint)
4	Tie-rod end ball joint (See N-11 Tie-rod End Ball Joint Removal Note)

5	Pressure pipe
6	Return pipe
7	Steering gear and linkage (See N-11 Steering Gear and Linkage Removal Note) (See N-12 Steering Gear and Linkage Installation Note)

ENGINE SPEED SENSING POWER STEERING

Bolt (Intermediate Shaft) Removal Note

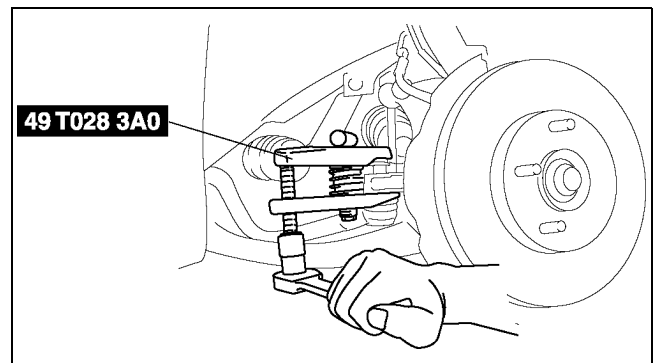
1. Mark the pinion shaft and gear housing for proper installation.



A6E0612W084

Tie-rod End Ball Joint Removal Note

1. Remove the tie rod-nut.
2. Separate the tie-rod end from the steering knuckle using the **SSTs**.



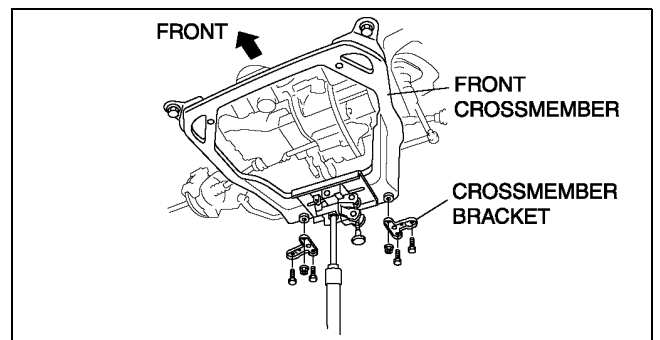
A6E0612W085

Steering Gear and Linkage Removal Note L.H.D.

Caution

- Excessively loosening the crossmember nuts may possibly cause the crossmember to fall off. The crossmember nuts must remain threaded on the studs when loosening.

1. Support the crossmember using jack before removing the crossmember bracket.
2. Loosen the jack and lower the crossmember.
3. Remove the steering gear and linkage by pulling it from the left side.



A6E0612W107

R.H.D.

1. Remove the steering gear and linkage by pulling it from the right side.

ENGINE SPEED SENSING POWER STEERING

Steering Gear and Linkage Installation Note

1. Loosely tighten bolts.
2. Tighten the mounting bracket bolts to the specified torque in the order shown.

Tightening torque

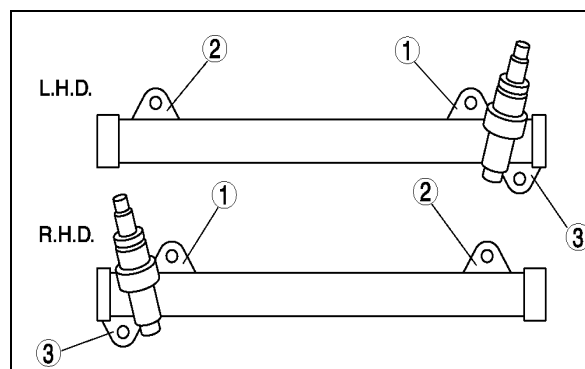
74.4—104.8 N·m {7.6—10.6 kgf·m, 55—77 ft·lbf}

3. Tighten the crossmember installation nuts. (L.H.D.)

Tightening torque

Nut: 119.6—154.8 N·m {12.2—15.7 kgf·m, 89—114 ft·lbf}

Bolt: 93.1—131.3 N·m {9.5—13.3 kgf·m, 69—96 ft·lbf}



A6E0612W027

Bolt (Intermediate Shaft) Installation Note

1. Align the marks and install the intermediate shaft and bolt.

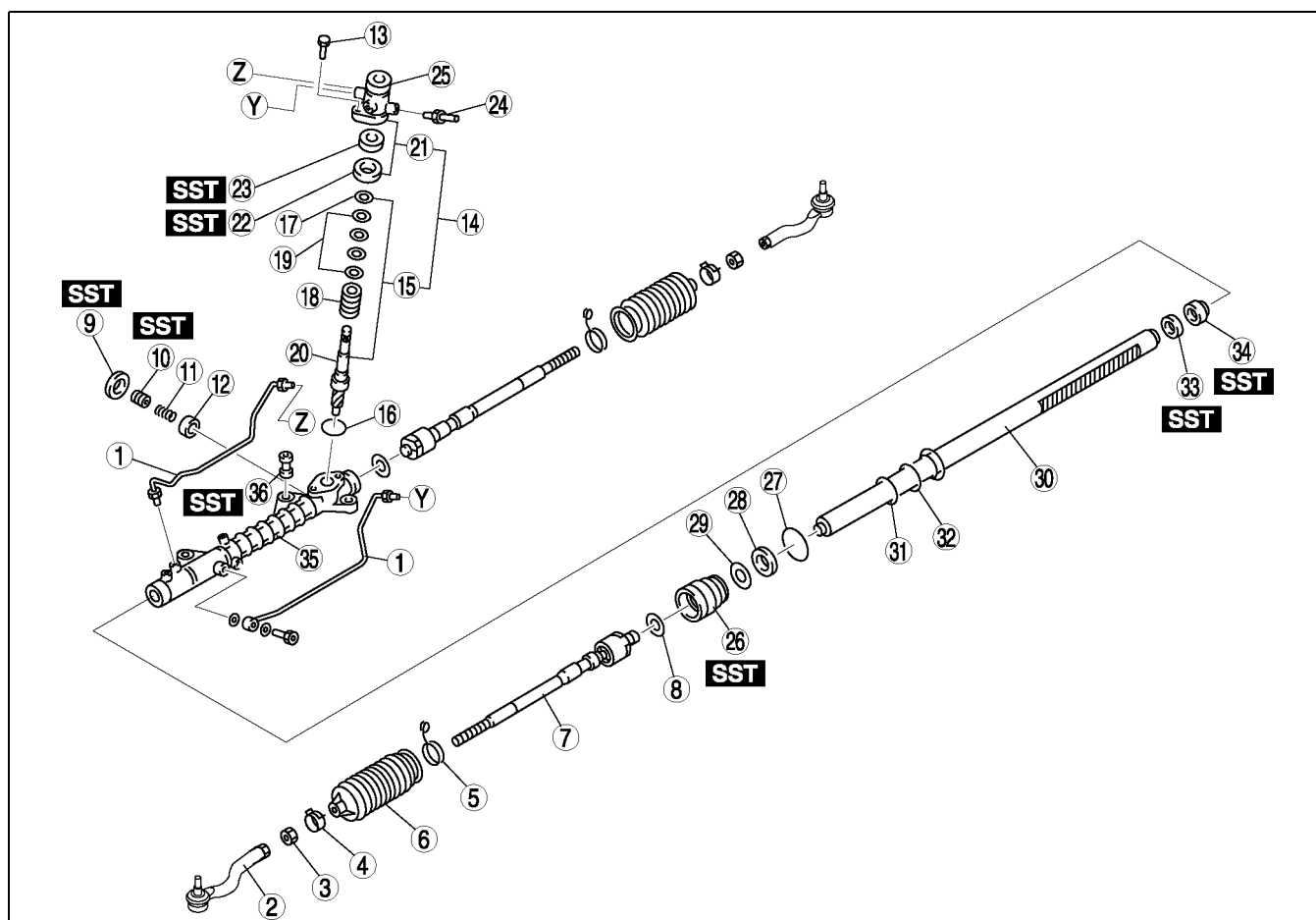
STEERING GEAR AND LINKAGE DISASSEMBLY

A6E661432960W02

Caution

- Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.

1. Disassemble in the order indicated in the table.



A6E0612W028

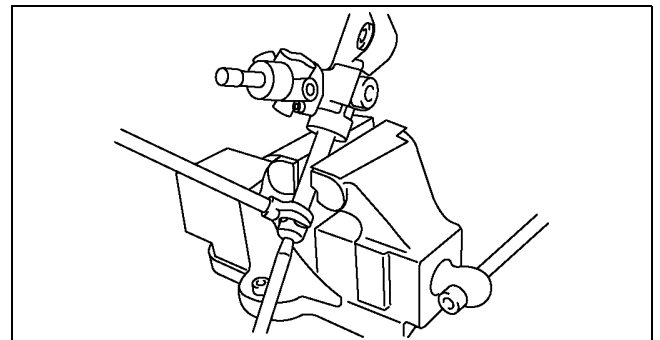
ENGINE SPEED SENSING POWER STEERING

1	Oil pipe
2	Tie-rod end
3	Locknut
4	Boot clamp
5	Boot band
6	Boot
7	Tie rod (See N-13 Tie Rod Disassembly Note)
8	Washer
9	Locknut (adjusting cover) (See N-13 Locknut (Adjusting Cover) Disassembly Note)
10	Adjusting cover (See N-14 Adjusting Cover Disassembly Note)
11	Yoke spring
12	Support yoke
13	Bolt
14	Pinion shaft and housing component (See N-14 Pinion Shaft and Housing Component Disassembly Note)
15	Pinion shaft component (See N-14 Pinion Shaft Component Disassembly Note)
16	O-ring
17	Snap ring (See N-14 Snap Ring Disassembly Note)
18	Control valve component

19	Seal ring
20	Pinion shaft
21	Valve housing component
22	Upper bearing (See N-15 Upper Bearing, Oil Seal Disassembly Note)
23	Oil seal (See N-15 Upper Bearing, Oil Seal Disassembly Note)
24	Return pipe
25	Valve Housing
26	Holder (See N-15 Holder Disassembly Note)
27	O-ring
28	U-gasket
29	Backup ring
30	Steering rack
31	Seal ring
32	O-ring
33	Oil seal (See N-15 Oil Seal, Inner Guide Disassembly Note)
34	Inner guide (See N-15 Oil Seal, Inner Guide Disassembly Note)
35	Gear housing
36	Mounting rubber (See N-15 Mounting Rubber Disassembly Note)

Tie Rod Disassembly Note

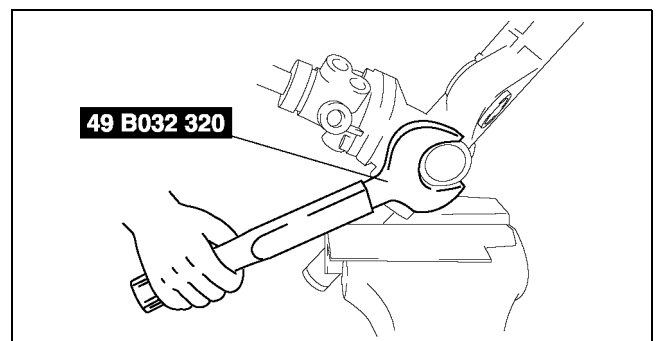
1. Unclamp the washer.
2. Remove the tie rod.



A6E0612W031

Locknut (Adjusting Cover) Disassembly Note

1. Remove the locknut using the SST.

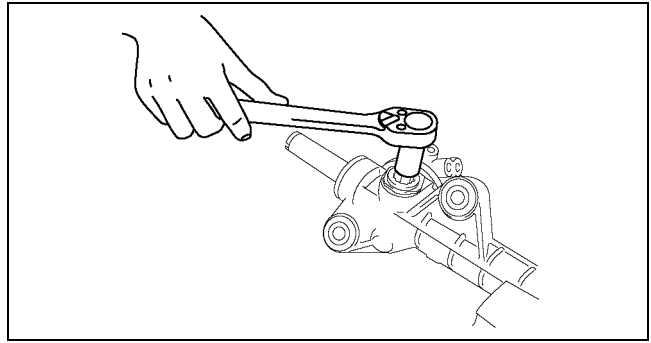


A6E0612W056

ENGINE SPEED SENSING POWER STEERING

Adjusting Cover Disassembly Note

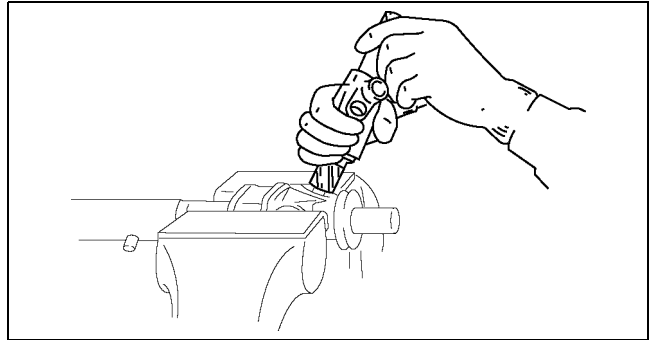
1. Remove the adjusting cover.



A6E0612W033

Pinion Shaft and Housing Component Disassembly Note

1. Hold the pinion shaft as shown, and pull out the pinion shaft and housing component.



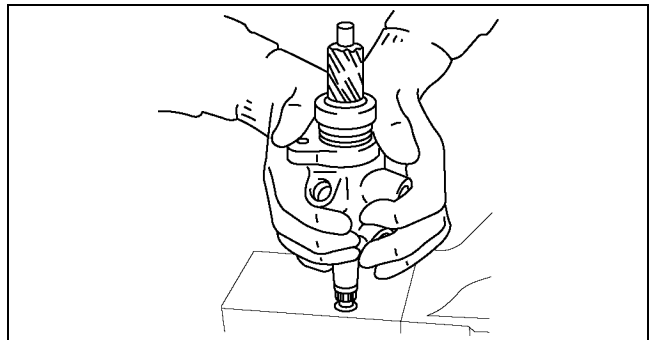
A6E0612W038

Pinion Shaft Component Disassembly Note

Note

- If the pinion shaft does not come out easily, remove it using a press.

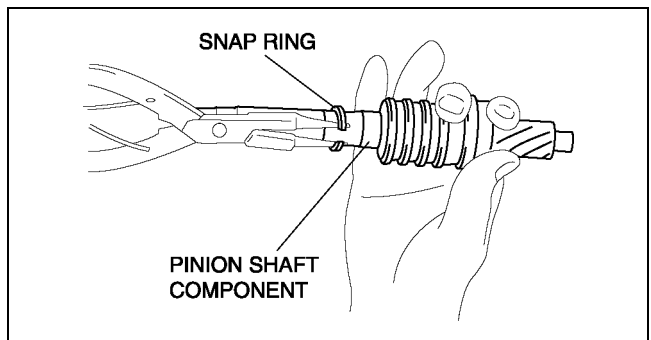
1. Push out the pinion shaft component from the valve housing as shown.



A6E0612W034

Snap Ring Disassembly Note

1. Carefully remove the snap ring without damaging the pinion shaft component.

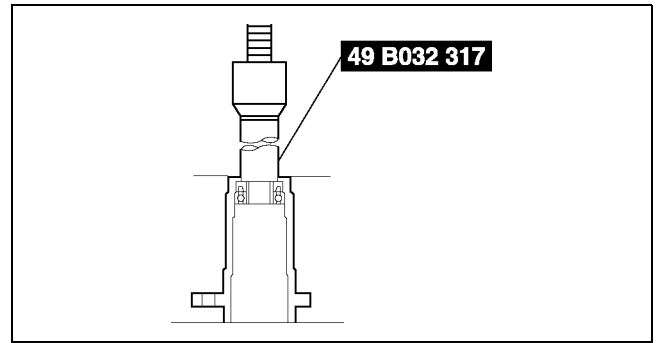


A6E0612W074

ENGINE SPEED SENSING POWER STEERING

Upper Bearing, Oil Seal Disassembly Note

1. Set the **SST** as shown.
2. Using a press, remove the oil seal and upper bearing without applying pressure to the edge of the valve housing.



A6E0612W035

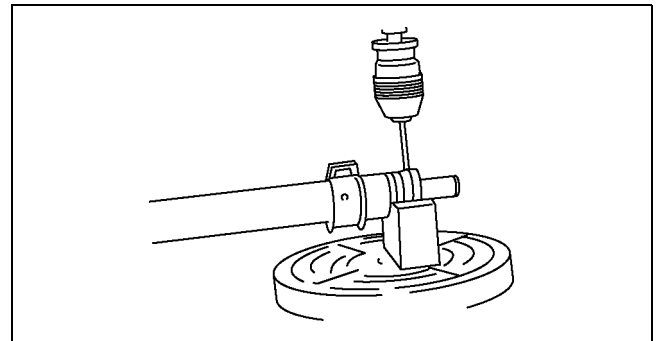
Holder Disassembly Note

1. Cut away the staked area by using a drill.

Caution

- Carefully pull out the holder without damaging the U gasket.

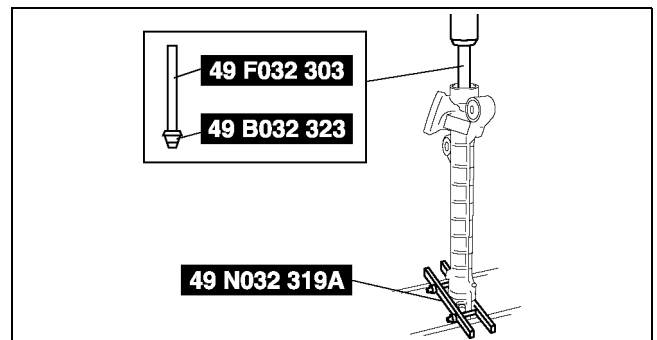
2. Disassemble the holder.



A6E0612W037

Oil Seal, Inner Guide Disassembly Note

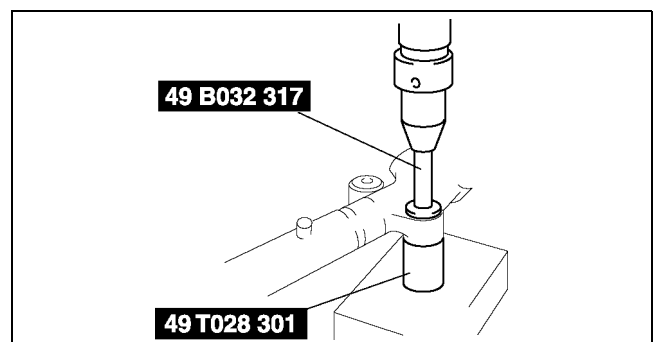
1. Set the **SSTs** into the valve side.
2. Install the **SST** to the gear housing.
3. Press out the oil seal and inner guide.



A6E0612W086

Mounting Rubber Disassembly Note

- Press the mounting rubber out from the gear housing using the **SSTs** and a press.



A6E0612W040

ENGINE SPEED SENSING POWER STEERING

STEERING GEAR AND LINKAGE INSPECTION

A6E661432960W03

Rack Inspection

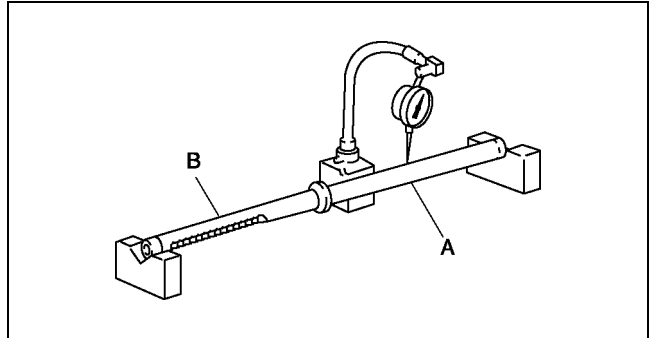
1. Inspect the rack for cracking, damage, and tooth wear. Replace it as necessary.
2. Measure the runout of the rack.

Runout

Near point A: 0.15 mm {0.006 in} max.

Near point B: 0.20 mm {0.008 in} max.

3. If not within the specification, replace the rack.



A6E0612W041

Tie-rod End Inspection

1. Inspect the tie-rod end for damage and boot cracks. Replace it as necessary.
2. Inspect the ball joint for looseness. Replace the tie-rod end as necessary.
3. Rotate the ball joint five times.
4. Measure the rotation torque of the ball joint using the SST and a pull scale.

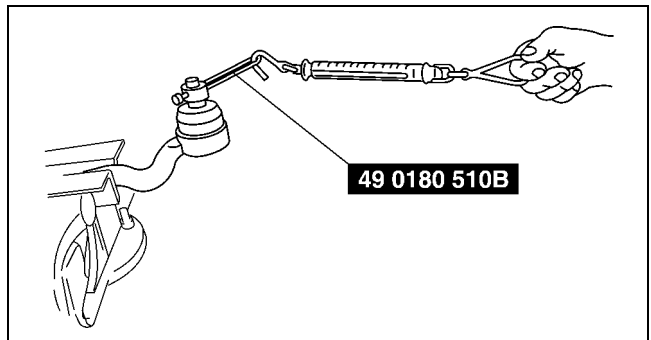
Rotation torque

0.4—2.7 N·m {3.5—27.5 kgf·cm, 3.1—23.8 in·lbf}

Pull scale reading

3.4—25.5 N {0.35—2.60 kgf, 0.8—5.7 lbf}

5. If not within the specification, replace the tie-rod end.



A6E6316W100

Tie rod Inspection

1. Inspect the tie rod for bending and damage. Replace it as necessary.
2. Inspect the ball joint for looseness. Replace the tie rod as necessary.
3. Swing the tie rod five times.
4. Measure the swinging torque using a pull scale.

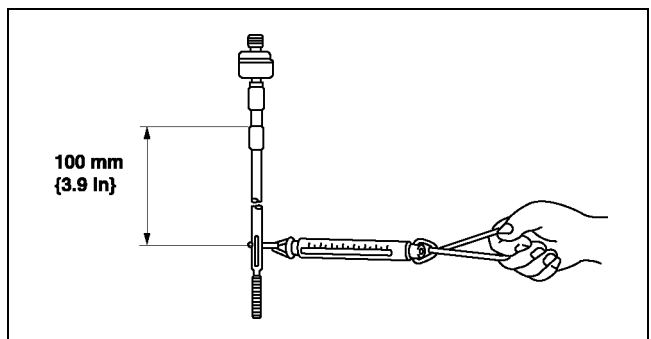
Swinging torque

0.1—4.0 N·m {1—40.7 kgf·cm, 0.9—35.3 in·lbf}

Pull scale reading

0.6—24.5 N {0.06—2.49 kgf, 0.2—5.50 lbf}

5. If not within the specification, replace the tie-rod.



A6E0612W043

STEERING GEAR AND LINKAGE ASSEMBLY

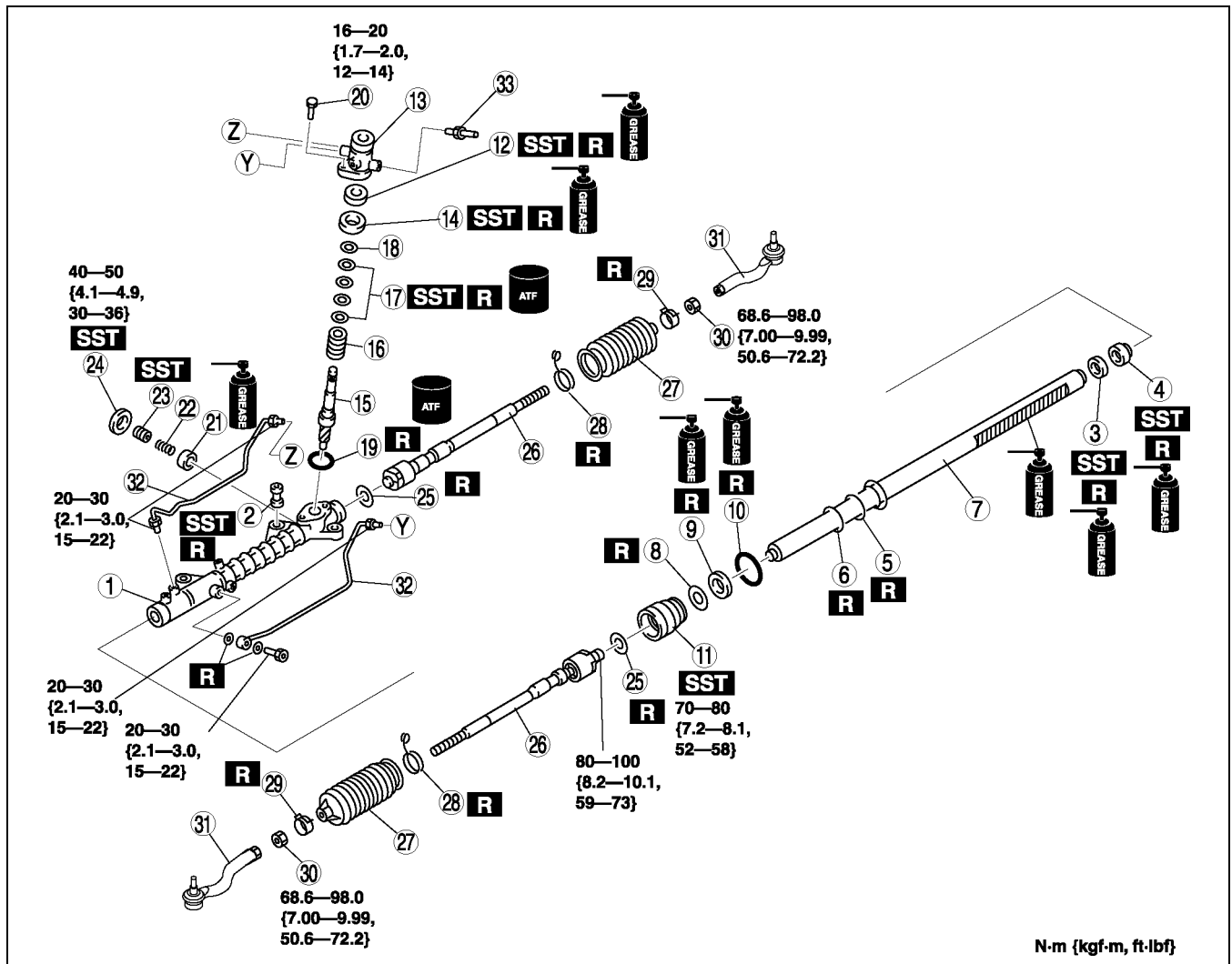
A6E661432960W04

Caution

- Place copper plates, rag, or similar material in a vise, when secure the mounting bracket portion of the steering gear.

ENGINE SPEED SENSING POWER STEERING

1. Assemble in the order indicated in the table.



A6E0612W044

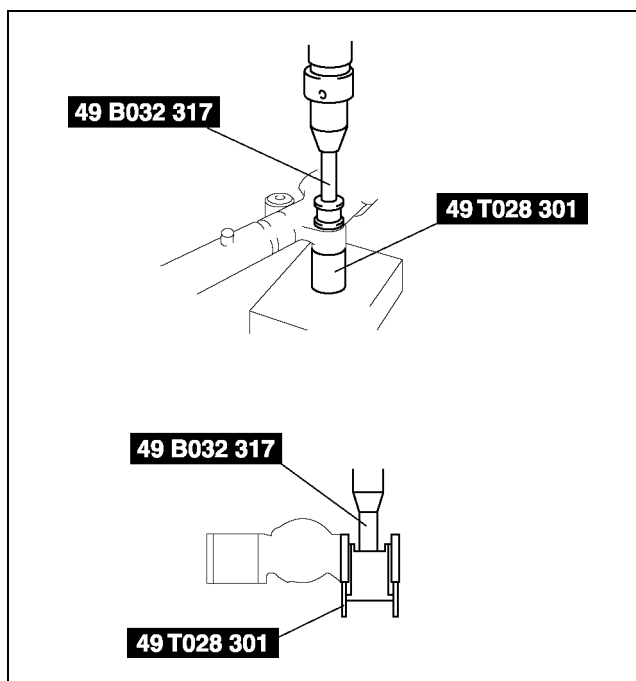
1	Gear housing
2	Mounting rubber (See N-18 Mounting Rubber Assembly Note)
3	Oil seal (See N-18 Oil Seal, Inner Guide Assembly Note)
4	Inner guide (See N-18 Oil Seal, Inner Guide Assembly Note)
5	O-ring
6	Seal ring
7	Steering rack
8	Backup ring
9	U-gasket
10	O-ring
11	Holder (See N-19 Holder Assembly Note)
12	Oil seal (See N-20 Oil Seal Assembly Note)
13	Valve housing
14	Upper bearing (See N-20 Upper Bearing Assembly Note)
15	Pinion shaft

16	Control valve
17	Seal ring (See N-20 Seal Ring Assembly Note)
18	Snap ring
19	O-ring
20	Bolt
21	Support yoke
22	Yoke spring
23	Adjusting cover (See N-20 Adjusting Cover Assembly Note)
24	Locknut (adjusting cover)
25	Washer
26	Tie rod
27	Boot
28	Boot band
29	Boot clamp
30	Locknut
31	Tie-rod end
32	Oil pipe
33	Return pipe

ENGINE SPEED SENSING POWER STEERING

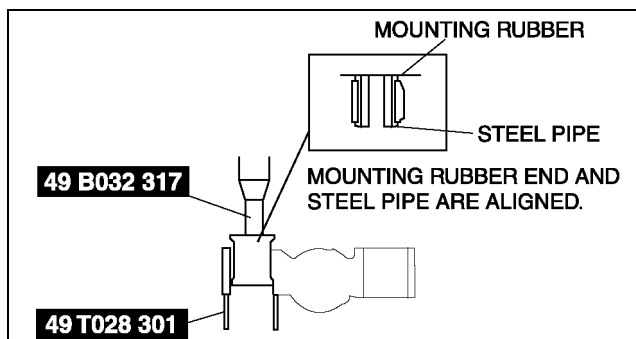
Mounting Rubber Assembly Note

1. Apply soapy water to the rubber part of the mounting rubber.
2. Press the mounting rubber until the mounting rubber end comes out completely from the gear housing using the **SSTs** and a press.



A6E0612W087

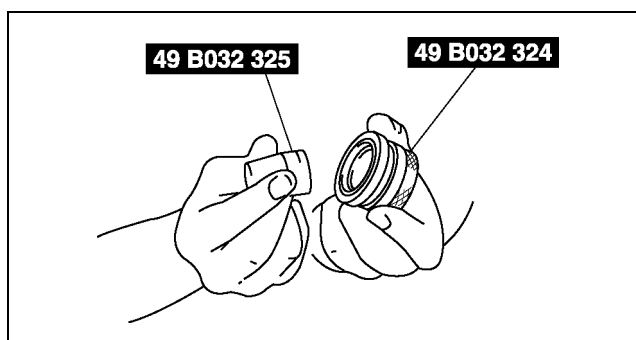
3. Reverse the gear housing, then press the mounting rubber until the mounting rubber end comes out completely from the other side. At this time, mounting rubber end and steel pipe are aligned.



A6E0612W088

Oil Seal, Inner Guide Assembly Note

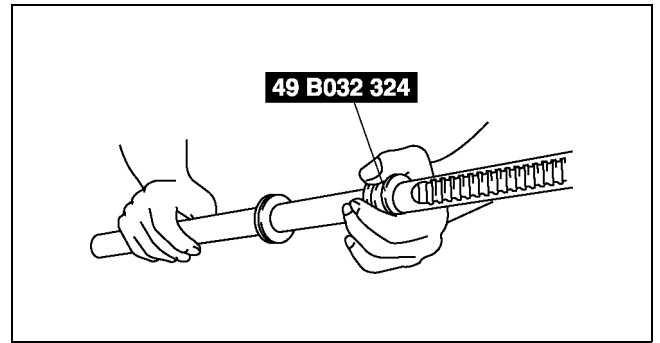
1. Install a new O-ring and a new seal ring to the rack's piston.
2. After installing the seal ring, seat it properly at the piston circumference.
3. Apply grease to a new oil seal and inner guide.
4. Install the oil seal to the **SST**.



A6E0612W048

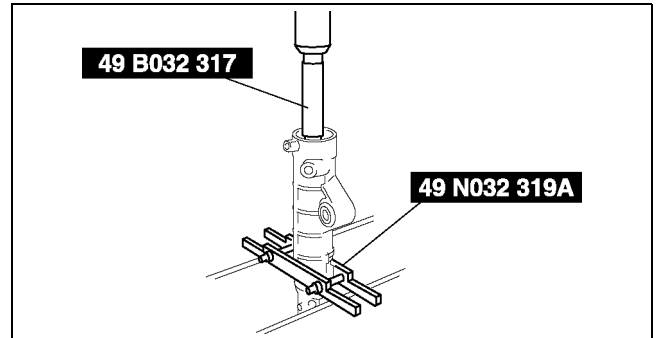
ENGINE SPEED SENSING POWER STEERING

- Using the **SST**, place the oil seal and inner guide at the edge of the steering rack's pinion, and remove the **SST**.



A6E0612W049

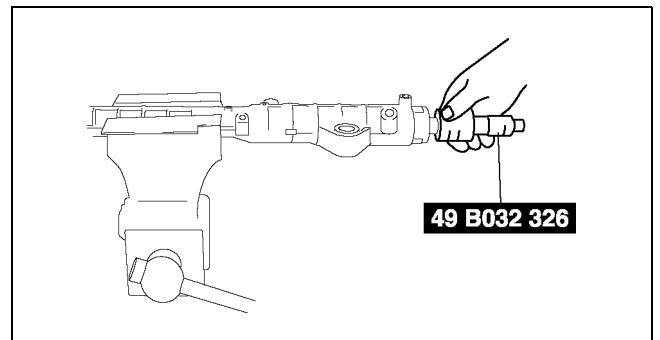
- After installing the steering rack to the gear housing, press the oil seal and inner guide using the **SSTs** until the force required suddenly increases.



A6E0612W039

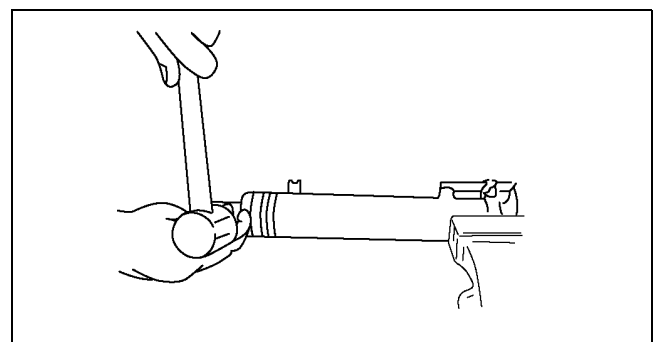
Holder Assembly Note

- Apply grease to the U-gasket and O-ring.
- Assemble the U-gasket, backup ring and O-ring into the holder.
- Assemble the **SST** to the steering rack.



A6E0612W090

- Stake the holder to the cylinder using a punch.

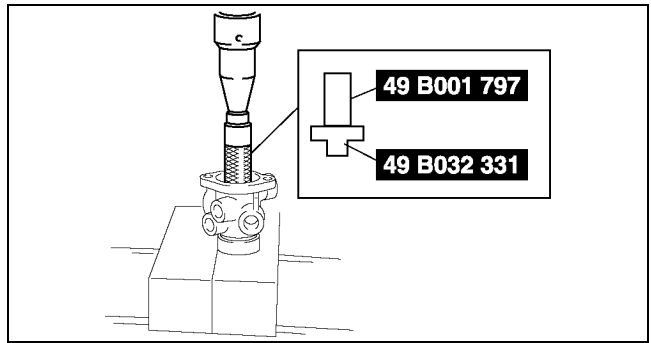


A6E6316W012

ENGINE SPEED SENSING POWER STEERING

Oil Seal Assembly Note

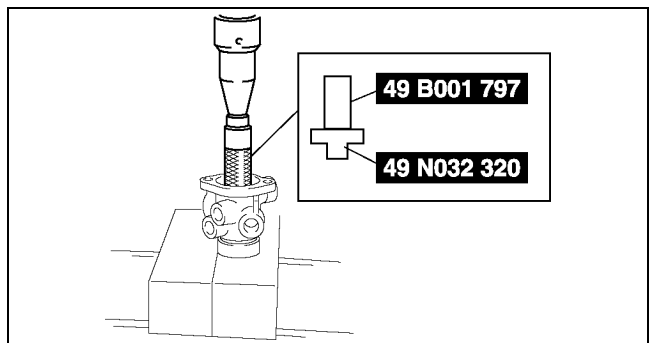
1. Apply grease to a new oil seal.
2. Press in the new oil seal using the **SSTs**.



A6E0612W036

Upper Bearing Assembly Note

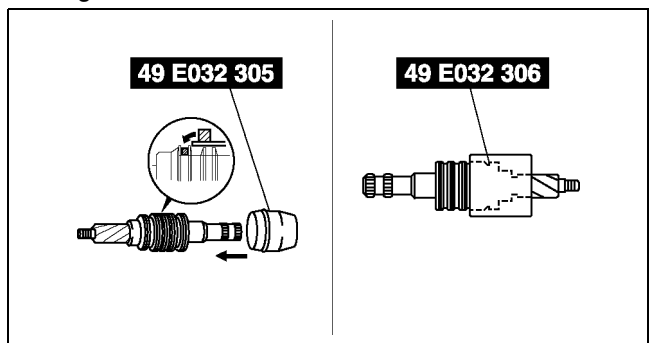
1. Apply grease to a new upper bearing.
2. Press in the upper bearing using the **SST**.



A6E0612W051

Seal Ring Assembly Note

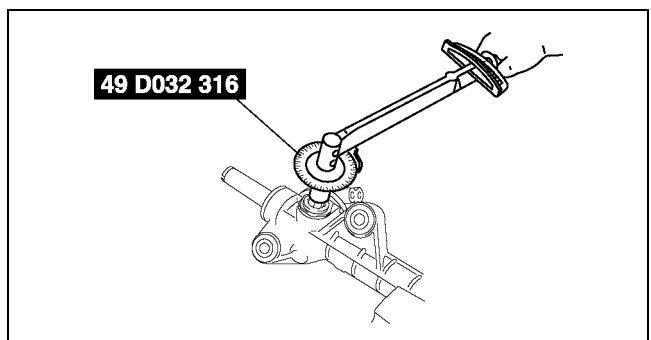
1. Install a new seal ring to the valve part of the pinion shaft using the **SST**.
2. After installing it, seat it properly using the **SST**.
3. Install the snap ring.



A6E0612W052

Adjusting Cover Assembly Note

1. Set the rack to the center position.
2. Tighten the adjusting cover to **4.9 N·m {50 kgf·cm, 36 in·lbf}** three times, then return it **25°** using the **SST**.
3. Apply sealant to the threads of the locknut.
4. Attach the locknut.



A6E0612W062

ENGINE SPEED SENSING POWER STEERING

5. Measure the pinion torque using the **SST** and a pull scale.

Standard

Center of rack $\pm 90^\circ$

0.8—1.2 N·m

{8.2—12.2 kgf·cm, 5.8—8.8 in·lbf}

[Pull scale reading

8—12 N {0.9—1.2 kgf, 1.8—2.6 lbf}]

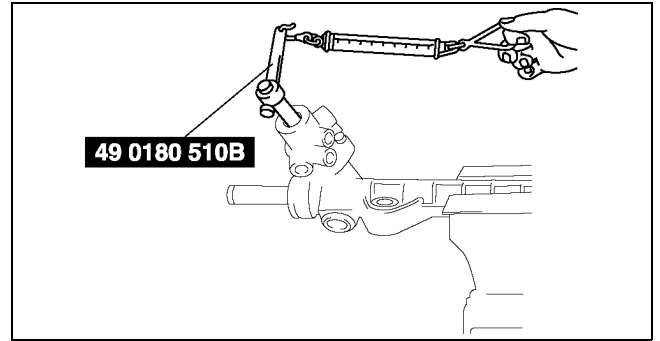
Except center of rack $\pm 90^\circ$

Less than 1.6 N·m

{16.3 kgf·cm, 11.8 in·lbf}

[Pull scale reading

Less than 16.7 N {1.7 kgf, 3.8 lbf}]

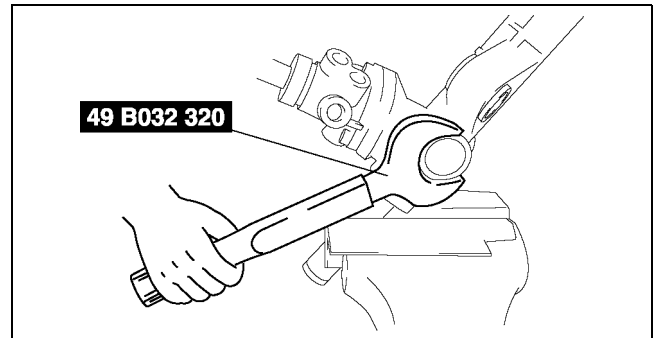


A6E0612W042

6. If not as specified, repeat steps 2 through 5.
7. Install the locknut using the **SST** (49 B032 320).

Tightening torque

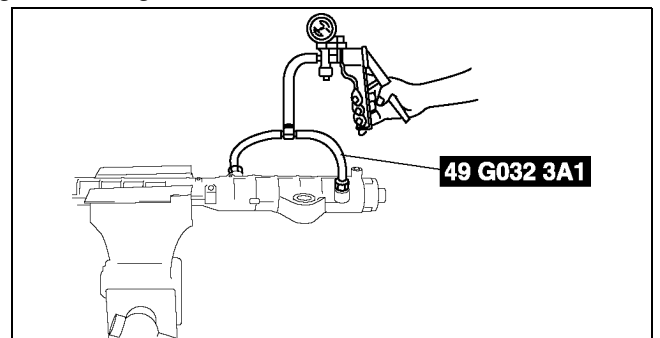
40—49 N·m {4.1—4.9 kgf·m, 30—36 ft·lbf}



A6E0612W056

Hermetic sealing inspection

1. Connect the **SSTs** to the power cylinder section of the gear housing.
2. Apply **53.3 kPa {400 mmHg, 15.7 inHg}** vacuum with a vacuum pump and verify that it is held for at least **30 seconds**.
3. If the vacuum is not held, replace the oil seal.



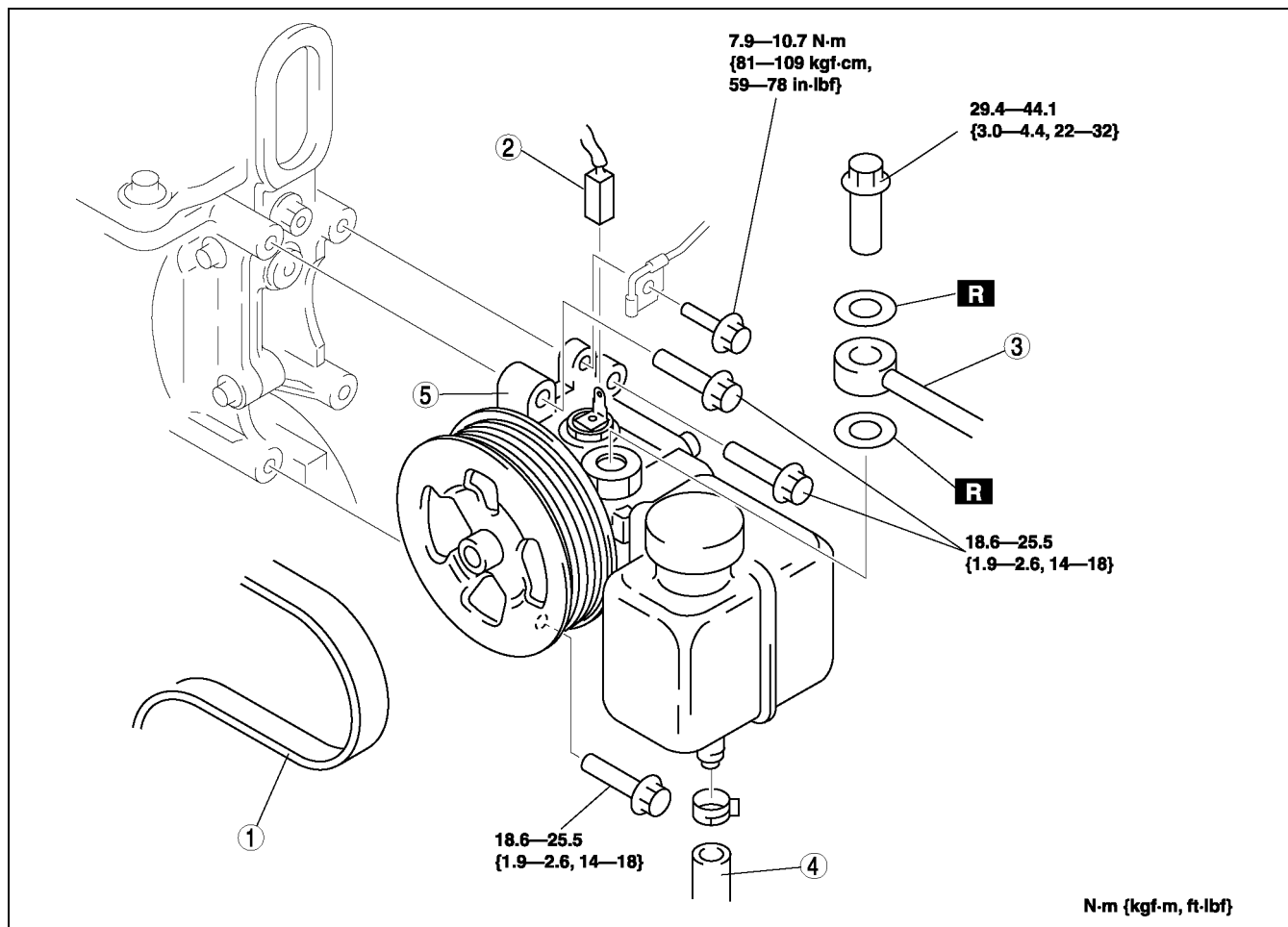
A6E0612W054

ENGINE SPEED SENSING POWER STEERING

POWER STEERING OIL PUMP REMOVAL/INSTALLATION

A6E661432650W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



A6E0612W092

1	Drive belt
2	Pressure switch connector
3	Pressure pipe

4	Suction hose
5	Power steering oil pump

POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY

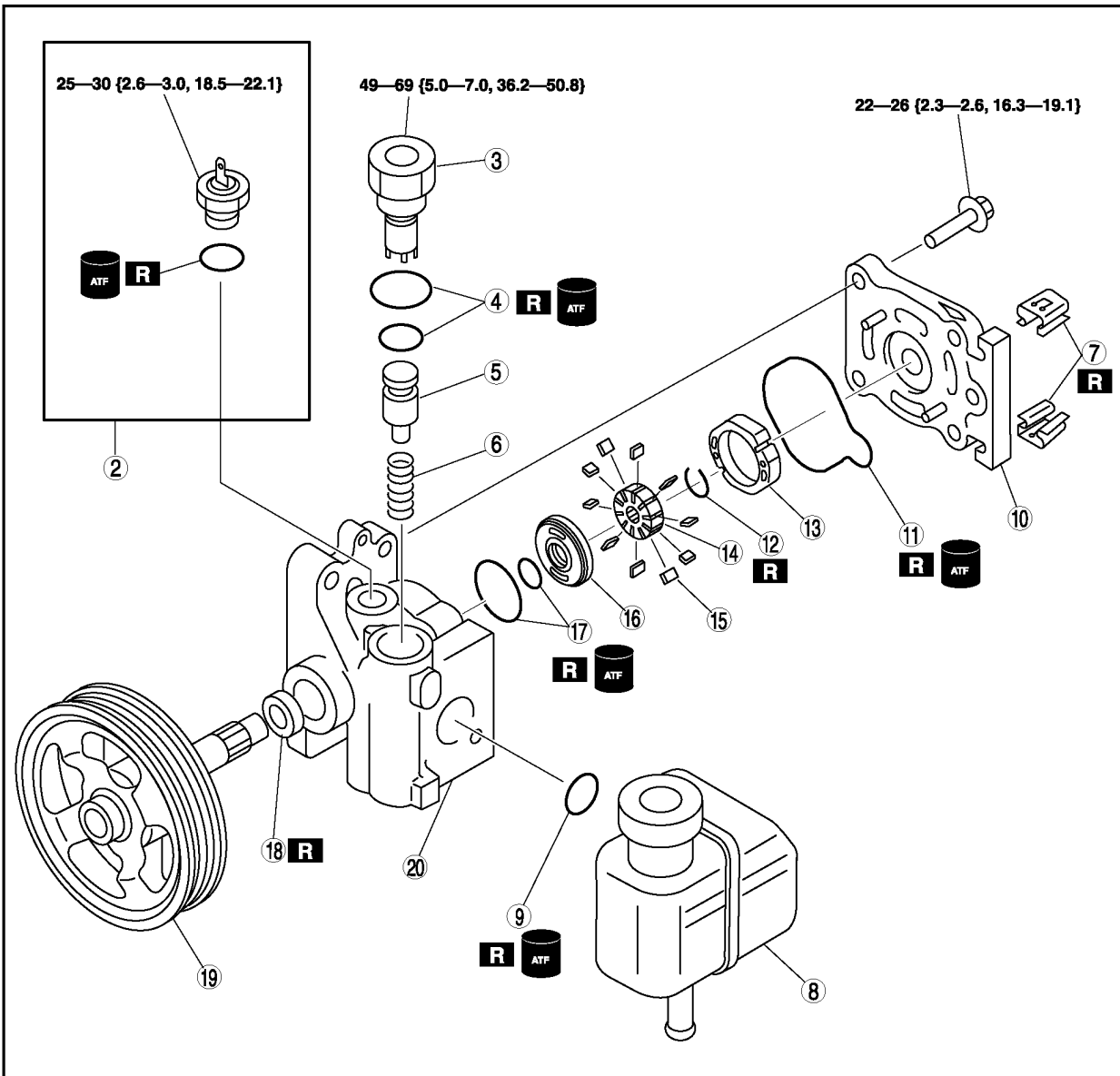
A6E661432650W02

Note

- The following procedure is for replacement of the O-ring and oil seal only. Replace the pump component if other repairs are necessary.

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

ENGINE SPEED SENSING POWER STEERING



N-m {kgf-m, ft-lbf}

A6E0612W068

1	Power steering oil pump component (See N-24 Power Steering Oil Pump Component Disassembly Note)
2	Pressure switch component
3	Connector
4	O-rings
5	Control valve
6	Spring
7	Clip (See N-24 Clip Disassembly Note) (See N-24 Clip Assembly Note)
8	Power steering reservoir tank
9	O-ring
10	Rear pump body (See N-25 Rear Pump Body Assembly Note)

11	O-ring
12	Clip
13	Cam ring (See N-25 Cam Ring Assembly Note)
14	Rotor
15	Vane (See N-25 Vane Assembly Note)
16	Side plate
17	O-ring
18	Oil seal (See N-25 Oil Seal Assembly Note)
19	Shaft component
20	Front pump body

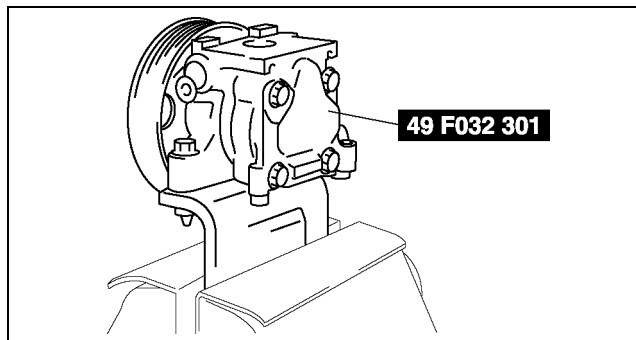
ENGINE SPEED SENSING POWER STEERING

Power Steering Oil Pump Component Disassembly Note

1. Secure the power pressure oil pump using the SST.

Caution

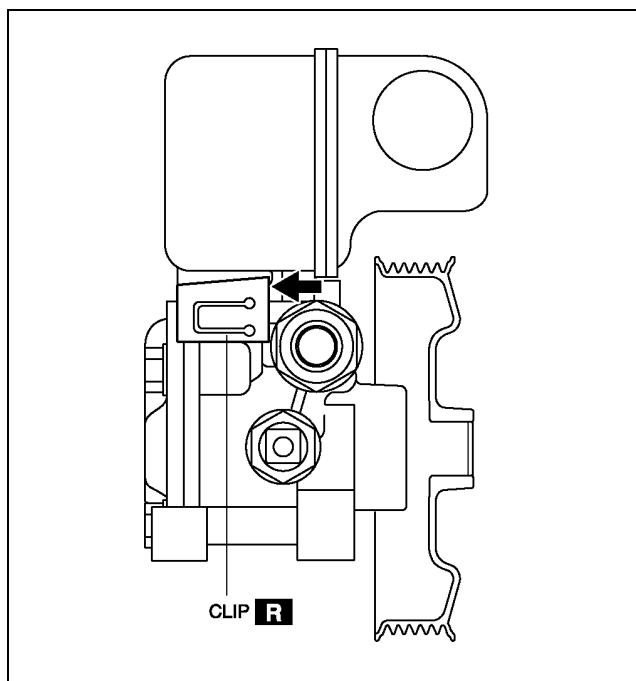
- Use the SST to prevent damage to the pump when securing it in a vise.



A6E0612W070

Clip Disassembly Note

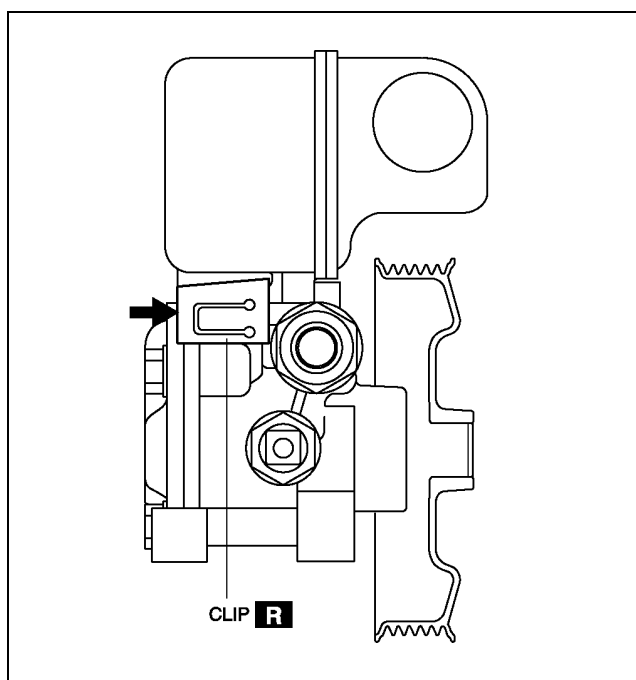
1. Lift up the clip tab using a flathead screwdriver.
2. Remove the clip pushing with a flathead screwdriver and a hammer as shown in the figure.



A6E0612W098

Clip Assembly Note

1. Push the clip slowly to the direction shown in the figure.
2. Confirm that the clip tab is caught correctly.

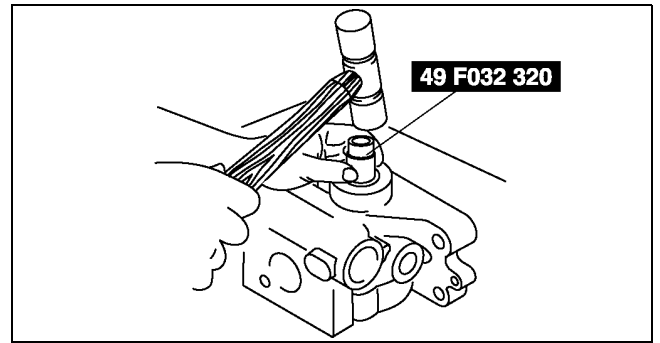


A6E0612W100

ENGINE SPEED SENSING POWER STEERING

Oil Seal Assembly Note

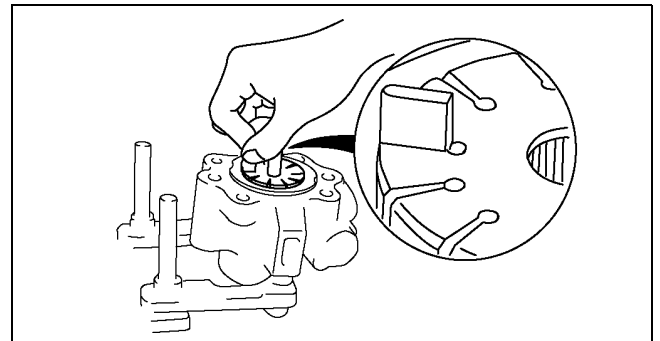
1. Install the oil seal in the front pump body using the **SST** and plastic hammer.



A6J6612W100

Vane Assembly Note

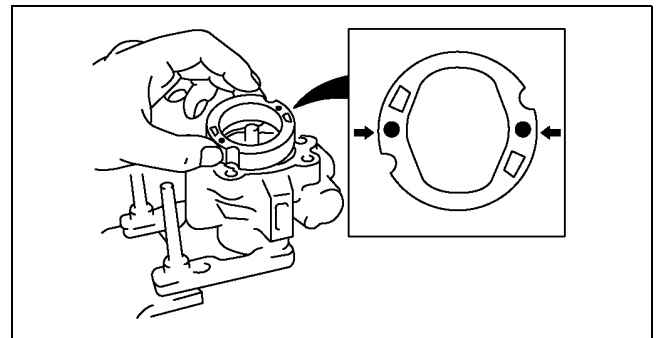
1. Place the vanes in the rotor with the rounded edges contacting the cam.



A6E6316W013

Cam Ring Assembly Note

1. Install the cam ring in the front pump body with the mark facing upward.



A6E6316W014

Rear Pump Body Assembly Note

1. After installing the rear body, manually turn the shaft to verify that it rotates smoothly.

N

BRAKING SYSTEM

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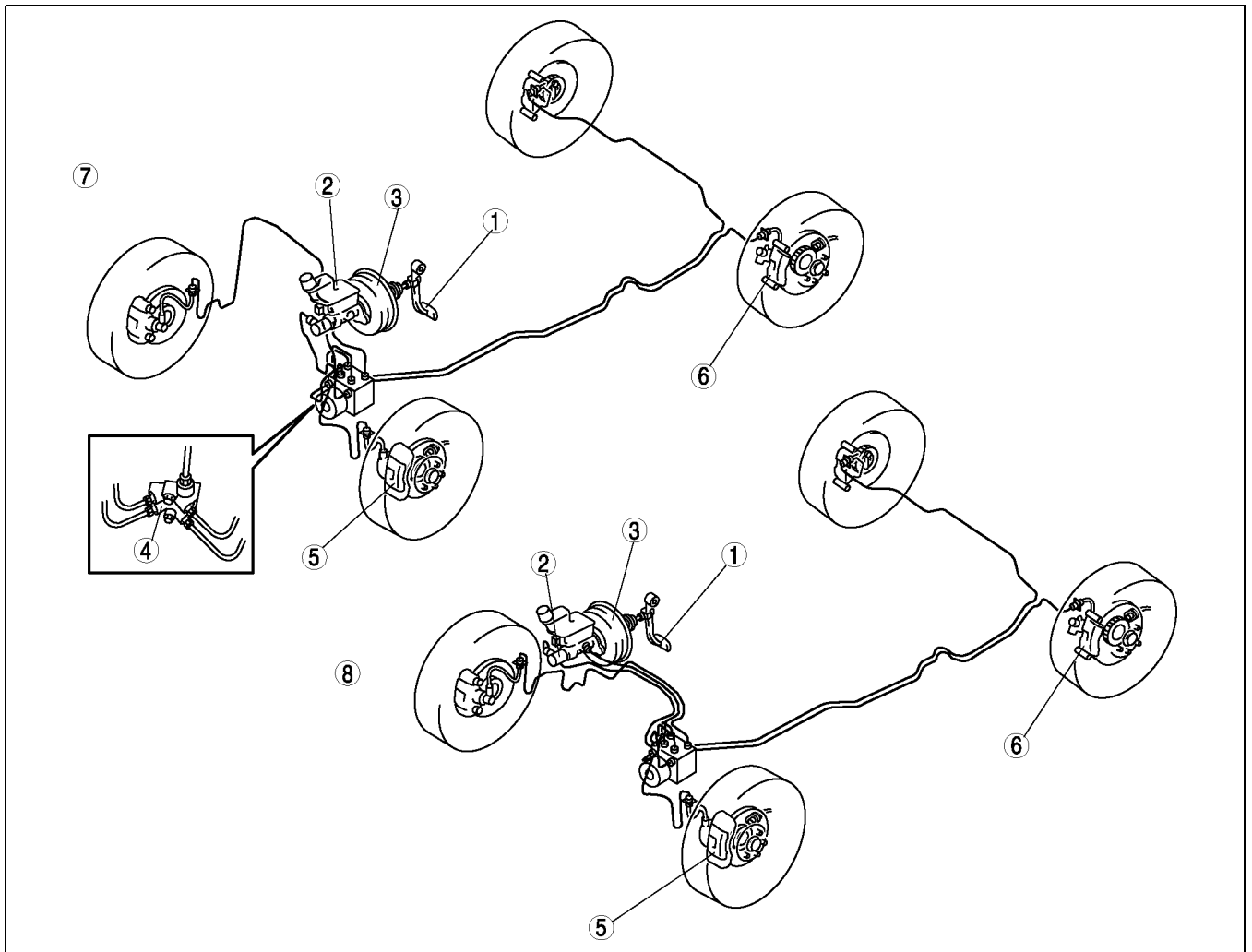
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A6E690001015W01



A6E6900W001

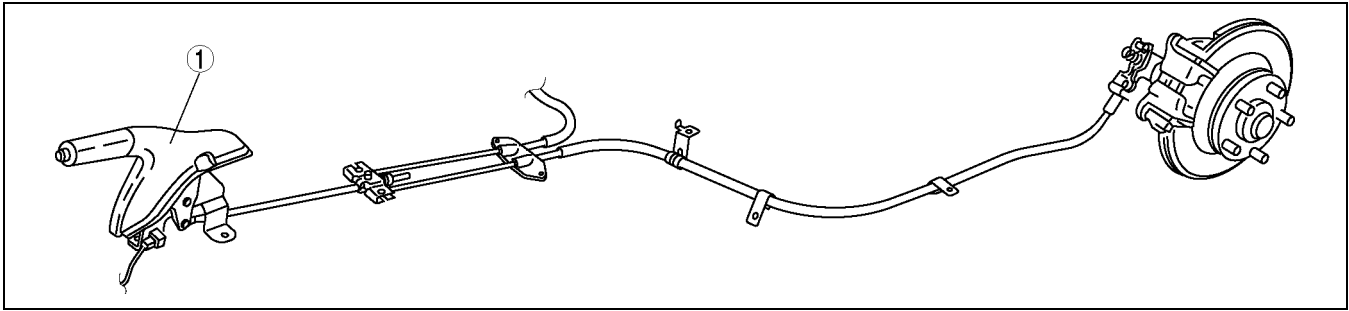
1	Brake pedal (SeeP-7 BRAKE PEDAL INSPECTION) (SeeP-9 BRAKE PEDAL REMOVAL/ INSTALLATION) (SeeP-8 BRAKE SWITCH INSPECTION)
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5	Front brake (disc) (SeeP-17 FRONT BRAKE (DISC) INSPECTION) (SeeP-20 FRONT BRAKE (DISC) REMOVAL/ INSTALLATION) (SeeP-22 CALIPER (FRONT) DISASSEMBLY/ ASSEMBLY)
6	Rear brake (disc) (SeeP-23 REAR BRAKE (DISC) INSPECTION) (SeeP-24 REAR BRAKE (DISC) REMOVAL/ INSTALLATION)
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A6E690001015W02

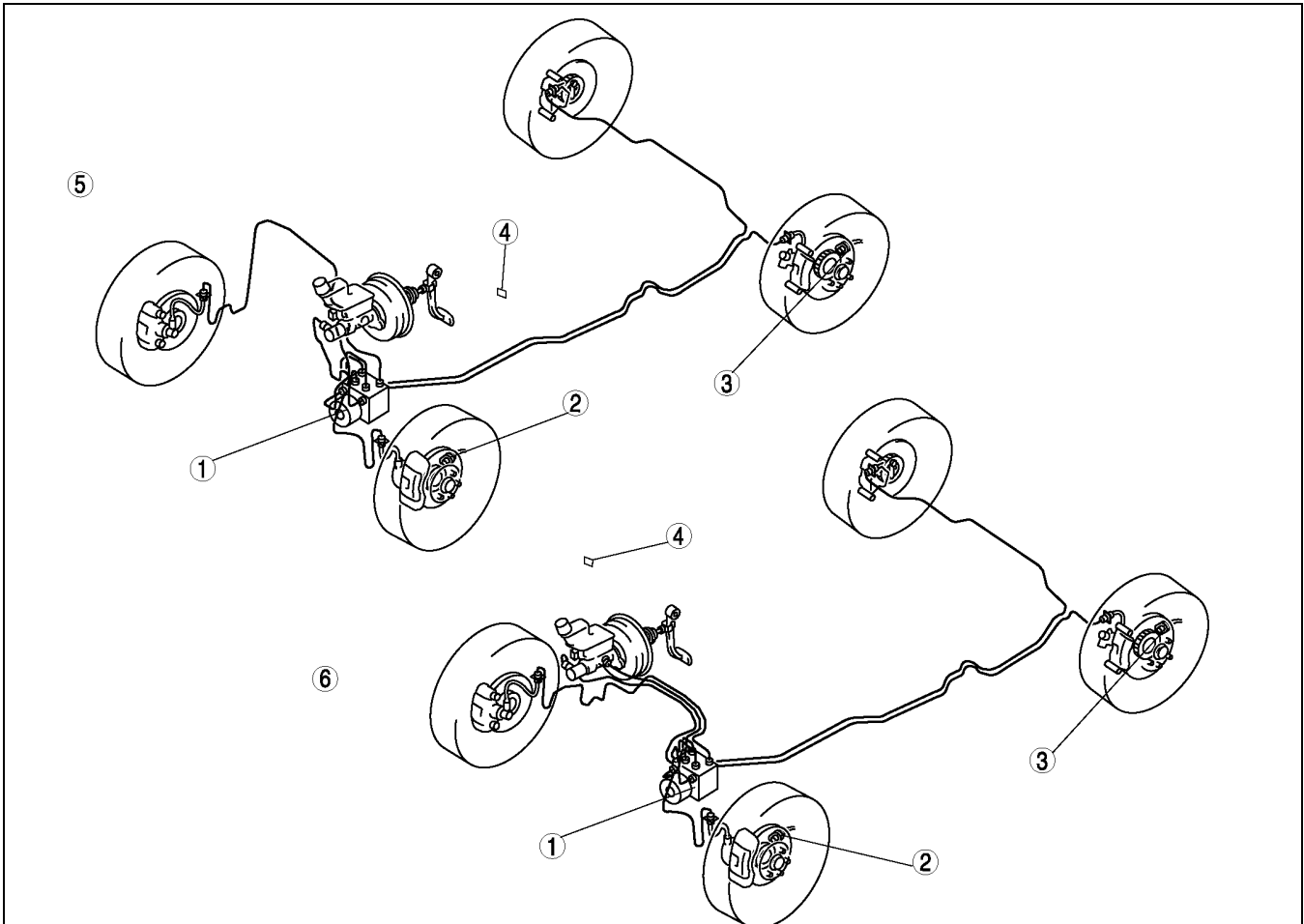


A6E6900W005

1	Parking brake lever (See P-26 PARKING BRAKE (LEVER TYPE) INSPECTION) (See P-26 PARKING BRAKE (LEVER TYPE) ADJUSTMENT) (See P-26 PARKING BRAKE (LEVER TYPE) REMOVAL/INSTALLATION)

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A6E690001015W03



A6E6900W003

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2	Front ABS wheel-speed sensor (See P-32 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION) (See P-33 FRONT/REAR ABS WHEEL-SPEED SENSOR INSPECTION)

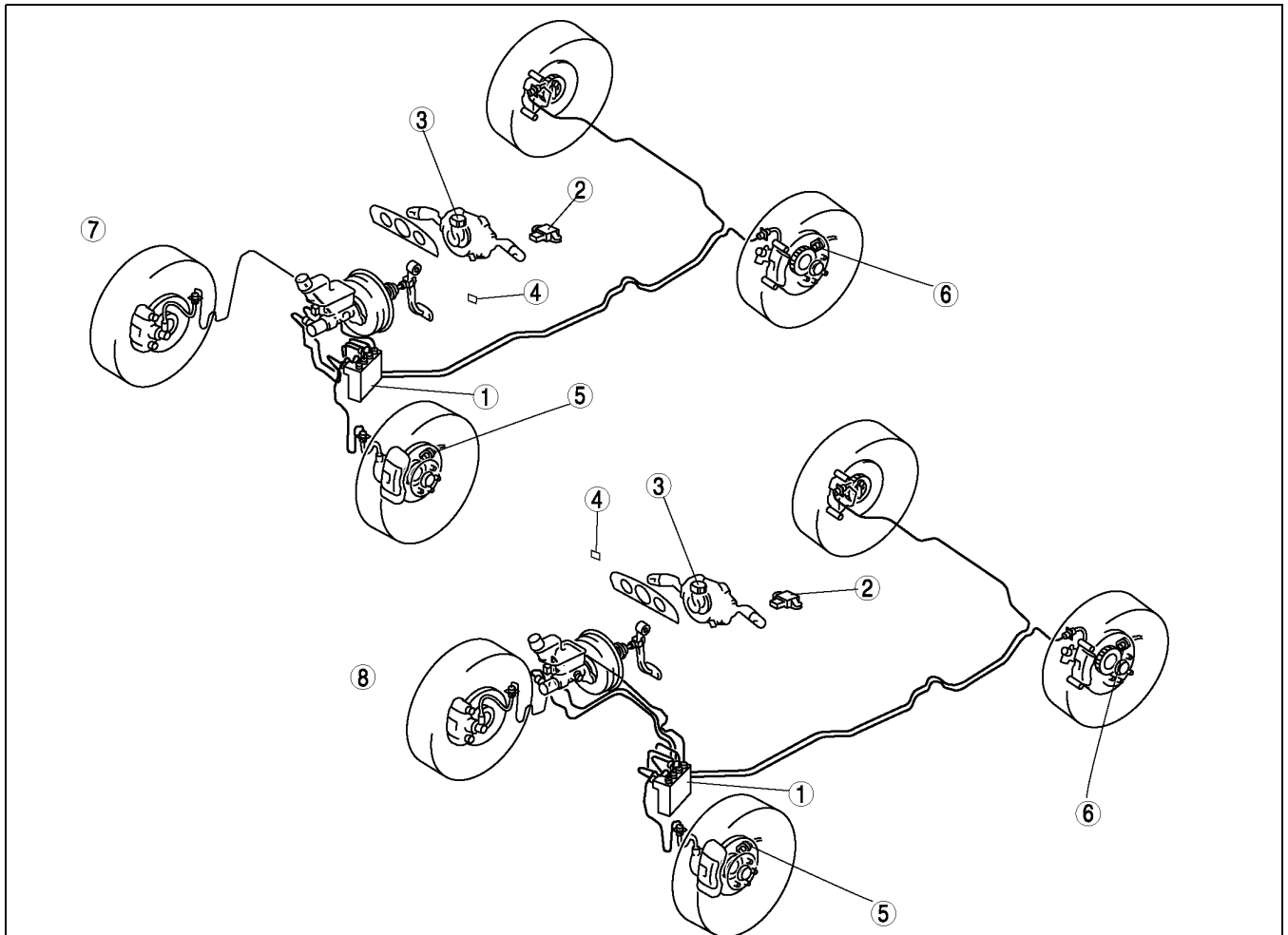
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3	Rear ABS wheel-speed sensor (SeeP-34 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION)
4	TCS OFF switch (SeeP-31 TCS (DSC) OFF SWITCH REMOVAL/INSTALLATION) (SeeP-32 TCS (DSC) OFF SWITCH INSPECTION)

5	L.H.D.
6	R.H.D.

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A6E690001015W04



A6E6900W004

1	DSC HU/CM (SeeP-40 DSC HU/CM INSPECTION) (SeeP-38 DSC HU/CM REMOVAL/INSTALLATION) (SeeP-40 DSC HU/CM INSPECTION)
2	Combine sensor (SeeP-42 COMBINE SENSOR REMOVAL/INSTALLATION) (SeeP-43 COMBINE SENSOR INSPECTION) (SeeP-44 COMBINE SENSOR INITIALIZATION PROCEDURE)
3	Steering angle sensor (SeeP-44 STEERING ANGLE SENSOR REMOVAL/INSTALLATION) (SeeP-44 STEERING ANGLE SENSOR INSPECTION)

4	DSC OFF switch (SeeP-31 TCS (DSC) OFF SWITCH REMOVAL/INSTALLATION) (SeeP-32 TCS (DSC) OFF SWITCH INSPECTION)
5	Front wheel-speed sensor (SeeP-32 FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION) (SeeP-33 FRONT/REAR ABS WHEEL-SPEED SENSOR INSPECTION)
6	Rear wheel-speed sensor (SeeP-34 REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION)
7	L.H.D.
8	R.H.D.

GENERAL PROCEDURES, CONVENTIONAL BRAKE SYSTEM

GENERAL PROCEDURES

PRECAUTION (BRAKES)

A6E691001020W01

Wheels and Tires Removal/Installation

1. The removal and installation procedures for the wheels and tires are not mentioned in this section. When a wheel is removed, tighten it to **88—118 N·m {9.0—12.0 kgf·m, 65.0—87.0 ft·lbf}**.

Brake Lines Disconnection/Connection

Caution

- **Brake fluid will damage painted surfaces. If brake fluid does get on a painted surface, wipe it off immediately.**

1. Tighten the brake pipe flare nut using the **SST** (49 0259 770B). Be sure to modify the brake pipe flare nut tightening torque to allow for use of a torque wrench-**SST** combination.
 - If any brake line has been disconnected anytime during the procedure, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

Connectors Disconnection

1. Disconnect the negative battery cable before doing any work that requires handling of connectors. Reconnect the negative battery cable only after the work is completed.

ABS, ABS/TCS, or DSC Components Operations

1. Make sure that there are no DTCs in the ABS, ABS/TCS, or DSC memory after working on ABS, ABS/TCS or DSC components.
 - If there are any DTCs in the memory, clear them.

CONVENTIONAL BRAKE SYSTEM

AIR BLEEDING

A6E691243001W01

Caution

- **Maintain the fluid level in the reservoir tank properly while bleeding the air.**

Specified fluid

European (L.H.D. U.K.) specs.	SAE J1703, FMVSS 116 DOT3 OR DOT4
GCC specs.	SAE J1703, FMVSS 116 DOT3

Note

- The brakes should be bled whenever a brake line is disconnected. If a hydraulic line is disconnected at the master cylinder, start at the slave cylinder farthest from the brake master cylinder, and move to the next farthest slave cylinder until all four cylinders have been bled. If the disconnection point is anywhere except the master cylinder, start at the point closest to the disconnection, and move to the next closest slave cylinder until all four cylinders have been bled.

1. Remove the bleeder cap and attach a vinyl tube to the bleeder screw.
2. Place the other end of the vinyl tube in a clear, fluid-filled container.
3. One person should depress the brake pedal a few times, and then hold it in the depressed position.

CONVENTIONAL BRAKE SYSTEM

- A second person should loosen the bleeder screw, drain out the fluid and close the screw using the SST.

Tightening torque

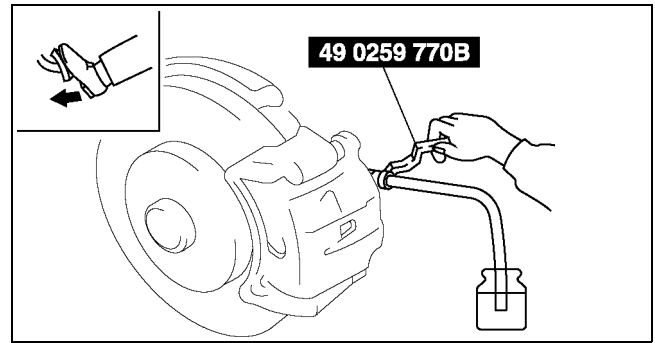
Front: 6.9—9.8 N·m

{71—99 kgf·cm, 62—86 in·lbf}

Rear: 5.9—8.8 N·m

{61—89 kgf·cm, 53—77 in·lbf}

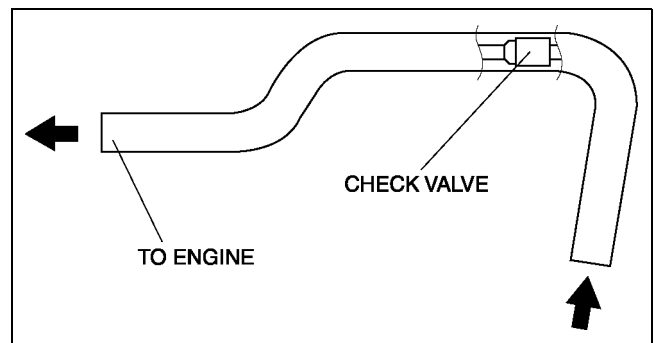
- Repeat steps 3 and 4 until no air bubbles are seen.
- Bleed air from each component by following the procedure above.
- After air bleeding, check the following:
 - Brake operation
 - fluid leakage
 - fluid level



A6E6912W001

VACUUM HOSE CHECK VALVE INSPECTION (POWER BRAKE UNIT)

- Remove the clamps and vacuum hose.
- Apply both suction and pressure to the engine-side hose, and verify that air blows only toward that side.
 - If air flows in both directions or not at all, replace the vacuum hose.



A6E6912W002

BRAKE PEDAL INSPECTION

Brake Pedal Height Inspection

- Verify that the distance from the carpet to the center of the upper surface of the pedal pad is as specified.

Pedal height (reference value)

R.H.D.	172 mm {6.77 in}
L.H.D.	187 mm {7.36 in}

Brake Pedal Height Adjustment

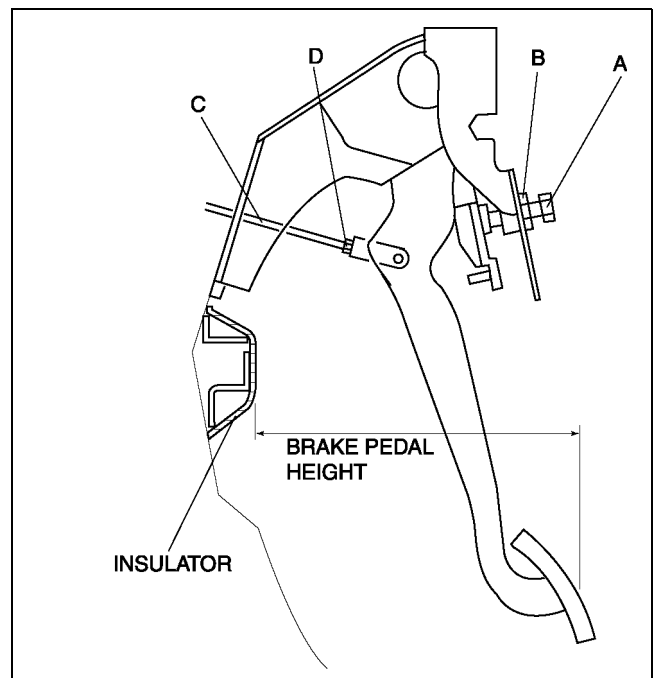
- Loosen locknut B and turn the bolt A until it does not contact the pedal.
- Loosen locknut D and turn rod C to adjust the height.
- Tighten the bolt with locknut B.

Tightening torque

9.8—14.7 N·m

{100—149 kgf·cm, 116—130 in·lbf}

- After adjustment, inspect the pedal play and the brake light operation.



A6E6912W017

CONVENTIONAL BRAKE SYSTEM

Brake Pedal Play Inspection

1. Depress the pedal a few times to eliminate the vacuum in the system.
2. Remove the spring pin, verify that the holes in the fork and in the pedal are aligned, and reinstall the pin. (See [P-9 BRAKE PEDAL REMOVAL/INSTALLATION](#).)
3. Gently depress the pedal by hand until resistance is felt, and check the pedal play.

Pedal play

0—3 mm {0—0.1 in}

Brake Pedal Play Adjustment

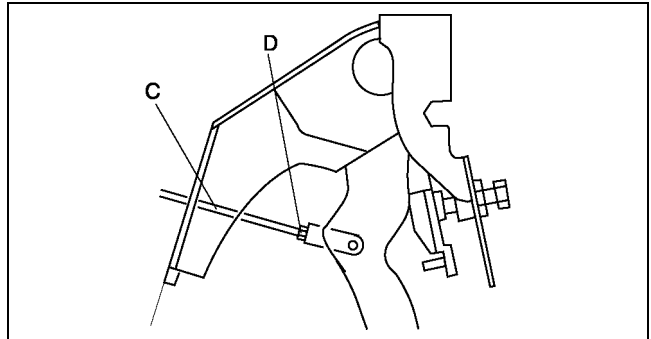
1. Remove the spring pin and clevis pin. (See [P-9 BRAKE PEDAL REMOVAL/INSTALLATION](#).)
2. Loosen locknut D and turn rod C to align the holes in the fork and in the pedal.
3. Install the clevis pin and the spring pin.
4. Tighten locknut D.

Tightening torque

15.7—21.6 N·m

{1.61—2.20 kgf·m, 11.6—15.9 ft·lbf}

5. Check the pedal height and the brake light operation.



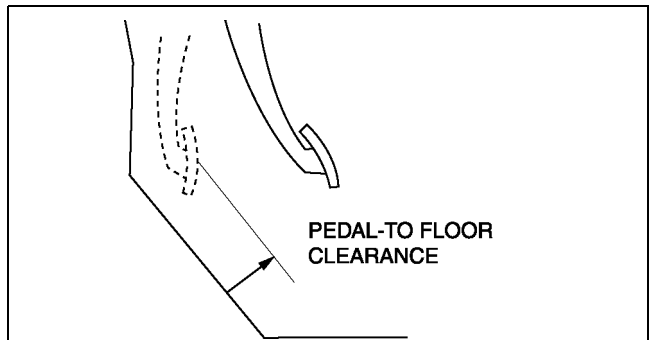
A6E6912W027

Pedal-to-floor Clearance Inspection

1. Start the engine and depress the brake pedal with a force of 588 N {60 kgf, 132 lbf}
2. Verify that the distance from the floor panel to the pedal pad center is as specified when the pedal is depressed.
 - If the distance is less than specified, check for the air in brake system.

Specification

68 mm {2.7 in} min.



A6E6912W003

BRAKE SWITCH INSPECTION

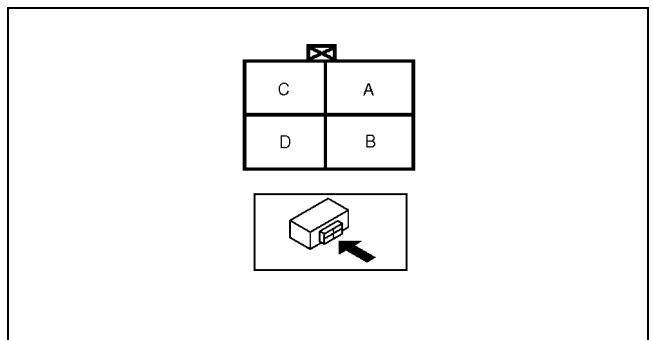
1. Disconnect the negative battery cable.
2. Disconnect the brake switch connector harness.
3. Inspect for continuity between the brake switch connector terminals.
 - If not as specified, replace the brake switch.

A6E691266490W01

○—○ : Continuity

Condition	Terminal			
	A	B	C	D
When the brake pedal is depressed		○—○		○—○
When the brake pedal is not depressed (Vehicle with auto cruise)	○—○		○—○	

A6E6912W033



A6E6912W034

CONVENTIONAL BRAKE SYSTEM

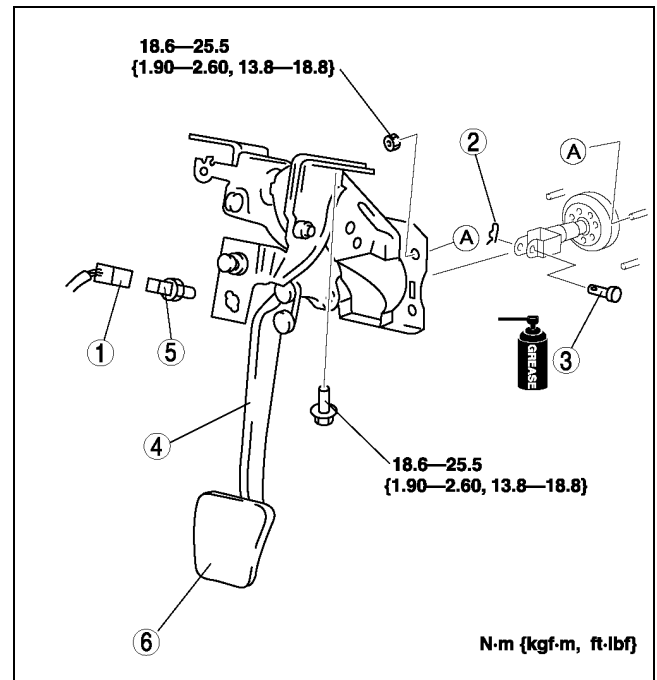
BRAKE PEDAL REMOVAL/INSTALLATION

A6E691243300W02

1. For ATX model, remove the lock unit with brake switch (R.H.D. only).
2. Remove in the order indicated in the table.

1	Brake switch connector
2	Spring pin
3	Clevis pin
4	Brake pedal
5	Brake switch (See P-9 Brake switch Installation Note)
6	Pedal pad

3. Install in the reverse order of removal.



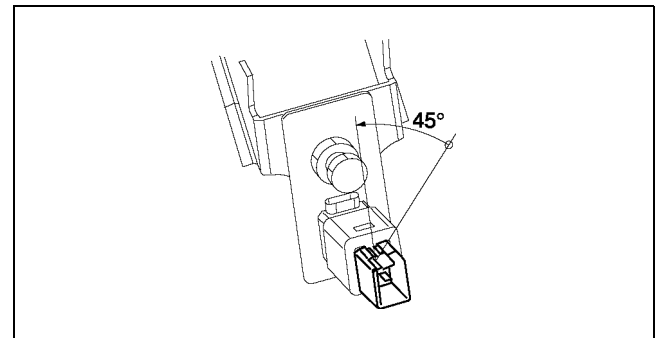
A6E6912W020

Brake switch Installation Note

1. Fix the brake switch on a bracket with pressing down at **50 N {5.1 kgf·m, 37 ft·lbf}**.
2. Rotate the brake switch **45°** counterclockwise.
3. Verify that the brake switch is locked securely.

Note

- Stopper bolt and pedal stopper clearance adjustment dose not need after the brake switch is locked securely.



A6E6912W051

P

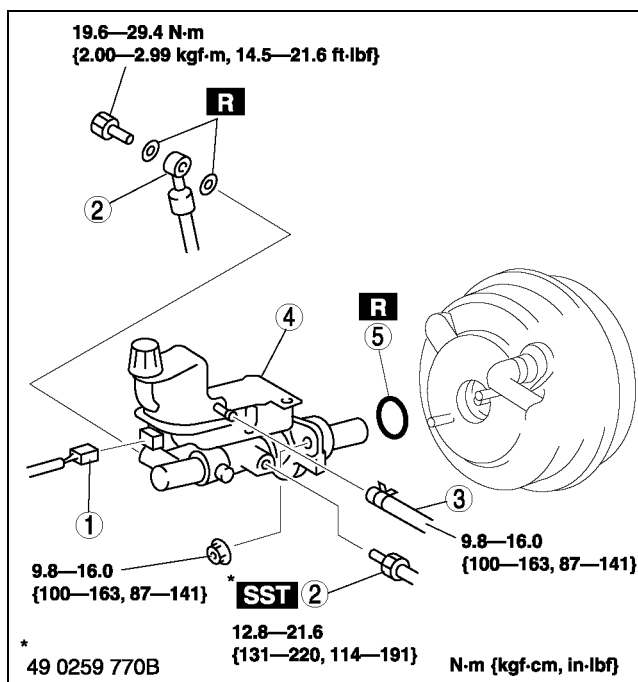
CONVENTIONAL BRAKE SYSTEM

MASTER CYLINDER REMOVAL/INSTALLATION

A6E691243400W01

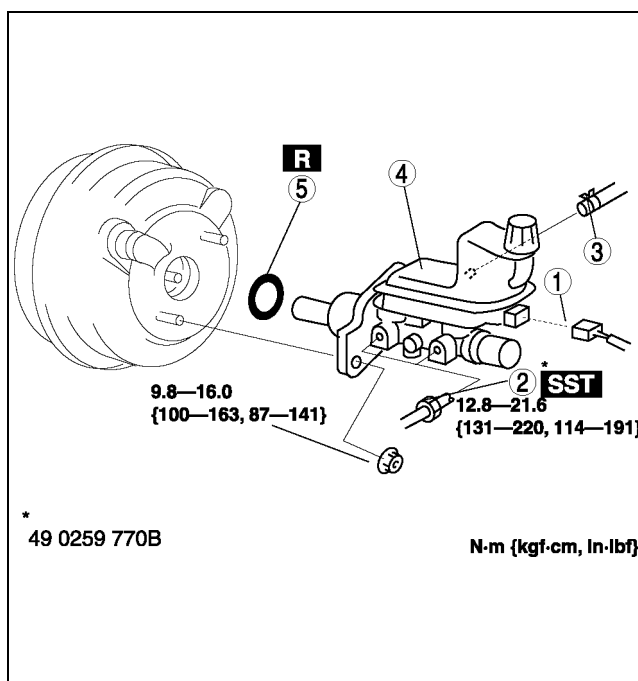
1. Remove in the order indicated in the table.

R.H.D.



A6E6912W028

L.H.D.



A6E6912W018

1	Brake fluid level sensor connector
2	Brake pipe
3	Hose (MTX)
4	Master cylinder (See P-11 Master Cylinder Installation Note)
5	O-ring

2. Install in the reverse order of removal.

CONVENTIONAL BRAKE SYSTEM

Master Cylinder Installation Note

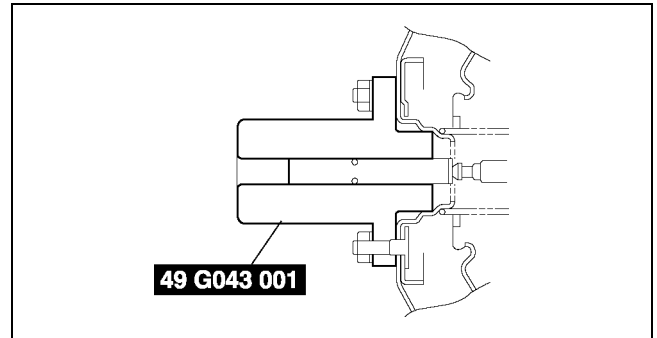
Caution

- Always install the gasket of the power brake unit push rod before performing measurement inspections or adjustments.

1. Install the **SST** to the power brake unit as shown, and tighten within the specified torque.

Tightening torque

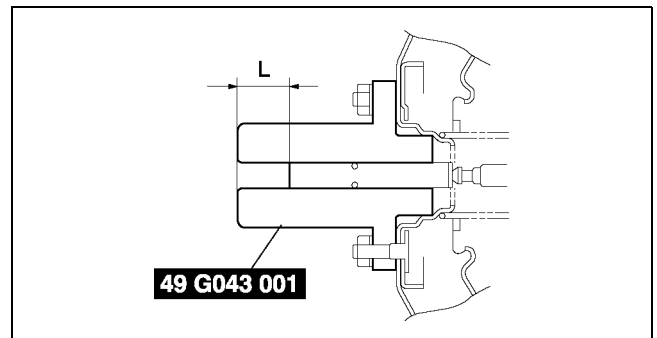
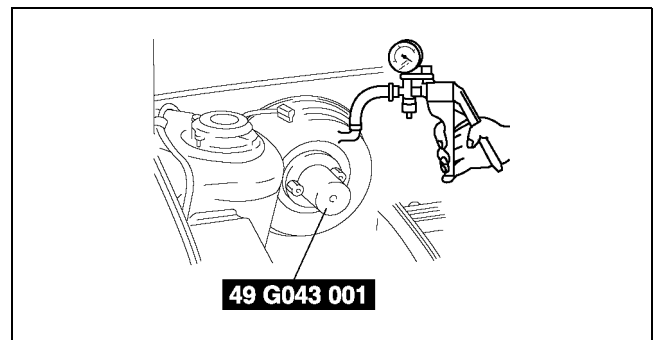
9.8—16.0 N·m {100—163 kgf·cm, 87—141 in·lbf}



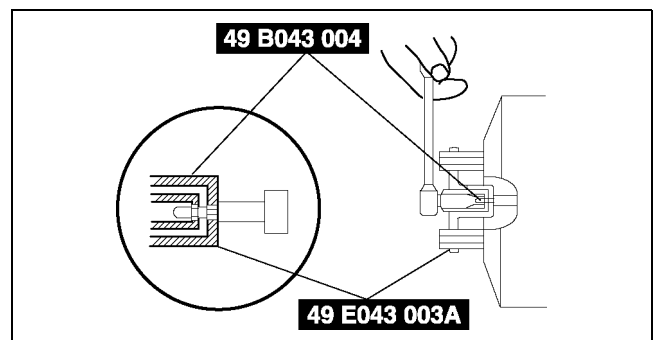
2. Using a vacuum gauge, create a vacuum pressure of **66.7 kPa {500 mmHg, 19.7 inHg}** in the power brake unit.
3. Using calipers, measure dimension L as shown.

Specification

22.7 mm{8.94 in}



4. If dimension L is not within the specification as shown, remove **SST** (49 E043 001) and use **SST** (49 B043 004) to adjust the length of the push rod while using **SST** (E043 003A) to keep the push rod from rotating.
5. Remove the **SSTs**, replace **SST** (49 E043 001) and measure dimension L again.

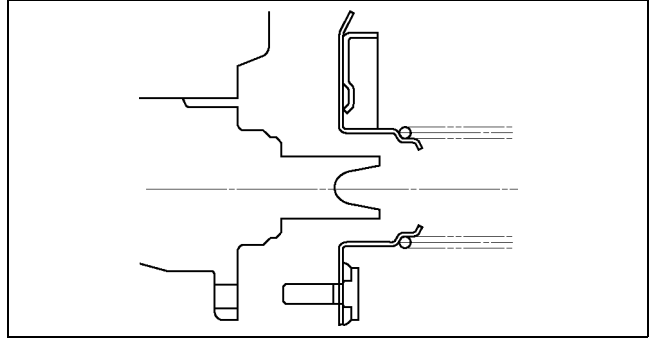


CONVENTIONAL BRAKE SYSTEM

6. Install the master cylinder to the power brake unit.

Caution

- If after installing the master cylinder, air does not bleed properly from the brake lines even after performing air bleeding, brake drag occurs or other characteristics are present, it is possible that the master cylinder piston is jammed against the power brake unit. If air cannot be bled properly, brake drag exists or other malfunctions occur, remove the master cylinder and reinstall properly.



A6E6912W032

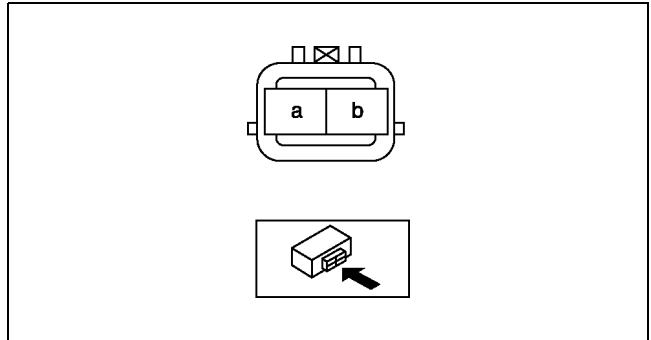
FLUID LEVEL SENSOR INSPECTION

A6E691243540W01

1. Disconnect the negative battery cable.
2. Disconnect the sensor connector.
3. Inspect for continuity between terminals of fluid level sensor.
 - If not as specified, replace the fluid level sensor.

	○—○ : Continuity	
Fluid level	A	B
Above MIN		
Below MIN	○—○	○—○

A6E6912W024



A6E6912W023

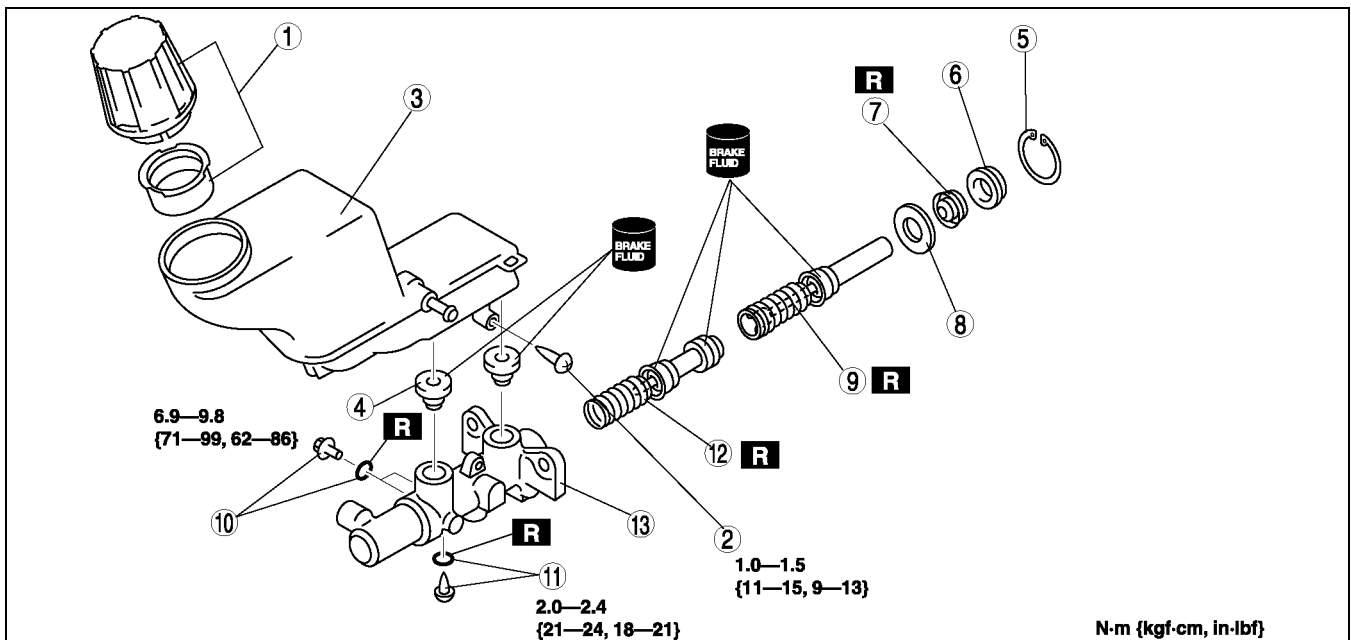
MASTER CYLINDER DISASSEMBLY/ASSEMBLY

A6E691243400W02

Caution

- If the master cylinder body is damaged, replace the unit as a component. When securing the master cylinder in a vise, tighten only the flange of the master cylinder.

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



N·m {kgf·cm, in·lbf}

A6E6912W019

1	Cap set

2	Screw

CONVENTIONAL BRAKE SYSTEM

3	Reservoir
4	Joint bushing
5	Snap ring
6	Piston guide
7	Cup
8	Stopper
9	Primary piston

10	Stop pin and O-ring (with ABS) (See P-13 Stop Pin and O-ring (with ABS) Assembly Note)
11	Stop screw and O-ring (without ABS) (See P-13 Stop Screw and O-ring (without ABS) Assembly Note)
12	Secondary piston
13	Master cylinder body

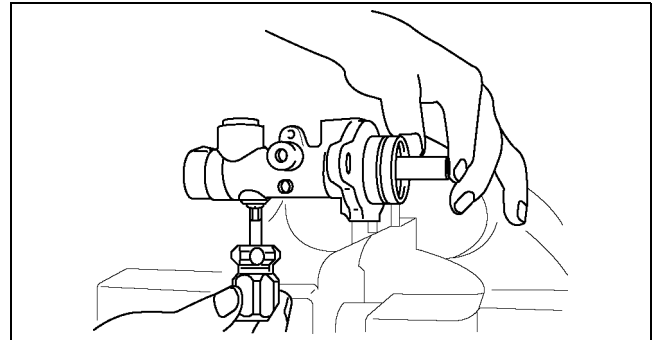
Stop Screw and O-ring (without ABS) Assembly Note

1. Install the secondary piston and primary piston.
2. Install the new O-ring onto the stop screw.
3. Push the primary piston assembly in full.
4. Install and tighten the stop screw.

Tightening torque

2.0—2.4 N·m {21—24 kgf·cm, 18—21 in·lbf}

5. Push and release the secondary piston component to verify that it is held properly by the stop screw.



A6E6912W025

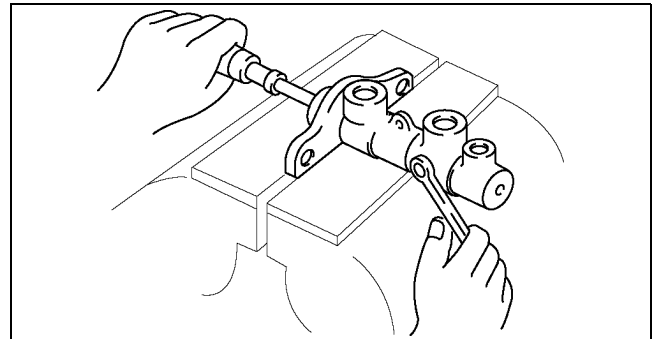
Stop Pin and O-ring (with ABS) Assembly Note

1. Install the secondary piston with the piston hole facing the stop pin and primary piston.
2. Install the new O-ring onto the stop pin.
3. Push the primary piston assembly in full.
4. Install and tighten the stop pin.

Tightening torque

6.9—9.8 N·m {71—99 kgf·cm, 62—86 in·lbf}

5. Push and release the secondary piston component to verify that it is held properly by the stop pin.



A6E6912W043

CONVENTIONAL BRAKE SYSTEM

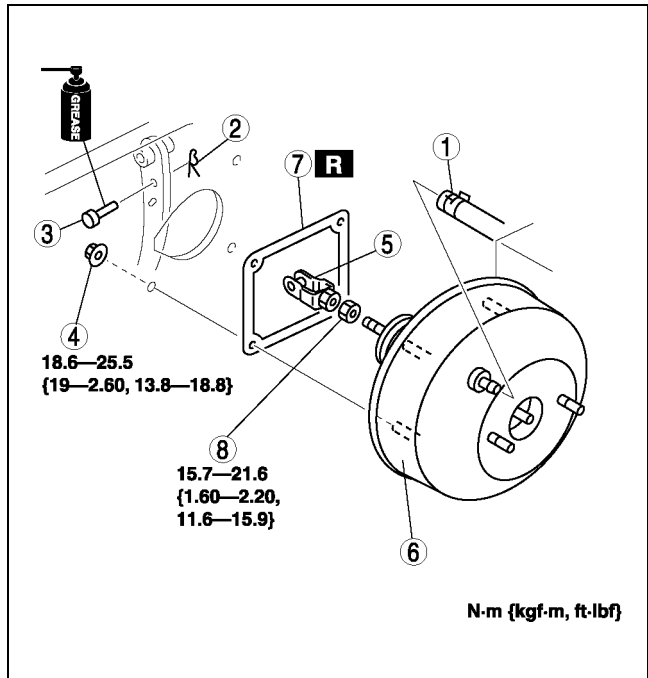
POWER BRAKE UNIT REMOVAL/INSTALLATION

A6E691243800W02

1. Remove the master cylinder. (See [P-10 MASTER CYLINDER REMOVAL/INSTALLATION.](#))
2. Remove the wiper arm. (See [T-57 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.](#))
3. Remove the cowl grille. (See [S-50 COWL GRILLE REMOVAL/INSTALLATION.](#))
4. Remove the wiper motor. (See [T-56 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION.](#))
5. Remove the cowl panel. (See [S-119 COWL PANEL REMOVAL/INSTALLATION.](#))
6. For L.H.D., remove the A/C bracket.
7. For L.H.D., remove the ABS/TCS HU/CM or DSC HU/CM . (See [P-28 ABS \(ABS/TCS\) HU/CM REMOVAL/INSTALLATION.](#)) (See [P-38 DSC HU/CM REMOVAL/INSTALLATION.](#))
8. For R.H.D., remove the alternator cover.
9. For R.H.D., remove the insulator.
10. For R.H.D., remove the vacuum pipe bracket.
11. Remove in the order indicated in the table.

1	Vacuum hose
2	Snap pin
3	Clevis pin
4	Nut
5	Fork
6	Power brake unit
7	Gasket
8	Nut

12. Install in the reverse order of removal.



A6E6912W044

POWER BRAKE UNIT INSPECTION

A6E691243800W01

Warning

- The following inspection methods are the simple inspection methods to judge the function of power brake.
- If there is malfunction in power brake unit, replace the power brake unit as a component.

Power Brake Unit Function Check (Simple Method)

Step 1

1. With the engine stopped, depress the pedal a few times.
2. With the pedal depressed, start the engine.
3. If the pedal moves down slightly immediately after the engine starts, the unit is operating.

Step 2

1. Start the engine.
2. Stop the engine after it has run for **1 or 2 minutes**.
3. Depress the pedal with the usual force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is operating.
 - If a problem is found, inspect for damage of the vacuum hose, and vacuum tank. Repair if necessary, and inspect it again.

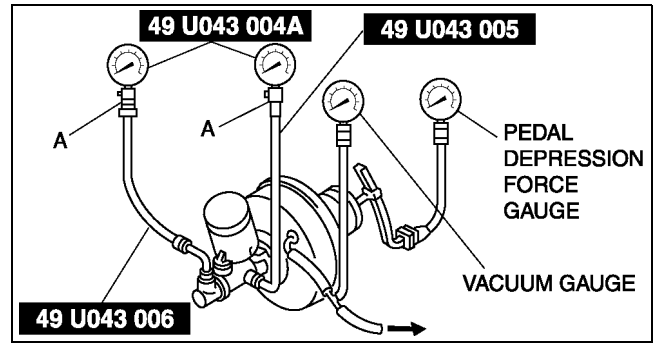
Step 3

1. Start the engine.
2. Depress the pedal with usual force.
3. If the pedal height does not change, the unit is operating.
4. Hold the pedal down for **about 30 seconds**.
5. If the pedal height does not change, the unit is operating.

CONVENTIONAL BRAKE SYSTEM

Power Brake Unit Function Check (Inspection Using The Testers)

1. Connect the **SSTs**, vacuum gauge, and pedal depression force gauge as shown in the figure to bleed the air from **SSTs** and brake line. (Bleed the air from **SSTs** using a air bleed valve A.)



A6E6912W005

Checking for vacuum loss (unloaded condition)

1. Stop the engine when the vacuum gauge reading reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
2. Observe the vacuum gauge for **15 seconds**.
 - If the gauge shows **63.3—66.7 kPa {475—500 mmHg, 18.7—19.6 inHg}**, the unit is operating.
 - If not, inspect for damage on the check valve or vacuum hose, and examine the installation. Repair as necessary, and inspect it again.

Checking for vacuum loss (loaded condition)

1. Start the engine.
2. Depress the brake pedal with a force of **196 N {20 kgf, 44 lbf}**.
3. Stop the engine when the vacuum gauge reading reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
4. Observe the vacuum gauge for **15 seconds**.
5. If the gauge shows **63.3—66.7 kPa {475—500 mmHg, 18.7—19.6 inHg}**, the unit is operating.

Checking for hydraulic pressure

1. When the engine is stopped (vacuum **0 kPa {0 mmHg, 0 inHg}**) and the fluid pressure is within the specification, the unit is operating.

Pedal force	Fluid pressure
200 N {20 kgf, 44 lbf}	588 kPa {5.95 kgf/cm ² , 84.7 psi} min.

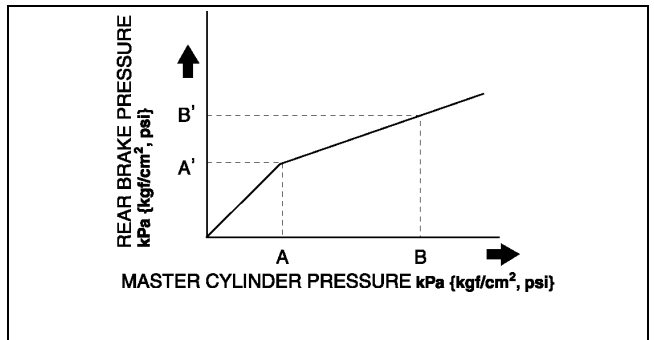
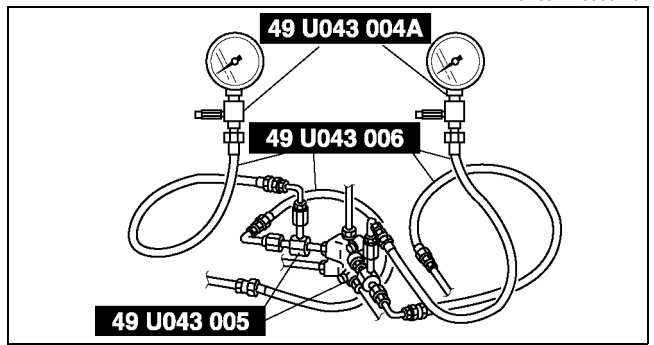
2. Start the engine. Depress the brake pedal when the vacuum reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
 - If the fluid pressure is within the specification, the unit is operating.
 - If the fluid pressure is not as specified, inspect for damage to the check valve or vacuum hose, and fluid leakage of the hydraulic line. Repair as necessary, and inspect again.

Pedal force	Fluid pressure
200 N {20 kgf, 44 lbf}	8,787 kPa {89.60 kgf/cm ² , 1,274 psi} min.

CONVENTIONAL BRAKE SYSTEM

DUAL PROPORTIONING VALVE INSPECTION (WITHOUT ABS)

1. Connect the **SSTs** to the brake pipes as shown in the figure.
2. Bleed the air from the brake system.
3. Measure the fluid pressure of the master cylinder and the rear brake.
 - If not within the specification, replace the dual proportioning valve.



Fluid pressure

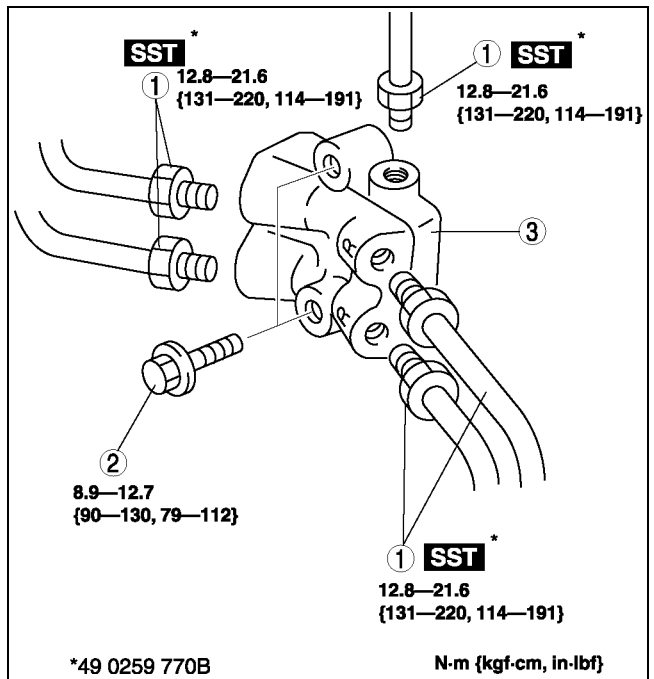
kPa {kgf/cm ² , psi}			
A	A'	B	B'
2,450 {25, 355}	2,450 {25, 355} ± 200 {2, 29}	5,880 {60, 853}	3,480 {35.5, 505} ± 300 {3, 44}

DUAL PROPORTIONING VALVE REPLACEMENT (WITHOUT ABS)

1. Remove in the order indicated in the table.

1	Brake pipe
2	Bolt
3	Dual proportioning valve (See P-17 Dual Proportioning Valve Installation Note)

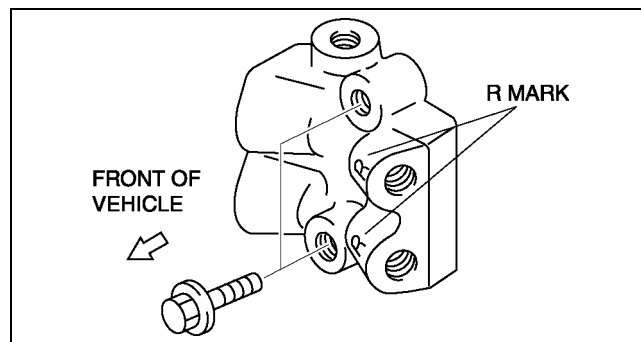
2. Install in the reverse order of removal.



CONVENTIONAL BRAKE SYSTEM

Dual Proportioning Valve Installation Note

1. Install the dual proportioning valve so that the R mark faces the left side of the vehicle.



A6E6912W045

FRONT BRAKE (DISC) INSPECTION

Brake Judder Repair Hint

Description

1. Brake judder concern has the following 3 characteristics:

Steering wheel vibration

1. Steering wheel vibrates in the direction of its rotation. This characteristic is most noticeable when applying brakes at a vehicle speed of **100—140 km/h {62.1—86.8 mph}**.

Floor vibration

1. When applying brakes, the vehicle body shakes back and forth. The seriousness of shake is not influenced by vehicle speed.

Brake pedal vibration

1. When applying brakes, a pulsating force tries to push the brake pad back occurs. The pulsation is transmitted to the brake pedal.
2. The following are the main possible causes of brake judder:

Due to an excessive runout (side-to-side wobble) of disc plate, the thickness of disc plate is uneven.

1. If the runout is **more than 0.05 mm {0.002 in} to 10 mm {0.39 in}** from the disc plate edge, an uneven wear occurs on the disc plate because the pad contacts the plate unevenly.
2. If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

The disc plate is deformed by heat.

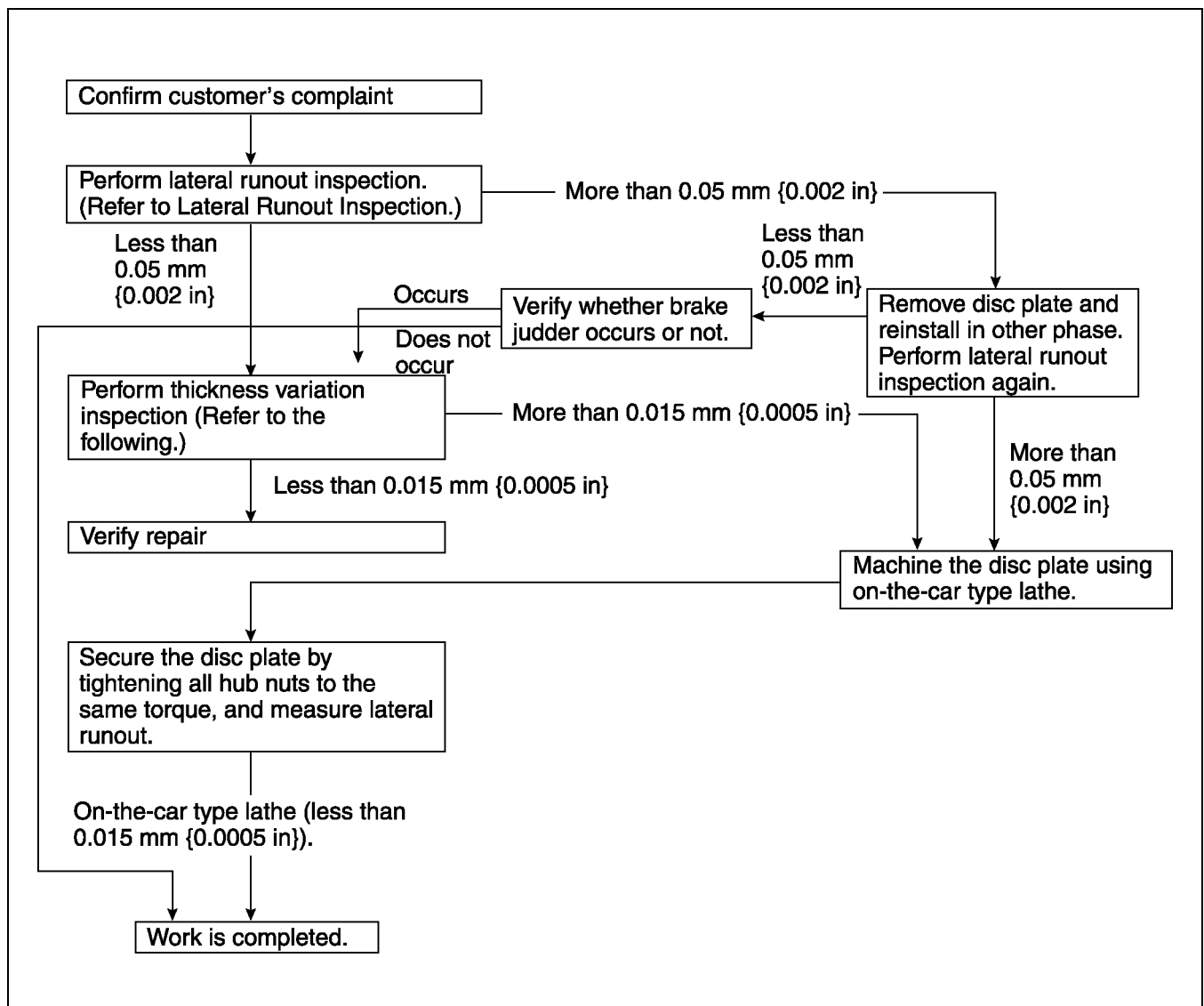
1. Repeated panic braking may raise the temperature in some portions of disc plate by **approximately 1,000 °C {1,832 °F}**. This results in deformed disc plate.

Due to corrosion, the thickness and friction coefficient of disc plate change.

1. If a vehicle is parked under damp conditions for a long time, corrosion occurs on the friction surface of disc plate.
2. The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

CONVENTIONAL BRAKE SYSTEM

Inspection and repair procedure



A6E6912W008

Lateral runout inspection

1. To secure the disc plate and the hub, tighten the hub nuts upside down or insert a washer (thickness **10 mm {0.39 in}**, inner diameter **more than 12 mm {0.47 in}**) between the hub bolt and the hub nut.

Note

- The component parts of the **SST** (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of disc plate **10 mm {0.39 in}** from the disc plate edge.
3. Rotate the disc plate one time and measure the runout.

Runout limit

0.05 mm {0.002 in}

CONVENTIONAL BRAKE SYSTEM

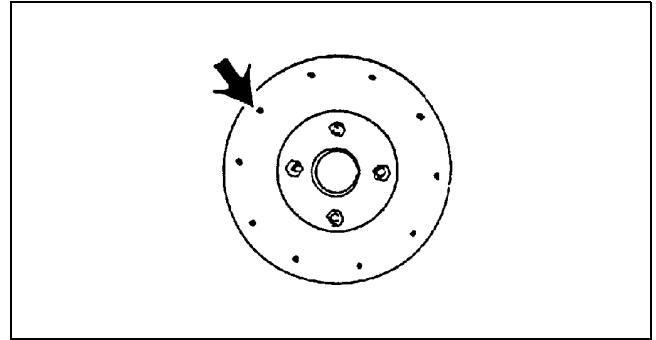
Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).
3. Subtract the minimum value from the maximum, and if the result is not within specification, machine the disc plate using a lathe.

Thickness variation limit
0.015 mm {0.00059 in}

Warning

- Do not exceed minimum disc plate thickness.



X3U411WAR

Disc Plate Thickness Inspection

Caution

- Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.

1. Measure the thickness of the disc plate.
 - If the thickness is not within the specification, replace the disc plate.

Minimum
22 mm {0.87 in}

Minimum thickness after machining using a brake lathe on-vehicle
22.8 mm {0.90 in}

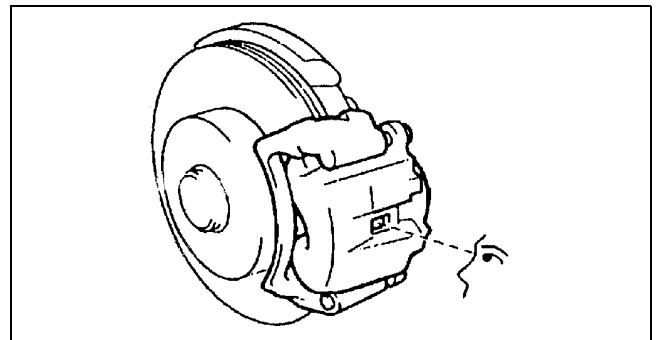
P

Disc Pad Thickness Inspection

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheel and tires.
3. Verify the remaining thickness of the pads.

Minimum thickness
2.0 mm {0.079 in} min.

4. Replace the pads as a set: right and left wheels, if either one is at or less than the minimum thickness.



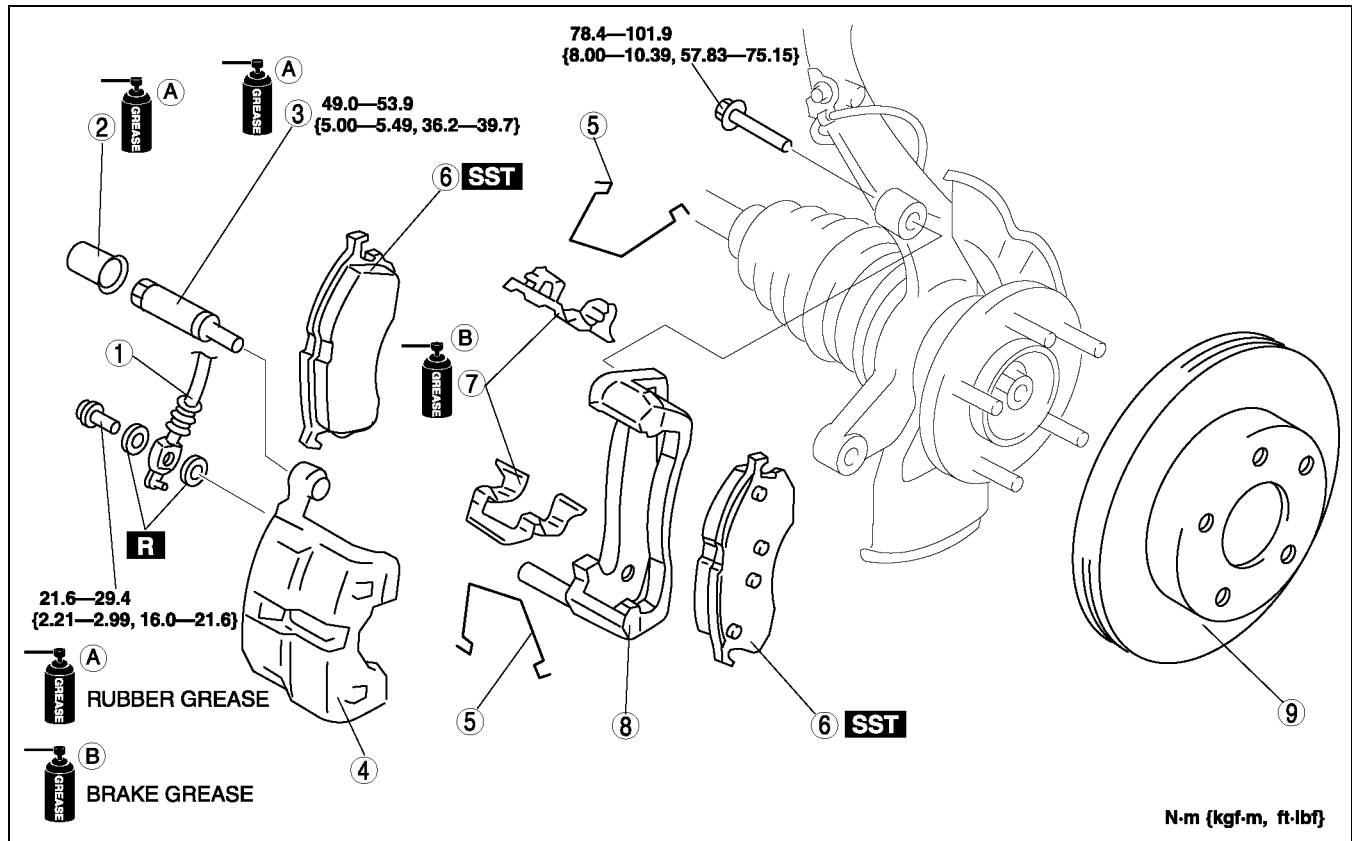
X3U411WAS

CONVENTIONAL BRAKE SYSTEM

FRONT BRAKE (DISC) REMOVAL/INSTALLATION

A6E691233980W02

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the pedal a few times, rotate the wheel by hand, and verify that the brake does not drag.



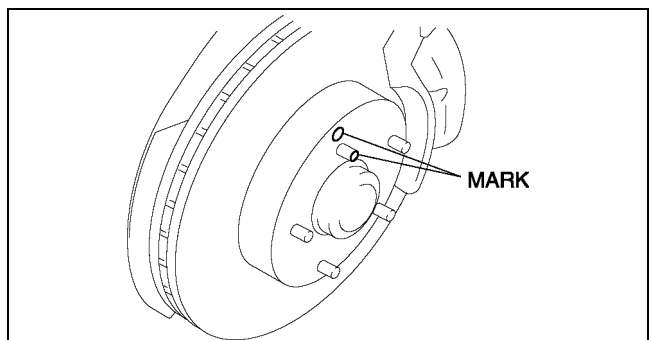
A6E6912W021

1	Flexible hose
2	Cap
3	Guide pin
4	Caliper
5	M-spring

6	Disc pad (See P-21 Disc Pad Installation Note)
7	Guide plate
8	Mounting support
9	Disc plate (See P-20 Disc Plate Removal Note) (See P-20 Disc Plate Installation Note)

Disc Plate Removal Note

1. Mark the wheel hub bolt and disc plate before removal for reference during installation.



A6E6912W037

Disc Plate Installation Note

1. Remove any rust or grime on the contact face of the disc plate and wheel hub.
2. Install the disc plate and align the marks made before removal.

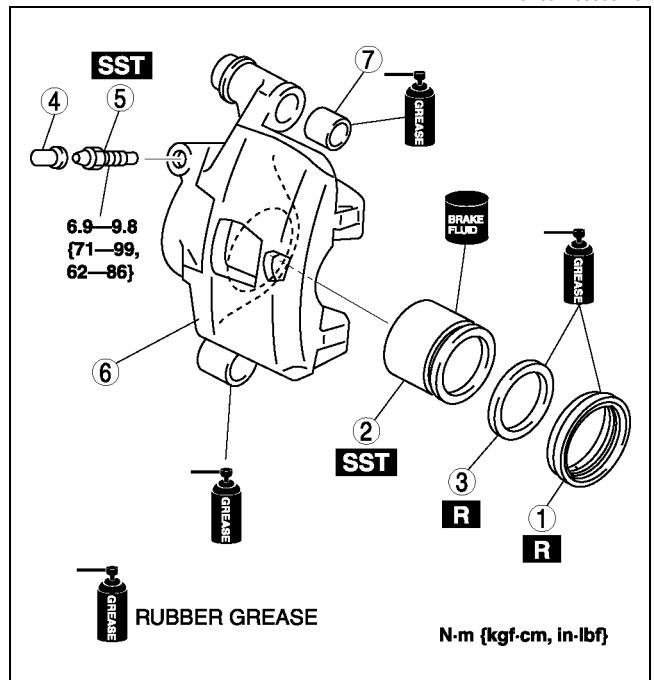
CONVENTIONAL BRAKE SYSTEM

CALIPER (FRONT) DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

1	Dust seal
2	Piston (See P-22 Piston Disassembly Note)
3	Piston seal (See P-22 Piston Seal Disassembly Note)
4	Bleeder cap
5	Bleeder screw (See P-23 Bleeder Screw Assembly Note)
6	Caliper body
7	Boot

2. Assemble in the reverse order of removal.



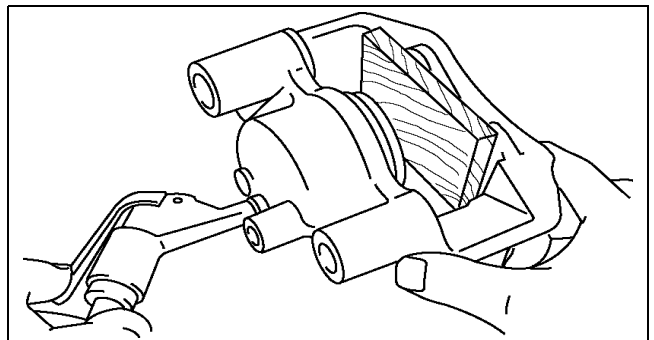
A6E6912W046

Piston Disassembly Note

Caution

- Blow the compressed air slowly to prevent the piston from suddenly popping out.

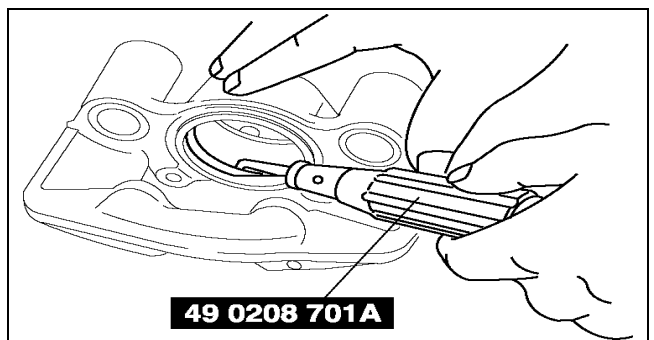
1. Place a piece of wood in the caliper, then blow compressed air through the hole to force the piston out of the caliper.



A6E6912W047

Piston Seal Disassembly Note

1. Remove the piston seal from the brake caliper using the SST.



A6E6912W048

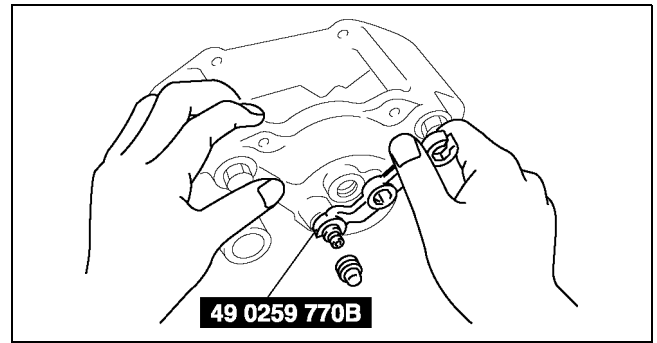
CONVENTIONAL BRAKE SYSTEM

Bleeder Screw Assembly Note

1. Assemble the bleeder screw to the caliper using the SST.

Tightening torque

6.9—9.8 N·m {71—99 kgf·cm, 62—86 in·lbf}



A6E6912W049

REAR BRAKE (DISC) INSPECTION

A6E691226980W01

Brake Judder Repair Hint

1. (See [P-17 FRONT BRAKE \(DISC\) INSPECTION.](#))

Disc Plate Thickness Inspection

Caution

- Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.

1. Measure the thickness of the disc plate.
 - If the thickness is not within the specification, replace the disc plate.

Minimum

8 mm {0.31 in}

Minimum thickness after machining using a brake lathe on-vehicle

8.8 mm {0.35 in}

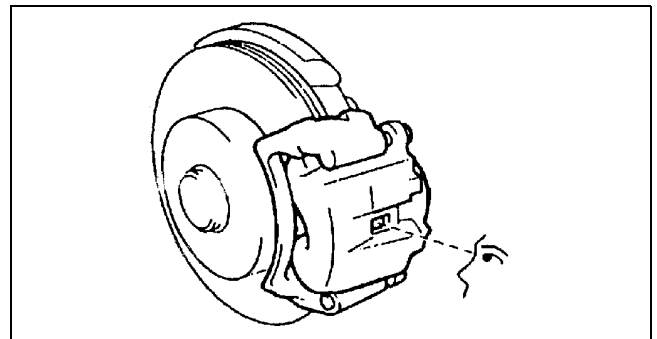
Disc Pad Thickness Inspection

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheel and tires.
3. Verify the remaining thickness of the pads.

Minimum thickness

2.0 mm {0.079 in} min.

4. Replace the pads as a set: right and left wheels, if either one is at or less than the minimum thickness.



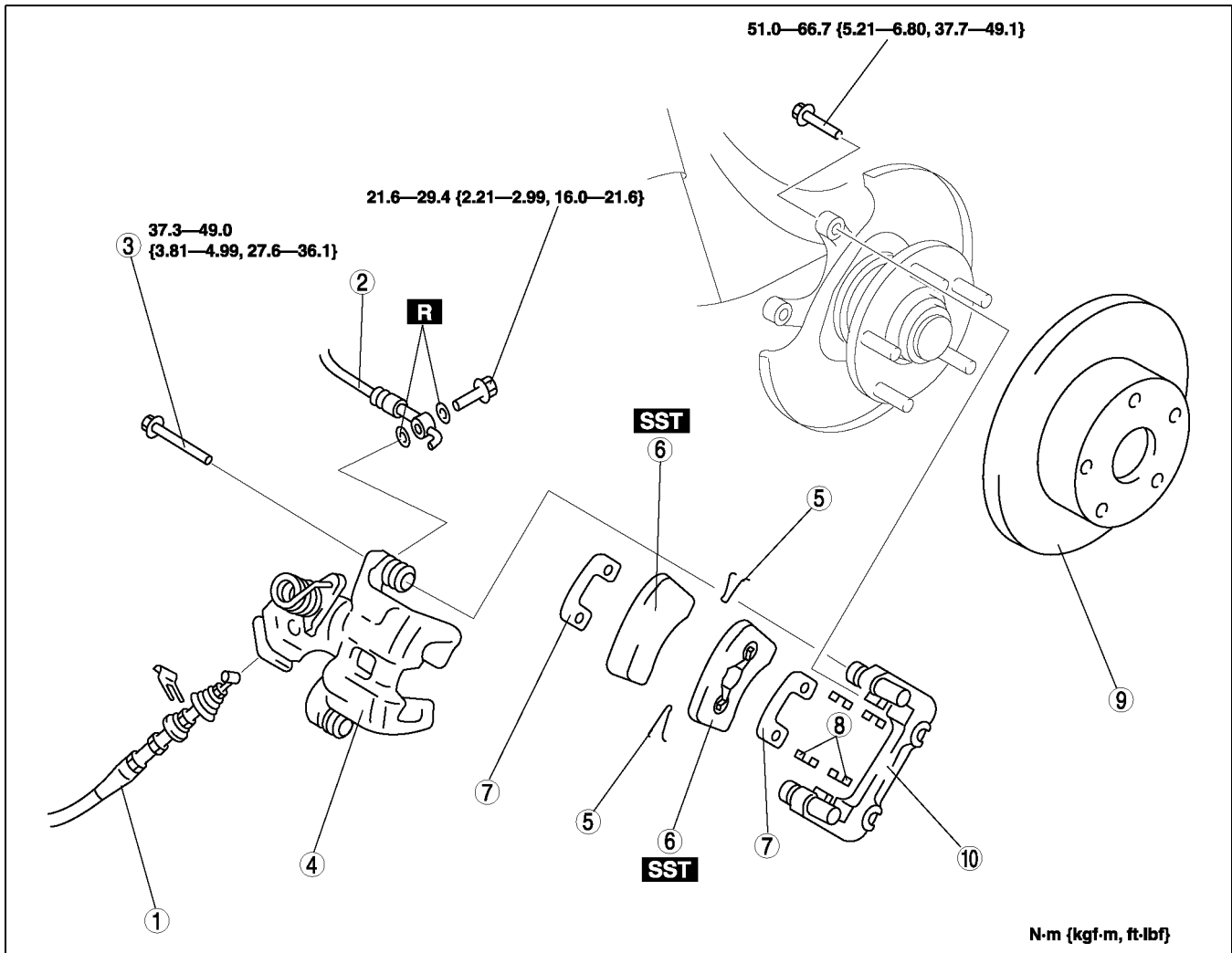
X3U411WAS

CONVENTIONAL BRAKE SYSTEM

REAR BRAKE (DISC) REMOVAL/INSTALLATION

A6E691226980W02

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the pedal several times, rotate the wheel by hand, and verify that the brake does not drag.



A6E6912W026

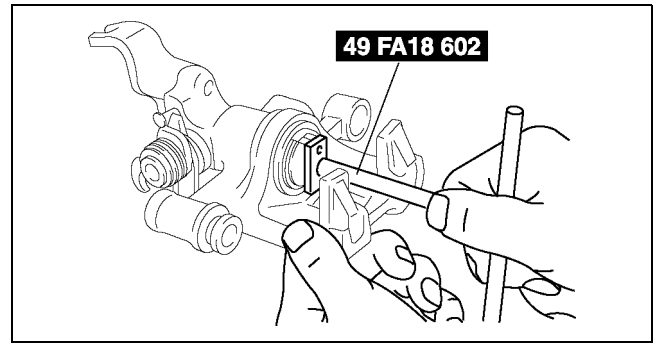
1	Parking brake cable, clip
2	Flexible hose
3	Bolt
4	Caliper
5	Spring
6	Disc pad (See P-25 Disc Pad Installation Note)

7	Shim
8	Guide plate
9	Disc plate (See P-20 Disc Plate Removal Note) (See P-20 Disc Plate Installation Note)
10	Mounting support

CONVENTIONAL BRAKE SYSTEM

Disc Pad Installation Note

1. Turn the manual adjustment gear counterclockwise with an Allen wrench to pull the brake caliper piston inward. (Turn until it stops.)
2. Install the disc pads.
3. Turn the manual adjustment gear clockwise until the brake pads just touch the disc plate. Turn the manual adjustment gear back 1/3-turn.

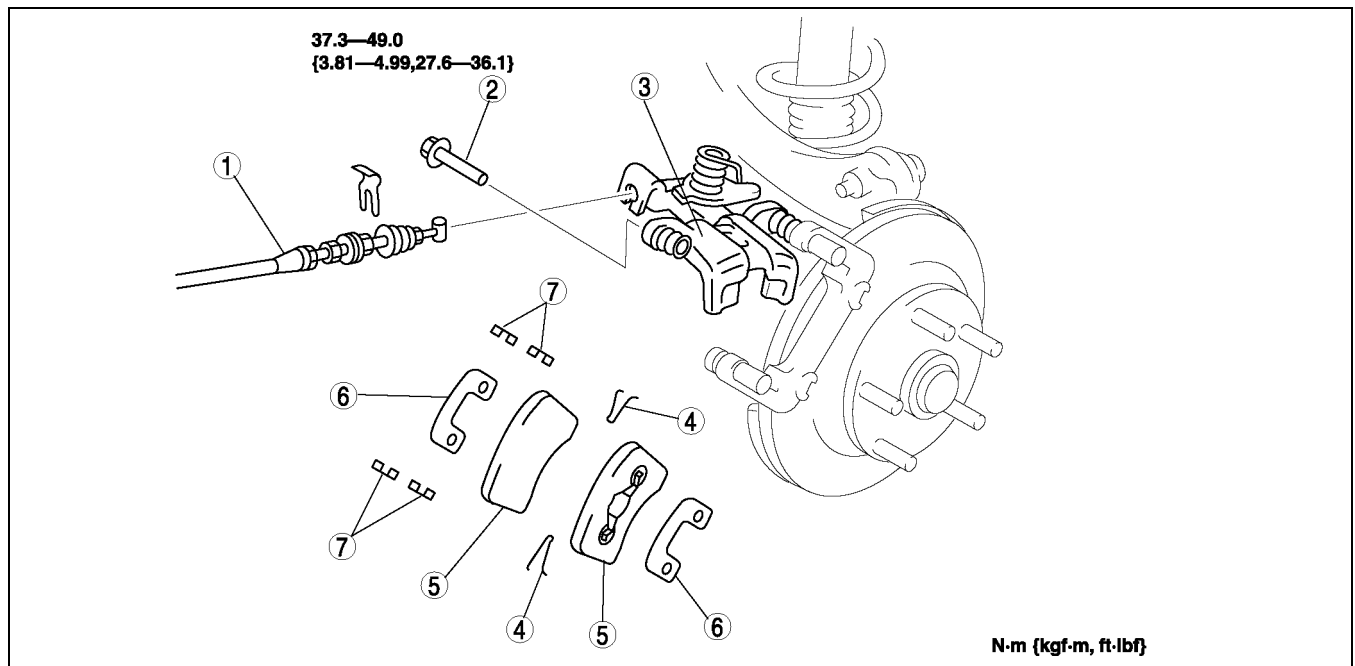


A6E6912W039

DISC PAD (REAR) REPLACEMENT

A6E691226630W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



Z3U0411W009

1	Parking brake cable, clip
2	Screw plug
3	Lock bolt

4	Disc pad (See P-25 Disc Pad Installation Note)
5	Shim
6	Guide plate

PARKING BRAKE SYSTEM

PARKING BRAKE SYSTEM

PARKING BRAKE (LEVER TYPE) INSPECTION

A6E691444000W01

1. Pull the parking brake lever a few times.
2. Depress the brake pedal a few times.
3. Inspect the parking brake stroke by pulling the parking brake lever with a force of **98 N {10 kgf, 22 lbf}**.

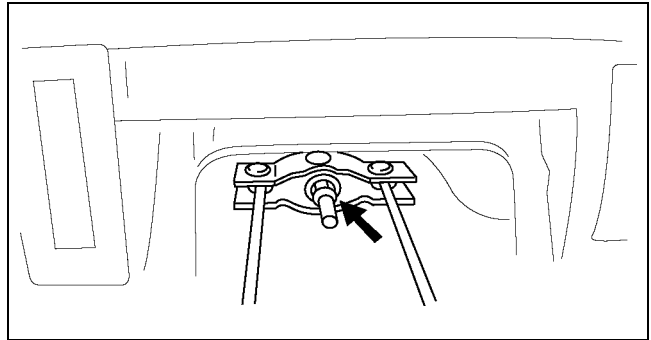
Stroke

3—6 notches

PARKING BRAKE (LEVER TYPE) ADJUSTMENT

A6E691444000W02

1. Start the engine and depress the brake pedal several times.
2. Stop the engine.
3. Remove the ashtray behind the center console.
4. Turn the adjusting nut as shown in the figure.
5. After adjustment, inspect the following points:
 - (1) Turn the ignition switch to ON, pull the parking brake lever one notch, and verify that the parking brake warning light illuminates.
 - (2) Verify that the rear brakes do not drag.

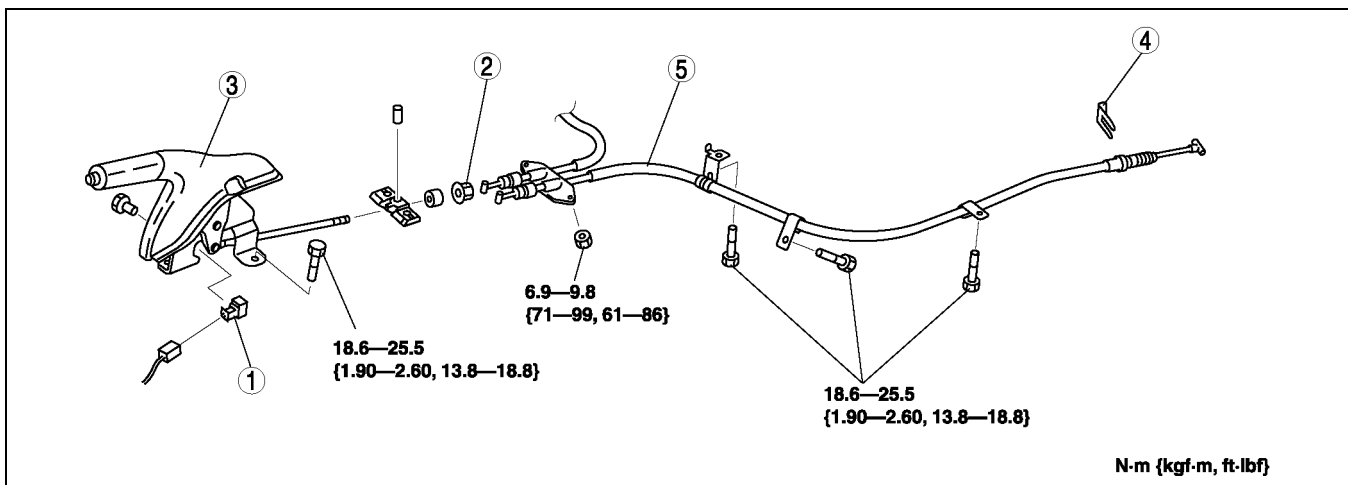


A6E6914W002

PARKING BRAKE (LEVER TYPE) REMOVAL/INSTALLATION

A6E691444000W03

1. Remove the center console. (See [S-86 CONSOLE REMOVAL/INSTALLATION.](#))
2. Remove the rear seat cushion (4SD) or rear seat (5HB) . (See [S-110 REAR SEAT REMOVAL/INSTALLATION.](#))
3. Remove the exhaust pipe bracket.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Adjust the parking brake stroke. (See [P-26 PARKING BRAKE \(LEVER TYPE\) ADJUSTMENT.](#))



A6E6914W001

1	Parking brake switch
2	Adjusting nut
3	Parking brake lever

4	Clip
5	Parking brake cable

ABS/TCS

ABS/TCS

ABS (ABS/TCS) HU/CM SYSTEM INSPECTION

A6E692143780W01

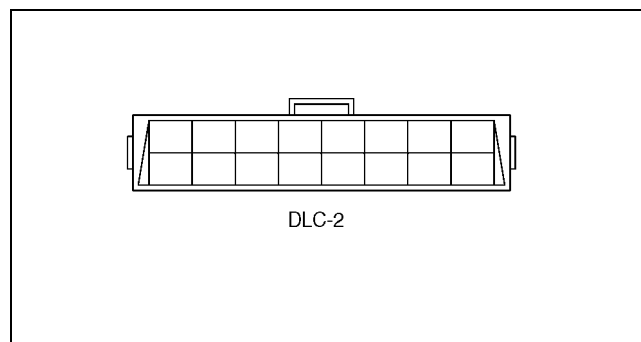
System Inspection

Preparation

1. Verify that the battery is fully charged. With the ignition switch on, verify that the ABS and BRAKE system warning lights goes out after **2.4 seconds**.
2. If the lights stays on after **2.4 seconds**, the ABS (ABS/TCS) HU/CM detects a failure. Follow the troubleshooting procedures.
3. Turn the ignition switch off.
4. On level ground, jack up the vehicle and support it evenly on safety stands. Shift the transaxle to N position.
5. Release the parking brake.
6. Rotate the wheels by hand, and inspect for brake drag.

Operation of ABS inspection

1. Perform the "Preparation."
2. Connect the **SSTs** (WDS or equivalent) to the data link connector-2 (DLC-2).
3. Set up an active command mode inspection according to the combination of commands below.



A6E6921W007

OPERATION	COMMAND NAME				COMMAND TYPE
	PMP_MOTOR	RF_OUTLET	RF_INLET	ABS_POWER	
Pressure retention	OFF	OFF	ON	ON	Manual
Pressure reduction	ON	ON	ON	ON	

The chart above shows an example of a right wheel inspection.

Note

- When working with two people, one should press on the brake pedal, the other should attempt to rotate the wheel being inspected.

4. Send the command while pressing on the brake pedal and attempting to rotate the wheel being inspected.
5. When pressure is being maintained, and click sound indicating the solenoid is operating comes from the ABS (ABS/TCS) HU/CM, confirm that the wheel does not rotate. When pressure is being reduced, and click sound indicating the solenoid is operating comes from the ABS (ABS/TCS) HU/CM, confirm that the wheel rotates, even though the brake pedal is being depressed.

Note

- To protect the ABS (ABS/TCS) HU/CM, the solenoid valve used for simulations and the ABS motor stay on for **10 seconds** each time they are switched on.
- Performing the inspections above determines the following.
 - The ABS (ABS/TCS) HU/CM brake lines are normal.
 - The ABS (ABS/TCS) HU/CM hydraulic system is not significantly abnormal.
 - The ABS (ABS/TCS) HU/CM wiring is normal.
- However, the following items cannot be checked.
 - ABS (ABS/TCS) HU/CM input system harness and parts
 - Extremely small leaks in the ABS (ABS/TCS) HU/CM internal hydraulic system
 - Unusual intermittent occurrences in the above items

ABS/TCS

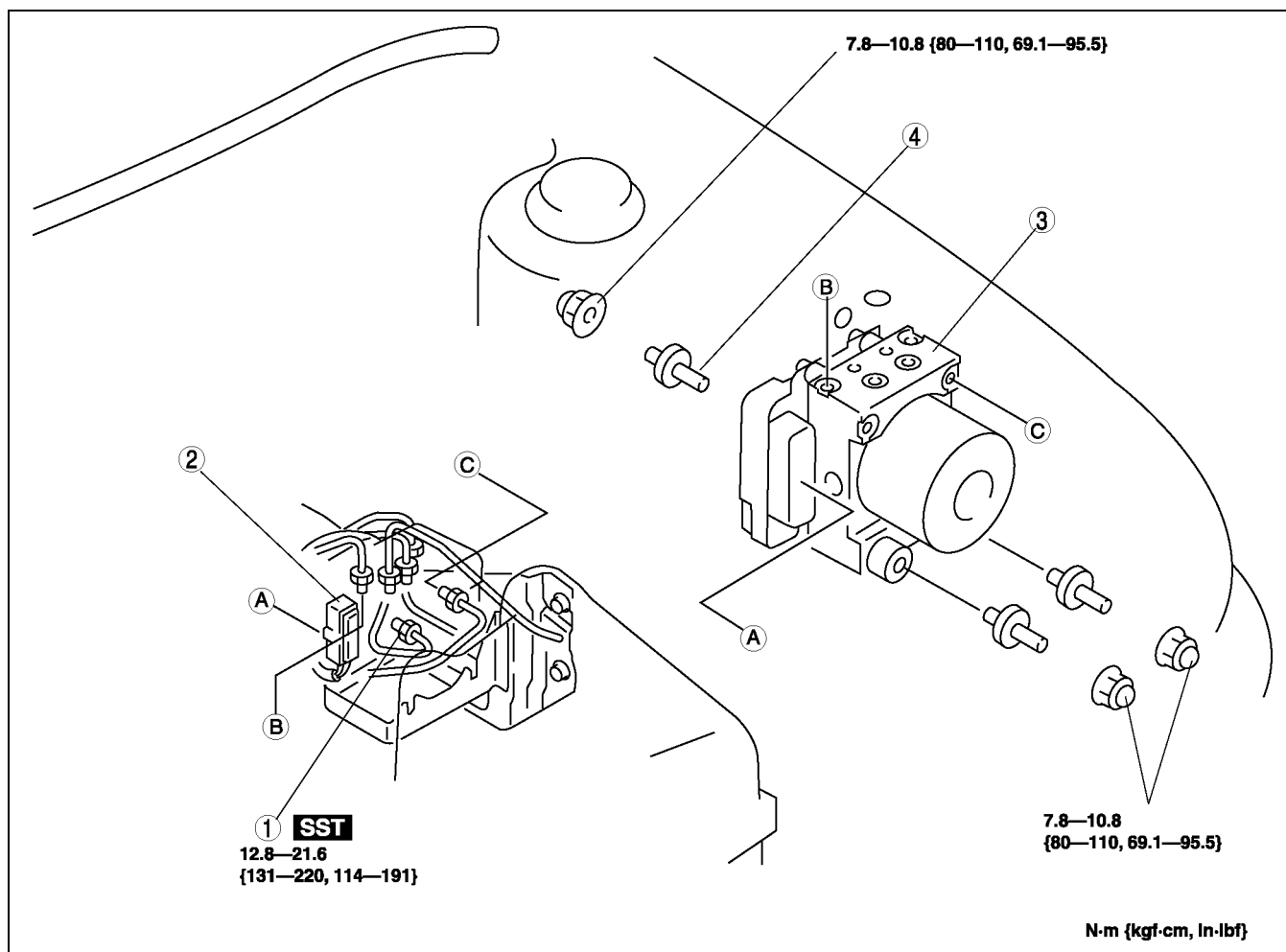
ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION

A6E692143700W01

Caution

- When replacing the ABS (ABS/TCS) HU/CM, configuration procedure must be done before removing the ABS (ABS/TCS) HU/CM. If configuration is not completed before removing the ABS (ABS/TCS) HU/CM, TCS will not work properly (with TCS model).
- Do not drop the ABS (ABS/TCS) HU/CM. Replace it if it is subjected to an impact.

1. Configure the ABS (ABS/TCS) HU/CM (when only replacing it). (See [P-29 ABS \(ABS/TCS\) or DSC HU/CM CONFIGURATION.](#))
2. Remove the battery, battery tray and battery tray bracket. (See [G-3 BATTERY REMOVAL/INSTALLATION.](#))
3. Remove the under cover.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.



A6E6921W002

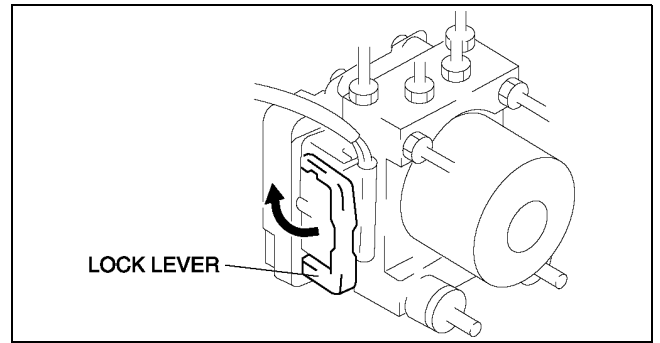
1	Brake pipe
2	Connector (See P-29 Connector Removal Note) (See P-29 Connector Installation Note)

3	ABS HU/CM (See P-29 ABS HU/CM Removal/Installation Note)
4	Stud

ABS/TCS

Connector Removal Note

1. Pull the lock lever up and make it unlock.
2. Remove the connector.



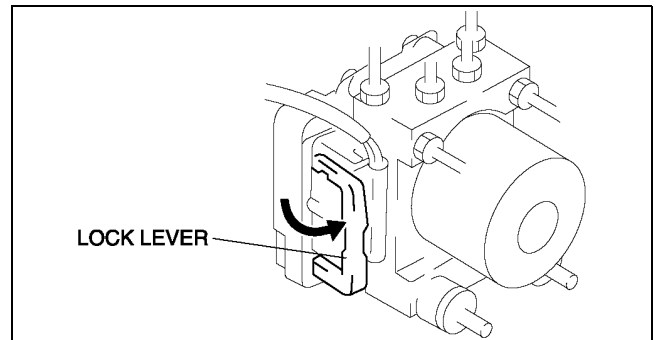
A6E6916W006

ABS HU/CM Removal/Installation Note

1. When removing/installing the ABS HU/CM from/to the vehicle, attach a strip of protective tape on the ABS HU/CM connector to prevent brake fluid from entering.

Connector Installation Note

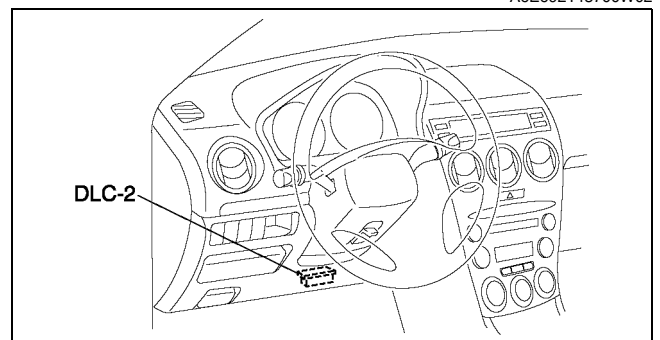
1. Verify that the lock lever of the harness connector is completely pulled up.



A6E6916W007

ABS (ABS/TCS) OR DSC HU/CM CONFIGURATION

1. Connect the WDS or equivalent to the DLC-2.
2. Input vehicle information following the direction on the WDS or equivalent screen.
3. Select "Module programming".
4. Select "Programmable module installation".
5. Select "ABS/TCS".
6. Retrieve DTCs by the WDS or equivalent, then verify that there is no DTC present.
 - If DTC is present, perform applicable DTC inspection.

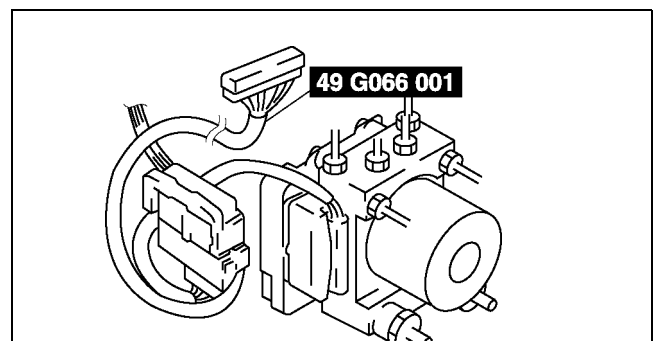


A6E692143700W02

A6E3970W002

ABS (ABS/TCS) HU/CM INSPECTION

1. Disconnect the negative battery cable.
2. Connect the **SST** between the ABS (ABS/TCS) HU/CM and harness connector with the ignition switch off.
3. Attach the tester leads to the **SST** and inspect voltage referring the table below.

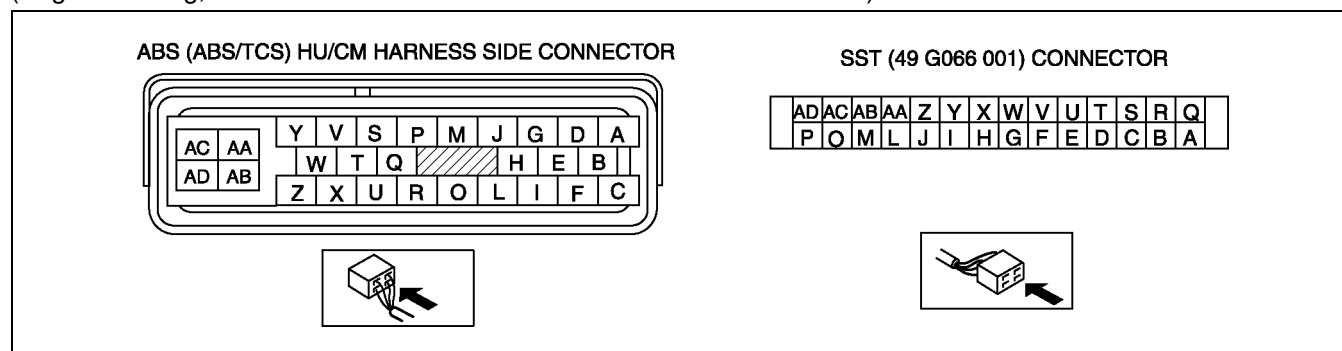


A6E6921W005

ABS/TCS

Terminal Voltage Table (Reference)

(Engine is idling, and connector is connected unless otherwise indicated.)



A6E6921W001

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
A B	RR wheel-speed	RR wheel-speed sensor	Vehicle is stopped	0 (AC)	- Inspect related harness - Inspect ABS wheel-speed sensor
			Inspect by using the wave profile. (See P-31 Inspection Using An Oscilloscope (Reference))		
C F	LR wheel-speed	LR wheel-speed sensor	Vehicle is stopped	0 (AC)	
			Inspect by using the wave profile. (See P-31 Inspection Using An Oscilloscope (Reference))		
G D	RF wheel-speed	RF wheel-speed sensor	Vehicle is stopped	0 (AC)	
			Inspect by using the wave profile. (See P-31 Inspection Using An Oscilloscope (Reference))		
I E	LF wheel-speed	LF wheel-speed sensor	Vehicle is stopped	0 (AC)	- Inspect related harness - Inspect ABS wheel-speed sensor
			Inspect by using the wave profile. (See P-31 Inspection Using An Oscilloscope (Reference))		
H	—	—	—	—	—
K	—	—	—	—	—
L	—	—	—	—	—
M	—	—	—	—	—
N	—	—	—	—	—
O	CAN-H	—	—	No need to check	—
P*1	TCS OFF switch	TCS OFF switch	When switch is pressed	Below 1.0	- Inspect related harness - Inspect TCS OFF switch
			When switch is not pressed	B+	
Q	—	—	—	—	—
R	CAN-L	—	—	No need to check	—
S	—	—	—	—	—
T	—	—	—	—	—
U*2	—	DLC	—	No need to check	—
V	Vehicle speed output	Cruise actuator, Wiper and washer switch, Audio unit, Car-navigation unit, Headlight leveling actuator	Vehicle is stopped	0	- Inspect related harness - Inspect ABS wheel-speed sensor
W	—	—	—	—	—
X	OBD	KLN terminal of DLC-2	It cannot be determined with terminal voltage whether the condition is good or bad because advanced function diagnostic output is performed with serial communication. Inspect with service codes.		- Inspect related harness - Inspect ABS/TCS HU/CM

ABS/TCS

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
Y	Brake switch	Brake switch	Brake pedal is depressed	10—14	• Inspect related harness
			Brake pedal is released	Below 0.5	
Z	Power supply	Ignition switch	—	B+	• Inspect related harness
AA	Power supply (Solenoid valve)	Battery	—	B+	• Inspect related harness
AB	Power supply (ABS motor)	Battery	—	B+	
AC	Ground	Ground	—	0	• Inspect related harness
AD	Ground	Ground	—	0	• Inspect related harness

*1 : With TCS

*2 : Use this terminal at factory only, not used for inspection and repair at field

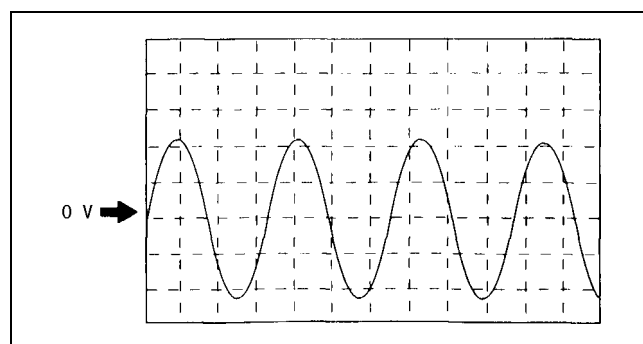
Inspection Using An Oscilloscope (Reference)

Wheel speed

- ABS/TCS HU/CM terminal:
RR : A (+) — B (-)
LR : C (+) — F (-)
RF : D (+) — G (-)
LF : E (+) — I (-)
- Oscilloscope setting:
1 V/DIV (Y), 2 ms/DIV (X), AC range
- Vehicle condition: Driving 30 km/h (18.6 mph)

Note

- As vehicle speed increases, period of wave shortens.
- If there is malfunctioning in the sensor rotor, wave profile warps.

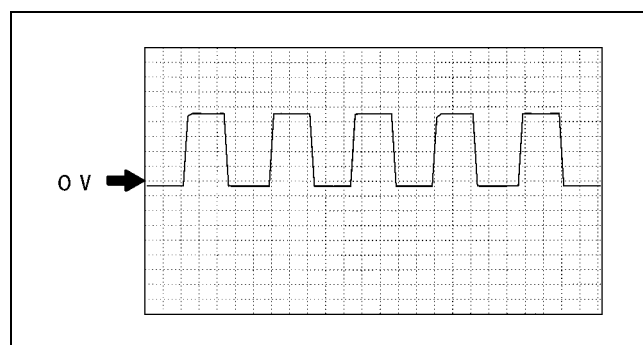


Vehicle speed output

- ABS/TCS HU/CM terminal: V(+) — AC (-)
- Oscilloscope setting:
1 V/DIV (Y), 5 ms/DIV (X), DC range
- Vehicle condition: Driving 30 km/h (18.6 mph)

Note

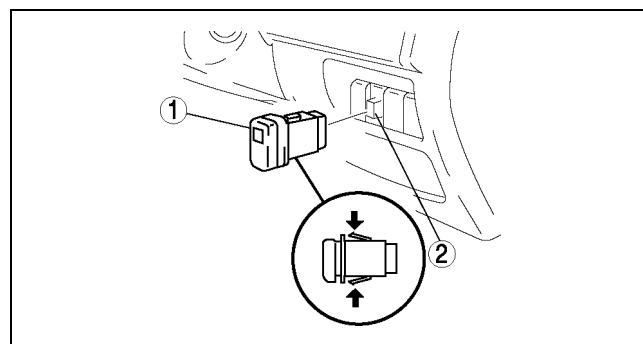
- As vehicle speed increases, period of wave shortens.



TCS (DSC) OFF SWITCH REMOVAL/INSTALLATION

A6E692167650W02

1. Press the hooks of the TCS OFF switch and pull the switch out.
2. Disconnect the connector.
3. Install in the reverse order of removal.



A6E6921W008

ABS/TCS

TCS (DSC) OFF SWITCH INSPECTION

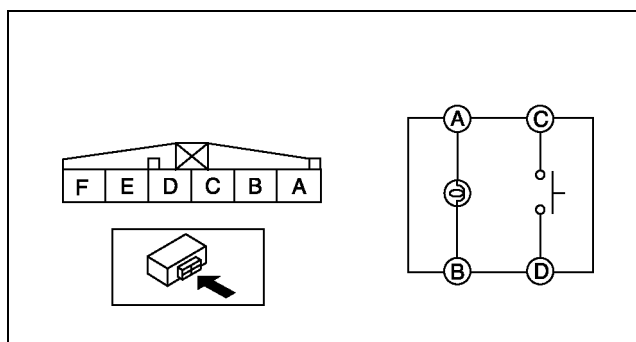
A6E692167650W03

1. Remove the TCS OFF switch.
2. Inspect for continuity between the TCS OFF switch terminals using an ohmmeter.

○—○ : Bulb ○—○ : Continuity

Condition	Terminal			
	A	B	C	D
When the switch is pressed	○—○	○—○	○—○	○—○
When the switch is released	○—○	○—○		

A6E6921W010



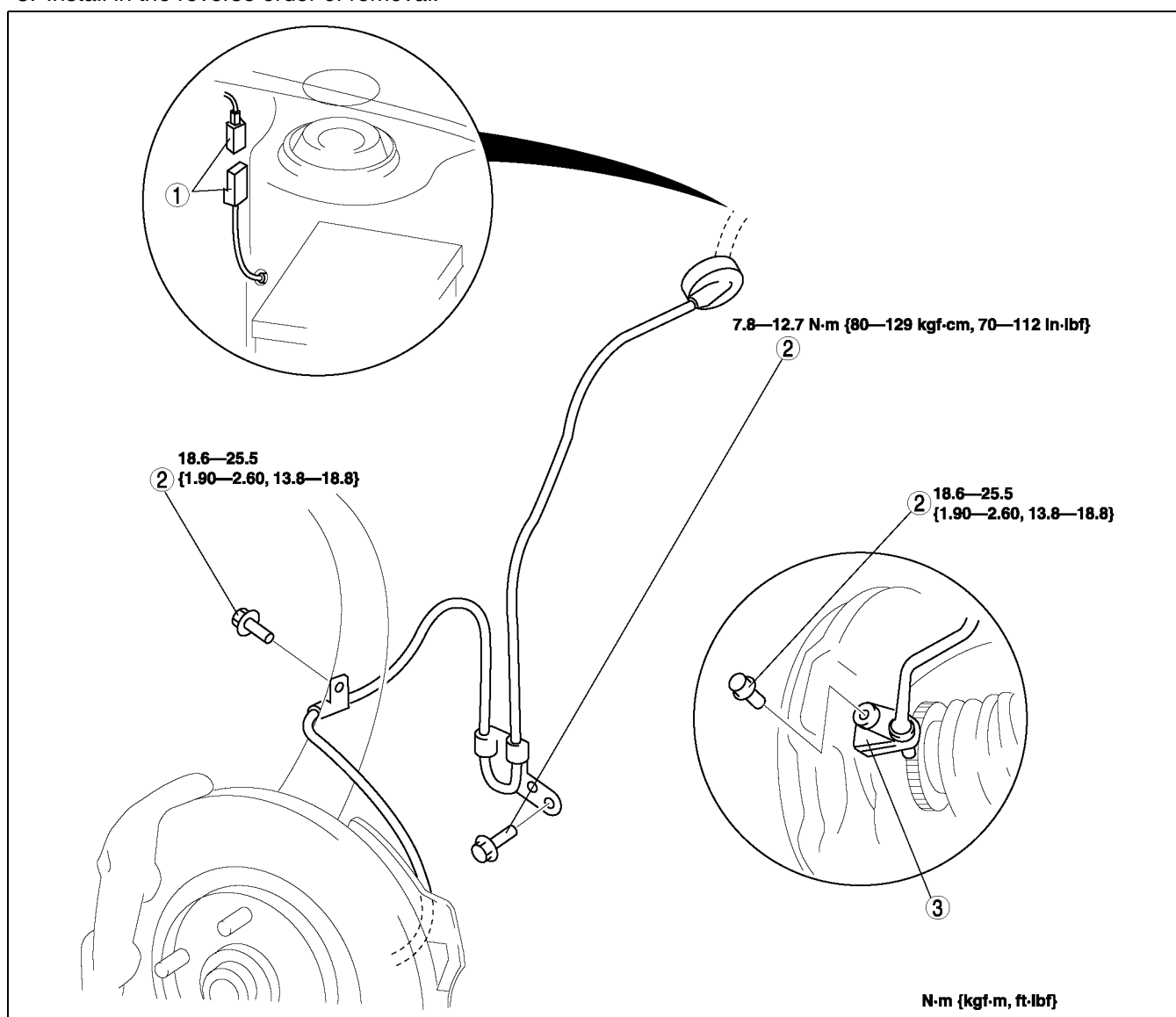
A6E6921W009

- If not within the specification, replace the TCS OFF switch.

FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

A6E692143720W01

1. Remove the mud guard.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



A6E6916W001

1	Connector
2	Bolt

3	Front ABS wheel-speed sensor

FRONT/REAR ABS WHEEL-SPEED SENSOR INSPECTION

A6E692143720W02

Visual Inspection

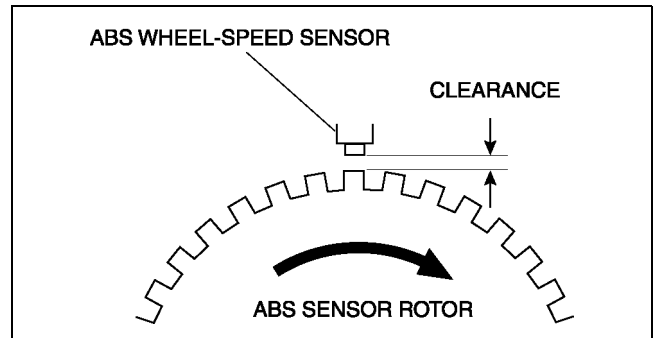
1. Remove the wheel and tire, and inspect the sensor for looseness and damage. Replace the sensor if necessary.

Clearance Inspection

1. Inspect the clearance between the wheel-speed sensor and the sensor rotor.

Clearance

0.3—1.1 mm {0.012—0.043 in}



A6E6921W003

Resistance Inspection

1. Disconnect the ABS wheel-speed sensor connector.
2. Inspect the resistance at the ABS wheel-speed sensor.
 - If not as specified, replace the ABS wheel-speed sensor.

Resistance

1.3—1.7 kilohm

P

Voltage Inspection

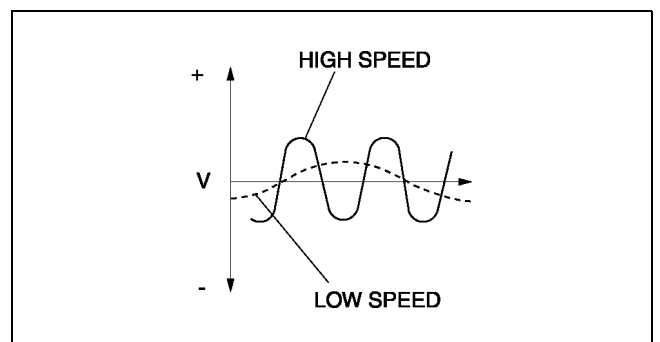
1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Disconnect the ABS wheel-speed sensor connector.
3. Inspect each sensor by rotating each wheel one revolution per second.
 - If not as specified, replace the ABS wheel-speed sensor.

Voltage

0.25—1.2 V (AC)

Voltage Pattern Inspection

1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Disconnect the ABS wheel-speed sensor connector.
3. Using an oscilloscope, inspect voltage pattern for distortion and noise by rotating each wheel.
 - If there is distortion or noise, inspect the ABS sensor rotor.



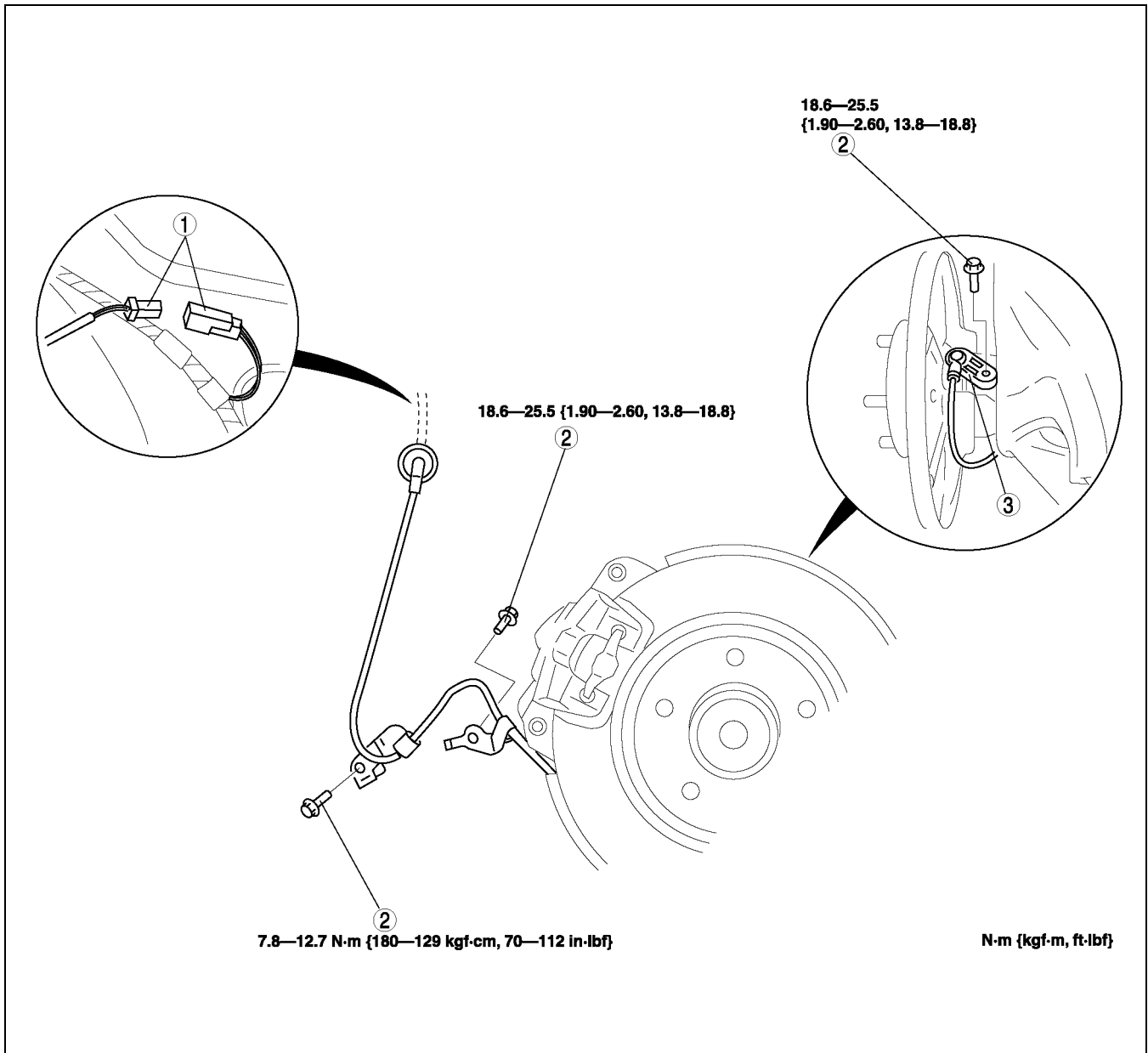
A6E6921W004

ABS/TCS

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

A6E692143710W01

1. Remove the tire house trim.[S-91 TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



A6E6916W002

1	Connector
2	Bolt

3	Rear ABS wheel-speed sensor

DYNAMIC STABILITY CONTROL

DYNAMIC STABILITY CONTROL

DSC SYSTEM INSPECTION

A6E692067650W01

Preparation

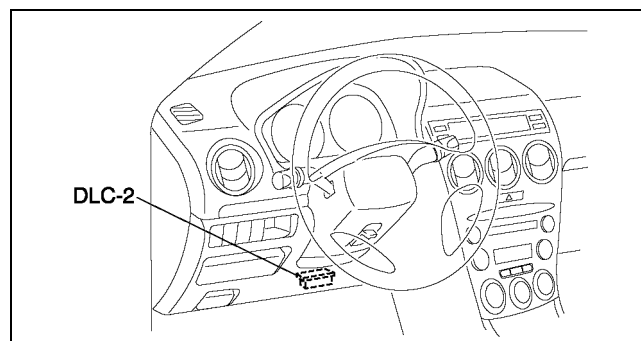
1. Verify that the battery is fully charged.
2. With ignition switch on, verify that the ABS warning light goes out after **2.4 seconds**.
3. Turn the ignition switch off.
4. On level ground, jack up the vehicle and support it evenly on safety stands.
5. Shift the transaxle to N position.
6. Release the parking brake.
7. Rotate the wheels by hand, and inspect for brake drag.

Operation of DSC Inspection

1. Perform the "Preparation."
2. Connect WDS or equivalent to the DLC-2.
3. Set up an active command modes inspection according to the combination of commands below.

Note

- When working with two people, one should press on the brake pedal, the other should attempt to rotate the wheel being inspected.



A6E3970W002

Pressure retention

Command name	Wheels			
	LF	RF	LR	RR
LF_TC_VLV	OFF			
RF_TC_VLV				
LF_DSC_V				
RF_DSC_V				
ABS_POWER	ON			
LF_INLET	ON	OFF	OFF	OFF
LF_OUTLET	OFF		ON	
LR_INLET		OFF		
LR_OUTLET				
RF_INLET		ON		
RF_OUTLET		OFF		
RR_INLET			ON	
RR_OUTLET			OFF	
PMP_MOTOR				

DYNAMIC STABILITY CONTROL

Pressure reduction

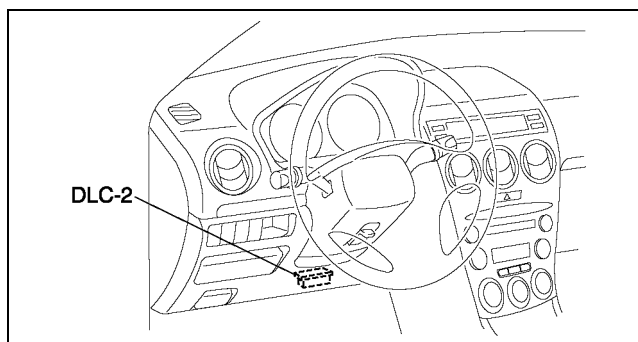
Command name	Wheels			
	LF	RF	LR	RR
LF_TC_VLV	OFF			
RF_TC_VLV				
LF_DSC_V				
RF_DSC_V				
ABS_POWER	ON			
LF_INLET	ON	OFF	OFF	OFF
LF_OUTLET				
LR_INLET	OFF		ON	
LR_OUTLET				
RF_INLET		ON	OFF	
RF_OUTLET				
RR_INLET		OFF		ON
RR_OUTLET				
PMP_MOTOR	ON			

Note

- To protect the DSC HU/CM, the solenoid valve used for simulations and the ABS motor stay on for **10 seconds** each time they are switched on.
4. Send the command while pressing on the brake pedal and attempting to rotate the wheel being inspected.
 5. When pressure is being maintained, and a click sound indicating the solenoid is operating comes from the DSC HU/CM, confirm that the wheel does not rotate. When pressure is being reduced, and a click sound indicating the solenoid is operating comes from DSC HU/CM, confirm that the wheel rotates, even though the brake pedal is being depressed.
 - Performing the inspections above determines the following.
 - The DSC HU/CM brake lines are normal
 - The DSC HU/CM hydraulic system is not significantly abnormal
 - The DSC HU/CM wiring is normal
 - Output system harness in DSC HU/CM (solenoid, relay) are normal
 - However, the following items cannot be checked.
 - The DSC HU/CM input system harness and parts
 - Extremely small leaks in the DSC HU/CM internal hydraulic system
 - Unusual intermittent occurrences in the above items

DSC Control Inspection

1. Perform the "Preparation."
2. Connect WDS or equivalent to the DLC-2.
3. Set up an active command modes inspection according to the combination of commands below.



A6E3970W002

DYNAMIC STABILITY CONTROL

Pressure retention

Command name	Wheels				
	Inhibition of understeer tendency control		Inhibition of oversteer tendency control		
	LF	RF	LR	RR	
LF_TC_VLV	ON	OFF		ON	
RF_TC_VLV	OFF	ON		OFF	
LF_DSC_V	OFF				
RF_DSC_V					
ABS_POWER	ON				
LF_INLET	OFF	OFF	OFF	ON	
LF_OUTLET		ON		OFF	
LR_INLET		OFF			
LR_OUTLET					
RF_INLET			ON		
RF_OUTLET			OFF		
RR_INLET			OFF		
RR_OUTLET					
PMP_MOTOR	ON				

Note

- To protect the DSC HU/CM, the solenoid valve used for simulations and the ABS motor stay on for **10 seconds** each time they are switched on.

- Send the command while attempting to rotate the wheel being inspected.
- When pressure is being maintained, and a click sound indicating the solenoid is operating comes from the DSC HU/CM, confirm that the wheel does not rotate.
 - Performing the inspections above determines the following.
 - The DSC HU/CM brake lines are normal
 - The DSC HU/CM hydraulic system is not significantly abnormal
 - The DSC HU/CM wiring is normal
 - Output system harness in DSC HU/CM (solenoid, relay) are normal
 - However, the following items cannot be checked.
 - The DSC HU/CM input system harness and parts
 - Extremely small leaks in the DSC HU/CM internal hydraulic system
 - Unusual intermittent occurrences in the above items

DYNAMIC STABILITY CONTROL

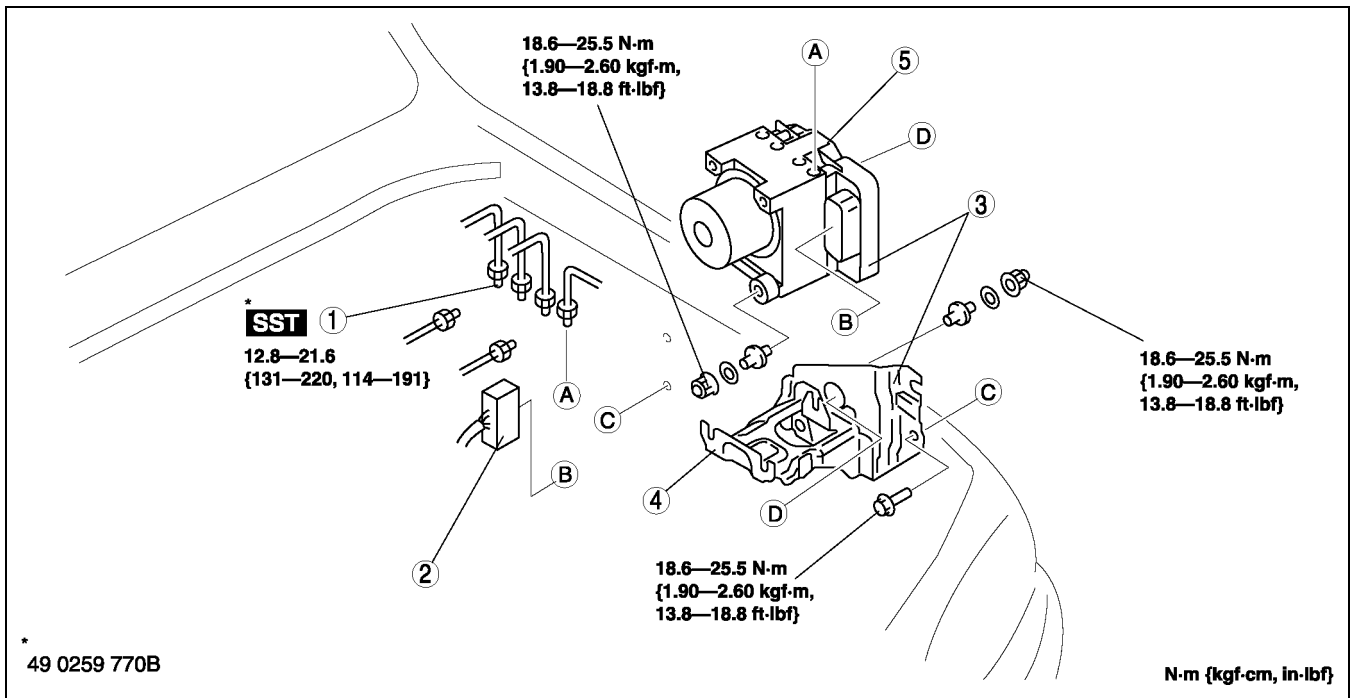
DSC HU/CM REMOVAL/INSTALLATION

A6E692067650W03

Caution

- When replacing the DSC HU/CM, configuration procedure must be done before removing the DSC HU/CM. If configuration is not completed before removing the DSC HU/CM, DTC B2477 will be detected.
- Do not drop the DSC HU/CM. Replace it if it is subjected to an impact.

1. Configure the DSC HU/CM (when only replacing it).(See [P-29 ABS \(ABS/TCS\) or DSC HU/CM CONFIGURATION.](#))
2. Remove the battery, battery tray and battery tray bracket.(See [G-3 BATTERY REMOVAL/INSTALLATION.](#))
3. Remove the under cover.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.



A6E6920W001

1	Connector (See P-39 Connector Removal Note) (See P-39 Connector Installation Note)
2	Brake pipe

3	DSC HU/CM and Bracket (See P-39 DSC HU/CM and Bracket Removal/Installation Note)
4	Bracket
5	DSC HU/CM

DYNAMIC STABILITY CONTROL

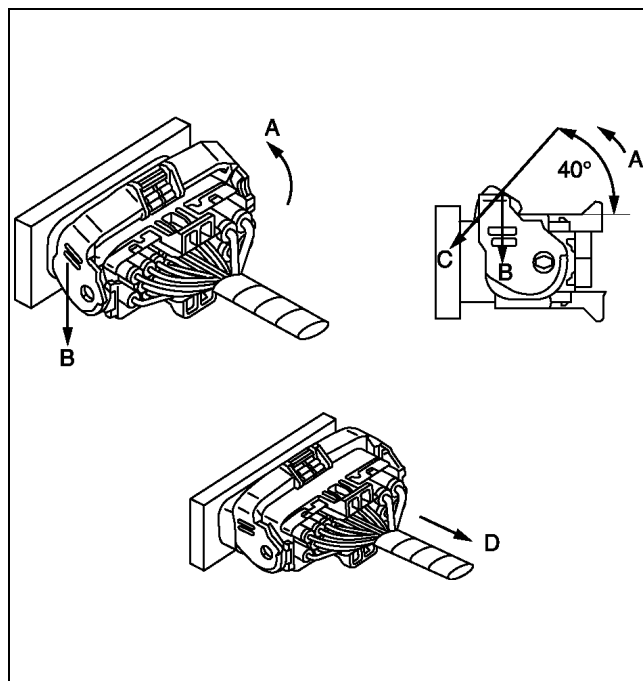
Connector Removal Note

1. Rotate the lock lever 40° to the direction A, then push the lock lever to the direction B.

Caution

- After rotated the lever 40°, do not push the lock lever to the direction C. The lock lever will be damaged.

2. Verify that the lock lever is completely returned.
3. Remove the harness side connector to the direction D.



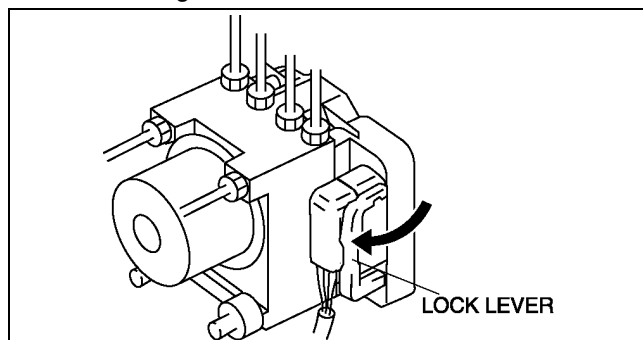
A6E6920W011

DSC HU/CM and Bracket Removal/Installation Note

1. When removing/installing the DSC HU/CM from/to the vehicle, attach a strip of tape on the DSC HU/CM connector to prevent brake fluid from entering.

Connector Installation Note

1. Verify that the connection part and waterproof packing are free of foreign material, then connect the connector.
2. Verify that the lock lever is completely pushed in.



A6E6916W005

P

DYNAMIC STABILITY CONTROL

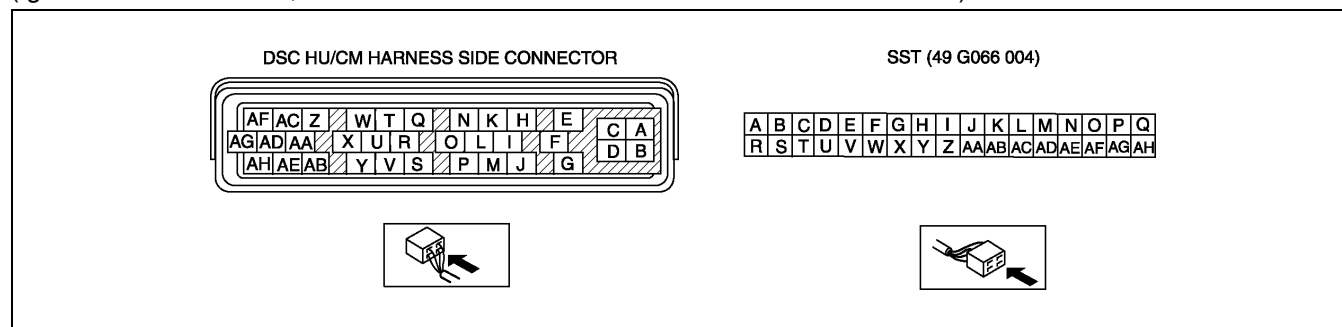
DSC HU/CM INSPECTION

A6E692067650W04

1. Remove the battery and battery bracket.
2. Disconnect the DSC HU/CM connector.
3. Connect the **SST** (49 G066 004) to the DSC HU/CM connector and harness side connector.
4. Inspect voltage referring the table below.

Terminal Voltage Table (reference value)

(Ignition switch is at ON, and connector is connected unless indicated otherwise.)



A6E6920W009

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
A	Ground (1)	Ground part 1	—	Below 1.0	• Inspect related harness
B	Ground (2)	Ground part 2	—	Below 1.0	• Inspect related harness
C	Solenoid valve (power supply)	Battery	—	B+	• Inspect DSC HU/CM • Inspect related harness
D	Pump motor (power supply)	Battery	—	B+	• Inspect DSC HU/CM • Inspect related harness
E*	—	Check connector	—	No need to check	• Inspect related harness
F J	LF wheel-speed	LF wheel-speed sensor	Vehicle is stopped • Inspect using the wave profile. (See P-41 Inspection Using An Oscilloscope (Reference))	0 (AC)	• Inspect related harness • Inspect wheel-speed sensor
K H	RR wheel-speed	RR wheel-speed sensor	Vehicle is stopped • Inspect using the wave profile. (See P-41 Inspection Using An Oscilloscope (Reference))	0 (AC)	• Inspect related harness • Inspect wheel-speed sensor
M I	RF wheel-speed	RF wheel-speed sensor	Vehicle is stopped • Inspect using the wave profile. (See P-41 Inspection Using An Oscilloscope (Reference))	0 (AC)	• Inspect related harness • Inspect wheel-speed sensor
Q N	LR wheel-speed	LR wheel-speed sensor	Vehicle is stopped • Inspect using the wave profile. (See P-41 Inspection Using An Oscilloscope (Reference))	0 (AC)	• Inspect related harness • Inspect wheel-speed sensor
G	Battery (IG)	Ignition switch	Ignition switch ON	B+	• Inspect related harness • Inspect ignition switch
L	Brake switch	Brake switch	When brake pedal is depressed	10—14	• Inspect related harness • Inspect brake switch
O	Lateral-G (lateral-G signal)	Combine sensor	Vehicle is stopped Right cornering Left cornering	2.1—2.9 Fluctuation between 2.5—4.0 Fluctuation between 2.5—1.0	• Inspect related harness • Inspect combine sensor
P	Combine sensor power output	Combine sensor	Ignition switch ON	4.75—5.25	• Inspect related harness • Inspect combine sensor
R	Steering angle (ground)	Steering angle sensor	—	Below 1.0	• Inspect related harness • Inspect steering angle sensor

DYNAMIC STABILITY CONTROL

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
S	Combine sensor	Combine sensor	—	3.5—5.0	- Inspect related harness - Inspect combine sensor
T	Yaw rate (yaw rate signal)	Combine sensor	Vehicle is stopped	2.3—2.7	- Inspect related harness - Inspect yaw rate sensor
			Right cornering	Fluctuation between 2.5—4.62	
			Left cornering	Fluctuation between 2.5—0.33	
U	Steering angle (neutral signal)	Steering angle sensor	Steering position: center position 25°—29°	Below 1.0	- Inspect related harness - Inspect steering angle sensor
			Except above condition	Approx. 4	
V	—	—	—	—	—
W	Steering angle (steering angle signal 2)	Steering angle sensor	Inspect using the wave profile. (See P-41 Inspection Using An Oscilloscope (Reference))		- Inspect related harness - Inspect steering angle sensor
X	Steering angle (steering angle signal 1)	Steering angle sensor	Inspect using the wave profile. (See P-41 Inspection Using An Oscilloscope (Reference))		- Inspect related harness - Inspect steering angle sensor
Y	Combine sensor (ground)	Combine sensor	—	Below 1.0	- Inspect related harness - Inspect combine sensor
AA	DSC OFF switch	DSC OFF switch	When switch is pressed	Below 1.0	- Inspect related harness - Inspect DSC OFF switch
			When switch is not pressed	B+	
AB	OBD	KLN terminal of DLC-2	It cannot be determined with terminal voltage whether the condition is good or bad because advanced function diagnostic output is performed with serial communication. Inspect with service codes.		- Inspect related harness - Inspect DSC HU/CM
AC	Auto cruise set signal output	Auto cruise unit	When auto cruise is ON	Below 1.0	- Inspect related harness - Inspect DSC HU/CM
			When auto cruise is OFF	B+	
AD	—	—	—	—	—
AE	Vehicle speed output	Audio unit, Wiper and washer switch, Car-navigation unit, Auto leveling control unit, Cruise actuator	Vehicle is stopped	0	- Inspect related harness - Inspect front wheel-speed sensor
			Inspect using the wave profile. (See P-41 Inspection Using An Oscilloscope (Reference))		
AF	CAN-L	—	—	No need to check	—
AG	CAN-H	—	—	No need to check	—
AH	—	—	—	—	—

* : Used for vehicle manufacturing, not used for DSC.

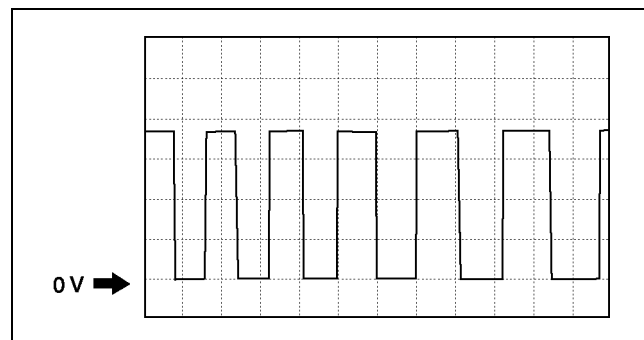
Inspection Using An Oscilloscope (Reference)

Steering angle (steering angle signal 1 and 2)

- DSC HU/CM terminal:
Steering angle signal 2 : W (+) — R (-)
Steering angle signal 1 : X (+) — R (-)
- Oscilloscope setting:
1 V/DIV (Y), 25 ms/DIV (X), DC range
- Vehicle condition: Rotating steering wheel at one revolution per second

Note

- As steering wheel rotation speed increases, period of wave shortens.
- As for shape of steering angle signals 1 and 2, the phase is different.



A6E6921W014

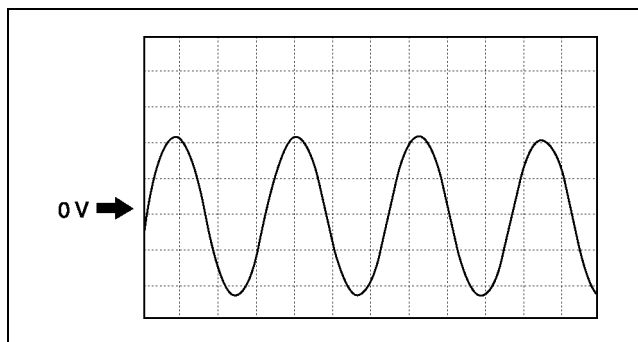
DYNAMIC STABILITY CONTROL

Wheel speed

- DSC HU/CM terminal:
RF : M (+) — I (-)
RR : K (+) — H (-)
LF : F (+) — J (-)
LR : Q (+) — N (-)
- Oscilloscope setting:
1 V/DIV (Y), 2 ms/DIV (X), AC range
- Vehicle condition: Driving 30 km/h (18.6 mph)

Note

- As vehicle speed increases, period of wave shortens.
- If there is malfunctioning in the sensor rotor, wave profile warps.



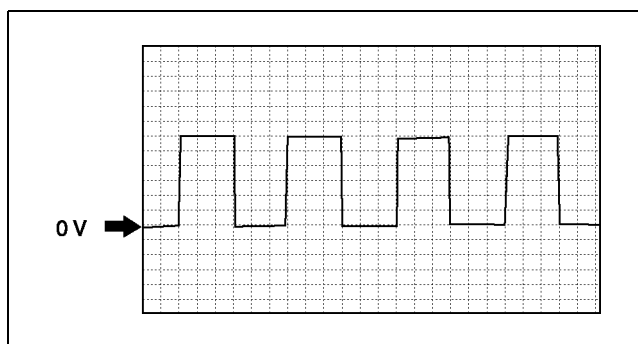
A6E6921W013

Vehicle speed output

- DSC HU/CM terminal: AE (+) — A (-)
- Oscilloscope setting:
1 V/DIV (Y), 5 ms/DIV (X), DC range
- Vehicle condition: Driving 30 km/h (18.6 mph)

Note

- As vehicle speed increases, period of wave shortens.



A6E6921W012

COMBINE SENSOR REMOVAL/INSTALLATION

A6E692067650W05

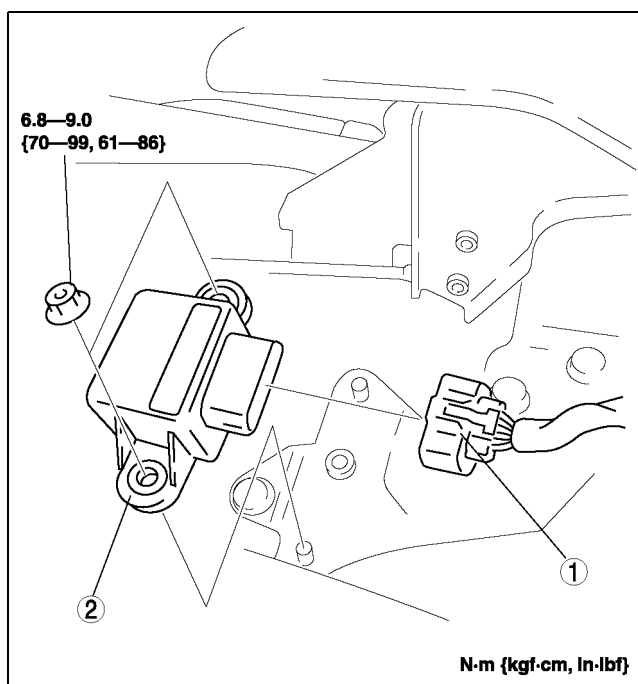
Caution

- Be careful and do not allow the combine sensor to fall. If by chance it is subjected to strong impact, replace it.

- Remove the center console.
- Remove in the order indicated in the table.

1	Combine sensor connector
2	Combine sensor

- Install in the reverse order of removal.
- After installation, perform the combine sensor initialization procedure. (See [P-44 COMBINE SENSOR INITIALIZATION PROCEDURE.](#))



A6E6920W004

DYNAMIC STABILITY CONTROL

COMBINE SENSOR INSPECTION

A6E692067650W06

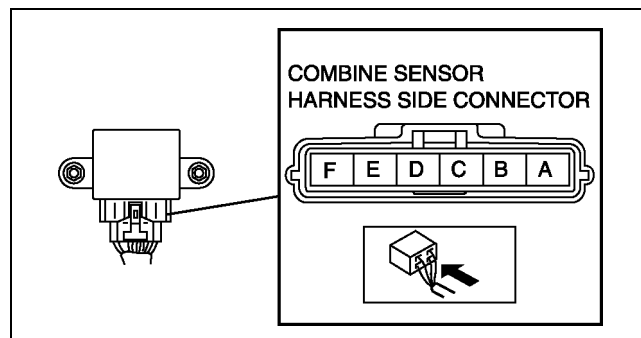
Caution

- Be careful and do not allow the lateral-G sensor to fall. If by chance it is subjected to strong impact, replace it.

1. Connect the connector.
 2. Turn ignition switch on, verify the voltage between terminals B and E under the following conditions.
 - If not within the specification, replace the lateral-G sensor.
- (1) Lateral-G
- 1) Horizontal

Voltage

2.4—2.6 V

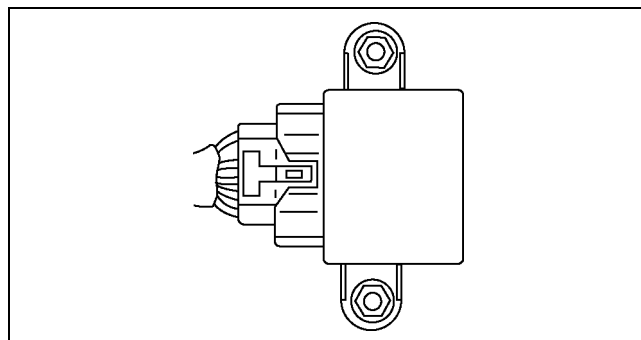


A6E6920W008

- 2) Facing up (inclined 90° from horizontal)

Voltage

3.3—3.7 V

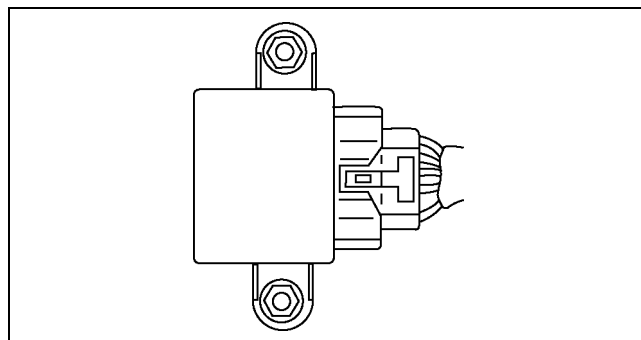


A6E6920W002

- 3) Facing down (declined 90° from horizontal)

Voltage

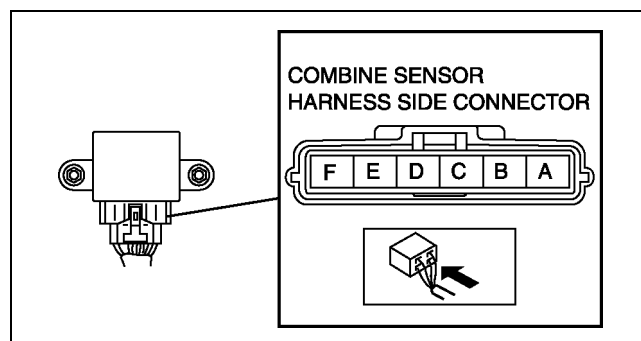
1.3—1.7 V



A6E6920W003

- (2) Yaw rate

- 1) Measure yaw rate sensor voltage under static condition.



A6E6920W008

DYNAMIC STABILITY CONTROL

- 2) Measure voltage at output terminal D and ground terminal E when the yaw rate sensor is rotated left and right.

Caution

- Be careful when turning the yaw rate sensor rotation position while it is in a reversed state because the rotation direction and voltage will be reversed.

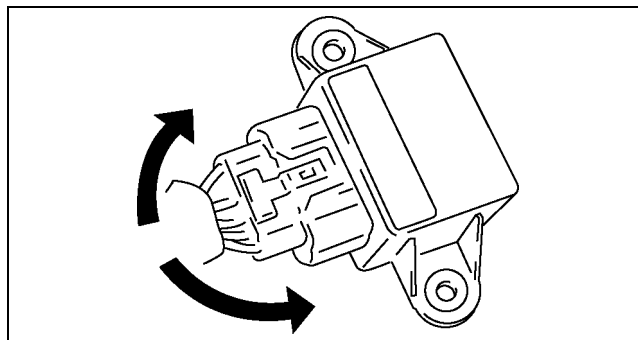
Voltage

Right rotation:

fluctuation between 2.5—4.62 V

Left rotation:

fluctuation between 2.5—0.33 V

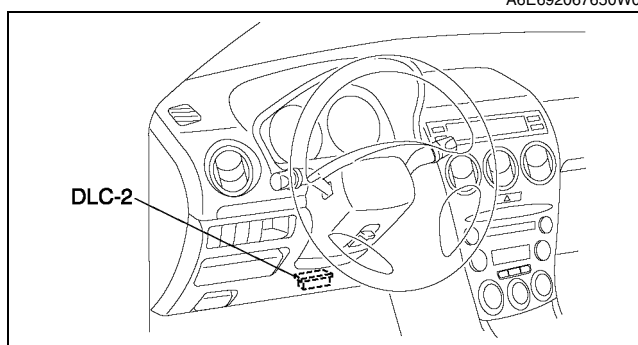


A6E6920W005

COMBINE SENSOR INITIALIZATION PROCEDURE

1. Set the **SST** (WDS or equivalent) to the DLC-2
2. Access the active command mode and select the YAWRATE, then follow the indication on the monitor.
3. Select the LATACCEL and follow the indication on the monitor.

A6E692067650W07



A6E3970W002

STEERING ANGLE SENSOR REMOVAL/INSTALLATION

1. (See [T-38 COMBINATION SWITCH DISASSEMBLY/ASSEMBLY.](#))

A6E692067650W08

STEERING ANGLE SENSOR INSPECTION

1. (See [T-39 STEERING ANGLE SENSOR INSPECTION.](#))

A6E692067650W09

DSC OFF SWITCH REMOVAL/INSTALLATION

1. (See [P-31 TCS \(DSC\) OFF SWITCH REMOVAL/INSTALLATION.](#))

A6E692067650W10

DSC OFF SWITCH INSPECTION

1. (See [P-32 TCS \(DSC\) OFF SWITCH INSPECTION.](#))

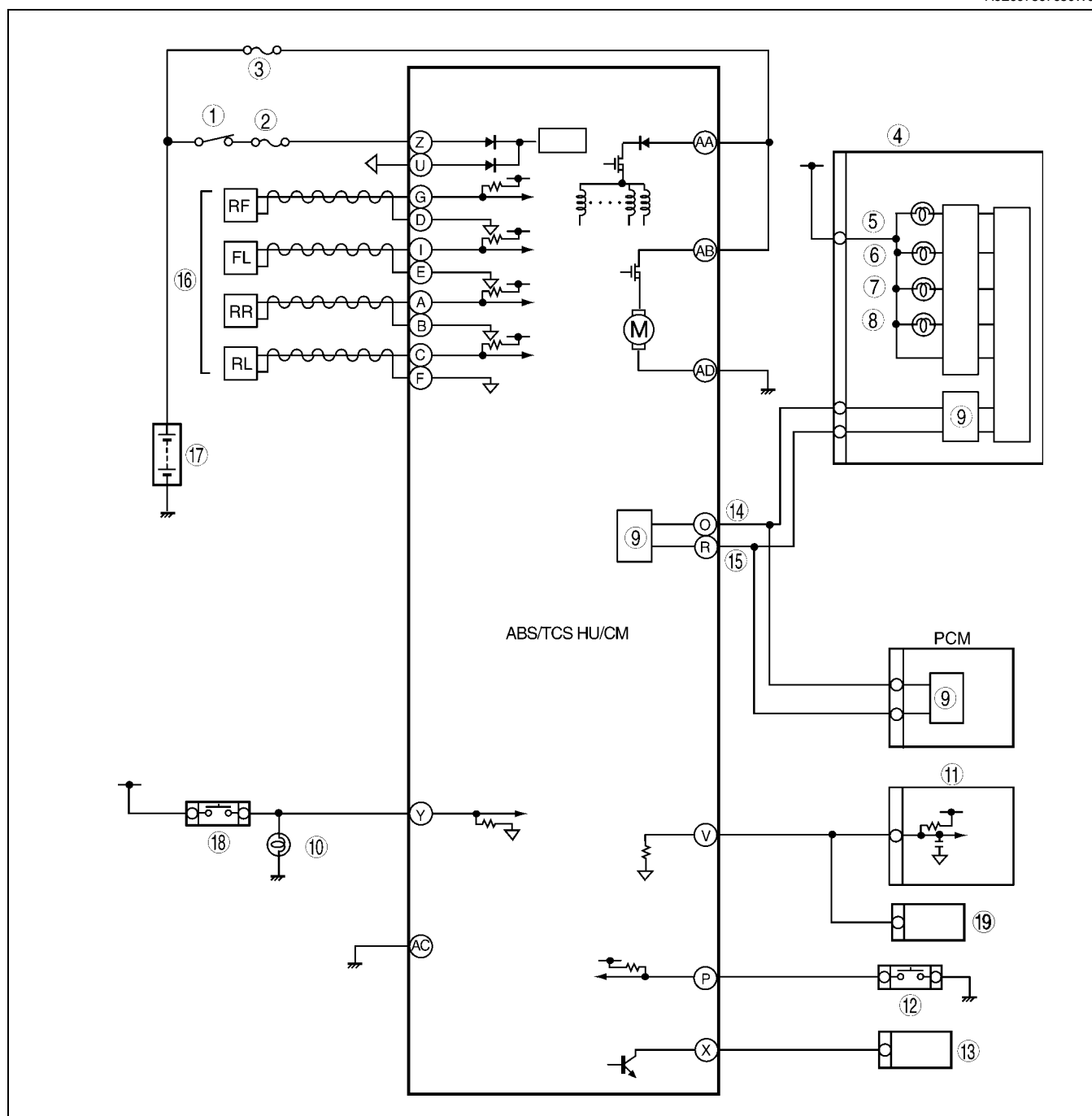
A6E692067650W11

ON-BOARD DIAGNOSTIC (ABS/TCS)

ON-BOARD DIAGNOSTIC (ABS/TCS)

ABS (ABS/TCS) SYSTEM WIRING DIAGRAM

A6E697567650W01



A6E6921T001

1	IG switch
2	SUS 15 A fuse
3	ABS 60 A fuse
4	Meter
5	ABS warning light
6	Brake system warning light
7	TCS OFF light
8	TCS indicator light
9	CAN driver
10	Brake light

11	Cruise actuator
12	TCS OFF switch
13	DLC-2
14	CAN-H
15	CAN-L
16	ABS Wheel-speed sensor
17	Battery
18	Brake switch
19	Audio unit, Wiper and washer switch, Car-navigation unit, Auto leveling control unit

ON-BOARD DIAGNOSTIC (ABS/TCS)

ABS (ABS/TCS) ON-BOARD DIAGNOSIS

A6E697567650W02

On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the ABS (ABS/TCS) and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
 - Provides a quick inspection of the ABS (ABS/TCS) usually performed at the start of each diagnostic procedure.
 - Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
 - Read/clear diagnostic results, PID monitor and record and active command modes.

Read/clear diagnostic results

- This function allows you to read or clear DTCs in the ABS (ABS/TCS) HU/CM memory.

PID/data monitor and record

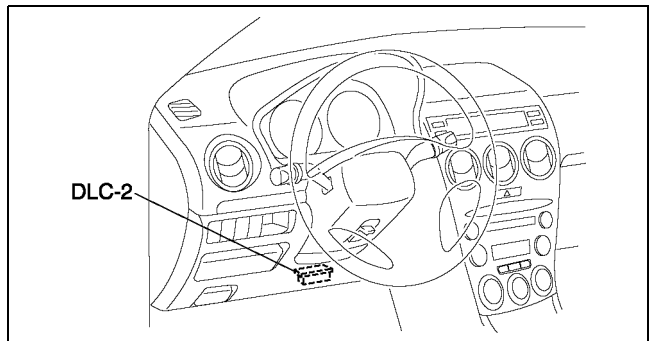
- This function allows you to access certain data values, input signals, calculated values, and system status information.

Active command modes

- This function allows you to control devices through the WDS or equivalent.

Reading DTCs Procedure

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector.
2. Retrieve DTC by WDS or equivalent.



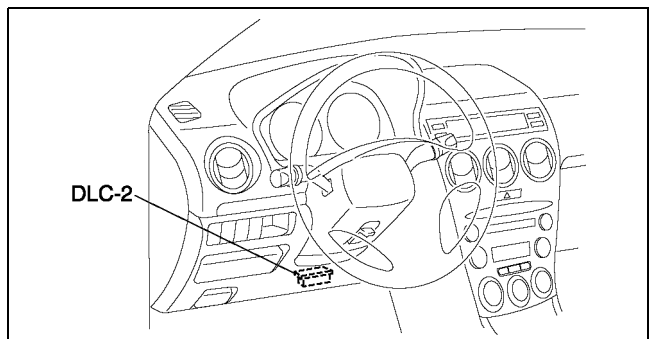
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Clearing DTCs Procedures

1. After repairs have been made, perform the **DTCs reading procedure**.
2. Erase DTC by WDS or equivalent.
3. Ensure that the customer's concern has been resolved.

PID/Data Monitor and Record Procedure

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector.
2. Access and monitor PIDs by WDS or equivalent.



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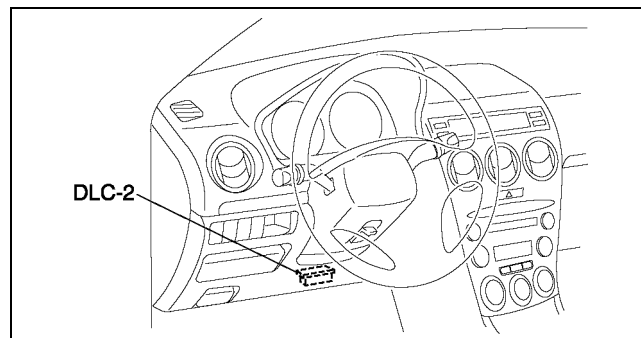
ON-BOARD DIAGNOSTIC (ABS/TCS)

Active Command Modes Procedure

Note

- When driving, the ABS motor and each valve forcibly turn ABS_VOLT on, and then each command on. ABS_VOLT regulates the power supply for the ABS motor and 8 valves.

- Connect WDS or equivalent to the vehicle DLC-2 16-pin connector.
- Turn the ignition switch to ON (Engine OFF) or start engine.
- Activate active command modes using WDS or equivalent.



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DTC Table

DTC	Diagnosis system component	Page
WDS or equivalent		
B1318	ABS (ABS/TCS) power supply	(See P-50 DTC B1318)
B1342	ABS (ABS/TCS) HU/CM	(See P-52 DTC B1342)
C1095	Motor relay, pump motor	(See P-52 DTC C1095, C1096)
C1096	Motor relay, pump motor	(See P-52 DTC C1095, C1096)
C1119	Engine control system	(See P-54 DTC C1119)
C1140	ABS (ABS/TCS) HU/CM (pump)	(See P-55 DTC C1140)
C1145	Right front wheel-speed sensor	(See P-56 DTC C1145, C1155, C1165, C1175)
C1148	Right front wheel-speed sensor/sensor rotor	(See P-59 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1155	Left front wheel-speed sensor	(See P-56 DTC C1145, C1155, C1165, C1175)
C1158	Left front wheel-speed sensor/sensor rotor	(See P-59 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1165	Right rear wheel-speed sensor	(See P-56 DTC C1145, C1155, C1165, C1175)
C1168	Right rear wheel-speed sensor/sensor rotor	(See P-59 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1175	Left rear wheel-speed sensor	(See P-56 DTC C1145, C1155, C1165, C1175)
C1178	Left rear wheel-speed sensor/sensor rotor	(See P-59 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1186	Fail-safe relay	(See P-62 DTC C1186, C1266)
C1194	Left front pressure reduction solenoid valve	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1198	Left front pressure retention solenoid valve	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1210	Right front pressure reduction solenoid valve	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1214	Right front pressure retention solenoid valve	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1233	Left front wheel-speed sensor/sensor rotor	(See P-59 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1234	Right front wheel-speed sensor/sensor rotor	(See P-59 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1235	Right rear wheel-speed sensor/sensor rotor	(See P-59 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1236	Left rear wheel-speed sensor/sensor rotor	(See P-59 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1242	Left rear pressure reduction solenoid valve	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)

ON-BOARD DIAGNOSTIC (ABS/TCS)

DTC	Diagnosis system component	Page
WDS or equivalent		
C1246	Right rear pressure reduction solenoid valve	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1250	Left rear pressure retention solenoid valve	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1254	Right rear ABS pressure retention solenoid valve	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1266	Fail-safe relay	(See P-63 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254)
C1414	ABS (ABS/TCS) HU/CM	(See P-64 DTC C1414)
C1508	ABS/TCS HU/CM	(See P-64 DTC C1508)
C1510	Right front solenoid valve, motor or wheel-speed sensor/sensor rotor	(See P-64 DTC C1510, C1511, C1512, C1513)
C1511	Left front solenoid valve, motor or wheel-speed sensor/sensor rotor	(See P-64 DTC C1510, C1511, C1512, C1513)
C1512	Right rear solenoid valve, motor or wheel-speed sensor/sensor rotor	(See P-64 DTC C1510, C1511, C1512, C1513)
C1513	Left rear solenoid valve, motor or wheel-speed sensor/sensor rotor	(See P-64 DTC C1510, C1511, C1512, C1513)
U1900	Can communication	(See T-144 DTC U0073, U1900, U2516)
U2021	Invalid/fault data received	(See P-65 DTC U2021)
U2516	Can communication	(See T-144 DTC U0073, U1900, U2516)

PID/DATA Monitor Table

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS (ABS/TCS) HU/CM/CM terminal
RPM (Engine speed signal input)	RPM	- Engine is stopped: 0 RPM - Engine is running: Indicates engine speed	Inspect PCM.	—
CCNTABS (Number of continuous codes)	—	DTC is detected: 1—255 DTC is not detected: 0	Perform inspection using appropriate DTC.	—
PMPSTAT (Pump motor output state)	ON/OFF	- Pump motor is activated: ON - Pump motor is deactivated: OFF	Inspect ABS (ABS/TCS) HU/CM. (See P-27 ABS (ABS/TCS) HU/CM SYSTEM INSPECTION)	—
BOO_ABS (Brake pedal switch input)	ON/OFF	- Brake pedal is depressed: ON - Brake pedal is released: OFF	Inspect brake switch.	Y
ABS_LAMP (ABS warning light driver output state)	ON/OFF	- ABS warning light is illuminated: ON - ABS warning light is not illuminated: OFF	Inspect ABS warning light.	—
BRAKE_LMP (BRAKE system warning light output state)	ON/OFF	- BRAKE system warning light is illuminated: ON - BRAKE system warning light is not illuminated: OFF	Inspect BRAKE system warning light.	—
ABSR_R_O (Right rear ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of ABS (ABS/TCS) HU/CM. Replace ABS (ABS/TCS) HU/CM. (See P-28 ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION)	—

ON-BOARD DIAGNOSTIC (ABS/TCS)

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS (ABS/ TCS) HU/CM/ CM terminal
ABSLR_O (Left rear ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS or EBD control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS and EBD control: OFF (solenoid valve is deactivated)	Internal fault of ABS (ABS/TCS) HU/CM. Replace ABS (ABS/TCS) HU/CM. (See P-28 ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION)	—
ABSRF_O (Right front ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of ABS (ABS/TCS) HU/CM. Replace ABS (ABS/TCS) HU/CM. (See P-28 ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION)	—
ABSLF_O (Left front ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of ABS (ABS/TCS) HU/CM. Replace ABS (ABS/TCS) HU/CM. (See P-28 ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION)	—
ABSRRL_I (Right rear ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of ABS (ABS/TCS) HU/CM. Replace ABS (ABS/TCS) HU/CM. (See P-28 ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION)	—
ABSLR_I (Left rear ABS pressure retention solenoid valve output state)	ON/OFF	- During ABS or EBD control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS and EBD control: OFF (solenoid valve is deactivated)	Internal fault of ABS (ABS/TCS) HU/CM. Replace ABS (ABS/TCS) HU/CM. (See P-28 ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION)	—
ABSRF_I (Right front ABS pressure retention solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of ABS (ABS/TCS) HU/CM. Replace ABS (ABS/TCS) HU/CM. (See P-28 ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION)	—
ABSLF_I (Left front ABS pressure retention solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of ABS (ABS/TCS) HU/CM. Replace ABS (ABS/TCS) HU/CM. (See P-28 ABS (ABS/TCS) HU/CM REMOVAL/INSTALLATION)	—
ABSVLVRLY (Fail-safe relay output state)	ON/OFF	- Fail-safe relay is activated: ON - Fail-safe relay is deactivated: OFF	Inspect ABS (ABS/TCS) HU/CM. (See P-29 ABS (ABS/TCS) HU/CM INSPECTION)	—
ABSPMPRLY (Motor relay output state)	ON/OFF	- Motor relay is activated: ON - Motor relay is deactivated: OFF	Inspect ABS (ABS/TCS) HU/CM. (See P-29 ABS (ABS/TCS) HU/CM INSPECTION)	—
LF_WSPD (Left front wheel-speed sensor input)	KPH or MPH	- Vehicle is stopped: 0 KPH {0 MPH} - Vehicle is driving: Indicates vehicle speed	Inspect wheel-speed sensor/sensor rotor.	E, I

ON-BOARD DIAGNOSTIC (ABS/TCS)

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS (ABS/ TCS) HU/CM/ CM terminal
RF_WSPD (Right front wheel-speed sensor input)	KPH or MPH	- Vehicle is stopped: 0 KPH {0 MPH} - Vehicle is driving: Indicates vehicle speed	Inspect wheel-speed sensor/sensor rotor.	D, G
LR_WSPD (Left rear wheel-speed sensor input)	KPH or MPH	- Vehicle is stopped: 0 KPH {0 MPH} - Vehicle is driving: Indicates vehicle speed	Inspect wheel-speed sensor/sensor rotor.	C, F
RR_WSPD (Right rear wheel-speed sensor input)	KPH or MPH	- Vehicle is stopped: 0 KPH {0 MPH} - Vehicle is driving: Indicates vehicle speed	Inspect wheel-speed sensor/sensor rotor.	A, B
ABS_VOLT (System battery voltage value)	V	- Ignition key at ON: B+ - Idle: Approx. 14—16 V	Inspect power supply circuit. (See P-29 ABS (ABS/TCS) HU/CM INSPECTION)	Z

Active Command Mode

Command Name	Definition	Operation	Note
ABS_POWER	Fail-safe relay	ON/OFF	Ignition key at ON (Engine OFF), and driving
LR_OUTLET	Left rear ABS pressure reduction solenoid valve	ON/OFF	
LR_INLET	Left rear ABS pressure retention solenoid valve	ON/OFF	
RR_INLET	Right rear ABS pressure retention solenoid valve	ON/OFF	
RR_OUTLET	Right rear ABS pressure reduction solenoid valve	ON/OFF	
LF_INLET	Left front ABS pressure retention solenoid valve	ON/OFF	
LF_OUTLET	Left front ABS pressure reduction solenoid valve	ON/OFF	
RF_INLET	Right front ABS pressure retention solenoid valve	ON/OFF	
RF_OUTLET	Right front ABS pressure reduction solenoid valve	ON/OFF	
PMP_MOTOR	ABS motor	ON/OFF	
VS_OUTPUT	Vehicle speed signal output	SPEED	

DTC B1318

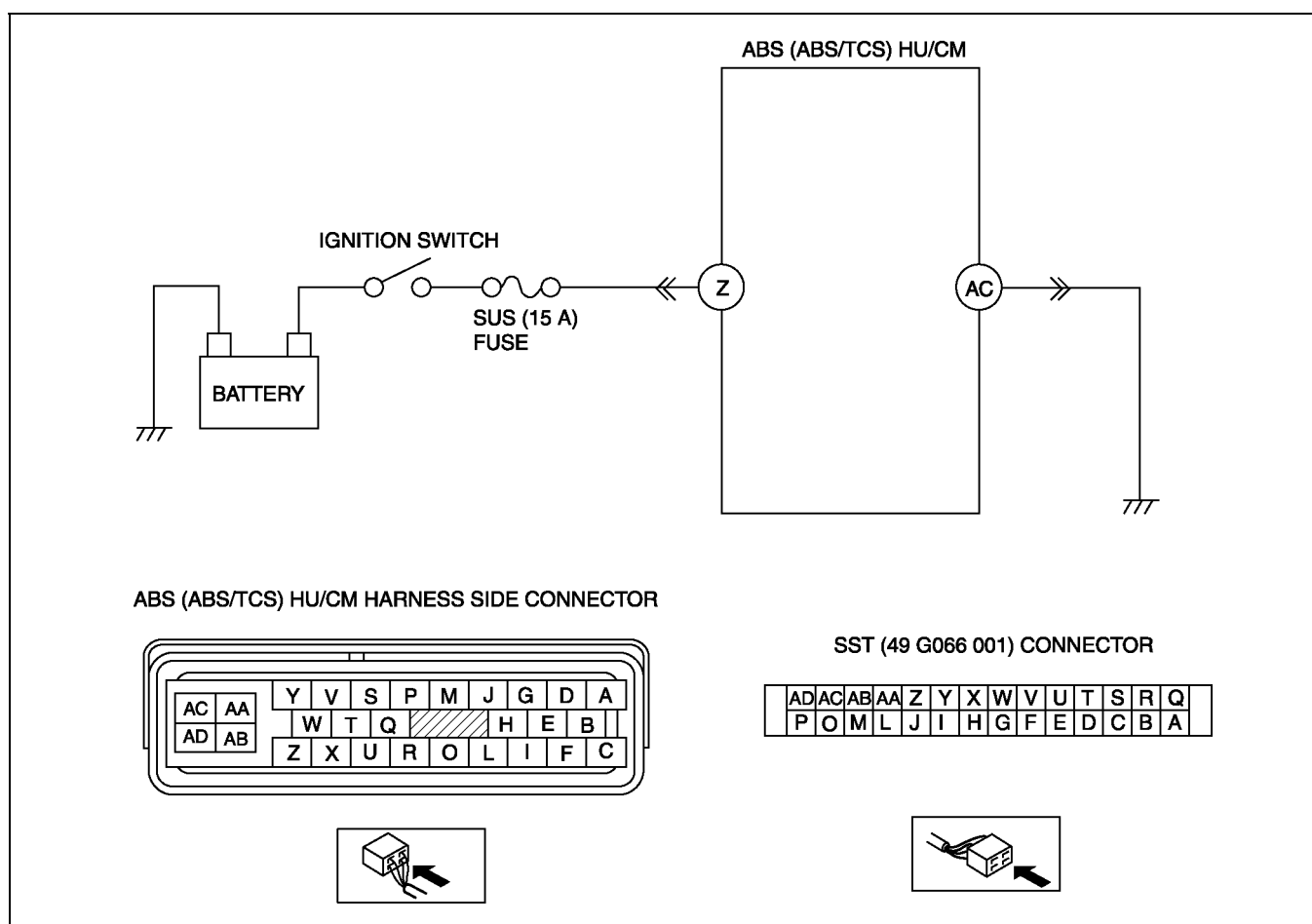
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Caution

- When attaching the tester lead to the ABS (ABS/TCS) HU/CM harness connector, the SST (49 G066 001) must be used. (See [P-29 ABS \(ABS/TCS\) HU/CM INSPECTION](#).)

DTC B1318		ABS (ABS/TCS) power supply
DETECTION CONDITION	Low voltage is detected at the voltage monitor of solenoid valve monitor, or the motor monitor.	
POSSIBLE CAUSE	- Malfunction of fuse (SUS 15 A) - Open or short to power circuit in harness between DSC HU/CM terminal G and battery positive terminal - Open circuit in harness between body ground and ABS (ABS/TCS) HU/CM terminal A - Battery and/or generator malfunction	

ON-BOARD DIAGNOSTIC (ABS/TCS)



Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT BATTERY VOLTAGE • Is battery terminal voltage okay?	Yes	Make sure that battery terminal connection is okay. Go to next step.
		No	Charge or replace battery, then go to Step 6.
2	INSPECT BATTERY GRAVITY • Is battery specific gravity as specified?	Yes	Go to next step.
		No	Replace battery, then go to Step 6.
3	INSPECT CHARGING SYSTEM • Are generator and drive belt tension okay?	Yes	Go to next step.
		No	Adjust drive belt tension as necessary. Replace generator and/or drive belt as necessary.
4	INSPECT ABS (ABS/TCS) HU/CM POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT • Start engine. • Measure voltage between ABS (ABS/TCS) HU/CM terminal Z and ground. • Is voltage above 10 V ?	Yes	Go to next step.
		No	Go to Step 6.
5	INSPECT ABS (ABS/TCS) HU/CM GROUND CIRCUIT FOR POOR GROUND OR OPEN CIRCUIT • Turn ignition key to OFF. • Measure resistance between ground and DSC HU/CM terminal AC. • Is resistance within 0—1 ohm ?	Yes	Go to next step.
		No	If there is no continuity: • Repair or replace harness for open circuit between ABS (ABS/TCS) HU/CM and ground, then go to next step. If resistance is not within 0—1 ohm : • Repair or replace harness for poor ground then go to next step.
6	VERIFY TROUBLESHOOTING COMPLETED • Make sure to reconnect all disconnected connectors. • Clear DTC from memory. (See P-46 Clearing DTCs Procedures) • Is same DTC present?	Yes	Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE • Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC (ABS/TCS)

DTC B1342

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Caution

- When attaching the tester lead to the ABS (ABS/TCS) HU/CM harness connector, the SST (49 G066 001) must be used. (See [P-29 ABS \(ABS/TCS\) HU/CM INSPECTION.](#))

DTC	B1342	ABS (ABS/TCS) HU/CM
DETECTION CONDITION	The on-board diagnostic function detects control module malfunction.	
POSSIBLE CAUSE	Malfunction of ABS (ABS/TCS) HU/CM	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY CURRENT STATUS OF MALFUNCTION - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Is same DTC present?	Yes Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No Inspect intermittent concern using the same procedure as engine control system.
2	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC C1095, C1096

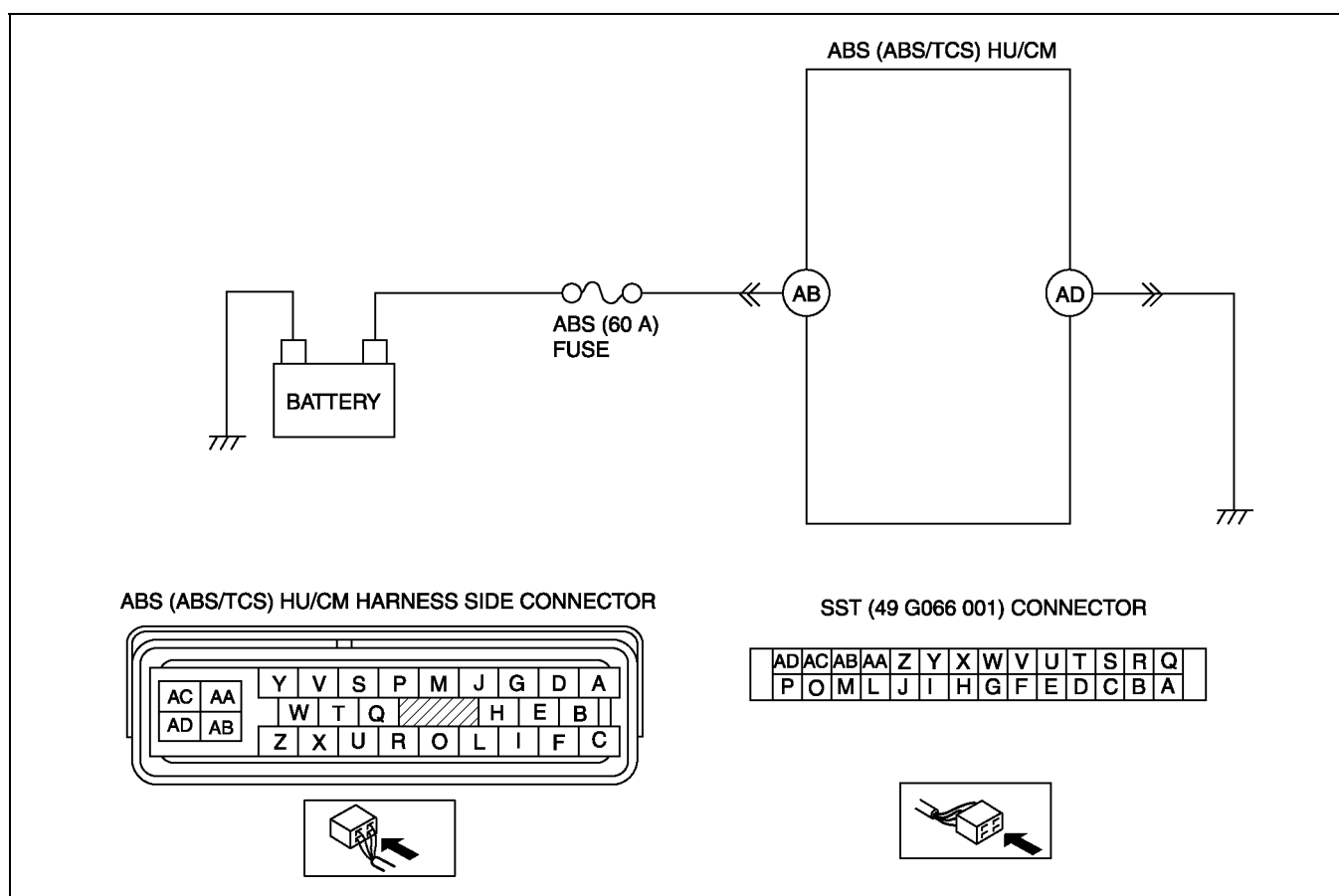
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Caution

- When attaching the tester lead to the ABS (ABS/TCS) HU/CM harnesses connector the SST (49 G066 001) must be used. (See [P-29 ABS \(ABS/TCS\) HU/CM INSPECTION.](#))

DTC	C1095, C1096	Motor relay, pump motor
DETECTION CONDITION	- C1095: - ABS motor stuck OFF when vehicle is started or during ABS operation, ABS motor ON is commanded. - C1096: - ABS motor stuck OFF when vehicle is started or during ABS operation, ABS motor ON is commanded. - Motor monitor ON signal is not input after specified time when the motor signal is switched from ON to OFF by ABS (ABS/TCS) HU/CM.	
POSSIBLE CAUSE	- Open, or short to power or short to ground of motor relay and/or ABS motor in ABS (ABS/TCS) HU/CM - Stuck motor relay and/or ABS motor - Open circuit of ABS motor power supply - Open circuit of ABS motor ground	

ON-BOARD DIAGNOSTIC (ABS/TCS)



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY OTHER DTC HAS BEEN RECORDED If any of DTC C1186 and/or C1266 has also been stored?	Yes
		No
2	INSPECT ABS FUSE CONDITION Is ABS fuse (60 A) okay?	Yes
		No
3	INSPECT MOTOR RELAY POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect ABS (ABS/TCS) HU/CM connector. - Connect SST (adapter harness) to ABS (ABS/TCS) HU/CM connector (harness side only). - Turn ignition key to ON (engine OFF). - Measure voltage between ABS (ABS/TCS) HU/CM terminal AB (harness side) of SST and ground. - Is voltage B+?	Yes
		No
4	INSPECT PUMP MOTOR GROUND CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Inspect continuity between ABS (ABS/TCS) HU/CM terminal AD (harness side) of SST and ground. - Is there continuity?	Yes
		No

ON-BOARD DIAGNOSTIC (ABS/TCS)

STEP	INSPECTION	ACTION	
5	VERIFY PUMP MOTOR OPERATION - Turn ignition key to OFF. - Remove SST (adapter harness) and connect all disconnected connectors. - Connect WDS or equivalent to DLC-2. - Turn ignition key to ON (engine OFF). - Access ABS_POWER and PMP_MOTOR active command modes using WDS or equivalent. - Does pump motor operate?	Yes	Go to next step.
		No	Repair ABS (ABS/TCS) HU/CM, then go to next step.
6	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Gradually slow down and stop vehicle. - Is same DTC present?	Yes	Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No	Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.

DTC C1119

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DTC C1119	Engine control system, torque reduction inhibit signal line
DETECTION CONDITION	- Engine RPM information through CAN is out of specification or invalid value - Throttle information through CAN is out of specification or invalid value
POSSIBLE CAUSE	Malfunction of PCM

PCM

ABS (ABS/TCS) HU/CM

ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR

SST (49 G066 001) CONNECTOR

PCM HARNESS SIDE CONNECTOR

ON-BOARD DIAGNOSTIC (ABS/TCS)

Diagnostic procedure

STEP	INSPECTION	ACTION
1	CHECK FOR CAN FOR DTCs If any of DTC U1900 and/or U2516 has also been stored?	Yes Follow inspection procedures for CAN system. See T-144 DTC U0073, U1900, U2516
		No Go to next step.
2	CHECK FOR PCM FOR DTCs - Turn ignition key to OFF. - Connect WDS or equivalent to DLC-2 - Turn ignition key to ON (engine OFF). - Is DTC for engine control system obtained?	Yes Follow inspection procedures for engine control system.
		No Go to next step.
3	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine.) - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
4	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC C1140

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Caution

- When attaching the tester lead to the ABS (ABS/TCS) HU/CM harness connector, the SST (49 G066 001) must be used. (See [P-29 ABS \(ABS/TCS\) HU/CM INSPECTION.](#))

DTC	C1140	ABS (ABS/TCS) HU/CM (pump)
DETECTION CONDITION	Right front and left rear wheels, or left front and right rear wheel-lock is detected during ABS (ABS/TCS) operation.	
POSSIBLE CAUSE	Stuck pump motor in ABS (ABS/TCS) HU/CM	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT ABS (ABS/TCS) HU/CM OPERATION - Perform ABS (ABS/TCS) HU/CM system inspection. (See P-27 ABS (ABS/TCS) HU/CM SYSTEM INSPECTION) - Is it okay?	Yes Go to next step.
		No Replace ABS (ABS/TCS) HU/CM, then go to Step 4.
2	INSPECT CONVENTIONAL BRAKE OPERATION - Inspect brake fluid level. - Start engine. - Perform a road test to verify conventional vehicle braking performance. - Is there any concern.	Yes Inspect conventional brake line, then go to Step 4.
		No Go to next step.
3	INSPECT REAR BRAKE DRAGGING - Turn ignition key to OFF. - Jack-up vehicle and support it with safety stand. - Release parking brake. - Turn rear wheel by hand and inspect for rear brake drag. - Is rear brake dragging?	Yes Repair parking brake system, then go to next step.
		No Go to next step.
4	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above at least one minute. - Gradually slow down vehicle and stop. - Is same DTC present?	Yes Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC (ABS/TCS)

DTC C1145, C1155, C1165, C1175

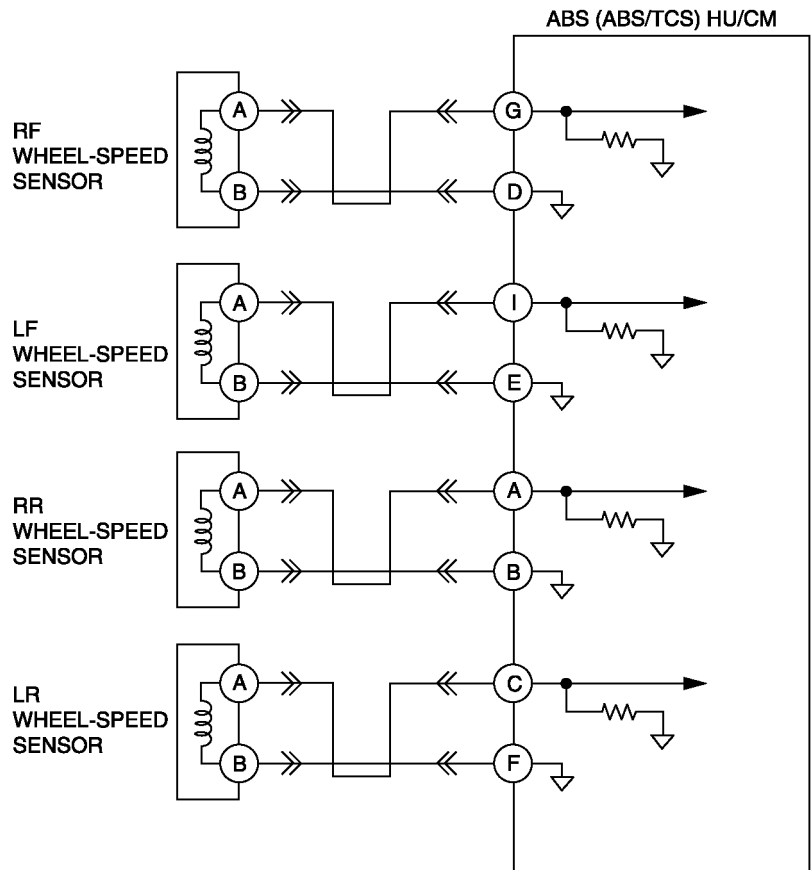
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Caution

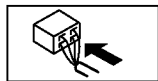
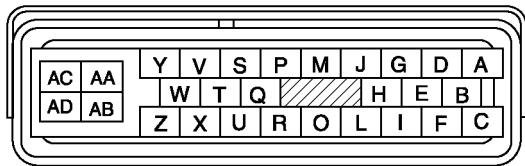
- When attaching the tester lead to the ABS (ABS/TCS) HU/CM harness connector, the SST (49 G066 001) must be used. (See [P-29 ABS \(ABS/TCS\) HU/CM INSPECTION.](#))

DTC	C1145 C1155 C1165 C1175	RF wheel-speed sensor LF wheel-speed sensor RR wheel-speed sensor LR wheel-speed sensor
DETECTION CONDITION	Abnormal input is detected.	
POSSIBLE CAUSE	- Open or short to ground circuit in harness between ABS (ABS/TCS) HU/CM terminal and wheel-speed sensor(s) terminal below — ABS (ABS/TCS) HU/CM terminal G—RF ABS wheel-speed sensor terminal A — ABS (ABS/TCS) HU/CM terminal D—RF ABS wheel-speed sensor terminal B — ABS (ABS/TCS) HU/CM terminal I—LF ABS wheel-speed sensor terminal A — ABS (ABS/TCS) HU/CM terminal E—LF ABS wheel-speed sensor terminal B — ABS (ABS/TCS) HU/CM terminal A—RR ABS wheel-speed sensor terminal A — ABS (ABS/TCS) HU/CM terminal B—RR ABS wheel-speed sensor terminal B — ABS (ABS/TCS) HU/CM terminal C—LR ABS wheel-speed sensor terminal A — ABS (ABS/TCS) HU/CM terminal F—LR ABS wheel-speed sensor terminal B - ABS wheel-speed sensor(s) malfunction	

ON-BOARD DIAGNOSTIC (ABS/TCS)

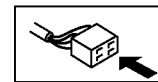


ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR

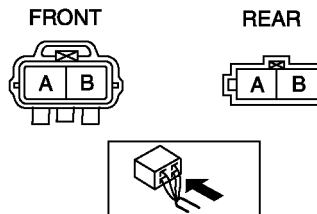


SST (49 G066 001) CONNECTOR

AD	AC	AB	AA	Z	Y	X	W	V	U	T	S	R	Q
P	O	M	L	J	I	H	G	F	E	D	C	B	A



ABS WHEEL-SPEED SENSOR HARNESS SIDE CONNECTOR



ON-BOARD DIAGNOSTIC (ABS/TCS)

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT WHEEL-SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect ABS (ABS/TCS) HU/CM connector. - Measure resistance between suspected sensor terminals of ABS (ABS/TCS) HU/CM connector (harness side). - RF wheel-speed sensor: G—D - LF wheel-speed sensor: I—E - RR wheel-speed sensor: A—B - LR wheel-speed sensor: C—F - Is resistance within 1.3—1.7 kilohm?	Yes	Go to next step.
		No	Go to Step 3.
2	INSPECT WHEEL-SPEED SENSOR CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between suspected sensor terminal(s) of ABS (ABS/TCS) HU/CM connector (harness side) and ground(s). - RF wheel-speed sensor: G—D - LF wheel-speed sensor: I—E - RR wheel-speed sensor: A—B - LR wheel-speed sensor: C—F - Is there continuity?	Yes	Repair or replace harness for short to ground circuit between ABS (ABS/TCS) HU/CM and wheel-speed sensor(s), then go to Step 5.
		No	Go to Step 5.
3	INSPECT WHEEL-SPEED SENSOR - Turn ignition key to OFF. - Disconnect suspected sensor connector(s) and inspect resistance between sensor terminals (part side). - Is resistance within 1.3—1.7 kilohm?	Yes	Go to next step.
		No	Replace wheel-speed sensor, then go to Step 5.
4	INSPECT ABS (ABS/TCS) HU/CM TO WHEEL-SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between suspected sensor terminal(s) of ABS (ABS/TCS) HU/CM connector (harness side) and wheel-speed sensor connector. (vehicle harness side) - RF wheel-speed sensor (+): G—A - RF wheel-speed sensor (–): D—B - LF wheel-speed sensor (+): I—A - LF wheel-speed sensor (–): E—B - RR wheel-speed sensor (+): A—A - RR wheel-speed sensor (–): B—B - LR wheel-speed sensor (+): C—A - LR wheel-speed sensor (–): F—B - Is there continuity?	Yes	Repair or replace poor connections of ABS (ABS/TCS) HU/CM connector and/or wheel-speed sensor connector(s), then go to next step.
		No	Repair or replace harness for open circuits between ABS (ABS/TCS) HU/CM and wheel-speed sensor(s), then go to next step.
5	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes	Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No	Go to next step.
6	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC (ABS/TCS)

DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236

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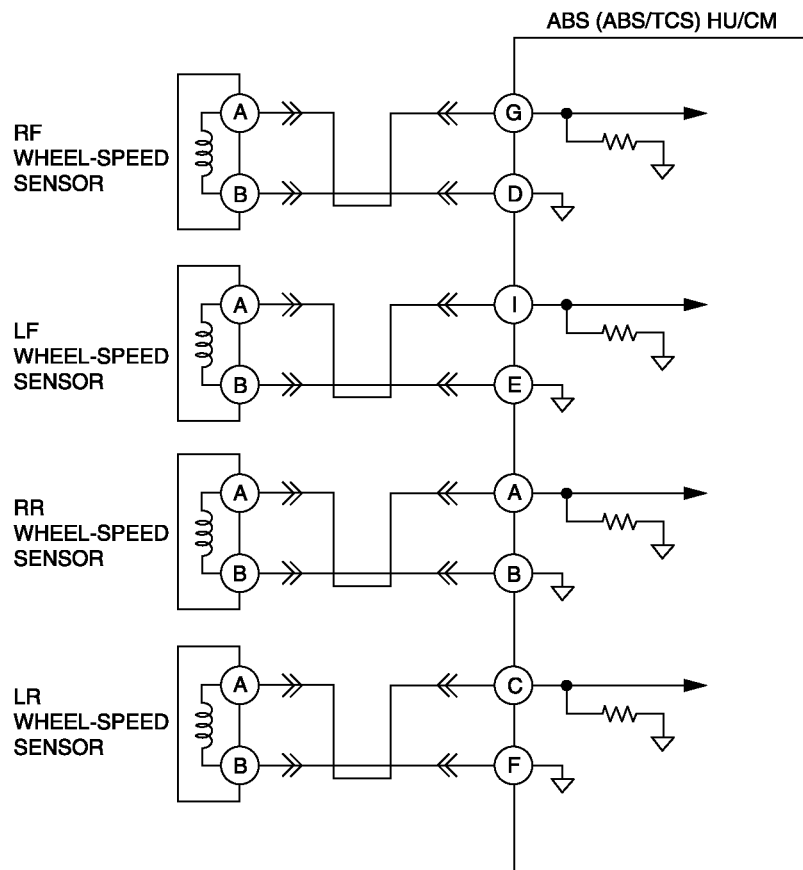
Caution

- When attaching the tester lead to the ABS (ABS/TCS) HU/CM harness connector, the SST (49 G066 001) must be used. (See [P-29 ABS \(ABS/TCS\) HU/CM INSPECTION.](#))

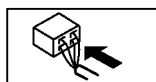
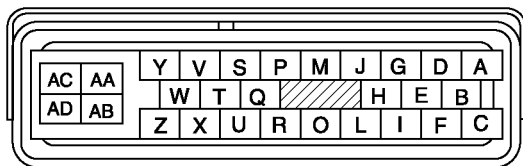
DTC	C1148, C1234 C1158, C1233 C1168, C1235 C1178, C1236	RF wheel-speed sensor/sensor rotor LF wheel-speed sensor/sensor rotor RR wheel-speed sensor/sensor rotor LR wheel-speed sensor/sensor rotor
DETECTION CONDITION	- C1148, C1158, C1168, C1178: - Abnormal sensor output is detected on any of four vehicle wheels when the vehicle goes from start to a speed of 10 km/h {6.2 mph}. - Greater than specified amount of ABS demand occurs from front wheel sensors when vehicle is started. - C1234, C1233, C1235, C1236: - Abnormal sensor output due to chipping of sensor rotor teeth, etc. is detected - ABS control operates for 60 seconds or more	
POSSIBLE CAUSE	- Short to ground circuit of wheel-speed sensor(s) circuit - Malfunction of ABC wheel-speed sensor(s) - Damaged sensor rotor(s) - Incorrect clearance between ABC wheel-speed sensor and sensor rotor - Poor installation of ABC wheel speed sensor and/or sensor rotor (If the sensor rotor is installed twisted, it may cause output of abnormal wave form at high speeds.) - ABS (ABS/TCS) HU/CM internal damage (Solenoid valve malfunction, pump motor malfunction, or pipe clogging)	

P

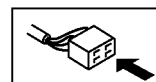
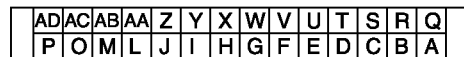
ON-BOARD DIAGNOSTIC (ABS/TCS)



ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR



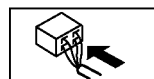
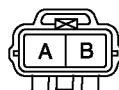
SST (49 G066 001) CONNECTOR



ABS WHEEL-SPEED SENSOR HARNESS SIDE CONNECTOR

FRONT

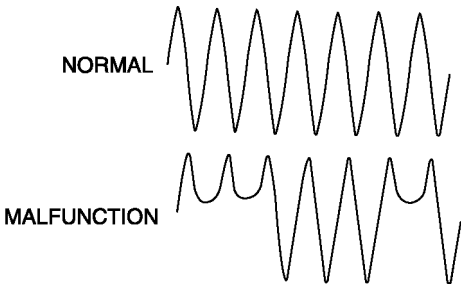
REAR



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY OTHER DTC HAS BEEN RECORDED	Yes	Go to applicable DTC inspection.
	Have DTCs related to solenoid valve, pump motor, or pump motor relay been stored?	No	Go to next step.

ON-BOARD DIAGNOSTIC (ABS/TCS)

STEP	INSPECTION	ACTION	
2	VERIFY IF CURRENT CONCERNED INPUT SIGNAL STATUS IS INTERMITTENT OR CONSTANT • Turn ignition key to OFF. • Connect WDS or equivalent to DLC-2. • Start engine and drive vehicle. • Access LF_WSPD, LR_WSPD, RF_WSPD and RR_WSPD using WDS or equivalent • Do vehicle speeds correspond approximately to the four PIDs above?	Yes	Go to Step 8.
		No	If there is a difference in speed of four wheels: Go to next step. If any wheel speed is 0 km/h {0 mph} : Go to Step 4.
3	INSPECT WHEEL-SPEED SENSOR OUTPUT PULSE • Start engine and drive vehicle. • Inspect output voltage pattern using an oscilloscope.  NORMAL MALFUNCTION • Is output voltage pattern okay?	Yes	Go to Step 9.
		No	Go to Step 6.
4	INSPECT ABS WHEEL-SPEED SENSOR CIRCUIT FOR SHORT TO GROUND • Turn ignition key to OFF. • Disconnect ABS (ABS/TCS) HU/CM and wheel-speed sensor connectors. • Inspect continuity between suspected sensor terminal(s) of ABS (ABS/TCS) HU/CM connector (harness side) and ground(s). — RF wheel-speed sensor: G—ground — LF wheel-speed sensor: I—ground — RR wheel-speed sensor: A—ground — LR wheel-speed sensor: C—ground • Is there continuity?	Yes	Repair or replace harness for short to ground circuit between ABS (ABS/TCS) HU/CM and ABC wheel-spded sensor, then go to Step 9.
		No	Go to next step.
5	INSPECT WHEEL-SPEED SENSOR • Turn ignition key to OFF. • Disconnect suspected wheel-speed sensor connector(s) and inspect resistance between wheel-speed sensor terminal(s) (part side). • Is resistance within 1.3—1.7 kilohm?	Yes	Go to next step.
		No	Replace wheel-speed sensor(s), then go to Step 9.
6	INSPECT SENSOR ROTOR CLEARANCE • Jack-up vehicle and support it with safety stands. • Remove suspected wheel(s). • Inspect clearance between wheel-speed sensor and sensor rotor. • Is clearance within 0.3—1.1 mm {0.012—0.043 in}?	Yes	Go to next step.
		No	Replace wheel-speed sensor(s), then go to Step 9.
7	INSPECT SENSOR ROTOR FOR DAMAGE • Jack-up vehicle and support it with safety stands. • Remove suspected wheel(s). • Visually inspect sensor rotor for missing, deformed and obstructed teeth. Number of teeth: 44 • Is sensor rotor okay?	Yes	Go to next step.
		No	Replace sensor rotor, then go to Step 9.

ON-BOARD DIAGNOSTIC (ABS/TCS)

STEP	INSPECTION	ACTION	
8	INSPECT ABS (ABS/TCS) HU/CM OPERATION - Perform ABS (ABS/TCS) HU/CM system inspection. (See P-27 ABS (ABS/TCS) HU/CM SYSTEM INSPECTION) - Is it okay?	Yes	Go to next step.
		No	Replace ABS (ABS/TCS) HU/CM, then go to next step.
9	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory. See P-46 Clearing DTCs Procedures - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Gradually slow down vehicle and stop. - Is same DTC present?	Yes	Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No	Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

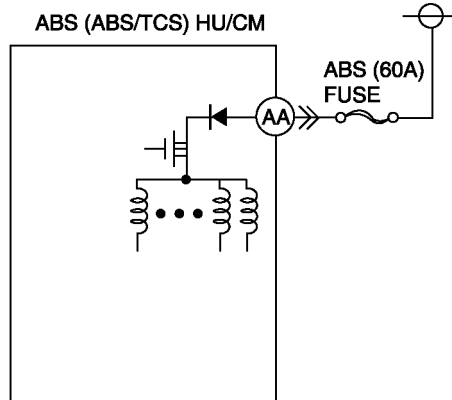
DTC C1186, C1266

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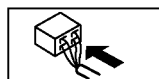
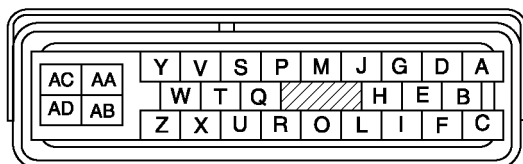
Caution

- When attaching the tester lead to the ABS (ABS/TCS) HU/CM harnesses connector the SST (49 G066 001) must be used. (See [P-29 ABS \(ABS/TCS\) HU/CM INSPECTION](#).)

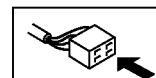
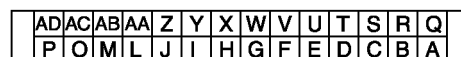
DTC	C1186, C1266	Fail-safe relay
DETECTION CONDITION	- C1186: - Fail-safe relay in ABS (ABS/TCS) HU/CM stuck OFF when ignition switch is turned ON, fail-safe relay ON is commanded. - C1266: - Fail-safe relay in ABS (ABS/TCS) HU/CM stuck ON when ignition switch is turned ON, fail-safe relay OFF is commanded.	
POSSIBLE CAUSE	- Malfunction of fuse (ABS 60 A) - Open circuit in harness between ABS (ABS/TCS) HU/CM terminal AA and battery positive terminal - Open or short of fail-safe relay in ABS (ABS/TCS) HU/CM - Stuck fail-safe relay in ABS (ABS/TCS) HU/CM	



ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR



SST (49 G066 001) CONNECTOR



ON-BOARD DIAGNOSTIC (ABS/TCS)

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT ABS FUSE CONDITION Is ABS fuse (60 A) okay?	Yes
		No
2	INSPECT FAIL-SAFE RELAY POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect ABS (ABS/TCS) HU/CM connector. - Connect SST (adapter harness) to ABS (ABS/TCS) HU/CM connector (harness side only). - Turn ignition key to ON (engine OFF). - Measure voltage between ABS (ABS/TCS) HU/CM terminal AA (harness side) of SST and ground. - Is voltage B+?	Yes
		No
3	VERIFY FAIL-SAFE OPERATION - Turn ignition key to OFF. - Remove SST (adapter harness) and connect all disconnected connectors. - Connect WDS or equivalent to DLC-2. - Turn ignition key to ON (engine OFF). - Access ABS_VOLT using WDS or equivalent. - Does fail-safe relay operate?	Yes
		No
4	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes
		No
5	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes
		No

DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254

A6E697567650W13

DTC	C 1210 C 1214 C 1194 C 1198 C 1246 C 1254 C 1242 C 1250	RF pressure reduction solenoid valve RF pressure retention solenoid valve LF pressure reduction solenoid valve LF pressure retention solenoid valve RR pressure reduction solenoid valve RR pressure retention solenoid valve LR pressure reduction solenoid valve LR pressure reduction solenoid valve
	DETECTION CONDITION Solenoid monitor signal does not track in response to solenoid ON/OFF command.	
POSSIBLE CAUSE - Open, short to power, or short to ground circuit in ABS (ABS/TCS) HU/CM - Stuck solenoid valve in ABS (ABS/TCS) HU/CM		

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY SOLENOID VALVE OPERATION - Turn ignition key to OFF. - Remove SST (adapter harness) and connect all disconnected connectors. - Connect WDS or equivalent to DLC-2. - Turn ignition key to ON (engine OFF). - Access solenoid valve(s) PIDs using WDS or equivalent. - Does solenoid valve operate?	Yes
		No
2	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Gradually slow down and stop vehicle. - Is same DTC present?	Yes
		No
3	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes
		No

ON-BOARD DIAGNOSTIC (ABS/TCS)

DTC C1414

A6E697567650W14

DTC	C1414	ABS (ABS/TCS) HU/CM mismatched installation
DETECTION CONDITION	Detection of situation where vehicle-type or drive system input signal and ABS (ABS/TCS) HU/CM information remains incongruent through CAN information.	
POSSIBLE CAUSE	Mismatched installation of ABS (ABS/TCS) HU/CM	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT ABS (ABS/TCS) UNIT FOR MISMATCHED INSTALLATION - Verify ABS (ABS/TCS) HU/CM part number. - Has a ABS (ABS/TCS) HU/CM with the correct part number been installed?	Yes	Go to next step.
		No	Replace with correct ABS (ABS/TCS) unit part number, then go to Step 3.
2	Configurate ABS (ABS/TCS) HU/CM Does ABS (ABS/TCS) HU/CM configure properly?	Yes	Go to next step.
		No	Replace ABS (ABS/TCS) HU/CM
3	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnected all disconnect connectors. - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes	Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No	Go to next step.
4	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1508

A6E697567650W17

DTC	C1508	TCS control
DETECTION CONDITION	TCS control continues operation for 60 seconds or more	
POSSIBLE CAUSE	System is normal For protection of solenoid valves in the ABS/TCS HU/CM, or protection of the engine, sustained and continual control of TCS is inhibited	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY CURRENT STATUS OF MALFUNCTION - Clear DTC from memory (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Is same DTC present?	Yes	Replace ABS/TCS HU/CM, then go to next step.
		No	Inspect intermittent concern using the same procedure as engine control system.
2	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1510, C1511, C1512, C1513

A6E697567650W15

DTC	C1510 C1511 C1512 C1513	RF solenoid valve, motor or RF wheel-speed sensor/sensor rotor LF solenoid valve, motor or LF wheel-speed sensor/sensor rotor RR solenoid valve, motor or RR wheel-speed sensor/sensor rotor LR solenoid valve, motor or LR wheel-speed sensor/sensor rotor
DETECTION CONDITION	- Wheel lock is detected during ABS operation (pressure reduction inoperative). - Pressure reduction on a single wheel continues for more than 20 seconds.	
POSSIBLE CAUSE	- Malfunction of solenoid valve in ABS (ABS/TCS) HU/CM - Malfunction of wheel-speed sensor - Damaged sensor rotor - Stuck pump motor in ABS (ABS/TCS) HU/CM	

ON-BOARD DIAGNOSTIC (ABS/TCS)

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY OTHER DTC HAS BEEN RECORDED Has any ABS wheel-speed sensor, sensor rotor, solenoid valve, pump motor, or motor relay related DTC been output?	Yes	Go to applicable DTC inspection.
		No	Go to next step.
2	INSPECT ABS (ABS/TCS) HU/CM OPERATION - Perform ABS (ABS/TCS) HU/CM system inspection. (See P-27 ABS (ABS/TCS) HU/CM SYSTEM INSPECTION) - Is it okay?	Yes	Go to next step.
		No	Replace ABS (ABS/TCS) HU/CM, then go to next step.
3	VERIFY CURRENT STATUS OF MALFUNCTION - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above at least one minute. - Gradually slow down and stop vehicle. - Is same DTC present?	Yes	Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No	Go to next step.
4	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC U2021

A6E697567650W16

Note

- To warm up the engine completely, idle the engine and wait for **more than 5 minutes**.

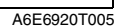
DTC	U2021	Engine coolant temperature
DETECTION CONDITION	After engine is warmed up, engine coolant temperature is 0 °C {32 °F} or less, and TCS operation is inhibited by PCM.	
POSSIBLE CAUSE	System is normal. When engine coolant temperature rises, TCS operation is executed by PCM.	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	CHECK WHETHER ENGINE HAS WARMED UP Has engine warmed up?	Yes	Go to next step.
		No	Warm up the engine. If TCS OFF light goes out, system is normal.
2	VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER ENGINE IS WARMED UP - Warm up the engine. - Is TCS indicator light also illuminated and DTC C1119 obtained?	Yes	Go to DTC C1119 chart.
		No	If TCS OFF light goes out, system is normal. If TCS OFF light does not goes out, go to next step.
3	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes	Replace ABS (ABS/TCS) HU/CM, then go to next step.
		No	Go to next step.
4	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

A6E697367650W01



4	Meter
5	ABS warning light
6	Brake system warning light

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

7	DSC OFF light
8	DSC indicator light
9	CAN driver
10	Battery
11	Cruise actuator
12	DSC OFF switch
13	DLC-2
14	CAN-H
15	CAN-L

16	Wheel-speed sensor
17	Combine sensor
18	Steering angle sensor
19	Brake switch
20	Brake light
21	Back-up light switch (MTX only)
22	Back-up light
23	Audio unit, Wiper and washer switch, Car-navegation unit, Auto leveling control unit

DSC ON-BOARD DIAGNOSIS

A6E697367650W02

On-Board Diagnostic (OBD) Test Description

1. (See [P-46 ABS \(ABS/TCS\) ON-BOARD DIAGNOSIS](#))

DTC Table

DTC	Diagnosis system component	Page
B1318	DSC power supply	(See P-72 DTC B1318)
B1342	DSC HU/CM	(See P-74 DTC B1342)
B1483	Stop switch signal	(See P-74 DTC B1483, B1484, B1486)
B1484	Stop switch signal	(See P-74 DTC B1483, B1484, B1486)
B1486	Stop switch signal	(See P-74 DTC B1483, B1484, B1486)
B1627	Reverse signal	(See P-76 DTC B1627)
B2477	Module configuration	(See P-77 DTC B2477)
C1095	Motor relay, pump motor	(See P-77 DTC C1095, C1096)
C1096	Motor relay, pump motor	(See P-77 DTC C1095, C1096)
C1119	Engine control system	(See P-79 DTC C1119)
C1125	Brake fluid level sensor	(See P-80 DTC C1125)
C1140	DSC HU (pump)	(See P-81 DTC C1140)
C1145	Right front wheel-speed sensor	(See P-81 DTC C1145, C1155, C1165, C1175)
C1148	Right front wheel-speed sensor/sensor rotor	(See P-83 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1155	Left front wheel-speed sensor	(See P-81 DTC C1145, C1155, C1165, C1175)
C1158	Left front wheel-speed sensor/sensor rotor	(See P-83 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1165	Right rear wheel-speed sensor	(See P-81 DTC C1145, C1155, C1165, C1175)
C1168	Right rear wheel-speed sensor/sensor rotor	(See P-83 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1175	Left rear wheel-speed sensor	(See P-81 DTC C1145, C1155, C1165, C1175)
C1178	Left rear wheel-speed sensor/sensor rotor	(See P-83 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1186	Fail-safe relay	(See P-86 DTC C1186, C1266)
C1194	Left front pressure reduction solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1198	Left front pressure retention solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1210	Right front pressure reduction solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1214	Right front pressure retention solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1233	Left front wheel-speed sensor/sensor rotor	(See P-83 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC	Diagnosis system component	Page
WDS or equivalent		
C1234	Right front wheel-speed sensor/sensor rotor	(See P-83 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1235	Right rear wheel-speed sensor/sensor rotor	(See P-83 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1236	Left rear wheel-speed sensor/sensor rotor	(See P-83 DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236)
C1242	Left rear pressure reduction solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1246	Right rear pressure reduction solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1250	Left rear pressure retention solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1254	Right rear ABS pressure retention solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1266	Fail-safe relay	(See P-86 DTC C1186, C1266)
C1280	Combine sensor	(See P-88 DTC C1280, C1730, C1951, C1952, C1959)
C1400	Right front traction switch solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1410	Left front traction switch solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1414	DSC HU/CM	(See P-91 DTC C1414)
C1507	DSC control	(See P-91 DTC C1507, C1508)
C1508	DSC control	(See P-91 DTC C1507, C1508)
C1510	Right front solenoid valve, motor or wheel-speed sensor/sensor rotor	(See P-92 DTC C1510, C1511, C1512, C1513)
C1511	Left front solenoid valve, motor or wheel-speed sensor/sensor rotor	(See P-92 DTC C1510, C1511, C1512, C1513)
C1512	Right rear solenoid valve, motor or wheel-speed sensor/sensor rotor	(See P-92 DTC C1510, C1511, C1512, C1513)
C1513	Left rear solenoid valve, motor or wheel-speed sensor/sensor rotor	(See P-92 DTC C1510, C1511, C1512, C1513)
C1730	Combine sensor	(See P-88 DTC C1280, C1730, C1951, C1952, C1959)
C1951	Combine sensor	(See P-88 DTC C1280, C1730, C1951, C1952, C1959)
C1952	Combine sensor	(See P-88 DTC C1280, C1730, C1951, C1952, C1959)
C1953	Brake fluid pressure sensor	(See P-92 DTC C1953, C1954)
C1954	Brake fluid pressure sensor	(See P-92 DTC C1953, C1954)
C1955	Steering angle sensor	(See P-93 DTC C1955, C1956)
C1956	Steering angle sensor	(See P-93 DTC C1955, C1956)
C1957	Right front DSC switch solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1958	Left front DSC switch solenoid valve	(See P-87 DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958)
C1959	Combine sensor	(See P-88 DTC C1280, C1730, C1951, C1952, C1959)
U1900	Can communication	(See T-144 DTC U0073, U1900, U2516)
U2021	Invalid/fault data received	(See P-96 DTC U2021)

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC	Diagnosis system component	Page
WDS or equivalent		
U2516	Can communication	(See T-144 DTC U0073, U1900, U2516)

PID/DATA Monitor Table

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS/TCS HU/ CM or DSC HU/ CM terminal
RPM (Engine speed signal input)	RPM	- Engine is stopped: 0 RPM - Engine is running: Indicates engine speed	Inspect PCM.	—
TRANSGR (Transaxle gear position)	1/2/3/4/P/R/N	- Selector lever position is displayed ATX — D range (1GR): 1 — D range (2GR): 2 — D range (3GR): 3 — D range (4GR): 4 — P position: P — N position: N — R position: R MTX — 1GR: 1 — 2GR: 2 — 3GR: 3 — 4GR: 4 — 5GR: 5 — Neutral: N — Reverse: R	Inspect PCM, TR switch, or DSC HU/CM.	—
TRAC_SW (TCS OFF switch input)	ON/OFF	- TCS (DSC) OFF switch is depressed: ON - TCS(DSC) OFF switch is released: OFF	Inspect TCS(DSC) OFF switch.	AA
TC LVAL (Traction switch solenoid valve (LF-RR))	ON/OFF	- Solenoid valve is activated: ON - Solenoid valve is deactivated: OFF	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
TC RVAL (Traction switch solenoid valve (RF-LR))	ON/OFF	- Solenoid valve is activated: ON - Solenoid valve is deactivated: OFF	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
L_DSC O (Stability control solenoid valve (LF-RR))	ON/OFF	- Solenoid valve is activated: ON - Solenoid valve is deactivated: OFF	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
R_DSC O (Stability control solenoid valve (RF-LR))	ON/OFF	- Solenoid valve is activated: ON - Solenoid valve is deactivated: OFF	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
CCNTABS (Number of continuous codes)	—	DTC is detected: 1—255 DTC is not detected: 0	Perform inspection using appropriate DTC.	—
PMPSTAT (Pump motor output state)	ON/OFF	- Pump motor is activated: ON - Pump motor is deactivated: OFF	Inspect DSC HU/CM. (See P-40 DSC HU/CM INSPECTION)	—
BRK_FLUID (Brake fluid level sensor input)	YES/NO	- Brake fluid is above LOW: YES - Brake fluid is below LOW: NO	Inspect brake fluid level. Inspect brake fluid level sensor.	—

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS/TCS HU/ CM or DSC HU/ CM terminal
BOO_ABS (Brake pedal switch input)	ON/OFF	- Brake pedal is depressed: ON - Brake pedal is released: OFF	Inspect brake switch.	L
ABS_LAMP (ABS warning light driver output state)	ON/OFF	- ABS warning light is illuminated: ON - ABS warning light is not illuminated: OFF	Inspect ABS warning light.	—
BRAKE_LMP (BRAKE system warning light output state)	ON/OFF	- BRAKE system warning light is illuminated: ON - BRAKE system warning light is not illuminated: OFF	Inspect BRAKE system warning light.	—
ABSR_R_O (Right rear ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
ABSL_R_O (Left rear ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS or EBD control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS and EBD control: OFF (solenoid valve is deactivated)	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
ABSR_F_O (Right front ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
ABSL_F_O (Left front ABS pressure reduction solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
ABSR_R_I (Right rear ABS pressure retention solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
ABSL_R_I (Left rear ABS pressure retention solenoid valve output state)	ON/OFF	- During ABS or EBD control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS and EBD control: OFF (solenoid valve is deactivated)	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
ABSR_F_I (Right front ABS pressure retention solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—
ABSL_F_I (Left front ABS pressure retention solenoid valve output state)	ON/OFF	- During ABS control: ON/OFF (solenoid valve is activated/deactivated) - Not ABS control: OFF (solenoid valve is deactivated)	Internal fault of DSC HU/CM. Replace DSC HU/CM. (See P-38 DSC HU/CM REMOVAL/INSTALLATION)	—

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS/TCS HU/ CM or DSC HU/ CM terminal
ABSVLVRLY (Fail-safe relay output state)	ON/OFF	- Fail-safe relay is activated: ON - Fail-safe relay is deactivated: OFF	Inspect DSC HU/CM. (See P-40 DSC HU/CM INSPECTION)	—
ABSPMPRLY (Motor relay output state)	ON/OFF	- Motor relay is activated: ON - Motor relay is deactivated: OFF	Inspect DSC HU/CM. (See P-40 DSC HU/CM INSPECTION)	—
SWA POS (Steering angle sensor input)	DEG	- Steering wheel is in neutral position: 0 DEG - Steering wheel is turned to left: Changes between 0 DEG and -1,638.40 DEG - Steering wheel is turned to right: Changes between 0 DEG and 1,638.35 DEG	Inspect steering angle sensor.	R, U, W, X
LF_WSPD (Left front wheel-speed sensor input)	KPH or MPH	- Vehicle is stopped: 0 KPH {0 MPH} - Vehicle is driving: Indicates vehicle speed	Inspect wheel-speed sensor/sensor rotor.	F, J
RF_WSPD (Right front wheel-speed sensor input)	KPH or MPH	- Vehicle is stopped: 0 KPH {0 MPH} - Vehicle is driving: Indicates vehicle speed	Inspect wheel-speed sensor/sensor rotor.	I, M
LR_WSPD (Left rear wheel-speed sensor input)	KPH or MPH	- Vehicle is stopped: 0 KPH {0 MPH} - Vehicle is driving: Indicates vehicle speed	Inspect wheel-speed sensor/sensor rotor.	N, Q
RR_WSPD (Right rear wheel-speed sensor input)	KPH or MPH	- Vehicle is stopped: 0 KPH {0 MPH} - Vehicle is driving: Indicates vehicle speed	Inspect wheel-speed sensor/sensor rotor.	H, K
LAT ACC (Lateral-G sensor input)	G	- Vehicle is stopped or driving straight: 0 G - Cornering to left: Changes between 0 G and 1.27 G - Cornering to right: Changes between 0 G and -1.28 G	Inspect ABS wheel-speed sensor/sensor rotor.	O
YAW_RATE (Yaw rate sensor input)	DG/S	- Vehicle is stopped or driving straight: 0 DG/S - Cornering to left: Changes between 0 DG/S and 127 DG/S - Cornering to right: Changes between 0 DG/S and -128 DG/S	Inspect combine sensor. (See P-43 COMBINE SENSOR INSPECTION)	T
MCYLI P (Brake fluid pressure sensor input)	MPA	- Brake pedal is released: 0 MPA - Brake pedal is depressed: Changes between 0 MPA and 25.5 MPA	Inspect DSC HU/CM. (See P-40 DSC HU/CM INSPECTION)	—
TCSOUTD (Torque reduction request value)	%	- Torque reduction is not requested: 0 % - Torque reduction is requested: Changes between 0 % and 100 %	Inspect DSC HU/CM. (See P-40 DSC HU/CM INSPECTION)	—
TPI (Throttle position signal input)	—	- Closed throttle position: 0 - Wide open throttle: Changes between 1 and 7	Inspect PCM and throttle position sensor.	—
ABS_VOLT (System battery voltage value)	V	- Ignition key at ON: B+ - Idle: Approx. 14—16 V	Inspect power supply circuit. (See P-40 DSC HU/CM INSPECTION)	G

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

Active Command Modes Table

Command Name	Definition	Operation	Note
RF_DSC_V	Stability control solenoid valve (RF-LR)	ON/OFF	Ignition key at ON (Engine OFF), and driving
LF_DSC_V	Stability control solenoid valve (LF-RR)	ON/OFF	
ABS_POWER	Fail-safe relay	ON/OFF	
LR_OUTLET	Left rear ABS pressure reduction solenoid valve	ON/OFF	
LR_INLET	Left rear ABS pressure retention solenoid valve	ON/OFF	
RR_INLET	Right rear ABS pressure retention solenoid valve	ON/OFF	
RR_OUTLET	Right rear ABS pressure reduction solenoid valve	ON/OFF	
LF_INLET	Left front ABS pressure retention solenoid valve	ON/OFF	
LF_OUTLET	Left front ABS pressure reduction solenoid valve	ON/OFF	
RF_INLET	Right front ABS pressure retention solenoid valve	ON/OFF	
RF_OUTLET	Right front ABS pressure reduction solenoid valve	ON/OFF	
PMP_MOTOR	ABS motor	ON/OFF	
RF_TC_VLV	Traction switch solenoid valve (RF-LR)	ON/OFF	
LF_TC_VLV	Traction switch solenoid valve (LF-RR)	ON/OFF	
TRAC OFF	Traction control off indicator	ON/OFF	
STAB_IND	DSC indicator light	ON/OFF	
YAWRATE	Yaw rate sensor initialization start	ON/OFF	
LATACCEL	Lateral accel sensor initialization start	TRUE/FALSE	

DTC B1318

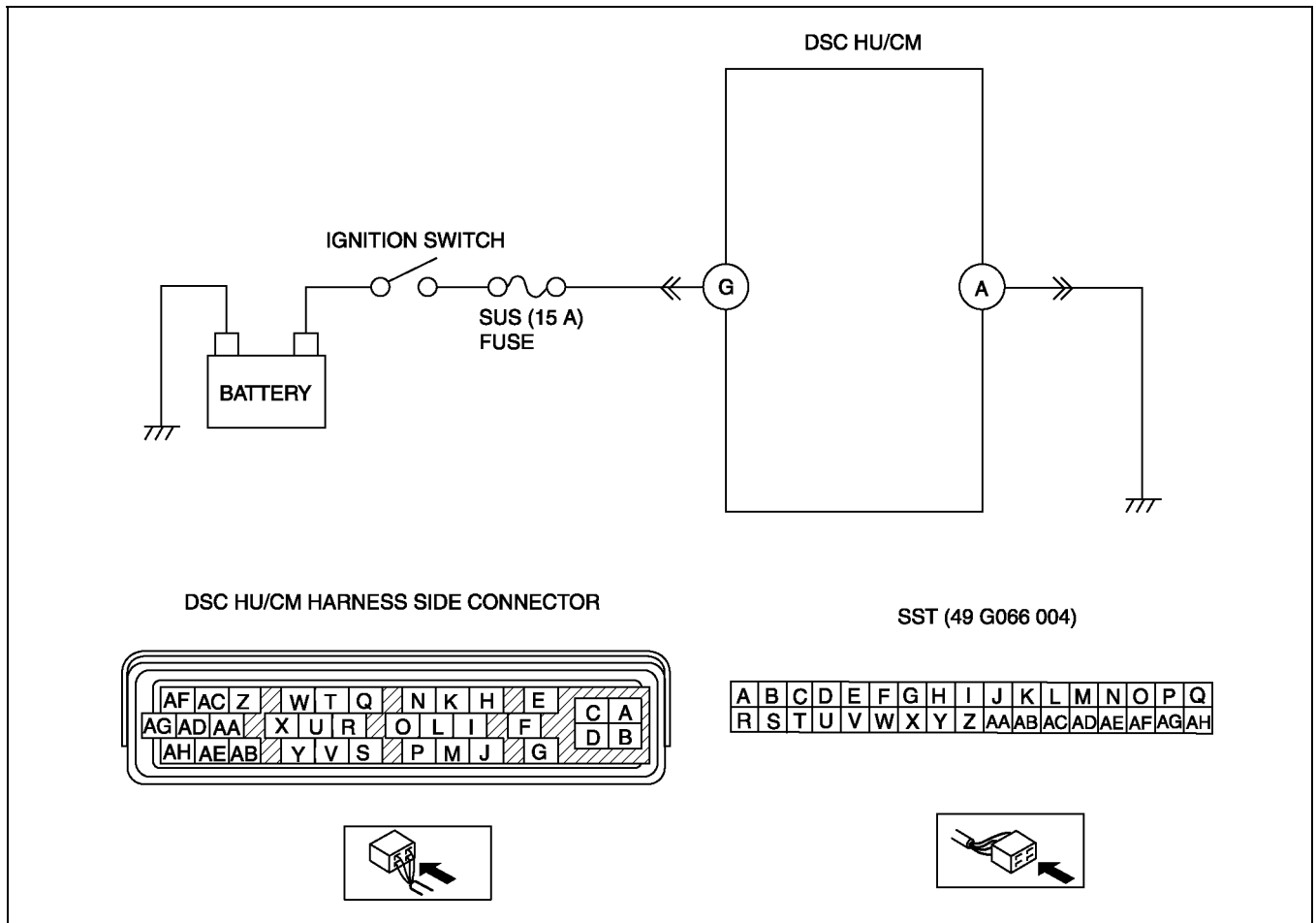
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Caution

- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

DTC B1318		DSC power supply
DETECTION CONDITION	Low voltage is detected at the voltage monitor of solenoid valve monitor, or the motor monitor.	
POSSIBLE CAUSE	- Malfunction of fuse (SUS 15 A) - Open or short to power circuit in harness between DSC HU/CM terminal G and battery positive terminal - Open circuit in harness between body ground and DSC HU/CM terminal A - Battery and/or generator malfunction	

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)



Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT BATTERY VOLTAGE • Is battery terminal voltage okay?	Yes Make sure that battery terminal connection is okay. Go to next step.
		No Charge or replace battery, then go to Step 6.
2	INSPECT BATTERY GRAVITY • Is battery specific gravity as specified?	Yes Go to next step.
		No Replace battery, then go to Step 6.
3	INSPECT CHARGING SYSTEM • Are generator and drive belt tension okay?	Yes Go to next step.
		No Adjust drive belt tension as necessary. Replace generator and/or drive belt as necessary.
4	INSPECT DSC HU/CM POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT • Start engine. • Measure voltage between DSC HU/CM terminal G and ground. • Is voltage above 10 V ?	Yes Go to next step.
		No Go to Step 6.
5	INSPECT DSC HU/CM GROUND CIRCUIT FOR POOR GROUND OR OPEN CIRCUIT • Turn ignition key to OFF. • Measure resistance between ground and DSC HU/CM terminal A. • Is resistance within 0—1 ohm ?	Yes Go to next step.
		No If there is no continuity: • Repair or replace harness for open circuit between DSC HU/CM and ground, then go to next step. If resistance is not within 0—1 ohm : • Repair or replace harness for poor ground, then go to next step.
6	VERIFY TROUBLESHOOTING COMPLETED • Make sure to reconnect all disconnected connectors. • Clear DTC from memory. (See P-46 Clearing DTCs Procedures) • Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE • Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC B1342

A6E697367650W04

Caution

- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

DTC B1342		DSC HU/CM
DETECTION CONDITION	The on-board diagnostic function detects control module malfunction.	
POSSIBLE CAUSE	Malfunction of DSC HU/CM	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY CURRENT STATUS OF MALFUNCTION - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Inspect intermittent concern using the same procedure as engine control system.
2	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC B1483, B1484, B1486

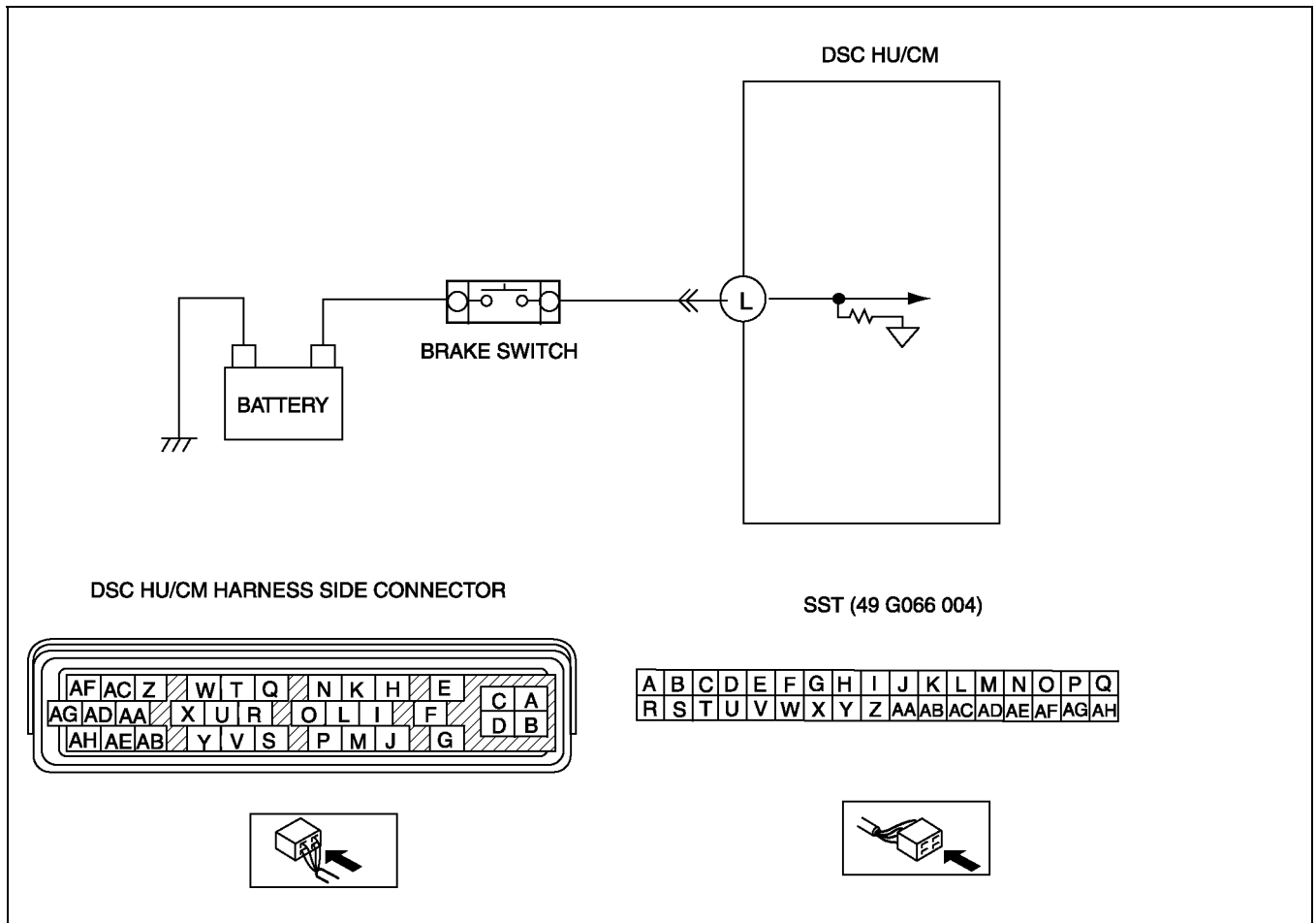
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Caution

- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

DTC B1483, B1484, B1486		Brake switch signal
DETECTION CONDITION	Low voltage is detected at the voltage monitor of solenoid valve monitor, or the motor monitor	
POSSIBLE CAUSE	- B1483 - Malfunction of brake switch - B1484 - Open circuit in harness between DSC HU/CM terminal I and brake switch - B1486 - Short to ground circuit in harness between DSC HU/CM terminal I and brake switch - Short to power circuit in harness between DSC HU/CM terminal I and brake switch	

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT DSC HU/CM TO BRAKE SWITCH FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect DSC HU/CM and brake switch connector - Inspect continuity DSC HU/CM terminal L and brake switch - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between DSC HU/CM and brake switch, then go to next step.
2	INSPECT DSC HU/CM TO BRAKE SWITCH FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity DSC HU/CM terminal L and ground - Is there continuity?	Yes	Repair or replace harness for open circuit between DSC HU/CM and brake switch, then go to next step.
		No	Go to next step.
3	INSPECT BRAKE SWITCH - Inspect brake switch. - Is it okay?	Yes	Go to next step.
		No	Replace brake switch, then go to next step.
4	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes	Replace brake switch, then go to next step.
		No	Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

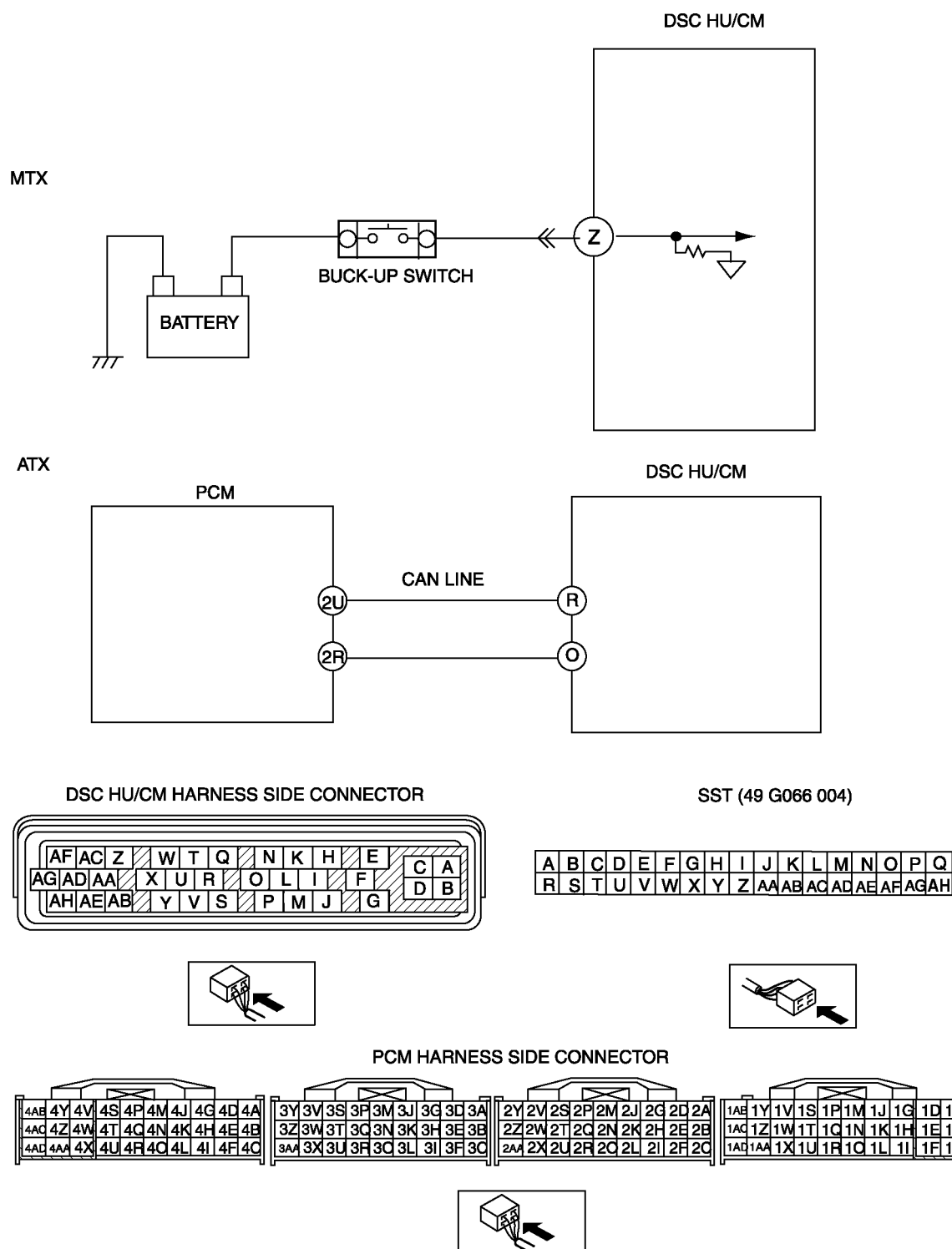
DTC B1627

A6E697367650W06

Caution

- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

DTC B1627	Reverse signal
DETECTION CONDITION	Reverse signal is input for 10 seconds or more while driving at a vehicle speed of 65 km/h {40.3 mph}.
POSSIBLE CAUSE	- Short to power circuit in harness between DSC HU/CM terminal Z and back-up light switch (MTX) - Malfunction of TR switch (ATX) or back-up light switch (MTX)



ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

Diagnostic procedure

STEP	INSPECTION	ACTION
1	CHECK TR SWITCH FOR DTCs (ATX) - Turn ignition key to OFF. - Connect WDS or equivalent to DLC-2. - Turn ignition key to ON (engine OFF). - Is DTC for TR switch obtained?	Yes Follow inspection procedures for TR switch.
		No Go to step 4.
2	INSPECT BACK-UP LIGHT SWITCH (MTX) - Inspect back-up light switch. - Is it okay?	Yes Go to next step.
		No Replace back-up light switch, then go to next step.
3	INSPECT REVERSE SIGNAL CIRCUIT FOR SHORT TO POWER (MTX) - Shift select lever to neutral position. - Turn ignition key to ON. - Measure voltage between DSC HU/CM terminal Z and ground. - Is voltage above 10 V?	Yes Go to next step.
		No Replace back-up light switch, then go to next step. Replace reverse signal circuit, then go to next step.
4	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC B2477

A6E697367650W07

DTC	B2477	Module configuration
DETECTION CONDITION	Configuration write failure is detected.	
POSSIBLE CAUSE	Module configuration procedure is not done properly.	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	CHECK WHETHER DSC HU/CM IS CONFIGURED Is DSC HU/CM configured?	Yes Go to next step.
		No Configure DSC using WDS or equivalent. (See P-29 ABS (ABS/TCS) or DSC HU/CM CONFIGURATION)
2	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
3	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC C1095, C1096

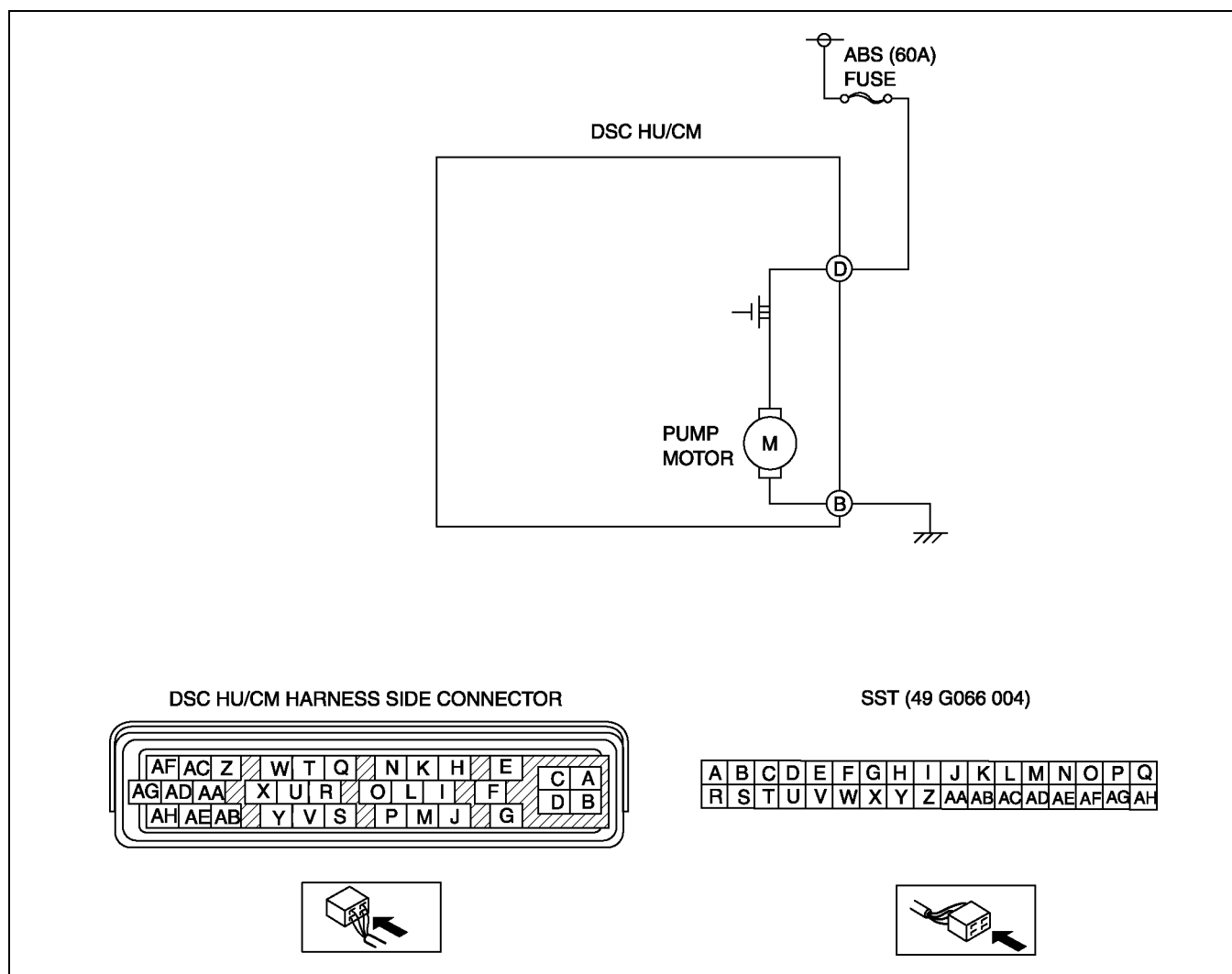
A6E697367650W08

Caution

- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

DTC	C1095, C1096	Motor relay, pump motor
DETECTION CONDITION	- C1095 (54): — No motor monitor signal congruency is detected in relation to DSC HU/CM ON signal. - C1096 (53): — No motor monitor signal congruency is detected in relation to DSC HU/CM OFF signal. — Motor monitor ON signal is not input after specified time when the motor signal is switched from ON to OFF by DSC HU/CM.	
POSSIBLE CAUSE	- Malfunction of fuse (ABS 60 A) - Open circuit in harness between DSC HU/CM terminal D and battery positive terminal - Open circuit in harness between DSC HU/CM terminal B and body ground - Open or short of motor relay and/or pump motor in DSC HU/CM - Stuck motor relay and/or pump motor in DSC HU/CM	

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)



Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY OTHER DTC HAS BEEN RECORDED If any of DTC C1186 and/or C1266 has also been stored?	Yes	Go to applicable DTC inspection.
		No	Go to next step.
2	INSPECT ABS FUSE CONDITION Is ABS fuse (60 A) okay?	Yes	Go to next step.
		No	Replace fuse, then go to Step 6.
3	INSPECT MOTOR RELAY POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect DSC HU/CM connector. - Connect SST (adapter harness) to DSC HU/CM connector (harness side only). - Turn ignition key to ON (engine OFF). - Measure voltage between DSC HU/CM terminal D (harness side) of SST and ground. - Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between battery positive terminal and DSC HU/CM terminal D, then go to Step 9.
4	INSPECT PUMP MOTOR GROUND CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Inspect continuity between DSC HU/CM terminal B (harness side) of SST and ground. - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between DSC HU/CM terminal B and ground, then go to Step 6.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

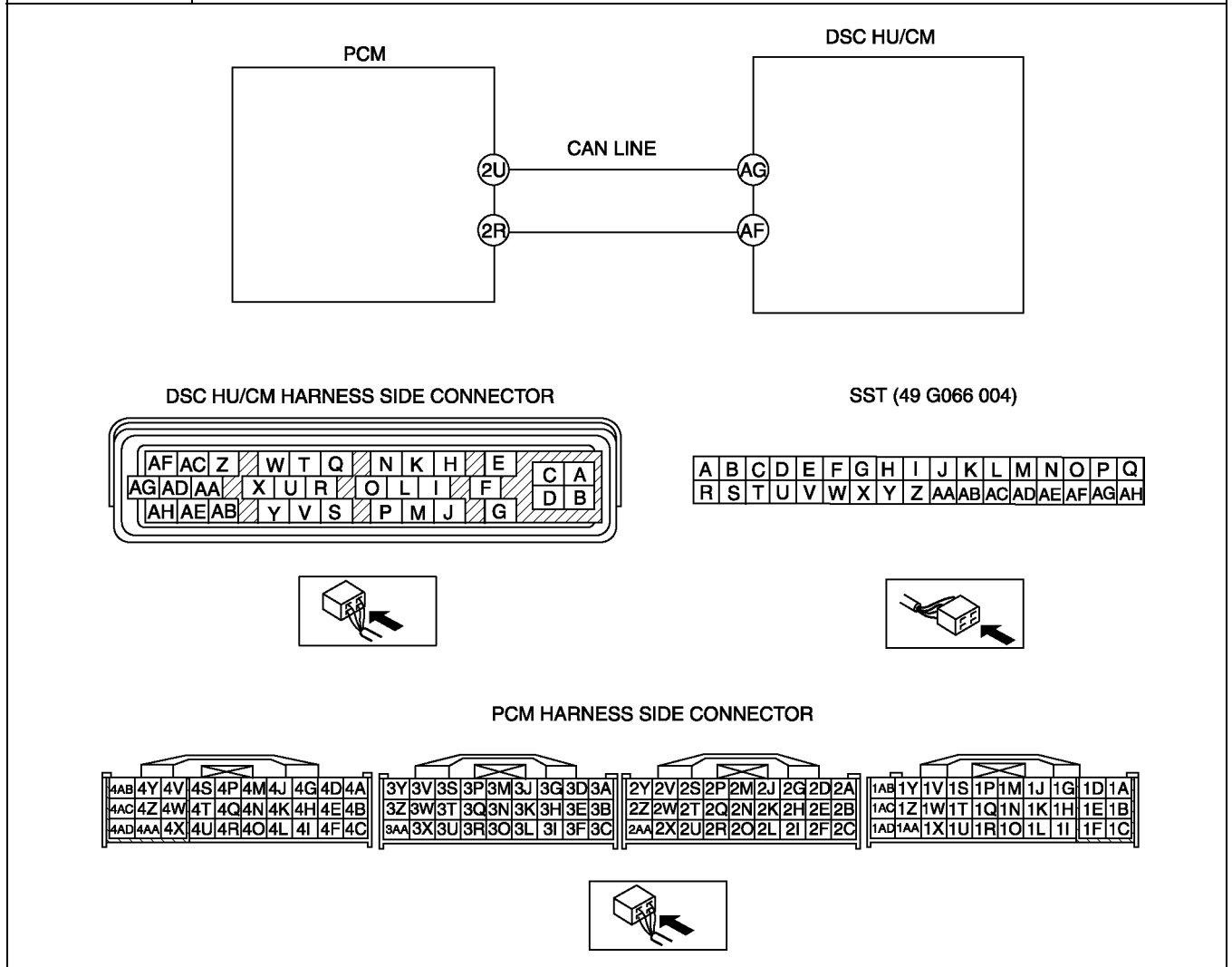
STEP	INSPECTION	ACTION
5	VERIFY PUMP MOTOR OPERATION - Turn ignition key to OFF. - Remove SST (adapter harness) and connect all disconnected connectors. - Connect WDS or equivalent to DLC-2. - Turn ignition key to ON (engine OFF). - Access ABS_POWER and PMP_MOTOR active command modes using WDS or equivalent. - Does pump motor operate?	Yes Go to next step.
		No Repair DSC HU/CM, then go to next step.
6	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Gradually slow down and stop vehicle. - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
7	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC C1119

A6E697367650W09

DTC C1119	Engine control system, torque reduction inhibit signal line
DETECTION CONDITION	- Engine RPM information through CAN is out of specification. - Throttle information through CAN is out of specification.
POSSIBLE CAUSE	- Malfunction of PCM - Malfunction of CAN

P



ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	CHECK FOR PCM FOR DTCs - Turn ignition key to OFF. - Connect WDS or equivalent to DLC-2 - Turn ignition key to ON (engine OFF). - Is DTC for engine control system obtained?	Yes	Follow inspection procedures for engine control system.
		No	Go to next step.
2	MONITOR CAN SIGNAL - Access PID RPM and TP using WDS or equivalent. - Are engine speed and throttle position within specification?	Yes	Go to next step.
		No	Follow inspection procedures for engine control system.
3	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine. - Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Go to next step.

DTC C1125

A6E697367650W10

DTC	C1125	Brake fluid level sensor
DETECTION CONDITION	Brake fluid level remains low for 5 seconds or more.	
POSSIBLE CAUSE	- Decrease in amount of brake fluid - Malfunction of brake fluid level sensor	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	CHECK FOR CAN FOR DTCs Is any of DTC U1900 and/or U2516 has also been stored?	Yes	Follow inspection procedures for CAN system. (See T-144 DTC U0073, U1900, U2516)
		No	Go to next step.
2	INSPECT BRAKE FLUID LEVEL - Inspect brake fluid level. - Is it okay?	Yes	Go to next step.
		No	Add brake fluid to specified level, then go to Step 3.
3	INSPECT BRAKE FLUID LEVEL SENSOR - Turn ignition key to OFF. - Disconnect brake fluid level sensor connector. - Measure resistance between brake fluid level sensor terminals. - Brake fluid level above MIN: resistance about 500 ohms - Brake fluid level below MIN: resistance within 0—1 ohm - Is it okay?	Yes	Go to next step.
		No	Repair brake fluid level sensor, then go to Next step.
4	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC C1140

A6E697367650W11

DTC C1140	DSC HU/CM (pump)
DETECTION CONDITION	Right front and left rear wheels, or left front and right rear wheel-lock is detected during DSC operation.
POSSIBLE CAUSE	Stuck pump motor in DSC HU/CM

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT DSC HU/CM OPERATION - Perform DSC HU/CM system inspection. (See P-35 DSC SYSTEM INSPECTION) - Is it okay?	Yes Go to next step.
		No Replace DSC HU/CM, then go to Step 4.
2	INSPECT CONVENTIONAL BRAKE OPERATION - Inspect brake fluid level. - Start engine. - Perform a road test to verify conventional vehicle braking performance. - Is there any concern.	Yes Inspect conventional brake line, then go to Step 4.
		No Go to next step.
3	INSPECT REAR BRAKE DRAGGING - Turn ignition key to OFF. - Jack-up vehicle and support it with safety stand. - Release parking brake. - Turn rear wheel by hand and inspect for rear brake drag. - Is rear brake dragging?	Yes Repair parking brake system, then go to next step.
		No Go to next step.
4	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above at least one minute. - Gradually slow down vehicle and stop. - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC C1145, C1155, C1165, C1175

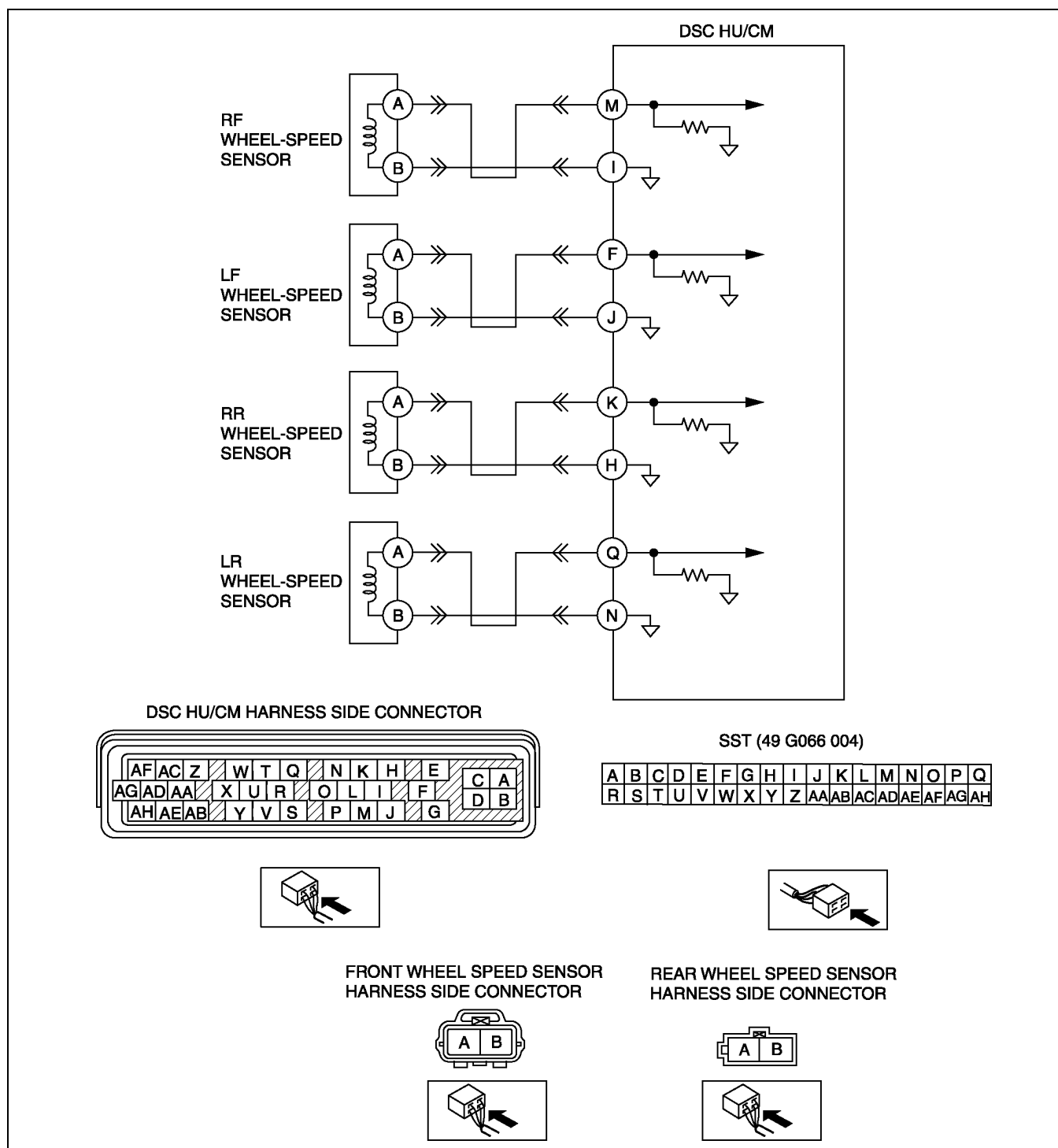
A6E697367650W12

Caution

- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

DTC	C1145 C1155 C1165 C1175	RF wheel-speed sensor LF wheel-speed sensor RR wheel-speed sensor LR wheel-speed sensor
DETECTION CONDITION	Abnormal input is detected.	
POSSIBLE CAUSE	- Open or short to ground circuit in harness between DSC HU/CM terminal and wheel-speed sensor(s) terminal below - DSC HU/CM terminal M—RF wheel-speed sensor terminal A - DSC HU/CM terminal I—RF wheel-speed sensor terminal B - DSC HU/CM terminal F—LF wheel-speed sensor terminal A - DSC HU/CM terminal J—LF wheel-speed sensor terminal B - DSC HU/CM terminal K—RR wheel-speed sensor terminal A - DSC HU/CM terminal H—RR wheel-speed sensor terminal B - DSC HU/CM terminal Q—LR wheel-speed sensor terminal A - DSC HU/CM terminal N—LR wheel-speed sensor terminal B - Malfunction of wheel-speed sensor(s)	

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT WHEEL-SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect DSC HU/CM connector. - Measure resistance between suspected sensor terminals of DSC HU/CM connector (harness side). - RF wheel-speed sensor: M—I - LF wheel-speed sensor: F—J - RR wheel-speed sensor: K—H - LR wheel-speed sensor: Q—N - Is resistance within 1.3—1.7 kilohm?	Yes	Go to next step.
		No	Go to Step 3.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

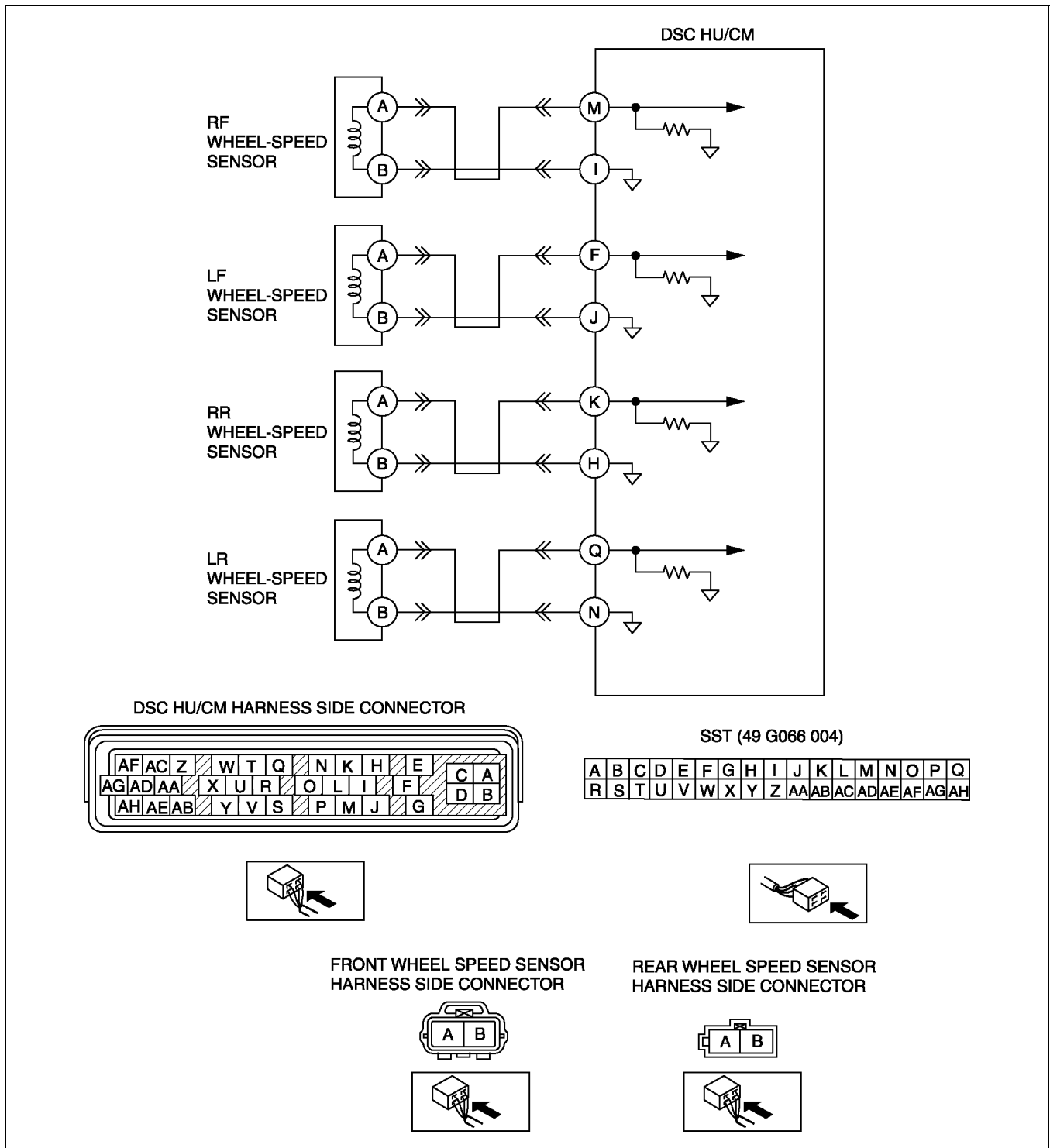
STEP	INSPECTION	ACTION
2	INSPECT WHEEL-SPEED SENSOR CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between suspected sensor terminal(s) of DSC HU/CM connector (harness side) and ground(s). - RF wheel-speed sensor (+): M - RF wheel-speed sensor (-): I - LF wheel-speed sensor (+): F - LF wheel-speed sensor (-): J - RR wheel-speed sensor (+): K - RR wheel-speed sensor (-): H - LR wheel-speed sensor (+): Q - LR wheel-speed sensor (-): N - Is there continuity?	Yes Repair or replace harness for short to ground circuit between DSC HU/CM and wheel-speed sensor(s), then go to Step 5.
		No Go to Step 5.
3	INSPECT WHEEL-SPEED SENSOR - Turn ignition key to OFF. - Disconnect suspected sensor connector(s) and inspect resistance between sensor terminals (part side). - Is resistance within 1.3—1.7 kilohm?	Yes Go to next step.
		No Replace wheel-speed sensor, then go to Step 5.
4	INSPECT DSC HU/CM TO WHEEL-SPEED SENSOR CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between suspected sensor terminal(s) of DSC HU/CM connector (harness side) and wheel-speed sensor connector. (vehicle harness side) - RF wheel-speed sensor (+): M—A - RF wheel-speed sensor (-): I—B - LF wheel-speed sensor (+): F—A - LF wheel-speed sensor (-): J—B - RR wheel-speed sensor (+): K—A - RR wheel-speed sensor (-): H—B - LR wheel-speed sensor (+): Q—A - LR wheel-speed sensor (-): N—B - Is there continuity?	Yes Repair or replace poor connections of DSC HU/CM connector and/or wheel-speed sensor connector(s), then go to next step.
		No Repair or replace harness for open circuits between DSC HU/CM and wheel-speed sensor(s), then go to next step.
5	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
6	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC C1148, C1158, C1168, C1178, C1233, C1234, C1235, C1236

A6E697367650W13

DTC	C1148, C1234 C1158, C1233 C1168, C1235 C1178, C1236	RF wheel-speed sensor/sensor rotor LF wheel-speed sensor/sensor rotor RR wheel-speed sensor/sensor rotor LR wheel-speed sensor/sensor rotor
DETECTION CONDITION	- C1148, C1158, C1168, C1178: - Abnormal sensor output is detected on any of four vehicle wheels when the vehicle goes from start to a speed of 10 km/h {6.2 mph}. - Greater than specified amount of ABS demand occurs from front wheel sensors when vehicle is started. - C1234, C1233, C1235, C1236: - Abnormal sensor output due to chipping of sensor rotor teeth, etc. is detected. - ABS control operates for 60 seconds or more.	
POSSIBLE CAUSE	- Short to ground circuit of wheel-speed sensor(s) circuit - Malfunction of wheel-speed sensor(s) - Damaged sensor rotor(s) - Incorrect clearance between wheel-speed sensor and sensor rotor - Poor installation of wheel speed sensor and/or sensor rotor (If the sensor rotor is installed twisted, it may cause output of abnormal wave form at high speeds). - DSC HU/CM internal damage (Solenoid valve malfunction, pump motor malfunction, or pipe clogging)	

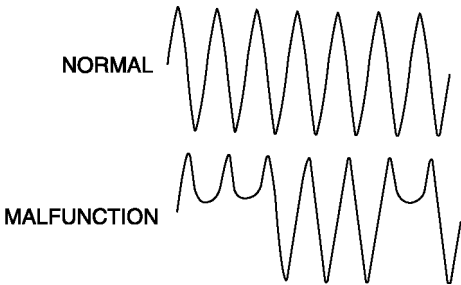
ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY OTHER DTC HAS BEEN RECORDED Have DTCs related to solenoid valve, pump motor, or pump motor relay been stored?	Yes	Go to applicable DTC inspection.
		No	Go to next step.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

STEP	INSPECTION	ACTION	
2	VERIFY IF CURRENT CONCERNED INPUT SIGNAL STATUS IS INTERMITTENT OR CONSTANT • Turn ignition key to OFF. • Connect WDS or equivalent to DLC-2. • Start engine and drive vehicle. • Access LF_WSPD, LR_WSPD, RF_WSPD and RR_WSPD using WDS or equivalent. • Do vehicle speeds correspond approximately to the four PIDs above?	Yes	Go to Step 8.
		No	If there is a difference in speed of four wheels, go to next step. If any wheel speed is 0 km/h {0 mph} , go to Step 4.
3	INSPECT WHEEL-SPEED SENSOR OUTPUT PULSE • Start engine and drive vehicle. • Inspect output voltage pattern using an oscilloscope.  • Is output voltage pattern okay?	Yes	Go to Step 9.
		No	Go to Step 6.
4	INSPECT ABS WHEEL-SPEED SENSOR CIRCUIT FOR SHORT TO GROUND • Turn ignition key to OFF. • Disconnect DSC HU/CM and wheel-speed sensor connectors. • Inspect continuity between suspected sensor terminal(s) of DSC HU/CM connector (harness side) and ground(s). — RF wheel-speed sensor: M—ground — LF wheel-speed sensor: F—ground — RR wheel-speed sensor: K—ground — LR wheel-speed sensor: Q—ground • Is there continuity?	Yes	Repair or replace harness for short to ground circuit between DSC HU/CM and wheel-speed sensor, then go to Step 9.
		No	Go to next step.
5	INSPECT WHEEL-SPEED SENSOR • Turn ignition key to OFF. • Disconnect suspected wheel-speed sensor connector(s) and inspect resistance between wheel-speed sensor terminal(s) (part side). • Is resistance within 1.3—1.7 kilohm?	Yes	Go to next step.
		No	Replace wheel-speed sensor, then go to Step 9.
6	INSPECT SENSOR ROTOR CLEARANCE • Jack-up vehicle and support it with safety stands. • Remove suspected wheel(s). • Inspect clearance between wheel-speed sensor and sensor rotor. • Is clearance within 0.3—1.1 mm {0.012—0.043 in}?	Yes	Go to next step.
		No	Replace wheel-speed sensor(s), then go to Step 9.
7	INSPECT SENSOR ROTOR FOR DAMAGE • Jack-up vehicle and support it with safety stands. • Remove suspected wheel(s). • Visually inspect sensor rotor for missing, deformed and obstructed teeth. Number of teeth: 44 • Is sensor rotor okay?	Yes	Go to next step.
		No	Replace sensor rotor, then go to Step 9.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

STEP	INSPECTION	ACTION	
8	INSPECT DSC HU/CM OPERATION - Perform DSC HU/CM system inspection. - See P-35 DSC SYSTEM INSPECTION - Is it okay?	Yes	Go to next step.
		No	Replace DSC HU/CM, then go to next step.
9	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnect all disconnected connectors. - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Gradually slow down vehicle and stop. - Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Go to next step.
10	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

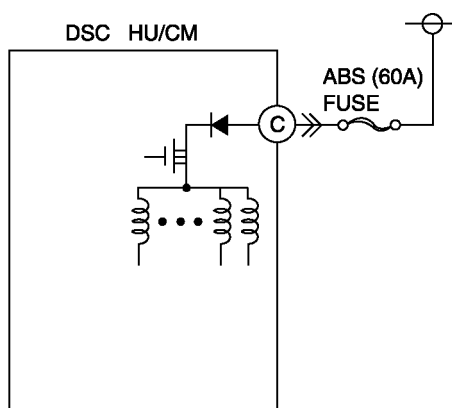
DTC C1186, C1266

A6E697367650W14

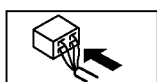
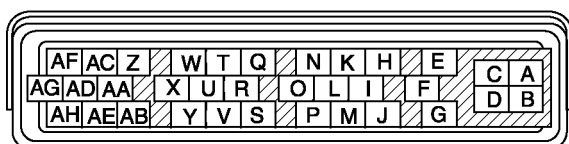
Caution

- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

DTC	C1186, C1266	Fail-safe relay
DETECTION CONDITION	- C1186: - Fail-safe relay in DSC HU/CM stuck OFF when ignition switch is turned ON, fail-safe relay ON is commanded. - C1266: - Fail-safe relay in DSC HU/CM stuck ON when ignition switch is turned ON, fail-safe relay OFF is commanded.	
POSSIBLE CAUSE	- Malfunction of fuse (ABS 60 A) - Open circuit in harness between DSC HU/CM terminal C and battery positive terminal - Open or short of fail-safe relay in DSC HU/CM - Stuck fail-safe relay in DSC HU/CM	

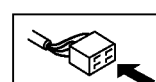


DSC HU/CM HARNESS SIDE CONNECTOR



SST (49 G066 004)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH



ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT ABS FUSE CONDITION Is ABS fuse (60 A) okay?	Yes Go to next step.
		No Replace fuse, then go to Step 4.
2	INSPECT FAIL-SAFE RELAY POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect DSC HU/CM connector. - Connect SST (adapter harness) to DSC HU/CM connector (harness side only). - Turn ignition key to ON (engine OFF). - Measure voltage between DSC HU/CM terminal C (harness side) of SST and ground. - Is voltage B+?	Yes Go to next step.
		No Repair or replace harness for open circuit between battery positive terminal and DSC HU/CM terminal C, then go to Step 4.
4	VERIFY FAIL-SAFE OPERATION - Turn ignition key to OFF. - Remove SST (adapter harness) and connect all disconnected connectors. - Connect WDS or equivalent to DLC-2. - Turn ignition key to ON (engine OFF). - Access ABS_POWER using WDS or equivalent. - Does fail-safe relay operate?	Yes Go to next step.
		No Replace DSC HU/CM, then go to next step.
5	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. - See P-46 Clearing DTCs Procedures - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
6	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958

A6E697367650W15

DTC	C 1210 C 1214 C 1194 C 1198 C 1246 C 1254 C 1242 C 1250 C 1400 C 1410 C 1957 C 1958	RF pressure reduction solenoid valve RF pressure retention solenoid valve LF pressure reduction solenoid valve LF pressure retention solenoid valve RR pressure reduction solenoid valve RR pressure retention solenoid valve LR pressure reduction solenoid valve LR pressure reduction solenoid valve RF traction switch solenoid valve LF traction switch solenoid valve RF DSC switch solenoid valve LF DSC switch solenoid valve
	DETECTION CONDITION Solenoid monitor signal does not track in response to solenoid ON/OFF command.	
	POSSIBLE CAUSE Stuck solenoid valve in DSC HU/CM	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY SOLENOID VALVE OPERATION - Turn ignition key to OFF. - Remove SST (adapter harness) and connect all disconnected connectors. - Connect WDS or equivalent to DLC-2. - Turn ignition key to ON (engine OFF). - Access solenoid valve(s) PIDs using WDS or equivalent. - Does solenoid valve operate?	Yes Go to next step.
		No Repair DSC HU/CM, then go to next step.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

STEP	INSPECTION	ACTION	
2	VERIFY TROUBLESHOOTING COMPLETED • Clear DTC from memory. (See P-46 Clearing DTCs Procedures) • Start engine and drive vehicle at 10 km/h {6.2 mph} or above. • Gradually slow down and stop vehicle. • Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Go to next step.
3	VERIFY AFTER REPAIR PROCEDURE • Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1280, C1730, C1951, C1952, C1959

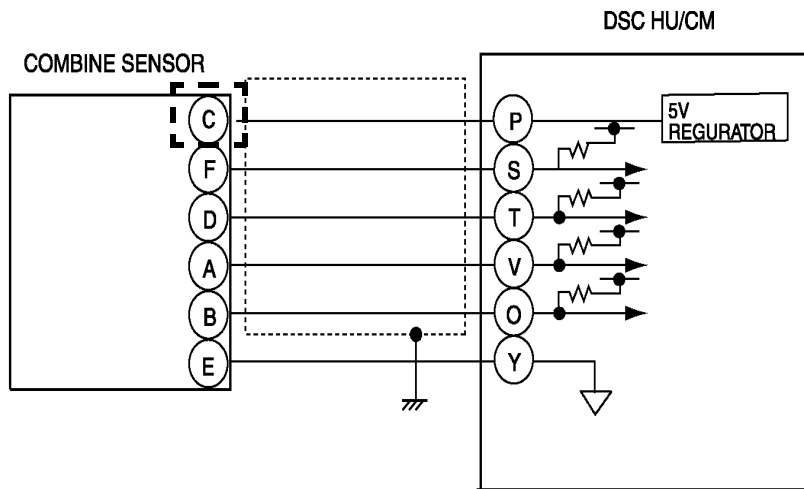
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Caution

- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

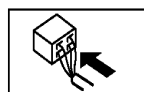
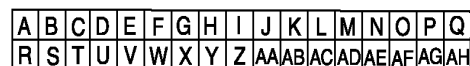
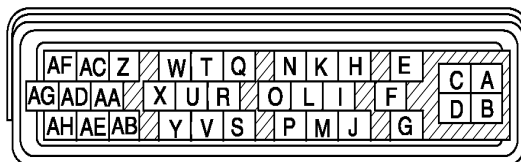
ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC C1280, C1730, C1951, C1952, C1959	Combine sensor
DETECTION CONDITION	• C1280: — Yaw rate sensor part 0-point correction value is 3 or more, or 2 or less. — Output voltage value from yaw rate sensor part remains absolutely unchanged. — Difference between estimated yaw rate value, calculated from wheel speed-sensor, lateral-G sensor, steering angle sensor, and the value output from yaw rate sensor exceeds specification. • C1730 — Voltage to combine sensor is detected out of range. • C1952: — Voltage of yaw rate sensor monitor is detected at 3.5 V or less. • C1951: — Monitor voltage of lateral-G sensor is detected at 4.5 V or more, or 0.5 V or less. — Monitor voltage difference of 1.25 V or more, within 1 cycle is detected 8 times in 1 second. • C1959: — Lateral-G sensor part 0-point correction value is 3 or more, or 2 or less. — Output voltage value from lateral-G sensor part remains absolutely unchanged. — Difference between estimated lateral-G force calculated from steering angle sensor, and the value output from lateral-G sensor exceeds specification.
POSSIBLE CAUSE	• Open circuit in harness between combine sensor terminal C and DSC HU/CM terminal P • Open, short to power, or short to ground circuit in harness between DSC HU/CM terminal T and Combine sensor terminal D • Open circuit, short to power, or short to ground in harness between DSC HU/CM terminal O and combine sensor terminal B • Open circuit in harness between combine sensor terminal E and DSC HU/CM terminal Y • Open circuit, short to power, or short to ground in harness between DSC HU/CM terminal S and combine sensor terminal F • Malfunction of combine sensor

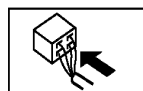
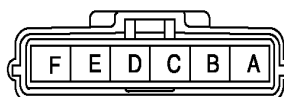


DSC HU/CM HARNESS SIDE CONNECTOR

SST (49 G066 004)



COMBINE SENSOR HARNESS SIDE CONNECTOR



ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT COMBINE SENSOR POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to ON (engine OFF). - Measure voltage between combine sensor terminal C (harness side) of and ground. - Is voltage 4.5—5.5 V?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between yaw rate sensor terminal C and ignition switch, then go to Step 8.
2	INSPECT COMBINE SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect DSC HU/CM and yaw rate sensor connectors. - Inspect continuity between DSC HU/CM terminal Y (harness side) and combine sensor terminal E (harness side). - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between DSC HU/CM terminal Y and yaw rate sensor terminal E, then go to Step 8.
3	INSPECT YAW RATE SENSOR PART SIGNAL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between DSC HU/CM terminal T (harness side) and combine sensor terminal D (harness side). - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between DSC HU/CM terminal T and yaw rate sensor terminal D, then go to Step 8.
4	INSPECT LATERAL-G SENSOR PART SIGNAL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between DSC HU/CM terminal O (harness side) and combine sensor terminal B (harness side). - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between DSC HU/CM terminal O and combine sensor terminal B, then go to Step 8.
5	INSPECT YAW RATE SENSOR PART SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between DSC HU/CM terminal T (harness side) and ground. - Is there continuity?	Yes	Repair or replace harness for short to ground circuit between DSC HU/CM terminal T and combine sensor terminal D, then go to Step 8.
		No	Go to next step.
6	INSPECT LATERAL-G SENSOR PART SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between DSC HU/CM terminal O (harness side) and ground. - Is there continuity?	Yes	Repair or replace harness for short to ground circuit between DSC HU/CM terminal O and combine sensor terminal B, then go to Step 8.
		No	Go to next step.
7	INSPECT DIAGNOSIS SIGNAL CIRCUIT FOR SHORT FOR OPEN - Turn ignition key to OFF. - Inspect continuity between DSC HU/CM terminal S (harness side) and combine sensor terminal F. - Is there continuity?	Yes	Repair or replace harness for open circuit between DSC HU/CM terminal S and combine sensor terminal F, then go to Step 8.
		No	Go to next step.
8	INSPECT DIAGNOSIS SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between DSC HU/CM terminal S (harness side) and combine sensor terminal F. - Is there continuity?	Yes	Repair or replace harness for short to ground circuit between DSC HU/CM terminal S and combine sensor terminal F, then go to Step 8.
		No	Go to next step.
9	INSPECT COMBINE SENSOR - Inspect combine sensor. (See P-43 COMBINE SENSOR INSPECTION) - Is it okay?	Yes	Go to next step.
		No	Replace yaw rate sensor, then go to next step.
10	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Go to next step.
11	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC C1414

A6E697367650W16

DTC C1414	DSC HU/CM mismatched installation
DETECTION CONDITION	Detection of situation where vehicle-type or drive system input signal and DSC HU/CM information remains incongruent through CAN information
POSSIBLE CAUSE	Mismatched installation of DSC HU/CM

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT DSC HU/CM FOR MISMATCHED INSTALLATION - Verify DSC HU/CM part number - Has a DSC HU/CM with the correct part number been installed?	Yes Go to next step.
		No Replace with correct DSC HU/CM part number, then go to Step 7.
2	INSPECT RELATED WIRING HARNESS FOR MISMATCHED INSTALLATION - Verify wiring harness part number - Has a wiring harness with the correct part number been installed?	Yes Go to next step.
		No Replace with correct DSC HU/CM part number, then go to next Step.
3	Configurate ABS (ABS/TCS) HU/CM Can DSC HU/CM configure properly?	Yes Go to next step.
		No Replace DSC HU/CM
4	VERIFY TROUBLESHOOTING COMPLETED - Make sure to reconnected all disconnect connectors. - Clear DTC from memory. See P-46 Clearing DTCs Procedures - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC C1507, C1508

A6E697367650W20

DTC C1507 C1508	DSC control
DETECTION CONDITION	- C1507: — Brake TCS or DSC controls continue operation for 20 seconds or more. - C1508: — Engine TCS control continues operation for 60 seconds or more.
POSSIBLE CAUSE	System is normal For protection of solenoid valves in the DSC HU/CM, or protection of the engine, sustained and continual control of DSC and TCS is inhibited.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY CURRENT STATUS OF MALFUNCTION - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Start engine and drive vehicle at 10 km/h {6.2 mph} or above. - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Inspect intermittent concern using the same procedure as engine control system.
2	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC C1510, C1511, C1512, C1513

A6E697367650W21

DTC	C1510 C1511 C1512 C1513	RF solenoid valve, motor or RF wheel-speed sensor/sensor rotor LF solenoid valve, motor or LF wheel-speed sensor/sensor rotor RR solenoid valve, motor or RR wheel-speed sensor/sensor rotor LR solenoid valve, motor or LR wheel-speed sensor/sensor rotor
DETECTION CONDITION	- Wheel lock is detected during ABS operation (pressure reduction inoperative). - Pressure reduction on a single wheel continues for 20 seconds or more.	
POSSIBLE CAUSE	- Malfunction of solenoid valve in DSC HU/CM - Malfunction of wheel-speed sensor - Damaged sensor rotor - Stuck pump motor in DSC HU/CM	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	VERIFY OTHER DTC HAS BEEN RECORDED Has any wheel speed sensor, sensor rotor, solenoid valve, pump motor, or motor relay related DTC been output?	Yes	Go to applicable DTC inspection.
		No	Go to next step.
2	INSPECT DSC HU/CM OPERATION - Perform DSC HU/CM system inspection. See P-35 DSC SYSTEM INSPECTION - Is it okay?	Yes	Go to next step.
		No	Replace DSC HU/CM, then go to next step.
3	VERIFY CURRENT STATUS OF MALFUNCTION - Clear DTC from memory. See P-46 Clearing DTCs Procedures - Start engine and drive vehicle at 10 km/h {6.2 mph} or above at least one minute. - Gradually slow down and stop vehicle. - Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Go to next step.
4	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1953, C1954

A6E697367650W18

DTC	C1953, C1954	Brake fluid pressure sensor
DETECTION CONDITION	- C1953: - Monitor voltage of the brake fluid pressure sensor is detected at 4.5 V or more, or 0.5 V or less. - Monitor voltage difference of 0.4 V or more within 1 cycle is detected 8 times in 1 second. - C1954: - Brake fluid pressure sensor 0-point correction value is 0.3 V or less, or 0.9 V or more. - Output voltage value from brake fluid pressure sensor does not increase above 0.06 V. - Difference between estimated brake pressure value and output value of brake fluid pressure sensor exceeds specification.	
POSSIBLE CAUSE	Malfunction of brake fluid pressure sensor	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT BRAKE FLUID PRESSURE SENSOR - Inspect PID/DATA in brake fluid pressure sensor. - Inspect MCYLIP item using WDS or equivalent. - Is pressure value change between 0—22.5 MPa when brake pedal is pressed?	Yes	Go to next step.
		No	Repair DSC HU/CM.
2	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Go to next step.
3	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC C1955, C1956

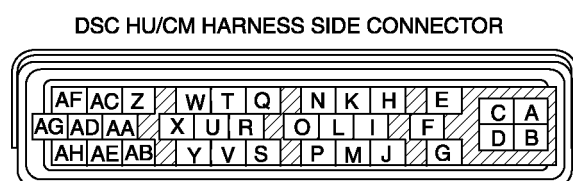
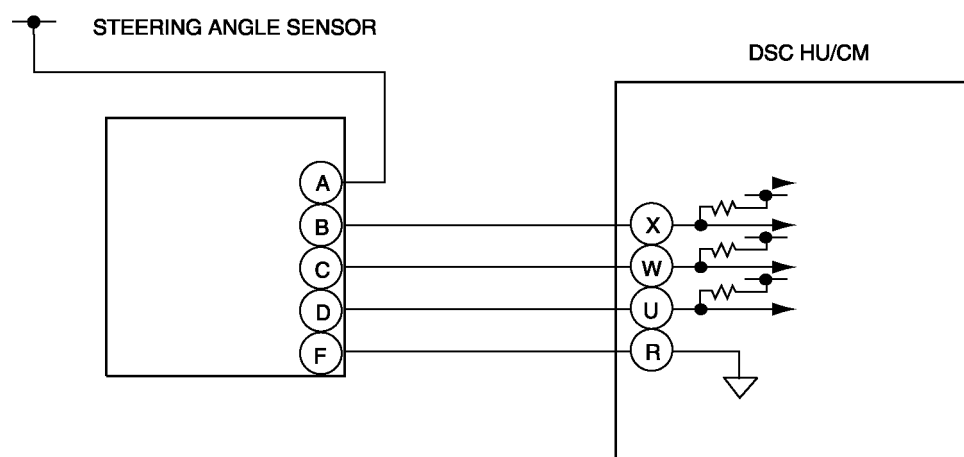
A6E697367650W19

Caution

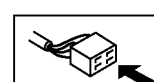
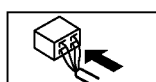
- When attaching the tester lead to the DSC HU/CM connector the SST (49 G066 004) must be used.

DTC	C1955, C1956	Steering angle sensor
DETECTION CONDITION	• C1955: — Output voltages from steering angle sensors 1 and 2 are not at 1 V or less, or not at 3.25 V or more. • C1956: — Sensor 1 voltage remains unchanged, sensor 2 voltage changes. — Sensor 2 voltage remains unchanged, sensor 1 voltage changes. — When steering wheel is turned in specified direction, neutral position is detected even when rotated at 18 degrees or more.j	
POSSIBLE CAUSE	• Open circuit in harness between steering angle sensor terminal A and ignition switch • Open, short to power, or short to ground circuit in harness between DSC HU/CM terminal X and steering angle sensor terminal B • Open, short to power, or short to ground circuit in harness between DSC HU/CM terminal W and steering angle sensor terminal C • Open, short to power, or short to ground circuit in harness between DSC HU/CM terminal U and steering angle sensor terminal D • Open circuit in harness between DSC HU/CM terminal R and steering angle sensor terminal F • Malfunction of steering angle sensor	

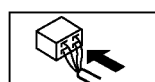
ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)



SST (49 G066 004)



STEERING ANGLE SENSOR
HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to ON (engine OFF). - Measure voltage between steering angle sensor terminal A (harness side) and ground. - Is voltage B+?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between steering angle sensor terminal A and ignition switch, then go to Step 7.
2	INSPECT STEERING ANGLE SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT - Turn ignition key to OFF. - Disconnect DSC HU/CM and steering angle sensor connectors. - Inspect continuity between DSC HU/CM terminal R (harness side) and steering angle sensor terminal F (harness side). - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between DSC HU/CM terminal R and steering angle sensor terminal F, then go to Step 7.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

STEP	INSPECTION	ACTION	
3	INSPECT STEERING ANGLE SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT - Inspect continuity between DSC HU/CM terminal (harness side) and steering angle sensor terminal (harness side) below. - Sensor 1: DSC HU/CM X and steering angle sensor B - Sensor 2: DSC HU/CM W and steering angle sensor C - Neutral: DSC HU/CM U and steering angle sensor D - Is there continuity?	Yes	Go to next step.
		No	Repair or replace harness for open circuit between DSC HU/CM terminal and steering angle sensor terminal, then go to Step 7.
4	INSPECT STEERING ANGLE SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER - Turn ignition key to ON (engine OFF). - Measure voltage between DSC HU/CM terminal (harness side) and ground below. - Sensor 1: DSC HU/CM X and ground - Sensor 2: DSC HU/CM W and ground - Neutral: DSC HU/CM U and ground - Is voltage B+?	Yes	Repair or replace harness for short to power circuit between DSC HU/CM terminal and steering angle sensor terminal, then go to Step 7.
		No	Go to next step.
5	INSPECT STEERING ANGLE SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND - Turn ignition key to OFF. - Inspect continuity between DSC HU/CM terminal (harness side) and ground below. - Sensor 1: DSC HU/CM X and ground - Sensor 2: DSC HU/CM W and ground - Neutral: DSC HU/CM U and ground - Is there continuity?	Yes	Repair or replace harness for short to ground circuit between DSC HU/CM terminal and steering angle sensor terminal, then go to Step 7.
		No	Go to next step.
6	INSPECT STEERING ANGLE SENSOR - Inspect steering angle sensor. (See P-44 STEERING ANGLE SENSOR INSPECTION) - Is it okay?	Yes	Go to next step.
		No	Replace steering angle sensor, then go to next step.
7	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes	Replace DSC HU/CM, then go to next step.
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC (DYNAMIC STABILITY CONTROL)

DTC U2021

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Note

- To warm up the engine completely, idle the engine and wait for **more than 5 minutes**.

DTC U2021	Engine coolant temperature
DETECTION CONDITION	After engine is warmed up, engine coolant temperature is 0 °C {32 °F} or less, and TCS operation is inhibited by PCM.
POSSIBLE CAUSE	System is normal. When engine coolant temperature rises, TCS operation is executed by PCM.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	CHECK WHETHER ENGINE HAS WARMED UP Has engine warmed up?	Yes Go to next step.
		No Warm up the engine. If DSC OFF light goes out, system is normal.
2	VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER ENGINE IS WARMED UP - Warm up the engine. - Is DSC indicator light also illuminated and DTC C1119 obtained?	Yes Go to DTC C1119 chart.
		No If DSC OFF light goes out, system is normal. If DSC OFF light does not go out, go to next step.
3	VERIFY TROUBLESHOOTING COMPLETED - Clear DTC from memory. (See P-46 Clearing DTCs Procedures) - Is same DTC present?	Yes Replace DSC HU/CM, then go to next step.
		No Go to next step.
4	VERIFY AFTER REPAIR PROCEDURE Is there any other DTC present?	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

A6F699067650W01

A6E6921T001

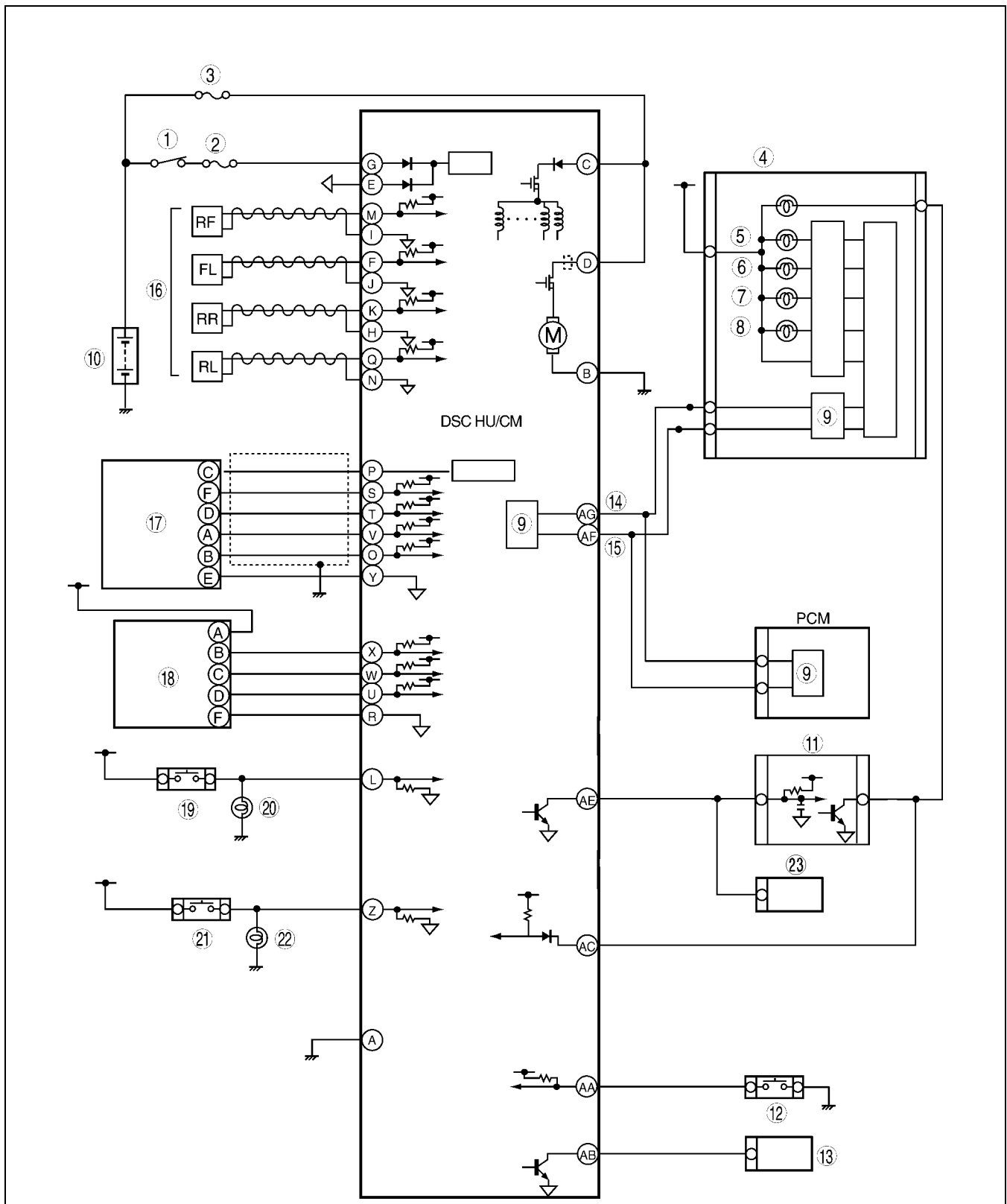
1	IG switch
2	SUS 15 A fuse
3	ABS 60 A fuse
4	Meter
5	ABS warning light
6	Brake system warning light
7	TCS OFF light
8	TCS indicator light
9	CAN driver
10	Brake light

11	Cruise actuator
12	TCS OFF switch
13	DLC-2
14	CAN-H
15	CAN-L
16	ABS Wheel-speed sensor
17	Battery
18	Brake switch
19	Audio unit, Wiper and washer switch, Car-navigation unit, Auto leveling control unit

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TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

DSC



A6E6920T005

1	IG switch
2	SUS 15A fuse
3	ABS 60 A fuse
4	Meter
5	ABS warning light
6	Brake system warning light

7	DSC OFF light
8	DSC indicator light
9	CAN driver
10	Battery
11	Cruise actuator
12	DSC OFF switch

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

13	DLC-2
14	CAN-H
15	CAN-L
16	Wheel-speed sensor
17	Combine sensor
18	Steering angle sensor

19	Brake switch
20	Brake light
21	Back-up light switch (MTX only)
22	Back-up light
23	Audio unit, Wiper and washer switch, Car-navegation unit, Auto leveling control unit

FOREWORD

A6E699067650W02

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic Inspection. To check the DTC, follow the DTC Inspection steps.

PRECAUTION

A6E699067650W03

Vehicles with ABS/TCS

- The ABS warning light, BRAKE system warning light, TCS indicator light and/or TCS OFF light illuminate even when the system is normal.

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD, TCS and DSC control
Any or all the following light(s) illuminate: - ABS warning light - BRAKE system warning light^(*)	Under any of the following conditions: When the front wheels are jacked up, stuck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun for more than 60 seconds.	After turning ignition switch OFF, vehicle is driven at speed greater than 10 km/h {6.2 mph} and normal operation is confirmed.	- ABS: Cuts control. - EBD: - Cuts control, in cases where the light may illuminate, only when ABS CM detects that a wheel speed sensor determines that more than the two rear wheels are malfunctioning. - Operates control, if wheel speed sensor determines that more than 3 wheels are functioning correctly.
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/ deceleration.		
	Left/right or front/rear tires are different. (Size, radius, tire pressure, or wear is other than that listed on tire label.)		
All the following lights illuminate: - ABS warning light - BRAKE system warning light	Battery voltage at ABS-TCS HU/CM ignition terminal Z drops below about 9 to 10 V . ^(*)	Battery voltage rises above about 10 V . (Only BRAKE system warning light goes out.)	ABS: Operates control. EBD: Operates control.

*1 : In cases where the light may illuminate, only when ABS/TCS HU/CM detects that speed sensor of rear wheel is malfunctioning.

*2 : If battery voltage drops **below 9 V** while vehicle speed is **greater than 6 km/h {3.7mph}**, ABS HU/CM records DTC B1318.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD, TCS and DSC control
All the following lights illuminate: TCS OFF light	When the engine coolant temperature is below 0°C {32 F}. ^(*)2)	When engine is started and engine coolant temperature rises above 0°C {32 F}.	ABS: Cuts control. EBD: Cuts control. TCS: 1. If TCS is operating, cuts control after gradually released TCS control value. 2. If TCS is not operating, cuts control.
All the following lights flash: - ABS warning light - BRAKE system warning light Following light illuminates: - TCS OFF light	When confirming DTC,PID/ DATA and ACTIVE COMAND MODES item using WDS or equivalent.	When ABS ON-BOARD DIAGNOSTIC SYSTEM is released.	ABS: Cuts control. EBD: Cuts control. TCS: Cuts control.

*1 : DTC U2021 for past malfunction is not recorded in the ABS/TCS HU/CM. DTC U2021 for present malfunction displayed, but goes out when engine coolant temperature rises **above 0°C {32F}.**

*2 : When malfunctions happen that display DTCs, flashes the ABS warning light.

2. Precautions during servicing of ABS/TCS

The ABS/TCS is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.

(1) Malfunction in electrical system

- The ABS/TCS hydraulic unit and control module (ABS/TCS HU/CM) has an on-board diagnostic function. With this function, the ABS warning light and/or BRAKE system warning light will come on when there is a problem in the electrical system. Also, past and present malfunctions are recorded in the ABS/TCS HU/CM. This function can find malfunctions that do not occur during periodic inspections. Connect the WDS or equivalent to the DLC-2. The stored malfunction will be displayed in the order of occurrence. To find out the causes of ABS/TCS malfunction, use these on-board diagnostic results.
- If malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the harness. The ABS/TCS HU/CM usually operates normally. Be careful when searching for the cause of malfunction.
- After repair, it is necessary to clear the DTC from the ABS/TCS HU/CM memory. Also, if the ABS/TCS related parts have been replaced, verify that the no DTC has been displayed after repairs.
- After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the ABS CM (ABS motor or ABS motor relay or solenoid valve), the ABS warning light may not go off () even when the ignition switch is turned on. In this case, drive the vehicle at a speed of **more than 10km/h{6.2mph}**, make sure that ABS warning light goes off, and then clear the DTC.
 * The BRAKE system warning light also illuminates when any rear wheel malformations.
- When repairing, if the ABS/TCS related connectors are disconnected and the ignition switch is turned on, the ABS/TCS CM will mistakenly detect a fault and record it as a malfunction.
- To protect the ABS/TCS HU/CM, make sure the ignition is off before connecting or disconnecting the ABS/TCS CM connector.
- To protect the terminal, use the **SST** (ABS/TCS: 49 G066 001, DSC: 49 G066 004) when connecting the tester lead to the ABS/TCS HU/CM connector.

(2) Malfunction in hydraulic system

- Symptom in hydraulic system malfunction are similar to those in conventional brake malfunction. However, it is necessary to determine if the malfunction is in an ABS component or the conventional brake system.
- The ABS hydraulic unit contains delicate mechanical parts. If foreign materials get into the component, the ABS may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the ABS does not. Make sure foreign materials do not get inside when servicing the ABS (e.g. brake fluid replacement, pipe removal).

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

Vehicle with DSC

1. The ABS warning light and/or BRAKE system warning light and/or DSC indicator light and/or TSC OFF light illuminate even when the system is normal.

Warning lights that may illuminate and/or flash	Cases in which the light may illuminate	Conditions in which the light will go out	ABS, EBD, TCS and DSC control
- ABS warning light - BRAKE system warning light - DSC indicator light - DSC OFF light	Under any of the following conditions: When the front wheels are jacked up, struck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun for more than 60 seconds.	After turning ignition switch OFF, vehicle is driven at speed greater than 10 km/h {6.2MPH} and normal operation is confirmed.	- ABS: Cuts control. - EBD: Cuts control. - TCS: Cuts control. - DSC: Cuts control.
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/deceleration.		
	Left/right or front/rear tires are different. (Size, radius, tire pressure, or wear is other than that listed on tire label.)		
	Battery voltage at DSC HU/CM ignition terminal drops below about 9.5 V .	Battery voltage rises above about 9.5 V .	ABS: Operates control. EBD: Operates control. TCS: Operates control. DSC: Operates control.
- Brake system warning light - DSC indicator light - TSC OFF light	Brake fluid amount is low.	Brake fluid level lower than recommended amount.	ABS: Operates control. EBD: Operates control. TCS: Cuts control. DSC: Cuts control.

P

2. Precautions during servicing of DSC The DSC is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.

(1) Malfunction in electrical system

- The control module has an on-board diagnostic function. With this function, the ABS warning light and/or BRAKE system warning light and/or DSC indicator light and/or TSC OFF light will come on when there is a problem in the electrical system.
Also, past and present malfunction are recorded in the control module. This function can find malfunction that do not occur during periodic inspections. Connect the WDS or equivalent to the DLC-2. The stored malfunction will be displayed in the order of occurrence. To find out the causes of DSC malfunction, use these on-board diagnostic results.
- If a malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the harness.
The control module usually operates normally. Be careful when searching for the cause of malfunction.
- After repair, it is necessary to clear the DTC from the control module memory.
Also, if the DSC related parts have been replaced, verify that the no DTC has been displayed after repairs.
- After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the control module, the ABS warning light may not go off even when the ignition switch is turned on. In this case, drive the vehicle at a speed of **more than 10 km/h {6.2 mph}**, make sure the ABS warning light goes off, and then clear the DTC.
- When repairing, if the DSC related connectors are disconnected and the ignition switch is turned on, the control module will mistakenly detect a fault and record it as malfunction.

Caution

- In DSC vehicles, when any DSC HU/CM, steering angle sensor, lateral-G sensor, yaw rate sensor are replaced. Perform the sensor standard point installation of each sensor.**
- To protect the control module, make sure the ignition is off before connecting or disconnecting the control module connector.
- To protect the terminal, use the **SST** (ABS/TCS: 49 G066 001, DSC: 49 G066 004) when connecting the tester lead to the DSC HU connector.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

(2) Malfunction in hydraulic system

- Symptom in hydraulic system malfunction are similar to those in a conventional brake malfunction. However, it is necessary to determine if the malfunction is in a DSC component or the conventional brake system.
- The hydraulic unit contains delicate mechanical parts. If foreign materials get into the component, the DSC may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the DSC does not. Make sure foreign materials do not get inside when servicing the DSC (e.g.brake fluid replacement, pipe removal).

Intermittent Concern Troubleshooting

Vibration method

- If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Check the following:
 - Connectors not fully seated.
 - Wire harnesses not having full play.
 - Wires laying across brackets or moving parts.
 - Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wire harnesses pass through the firewall, body panels, etc. are the major areas to be checked.

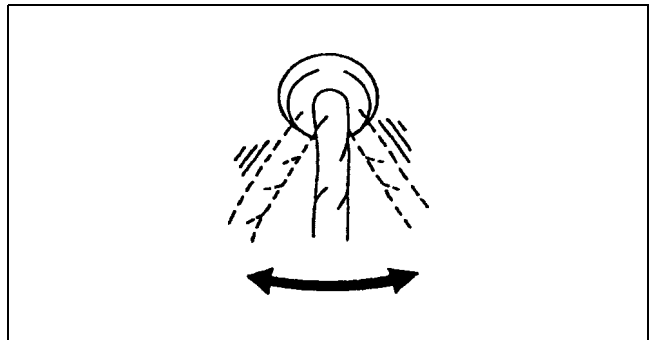
Inspection method for switch connectors or wires

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition key to ON (Engine OFF).

Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Turn switch on manually.
5. Shake each connector or wire harness a bit vertically and horizontally while monitoring the PID.
 - If PID value is unstable, check for poor connection.



YDE6980W003

Inspection method for sensor connectors or wires

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition key to ON (Engine OFF).

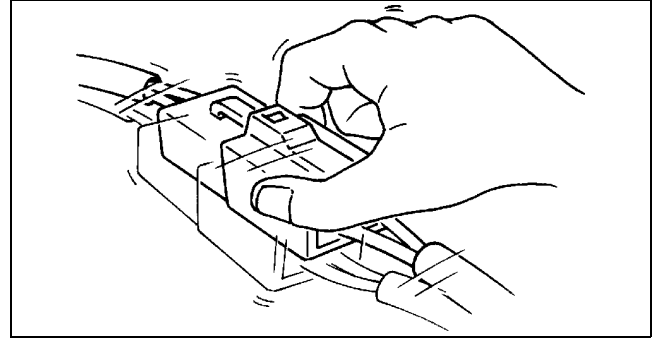
Note

- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

4. Shake each connector or wire harness a bit vertically and horizontally while monitoring the PID.
 - If PID value is unstable, check for poor connection.



YDE6980W002

Inspection method for sensors

1. Connect WDS or equivalent to DLC-2.
2. Turn ignition key to ON (Engine OFF).

Note

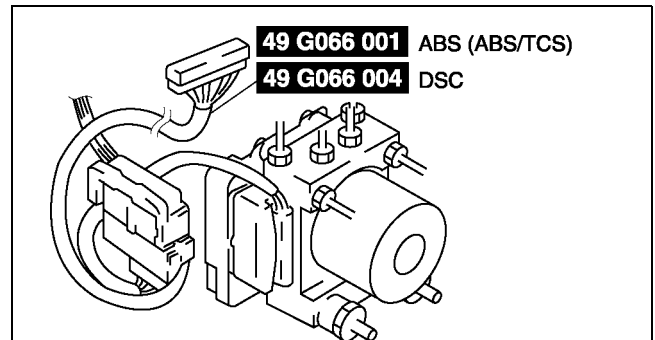
- If engine starts and runs, perform the following steps at idle.

3. Access PIDs for the switch you are inspecting.
4. Vibrate the sensor slightly with your finger.
 - If PID value is unstable or malfunction occurs, check for poor connection and/or poorly mounted sensor.

Malfunction data monitor method

1. Perform malfunction reappearance test according to malfunction reappearance mode and malfunction data monitor. The malfunction cause is found in the malfunction data.

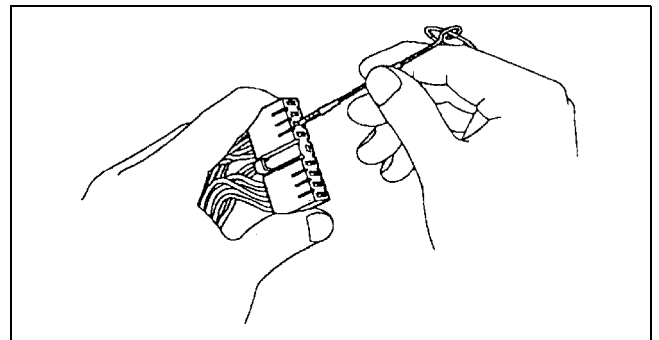
Malfunction data monitor using SST (ABS/TCS: 49 G066 001, DSC: 49 G066 004)



A6E6921W016

Connector terminal check method

1. Check the connection condition of each female terminal.
2. Insert male terminal; fit female terminal size to male terminal and check to see whether malfunction is in female terminal or not.



Y3E6980W001

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

SYMPTOM TROUBLESHOOTING

A6E699067650W04

- Verify the symptoms, and perform troubleshooting according to the appropriate number.

Vehicles with ABS/TCS

No.	Symptom
1	ABS warning light, BRAKE system warning light, TCS OFF light do not illuminate with ignition switch on.
2	Neither ABS warning light nor BRAKE system warning light illuminate with ignition switch on.
3	ABS warning light does not illuminate with ignition switch on.
4	BRAKE system warning light does not illuminate with ignition switch on.
5	TCS OFF light and TCS indicator light do not illuminate with ignition switch on.
6	Both ABS warning light and BRAKE system warning light stay on more than 4 seconds with ignition switch on.
7	ABS warning light stays on more than 4 seconds with ignition switch on.
8	BRAKE system warning light stays on more than 4 seconds with ignition switch on. (Parking brake is released.)
9	TCS OFF light stays on more than 4 seconds with ignition switch on.
10	TCS does not work correctly.
11	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, TCS OFF light, TCS indicator light do not illuminate.

Vehicles with DSC

No.	Symptom
1	Any of the following lights do not illuminate with ignition switch on. • ABS warning light • BRAKE system warning light • DSC indicator light • DSC OFF light
2	Any of the following lights stay on: • ABS warning light. • BRAKE system warning light • DSC indicator light • DSC OFF light
3	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light and DSC OFF light do not illuminate.
4	ABS or TCS ^{*1} operates frequently.
	TCS does not work correctly.
5	DSC ^{*2} operates frequently.
	DSC does not work correctly.

^{*1} : DSC system contains traction control function, DSC indicator light goes on and off while DSC operates.

^{*2} : DSC indicator light goes on and off while DSC operates.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

Vehicle with ABS/TCS

x: Applicable

Possible factor																			
Troubleshooting item		ABS/TCS HU/CM	Instrument cluster	ABS warning light circuit	BRAKE system warning light circuit	TCS OFF light circuit	TCS OFF switch circuit	Battery	Brake fluid	Brake fluid level sensor	Parking brake switch	Charging system	ABS/TCS HU/CM power supply (terminal Z)	ABS/TCS HU/CM GND 1 (terminal AA)	Instrument cluster power supply (terminal 2V)	Instrument cluster GND (terminal 2E)	Tire size, tire air pressure	Conventional brakes	Brake pipe routing
1	ABS warning light,BRAKE system warning light,TCS OFF light do not illuminate with ignition switch on.		X												X				
2	Neither ABS warning light nor BRAKE system warning light illuminates with ignition switch on.		X													X			
3	ABS warning light does not illuminate with ignition switch on.	X	X	X															
4	BRAKE system warning light does not illuminate with ignition switch on.	X	X		X														
5	TCS OFF light and TCS indicator light do not illuminate with ignition switch on.	X	X			X													
6	Both ABS warning light and BRAKE system warning light stay on more than 4 seconds with ignition switch on.	X	X	X	X			X				X	X	X					
7	ABS warning light stays on more than 4 seconds with ignition switch on.	X	X	X															
8	BRAKE system warning light stays on more than 4 seconds with ignition switch on.	X	X		X				X	X	X								
9	TCS OFF light stays on more than 4 seconds with ignition switch on.	X	X			X	X												
10	TCS does not work correctly.	X															X		
11	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, TCS OFF light, TCS indicator light do not illuminate.	X																X	X

A6E6980W002

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

Vehicle with DSC

x: Applicable

Troubleshooting item		Possible factor	DSC unit	Instrument cluster	ABS warning light circuit	BRAKE system warning light circuit	DSC indicator light circuit	DSC OFF light circuit	Each sensor installation	Battery	Charging system	Brake fluid	Parking brake	Tire	Tire air pressure	Control module power supply system	Control module ground system	Instrument cluster power supply system	Instrument cluster ground system	Conventional brake
1	Any of the following lights do not illuminate with ignition switch on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).		x	x														x	x	
2	Any of the following lights stay on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).			x	x	x	x	x		x	x	x	x			x	x			
3	There is a malfunction in the system even though ABS warning light, DSC indicator light, and DSC OFF light do not illuminate.																			x
4	ABS or TCS (*1) operates frequently. /TCS does not work correctly. (*1): DSC system's contain traction control function, DSC indicator light goes on and off while DSC operate.								x					x	x					
5	DSC (*2) operates frequently. /DSC does not work correctly. (*2): DSC indicator light goes on and while DSC operate.								x											

A6E6980W001

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

NO.1 ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, TCS OFF LIGHT DO NOT ILLUMINATE WITH IGNITION SWITCH ON

A6E699067650W05

Vehicle with ABS/TCS

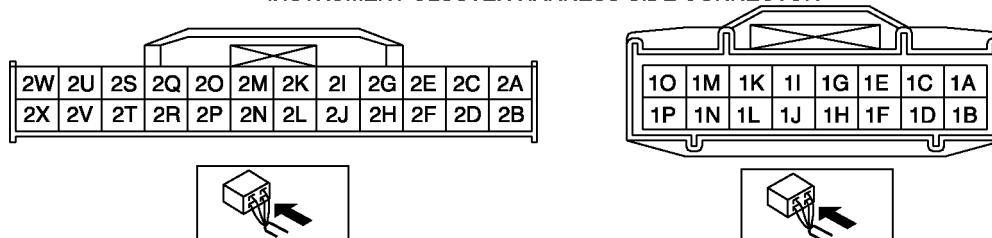
1	ABS warning light, BRAKE system warning light, TCS OFF light do not illuminate with ignition switch on.

[TROUBLESHOOTING HINTS]

- Malfunction of instrument cluster or ABS/TCS HU/CM
- Improper configuration (instrument cluster)

STEP	INSPECTION		ACTION
1	VERIFY WHETHER MALFUNCTION IS IN WARNING LIGHTS AND INDICATOR LIGHTS' COMMON POWER SUPPLY, OR IN OTHER WARNING LIGHTS AND INDICATOR LIGHTS • Do other warning and indicator lights illuminate when IG switch is turned ON?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Go to next step.
2	INSPECT INSTRUMENT CLUSTER POWER SUPPLY FUSE • Is instrument cluster ignition power supply fuse okay?	Yes	Go to next step.
		No	Check for a short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse.
*3	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN INSTRUMENT CLUSTER POWER SUPPLY AND INSTRUMENT CLUSTER FOR CONTINUITY) OR INSTRUMENT CLUSTER • Turn ignition switch ON. • Measure voltage at instrument cluster connector (24-pin) terminal 2V. • Is voltage approximately 12V?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Check for open circuit between instrment cluster and ground. Repair or replace as neccessary.
4	CONFIRM DTC U1900 USING WDS OR EQUIVALENT • Retrieve DTC from PCM, ABS/TCS and instrument cluster. • Is DTC U1900 retrieved?	Yes	Go to next step.
		No	Inspect instrment cluster. If OK, then go to step6.
5	CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT: • ABS_MSG • PCM_MSG • Is "not present" message displayed on WDS or equivalent?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Network communication, for related system is malfunction. Repair or replace as neccessary.
6	CONFIRM DTC B2477 FOR INSTRUMENT CLUSTER USING WDS OR EQUIVALENT • Is DTC B2477 retrieved?	Yes	Re-configure the instrument cluster.
		No	Replace ABS/TCS HU/CM.

INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

NO.2 NEITHER ABS WARNING LIGHT NOR BRAKE SYSTEM WARNING LIGHT ILLUMINATE WITH IGNITION SWITCH ON

A6E699067650W06

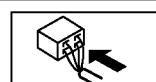
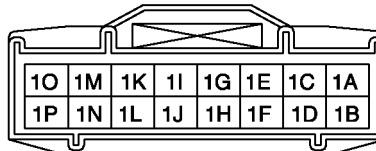
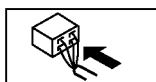
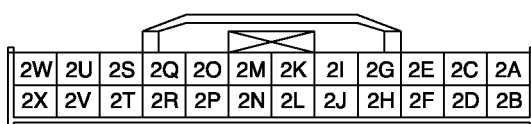
2	Neither ABS warning light nor BRAKE system warning light illuminate with ignition switch on.

[TROUBLESHOOTING HINTS]

- Malfunction of instrument cluster or ABS/TCS HU/CM
- Improper configuration (instrument cluster)

STEP	INSPECTION	ACTION	
1	VERIFY WHETHER MALFUNCTION IS IN WARNING LIGHTS AND INDICATOR LIGHTS' COMMON POWER SUPPLY, OR IN OTHER WARNING LIGHTS AND INDICATOR LIGHTS • Do other warning and indicator lights illuminate when IG switch is turned ON?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Go to next step.
2	INSPECT INSTRUMENT CLUSTER POWER SUPPLY FUSE • Is instrument cluster ignition power supply fuse okay?	Yes	Go to next step.
		No	Check for a short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse.
*3	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN INSTRUMENT CLUSTER POWER SUPPLY AND INSTRUMENT CLUSTER FOR CONTINUITY) OR INSTRUMENT CLUSTER • Turn ignition switch ON. • Measure voltage at instrument cluster connector (24-pin) terminal 2V. • Is voltage approximately 12V?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Check for open circuit between instrment cluster and ground. Repair or replace as neccessary.
4	CONFIRM DTC U1900 USING WDS OR EQUIVALENT • Retrieve DTC from PCM, ABS/TCS and instrument cluster. • Is DTC U1900 retrieved?	Yes	Go to next step.
		No	Inspect instrment cluster. If OK, then go to step6.
5	CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT: • ABS_MSG • PCM_MSG • Is "not present" message displayed on WDS or equivalent?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Network communication, for related system is malfunction. Repair or replace as neccessary.
6	CONFIRM DTC B2477 FOR INSTRUMENT CLUSTER USING WDS OR EQUIVALENT • Is DTC B2477 retrieved?	Yes	Re-configure the instrument cluster.
		No	Replace ABS/TCS HU/CM.

INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

NO.3 ABS WARNING LIGHT DOES NOT ILLUMINATE WITH IGNITION SWITCH ON

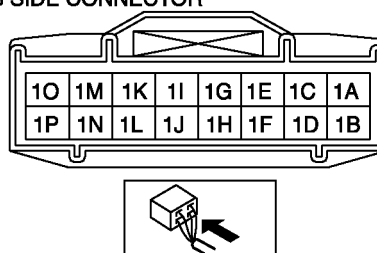
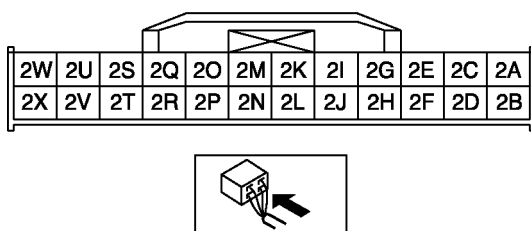
A6E699067650W07

3	ABS warning light does not illuminate with ignition switch on.
[TROUBLESHOOTING HINTS]	
Malfunction of instrument cluster or ABS/TCS HU/CM	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	CONFIRM DTC U1900 USING WDS OR EQUIVALENT - Retrieve DTC from PCM, ABS/TCS and instrument cluster. - Is DTC U1900 retrieved?	Yes Go to next step.
		No Inspect instrment cluster. If OK, then go to step6.
2	CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT: - ABS_MSG - PCM_MSG - Is "not present" message displayed on WDS or equivalent?	Yes Replace instrument cluster (open circuit in instrument cluster).
		No Network communication, for related system is malfunction. Repair or replace as necessary.

INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



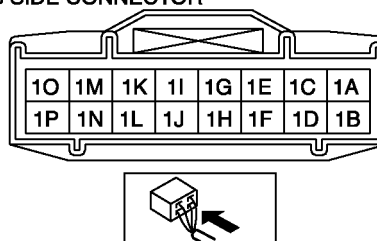
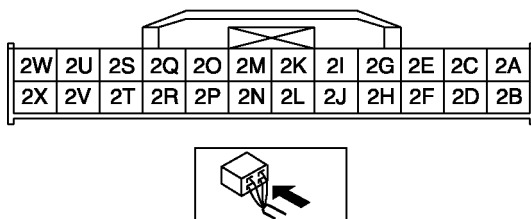
NO.4 BRAKE SYSTEM WARNING LIGHT DOES NOT ILLUMINATE WITH IGNITION SWITCH ON

A6E699067650W08

4	BRAKE system warning light does not illuminate with ignition switch on.
[TROUBLESHOOTING HINTS]	
Malfunction of instrument cluster or ABS/TCS HU/CM	

STEP	INSPECTION	ACTION
1	CONFIRM DTC U1900 USING WDS OR EQUIVALENT - Retrieve DTC from PCM, ABS/TCS and instrument cluster. - Is DTC U1900 retrieved?	Yes Go to next step.
		No Inspect instrment cluster. If OK, then go to step6.
2	CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT: - ABS_MSG - PCM_MSG - Is "not present" message displayed on WDS or equivalent?	Yes Replace instrument cluster (open circuit in instrument cluster).
		No Network communication, for related system is malfunction. Repair or replace as necessary.

INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

NO.5 TCS OFF LIGHT, TCS INDICATOR LIGHT DO NOT ILLUMINATE WITH IGNITION SWITCH ON

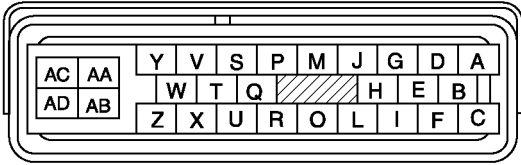
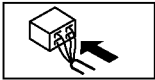
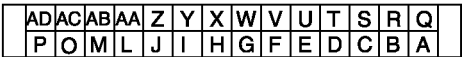
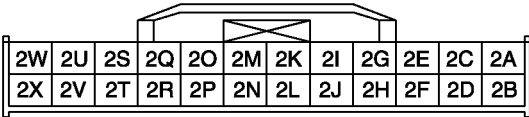
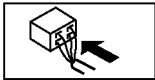
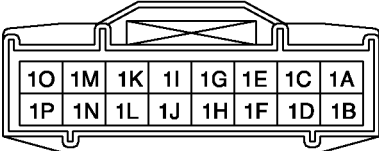
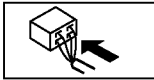
A6E699067650W09

5	TCS OFF light , TCS indicator light do not illuminate with ignition switch on.
[TROUBLESHOOTING HINTS] • Malfunction of instrument cluster or ABS/TCS HU/CM • Improper configuration (ABS/TCS HU/CM)	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY AND SHORTS Activate TRAC_OFF (TCS OFF light) using WDS or equivalent. Is error message displayed regarding communication between ABS/TCS CM and WDS or equivalent?	Yes	If a communication error message is displayed even after inspecting according to procedures displayed on the WDS or equivalent, go to Step 6.
		No	Go to next step.
2	CHECK TCS OFF LIGHT BULB FOR MALFUNCTIONS BY USING INSPECTION FUNCTION IN ABS/TCS HU/CM Activate TRAC_OFF (TCS OFF light) using WDS or equivalent Does TCS OFF light illuminate?	Yes	Go to next step.
		No	Go to next step3.
3	CONFIRM DTC U1900 USING WDS OR EQUIVALENT • Retrieve DTC from PCM, ABS/TCS and instrument cluster. • Is DTC U1900 retrieved?	Yes	Go to next step.
		No	Inspect instrment cluster. If OK, then go to step6.
4	CONFIRM THE FOLLOWING PIDs USING WDS OR EQUIVALENT: • ABS_MSG • PCM_MSG • Is “not present” message displayed on WDS or equivalent?	Yes	Replace instrument cluster (open circuit in instrument cluster).
		No	Network communication, for related system is malfunction. Repair or replace as neccessary.
5	CONFIRM DTC B2477 FOR INSTRUMENT CLUSTER USING WDS OR EQUIVALENT • Is DTC B2477 retrieved?	Yes	Re-configure the instrument cluster.
		No	Replace ABS/TCS HU/CM.
*6	INSPECT WIRING HARNESS BETWEEN ABS/TCS CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY Is there continuity between SST connector terminal X and data link connector?	Yes	Go to next step.
		No	Repair wiring harness between ABS/TCS HU/CM and data link connector.
*7	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO B+ Is voltage approximately 12 V at SST connector terminal X?	Yes	Repair wiring harness between ABS/TCS HU/CM and data link connector.
		No	Go to next step.
8	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO GROUND If there continuity between SST connector terminal X and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM and data link connector.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction in ABS/TCS HU/CM).

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

STEP	INSPECTION	ACTION
	ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR  	SST (49 G066 001) CONNECTOR  
	INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR  	 

P

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

NO.6 BOTH ABS WARNING LIGHT AND BRAKE SYSTEM WARNING LIGHT STAY ON MORE THAN 4 SECONDS WITH IGNITION SWITCH ON

A6E699067650W10

6	Both ABS warning light and BRAKE system warning light stay on more than 4 seconds with ignition switch on.
[TROUBLESHOOTING HINTS] - ABS/TCS HU/CM detects ABS proportioning system malfunction. - ABS/TCS HU/CM detects low voltage in power supply (ABS/TCS CM ingestion terminal Z voltage is below about 9 to 10 V). - ABS/TCS HU/CM does not operate. - Malfunction of communication network.	

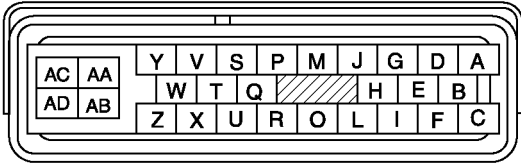
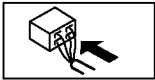
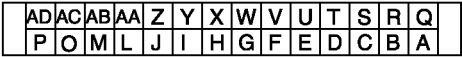
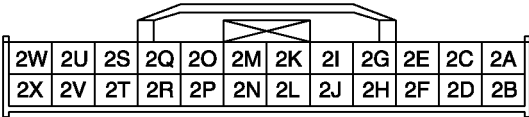
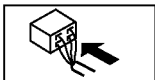
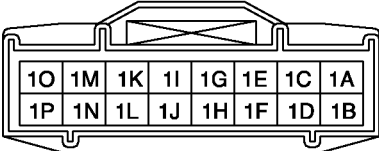
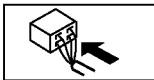
Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT ABS/TCS HU/CM POWER SUPPLY FUSE Is ABS/TCS HU/CM ignition power supply fuse okay?	Yes Go to next step. Check for a short to ground on blown fuse's circuit.
		No Repair or replace as necessary. Install appropriate amperage fuse.
2	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY AND SHORTS Perform DTC inspection. Is error message displayed regarding communication between ABS/TCS HU/CM and WDS or equivalent?	Yes If a communication error message is displayed even after inspecting according to procedure displayed on WDS or equivalent, go to step 8.
		No Go to next step.
3	CHECK FOR DTCS IN ABS/TCS HU/CM Have DTCs been recorded in memory?	Yes Perform inspection using appropriate DTC.
		No Go to next step.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

STEP	INSPECTION	ACTION	
4	INSPECT PID/DATA IN ABS/TCS HU/CM Inspect the following items using WDS or equivalent PID/DATA monitor function. • ABS_LAMP (ABS warning light) • BRAKE_LAMP (BRAKE system warning light) • ABS_VOLT (power supply voltage) Is ABS_LAMP and BRAKE_LAMP ON after more than 4 seconds with ignition switch on?	Yes	Go to Step 7.
		No	Go to next step.
5	INSPECT ABS/TCS HU/CM IGNITION POWER SUPPLY SYSTEM (TERMINAL Z) Check the voltage for PID/DATA monitor ABS_VOLT item. Specification: about 10 V Is voltage within specification?	Yes	Replace ABS/TCS HU/CM (open or short in ground circuit in ABS/TCS HU/CM)
		No	Go to next step.
6	INSPECT BATTERY Is battery voltage normal?	Yes	Go to next step.
		No	Inspect battery and charging system.
7	INSPECT CHARGING SYSTEM Is battery voltage normal with electrical load (A/C, headlight, etc.) on and engine idling?	Yes	Go to Step 7.
		No	Inspect charging system (drive belt tension, generator, etc.).
*8	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM POWER SUPPLY AND ABS/TCS HU/CM FOR CONTINUITY Disconnect ABS/TCS HU/CM connector. Connect the SST (49 G066 001) (vehicle harness side only). Is voltage approximately 12 V at SST connector terminal Z?	Yes	Go to next step.
		No	Check for connection of ABS/TCS HU/CM connector securely.
*9	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM GROUND FOR CONTINUITY Turn ignition switch to LOCK. Is there continuity between SST connector terminal AC and ground?	Yes	If a malfunction error message is displayed on WDS or equivalent in Step 1 inspection, go to next step. If a malfunction error message is not displayed on WDS or equivalent in Step 1 inspection, troubleshooting is completed.
		No	Repair wiring harness between ABS/TCS HU/CM and ground.
*10	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY Is there continuity between SST connector terminal X and DLC-2?	Yes	Go to next step.
		No	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
11	*INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO BATTERY Is voltage approximately 12 V at SST connector terminal X?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Go to next step.
12	*INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO GROUND Is there continuity between SST connector Terminal X and DLC-2?	Yes	Repair wiring harness between ABS/TCS HU/CM and DLC-2.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction in ABS/TCS HU/CM)

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

STEP	INSPECTION	ACTION
	ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR  	SST (49 G066 001) CONNECTOR  
	INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR  	 

NO.7 ABS WARNING LIGHT STAYS ON MORE THAN 4 SECONDS WITH IGNITION SWITCH ON

A6E699067650W11

7	ABS warning light stays on more than 4 seconds with ignition switch on.
[TROUBLESHOOTING HINTS] ABS/TCS CM detects ABS system malfunction.	

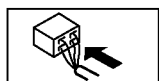
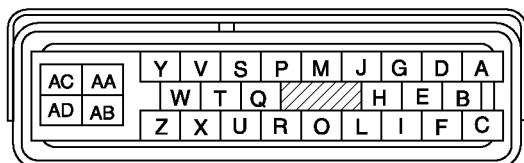
Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY AND SHORTS Perform DTC inspection. Is error message displayed regarding communication between ABS/TCS HU/CM and WDS or equivalent?	Yes If the communication error message is displayed even after inspecting according to procedures displayed in the WDS or equivalent, go to Step 4.
		No Go to next step.
2	CHECK FOR DTCs IN ABS/TCS HU/CM Have DTCs been recorded in memory?	Yes Perform inspection using appropriate DTC.
		No Go to next step.
3	INSPECT PID/DATA IN ABS/TCS HU/CM Inspect the following items using WDS or equivalent PID/DATA monitor function. ABS_LAMP (ABS warning light) Is ABS_LAMP ON after more than 4 seconds with ignition switch on?	Yes Replace ABS/TCS HU/CM (open circuit or short to ground in ABS/TCS HU/CM).
		No Inspect instrmtent cluster.
*4	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY Disconnect ABS/TCS HU/CM connector. Connect the SST (49 G066 001) (vehicle harness side only). Is there continuity between SST connector terminal X and data link connector?	Yes Go to next step.
		No Repair wiring harness between ABS/TCS HU/CM and data link connector.
*5	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO B+ Is voltage approximately 12V at SST connector terminal X?	Yes Repair wiring harness between ABS/TCS HU/CM and data link connector.
		No Go to next step.

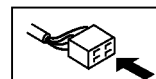
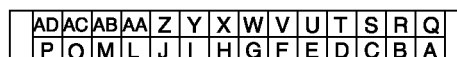
TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

STEP	INSPECTION		ACTION
*6	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO GROUND Is there continuity between SST connector terminal X and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM and data link connector.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction is ABS/TCS HU/CM).

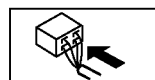
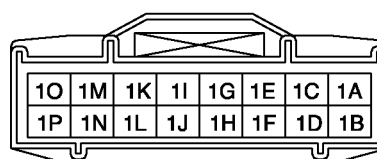
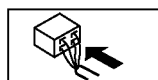
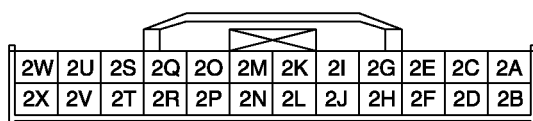
ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR



SST (49 G066 001) CONNECTOR



INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR



- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

NO.8 BRAKE SYSTEM WARNING LIGHT STAYS ON MORE THAN 4 SECONDS WITH IGNITION SWITCH ON

A6E699067650W12

8	BRAKE system warning light stays on more than 4 seconds with ignition switch on. (Parking brake is released.)

[TROUBLESHOOTING HINTS]

- Malfunction of instrmnt cluster or ABS/TCS HU/CM
- Short to ground in circuit in parking brake switch and/or brake fluid level sensor

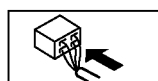
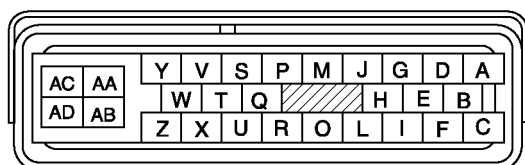
Diagnostic procedure

1	INSPECT BRAKE FLUID LEVEL Is brake fluid level okay?	Yes	Go to next step.
		No	Add brake fluid.
*2	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY AND SHORTS Inspect the following items using WDS or equivalent PID/DATA monitor function. • BRAKE_LAMP(BRAKE system warning light) Is error message displayed regarding communication between ABS/TCS HU/CM and WDS or equivalent?	Yes	If a communication error message is displayed even after inspecting according to procedures displayed on WDS or equivalent. Go to next step6.
		No	Go to next step.
3	CHECK FOR DTCs IN ABS/TCS HU/CM Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

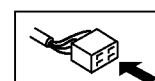
4	INSPECT PID/DATA IN ABS/TCS HU/CM Inspect (BRAKE system warning light) using WDS or equivalent PID/DATA monitor function. Is BRAKE_LAMP on after more than 4 seconds with ignition switch on?	Yes	Connect ABS/TCS HU/CM connector terminal X securely, then go to next step.
		No	Go to step 6.
5	VERIFY WHETHER MALFUNCTION IS IN PARKING BRAKE SWITCH OR BRAKE FLUID LEVEL SENSOR, OR IN SOME OTHER PART Disconnect the following in order: 1. Parking brake switch connector 2. Brake fluid level sensor connector Does BRAKE system warning light go out with ignition switch on?	Yes	Replace parking brake switch and/or brake fluid level sensor (shorted on some internal part).
		No	Perform the following inspections. Repair if necessary. • Short to ground in wiring harness between instrument cluster (BRAKE system warning light) and parking brake switch. • Short to ground in wiring harness between instrument cluster (BRAKE system warning light) and brake fluid level sensor. Inspect instrument cluster.
*6	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY Disconnect ABS/TCS HU/CM connector. Connect the SST (49 G066 001) (vehicle harness side only). Is there continuity between SST connector terminal X and data link connector?	Yes	Go to next step.
		No	Repair wiring harness between ABS/TCS HU/CM and data link connector.
*7	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO B+ Is voltage approximately 12 V at SST connector terminal X?	Yes	Repair wiring harness between ABS/TCS HU/CM and data link connector.
		No	Go to next step.
*8	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO GROUND Is there continuity between SST connector terminal X and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM and data link connector.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction in ABS/TCS HU/CM).

ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR



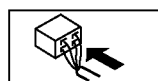
SST (49 G066 001) CONNECTOR

AD	AC	AB	AA	Z	Y	X	W	V	U	T	S	R	Q
P	O	M	L	J	I	H	G	F	E	D	C	B	A

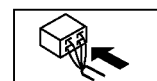


INSTRUMENT CLUSTER HARNESS SIDE CONNECTOR

2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A
2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B



1O	1M	1K	1I	1G	1E	1C	1A
1P	1N	1L	1J	1H	1F	1D	1B



- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

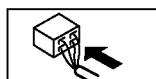
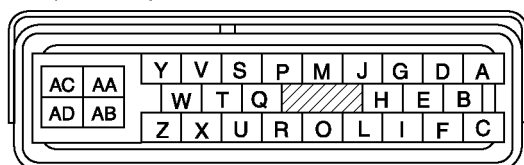
NO.9 TCS OFF LIGHT STAYS ON MORE THAN 4 SECONDS WITH IGNITION SWITCH ON

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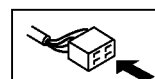
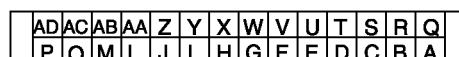
9	BRAKE system warning light stays on more than 4 seconds with ignition switch on. (Parking brake is released.)
[TROUBLESHOOTING HINTS] Warning light circuit open or shorted to ground in ABS/TCS HU/CM	

1	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR CONTINUITY AND SHORTS Perform DTC inspection. Is error message displayed regarding communication between ABS/TCS HU/CM and WDS or equivalent?	Yes	If a communication error message is displayed even after inspecting according to procedures displayed on WDS or equivalent, go to Step 7.
		No	Go to next step.
2	CHECK FOR DTCS IN ABS/TCS HU/CM Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.
3	INSPECT PID/DATA IN ABS/TCS HU/CM Inspect the following items using WDS or equivalent PID/DATA monitor function. TRAC_SW (TCS OFF switch) Is TRAC_SW ON displayed on WDS or equivalent?	Yes	Go to Step 5 (TCS OFF switch system malfunction).
		No	Go to next step.
*4	CHECK FOR SHORT TO GROUND IN ABS/TCS HU/CM Disconnect ABS/TCS HU/CM connector. Does TCS OFF light go out with ignition switch on?	Yes	Replace ABS/TCS HU/CM (short to ground in ABS/TCS HU/CM).
		No	Inspect instrument cluster.
*5	INSPECT TCS OFF SWITCH Disconnect TCS OFF switch connector. Is TRAC_SW ON displayed on WDS or equivalent?	Yes	Go to next step.
		No	Replace TCS OFF switch (TCS will not turn off, even though switch is OFF).
*6	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN ABS/TCS HU/CM AND TCS OFF SWITCH FOR SHORT TO GROUND) OR ABS/TCS HU/CM Is there continuity between SST connector terminal P and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM (terminal P) and TCS OFF switch.
*7	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO B+ Is voltage approximately 12 V at SST connector terminal T?	Yes	Repair wiring harness between ABS/TCS HU/CM (terminal P) and data link connector.
		No	Go to next step.
*8	INSPECT WIRING HARNESS BETWEEN ABS/TCS HU/CM AND DLC-2 (DATA LINK CONNECTOR-2) FOR SHORT TO GROUND Is there continuity between SST connector terminal T and ground?	Yes	Repair wiring harness between ABS/TCS HU/CM and data link connector.
		No	Replace ABS/TCS HU/CM (communication circuit malfunction in ABS/TCS HU/CM).

ABS (ABS/TCS) HU/CM HARNESS SIDE CONNECTOR



SST (49 G066 001) CONNECTOR



- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

NO.10 TCS DOES NOT WORK CORRECTLY

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10	TCS does not work correctly.
[TROUBLESHOOTING HINTS] • There is difference in size or air pressure between the front and rear tires. • There is malfunction in the engine control system. • ABS/TCS HU/CM detects TCS system malfunction.	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	CHECK TIRE SIZE AND AIR PRESSURE Inspect tire size and air pressure. Are size and air pressure as specified?	Yes	Go to next step.
		No	Replace with specified tires or adjust tire air pressure.
2	CHECK FOR DTCS IN ABS/TCS HU/CM Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.
3	CHECK FOR DTCS IN PCM Check the DTC for the PCM ON-BOARD DIAGNOSTIC SYSTEM. Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.
4	CHECK TO MAKE SURE TORQUE REDUCTION SIGNAL GOING FROM ABS/TCS HU/CM TO PCM IS BEING RECEIVED CORRECTLY Select ENG _ TRQ (engine torque reduction signal) using WDS or equivalent. Increase the engine speed to 3,000 rpm. Input 280 N·m ENG _ TRQ to PCM using WDS or equivalent. Does engine speed decrease?	Yes	System is normal. Recheck customer's complaint.
		No	Replace ABS/TCS HU/CM.

NO.11 THERE IS MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, TCS OFF LIGHT, TCS INDICATOR LIGHT DO NOT ILLUMINATE

A6E699067650W15

11	There is a malfunction in system even though ABS warning light, BRAKE system warning light, TCS OFF light, TCS indicator light do not illuminate.
[TROUBLESHOOTING HINTS] • There is a difference in size or air pressure between the front and rear tires	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	CHECK FOR DTCS IN ABS/TCS HU/CM Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.
2	INSPECT ABS HYDRAULIC UNIT Perform "ABS hydraulic unit system inspection". Is system okay?	Yes	Inspect conventional brake system.
		No	If wheels do not rotate: Replace ABS/TCS HU/CM. If wheels rotate but order in which wheels rotate is incorrect: Inspect brake pipe passage to ABS/TCS HU/CM.

NO.1 ANY OF THE FOLLOWING LIGHTS DO NOT ILLUMINATE WITH IGNITION SWITCH ON: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)

A6E699067650W16

1	Any of the following lights do not illuminate with ignition switch on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).
[TROUBLESHOOTING HINTS] • Check each light in the instrument cluster for malfunction. • Poor connection at DSC HU/CM connector • ABS warning light circuit or BRAKE system warning light circuit shorted out (when harness is shorted out between DSC HU/CM and ABS warning light or BRAKE system warning light, each warning lights go off.) • DSC indicator light circuit and/or DSC OFF light circuit may be open. (when DSC indicator light circuit and/or DSC OFF light circuit is open, each circuit's warning lights go off.)	

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	CHECK FOR DTCS IN DSC HU/CM - Check the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM. - Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.
2	CHECK TO SEE WHETHER MALFUNCTION IS IN INSTRUMENT CLUSTER SYSTEM OR OTHER SYSTEM Do other warning and indicator lights illuminate when IG switch is turned ON?	Yes	Go to next step.
		No	Inspect or repair instrument cluster (power supply system, ground system).
3	VERIFY THAT DSC HU/CM CONNECTOR IS CONNECTED Is DSC HU/CM securely connected?	Yes	Go to next step.
		No	Connect DSC HU/CM connector securely, then go to next step.
4	VERIFY THAT DSC HU/CM CONNECTOR TERMINAL OR RELATED CONNECTOR TERMINALS ARE CONNECTED Are DSC HU/CM connector terminal, or instrument cluster connector terminal, or related connector terminals securely connected?	Yes	Go to next step.
		No	Connect DSC HU/CM connector terminal etc. related connector terminal securely.
5	CHECK TO SEE WHETHER MALFUNCTION IS IN DSC INDICATOR LIGHT AND TCS OFF LIGHT OR ABS WARNING LIGHT AND BRAKE SYSTEM WARNING LIGHT - If DSC indicator light and TCS OFF light do not illuminate, go to Step 6. - If ABS warning light and BRAKE system warning light do not illuminate, go to Step 8.	-	-
6	CHECK TO SEE WHETHER MALFUNCTION IS IN DSC HU/CM OR OTHER - Disconnect DSC HU/CM. - Connect the DSC indicator light terminal and DSC OFF light terminal to body ground. - Do both indicator lights illuminate with ignition switch on?	Yes	Replace DSC HU/CM (open in DSC HU/CM).
		No	Go to next step.
7	INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND DSC HU/CM FOR CONTINUITY Is there continuity between each indicator light terminals of instrument cluster and DSC HU/CM connector terminal?	Yes	Inspect or repair indicator light circuit in instrument cluster.
		No	Repair malfunctioning part.
8	CHECK TO SEE WHETHER MALFUNCTION IS IN DSC HU/CM OR OTHER - Disconnect DSC HU/CM and turn ignition switch on. - Do ABS warning light and BRAKE system warning lights illuminate with ignition switch on? (If above lights illuminate, both lights circuits are normal.)	Yes	Replace DSC HU/CM (short in DSC HU/CM).
		No	Go to next step.
9	INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND DSC HU/CM FOR SHORT Is there continuity between each warning light terminal of DSC HU/CM and ground?	Yes	Repair malfunctioning part.
		No	Inspect or repair warning light circuit in instrument cluster.

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

NO.2 ANY OF THE FOLLOWING LIGHTS STAY ON: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)

A6E699067650W17

2	Any of the following lights stay on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light)
[TROUBLESHOOTING HINTS] • Brake fluid amount is low. • Parking brake does not release. • No connection at DSC HU/CM connector (when DSC HU/CM connector comes off, ABS warning light and BRAKE system warning light illuminate.) • DSC HU/CM detected malfunction (input and output device malfunction) • DSC HU/CM detects low voltage in power supply. • DSC HU/CM ground malfunction (when DSC HU/CM ground is not securely connected, ABS warning light and BRAKE system warning light illuminate but diagnostic trouble code does not display) • DSC HU/CM does not operate (DSC HU/CM malfunction.) • DSC OFF light circuit shorted in ground (when DSC OFF circuit is shorted in ground, DSC OFF light illuminated.) • ABS warning light circuit or BRAKE system warning light circuit open (when the harness is open between DSC HU/CM and each warning light, each warning light illuminates)	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT BRAKE FLUID AMOUNT AND VERIFY THAT PARKING BRAKE RELEASES • Is brake fluid amount normal? • Is parking brake lever released?	Yes Go to next step.
		No Add brake fluid or release parking brake lever.
2	CHECK FOR DTCS IN DSC HU/CM • Check the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM. • Have DTCs been recorded in memory?	Yes Perform inspection using appropriate DTC.
		No Go to next step.
3	CHECK TO SEE WHETHER MALFUNCTION IS IN CONTROL MODULE CONNECTOR, TERMINAL OR OTHER • Do ABS warning light and BRAKE system warning light go off after 4 seconds with ignition switch on?	Yes Temporary poor connection in control module connector. Inspect DSC HU/CM connector, then go to Step 6. Inspect DSC HU/CM connector terminal, then go to Step 7.
		No Go to next step.
4	INSPECT BATTERY • Is battery voltage normal?	Yes Go to next step.
		No Inspect battery and charging system.
5	INSPECT CHARGING SYSTEM • Is battery voltage normal with electrical load (A/C, headlight, etc.) on and engine idling?	Yes Go to next step.
		No Inspect charging system (drive belt tension, generator, etc.).
6	VERIFY THAT DSC HU/CM CONNECTOR IS CONNECTED • Is DSC HU/CM securely connected?	Yes Go to next step.
		No Connect DSC HU/CM connector securely, then go to next step.
7	VERIFY THAT DSC HU/CM CONNECTOR TERMINAL OR RELATED CONNECTOR TERMINALS ARE CONNECTED • Are DSC HU/CM connector terminal or instrument cluster connector terminal etc. related connector terminals securely connected?	Yes Go to next step.
		No Connect DSC HU/CM connector terminal etc. related connector terminals securely.
8	INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND DSC HU/CM FOR CONTINUITY • Is there continuity between each warning light terminal of instrument cluster and DSC HU/CM connector terminal?	Yes Go to next step.
		No Repair malfunctioning part.
9	INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND DSC HU/CM FOR SHORT IN GROUND • Is there continuity between each indicator light terminal of DSC HU/CM and ground?	Yes Repair malfunctioning part.
		No Inspect power supply harness and ground harness of DSC HU/CM. If above wiring harness are okay, replace DSC HU/CM. If above wiring harness are malfunctioning, repair malfunctioning wiring harness.

P

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

NO.3 THERE IS A MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND DSC OFF LIGHT DO NOT ILLUMINATE

A6E699067650W18

3	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light and DSC OFF light do not illuminate.
[TROUBLESHOOTING HINTS] There is mechanical malfunction in system.	

Diagnostic procedure

Diagnostic procedure			
STEP	INSPECTION		ACTION
1	CHECK DSC HU/CM FOR DTCs - Check the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM. - Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.
2	INSPECT DSC SYSTEM - Perform DSC system inspection. - Is the system okay?	Yes	Inspect conventional brake system.
		No	Repair or replace malfunctioning part.

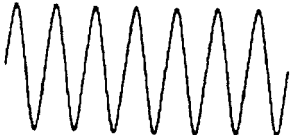
NO.4 ABS OR TCS^{*1} OPERATES FREQUENTLY/TCS DOES NOT WORK CORRECTLY^{*1}: DSC SYSTEM FUNCTION CONTAINS TRACTION CONTROL FUNCTION, DSC INDICATOR LIGHT GOES ON AND OFF WHILE DSC OPERATES

A6E699067650W19

4	ABS or TCS (*1) operates frequently./TCS does not work correctly. (*1): DSC system function contains traction control function, DSC indicator light goes on and off while DSC operates.
[TROUBLESHOOTING HINTS] - There is difference in size or air pressure between the front and rear tires. - Incorrect ABS wheel-speed signal is inputted to DSC HU/CM. - There is malfunction in the engine control system (TCS malfunction.)	

Diagnostic procedure

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	CHECK FOR DTCS IN DSC HU/CM - Check the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM. - Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.
2	CHECK TIRE SIZE AND AIR PRESSURE - Inspect tire size and air pressure. - Are size and air pressure as specified?	Yes	Go to next step.
		No	Replace with specified tires and adjust tire air pressure.
3	INSPECT ABS WHEEL-SPEED SENSOR OUTPUT PULSE - Start engine and drive vehicle. - Inspect output voltage pattern using WDS or equivalent (oscilloscope). - Is output voltage pattern okay? NORMAL  MALFUNCTION 	Yes	Found malfunctioning part according to “INTERMITTENT CONCERN TROUBLESHOOTING”.
		No	- ABS wheel-speed sensor installation inspection: Inspect the sensor for looseness and confirm it is securely adhered. - Sensor rotor installation inspection: Inspect the sensor rotor for poor installation and chipping of sensor rotor teeth. (If sensor rotor is installed poorly, it may cause output of abnormal wave form at high speed.)

TROUBLESHOOTING (ABS/TCS/DYNAMIC STABILITY CONTROL)

NO.5 DSC^{*2} OPERATES FREQUENTLY/DSC DOES NOT WORK CORRECTLY^{*2}: DSC INDICATOR LIGHT GOES ON AND OFF WHILE DSC OPERATES

A6E699067650W20

5	DSC (*2) operates frequently. /DSC does not work correctly. (*2): DSC indicator light goes on and off while DSC operates.
[TROUBLESHOOTING HINTS] - DSC HU/CM detected malfunction (input and output device malfunction) - Poor installation with combine sensor and/or steering angle sensor (If any of the above sensors are poorly installed, DSC may operate intermittently.) - When replacing DSC HU/CM, combine sensor or steering angle sensor, initialization is not performed. (If initialization is not performed correctly, DSC may not work correctly.)	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	CHECK DSC HU/CM FOR DTCs - Check the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM. - Have DTCs been recorded in memory?	Yes	Perform inspection using appropriate DTC.
		No	Go to next step.
2	VERIFY THAT EACH SENSOR IS INSTALLED Are yaw rate sensor, lateral-G sensor and steering angle sensor securely installed?	Yes	Go to next step.
		No	Install malfunctioning sensor securely.
*3	VERIFY THAT EACH SENSOR IS INITIALIZED Did each sensor initialize after replacement of DTC unit, yaw rate sensor, lateral-G sensor or steering angle sensor?	Yes	Find malfunctioning part according to "INTERMITTENT CONCERN TROUBLESHOOTING."
		No	Perform initialization.

P

SUSPENSION

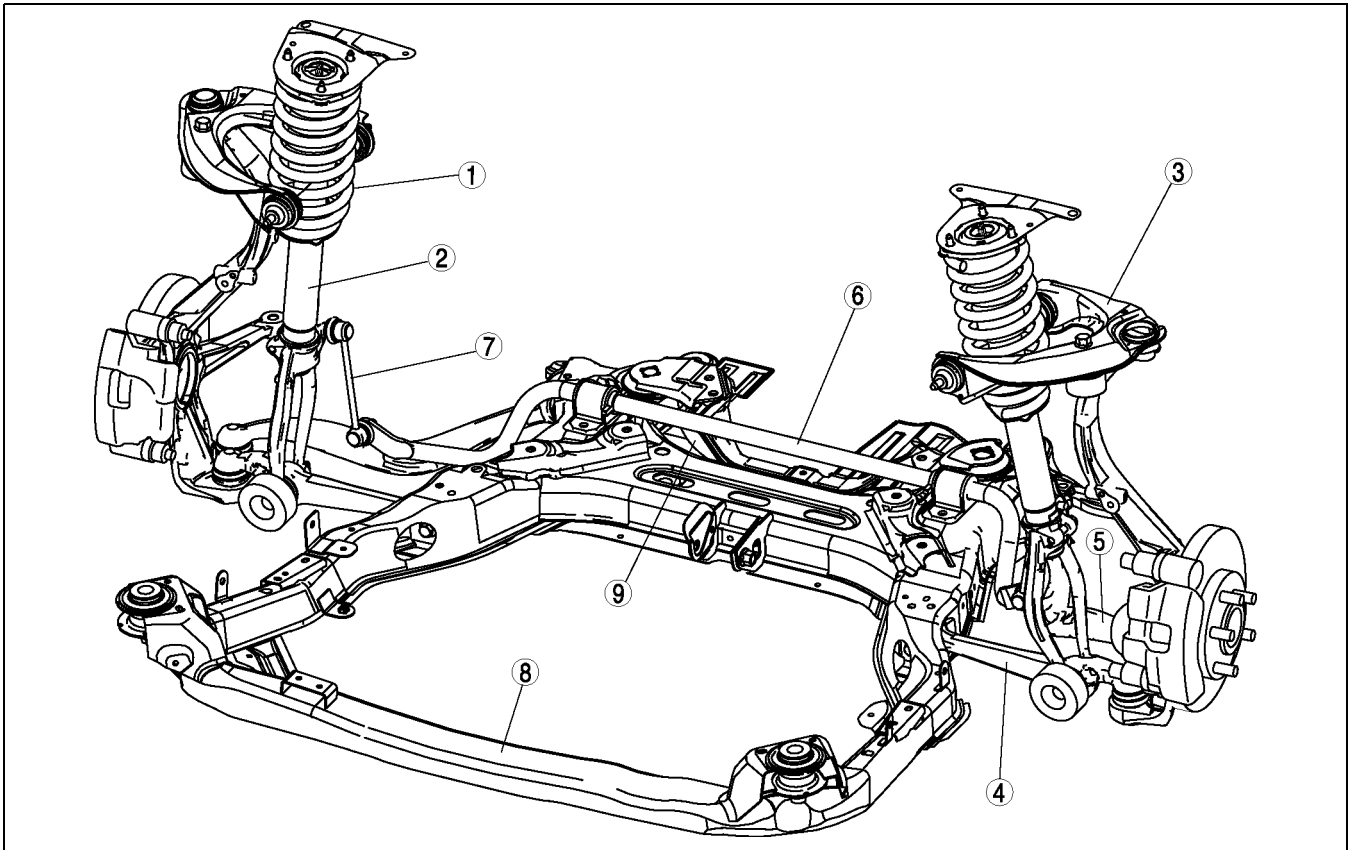
LOCATION INDEX	R-2	TRAILING LINK	
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REAR SUSPENSION LOCATION INDEX	R-3	REAR CROSSMEMBER	
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REAR LATERAL LINK			
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FRONT SUSPENSION LOCATION INDEX

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A6E7414W033

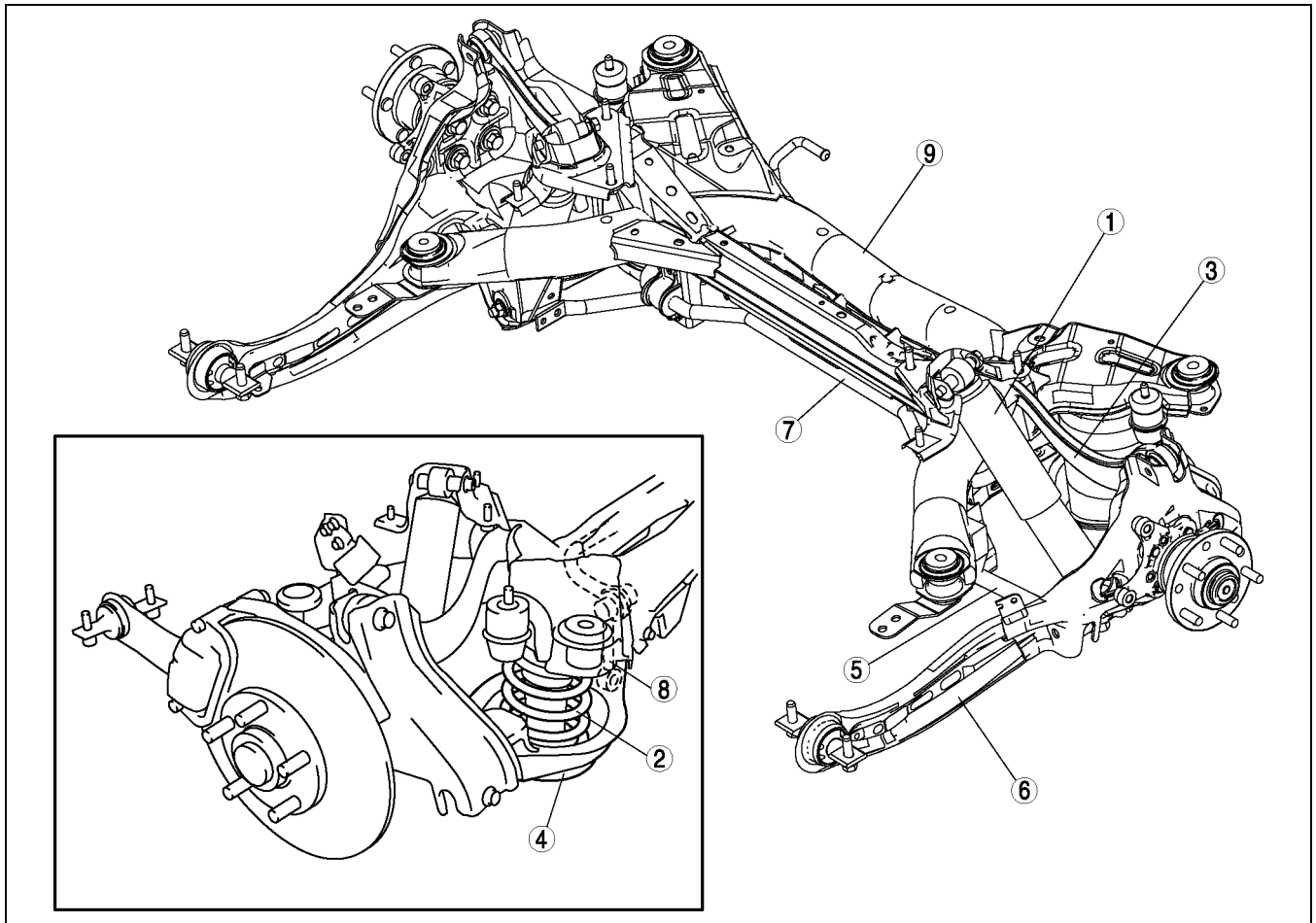
1	Front shock absorber and coil spring (See R-9 FRONT SHOCK ABSORBER AND SPRING REMOVAL/INSTALLATION)
2	Front shock absorber (See R-12 FRONT SHOCK ABSORBER INSPECTION) (See R-12 FRONT SHOCK ABSORBER DISPOSAL)
3	Front upper arm (See R-13 FRONT UPPER ARM REMOVAL/INSTALLATION) (See R-14 FRONT UPPER ARM INSPECTION)
4	Front lower arm (front) (See R-15 FRONT LOWER ARM (FRONT) REMOVAL/INSTALLATION) (See R-18 FRONT LOWER ARM (FRONT) INSPECTION)

5	Front lower arm (rear) (See R-19 FRONT LOWER ARM (REAR) REMOVAL/INSTALLATION) (See R-21 FRONT LOWER ARM (REAR) INSPECTION)
6	Front stabilizer (See R-22 FRONT STABILIZER REMOVAL/INSTALLATION)
7	Stabilizer control link (See R-23 STABILIZER CONTROL LINK INSPECTION)
8	Front crossmember (See R-23 FRONT CROSSMEMBER REMOVAL/INSTALLATION)
9	Transverse member (See R-27 TRANSVERSE MEMBER REMOVAL/INSTALLATION)

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REAR SUSPENSION LOCATION INDEX

A6E740001016W01



A6E7416W016

1	Rear shock absorber (See R-28 REAR SHOCK ABSORBER REMOVAL/INSTALLATION) (See R-28 REAR SHOCK ABSORBER INSPECTION) (See R-28 REAR SHOCK ABSORBER DISPOSAL)
2	Rear coil spring (See R-29 REAR COIL SPRING REMOVAL/INSTALLATION)
3	Rear upper arm (See R-31 REAR UPPER ARM REMOVAL/INSTALLATION)
4	Rear lower arm (See R-30 REAR LOWER ARM REMOVAL/INSTALLATION)

5	Rear lateral link (See R-33 REAR LATERAL LINK REMOVAL/INSTALLATION)
6	Trailing link (See R-35 TRAILING LINK REMOVAL/INSTALLATION)
7	Rear stabilizer (See R-34 REAR STABILIZER REMOVAL/INSTALLATION)
8	Stabilizer control link (See R-35 STABILIZER CONTROL LINK INSPECTION)
9	Rear crossmember (See R-37 REAR CROSSMEMBER REMOVAL/INSTALLATION)

R

GENERAL PROCEDURES , WHEEL ALIGNMENT

GENERAL PROCEDURES

PRECAUTION (SUSPENSION)

A6E741001013W01

Wheels and Tires Removal/Installation

1. When a wheel is installed, tighten it to **88—118 N·m {9.0—12.0 kgf·m, 65.0—87.0 ft·lbf}**.

Suspension Links Removal/Installation

1. Tighten any part of the suspension that uses rubber bushings only after the vehicle has been lowered and unloaded.

Note

- Unloaded: Fuel tank is full. Engine coolant and engine oil are at specified levels. Spare tire, jack and tools are in designated position.

Brake Lines Disconnection/Connection

Caution

- **Brake fluid will damage painted surfaces. If brake fluid does get on a painted surface, wipe it off immediately.**
1. Tighten the brake pipe flare nut using the **SST** (49 0259 770B). Be sure to modify the brake pipe flare nut tightening torque to allow for use of a torque wrench-**SST** combination. (See [GI-16 TORQUE FORMULAS](#).)
 2. If any brake line has been disconnected anytime during the procedure, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

Power Steering Components Removal/Installation

1. If any power steering fluid line has been disconnected anytime during the procedure, add ATF M-III or equivalent (e.g. Dexron® II), bleed the fluid line, and inspect for leakage after the procedure has been completed.

WHEEL ALIGNMENT

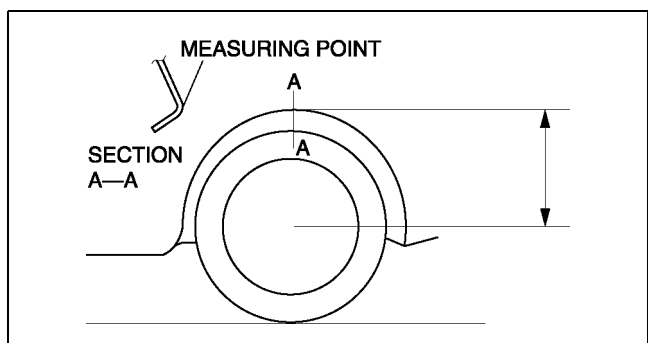
WHEEL ALIGNMENT PRE-INSPECTION

A6E741201013W01

1. Inspect the tire inflation, and adjust to the recommended pressure as necessary.
2. Inspect the front wheel bearing play and correct it if necessary. (See [M-4 Wheel Bearing Play Inspection](#).)
3. Inspect the wheel and tire runouts. (See [TD-8 SUSPENSION](#).)
4. Inspect the ball joints and steering linkage for excessive looseness.
5. Shake the vehicle to inspect the operation of the shock absorbers.

Note

- The vehicle must be on level ground and unloaded.
 - Unloaded: Fuel tank is full. Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.
6. Measure the height from the center of the wheel to the fender brim. The difference between the left and right measurement must not exceed **10 mm {0.39 in}**.



A6E7412W001

WHEEL ALIGNMENT

FRONT WHEEL ALIGNMENT

A6E741201015W01

Specification (Unloaded)*¹

Normal

Item		Fuel gauge indication				
		Empty	1/4	1/2	3/4	Full
Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1±3 {0.04±0.12}				
	(degree)	0°11'±0°22'				
Maximum steering angle	Inner	39°±3°				
	Outer	31°±3°				
Caster angle* ² (reference value)		3°37'±1°	3°39'±1°	3°41'±1°	3°44'±1°	3°47'±1°
Camber angle* ² (reference value)		-0°16'±1°			-0°17'±1°	
Steering axis inclination (reference value)		5°26'			5°28'	

Elevated*³

Item		Fuel gauge indication				
		Empty	1/4	1/2	3/4	Full
Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1±3 {0.04±0.12}				
	(degree)	0°11'±0°22'				
Maximum steering angle	Inner	39°±3°				
	Outer	31°±3°				
Caster angle* ² (reference value)		3°32'±1°	3°34'±1°	3°36'±1°	3°39'±1°	3°42'±1°
Camber angle* ² (reference value)		-0°09'±1°			-0°10'±1°	
Steering axis inclination (reference value)		5°17'			5°18'	

*¹ : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.

*² : Difference between left and right must not exceed 1°30'.

*³ : Distance between wheel center and fender brim is 402 mm {15.8 in} (reference value).

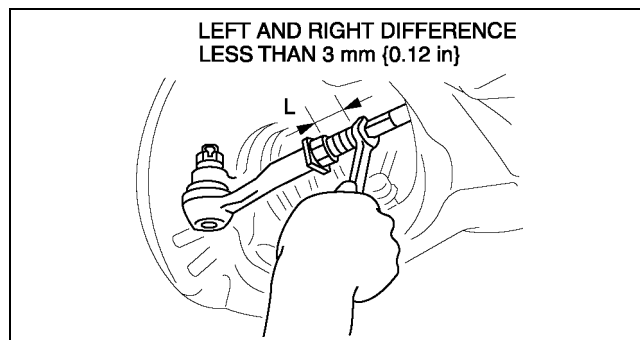
Maximum Steering Angle Adjustment

1. Loosen the tie-rod end locknuts.
2. Remove the steering gear boot clamp.
3. Turn the tie rods to equalize the length L.

Maximum left/right difference
3 mm {0.12 in}

4. Turn the tie rods equally to provide the correct maximum steering angle.
5. Tighten the tie-rod end locknuts.

Tightening torque
68.6—98.0 N·m
{7.00—9.99 kgf·m, 50.6—72.2 ft·lbf}



A6E7412W002

6. Verify that the boot is not twisted, and install the boot clamp.
7. Adjust the toe-in after adjusting the steering angle.

Total Toe-in Adjustment

1. Center the steering wheel and confirm that the vehicle wheels/tires are pointing straight.
2. Loosen the left and right tie-rod end locknuts and turn the tie-rods equally. Both tie rods are right threaded, so turning the right tie-rod toward the front of the vehicle and the left toward the rear increases toe-in.

Note

- Turning both tie-rods one complete turn changes toe-in by **about 6 mm {0.24 in} (0°36')**.

3. Tighten the tie-rod end locknuts to the specified torque.

Tightening torque
68.6—98.0 N·m {7.00—9.99 kgf·m, 50.6—72.2 ft·lbf}

4. Verify that the boot is not twisted, and install the boot clamp.

R

WHEEL ALIGNMENT

REAR WHEEL ALIGNMENT

Specification (Unloaded)*¹

A6E741201016W01

Normal

Item		Fuel gauge indication				
		Empty	1/4	1/2	3/4	Full
Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1±3 {0.04±0.12}				
	(degree)	0°11'±0°22'				
Camber angle* ²		-1°05'±1°	-1°07'±1°	-1°09'±1°	-1°11'±1°	-1°13'±1°
Thrust angle	(degree)	0°±0°48'				

Elevated*³

Item		Fuel gauge indication				
		Empty	1/4	1/2	3/4	Full
Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1±3 {0.04±0.12}				
	(degree)	0°11'±0°22'				
Camber angle* ²		-0°56'±1°	-0°58'±1°	-1°00'±1°	-1°02'±1°	-1°05'±1°
Thrust angle	(degree)	0°±0°48'				

*¹ : Engine coolant and engine oil are at specified level. Spare tire, jack and tools are in designated position.

*² : Difference between left and right must not exceed 1°30'.

*³ : Distance between wheel center and fender brim is 392 mm {15.4 in} (reference value).

Note

- Adjust the toe-in after adjusting the camber.

Camber Adjustment

- Loosen the cam nut on the lower arm.
- Turn the adjusting cam bolt to provide the correct camber angles as indicated.

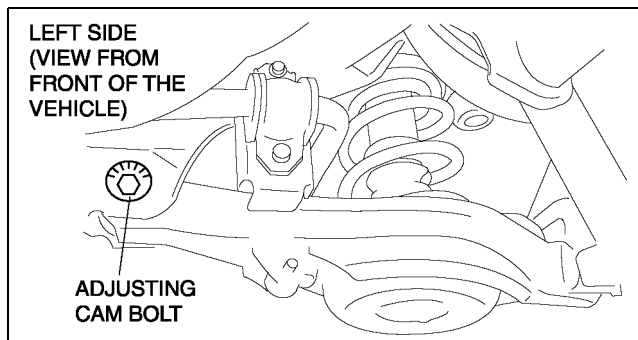
	Left wheel	Right wheel
Positive direction	Clockwise	Counter-clockwise
Negative direction	Counter-clockwise	Clockwise

- Tighten the cam nut.

Tightening torque

86.2—116.6 N·m

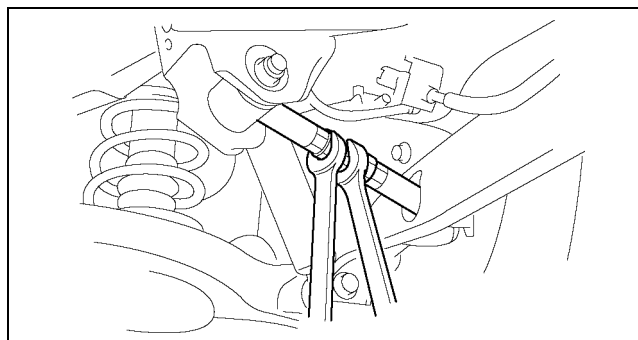
{8.79—11.88 kgf·m, 63.58—85.99 ft·lbf}



A6E7412W003

Total Toe-in Adjustment

- Loosen the locknut of the lateral link.



A6E7412W004

WHEEL ALIGNMENT, WHEEL AND TIRE

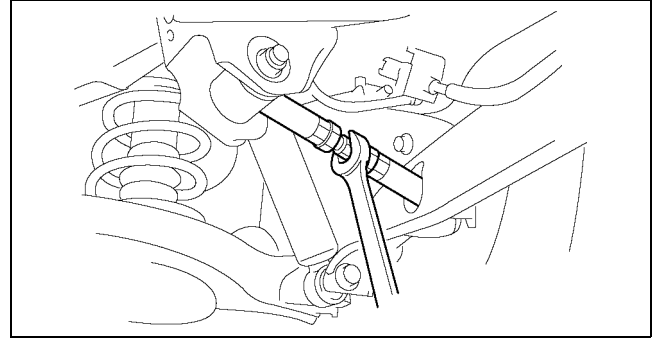
- Adjust the toe-in turning the adjusting link.

Specification

Total Toe-in: 2 ± 4 mm { 0.08 ± 0.16 in}

Note

- Toe change amount: $0^{\circ}43'$ / one rotation



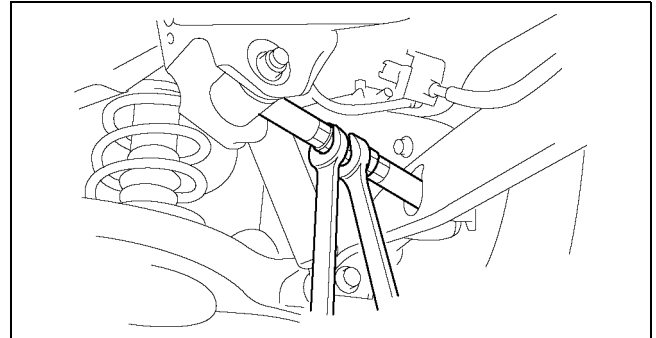
A6E7412W005

- Tighten the locknut.

Tightening torque

68.6—98.1 N·m

{7.0—10.0 kgf·m, 50.6—72.3 ft·lbf}



A6E7412W004

WHEEL AND TIRE

R

WHEEL BALANCE ADJUSTMENT (16 INCH AND 17 INCH ALUMINUM ALLOY WHEEL)

A6E741701014W01

Caution

- Adjust the outer wheel balance first, then the inner wheel balance.
- Be careful not to scratch the wheels.

Adhesive-type Balance Weight (Outer)

- Remove the old balance weight from the wheel.
- Remove the double-sided adhesive tape remaining on the wheel, then clean and degrease the bonding area.
- Set the wheel on a wheel balancer, measure the amount of unbalance and the position with the mode set for knock-type balance weight.
- Multiply the amount of unbalance by **1.6** to get the balance weight value.
- Select a balance weight closest to the weight value and attach the balance weight on the position (outer) indicated by the wheel balancer.

Example calculation of balance weight value

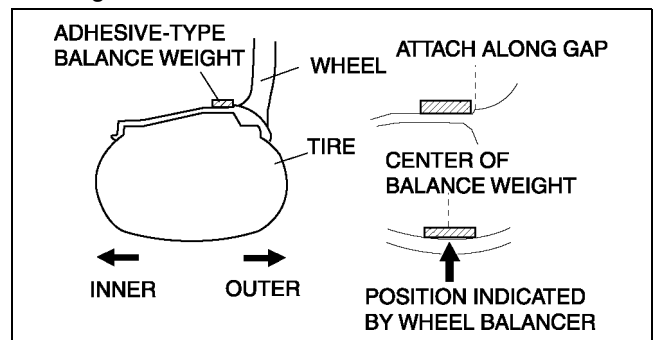
Indicated amount of unbalance: 23 g

{0.81 oz}

$23\text{ g } \{0.81\text{ oz}\} \times 1.6 = 36.8\text{ g } \{1.30\text{ oz}\}$

Selected balance weight value: 35 g

{1.24 oz}



Z5U0212W101

Note

- When selecting a balance weight, select one closest to the calculated value.
Example: $32.4\text{ g } \{1.14\text{ oz}\} = 30\text{ g } \{1.06\text{ oz}\}$, $32.5\text{ g } \{1.15\text{ oz}\} = 35\text{ g } \{1.24\text{ oz}\}$

Caution

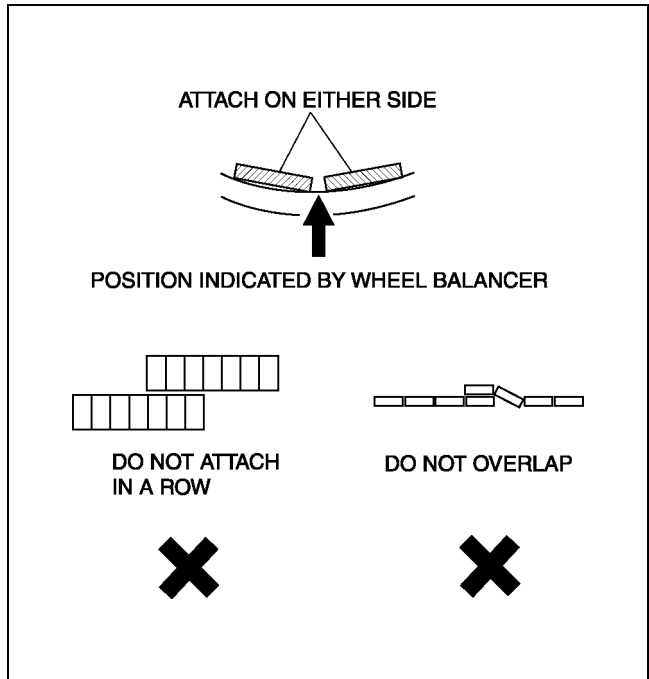
- Use a genuine balance weight or equivalent (steel).
- When attaching the weight balance, press the balance weight with a force of 25 N {2.5 kgf, 5.5 lbf} per 5 g for 2 seconds or more.

WHEEL AND TIRE

6. If attaching 2 balance weights, position them so that each is on either side of the position indicated by the wheel balancer.

Caution

- Do not attach weight balances in a row.
- Do not overlap the balance weights.
- Total weight must not exceed 160g {5.65 oz}.



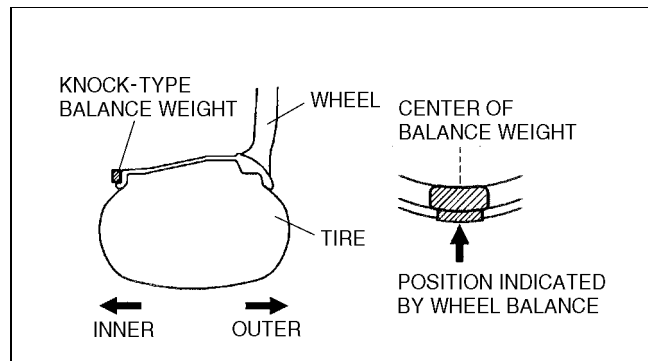
Z5U0212W102

Knock-type Balance Weight (Inner)

1. Measure the amount of unbalance with a wheel balancer.
2. Attach a balance weight corresponding to the measured weight value on the position (inner) indicated by the wheel balancer.

Caution

- Do not attach 3 or more balance weights.
- One balance weight must not exceed 60g {2.12 oz}, and a total of 2 balance weights must not exceed 100g {3.53 oz}.



Z5U0212W103

Remaining Amount of Unbalance Confirmation

1. After installing the outer and inner balance weights, operate the wheel balancer again.
2. Confirm that the remaining unbalance does not exceed followings on either side.

	Outer	Inner
16 inch wheel	10 g {0.35 oz}	8 g {0.28 oz}
17 inch wheel	9 g {0.32 oz}	7 g {0.25 oz}

- If the remaining unbalance exceeds **10 g {0.35 oz}** (16 inch wheel) or **9g {0.32 oz}** (17 inch wheel), perform wheel balance adjustment again.

Allowable remaining unbalance value (g)

	Dynamic unbalance (at rim)		Static unbalance (at rim)
	Outer	Inner	
16 inch wheel	10 g {0.35 oz} max.	8 g {0.28 oz} max.	13 g {0.46 oz} max.
17 inch wheel	9 g {0.32 oz} max.	7 g {0.25 oz} max.	11 g {0.39 oz} max.

FRONT SUSPENSION

A6F741404910W01

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



1	Bolt (ABS wheel-speed sensor)
2	Bolt (brake hose bracket)
3	Nut (front stabilizer control link)
4	Bolt (front shock absorber lower side) (See R-10 Bolt (Front Shock Absorber Lower Side Removal Note))
5	Dynamic damper
6	Damper fork (See R-12 Damper Fork Installation Note)
7	Nut (front shock absorber upper side)

8	Front shock absorber and coil spring (See R-11 Front Shock Absorber and Coil Spring Installation Note)
9	Piston rod nut (See R-10 Piston Rod Nut Removal Note)
10	Mounting rubber
11	Bound stopper
12	Dust boot
13	Coil spring (See R-10 Coil Spring Installation Note)
14	Front shock absorber

FRONT SUSPENSION

Bolt (Front Shock Absorber Lower Side) Removal Note

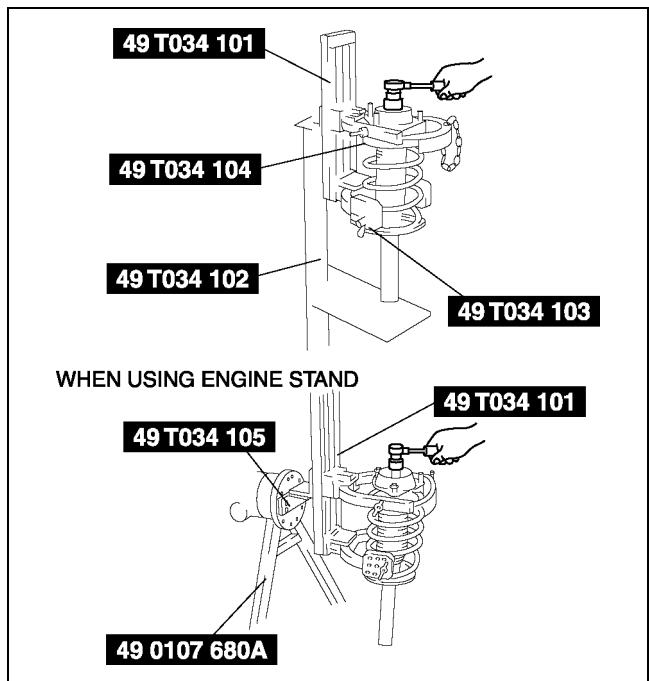
1. Support the knuckle with a jack to prevent from falling.

Piston Rod Nut Removal Note

Warning

- Removing the piston rod nut is dangerous. The shock absorber and spring could fly off under tremendous pressure and cause serious injury or death. Secure the shock absorber in the SSTs before removing the piston rod nut.

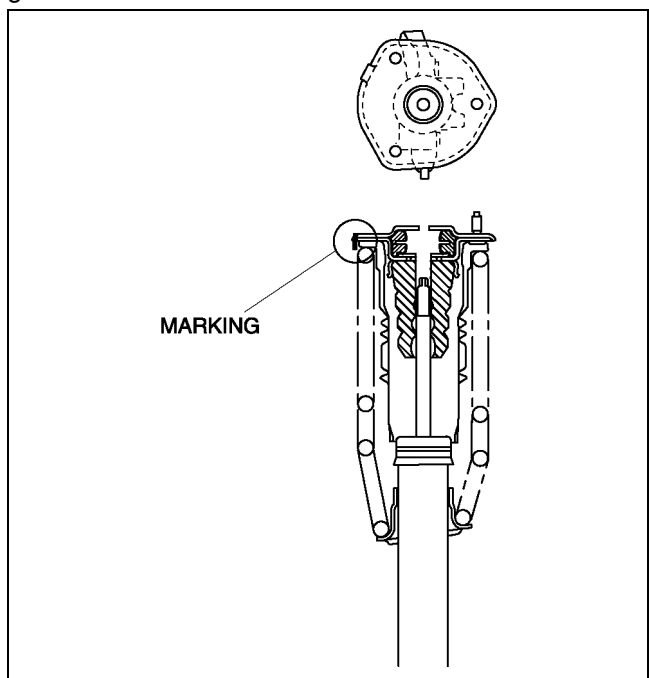
1. Protect the coil spring using a piece of cloth, then set the **SSTs**.
2. Compress the coil spring using the **SSTs**, and remove the piston rod nut.



A6E7414W008

Coil Spring Installation Note

1. Temporarily install the coil spring, dust boot and mounting rubber on the shock absorber so that the lower end of the coil spring is seated on the step of the lower spring seat.
2. Mark the coil spring, dust boot and mounting rubber for proper installation as shown in the figure.
3. Align the marks of the coil spring and dust boot. Protect the coil spring and dust boot using a piece of cloth, then set the **SSTs**.



A6E7414W039

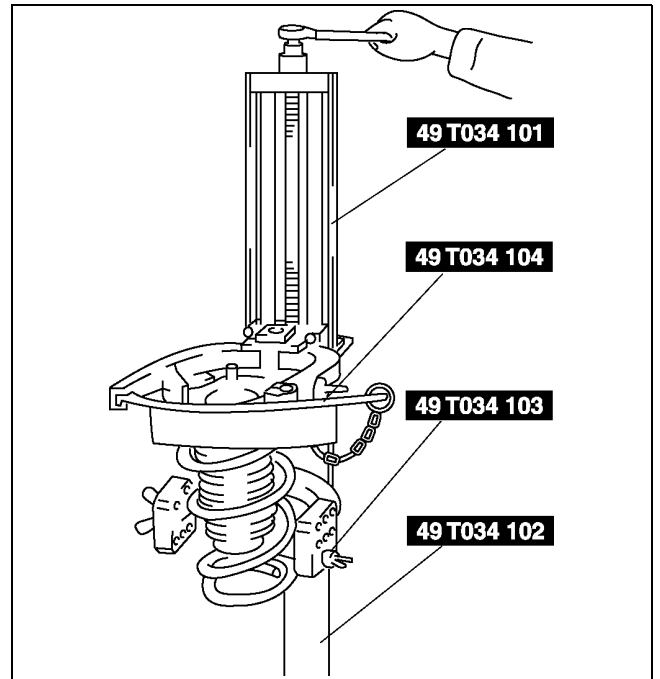
FRONT SUSPENSION

4. Compress the coil spring using the **SSTs**.
5. Install the shock absorber so that the lower end of the coil spring is seated on the step of the lower spring seat.
6. Make sure that the marks on the shock absorber and dust boot are aligned.
7. Install the mounting rubber and piston rod nut, then remove the **SSTs**.

Piston rod nut tightening torque

39.2—52.9 N·m

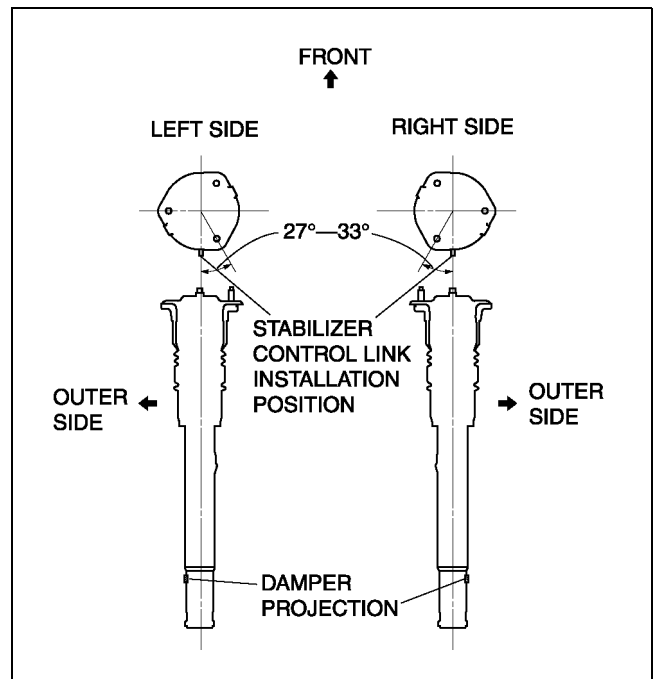
{4.00—5.39 kgf·m, 29.0—39.0 ft·lbf}



A6E7414W029

Front Shock Absorber and Coil Spring Installation Note

1. Install the stud bolts at a 27°—33° angle from where the stabilizer control link is installed (center line), towards the inner side of the vehicle.



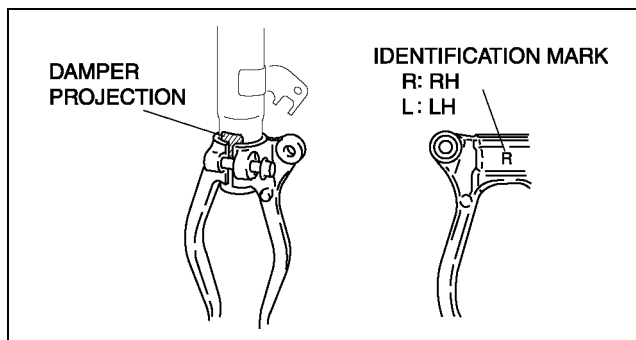
A6E7414W004

R

FRONT SUSPENSION

Damper Fork Installation Note

1. Align the gap of the damper fork with the projections of the damper.
2. Tighten the bolt.



A6E7414W005

FRONT SHOCK ABSORBER INSPECTION

A6E741434700W01

1. Remove the front shock absorber from the vehicle.
2. Inspect for damage and oil leakage.
3. Inspect the rubber bushing for deterioration and wear.
4. Compress and extend the shock piston at least three times. Verify that the operational force does not change and that there is no unusual noise.
 - If not as specified, replace the shock absorber.
 - (1) Compress the shock absorber piston and release it.
 - (2) Verify that the piston extends fully at a normal speed.

FRONT SHOCK ABSORBER DISPOSAL

A6E741434700W02

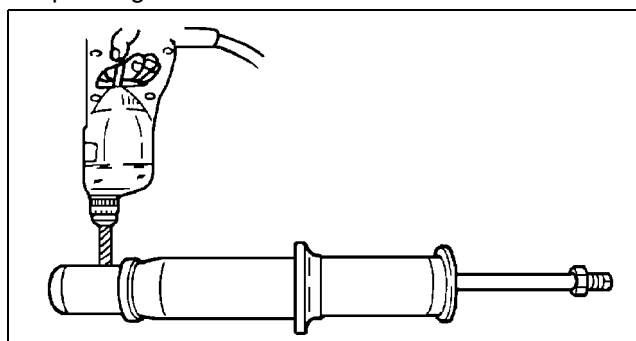
Warning

- Whenever drilling into a shock absorber, wear protective eye wear. The gas in the shock absorber is pressurized, and could spray metal chips into the eyes and face when drilling.

1. Clamp a shock absorber on a flat surface or with the piston pointing downwards.
2. Drill a 2—3 mm {0.08—0.12 in} hole at a point 20—30 mm {0.8—1.2 in} from the bottom of the tube, so that the gas can escape.
3. Turn the hole downwards.
4. The oil can be collected by moving the piston rod several times up and down and cutting the tube at the end.
5. Dispose of waste oil according to the waste disposal law.

Note

- Shock absorber gas is nitrogen gas.
- Shock absorber oil is mineral oil.



FRONT SUSPENSION

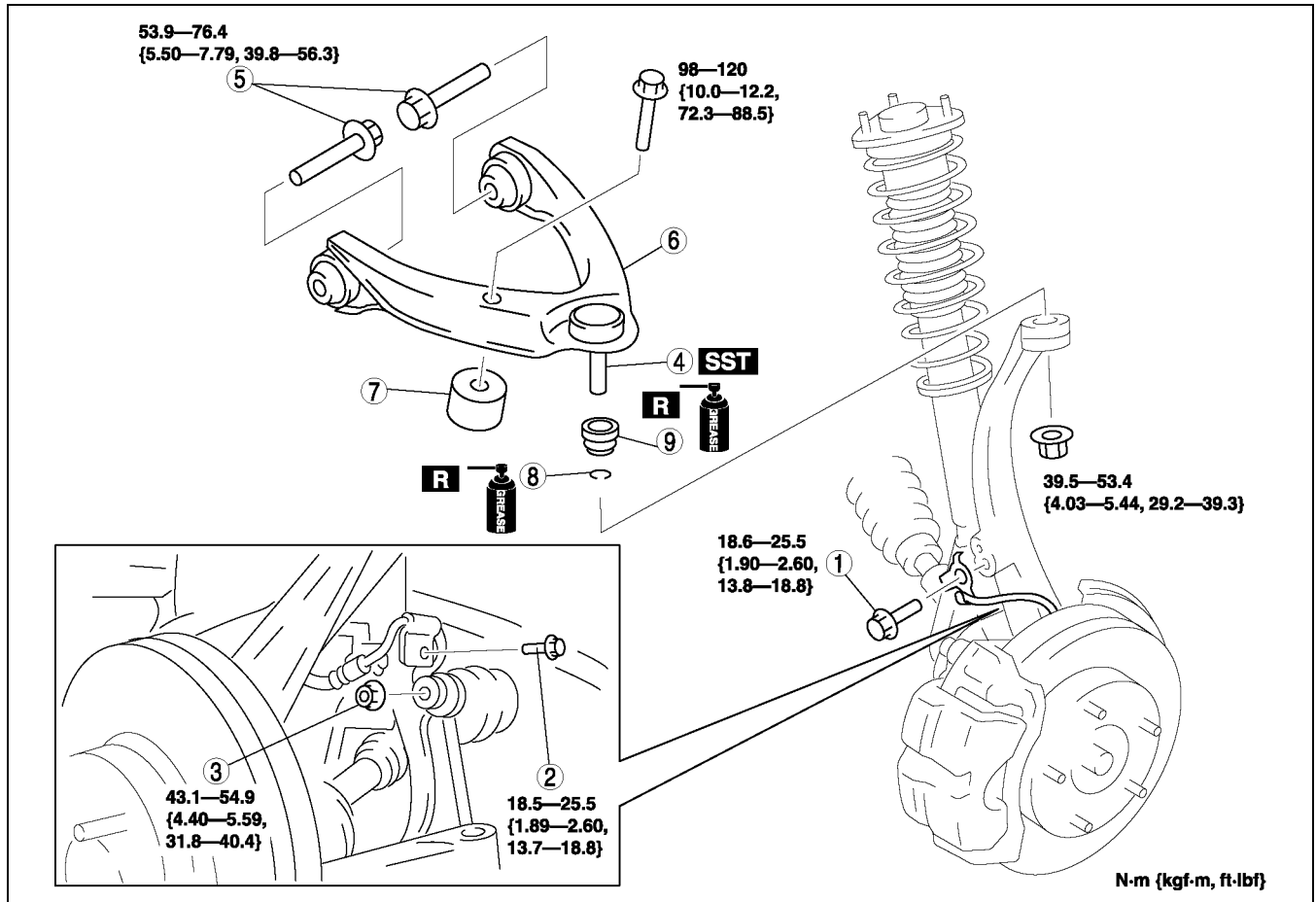
FRONT UPPER ARM REMOVAL/INSTALLATION

A6E741434200W01

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

- Remove in the order indicated in the table.
- Install in the reverse order of removal.
- Inspect the front wheel alignment.
(See [R-5 FRONT WHEEL ALIGNMENT](#).)



A6E7414W035

1	Bolt (ABS wheel-speed sensor)
2	Bolt (brake hose bracket)
3	Nut (stabilizer control link)
4	Front upper arm ball joint (See R-13 Front Upper Arm Ball Joint Removal Note)

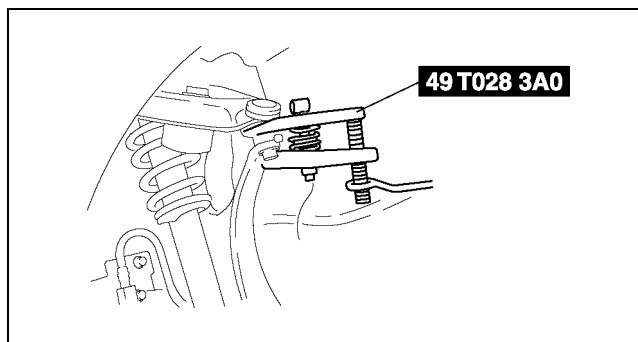
5	Bolt (front upper arm) (See R-14 Bolt (Front Upper Arm) Removal Note)
6	Front upper arm
7	Dynamic Damper
8	Clip (See R-14 Clip Installation Note)
9	Dust boot

Front Upper Arm Ball Joint Removal Note

- Support the knuckle using the jack.

FRONT SUSPENSION

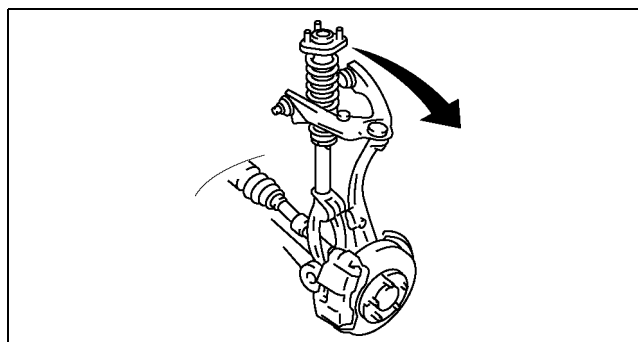
2. Separate the ball joint from the knuckle using the **SST**.



A6E7414W006

Bolt (Front Upper Arm) Removal Note

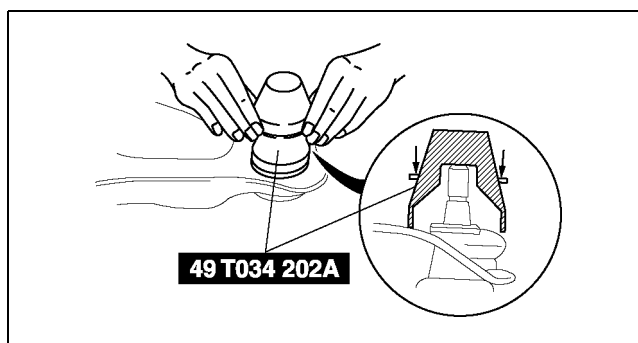
1. Remove the nuts (3 locations) from the upper part of the front shock absorber.
2. Pull the front shock absorber and coil spring out of the way, towards the outer side of the vehicle.
3. Remove the bolts.



A6E7414W023

Clip Installation Note

1. Wipe the grease off the ball stud.
2. Fill the inside of the new dust boot with grease.
3. Install the boot on the ball joint.
4. Install the new clip using the **SST**.
5. Verify that the clip is installed securely to the groove.
6. Wipe away the excess grease.



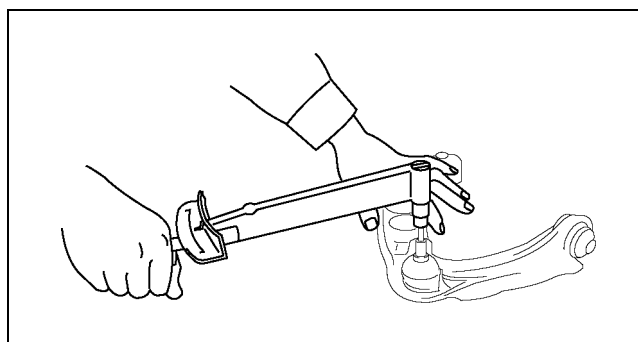
A6E7414W024

FRONT UPPER ARM INSPECTION

1. Remove the upper arm from the vehicle.
2. Inspect for damage, cracks, and bending.
3. Inspect the ball joint rotation torque.
 - (1) Rotate the ball joint five times.
 - (2) Measure the rotation torque using a suitable allen socket and a torque wrench.
 - If not within the specification, replace the lower arm component.

Rotation torque

1.5 N·m {15.0 kgf·cm, 13.2 in·lbf} max.



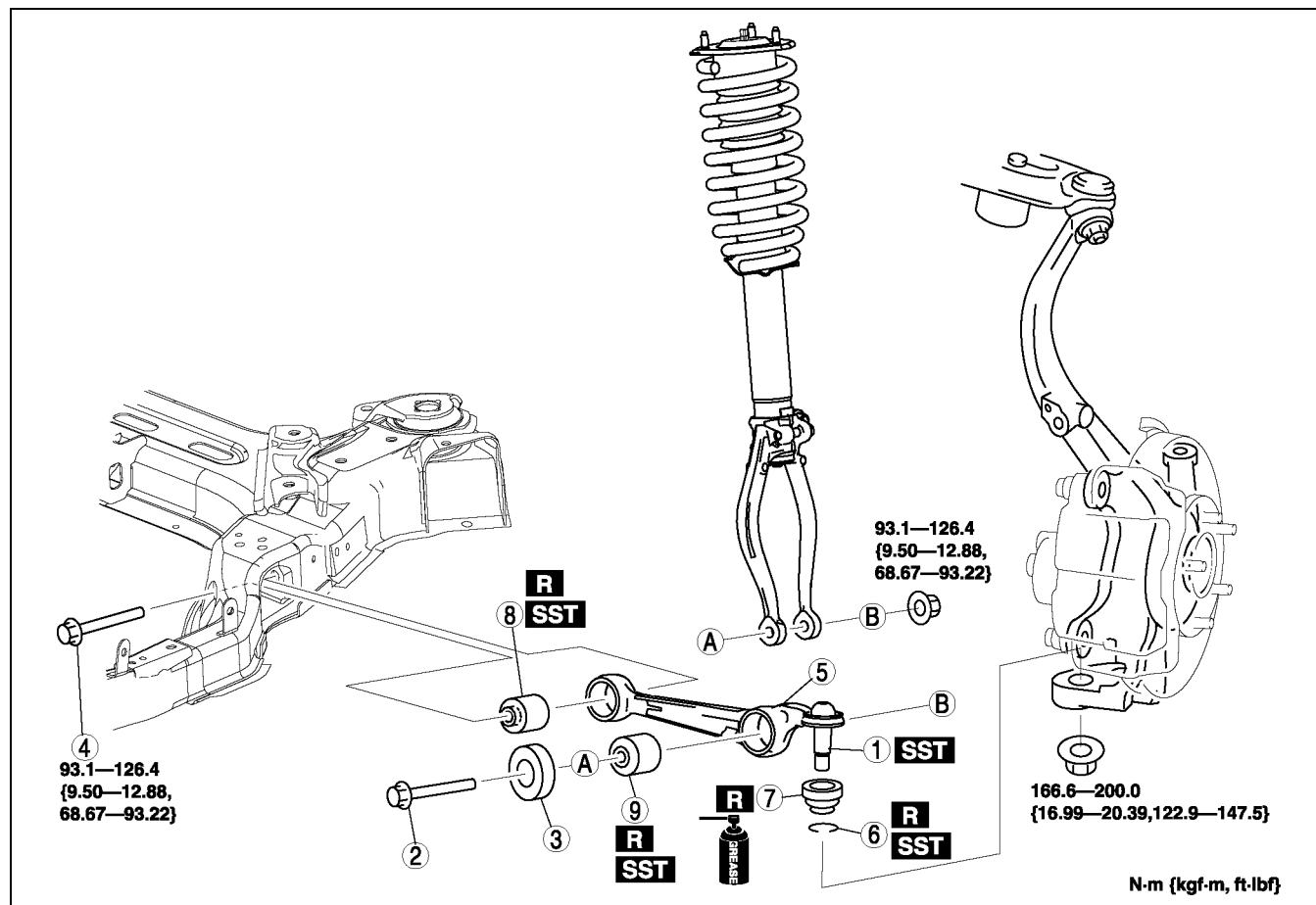
A6E7414W043

FRONT SUSPENSION

FRONT LOWER ARM (FRONT) REMOVAL/INSTALLATION

A6E741434300W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



A6E7414W018

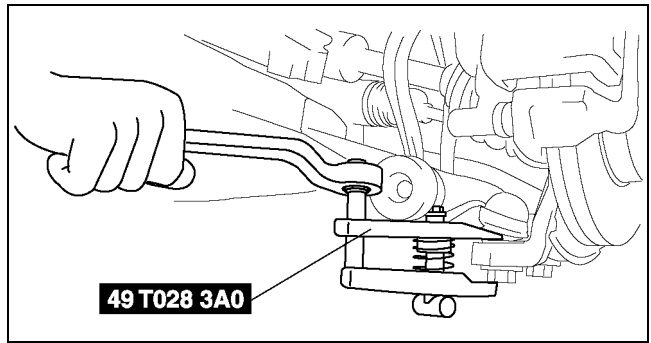
1	Front lower arm (front) ball joint (See R-16 Front Lower Arm (Front) Ball Joint Removal Note)
2	Bolt (front shock absorber lower side)
3	Dynamic damper
4	Bolt (front lower arm inner side)
5	Front lower arm (front) component
6	Clip (See R-18 Clip Installation Note)
7	Dust boot

8	Front lower arm (front) bushing (inner side) (See R-16 Front Lower Arm (Front) Bushing (Inner Side) Removal Note) (See R-17 Front Lower Arm (Front) Bushing (Inner Side) Installation Note)
9	Front lower arm (front) bushing (outer side) (See R-16 Front Lower Arm (Front) Bushing (Outer Side) Removal Note) (See R-16 Front Lower Arm (Front) Bushing (Outer Side) Installation Note)

FRONT SUSPENSION

Front Lower Arm (Front) Ball Joint Removal Note

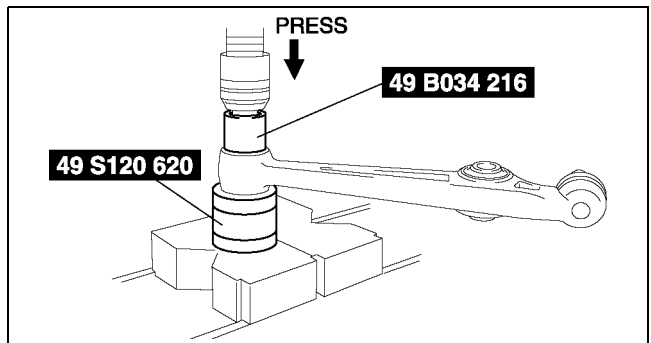
1. Separate the ball joint from the knuckle using the SSTs.



A6E7414W030

Front Lower Arm (Front) Bushing (Inner Side) Removal Note

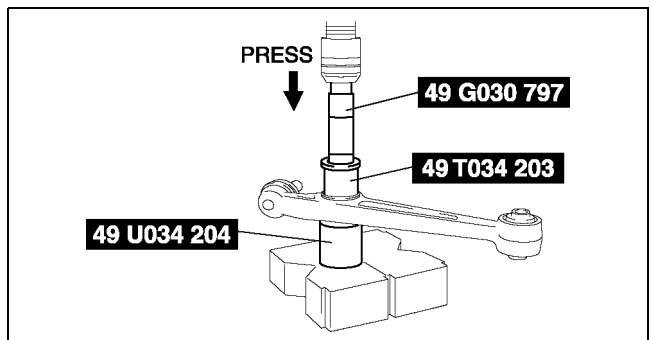
1. Press the bushing (inner side) out using the SSTs.



A6E7414W001

Front Lower Arm (Front) Bushing (Outer Side) Removal Note

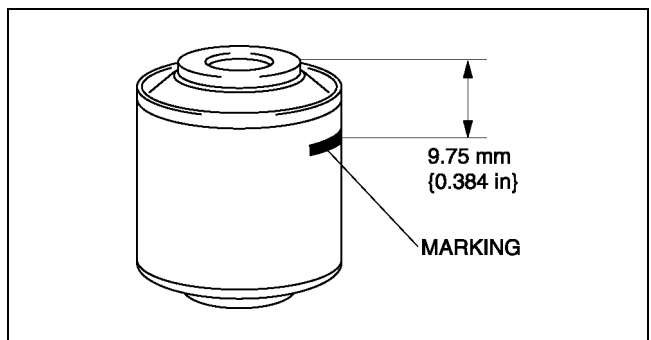
1. Press the bushing (outer side) out using the SSTs.



A6E7414W010

Front Lower Arm (Front) Bushing (Outer Side) Installation Note

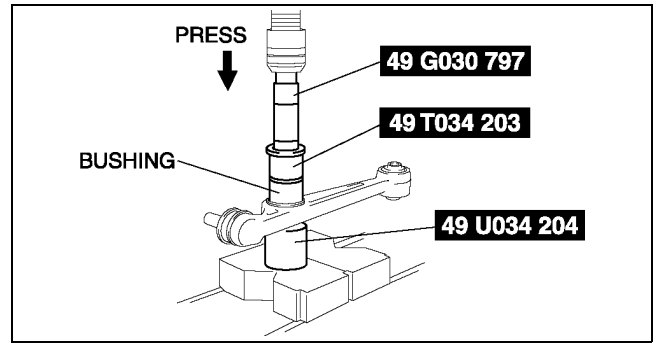
1. Mark the new bushing as shown in the figure.



A6E7414W011

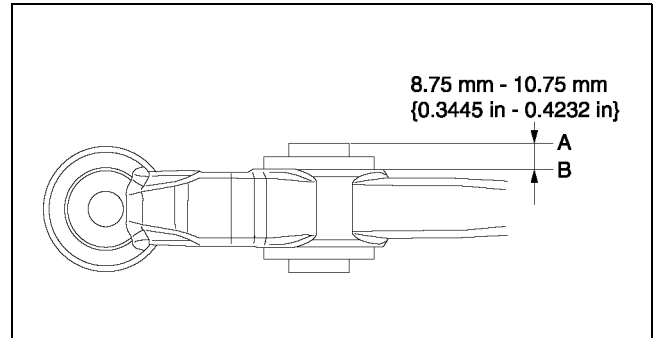
FRONT SUSPENSION

- Press the bushing in to the marking using the **SSTs**.



A6E7414W012

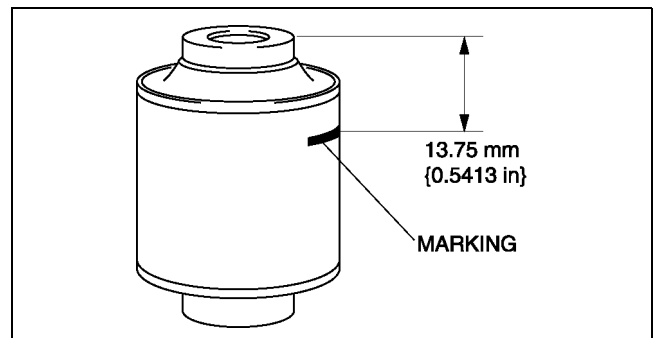
- Verify that clearance distance A—B is **8.75 mm—10.75 mm {0.3445 in—0.4232 in}**.



A6E7414W003

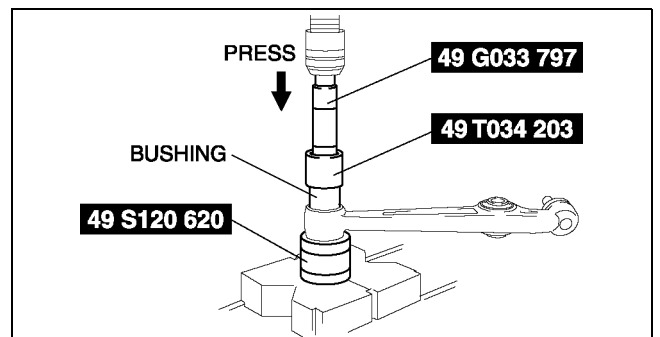
Front Lower Arm (Front) Bushing (Inner Side) Installation Note

- Mark the new bushing as shown in the figure.



A6E7414W013

- Press the bushing in to the marking using the **SSTs**.

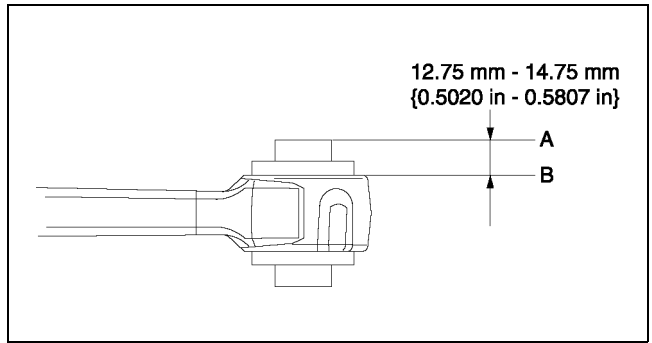


A6E7414W002

R

FRONT SUSPENSION

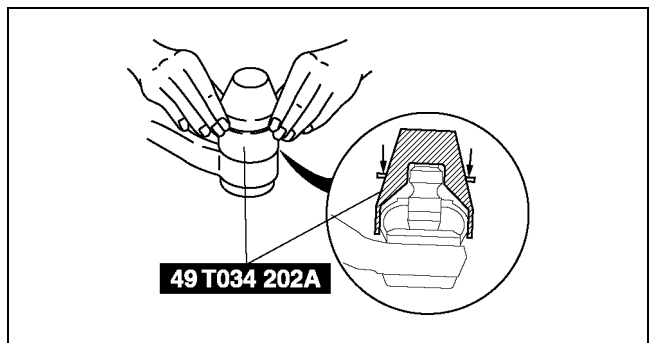
3. Verify that clearance distance A—B is **12.75 mm—14.75 mm {0.5020 in—0.5807 in}**.



A6E7414W007

Clip Installation Note

1. Wipe the grease off the ball stud.
2. Fill the inside of the new dust boot with grease.
3. Install the boot on the ball joint.
4. Install the new clip using the **SST**.
5. Verify that the clip is installed securely to the groove.
6. Wipe away the excess grease.



A6E7414W025

FRONT LOWER ARM (FRONT) INSPECTION

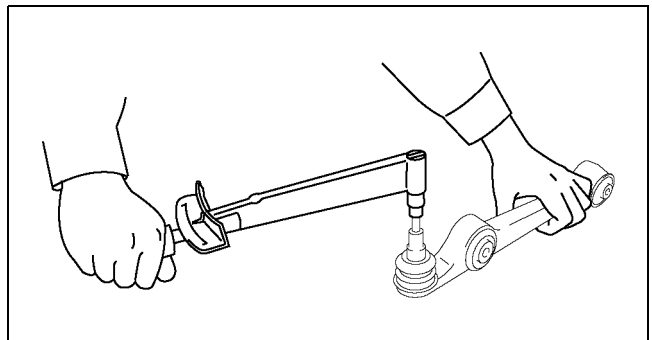
1. Remove the lower arm (front) from the vehicle.
2. Inspect for damage, cracks, and bending.
3. Inspect the ball joint rotation torque.
 - (1) Rotate the ball joint five times.
 - (2) Measure the rotation torque using a suitable allen socket and a torque wrench.
 - If not within the specification, replace the lower arm component.

A6E741434300W03

Rotation torque

1.18—2.23 N·m

{12.1—22.7 kgf·cm, 10.5—19.7 in·lbf}



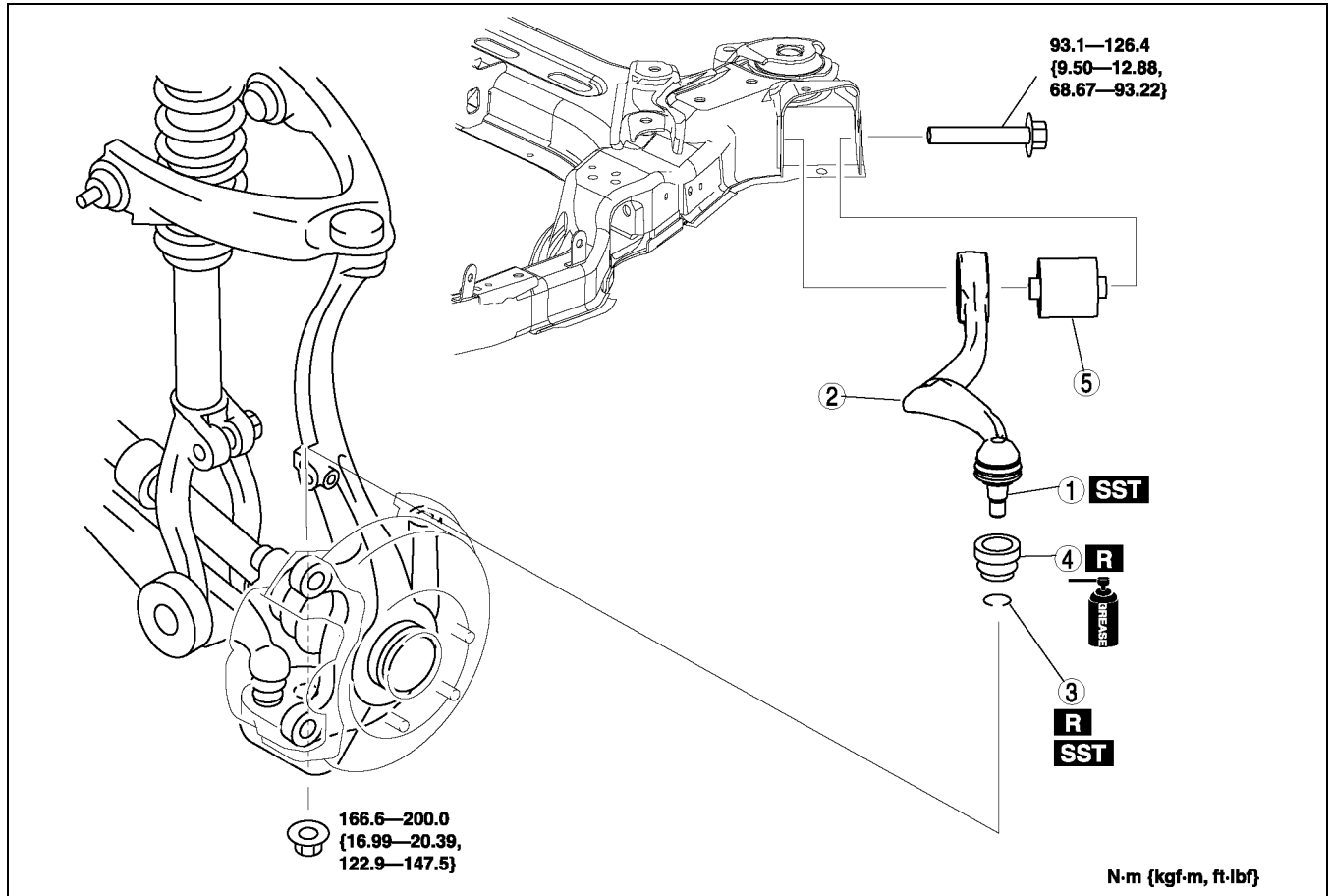
A6E7414W044

FRONT SUSPENSION

FRONT LOWER ARM (REAR) REMOVAL/INSTALLATION

A6E741434300W02

1. Remove the front crossmember component.
(See [R-23 FRONT CROSSMEMBER REMOVAL/INSTALLATION.](#))
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Inspect the front wheel alignment.
(See [R-5 FRONT WHEEL ALIGNMENT.](#))



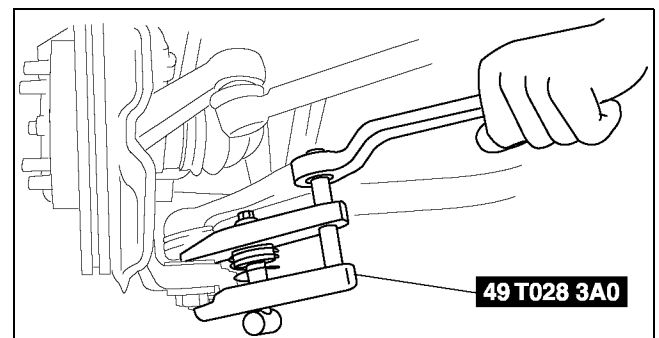
A6E7414W019

1	Front lower arm (rear) ball joint (See R-19 Front Lower Arm (Rear) Ball Joint Removal Note)
2	Front lower arm (rear) (See R-21 Front Lower Arm (Rear) Installation Note)
3	Clip R-21 Clip Installation Note

4	Dust boot
5	Front lower arm (rear) bushing (See R-20 Front Lower Arm (Rear) Bushing Removal Note) (See R-20 Front Lower Arm (Rear) Bushing Installation Note)

Front Lower Arm (Rear) Ball Joint Removal Note

1. Separate the ball joint from the knuckle using the SSTs.

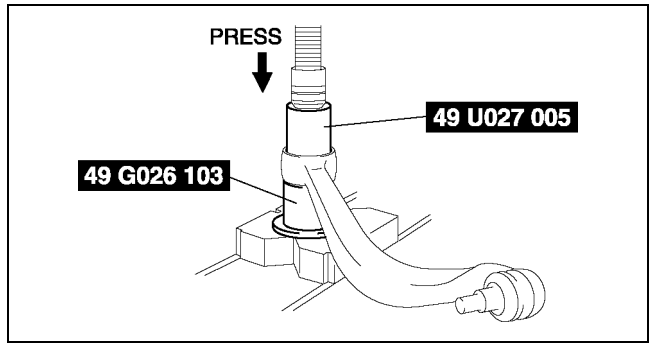


A6E7414W031

FRONT SUSPENSION

Front Lower Arm (Rear) Bushing Removal Note

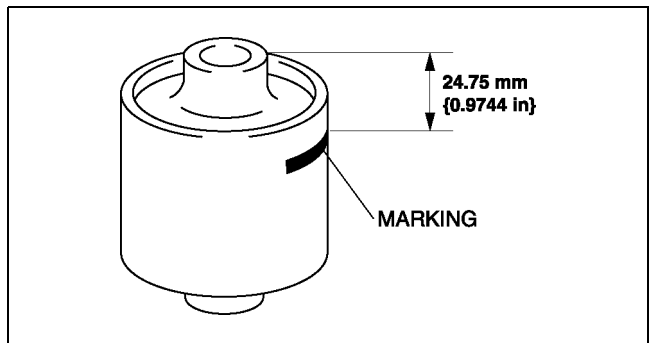
1. Press the bushing out using the **SSTs**.
2. Remove the front lower arm (rear) from the press and tap the bushing out with a hammer.



A6E7414W014

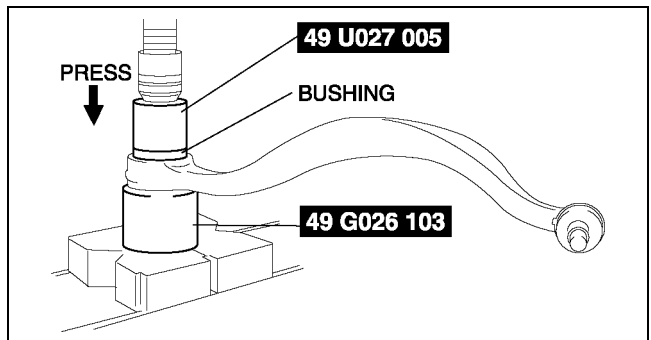
Front Lower Arm (Rear) Bushing Installation Note

1. Mark the new bushing as shown in the figure.



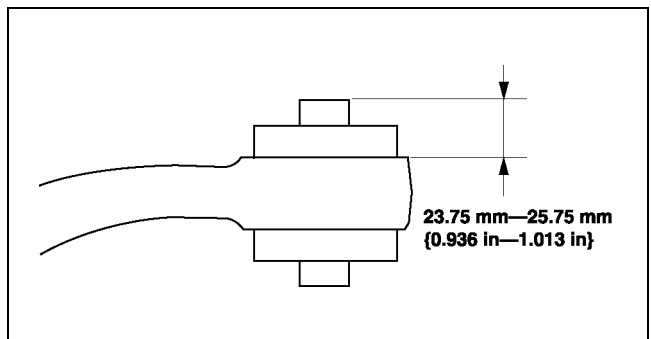
A6E7414W026

2. Press the bushing in to the marking using the **SSTs**.



A6E7414W027

3. Verify that clearance distance A—B is **23.75 mm—25.75 mm {0.936 in—1.013 in}**.

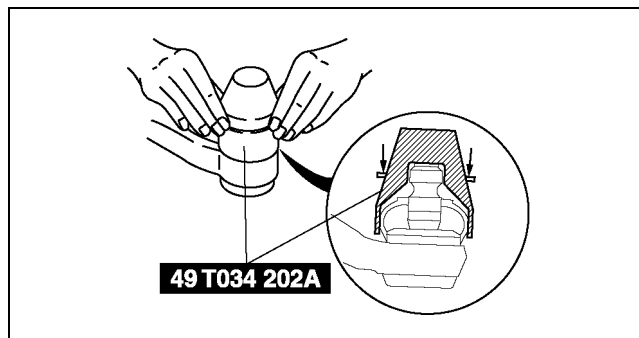


A6E7414W028

FRONT SUSPENSION

Clip Installation Note

1. Wipe the grease off the ball stud.
2. Fill the inside of the new dust boot with grease.
3. Install the boot on the ball joint.
4. Install the new clip using the **SST**.
5. Verify that the clip is installed securely to the groove.
6. Wipe away the excess grease.



A6E7414W025

Front Lower Arm (Rear) Installation Note

1. Install the lower arm (rear) so that identification mark (L or R) faces toward the front of the vehicle.

FRONT LOWER ARM (REAR) INSPECTION

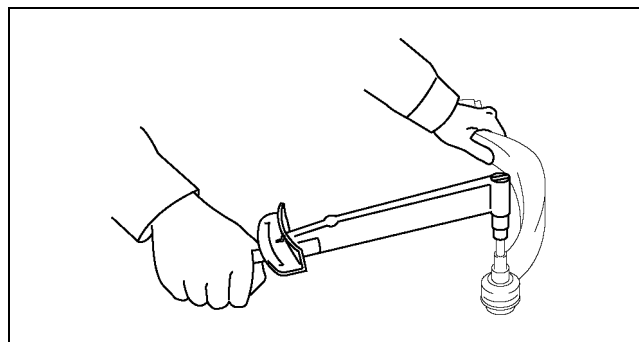
A6E741434300W04

1. Remove the lower arm (rear) from the vehicle.
2. Inspect for damage, cracks, and bending.
3. Inspect the ball joint rotation torque.
 - (1) Rotate the ball joint five times.
 - (2) Measure the rotation torque using a suitable allen socket and a torque wrench.
 - If not within the specification, replace the lower arm component.

Rotation torque

1.00—2.22 N·m

{10.2—22.6 kgf·cm, 8.86—19.6 in·lbf}



A6E7414W045

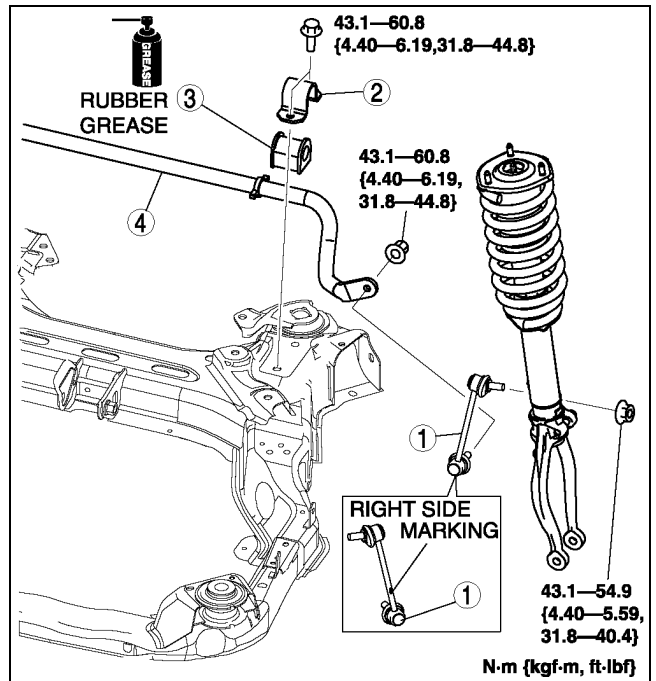
R

FRONT SUSPENSION

FRONT STABILIZER REMOVAL/INSTALLATION

1. Remove the front crossmember component. (See [R-23 FRONT CROSSMEMBER REMOVAL/INSTALLATION](#).)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Adjust the headlight zero set.
(See [T-31 HEADLIGHT ZEROSET](#).)
5. Inspect the front wheel alignment.
(See [R-5 FRONT WHEEL ALIGNMENT](#).)

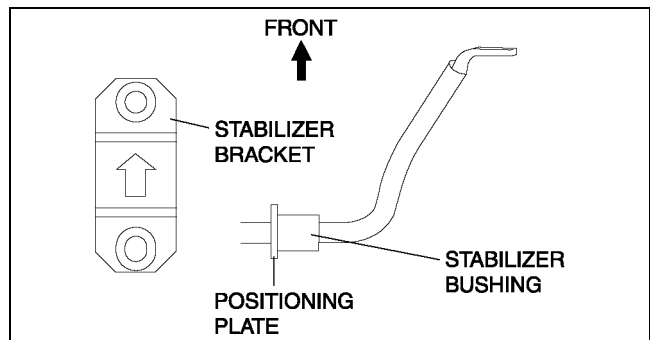
1	Stabilizer control link
2	Stabilizer bracket (See R-22 Stabilizer Bracket Installation Note)
3	Stabilizer bushing
4	Front stabilizer



A6E7414W020

Stabilizer Bracket Installation Note

1. Apply rubber grease to the inside surface of the stabilizer bushing.
2. Align the bushing with the inside of positioning plate on the stabilizer bar.
3. Install the stabilizer bracket.



A6E7414W015

FRONT SUSPENSION

STABILIZER CONTROL LINK INSPECTION

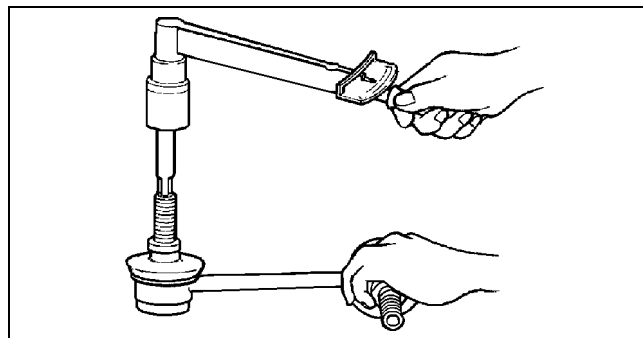
A6E741434150W01

1. Remove the stabilizer control link from the vehicle.
2. Inspect for bending and damage.
3. Measure the ball joint starting torque.
 - (1) Rock the ball joint stud side to side 10 times.
 - (2) Rotate the ball joint stud 10 times.
 - (3) Measure the starting torque using a suitable allen socket and a torque wrench.

Starting torque

0.23—0.47 N·m

{2.4—4.7 kgf·cm, 2.1—4.1 in·lbf}



A6E7414W021

FRONT CROSSMEMBER REMOVAL/INSTALLATION

A6E741434800W01

1. Remove the under cover.
2. Remove the splash shield.
3. Remove the front auto leveling sensor.
(See [T-32 FRONT AUTO LEVELING SENSOR REMOVAL/INSTALLATION.](#))
4. Remove the transverse member.
(See [R-27 TRANSVERSE MEMBER REMOVAL/INSTALLATION.](#))
5. Remove the steering gear and linkage, and pipe assembly installation bolts from the front crossmember, then suspend the steering gear and linkage with a cable.

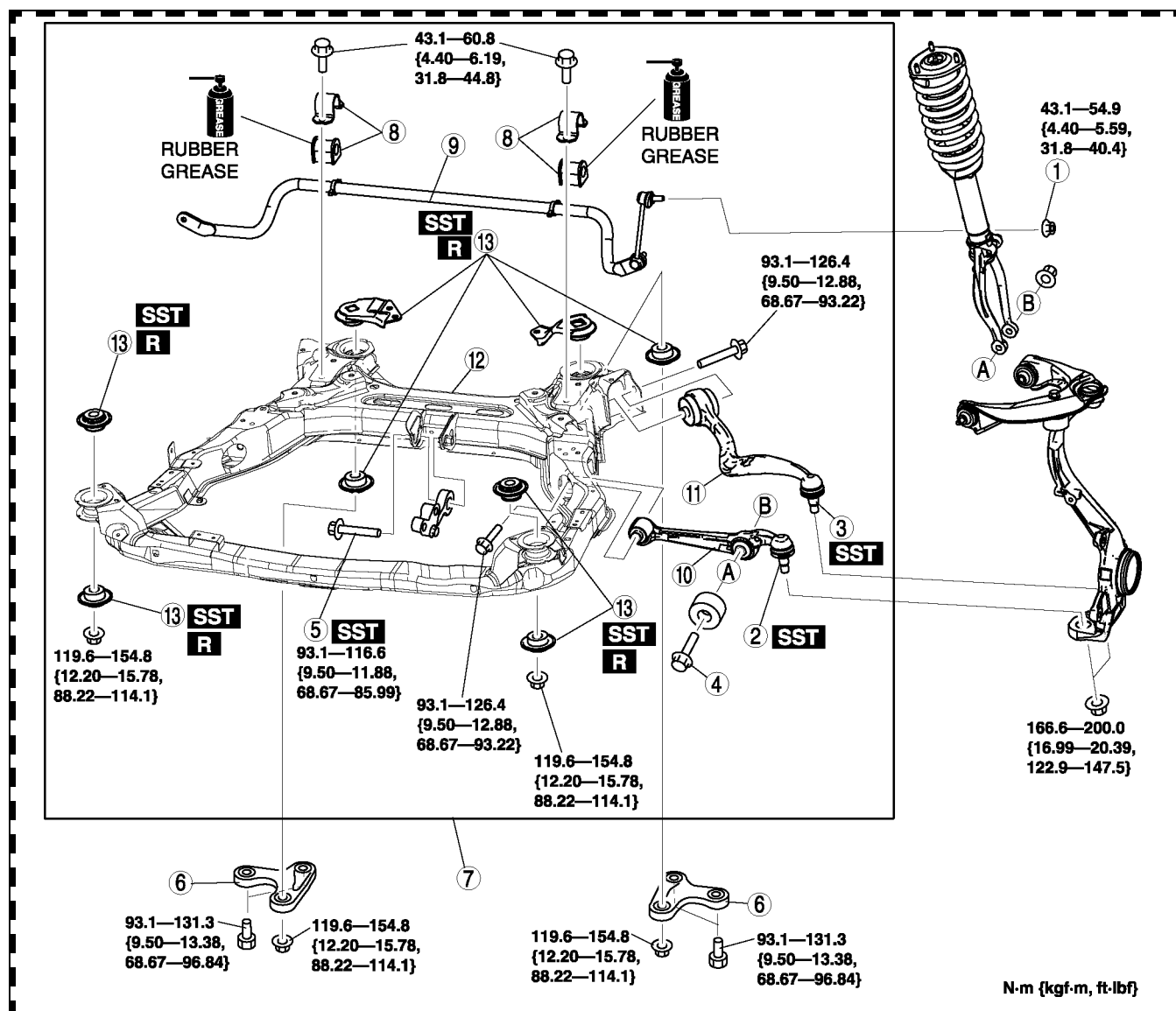
Tightening torque

- **Steering gear and linkage:** 74.4—104.8 N·m {7.857—10.68 kgf·m, 54.88—77.29 ft·lbf}
- **Pipe assembly:** 7.8—10.8 N·m {79.6—110.0 kgf·cm, 69.1—95.5 in·lbf}

6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. Adjust the headlight zeroset.
(See [T-31 HEADLIGHT ZEROSET.](#))
9. Inspect the front wheel alignment.
(See [R-5 FRONT WHEEL ALIGNMENT.](#))

R

FRONT SUSPENSION



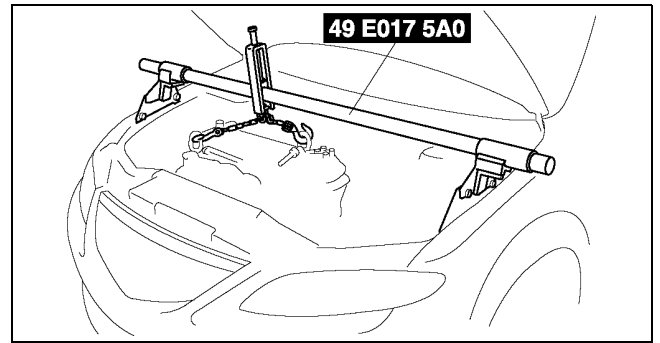
1	Nut (stabilizer control link)
2	Front lower arm (front) ball joint (See R-16 Front Lower Arm (Front) Ball Joint Removal Note)
3	Front lower arm (rear) ball joint (See R-19 Front Lower Arm (Rear) Ball Joint Removal Note)
4	Bolt (front shock absorber lower side)
5	No.1 engine mount center bolt (See R-25 No.1 Engine Mount Center Bolt Removal Note)
6	Crossmember bracket (See R-25 Crossmember Bracket Removal Note)

7	Crossmember component
8	Stabilizer bracket and bushing
9	Front Stabilizer
10	Front lower arm (front)
11	Front lower arm (rear)
12	Front crossmember
13	Front crossmember bushing (See R-25 Front Crossmember Bushing Removal Note) (See R-26 Front Crossmember Bushing Installation Note)

FRONT SUSPENSION

No.1 Engine Mount Center Bolt Removal Note

1. Suspend the engine using the **SST**.
2. Remove the No.1 engine mount center bolt.



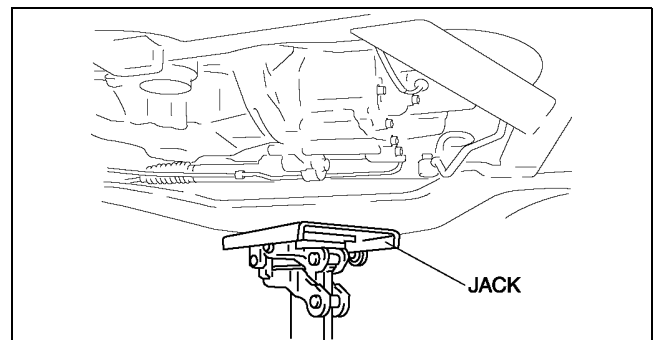
A6E7414W016

Crossmember Bracket Removal Note

Warning

- Removing the crossmember is dangerous. The crossmember component could fall and cause serious injury or death. Verify that the jack securely supports the crossmember component before removing the crossmember bracket.

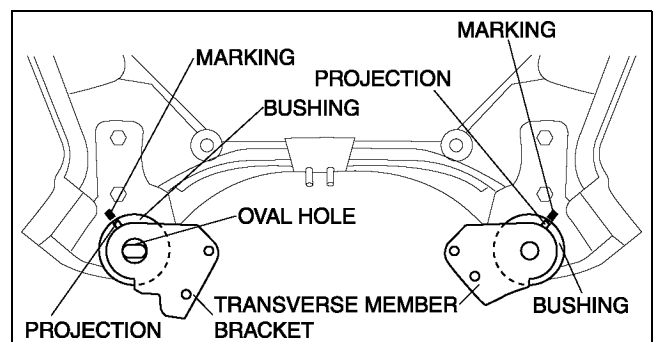
1. Support the crossmember component with a jack and remove the nuts.
2. Remove the crossmember bracket.



A6E7414W036

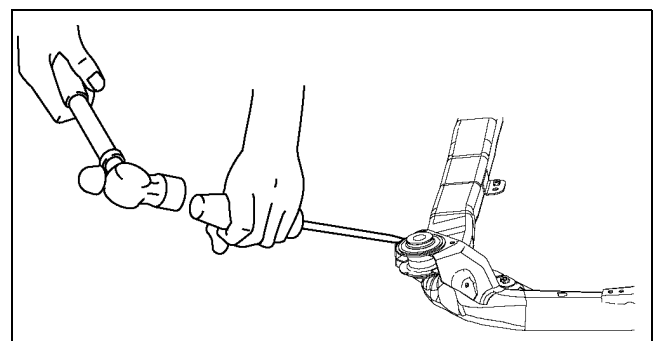
Front Crossmember Bushing Removal Note

1. Mark the crossmember as shown in the figure (rear upper side only).



A6E7414W040

2. Remove the bushings using screw driver (-), being care not to damage the front crossmember.

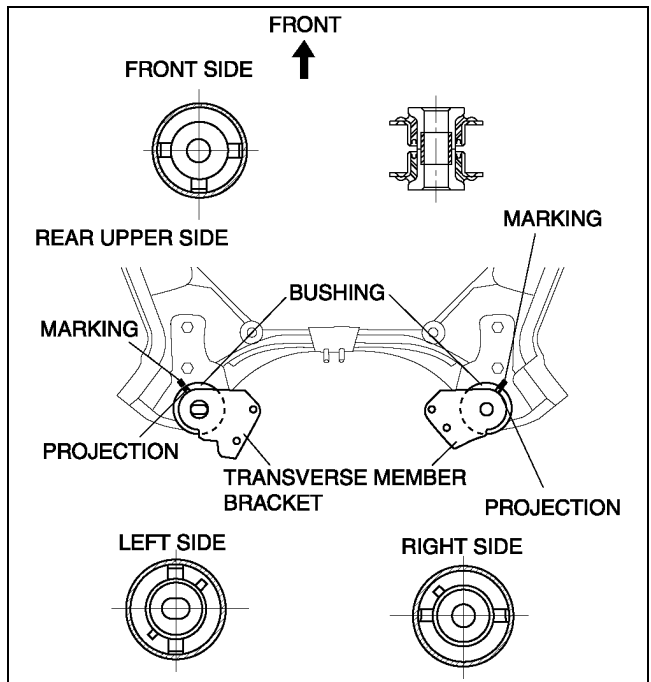


A6E7414W032

FRONT SUSPENSION

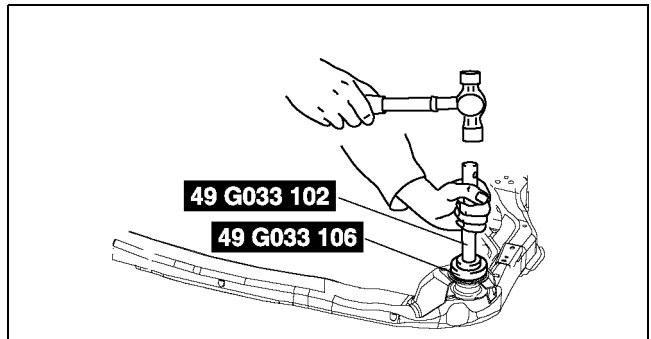
Front Crossmember Bushing Installation Note

1. Set the bushings as shown in the figure.



A6E7414W041

2. Install the bushing onto the crossmember using the **SSTs**.



A6E7414W042

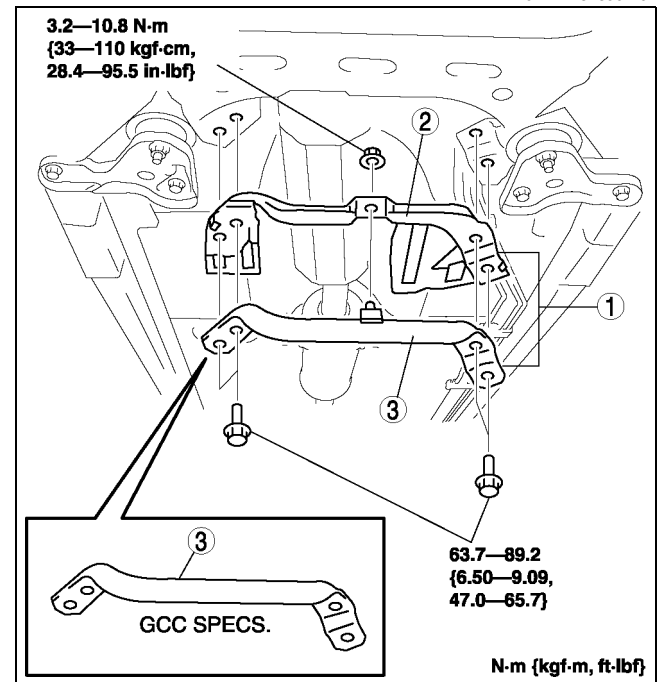
FRONT SUSPENSION

TRANSVERSE MEMBER REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.

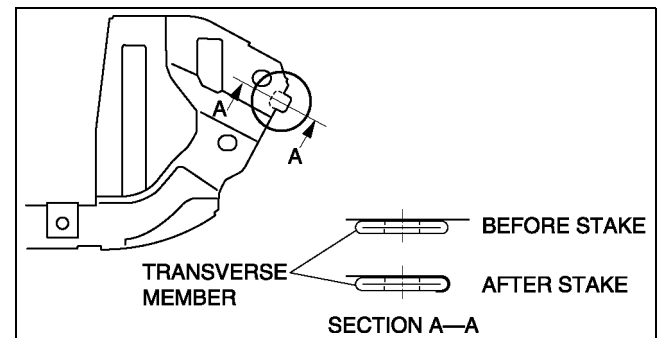
1	Transverse member and transverse cover
2	Transverse cover (European (L.H.D. U.K.) specs.) (See R-27 Transverse Cover Installation Note)
3	Transverse member

2. Install in the reverse order of removal.



Transverse Cover Installation Note

1. Install the transverse cover.
2. Stake area A as shown in the figure.



A6E7414W038

R

REAR SUSPENSION

REAR SUSPENSION

REAR SHOCK ABSORBER REMOVAL/INSTALLATION

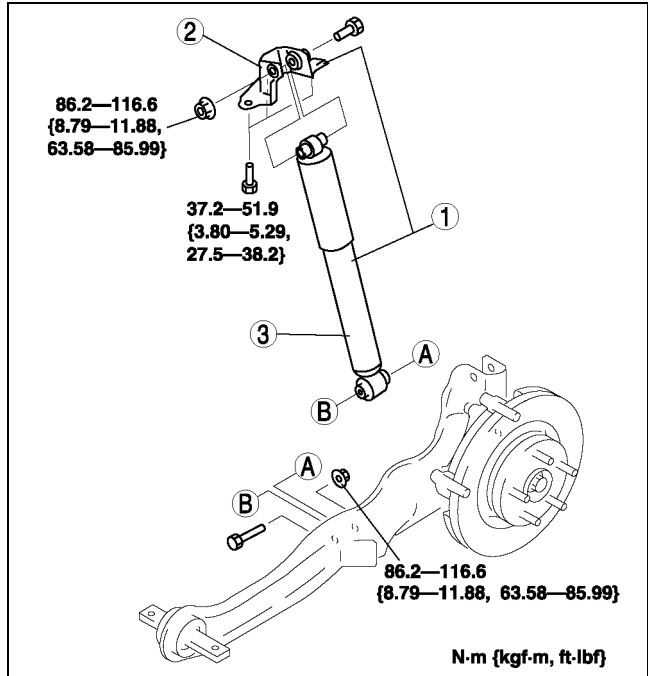
A6E741628700W01

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

- Remove in the order indicated in the table.
- Install in the reverse order of removal.

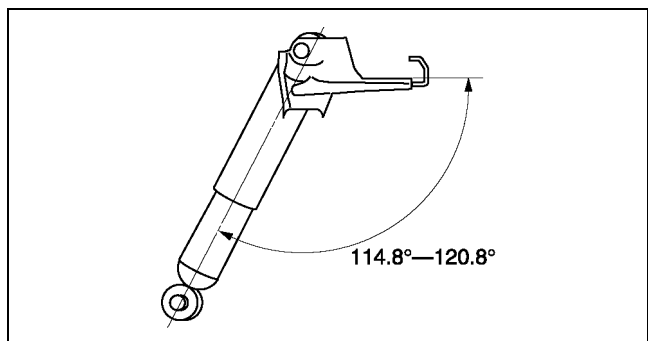
1	Rear shock absorber and bracket
2	Bracket (See R-28 Bracket Installation Note)
3	Rear shock absorber



A6E7416W003

Bracket Installation Note

- Install the bracket as shown in the figure.



A6E7416W024

REAR SHOCK ABSORBER INSPECTION

A6E741628700W02

- Inspect the rear shock absorber in the same way as the front shock absorber. (See [R-12 FRONT SHOCK ABSORBER INSPECTION](#).)

REAR SHOCK ABSORBER DISPOSAL

A6E741628700W03

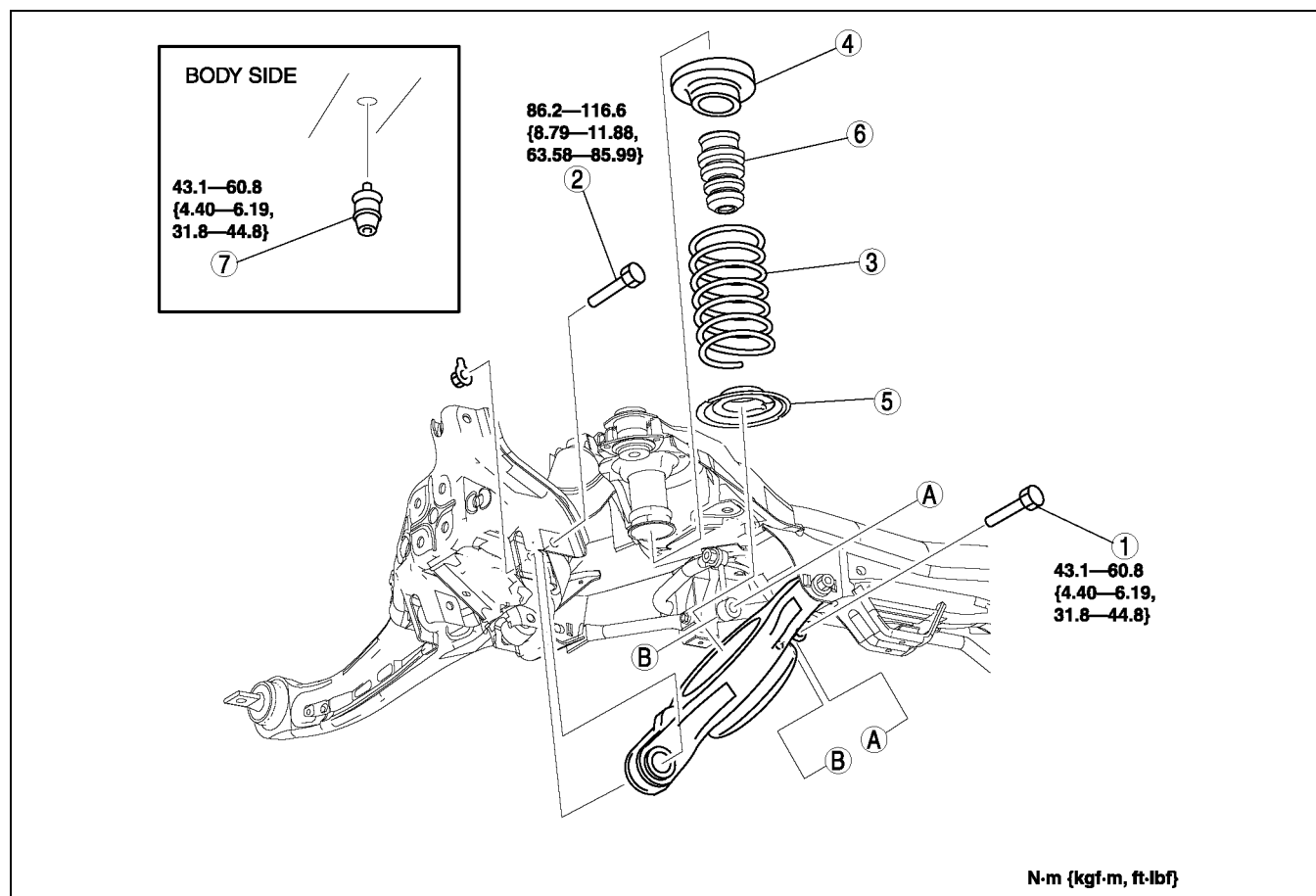
- Dispose the rear shock absorber in the same way as the front shock absorber. (See [R-12 FRONT SHOCK ABSORBER DISPOSAL](#).)

REAR SUSPENSION

REAR COIL SPRING REMOVAL/INSTALLATION

A6E741628011W01

1. Remove the rear auto leveling sensor.
(See [T-32 REAR AUTO LEVELING SENSOR REMOVAL/INSTALLATION.](#))
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Adjust the headlight zeroset.
(See [T-31 HEADLIGHT ZEROSET.](#))
5. Inspect the rear wheel alignment.
(See [R-6 REAR WHEEL ALIGNMENT.](#))



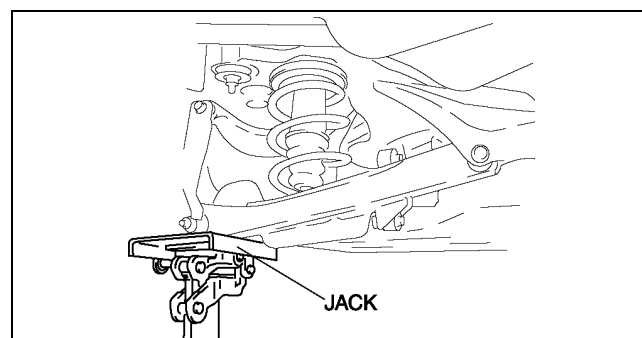
A6E7416W022

1	Bolt (stabilizer control link lower side)
2	Bolt (rear lower arm outer side) (See R-29 Bolt (Rear Lower Arm Outer Side) Removal Note)
3	Rear coil spring (See R-30 Rear Coil Spring Installation Note)

4	Upper spring seat rubber
5	Lower spring seat
6	Bound stopper (spring side)
7	Bound stopper (body side) (See R-30 Bound Stopper (Body Side) Removal/Installation Note)

Bolt (Rear Lower Arm Outer Side) Removal Note

1. Support the lower arm with a jack.
2. Loosen the inner bolt of the lower arm.
3. Remove the outer bolt of the lower arm.



A6E7416W019

REAR SUSPENSION

Bound Stopper (Body Side) Removal/Installation Note

1. Remove or/and install the bound stopper (body side) using the extension bar.

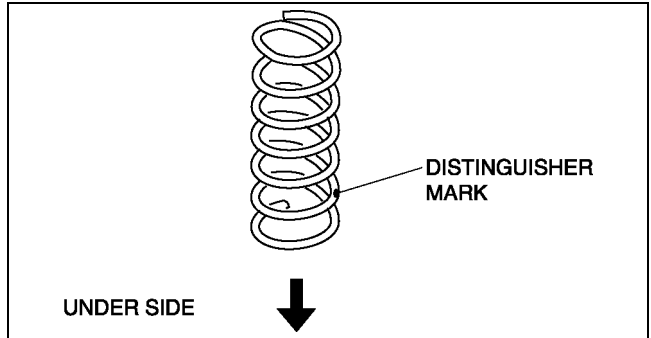
Rear Coil Spring Installation Note

1. Install the coil spring so that the distinguisher mark is located on under side.
2. Position the jack under the lower arm and jack up slowly.

Warning

- Installing the coil spring is dangerous. The coil spring could fly off, and cause serious injury or death.

3. Install the lower arm (outer side) bolt.

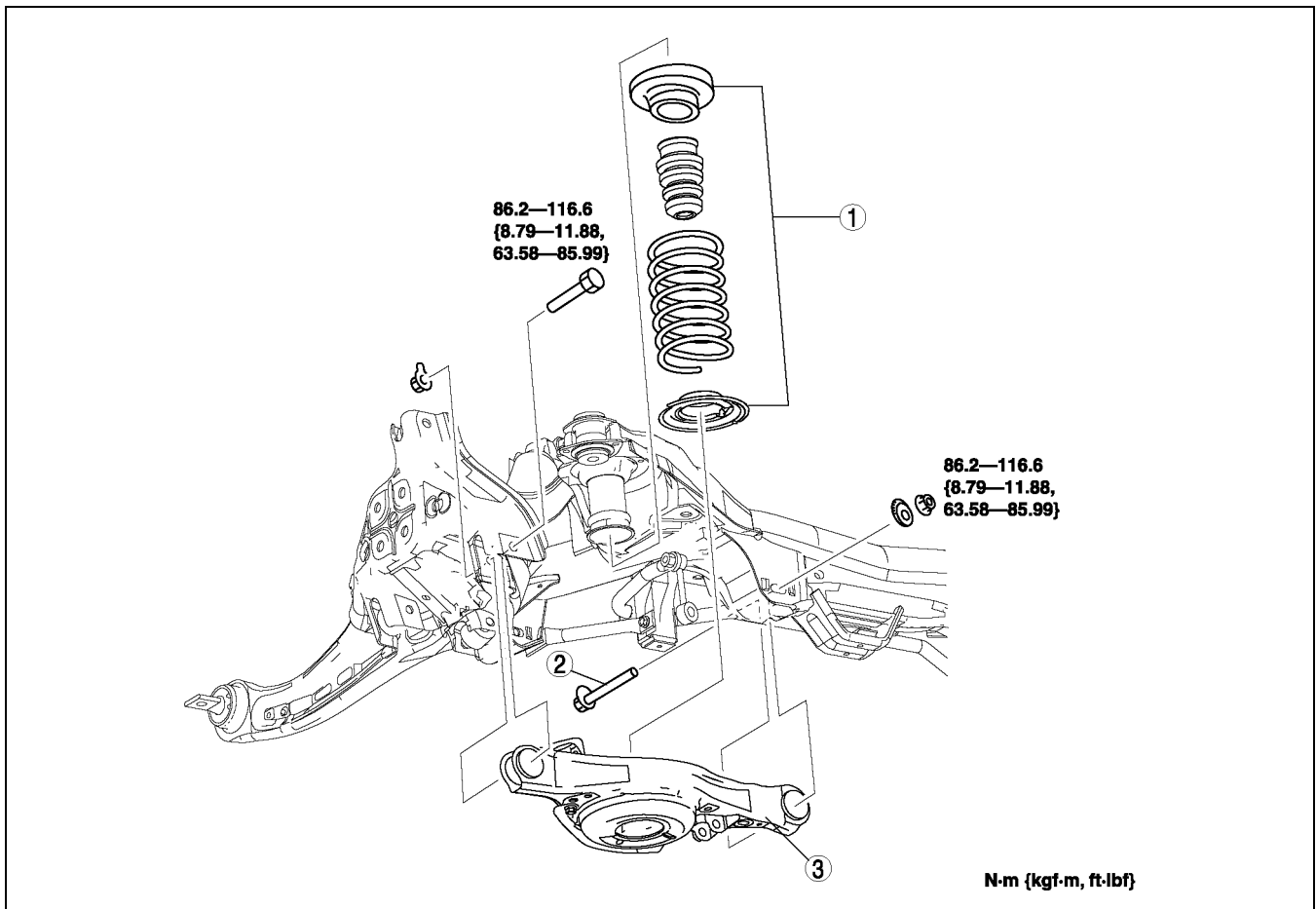


A6E7416W015

REAR LOWER ARM REMOVAL/INSTALLATION

A6E741628310W01

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the rear wheel alignment.
(See [R-6 REAR WHEEL ALIGNMENT](#).)



A6E7416W008

1	Rear coil spring component (See R-29 REAR COIL SPRING REMOVAL/INSTALLATION)
2	Bolt (rear lower arm inner side)
3	Rear lower arm

REAR SUSPENSION

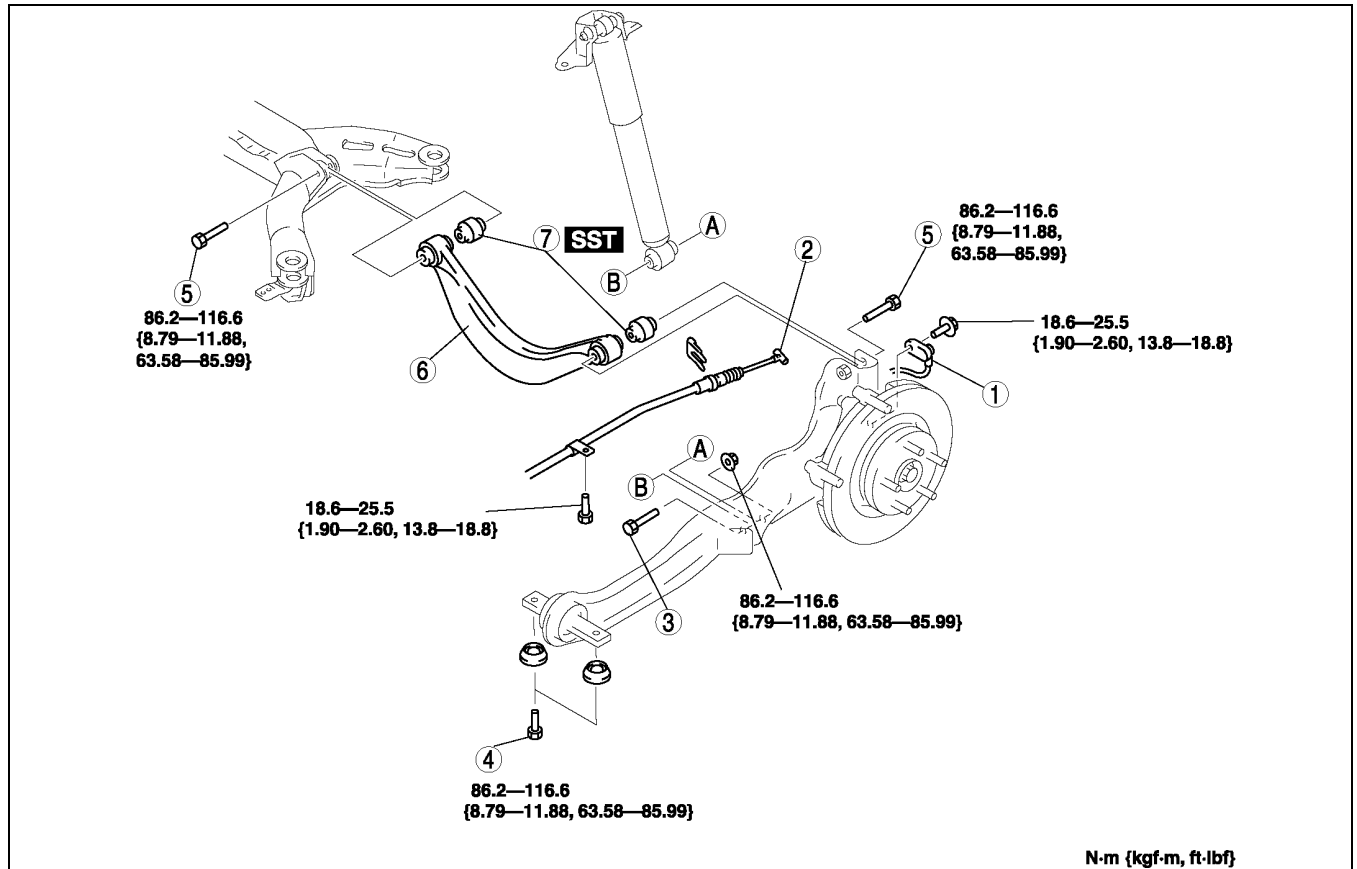
REAR UPPER ARM REMOVAL/INSTALLATION

A6E741628210W01

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

- Remove in the order indicated in the table.
- Install in the reverse order of removal.
- Inspect the rear wheel alignment.
(See [R-6 REAR WHEEL ALIGNMENT](#).)



A6E7416W009

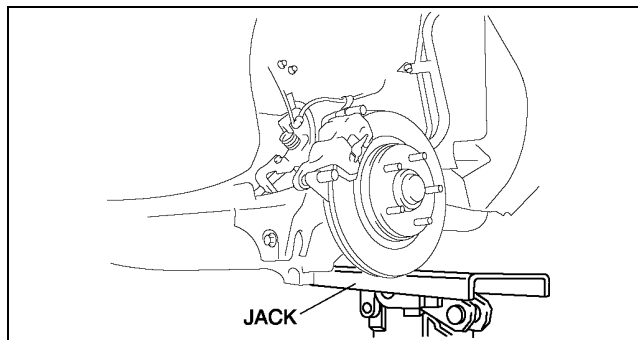
1	ABS wheel-speed sensor
2	Parking brake cable
3	Bolt (rear shock absorber lower side) (See R-32 Bolt (Rear Shock Absorber Lower Side) Removal Note)
4	Bolt (trailing link front side)

5	Bolt (rear upper arm) (See R-32 Bolt (Rear Upper Arm) Removal Note)
6	Rear upper arm
7	Rear upper arm bushing (See R-32 Rear Upper Arm Bushing Removal Note) (See R-32 Rear Upper Arm Bushing Installation Note)

REAR SUSPENSION

Bolt (Rear Shock Absorber Lower Side) Removal Note

1. Support the trailing link with a jack.



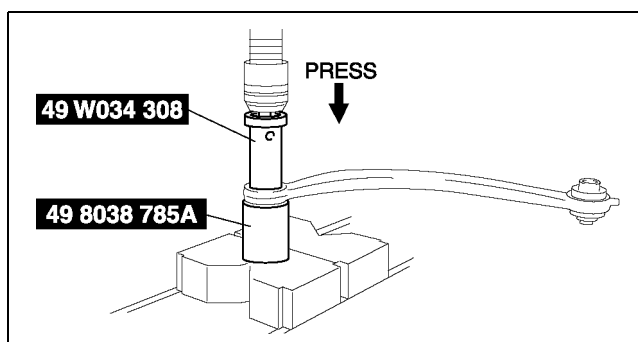
A6E7416W005

Bolt (Rear Upper Arm) Removal Note

1. Loosen the bolts on the inner and outer side of the lateral link.

Rear Upper Arm Bushing Removal Note

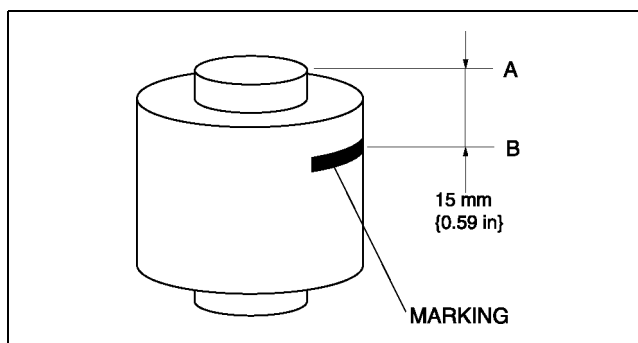
1. Press the upper arm bushing out using the SSTs.



A6E7416W010

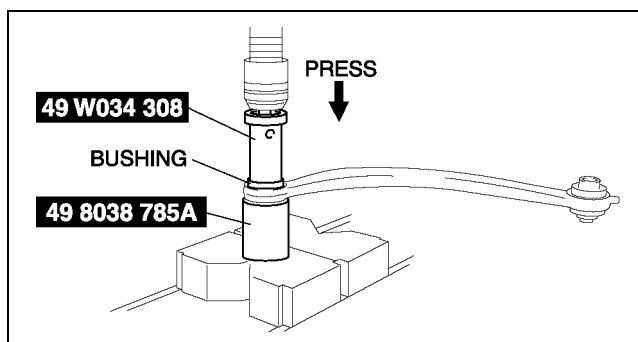
Rear Upper Arm Bushing Installation Note

1. Mark the new bushing as shown in the figure.



A6E7416W011

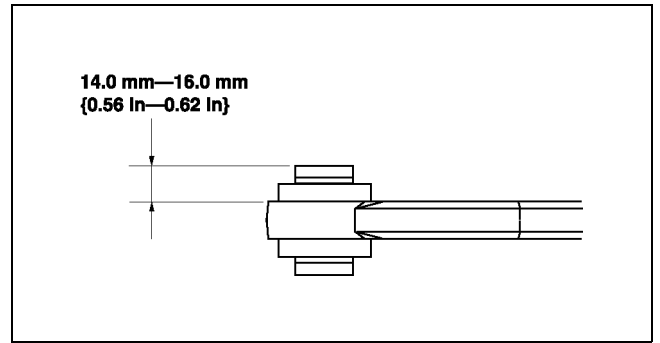
2. Press the bushing in to the marking using the SSTs.



A6E7416W012

REAR SUSPENSION

3. Verify that clearance distance A—B is 14.0 mm—16.0 mm {0.56 in—0.62 in}.



A6E7416W013

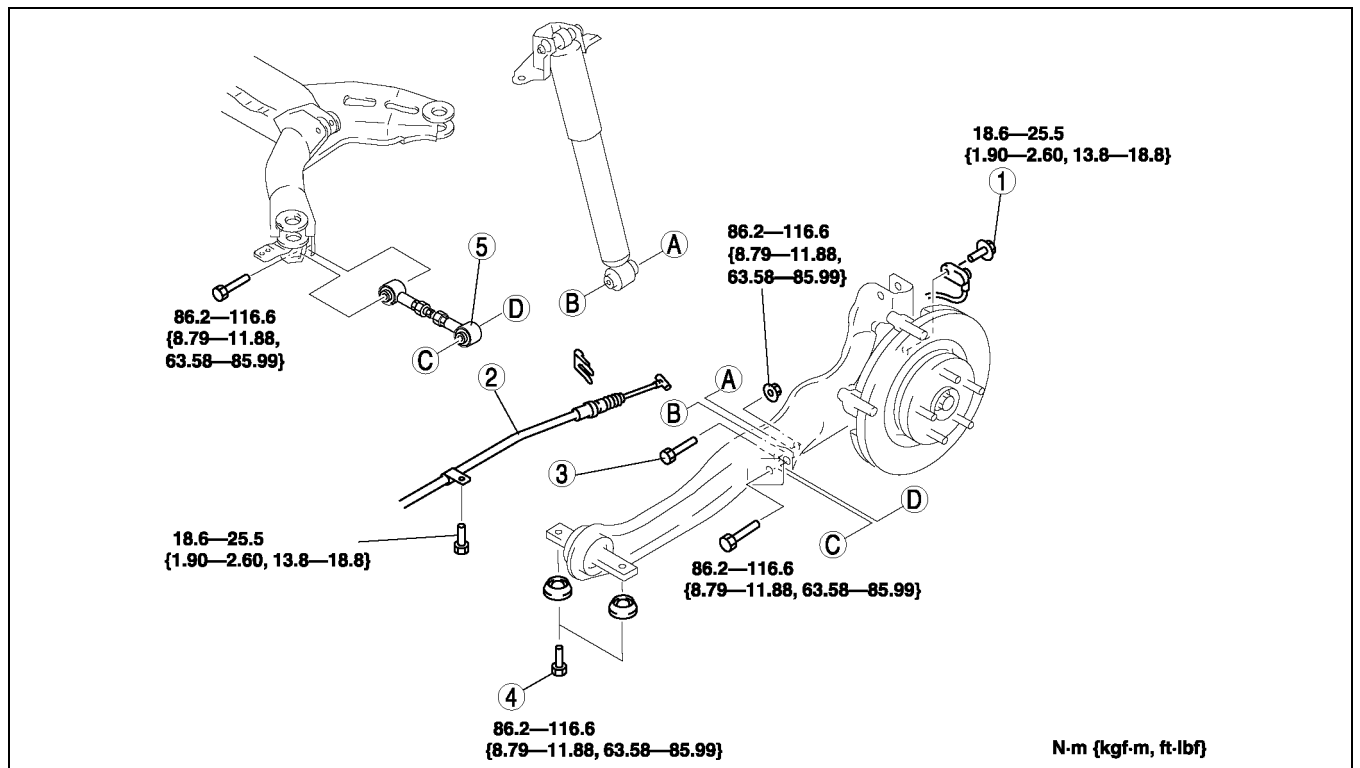
REAR LATERAL LINK REMOVAL/INSTALLATION

A6E741628600W01

Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the rear wheel alignment.
(See [R-6 REAR WHEEL ALIGNMENT](#).)



A6E7416W017

1	ABS wheel-speed sensor
2	Parking brake cable
3	Bolt (rear shock absorber lower side) (See R-34 Bolt (Rear Shock Absorber Lower Side Removal Note))

4	Bolt (trailing link front side)
5	Rear lateral link

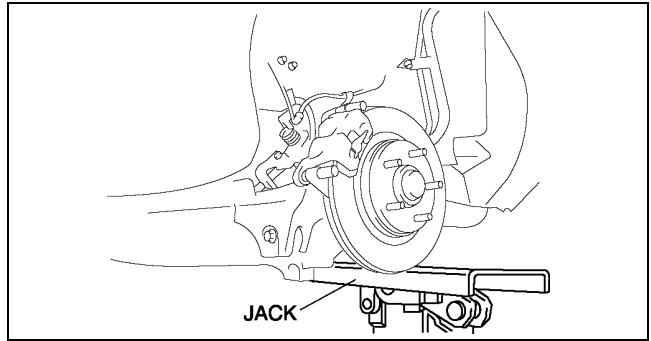
REAR SUSPENSION

Bolt (Rear Shock Absorber Lower Side) Removal Note

1. Support the trailing link with a jack.

Caution

- Removing the trailing link is dangerous. The trailing link could fall and cause serious injury or death. Verify that the jack securely supports the trailing link.

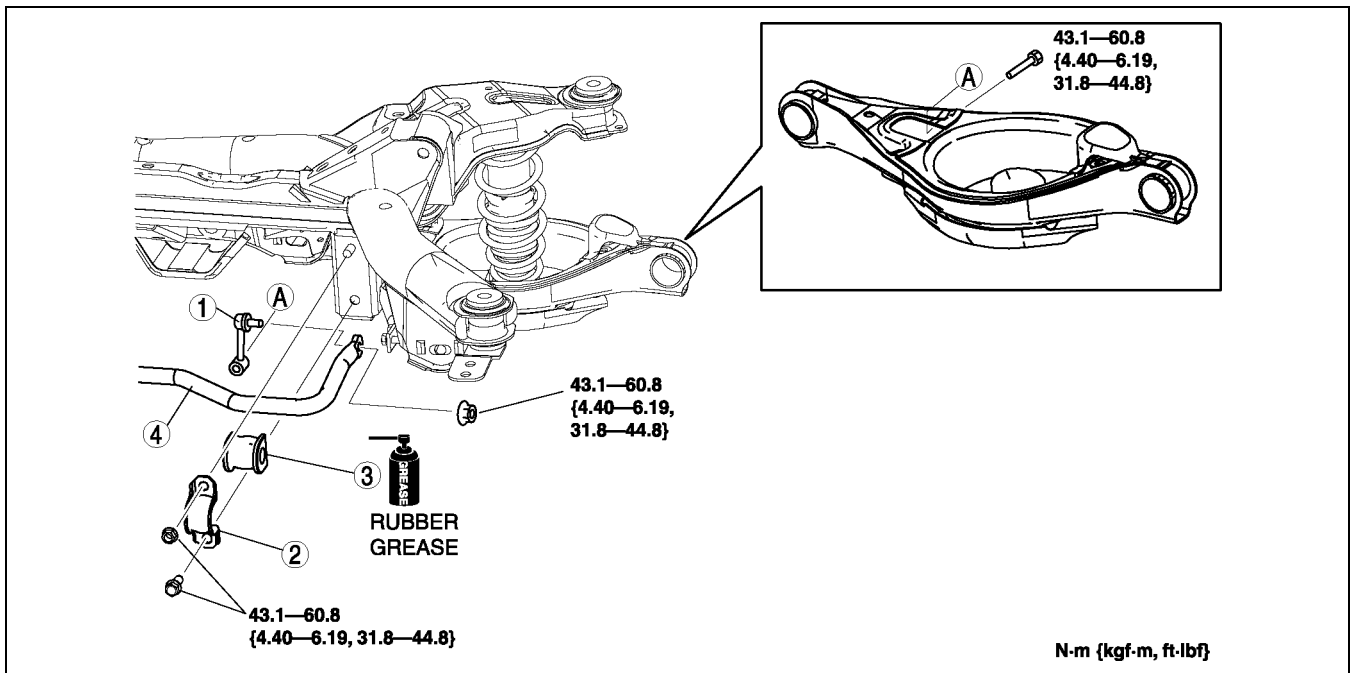


A6E7416W005

REAR STABILIZER REMOVAL/INSTALLATION

A6E741628100W01

1. Remove the rear auto leveling sensor.
(See [T-32 REAR AUTO LEVELING SENSOR REMOVAL/INSTALLATION.](#))
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Adjust the headlight zero set.
(See [T-31 HEADLIGHT ZEROSET.](#))



A6E7416W004

1	Stabilizer control link
2	Stabilizer bracket

3	Bushing
4	Rear stabilizer

REAR SUSPENSION

STABILIZER CONTROL LINK INSPECTION

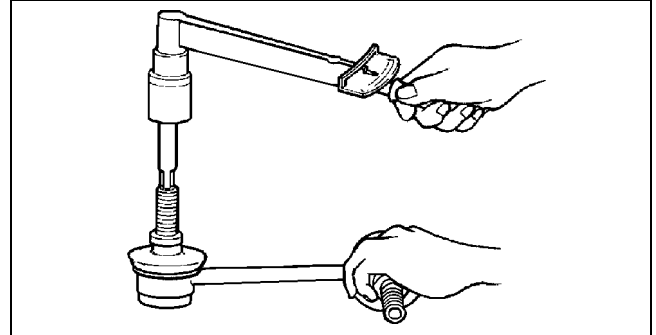
A6E741634150W01

1. Remove the stabilizer control link from the vehicle.
2. Inspect for bending and damage.
3. Measure the ball joint starting torque.
 - (1) Rock the ball joint stud side to side 10 times.
 - (2) Rotate the ball joint stud 10 times.
 - (3) Measure the starting torque using a suitable Allen socket and a torque wrench.

Starting torque

0.23—0.47 N·m

{2.4—4.7 kgf·cm, 2.1—4.1 in·lbf}



A6E7414W021

TRAILING LINK REMOVAL/INSTALLATION

A6E741628200W01

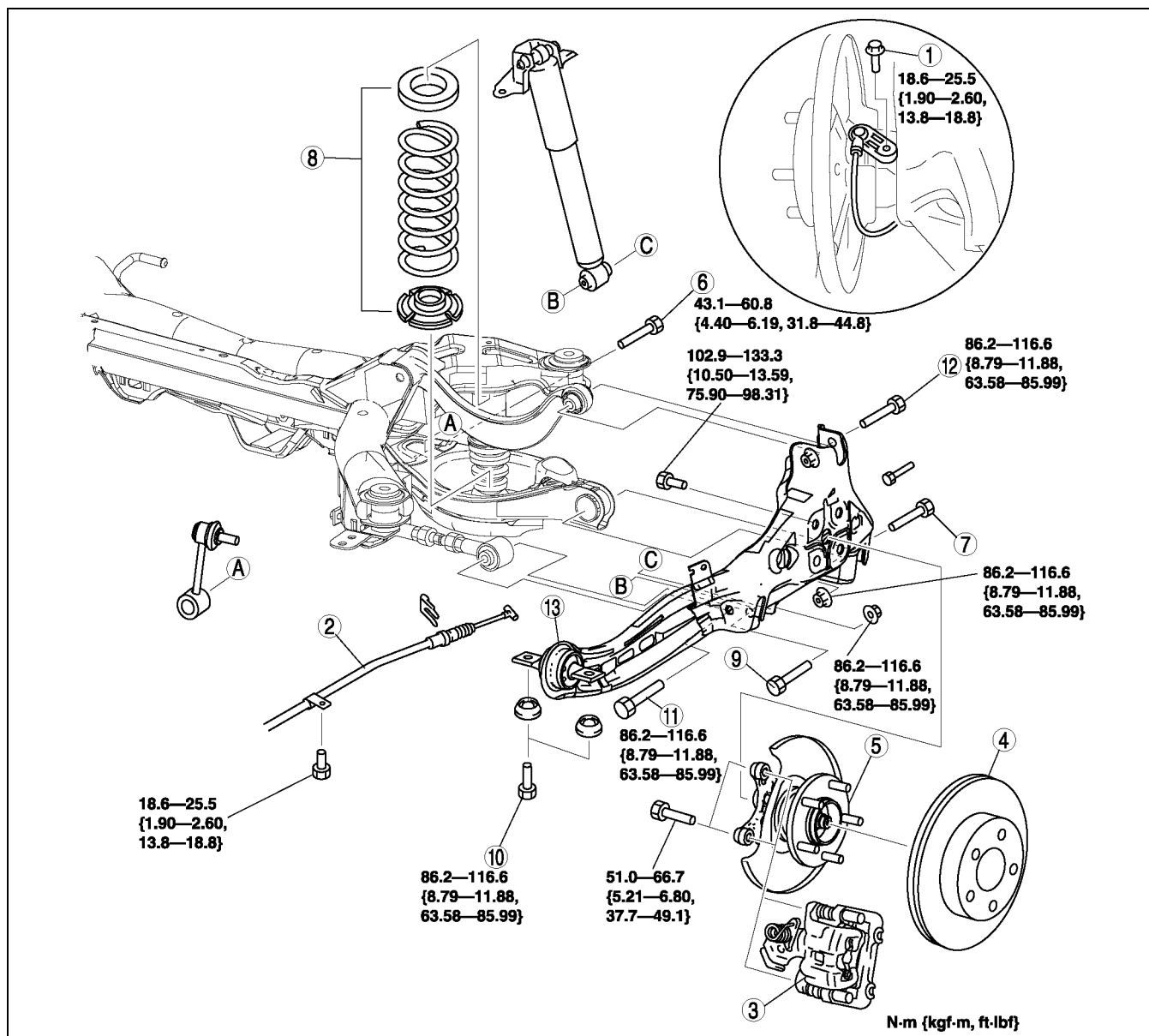
Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

R

1. Remove the rear auto leveling sensor.
(See [T-32 REAR AUTO LEVELING SENSOR REMOVAL/INSTALLATION.](#))
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Adjust the headlight zero set.
(See [T-31 HEADLIGHT ZEROSET.](#))
5. Inspect the rear wheel alignment.
(See [R-6 REAR WHEEL ALIGNMENT.](#))

REAR SUSPENSION



A6E7416W018

1	ABS wheel-speed sensor
2	Parking brake cable
3	Calliper component (See R-37 Caliper Component Removal Note)
4	Disc plate
5	Spindle and hub component (See M-10 WHEEL HUB, HUB SPINDLE REMOVAL/INSTALLATION)
6	Bolt (stabilizer control link lower side)
7	Bolt (rear lower arm outer side) (See R-29 Bolt (Rear Lower Arm Outer Side) Removal Note)
8	Spring component

9	Bolt (rear shock absorber lower side)
10	Bolt (trailing link front side) (See R-37 Bolt (Trailing Link Front Side) Removal Note) (See R-37 Bolt (Trailing Link Front Side) Installation Note)
11	Bolt (rear lateral link outer side) (See R-37 Bolt (Rear Lateral Link Outer Side) Removal Note)
12	Bolt (rear upper arm outer side)
13	Trailing link

REAR SUSPENSION

Caliper Component Removal Note

1. Suspend the caliper aside with cable.

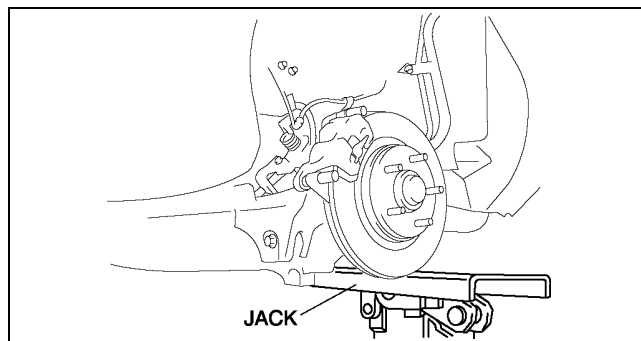
Bolt (Trailing Link Front Side) Removal Note

1. Support the trailing link with a jack.

Caution

- Removing the trailing link is dangerous. The trailing link could fall and cause serious injury or death. Verify that the jack securely supports the trailing link.

2. Remove the bolts (trailing link front side).



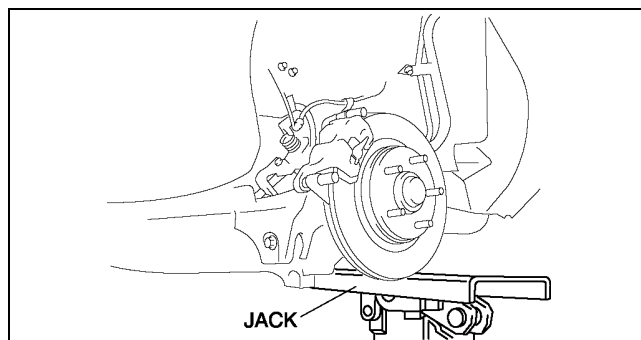
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Bolt (Rear Lateral Link Outer Side) Removal Note

1. Loosen the bolt (lateral link inner side).
2. Remove the bolt (lateral link outer side).

Bolt (Trailing Link Front Side) Installation Note

1. Support the trailing link with a jack.
2. Tighten the bolts (trailing link front side).



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REAR CROSSMEMBER REMOVAL/INSTALLATION

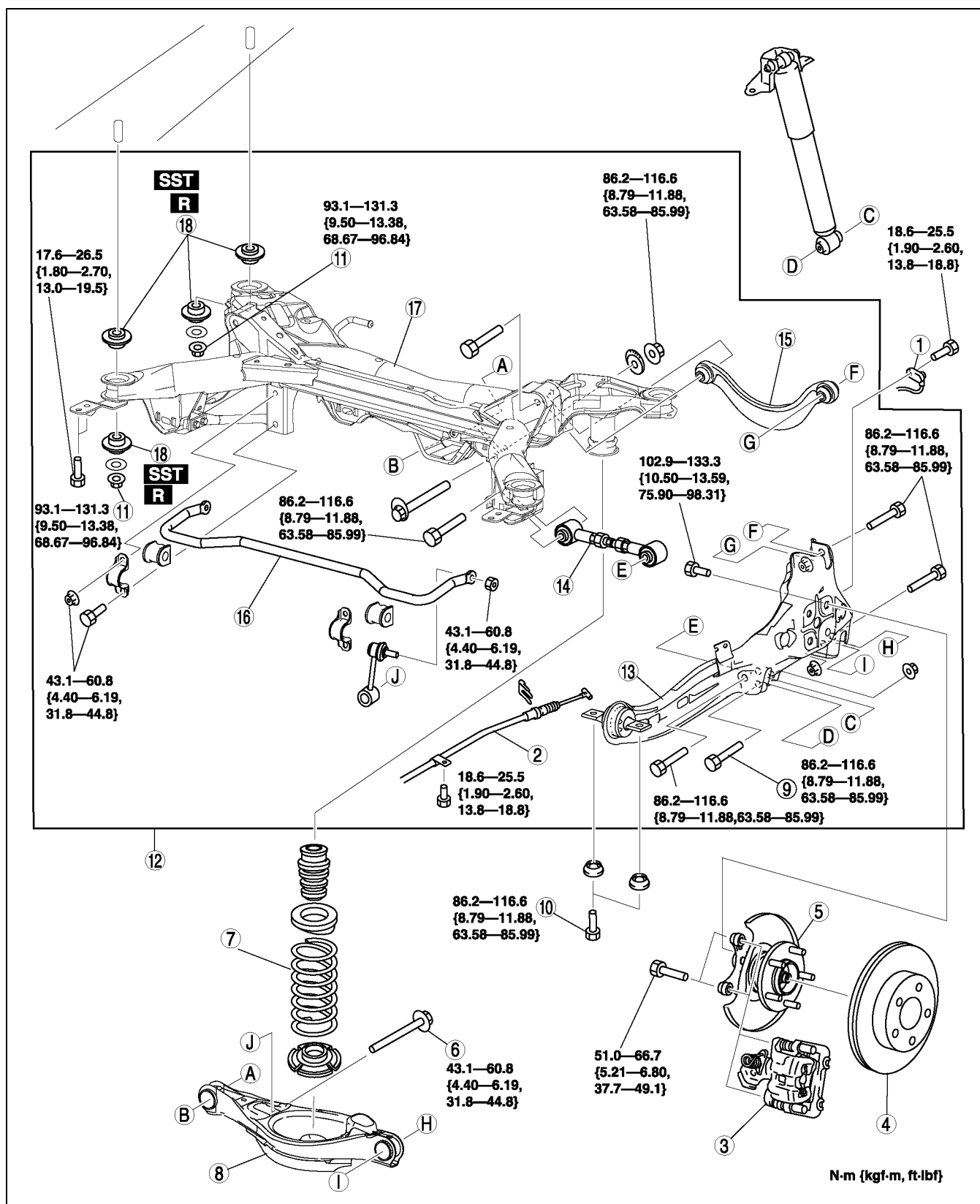
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Caution

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

1. Remove the rear auto leveling sensor and harness.
(See [T-32 REAR AUTO LEVELING SENSOR REMOVAL/INSTALLATION.](#))
2. Remove the middle pipe.
(See [F-35 EXHAUST SYSTEM REMOVAL/INSTALLATION.](#))
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Adjust the headlight zero set.
(See [T-31 HEADLIGHT ZEROSET.](#))
6. Inspect the rear wheel alignment.
(See [R-6 REAR WHEEL ALIGNMENT.](#))

REAR SUSPENSION



A6E7416W020

1	ABS wheel-speed sensor
2	Parking brake cable
3	Caliper component (See R-39 Caliper Component Removal Note)
4	Disc plate

5	Spindle and hub component (See M-10 WHEEL HUB, HUB SPINDLE REMOVAL/INSTALLATION)
6	Bolt (stabilizer control link)
7	Rear coil spring (See R-29 REAR COIL SPRING REMOVAL/INSTALLATION)

REAR SUSPENSION

8	Rear lower arm (See R-30 REAR LOWER ARM REMOVAL/INSTALLATION)
9	Bolt (rear shock absorber lower side)
10	Bolt (trailing link front side) (See R-39 Bolt (Trailing Link Front Side) Removal Note) (See R-40 Bolt (Trailing Link Front Side) Installation Note)
11	Nut (crossmember)
12	Crossmember component (See R-39 Crossmember Component Removal Note)

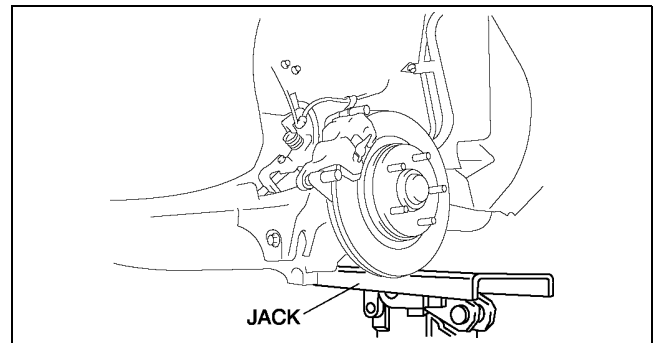
13	Trailing link
14	Rear lateral link
15	Rear upper arm
16	Rear stabilizer
17	Rear crossmember
18	Rear crossmember Bushing (See R-39 Rear Crossmember Bushing Removal Note) (See R-40 Rear Crossmember Bushing Installation Note)

Caliper Component Removal Note

1. Remove the caliper, and suspend it aside with cable.

Bolt (Trailing Link Front Side) Removal Note

1. Support the trailing link with a jack.
2. Loosen the bolt (lateral link inner side).



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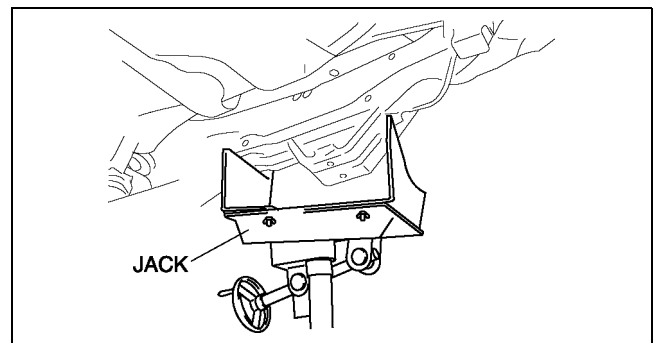
Crossmember Component Removal Note

1. Support the crossmember component using a jack and remove the nuts.

Warning

- Removing the crossmember is dangerous. The crossmember component could fall and cause serious injury or death. Verify that the jack securely supports the crossmember component.

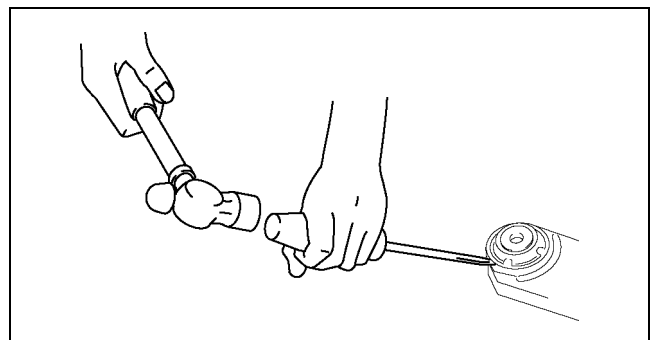
2. Remove the crossmember component.



A6E7416W014

Rear Crossmember Bushing Removal Note

1. Remove the bushing using screw driver (-), being care not to damage the rear crossmember.

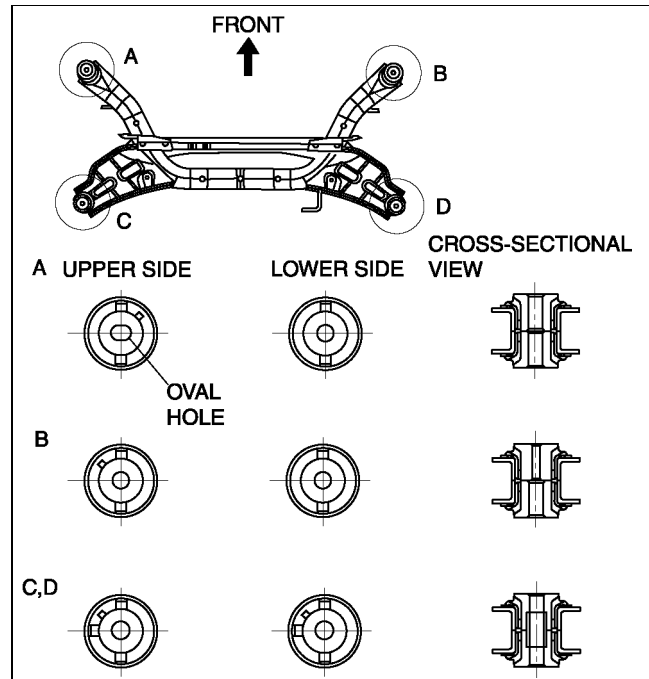


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REAR SUSPENSION

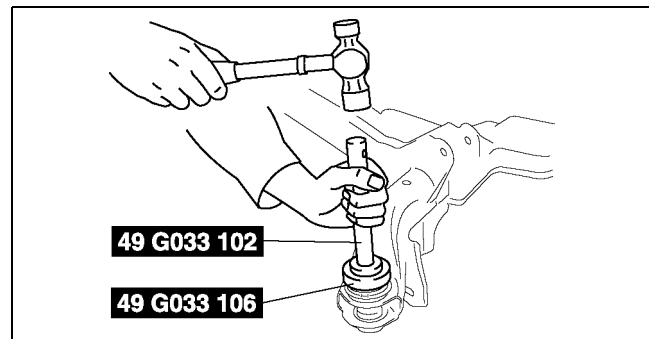
Rear Crossmember Bushing Installation Note

1. Set the bushings as shown in the figure.



A6E7416W021

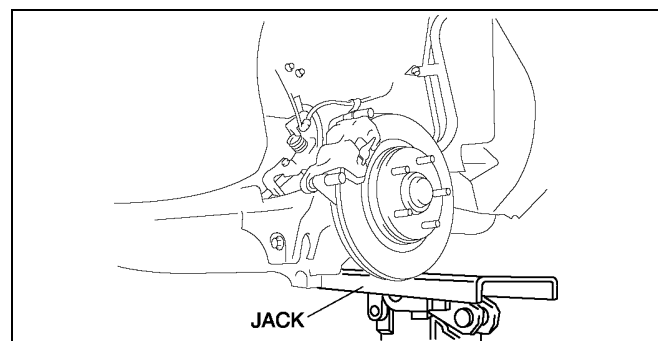
2. Tap the bushing onto the rear crossmember using the **SSTs**.



A6E7416W002

Bolt (Trailing Link Front Side) Installation Note

1. Support the trailing link with a jack.
2. Tighten the bolts (trailing link front side).



A6E7416W005

BODY

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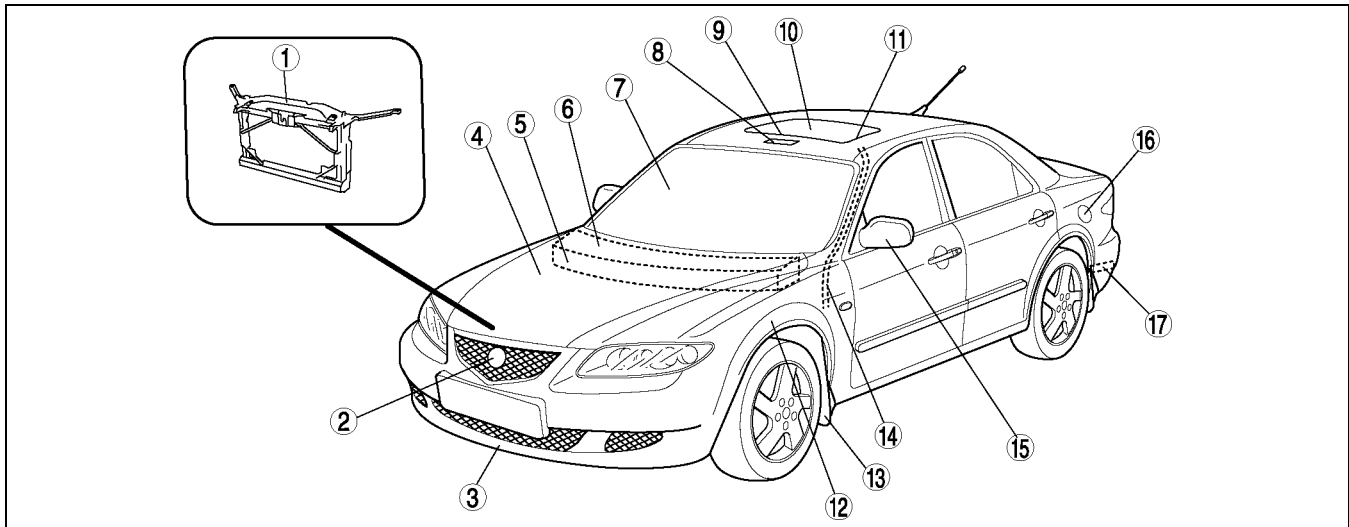
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LOCATION INDEX

EXTERIOR

Front

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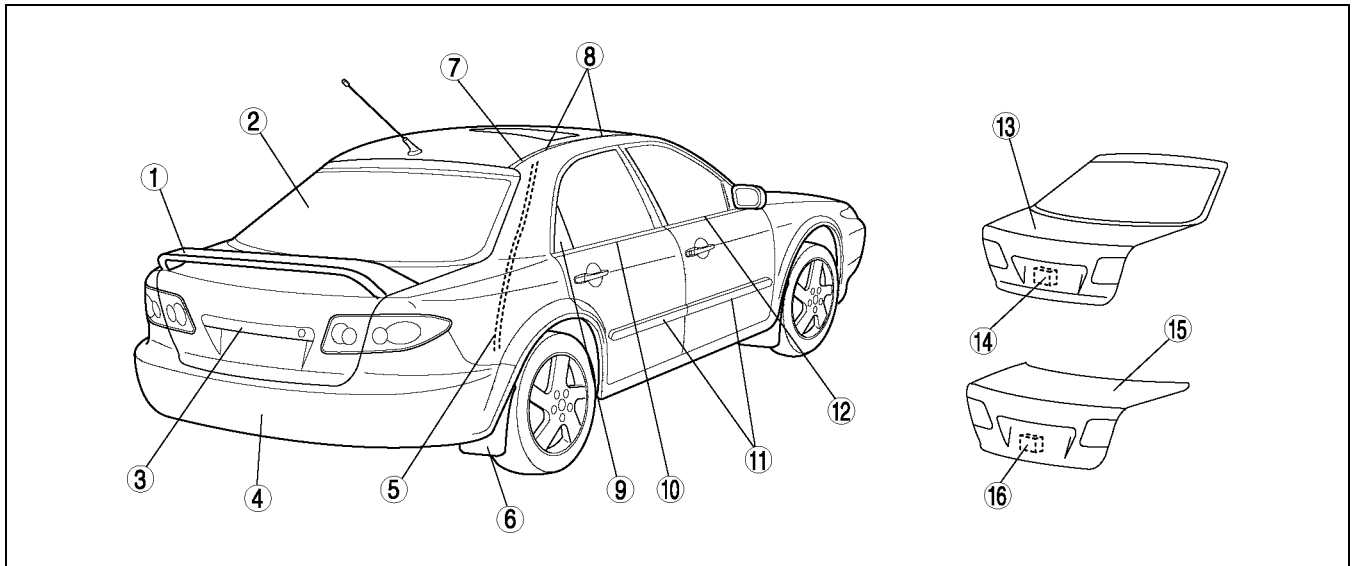
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2	Radiator grille (See S-50 RADIATOR GRILLE REMOVAL/INSTALLATION)
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6	Cowl grille (See S-50 COWL GRILLE REMOVAL/INSTALLATION)
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14	Front drain hose (See S-75 FRONT DRAIN HOSE REMOVAL) (See S-75 FRONT DRAIN HOSE INSTALLATION)
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10	Rear beltline molding (See S-56 REAR BELTLINE MOLDING REMOVAL) (See S-56 REAR BELTLINE MOLDING INSTALLATION)

11	Side protector (See S-52 SIDE PROTECTOR REMOVAL) (See S-53 SIDE PROTECTOR INSTALLATION)
12	Front beltline molding (See S-55 FRONT BELTLINE MOLDING REMOVAL) (See S-55 FRONT BELTLINE MOLDING INSTALLATION)
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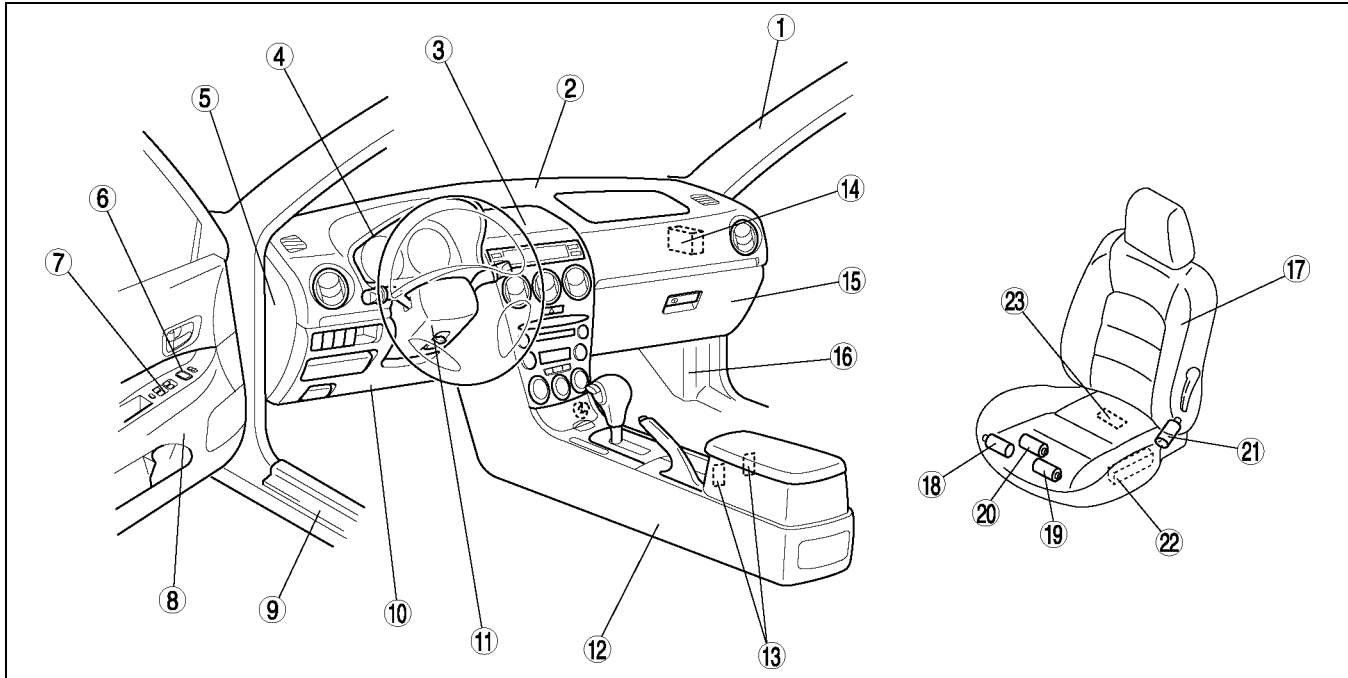
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INTERIOR

Front

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4	Meter hood (See S-84 METER HOOD REMOVAL/INSTALLATION)
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9	Front scuff plate (See S-89 FRONT SCUFF PLATE REMOVAL/INSTALLATION)

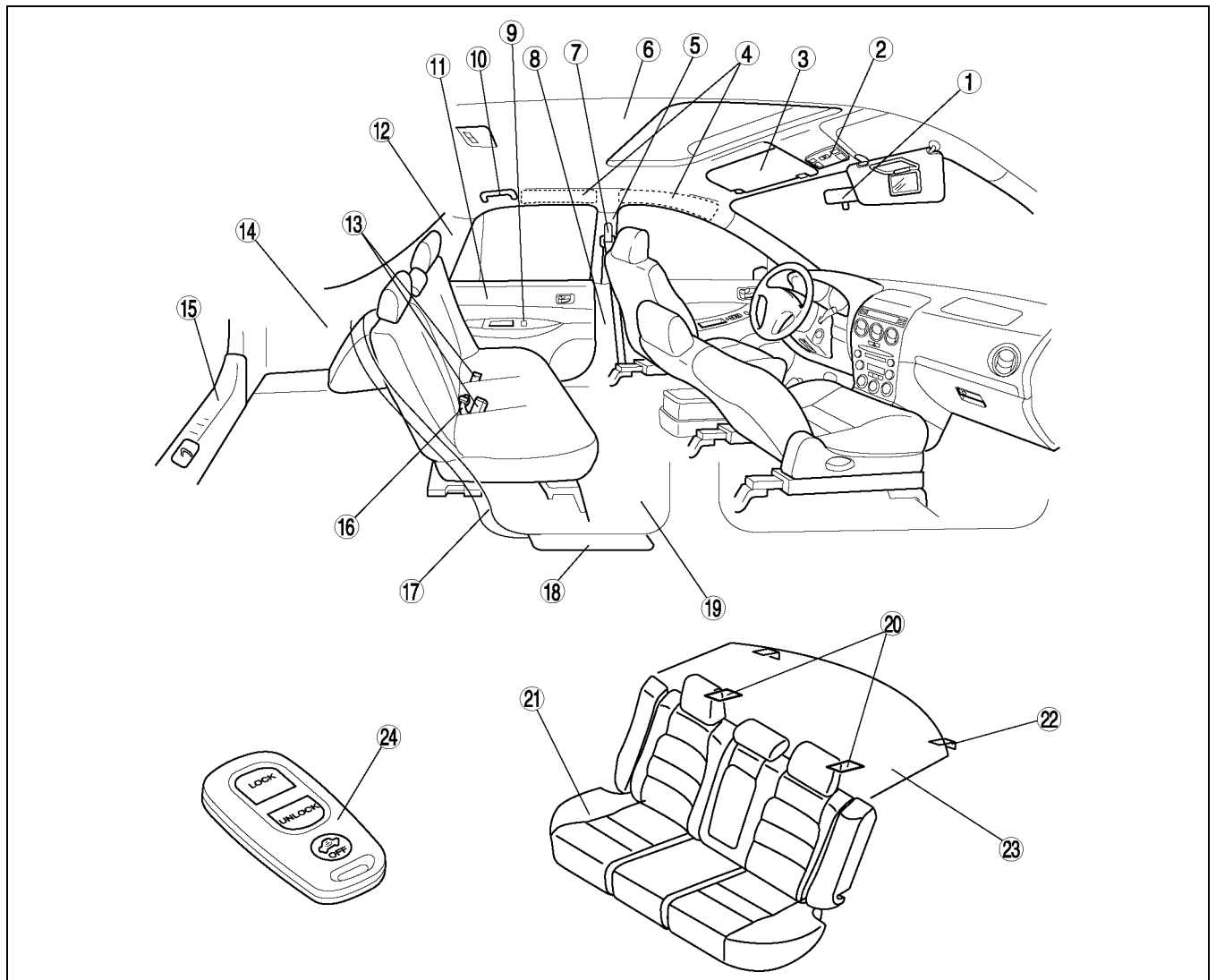
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14	Door lock timer unit (See S-33 DOOR LOCK TIMER UNIT REMOVAL/INSTALLATION) (See S-34 DOOR LOCK TIMER UNIT INSPECTION) (See S-36 DOOR LOCK TIMER UNIT ID CODE CHANGE)
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19	Front tilt motor (See S-116 FRONT TILT MOTOR INSPECTION)
20	Slide motor (See S-116 SLIDE MOTOR INSPECTION)

LOCATION INDEX

21	Recliner motor (See S-116 RECLINER MOTOR INSPECTION)
22	Power seat switch (See S-115 POWER SEAT SWITCH INSPECTION)

23	Seat warmer unit (See S-118 SEAT WARMER UNIT INSPECTION)

Rear



A6E7700W004

1	Rearview mirror (See S-61 REARVIEW MIRROR REMOVAL) (See S-61 REARVIEW MIRROR INSTALLATION) (See S-61 BASE REMOVAL) (See S-62 BASE INSTALLATION)
2	Sunroof switch (See S-81 SUNROOF SWITCH REMOVAL/INSTALLATION) (See S-81 SUNROOF SWITCH INSPECTION)
3	Sunvisor (See S-98 SUNVISOR REMOVAL/INSTALLATION)
4	Shock absorbing pad (See S-97 SHOCK ABSORBING PAD REMOVAL/INSTALLATION)
5	B-pillar upper trim (See S-88 B-PILLAR UPPER TRIM REMOVAL/INSTALLATION)

6	Headliner (See S-96 HEADLINER REMOVAL/INSTALLATION)
7	Front seat belt (See S-100 FRONT SEAT BELT REMOVAL/INSTALLATION) (See S-103 SEAT BELT INSPECTION)
8	B-pillar lower trim (See S-88 B-PILLAR LOWER TRIM REMOVAL/INSTALLATION)
9	Power window subswitch (See S-25 POWER WINDOW SWITCH REMOVAL/INSTALLATION) (See S-28 POWER WINDOW SUBSWITCH INSPECTION)
10	Assist handle (See S-97 ASSIST HANDLE REMOVAL/INSTALLATION)

LOCATION INDEX

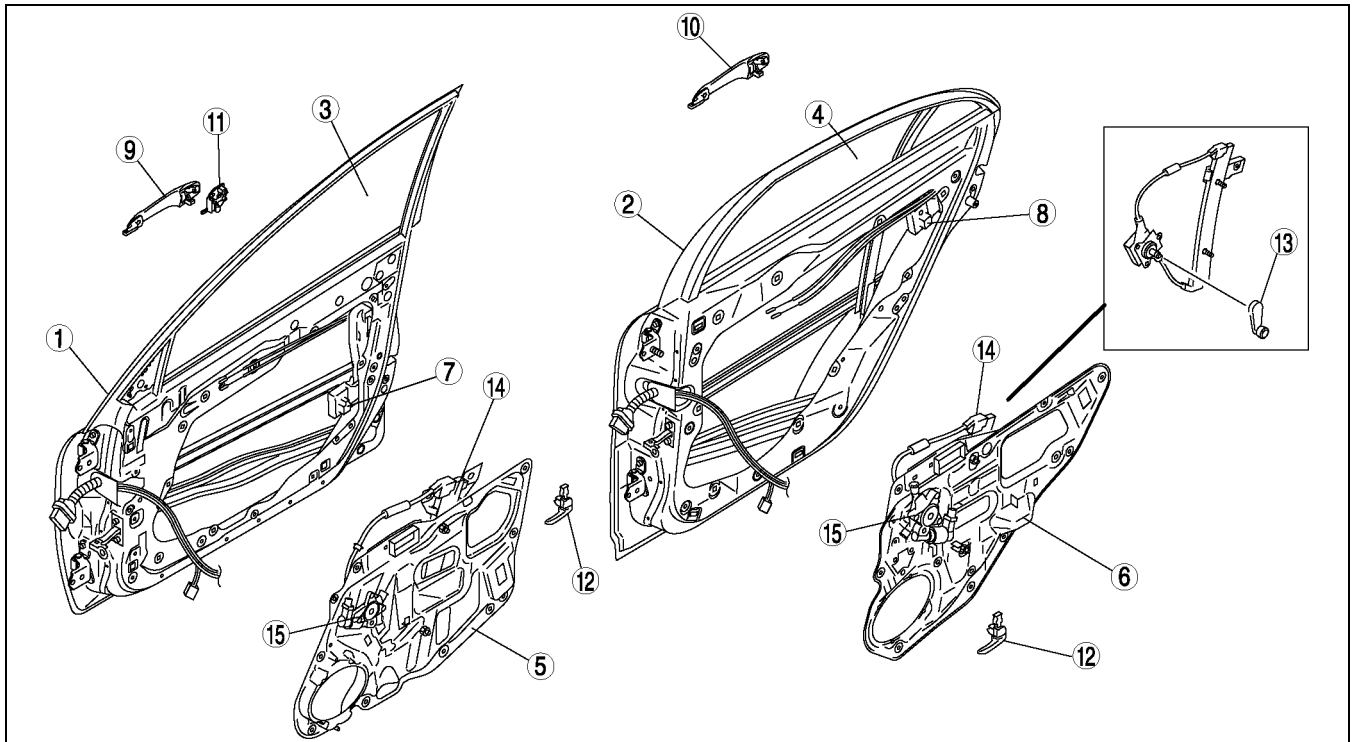
11	Rear door trim (See S-90 REAR DOOR TRIM REMOVAL/INSTALLATION)
12	C-pillar trim (See S-89 C-PILLAR TRIM REMOVAL/INSTALLATION)
13	Rear buckle (See S-102 REAR BUCKLE REMOVAL/INSTALLATION)
14	Trunk side trim (See S-92 TRUNK SIDE TRIM REMOVAL/INSTALLATION) Trunk side upper trim (See S-93 TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION)
15	Trunk end trim (See S-93 TRUNK END TRIM REMOVAL/INSTALLATION)
16	Rear center seat belt (See S-101 REAR CENTER SEAT BELT REMOVAL/INSTALLATION) (See S-103 SEAT BELT INSPECTION)
17	Tire house trim (See S-91 TIRE HOUSE TRIM REMOVAL/INSTALLATION)

18	Rear scuff plate (See S-89 REAR SCUFF PLATE REMOVAL/INSTALLATION)
19	Front floor covering (See S-99 FRONT FLOOR COVERING REMOVAL/INSTALLATION)
20	Child restraint seat anchor (See S-104 CHILD RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION)
21	Rear seat (See S-110 REAR SEAT REMOVAL/INSTALLATION) (See S-112 REAR SEAT DISASSEMBLY/ASSEMBLY)
22	Remote handle lever (See S-114 REMOTE HANDLE LEVER REMOVAL/INSTALLATION)
23	Rear package trim (See S-92 REAR PACKAGE TRIM REMOVAL/INSTALLATION)
24	Transmitter (See S-37 TRANSMITTER BATTERY REPLACEMENT) (See S-38 TRANSMITTER BATTERY INSPECTION)

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DOOR

A6E770001086W03



A6E7700WH01

1	Front door (See S-15 FRONT DOOR REMOVAL/INSTALLATION) (See S-16 DOOR ADJUSTMENT)
2	Rear door (See S-15 REAR DOOR REMOVAL/INSTALLATION) (See S-16 DOOR ADJUSTMENT)
3	Front door glass (See S-16 FRONT DOOR GLASS REMOVAL/INSTALLATION)
4	Rear door glass (See S-17 REAR DOOR GLASS REMOVAL/INSTALLATION)
5	Front door unit (See S-18 FRONT DOOR UNIT REMOVAL/INSTALLATION)
6	Rear door unit (See S-18 REAR DOOR UNIT REMOVAL/INSTALLATION)
7	Front door latch and lock actuator (See S-19 FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION) (See S-30 FRONT DOOR LOCK ACTUATOR INSPECTION)
8	Rear door latch and lock actuator (See S-19 REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION) (See S-32 REAR DOOR LOCK ACTUATOR INSPECTION)

9	Front outer handle (See S-21 FRONT OUTER HANDLE REMOVAL/INSTALLATION)
10	Rear outer handle (See S-21 FRONT OUTER HANDLE REMOVAL/INSTALLATION)
11	Front door key cylinder (See S-20 FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION) (See S-30 FRONT DOOR LOCK ACTUATOR INSPECTION)
12	Inner handle (See S-22 INNER HANDLE REMOVAL/INSTALLATION)
13	Regulator handle (See S-22 REGULATOR HANDLE REMOVAL) (See S-22 REGULATOR HANDLE INSTALLATION)
14	Power window regulator (See S-28 POWER WINDOW REGULATOR REMOVAL/installation)
15	Power window motor (See S-29 POWER WINDOW MOTOR REMOVAL/INSTALLATION) (See S-29 POWER WINDOW MOTOR INSPECTION)

S

BONNET

BONNET

BONNET REMOVAL/INSTALLATION

A6E771001084W01

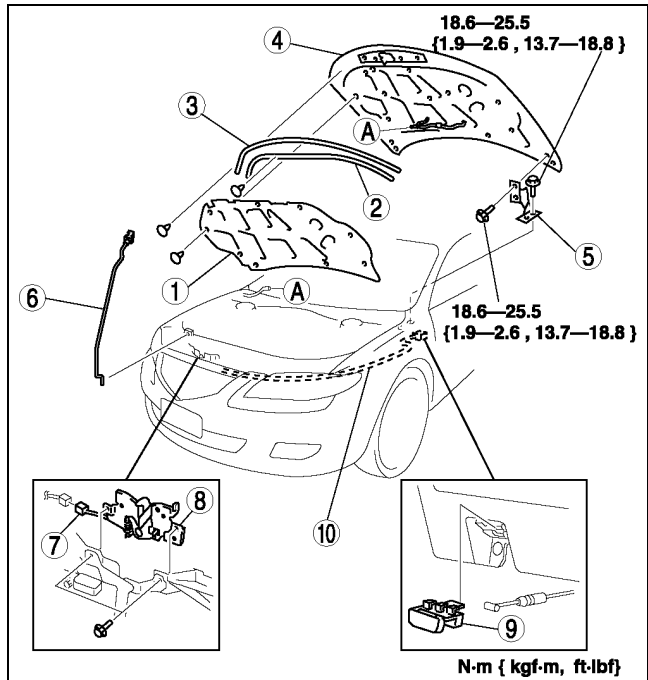
Warning

- Removing the bonnet without supporting can be dangerous. The bonnet may fall and injure you. Always perform the following procedure with at least another person.

1. Disconnect the windshield washer hose.
2. To remove the bonnet hinge, remove the front fender panel.
3. To remove the bonnet lock, remove the radiator grille.
4. To remove the bonnet release cable, remove the driver-side mud guard.
5. Remove in the order indicated in the table.

1	Bonnet insulator
2	Shroud seal weatherstrip
3	Parting seal weatherstrip
4	Bonnet
5	Bonnet hinge
6	Bonnet stay
7	Bonnet switch connector (With theft-deterrent system)
8	Bonnet lock
9	Bonnet release lever
10	Bonnet release cable

6. Install in the reverse order of removal.
7. Adjust the bonnet. (See [S-10 BONNET ADJUSTMENT](#).)



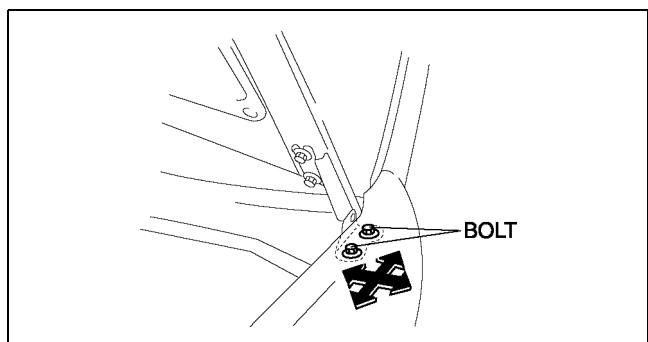
A6E7710W001

BONNET ADJUSTMENT

A6E771001084W02

Gap Adjustment

1. Remove the front fender.
2. Loosen the bonnet hinge installation bolts and reposition the bonnet.
3. Tighten the bolts.



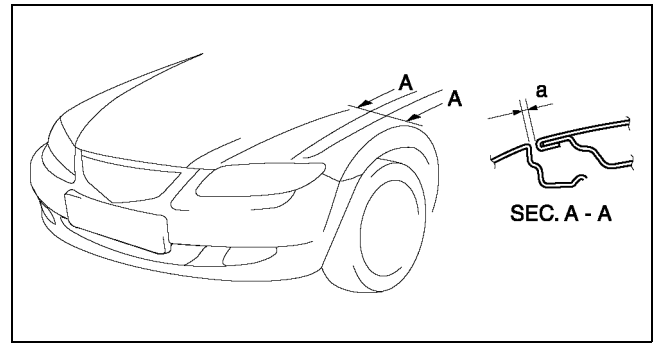
A6E7710W002

BONNET

- Verify that the gap between the bonnet and the body is within the specification.

Clearance

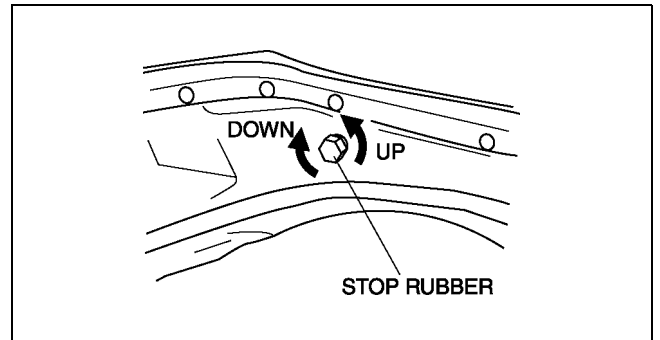
a: 2.5—4.5 mm {0.08—0.17 in}



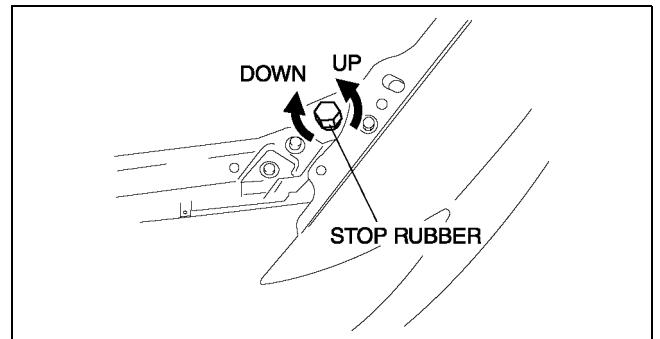
A6E7710W004

Height Adjustment

- Turn the stop rubber to adjust the height of the bonnet.



A6E7710W006



A6E7710W003

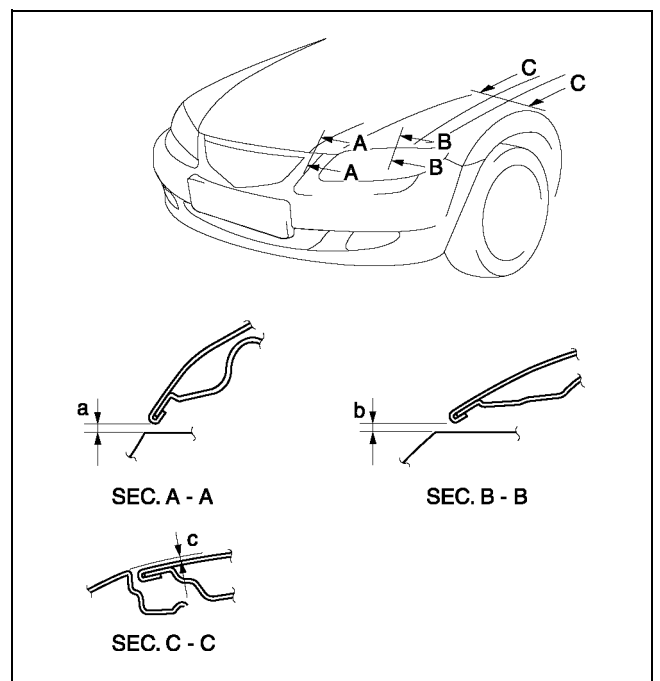
- Verify that the height between the bonnet and the body is within the specification.

Clearance

a: 3.0—6.0 mm {0.12—0.23 in}

b: 3.0—6.0 mm {0.12—0.23 in}

c: -1.0—1.0 mm {-0.04—0.04 in}



A6E7710W005

FRONT FENDER PANEL

FRONT FENDER PANEL

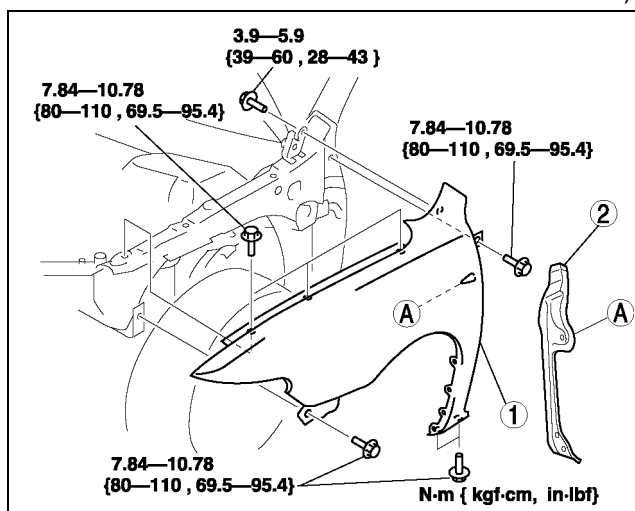
FRONT FENDER PANEL REMOVAL/INSTALLATION

A6E771252110W01

1. Disconnect the negative battery cable.
2. Remove the front side turn light.
3. Remove the fender molding. (See [S-50 COWL GRILLE REMOVAL/INSTALLATION.](#))
4. Remove the front bumper. (See [S-47 FRONT BUMPER REMOVAL/INSTALLATION.](#))
5. Remove the front combination light. (See [T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.](#))
6. Remove in the order indicated in the table.

1	Front fender panel
2	Seal plate

7. Install in the reverse order of removal.



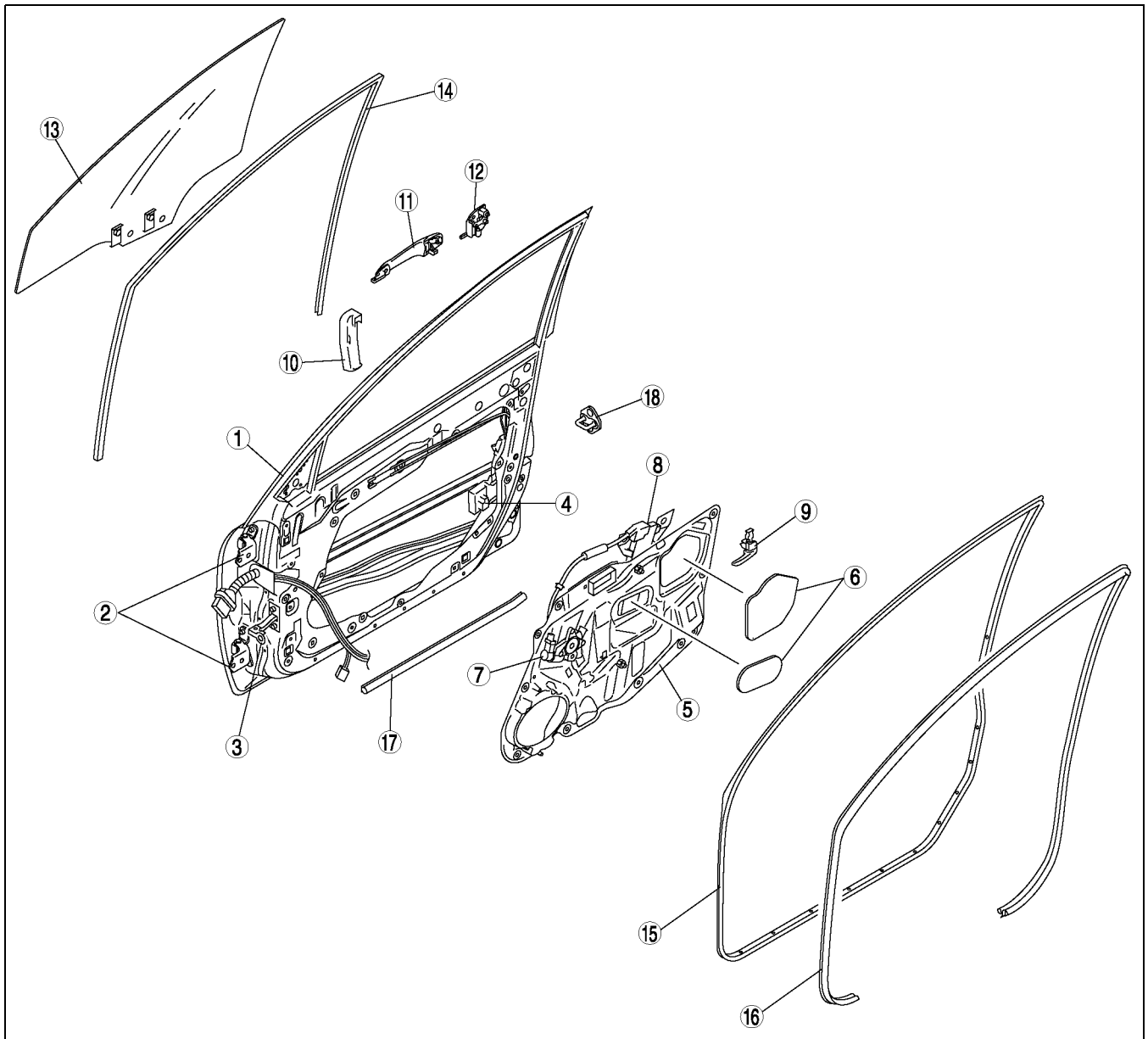
A6E7712W001

DOOR

DOOR

FRONT DOOR STRUCTURAL VIEW

A6E771458010W01



A6E7714W001

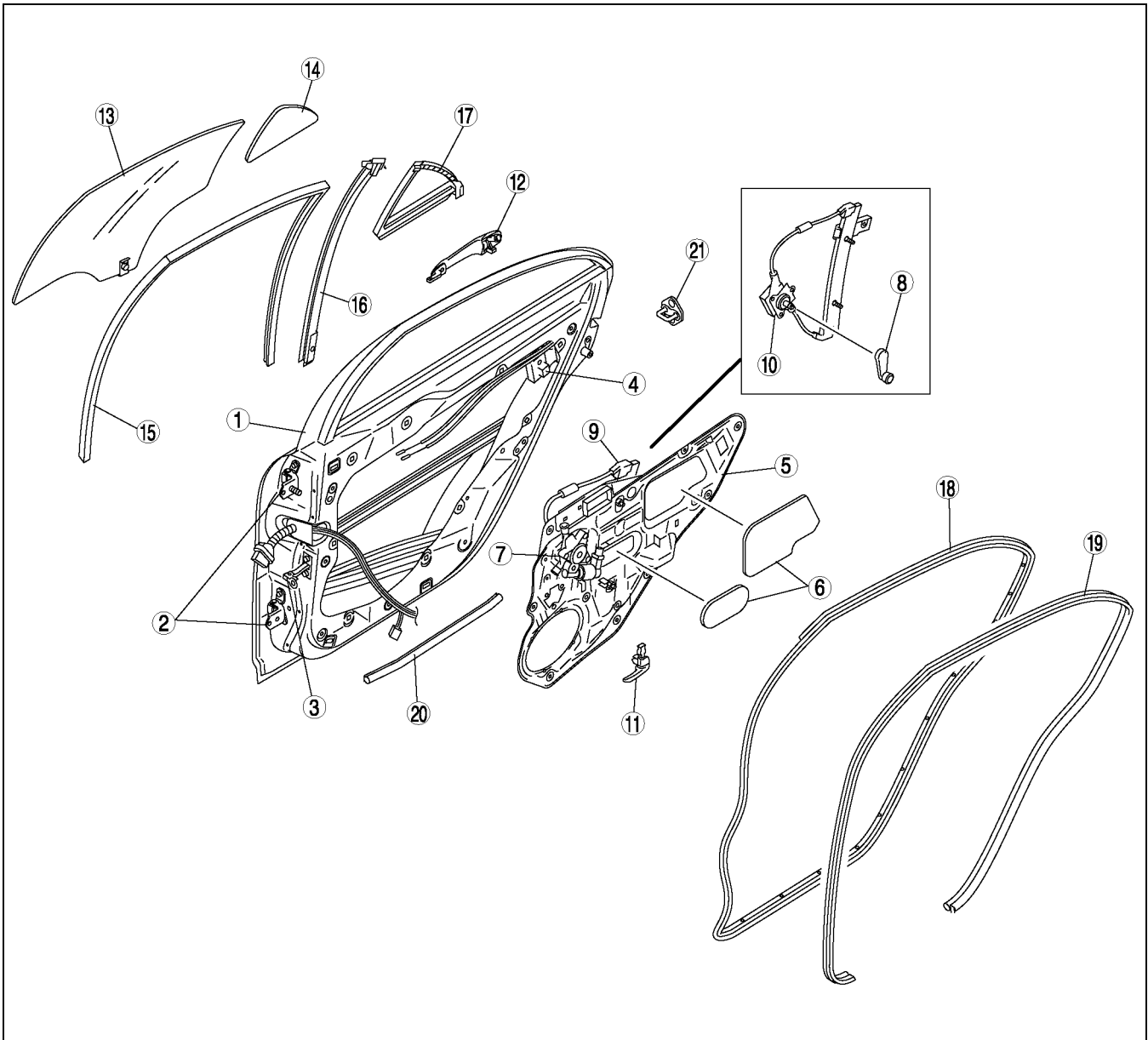
1	Front door
2	Front door hinge
3	Checker
4	Front door latch and lock actuator
5	Front door unit
6	Hole cover
7	Power window motor
8	Power window regulator
9	Inner handle

10	Protector
11	Outer handle
12	Front door key cylinder
13	Front door glass
14	Glass run channel
15	Front door weatherstrip A
16	Front door lower weatherstrip
17	Front door weatherstrip B
18	Striker

DOOR

REAR DOOR STRUCTURAL VIEW

A6E771472010W01



A6E7714W002

1	Rear door
2	Rear door hinge
3	Checker
4	Rear door latch and lock actuator
5	Rear door unit
6	Hole cover
7	Power window motor
8	Regulator handle
9	Power window regulator
10	Manual window regulator
11	Inner handle

12	Outer handle
13	Rear door glass
14	Quarter window glass
15	Glass run channel
16	Glass guide
17	Quarter window molding
18	Rear door weatherstrip A
19	Rear door lower weatherstrip
20	Rear door weatherstrip B
21	Striker

DOOR

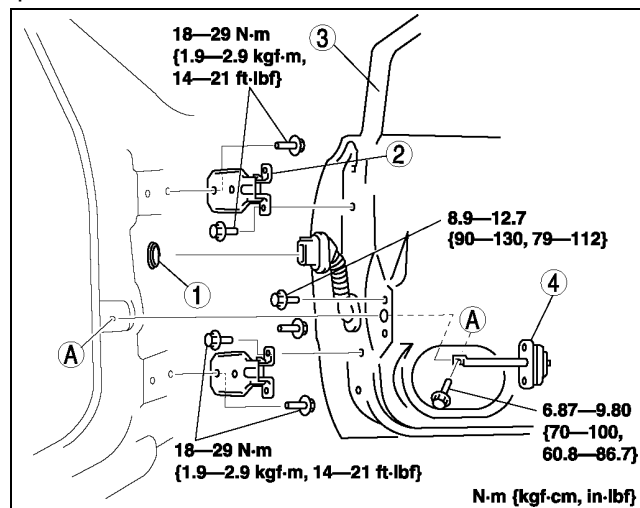
FRONT DOOR REMOVAL/INSTALLATION

A6E771458010W02

1. Disconnect the negative battery cable.
2. To remove the front door hinge, remove the front fender panel.
3. To remove the checker, remove the door speaker.
4. Remove in the order indicated in the table.

1	Connector (See S-15 Connector Removal Note)
2	Front door hinge
3	Front door
4	Checker

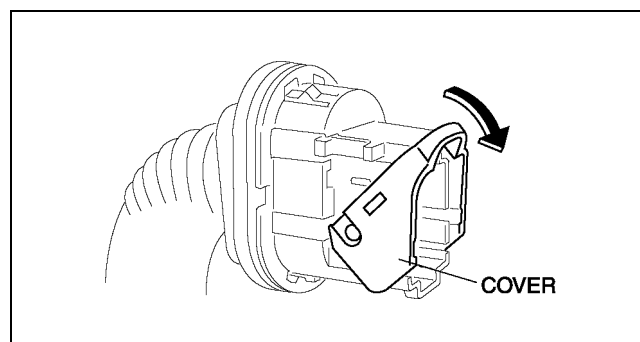
5. Install in the reverse order of removal.
6. Adjust the front door. (See [S-16 DOOR ADJUSTMENT.](#))



A6E7714W006

Connector Removal Note

1. Push the rubber boot backward.
2. Pull down the cover in the direction indicated by the arrow and disconnect the connector.



A6E7714W007

REAR DOOR REMOVAL/INSTALLATION

A6E771472010W02

Warning

- Handling the side air bag sensor improperly can accidentally deploy the side air bag module, which may seriously injure you. Read **AIR BAG SYSTEM SERVICE WARNINGS** before working around the B-pillar areas. (See [T-117 SERVICE WARNINGS.](#))

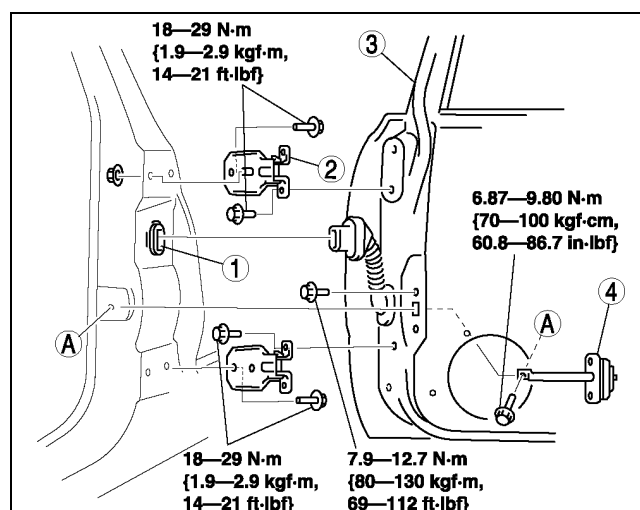
Note

- The side air bag sensor is located in the B-pillar.

1. Disconnect the negative battery cable.
2. To remove the checker, turn the rear door speaker.
3. Remove in the order indicated in the table.

1	Connector
2	Rear door hinge
3	Rear door
4	Checker

4. Install in the reverse order of removal.
5. Adjust the rear door. (See [S-16 DOOR ADJUSTMENT.](#))



A6E7714W023

DOOR

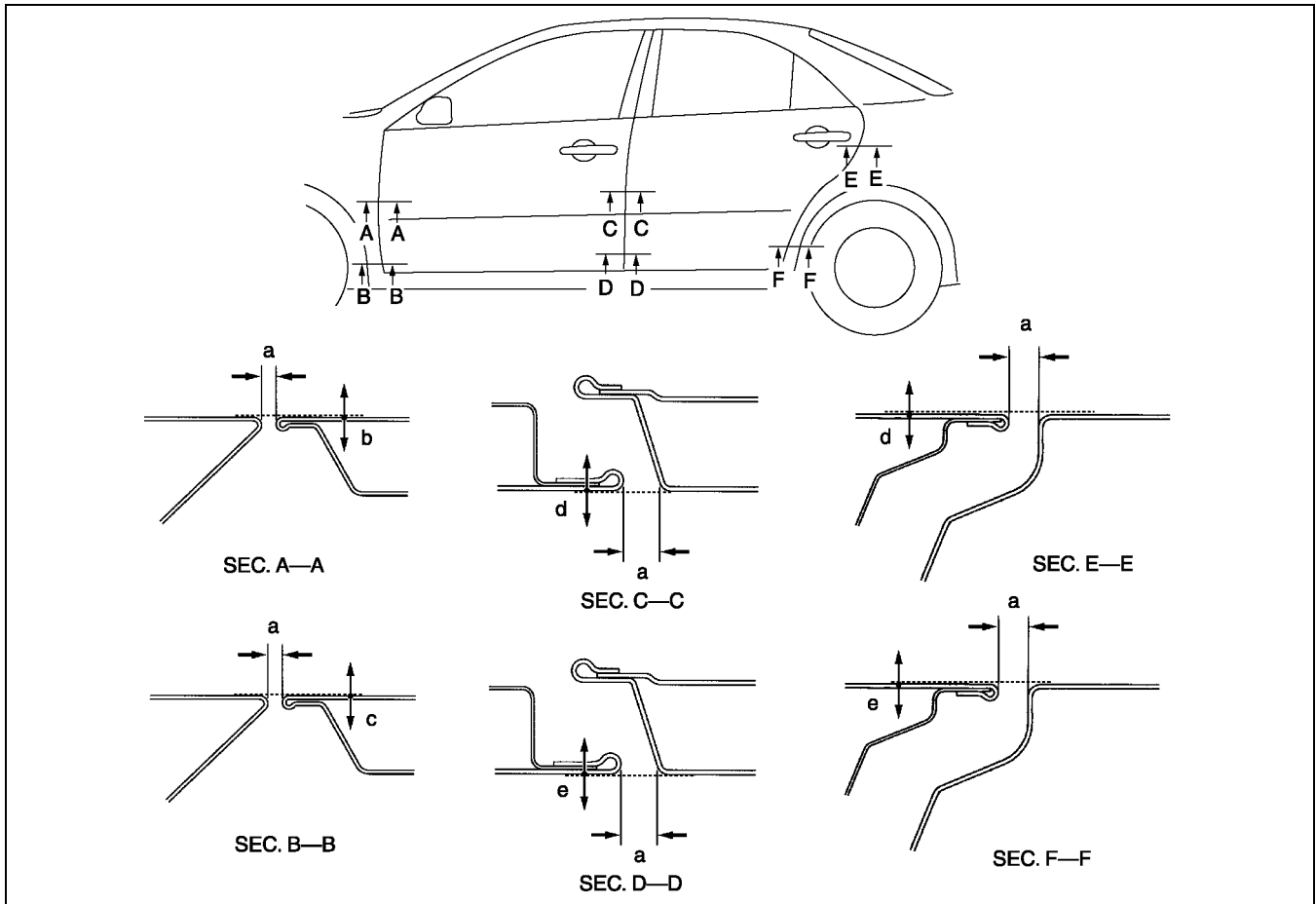
DOOR ADJUSTMENT

A6E771458010W03

1. Measure the gap and height between the front or rear door and the body.
2. If not as specified, loosen the front or rear door hinge installation bolts or the door lock striker installation screws, and reposition the door.

Clearance

- a: 2.5—4.5 mm {0.10—0.18 in}
- b: -0.8—1.2 mm {-0.03—0.05 in}
- c: -0.3—1.7 mm {-0.01—0.07 in}
- d: -1.0—1.0 mm {-0.04—0.04 in}
- e: -0.5—1.5 mm {-0.02—0.06 in}



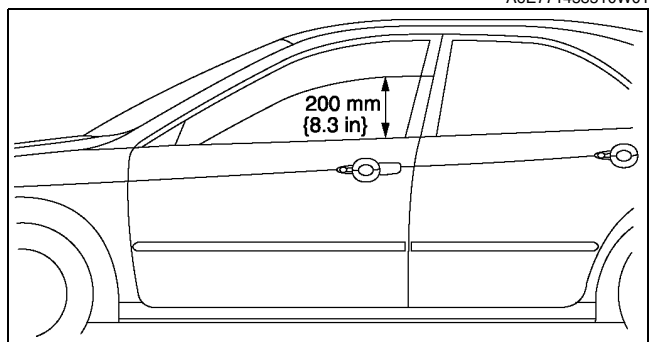
A6E7714W025

3. Tighten the bolts or screws.

FRONT DOOR GLASS REMOVAL/INSTALLATION

A6E771458510W01

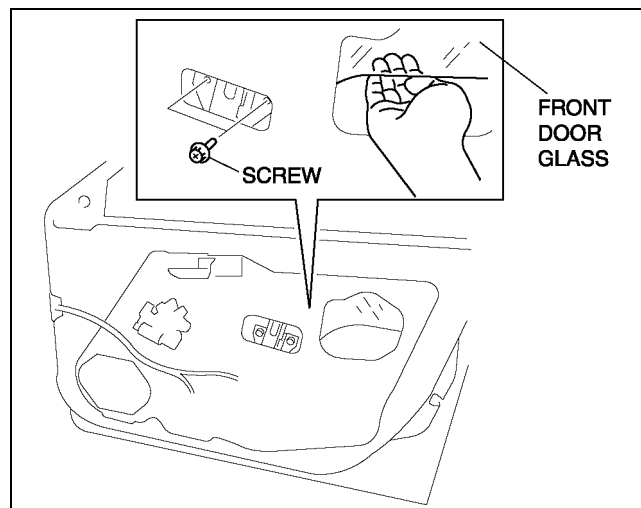
1. Operate the front door glass so that the distance from the top of the front door glass to the upper part of the rear beltline molding is **210 mm {8.3 in}**.
2. Disconnect the negative battery cable.
3. Remove the front door trim.
4. Remove the hole cover.



A6E7714W022

DOOR

5. Remove the screws.
6. Insert your hand in hole of the front door unit, and lift out the front door glass.
7. Install in the reverse order of removal.

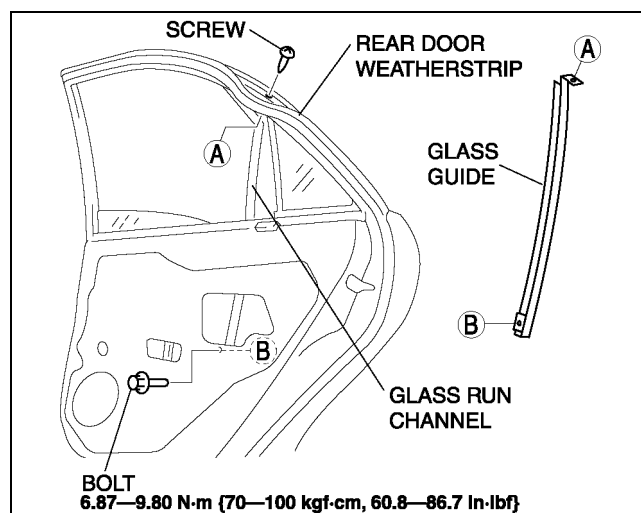


A6E7714W003

REAR DOOR GLASS REMOVAL/INSTALLATION

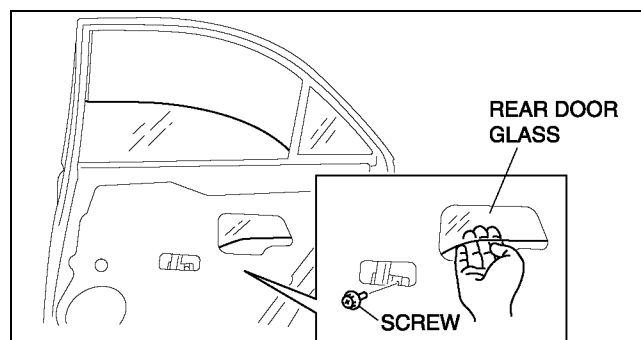
A6E771472510W01

1. Fully down the rear door glass.
2. Remove the rear door trim.
3. Remove the hole cover.
4. Pull up the rear door weatherstrip and remove the screw.
5. Remove the bolt.
6. Remove the glass run channel from the rear door glass guide.



A6E7714W014

7. Lift the rear door glass to the position where the rear door glass installation screw is visible.
8. Remove the screw.
9. Insert your hand through the rear door unit hole and lift out the rear door glass.
10. Install in the reverse order of removal.



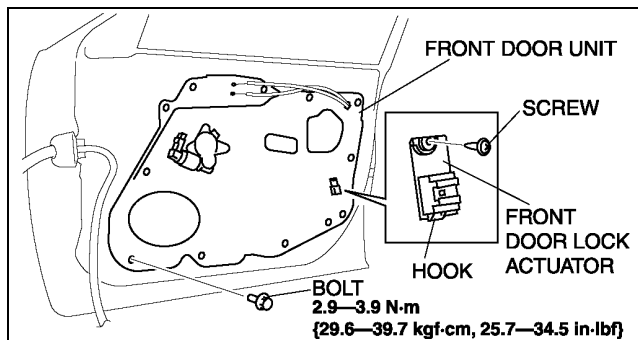
A6E7714W015

DOOR

FRONT DOOR UNIT REMOVAL/INSTALLATION

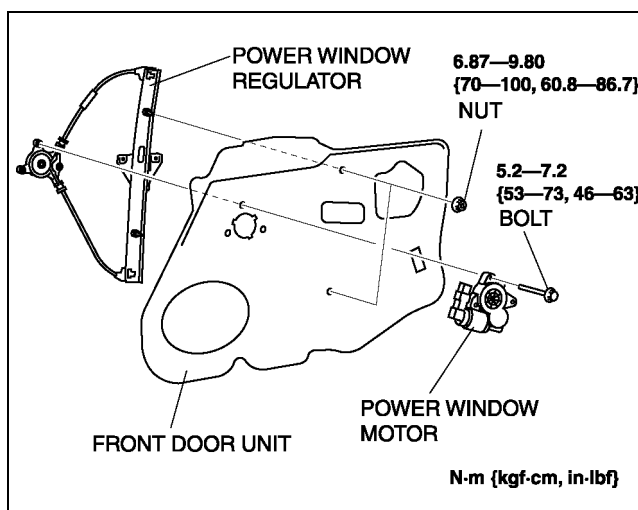
A6E771458971W01

1. Remove the front door glass.
2. Remove the inner handle.
3. Remove the front door speaker.
4. Disconnect the power window motor connector, front door lock actuator connector, power outside mirror connector.
5. Remove the door harness from the front door unit.
6. Remove the bolts.
7. Remove the screw.
8. Remove the front door actuator hook from the front door unit.
9. Pull the front door unit slightly towards you, and while keeping the power window regulator from catching on the door, remove the door unit from the door.
10. Pull out the inner handle cable and door lock knob cable from the hole.



A6E7714W011

11. Remove the power window motor and power window regulator from the door unit.
12. Install in the reverse order of removal.

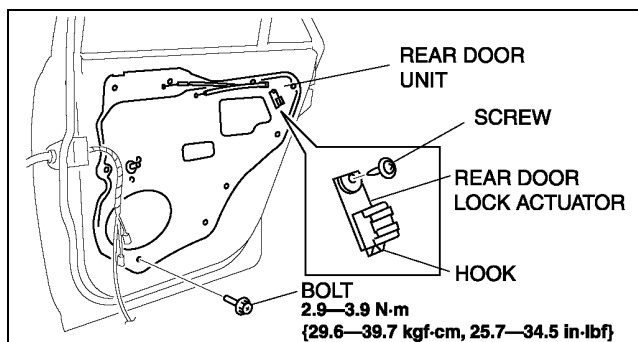


A6E7714W012

REAR DOOR UNIT REMOVAL/INSTALLATION

A6E771458971W02

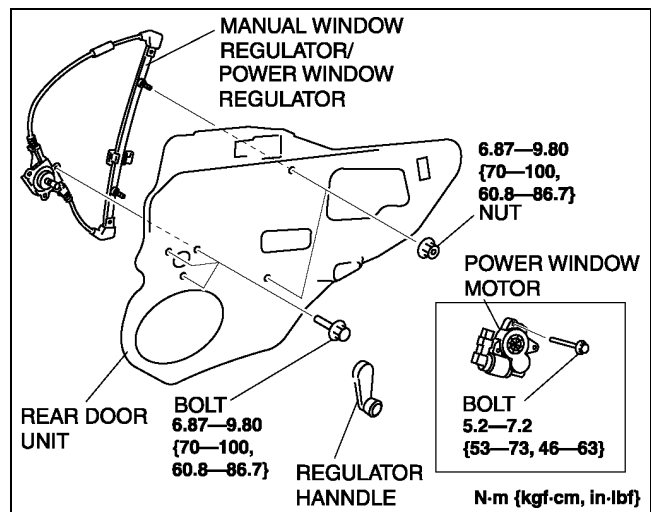
1. Remove the rear door glass.
2. Remove the inner handle.
3. Remove the rear door speaker.
4. Disconnect the power window motor connector, and power door lock actuator connector.
5. Remove the rear door harness from the rear door unit.
6. Remove the bolts.
7. Remove the rear door lock actuator hook from the rear door unit.
8. Pull the rear door unit slightly towards you, and while keeping the power window regulator or manual window regulator from catching on the door, remove the door unit from the door.
9. Pull out the inner handle cable and door lock knob cable from the hole.



A6E7714W016

DOOR

10. For power window system-equipped vehicles, remove the power window motor and power window regulator from the door unit. For manual window system-equipped vehicles, remove the regulator handle and manual window regulator.
11. Install in the reverse order of removal.

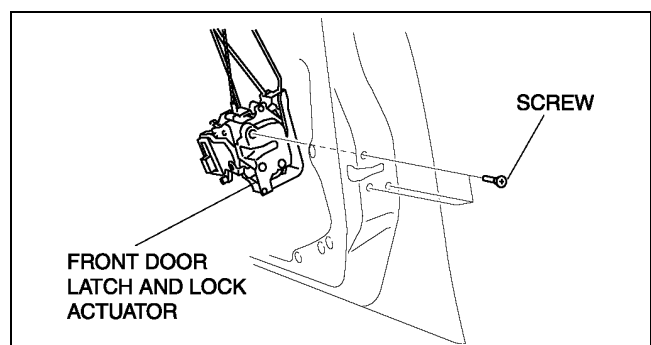


A6E7714W017

FRONT DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

A6E771458310W01

1. Remove the front door unit.
2. Remove the screws, then remove the front door latch and door lock actuator.
3. Install in the reverse order of removal.

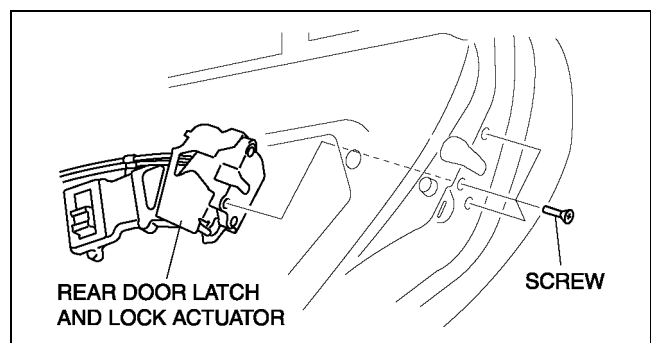


A6E7714W013

REAR DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION

A6E771472310W01

1. Remove the rear door unit.
2. Remove the screws, then remove the rear door latch and lock actuator.
3. Install in the reverse order of removal.



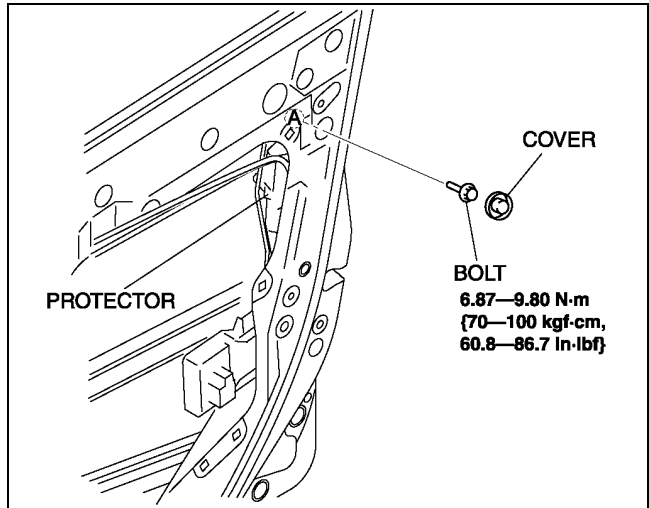
A6E7714W020

DOOR

FRONT DOOR KEY CYLINDER REMOVAL/INSTALLATION

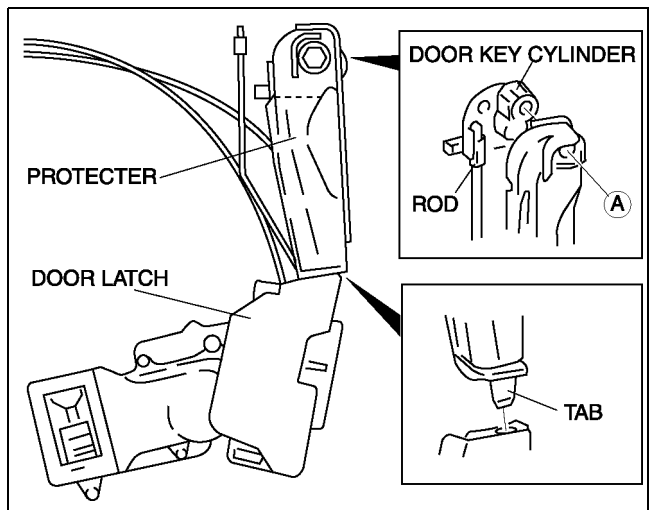
A6E771458310W03

1. Remove the front door unit.
2. Remove the cover, then remove the bolt.



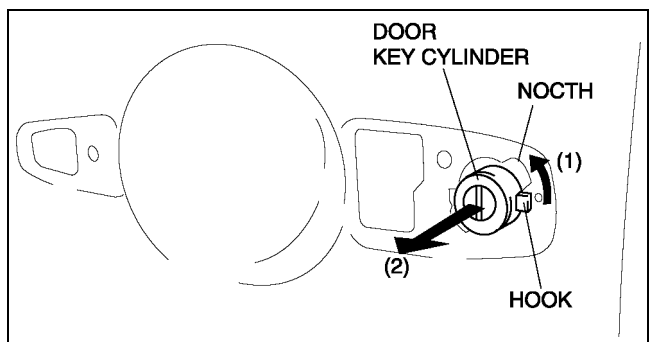
A6E7714W027

3. For protector-equipped vehicles, pull out the protector tab from the latch and remove the protector.
4. Disconnect the rod.
5. Remove the front outer handle.



A6E7714W028

6. Turn the key cylinder in the direction indicated by the arrow (1) and move the hook to the notch.
7. Pull the key cylinder towards you (2) to remove it.
8. Install in the reverse order of removal.



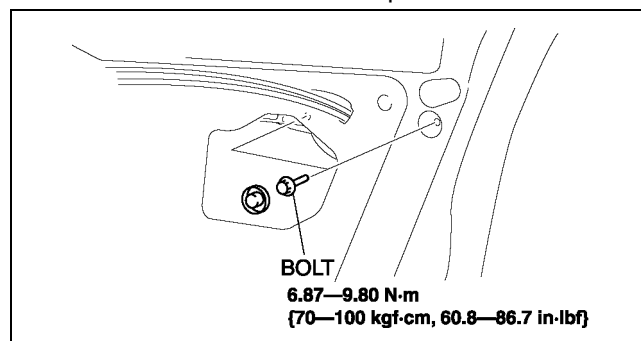
A6E7714W029

DOOR

FRONT OUTER HANDLE REMOVAL/INSTALLATION

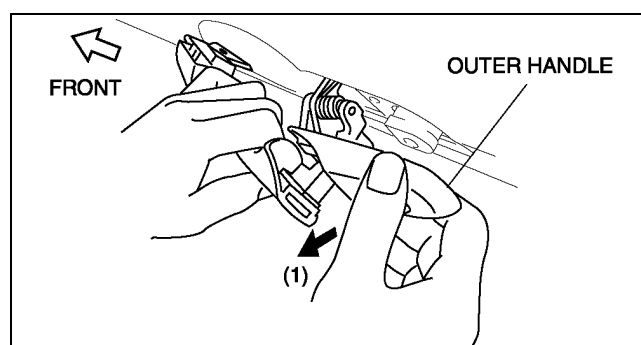
A6E771458410W01

1. Remove the front door glass.
2. Detach the outer handle and front door latch rod.
3. For protector-equipped vehicles, refer to key cylinder removal/installation to remove the protector.
4. Remove the bolts.



A6E7714W004

5. With the rear side of the outer handle fixed and the outer handle lever pulled out (1), remove the rear side of the outer handle from the front door.
6. Pull out the front side of the outer handle from the front door.
7. Install in the reverse order of removal.

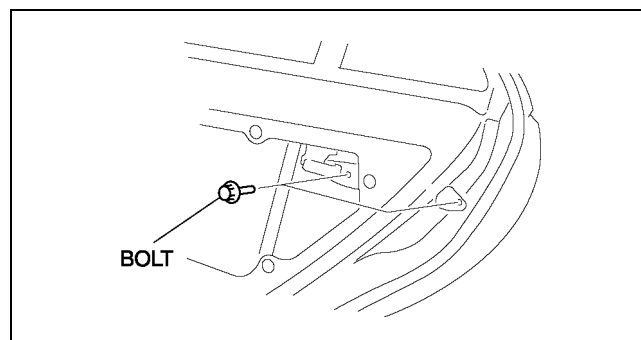


A6E7714W005

REAR OUTER HANDLE REMOVAL/INSTALLATION

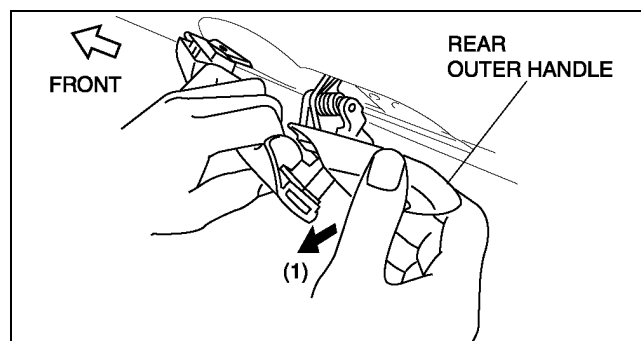
A6E771458410W02

1. Remove the rear door glass.
2. Remove the rear door unit.
3. Remove the rear door latch.
4. Remove the bolts.
5. Detach the rear outer handle and rear door latch rod.



A6E7714W018

6. With the rear side of the rear outer handle fixed and the outer handle lever pulled out (1), remove the rear side of the rear outer handle from the rear door.
7. Pull out the front side of the rear outer handle from the rear door.
8. Install in the reverse order of removal.



A6E7714W019

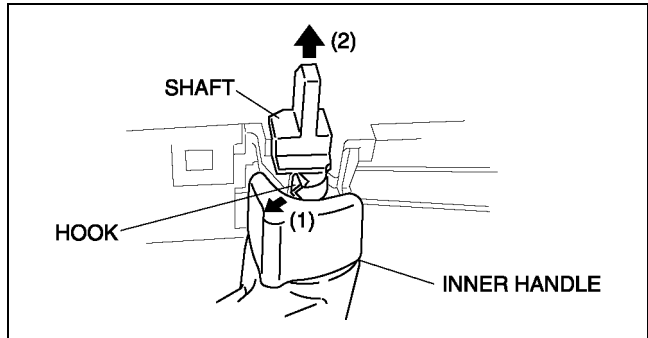
S

DOOR

INNER HANDLE REMOVAL/INSTALLATION

A6E771458330W01

1. Remove the front door trim.
2. Using a flathead screwdriver, press and hold the hook in the direction indicated by arrow (1), and pull the shaft in the direction indicated by arrow (2), remove the shaft.
3. Pull off the inner handle, and remove the door lock knob cable and inner handle cable.
4. Install in the reverse order of removal.

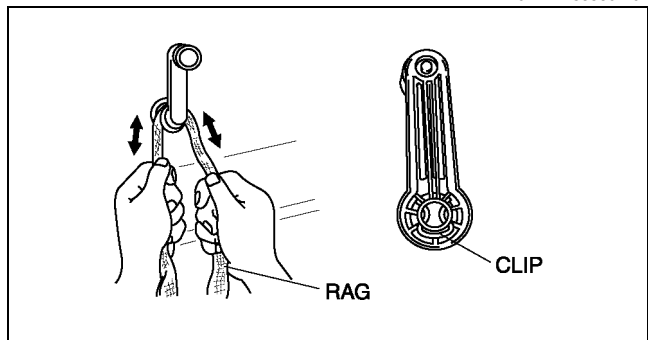


A6E7714W010

REGULATOR HANDLE REMOVAL

A6E771458580W01

1. Remove the regulator handle clip using a rag as shown.

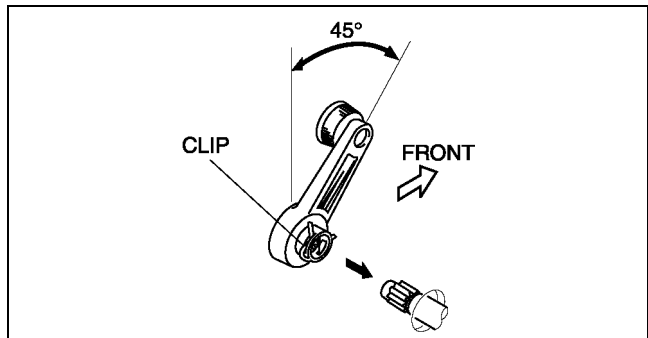


A6E7714W008

REGULATOR HANDLE INSTALLATION

A6E771458580W02

1. Install the clip in the regulator handle.
2. Close the door glass fully and push the regulator handle on as shown.



A6E7714W009

POWER WINDOW SYSTEM

POWER WINDOW SYSTEM

INITIAL SETTING

A6E771666350W01

Note

- A driver side window will not fully close automatically under following the conditions:
 - The battery has been disconnected during vehicle maintenance or for other reasons.
 - The power window main switch connector, or driver-side power window motor connector has been disconnected.
- Carry out the following procedure to resume operation:

1. Turn the ignition switch to the ON position.
2. Press the driver side power window main switch and fully open the driver side window.
3. Pull up the driver side power window main switch to manual-up position to fully close the driver side window, and keep holding the switch up at the position for **about 2 seconds** to complete initial setting.

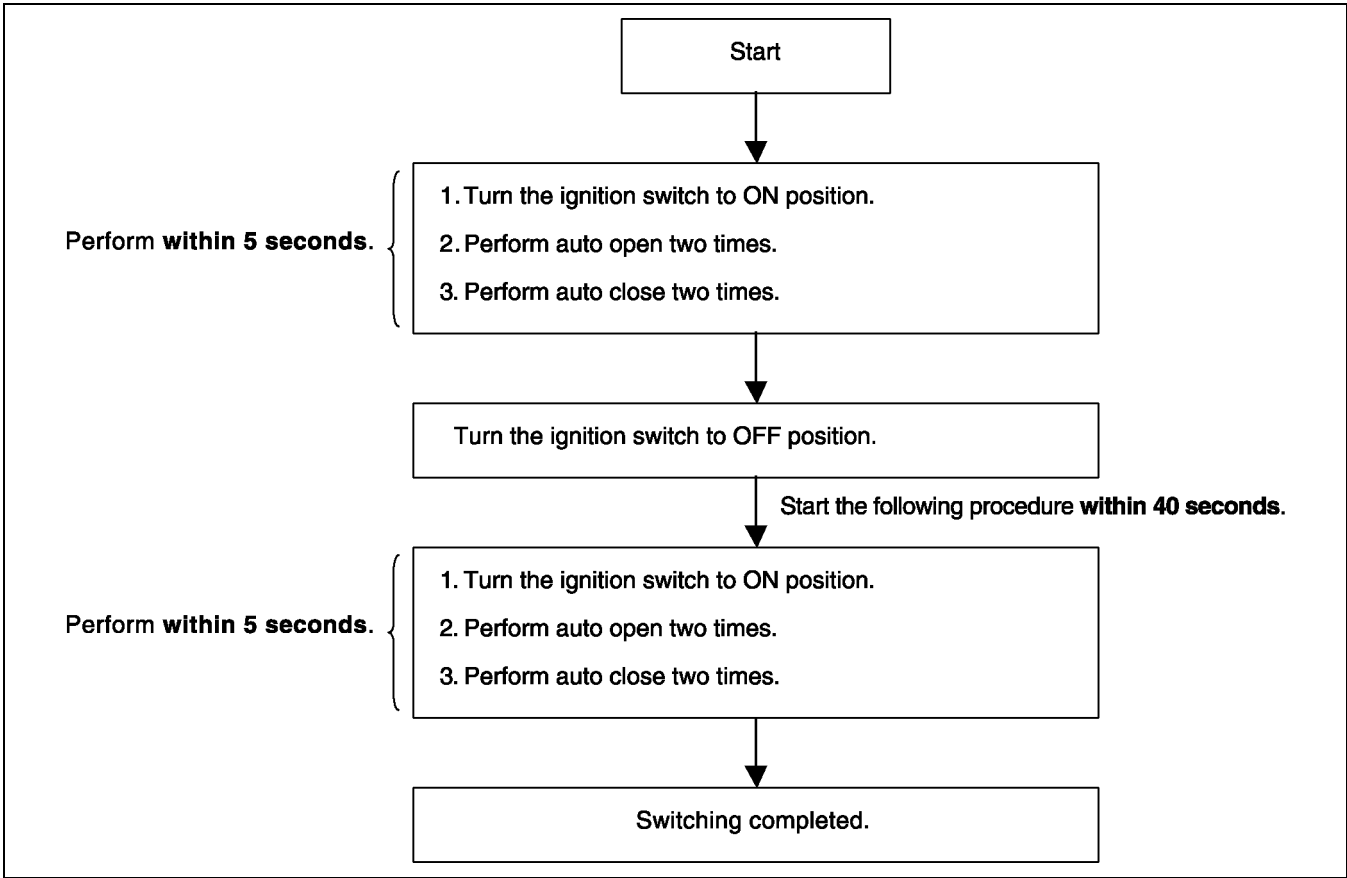
TWO-STEP DOWN FUNCTION OPERATIVE/NON-OPERATIVE SWITCHING PROCEDURE

A6E771666350W02

Note

- By following the procedure below, the two-step down function is switched to non-operative when it is operative, and to operative when it is non-operative.

S



A6E7716W014

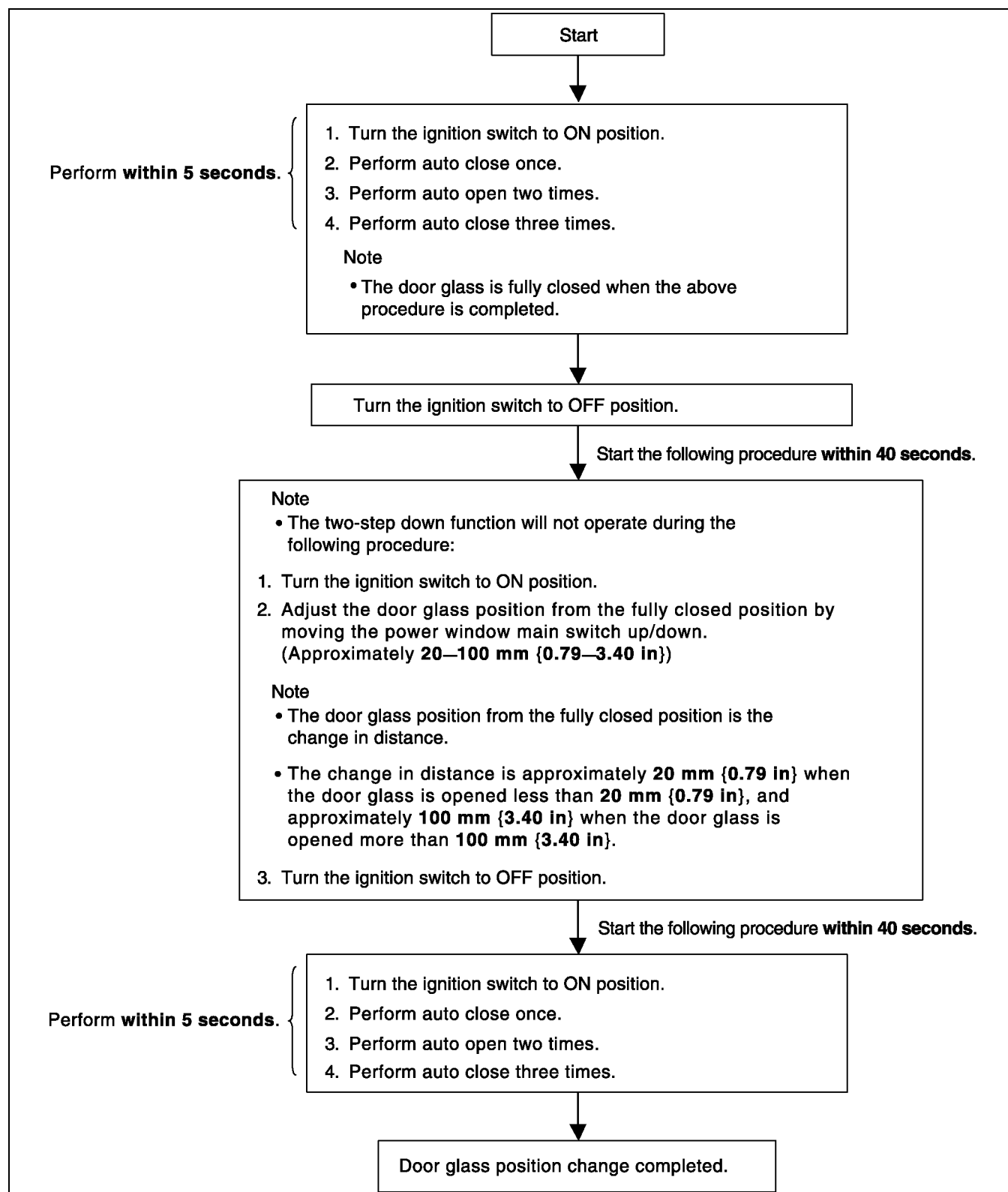
POWER WINDOW SYSTEM

DOOR GLASS POSITION CHANGE PROCEDURE

A6E771666350W03

Note

- After performing the following procedure, verify that the two-step down function operates normally and the door glass position has changed. If the two-step down function does not operate or the door glass position has not changed, the procedure was not performed properly. Repeat the procedure from the beginning.



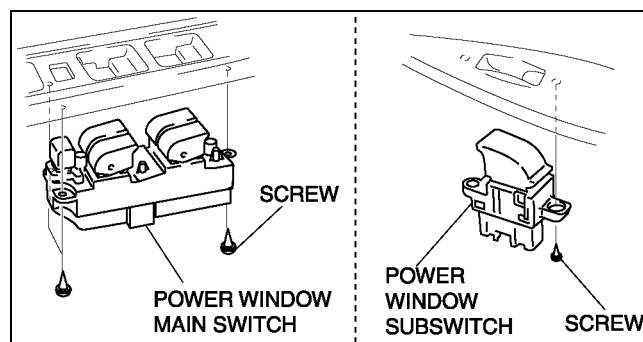
A6E7716W015

POWER WINDOW SYSTEM

POWER WINDOW SWITCH REMOVAL/INSTALLATION

A6E771666350W04

1. Disconnect the negative battery cable.
2. Remove the front door trim or rear door trim.
3. Remove the screws, then the power window switch.
4. Install in the reverse order of removal.



A6E7716W003

POWER WINDOW SYSTEM

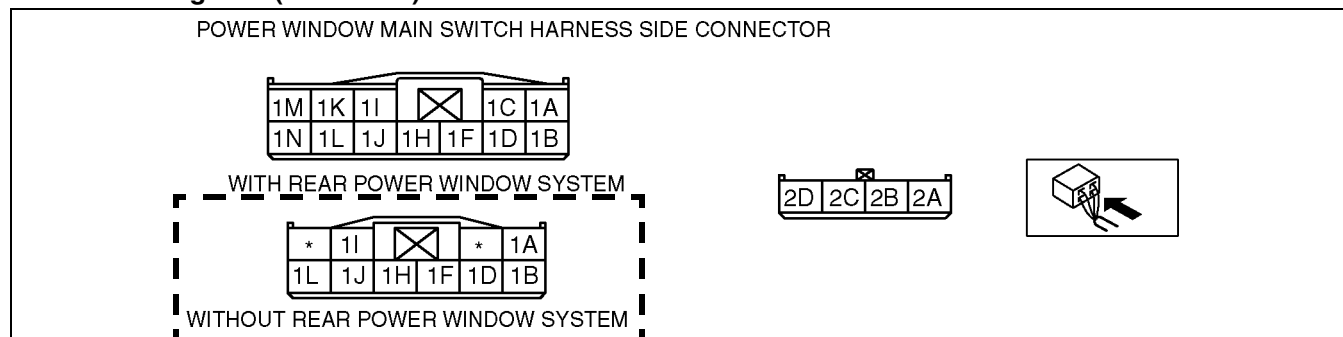
POWER WINDOW MAIN SWITCH INSPECTION

A6E771666350W05

Driver's side

1. Remove the driver-side front door trim.
2. Connect the power window main switch connector.
3. Measure the voltage at the power window main switch terminals as indicated below.
4. Disconnect the power window main switch connector before inspecting for continuity at terminals 1M (1J^{*2}) and 1F (1L^{*2}).
 - If not as specified, inspect the parts listed under "Action."
 - If the parts and wiring harnesses are okay but the system still does not work properly, replace the power window main switch.

Terminal voltage list (Reference)



A6E7716W001

Terminal	Signal	Connected to	Test condition	Voltage (V)/Continuity	Action
1N ^{*1} 1F ^{*2} 1B ^{*3}	Open output	Power window motor	While door glass is opening	B+	- Power window motor - Inspect related harness
			While door glass is closing	Below 1.0	
1L ^{*1} 1D	Close output	Power window motor	While door glass is opening	Below 1.0	- Power window motor - Inspect related harness
			While door glass is closing	B+	
1F 1L ^{*2}	Door switch	Door switch	Any door is open (door switch is on): inspect for continuity to ground	Yes	- Inspect door switch - Inspect related harness
			All doors are closed (door switch is off): inspect for continuity to ground	No	
1H 1B ^{*2}	IG1	P. WIND 30 A fuse	Ignition switch is at ON position	B+	- Inspect P. WIND 30 A fuse - Inspect related harness
			Ignition switch is at LOCK position	Below 1.0	
1J 1H ^{*2}	Power supply	P. WIND 20 A fuse	Under any condition	B+	P. WIND 20 A fuse - Inspect related harness
1M 1J ^{*2}	Ground	GND	Under any condition: inspect for continuity to ground	Yes	Inspect GND
2A	Ground	Power window motor	Under any condition: inspect for continuity to ground	Yes	- Power window motor - Inspect related harness
2B	Pulse 2	Power window motor	Door glass is in motion	Alternates between 0 and 5	- Power window motor - Inspect related harness
			Door glass is not in motion	0 or 5	
2C	Pulse 1	Power window motor	Door glass is in motion	Alternates between 0 and 5	- Power window motor - Inspect related harness
			Door glass is not in motion	0 or 5	
2D	Power supply	Power window motor	Under any condition	9	- Power window motor - Inspect related harness

^{*1} : With rear power window system (L.H.D.)

^{*2} : Without rear power window system (L.H.D.)

^{*3} : R.H.D.

POWER WINDOW SYSTEM

Except driver's side

1. Turn the power-cut switch to UNLOCK.
2. Inspect for continuity between the power window main switch terminals using an ohmmeter.
 - If not as specified, replace the power window main switch.

PASSENGER'S SIDE

○—○ : Continuity

Switch position	Terminal			
	1H 1B ^{*2}	1M 1J ^{*2}	1D ^{*1} 1A ^{*2} 1L ^{*3}	1B ^{*1} 1I ^{*2} 1N ^{*3}
CLOSE	○	○	○	○
OFF		○	○	○
OPEN	○	○	○	○

*1: With rear power window system (L.H.D.)

*2: Without rear power window system (L.H.D.)

*3: R.H.D.

REAR RIGHT

○—○ : Continuity

Switch position	Terminal			
	1H	1M	1A	1C
CLOSE	○	○	○	○
OFF		○	○	○
OPEN	○	○	○	○

REAR LEFT

○—○ : Continuity

Switch position	Terminal			
	1H	1M	1K	1I
CLOSE	○	○	○	○
OFF		○	○	○
OPEN	○	○	○	○

POWER-CUT SWITCH

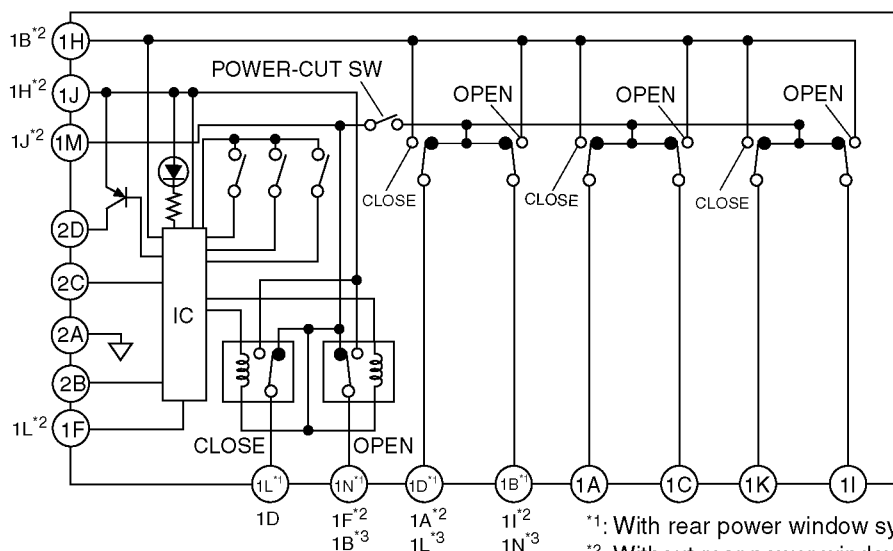
○—○ : Continuity

Switch position	Terminal								
	1M 1J ^{*2}	1L ^{*1} 1D	1N ^{*1} 1F ^{*2} 1B ^{*3}	1D ^{*1} 1A ^{*2} 1L ^{*3}	1B ^{*1} 1I ^{*2} 1N ^{*3}	1A	1C	1K	1I
UNLOCK									
LOCK									

*1: With rear power window system (L.H.D.)

*2: Without rear power window system (L.H.D.)

*3: R.H.D.



*1: With rear power window system (L.H.D.)

*2: Without rear power window system (L.H.D.)

*3: R.H.D.

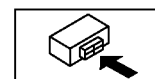
1M	1K	1I			1C	1A
1N	1L	1J	1H	1F	1D	1B

WITH REAR POWER WINDOW SYSTEM

*	1I			*	1A
1L	1J	1H	1F	1D	1B

WITHOUT REAR POWER WINDOW SYSTEM

2D	2C	2B	2A



A6E7716W009

POWER WINDOW SYSTEM

POWER WINDOW SUBSWITCH INSPECTION

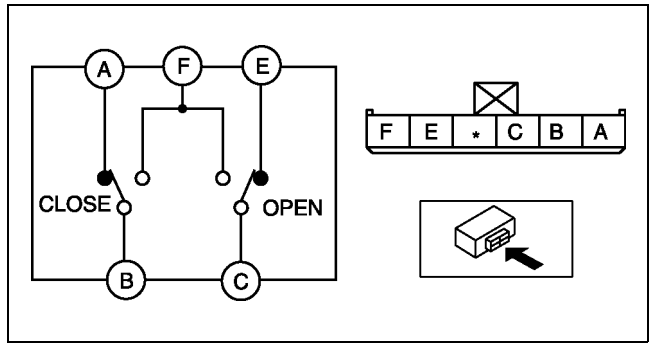
- Inspect for continuity between the power window subswitch terminals.
 - If not as specified, replace the power window subswitch.

○—○ : Continuity

Switch position	Terminal				
	A	B	C	E	F
CLOSE		○—○	○—○		○—○
OFF	○—○		○—○		
OPEN	○—○		○—○		

A6E7716W013

A6E771666370W01

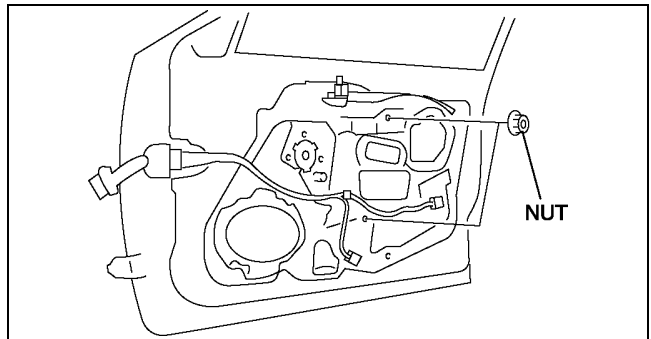


A6E7716W011

POWER WINDOW REGULATOR REMOVAL/INSTALLATION

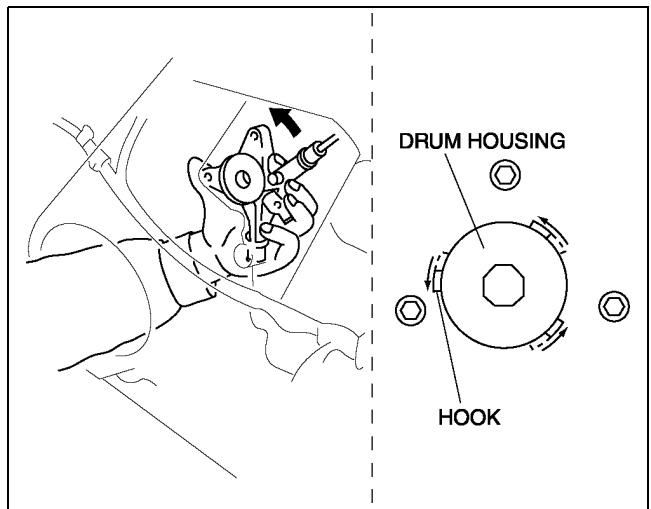
- Disconnect the negative battery cable.
- Remove the front door glass/rear door glass.
- Remove the front door speaker/rear door speaker.
- Remove the power window motor.
- Remove the nuts.

A6E771658560W01



A6E7716W005

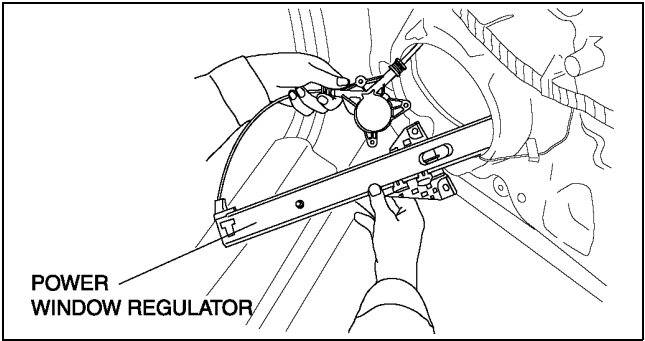
- Insert hand through the speaker installation hole, rotate the regulator drum housing in the direction shown in the figure and disengage the regulator drum housing from the door unit connection hooks.



A6E7716W006

POWER WINDOW SYSTEM

7. Remove the power window regulator from the speaker installation hole.
8. Install in the reverse order of removal.



A6E7716W007

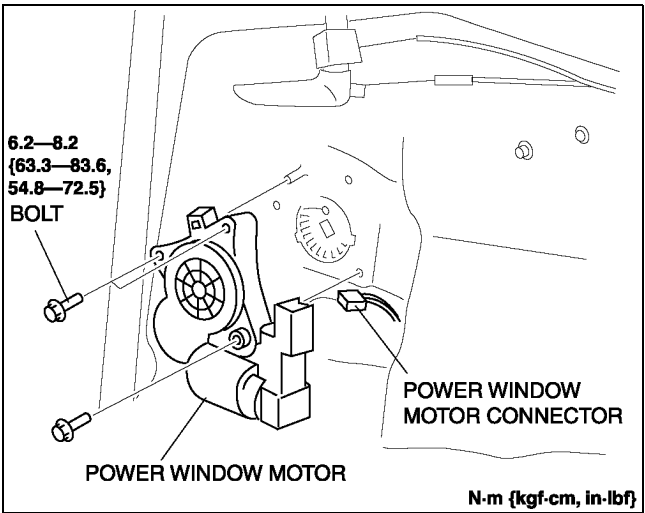
POWER WINDOW MOTOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the front door trim or rear door trim.
3. Disconnect the power window motor connector.
4. Remove the bolts.
5. Remove the power window motor from the power window regulator drum.
6. Install in the reverse order of removal.

A6E771659560W01

Note

- When installing the power window motor to the power window regulator drum, the drum housing hook may come off the door unit. If this happens, remove the door speaker, insert your hand in the speaker installation hole, connect the drum housing hooks, and while supporting the drum housing, install the power window motor to the drum.



A6E7716W004

POWER WINDOW MOTOR INSPECTION

A6E771659560W02

Driver's Side

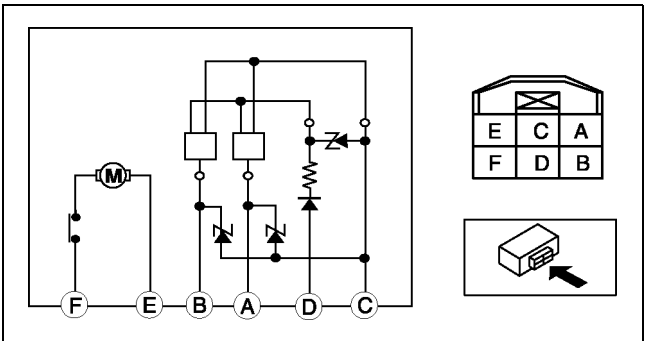
1. Disconnect the power window motor connector.
2. Apply battery positive voltage to the power window motor terminals E and F and inspect the operation the power window motor operation.
 - If not as specified, replace the power window motor.

Motor operation	Terminal	
	F	E
UP	GND	B+
DOWN	B+	GND

3. Apply **battery positive voltage** to the power window motor terminal D and connect terminal C to ground.
4. Measure the voltage at terminal B and A while performing Step 3.
 - If not as specified, replace the power window motor.

Voltage

Pulse wave: MAX. 5 V, MIN. 0 V



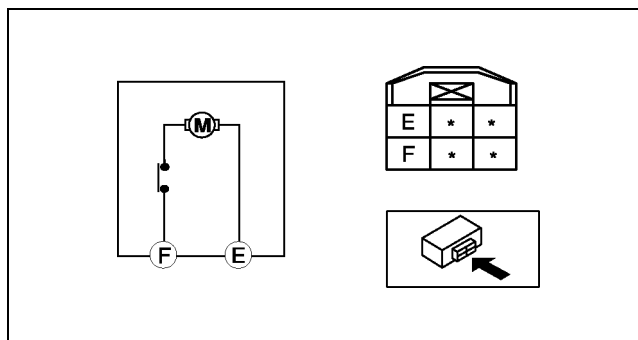
A6E7716W008

POWER WINDOW SYSTEM, POWER DOOR LOCK SYSTEM

Except Driver's Side

1. Apply battery positive voltage to the power window motor terminals and inspect the operation of the power window motor.
 - If not as specified, replace the power window motor.

Motor operation	Terminal	
	F	E
UP	GND	B+
DOWN	B+	GND



A6E7716W010

POWER DOOR LOCK SYSTEM

FRONT DOOR LOCK ACTUATOR INSPECTION

A6E771858310W01

Door Lock Actuator

1. Disconnect the front door lock actuator connector.
2. Apply battery positive voltage to the front door lock actuator terminals and inspect the operation of the front door lock actuator.
 - If not as specified, replace the front door lock actuator.

With double locking system

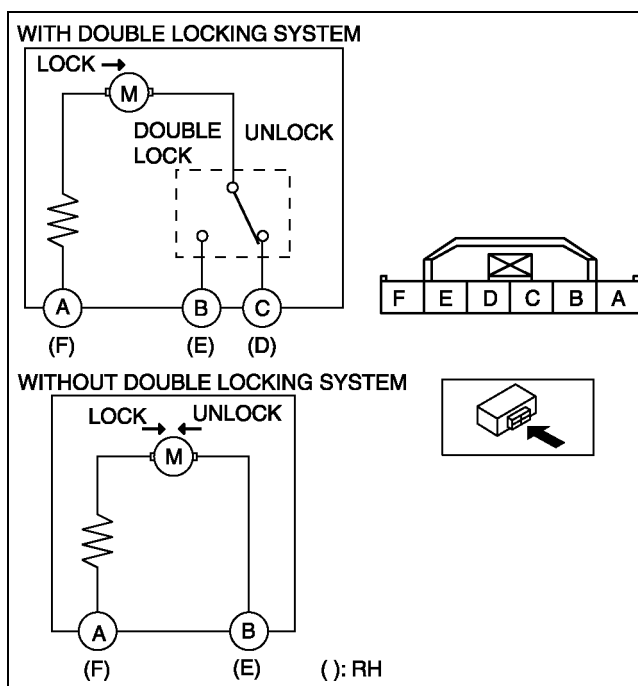
Actuator operation	Connection	
	B+	GND
Lock	A (F)	C (D)
Double lock	A (F)	B (E)
Unlock	C and B (D and E)	A (F)

() : RH

Without double locking system

Actuator operation	Connection	
	B+	GND
Lock	A (F)	B (E)
Unlock	A (F)	B (E)

() : RH



A6E7718W011

POWER DOOR LOCK SYSTEM

Door Lock-link Switch

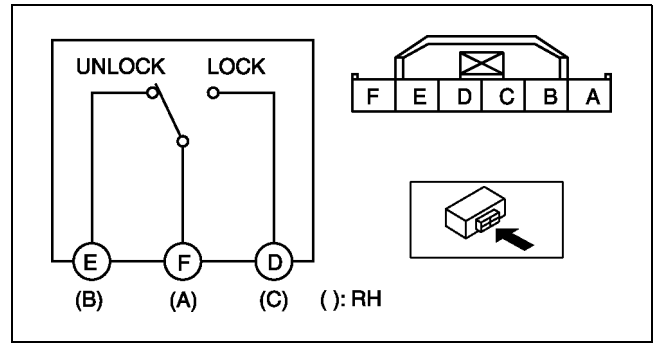
1. Disconnect the front door lock actuator connector.
2. Inspect for continuity between the door lock-link switch terminals using an ohmmeter.
 - If not as specified, replace the front door lock actuator.

○—○ : Continuity

Lock knob position	Terminal		
	E (B)	F (A)	D (C)
Lock		○—○	○—○
Unlock	○—○	○—○	

(): RH

A6E7718W012



A6E7718W008

Door Key Cylinder Switch

1. Disconnect the front door lock actuator connector.
2. Inspect for continuity between the door lock-link switch terminals using an ohmmeter.
 - If not as specified, replace the front door lock actuator.

WITH DOUBLE LOCKING SYSTEM

○—○ : Continuity ○—w—○ : Resistance

Key cylinder position	Terminal	
	A	B
Neutral		
Lock	○—w—○	○—○ R
Unlock	○—○	○—○

R: 950—1050 Ω

WITHOUT DOUBLE LOCKING SYSTEM

○—○ : Continuity ○—w—○ : Resistance

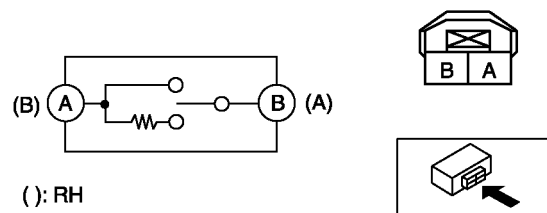
Key cylinder position	Terminal	
	C (A)	D (F)
Neutral		
Lock	○—w—○	○—○ R
Unlock	○—○	○—○

(): RH

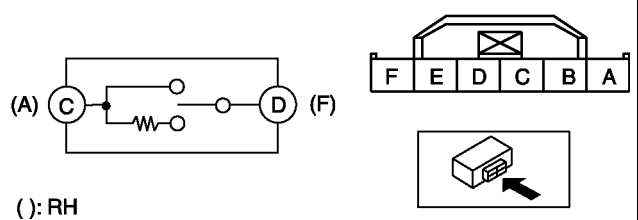
R: 950—1050 Ω

A6E7718W022

WITH DOUBLE LOCKING SYSTEM



WITHOUT DOUBLE LOCKING SYSTEM



A6E7718W015

POWER DOOR LOCK SYSTEM

REAR DOOR LOCK ACTUATOR INSPECTION

A6E771872310W01

Door Lock Actuator

1. Disconnect the front door lock actuator connector.
2. Apply battery positive voltage to the front door lock actuator terminals and inspect the operation of the front door lock actuator.
 - If not as specified, replace the front door lock actuator.

With double locking system

Connection		Actuator operation
B+	GND	
A (F)	F (A)	Lock
F (A)	A (F)	Double lock
F and E (A and B)	E (A)	Unlock

() : RH

Without double locking system

Actuator operation	Connection	
	B+	GND
Lock	A (F)	B (E)
Unlock	B (E)	A (F)

() : RH

Door Lock-link Switch (With Theft-deterrent System)

1. Disconnect the front door lock actuator connector.
2. Inspect for continuity between the door lock-link switch terminals using an ohmmeter.
 - If not as specified, replace the front door lock actuator.

○—○ : Continuity

Lock knob position	Terminal	
	D (C)	B (E)
Lock		
Unlock	○—○	○—○

() : RH

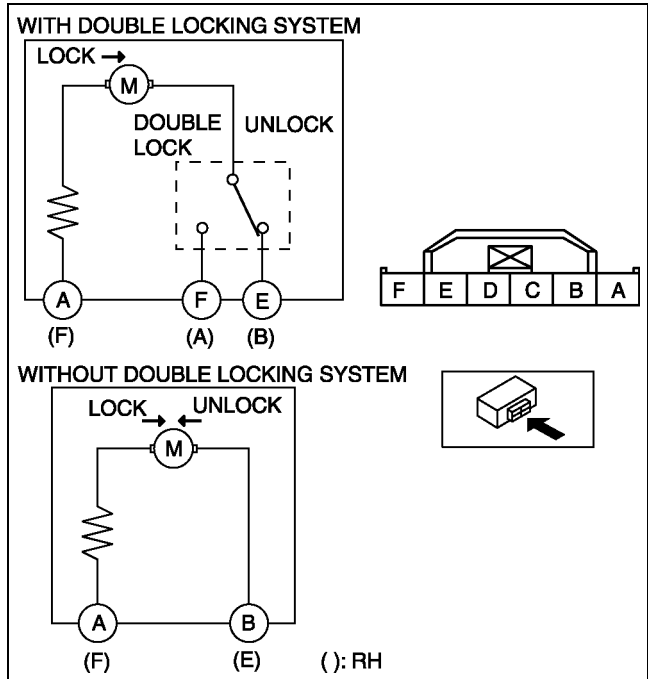
A6E7718W019

TRUNK LID LOCK ACTUATOR INSPECTION

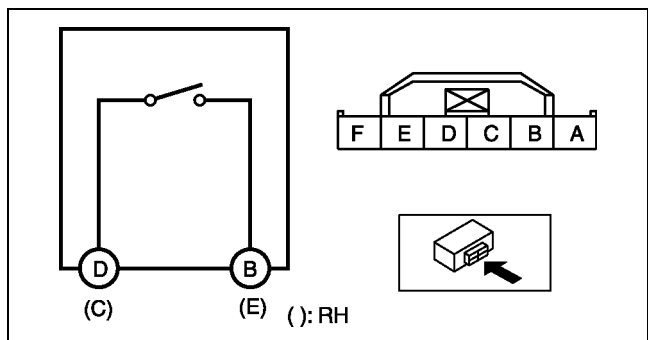
A6E771856840W02

1. Disconnect the trunk lid lock actuator connector.
2. Apply battery positive voltage to the trunk lid lock actuator terminals and inspect the operation of the trunk lid lock actuator.
 - If not as specified, replace the trunk lid lock.

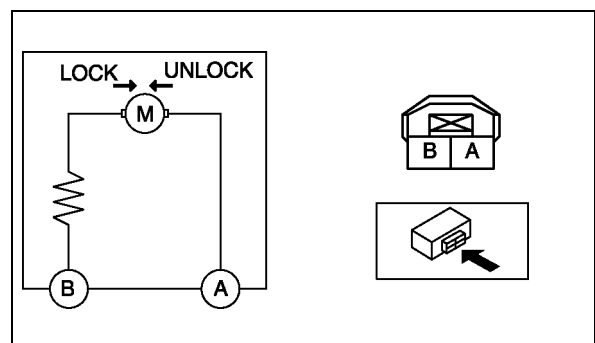
Actuator operation	Connection	
	B+	GND
Lock	A	B
Unlock	B	A



A6E7718W018



A6E7718W010



A6E7718W016

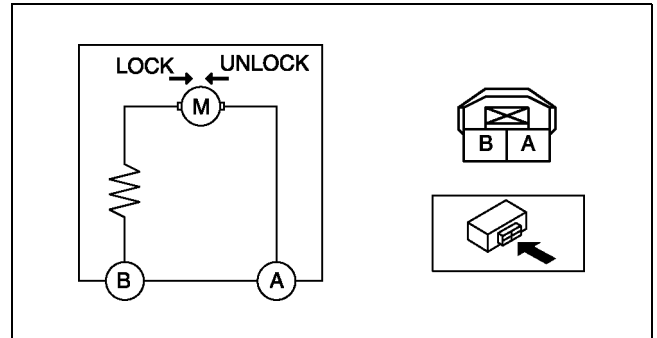
POWER DOOR LOCK SYSTEM

LIFTGATE LOCK ACTUATOR INSPECTION

A6E771862310W01

1. Disconnect the liftgate lock actuator connector.
2. Apply battery positive voltage to the liftgate lock actuator terminals and inspect the operation of the liftgate lock actuator.
 - If not as specified, replace the liftgate lock.

Actuator operation	Connection	
	B+	GND
Lock	A	B
Unlock	B	A

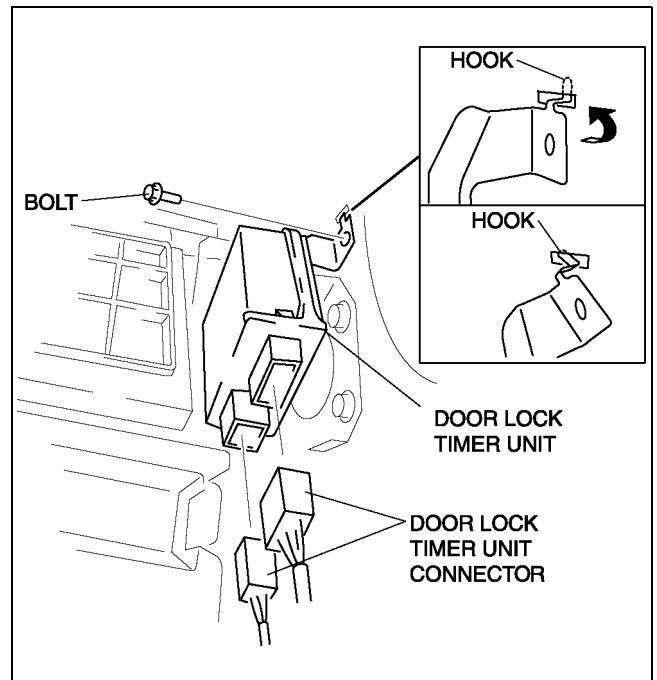


A6E7718W016

DOOR LOCK TIMER UNIT REMOVAL/INSTALLATION

A6E771867830W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment. (L.H.D.)
3. Remove the bolt.
4. While inclining the door lock timer unit along the body panel in the direction indicated by the arrow, disengage the bracket hook from the hole in the body panel.
5. Disconnect the door lock timer unit connector.
6. Remove the door lock timer unit.



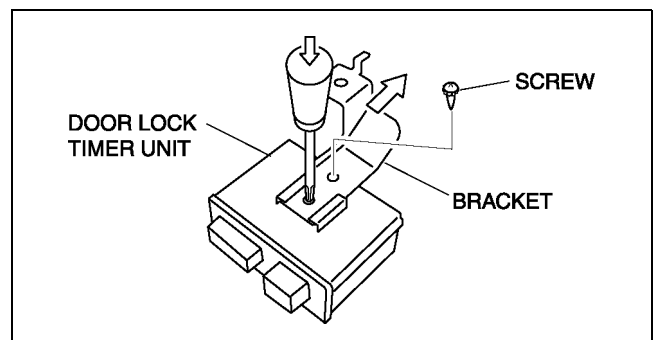
A6E7718W004

7. Remove the screw, then remove the bracket.

Note

- The screw which fixes the door lock timer unit and bracket is for a body ground connection. Be sure to secure the screw when installing.

8. Install in the reverse order of removal.



A6E7718W020

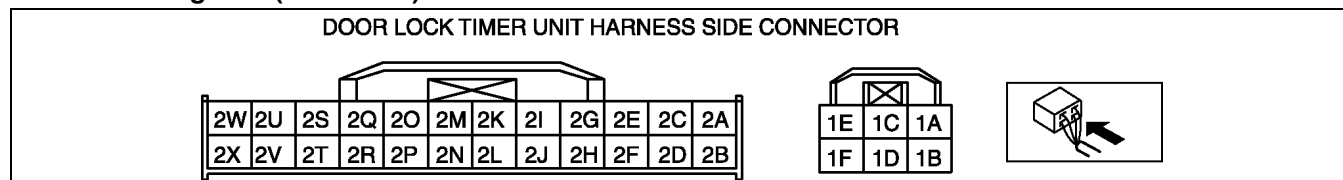
POWER DOOR LOCK SYSTEM

DOOR LOCK TIMER UNIT INSPECTION

A6E771867830W02

1. Measure the voltage at the door lock timer unit terminals (other than terminal 1E and 2W) as indicated below.
 - If not as specified, inspect the parts listed under "Action."
2. Disconnect the negative battery cable.
3. Disconnect the door lock timer unit connector and inspect for continuity between terminal 1E or 2W and the bracket.
4. Inspect for continuity at terminal 1E and 2W as indicated below.
5. If the parts and wiring harnesses are okay but the system still does not work properly, perform the troubleshooting.

Terminal voltage list (Reference)



A6E7718W017

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
1A	Power supply	D. LOCK 30 A fuse	Under any condition	B+	- Inspect D. LOCK 30 A fuse - Inspect the vehicle battery - Inspect related harness
1B	Room light control	- Front map light - Rear map light - Courtesy light	Any door is open	Below 1.0	- Inspect ROOM 15 A fuse - Inspect door switch - Inspect front map light - Inspect rear map light - Inspect courtesy light - Inspect related harness
1C	Unlock output	- Door lock actuator - Trunk lid lock actuator (4SD) - Liftgate lock actuator (5HB)	While lock actuator is unlocking	Below 1.0→B+→Below 1.0	- Inspect door lock actuator - Inspect trunk lid lock actuator (4SD) - Inspect liftgate lock actuator (5HB) - Inspect D. LOCK 30 A fuse - Inspect related harness
			Other	Below 1.0	
1D	Lock output	- Door lock actuator - Trunk lid lock actuator (4SD) - Liftgate lock actuator (5HB)	While lock actuator is locking	Below 1.0→B+→Below 1.0	- Inspect door lock actuator - Inspect trunk lid lock actuator (4SD) - Inspect liftgate lock actuator (5HB) - Inspect D. LOCK 30 A fuse - Inspect related harness
			Other	Below 1.0	
1E	Power ground	GND	Under any condition: inspect for continuity to ground	Yes	Inspect GND
1F*1	Double lock output	Door lock actuator	Door lock actuators are double locked	Below 1.0→B+→Below 1.0	- Inspect door lock actuator - Inspect related harness
			Other	Below 1.0	
2A	Power supply	METER IG 15 A fuse	Under any condition	B+	- Inspect METER IG 15 A fuse - Inspect related harness
2B	IG1	ROOM 15 A fuse	Ignition switch is at ON position	B+	- Inspect ROOM 15 A fuse - Inspect related harness
			Ignition switch is at LOCK or ACC position	Below 1.0	
2C	-	-	-	-	-

POWER DOOR LOCK SYSTEM

Terminal	Signal	Connected to	Test condition		Voltage (V)/ Continuity	Action
2D	-	-	-		-	-
2E	-	-	-		-	-
2F	Key reminder switch	Key reminder switch	Key reminder switch at on		B+	- Inspect key reminder switch - Inspect related harness
			Other		Below 1.0	
2G	Liftgate open/closed	Door switch	Liftgate is open (cargo compartment light switch is on)		Below 1.0	- Inspect cargo compartment light switch - Inspect related harness
			Liftgate are closed (cargo compartment light switch are off)		B+	
2H	-	-	-		-	-
2I	Hazard	Flasher unit	Except vehicles with theft-deterrent system	Transmitter LOCK button is pressed	B+→Below 1.0→B+	- Inspect flasher unit - Inspect related harness
				Transmitter UNLOCK button is pressed	B+→Below 1.0→B+→Below 1.0→B+	
				No transmitter buttons are pressed	B+	
			Vehicles with theft-deterrent system	Under any condition	B+	- Inspect theft-deterrent control module - Inspect related harness
2J*1	Security light output	Instrument cluster	Double locking system operated		1.4	- Inspect instrument cluster - Inspect related harness
			Other		B+	
2K	Door open/closed	Door switch	Any door is open (any door switch is on)		Below 1.0	- Inspect door switches - Inspect related harness
			All door are closed (door switches are off)		B+	
2L	-	-	-		-	-
2N	-	-	-		-	-
2M	-	-	-		-	-
2O	-	-	-		-	-
2P*2	Theft-deterrent alarm control	Theft-deterrent control module	Ignition switch is at ON position		B+→Below 1.0→B+	- Inspect theft-deterrent control module - Inspect related harness
			Other		B+	
2Q	Lock input	Door lock-link switch	Driver's side door is locked: inspect for continuity to ground		Yes	- Inspect door lock-link switch - Inspect related harness
			Driver's side door is unlocked: inspect for continuity to ground		No	
2R	Unlock input	Door lock-link switch	Driver's side door is locked: inspect for continuity to ground		No	- Inspect door lock-link switch - Inspect related harness
			Driver's side door is unlocked: inspect for continuity to ground		Yes	
2S	Lock/Unlock input	- Door key cylinder switch (driver's side)*1 - Door key cylinder switch (passenger's side)	At the moment of key cylinder is locked		Approx. 2.5	- Inspect key cylinder switch - Inspect related harness
			At the moment of key cylinder is unlocked		Below 1.0	
			Key cylinder at neutral position		Approx. 5	
2T	-	-	-		-	-
2U	-	-	-		-	-
2V	-	-	-		-	-
2W	Signal ground	GND	Under any condition: inspect for continuity to ground		Yes	Inspect GND
2X	-	-	-		-	-

*1 : Vehicles with double locking system

*2 : Vehicles with theft-deterrent system

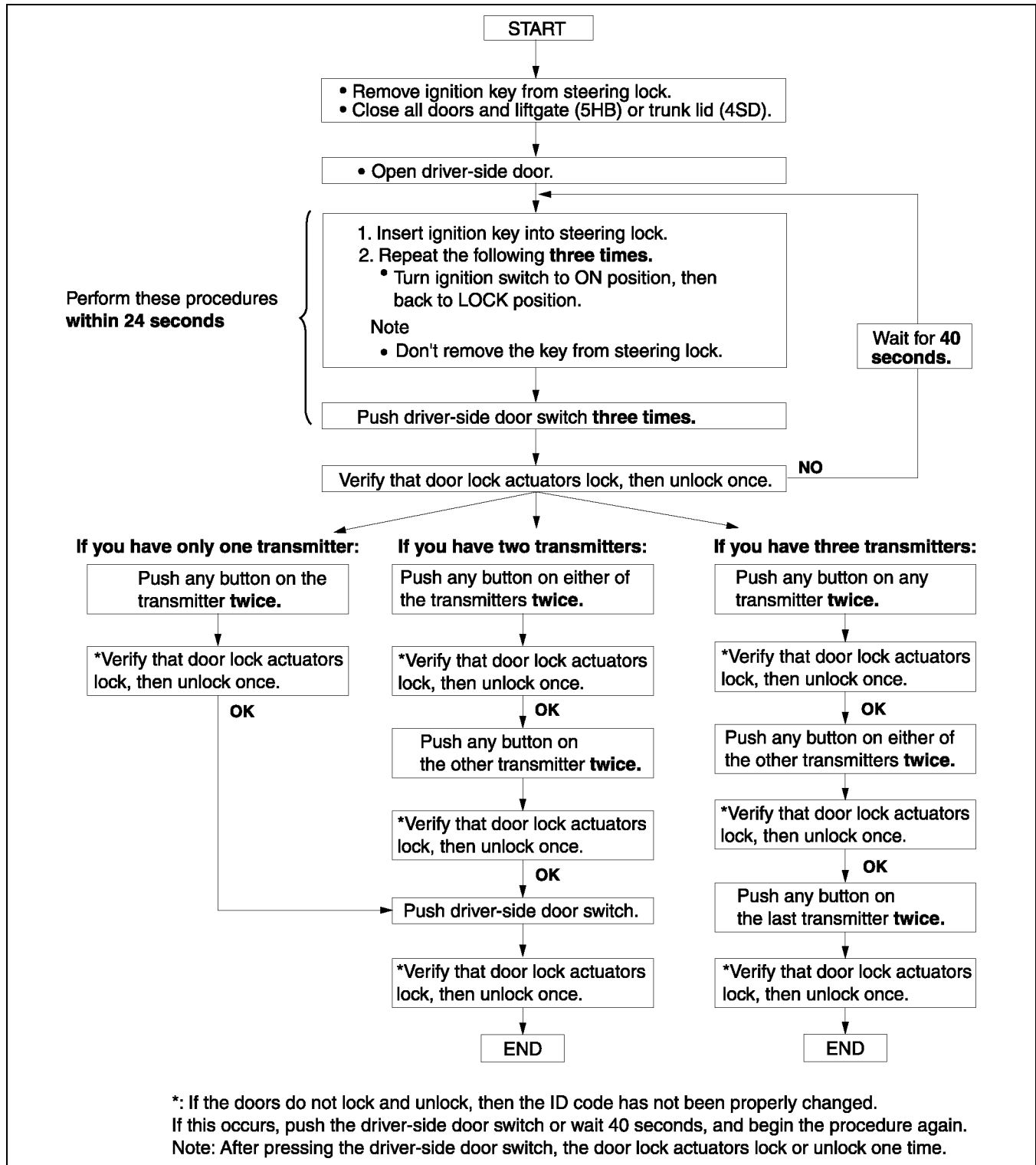
POWER DOOR LOCK SYSTEM

DOOR LOCK TIMER UNIT ID CODE CHANGE

A6E771801097W01

Note

- When programming the ID code into a door lock timer unit, verify that other transmitters are not being operated in the vicinity.

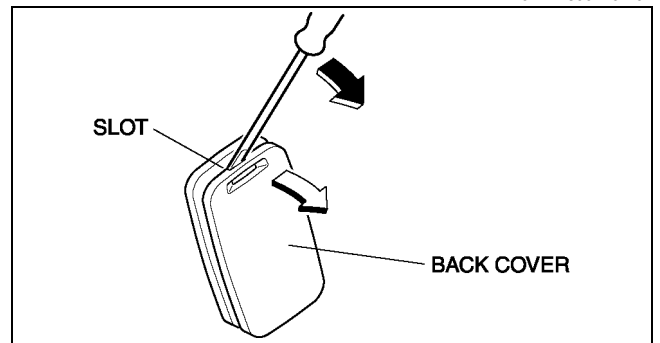


A6E7718W021

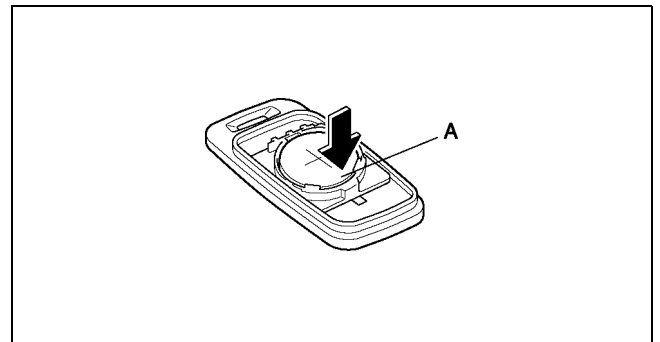
POWER DOOR LOCK SYSTEM

TRANSMITTER BATTERY REPLACEMENT

1. Insert a small screwdriver into the slot and gently pry open the transmitter.



2. Press the portion of the battery indicated by A and remove the battery.
3. Install a new battery (CR2025) into the front portion of the holder with the positive pole (+) facing up. Press on the B portion of the battery to set the battery.

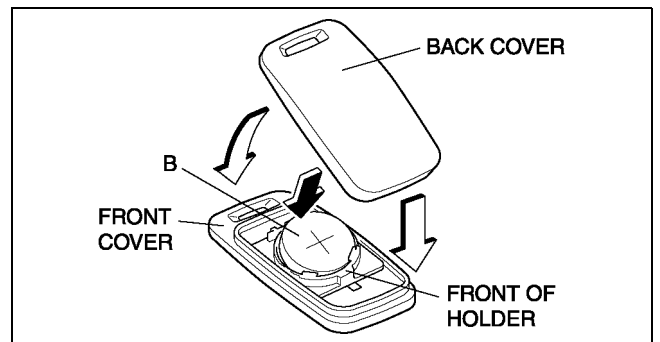


4. Align the front and back covers and snap the transmitter shut.

Battery specification Lithium CR2025 × 1

Note

- The batteries will last about **2 years** when used **10 times** a day.



POWER DOOR LOCK SYSTEM

TRANSMITTER BATTERY INSPECTION

A6E771800110W02

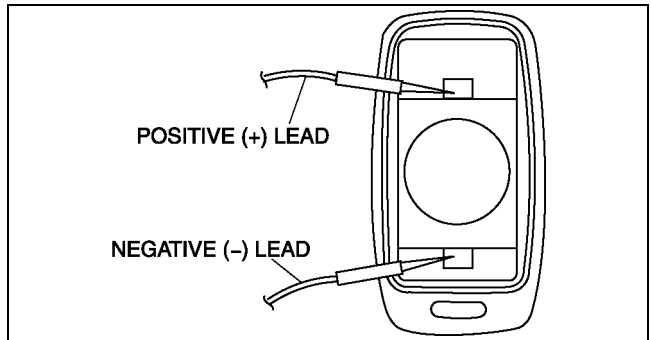
Caution

- Since the battery voltage does not drop fully if the button is pushed for only 4 seconds or less, it can not be properly examined to see whether it is good or bad. Always push the button for 5 seconds.

Note

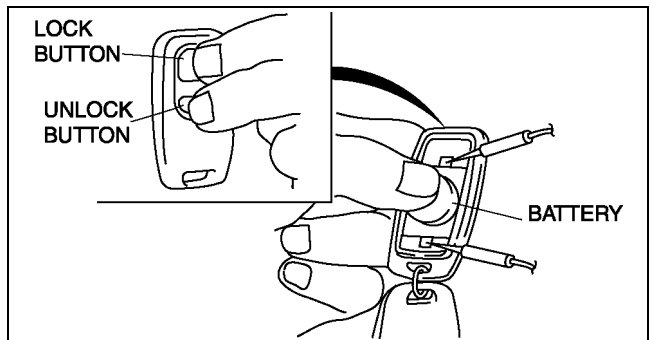
- A correct measurement can not be obtained if the battery temperature is low. Make sure the battery is at **18 °C {64 °F} or more** for **at least 30 minutes** before reinspecting if a measurement value is under the standard voltage.

1. Remove the transmitter cover.
2. Apply the circuit tester leads to the positions as indicated in the figure.



A6E7718W005

3. While pressing the battery as shown in the figure, press the LOCK and UNLOCK buttons on the transmitter at the same time to start measurement of the voltage.
4. Release the buttons after **5 seconds**.
5. Verify that the minimum voltage is the standard voltage or more for **10 seconds** after starting measurement.
 - If the voltage is under the standard voltage, replace the battery.



A6E7718W006

Standard voltage
2.7 V

TRUNK LID

TRUNK LID

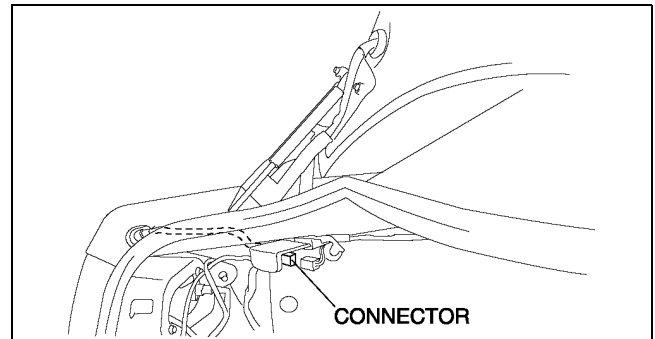
TRUNK LID REMOVAL/INSTALLATION

A6E772052610W01

Warning

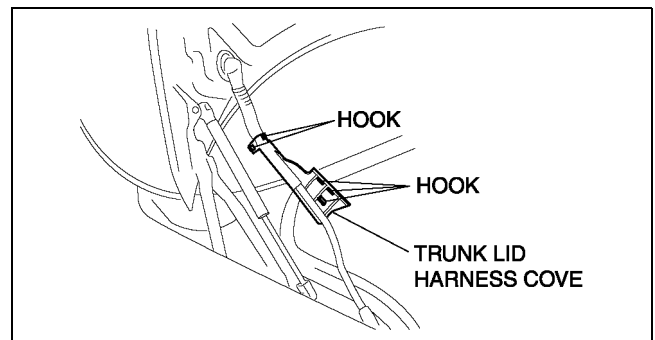
- Removing the stay damper without supporting the trunk lid can be dangerous. The trunk lid may fall and injure you. Open the trunk lid fully and support it before removing the stay damper.

1. Disconnect the negative battery cable.
2. Disconnect the trunk lid harness connector, pull the trunk lid harness out from the cabin.



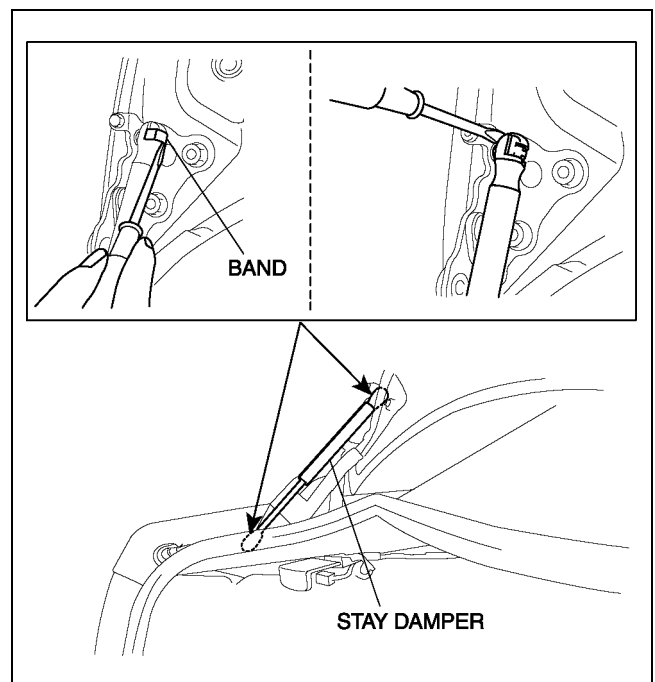
A6E7720W001

3. Disconnect the hooks, which secure the trunk lid harness to the trunk lid hinge.



A6E7720W004

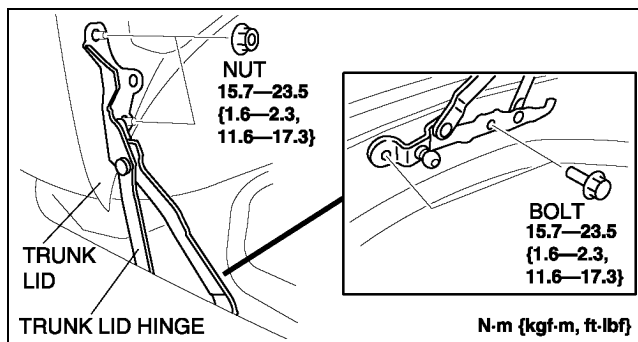
4. Pry away the stay damper's band with a screwdriver.
5. Pry out the connecting part of the stay damper and the hinge with a screwdriver to disconnect them. Then remove the stay damper.



A6E7720W002

TRUNK LID

6. Remove the nuts, then remove the trunk lid.
7. Remove the bolts, then remove the trunk lid hinge.
8. Install in the reverse order of removal.
9. Adjust the trunk lid. (See [S-41 TRUNK LID ADJUSTMENT.](#))

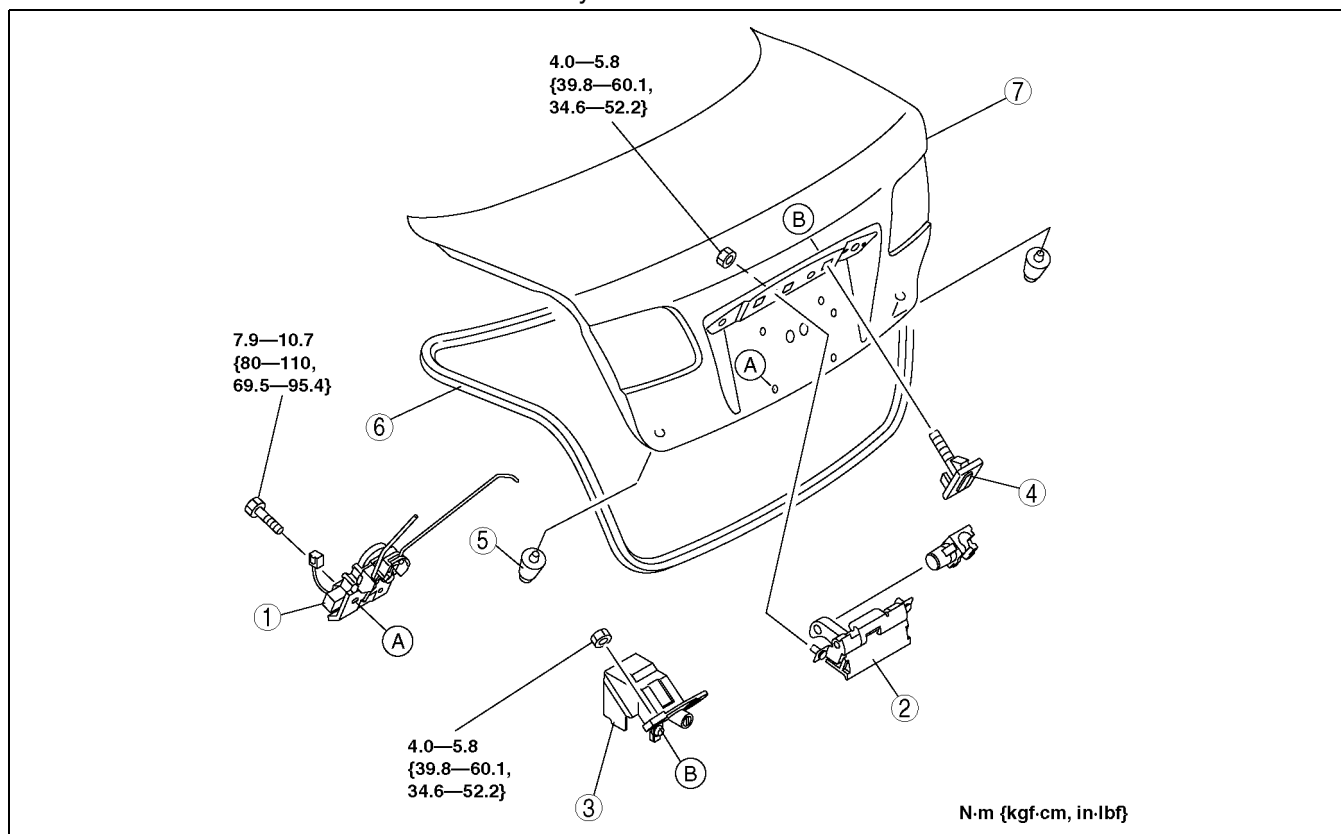


A6E7720W007

TRUNK LID DISASSEMBLY/ASSEMBLY

A6E772052610W02

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim.
3. To remove the trunk lid outer handle and trunk lid key cylinder, remove the rear finisher.
4. Disassemble in the order indicated in the table.
5. Assemble in the reverse order of disassembly.



A6E7720W006

1	Trunk Lid latch and lock actuator
2	Trunk Lid outer handle
3	Trunk Lid key cylinder
4	Clip

5	Stopper
6	Trunk Lid weatherstrip
7	Trunk Lid

TRUNK LID

TRUNK LID ADJUSTMENT

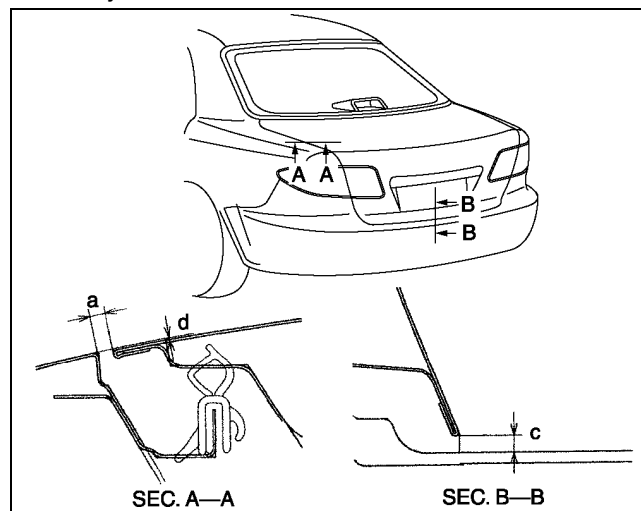
A6E772052610W03

1. Measure the gap and height between the front door and the body.
2. If not as specified, loosen the door hinge installation bolts or the door lock striker installation screws, and reposition the door.

Clearance

- a: 2.5—4.5 mm {0.10—0.18 in}
- b: -1.0—1.0 mm {-0.04—0.04 in}
- c: 4.0—8.0 mm {0.16—0.31 in}

3. Tighten the bolts or screws.



A6E7720W005

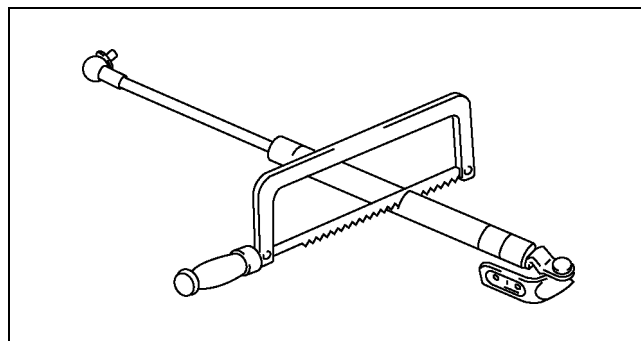
STAY DAMPER DISPOSAL

A6E772052610W04

Note

- The gas in the stay damper is colorless, odorless, and non-toxic.

1. Wear protective eye wear.
2. Lay the stay damper flat.
3. Saw through the stay damper body using a hacksaw.
4. Allow the gas to escape from the stay damper.
5. Discard the stay damper.



A6E7722W006

LIFTGATE

LIFTGATE

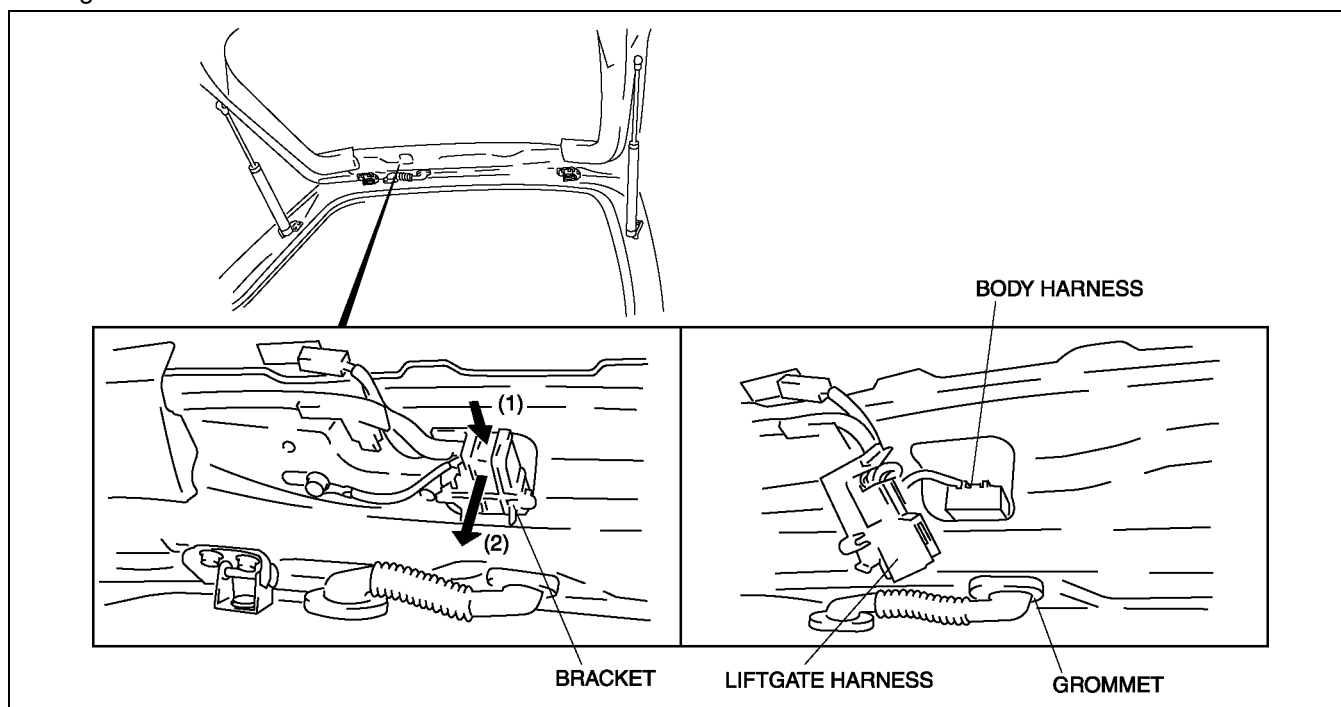
LIFTGATE REMOVAL/INSTALLATION

A6E772262010W01

Warning

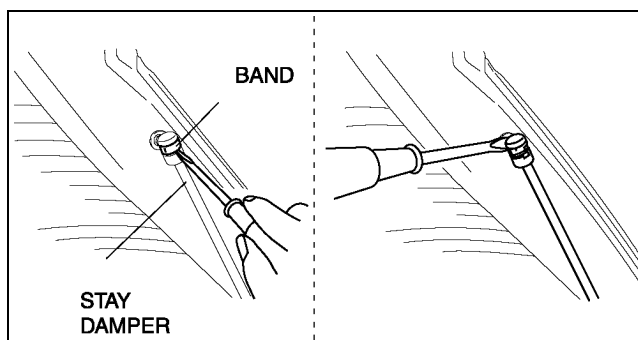
- Removing the stay damper without supporting the liftgate can be dangerous. The liftgate may fall and injure you. Open the liftgate fully and support it before removing the stay damper.

1. Disconnect the negative battery cable.
2. Remove the liftgate lower upper trim.
3. Press the liftgate harness connector's bracket, which is attached to the liftgate, to the (1) direction shown in the figure, and then detach the fit. Then remove the connector toward the (2) direction shown in the figure.
4. Disconnect the vehicle harness connector and the liftgate connector. Then remove the grommet from the liftgate.



A6E7722W003

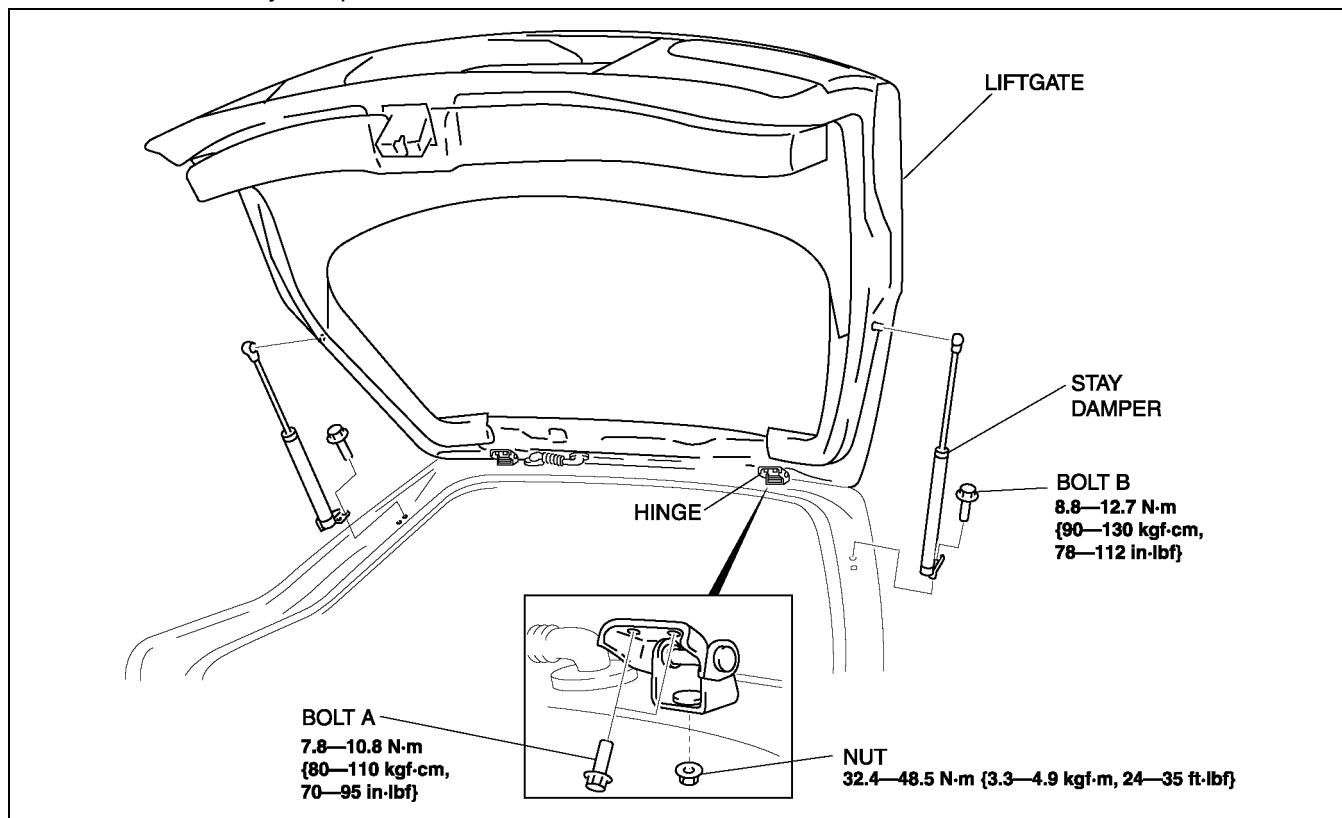
5. Pry away the stay damper's band with a screwdriver.
6. Pry out the connecting part of the stay damper and the hinge with a screwdriver to disconnect them. Then remove the stay damper.
7. Remove the bolts A, then remove the liftgate.
8. To remove the hinge, remove the headliner and the nut.



A6E7722W005

LIFTGATE

9. To remove the stay damper, remove the bolt B.



A6E7722W001

10. Install in the reverse order of removal.

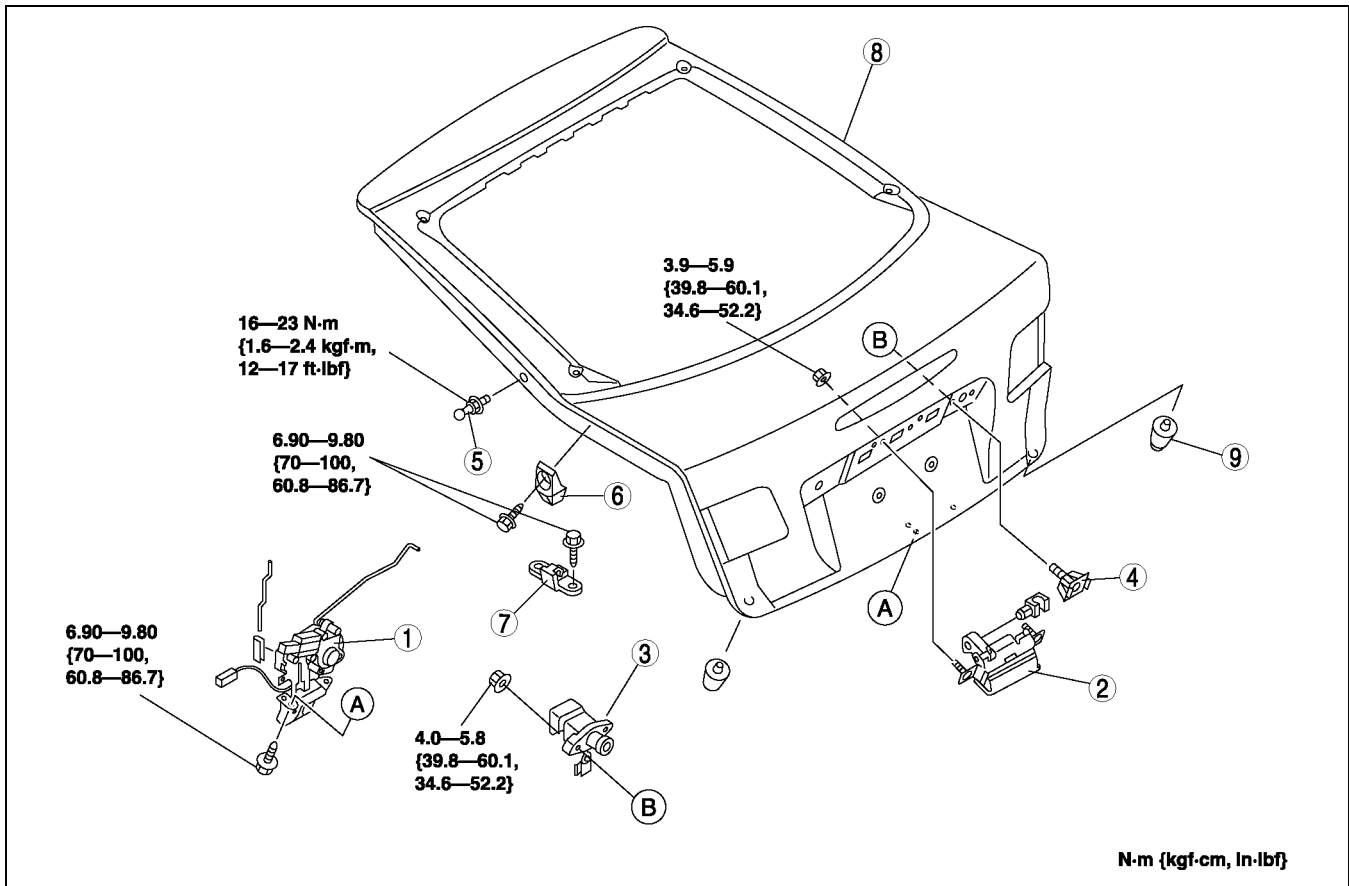
S

LIFTGATE

LIFTGATE DISASSEMBLY/ASSEMBLY

A6E772262010W02

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim.
3. To remove the liftgate outer handle and liftgate key cylinder, remove the rear finisher.
4. To remove the stud ball, separate the stud ball and the stay damper.
5. Disassemble in the order indicated in the table.
6. Assemble in the reverse order of disassembly.



A6E7722W007

1	Liftgate latch and lock actuator
2	Liftgate outer handle
3	Liftgate key cylinder
4	Clip
5	Stud ball

6	Liftgate wedge
7	Liftgate dovetail
8	Liftgate
9	Stopper

STAY DAMPER DISPOSAL

A6E7722620W01

1. Referring to procedures for trunk lid stay damper disposal, dispose of the liftgate stay damper.

LIFTGATE

LIFTGATE ADJUSTMENT

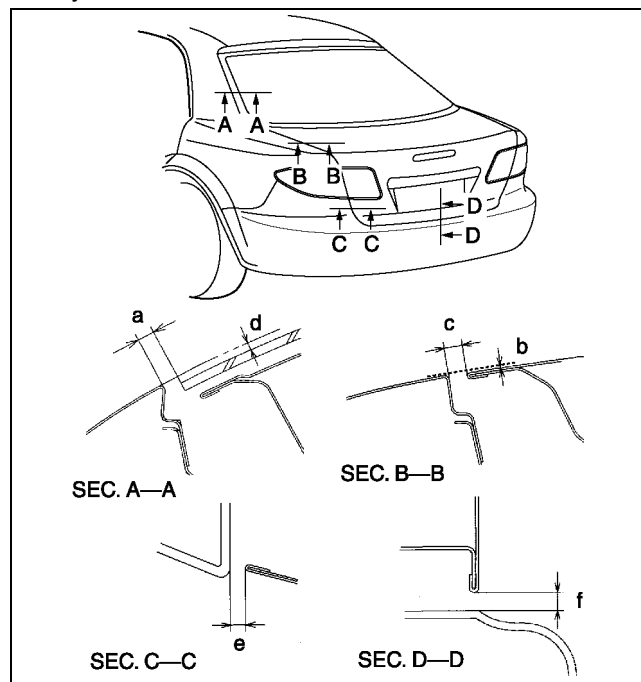
A6E772262010W03

1. Measure the gap and height between the liftgate and the body.
2. If not as specified, loosen the liftgate hinge installation bolts or the liftgate striker installation screws, and reposition the liftgate.

Clearance

- a: 3.0—7.0 mm {0.12—0.28 in}
- b: -1.0—3.4 mm {-0.04—0.13 in}
- c: 2.8—5.2 mm {0.11—0.24 in}
- d: -1.2—1.2 mm {0.05—0.05 in}
- e: 2.8—5.8 mm {0.11—0.22 in}
- f: 4.0—8.0 mm {0.16—0.31 in}

3. Tighten the bolts or screws.



A6E7722W004

FUEL-FILLER LID AND OPENER

FUEL-FILLER LID AND OPENER

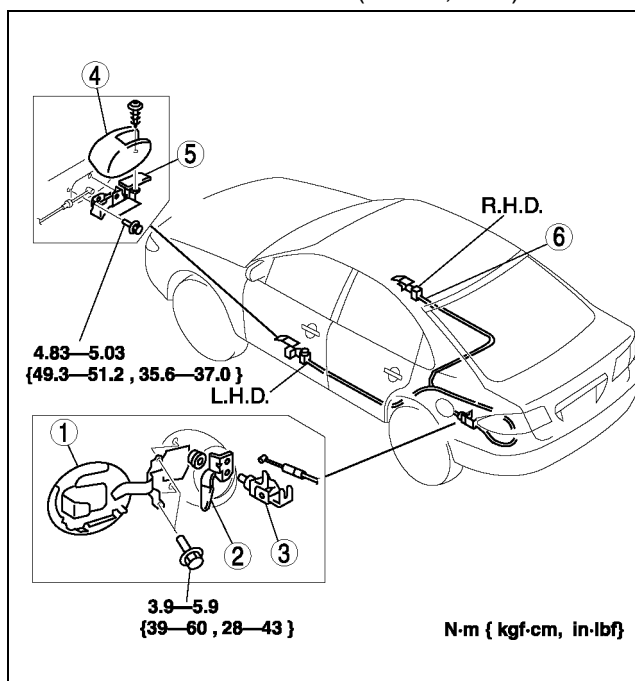
FUEL-FILLER LID AND OPENER REMOVAL/INSTALLATION

A6E772456890W01

- To remove the fuel-filler lid opener, remove the left side trunk side trim (4SD) or trunk side lower trim (5HB).
- To remove the fuel-filler lid opener cable, perform the following and turn over the floor covering.
 - Remove the driver-side front seat.
 - Remove the driver-side front scuff plate.
 - Remove the driver-side rear scuff plate.
 - Remove the driver-side B-pillar lower trim.
 - Remove the driver-side tire house trim.
 - Remove the rear seat cushion. (R.H.D., 4SD)
 - Remove the rear seat installation bolts (front side), then lift the rear seat cushion. (R.H.D., 5HB)
- Remove in the order indicated in the table.

1	Fuel-filler lid
2	Lift spring
3	Fuel-filler lid opener
4	Cover
5	Fuel-filler lid opener lever
6	Fuel-filler lid opener cable

- Install in the reverse order of removal.
- Adjust the fuel-filler lid. (See [S-46 FUEL-FILLER LID ADJUSTMENT](#).)



A6E7724W001

FUEL-FILLER LID ADJUSTMENT

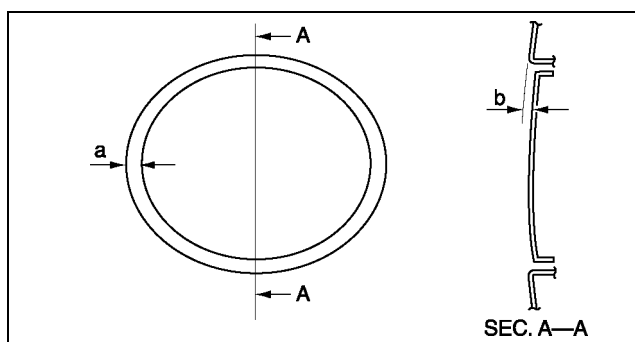
A6E772442410W01

- If not as specified, loosen the fuel-filler lid installation bolts, and reposition the fuel-filler lid.
- Measure the gap and height between the fuel-filler lid and the body.

Clearance

- a: 1.7—3.7 mm {0.067—0.145 in}
b: -0.5—1.5 mm {-0.019—0.059 in}

- Tighten the bolts.



A6E7724W002

BUMPER

BUMPER

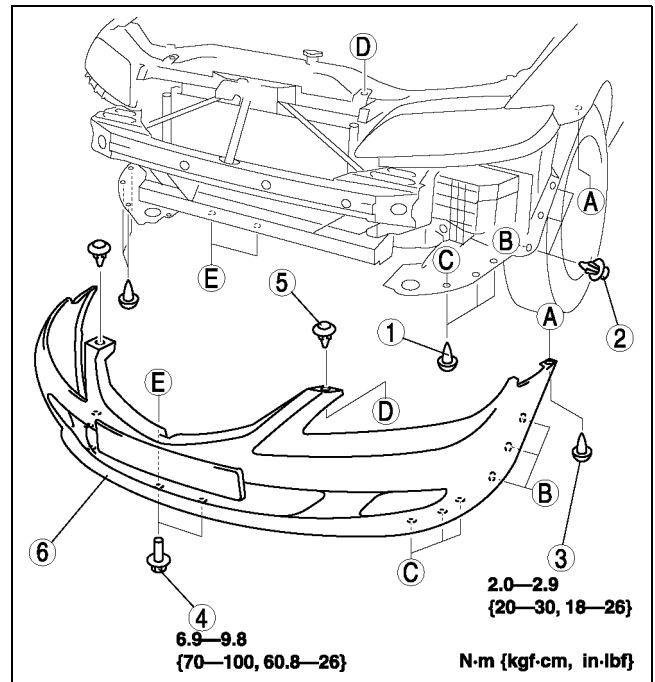
FRONT BUMPER REMOVAL/INSTALLATION

A6E772650031W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Screw A
2	Fastener A
3	Screw B
4	Bolt
5	Fastener B
6	Front bumper (See S-47 Front Bumper Removal Note) (See S-48 Front Bumper Installation Note)

3. Install in the reverse order of removal.



A6E7726W003

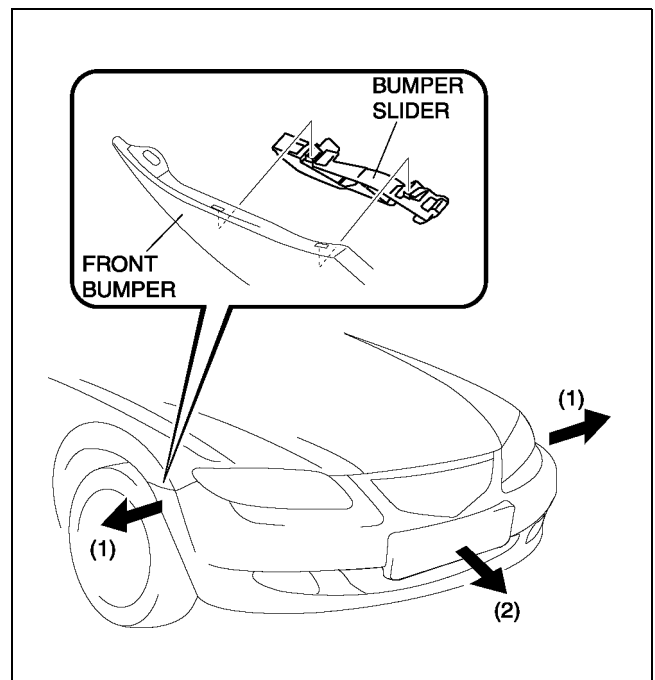
Front Bumper Removal Note

1. Pull the front bumper ends (wheel arch) outward to disengage from the bumper slider.

Caution

- If only one side of the front bumper is disengaged from the bumper slider and the bumper falls, it could be damaged. When disengaging the front bumper from the slider, secure the bumper so that it does not fall.

2. Remove the front bumper from the body.



A6E7726W006

BUMPER

Front Bumper Installation Note

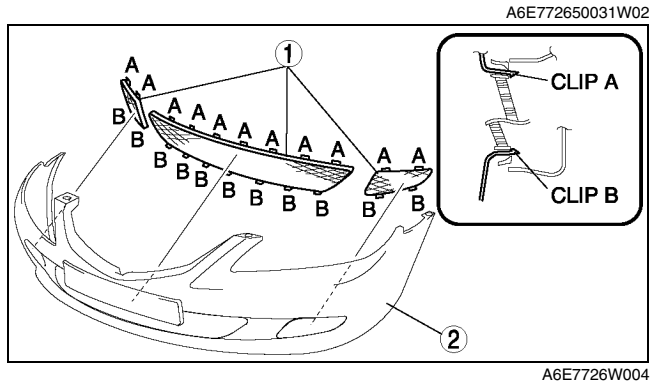
1. Spread the front bumper ends (wheel arches) apart.
2. Attach the front bumper to the body.
3. Press the front bumper connection portion into the body to engage with the bumper slider.

FRONT BUMPER DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

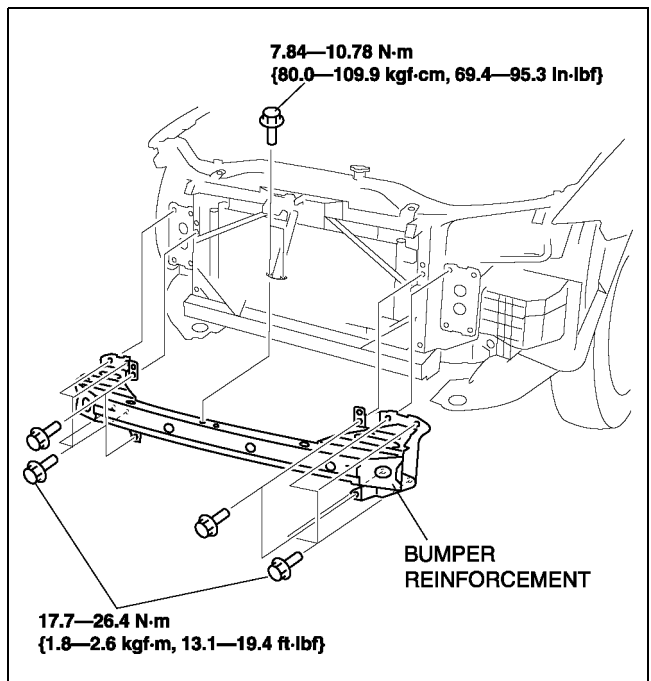
1	Front bumper mesh
2	Front bumper fascia

2. Assemble in the reverse order of disassembly.



BUMPER REINFORCEMENT REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See [S-47 FRONT BUMPER REMOVAL/INSTALLATION.](#))
3. Remove the headlight. (See [T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.](#))
4. Support the radiator and the condenser using the wire.
5. Remove the bolt.
6. Remove the bumper reinforcement.
7. Install in the reverse order of removal.



BUMPER

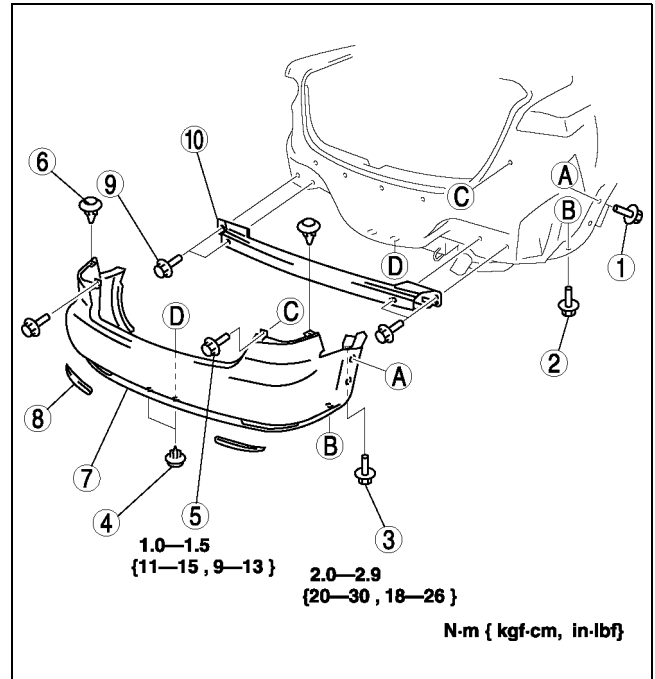
REAR BUMPER REMOVAL/INSTALLATION

A6E772650221W01

1. Disconnect the negative battery cable.
2. Remove the rear combination light.
3. Remove in the order indicated in the table.

1	Screw A
2	Screw B
3	Screw C
4	Fastener A
5	Bolt A
6	Fastener B
7	Rear bumper (See S-49 Rear Bumper Removal Note) (See S-49 Rear Bumper Installation Note)
8	Refractor (See S-50 Refractor Removal Note)
9	Bolt B
10	Rear bumper reinforcement

4. Install in the reverse order of removal.



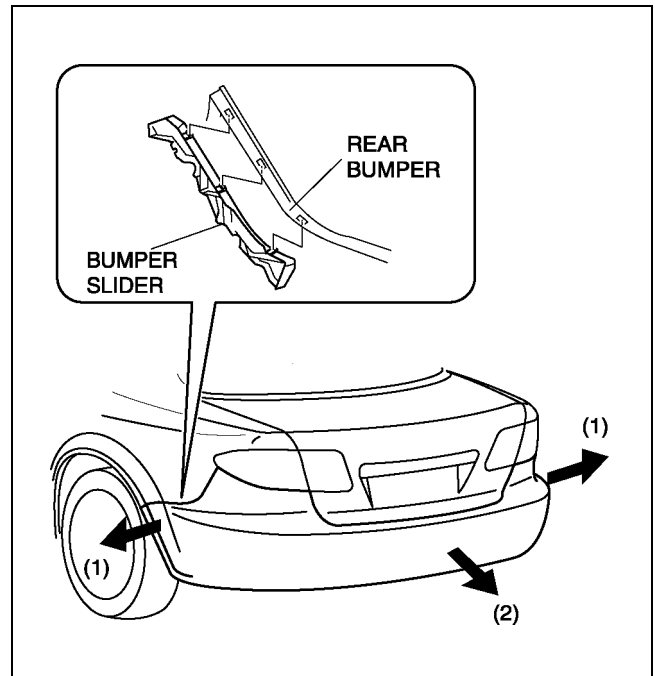
A6E7726W001

Rear Bumper Removal Note

1. Pull the rear bumper ends (wheel arch) outward to disengage with the bumper slider.

Caution

- If only one side of the rear bumper is disengaged from the bumper slider and the bumper falls, it could be damaged. When disengaging the rear bumper from the slider, secure the bumper so that it does not fall.



A6E7726W007

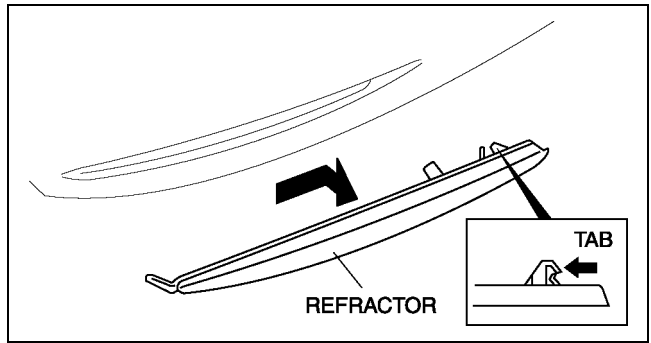
Rear Bumper Installation Note

1. Spread the rear bumper ends (wheel arches) apart.
2. Attach the rear bumper to the body.
3. Press the rear bumper connection portion into the body to engage with the bumper slider.

BUMPER, EXTERIOR ATTACHMENT

Refractor Removal Note

1. Lift the refractor up in the direction of the arrow, then unhook it from the rear bumper.



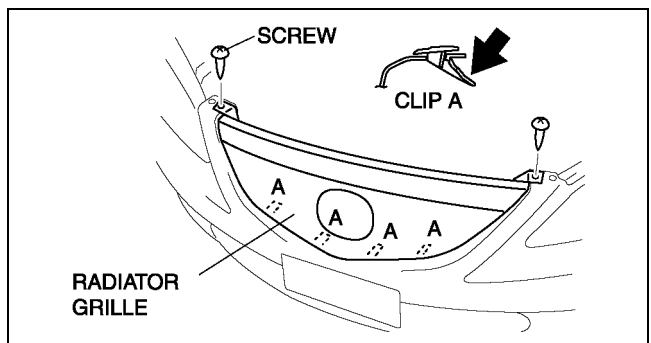
A6E7726W002

EXTERIOR ATTACHMENT

RADIATOR GRILLE REMOVAL/INSTALLATION

A6E772850710W01

1. Remove the screws.
2. Press clip A in the direction of the arrow, pull the radiator grille outward and remove from the front bumper.
3. Install in the reverse order of removal.



A6E7728W005

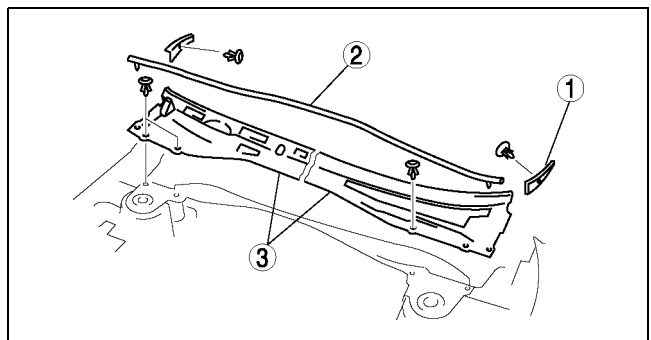
COWL GRILLE REMOVAL/INSTALLATION

A6E772850790W01

1. Remove the windshield wiper arm and blade. (See [T-57 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
2. Remove in the order indicated in the table.

1	Front fender molding
2	Weatherstrip
3	Cowl grille

3. Install in the reverse order of removal.



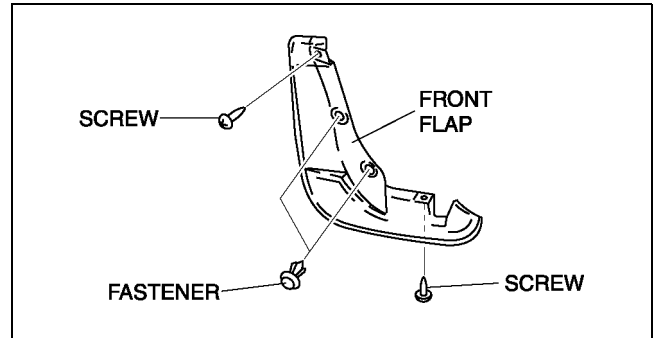
A6E7728W004

EXTERIOR ATTACHMENT

FRONT FLAP REMOVAL/INSTALLATION

A6E772851840W01

1. Remove the screws and fastener.
2. Remove the front flap.
3. Install in the reverse order of removal.

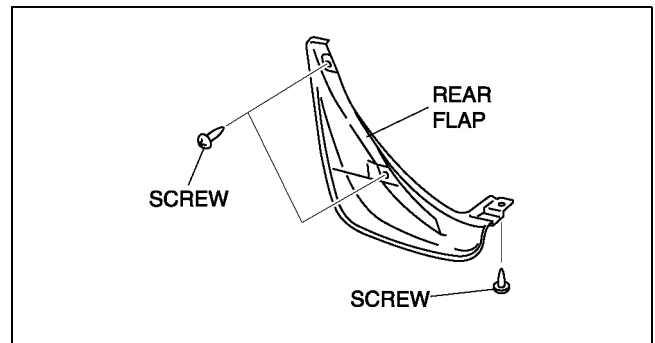


A6E7728W011

REAR FLAP REMOVAL/INSTALLATION

A6E772851940W01

1. Remove the screws.
2. Remove the rear flap.
3. Install in the reverse order of removal.



A6E7728W012

REAR DOOR GARNISH REMOVAL

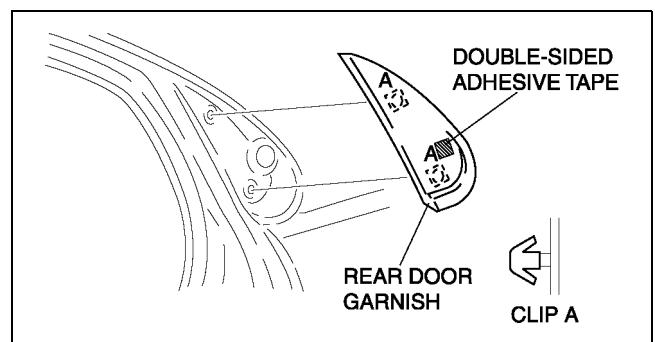
A6E772850030W01

1. Disengage the door garnish clips using a fastener remover.
2. While cutting the double-sided adhesive tape using a screwdriver or a razor, separate the rear door garnish from the body.

Warning

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

3. Remove the rear door garnish.



A6E7728W009

EXTERIOR ATTACHMENT

REAR DOOR GARNISH INSTALLATION

A6E772850030W02

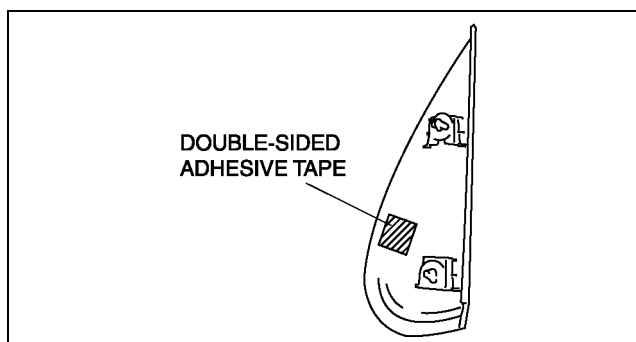
Note

- Double-sided adhesive tape has already been attached to the new rear door garnish.

Warning

- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

1. When installing a new rear door garnish, follow the procedure below:
 - (1) Remove the adhesive remaining on the body using razor.
 - (2) Remove any grease or dirt from the adhesion surface of the body.
2. When reusing the rear door garnish, follow the procedure below:
 - (1) Remove the adhesive remaining on the rear door garnish and the body using a razor.
 - (2) Remove any grease or dirt from the adhesion surface of the rear door garnish and the body.
 - (3) Apply primer to the bonding area of the rear door garnish.
 - (4) Attach double-sided adhesive tape to the rear door garnish as shown.
3. Peel off the backing of the double-sided adhesive tape, then install the rear door garnish to the body.



A6E7728W010

SIDE PROTECTOR REMOVAL

A6E772850680W01

1. Pry the side protector end **20—30 mm {0.8—1.1 in}** using a flathead screwdriver or a razor.

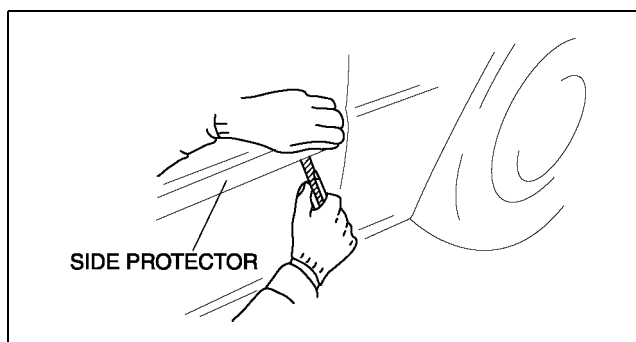
Warning

- **Using a razor with bare hands can cause injury. Always wear gloves when using a razor.**

Note

- The side protector is installed with double-sided adhesive tape. If the side protector is difficult to remove, soften the double-sided adhesive tape using a hot air blower.

2. Pull the side protector toward you, then remove it.



A6E7728W006

EXTERIOR ATTACHMENT

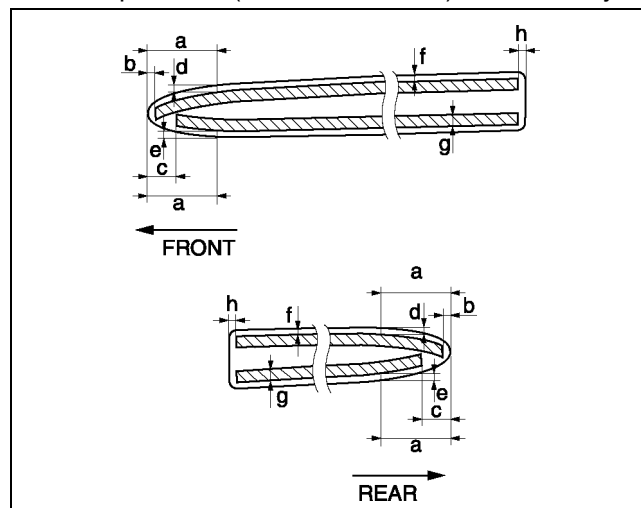
SIDE PROTECTOR INSTALLATION

A6E772850680W02

1. Remove the adhesive remaining on the side protector (if it will be reused) and the body using a razor.
2. Remove any grease or dirt from the adhesion surface of the side protector (if it will be reused) and the body.
3. Attach double-sided adhesive tape to the side protector as shown (if it will be reused).

Clearance

- a: 30.0 mm {1.18 in}
- b: 3.0 mm {0.11 in}
- c: 12.0 mm {0.47 in}
- d: 3.0 mm {0.11 in}
- e: 3.0 mm {0.11 in}
- f: 1.0—3.0 mm {0.04—0.11 in}
- g: 5.0 mm {0.19 in}
- h: 2.0 mm {0.07 in}

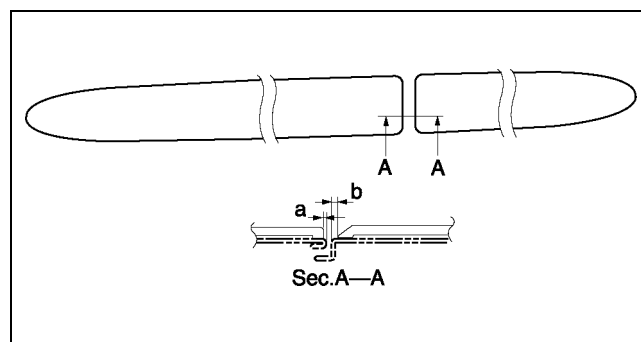


A6E7728W007

4. Peel off the backing paper from the double-sided adhesive tape and attach the side protector onto the body as shown.

Clearance

- a: 1.2—4.2 mm {0.05—0.16 in}
- b: 3.2—6.2 mm {0.13—0.24 in}

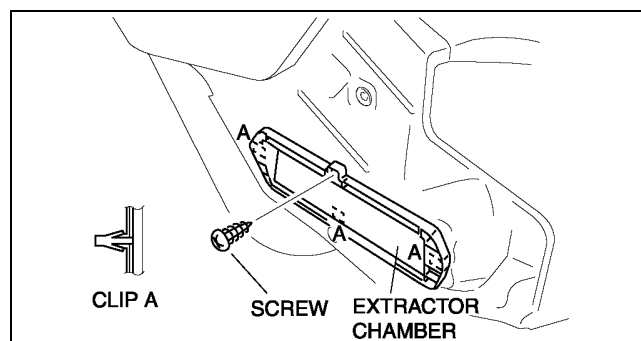


A6E7728W008

EXTRACTOR CHAMBER REMOVAL/INSTALLATION

A6E772851920W01

1. Remove the rear bumper. (See [S-49 REAR BUMPER REMOVAL/INSTALLATION.](#))
2. Remove the left side trunk side trim.
3. Remove the screw.
4. Squeeze the clips with your fingers and remove the extractor chamber from the vehicle side.
5. Install in the reverse order of removal.



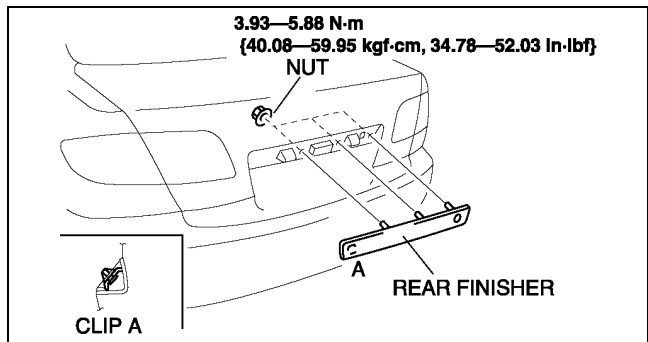
A6E7728W001

EXTERIOR ATTACHMENT

REAR FINISHER REMOVAL/INSTALLATION

A6E772850850W01

1. Remove the trunk lid trim (4SD).
2. Remove the liftgate lower trim (5HB).
3. Remove the nuts.
4. Pull the rear finisher toward you, then disengage clip A from the body.
5. Install in the reverse order of removal.

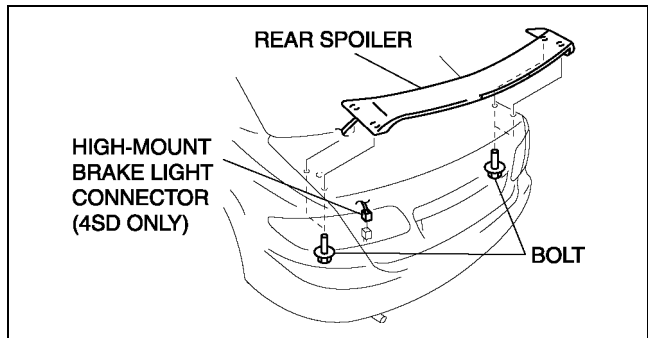


A6E7728W002

REAR SPOILER REMOVAL/INSTALLATION

A6E772851920W02

1. Remove the trunk lid trim. (4SD)
2. Remove the liftgate lower trim. (5HB)
3. Remove the bolts.
4. Disconnect the high-mount brake light connector. (4SD)
5. Remove the rear spoiler.
6. Install in the reverse order of removal.

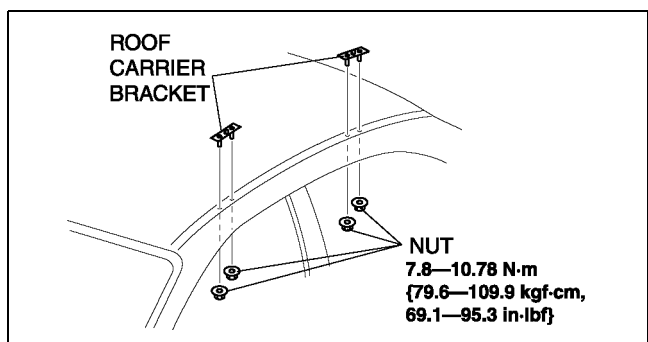


A6E7728W003

ROOF CARRIER BRACKET REMOVAL/INSTALLATION

A6E772870600W01

1. Remove the headliner.
2. Remove the nuts.
3. Remove the roof carrier bracket.
4. Install in the reverse order of removal.



A6E7728W013

MOLDING

MOLDING

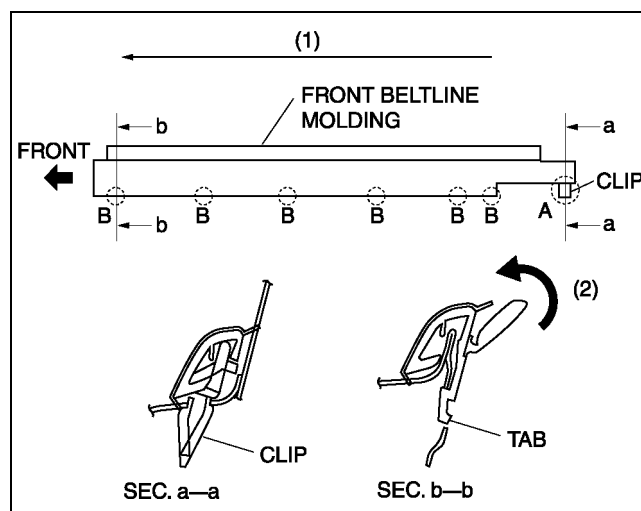
FRONT BELTLINE MOLDING REMOVAL

A6E773050640W01

Note

- When removing the front beltline molding, the clip may be damaged. If the clip is damaged, replace it with a new one.

- Pull the A section upward and remove the clip.
- Rotate the B section of the front beltline molding in direction (2), along the direction (1) shown in the figure and remove it from the body.



A6E7730W001

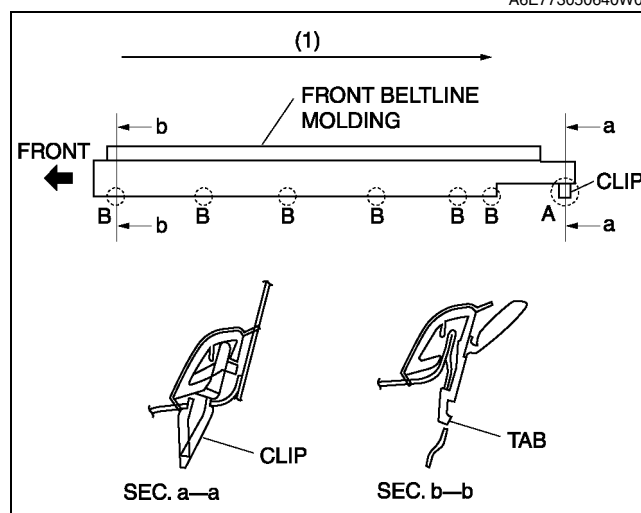
FRONT BELTLINE MOLDING INSTALLATION

A6E773050640W02

- Press the clip into the body.
- Press in the B section of the front beltline molding along the direction (1) shown in the figure to attach it to the body.

Note

- If the front beltline molding is difficult to attach, apply soapy water.



A6E7730W003

S

MOLDING

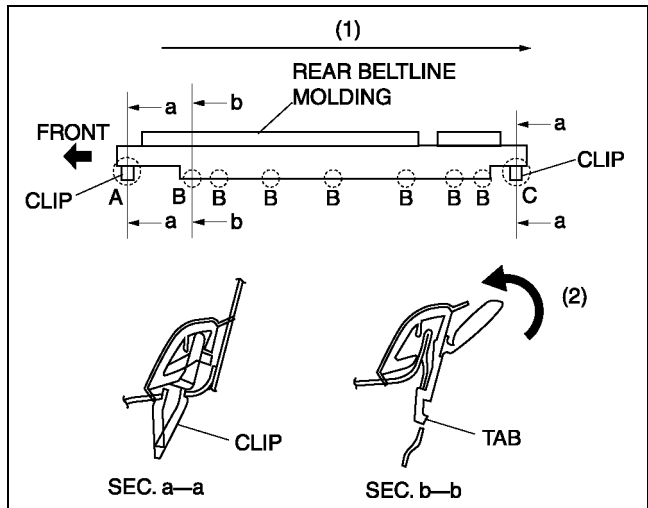
REAR BELTLINE MOLDING REMOVAL

A6E773050660W01

Note

- When removing the rear beltline molding, the clip may be damaged. If the clip is damaged, replace it with a new one.

1. Pull the A section upward and remove the clip.
2. Rotate the B section of the front beltline molding in direction (2), along the direction (1) shown in the figure and remove it from the body.
3. Pull the C section upward and remove the clip. Then remove the front beltline molding.



A6E7730W004

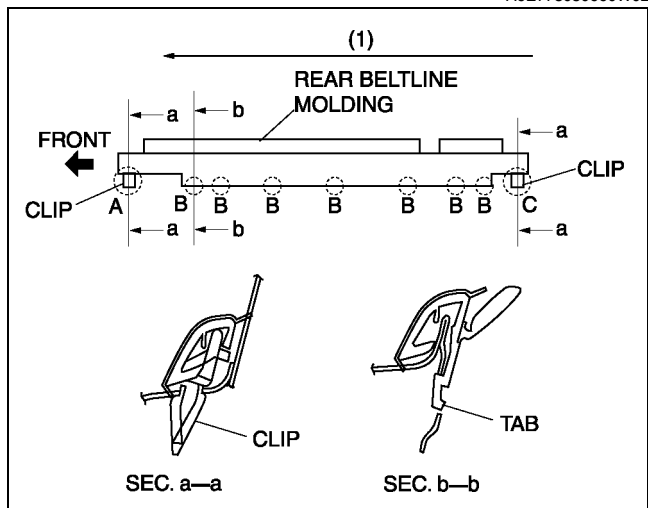
REAR BELTLINE MOLDING INSTALLATION

A6E773050660W02

1. Press the clip at the C section into the body.
2. Press in the B section of the rear beltline molding along the direction (1) to attach it to the body.
3. Press the clip at the A section in and attach the rear beltline molding.

Note

- If the rear beltline molding is difficult to attach, apply soapy water.

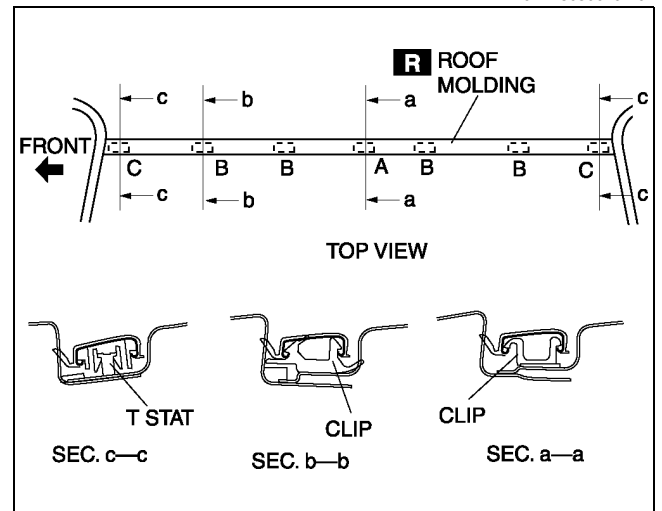


A6E7730W005

MOLDING

ROOF MOLDING REMOVAL

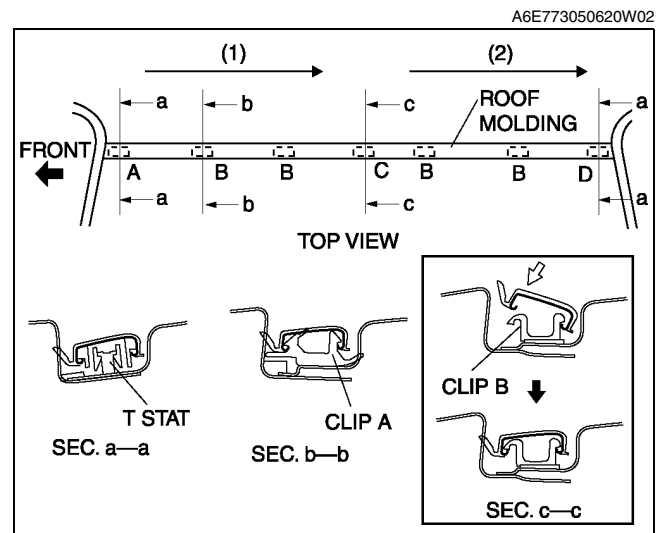
1. Detach the clips which secure A and B sections of roof molding, using a screwdriver or equivalent tool.
2. While pulling the roof molding up, detach the fit for the T stat of the A section and the roof molding and then remove the roof molding.



A6E7730W007

ROOF MOLDING INSTALLATION

1. Attach the roof molding to the T stud at the A section.
2. Press in the roof molding along the direction (1) shown in the figure and attach it to the clip A at the B section.
3. Hook the roof molding to the clip B at the C section, press it in, and attach the roof molding to the clip B.
4. Press the roof molding along the direction (2) shown in the figure and attach it to the clip A at the B section.
5. Attach the roof molding to the T stud at the D section.



A6E7730W006

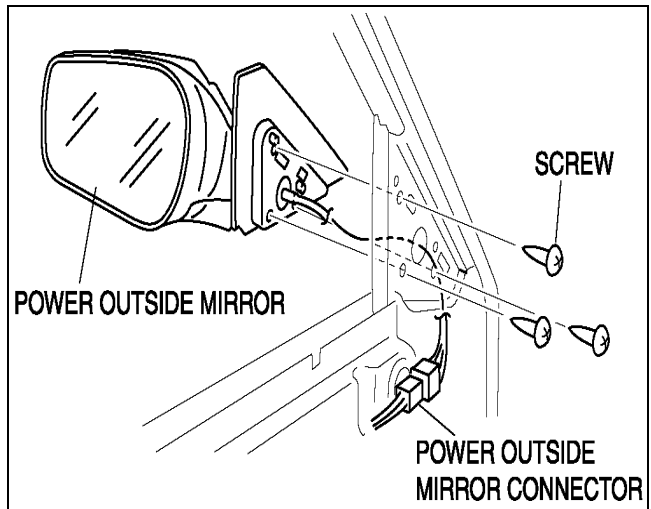
OUTSIDE MIRROR

OUTSIDE MIRROR

POWER OUTSIDE MIRROR REMOVAL/INSTALLATION

A6E773269110W01

1. Disconnect the negative battery cable.
2. Remove the inner garnish.
3. Remove the front door trim.
4. Disconnect the power outside mirror connector.
5. Remove the screws and the mirror retention clips.
6. Remove the power outside mirror.
7. Install in the reverse order of removal.



A6E7732W006

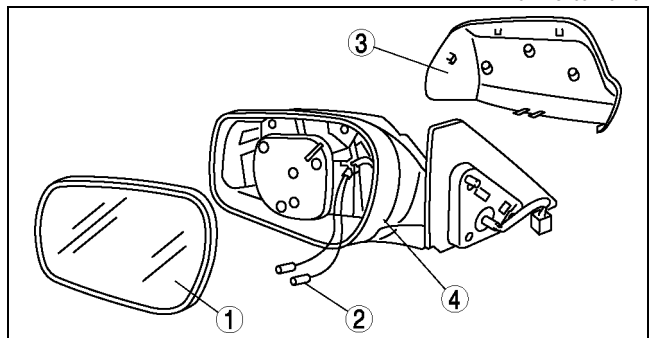
POWER OUTSIDE MIRROR DISASSEMBLY/ASSEMBLY

A6E773269110W02

1. Disassemble in the order indicated in the table.

1	Outside mirror glass (See S-58 Outside Mirror Glass Disassembly Note) (See S-59 Outside Mirror Glass Assembly Note)
2	Connector (with heated outside mirror)
3	Cover (See S-59 Cover Disassembly Note)
4	Outside mirror holder

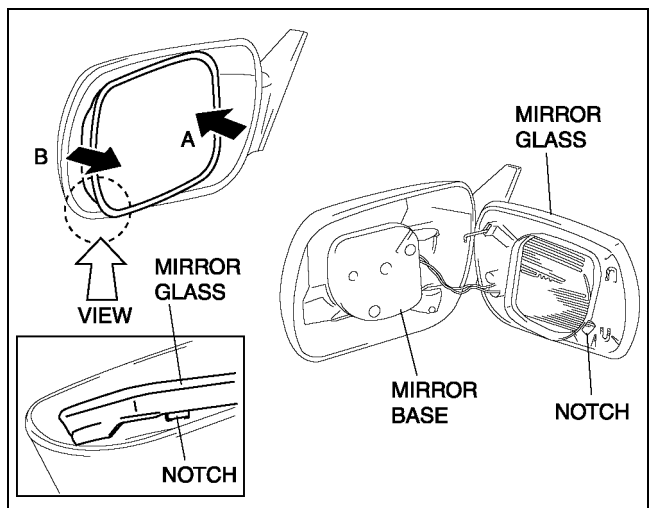
2. Assemble in the reverse order of disassembly.



A6E7732W002

Outside Mirror Glass Disassembly Note

1. Press area A of the glass so that area B moves toward you.
2. Insert a screwdriver into the notch and remove the glass from the mirror base.

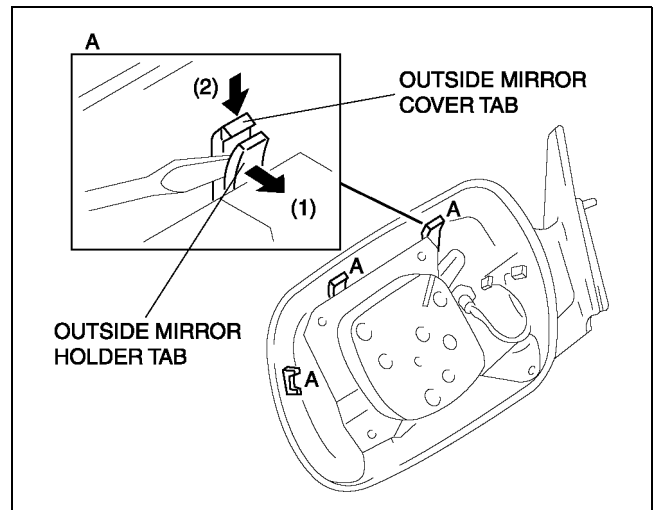


A6E7732W003

OUTSIDE MIRROR

Cover Disassembly Note

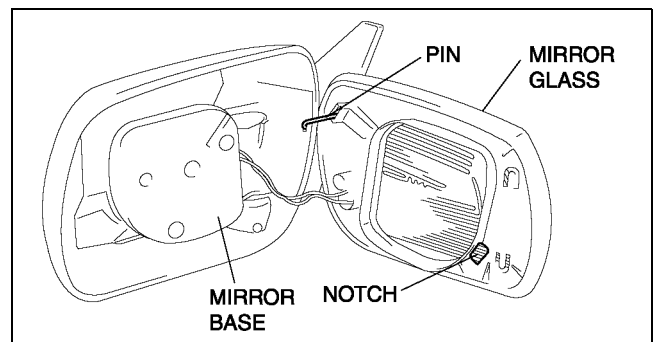
1. Pull off the mirror holder tab with a screwdriver and press the mirror cover tab downward.



A6E7732W004

Outside Mirror Glass Assembly Note

1. Press the mirror into the base so that the pin does not dislodge.

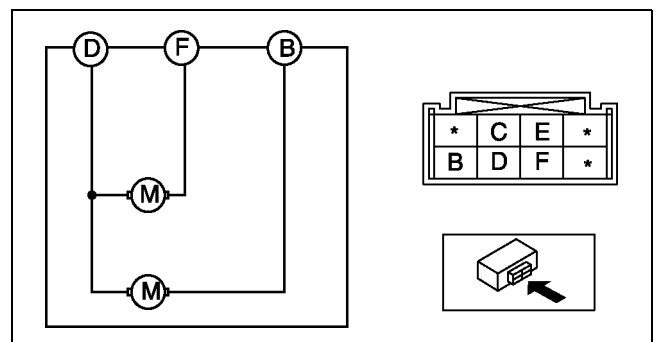


A6E7732W005

POWER OUTSIDE MIRROR INSPECTION

1. Disconnect the power outside mirror connector.
2. Apply battery positive voltage to the power outside mirror terminals and inspect the operation of the power outside mirror.
 - If not as specified, replace the power outside mirror.

Mirror operation	Terminal	
	B+	GND
Up	B	D
Down	D	B
Left	F	D
Right	D	F



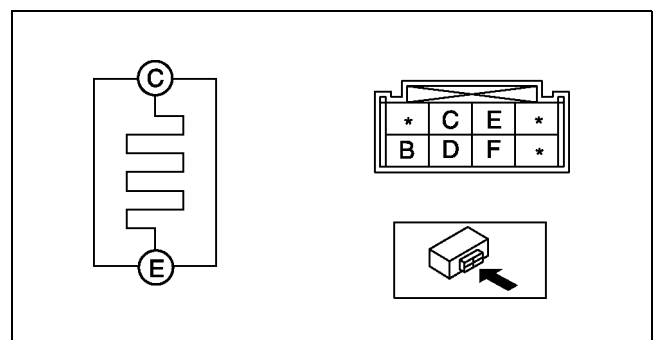
A6E7732W007

3. Inspect for continuity between the power outside mirror heater terminals.
 - If not as specified, replace the power outside mirror.

○—○ : Continuity

Mirror operation	Terminal	
	C	E
Heater	○	○

A6E7732W010



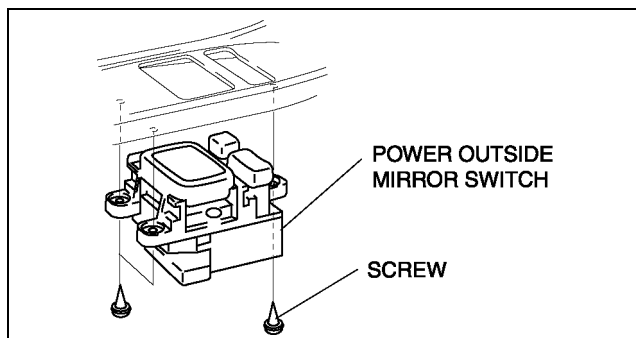
A6E7732W009

OUTSIDE MIRROR

POWER OUTSIDE MIRROR SWITCH REMOVAL/INSTALLATION

A6E77326600W01

1. Disconnect the negative battery cable.
2. Remove the front door trim.
3. Remove the screws and the power outside mirror switch.
4. Install in the reverse order of removal.



A6E7732W008

POWER OUTSIDE MIRROR SWITCH INSPECTION

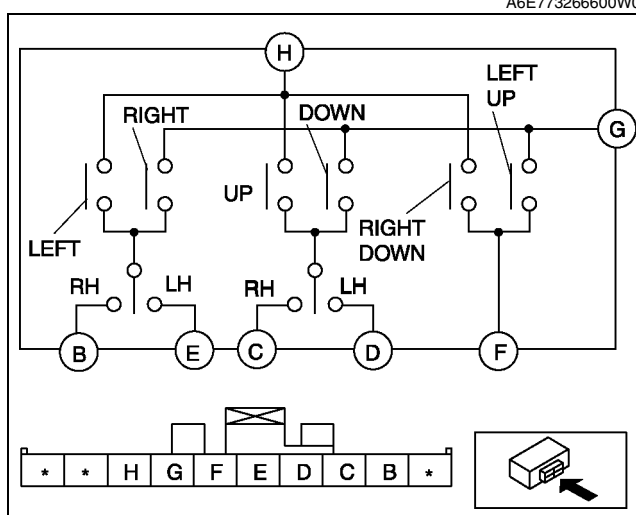
A6E77326600W02

1. Inspect for continuity between the power outside mirror switch terminals using an ohmmeter.
 - If not as specified, replace the power outside mirror switch.

○—○ : Continuity

OPERATION		D	C	E	B	H	G	F
LH	UP	○		○	○	○	○	○
	DOWN	○		○	○	○	○	○
	LEFT	○	○	○	○	○	○	○
	RIGHT	○	○	○	○	○	○	○
RH	UP		○	○	○	○	○	○
	DOWN		○	○	○	○	○	○
	LEFT	○	○	○	○	○	○	○
	RIGHT	○	○	○	○	○	○	○

A6E7734W003



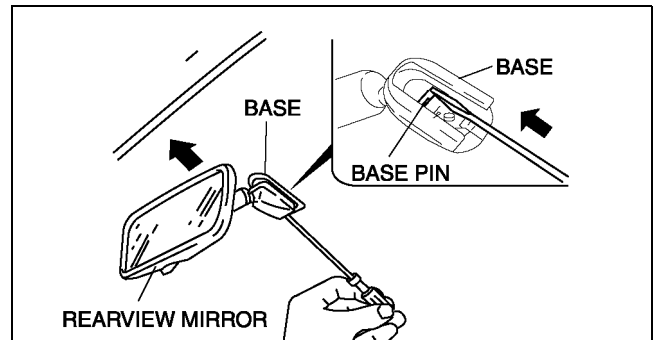
A6E7732W001

REARVIEW MIRROR

REARVIEW MIRROR

REARVIEW MIRROR REMOVAL

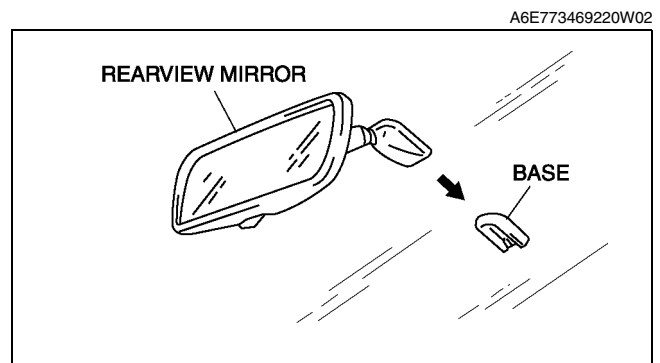
1. Insert a screwdriver between the mirror and the base.
2. Push the base pin down to remove the rearview mirror.



A6E7734W001

REARVIEW MIRROR INSTALLATION

1. Install the rearview mirror onto the base.



A6E7734W002

BASE REMOVAL

1. Remove the rearview mirror.
2. Wind each end of a wire around a bar.

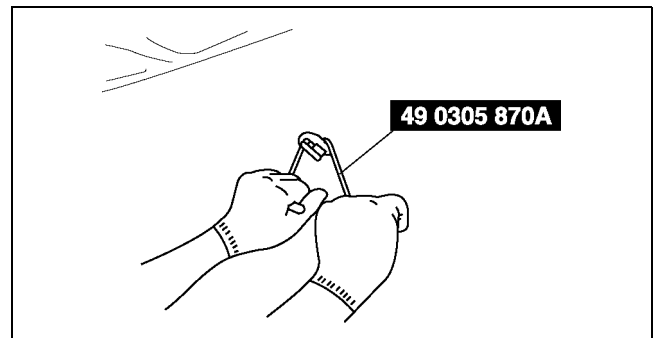
Warning

- Using a SST (piano wire) with bare hands can cause injury. Always wear gloves when using a SST (piano wire).

Note

- Use a long sawing action to spread the work over the whole length of the SST (piano wire) to prevent it from breaking.

3. Saw through the sealant to remove the base.



A6E7734W006

REARVIEW MIRROR

BASE INSTALLATION

A6E773469240W02

1. Cut away all of the original sealant using a razor.
2. Clean and degrease the ceramic coating on the glass and the base.
3. Apply primer to the bonding area of the glass and the base.

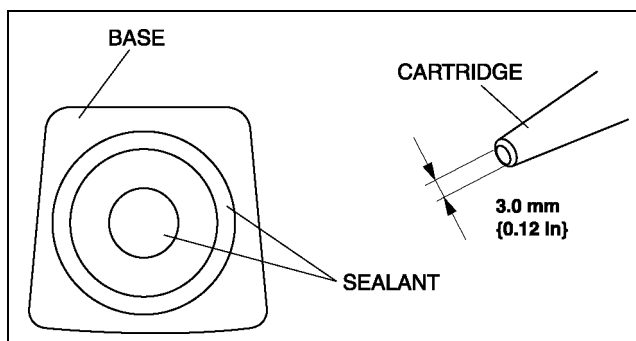
Caution

- **Keep the area free of dirt and grease, and do not touch the surface or the primer may not properly bond to the surface of the glass.**

4. Apply a height of **3.0 mm {0.12 in}** sealant to the base.

Note

- Use only glass primer on the glass, and body primer on the base. Allow the primer to dry for **approximately 30 minutes**.

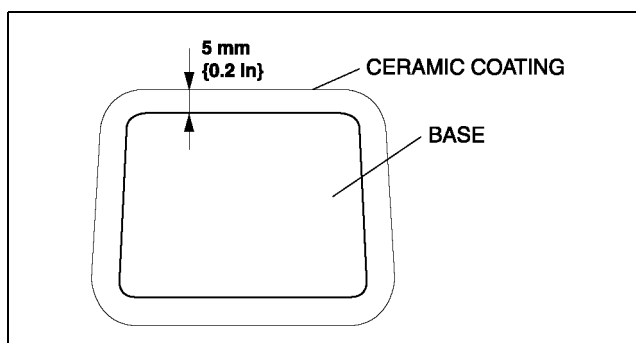


A6E7734W004

5. Center the base in the ceramic coating and press it onto the glass.
6. Use isopropyl alcohol to remove any excess repair sealant.

Hardening time of sealant

Temperature	Surface hardening time	Time required until vehicle can be put into service
5 °C {41 °F}	Approx. 1.5 h	Approx. 12 h
20 °C {68 °F}	Approx. 1 h	Approx. 4 h
35 °C {95 °F}	Approx. 10 min.	Approx. 2 h



A6E7734W005

7. Install the rearview mirror.

REAR WINDOW DEFROSTER

REAR WINDOW DEFROSTER

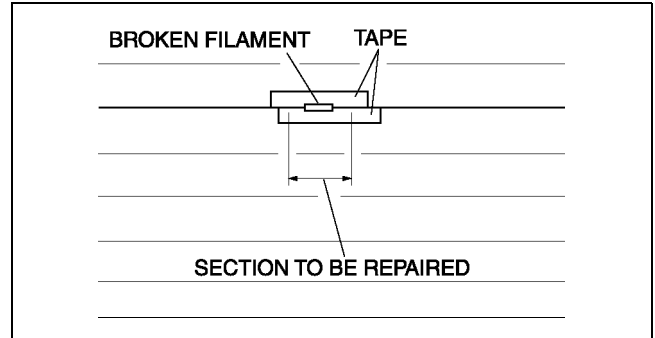
FILAMENT REPAIR

A6E773663930W01

1. Use isopropyl alcohol to clean around the damaged section of the filament.
2. Attach tape above and below the damaged section of the filament.
3. Using a small brush or marking pen, repair the filament with silver paint or equivalent.
4. After **2—3 minutes**, carefully remove the tape without disturbing the repaired area.

Caution

- **Do not use the rear window defroster until the paint is completely dry. It may cause other malfunctions if it is used before the paint is dry.**



A6E7736W003

5. Use a hot air blower heated to **150 °C {302 °F}** for **30 minutes** or let the paint set for **24 hours** at **25 °C {77 °F}** to allow it to dry completely.

FILAMENT INSPECTION

A6E773663930W02

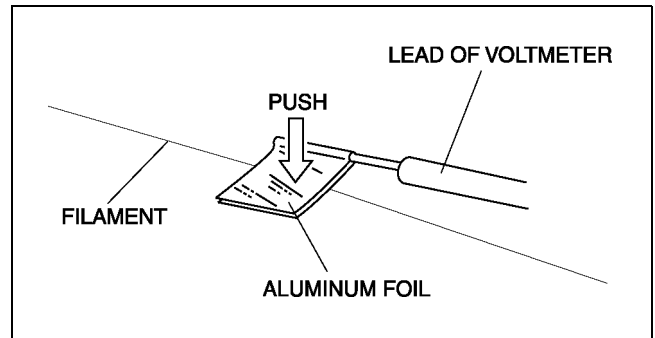
1. Turn the ignition switch to ON position.
2. Turn the rear window defroster switch on.

Caution

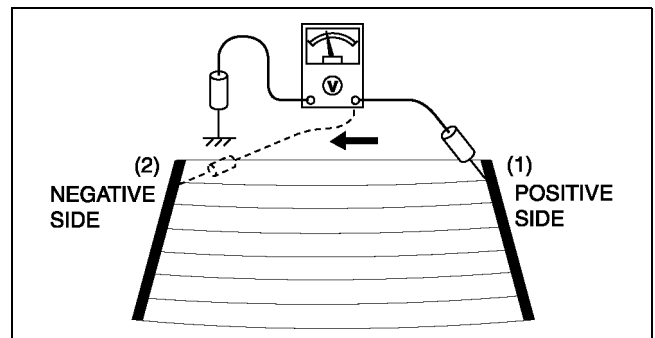
- **Directly touching the rear window defroster filament with the lead of the voltmeter will damage it. Wrap aluminum foil around the end of the lead and test the filament by touching it with the foil.**

3. Connect the positive (+) lead of the voltmeter to the positive side of each filament and the negative (–) lead to ground.
4. Gradually, slide the positive (+) lead from the positive side to the negative side and measure the voltage. Verify that the voltage decreases accordingly.
 - If the voltage is not as specified or it changes rapidly, the filament is faulty. Repair the filament.

Measurement place	Voltage (Reference value)
(1)→(2)	Approx. 12 V→ Approx. 0 V



A6E7736W001



A6E7736W002

WINDOW GLASS

WINDOW GLASS

WINDSHIELD REMOVAL

A6E773863900W01

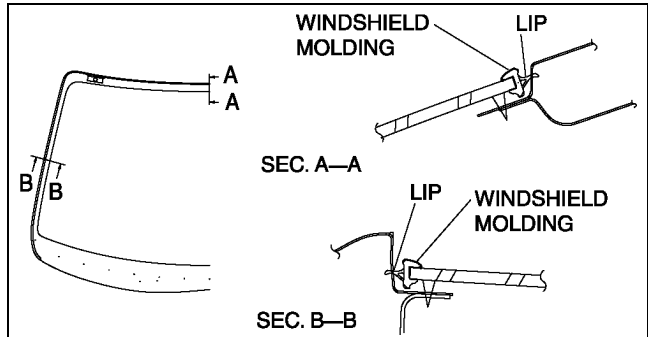
1. Remove the rearview mirror.
2. Remove the cowl grille.
3. Remove the headliner.
4. Apply protective tape along the edge of the body to protect it from damage.
5. Apply protective tape to the dashboard to protect it from damage.
6. Cut the lip of the windshield molding using a razor.

Warning

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

Note

- The windshield molding is a replacement part.



A6E7738W006

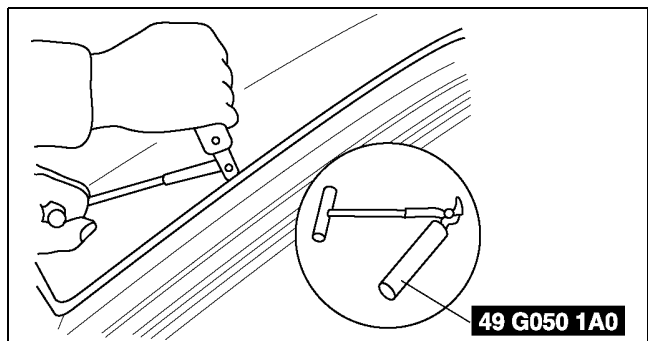
Not Reusing Windshield

1. Remove the base.

Note

- For the areas of the sealant that are difficult to cut, use a **SST** (piano wire) and follow the procedure under "Reusing Windshield."

2. Use a **SST**, and insert the blade into the sealant.
3. Pull through the sealant around the edge of the glass.
4. Remove the windshield.



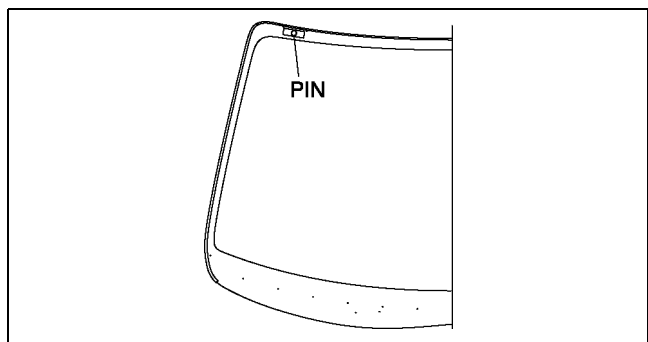
A6E7738W022

Reusing Windshield

Note

- Before removing the windshield from the body, mark the position of the windshield by affixing tape to the windshield and body panel.

1. Make a hole through the sealant, avoiding pins, from the inside of the vehicle using an awl.



A6E7738W007

WINDOW GLASS

- Pass the **SST** (piano wire) through the hole.

Warning

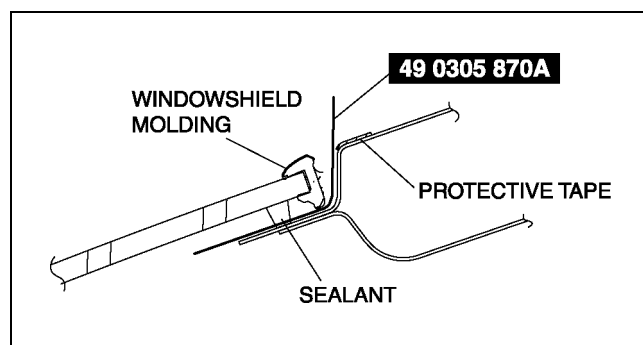
- Using a **SST** (piano wire) with bare hands can cause injury. Always wear gloves when using a **SST** (piano wire).

- Wind each end of the **SST** (piano wire) around a bar.

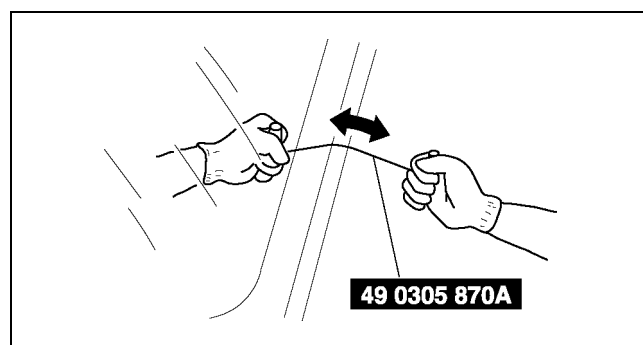
Note

- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking.

- Working with another person, saw through the sealant around the edge of the glass.
- Remove the windshield.
- Remove the pins from the windshield.
- Remove the windshield molding from the windshield glass.



A6E7738W008



A6E7738W021

WINDSHIELD INSTALLATION

A6E773863900W02

Caution

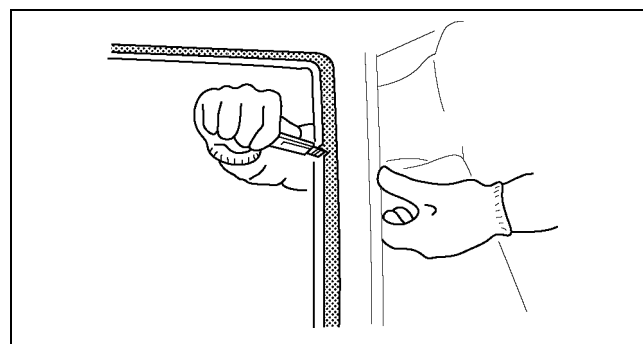
- To prevent the sealant from cracking or the glass from being pushed out by air pressure if a door is closed, open all of the windows and leave them open until the sealant has hardened.

- Cut away the old sealant using a razor so that 1—2 mm {0.04—0.07 in} thickness of sealant remains around the circumference of the frame.

Warning

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

- If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it **approximately 30 minutes** to dry. Then put on new sealant to create a 2 mm {0.08 in} layer.
- Clean and degrease an **approximately 50.0 mm {1.97 in}** wide strip around the circumference of the glass and the bonding area on the body.



A6E7738W023

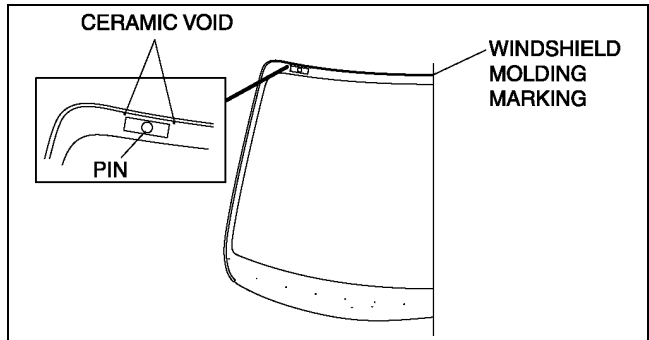
S

WINDOW GLASS

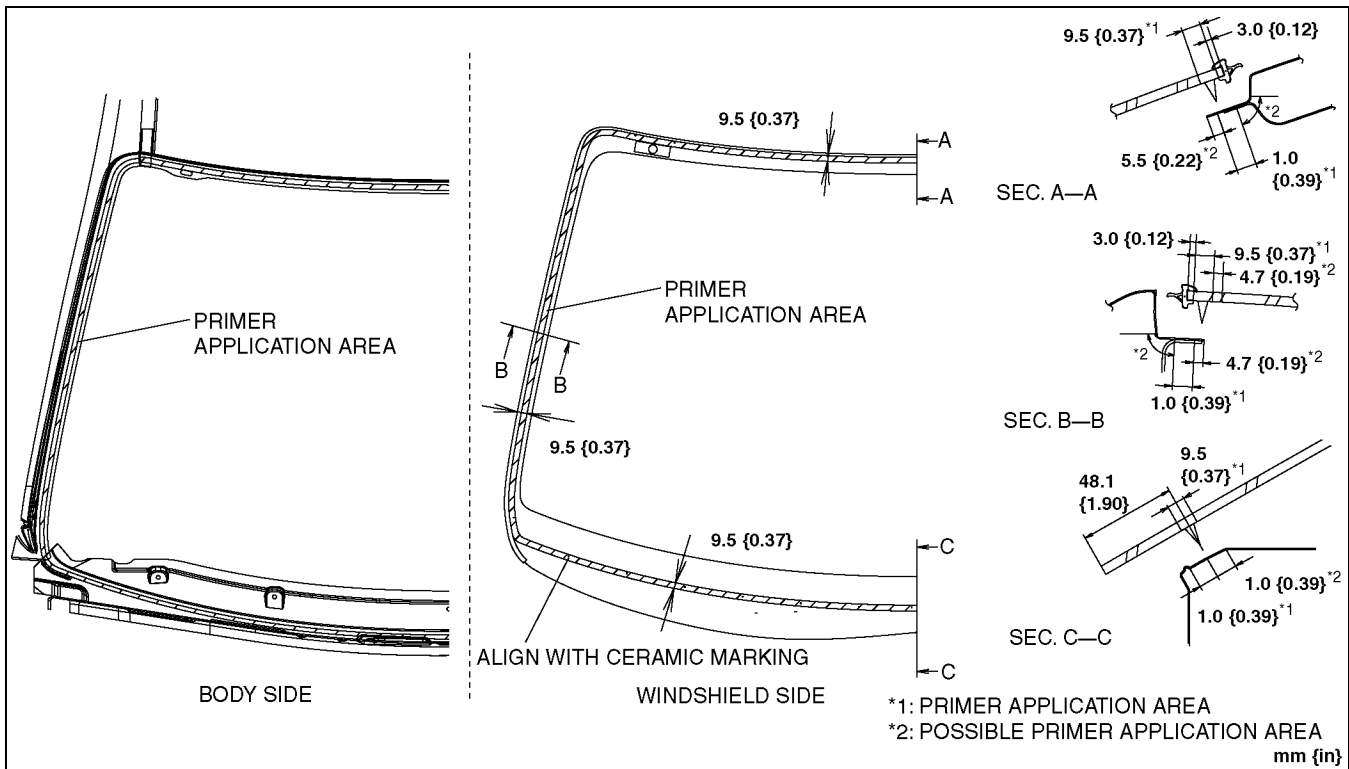
4. If installing reused glass, install pins at the ceramic void on the upper part of the windshield.
5. If installing reused glass, align the front windshield molding marking and the center of the upper section of the windshield, then install the molding to the windshield.
6. Use only glass primer on the glass, and body primer on the body and the molding. Allow it to dry for **approximately 30 minutes**.

Caution

- Keep the area free of dirt and grease, and do not touch the surface or the primer may not properly bond to the surface of the glass and body, which may cause leaks to occur.

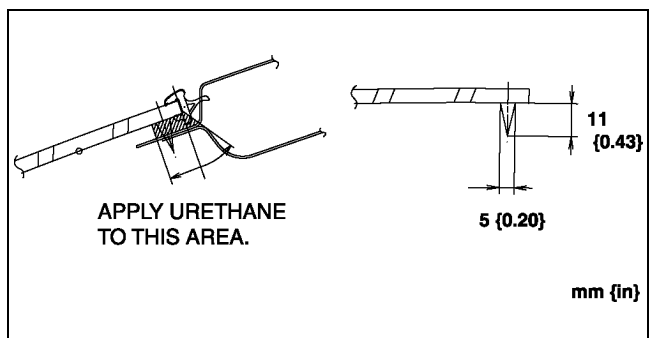


A6E7738W005



A6E7738W001

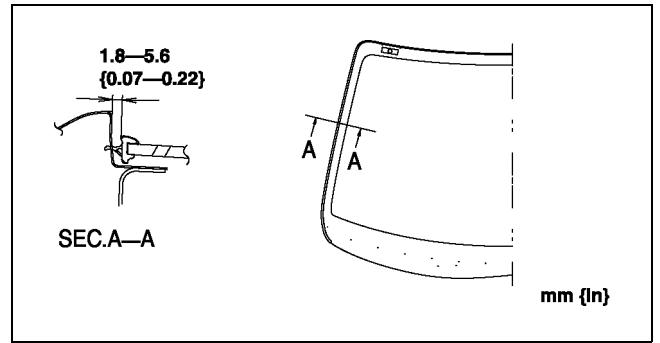
7. Apply urethane to the area of the glass surface as shown in the figure.
8. Set the the windshield in place and insert the pins into the body. Install the windshield.



A6E7738W002

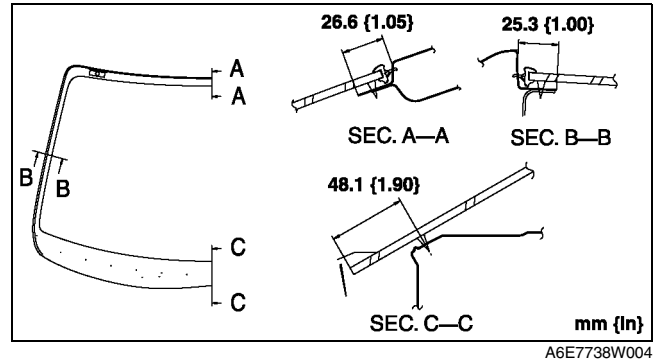
WINDOW GLASS

- Verify that the gap of the A pillar part as shown the figure.



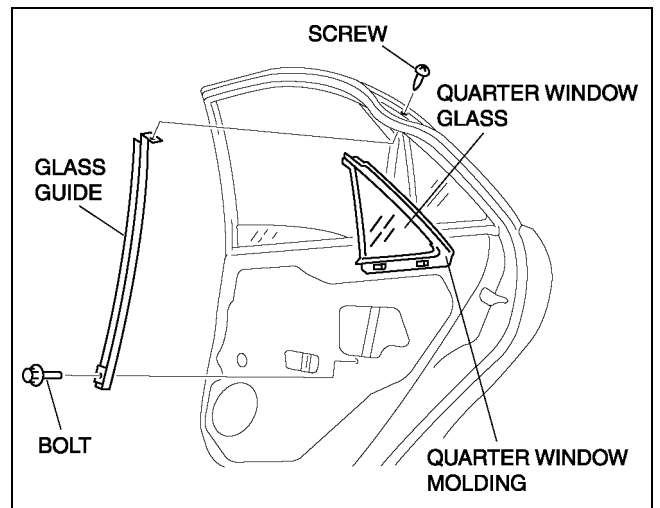
- Keeping the measurement of the molding lip gap within specification, press completely along the perimeter of the glass.
- Install the seaming welt.
- Install the cowl grille.
- Install the headliner
- Install the interior light. (See [T-48 FRONT MAP LIGHT REMOVAL/INSTALLATION](#).)
- Allow the sealant to harden completely.

Sealant hardening time: 24 hours



QUARTER WINDOW GLASS REMOVAL/INSTALLATION

- Remove the rear door trim.
- Remove the screw and bolt, then remove the glass guide.
- Remove the quarter window and the molding together in one piece.
- Remove the molding from the glass.
- Install in the reverse order of removal.



WINDOW GLASS

REAR WINDOW GLASS REMOVAL

A6E773863931W01

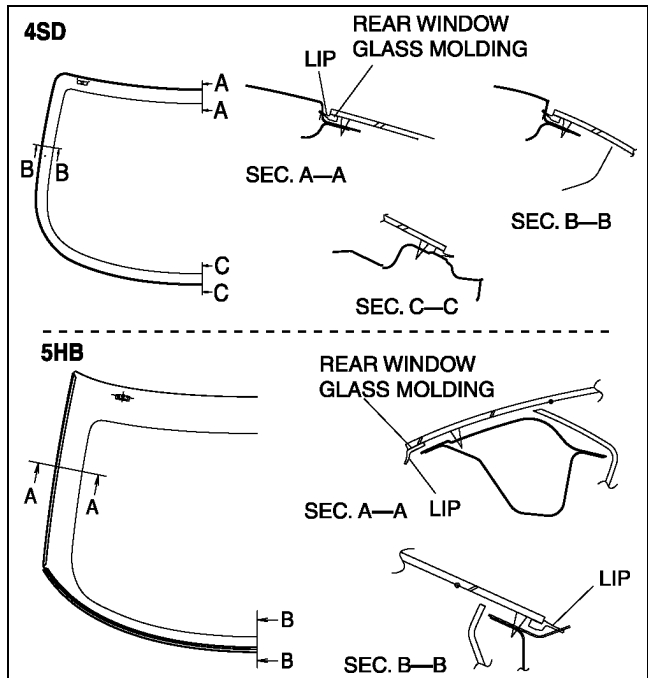
- For the 4SD, remove the following parts:
 - (1) Remove the headliner.
 - (2) Remove the rear package trim.
- For the 5HB, remove the following parts.
 - (1) Remove the rear wiper arm and blade.
 - (2) Remove the liftgate lower trim.
- Apply protective tape along the edge of the body to protect it from damage.
- Cut the lip of the rear window molding using a razor.

Warning

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

Note

- The rear window molding is a replacement part.



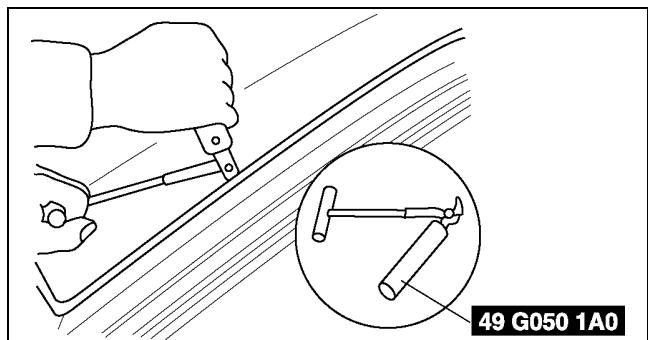
A6E7738W009

Not Reusing Glass

Note

- For the areas of the sealant that are difficult to cut, use a **SST** (piano wire) and follow the procedure under "Reusing Glass."

- Use a **SST**, and insert the blade into the sealant.
- Pull through the sealant around the edge of the glass.
- Remove the glass.



A6E7738W022

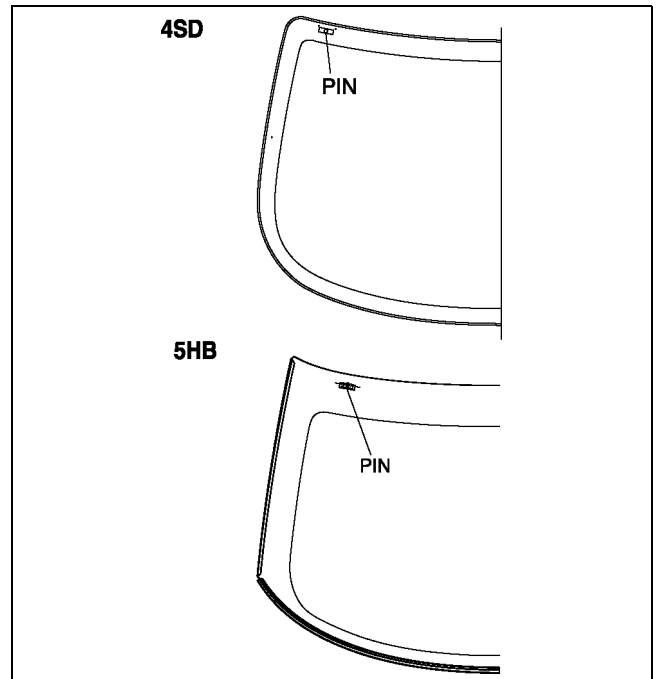
WINDOW GLASS

Reusing Glass

Note

- Before removing the rear window glass from the body, mark the position of the glass by affixing tape to the glass and body panel.

1. Make a hole through the sealant, avoiding pins, from the inside of the vehicle using an awl.



A6E7738W010

S

2. Pass the **SST** (piano wire) through the hole.

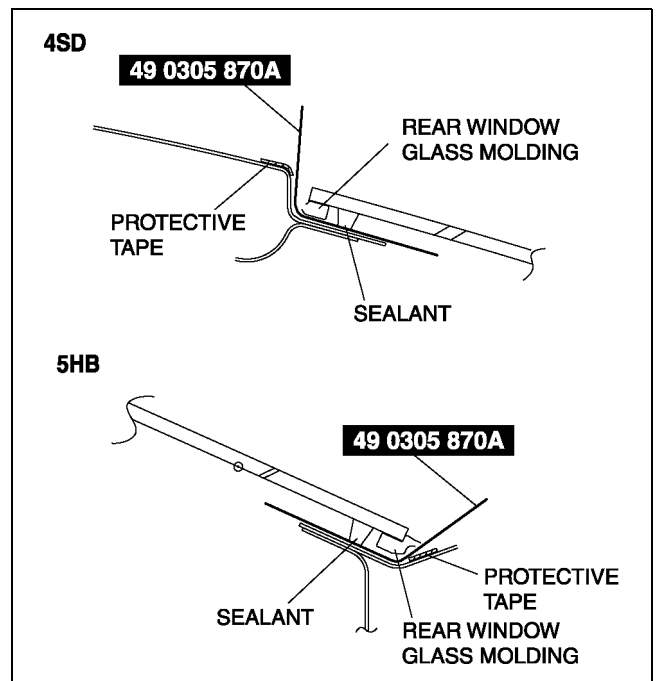
Warning

- Using a **SST** (piano wire) with bare hands can cause injury. Always wear gloves when using a **SST** (piano wire).

3. Wind each end of the **SST** (piano wire) around a bar.

Note

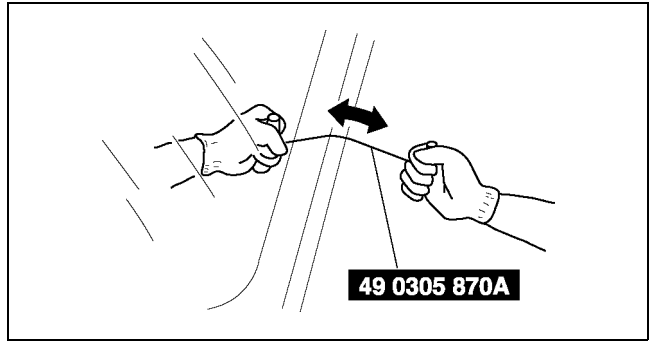
- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking.



A6E7738W011

WINDOW GLASS

4. Working with another person, saw through the sealant around the edge of the glass.
5. Remove the rear window glass.
6. Remove the pins from the glass.
7. Remove the rear window molding from the glass.



A6E7738W021

REAR WINDOW GLASS INSTALLATION

A6E773863931W02

Caution

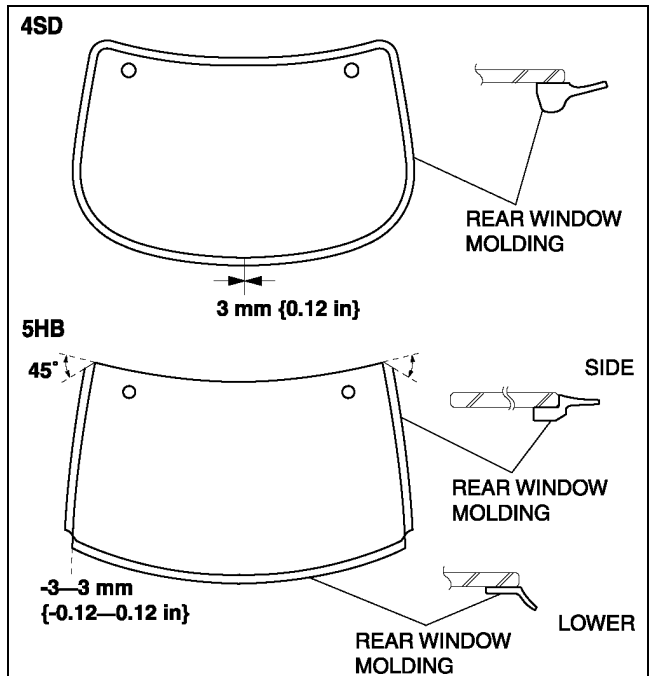
- To prevent the sealant from cracking or the glass from being pushed out by air pressure if a door is closed, open all of the windows and leave them open until the sealant has hardened.

1. Cut away the old sealant using a razor so that 1—2 mm {0.04—0.07 in} thickness of sealant remains around the circumference of the frame.

Warning

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

2. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it **approximately 30 minutes** to dry. Then put on new sealant to create a **2 mm {0.08 in}** layer.
3. Clean and degrease an **approximately 50.0 mm {1.97 in}** wide strip around the circumference of the glass and the bonding area on the body.
4. Install the molding as shown in the figure.



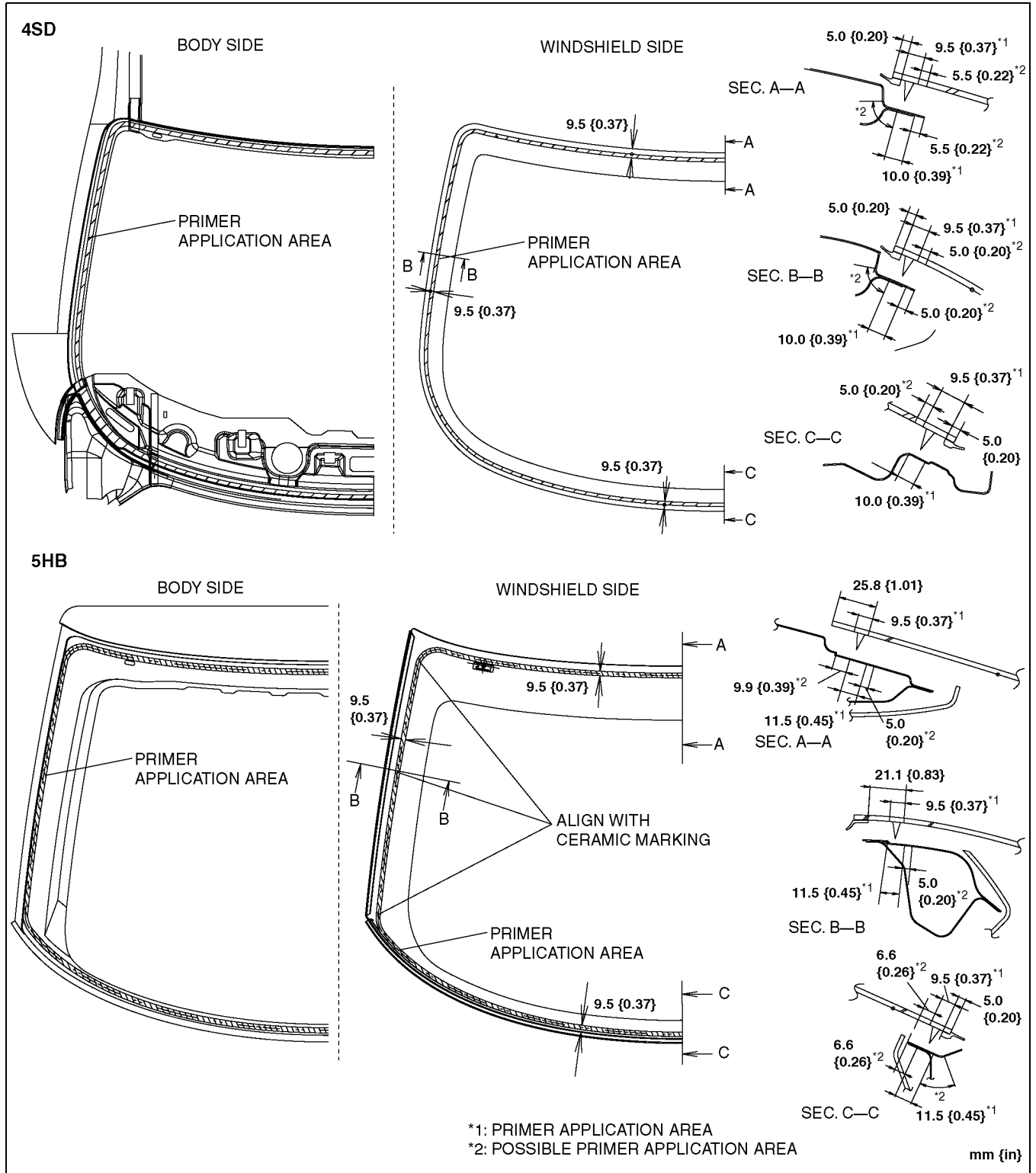
A6E7738W025

WINDOW GLASS

5. Use only glass primer on the glass, and body primer on the body and the molding. Allow it to dry for **approximately 30 minutes**.

Caution

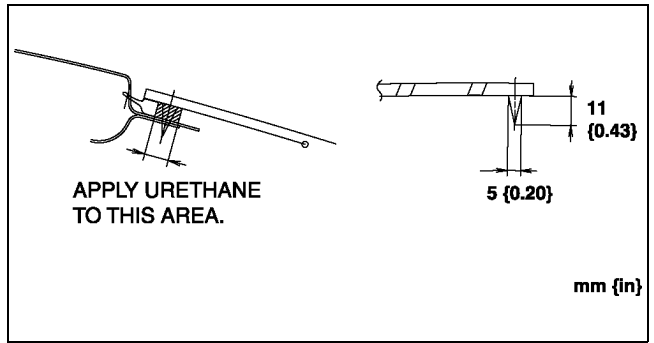
- Keep the area free of dirt and grease, and do not touch the surface or the primer may not properly bond to the surface of the glass and body, which may cause leaks to occur.



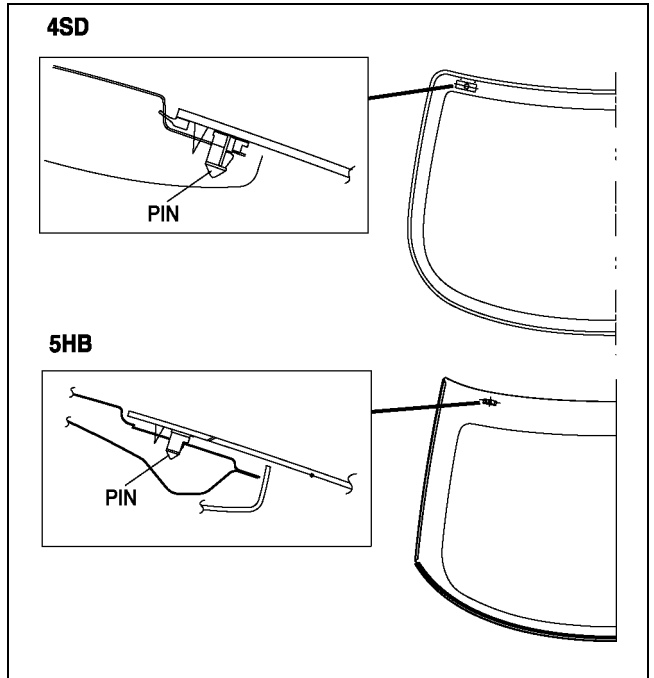
A6E7738W019

WINDOW GLASS

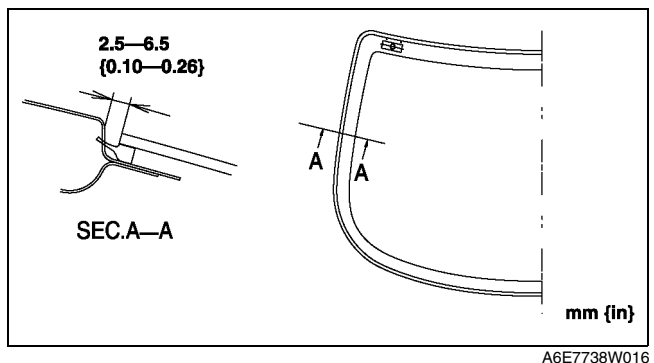
6. Apply urethane to the area of the glass surface as shown in the figure.



7. Set the position of the front windshield glass and insert a pin into the body. Install the glass.



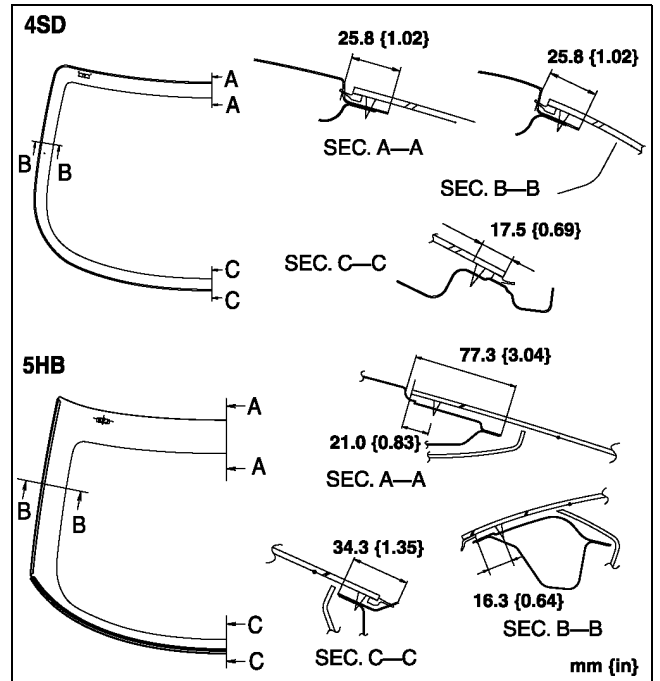
8. Verify that the gap of the upper part is **7.3 mm {0.29 in}** and the A pillar part is **6.8 mm {0.27 in}**. (Only for 4SD)



WINDOW GLASS

9. Keeping the measurement of the molding lip gap within specification, press completely along the perimeter of the glass.
10. For the 4SD, install the following parts:
 - (1) Install the headliner.
 - (2) Install the rear package trim.
11. For the 5HB, install the following points.
 - (1) Install the rear wiper motor.
 - (2) Install the liftgate lower trim.
12. Allow the sealant to harden completely.

Sealant hardening time: 24 hours



A6E7738W017

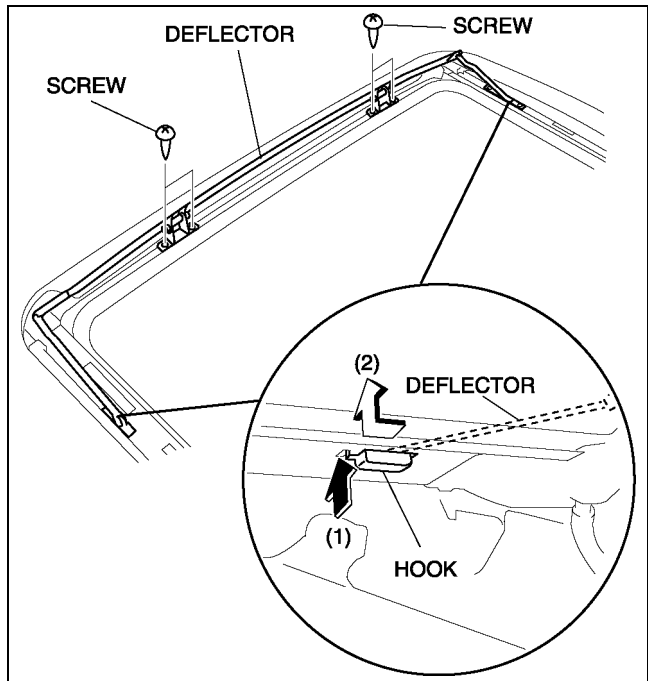
SLIDING SUNROOF

SLIDING SUNROOF

DEFLECTOR REMOVAL/INSTALLATION

A6E774069880W01

1. Fully open the glass panel.
2. Remove the headliner.
3. Remove the screws.
4. Disengage the hooks.
 - (1) Press the rear end of each hook.
 - (2) After sliding the hooks rearward, press them upward.
5. Remove the deflector.
6. Install in the reverse order of removal.

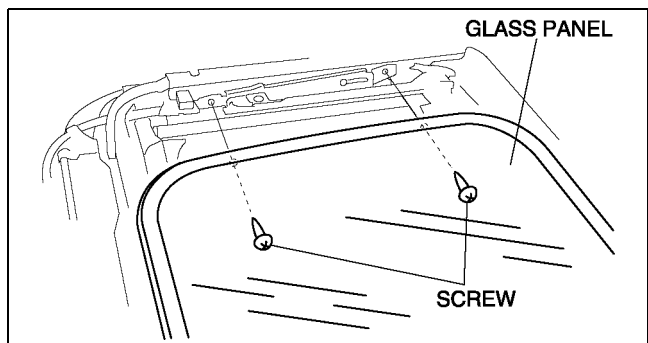


A6E7740W003

GLASS PANEL REMOVAL/INSTALLATION

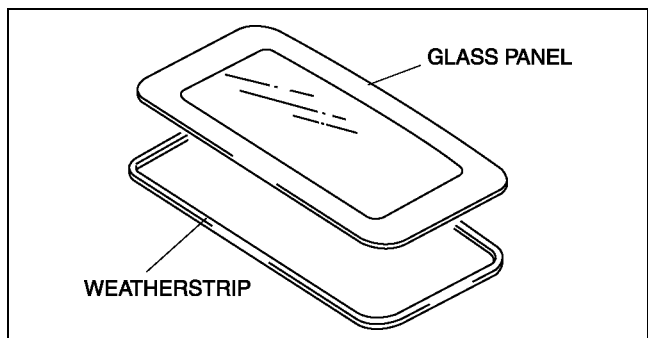
A6E774069810W01

1. Fully close the glass panel.
2. Fully open the sunshade.
3. Remove the screws, and then remove the glass panel.



A6E7740W004

4. Peel the weatherstrip off the glass panel.
5. Install in the reverse order of removal.
6. Adjust the glass panel. (See [S-75 GLASS PANEL ADJUSTMENT](#).)



A6E7740W006

SLIDING SUNROOF

GLASS PANEL ADJUSTMENT

A6E774069810W02

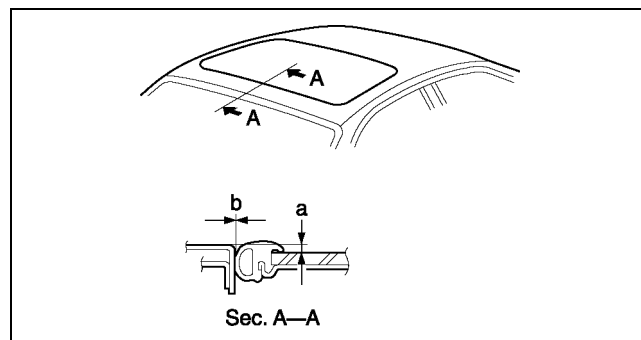
1. Fully close the glass panel.
2. Measure the gap and height between the glass panel and body.
3. If not as specified, loosen the glass panel installation screws and reposition the glass panel.

Clearance

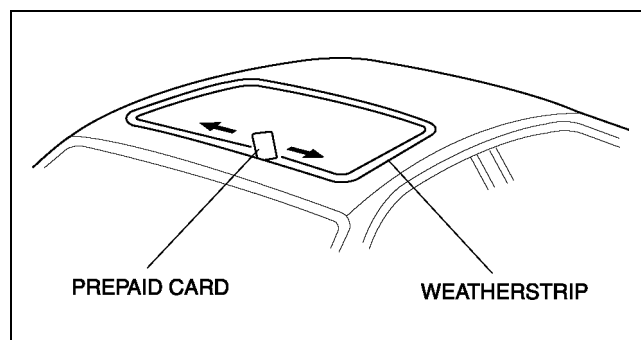
a: -0.8—1.2 mm {-0.032—0.047 in}

b: 0 mm {0 in}

4. Tighten the installation screws.
5. Insert a prepaid card between the weatherstrip and the body of the vehicle. Verify that the sunroof is shut tightly (there is resistance when the prepaid card is moved).
 - If the sunroof is not shut tightly, readjust by performing Steps 3 and 4.



A6E7740W007

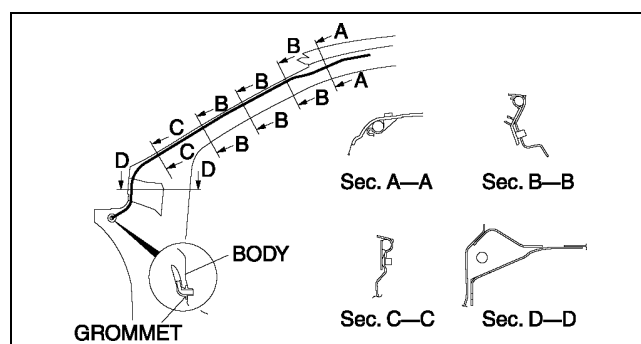


A6E7740W008

FRONT DRAIN HOSE REMOVAL

A6E774069920W01

1. Remove the headliner.
2. Disconnect the front drain hose from the sunroof frame.
3. Remove the front drain hose from the clips.
4. Pull the front drain hose into the room side.
5. Remove the front drain hose.



A6E7740W009

FRONT DRAIN HOSE INSTALLATION

A6E774069920W02

Caution

- If the front drain hose is pinched or bent anywhere, the water in the hose may not discharge and enter the inside of the vehicle. During and after installation of the trims and the headliner, always make sure there is no interference with the front drain hose. Fix any problem if found.

1. Apply soapy water to the front drain hose inserting area.
2. Insert one end (the wider end) of the front drain hose into the sunroof frame.
3. Install the front drain hose to the clips, parallel to the pillar and free of slack.
4. Insert the front drain hose joint into the hinge pillar inner hole.
5. Install the headliner.

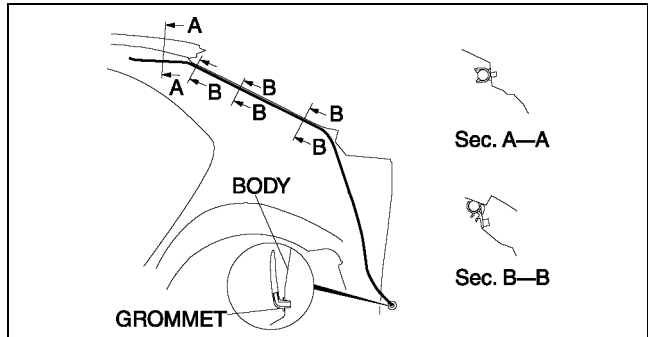
SLIDING SUNROOF

REAR DRAIN HOSE REMOVAL

A6E774069922W01

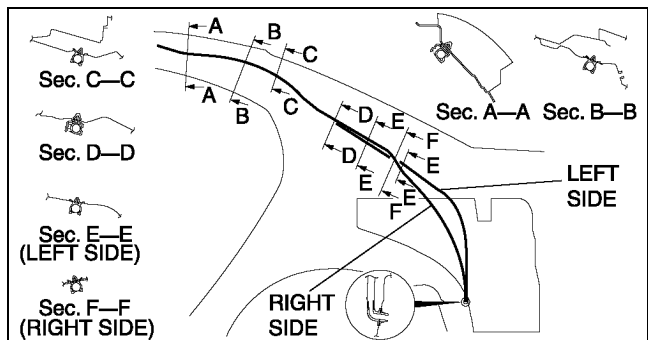
1. Remove the headliner.
2. Remove the trunk side trim. (4SD)
3. Remove the trunk side upper trim and trunk side trim. (5HB)
4. Disconnect the rear drain hose from the sunroof frame.
5. Remove the rear drain hose from the clips.
6. Pull the rear drain hose into the room side.
7. Remove the rear drain hose.

4SD



A6E7740W010

5HB



A6E7740W011

REAR DRAIN HOSE INSTALLATION

A6E774069922W02

Caution

- If the rear drain hose is pinched or bent anywhere, the water in the hose may not discharge and enter the inside of the vehicle. During and after installation of the trims and the headliner, always make sure there is no interference with the rear drain hose. Fix any problem if found.

1. Apply soapy water to the rear drain hose inserting area.
2. Insert one end (the wider side) of the rear drain hose into the sunroof frame.
3. Install the rear drain hose to the clips parallel to the pillar and free of slack.
4. Insert the rear drain hose joint into the rear pillar inner hole.
5. Install the trunk side trim. (4SD)
6. Install the trunk side upper trim and trunk side trim. (5HB)
7. Install the headliner.

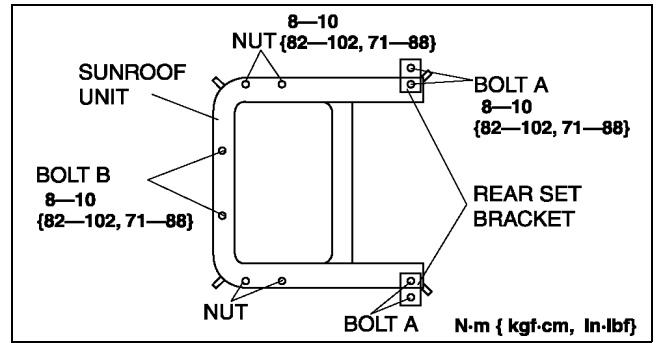
SUNROOF UNIT REMOVAL/INSTALLATION

A6E774069850W01

1. Disconnect the negative battery cable.
2. Remove the headliner.
3. Remove the glass panel.
4. Disconnect the front and rear drain hose from the sunroof frame.
5. Remove the bolt A, and then remove the rear set bracket.

SLIDING SUNROOF

6. Remove the bolt B and nuts, and then remove the sunroof unit.
7. Install in the reverse order of removal.
8. Adjust the glass panel. (See [S-75 GLASS PANEL ADJUSTMENT.](#))

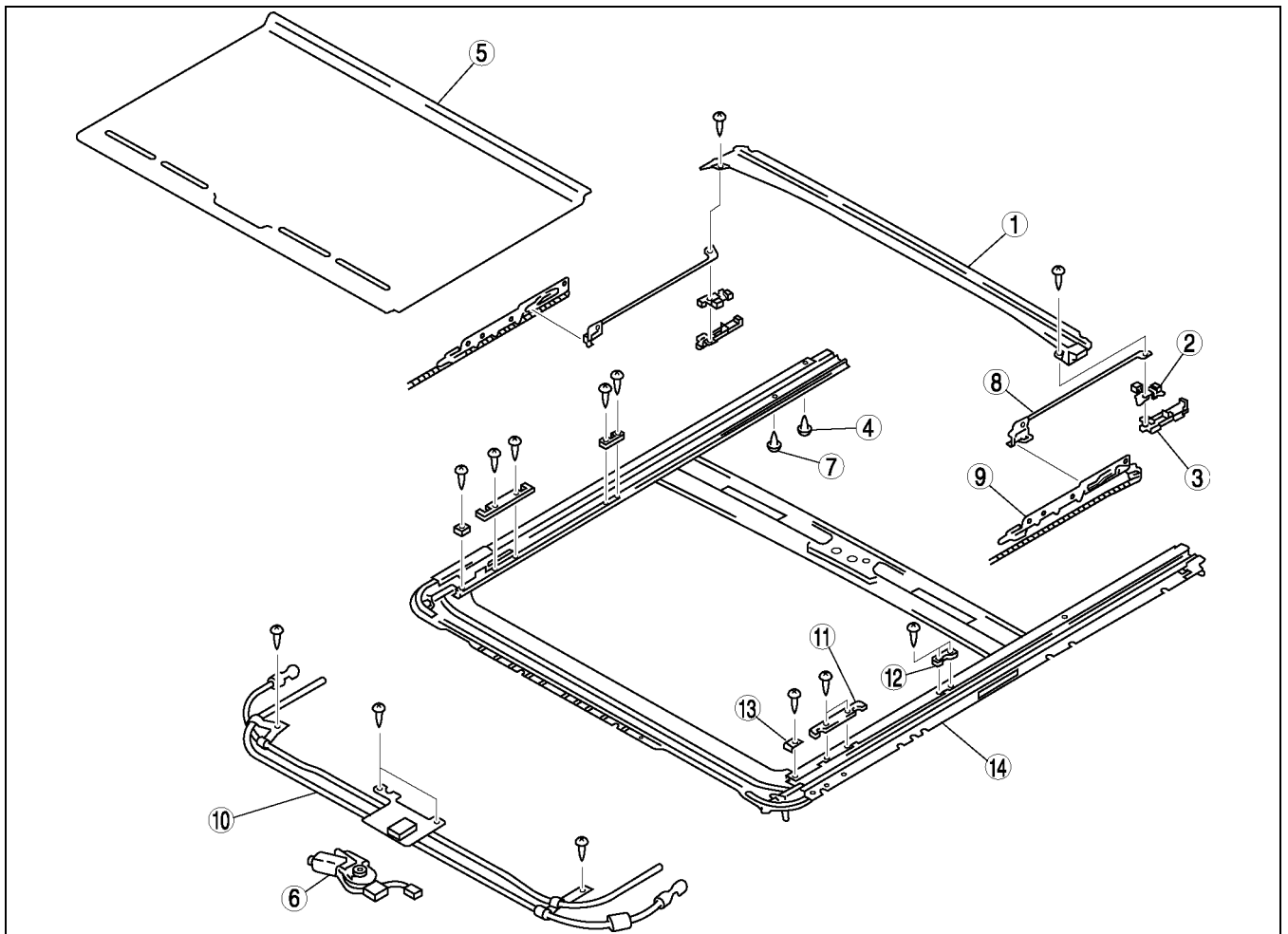


A6E7740W005

SUNROOF UNIT DISASSEMBLY/ASSEMBLY

A6E774069850W02

1. Disconnect the negative battery cable.
2. Remove the deflector.
3. Remove the glass panel.
4. Disassemble in the order indicated in the table.
5. Assemble in the reverse order of disassembly.



A6E7740W001

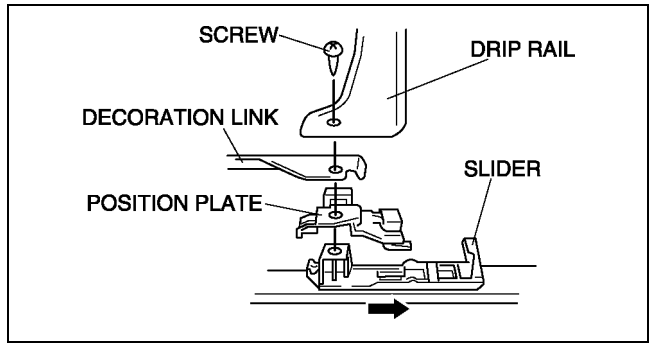
1	Drip rail
2	Position plate
3	Slider (See S-78 Slider Disassembly Note)
4	Rear stopper A
5	Sunshade
6	Sunroof motor
7	Rear stopper B
8	Decoration link (See S-78 Decoration Link Assembly Note)

9	Guide (See S-78 Guide Disassembly Note)
10	Drive unit (See S-78 Guide Assembly Note)
11	Set plate A
12	Set plate B
13	Front stopper
14	Frame

SLIDING SUNROOF

Slider Disassembly Note

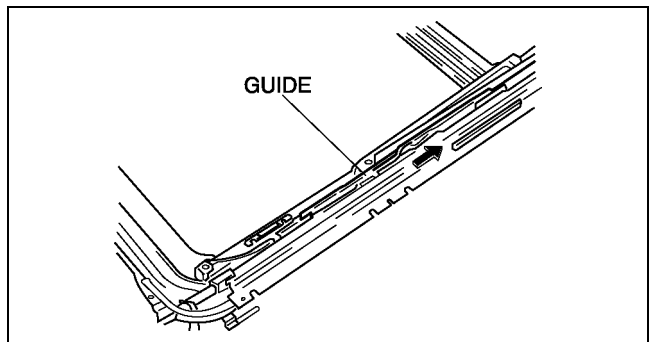
1. Remove the screw.
2. Slide the slider rearward, and remove it from the sunroof frame.



A6E7740W012

Guide Disassembly Note

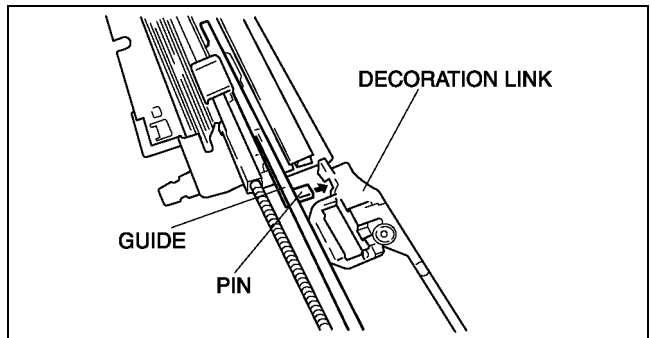
1. Slide the guide rearward, and remove it from the sunroof frame.



A6E7740W013

Decoration Link Assembly Note

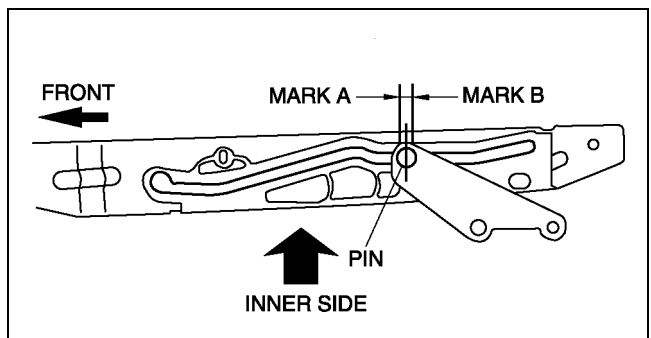
1. Set the pin in the decoration link.



A6E7740W014

Guide Assembly Note

1. Move the guide by hand until it comes to the front stopper.
2. Move the guide by hand until center of pin comes between mark A and B.



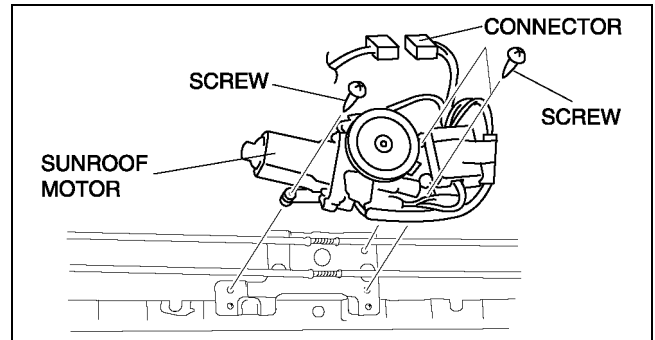
A6E7740W015

SLIDING SUNROOF

SUNROOF MOTOR REMOVAL

A6E774069870W01

1. Disconnect the negative battery cable.
2. Remove the headliner.
3. Disconnect the connector.
4. Remove the screws, and then remove the sunroof motor.



A6E7740W002

SUNROOF MOTOR INSTALLATION

A6E774069870W02

1. Connect the sunroof motor connector.
2. Connect the sunroof switch connector.
3. Connect the negative battery cable.
4. Turn the ignition switch to ON position.
5. Press the CLOSE side of the slide switch until the sunroof motor stops.
6. Disconnect the sunroof switch connector.
7. Install the screws, and then install the sunroof motor.
8. Install the headliner.

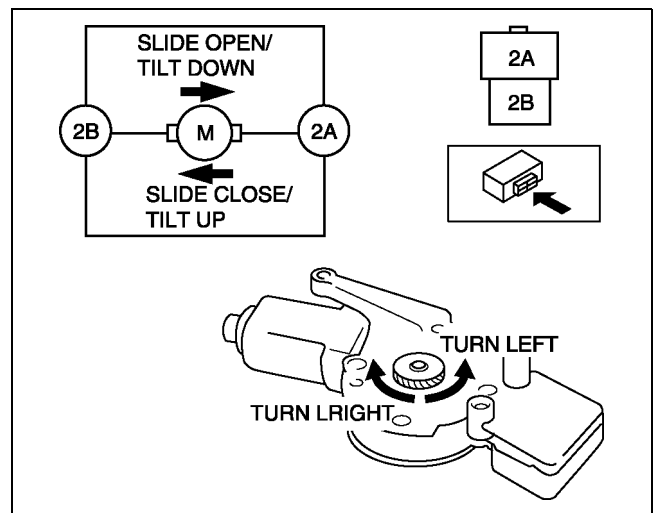
SUNROOF MOTOR INSPECTION

A6E774069870W03

Motor

1. Remove the sunroof motor.
2. Apply battery positive voltage to the sunroof motor terminals and inspect the operation of the sunroof motor.
 - If not as specified, replace the sunroof motor.

Connection		Motor operation
2A	2B	
B+	GND	Turn left (Slide close/Tilt up)
GND	B+	Turn right (Slide open/Tilt down)



A6E7740W016

SLIDING SUNROOF

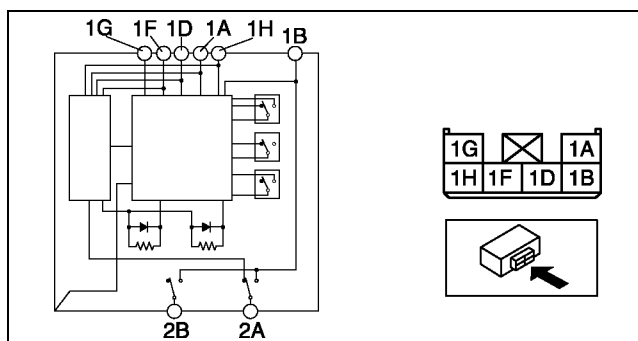
Limit Switch

1. Remove the headliner. (See [S-96 HEADLINER REMOVAL/INSTALLATION](#).)
2. Verify the glass panel position.
3. Disconnect the connector.
4. Inspect for continuity between the sunroof motor terminals using an ohmmeter.
 - If not as specified, replace the sunroof motor.

○—○ : Continuity

Glass panel position	Terminal					
	1A	1D	1F	1H	GND	2B
Fully open			○		○	○
Fully closed	○	○	○	○	○	○
Fully tilt up				○	○	○

A6E7740W021



A6E7740W020

SUNROOF RELAY INSPECTION

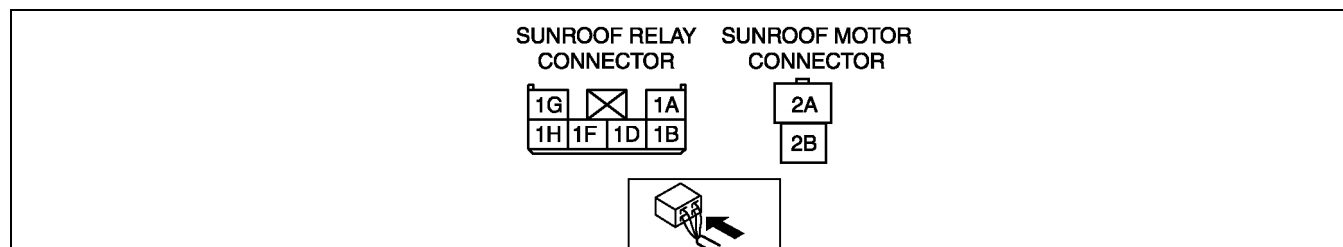
A6E774069873W01

Note

- Sunroof relay is built in the sunroof motor.

1. Remove the headliner. (See [S-96 HEADLINER REMOVAL/INSTALLATION](#).)
2. Connect the sunroof switch connector.
3. Measure the voltage at the sunroof relay terminals as indicated below.
4. Disconnect the sunroof relay connector before inspecting for continuity at terminal 1G.
 - If not as specified, inspect the parts listed under “Action” and the related wiring harnesses.
 - If the parts and wiring harnesses are okay but the system still does not work properly, replace the sunroof relay.
5. Connect the negative battery cable.

Terminal voltage list (Reference)



A6E7740W019

Terminal	Signal	Connected to	Test condition	Voltage (V)/Continuity	Action
1A	Tilt down	Sunroof switch	Sunroof is tilting down. (Not including position when fully closed)	0	• Inspect sunroof switch (See S-81 SUNROOF SWITCH INSPECTION) • Inspect related harness
			Other	B+	
1B	IG2	Sunroof motor	Ignition switch is at ON position.	B+	• Inspect A/C 15 A fuse • Inspect sunroof switch (See S-81 SUNROOF SWITCH INSPECTION) • Inspect related harness
			Other	0	
1C	—	—	—	—	—
1D	Slide close	Sunroof switch	Sunroof is closing. (Including position when fully closed and open)	0	• Inspect sunroof switch (See S-81 SUNROOF SWITCH INSPECTION) • Inspect related harness
			Other	B+	
1E	—	—	—	—	—

SLIDING SUNROOF

Terminal	Signal	Connected to	Test condition	Voltage (V)/Continuity	Action
1F	Slide open	Sunroof switch	Sunroof is fully opening.	0	- Inspect sunroof switch (See S-81 SUNROOF SWITCH INSPECTION) - Inspect related harness
			Other	B+	
1G	Sunroof relay ground	GND	Under any condition: inspect for continuity to ground.	Yes	Inspect related harness
1H	Tilt up	Sunroof switch	Sunroof is tilting up. (Including position when fully closed)	0	- Inspect sunroof switch (See S-81 SUNROOF SWITCH INSPECTION) - Inspect related harness
			Other	B+	
2A	Slide close/tilt up	Sunroof motor	Sunroof is opening/tilting down.	0	- Inspect sunroof switch (See S-81 SUNROOF SWITCH INSPECTION) - Inspect sunroof motor (See S-79 SUNROOF MOTOR INSPECTION) - Inspect related harness
			Sunroof is closing/tilting up.	B+	
			Other	0	
2B	Slide open/tilt down	Sunroof motor	Sunroof is opening/tilting down.	B+	- Inspect sunroof switch (See S-81 SUNROOF SWITCH INSPECTION) - Inspect sunroof motor (See S-79 SUNROOF MOTOR INSPECTION) - Inspect related harness
			Sunroof is closing/tilting up.	0	
			Other	0	

SUNROOF SWITCH REMOVAL/INSTALLATION

A6E774066560W01

Note

- The sunroof switch is together with the map light.

S

- Disconnect the negative battery cable.
- Remove the map light from the headliner.
- Install in the reverse order of removal.

SUNROOF SWITCH INSPECTION

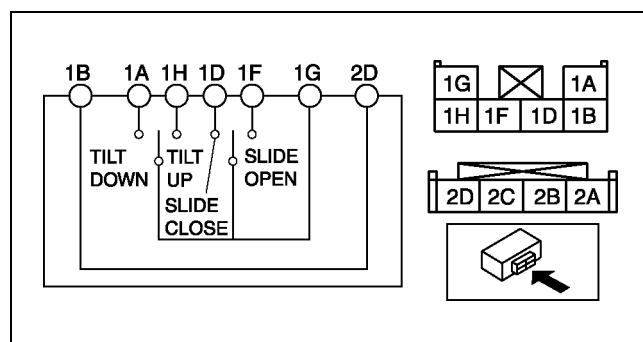
A6E774066560W02

- Remove the sunroof switch.
- Inspect for continuity between the sunroof switch terminals using an ohmmeter.
 - If not as specified, replace the sunroof switch.

○—○ : Continuity

Switch position	Terminal						
	1A	1D	1F	1G	1H	1B	2D
Slide open			○—○			○—○	
Slide closed		○—○				○—○	
Tilt up				○—○		○—○	
Tilt down	○—○					○—○	
Off						○—○	

A6E7740W022



A6E7740W023

DASHBOARD AND CONSOLE

DASHBOARD AND CONSOLE

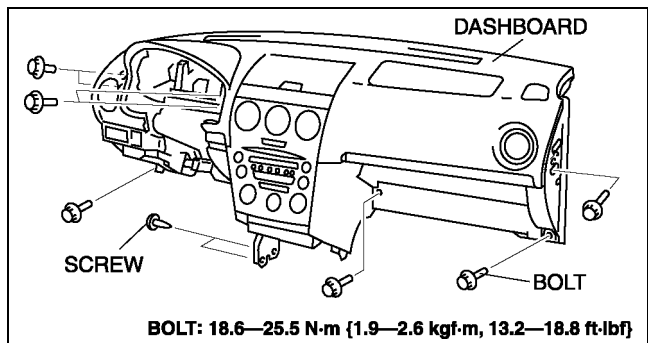
DASHBOARD REMOVAL/INSTALLATION

A6E774255100W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the console.
4. Remove the meter hood.
5. Remove the instrument cluster.
6. Remove the column cover.
7. Remove the lower panel.
8. Remove the steering shaft.
9. Remove the A-pillar trims.
10. Remove the front scuff plates.
11. Remove the front side trims.
12. Remove the side panels.
13. For vehicles equipped with the wire-type climate control unit, disconnect the wires for the front A/C unit. (See to [U-44 CLIMATE CONTROL UNIT REMOVAL](#).) (See to [U-45 CLIMATE CONTROL UNIT INSTALLATION](#).)
14. Disconnect the dashboard harness connectors.
15. Remove the bolts.

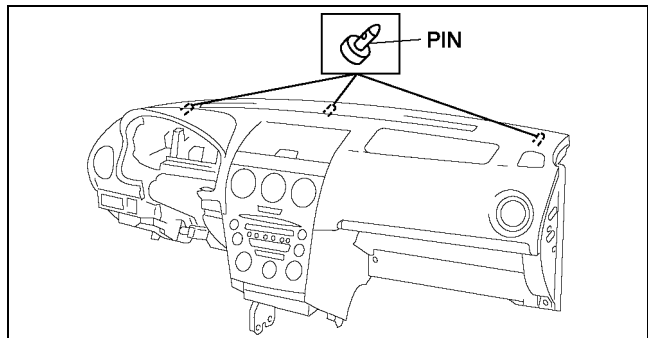
Warning

- Removing the dashboard without supporting it can be dangerous. The dashboard may fall and injure you. Always perform these procedures together with at least another person.



A6E7742W004

16. Pull out the support pins from the body to remove the dashboard.
17. Take the dashboard off from the driver-side door opening.
18. Install in the reverse order of removal.



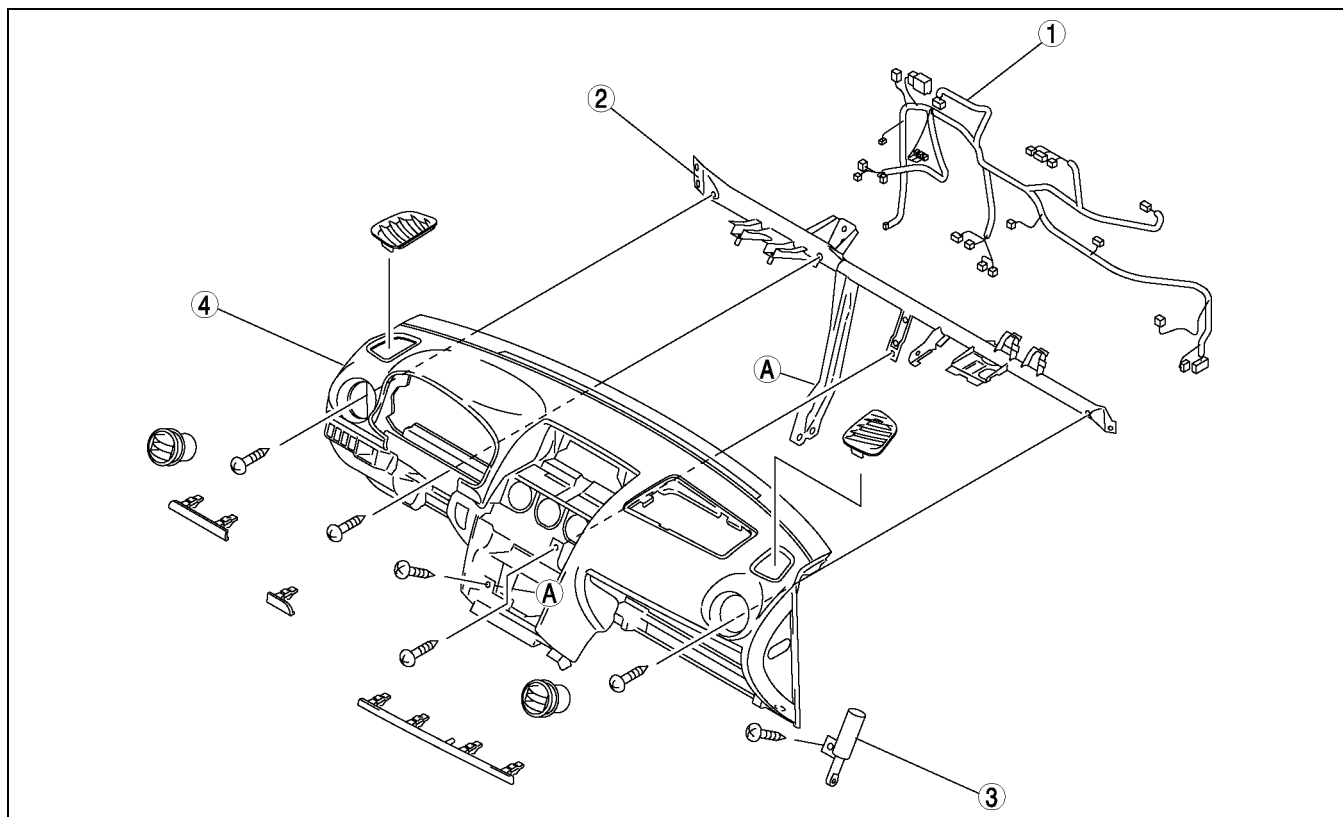
A6E7742W005

DASHBOARD AND CONSOLE

DASHBOARD DISASSEMBLY/ASSEMBLY

A6E774255100W02

1. Remove the passenger-side air bag module.
2. Remove the ventilator grilles.
3. Remove the audio unit.
4. Remove the climate control unit.
5. Disassemble in the order indicated in the table.
6. Assemble in the reverse order of disassembly.



A6E7742W003

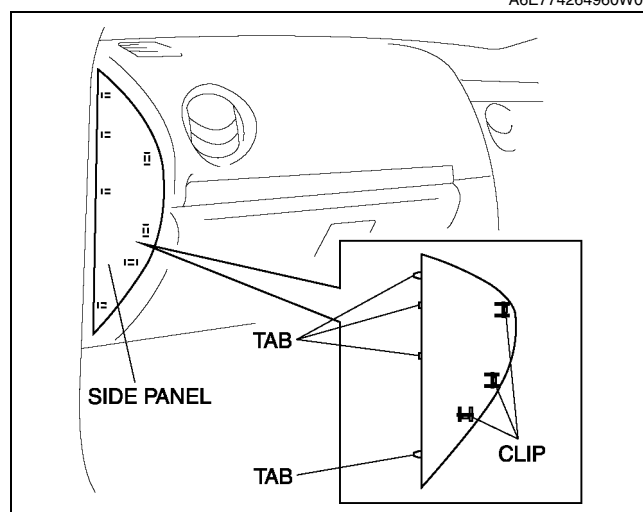
1	Dashboard harness
2	Dashboard member

3	Damper
4	Dashboard

SIDE PANEL REMOVAL/INSTALLATION

A6E774264960W01

1. Disengage clips using a tape-wrapped flathead screwdriver.
2. Pull the side panel toward you, then disengage tabs from dashboard, and remove the side panel.
3. Install in the reverse order of removal.



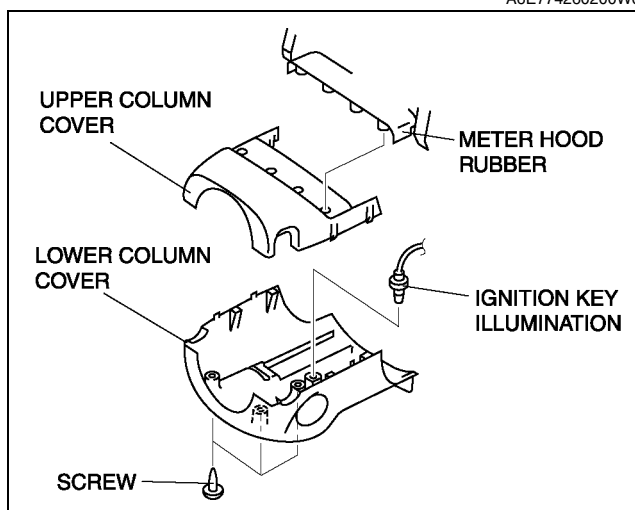
A6E7742W010

DASHBOARD AND CONSOLE

COLUMN COVER REMOVAL/INSTALLATION

1. Detach the fit of the upper column cover from the meter hood rubber.
2. Remove the upper column cover.
3. Remove the ignition key illumination.
4. Remove the screws.
5. Remove the lower column cover.
6. Install in the reverse order of removal.

A6E774260200W01

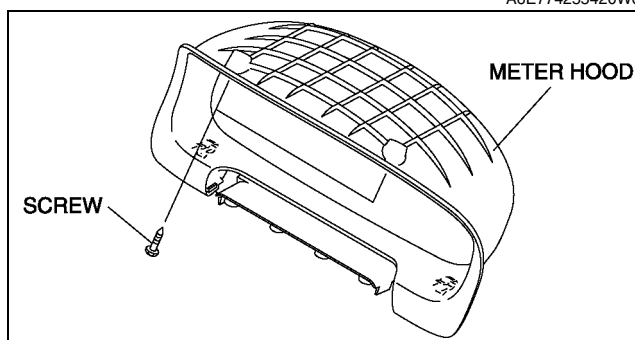


A6E7742W008

METER HOOD REMOVAL/INSTALLATION

1. Remove the screws.
2. Pull the meter hood toward you, then detach the column cover.
3. Install in the reverse order of removal.

A6E774255420W01

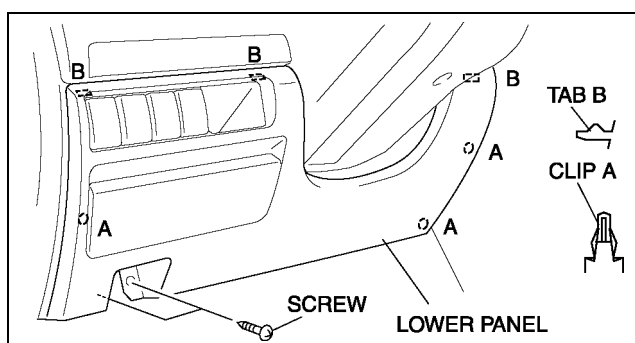


A6E7742W002

LOWER PANEL REMOVAL/INSTALLATION

1. Remove the bonnet release lever.
2. Remove the screws.
3. Pull the lower panel toward you, then disengage clips A and tabs B from the dashboard, and remove the lower panel.
4. Install in the reverse order of removal.

A6E774264280W01



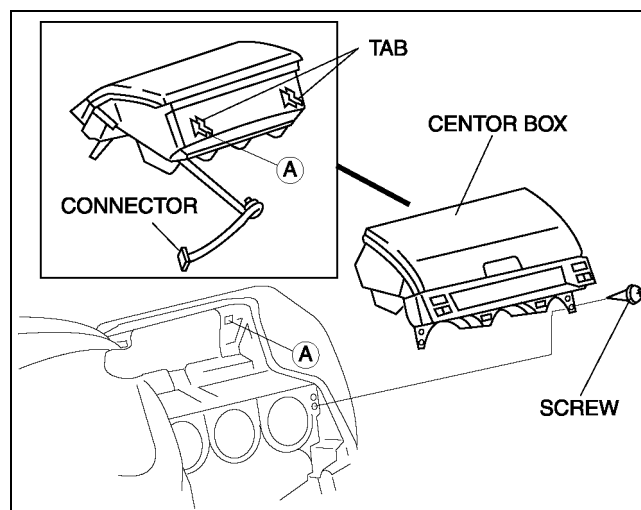
A6E7742W009

DASHBOARD AND CONSOLE

CENTER BOX REMOVAL/INSTALLATION

A6E774264030W01

1. Disconnect the negative battery cable.
2. Remove the center panel module.
3. Remove the screws.
4. Pull the center box forward, then disengage the tabs
5. Disconnect the LDC unit connector.
6. Install in the reverse order of removal.

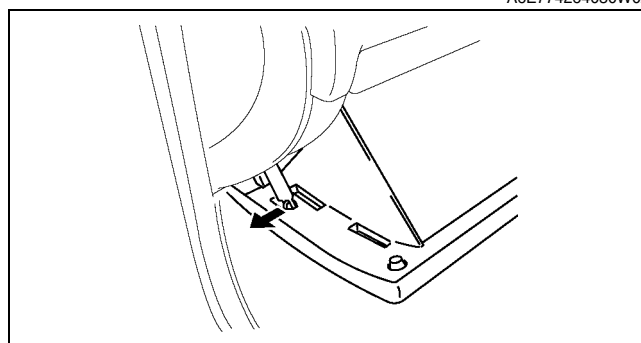


A6E7742W012

GLOVE COMPARTMENT REMOVAL/INSTALLATION

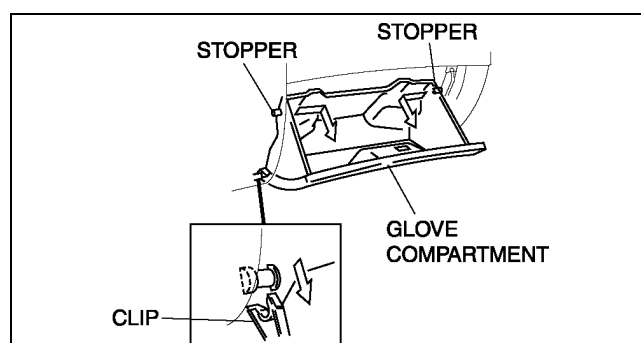
A6E774264030W02

1. Pull the stay damper to the direction shown in the figure. Then detach the fit for the glove compartment from the stay damper.



A6E7742W006

2. Bend the stoppers inward to remove.
3. Turn the glove compartment downward and pull the clips to remove it.
4. Install in the reverse order of removal.



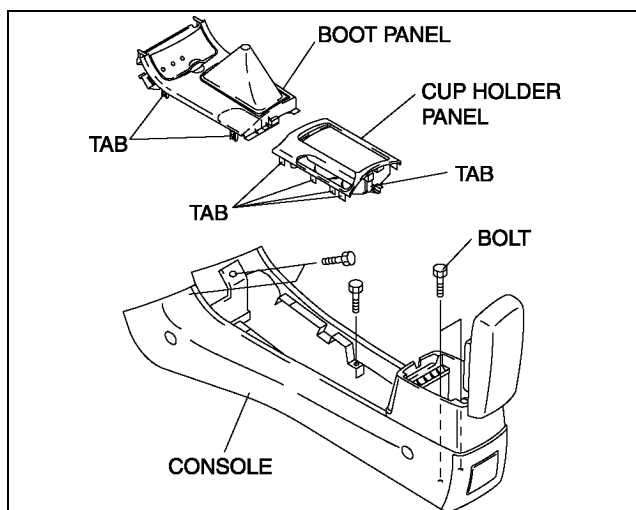
A6E7742W007

DASHBOARD AND CONSOLE

CONSOLE REMOVAL/INSTALLATION

A6E774264270W01

1. For MT vehicle, remove the shift lever knob.
2. Remove the cup holder panel using a tape-wrapped screwdriver.
3. Remove the boot panel using a tape-wrapped screwdriver, disconnect the cigarette lighter connector, and remove the front ashtray illumination.
4. Remove the bolts.
5. Install in the reverse order of removal.



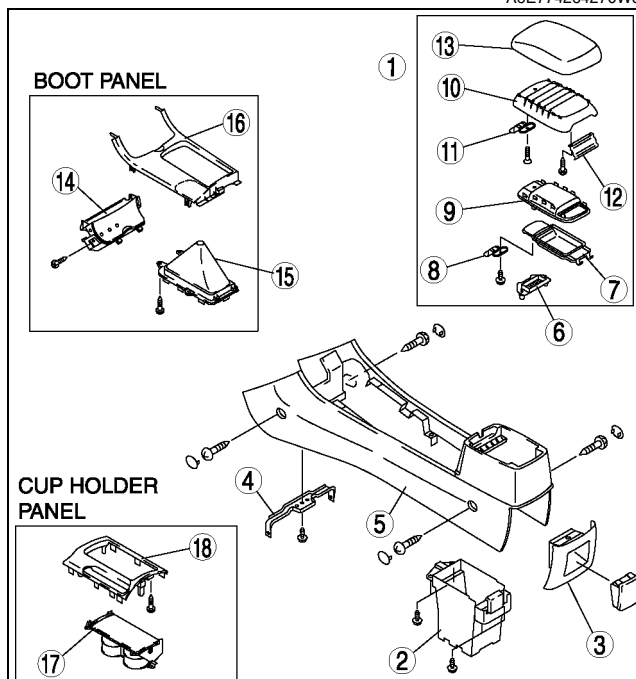
A6E7742W011

CONSOLE DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

1	Console lid (only large console box)
2	Box
3	Rear ashtray case
4	Bracket
5	Console
6	Console cover
7	Box storage
8	Lock No.1
9	Inner console lid
10	Lid core
11	Lock No.2
12	Hinge
13	Outer console lid
14	Front ashtray
15	Boot
16	Boot panel
17	Cup holder
18	Cup holder panel

A6E774264270W02



A6E7742W001

2. Assemble in the reverse order of disassembly.

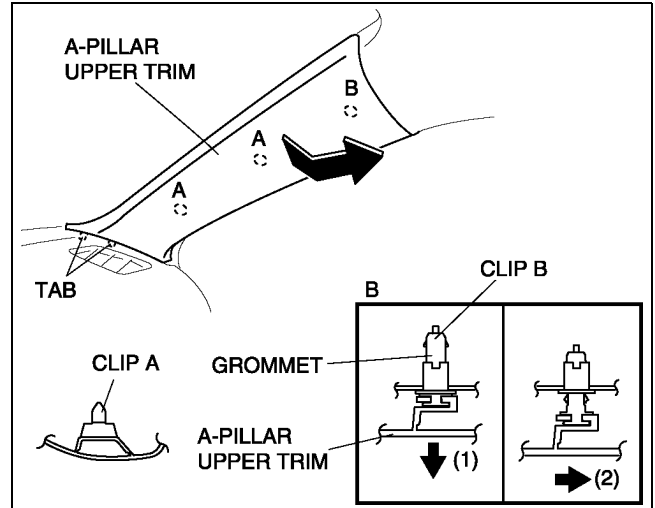
TRIM

TRIM

A-PILLAR TRIM REMOVAL

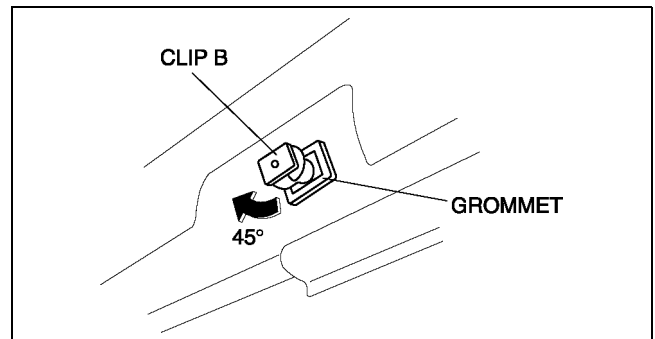
A6E774468160W01

1. Turn the seaming welt over.
2. Disengage clips A using a fastener remover.
3. Pull the A-pillar trim, then disengage clip B (1).
4. Pull the A-pillar trim upward, then disengage clip B from the A-pillar trim (2).



A6E7744W023

5. Pull clip B out, then rotate 45°.
6. Remove clip B from the grommet by pulling it toward you.

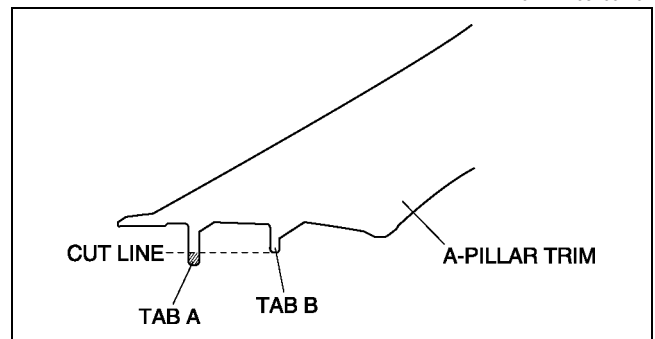


A6E7744W024

A-PILLAR TRIM INSTALLATION

A6E774468160W02

1. Cut A-pillar trim tab A to the same length as tab B.
2. Install clip B to the A-pillar trim.
3. Install the A-pillar trim by tapping the clip into the body.



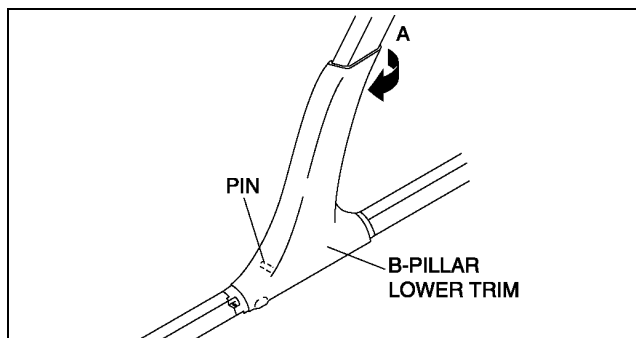
A6E7744W022

TRIM

B-PILLAR LOWER TRIM REMOVAL/INSTALLATION

A6E774468220W01

1. Remove the front scuff plate.
2. Remove the rear scuff plate.
3. Pull the area marked A, then remove one side of the B-pillar lower trim.
4. Pull the B-pillar lower trim, then remove the pin from the body.
5. Remove the B-pillar lower trim.
6. Install in the reverse order of removal.

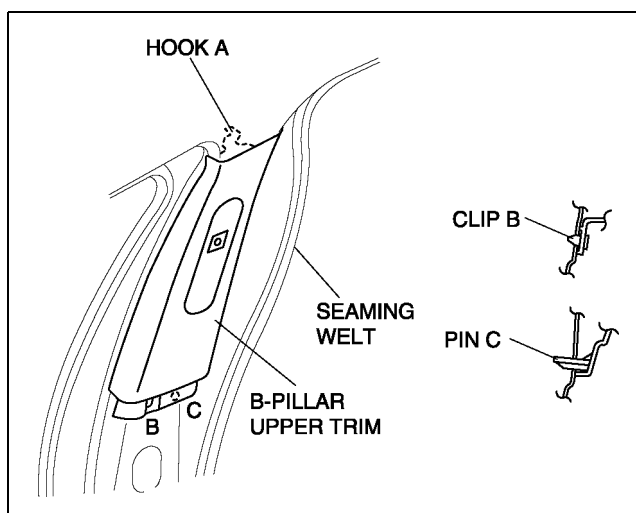


A6E7744W021

B-PILLAR UPPER TRIM REMOVAL/INSTALLATION

A6E774468210W01

1. Remove the upper anchor of the front seat belt.
2. Remove the B-pillar lower trim.
3. Turn the seaming welt over.
4. Pull the B-pillar upper trim toward you, then disengage, clip B, and pin C from the body.
5. Disengage hook A from the body, then remove B-pillar upper trim.
6. Install in the reverse order of removal.

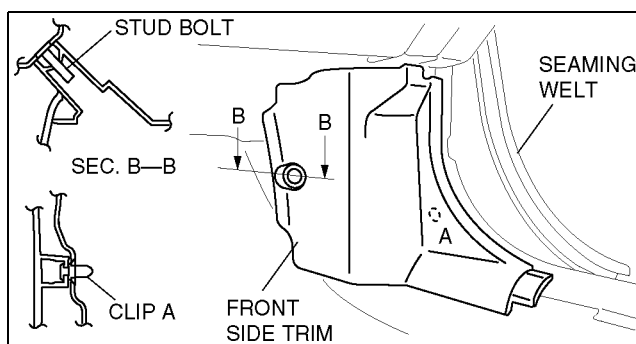


A6E7744W025

FRONT SIDE TRIM REMOVAL/INSTALLATION

A6E774468370W01

1. Remove the front scuff plate.
2. Turn the seaming welt over.
3. Pull the front side trim toward you, then disengage clip A and the stud bolt, then remove the front side trim.
4. Install in the reverse order of removal.

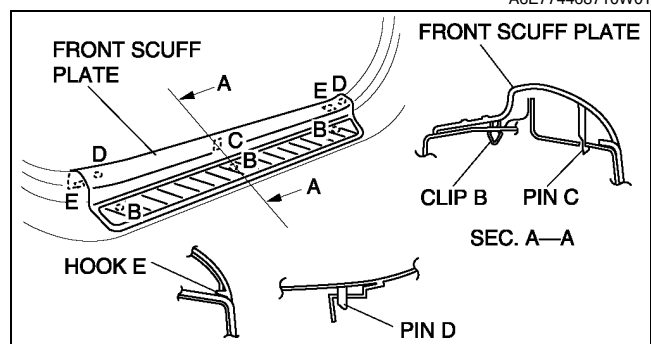


A6E7744W014

TRIM

FRONT SCUFF PLATE REMOVAL/INSTALLATION

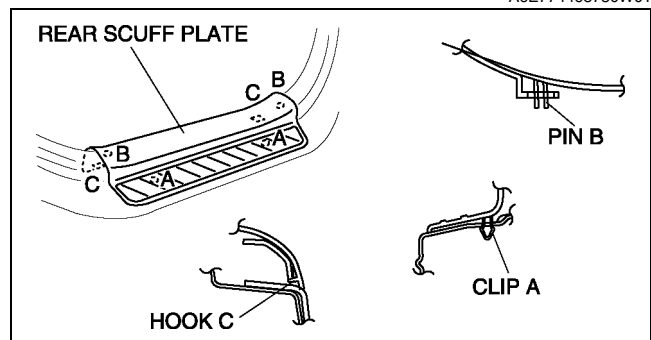
1. Pull the front scuff plate upward, then disengage clips B, pins C, D and hooks E from the body, and remove the front scuff plate.
2. Install in the reverse order of removal.



A6E7744W017

REAR SCUFF PLATE REMOVAL/INSTALLATION

1. Pull the rear scuff plate upward, then disengage clips A, pin B, and hooks C from the body, and remove the rear scuff plate.
2. Install in the reverse order of removal.

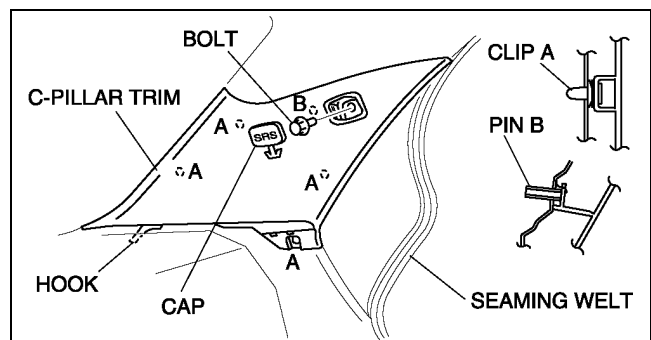


A6E7744W018

C-PILLAR TRIM REMOVAL/INSTALLATION

4SD

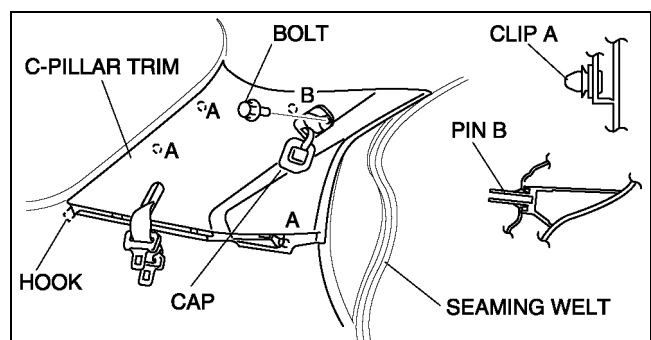
1. Remove the tire house trim.
2. Turn the seaming welt over.
3. Remove the cap using a fastener remover, and remove the bolt (with curtain air bag system).
4. Disengage clips A and clip B using a fastener remover.
5. Pull the C-pillar trim forward, then disengage hook C from the body, and remove the C-pillar trim.
6. Install in the reverse order of removal.



A6E7744W019

5HB

1. Remove the tire house trim.
2. Remove the trunk side upper trim
3. Turn the seaming welt over.
4. Remove the cap using a fastener remover the bolt. (with curtain air bag system)
5. Disengage clips A and pin B using a fastener remover.
6. Pull the C-pillar trim forward, then disengage the hook from the body.
7. Remove the rear center seat belt tongue from the C-pillar trim. (LH only)
8. Remove the C-pillar trim.
9. Install in the reverse order of removal.



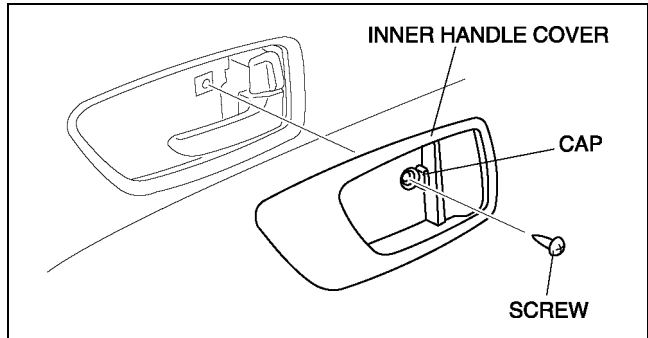
A6E7744W020

TRIM

FRONT DOOR TRIM REMOVAL/INSTALLATION

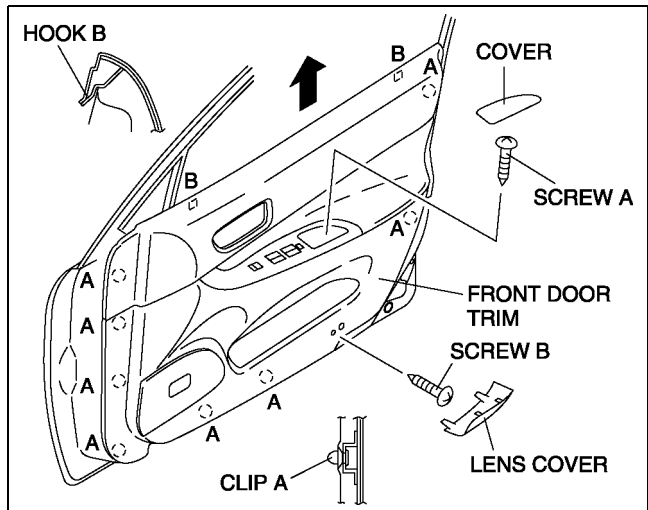
A6E774468420W01

1. Disconnect the negative battery cable.
2. Open the cap using a small screwdriver, then remove the screw.
3. Remove the inner handle cover.
4. Remove the inner garnish.



A6E7744W009

5. Remove the cover, then remove screw A.
6. Remove the lens cover, then remove screw B.
7. Disengage clips A from the front door using a fastener remover.
8. Pull the front door trim upward, then disengage hooks B from the front door.
9. Disconnect the power door mirror switch connector and the power window main switch connector (driver's side) or power window subswitch connector (passenger's side).
10. Remove the courtesy light.
11. Remove the front door trim.
12. Remove the switch panel from the front door trim.
13. Install in the reverse order of removal.

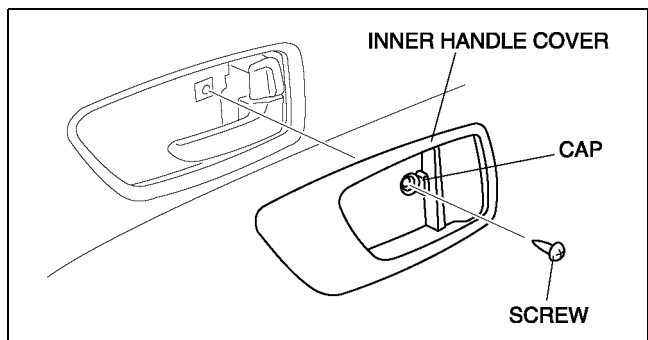


A6E7744W010

REAR DOOR TRIM REMOVAL/INSTALLATION

A6E774468520W01

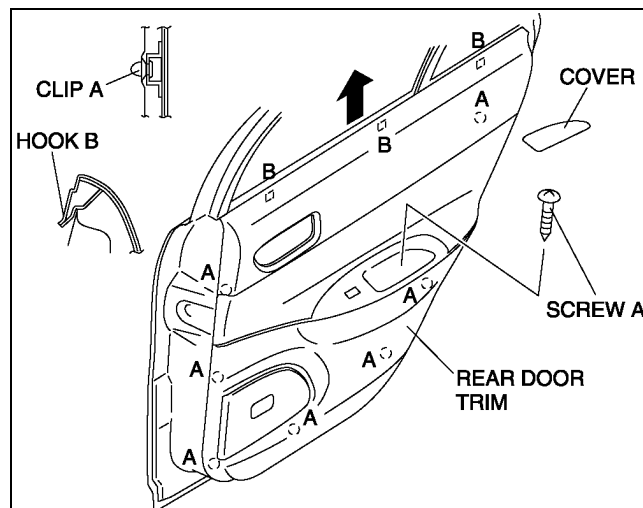
1. Disconnect the negative battery cable if equipped with power window system.
2. Remove the regulator handle if equipped.
3. Open the cap using a small screwdriver, then remove the screw.
4. Remove the inner handle cover.
5. Remove the cover, then remove screw.
6. Disengage clips A from the rear door using a fastener remover.



A6E7744W009

TRIM

7. Pull the rear door trim upward, then disengage hooks B from the rear door.
8. Disconnect the power window subswitch connector if equipped.
9. Remove the rear door trim.
10. Remove the switch panel from the rear door trim.
11. Install in the reverse order of removal.



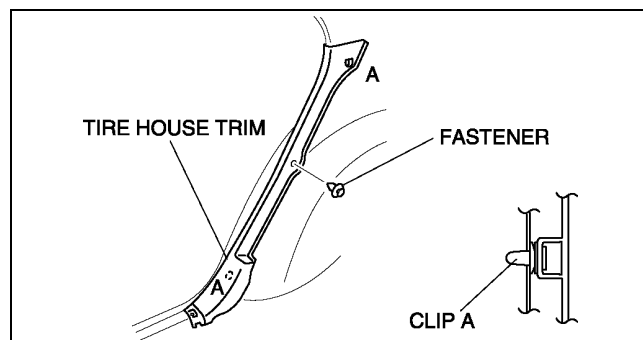
A6E7744W011

TIRE HOUSE TRIM REMOVAL/INSTALLATION

4SD

A6E774468760W01

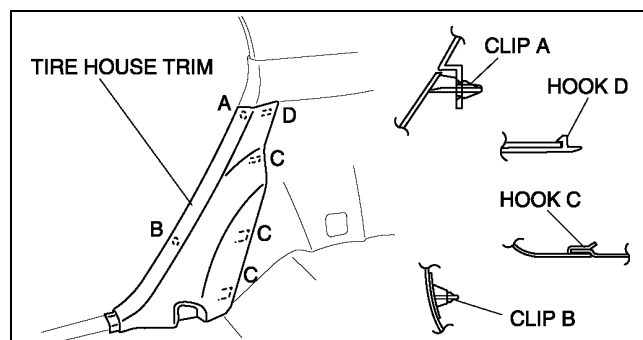
1. Remove the rear scuff plate.
2. Remove the rear seat side.
3. Remove the fastener.
4. Pull the tire house trim upward, then disengage clips A from the body, and remove the tire house trim.
5. Install in the reverse order of removal.



A6E7744W015

5HB

1. Remove the rear scuff plate.
2. Pull the tire house trim toward you, then disengage clip B from the body and clip A, hooks C, D from the trunk side trim.
3. Remove the tire house trim.
4. Install in the reverse order of removal.



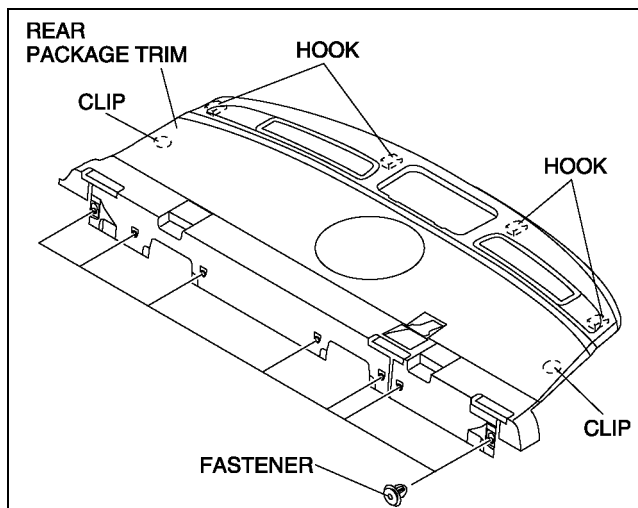
A6E7744W016

TRIM

REAR PACKAGE TRIM REMOVAL/INSTALLATION

A6E774468320W01

1. Remove the high-mount brake light.
2. Fold the rear seat back.
3. Remove the fasteners.
4. Pull the rear package trim upward, then disengage the clips from the body.
5. Disengage the hooks, then remove the rear package trim.
6. Install in the reverse order of removal.



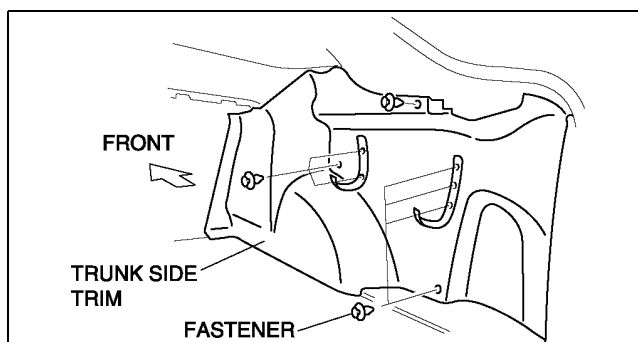
A6E7744W026

TRUNK SIDE TRIM REMOVAL/INSTALLATION

4SD

A6E774468860W01

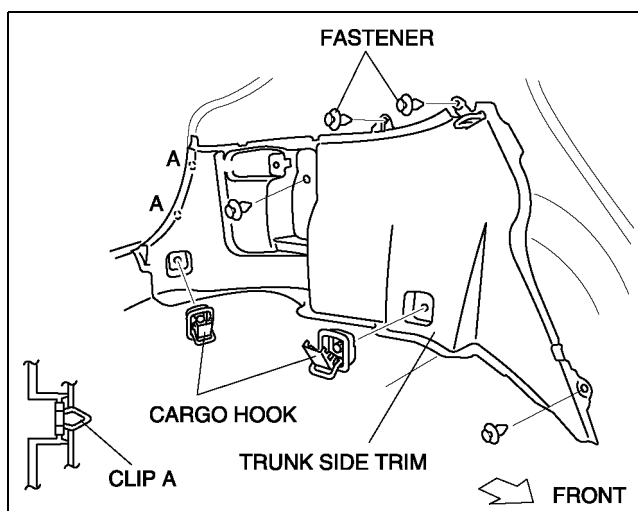
1. Remove the trunk end trim.
2. Remove the fasteners, then remove the trunk side trim.
3. Install in the reverse order of removal.



A6E7744W007

5HB

1. Remove the trunk end trim.
2. Remove the trunk side upper trim.
3. Remove the cargo hooks.
4. Remove the fasteners.
5. Pull the trunk side trim toward you, then disengage clips A from the body.
6. Install in the reverse order of removal.



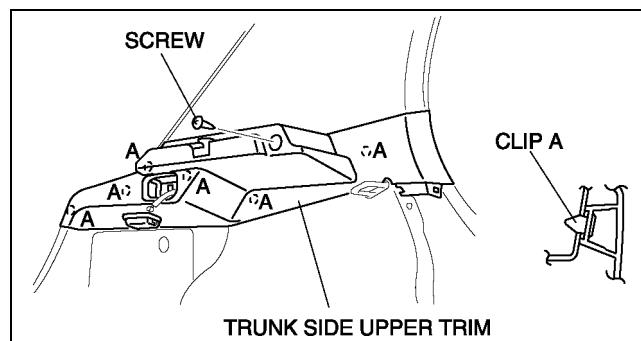
A6E7744W008

TRIM

TRUNK SIDE UPPER TRIM REMOVAL/INSTALLATION

A6E774468860W02

1. Disconnect the negative battery cable. (LH only)
2. Remove the tire house trim.
3. Remove the rear seat remote lever.
4. Remove the screw.
5. Pull the trunk side upper trim toward you, then disengage clips A from the body.
6. Disconnect the cargo compartment light connector. (LH only)
7. Install in the reverse order of removal.

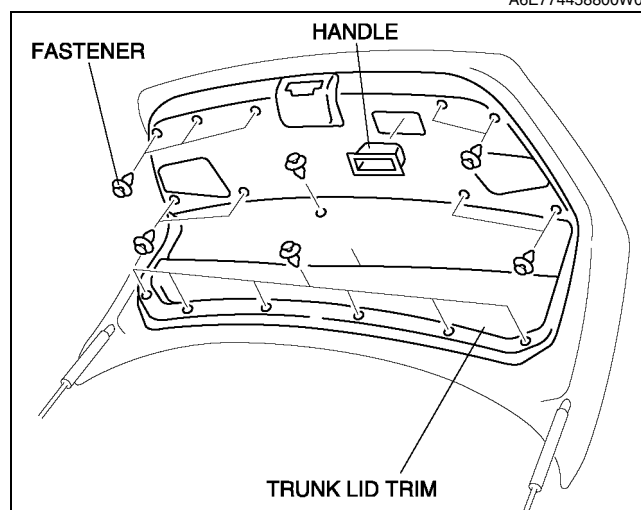


A6E7744W006

TRUNK LID TRIM REMOVAL/INSTALLATION

A6E774458800W01

1. Pull the handle toward you, then remove the handle.
2. Remove the fasteners, then remove the trunk lid trim.
3. Install in the reverse order of removal.



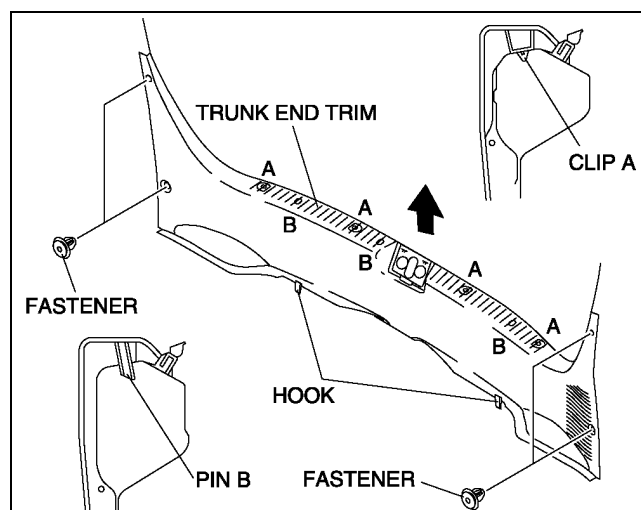
A6E7744W005

TRUNK END TRIM REMOVAL/INSTALLATION

A6E774468890W01

4SD

1. Remove the fasteners.
2. Pull the trunk end trim upward, then disengage clips A, pins B, and hooks.
3. Remove the trunk end trim.
4. Install in the reverse order of removal.

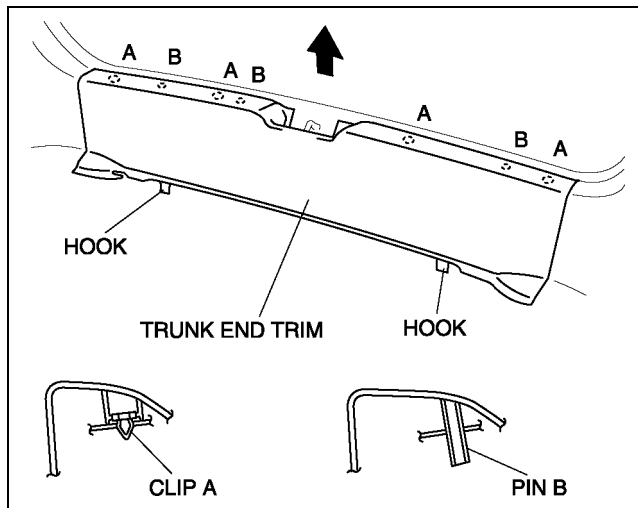


A6E7744W012

TRIM

5HB

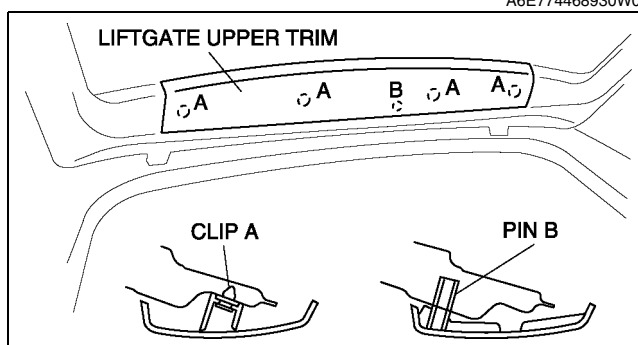
1. Pull the trunk end trim upward, then disengage clips A, pins B, and hooks.
2. Remove the trunk end trim.
3. Install in the reverse order of removal.



A6E7744W013

LIFTGATE UPPER TRIM REMOVAL/INSTALLATION

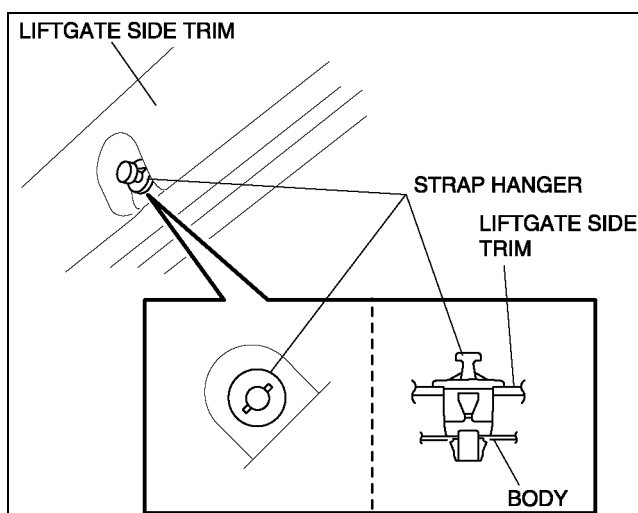
1. Pull the liftgate upper trim toward you, then disengage clips A, and pin B from the body.
2. Remove the liftgate upper trim.
3. Install in the reverse order of removal.



A6E7744W002

LIFTGATE SIDE TRIM REMOVAL/INSTALLATION

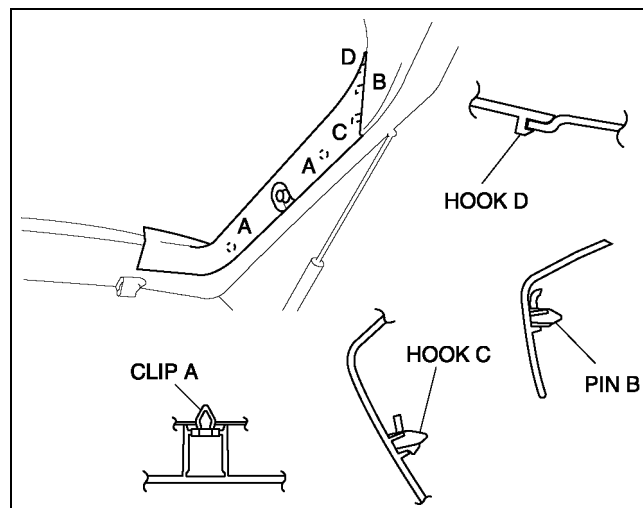
1. Remove the liftgate upper trim.
2. Position the strap hanger as shown in the figure.



A6E7744W003

TRIM

3. Pull the liftgate side trim toward you, then disengage clips A, pin B and the strap hanger from the body and pin B, hook C, D from the liftgate lower trim.
4. Remove the liftgate side trim.
5. Remove the hanger strap from the liftgate side trim.
6. Install in the reverse order of removal.

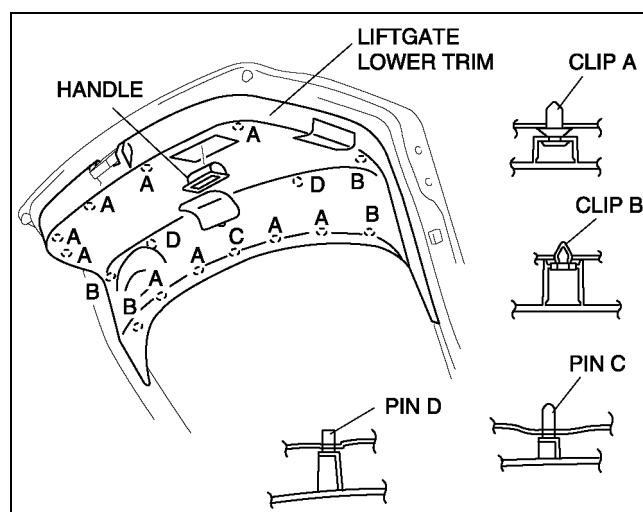


A6E7744W004

LIFTGATE LOWER TRIM REMOVAL/INSTALLATION

1. Remove the liftgate upper trim.
2. Remove the liftgate side trim.
3. Pull the handle toward you, then remove the handle.
4. Pull the liftgate lower trim toward you, then disengage clips A, B and pins C, D from the body.
5. Remove the liftgate lower trim.
6. Install in the reverse order of removal.

A6E774468960W01



A6E7744W001

HEADLINER

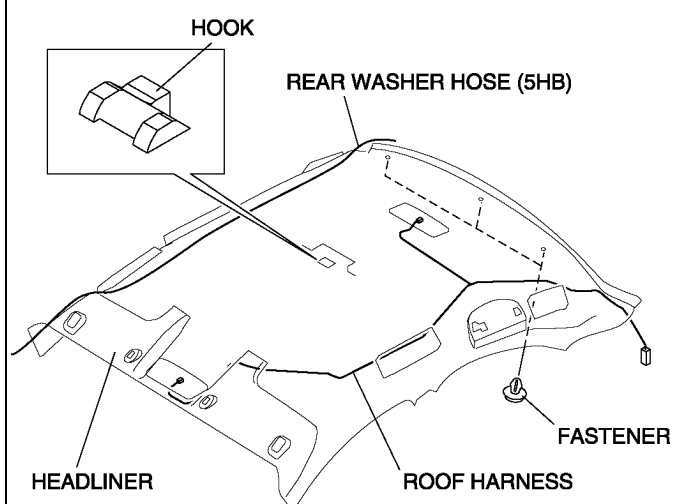
HEADLINER

HEADLINER REMOVAL/INSTALLATION

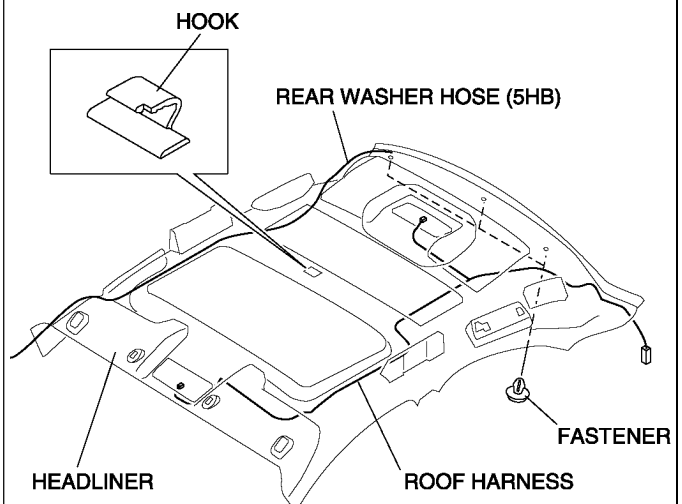
A6E774668030W01

1. Disconnect the negative battery cable.
2. Turn the seaming welt and weatherstrip over.
3. Remove the sunroof seaming welt. (vehicles with sunroof only)
4. Remove the A-pillar trims.
5. Remove the B-pillar upper trims.
6. Remove the C-pillar trims.
7. Remove the front and rear map light. (See [T-48 FRONT MAP LIGHT REMOVAL/INSTALLATION.](#))
(See [T-49 REAR MAP LIGHT REMOVAL/INSTALLATION.](#))
8. Remove the sunvisors.
9. Remove the assist handle.
10. Disconnect the roof harness connector, remove the clip, and remove the connector.
11. Remove the fasteners.
12. Disconnect the front and rear drain hose.
13. Disconnect the rear washer hose (5HB).
14. Remove the hook holding the roof panel and remove the headliner.

WITHOUT SUNROOF



WITH SUNROOF



A6E7746W004

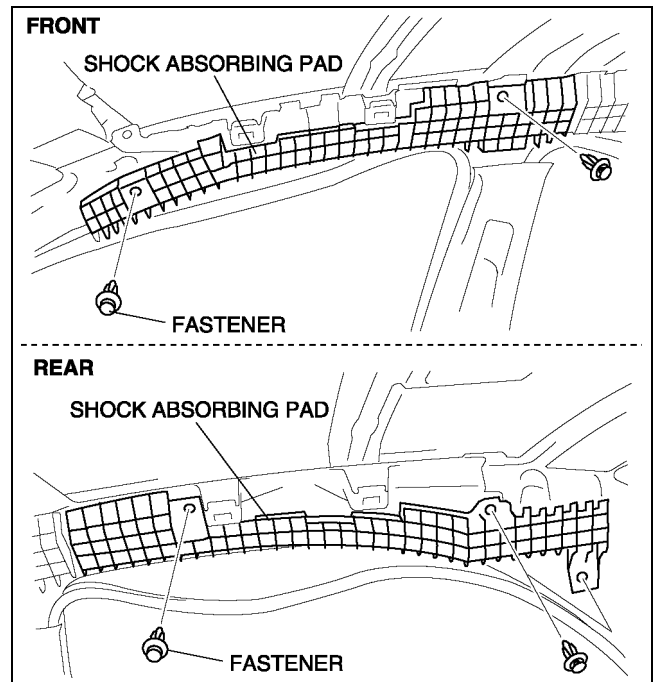
15. Take the headliner off from the passenger-side door opening.
16. Install in the reverse order of removal.

HEADLINER

SHOCK ABSORBING PAD REMOVAL/INSTALLATION

A6E774668H10W01

1. Remove the headliner.
2. Remove the fastener, then remove the shock absorbing pad.
3. Install in the reverse order of removal.

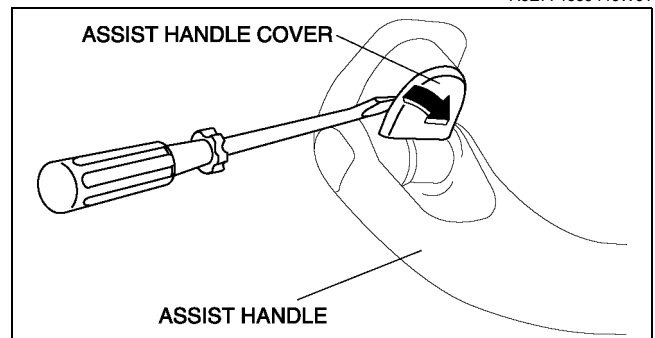


A6E7746W003

ASSIST HANDLE REMOVAL/INSTALLATION

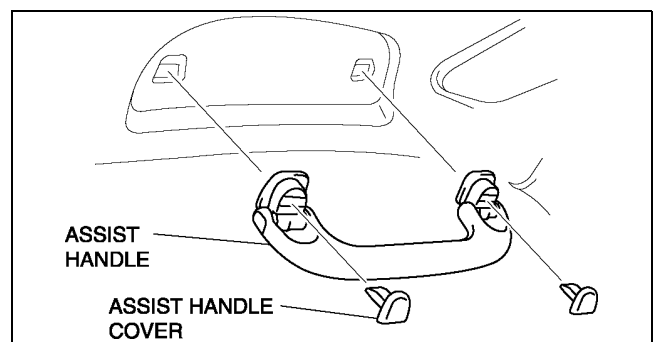
1. Insert a screwdriver into the assist handle notch and remove the assist handle cover.

A6E774669440W01



A6E7746W001

2. Pull the assist handle forward you, then remove the assist handle.
3. Install in the reverse order of removal.



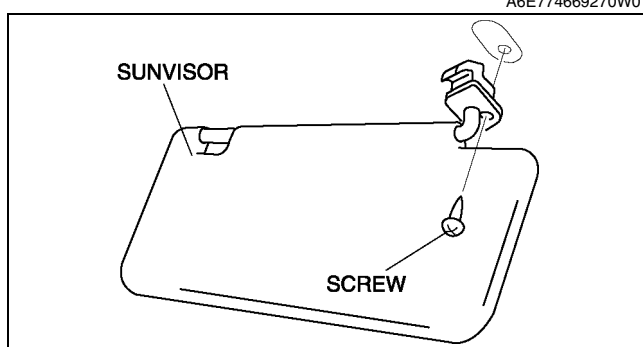
A6E7746W002

S

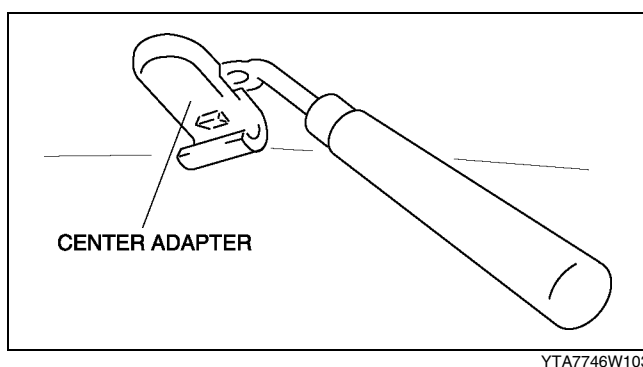
HEADLINER

SUNVISOR REMOVAL/INSTALLATION

1. Remove the screws, then the sunvisor.



2. Disengage the center adapter (sunvisor stopper) from the body using a fastener remover.
3. Install in the reverse order of removal.



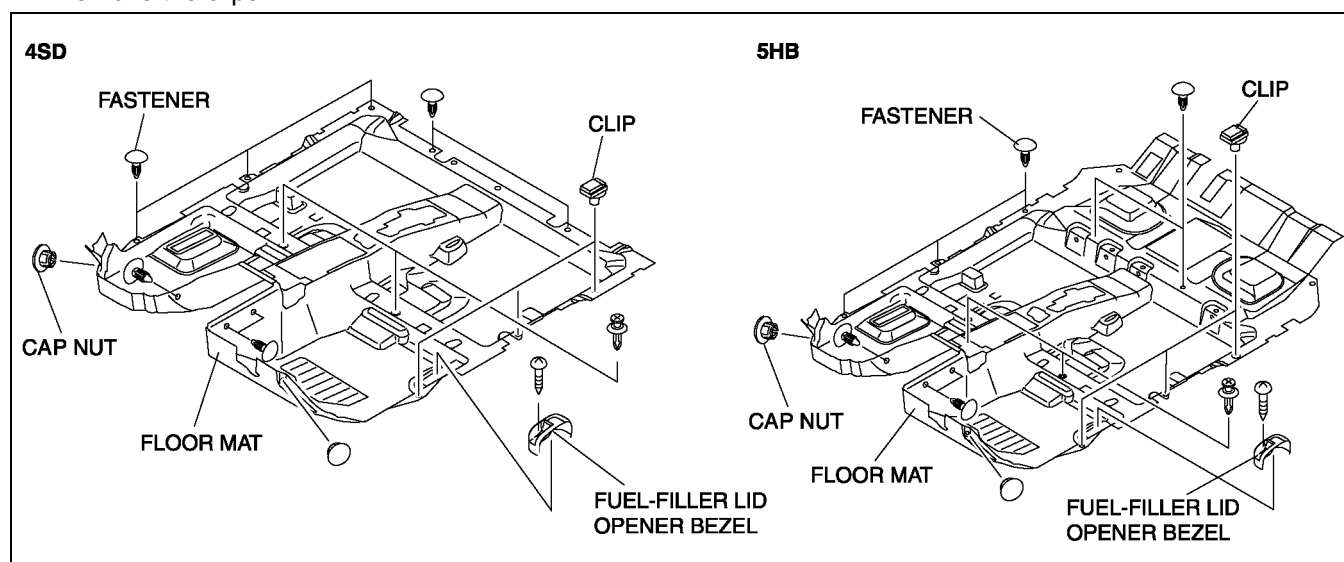
FLOOR COVERING

FLOOR COVERING

FRONT FLOOR COVERING REMOVAL/INSTALLATION

A6E774868670W01

1. Disconnect the negative battery cable.
2. Remove the front seats. (See [S-105 FRONT SEAT REMOVAL/INSTALLATION.](#))
3. Remove the rear seat.
4. Remove the front scuff plates.
5. Remove the rear scuff plates.
6. Remove the console.
7. Remove the front side trims.
8. Remove the B-pillar lower trims.
9. Remove the lower anchor of the front seat belt installation bolts.
10. Remove the tire house trim. (5HB)
11. Remove the fuel-filler lid opener bezel.
12. Remove the fasteners.
13. Remove the cap nuts.
14. Remove the clips.



A6E7748W001

15. Take the front floor covering off from the passenger-side door opening.
16. Install in the reverse order of removal.

SEAT BELT

SEAT BELT

FRONT SEAT BELT REMOVAL/INSTALLATION

A6E775057630W01

Warning

- Handling the front seat belt (pre-tensioner seat belt) improperly can accidentally deploy the pre-tensioner, which may seriously injure you. Read **SERVICE WARNINGS** before handling the front seat belt. (See **T-117 SERVICE WARNINGS**.)

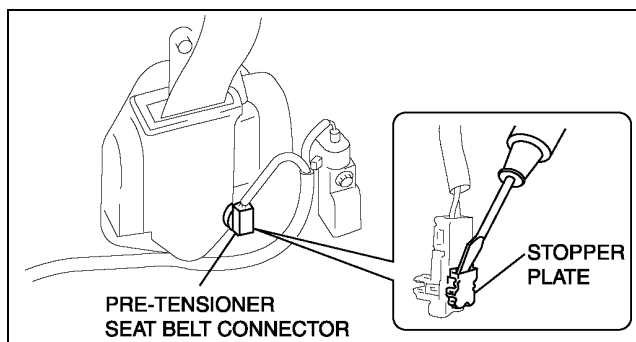
Warning

- The side air bag sensor is attached to the lower part of the B-pillar. When working around the B-pillar, disconnect the negative battery cable or work carefully, avoiding excessive impact to the lower part of the B-pillar.

Caution

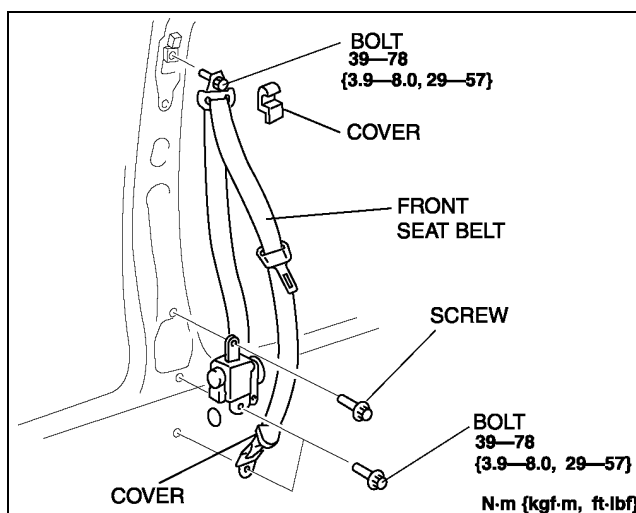
- The ELR has a spring that will unwind if the retractor's cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the B-pillar lower trim.
4. Using a screwdriver, pry out the pre-tensioner seat belt connector's stopper plate.
5. Disconnect the pre-tensioner seat belt connector.



A6E7750W008

6. Remove the covers.
7. Remove the bolts and screw, then remove the front seat belt.
8. Install in the reverse order of removal.
9. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
 - If the air bag system warning light does not operate in the manner described above, there are malfunction in the system. Inspect the system using the on-board diagnostic function.



A6E7750W007

SEAT BELT

REAR SIDE SEAT BELT REMOVAL/INSTALLATION

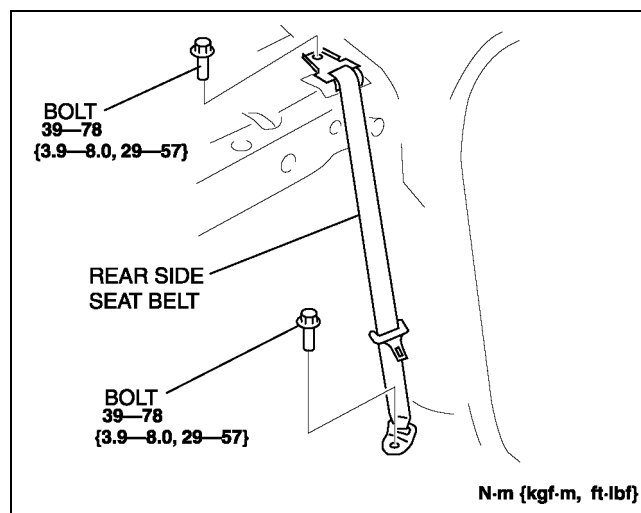
A6E775057730W01

Caution

- The ELR has a spring that will unwind if the retractor's cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.

4SD

1. Fold the rear seat back.
2. Remove the rear side seats.
3. Remove the rear package trim.
4. Remove the bolts.
5. Remove the rear seat belt.
6. Install in the reverse order of removal.



A6E7750W005

5HB

Note

- Rear side seat belts are embedded in the rear seat back. See rear seat disassembly/assembly, remove/install the rear center seat belt.

REAR CENTER SEAT BELT REMOVAL/INSTALLATION

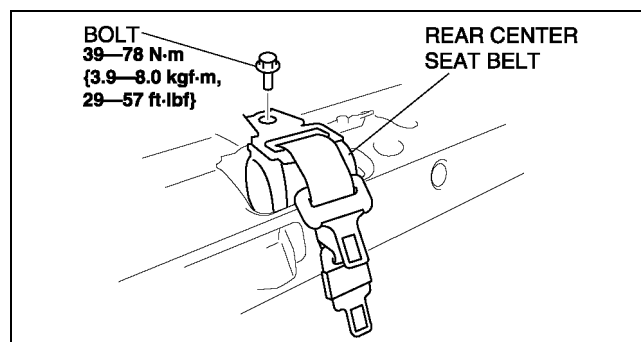
A6E775057730W02

Caution

- The ELR has a spring that will unwind if the retractor's cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.

4SD

1. Fold the rear seat back.
2. Remove the rear package trim.
3. Remove the bolt.
4. Remove the rear center seat belt.
5. Install in the reverse order of removal.

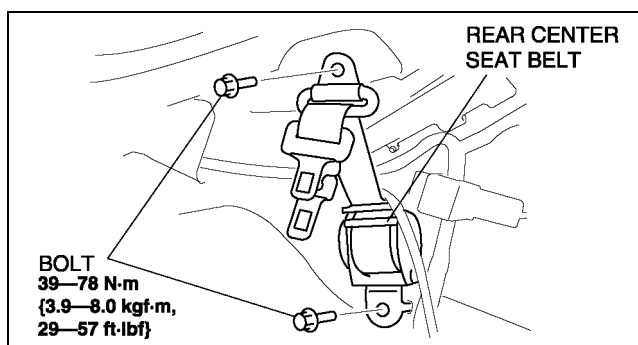


A6E7750W003

SEAT BELT

5HB

1. Remove the rear scuff plate.
2. Remove the tire house trim.
3. Remove the trunk side upper trim.
4. Remove the C-pillar trims.
5. Remove the bolts.
6. Remove the rear center seat belt.
7. Install in the reverse order of removal.

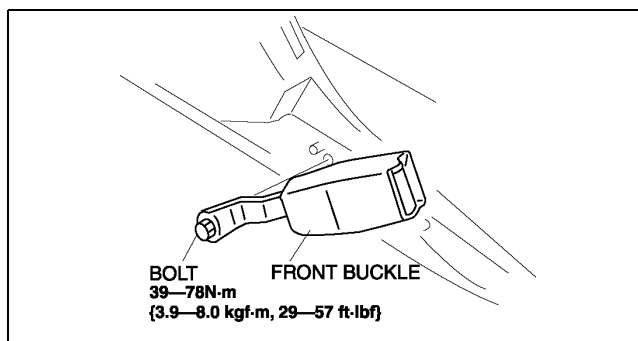


A6E7750W004

FRONT BUCKLE REMOVAL/INSTALLATION

1. Perform the following procedure for vehicles with seat belt warning.
 - (1) Disconnect the negative battery cable.
 - (2) Remove the front seat.
 - (3) Disconnect the buckle switch connector.
2. Perform the following procedure for vehicles without seat belt warning.
 - (1) Remove the console.
3. Remove bolt.
4. Install in the reverse order of removal.

A6E775057620W01

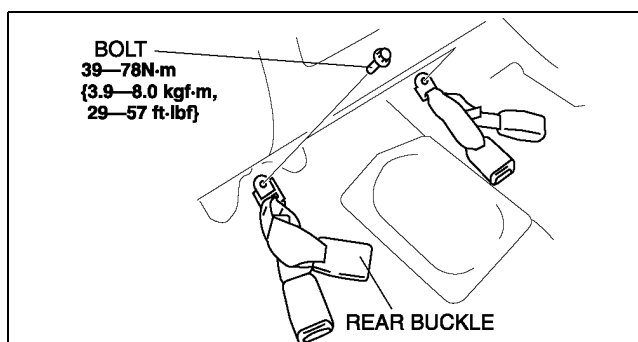


A6E7750W002.

REAR BUCKLE REMOVAL/INSTALLATION

1. Remove the rear seat cushion.
2. Remove the bolts.
3. Remove the rear buckles.
4. Install in the reverse order of removal.

A6E775057720W01



A6E7750W006

SEAT BELT

SEAT BELT INSPECTION

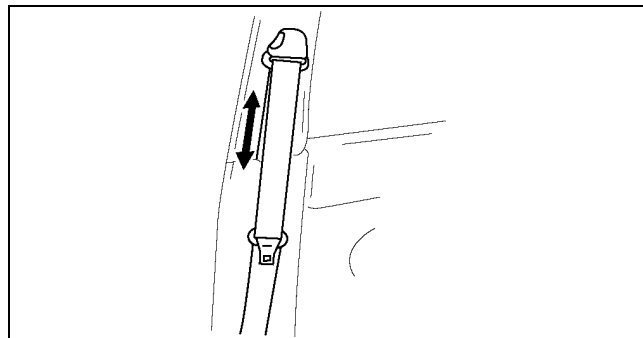
A6E775057000W01

Belt

1. Confirm that the seat belt is installed correctly.
2. Inspect the seat belt for damage and deformation of metal parts.
 - If any damage is found, replace as necessary.

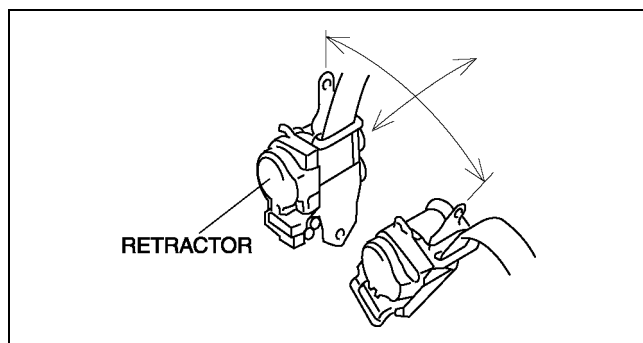
ELR

1. Verify that the belt can be pulled out smoothly, and that it moves smoothly when wound.
 - If not as specified, replace the seat belt.
2. Verify that the retractor locks when the belt is quickly pulled.
 - If not as specified, replace the seat belt.
3. Remove the retractor.



YMU811WB0

4. Make sure that the seat belt does not lock when the retractor is tilted slowly up to **15°** from the mounted position and locks when the retractor is tilted **40° or more**.
 - If not as specified, replace the seat belt.



YMU811WA4

ALR

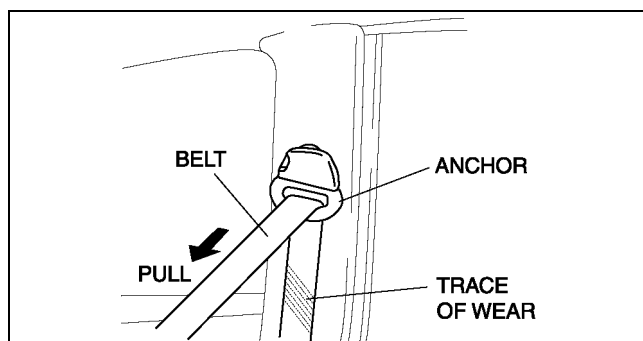
1. Pull the belt out fully and the lock mode changes from ELR to ALR.
2. Verify that retractor makes a clicking sound as the belt slowly retracts. If no sound is heard, the lock mode has not changed to ALR. If necessary, repeat the above Step 1.
 - If not as specified, replace the seat belt.
3. Verify that the belt locks when pulled.
 - If not as specified, replace the seat belt.
4. Verify that the lock mode changes to ELR when the belt fully retracts.
 - If not as specified, replace the seat belt.

Load Limiter Retractor

Warning

- **When the load limiter operates, the belt and anchor rub against each other strongly leaving a trace of wear. If the seat belt is used in this state, the seat belt will not function to its designed effect and there is the possibility of serious injury to passengers. Be sure to replace the seat belt once the load limiter operates.**

1. If the vehicle has been subjected to a shock in an accident, pull the belt from the retractor and confirm that there is no trace of wear (the load limiter has not operated) by visually inspecting and feeling the belt.
 - If not as specified, replace the seat belt.



YMU811WA6

SEAT BELT

BUCKLE SWITCH INSPECTION

A6E775057620W02

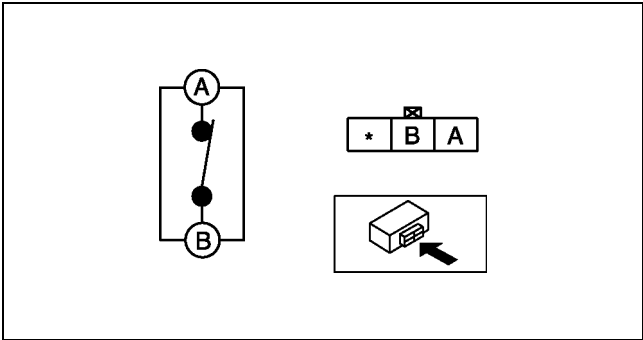
Driver's Seat

- 1. Disconnect the negative battery cable.
- 2. Disconnect the buckle switch connector.
- 3. Inspect for continuity between the buckle switch terminals using an ohmmeter.
 - If not as specified, replace the front buckle.

○—○ : Continuity

Seat belt	Terminal	
	A	B
Fastened		
Unfastened	○—○	○—○

A6E7750W009

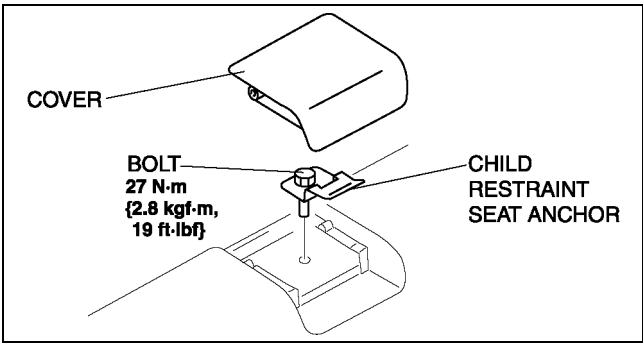


A6E7750W010

CHILD RESTRAINT SEAT ANCHOR REMOVAL/INSTALLATION

A6E77505777ZW01

- 1. Remove the cover.
- 2. Remove the bolt and child restraint seat anchor.
- 3. Install in the reverse order of removal.



A6E7750W001

SEAT

SEAT

FRONT SEAT REMOVAL/INSTALLATION

A6E775257100W01

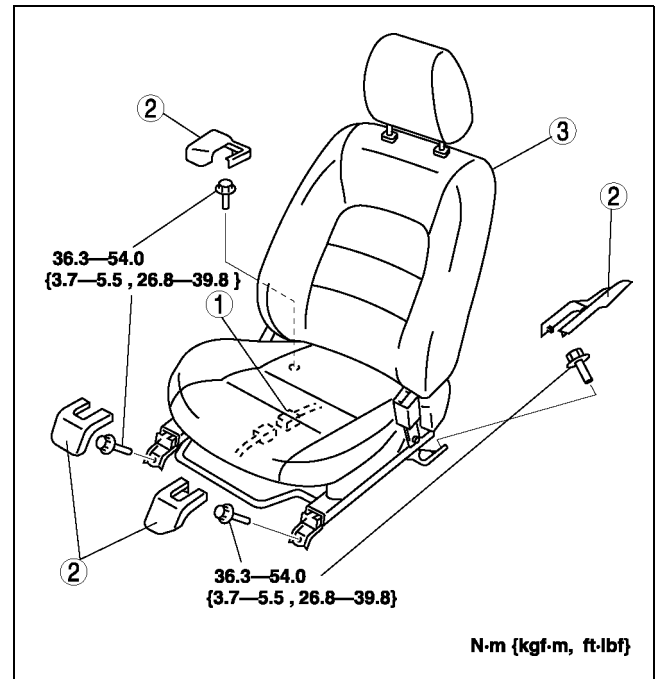
Warning

- Handling the front seat (side air bag) improperly can accidentally deploy the side air bag, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the front seat. (See [T-117 SERVICE WARNINGS](#).)

- Turn the ignition switch to the LOCK position.
- Disconnect the negative battery cable and wait for **more than 1 minute**.
- Remove in the order indicated in the table.

1	Connector
2	Cover
3	Front seat

- Install in the reverse order of removal.



A6E7752W002

SEAT

FRONT SEAT DISASSEMBLY/ASSEMBLY

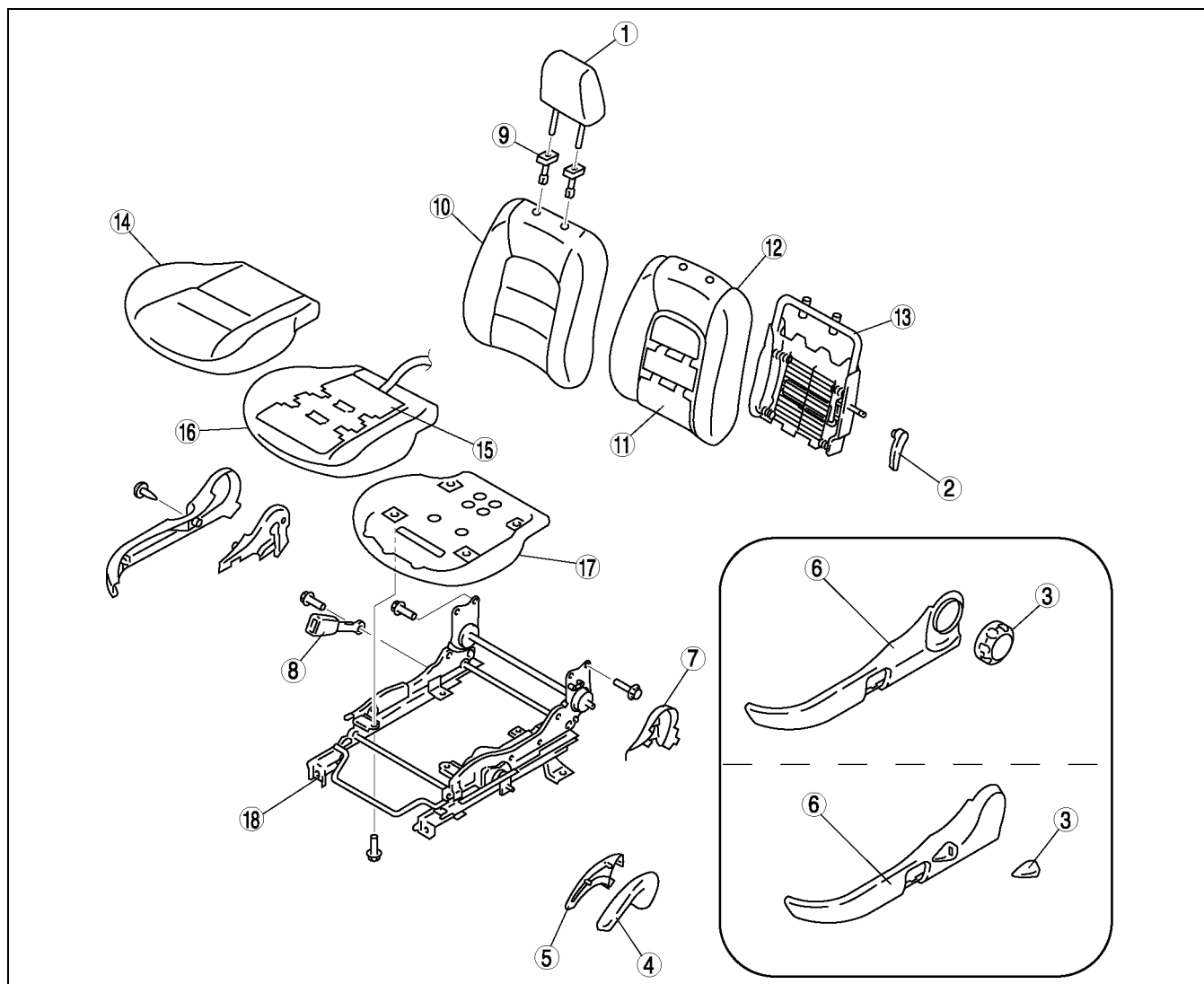
A6E775257100W02

Warning

- Handling the front seat (side air bag) improperly can accidentally deploy the side air bag, which may seriously injure you. Read **AIR BAG SYSTEM SERVICE WARNINGS** before handling the front seat. (See **T-117 SERVICE WARNINGS**.)

1. Disconnect the negative battery cable and wait for **more than 1 minute**.
2. Remove the side air bag module. (See **T-121 SIDE AIR BAG MODULE REMOVAL/INSTALLATION**.)
3. Disassemble in the order indicated in the table.
4. Assemble in the reverse order of disassembly.

Driver's Seat (Normal Seat)



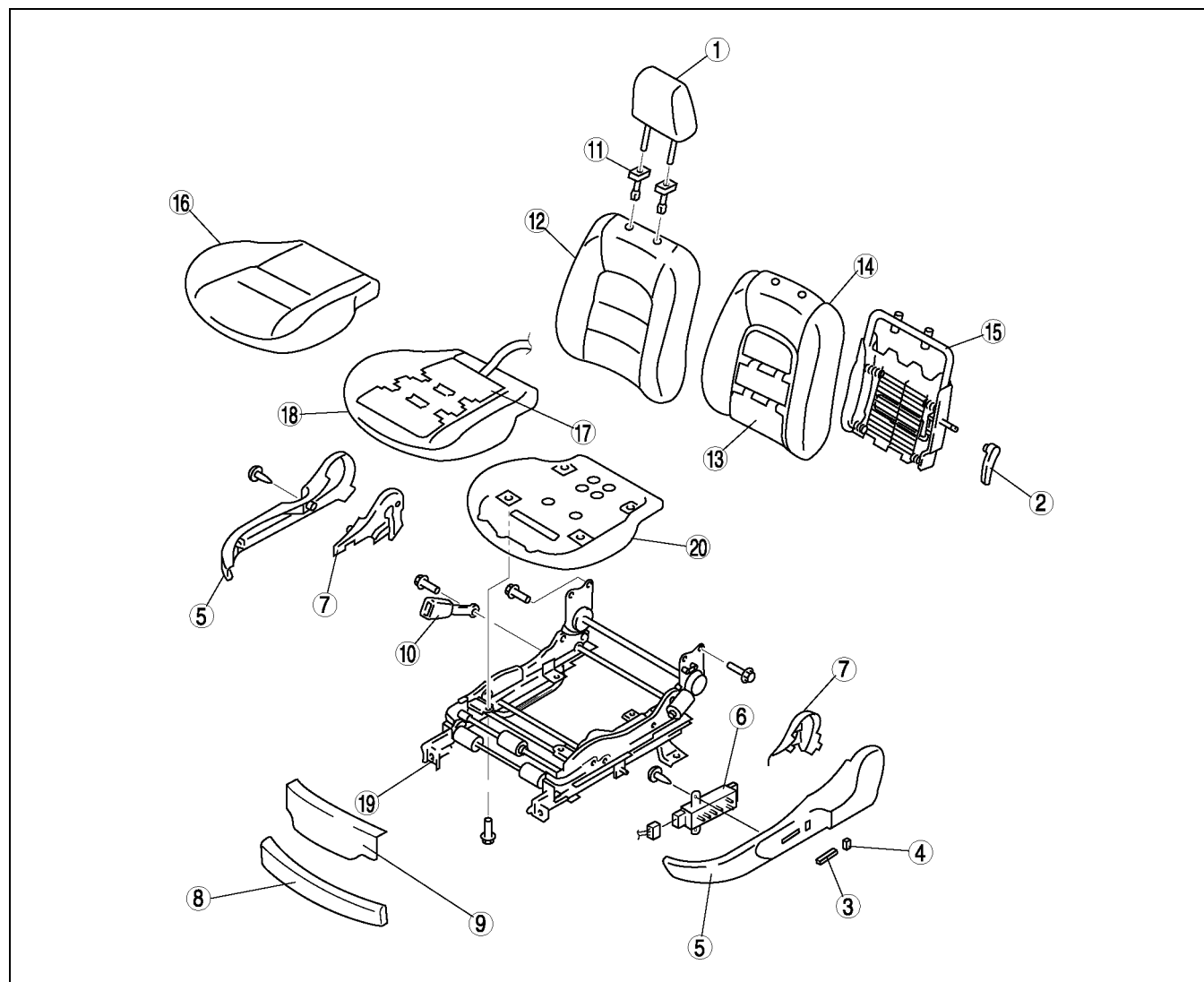
A6E7752W017

1	Headrest
2	Lumber support lever (See S-109 Lumber support lever disassembly note .)
3	Recliner dial (dial type) (See S-109 Recliner dial disassembly note .) Recliner lever (lever type)
4	Lift lever outer
5	Lift lever inner
6	Side cover (See S-109 Side cover disassembly note .)
7	Reverse cover

8	Front buckle
9	Pole guide
10	Seat back trim
11	Seat warmer unit (European (L.H.D.) specs. only)
12	Seat back pad
13	Seat back frame
14	Seat cushion trim
15	Seat warmer unit (European (L.H.D.) specs. only)
16	Seat cushion pad
17	Seat cushion frame
18	Slide adjuster

SEAT

Driver's Seat (Power Seat)



A6E7752W027

1	Headrest
2	Lumber support lever (See S-109 Lumber support lever disassembly note.)
3	Slider and lifter switch knob
4	Recliner switch knob
5	Side cover (See S-109 Side cover disassembly note.)
6	Power seat switch
7	Reverse cover
8	Front cover No. 1
9	Front cover No. 2

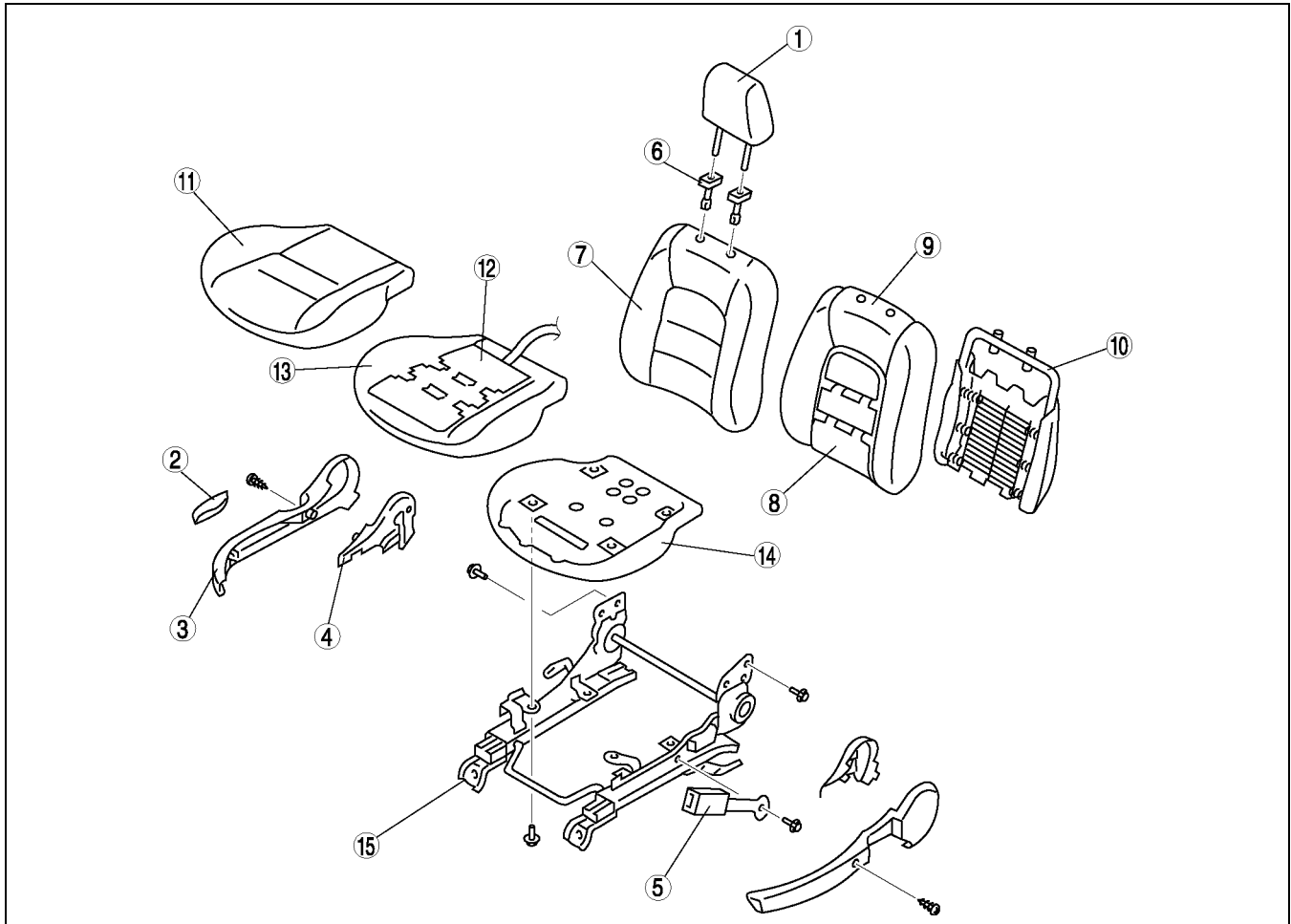
10	Front buckle
11	Pole guide
12	Seat back trim
13	Seat warmer unit (European (L.H.D.) specs. only)
14	Seat back pad
15	Seat back frame
16	Seat cushion trim
17	Seat warmer unit (European (L.H.D.) specs. only)
18	Seat cushion pad
19	Seat cushion frame
20	Slide adjuster

SEAT

Passenger's Seat

Warning

- Do not disassemble the seat cushion. Doing so will necessitate reassembly which may damage or press the occupancy sensor. This will cause the misoperation of the air bag system, which may seriously injure you.



A6E7752W003

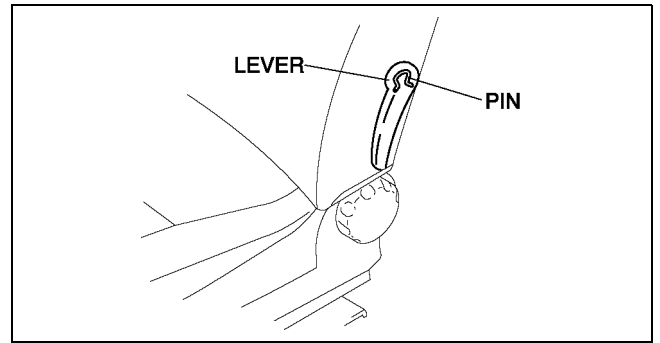
1	Headrest
2	Recliner lever
3	Side cover (See S-109 Side cover disassembly note.)
4	Reverse cover
5	Front buckle
6	Pole guide
7	Seat back trim

8	Seat warmer unit (European (L.H.D.) specs. only)
9	Seat back pad
10	Seat back frame
11	Seat cushion trim
12	Seat warmer unit (European (L.H.D.) specs. only)
13	Seat cushion pad
14	Seat cushion frame
15	Slide adjuster

SEAT

Lumber support lever disassembly note

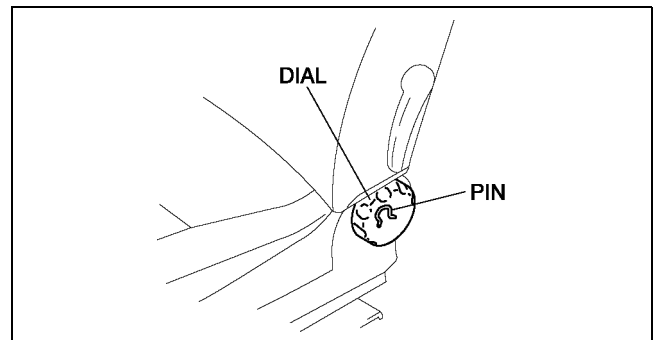
1. Remove the pin from the lumber support lever installation part with rag.



A6E7752W018

Recliner dial disassembly note

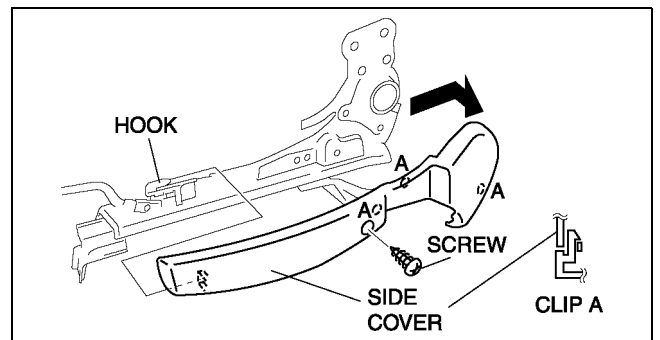
1. Remove the pin from the recliner dial installation part with rag.



A6E7752W019

Side cover disassembly note

1. Remove the screws.
2. Disengage the clips.
3. Lift the side cover up in the direction of the arrow, then unhook it from slide adjuster.



A6E7752W004

S

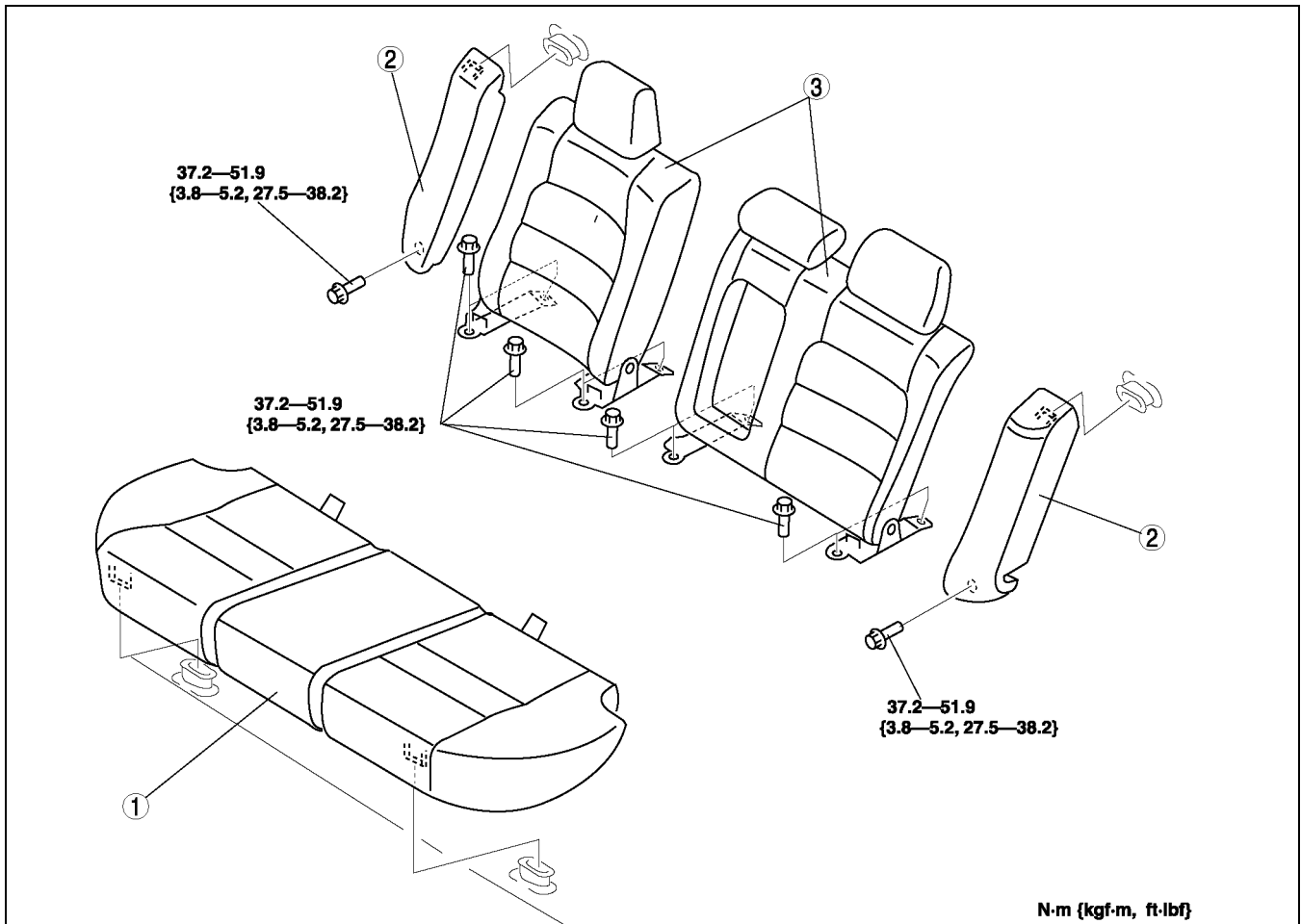
SEAT

REAR SEAT REMOVAL/INSTALLATION

A6E775257200W01

4SD

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



A6E7752W006

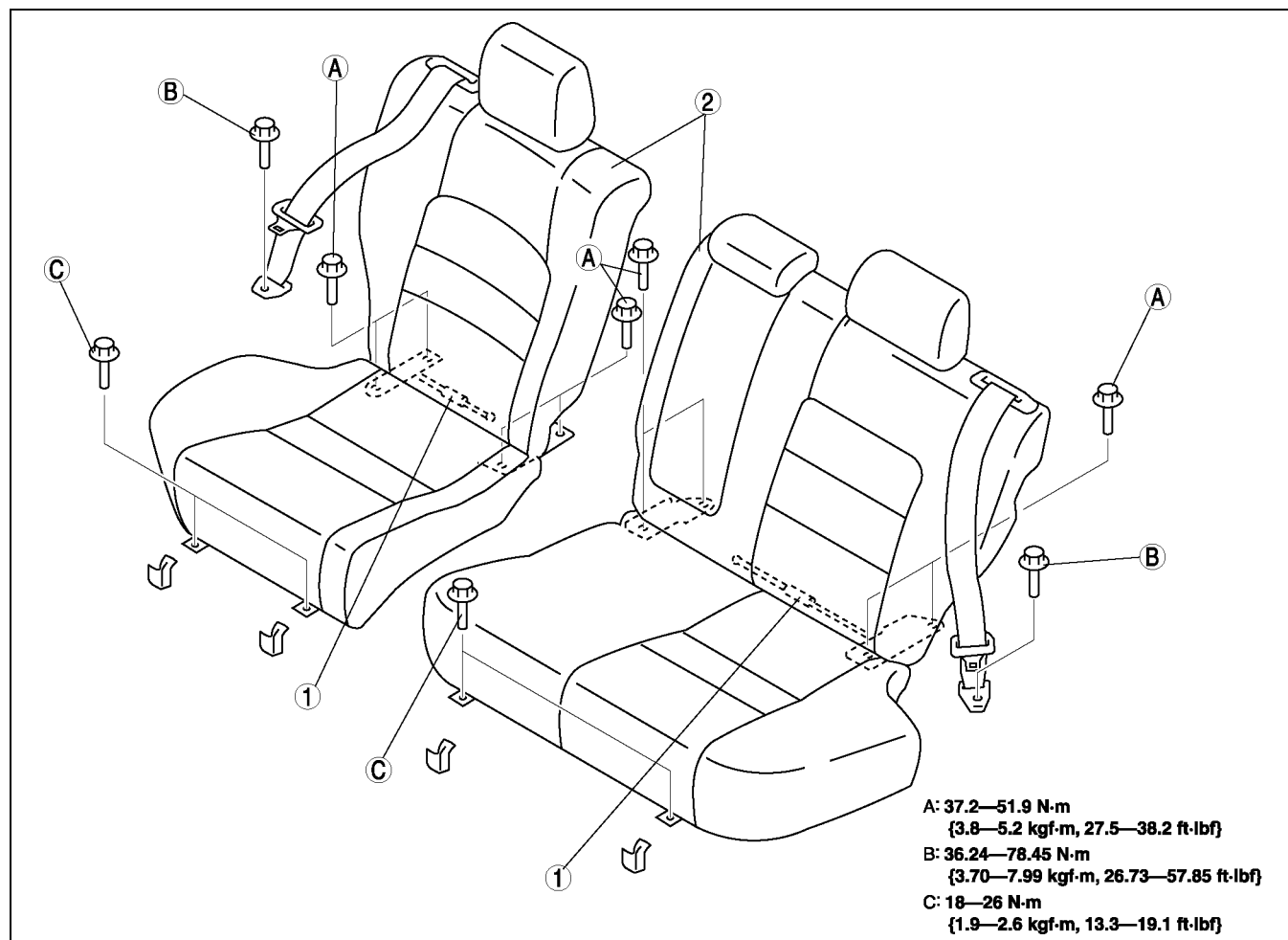
1	Rear seat cushion
2	Rear side seat

3	Rear seat back

SEAT

5HB

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



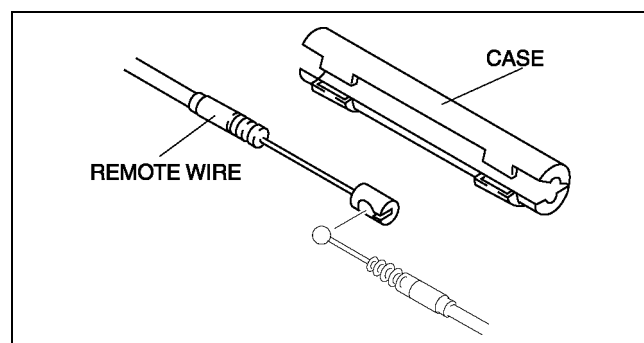
A6E7752W012

1	Remote wire (See S-111 Remote wire removal note.)

2	Rear seat (See S-112 Rear seat removal note.)

Remote wire removal note

1. Turn over the trunk floor mat.
2. Remove the case.
3. Remove the remote wire.

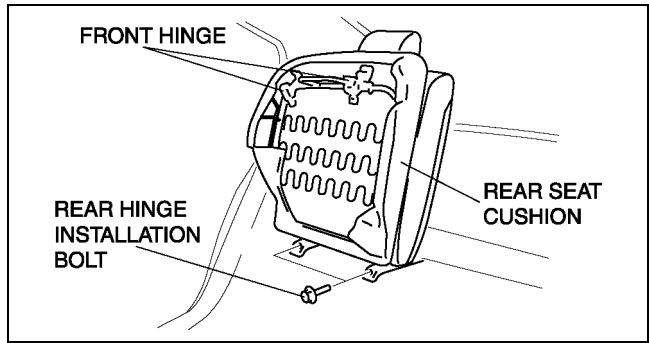


A6E7752W014

SEAT

Rear seat removal note

1. Remove the front hinge installation bolts.
2. Lift the rear seat cushion, then remove the rear hinge installation bolts.



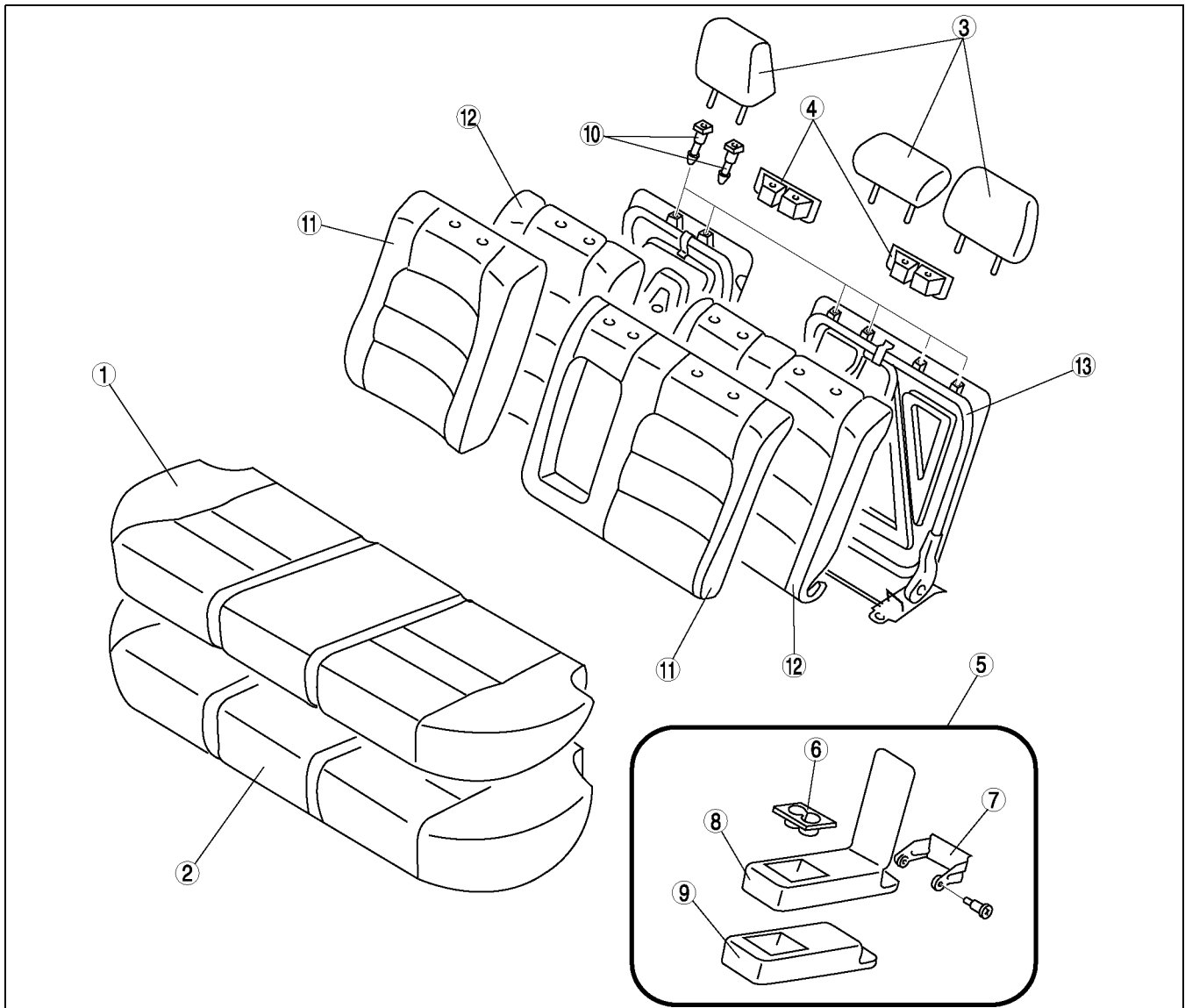
A6E7752W013

REAR SEAT DISASSEMBLY/ASSEMBLY

4SD

A6E775257200W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A6E7752W007

1	Seat cushion trim
2	Seat cushion pad
3	Headrest
4	Striker cover

5	Armrest assembly
6	Cup holder
7	Armrest hinge
8	Armrest trim

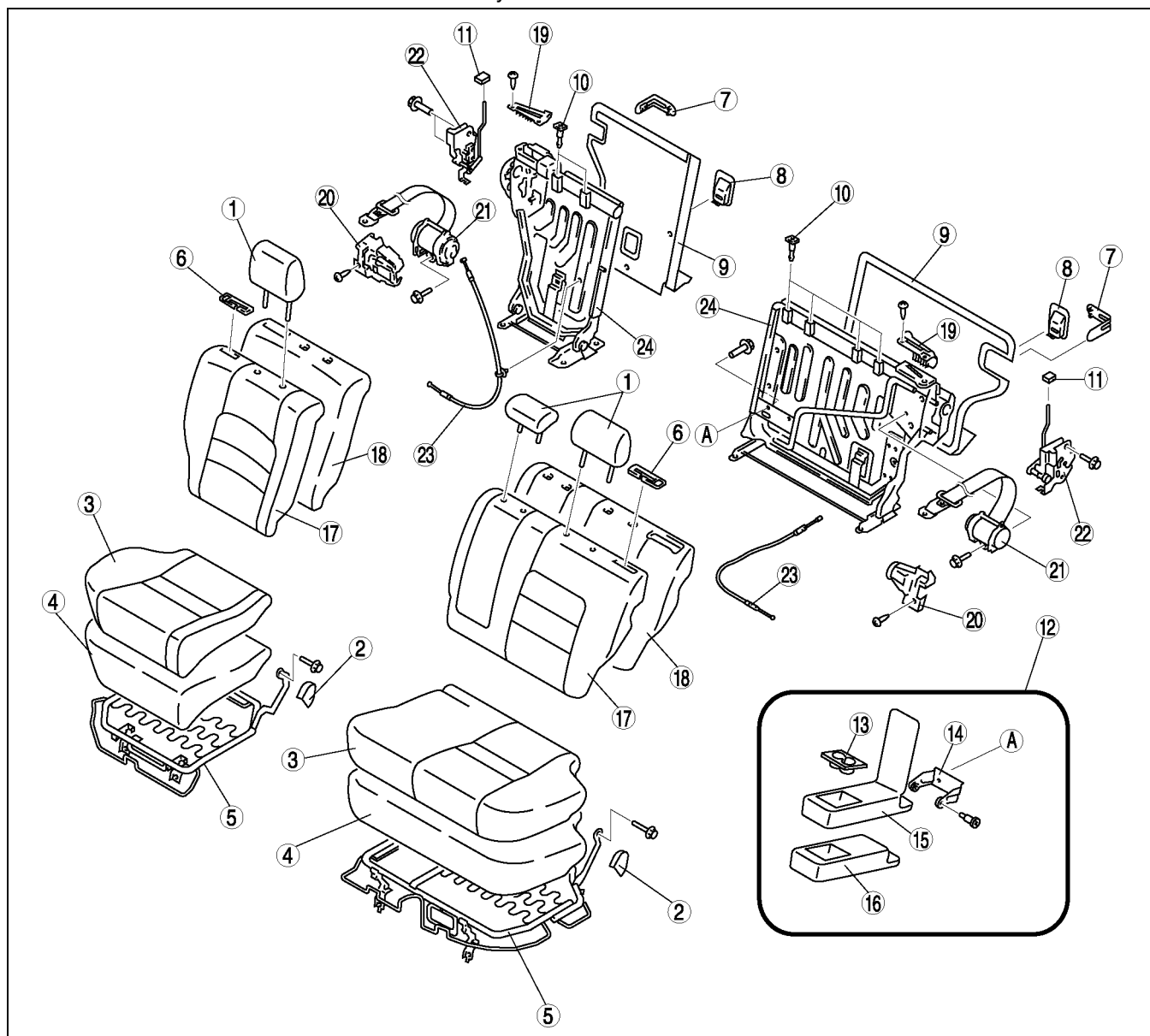
SEAT

9	Armrest pad
10	Pole guide
11	Seat back trim

12	Seat back pad
13	Seat back frame

5HB

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A6E7752W015

1	Headrest
2	Hinge cover
3	Seat cushion trim
4	Seat cushion pad
5	Seat cushion frame
6	Remote button cover
7	Seat back catch cover
8	Child seat anchor cover
9	Seat back board
10	Pole guide
11	Remote button
12	Armrest assembly

13	Cup holder
14	Armrest hinge
15	Armrest trim
16	Armrest pad
17	Seat back trim
18	Seat back pad
19	Seat belt guide
20	Retractor cover
21	Rear seat belt
22	Seat back catch
23	Remote wire
24	Seat back frame

REMOTE HANDLE LEVER REMOVAL/INSTALLATION

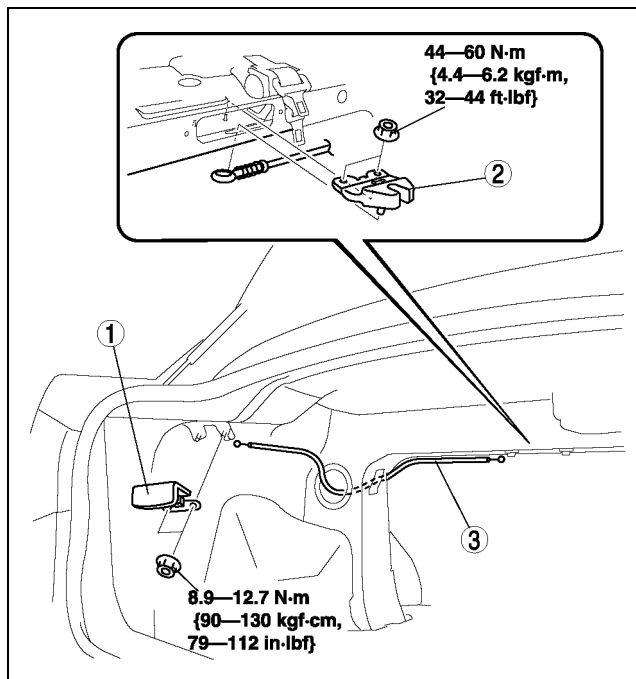
A6E775200166W01

4SD

1. To remove the remote wire, remove the trunk side trim.
2. Remove in the order indicated in the table.

1	Remote handle lever
2	Remote wire
3	Remote catch

3. Install in the reverse order of removal.



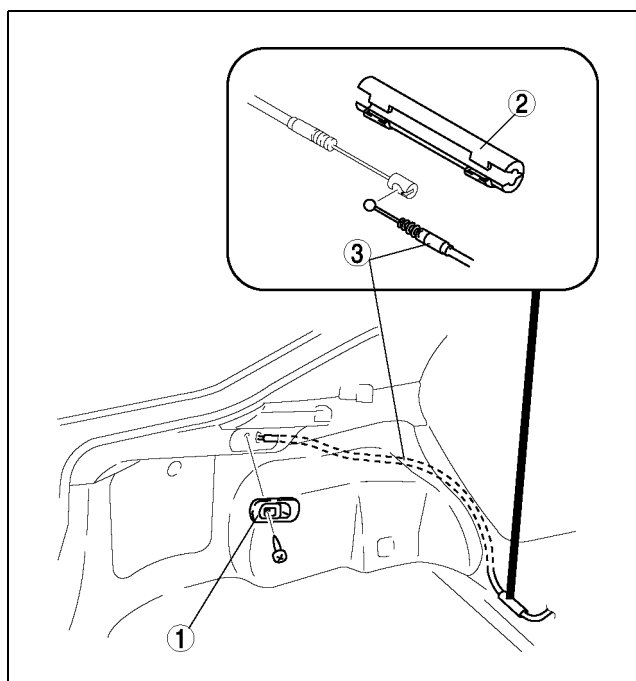
A6E7752W005

5HB

1. To remove the remote wire, remove the trunk side upper trim and trunk side trim.
2. Remove in the order indicated in the table.

1	Remote handle lever
2	Cover
3	Remote wire

3. Install in the reverse order of removal.



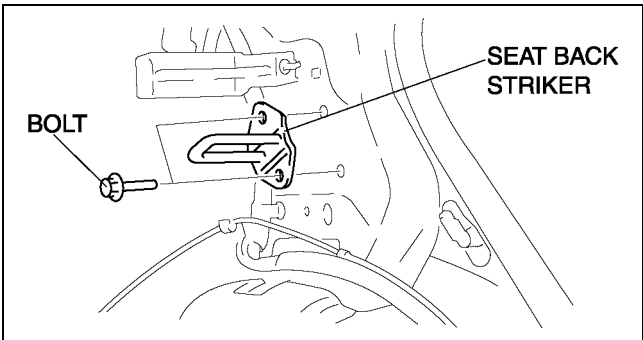
A6E7752W011

SEAT

SEAT BACK STRIKER REMOVAL/INSTALLATION

A6E775262361W01

1. Remove the tire house trim.
2. Remove the trunk side upper trim and trunk side lower trim.
3. Remove the bolts.
4. Remove the seat back striker.
5. Install in the reverse order of removal.



A6E7752W016

POWER SEAT SWITCH INSPECTION

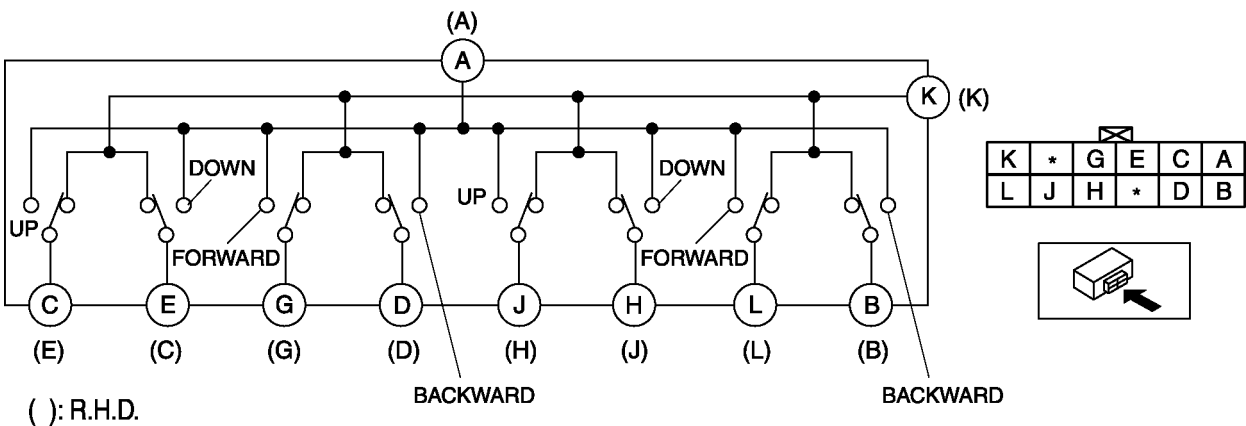
A6E775257155W01

1. Disconnect the power seat switch connector.
2. Disconnect the rear tilt motor connector.
3. Inspect for continuity between the power seat switch connector terminals using an ohmmeter.
 - If not as specified, replace the power seat switch.

○—○ : Continuity

Switch position		Terminal									
		A (A)	B (B)	C (E)	D (D)	E (C)	G (G)	H (J)	J (H)	K (K)	L (L)
Recliner	Forward	○	○							○	○
	Off		○							○	○
	Backward	○	○							○	○
Slide	Forward	○			○		○			○	
	Off				○		○			○	
	Backward	○			○		○			○	
Front tilt	Up	○		○		○				○	
	Off			○		○				○	
	Down	○		○		○				○	
Rear tilt	Up	○						○	○	○	
	Off							○	○	○	
	Down	○						○	○	○	

(): R.H.D.



A6E7752W029

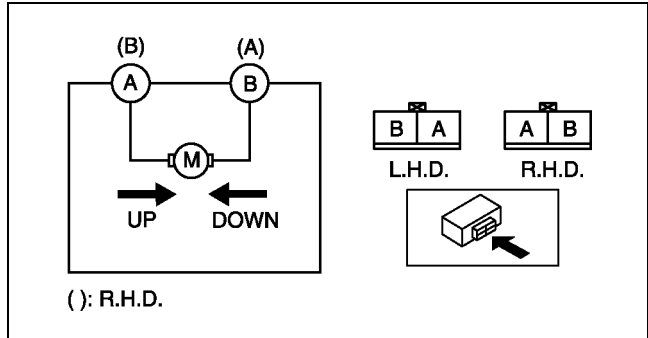
FRONT TILT MOTOR INSPECTION

A6E775288650W01

1. Disconnect the front tilt motor connector.
2. Inspect the front tilt motor operation when B+ is applied to the terminals as shown.
 - If not as specified, replace the seat cushion frame.

Motor operation	Connection	
	B+	GND
Up	A (B)	B (A)
Down	B (A)	A (B)

() : R.H.D.



A6E7752W008

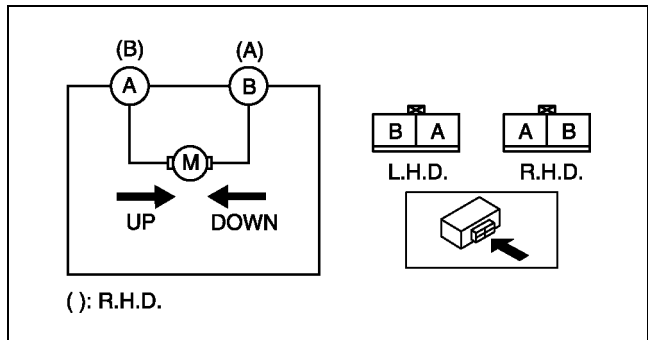
REAR TILT MOTOR INSPECTION

A6E775288651W01

1. Disconnect the rear tilt motor connector.
2. Inspect the rear tilt motor operation when B+ is applied to the terminals as shown.
 - If not as specified, replace the seat cushion frame.

Motor operation	Connection	
	B+	GND
Up	A (B)	B (A)
Down	B (A)	A (B)

() : R.H.D.



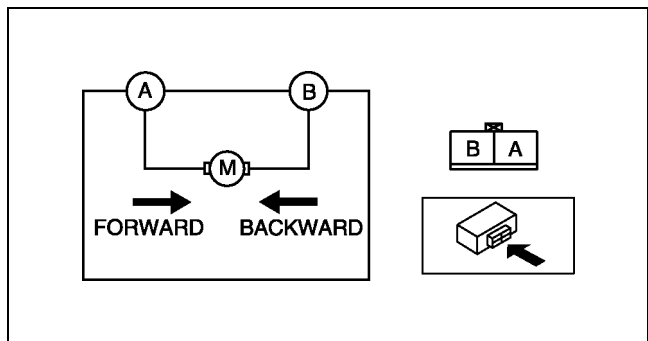
A6E7752W009

SLIDE MOTOR INSPECTION

A6E775288662W01

1. Disconnect the slide motor connector.
2. Inspect the slide motor operation when B+ is applied to the terminals as shown.
 - If not as specified, replace the seat cushion frame.

Motor operation	Connection	
	B+	GND
Forward	A	B
Backward	B	A



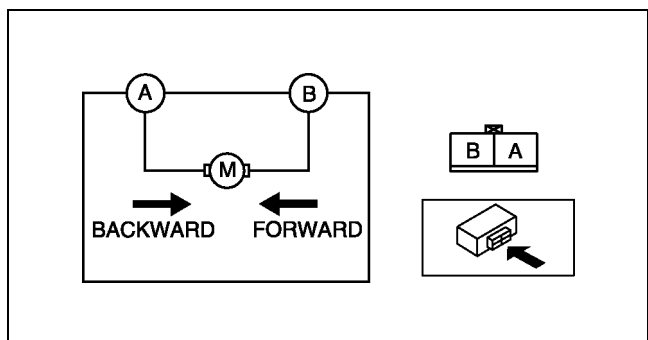
A6E7752W010

RECLINER MOTOR INSPECTION

A6E775288663W01

1. Disconnect the recliner motor connector.
2. Inspect the recliner motor operation when B+ is applied to the terminal as shown.
 - If not as specified, replace the seat cushion frame.

Motor operation	Connection	
	B+	GND
Forward	B	A
Backward	A	B



A6E7752W028

SEAT

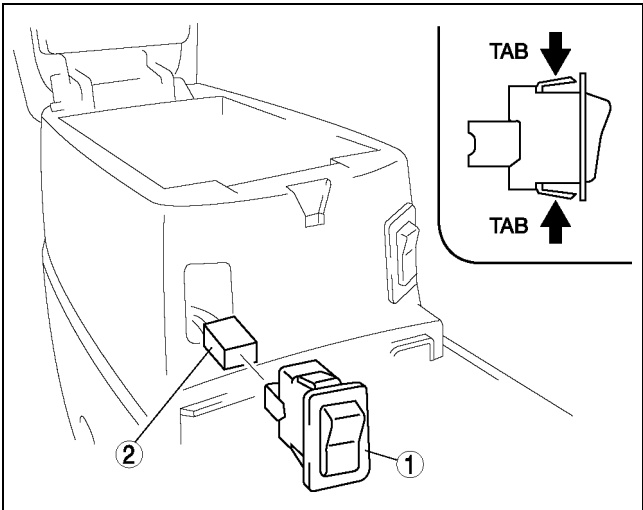
SEAT WARMER SWITCH REMOVAL/INSTALLATION

A6E775259000W01

1. Disconnect the negative battery cable.
2. Remove the brake boots panel. (See [S-86 CONSOLE REMOVAL/INSTALLATION](#).)
3. Remove in the order indicated in the table.

1	Seat warmer switch (See S-117 Seat Warmer Switch Removal Note .)
2	Connector

4. Install in the reverse order of removal.



A6E7752W001

Seat Warmer Switch Removal Note

1. Squeeze the tabs of seat warmer switch and pull it forward to remove it.

SEAT WARMER SWITCH INSPECTION

A6E775259000W02

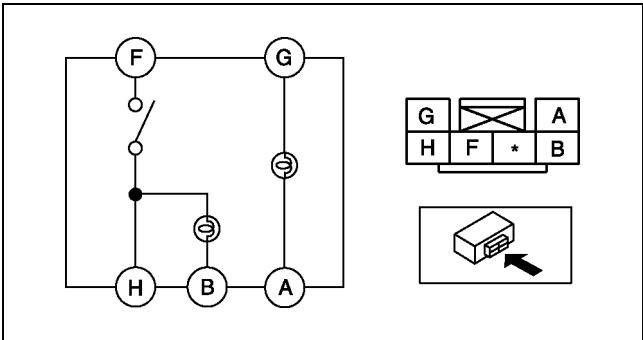
1. Remove the seat warmer switch.
2. Inspect for continuity between the seat warmer switch terminals using an ohmmeter.
 - If not as specified, replace the seat warmer switch.

Driver's side

○—○: Continuity ○⊗○: Bulb

Switch position	Terminal				
	B	H	F	A	G
ON	○⊗○	○—○		○⊗○	
OFF	○⊗○			○⊗○	

A6E7752W024



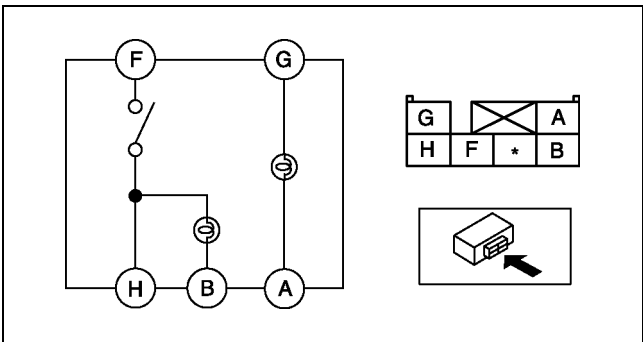
A6E7752W025

Passenger's side

○—○: Continuity ○⊗○: Bulb

Switch position	Terminal				
	B	H	F	A	G
ON	○⊗○	○—○		○⊗○	
OFF	○⊗○			○⊗○	

A6E7752W024



A6E7752W026

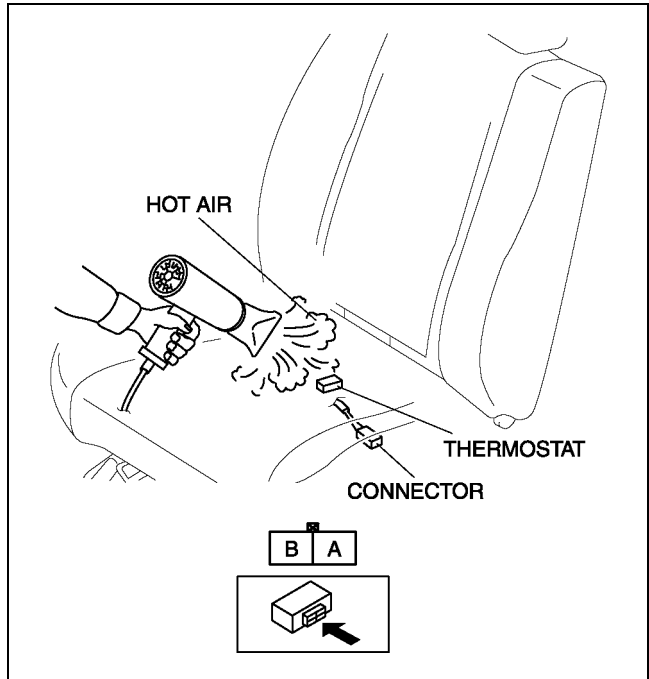
S

SEAT

SEAT WARMER UNIT INSPECTION

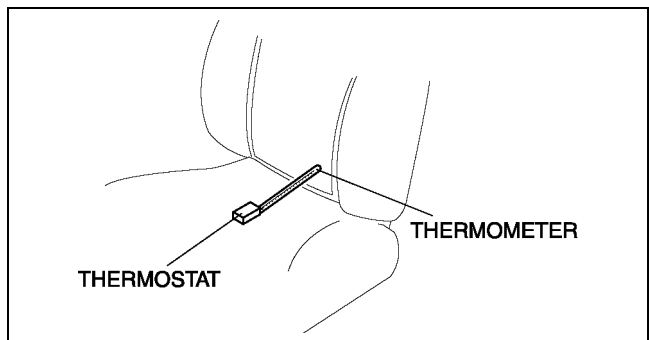
A6E775259000W03

1. Remove the front seat. (See [S-105 FRONT SEAT REMOVAL/INSTALLATION.](#))
2. Remove the seat cushion trim.
3. While inspecting for continuity between the terminals A and B of the connector, use a dryer to warm the thermostat of the seat warmer unit on seat cushion.



A6E7752W020

4. When the indication on the ohmmeter is no continuity, turn off the dryer, then use a thermometer to measure the temperature of the thermostat.
5. Verify that the temperature is **approximately 29 °C {84 °F}**.



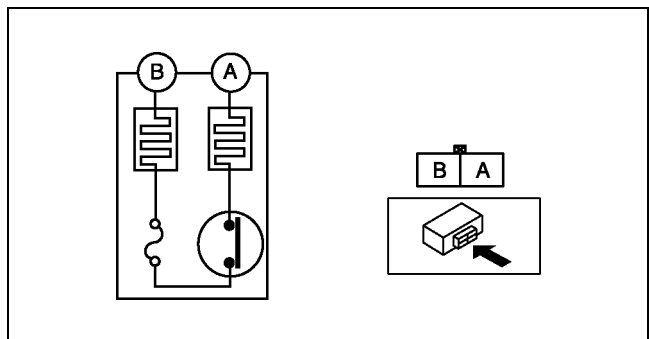
A6E7752W021

6. Verify that there is continuity between the terminals of seat warmer unit's connector using an ohmmeter when temperature drops to **approximately 20 °C {68 °F}**.

○—○ : Continuity

Thermostat temperature	Terminal	
	A	B
More than approx. 29 °C {84 °F}		
Less than approx. 20 °C {68 °F}	○—○	○—○

A6E7752W022



A6E7752W023

BODY SHELL

BODY SHELL

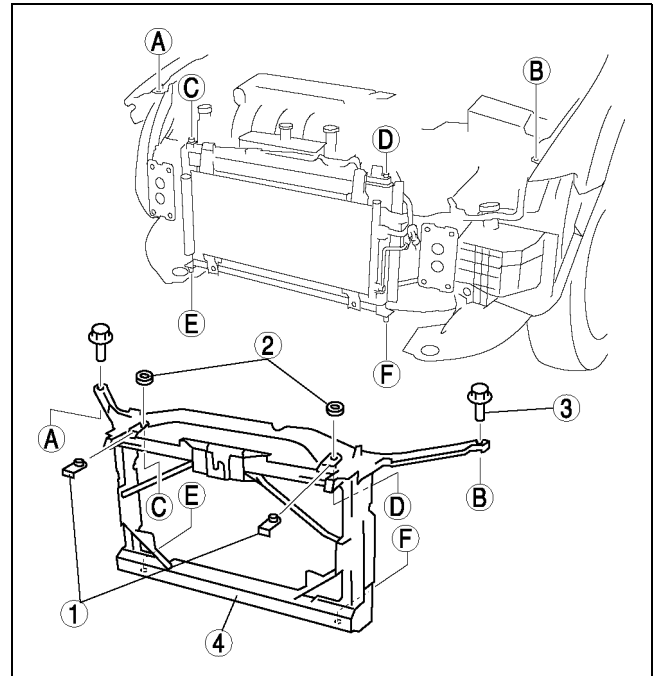
SHROUD PANEL REMOVAL/INSTALLATION

A6E775453140W01

1. Remove the bonnet. (See [S-10 BONNET REMOVAL/INSTALLATION.](#))
2. Remove the front bumper. (See [S-47 FRONT BUMPER REMOVAL/INSTALLATION.](#))
3. Remove the front combination light. (See [T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.](#))
4. Remove the front bumper reinforcement. (See [S-48 BUMPER REINFORCEMENT REMOVAL/INSTALLATION.](#))
5. Remove in the order indicated in the table.

1	Radiator mount cover
2	Radiator mount rubber
3	Bolt
4	Shroud panel

6. Install in the reverse order of removal.



A6E7754W001

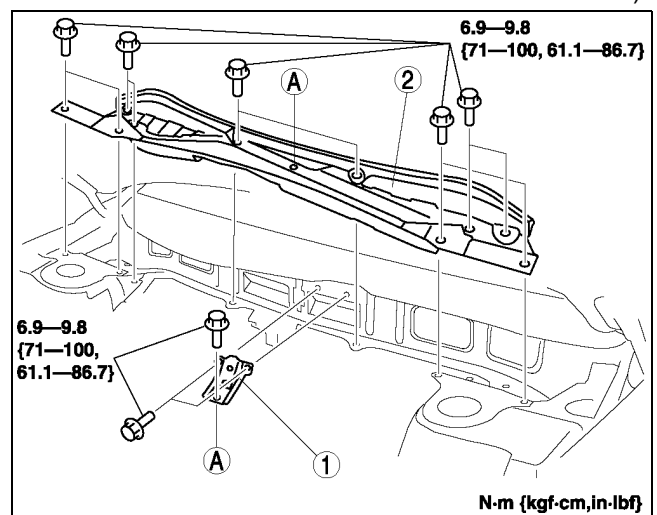
COWL PANEL REMOVAL/INSTALLATION

A6E775453580W01

1. Remove the windshield wiper arm and blade. (See [T-57 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION.](#))
2. Remove the cowl grille.
3. Remove the windshield wiper motor. (See [T-56 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.

1	Gusset
2	Cowl panel

5. Install in the reverse order of removal.



A6E7754W002

TROUBLESHOOTING [POWER WINDOW SYSTEM]

TROUBLESHOOTING [POWER WINDOW SYSTEM]

INTERMITTENT CONCERN TROUBLESHOOTING

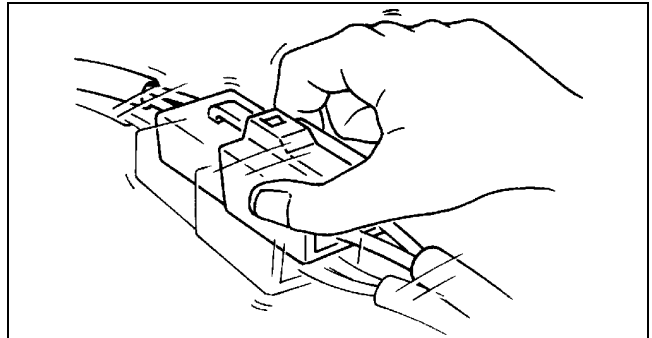
A6E778058000W01

Vibration Method

- If malfunction occurs or becomes worse while driving on a rough road or when engine is vibrating, perform the steps below.

Note

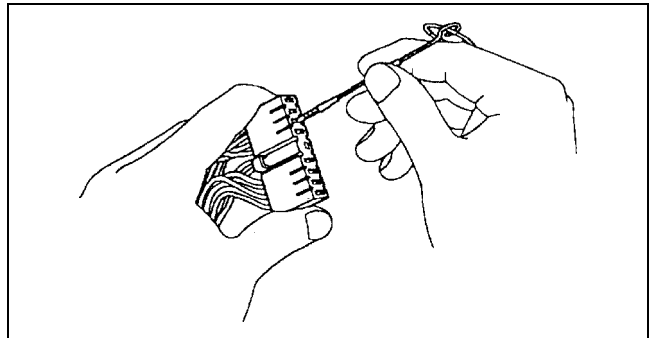
- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Some of the things to check for:
 - Connectors not fully seated.
 - Wire harnesses not having full play.
 - Wires laying across brackets or moving parts.
 - Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wire harnesses pass through the firewall, body panels, etc. are the major areas to be checked.
- Check for DTCs or malfunctions by shaking harnesses and connectors that are suspected to be causing malfunction.



YDE7780W001

Connector Terminal Check Method

1. Check the connection condition of each female terminal.
2. Insert male terminal into the female terminals to check for looseness.



YDA8180W000

FOREWORD

A6E778058000W02

- Always perform basic power window system inspection before troubleshooting.
- Troubleshooting gives content unique to trouble caused by problems in the automatic window return function.

TROUBLESHOOTING [POWER WINDOW SYSTEM]

BASIC POWER WINDOW SYSTEM INSPECTION

A6E778058000W03

Manual Mode Function Inspection

STEP	INSPECTION	ACTION
1	- Turn ignition switch to ON position. - Do all windows go up and down in manual mode using power window main switch?	Yes Go to next step.
		No - Inspect the following items: - Power window main switch power supply fuses - Power window main switch ground wiring harness - Power window main switch power supply wiring harnesses - Wiring harness between power window main switch and power window motor - Power window main switch - Power window motor - Each power window motor wire installation point - Each window installation point on its carrier plate - Each power window regulator installation point on each door - Repair or replace the problem area, then go to Step 4.
2	Does each window go up and down in manual mode using power window subswitch?	Yes Go to next step.
		No - Inspect the following items: - Power window main switch (power-cut switch system malfunction) - Power window subswitch - Subswitch power supply wiring harnesses - Repair or replace the problem area, then go to automatic mode function inspection.
3	- Turn power-cut switch UNLOCK. - Push/pull power window main switch (switches for all doors in manual mode). - Does only driver-side front window go up and down?	Yes - Manual mode function is normal. - Go to automatic mode function inspection.
		No Replace power window main switch, then go to automatic mode function inspection (power-cut switch system malfunction).

S

Automatic Mode Function Inspection

STEP	INSPECTION	ACTION
1	- Turn ignition switch to ON position. - Operate power window main switch for driver-side front door in automatic mode. - Does driver-side front window go up and down?	Yes Go to next step.
		No Driver-side front window does not go up and down in automatic mode: - Go to Step 1 of NO. 1 DRIVER-SIDE FRONT WINDOW DOES NOT GO UP AND DOWN IN AUTOMATIC MODE. Driver-side front window go up and down in automatic mode, but driver-side front window reverses: - Go to Step 1 of NO. 3 DRIVER-SIDE FRONT WINDOW REVERSES EVEN THOUGH THE GLASS DOES NOT ENCOUNTER A FOREIGN OBJECT WHILE IT IS GOING UP IN AUTOMATIC MODE.
2	- Gently pull the driver-side front power window switch while driver-side front window is going down in automatic mode. - Does the glass stop?	Yes Go to next step.
		No Replace power window main switch, then go to automatic window return function inspection.
3	- Gently press the driver-side front power window switch while driver-side front window is going up in automatic mode. - Does the glass stop?	Yes - Automatic mode function is normal. - Go to automatic window return function inspection.
		No Replace power window main switch, then go to automatic window return function inspection.

TROUBLESHOOTING [POWER WINDOW SYSTEM]

Automatic Window Return Function Inspection

STEP	INSPECTION		ACTION
1	- Turn ignition switch to ON position. - Lower driver-side front window completely. - Use power window main switch to close driver's window in automatic mode. - Does window automatically reverse even though the glass does not encounter a foreign object while it is going up in automatic mode?	Yes	Go to Step 1 of NO. 3 DRIVER-SIDE FRONT WINDOW REVERSES EVEN THOUGH THE GLASS DOES NOT ENCOUNTER A FOREIGN OBJECT WHILE IT IS GOING UP IN AUTOMATIC MODE.
		No	Go to next step.
2	- Lower driver-side front window completely. - Take a hammer and hold it against the inside of the top of the window frame so that the window will hit its handle when it is closed. - Raise the window using automatic mode. - When the window hits the hammer handle, does it immediately reverse and go down to approximately 200 mm {7.87 in} from the completely closed position?	Yes	- Automatic window return function inspection is normal. - Go to IG OFF timer function inspection.
		No	Go to Step 1 of NO. 2 DRIVER-SIDE FRONT WINDOW DOES NOT REVERSE, EVEN WHEN ENCOUNTERING A FOREIGN OBJECT IN ITS PATH.

IG OFF Timer Function Inspection

STEP	INSPECTION		ACTION
1	- Turn ignition switch to ON position. - In automatic mode, push down power window main switch for driver-side front window. Window should go down within approximately 42 seconds from ignition switch OFF position. - In manual mode (finger continuously depressing power window main switch), window should go down within approximately 42 seconds from ignition switch OFF position. - Does driver-side front window go down?	Yes	Go to next step.
		No	Replace power window main switch, then go to next step.
2	- Turn ignition switch to ON position. - In automatic mode, pull up power window main switch for driver-side front window. Window cannot go up within approximately 4 seconds from ignition switch OFF position. - Verify that driver-side front window does not operate. - Does driver-side front window go up?	Yes	Replace power window main switch, then go to next step.
		No	Go to next step.
3	- Turn ignition switch to ON position. - Lower driver-side front window completely. - Take a hammer and hold it against the inside of the top of the window frame so that the window will hit its handle when it is closing. - Raise the window using manual mode. - When the window hits the hammer handle, does it immediately reverse and go down to approximately 200 mm {7.87 in} from the completely raised position?	Yes	Go to next step.
		No	Replace power window main switch, then go to next step.
4	- Open any door. - Turn ignition switch to ON position. - Push/pull power window main switch for driver-side front window within approximately 42 seconds from ignition switch OFF position. - Verify that driver-side front window does not go up or down. - Does driver-side front window go up or down?	Yes	- Inspect door switch and related warning harness. - If above parts are okay, replace power window main switch, then go to next step. - If above parts are incorrect, repair or replace malfunction part(s), then go to next step.
		No	Go to next step.

TROUBLESHOOTING [POWER WINDOW SYSTEM]

STEP	INSPECTION		ACTION
5	- Close all doors. - Turn ignition switch to ON position. - Push/pull power window main switch for driver-side front window after approximately 60 seconds from ignition switch OFF position. - Verify that driver-side front window does not go up or down. - Does driver-side front window go up or down?	Yes	Replace power window main switch, then go to two-step down function inspection.
		No	- IG OFF timer function is normal. - Go to two-step down function inspection..

Two-step Down Function Inspection

- The distance the door glass opens can be changed using the two-step down function. (**Approximately 20-100 mm {0.79-3.93 in}**)
- The two-step down function can be made non-operative. (The function is operative at the initial setting.)
- The two-step down function does not function during IG OFF timer.

STEP	INSPECTION		ACTION
1	- Turn ignition switch to ON position. - Raise driver-side front window completely. - When the driver-side front window is lowered using manual mode, does it go down to approximately 30 mm {1.18 in} from the completely closed position and stop for 1 second? (This inspection cannot be carried out during IG OFF timer function operation.)	Yes	- two-step down function is normal. - Recheck malfunction symptoms.
		No	Replace power window main switch.

TROUBLESHOOTING INDEX

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No.	TROUBLESHOOTING ITEM	PAGE
1	Driver-side front window does not go up and down in automatic mode.	(See S-123 NO. 1 DRIVER-SIDE FRONT WINDOW DOES NOT GO UP AND DOWN IN AUTOMATIC MODE.)
2	Driver-side front window does not reverse, even when encountering a foreign object in its path.	(See S-126 NO. 2 DRIVER-SIDE FRONT WINDOW DOES NOT REVERSE, EVEN WHEN ENCOUNTERING A FOREIGN OBJECT IN ITS PATH.)
3	Driver-side front window reverses even though the glass does not encounter a foreign object while it is going up in automatic mode.	(See S-127 NO. 3 DRIVER-SIDE FRONT WINDOW REVERSES EVEN THOUGH THE GLASS DOES NOT ENCOUNTER A FOREIGN OBJECT WHILE IT IS GOING UP IN AUTOMATIC MODE.)

S

NO. 1 DRIVER-SIDE FRONT WINDOW DOES NOT GO UP AND DOWN IN AUTOMATIC MODE

A6E778058000W05

1	Driver-side front window does not go up and down in automatic mode
POSSIBLE CAUSE	- Open or short to B+ circuit in position sensor 1 signal, ground signal from wiring harness (between power window main switch and driver-side front power window motor), inner power window main switch, or inner motor: Steps 3–6 - Open or short to B+/ground circuit in position sensor 2 signal from wiring harness (between power window main switch and driver-side front power window motor), inner power window main switch, or inner motor: Steps 7–11 Note - The automatic function and the ignition off timer function do not operate while power window main switch is in fail-safe mode. The fail-safe operates when position sensor 1, and/or position sensor 2, and/or position sensor 2 power supply malfunctions. - Position sensor 1 and/or 2 malfunction - When driver-side front window is kept up down, main switch can not sense a pulse signal from position sensor 1 during that can sense 5 pulses (2.5 cycles) from position 2. - When driver-side front window is kept up down, main switch can not sense a pulse signal from position sensor 2 during that can sense 5 pulses (2.5 cycles) from position 1. - There are 3 abnormal pulse from a pulse signal during driver-side front window is kept up or down. - There are 20 cycle pulses from a close position during driver-side front window is kept up. - There is no pulse signal during 1 sec. after down is operated.

TROUBLESHOOTING [POWER WINDOW SYSTEM]

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT WHETHER POWER WINDOW MAIN SWITCH ENTERS FAIL-SAFE MODE OR NOT Did driver-side front window go up or down in automatic mode?	Yes	Recheck malfunction symptoms.
		No	Go to next step. (Power window main switch may enter fail-safe mode.)
2	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR ELSEWHERE - Turn ignition switch ON position. - Test voltage at power window main switch connector terminal 2C (position sensor 1 signal). - Is voltage alternate between 0 V and approximately 5 V when driver-side front window is being gone up and down?	Yes	Go to Step 7.
		No	Go to next step.
3	VERIFY POSITION SENSOR 1 OUTPUT SIGNAL - Turn ignition switch to ON position. - Test voltage at driver-side front power window motor connector terminal H (position sensor 1 signal). - Is voltage alternate between 0 V and approximately 12 V when driver-side front window is being gone up and down at manual mode?	Yes	Go to next step.
		No	Replace driver-side front power window motor, then go to Step 12.
4	INSPECT WIRING HARNESS BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR FOR CONTINUITY - Turn ignition switch to LOCK position. - Disconnect power window main switch connector. - Is there continuity between the following power window main switch connector terminals and driver-side front power window motor connector terminals? — 2C–H (position sensor 1 signal) — 2D–E (position sensor power supply) — 2A–F (ground signal)	Yes	Go to next step.
		No	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 12.
5	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR POWER WINDOW MAIN SWITCH - Turn ignition switch to ON position. - Measure voltage at the following power window main switch connector terminals: — 2C (position sensor 1 signal) — 2A (ground signal) - Is voltage approximately 12 V?	Yes	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 12.
		No	Replace power window main switch (open or short to B+ in power window main switch).
6	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR ELSEWHERE - Is continuity between following power window main switch connector terminals and ground? — 2C (position sensor 1 signal) — 2D (position sensor power supply)	Yes	Replace wiring harness between power window main switch and driver-side front power window motor, then go to Step 12.
		No	Go to next step.

TROUBLESHOOTING [POWER WINDOW SYSTEM]

STEP	INSPECTION	ACTION	
7	VERIFY WHETHER MALFUNCTION IS IN POWER WINDOW MAIN SWITCH OR ELSEWHERE • Turn ignition switch to ON position. • Test voltage at power window main switch connector terminal 2B (position sensor 2 signal). • Does voltage alternate between 0 V and approximately 12 V when driver-side front window is being gone up down?	Yes	Replace power window main switch. (malfunction in power window main switch automatic mode control), then go to Step 11.
		No	Go to next step.
8	VERIFY POSITION SENSOR 2 OUTPUT SIGNAL • Turn ignition switch to ON position. • Test voltage at driver-side front power window motor connector terminal G (position sensor 2 signal). • Is voltage alternate between 0 V and approximately 12 V when driver-side front window is being gone up down?	Yes	Go to next step.
		No	Replace driver-side front power window motor, then go to Step 12.
9	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR ELSEWHERE • Turn ignition switch to LOCK position. • Disconnect power window main switch connector and driver-side front power window motor connector. • Is there continuity between power window main switch connector terminal 2B (position sensor 2 signal) and driver-side front power window motor connector terminal G (position sensor 2 signal)?	Yes	Go to next step.
		No	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 12.
10	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR ELSEWHERE • Is there continuity between power window main switch connector terminal 2B (position sensor 2 signal) and ground?	Yes	Repair wiring harness between power window main switch and driver-side front power window motor, then go to Step 12.
		No	Go to next step.
11	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR POWER WINDOW MAIN SWITCH • Turn ignition switch to ON position. • Measure voltage at power window main switch connector terminal 2B (position sensor 2 signal). • Is voltage approximately 12 V?	Yes	Repair wiring harness between power window main switch and front driver-side power window motor, then go to next step.
		No	Replace power window main switch (open or short to B+/ground in power window main switch), then go to next step.
12	RECHECK MALFUNCTION SYMPTOM AFTER REPAIR • Did malfunction disappear?	Yes	• Troubleshooting completed. • Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

TROUBLESHOOTING [POWER WINDOW SYSTEM]

NO. 2 DRIVER-SIDE FRONT WINDOW DOES NOT REVERSE, EVEN WHEN ENCOUNTERING A FOREIGN OBJECT IN ITS PATH

A6E778058000W06

2	Driver-side front window does not reverse, even when encountering a foreign object in its path.
POSSIBLE CAUSE	Automatic window return range did not reset after battery disconnect: Step 2

Diagnostic procedure

STEP	INSPECTION	ACTION
1	CHECK FOR CUSTOMER COMPLAINT Did customer complain that driver-side front window did not reverse when nearing complete close?	Yes - System normal. - Explain to customer that automatic window return power window system does not operate when nearing of complete close.
		No Go to next step.
2	RESET REVERSE AREA STORED IN DRIVER-SIDE FRONT WINDOW MOTOR - Reset the main switch to recognize driver-side front window fully closed position. - Did malfunction disappear?	Yes - Troubleshooting completed. - Explain to customer that misadjustment of automatic window return range was the problem.
		No Replace power window main switch.

TROUBLESHOOTING [POWER WINDOW SYSTEM]

NO. 3 DRIVER-SIDE FRONT WINDOW REVERSES EVEN THOUGH THE GLASS DOES NOT ENCOUNTER A FOREIGN OBJECT WHILE IT IS GOING UP IN AUTOMATIC MODE

A6E778058000W07

3	Driver-side front window reverses even though the glass does not encounter a foreign object while it is going up in automatic mode.
POSSIBLE CAUSE	- Too much driver-side front window friction resistance: Steps 1–5 - Short to ground in position sensor 1 signal from wiring harness (between power window main switch and driver-side front power window motor), inner driver-side front power window motor, or inner power window main switch: Steps 6, 7

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT FOR FOREIGN OBJECT IN DRIVER-SIDE FRONT WINDOW Is there a foreign object in driver-side front window?	Yes	Remove the object.
		No	Go to next step.
2	INSPECT ACRYLIC VISOR BRACKET INSTALLATION Is acrylic visor bracket properly installed?	Yes	Go to next step.
		No	Reinstall acrylic visor bracket properly.
3	INSPECT TO SEE IF GLASS RUN CHANNEL INTERFERES WITH DRIVER-SIDE FRONT WINDOW - Remove driver-side front door trim. - Does glass run channel interfere with driver-side front window?	Yes	Repair or replace glass run channel, then go to Step 9.
		No	Go to next step.
4	INSPECT LUBRICANT ON DRIVER-SIDE CARRIER PLATE Is there lubricant on driver-side carrier plate?	Yes	Go to next step.
		No	Apply lubricant (mineral oil).
5	INSPECT INSTALLATION OF DRIVER-SIDE FRONT POWER WINDOW SYSTEM COMPONENTS - Are the following parts properly installed? — Driver-side front door glass — Driver-side power window motor wire — Driver-side power window motor — Driver-side power window regulator frame — Driver-side carrier plate — Driver-side glass run channel	Yes	Go to next step.
		No	Reinstall part(s) properly, then go to Step 9.
6	VERIFY POSITION SENSOR 1 OUTPUT SIGNAL - Turn ignition switch to ON position. - Test voltage at driver-side front power window motor connector terminal H (position sensor 1 signal). - Is voltage alternate between 0 V and approximately 12 V when driver-side front window is being gone up and down at manual mode?	Yes	Go to next step.
		No	Replace driver-side front power window motor, then go to Step 8.
7	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN POWER WINDOW MAIN SWITCH AND DRIVER-SIDE FRONT POWER WINDOW MOTOR) OR POWER WINDOW MAIN SWITCH - Turn ignition switch to LOCK position. - Disconnect power window main switch. - Is there continuity between power window main switch connector terminal 2C (position sensor 1 signal) and ground?	Yes	Repair wiring harness between power window main switch and driver-side front power window motor, then go to next step.
		No	Replace power window main switch (short to ground in power window main switch), then go to next step.
8	RECHECK MALFUNCTION SYMPTOM AFTER REPAIR Did malfunction disappear?	Yes	- Troubleshooting completed. - Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

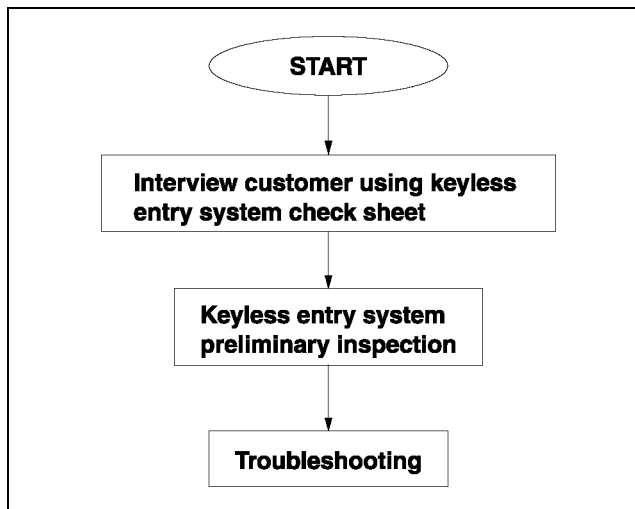
TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

FOREWORD

- Go to troubleshooting after identifying the specific malfunction by doing a keyless entry system preliminary inspection.

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Flowchart



A6E7782W002

TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

KEYLESS ENTRY SYSTEM CHECK SHEET

A6E778269000W02

- Use the sheet below as a customer interview sheet when accepting a vehicle for service.
- If the symptom is "Power door lock system does not operate with transmitter at all," find out how the customer uses the keyless entry system by following the check sheet below.

Perform the following inspection with customer.

Q1. What's the customer's complaint?

- ☐ Power door lock system does not operate with transmitter (door does not lock/unlock).
☐ Other _____

Q2. Is system factory-installed or after-market?

☐ Factory-installed system

→ GO to Q3.

☐ After-market system

→ Perform troubleshooting according to after-market keyless entry system manual.

Q3. Operate transmitter with customer from 2.5 m {8.2 ft} away from center of vehicle. (Make sure the ignition key is either in the LOCK position or removed.)
 Does keyless entry system work?

☐ Yes

→ Explain the following to the customer.

- Keyless entry system does not work when ignition switch is in ON position.
- Keyless entry system does not work form excessive distances (more than 2.5 m {8.2 ft} away from center of vehicle).

☐ No

→ Go to Q4.

Q4. Check location where customer uses keyless entry system.

Does a particular area, such as being near TV towers, power plants, power lines, or factories, have an effect on malfunction?

☐ Yes Place _____

→ Area of operation is bad. Explain effect of outside interference on transmitter to customer.

☐ No

→ Go to Q5.

Q5. Make sure there are no after-market electrical parts installed on vehicle.

Are there any of the following present?

- Cellular phone
- Radio-wave equipment
- Remote engine starter
- TV, ect.

☐ Yes Parts _____

☐ No

Perform the keyless entry system preliminary inspection.

A6E7782W001

KEYLESS ENTRY SYSTEM PRELIMINARY INSPECTION

A6E778269000W03

- Perform the following preliminary inspection before troubleshooting.

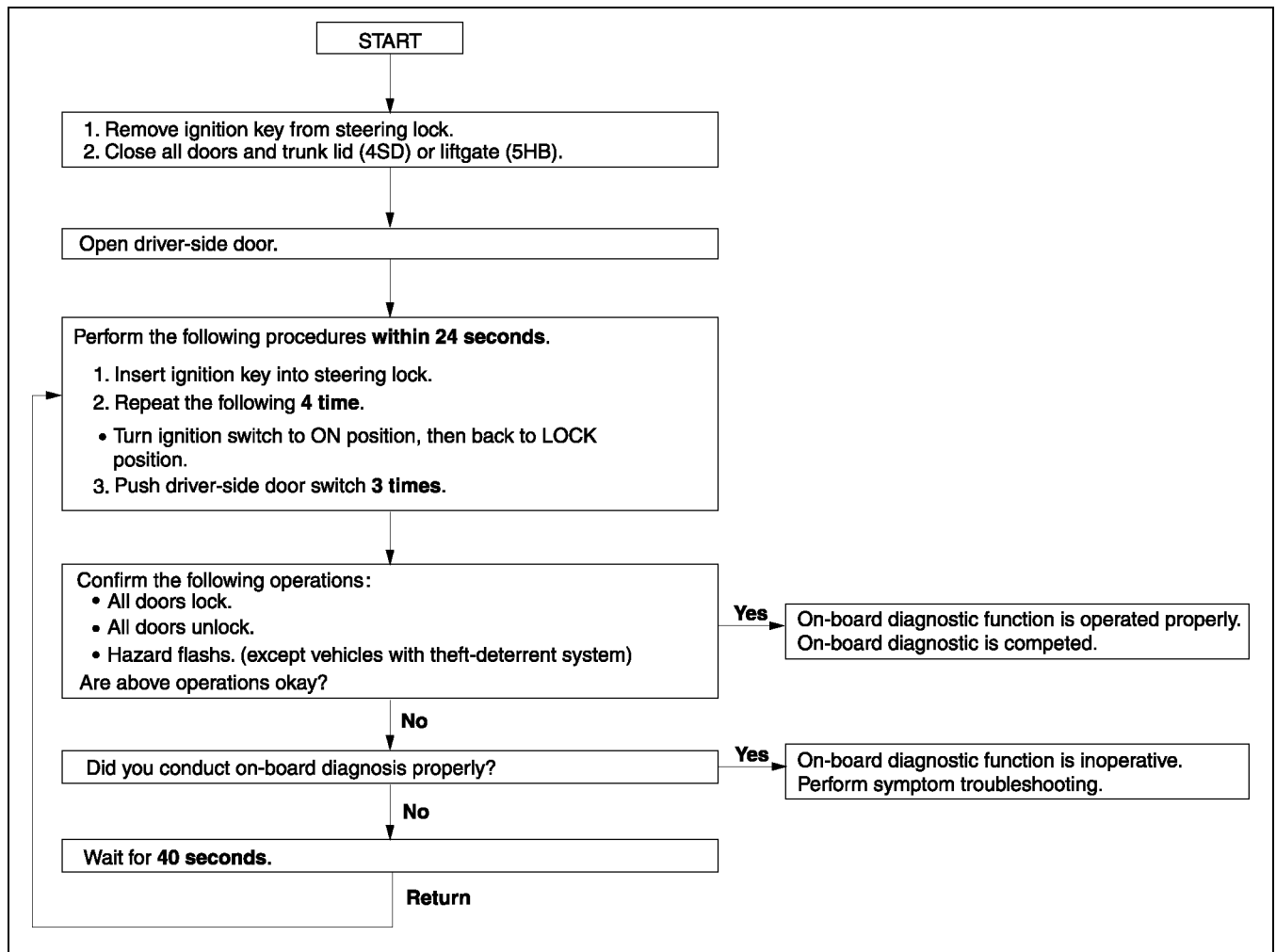
STEP	INSPECTION		ACTION
1	• Is system an after-market one?	Yes	Perform troubleshooting according to after-market keyless entry system manual.
		No	Go to next step.
2	• Did customer activate keyless entry system when ignition switch was in LOCK position?	Yes	Go to next step.
		No	• Explain to customer that system does not work when ignition is in ON position. • Turn ignition switch to LOCK position, then go to next step.

TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

STEP	INSPECTION	ACTION	
3	Did customer use keyless entry system in particular area, such as being near TV towers, power plants, power lines, or factories?	Yes	Attempt to lock/unlock doors with transmitter in non-interference area. If system operates: - Area of operation is bad. Explain effect of outside interference on transmitter to customer. If system does not operate: - Go to next step.
		No	Go to next step.
4	- Are any of the following after-market electrical parts on the vehicle? — Cellular phone — Radio-wave equipment — Remote engine starter — TV, etc.	Yes	Disconnect after-market electrical part connectors and attempt to lock/unlock doors with transmitter. If system operates: - After-market electrical parts are interfering with keyless entry system. If system does not operate: - Go to next step.
		No	Go to next step.
5	- Perform on-board diagnostic function. (See S-130 ON-BOARD DIAGNOSTIC FUNCTION.) - Does on-board diagnostic function work?	Yes	Go to next step.
		No	- Go to Step 1 of NO. 1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE. - Go to Step 1 of NO. 2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE.
6	- Attempt to reprogram transmitter ID code. - Can transmitter ID code be reprogrammed?	Yes	System is normal now.
		No	Go to Step 1 of troubleshooting NO. 3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED.

ON-BOARD DIAGNOSTIC FUNCTION

A6E778269000W04



A6E7782W003

TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

TROUBLESHOOTING INDEX

A6E778269000W05

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	One or more on-board diagnostic functions inoperative.	Malfunction in hazard warning light system (except vehicle with theft-deterrent system), or door lock linkage system, driver's door key cylinder switch system.	(See S-131 NO. 1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE)
2	All on-board diagnostic functions inoperative.	Malfunction in door lock timer unit power supply circuit, door switch circuit, cargo compartment light circuit or door lock timer unit ground circuit.	(See S-132 NO. 2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE)
3	Transmitter ID code cannot be reprogrammed.	Malfunction in transmitter battery, transmitter, door lock timer unit bracket, door lock timer unit bracket ground screw or door lock timer unit circuit.	(See S-133 NO. 3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED)

NO. 1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE

A6E778269000W06

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

1	One or more on-board diagnostic functions inoperative
DESCRIPTION	Malfunction in hazard warning light system, or door lock linkage system, driver's door key cylinder switch system.
POSSIBLE CAUSE	- Malfunction in hazard warning light system - Hazard warning light circuit - Door lock timer unit malfunction - Malfunction in wiring harness between door lock timer unit and flasher unit - Malfunction in door lock linkage - Malfunction in door lock timer unit door lock/unlock signal circuit - Door lock timer unit malfunction

S

Diagnostic procedure

Note

- For with theft-deterrent system, follow the procedure from Step 4.

STEP	INSPECTION	ACTION
1	INSPECT HAZARD WARNING LIGHT OPERATION DURING ON-BOARD DIAGNOSIS Did hazard warning lights flash during on-board diagnostic function operation?	Yes Go to Step 4.
		No Go to next step.
2	INSPECT HAZARD WARNING LIGHT CIRCUIT Do hazard warning lights flash when hazard warning switch is on?	Yes Go to next step.
		No Inspect hazard warning light circuit.
*3	CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN DOOR LOCK TIMER UNIT AND FLASHER UNIT) OR DOOR LOCK TIMER UNIT - Measure voltage at door lock timer unit connector terminal I (24 pin) during on-board diagnostic function operation. - When hazard warning light flashed: B+↔below 1.0 V - Is voltage as above?	Yes Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.
		No - Inspect wiring harness between door lock timer unit and flasher unit. - If wiring harness is OK, replace door lock timer unit and reprogram transmitter ID code, then go to Step 7. - If wiring harness malfunction, repair wiring harness, then go to Step 7.
4	MAKE SURE THAT ALL DOORS LOCK AND UNLOCK DURING ON-BOARD DIAGNOSIS Did all doors unlock and lock during on-board diagnostic function operation?	Yes Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.
		No Go to next step.
5	INSPECT DOOR LOCK LINKAGE - Operate door lock knob and make sure door locks and unlocks manually. - Does every door lock system work?	Yes Go to next step.
		No Inspect door lock linkage.

TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

STEP	INSPECTION	ACTION
*6	CHECK TO SEE WHETHER MALFUNCTION IS IN DOOR LOCK ACTUATOR, DOOR LOCK TIMER UNIT GROUND CIRCUIT OR ELSEWHERE - Measure voltage at door lock timer unit connector terminal C, D (6 pin) during on-board diagnostic function operation. - All door locked: below 1.0 V→B+→below 1.0 V (terminal D, 6 pin) - All door unlocked: B+→below 1.0 V→B+ (terminal C, 6 pin) - Is voltage as above?	Yes
		Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs. - Inspect door lock timer unit connector. - Inspect wiring harness between door lock timer unit and door lock actuator. - If above parts are OK, go to next step. - If above parts malfunction, repair malfunction part.
7	RECHECK MALFUNCTION SYMPTOM AFTER REPAIR Does keyless entry system operate properly?	Yes
		Troubleshooting completed. Explain repairs to customer.
		No
		Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.

NO. 2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE

A6E778269000W07

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

2	All on-board diagnostic functions inoperative
DESCRIPTION	Malfunction in door lock timer unit power supply circuit, door switch circuit, cargo compartment light circuit or door lock timer unit ground circuit.
POSSIBLE CAUSE	- Malfunction in IG1, B+ signal circuit of door lock timer unit - Door lock timer unit power supply fuse malfunction - Malfunction in wiring harness between door lock timer unit power supply fuse(s) and door lock timer unit itself - Malfunction in door lock timer unit's door open/closed signal circuit - Door switch system malfunction - Door lock timer unit malfunction - Malfunction in wiring harness between door lock timer unit and door switch - Malfunction in door lock timer unit's liftgate or trunk lid open/closed signal circuit - Cargo compartment light switch system malfunction - Door lock timer unit malfunction - Malfunction in wiring harness between door lock timer unit and cargo compartment light switch - Malfunction in door lock timer unit GND signal circuit - Malfunction in wiring harness between door lock timer unit and ground

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT DOOR LOCK TIMER UNIT POWER SUPPLY FUSES Are door lock timer unit power supply fuses okay?	Yes
		Go to next step.
2	INSPECT DOOR SWITCH INSTALLATION Are door switches installed securely?	No
		Check for a short to ground on blown fuse's circuit. Repair or replace as necessary. Install appropriate amperage fuse.
*3	CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN FUSE BLOCK AND DOOR LOCK TIMER UNIT) OR ELSEWHERE - Turn ignition switch to ON position. - Measure voltage at following door lock timer unit terminals: - IG1 signal (Terminal B (24 pin)) - B+ signal (Terminal A (24 pin)) - Is voltage B+?	Yes
		Go to next step.
		No
		Repair wiring harness between fuse block and door lock timer unit, then go to Step 8.

TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

STEP	INSPECTION	ACTION
*4	CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN FUSE BLOCK AND DOOR LOCK TIMER UNIT, OR BETWEEN DOOR LOCK TIMER UNIT AND GROUND) OR ELSEWHERE • Turn ignition switch to LOCK position. • Disconnect door lock timer unit connector. • Measure voltage at following door lock timer unit connector terminals: — IG1 signal (Terminal B (24 pin)) • Is voltage B+?	Yes Repair malfunctioning wiring harness, then go to Step 8.
		No Go to next step.
*5	CHECK TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN DOOR LOCK TIMER UNIT AND GROUND) OR ELSEWHERE • Is there continuity between door lock timer unit connector terminal W (24 pin) and ground?	Yes Go to next step.
		No Repair wiring harness between door lock timer unit and ground, then go to Step 8.
6	INSPECT FOR CHECK CODE 04 IN INSTRUMENT CLUSTER • Inspect door switch using instrument cluster input/output check mode. (See Section T) • Does DTC 04 function properly?	Yes Go to next step.
		No Repair door switch system using DTC 04 inspection procedure, then go to Step 8.
7	INSPECT DOOR LOCK TIMER UNIT OR WIRING HARNESS (BETWEEN DOOR LOCK TIMER UNIT AND DOOR SWITCHES, CARGO COMPARTMENT LIGHT SWITCH FOR CONTINUITY) • Open the driver-side door. • Is there continuity between door lock timer unit connector terminal K, G (24 pin) and ground?	Yes Replace door lock timer unit and reprogram door lock timer unit ID code, then go to next step.
		No Repair wiring harness between door lock timer unit and door switch(es), cargo compartment light switch then go to next step.
8	RECHECK MALFUNCTION SYMPTOM AFTER REPAIR • Does keyless entry system operate properly?	Yes Troubleshooting completed. Explain repairs to customer.
		No Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.

NO. 3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED

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3	Transmitter ID code cannot be reprogrammed
DESCRIPTION	• Malfunction in transmitter battery, transmitter door lock timer unit bracket, door lock timer unit bracket ground screw or door lock timer unit circuit.
POSSIBLE CAUSE	• Malfunction in transmitter battery, transmitter, door lock timer unit bracket, door lock timer unit bracket ground screw or door lock timer unit circuit — Transmitter battery, transmitter, door lock timer unit bracket, door lock timer unit bracket ground screw or door lock timer unit malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT TRANSMITTER BATTERY INSTALLATION AND TYPE • Visually inspect transmitter battery. • Are below items okay? — Transmitter battery installation (correct polarity) — Battery type (CR2025)	Yes Go to next step.
		No Set transmitter battery properly or replace with specified transmitter battery (CR2025), then go to Step 8.
2	INSPECT TRANSMITTER BATTERY TERMINALS FOR RUST AND POOR CONNECTION • Visually inspect transmitter. — Is there rust on transmitter battery terminals (positive or negative pole)? — Is there poor connection between terminals and battery?	Yes Replace transmitter battery or repair transmitter battery terminal, then go to Step 8.
		No Go to next step.

TROUBLESHOOTING [KEYLESS ENTRY SYSTEM]

STEP	INSPECTION	ACTION	
3	INSPECT TRANSMITTER BATTERY - Inspect transmitter battery. - Is battery voltage normal?	Yes	Go to next step.
		No	Replace transmitter battery, then go to Step 8.
4	INSPECT DOOR LOCK TIMER UNIT BRACKET INSTALLATION Is door lock timer unit bracket installed securely?	Yes	Go to next step.
		No	Install bracket securely, then go back to Step 6 of keyless entry system preliminary inspection.
5	INSPECT GROUND SCREW INSTALLATION BETWEEN DOOR LOCK TIMER UNIT AND DOOR LOCK TIMER UNIT BRACKET Are door lock timer unit and door lock timer unit bracket connected securely to ground screw?	Yes	Go to next step.
		No	Install screw securely, then go back to Step 6 of keyless entry system preliminary inspection.
6	CHECK TO SEE WHETHER MALFUNCTION IS IN TRANSMITTER BATTERY OR ELSEWHERE - Replace with a known good transmitter battery. - Does keyless entry system operate properly?	Yes	Replace transmitter battery, then go to Step 8.
		No	Go to next step.
7	CHECK TO SEE WHETHER MALFUNCTION IS IN TRANSMITTER OR DOOR LOCK TIMER UNIT - Reprogram door lock timer unit ID code by using another known good transmitter. - Does keyless entry system operate okay?	Yes	Replace transmitter and reprogram transmitter ID code, then go to next step.
		No	Replace door lock timer unit and reprogram door lock timer unit ID code, then go to next step.
8	RECHECK MALFUNCTION SYMPTOM AFTER REPAIR Does keyless entry system operate properly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction reoccurs.

BODY ELECTRICAL SYSTEM

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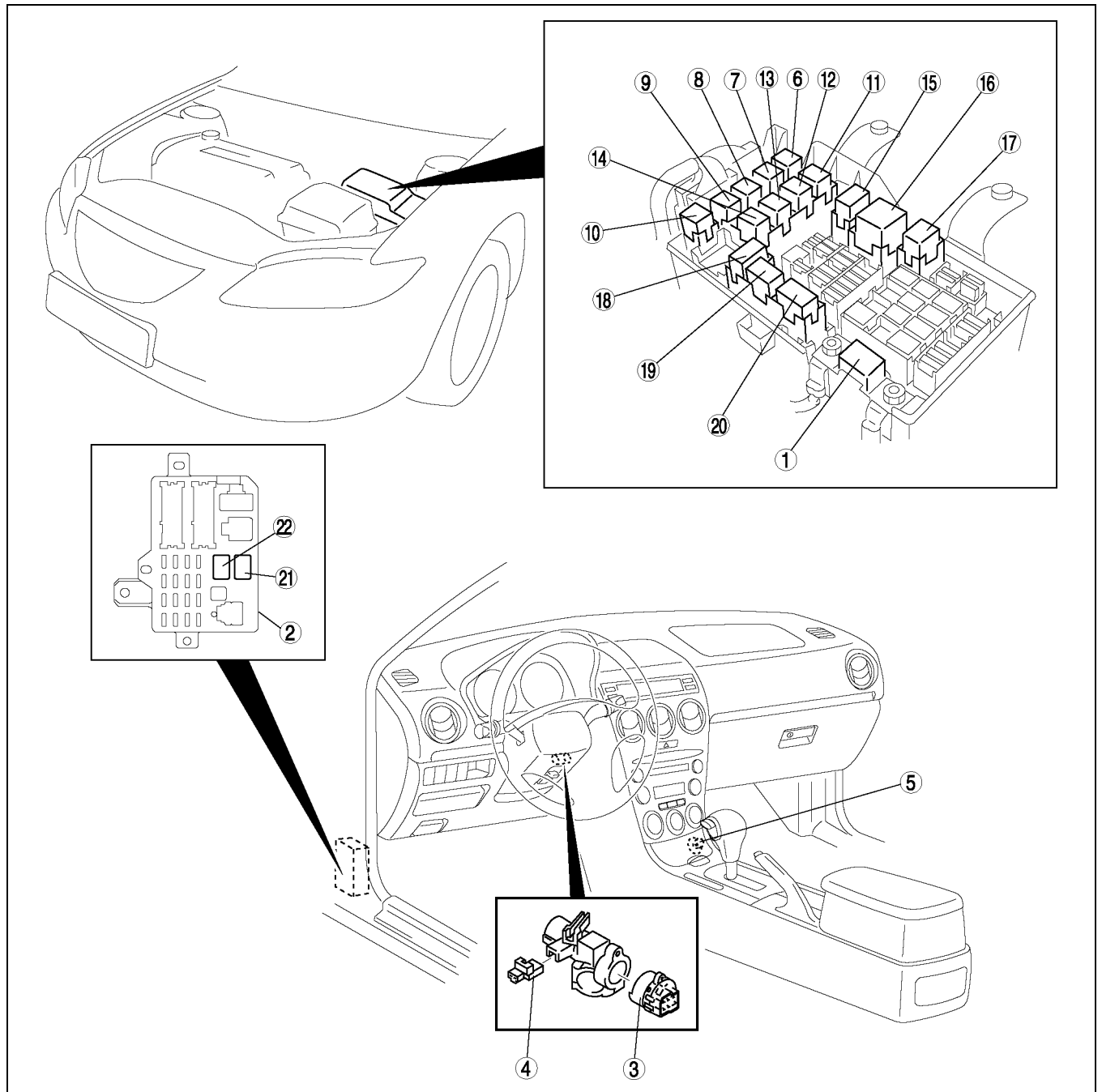
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6	Cooling fan relay No.2 (See T-24 RELAY INSPECTION)
7	Horn relay (See T-24 RELAY INSPECTION)

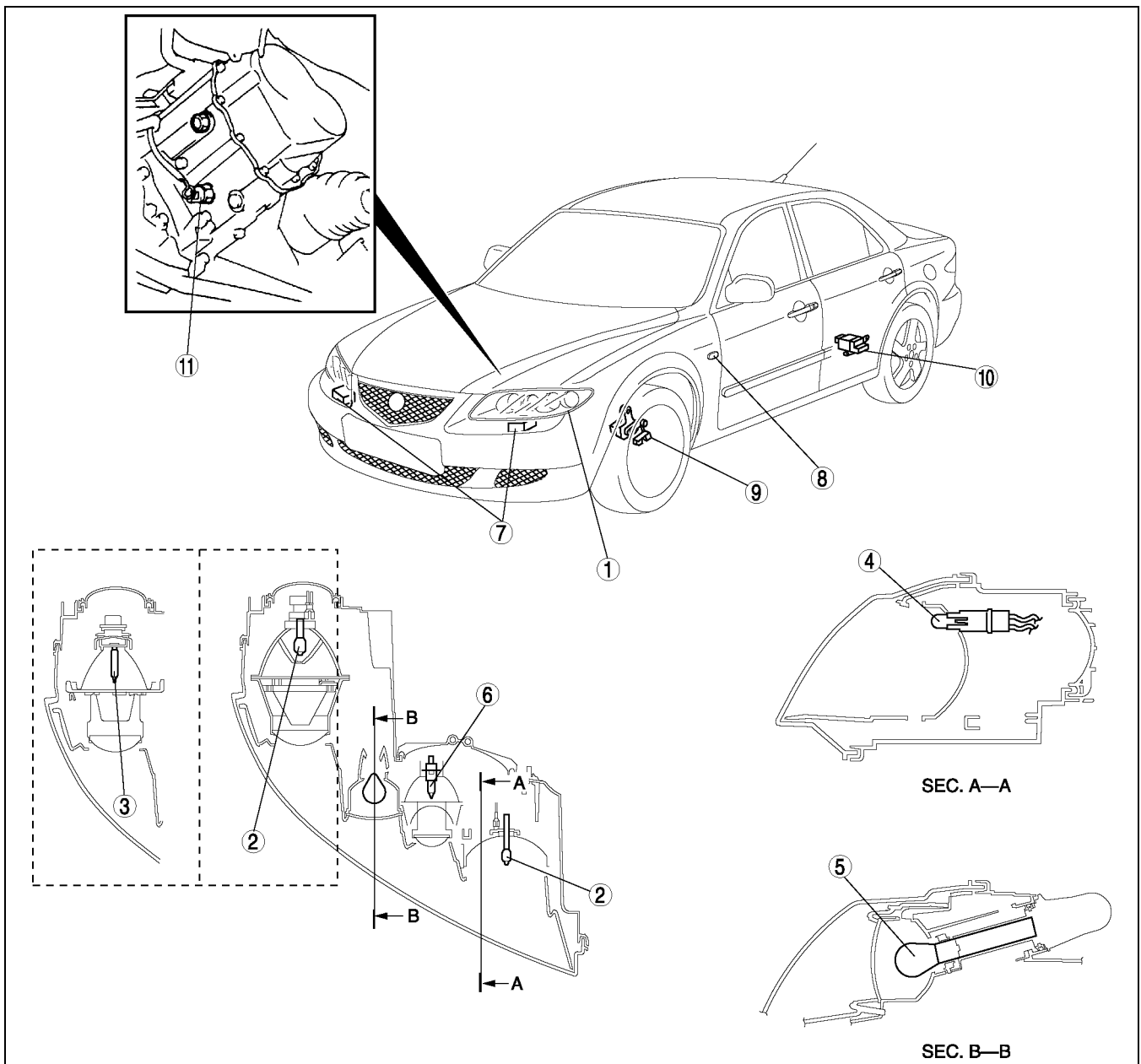
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9	Stater relay (See T-24 RELAY INSPECTION)
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22	Fuel pump relay (See T-24 RELAY INSPECTION)

EXTERIOR LIGHTING SYSTEM

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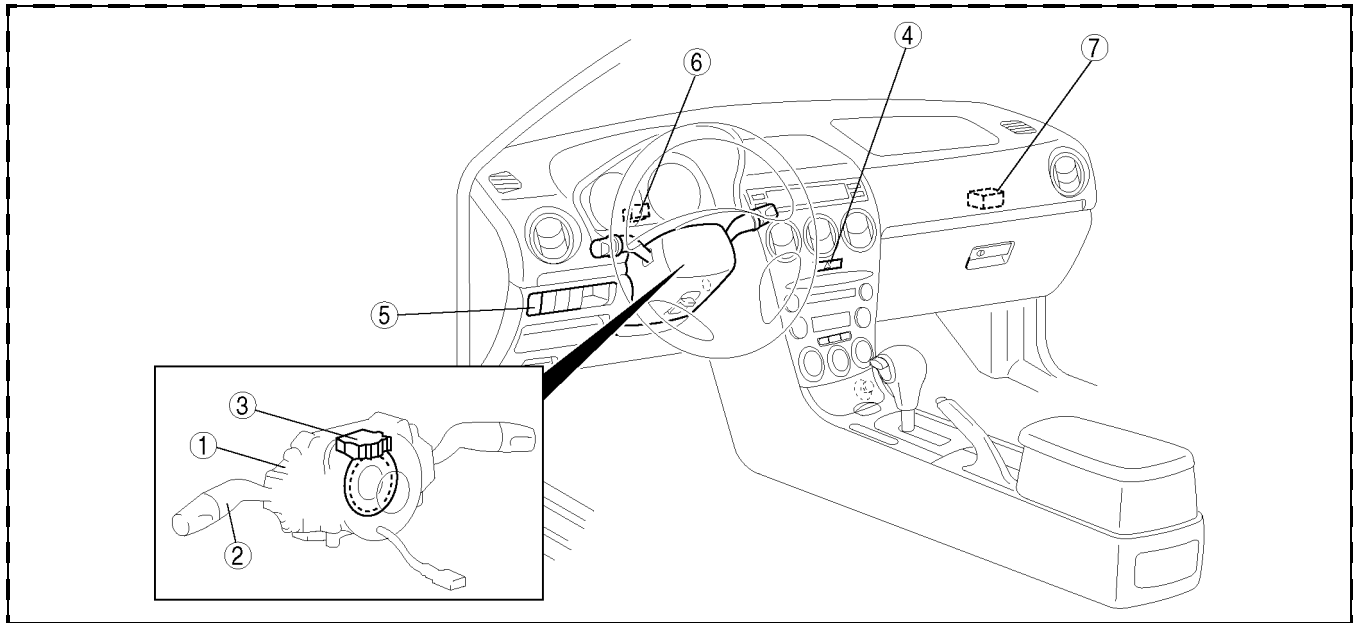


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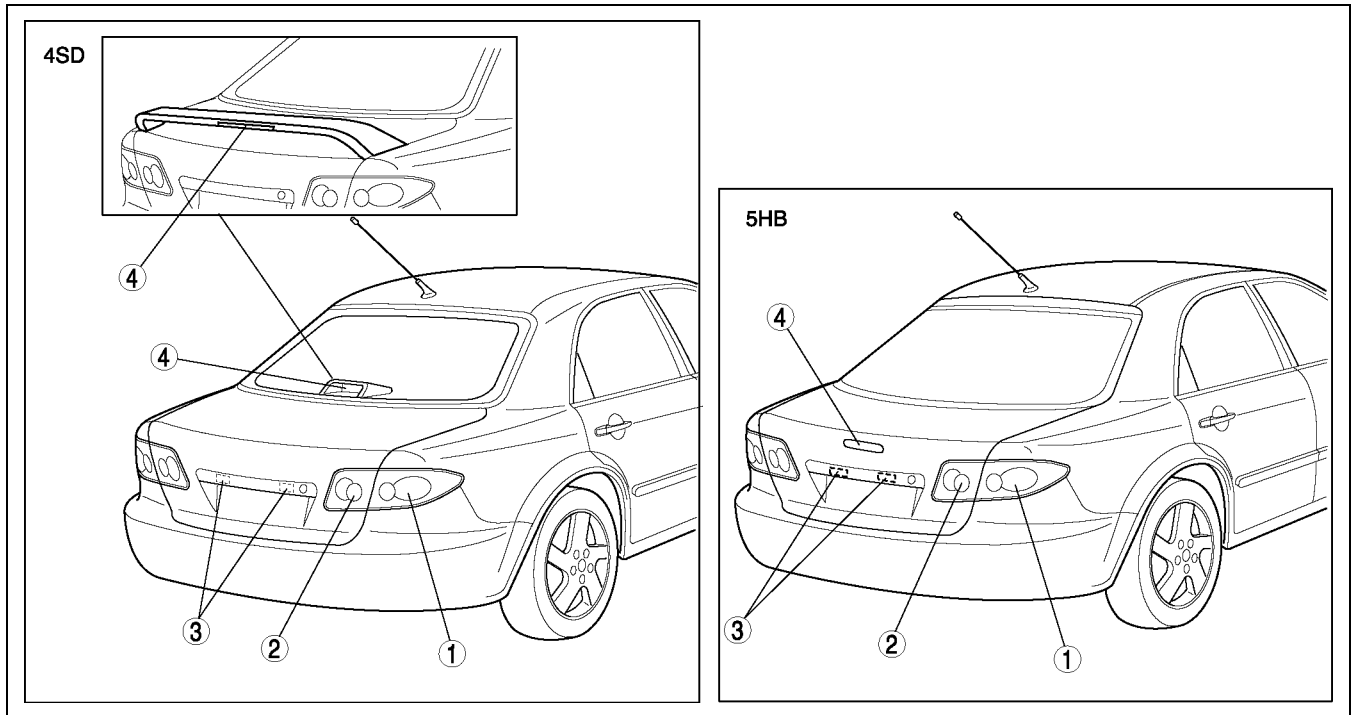
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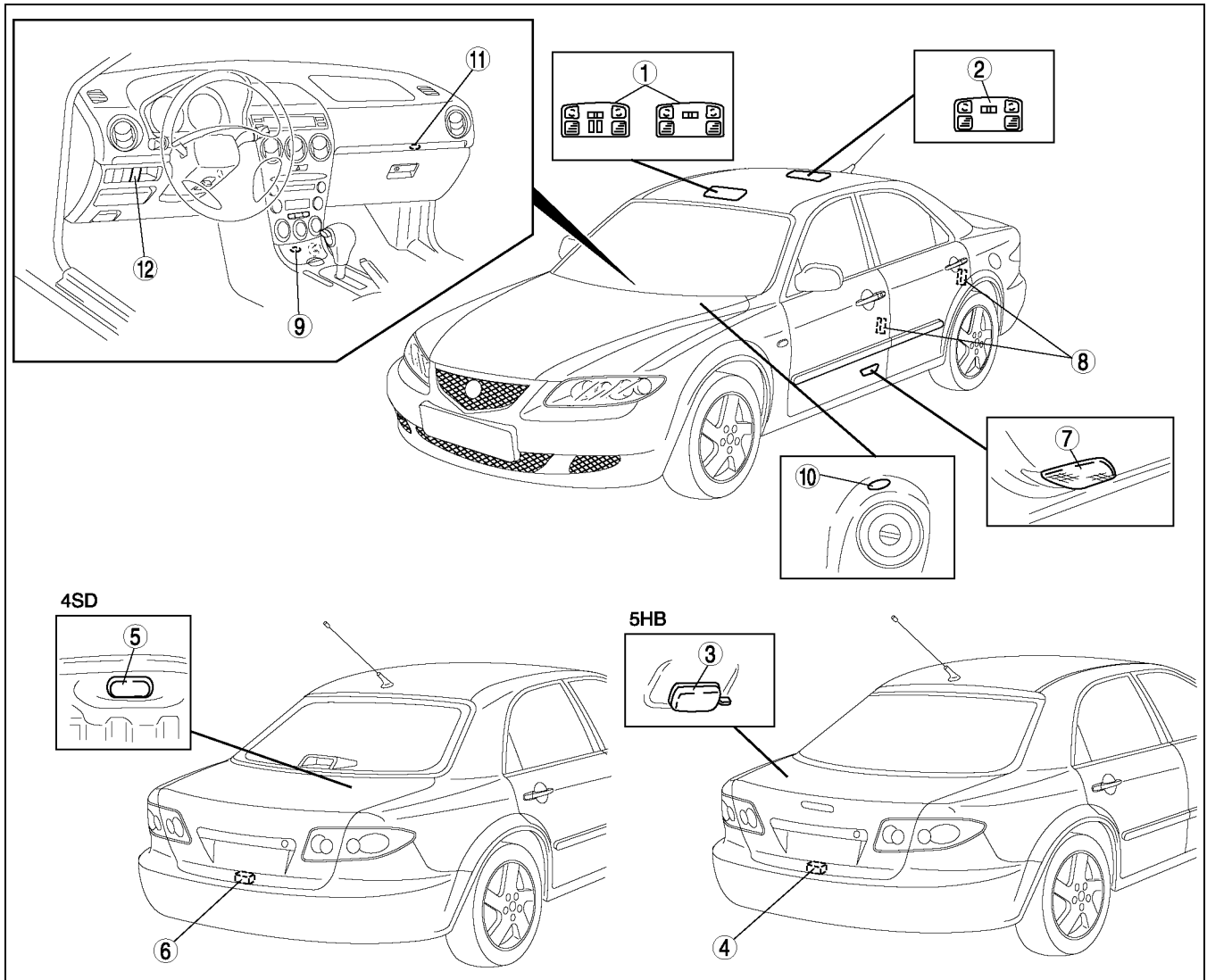
1	Rear combination light (See T-35 REAR COMBINATION LIGHT REMOVAL/INSTALLATION)
2	Inboard combination light (See T-35 INBOARD COMBINATION LIGHT REMOVAL/INSTALLATION)

3	License plate light (See T-37 LICENSE PLATE LIGHT REMOVAL/INSTALLATION)
4	High-mount brake light (See T-36 HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION)

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INTERIOR LIGHTING SYSTEM

A6E810001052W02



A6E8114W130

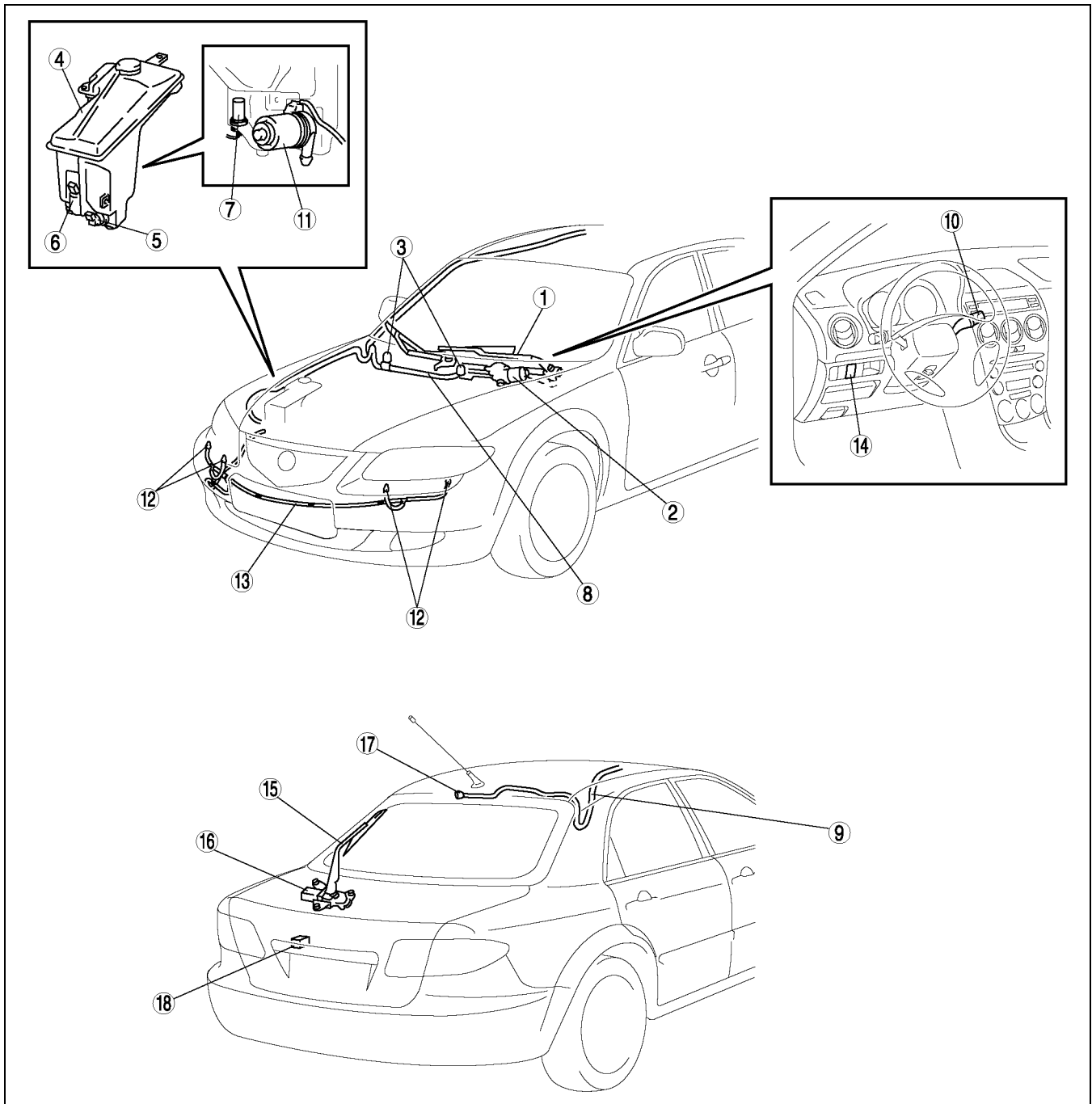
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3	Cargo compartment light (See T-50 CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION) (See T-50 CARGO COMPARTMENT LIGHT INSPECTION)
4	Cargo compartment light switch (See T-50 CARGO COMPARTMENT LIGHT SWITCH INSPECTION)
5	Trunk compartment light (See T-51 TRUNK COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION) (See T-51 TRUNK COMPARTMENT LIGHT SWITCH INSPECTION)
6	Trunk compartment light switch (See T-51 TRUNK COMPARTMENT LIGHT SWITCH INSPECTION)

7	Courtesy light (See T-51 COURTESY LIGHT BULB REMOVAL/ INSTALLATION)
8	Door switch (See T-52 DOOR SWITCH REMOVAL/ INSTALLATION) (See T-52 DOOR SWITCH INSPECTION)
9	Ashtray illumination (See T-52 ASHTRAY ILLUMINATION BULB REMOVAL/INSTALLATION)
10	Ignition key illumination (See T-53 IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION)
11	Glove compartment light (See T-53 GLOVE COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION)
12	Panel light control switch (See T-53 PANEL LIGHT CONTROL SWITCH REMOVAL/INSTALLATION) (See T-54 PANEL LIGHT CONTROL SWITCH INSPECTION)

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WIPER AND WASHER SYSTEM

A6E810001052W03



A6E8116T101

1	Windshield wiper arm and blade (See T-57 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION) (See T-58 WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT)
2	Windshield wiper motor (See T-56 WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION) (See T-56 WINDSHIELD WIPER MOTOR DISASSEMBLY/ASSEMBLY) (See T-56 WINDSHIELD WIPER MOTOR INSPECTION)

3	Windshield washer nozzle (See T-60 WINDSHIELD WASHER NOZZLE REMOVAL/INSTALLATION) (See T-60 WINDSHIELD WASHER NOZZLE CLEANING)
4	Washer tank (See T-58 WASHER TANK REMOVAL/INSTALLATION)
5	Windshield washer motor (See T-59 WINDSHIELD WASHER MOTOR REMOVAL/INSTALLATION) (See T-59 WINDSHIELD WASHER MOTOR INSPECTION)

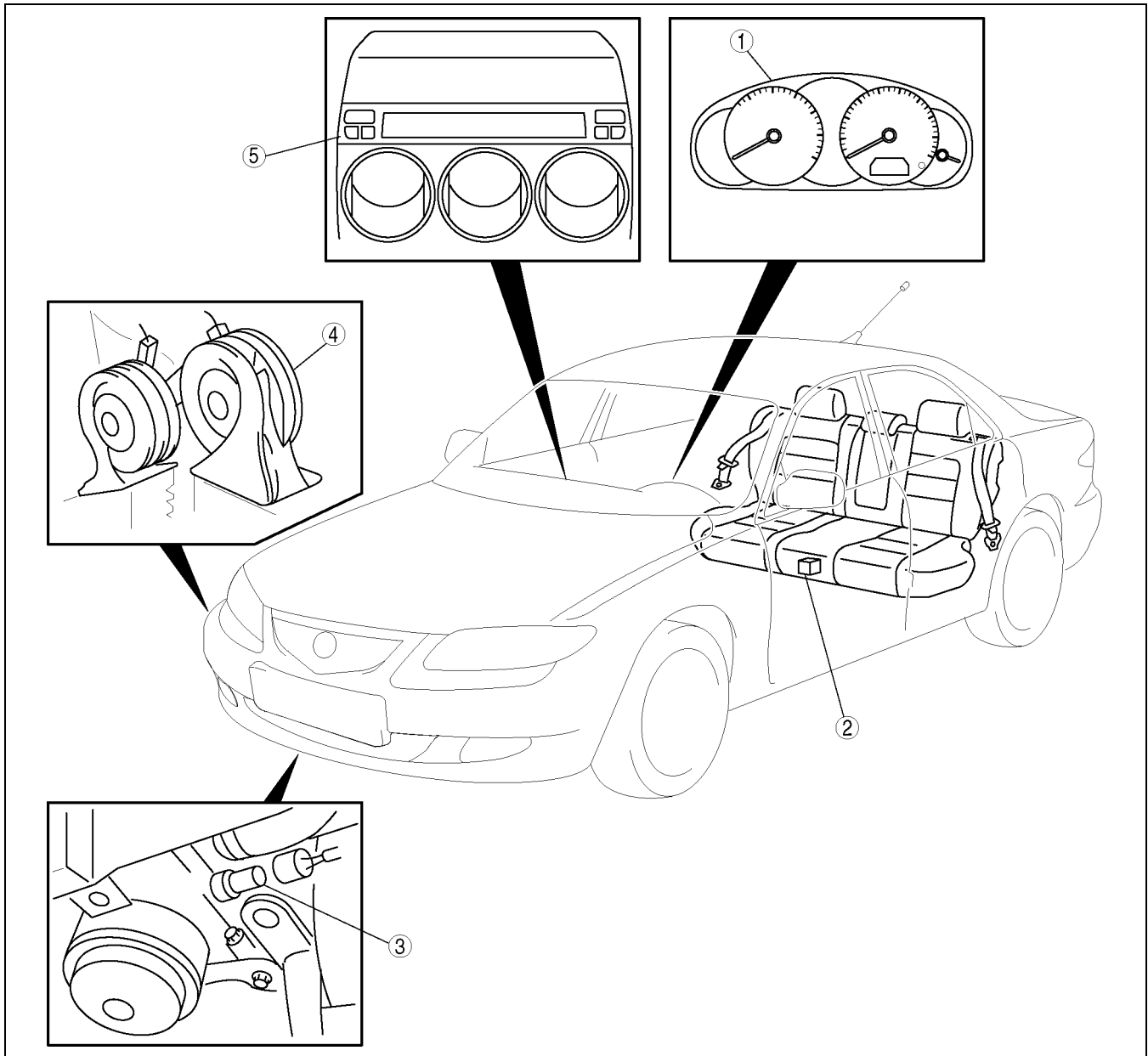
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6	Rear washer motor (5HB) (See T-61 REAR WASHER MOTOR REMOVAL/INSTALLATION) (See T-61 REAR WASHER MOTOR INSPECTION)
7	Washer fluid-level sensor (5HB) (See T-59 WASHER FLUID-LEVEL SENSOR REMOVAL/INSTALLATION) (See T-60 WASHER FLUID-LEVEL SENSOR INSPECTION)
8	Windshield washer hose (See T-61 WINDSHIELD WASHER HOSE REMOVAL/INSTALLATION)
9	Rear washer hose (5HB) (See T-65 REAR WASHER HOSE REMOVAL/INSTALLATION)
10	Wiper and washer switch (See T-67 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION) (See T-68 WIPER AND WASHER SWITCH INSPECTION)
11	Headlight cleaner motor (See T-69 HEADLIGHT CLEANER MOTOR REMOVAL/INSTALLATION) T-70 HEADLIGHT CLEANER MOTOR INSPECTION)
12	Headlight cleaner nozzle (See T-70 HEADLIGHT CLEANER NOZZLE REMOVAL/INSTALLATION) (See T-70 HEADLIGHT CLEANER NOZZLE ADJUSTMENT) (See T-70 HEADLIGHT CLEANER NOZZLE CLEANING)
13	Headlight cleaner hose (See T-71 HEADLIGHT CLEANER HOSE REMOVAL/INSTALLATION)
14	Headlight cleaner switch (See T-71 HEADLIGHT CLEANER SWITCH REMOVAL/INSTALLATION) (See T-71 HEADLIGHT CLEANER SWITCH INSPECTION)
15	Rear wiper arm and blade (5HB) T-63 REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION) (See T-64 REAR WIPER ARM AND BLADE ADJUSTMENT)
16	Rear wiper motor (5HB) (See T-62 REAR WIPER MOTOR REMOVAL/INSTALLATION) (See T-62 REAR WIPER MOTOR INSPECTION)
17	Rear washer nozzle (5HB) (See T-64 REAR WASHER NOZZLE REMOVAL/INSTALLATION) (See T-64 REAR WASHER NOZZLE ADJUSTMENT) (See T-64 REAR WASHER NOZZLE CLEANING)
18	Intermittent rear wiper relay (5HB) (See T-66 INTERMITTENT REAR WIPER RELAY REMOVAL/INSTALLATION) (See T-66 INTERMITTENT REAR WIPER RELAY INSPECTION)

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WARNING AND INDICATOR SYSTEM

A6E810001067W01



A6E8118W012

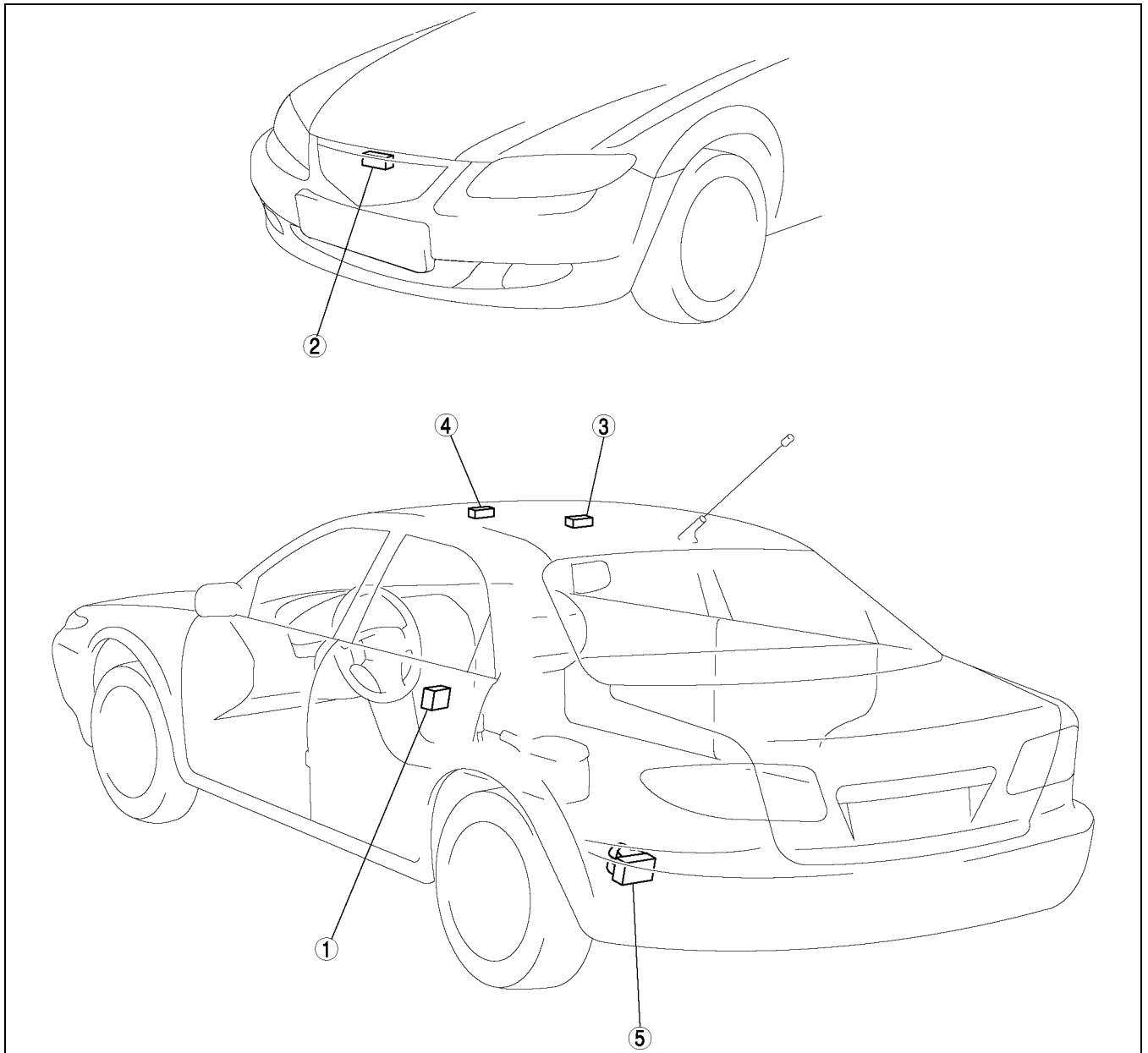
1	Instrument cluster (See T-72 INSTRUMENT CLUSTER REMOVAL/INSTALLATION) (See T-73 INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY) (See T-73 INSTRUMENT CLUSTER INSPECTION) (See T-74 INSTRUMENT CLUSTER REPAIR) (See T-75 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE)

2	Fuel gauge sender unit (See T-83 FUEL GAUGE SENDER UNIT INSPECTION)
3	Oil pressure switch (See T-84 OIL PRESSURE SWITCH INSPECTION)
4	Horn (See T-84 HORN REMOVAL/INSTALLATION)
5	Information display (See T-84 INFORMATION DISPLAY REMOVAL/INSTALLATION)

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THEFT-DETERRENT SYSTEM

A6E810050000W01



A6E8120W007

1	Theft-deterrent control module (See T-86 THEFT-DETERRENT CONTROL MODULE REMOVAL/INSTALLATION) (See T-86 THEFT-DETERRENT CONTROL MODULE INSPECTION)
2	Bonnet switch (See T-85 BONNET SWITCH INSPECTION)

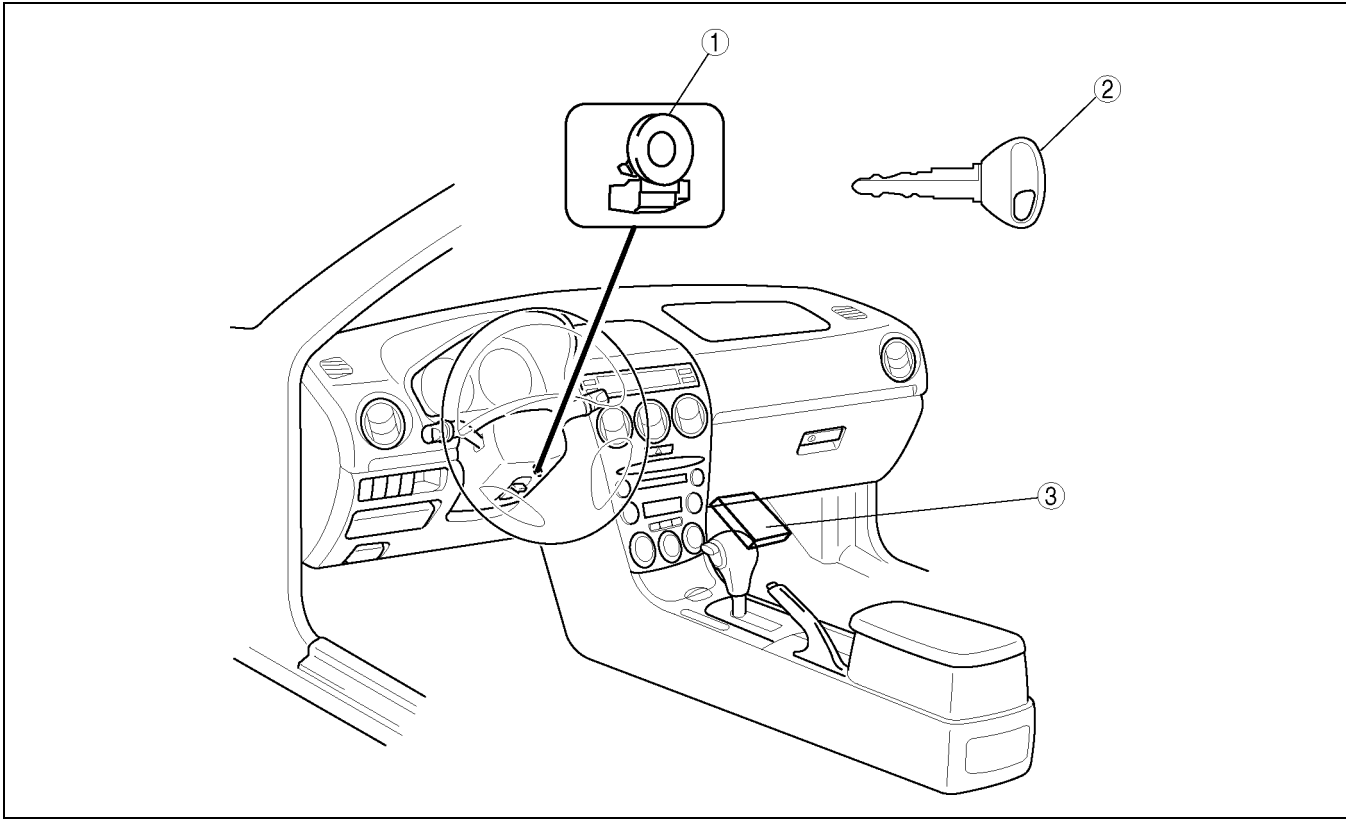
3	Intruder sensor (Vehicle with sliding sunroof) (See T-89 INTRUDER SENSOR REMOVAL/INSTALLATION)
4	Intruder sensor (Vehicle without sliding sunroof) (See T-89 INTRUDER SENSOR REMOVAL/INSTALLATION)
5	Theft-deterrent siren (See T-89 THEFT-DETERRENT SIREN REMOVAL/INSTALLATION)

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IMMOBILIZER SYSTEM

A6E810067000W01



A6E8122W004

1	Coil (See T-90 COIL REMOVAL/INSTALLATION)
2	Key (transponder) (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)

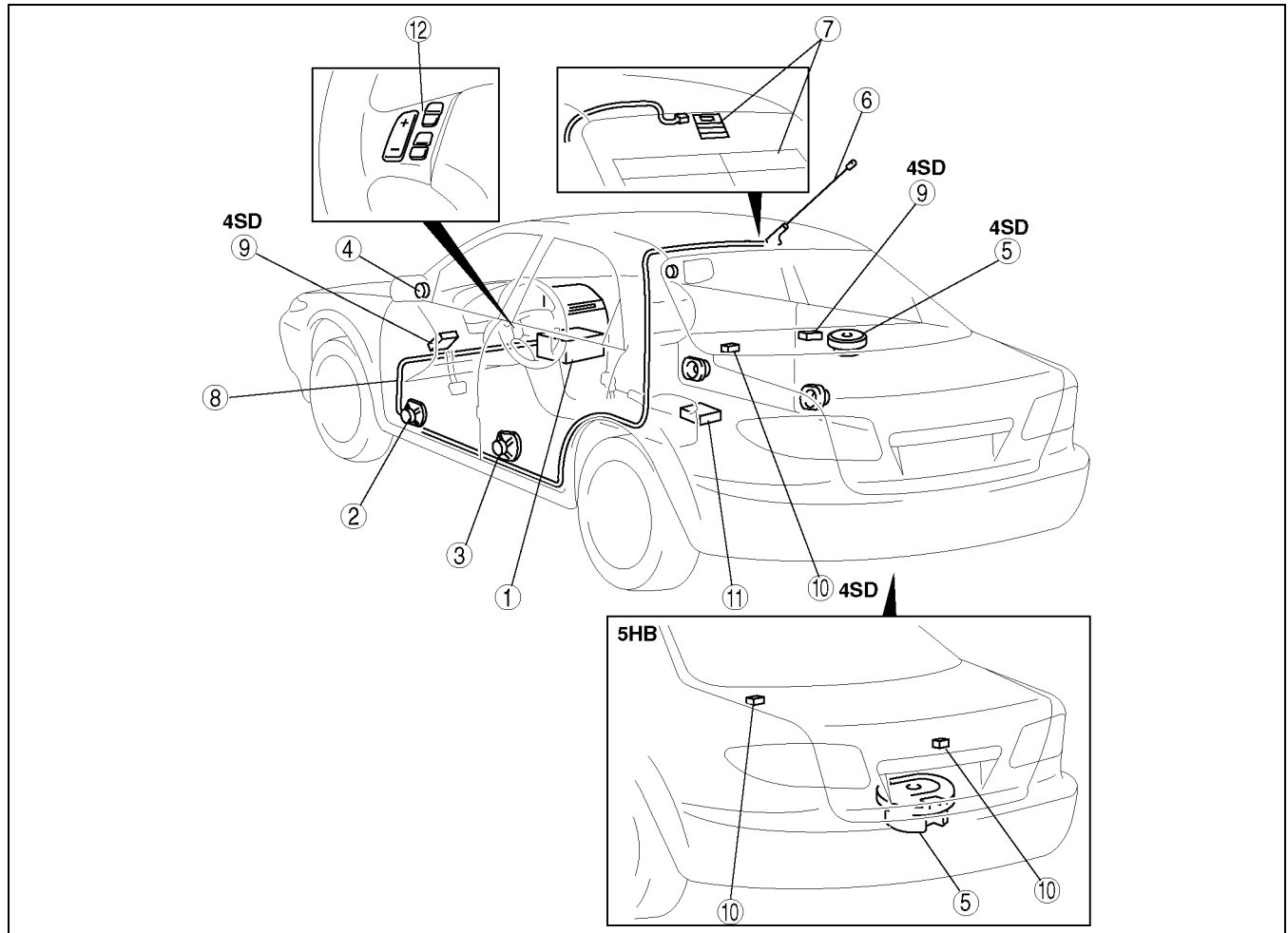
3	PCM (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)

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AUDIO AND NAVIGATION SYSTEM

A6E810001066W01

Audio System



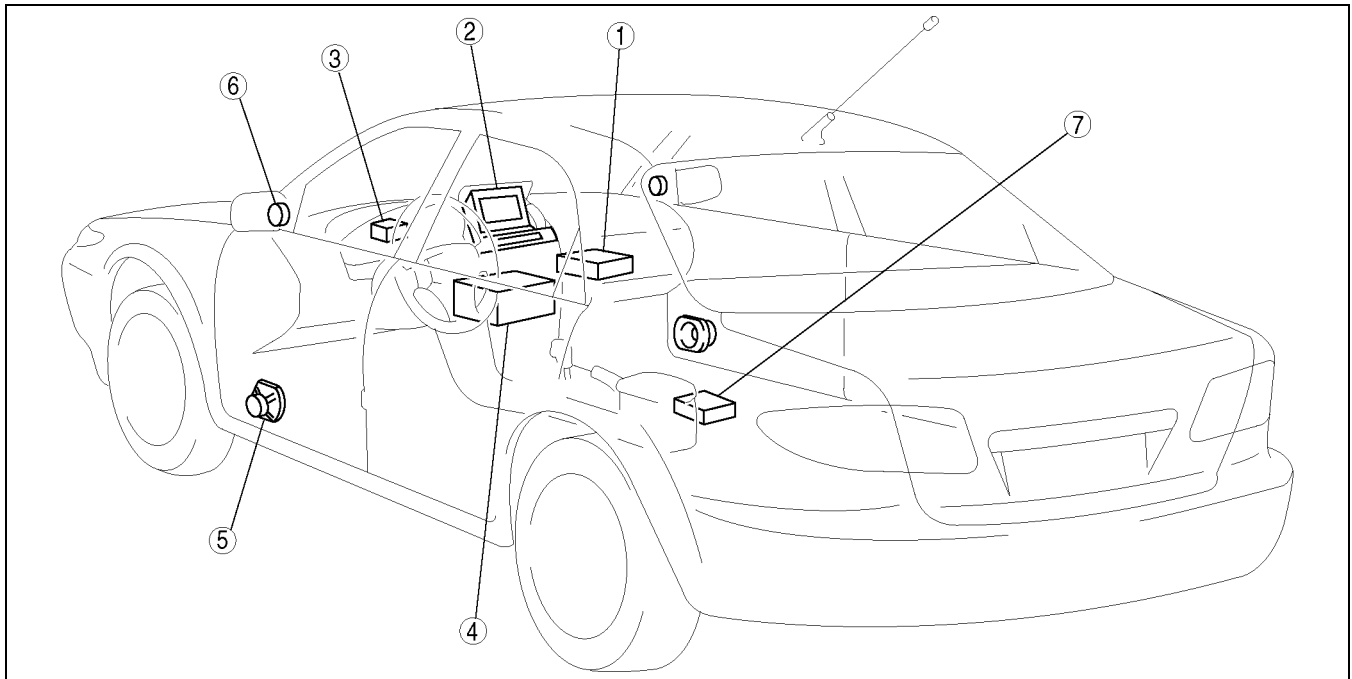
A6E8124W044

1	Audio unit (See T-93 ANTI-THEFT SYSTEM) (See T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION) (See T-97 CENTER PANEL MODULE DISASSEMBLY/ASSEMBLY) (See T-97 AUDIO UNIT DISASSEMBLY/ASSEMBLY)
2	Front door speaker (See T-101 FRONT DOOR SPEAKER REMOVAL/INSTALLATION) (See T-101 FRONT DOOR SPEAKER INSPECTION)
3	Rear door speaker (See T-102 REAR DOOR SPEAKER REMOVAL/INSTALLATION) (See T-102 REAR DOOR SPEAKER INSPECTION)
4	Tweeter (See T-103 TWEETER REMOVAL/INSTALLATION) (See T-103 TWEETER INSPECTION)
5	Woofer (See T-103 WOOFER REMOVAL/INSTALLATION) (See T-104 WOOFER INSPECTION)

6	Center roof antenna (See T-107 CENTER ROOF ANTENNA REMOVAL/INSTALLATION) (See T-107 CENTER ROOF ANTENNA INSPECTION)
7	Glass antenna (See T-107 GLASS ANTENNA INSPECTION)
8	Antenna feeder (See T-108 ANTENNA FEEDER LOCATION) (See T-109 FRONT ANTENNA FEEDER INSPECTION) (See T-109 REAR ANTENNA FEEDER INSPECTION)
9	Noise filter (See T-104 NOISE FILTER REMOVAL/INSTALLATION) (See T-105 NOISE FILTER INSPECTION)
10	Condenser (See T-106 CONDENSER REMOVAL/INSTALLATION)
11	Audio amplifier (See T-100 AUDIO AMPLIFIER REMOVAL/INSTALLATION)
12	Audio control switch (See T-99 AUDIO CONTROL SWITCH REMOVAL/INSTALLATION) (See T-100 AUDIO CONTROL SWITCH INSPECTION)

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Car-navigation System



A6E8124W045

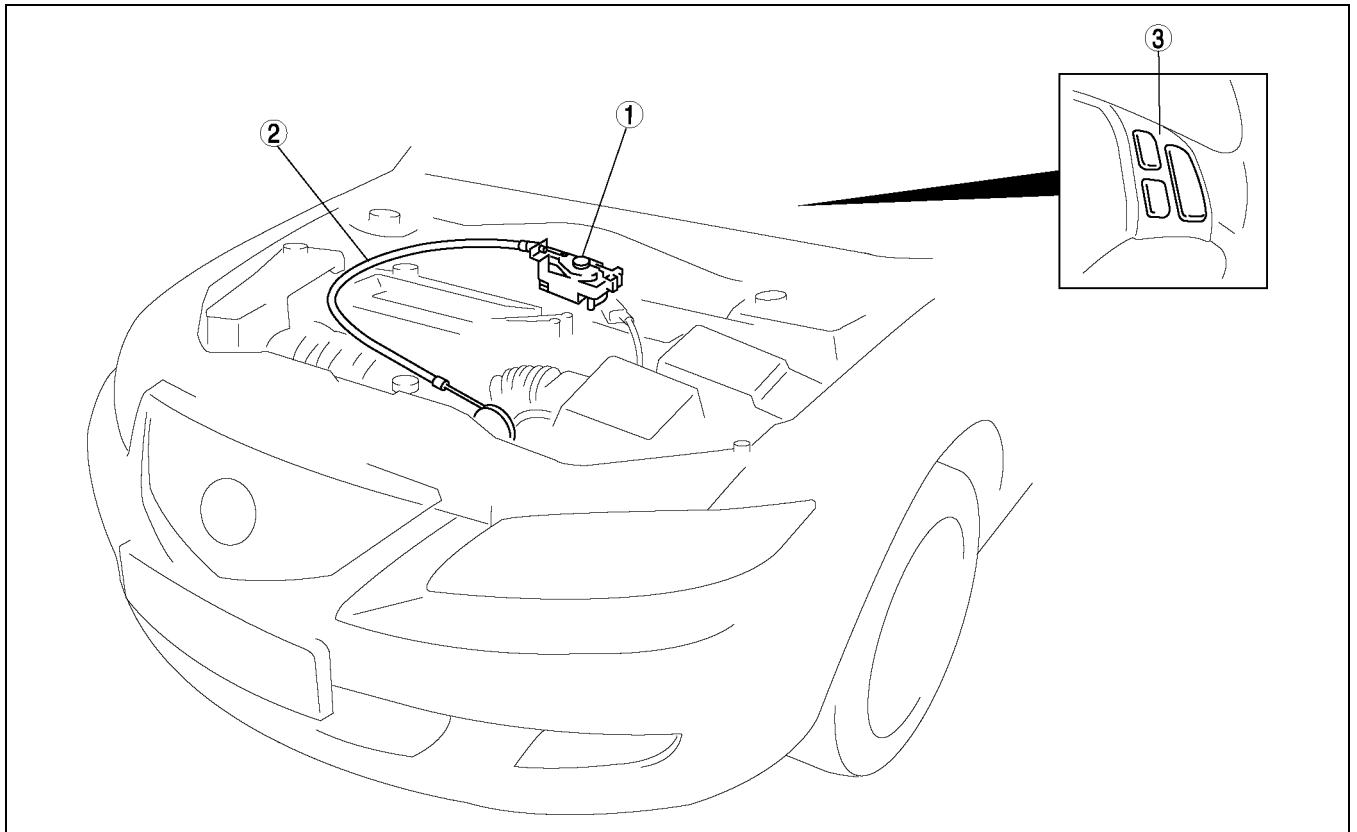
1	Car-navigation unit (See T-98 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION)
2	Car-navigation unit (See T-98 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION)
3	GPS antenna (See T-108 GPS ANTENNA REMOVAL/INSTALLATION)
4	Audio unit (See T-93 ANTI-THEFT SYSTEM) (See T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION) (See T-97 CENTER PANEL MODULE DISASSEMBLY/ASSEMBLY) (See T-97 AUDIO UNIT DISASSEMBLY/ASSEMBLY)

5	Front door speaker (See T-101 FRONT DOOR SPEAKER REMOVAL/INSTALLATION) (See T-101 FRONT DOOR SPEAKER INSPECTION)
6	Tweeter (See T-103 TWEETER REMOVAL/INSTALLATION) (See T-103 TWEETER INSPECTION)
7	Audio amplifier (See T-100 AUDIO AMPLIFIER REMOVAL/INSTALLATION)

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CRUISE CONTROL SYSTEM

A6E810001011W01



A6E8128W017

1	Cruise actuator (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION) (See T-110 CRUISE ACTUATOR INSPECTION)
2	Actuator cable (See T-112 ACTUATOR CABLE REMOVAL) (See T-114 ACTUATOR CABLE INSTALLATION)

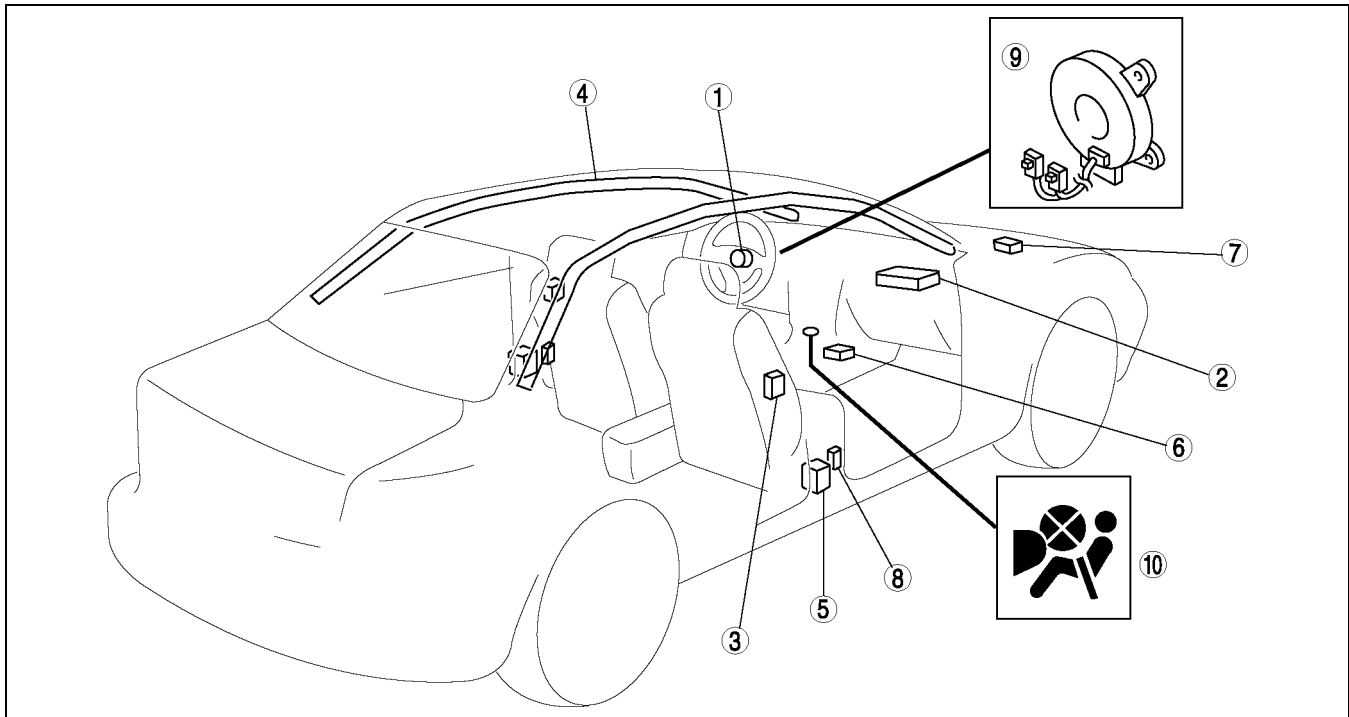
3	Cruise control switch (See T-115 CRUISE CONTROL SWITCH REMOVAL/INSTALLATION) (See T-116 CRUISE CONTROL SWITCH INSPECTION)

T

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AIR BAG SYSTEM

A6E810001046W01



A6E8130W049

1	Driver-side air bag module (See T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION) (See T-127 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)
2	Passenger-side air bag module (See T-121 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION) (See T-127 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)
3	Side air bag module (See T-121 SIDE AIR BAG MODULE REMOVAL/INSTALLATION) (See T-127 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)
4	Curtain air bag module (See T-122 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION) (See T-127 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)

5	Pre-tensioner seat belt (See T-127 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES)
6	SAS unit (See T-124 SAS UNIT REMOVAL/INSTALLATION)
7	Crash zone sensor (See T-123 CRASH ZONE SENSOR REMOVAL/INSTALLATION)
8	Side air bag sensor (See T-123 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
9	Clock spring (See T-125 CLOCK SPRING REMOVAL/INSTALLATION) (See T-126 CLOCK SPRING INSPECTION) (See T-125 CLOCK SPRING ADJUSTMENT)
10	Passenger-side air bag cut-off indicator light (See T-127 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT REMOVAL/INSTALLATION)

POWER SYSTEM

POWER SYSTEM

FUSE SERVICE CAUTION

A6E81106600W01

Caution

- Determine and correct the cause of the burnt fuse before replacing it with the specified type. If the fuse is replaced before doing this, it may burn again.

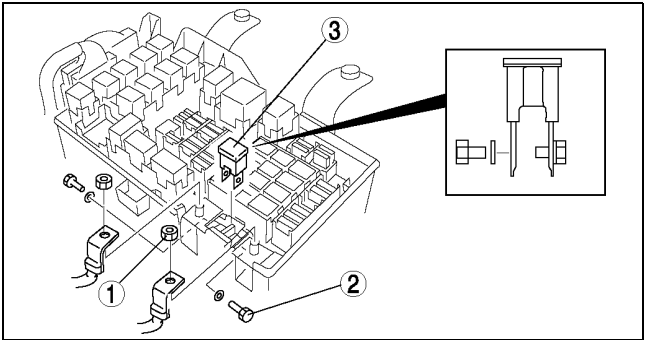
MAIN FUSE REMOVAL/INSTALLATION

A6E811066761W01

1. Disconnect the negative battery cable.
2. Remove the main fuse block cover.
3. Remove in the order indicated in the table.

1	Nut
2	Bolt (See T-19 Bolt Removal Note)
3	Main fuse

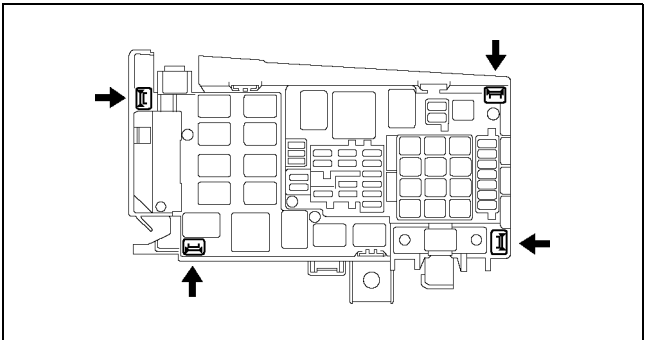
4. Install in the reverse order of removal.



A6E8110W108

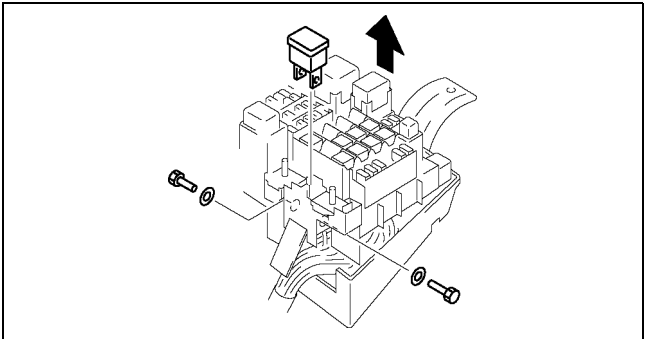
Bolt Removal Note

1. Press and remove the tabs on the main fuse block at the positions indicated by the arrows.



A6E8110W119

2. Lift up the main fuse block and remove the bolts.



A6E8110W120

POWER SYSTEM

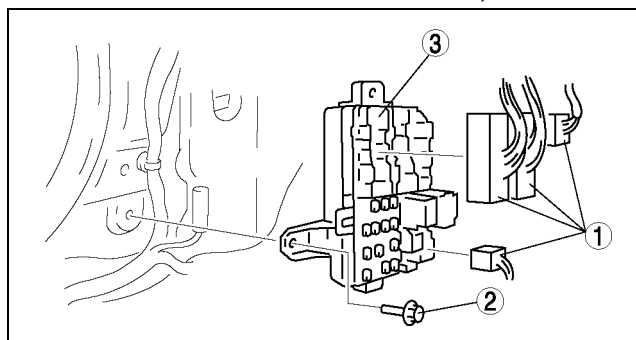
FUSE BLOCK REMOVAL/INSTALLATION

A6E811066730W01

1. Disconnect the negative battery cable.
2. Remove the left-side front side trim. (See [S-88 FRONT SIDE TRIM REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Fuse block

4. Install in the reverse order of removal.



A6E8110W107

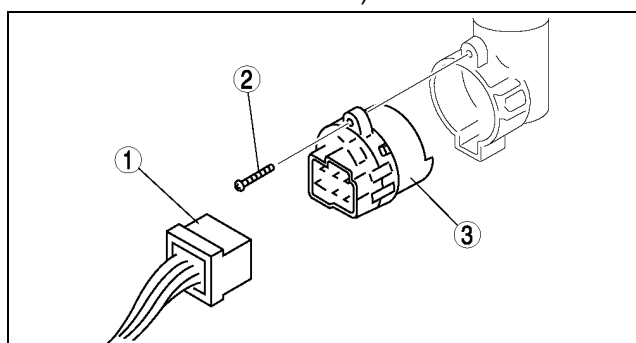
IGNITION SWITCH REMOVAL/INSTALLATION

A6E811066151W01

1. Disconnect the negative battery cable.
2. Remove the column cover. (See [S-84 COLUMN COVER REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Ignition switch

4. Install in the reverse order of removal.



A6E8110W101

IGNITION SWITCH INSPECTION

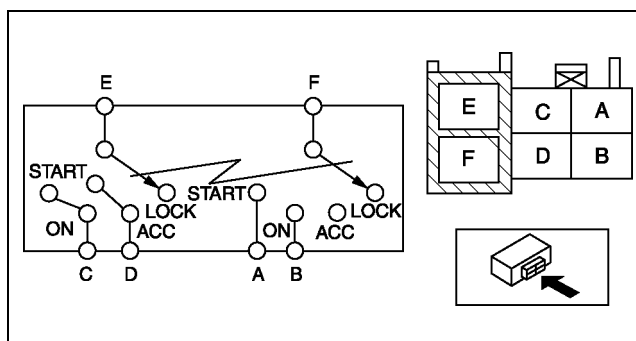
A6E811066151W02

1. Disconnect the negative battery cable.
2. Remove the column cover. (See [S-84 COLUMN COVER REMOVAL/INSTALLATION](#))
3. Disconnect the ignition switch connectors.
4. Inspect for continuity between the ignition switch terminals using an ohmmeter.
 - If not as specified, replace the ignition switch.

○—○: Continuity

Ignition key position	Terminal					
	E	F	D	C	B	A
LOCK						
ACC	○—○		○—○			
ON	○—○	○—○	○—○	○—○	○—○	
START	○—○	○—○	○—○	○—○	○—○	○—○

A6E8110W114



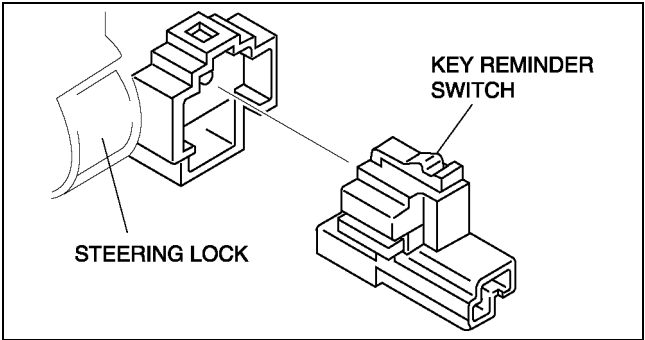
A6E8110W116

POWER SYSTEM

KEY REMINDER SWITCH REMOVAL/INSTALLATION

A6E811066152W01

- 1. Disconnect the negative battery cable.
- 2. Remove the column cover.
- 3. Disconnect the key reminder switch connector.
- 4. Remove the key reminder switch.
- 5. Install in the reverse order of removal.



A6E8110W102

KEY REMINDER SWITCH INSPECTION

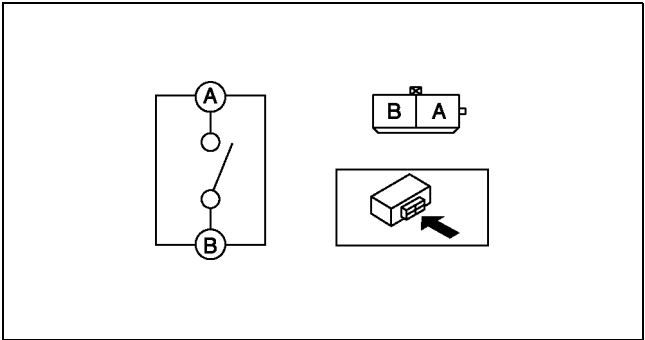
A6E811066152W02

- 1. Disconnect the negative battery cable.
- 2. Remove the column cover. (See [S-84 COLUMN COVER REMOVAL/INSTALLATION](#))
- 3. Disconnect the key reminder switch connector.
- 4. Inspect for continuity between the key reminder switch terminals using an ohmmeter.
 - If not as specified, replace the key reminder switch.

○—○ : Continuity

Key position	Terminal	
	A	B
Key inserted	○—○	○—○
Key removed		

A6E8110W115



A6E8110W117

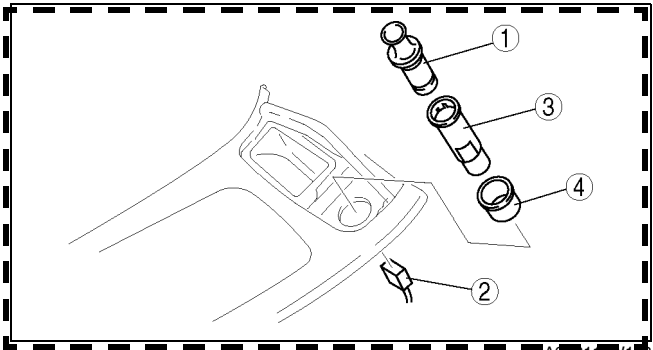
CIGARETTE LIGHTER REMOVAL/INSTALLATION

A6E811067000W01

- 1. Disconnect the negative battery cable.
- 2. Remove in the order indicated in the table.

1	Cigarette lighter plug
2	Connector
3	Socket (See T-22 Socket Removal Note)
4	Ring (See T-22 Ring Removal Note)

- 3. Install in the reverse order of removal.

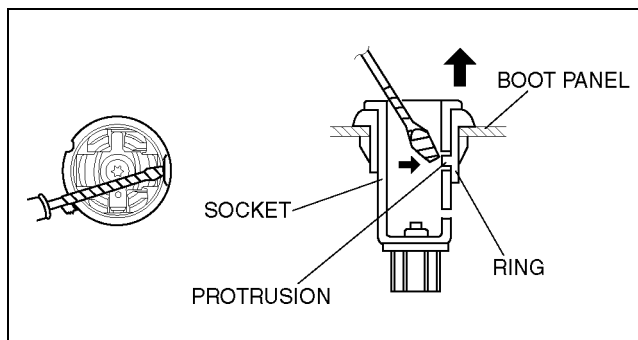


A6E8110W103

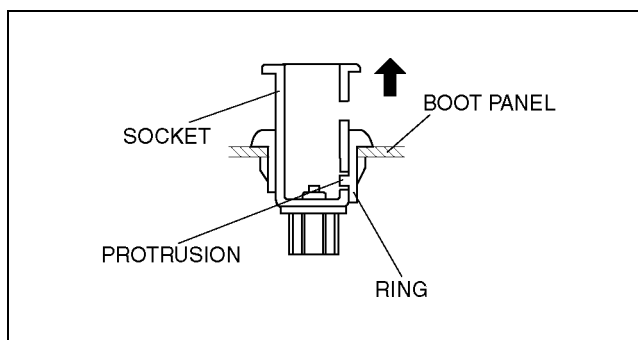
POWER SYSTEM

Socket Removal Note

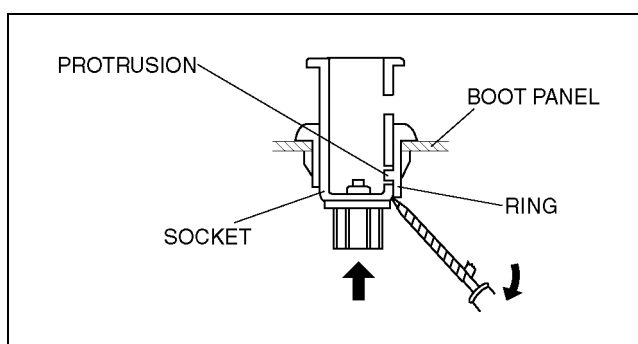
1. Insert a tape-wrapped screwdriver into the socket hole, then press against the ring protrusion to lift the socket toward you.



2. As shown in the figure, lift out the socket until the ring protrusion locks into the lower socket hole.
3. Remove the boot panel.

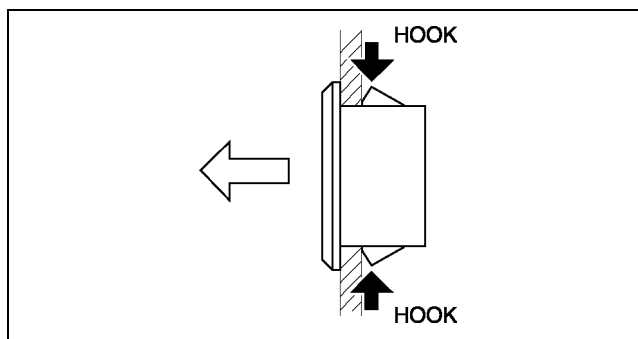


4. From behind the boot panel, slide a tape-wrapped screwdriver in between the socket and the ring protrusion..
5. While twisting the ring protrusion with the screwdriver, push out and remove the socket.



Ring Removal Note

1. Pull the ring forward while compressing the hooks.



CIGARETTE LIGHTER INSPECTION

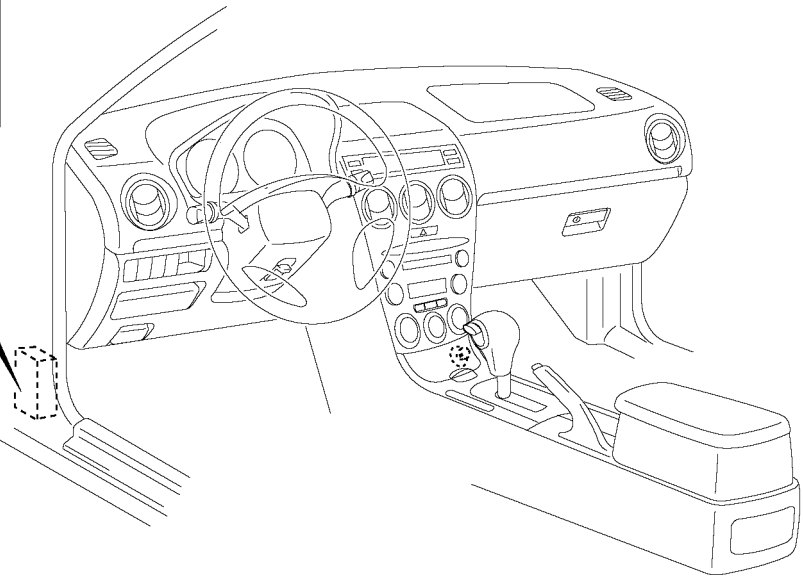
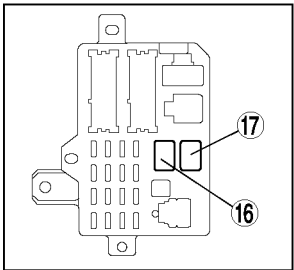
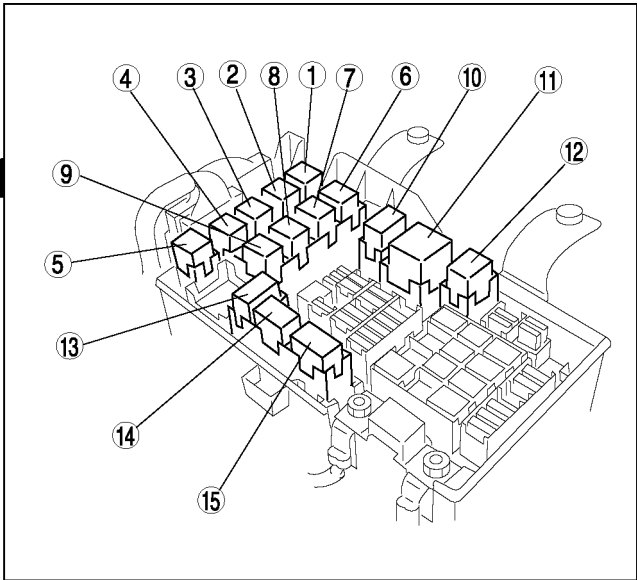
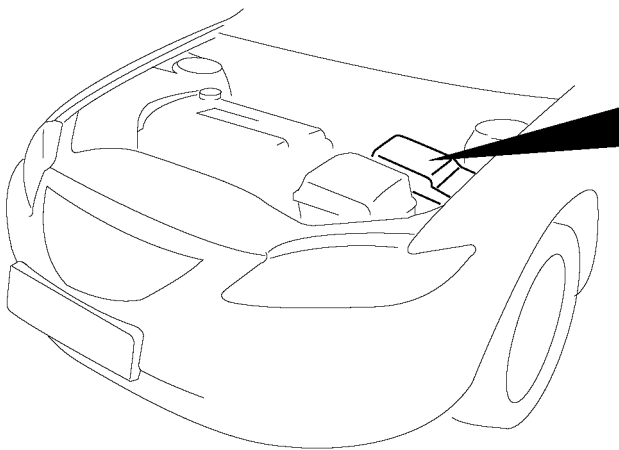
1. Turn the ignition switch to ACC position.
2. Verify that the cigarette lighter comes out within **10—20 seconds**, after pressing the plug into the socket.
 - If the cigarette lighter does not operate normally, replace the cigarette lighter plug and socket.

A6E811067000W02

POWER SYSTEM

RELAY LOCATION

A6E811067730W01



1	Cooling fan relay No.2
2	Horn relay
3	Cooling fan relay No.3
4	Stater relay
5	Cooling fan relay No.4
6	Woofer relay
7	Rear window defroster relay
8	Rear fog light relay
9	A/C relay

10	Main relay
11	Headlight relay
12	TNS relay
13	Cooling fan relay No.1
14	Headlight cleaner relay
15	Front fog light relay
16	Fuel pump relay
17	Blower relay

A6E8110T102

T

POWER SYSTEM

RELAY INSPECTION

Relay Type

A6E811067730W02

Terminal type		Parts name
Four-terminal	Type A	• Main relay • Fuel pump relay • Stater relay • TNS relay • Front fog light relay • Rear fog light relay • Horn relay • Headlight cleaner relay • Rear window defroster relay • Woofer relay • A/C relay • Blower relay • Cooling fan relay No.1 (except L3 engine) • Cooling fan relay No.2 • Cooling fan relay No.3 • Cooling fan relay No.4
	Type B	• Headlight relay
Five-terminal	Type C	• Cooling fan relay No.1 (L3 engine only)

Four-terminal

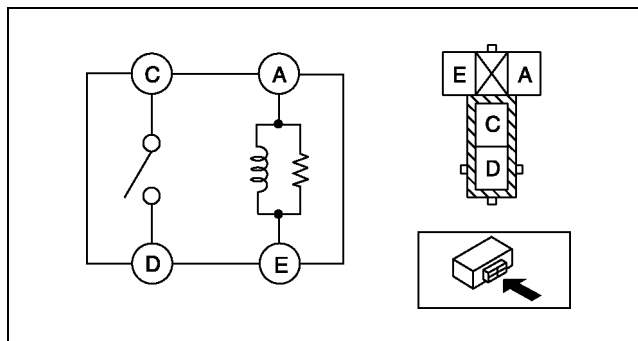
Type A

1. Remove the relay.
2. Inspect for continuity between the relay terminals using an ohmmeter.
 - If not as specified, replace the relay.

○—○ : Continuity

Step	Terminal			
	A	E	C	D
1	○—○			
2	B+	GND	○—○	

A6E8110W121



A6E8110W118

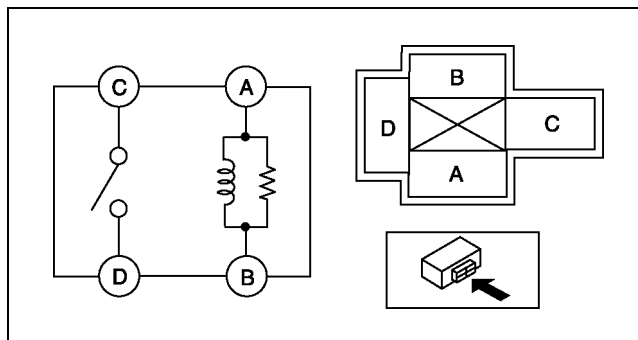
Type B

1. Remove the relay.
2. Inspect for continuity between the relay terminals using an ohmmeter.
 - If not as specified, replace the relay.

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○—○			
2	B+	GND	○—○	

A6E8110W123



A6E8110W125

POWER SYSTEM, EXTERIOR LIGHTING SYSTEM

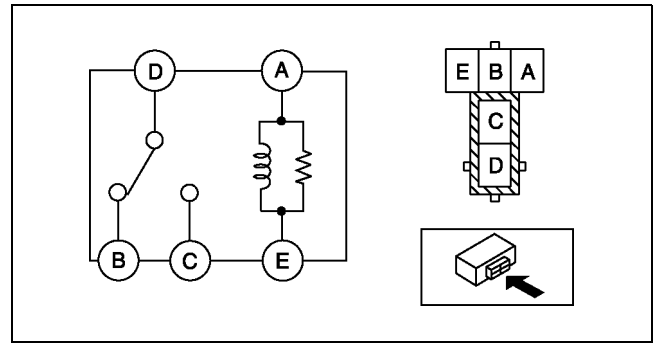
Type C

1. Remove the relay.
2. Inspect for continuity between the relay terminals using an ohmmeter.
 - If not as specified, replace the relay.

○—○ : Continuity

Step	Terminal				
	A	E	B	C	D
1	○—○		○—○		○—○
2	B+	GND		○—○	

A6E8110W126



A6E8110W122

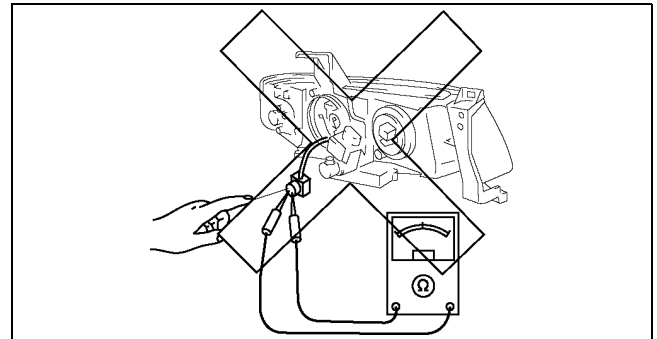
EXTERIOR LIGHTING SYSTEM

DISCHARGE HEADLIGHT SERVICE WARNINGS

A6E811251060W01

Discharge headlight bulb service warnings

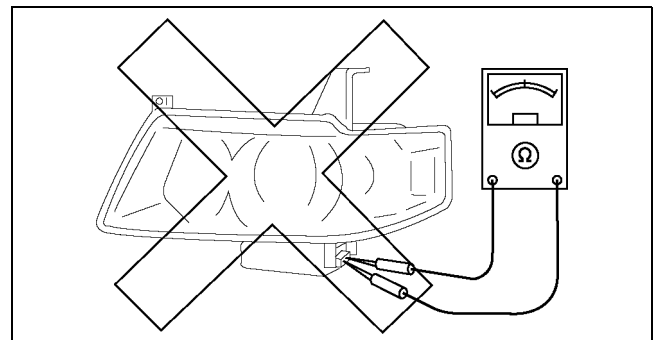
- To prevent electrical shock when replacing the discharge headlight bulb, dry hands thoroughly, and carry out work in an area out of rain.
- When the light switch is on, approx. 25,000 V of high voltage passes through the discharge headlight bulb socket. Because of the danger of electrical shock, do not insert fingers or a circuit tester.
- When the headlights are on, high voltage flows around the socket and bulb. When turning on the discharge headlights while working, always leave the headlights in the vehicle-installed condition to prevent electrical shock.



A6E8112W163

Discharge headlight control unit service warnings

- Because of the danger of electrical shock, when inspecting with a circuit tester or similar device, do not inspect the discharge headlight control unit as a single unit or disassemble it.
- If there are scratches or damage to the discharge headlight control unit, or it has been impacted, there may be damage despite apparent normal operation. Therefore, to prevent electrical shock or operation error, replace with new parts.



A6E8112W164

EXTERIOR LIGHTING SYSTEM

FRONT COMBINATION LIGHT REMOVAL/INSTALLATION

A6E811251060W02

Caution

- Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the "Discharge headlight service warnings." (See [T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS](#))

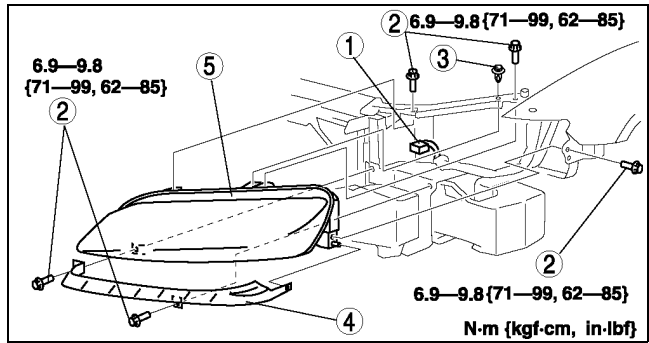
Note

- When the ignition switch is turned to ON, it is normal to hear the headlight leveling actuator operating for a few second, as it verifies headlight auto leveling system operating condition.

1. Disconnect the negative battery cable.
2. Remove the front bumper. (See [S-47 FRONT BUMPER REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Clip
4	Cover
5	Front combination light

4. Install in the reverse order of removal.
5. Adjust the headlight aiming. (See [T-26 HEADLIGHT AIMING.](#))



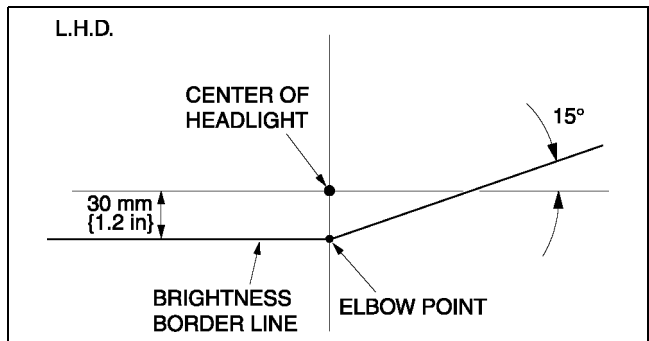
A6E8112W101

HEADLIGHT AIMING

A6E811251030W01

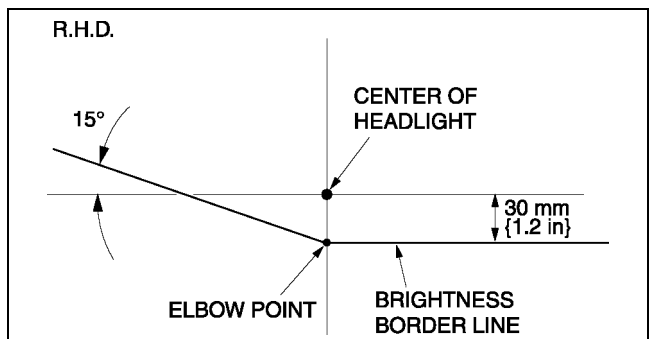
Low-beam

1. Set up a screen as shown in the figure below for aiming the headlights.



A6E8112W132

2. Adjust the tire air pressure to the specification.
3. Position the unloaded vehicle on a flat, level surface.
4. Seat one person in the driver's seat.
5. Position the vehicle straight ahead and perpendicular to a wall.



A6E8112W133

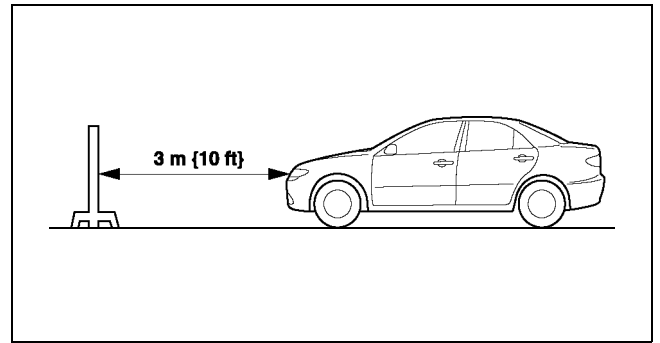
EXTERIOR LIGHTING SYSTEM

6. Set the headlights **3 m {10 ft}** from the wall.
7. While adjusting one headlight, mask the other.
8. Start the engine to charge the battery.
9. Turn on the lower-beam headlight.
10. Set the headlight leveling switch to 0 position.
11. Adjust the headlights by turning the adjusting screws as shown in the figure. Loosen the screws first, then tighten them.

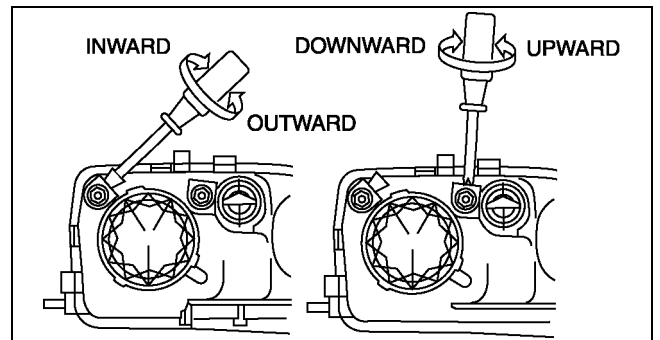
Note

- If the adjusting screws are tightened first, then loosened, they will continue to loosen when the vehicle is in motion and may cause the headlights to become misaligned.

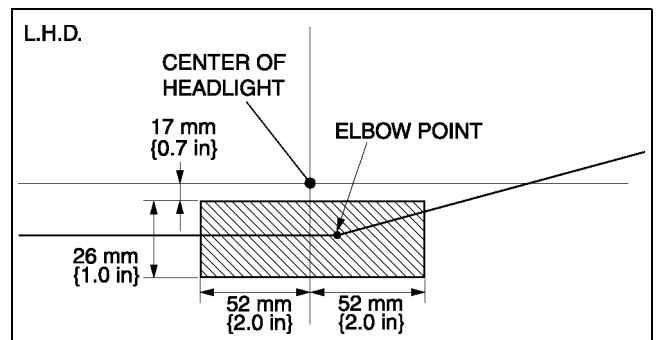
12. Turn the adjusting screws and adjust the headlight so that the elbow point in the shaded area in the figure.



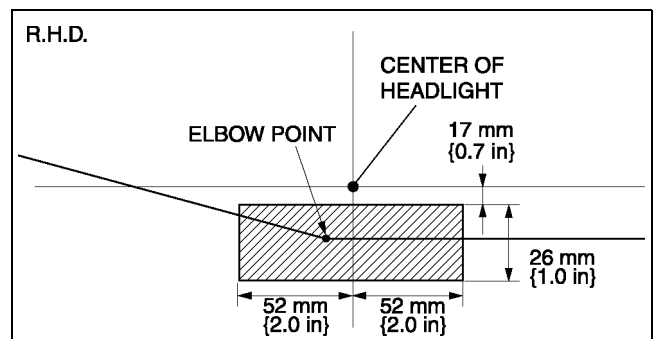
A6E8112W157



A6E8112W125



A6E8112W134



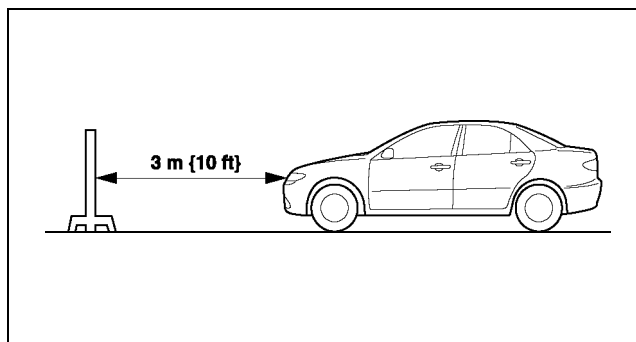
A6E8112W135

High-beam

1. Adjust the tire air pressure to the specification.
2. Position the unloaded vehicle on a flat, level surface.
3. Seat one person in the driver's seat.
4. Position the vehicle straight ahead and perpendicular to a wall.

EXTERIOR LIGHTING SYSTEM

5. Set the headlights **3 m {10 ft}** from the wall.
6. While adjusting one headlight, mask the other.
7. Start the engine to charge the battery.
8. Turn on the high-beam headlights.
9. Set the headlight leveling switch to 0 position.

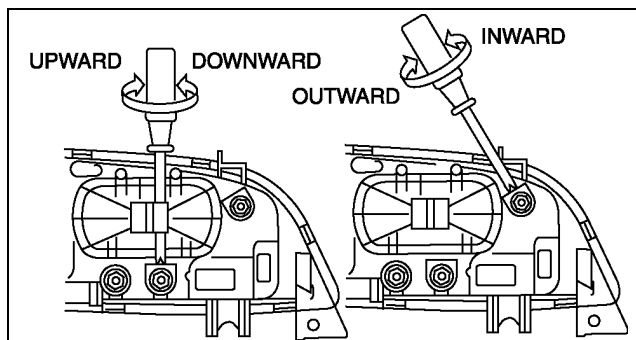


A6E8112W157

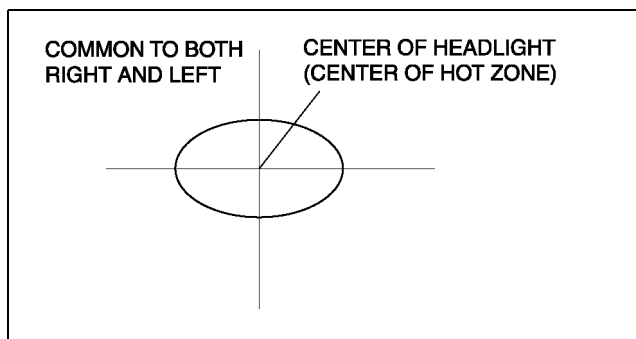
10. Adjust the headlights by turning the adjusting screws as shown in the figure. Loosen the screws first, then tighten them.

Note

- If the adjusting screws are tightened first, then loosened, they will continue to loosen when the vehicle is in motion and may cause the headlights to become misaligned.



A6E8112W124



A6E8112W136

HEADLIGHT BULB REMOVAL/INSTALLATION

A6E811251030W02

Low-beam

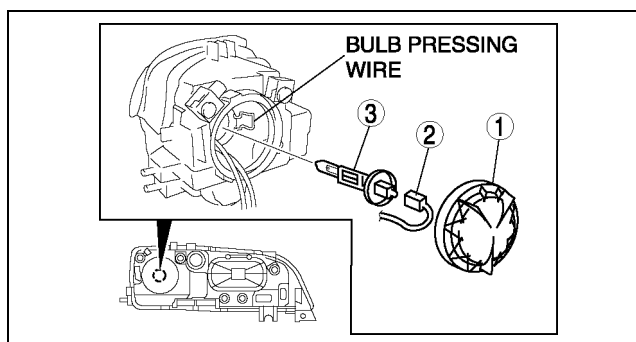
Halogen type

1. Disconnect the negative battery cable.
2. Disconnect the front combination light. (See [T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Cover
2	Connector
3	Headlight bulb (See T-28 Headlight bulb removal note)

Caution

- A halogen bulb generates extremely high heat when it is used. If the surface of the bulb is soiled, excessive heat will build up and the light's life will be shortened. When replacing the bulb, hold the metal flange, not the glass.



A6E8112W105

4. Install in the reverse order of removal.

Headlight bulb removal note

1. Release the bulb pressing wire to remove the headlight bulb.

T-28

EXTERIOR LIGHTING SYSTEM

Discharge type

Caution

- **Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS)**

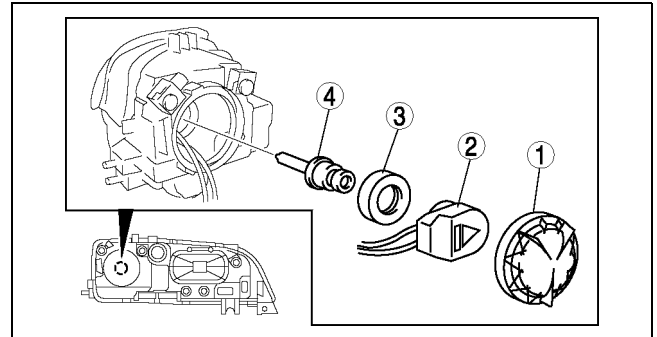
1. Disconnect the negative battery cable.
2. Disconnect the front combination light. (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)
3. Remove in the order indicated in the table.

1	Cover
2	Connector
3	Bulb cover
4	Discharge headlight bulb

Caution

- **A bulb generates extremely high heat when it is used. If the surface of the bulb is soiled, excessive heat will build up and the light's life will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

4. Install in the reverse order of removal.



A6E8112W106

High-beam

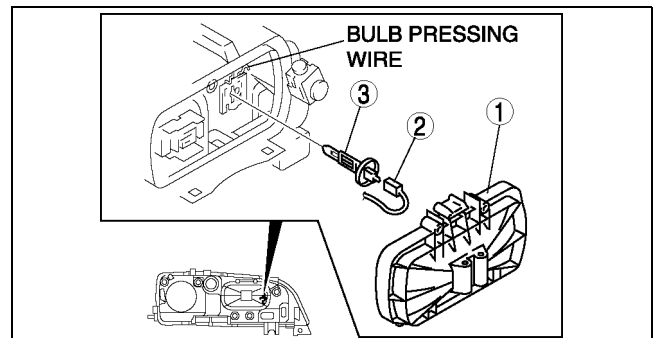
1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cover
2	Connector
3	Headlight bulb (See T-28 Headlight bulb removal note)

Caution

- **A halogen bulb generates extremely high heat when it is used. If the surface of the bulb is soiled, excessive heat will build up and the light's life will be shortened. When replacing the bulb, hold the metal flange, not the glass.**

3. Install in the reverse order of removal.



A6E8112W107

Headlight bulb removal note

1. Release the bulb pressing wire to remove the headlight bulb.

EXTERIOR LIGHTING SYSTEM

DISCHARGE HEADLIGHT CONTROL UNIT REMOVAL/INSTALLATION

A6E811251030W03

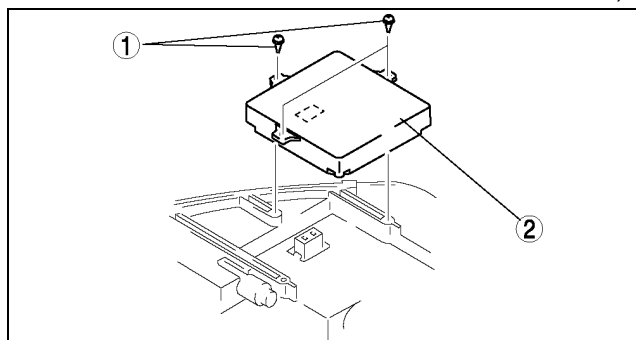
Caution

- Incorrect servicing of the discharge headlight control unit could result in electrical shock. Before servicing the discharge headlight control unit, always refer to the “Discharge headlight service warnings.” (See [T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS](#))
- When replacing the discharge headlight control unit, configuration procedure must be done before removing the auto leveling control unit. After replacing the discharge headlight control unit, perform the headlight zeroreset for auto leveling control unit.

1. Configure the discharge headlight control unit (when only replacing it). (See [T-30 AUTO LEVELING CONTROL UNIT CONFIGURATION](#))
2. Disconnect the negative battery cable.
3. Remove the front combination light. (See [T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION](#))
4. Remove in the order indicated in the table.

1	Bolt
2	Discharge headlight control unit

5. Install in the reverse order of removal.
6. Perform the headlight zeroreset for the discharge headlight control unit (when only replacing it). (See [T-31 HEADLIGHT ZEROSET](#))



A6E8112W141

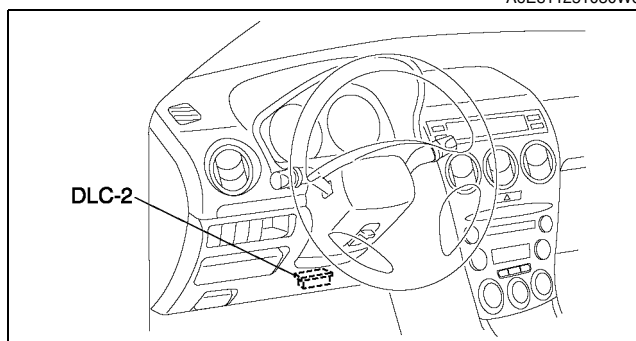
AUTO LEVELING CONTROL UNIT CONFIGURATION

A6E811251030W04

1. Connect the **SST** (WDS or equivalent) to the DLC-2.
2. Input vehicle information following the directions on the screen.
3. Select “Module programming”.
4. Select “Programmable module installation”.
5. When performing configuration corresponding to each auto leveling control unit, select the following items and perform procedures according to directions on the screen.

Items

- Main: “LHID”
- Sub: “RHID”



A6E3970W002

6. Retrieve DTCs by the WDS or equivalent, then verify that there is no DTC present.
 - If DTC is present, perform applicable DTC inspection.

EXTERIOR LIGHTING SYSTEM

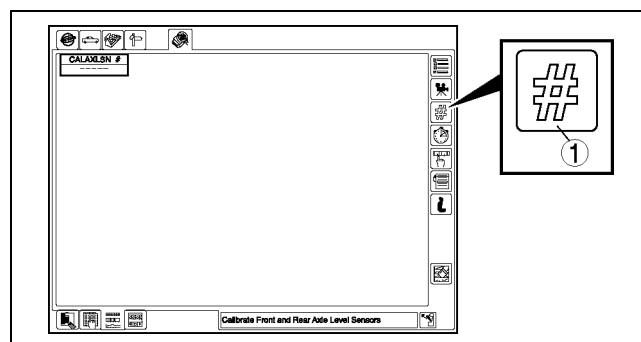
HEADLIGHT ZEROSET

A6E811251030W05

Note

- When the configuration is not set for the auto leveling control unit, headlight zeroset cannot be executed.

1. Adjust the tire air pressure to the specification.
2. Position the unloaded vehicle on a flat, level surface.
3. Connect the **SST** (WDS or equivalent) to the DLC-2.
4. Turn the ignition switch to ON position.
5. Turn on the headlights (low-beam).
6. Input the vehicle information following the directions on the screen.
7. Confirm that the WDS or equivalent identifies the vehicle, and select "Datelogger".
8. After the screen appears, select "LHID" under "Modules" from the cascading menu.
9. After the next screen appears, select "CALAXLSN#".
10. On the graphic display that appears, press the icon near the top right of the screen indicated by a 1 in the figure.



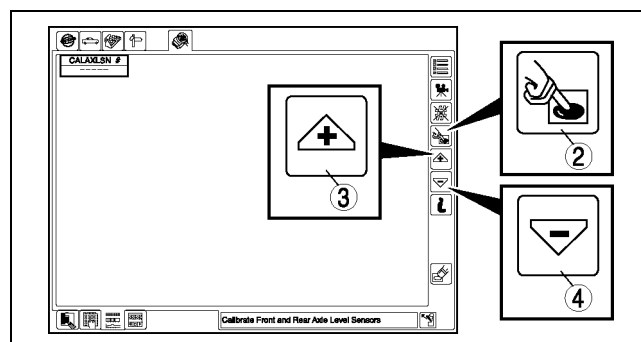
A6E8112W158

11. After the next screen appears, press the icon indicated by a 2 in the figure.
12. After pressing the icon indicated by the 2, press the icon indicated by a 3 or 4 in the figure to execute the zeroset setting.

Note

- Pressing an icon indicated by 3 or 4 once will execute the headlight zeroset setting.

13. After executing the headlight zeroset setting, perform an on-board diagnostic test and verify that no DTCs are displayed.
14. Perform the headlight aiming adjustment. (See [T-26 HEADLIGHT AIMING](#))



A6E8112W159

T

EXTERIOR LIGHTING SYSTEM

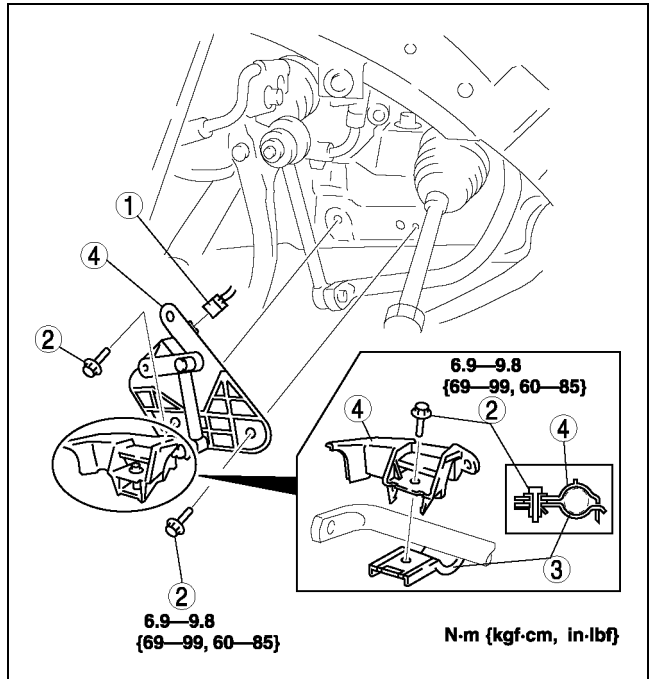
FRONT AUTO LEVELING SENSOR REMOVAL/INSTALLATION

A6E811251030W06

1. Disconnect the negative battery cable.
2. Jack up the vehicle and remove the wheel and tire.
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Bracket
4	Front auto leveling sensor

4. Install in the reverse order of removal.
5. Adjust the headlight zero set. (See [T-31 HEADLIGHT ZEROSET](#))



A6E8112W165

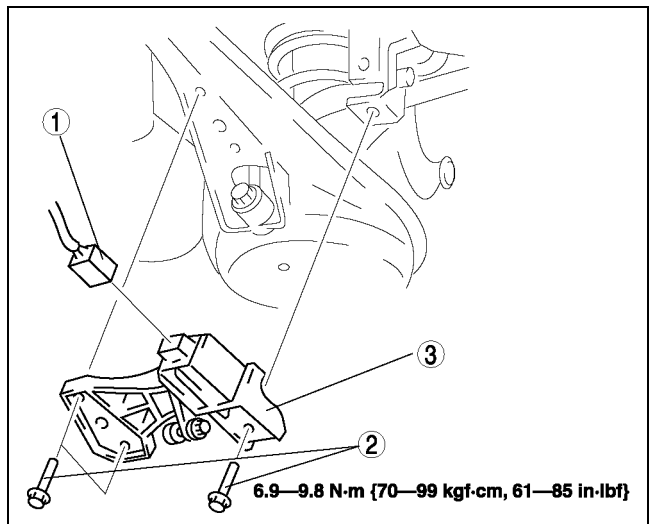
REAR AUTO LEVELING SENSOR REMOVAL/INSTALLATION

A6E811251030W07

1. Disconnect the negative battery cable.
2. Jack up the vehicle.
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Rear auto leveling sensor

4. Install in the reverse order of removal.
5. Adjust the headlight zero set. (See [T-31 HEADLIGHT ZEROSET](#))



A6E8112W156

EXTERIOR LIGHTING SYSTEM

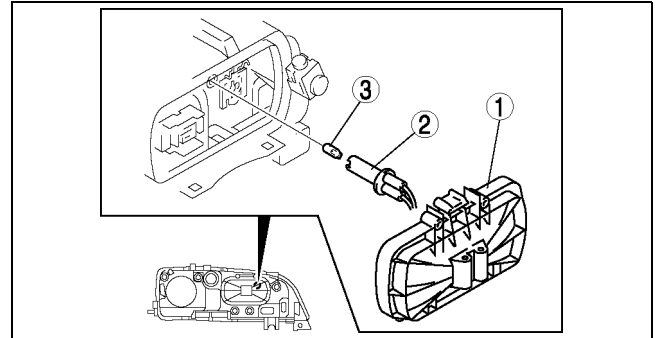
PARKING LIGHT BULB REMOVAL/INSTALLATION

A6E811251040W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cover
2	Socket
3	Parking light bulb

3. Install in the reverse order of removal.



A6E8112W109

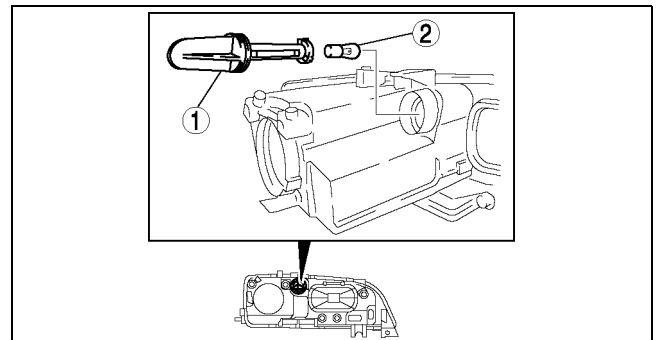
FRONT TURN LIGHT REMOVAL/INSTALLATION

A6E811251050W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Socket
2	Front turn light bulb

3. Install in the reverse order of removal.



A6E8112W110

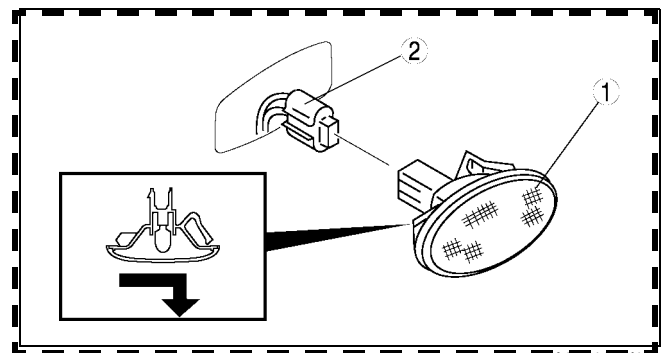
FRONT SIDE TURN LIGHT REMOVAL/INSTALLATION

A6E811268370W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Front side turn light
2	Connector

3. Install in the reverse order of removal.



A6E8112W127

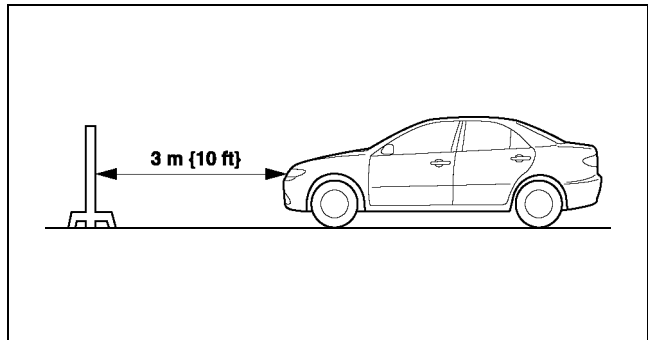
T

EXTERIOR LIGHTING SYSTEM

FRONT FOG LIGHT AIMING

A6E811251680W01

1. Adjust the tire air pressure to the specification.
2. Position the unloaded vehicle on a flat, level surface.
3. Seat one person in the driver's seat.
4. Position the vehicle **3 m {10 ft}** in front of a white screen.
5. While adjusting one fog light, mask the other.
6. Start the engine to charge the battery.
7. Turn the front fog light on.

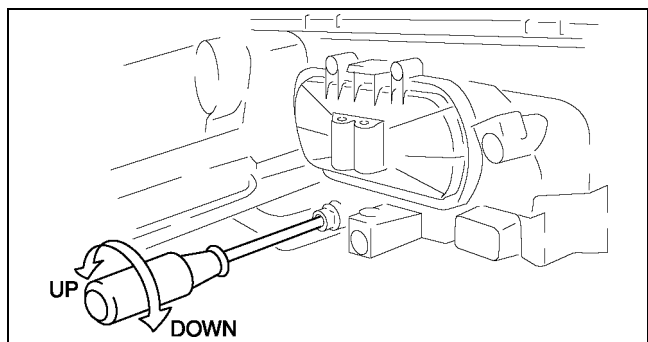


A6E8112W157

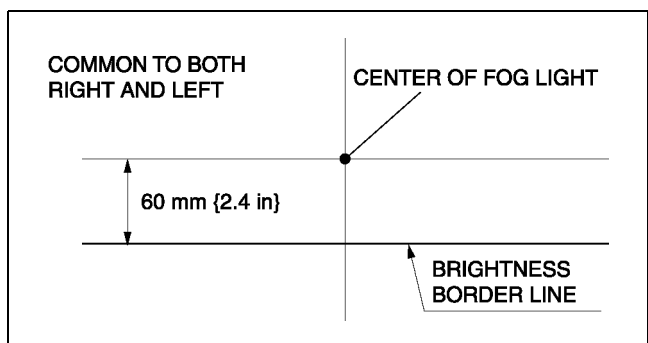
8. Adjust the front fog light by turning the adjusting screws as shown in the figure. Loosen the screws first, then tighten them.

Note

- If the adjusting screws are tightened first, then loosened, they will continue to loosen when the vehicle is in motion and may cause the front fog lights to become misaligned.



A6E8112W117



A6E8112W137

FRONT FOG LIGHT BULB REMOVAL/INSTALLATION

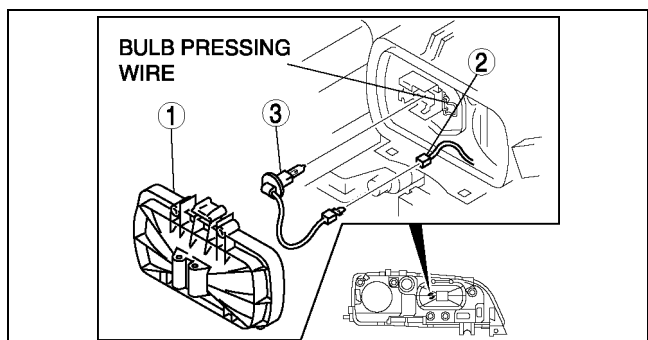
A6E811251680W02

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cover
2	Connector
3	Front fog light bulb (See T-34 Front Fog Light Bulb Removal Note)

Caution

- A halogen bulb generates extremely high heat when it is used. If the surface of the bulb is soiled, excessive heat will build up and the light's life will be shortened. When replacing the bulb, hold the metal flange, not the glass.



A6E8112W111

3. Install in the reverse order of removal.

Front Fog Light Bulb Removal Note

1. Release the bulb pressing wire to remove the front fog light bulb.

EXTERIOR LIGHTING SYSTEM

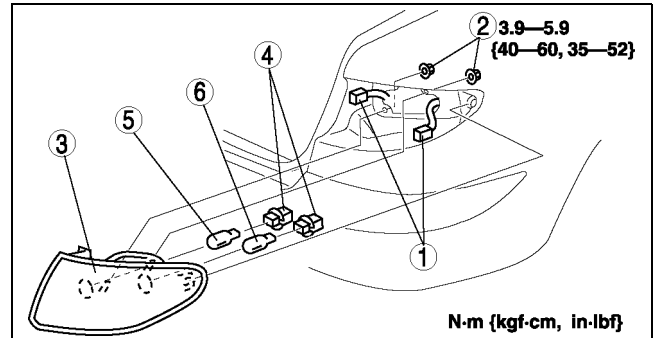
REAR COMBINATION LIGHT REMOVAL/INSTALLATION

A6E811251150W01

1. Disconnect the negative battery cable.
2. Remove the trunk side trim. (See [S-92 TRUNK SIDE TRIM REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Rear combination light
4	Socket
5	Rear turn light bulb
6	Brake light/taillight bulb

4. Install in the reverse order of removal.



A6E8112W118

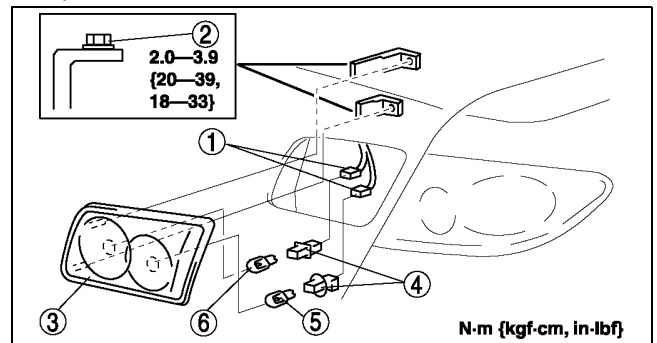
INBOARD COMBINATION LIGHT REMOVAL/INSTALLATION

A6E811251380W01

1. Disconnect the negative battery cable.
2. Remove the trunk lid trim (liftgate lower trim). (See [S-93 TRUNK LID TRIM REMOVAL/INSTALLATION](#)) (See [S-95 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Nut
3	Inboard combination light (See T-35 Inboard Combination Light Installation Note)
4	Socket
5	Back-up light bulb
6	Rear fog light bulb (L.H.D.: left side only, R.H.D.: right side only)

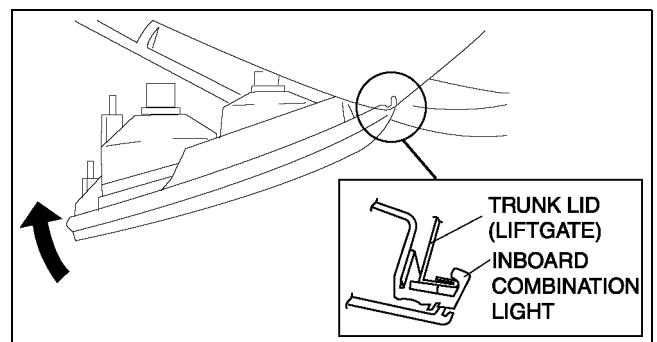
4. Install in the reverse order of removal.



A6E8112W119

Inboard Combination Light Installation Note

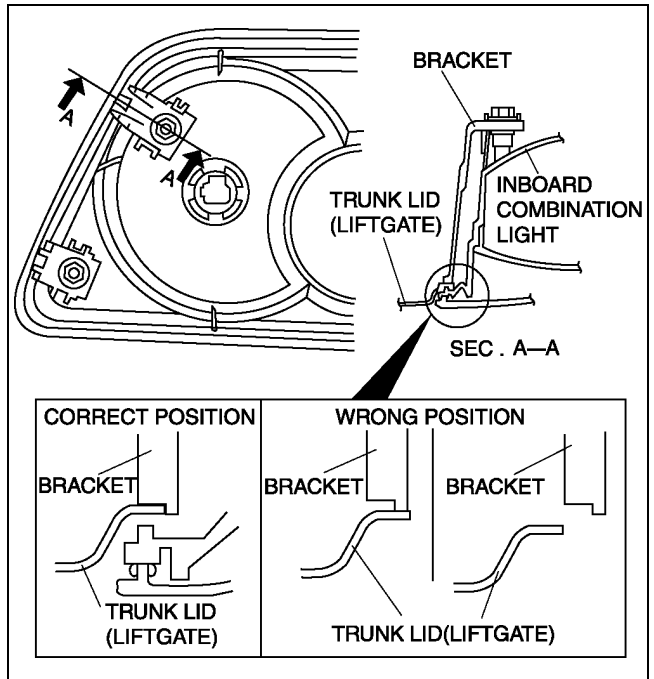
1. Insert the inboard combination light into the trunk lid (liftgate) as shown in the figure, then pivot it inward and fix in place.



A6E8112W120

EXTERIOR LIGHTING SYSTEM

- Place the bracket in the proper position as shown in the figure and press it to the trunk lid (liftgate) to attach.



A6E8112W121

HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION

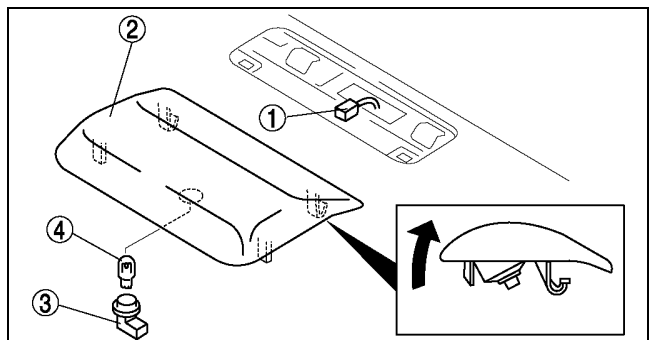
4SD

In-vehicle-type

- Disconnect the negative battery cable.
- Remove in the order indicated in the table.

1	Connector
2	High-mount brake light
3	Socket
4	High-mount brake light bulb

- Install in the reverse order of removal.



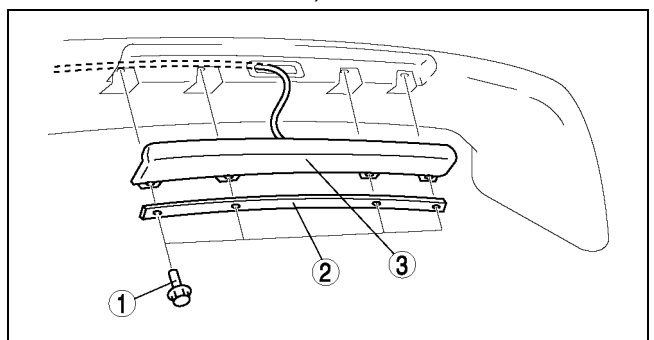
A6E8112W123

Rear spoiler type

- Disconnect the negative battery cable.
- Remove the rear spoiler. (See [S-54 REAR SPOILER REMOVAL/INSTALLATION](#))
- Remove in the order indicated in the table.

1	Bolt
2	Cover
2	High-mount brake light (See T-37 High-mount brake light removal note)

- Install in the reverse order of removal.

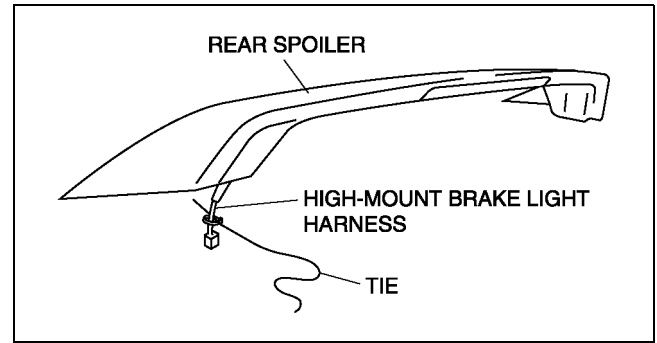


A6E8112W115

EXTERIOR LIGHTING SYSTEM

High-mount brake light removal note

1. Tie a string to the end of the connector of the high-mount brake light beforehand so that the connector can be passed easily through the rear spoiler during installation.



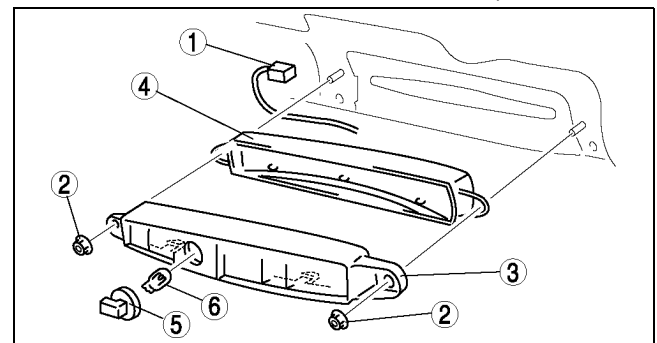
A6E8112W116

5HB

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim. (See [S-95 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Nut
3	High-mount brake light
4	Lens
5	Socket
6	High-mount brake light bulb

4. Install in the reverse order of removal.



A6E8112W142

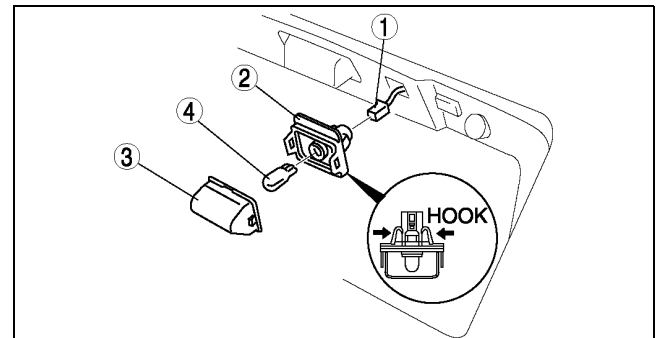
LICENSE PLATE LIGHT REMOVAL/INSTALLATION

A6E811251270W01

1. Disconnect the negative battery cable.
2. Remove the rear finisher. (See [S-54 REAR FINISHER REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	License plate light
3	Lens
4	License plate light bulb

4. Install in the reverse order of removal.



A6E8112W108

COMBINATION SWITCH REMOVAL/INSTALLATION

A6E811266120W01

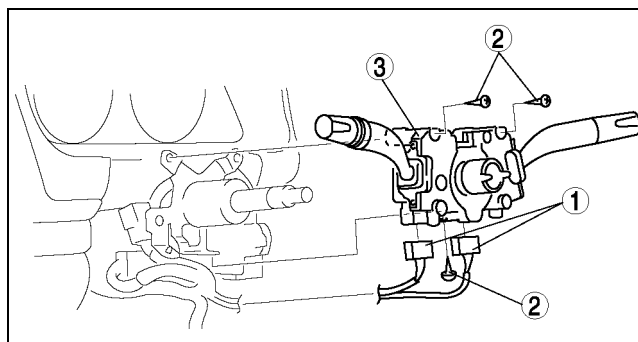
1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See [T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)
3. Remove the steering wheel. (See [N-7 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION](#).)
4. Remove the column cover. (See [S-84 COLUMN COVER REMOVAL/INSTALLATION](#).)
5. Remove the clock spring. (without DSC) (See [T-125 CLOCK SPRING REMOVAL/INSTALLATION](#).)

EXTERIOR LIGHTING SYSTEM

6. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Combination switch

7. Install in the reverse order of removal.



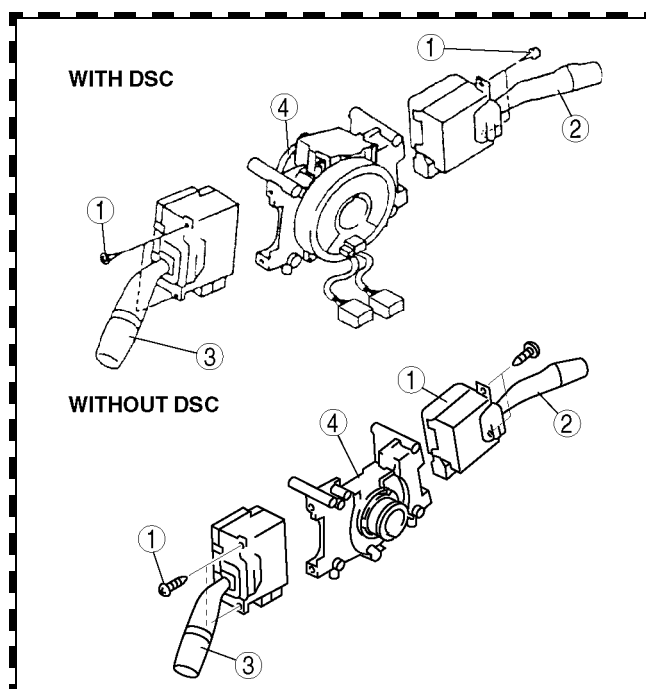
A6E8112W102

COMBINATION SWITCH DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.

1	Screw
2	Wiper and washer switch (Light switch)
3	Light switch (Wiper and washer switch)
4	Body

A6E811266120W02



A6E8112W103

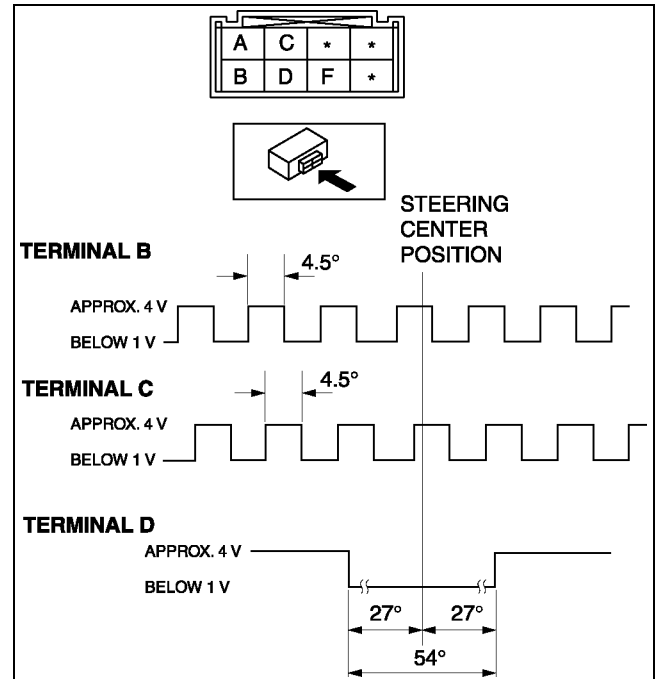
EXTERIOR LIGHTING SYSTEM

STEERING ANGLE SENSOR INSPECTION

A6E811266120W03

With DSC

1. Remove the column cover. (See [S-84 COLUMN COVER REMOVAL/INSTALLATION](#))
2. Disconnect the steering angle sensor connector.
3. Connect battery positive voltage to terminal A and ground to terminal F of the steering angle sensor.
4. Turn the steering wheel to the right and left, and verify that the voltage and pulses at the terminals are as shown in the figure.
 - If not as specified, replace the body of the combination switch.



A6E8112W143

LIGHT SWITCH REMOVAL/INSTALLATION

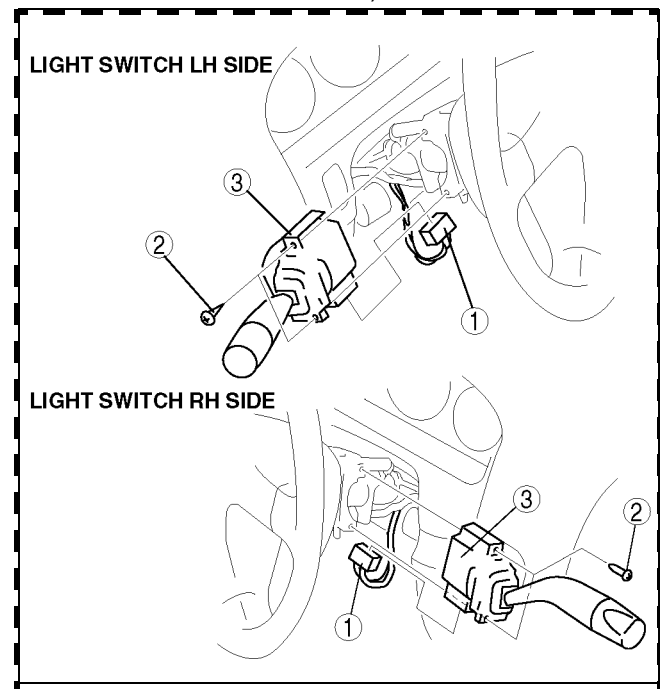
A6E811266121W01

T

1. Disconnect the negative battery cable.
2. Remove the column cover. (See [S-84 COLUMN COVER REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Light switch

4. Install in the reverse order of removal.



A6E8112W112

EXTERIOR LIGHTING SYSTEM

LIGHT SWITCH INSPECTION

A6E811266121W02

Light switch LH side

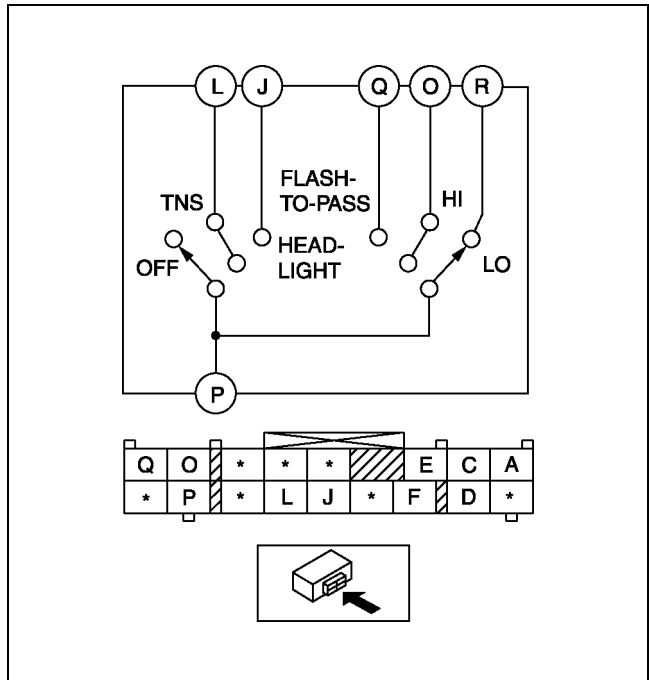
1. Remove the light switch. (See [T-39 LIGHT SWITCH REMOVAL/INSTALLATION](#))
2. Inspect for continuity between the light switch terminals using an ohmmeter.
 - If not as specified, replace the light switch.

Headlight switch

○—○ : Continuity

Switch position			Terminal					
Light	Dimmer	Flash-to-pass	J	L	P	O	Q	R
OFF	-	Off						
		On			○—○	○—○	○—○	
TNS	-	Off		○—○				
		On		○—○	○—○	○—○	○—○	
Head-light	LO	Off	○—○	○—○	○—○	○—○	○—○	○—○
		On	○—○	○—○	○—○	○—○	○—○	○—○
	HI	-	○—○	○—○	○—○	○—○		

A6E8112W129



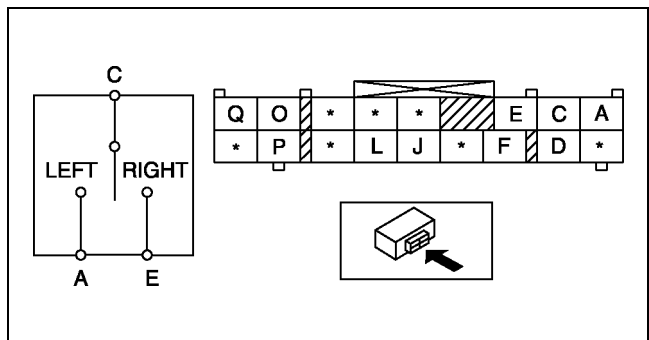
A6E8112W144

Turn switch

○—○ : Continuity

Switch position	Terminal		
	C	A	E
Left	○—○	○—○	
Off			
Right	○—○	○—○	○—○

A6E8112W130



A6E8112W145

EXTERIOR LIGHTING SYSTEM

Light switch RH side

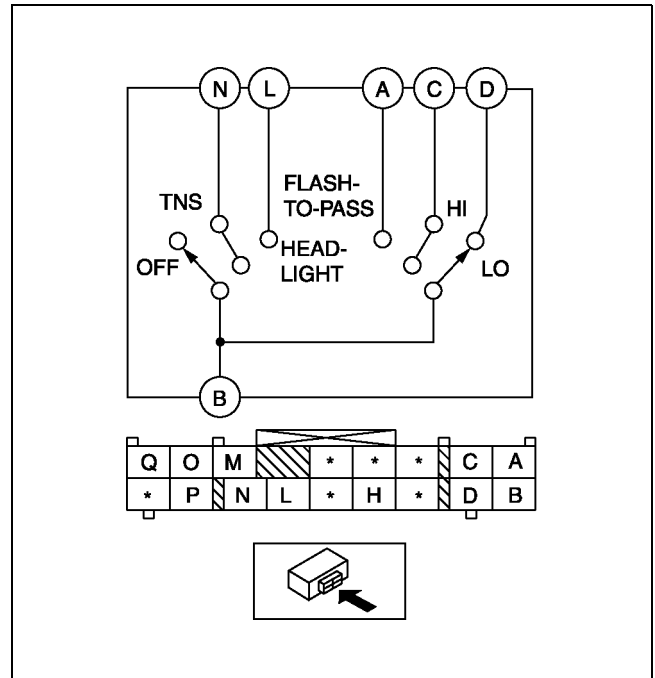
1. Remove the light switch. (See [T-39 LIGHT SWITCH REMOVAL/INSTALLATION](#))
2. Inspect for continuity between the light switch terminals using an ohmmeter.
 - If not as specified, replace the light switch.

Headlight switch

○—○ : Continuity

Switch position			Terminal					
Light	Dimmer	Flash-to-pass	L	N	B	C	A	D
OFF	-	Off						
		On			○	○	○	
TNS	-	Off		○	○			
		On		○	○	○	○	
Head-light	LO	Off	○	○	○			○
		On	○	○	○	○	○	
	HI	-	○	○	○	○		

A6E8112W131



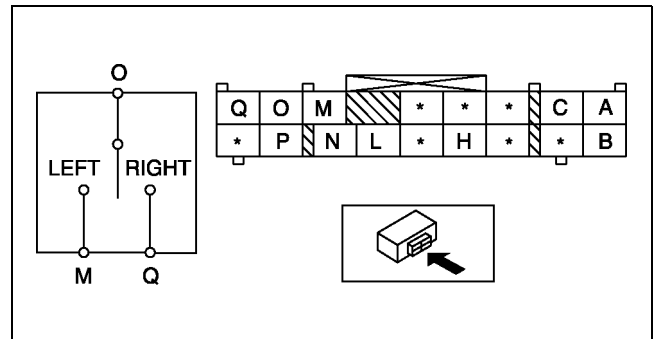
A6E8112W146

Turn switch

○—○ : Continuity

Switch position	Terminal		
	O	M	Q
Left	○	○	
Off			
Right	○		○

A6E8112W139



A6E8112W147

HAZARD WARNING SWITCH INSPECTION

1. Inspection the hazard warning switch. (See [U-47 CLIMATE CONTROL UNIT INSPECTION](#))

A6E811266401W01

EXTERIOR LIGHTING SYSTEM

FRONT AND REAR FOG LIGHT SWITCH INSPECTION

A6E811266402W01

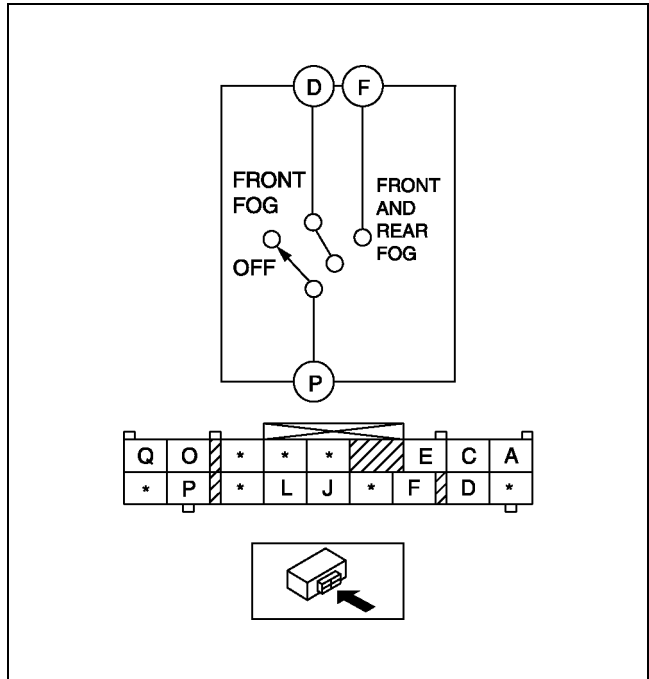
Light switch LH side

1. Remove the light switch. (See [T-39 LIGHT SWITCH REMOVAL/INSTALLATION.](#))
2. Inspect for continuity between the light switch terminals using an ohmmeter.
 - If not as specified, replace the light switch.

○—○ : Continuity

Switch position			Terminal		
Light	Front fog light switch	Front and rear fog light switch	D	F	P
OFF	Off	-			
	On	-	○—○		
TNS	On	Off	○—○		○—○
	On	On	○—○	○—○	○—○
Head-light	On	Off	○—○		○—○
	On	On	○—○	○—○	○—○

A6E8112W140



A6E8112W148

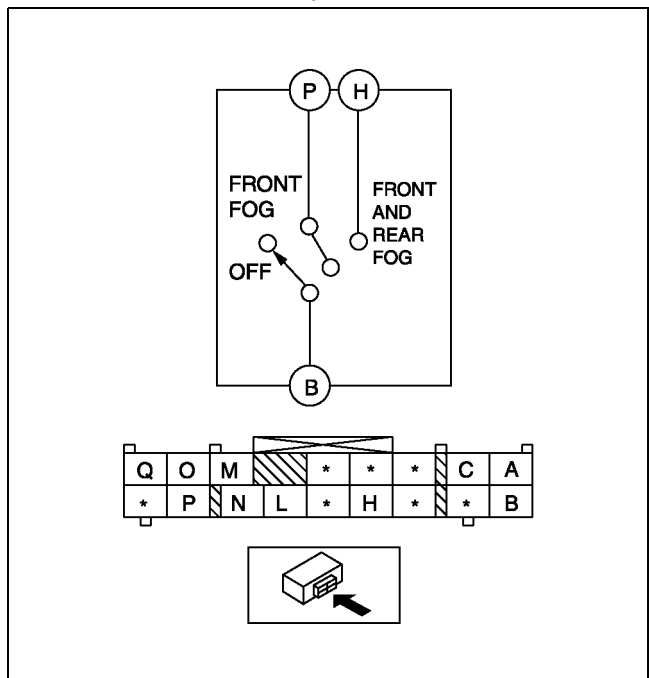
Light switch RH side

1. Remove the light switch. (See [T-39 LIGHT SWITCH REMOVAL/INSTALLATION.](#))
2. Inspect for continuity between the light switch terminals using an ohmmeter.
 - If not as specified, replace the light switch.

○—○ : Continuity

Switch position			Terminal		
Light	Front fog light switch	Front and rear fog light switch	P	H	B
OFF	Off	-			
	On	-	○—○		
TNS	On	Off	○—○		○—○
	On	On	○—○	○—○	○—○
Head-light	On	Off	○—○		○—○
	On	On	○—○	○—○	○—○

A6E8112W166



A6E8112W167

EXTERIOR LIGHTING SYSTEM

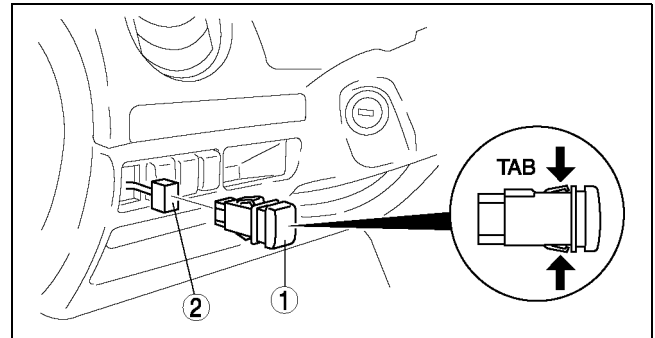
HEADLIGHT LEVELING SWITCH REMOVAL/INSTALLATION

A6E811251030W08

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Headlight leveling switch (See T-43 Headlight Leveling Switch Removal Note)
2	Connector

3. Install in the reverse order of removal.



A6E8112W138

Headlight Leveling Switch Removal Note

1. Insert your hand from the lower side of the dashboard and squeeze the tabs of the headlight leveling switch.
2. Pull the headlight leveling switch forward to remove it.

HEADLIGHT LEVELING SWITCH INSPECTION

A6E811251030W09

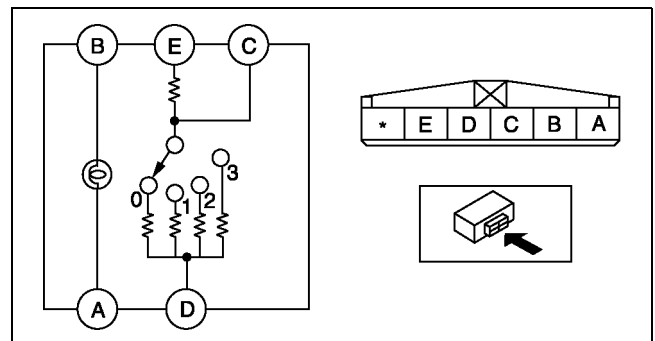
1. Remove the headlight leveling switch. (See [T-43 HEADLIGHT LEVELING SWITCH REMOVAL/INSTALLATION](#).)
2. Inspect for continuity between the headlight leveling switch terminals using an ohmmeter.
 - If not as specified, replace the headlight leveling switch.

○—○ : Resistance ○—○ : Bulb

Switch position	Terminal				
	E	C	D	B	A
0	○—R ₁ —○	○—R ₂ —○		○—○	
1	○—R ₁ —○	○—R ₃ —○		○—○	
2	○—R ₁ —○	○—R ₄ —○		○—○	
3	○—R ₁ —○	○—R ₅ —○		○—○	

R₁: 300 ohms R₂: 2700 ohms R₃: 866 ohms
R₄: 620 ohms R₅: 442 ohms

A6E8112W151



A6E8112W152

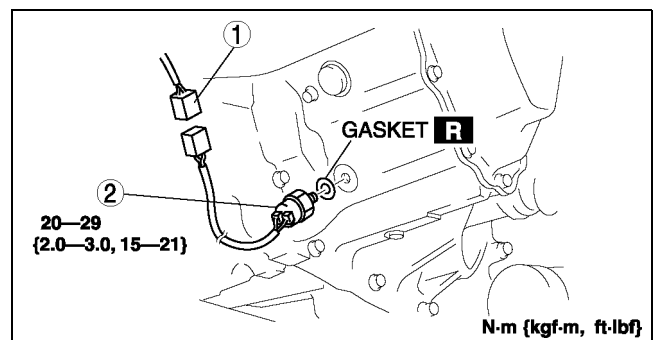
BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION

A6E811217640W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Connector
2	Back-up light switch

3. Install in the reverse order of removal.



A6E8112W104

EXTERIOR LIGHTING SYSTEM

BACK-UP LIGHT SWITCH INSPECTION

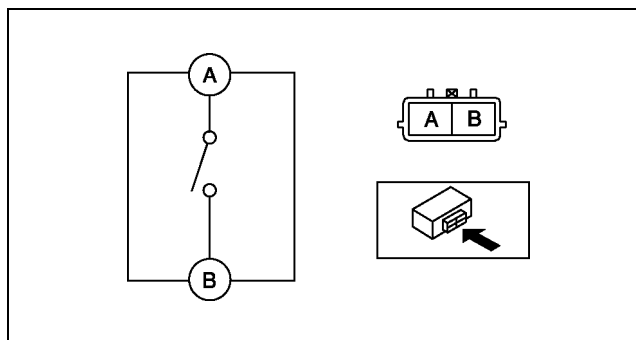
A6E811217640W02

1. Disconnect the back-up light switch connector.
2. Inspect for continuity between the back-up light switch terminals using an ohmmeter.
 - If not as specified, replace the back-up light switch.

○ — ○ : Continuity

Shift lever position	Terminal	
	A	B
Reverse	○ — ○	○ — ○
Other		

A6E8112W128



A6E8112W153

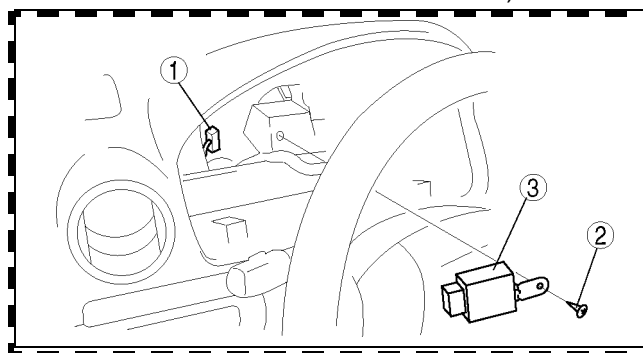
FLASHER UNIT REMOVAL/INSTALLATION

A6E811266830W01

1. Disconnect the negative battery cable.
2. Remove the instrument cluster. (See [T-72 INSTRUMENT CLUSTER REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Flasher unit

4. Install in the reverse order of removal.



A6E8112W114

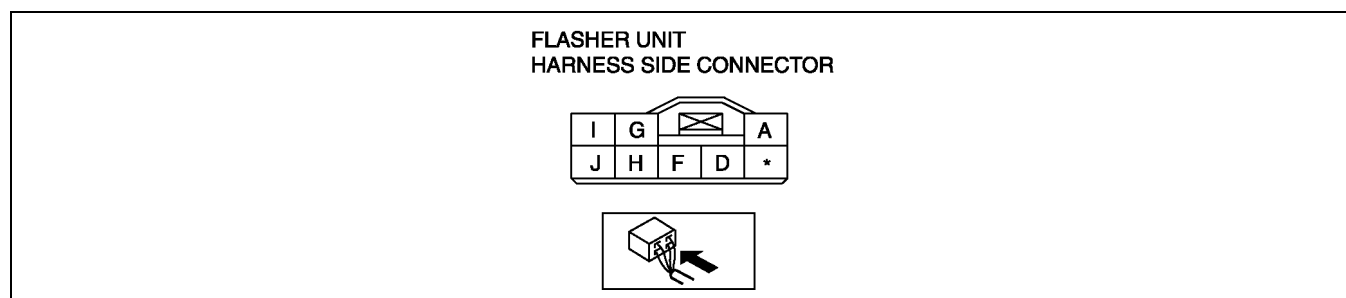
FLASHER UNIT INSPECTION

A6E811266830W02

1. Connect the connector to the flasher unit.
2. Connect the negative battery cable.
3. Measure the voltage at the flasher unit using voltmeter.
 - When inspecting terminal F for continuity, disconnect the flasher unit connector.
4. If the value are not as specified in the Terminal Voltage List (Reference), inspect the parts under "Action" and related wiring harnesses.
5. If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the flasher unit.

EXTERIOR LIGHTING SYSTEM

Terminal Voltage List (Reference)



Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
A	Power supply	HAZARD 10 A fuse	Under any condition	B+	- Inspect HAZARD 10 A fuse - Inspect related harness
D	Turn signal flasher (LH)	Turn signal light (LH)	Turn signal light (LH) flashes	Alternates below 1.0 and B+	- Inspect turn signal light (LH) - Inspect related harness
			Hazard warning switch at on position		
			Other	Below 1.0	
F	Flasher unit ground	GND	Constant: inspect for continuity to ground	Yes	Inspect GND
G	Turn signal flasher (RH)	Turn signal light (RH)	Turn signal light (RH) flashes	Alternates below 1.0 and B+	- Inspect turn signal light (RH) - Inspect related harness
			Hazard warning switch at on position		
			Other	Below 1.0	
H	Hazard warning on	Hazard warning switch	Hazard warning switch at on position	Below 1.0	- Inspect hazard warning switch - Inspect related harness
			Hazard warning switch at off position	B+	
I	Turn switch on/off (RH)	Combination switch	Ignition switch is at ON and turn switch (RH) on	B+	- Inspect combination switch - Inspect related harness
			Other	Below 1.0	
J	Turn switch on/off (LH)	Combination switch	Ignition switch is at ON and turn switch (LH) on	B+	- Inspect combination switch - Inspect related harness
			Other	Below 1.0	

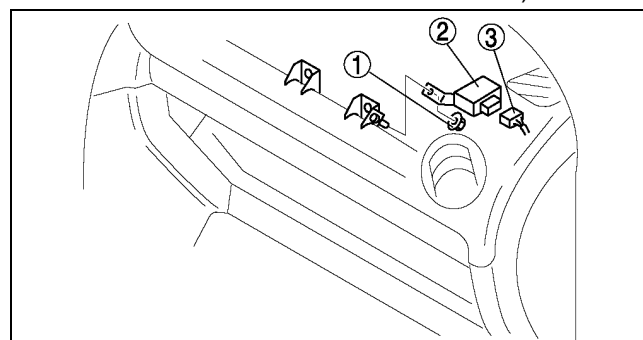
RUNNING LIGHT UNIT REMOVAL/INSTALLATION

A6E811266731W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment. (See [S-85 GLOVE COMPARTMENT REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Nut
2	Running light unit
3	Connector

4. Install in the reverse order of removal.



A6E8112W126

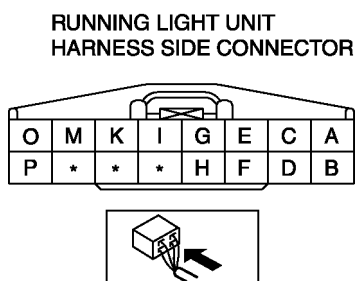
EXTERIOR LIGHTING SYSTEM

RUNNING LIGHT UNIT INSPECTION

A6E811266731W02

1. Connect the connector to the running light unit.
2. Connect the negative battery cable.
3. Measure the voltage at the running light unit using voltmeter.
 - When inspecting terminal D, H or P for continuity, disconnect the running light unit connector.
4. If the value are not as specified in the Terminal Voltage List (Reference), inspect the parts under "Action" and related wiring harnesses.
5. If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the running light unit.

Terminal Voltage List (Reference)



A6E8112W155

Terminal	Signal	Connected to	Test condition		Voltage (V)/Continuity	Action
A	Illumination light on/off	TNS relay	Ignition switch at ON position		B+	• Inspect ILLUMI 10 A fuse • Inspect TNS relay (See T-24 RELAY INSPECTION) • Inspect related harness
			Ignition switch at LOCK or ACC position	Headlight switch (light) at TNS or headlight position	Below 1.0	
				Headlight switch (light) at OFF position	B+	
B	Illumination light operation	• Instrument cluster • Panel control switch	Headlight switch (light) at TNS or headlight position		B+	—
			Headlight switch (light) at OFF position		Below 1.0	
C	Headlight relay (high-beam) on/off	Headlight relay	Ignition switch at ON position		B+	• Inspect headlight relay (See T-24 RELAY INSPECTION) • Inspect related harness
			Headlight switch (light) at headlight position	Headlight switch (dimmer) at LO position	B+	
				Headlight switch (dimmer) at HI position	B+	
			Flash-to-pass on		B+	
D	Running light unit ground	GND	Under any condition: inspect for continuity to ground		Yes	• Inspect GND
E	IG1	METER IG 15 A fuse	Ignition switch at ON position		B+	• Inspect METER IG 15 A fuse • Inspect related harness
			Ignition switch at LOCK or ACC position		Below 1.0	
F	Front fog light relay on/off	Front fog light relay	Front fog light switch at ON position	Headlight switch (light) at TNS or headlight position	Below 1.0	• Inspect TNS relay (See T-24 RELAY INSPECTION) • Inspect front fog light relay (See T-24 RELAY INSPECTION) • Inspect related harness
				Headlight switch (light) at OFF position	B+	
G	TNS relay on/off	TNS relay	Ignition switch at ON position		Below 1.0	• Inspect TNS relay (See T-24 RELAY INSPECTION) • Inspect related harness
			Ignition switch at LOCK or ACC position and headlight switch (light) at OFF position		B+	

EXTERIOR LIGHTING SYSTEM

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
H	Front fog light on/off	Front and rear fog light switch	Front and rear fog light switch at OFF position: inspect for continuity to ground	No	- Inspect front and rear fog light switch (See T-42 FRONT AND REAR FOG LIGHT SWITCH INSPECTION) - Inspect related harness
			Front and rear fog light switch at ON position: inspect for continuity to ground	Yes	
I	TNS on/off	Headlight switch	Headlight switch (light) at OFF position	No	- Inspect headlight switch (See T-40 LIGHT SWITCH INSPECTION) - Inspect related harness
			Headlight switch (light) at TNS or headlight position	Yes	
K	Headlight relay on/off	Headlight relay	Ignition switch at ON position	Below 1.0	- Inspect headlight relay (See T-24 RELAY INSPECTION) - Inspect related harness
			Ignition switch at LOCK or ACC and headlight switch (light) at OFF position	B+	
M	Flash-to-pass on/off	Headlight switch (dimmer switch)	Headlight switch (light) at OFF or TNS position	No	- Inspect headlight switch (See T-40 LIGHT SWITCH INSPECTION) - Inspect related harness
			Headlight switch (light) at headlight position	Yes	
			Flash-to-pass on	Yes	
O	Headlight high operation	Headlight switch (dimmer switch: HI position)	Ignition switch at ON position	B+	- Inspect headlight switch (See T-40 LIGHT SWITCH INSPECTION) - Inspect related harness
			Headlight switch (light) at headlight position and headlight switch (dimmer) at LO position	B+	
			Headlight switch (light) at headlight position and headlight switch (dimmer) at HI position	Below 1.0	
			Flash-to-pass on	Below 1.0	
P	Headlight (high-beam) on/off	Headlight switch	Headlight switch (dimmer) at LO position: inspect for continuity to ground	No	- Inspect headlight switch (See T-40 LIGHT SWITCH INSPECTION) - Inspect related harness
			Headlight switch (dimmer) at HI position: inspect for continuity to ground	Yes	

INTERIOR LIGHTING SYSTEM

INTERIOR LIGHTING SYSTEM

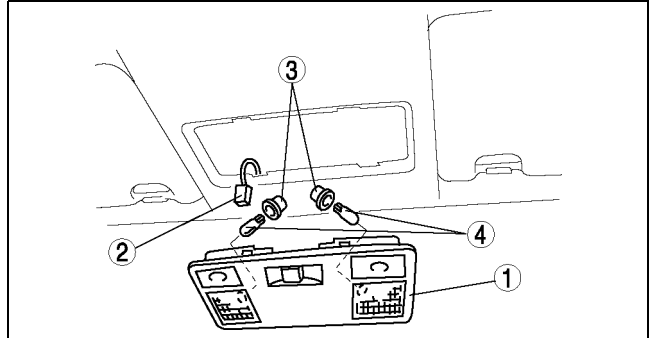
FRONT MAP LIGHT REMOVAL/INSTALLATION

A6E811451310W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Front map light (See T-48 Front Map Light Removal Note)
2	Connector
3	Socket
4	Map light bulb

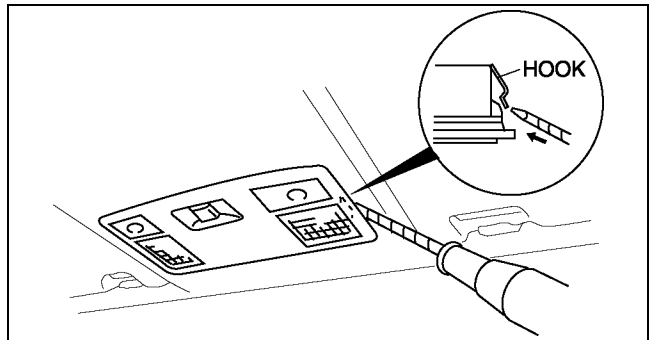
3. Install in the reverse order of removal.



A6E8114W102

Front Map Light Removal Note

1. Insert a tape-wrapped flathead screwdriver into the gap between the headliner and the front map light.
2. Push the hooks to remove the front map light.



A6E8114W103

FRONT MAP LIGHT INSPECTION

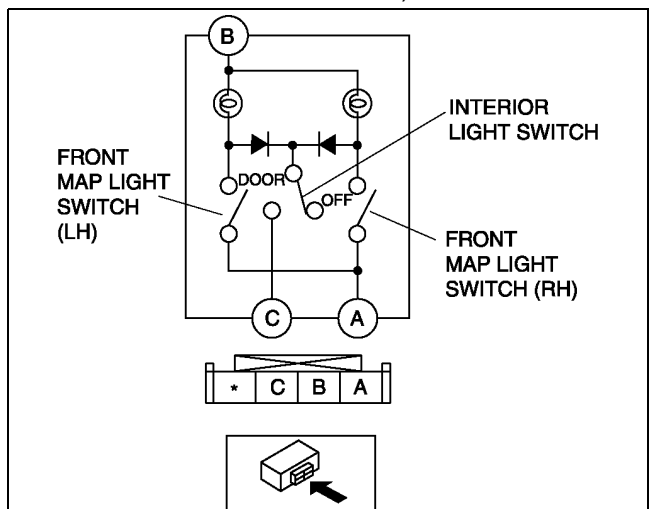
A6E811451310W02

1. Remove the front map light. (See [T-48 FRONT MAP LIGHT REMOVAL/INSTALLATION.](#))
2. Inspect for continuity between the front map light terminals using an ohmmeter.
 - If not as specified, replace the front map light.

○—○ : Bulb

Switch position		Terminal		
Front map light switch	Interior light switch	B	C	A
ON	-	○	○—○	○
OFF	DOOR	○	○—○	
	OFF			

A6E8114W117



A6E8114W118

INTERIOR LIGHTING SYSTEM

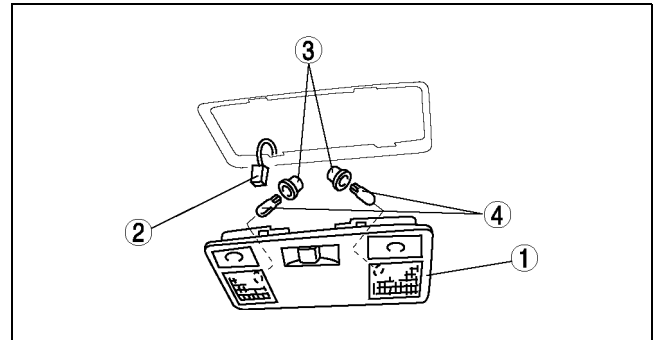
REAR MAP LIGHT REMOVAL/INSTALLATION

A6E811451311W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Rear map light (See T-49 Rear Map Light Removal Note)
2	Connector
3	Socket
4	Rear map light bulb

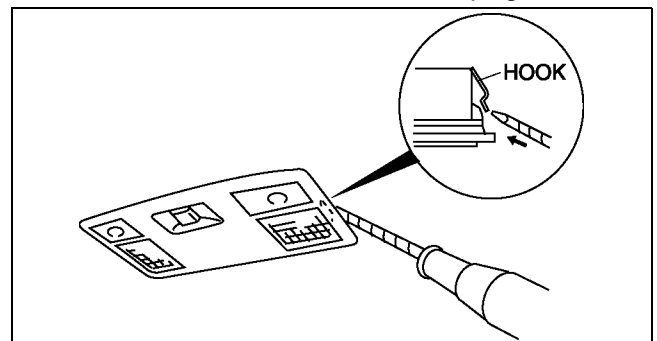
3. Install in the reverse order of removal.



A6E8114W104

Rear Map Light Removal Note

1. Insert a tape-wrapped flathead screwdriver into the gap between the headliner and the rear map light.
2. Push the hooks to remove the rear map light.



A6E8114W105

REAR MAP LIGHT INSPECTION

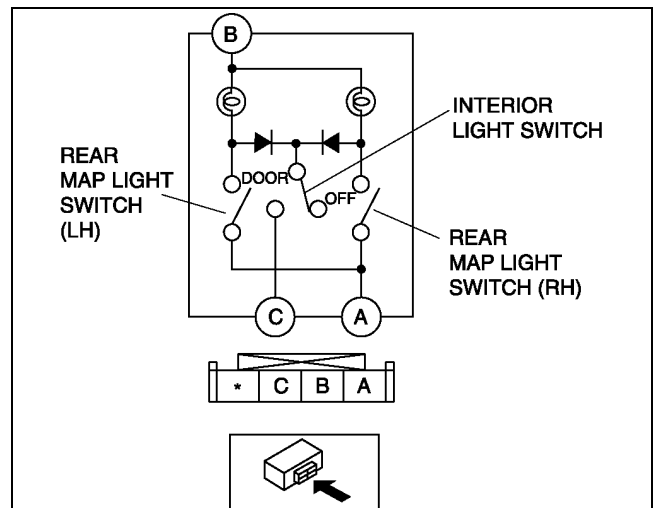
A6E811451311W02

1. Remove the rear map light. (See [T-49 REAR MAP LIGHT REMOVAL/INSTALLATION.](#))
2. Inspect for continuity between the rear map light terminals using an ohmmeter.
 - If not as specified, replace the rear map light.

○—○ : Bulb

Switch position		Terminal		
Rear map light switch	Interior light switch	B	C	A
ON	-	○	○—○	○
OFF	DOOR	○	○—○	
	OFF			

A6E8114W127



A6E8114W128

INTERIOR LIGHTING SYSTEM

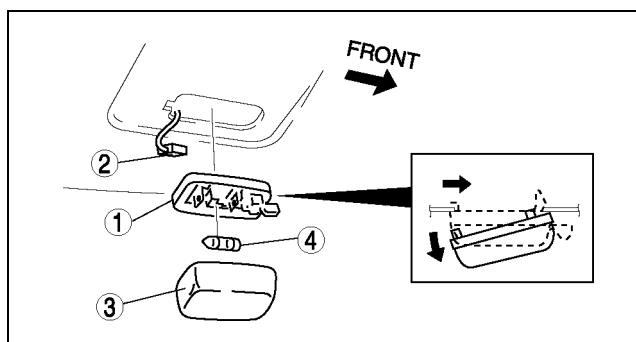
CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION

A6E811451441W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cargo compartment light
2	Connector
3	Lens
4	Cargo compartment light bulb

3. Install in the reverse order of removal.



A6E8114W101

CARGO COMPARTMENT LIGHT INSPECTION

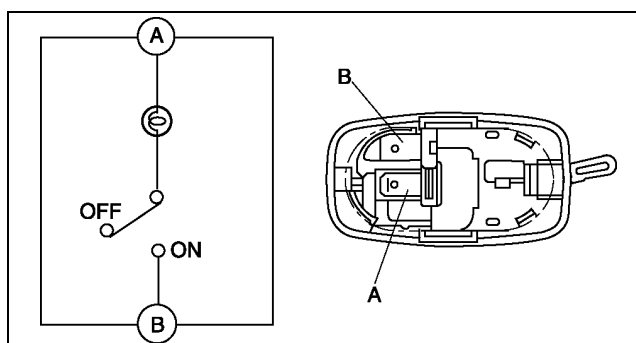
A6E811451441W02

1. Remove the cargo compartment light. (See [T-50 CARGO COMPARTMENT LIGHT REMOVAL/INSTALLATION](#))
2. Inspect for continuity between the cargo compartment light terminals using an ohmmeter.
 - If not as specified, replace the cargo compartment light.

○—○ : Bulb

Switch position	Terminal	
	A	B
ON	○	○
OFF	○	○

A6E8114W114



A6E8114W111

CARGO COMPARTMENT LIGHT SWITCH INSPECTION

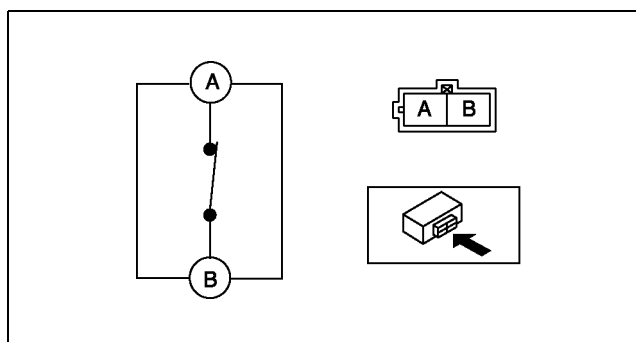
A6E811451442W01

1. Remove the liftgate lower trim. (See [S-95 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION](#))
2. Disconnect the cargo compartment light switch connector.
3. Inspect for continuity between the cargo compartment light switch terminals using an ohmmeter.
 - If not as specified, replace the liftgate lock.

○—○ : Continuity

Switch position	Terminal	
	A	B
On (liftgate open)	○	○
Off (liftgate closed)	○	○

A6E8114W120



A6E8114W119

INTERIOR LIGHTING SYSTEM

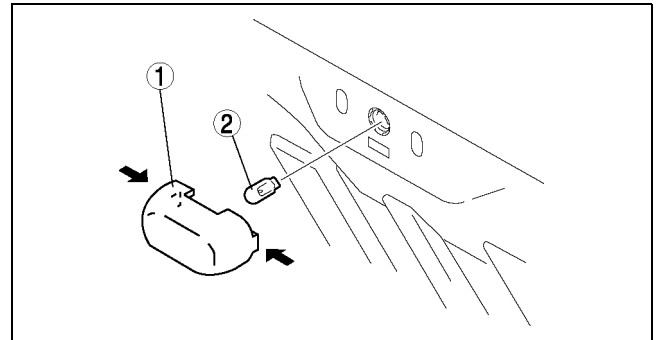
TRUNK COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION

A6E811451440W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Lens
2	Trunk compartment light bulb

3. Install in the reverse order of removal.



A6E8114W112

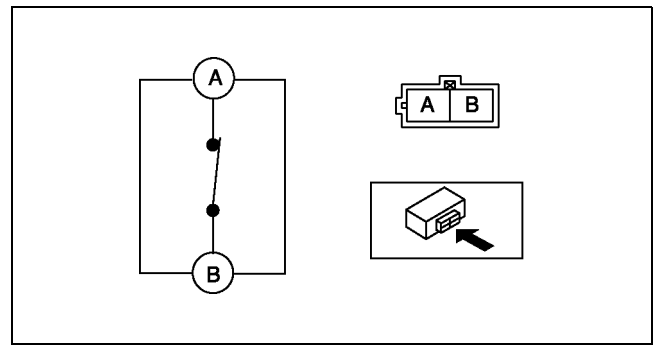
TRUNK COMPARTMENT LIGHT SWITCH INSPECTION

A6E811451440W02

1. Remove the trunk lid trim. (See [S-93 TRUNK LID TRIM REMOVAL/INSTALLATION](#))
2. Disconnect the trunk compartment light switch connector.
3. Inspect for continuity between the trunk compartment light switch terminals using an ohmmeter.
 - If not as specified, replace the trunk lock.

Switch position	Terminal	
	A	B
On (trunk open)	○ — ○	○ — ○
Off (trunk closed)	○ — ○	○ — ○

A6E8114W121



A6E8114W119

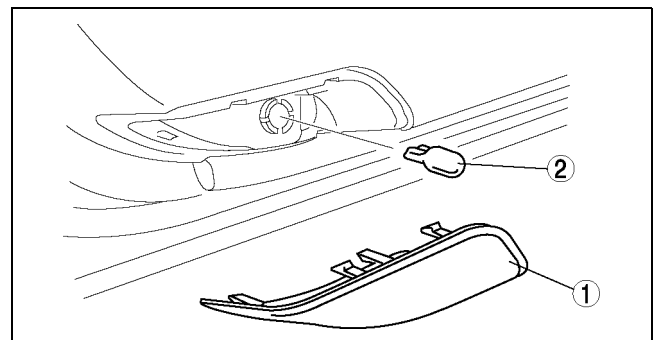
COURTESY LIGHT BULB REMOVAL/INSTALLATION

A6E811469971W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Lens
2	Courtesy light bulb

3. Install in the reverse order of removal.



A6E8114W110

INTERIOR LIGHTING SYSTEM

DOOR SWITCH REMOVAL/INSTALLATION

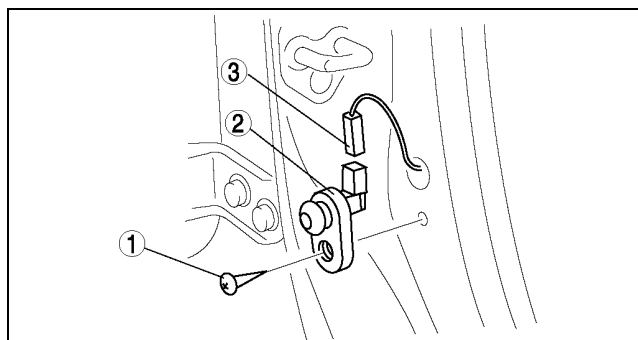
A6E811466540W01

Front

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Screw
2	Door switch
3	Connector

3. Install in the reverse order of removal.



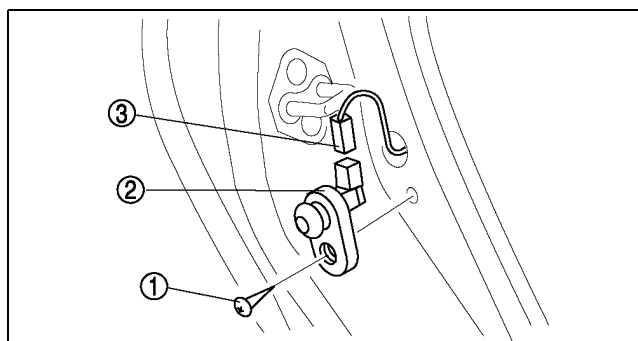
A6E8114W108

Rear

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Screw
2	Door switch
3	Connector

3. Install in the reverse order of removal.



A6E8114W109

DOOR SWITCH INSPECTION

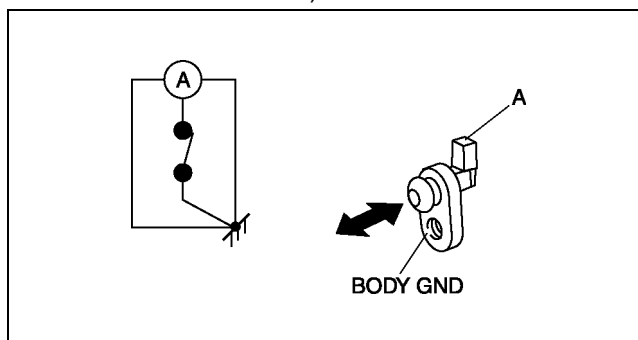
A6E811466540W02

1. Remove the door switch. (See [T-52 DOOR SWITCH REMOVAL/INSTALLATION](#))
2. Inspect for continuity between the door switch terminal and a body ground using an ohmmeter.
 - If not as specified, replace the door switch.

○—○ : Continuity

Switch position	Terminal	
	A	Body GND
Pressed		
Released	○—○	○—○

A6E8114W122



A6E8114W115

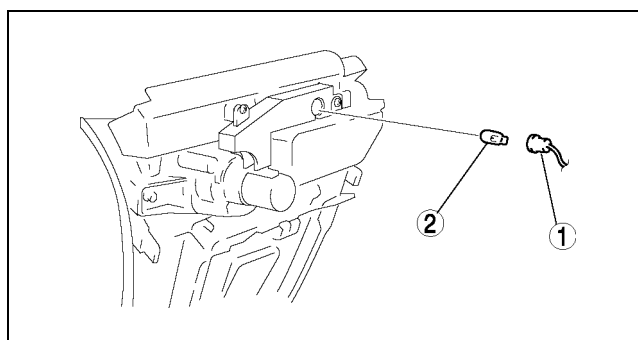
ASHTRAY ILLUMINATION BULB REMOVAL/INSTALLATION

A6E811455431W01

1. Disconnect the negative battery cable.
2. Remove the boot panel.
3. Remove in the order indicated in the table.

1	Socket
2	Ashtray illumination bulb

4. Install in the reverse order of removal.



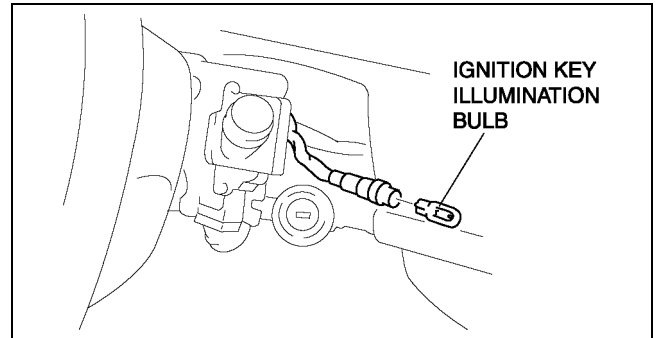
A6E8114W106

INTERIOR LIGHTING SYSTEM

IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION

A6E811460231W01

1. Disconnect the negative battery cable.
2. Remove the column cover. (See [S-84 COLUMN COVER REMOVAL/INSTALLATION](#))
3. Remove the ignition key illumination bulb.
4. Install in the reverse order of removal.



A6E8114W129

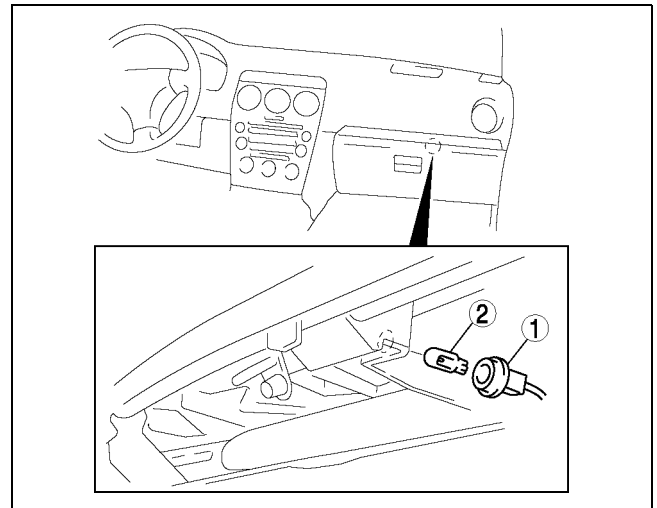
GLOVE COMPARTMENT LIGHT BULB REMOVAL/INSTALLATION

A6E811451445W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Socket
2	Glove compartment light bulb

3. Install in the reverse order of removal.



A6E8114W113

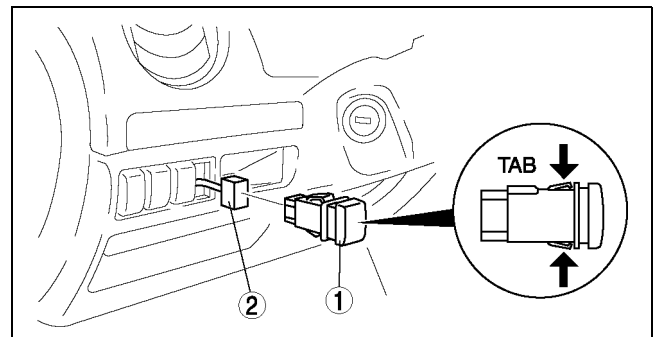
PANEL LIGHT CONTROL SWITCH REMOVAL/INSTALLATION

A6E811466600W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Panel light control switch (See T-53 Panel Light Control Switch Removal Note)
2	Connector

3. Install in the reverse order of removal.



A6E8114W116

Panel Light Control Switch Removal Note

1. Insert your hand from the lower side of the dashboard and squeeze the tabs of the panel light control switch.
2. Pull the panel light control switch forward to remove it.

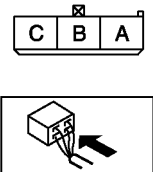
INTERIOR LIGHTING SYSTEM

PANEL LIGHT CONTROL SWITCH INSPECTION

A6E811466600W02

1. Connect the connector to the panel light control switch.
2. Connect the negative battery cable.
3. Measure the voltage at the panel light control switch using voltmeter.
 - When inspecting terminal B for continuity, disconnect the panel light control switch connector.
4. If the value are not as specified in the Terminal Voltage List (Reference), inspect the parts under “Action” and related wiring harnesses.
5. If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the panel light control switch.

Terminal Voltage Table (Reference)

PANEL LIGHT CONTROL SWITCH HARNESS SIDE CONNECTOR					
					

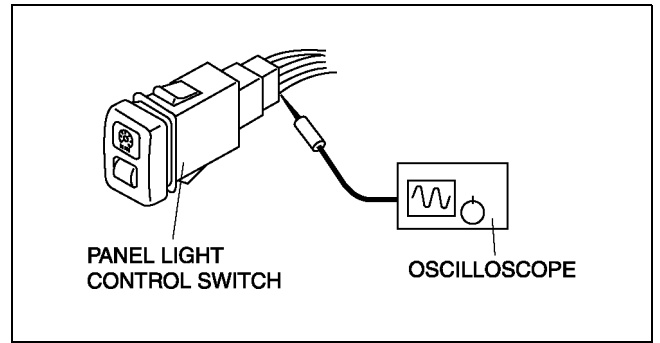
A6E8114W123

Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
A	TNS (Without running light system)	TNS relay	Headlight switch at TNS or headlight position	B+	- Inspect TNS relay (See T-24 RELAY INSPECTION) - Inspect ILLUMI 10A fuse - Inspect related harness
			Other	0	
	Running light (With running light system)	Running light unit	Headlight switch at TNS or headlight position	B+	- Inspect running light unit (See T-46 RUNNING LIGHT UNIT INSPECTION) - Inspect related harness
			Other	0	
C	Illumination	Each illumination	Inspect using an oscilloscope (See T-55 Terminal C inspection)	—	- Inspect each illumination - Inspect related harness
B	Ground	GND	Under any condition: inspect for continuity to ground	Yes	- Inspect GND - Inspect related harness

INTERIOR LIGHTING SYSTEM

Terminal C inspection

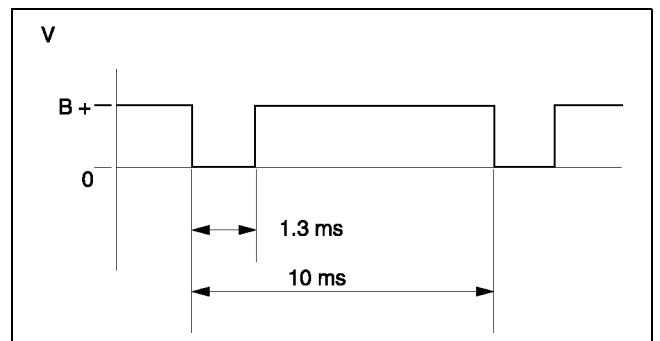
1. Measure the wave pattern of the terminal C on the panel light control switch using an oscilloscope.
2. Set the headlight switch to either the TNS or headlight position.
3. Set the panel light control switch to the brightest position.



4. Verify that the pattern on the screen is as shown in the figure.



5. Verify that the pattern on the screen matches the pattern shown in the figure as the panel light control switch is gradually turned to the darkest position.



WIPER AND WASHER

WIPER AND WASHER

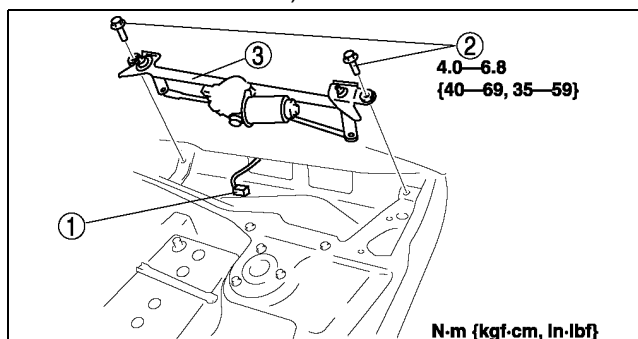
WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION

A6E811667340W01

1. Disconnect the negative battery cable.
2. Remove the windshield wiper arm and blade. (See [T-57 WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
3. Remove the cowl grille. (See [S-50 COWL GRILLE REMOVAL/INSTALLATION](#).)
4. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Windshield wiper motor

5. Install in the reverse order of removal.
6. Adjust the windshield wiper arm and blade. (See [T-58 WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT](#).)



A6E8116W102

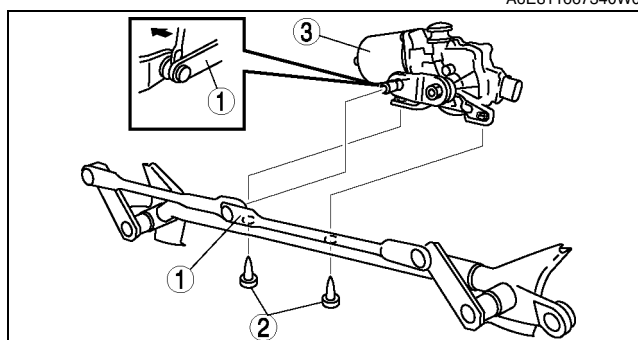
WINDSHIELD WIPER MOTOR DISASSEMBLY/ASSEMBLY

A6E811667340W02

1. Disassemble in the order indicated in the table.

1	Windshield wiper link (See T-56 Windshield Wiper Link Removal Note)
2	Bolt
3	Windshield wiper motor

2. Assemble in the reverse order of disassembly.



A6E8116W140

Windshield Wiper Link Removal Note

1. Pry off the connection between the windshield wiper motor and windshield wiper link.

WINDSHIELD WIPER MOTOR INSPECTION

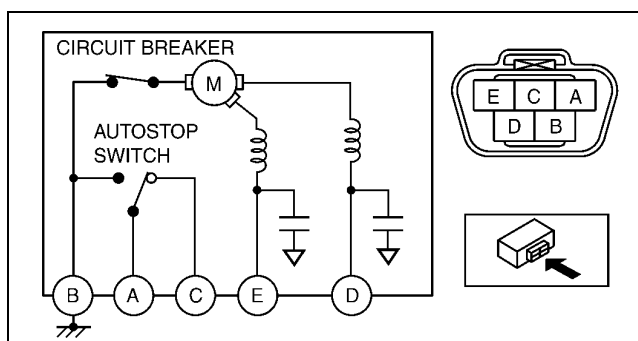
A6E811667340W03

L.H.D.

1. Disconnect the windshield wiper motor connector.
2. Connect battery positive voltage to terminal E or D and ground to terminal B, and inspect the operation of the windshield wiper motor as indicated below.

Terminal	Operation
E	High
D	Low

3. Disconnect battery positive voltage from terminal E of the motor while the wipers are operating.
4. Verify that the wipers do not stop in the park position.
5. Short between the motor terminals A and D and connect battery positive voltage to the motor terminal C.
6. Verify that the wipers operate at low speed again, then stop in the park position.
 - If not as specified, replace the windshield wiper motor.



A6E8116W127

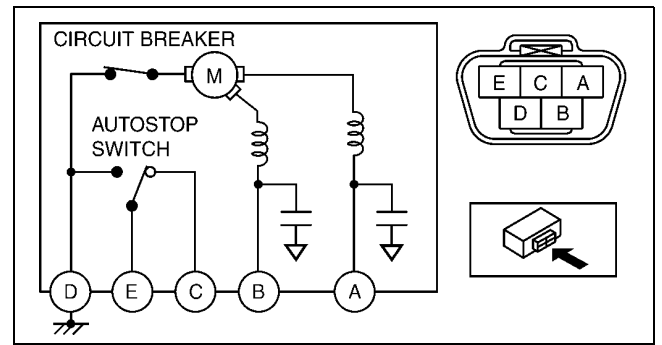
WIPER AND WASHER

R.H.D.

1. Disconnect the windshield wiper motor connector.
2. Connect battery positive voltage to terminal B or A and ground to terminal D, and inspect the operation of the windshield wiper motor as indicated below.

Terminal	Operation
B	High
A	Low

3. Disconnect battery positive voltage from terminal B of the motor while the wipers are operating.
4. Verify that the wipers do not stop in the park position.
5. Short between the motor terminals E and A and connect battery positive voltage to the motor terminal C.
6. Verify that the wipers operate at low speed again, then stop in the park position.
 - If not as specified, replace the windshield wiper motor.



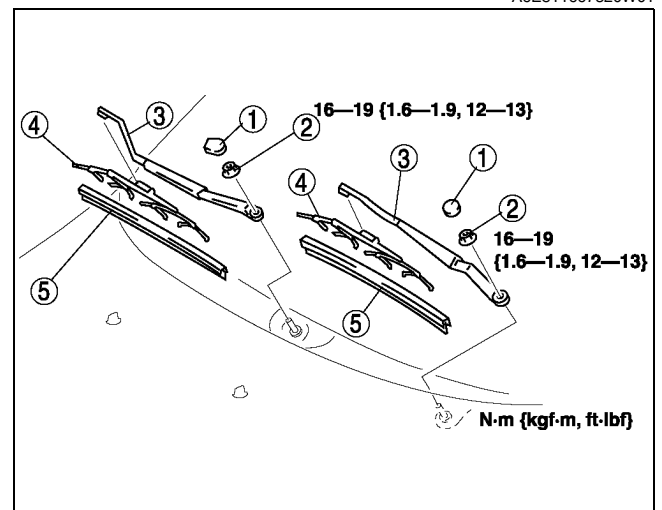
A6E8116W128

WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.

1	Cap
2	Nut
3	Windshield wiper arm (See T-57 Windshield Wiper Arm Installation Note)
4	Windshield wiper blade
5	Rubber brush

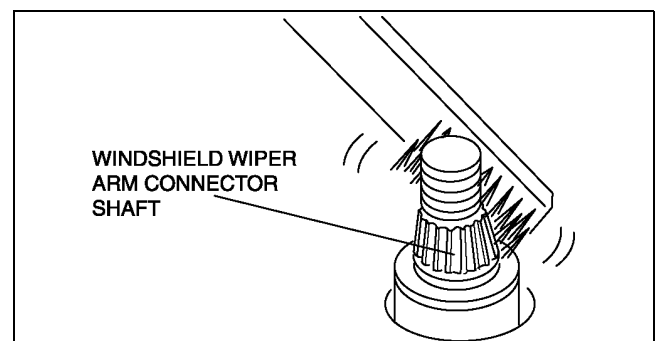
2. Install in the reverse order of removal.
3. Adjust the windshield wiper arm and blade. (See [T-58 WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT.](#))



A6E8116W111

Windshield Wiper Arm Installation Note

1. Clean the windshield wiper arm connector shafts using a wire brush before installing the windshield wiper arms.



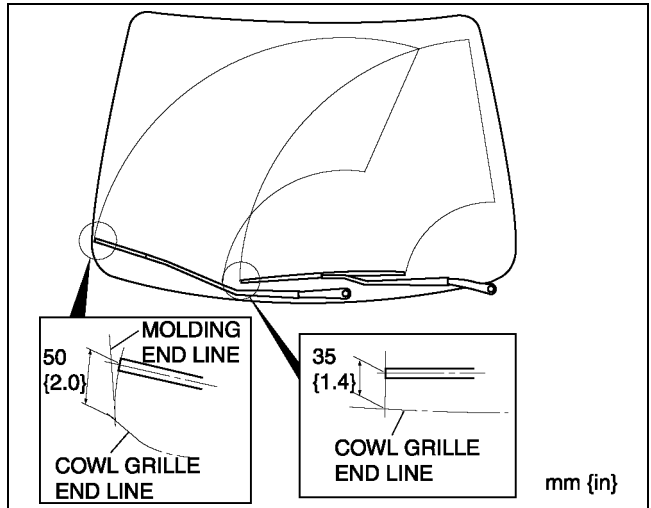
A6E8116W103

WIPER AND WASHER

WINDSHIELD WIPER ARM AND BLADE ADJUSTMENT

A6E811667320W02

1. Operate the windshield wiper motor to set the wipers in the park position.
2. Set the windshield wiper arms height as shown.



A6E8116W107

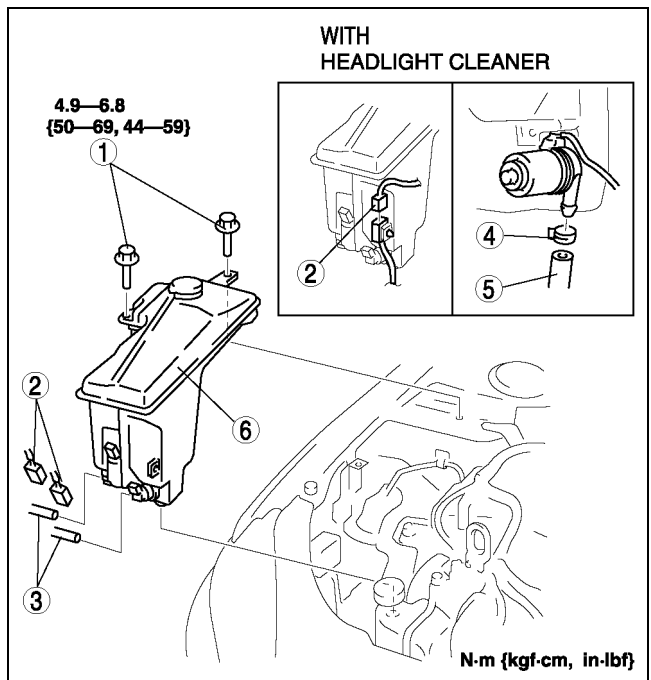
WASHER TANK REMOVAL/INSTALLATION

A6E811667481W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Washer hose
4	Clip
5	Headlight cleaner hose
6	Washer tank

3. Install in the reverse order of removal.



A6E8116W117

WIPER AND WASHER

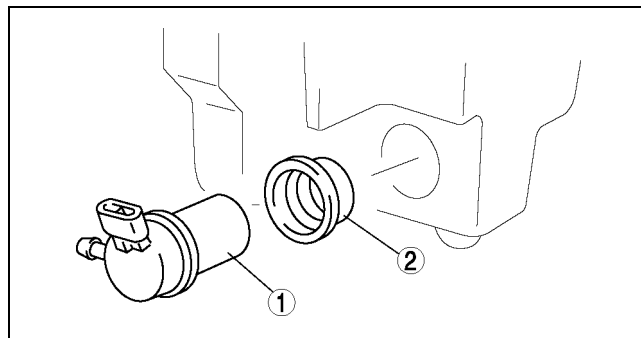
WINDSHIELD WASHER MOTOR REMOVAL/INSTALLATION

A6E811676670W01

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Windshield washer motor
2	Grommet

4. Install in the reverse order of removal.

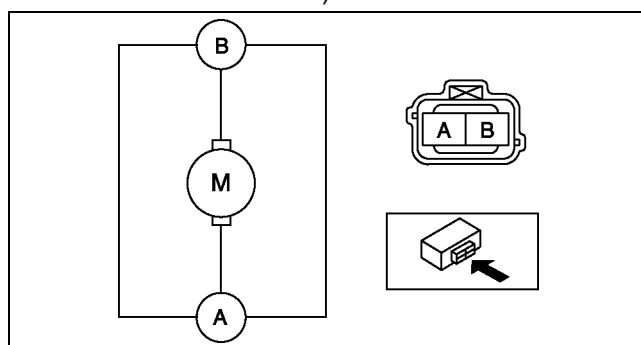


A6E8116W123

WINDSHIELD WASHER MOTOR INSPECTION

A6E811676670W02

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
3. Connect battery positive voltage to the motor terminal B and ground to the motor terminal A.
4. Verify that the windshield washer motor operates.
 - If the motor does not operate, replace the windshield washer motor.



A6E8116W129

T

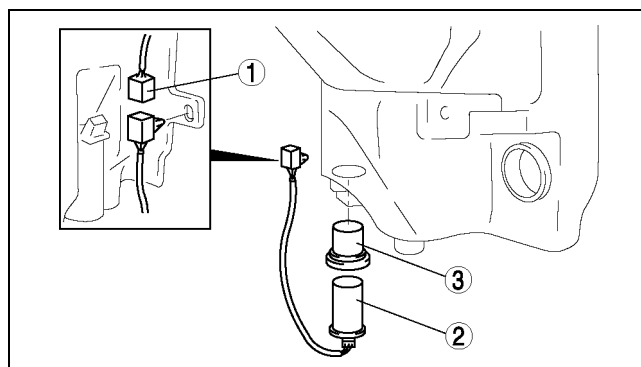
WASHER FLUID-LEVEL SENSOR REMOVAL/INSTALLATION

A6E811676670W03

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
3. Remove the headlight cleaner motor. (See [T-69 HEADLIGHT CLEANER MOTOR REMOVAL/INSTALLATION](#))
4. Remove in the order indicated in the table.

1	Connector
2	Washer fluid-level sensor
3	Grommet

5. Install in the reverse order of removal.



A6E8116W114

WIPER AND WASHER

WASHER FLUID-LEVEL SENSOR INSPECTION

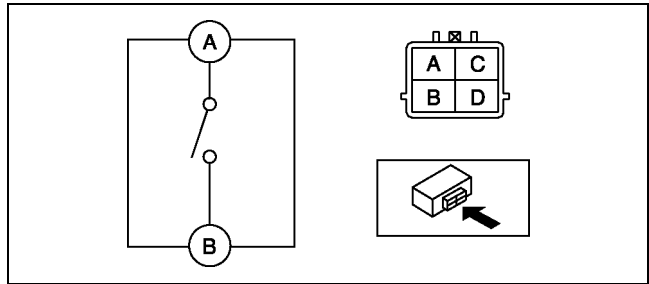
A6E811676670W04

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
3. Insoect for continuity between the washer fluid-level sensor terminals using an ohmmeter.
4. Verify that the windshield washer motor operates.
 - If not as specified, replace the washer fluid-level sensor.

○—○ : Continuity

Fluid level	Terminal	
	A	B
Above Low		
Below Low	○—○	○—○

A6E8116W144

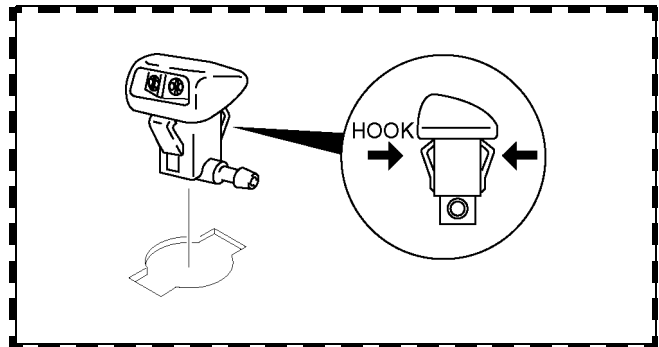


A6E8116W130

WINDSHIELD WASHER NOZZLE REMOVAL/INSTALLATION

A6E811667510W01

1. Remove the bonnet insulator.
2. Remove the windshield washer hose from the windshield washer nozzle.
3. Compress the hooks of the windshield washer nozzle.
4. Pull the windshield washer nozzle out to remove it.
5. Install in the reverse order of removal.

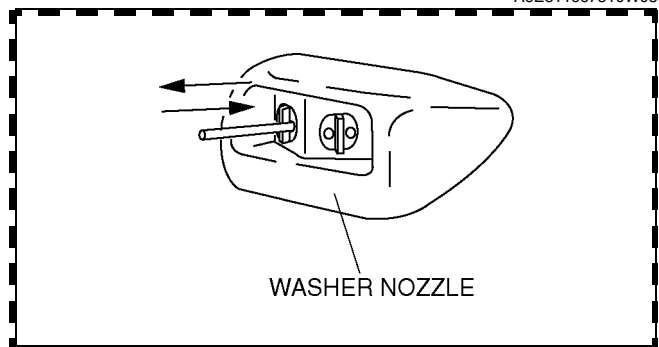


A6E8116W143

WINDSHIELD WASHER NOZZLE CLEANING

A6E811667510W03

1. Clean the washer nozzle by inserting and moving a needle or an equivalent tool back and forth.
 - If the nozzle becomes clogged again after cleaning, remove the hose from washer nozzle. Make sure there is enough washer fluid. Then turn the washer switch on and flush the inside of the hose.



A6E8116W124

WIPER AND WASHER

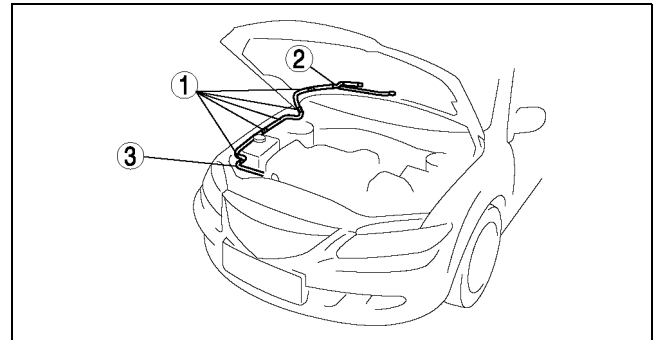
WINDSHIELD WASHER HOSE REMOVAL/INSTALLATION

A6E811650601W01

1. Remove the bonnet insulator.
2. Partially peel off the right side mud guard.
3. Remove in the order indicated in the table.

1	Clip
2	Joint pipe
3	Windshield washer hose

4. Install in the reverse order of removal.



A6E8116W126

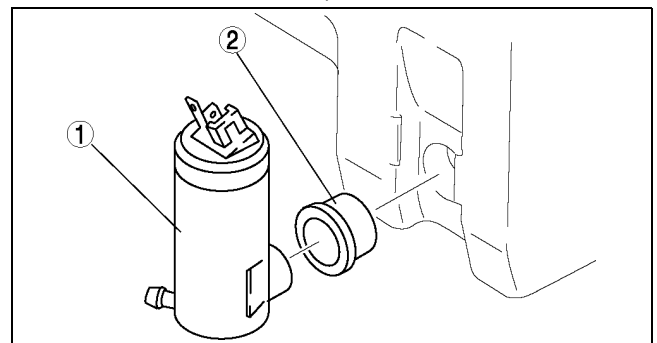
REAR WASHER MOTOR REMOVAL/INSTALLATION

A6E811676672W01

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Rear washer motor
2	Grommet

4. Install in the reverse order of removal.

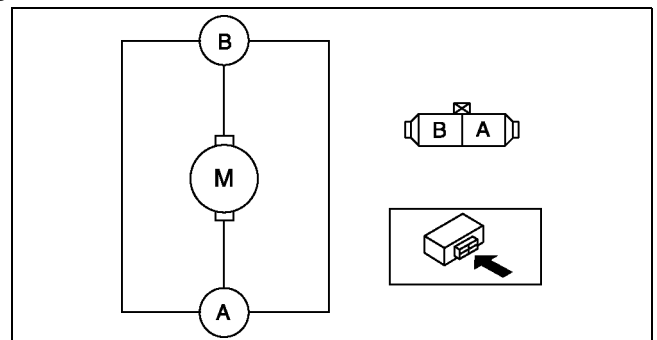


A6E8116W104

REAR WASHER MOTOR INSPECTION

A6E811676672W02

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
3. Connect battery positive voltage to the terminal B and ground to the terminal A of the motor.
4. Verify that the rear washer motor operates.
 - If the motor does not operate, replace the rear washer motor.



A6E8116W131

WIPER AND WASHER

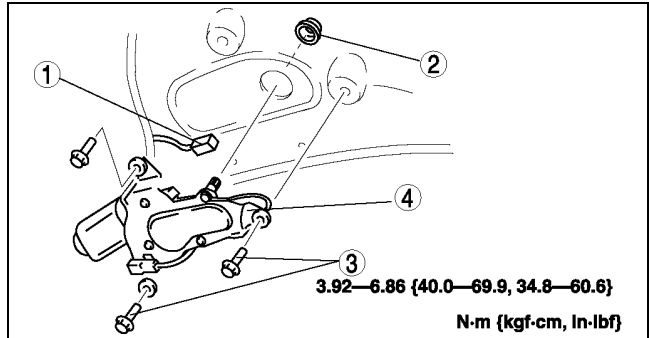
REAR WIPER MOTOR REMOVAL/INSTALLATION

A6E811667450W01

1. Disconnect the negative battery cable.
2. Remove the rear wiper arm and blade. (See [T-63 REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION.](#))
3. Remove the liftgate lower trim. (See [S-95 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION](#))
4. Remove in the order indicated in the table.

1	Connector
2	Outer bushing
3	Bolt
4	Rear wiper motor

5. Install in the reverse order of removal.
6. Adjust the rear wiper arm and blade. (See [T-64 REAR WIPER ARM AND BLADE ADJUSTMENT.](#))

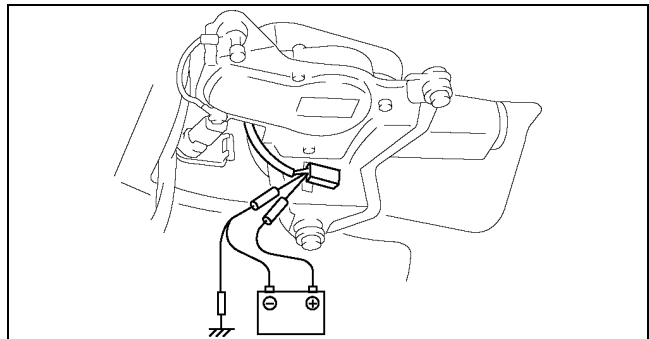


A6E8116W110

REAR WIPER MOTOR INSPECTION

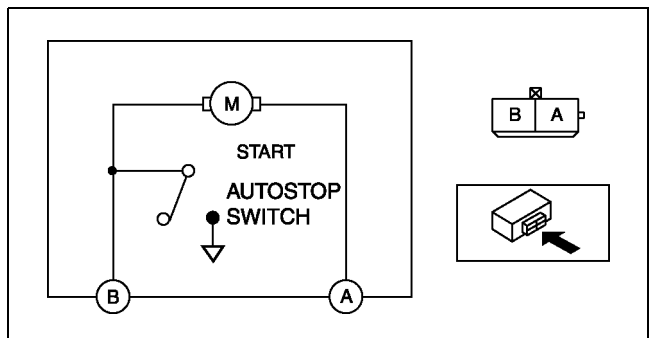
A6E811667450W02

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim. (See [S-95 LIFTGATE LOWER TRIM REMOVAL/INSTALLATION](#))
3. Disconnect the rear wiper motor connector.
4. Connect battery positive voltage to the rear wiper motor terminal A and the ground to a bare metal part of the vehicle and the rear wiper motor terminal B.
5. Verify that the rear wiper motor operates.



A6E8116W119

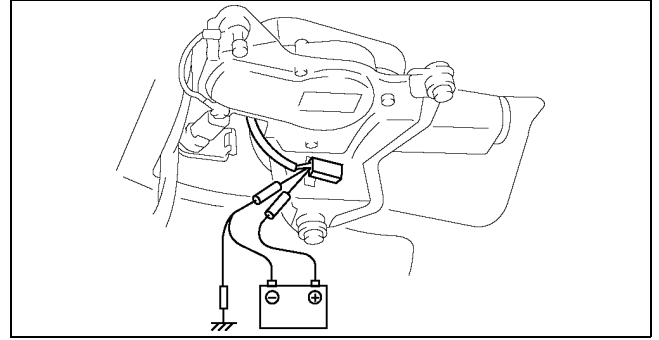
6. Disconnect the ground to the terminal B while the rear wiper is operating.



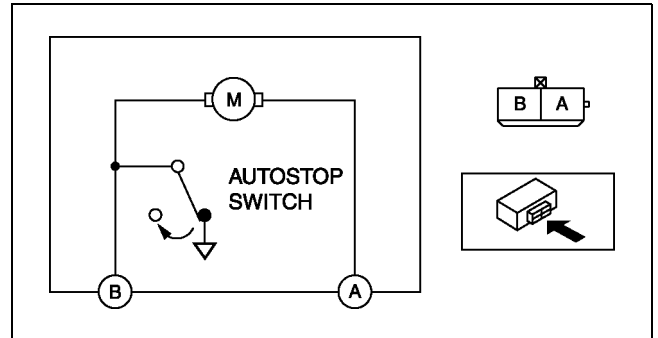
A6E8116W132

WIPER AND WASHER

7. Verify that the rear wiper stops in the park position.
 - If not as specified, replace the rear wiper motor.



A6E8116W119



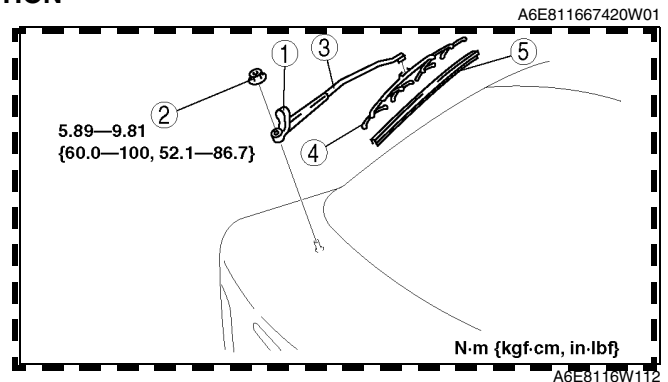
A6E8116W133

REAR WIPER ARM AND BLADE REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.

1	Cap
2	Nut
3	Rear wiper arm (See T-63 Rear Wiper Arm Installation Note)
4	Rear wiper blade
5	Rubber brush

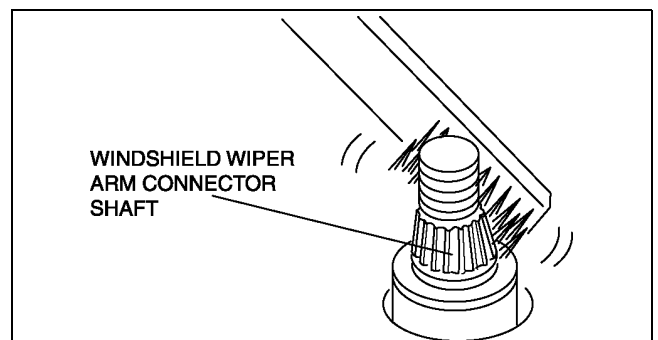
2. Install in the reverse order of removal.
3. Adjust the rear wiper arm and blade. (See [T-64 REAR WIPER ARM AND BLADE ADJUSTMENT](#))



A6E8116W112

Rear Wiper Arm Installation Note

1. Clean the rear wiper arm connector shaft using a wire brush before installing the rear wiper arm.



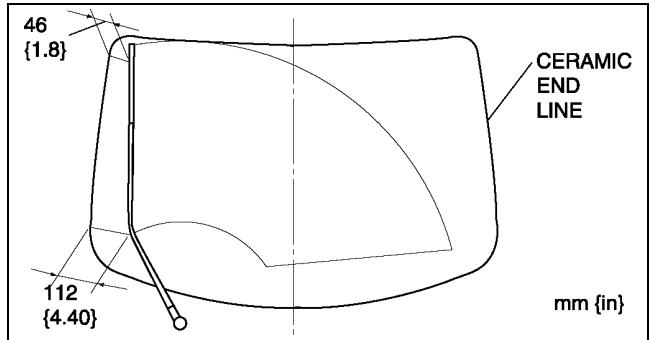
A6E8116W103

WIPER AND WASHER

REAR WIPER ARM AND BLADE ADJUSTMENT

A6E811667420W02

1. Operate the rear wiper motor to set the wiper in the park position.
2. Set the rear wiper arm onto the ceramics end line.

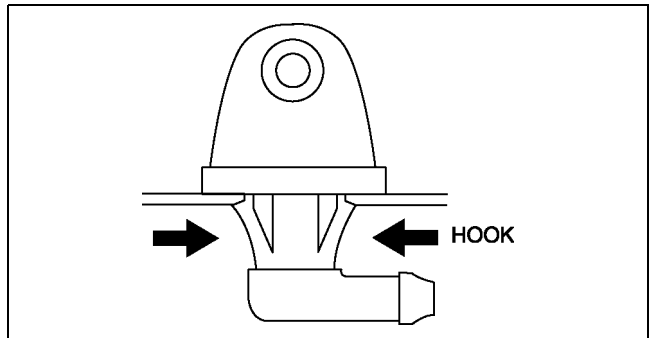


A6E8116W109

REAR WASHER NOZZLE REMOVAL/INSTALLATION

A6E811667511W01

1. Disconnect the negative battery cable.
2. Remove the liftgate upper trim. (See [S-94 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION](#))
3. Remove the rear washer hose from the rear washer nozzle.
4. Compress the tabs of the rear washer nozzle.
5. Pull the rear washer nozzle out to remove it.
6. Install in the reverse order of removal.
7. Adjust the rear washer nozzle. (See [T-64 REAR WASHER NOZZLE ADJUSTMENT.](#))

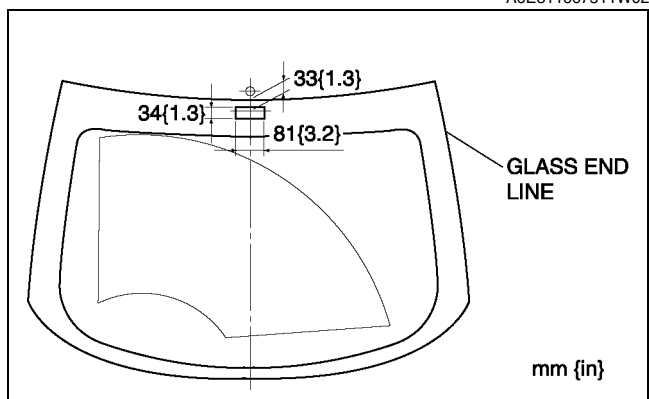


A6E8116W105

REAR WASHER NOZZLE ADJUSTMENT

A6E811667511W02

1. Insert a needle or an equivalent tool into the spray hole of the rear washer nozzle and adjust the nozzle direction as shown.



A6E8116W108

REAR WASHER NOZZLE CLEANING

A6E811667511W03

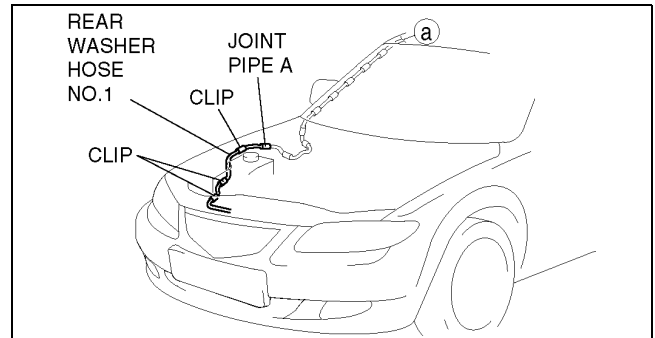
1. Clean the rear washer nozzle. (See [T-60 WINDSHIELD WASHER NOZZLE CLEANING.](#))

WIPER AND WASHER

REAR WASHER HOSE REMOVAL/INSTALLATION

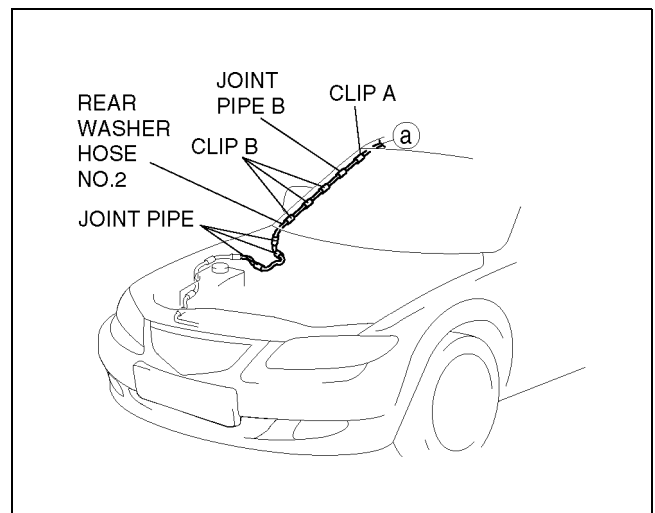
A6E811667470W01

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
3. Partially peel off the right side mud guard.
4. Remove rear washer hose No.1 from the clips.
5. Remove rear washer hose No.1 and joint pipe A.
6. Remove the A-pillar trim. (See [S-87 A-PILLAR TRIM REMOVAL](#))



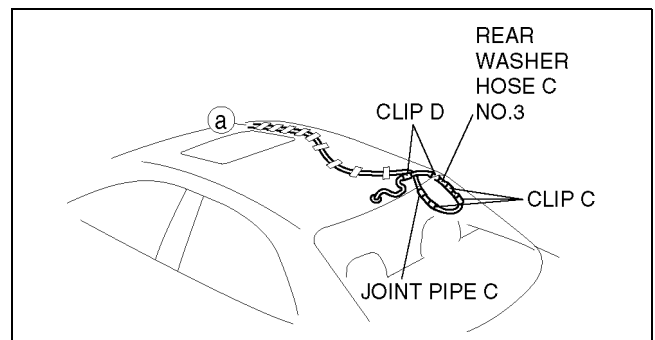
A6E8116W148

7. Remove rear washer hose No.2 from clip A.
8. Remove clips B from the body.
9. Remove rear washer hose No.2 and joint pipes B.
10. Remove the C-pillar trim. (See [S-89 C-PILLAR TRIM REMOVAL/INSTALLATION](#))
11. Remove the liftgate upper trim. (See [S-94 LIFTGATE UPPER TRIM REMOVAL/INSTALLATION](#))



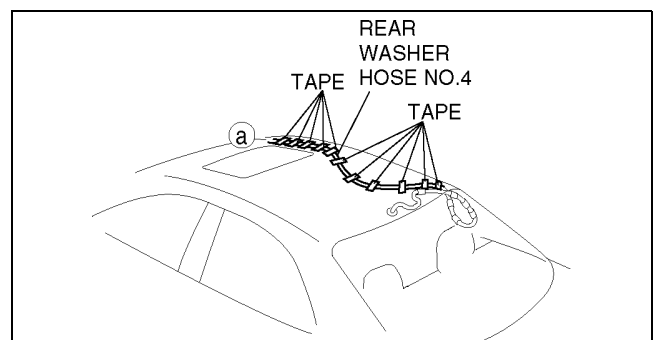
A6E8116W149

12. Remove rear washer hose No.3 from clip C.
13. Remove clips D from the body.
14. Remove rear washer hose No.3 and joint pipe C.
15. Remove the headliner. (See [S-96 HEADLINER REMOVAL/INSTALLATION](#))



A6E8116W201

16. Remove the tape from rear washer hose No.4.
17. Install in the reverse order of removal.



A6E8116W202

WIPER AND WASHER

INTERMITTENT REAR WIPER RELAY REMOVAL/INSTALLATION

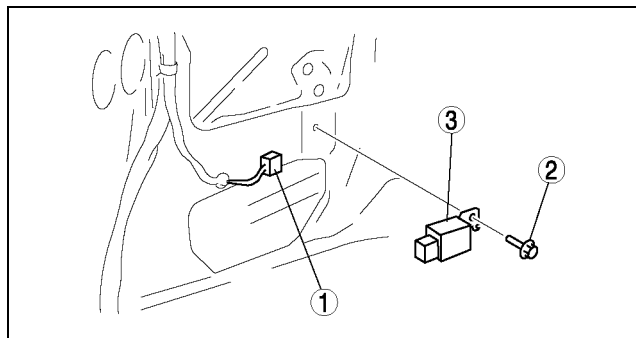
A6E811666810W01

5HB

1. Disconnect the negative battery cable.
2. Remove the trunk side trim. (See [S-92 TRUNK SIDE TRIM REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Intermittent rear wiper relay

4. Install in the reverse order of removal.



A6E8116W101

INTERMITTENT REAR WIPER RELAY INSPECTION

A6E811666810W02

1. Connect the connector to the intermittent rear wiper relay.
2. Connect the negative battery cable.
3. Measure the voltage at the intermittent rear wiper relay using voltmeter.
 - When inspecting terminal D for continuity, disconnect the intermittent rear wiper relay connector.
4. If the value are not as specified in the Terminal Voltage List (Reference), inspect the parts under "Action" and related wiring harnesses.
5. If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the intermittent rear wiper relay.

Terminal Voltage Table (Reference)

INTERMITTENT REAR WIPER RELAY HARNESS SIDE CONNECTOR					
I	G			A	
*	*	*	D	*	

A6E8116W134

Terminal	Signal	Connected to	Test condition	Voltage (V)/Continuity	Action
A	Autostop	Rear wiper motor	Rear wiper is operating (INT position or ON position)	Alternates 0 and B+	• Inspect R. WIP 10 A fuse • Inspect wiper and washer switch (See T-68 WIPER AND WASHER SWITCH INSPECTION) • Inspect rear wiper motor (See T-62 REAR WIPER MOTOR INSPECTION) • Inspect related harness
			Other	B+	
D	GND	GND	Under any condition: inspect for continuity to ground	Yes	• Inspect GND • Inspect related harness

WIPER AND WASHER

Terminal	Signal	Connected to	Test condition		Voltage (V)/ Continuity	Action
G	Rear wiper switch INT	Rear wiper switch	Ignition switch at ON position	Rear wiper switch at INT position	0	- Inspect R. WIP 10 A fuse - Inspect wiper and washer switch (See T-68 WIPER AND WASHER SWITCH INSPECTION) - Inspect related harness
				- Rear wiper switch at OFF position - Rear wiper switch at ON position	B+	
I	IG 2	R. WIP 10 A fuse	Ignition switch at ON position		B+	- Inspect R. WIP 10 A fuse - Inspect related harness
			Other		0	

WIPER AND WASHER SWITCH REMOVAL/INSTALLATION

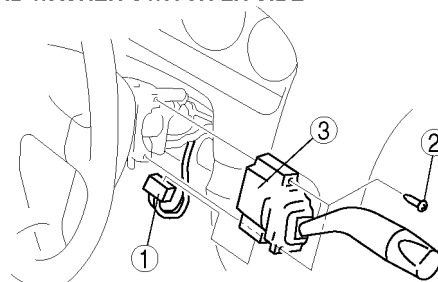
A6E811666122W01

1. Disconnect the negative battery cable.
2. Remove the column cover. (See [S-84 COLUMN COVER REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Connector
2	Screw
3	Wiper and washer switch

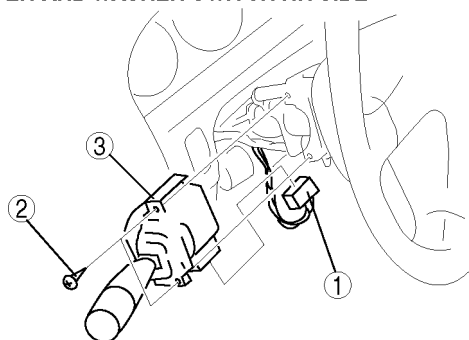
4. Install in the reverse order of removal.

WIPER AND WASHER SWITCH LH SIDE



A6E8116W203

WIPER AND WASHER SWITCH RH SIDE



A6E8116W204

WIPER AND WASHER

WIPER AND WASHER SWITCH INSPECTION

A6E811666122W02

Windshield Wiper And Washer Switch

Without vehicle-speed sensing type wipers

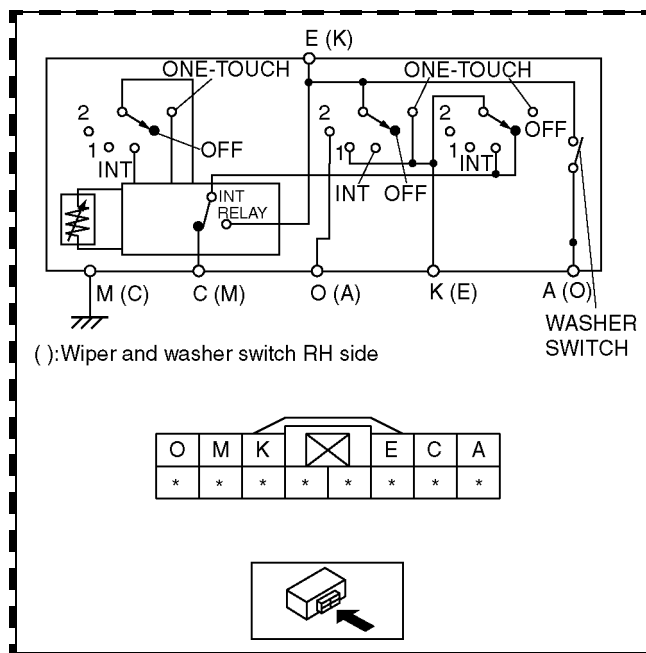
1. Remove the wiper and washer switch. (See [T-67 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION](#))
2. Inspect for continuity between the wiper and washer switch terminals using an ohmmeter.
 - If not as specified, replace the wiper and washer switch.

○—○ : Continuity

Switch position		One-touch	Terminal				
			A (O)	C (M)	E (K)	K (E)	O (A)
Wiper switch	OFF	OFF		○		○	
		ON			○	○	
	INT			○		○	
	1				○	○	
	2				○		○
Washer switch	ON		○		○		

() : Wiper and washer switch RH side

A6E8116W146



A6E8116W135

With vehicle-speed sensing type wipers

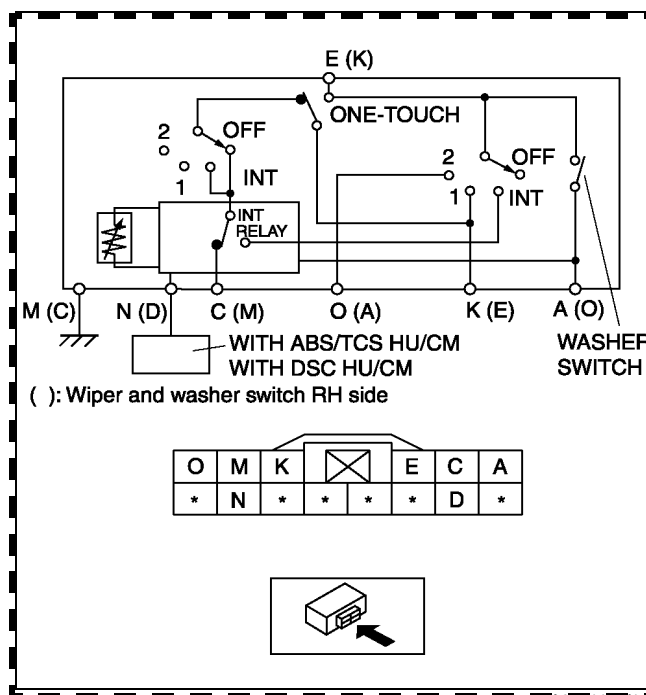
1. Remove the wiper and washer switch. (See [T-67 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION](#))
2. Inspect for continuity between the wiper and washer switch terminals using an ohmmeter.
 - If not as specified, replace the wiper and washer switch.

○—○ : Continuity

Switch position		One-touch	Terminal				
			A (O)	C (M)	E (K)	K (E)	O (A)
Wiper switch	OFF	OFF		○		○	
		ON			○	○	
	INT			○		○	
	1				○	○	
	2				○		○
Washer switch	ON		○		○		

() : Wiper and washer switch RH side

A6E8116W146



A6E8116W146

3. Connect the negative battery cable.

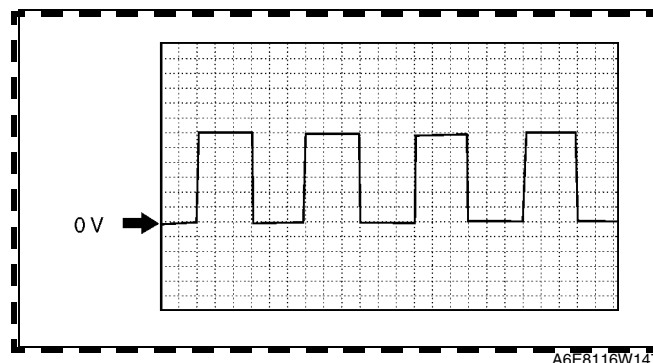
WIPER AND WASHER

- Inspect whether the vehicle speed signal to the wiper and washer switch terminal N (D) is input correctly using an oscilloscope.
 - Connect the oscilloscope probes to the wiper and washer switch terminal N (D) (+) and terminal M (C) (-).
 - Set oscilloscope to 1V/DIV (Y), 5ms/DIV (X).
 - Verify that the wave pattern below is displayed while the vehicle is moving at 30 km/h {19 mph}.

Note

- As the vehicle speed increases, the frequency shortens.

- If the vehicle speed input signal and continuity for the wiper and washer switch is correct, inspect the windshield wiper motor. (See [T-56 WINDSHIELD WIPER MOTOR INSPECTION](#))
 - Even if the windshield wiper motor is normal, if the vehicle-speed-sensing wipers do not operate correctly, replace the wiper and washer switch.



Rear Wiper and Washer Switch

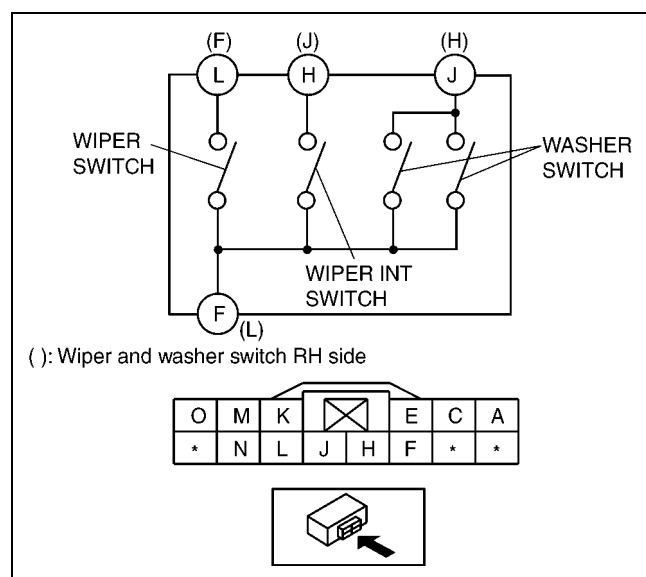
- Remove the wiper and washer switch. (See [T-67 WIPER AND WASHER SWITCH REMOVAL/INSTALLATION](#))
- Inspect for continuity between the wiper and washer switch terminals using an ohmmeter.
 - If not as specified, replace the wiper and washer switch.

○ — ○ : Continuity

Switch position	Terminal			
	F (L)	J (H)	H (J)	L (F)
OFF				
Wiper	○			○
Wiper INT	○	○		
Wiper and washer	○		○	○
Washer	○		○	

(): Wiper and washer switch RH side

A6E8116W121



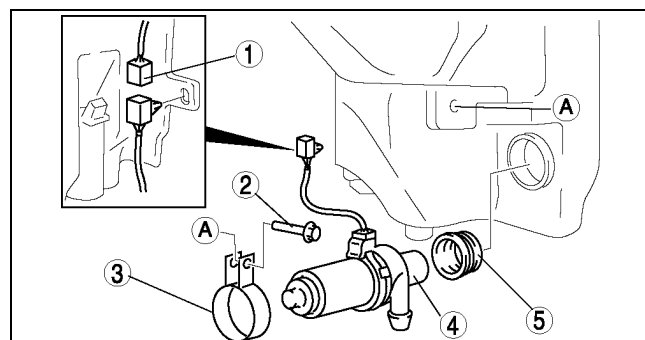
HEADLIGHT CLEANER MOTOR REMOVAL/INSTALLATION

A6E811651030W01

- Disconnect the negative battery cable.
- Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
- Remove the washer fluid-level sensor. (See [T-59 WASHER FLUID-LEVEL SENSOR REMOVAL/INSTALLATION](#))
- Remove in the order indicated in the table.

1	Connector
2	Bolt
3	Bracket
4	Headlight cleaner motor
5	Grommet

- Install in the reverse order of removal.

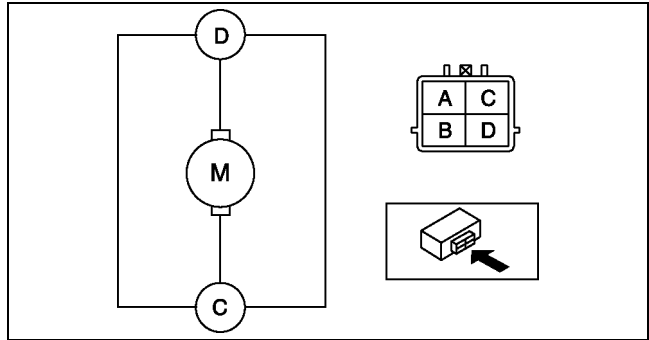


WIPER AND WASHER

HEADLIGHT CLEANER MOTOR INSPECTION

A6E811651030W02

1. Disconnect the negative battery cable.
2. Remove the washer tank. (See [T-58 WASHER TANK REMOVAL/INSTALLATION](#))
3. Connect battery positive voltage to terminal D and ground to terminal C of the motor.
4. Verify that the headlight cleaner motor operates.
 - If the motor does not operate, replace the headlight cleaner motor.



A6E8116W137

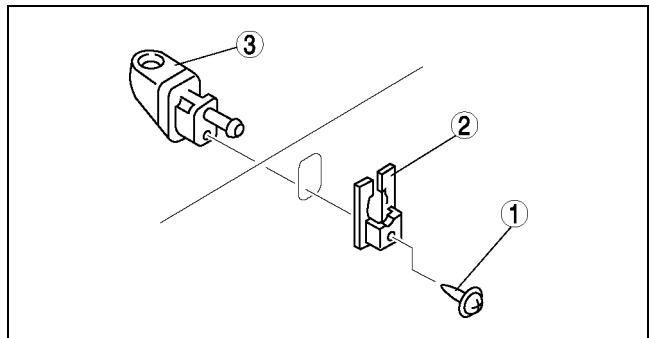
HEADLIGHT CLEANER NOZZLE REMOVAL/INSTALLATION

A6E811651030W03

1. Remove the front bumper. (See [S-47 FRONT BUMPER REMOVAL/INSTALLATION](#))
2. Disconnect the headlight cleaner hose. (See [T-71 HEADLIGHT CLEANER HOSE REMOVAL/INSTALLATION](#))
3. Remove in the order indicated in the table.

1	Screw
2	Spacer
3	Headlight cleaner nozzle

4. Install in the reverse order of removal.
5. Adjust the headlight cleaner nozzle. (See [T-70 HEADLIGHT CLEANER NOZZLE ADJUSTMENT.](#))

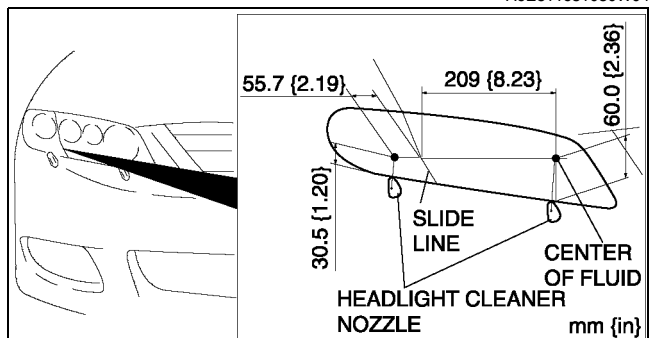


A6E8116W142

HEADLIGHT CLEANER NOZZLE ADJUSTMENT

A6E811651030W04

1. Use a needle or equivalent to adjust the headlight cleaner nozzle so that the center of fluid properly sprays on the headlight as shown in the figure.



A6E8116W115

HEADLIGHT CLEANER NOZZLE CLEANING

A6E811651030W05

1. Clean the rear washer nozzle. (See [T-60 WINDSHIELD WASHER NOZZLE CLEANING.](#))

WIPER AND WASHER

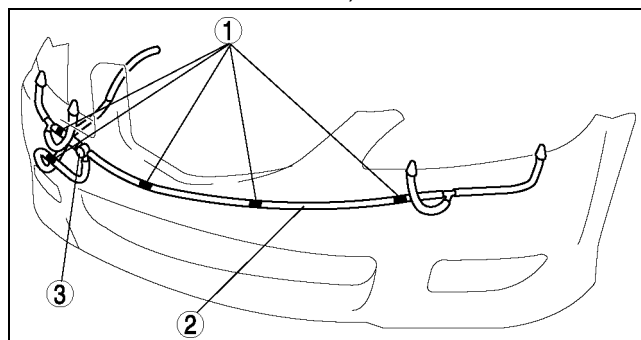
HEADLIGHT CLEANER HOSE REMOVAL/INSTALLATION

A6E811651030W06

1. Remove the front bumper. (See [S-47 FRONT BUMPER REMOVAL/INSTALLATION](#))
2. Remove in the order indicated in the table.

1	Clip
2	Headlight cleaner hose
3	Check valve

3. Install in the reverse order of removal.



A6E8116W118

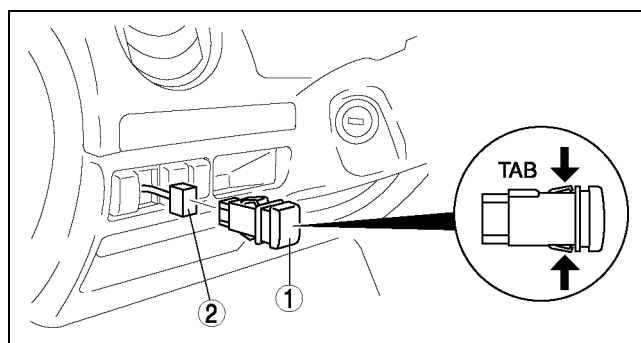
HEADLIGHT CLEANER SWITCH REMOVAL/INSTALLATION

A6E811651030W07

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Headlight cleaner switch (See T-71 Headlight Cleaner Switch Removal Note)
2	Connector

3. Install in the reverse order of removal.



A6E8116W125

Headlight Cleaner Switch Removal Note

1. Insert your hand from the lower side of the dashboard and squeeze the tabs of the headlight cleaner switch.
2. Pull the headlight cleaner switch forward to remove it.

HEADLIGHT CLEANER SWITCH INSPECTION

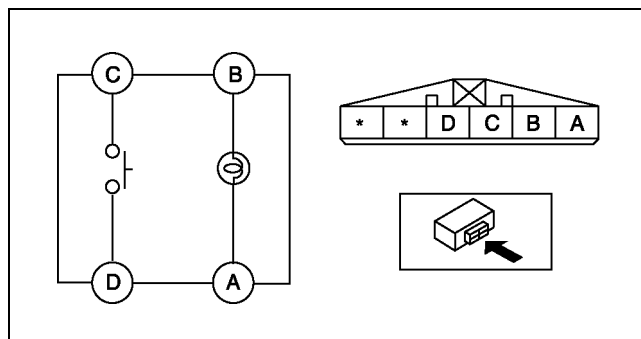
A6E811651030W08

1. Disconnect the negative battery cable.
2. Remove the headlight cleaner switch. (See [T-71 HEADLIGHT CLEANER SWITCH REMOVAL/INSTALLATION](#))
3. Inspect for continuity between the headlight cleaner switch terminals using an ohmmeter.
 - If not as specified, replace the light switch.

○—○ : Continuity ○—⊕—○ : Bulb

Switch position	Terminal			
	C	D	B	A
Pressed	○—○	○—○	○—⊕—○	○—○
Released			○—⊕—○	○—○

A6E8116W139



A6E8116W138

WARNING AND INDICATOR SYSTEM

WARNING AND INDICATOR SYSTEM

INSTRUMENT CLUSTER REMOVAL/INSTALLATION

A6E811855430W01

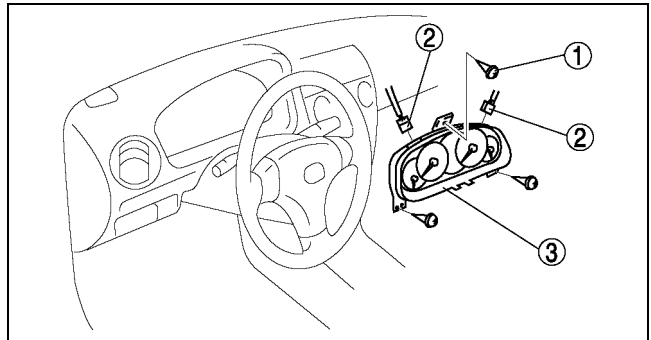
Caution

- When replacing the instrument cluster, the configuration procedure must be performed before removing the instrument cluster. If the configuration procedure is not performed before removing the instrument cluster, it is possible that the instrument cluster will not operate normally.

- Configure the instrument cluster (when only replacing it). (See [T-72 INSTRUMENT CLUSTER CONFIGURATION](#).)
- Disconnect the negative battery cable.
- Pull down the adjusting lever of the tilt steering wheel and push the steering wheel down.
- Pull the steering wheel toward you.
- Remove the meter hood.
- Remove in the order indicated in the table.

1	Screw
2	Connector
3	Instrument cluster (See T-72 Instrument Cluster Removal Note)

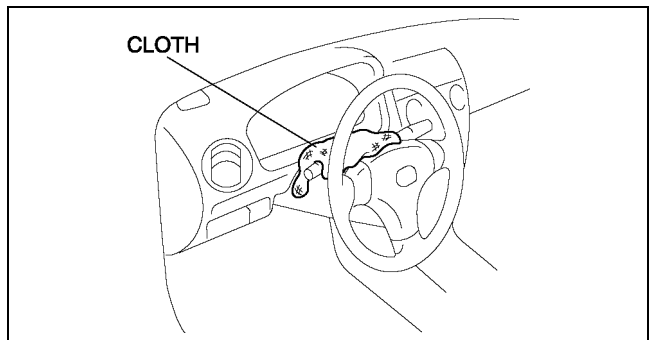
- Install in the reverse order of removal.



A6E8118W003

Instrument Cluster Removal Note

- When removing the instrument cluster, in order to prevent damage to the lens, cover the steering shaft with a cloth.



A6E8118W005

INSTRUMENT CLUSTER CONFIGURATION

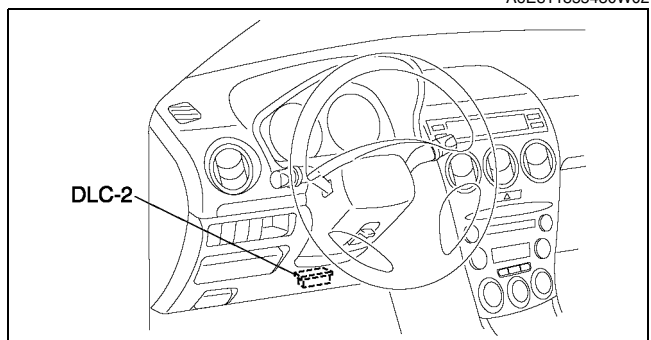
A6E811855430W02

- Connect the **SST** (WDS or equivalent) to the DLC-2.
- Input vehicle information following the directions on the screen.
- Select "Module programming".
- Select "Programmable module installation".
- Select the following items and perform procedures according to directions on the screen.

Items

- "IC"

- Retrieve DTCs by the **SST** (WDS or equivalent), then verify that there is no DTC present.
 - If DTC is present, perform applicable DTC inspection.



A6E3970W002

WARNING AND INDICATOR SYSTEM

INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY

A6E811855430W03

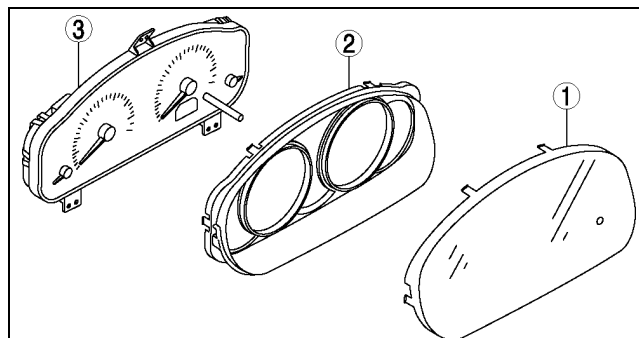
Caution

- If the instrument cluster is dropped or the print plate is damaged, the system will not work properly and it may be the cause of trouble or malfunctions.

1. Disassemble in the order indicated in the table.

1	Lens
2	Case
3	Meter unit

2. Assemble in the reverse order of disassembly.



A6E8118W004

INSTRUMENT CLUSTER INSPECTION

A6E811855430W04

Speedometer

Using the input/output check mode

1. Inspect the speedometer by setting it in the input/output check mode DTC 12.

Using a speedometer tester

1. Adjust the tire air pressure to the specification.
2. Using a speedometer tester, verify that the speedometer indication is within the allowable ranges shown below.

Speedometer tester indication (km/h)	Allowable range (km/h)
20	20—24
40	40—44
60	60—64
80	80—85
100	100—105
120	120—126
140	140—146

Speedometer tester indication (mph)	Allowable range (mph)
10	10—12
20	20—22
30	30—32
40	40—43
50	50—53
60	60—63
70	70—73
80	80—84

3. Verify that fluctuation of the speedometer needle is within the allowable range.

- If the speedometer needle does not move or the indication is outside of the allowable range, inspect the ABS (ABS/TCS) HU/CM (vehicles with ABS (ABS/TCS), DSC HU/CM (vehicles with DSC), PCM (vehicles without ABS) and related wiring harness.
 - If the ABS (ABS/TCS) HU/CM (vehicles with ABS (ABS/TCS), DSC HU/CM (vehicles with DSC), PCM (vehicles without ABS) and related wiring harness are normal, replace the instrument cluster.

Needle fluctuation allowable range

Within 3.0 km/h

WARNING AND INDICATOR SYSTEM

Tachometer

Using the input/output check mode

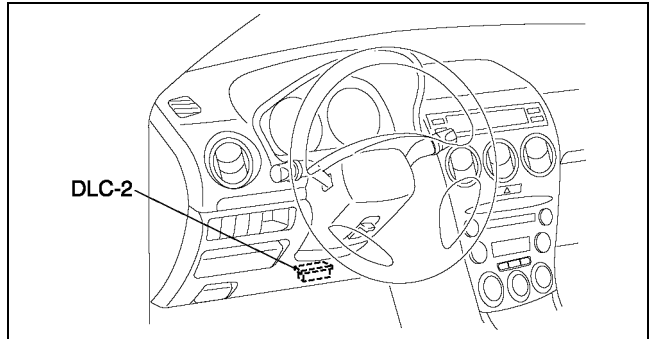
1. Inspect the tachometer by setting it in the input/output check mode DTC 13.

Using the SSTs (WDS or equivalent)

Caution

- If the engine speed exceeds the allowable range, the engine could be damaged. Therefore, when inspecting the tachometer, do not allow the engine speed to exceed the allowable range indication on the tachometer.

1. Connect the **SSTs** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Access and monitor PIDs by **SSTs** (WDS or equivalent).



A6E3970W002

Fuel Gauge

1. Inspect the fuel gauge by setting it in the input/output check mode DTC 23.

Water Temperature Gauge

1. Inspect the water temperature gauge by setting it in the input/output check mode DTC 25.

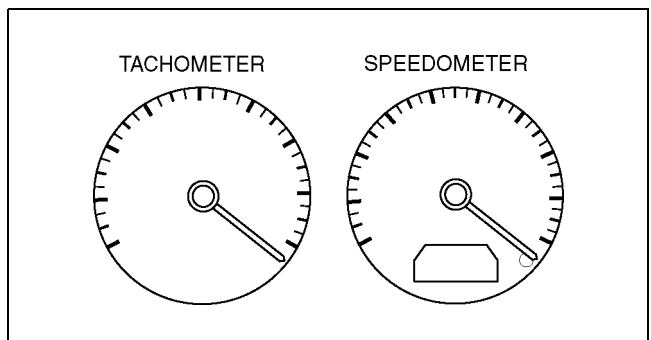
INSTRUMENT CLUSTER REPAIR

A6E811855430W05

Note

- The needle of speedometer or tachometer may continue to rotate clockwise until it indicates over maximum graduation. If a customer complains of this concern, repair the needle position according to the following steps.

1. Verify the concern.
2. Turn the ignition switch to LOCK position.
3. Disconnect the negative battery cable.
4. Connect the negative battery cable.
5. Turn the ignition switch to ON position.
6. Verify that the needle returns to zero.
 - If the needle does not return to zero, replace the instrument cluster



A6E8118W011

WARNING AND INDICATOR SYSTEM

INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE

A6E811855430W06

Note

- In this mode, it is possible to check the items in the following chart.

Diagnostic Trouble Code Chart

DTC	Checked item	Related item
01	Buckle switch	Buckle switch
04	Door switch	• Ignition key illumination • Key reminder warning buzzer • Interior light control • Power door lock system • Lights-on reminder warning buzzer
08	TNS relay	• Lights-on reminder warning buzzer • Each illumination
12	Speedometer	Speedometer
13	Tachometer	Tachometer
14	Buzzer	Buzzer
16	Fuel-level warning light	Fuel-level warning light
18	Ignition key cylinder illumination	Ignition key cylinder illumination
22	Fuel gauge sender unit	Fuel gauge
23	Fuel gauge	Fuel gauge
25	Water temperature gauge	Water temperature gauge
26	LCD	LCD
31	Key reminder switch	Key reminder warning buzzer

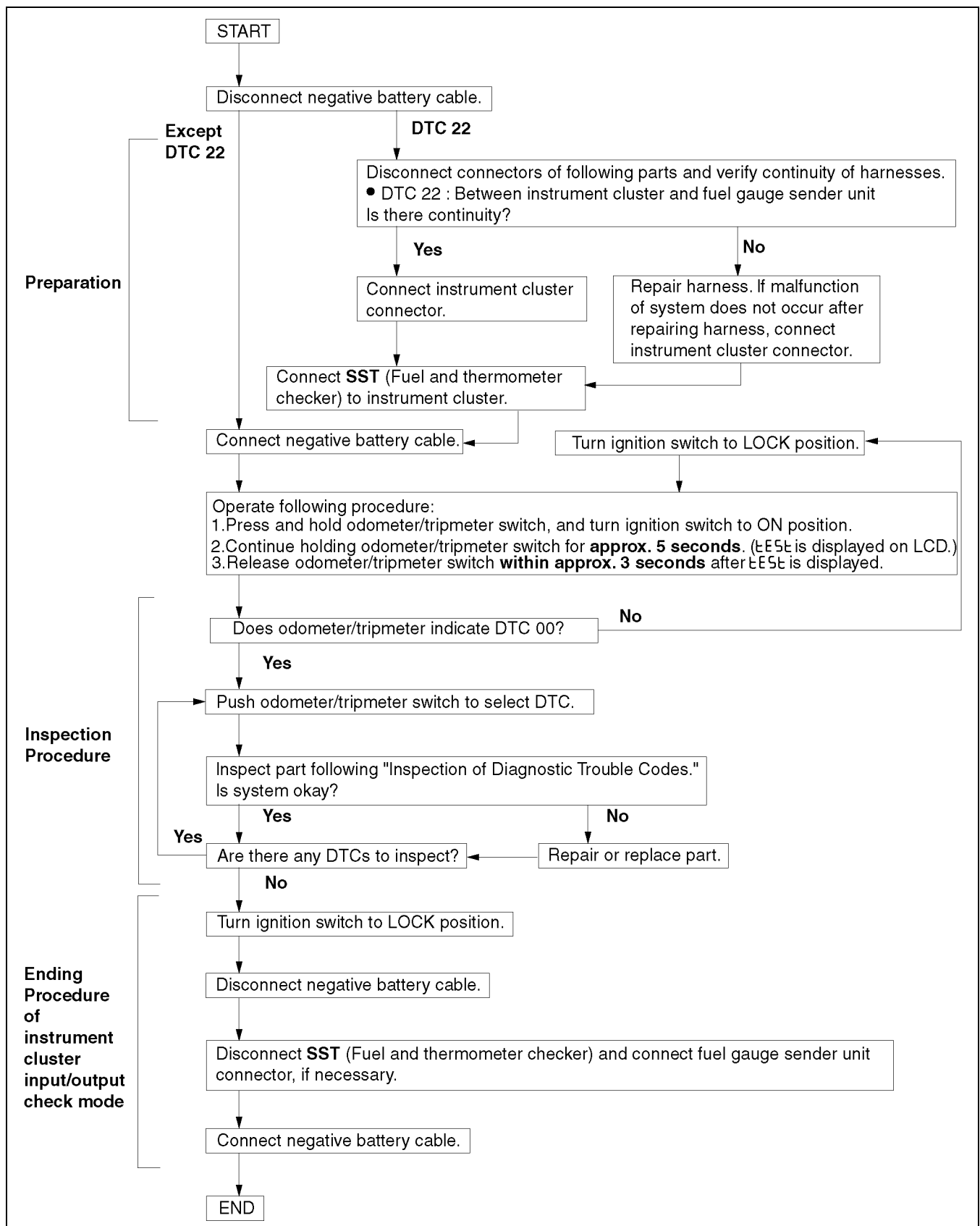
Note

- Diagnostic trouble codes which are not listed may be indicated, but they cannot be inspected.
- The diagnostic trouble codes are displayed in numerical order. (While performing the inspection, if you want to inspect a diagnostic trouble code of which the number is smaller than the code number you are currently inspecting, terminate the check mode then repeat the inspection from the beginning.)
- If the speed signal is put into the instrument cluster (the front wheels are rotated) while a code other than DTC 00 is display, the input/output check mode will be cancelled.
- The diagnostic trouble codes can be fast-forwarded by pushing and holding the odometer/tripmeter switch for **1 second or more**.

T

WARNING AND INDICATOR SYSTEM

Operating Order



A6E8118W009

WARNING AND INDICATOR SYSTEM

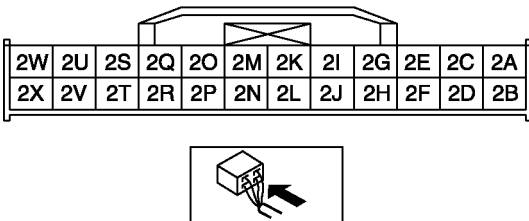
Checking Order

Note

- When inspecting more than two DTCs, perform the inspection by following the priority order of inspection indicated in the chart below.

Priority order of inspection	IG switch position	Check code
1	ON	22
2		01, 04, 08, 12, 13, 14, 16, 18, 23, 25, 26
3	LOCK	31

Inspection of Diagnostic Trouble Codes

DTC 01	Buckle switch on/off signal
INSTRUMENT CLUSTER CONNECTOR 	

Diagnostic procedure

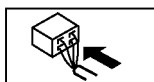
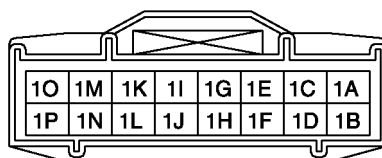
STEP	INSPECTION	INDICATION	ACTION
1	Unfasten driver-side seat belt. (Buckle switch on.)	ON	Go to next step.
		OFF	Measure voltage at instrument cluster terminal 2G. Is voltage 0 V ? - If as specified, replace instrument cluster. - If not as specified, inspect following parts. - Buckle switch - Wiring harness (Buckle switch—instrument cluster)
2	Fasten driver-side seat belt. (Buckle switch off.)	ON	Measure voltage at instrument cluster terminal 2G. Is voltage B+ ? - If as specified, replace instrument cluster. - If not as specified, inspect following parts. - Buckle switch - Wiring harness (Buckle switch—instrument cluster)
		OFF	Input signal to instrument cluster is okay.

T

WARNING AND INDICATOR SYSTEM

DTC 04 Door switch on/off signal

INSTRUMENT CLUSTER CONNECTOR

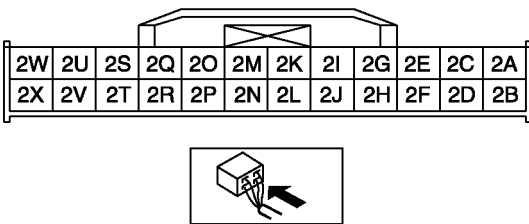


Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Open driver-side door. (Door switch on.)	ON	Close driver-side door, then go to next step.
		OFF	Measure voltage at instrument cluster terminal 1J. Is voltage 0 V ? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
2	Open passenger-side door. (Door switch on.)	ON	Close passenger-side door, then go to next step.
		OFF	Measure voltage at instrument cluster terminal 1I. Is voltage 0 V ? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
3	Open rear door on driver's side. (Door switch on.)	ON	Close rear door on driver's side, then go to next step.
		OFF	Measure voltage at instrument cluster terminal 1I. Is voltage 0 V ? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)
4	Open rear door on passenger's side. (Door switch on.)	ON	Close rear door on passenger's side, then go to next step.
		OFF	Measure voltage at instrument cluster terminal 1I. Is voltage 0 V ? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Door switch — Wiring harness (Instrument cluster—door switch)

WARNING AND INDICATOR SYSTEM

STEP	INSPECTION	INDICATION	ACTION
5	Close all doors. (Door switch off.)	0 0	Measure voltage at instrument cluster terminals 1I and 1J. Is voltage B+ ? - If as specified, replace instrument cluster. - If not as specified, inspect following parts. - Door switch - Wiring harness (Instrument cluster—door switch)
		0 F F	Input signals to instrument cluster are okay.

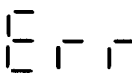
DTC 08	TNS relay on/off signal
INSTRUMENT CLUSTER CONNECTOR 	

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Turn headlight switch to TNS position. (TNS relay on.)	0 0	Go to next step.
		0 F F	Measure voltage at instrument cluster terminal 2K. Is voltage B+ ? - If as specified, replace instrument cluster. - If not as specified, inspect following parts. - TNS relay - Wiring harness (Battery—TNS relay—instrument cluster)
2	Turn headlight switch off. (TNS relay off.)	0 0	Measure voltage at instrument cluster terminal 2K. Is voltage 0 V ? - If as specified, replace instrument cluster. - If not as specified, inspect following parts. - TNS relay - Wiring harness (TNS relay—instrument cluster)
		0 F F	Input signal to instrument cluster is okay.

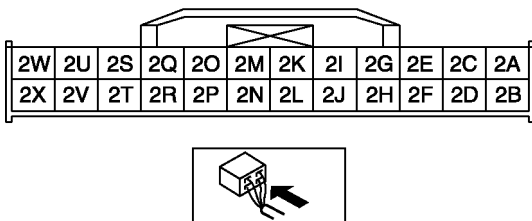
DTC 12	Operation signal to speedometer		
INSPECTION	INDICATION	SITUATION	ACTION
Wait for 2 seconds after selecting DTC 12.		Speedometer needle moves full scale then returns to 60 km/h or 60 MPH.	Speedometer is okay.
		Other than stated above.	Replace instrument cluster.
			

WARNING AND INDICATOR SYSTEM

DTC 13 Operation signal to tachometer				
INSPECTION		INDICATION	SITUATION	ACTION
Wait for 2 seconds after selecting DTC 13.			Tachometer needle moves full scale then returns to 3000 rpm .	Tachometer is okay.
			Other than stated above.	Replace instrument cluster.

DTC 14 Operation signal to buzzer				
INSPECTION		INDICATION	SITUATION	ACTION
Wait for 2 seconds after selecting DTC 14.		 (Fixed)	Buzzer continuously sounds.	Buzzer is okay.
			Buzzer does not continuously sound.	Replace instrument cluster.

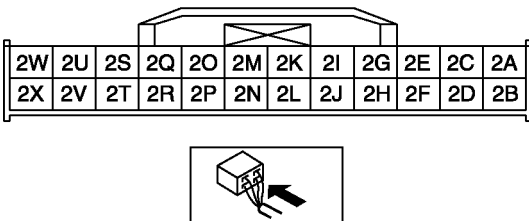
DTC 16 Operation signal to fuel-level warning light				
INSPECTION		INDICATION	SITUATION	ACTION
Wait for 2 seconds after selecting DTC 16.		 (Turns on and off)	Fuel-level warning light turns on and off three times .	Fuel-level warning light is okay.
			Other than stated above.	Replace instrument cluster.

DTC 18 Ignition key illumination on/off signal				
INSTRUMENT CLUSTER CONNECTOR 				

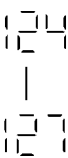
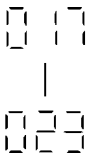
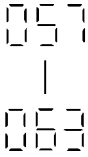
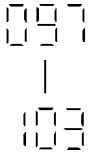
Diagnostic procedure

INSPECTION		INDICATION	SITUATION	ACTION
Wait for 2 seconds after selecting DTC 18.		 (Turns on and off)	Ignition key illumination turns on and off three times .	Ignition key illumination is okay.
			Other than stated above.	Measure voltage at instrument cluster terminal 2C. Is voltage B+ ? • If as specified, replace instrument cluster. • If not as specified, inspect following parts. — Ignition key illumination — Wiring harness (Battery—ignition key illumination—instrument cluster)

WARNING AND INDICATOR SYSTEM

DTC 22	Fuel level signal
INSTRUMENT CLUSTER CONNECTOR 	

Diagnostic procedure

STEP	INSPECTION	INDICATION	ACTION
1	Select DTC 22 with fuel gauge sender unit connector disconnected.		Go to next step.
		Other than stated above.	Replace instrument cluster.
2	Connect between instrument cluster terminals 2D and 2M.		Go to next step.
		Other than stated above.	Replace instrument cluster.
3	Using SST (Fuel and thermometer checker) or resistor, input 20 ohms to between instrument cluster terminals 2D and 2M.		Go to next step.
		Other than stated above.	Replace instrument cluster.
4	Using SST (Fuel and thermometer checker) or resistor, input 60 ohms to between instrument cluster terminals 2D and 2M.		Go to next step.
		Other than stated above.	Replace instrument cluster.
5	Using SST (Fuel and thermometer checker) or resistor, input 100 ohms to between instrument cluster terminals 2D and 2M.		Inspect fuel gauge sender unit.
		Other than stated above.	Replace instrument cluster.

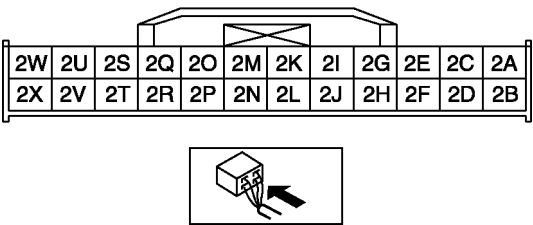
T

WARNING AND INDICATOR SYSTEM

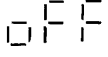
DTC 23 Operation signal to fuel gauge			
INSPECTION	INDICATION	SITUATION	ACTION
Wait for 2 seconds after selecting DTC 23.		Fuel gauge indicates in following order for every 2 seconds . • F→1/2→E→F (fixed)	Fuel gauge is okay.
		Other than stated above.	Replace instrument cluster.
		Replace instrument cluster.	

DTC 25 Operation signal to water temperature gauge			
INSPECTION	INDICATION	SITUATION	ACTION
Wait for 2 seconds after selecting DTC 25.		Water temperature gauge indicates in following order for every 2 seconds . • H→Center→C→H (fixed)	Water temperature gauge is okay.
		Other than stated above.	Replace instrument cluster.
		Replace instrument cluster.	

DTC 26 LCD indication			
INSPECTION	INDICATION	SITUATION	ACTION
Select DTC 26.		Indication is normal.	LCD is okay.
		Other than stated above.	Replace instrument cluster.

DTC 31 Key reminder on/off signal			
INSTRUMENT CLUSTER CONNECTOR 			

Diagnostic procedure

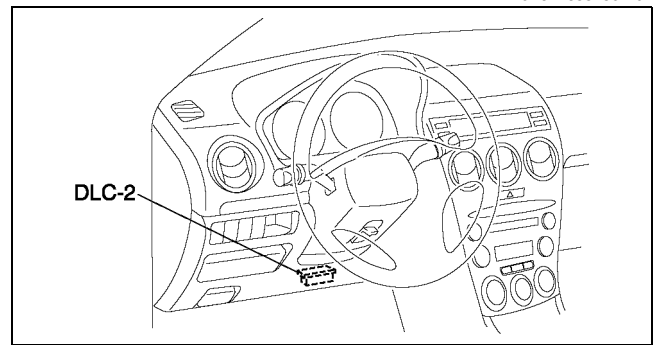
STEP	INSPECTION	INDICATION	ACTION
1	Remove key from steering lock and then insert key into steering lock after selecting DTC 31. (Key reminder switch on.)		Go to next step.
			Measure voltage at instrument cluster terminal 2B. Is voltage B+ ? • If as specified, replace instrument cluster. • If not as specified, replace following parts. — Key reminder switch — Wiring harness (Battery—key reminder switch—instrument cluster)

WARNING AND INDICATOR SYSTEM

STEP	INSPECTION	INDICATION	ACTION
2	Remove key from steering lock (Key reminder switch off.)	ON	Measure voltage at instrument cluster terminal 2B. Is voltage 0 V ? - If as specified, replace instrument cluster. - If not as specified, inspect following parts. — Key reminder switch — Wiring harness (Key reminder switch— instrument cluster)
		OFF	Input signal to instrument cluster is okay.

PID/DATA MONITOR AND RECORD PROCEDURE

1. Connect **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Access and monitor PIDs using **SST** (WDS or equivalent).



A6E811855430W07

A6E3970W002

Monitor Item Table

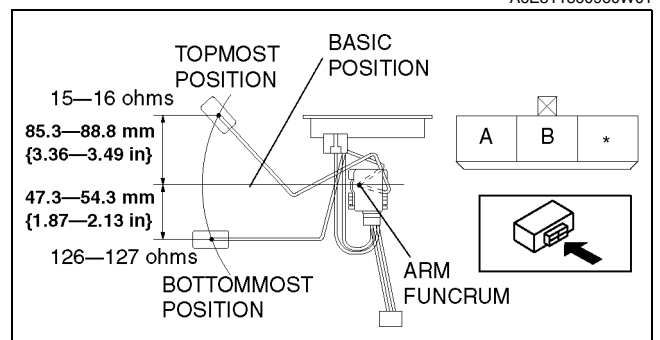
- The PID/DATA monitoring items for the instrument cluster is as shown in the table below.

PID item	Definition	Unit/Condition		Terminal
CCNT_HE	Continuous codes	Number of continuous codes		—
ECT_GAUGE	Temperature gauge	°C	°F	2W, 2X
FUEL	Fuel flow	l/min		2M
ODOMETR	Total distance	km	mile	2W, 2X
SPEEDSG	Speedometer	km/h	mile/h	
RPM	Tachometer	rpm		

—: Not applicable

FUEL GAUGE SENDER UNIT INSPECTION

1. Move the float to the topmost and bottommost positions, and verify that the resistance between terminals A and B of the unit and the position of the float are as indicated in the figure.
 - If they are not as indicated, replace the fuel gauge sender unit.



A6E811860960W01

A6E8118W002

WARNING AND INDICATOR SYSTEM

OIL PRESSURE SWITCH INSPECTION

A6E811818500W01

1. Verify that the oil pressure warning light illuminates when the ignition switch is at ON position.
2. Verify that the oil pressure warning light goes off when the engine is started.
 - If the oil pressure warning light does not illuminate or remains illuminated, inspect the related wiring harness.
 - If the related wiring harness are normal, inspect the oil pressure. (See [D-3 OIL PRESSURE INSPECTION.](#))
 - If the oil pressure is normal, replace the oil pressure switch.

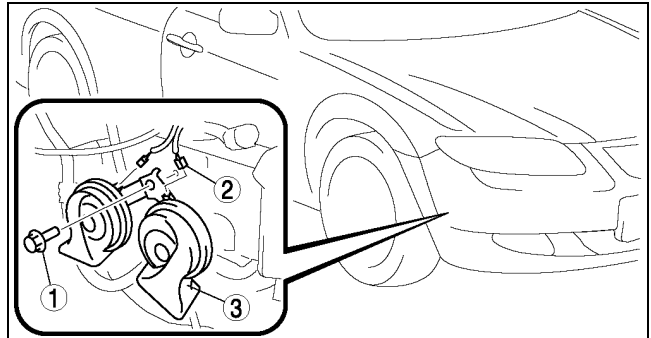
HORN REMOVAL/INSTALLATION

A6E811866790W01

1. Disconnect the negative battery cable.
2. Bend the mud guard.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Horn

4. Install in the reverse order of removal.



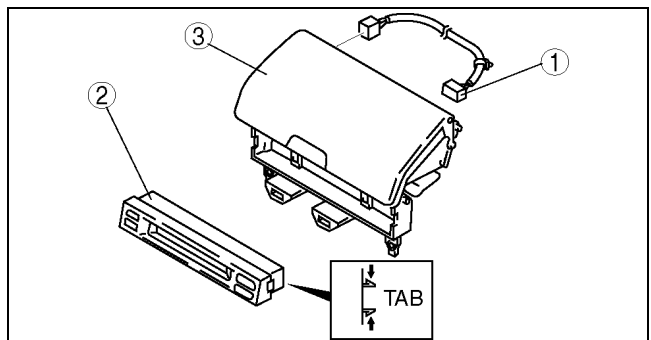
A6E8118W001

INFORMATION DISPLAY REMOVAL/INSTALLATION

A6E811855000W01

1. Disconnect the negative battery cable.
2. Remove the center panel module. (See [T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION.](#))
3. Remove the LCD unit. (with car-navigation system) (See [T-98 LCD UNIT REMOVAL/INSTALLATION.](#))
4. Remove the center box. (without car-navigation system)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.

1	Short harness
2	Information display (See T-84 Information Display Removal Note)
3	LCD unit (with car-navigation system) Center box (without car-navigation system)



A6E8118W008

Information Display Removal Note

1. Squeeze the tabs of information display and pull it forward to it.

THEFT-DETERRENT SYSTEM

THEFT-DETERRENT SYSTEM

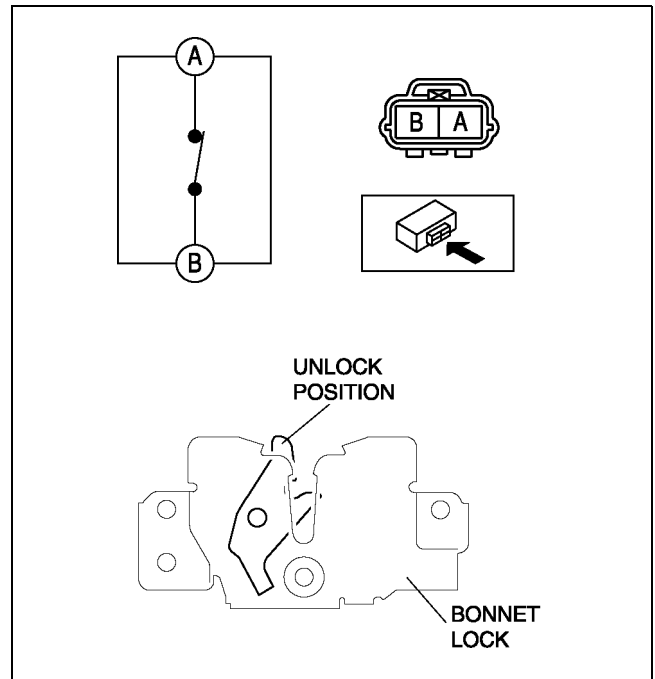
BONNET SWITCH INSPECTION

A6E812001084W01

Note

- Bonnet switch has a built-in bonnet lock.

1. Open the bonnet.
2. Disconnect the negative battery cable.
3. Remove the radiator grille.
4. Disconnect the bonnet switch connector.
5. Check the continuity between the bonnet switch terminals A and B using an ohmmeter.
 - If there is continuity, replace the bonnet switch.

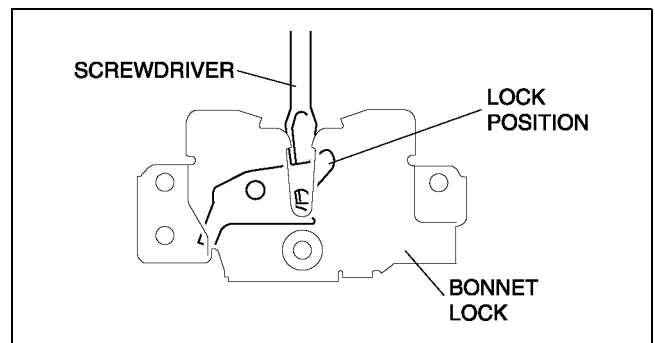


A6E8120W002

6. Lock the bonnet lock using a flat-head screwdriver or equivalent as shown.
7. Check the no continuity between the bonnet switch terminals A and B using an ohmmeter.
 - If there is no continuity, replace the bonnet switch.

Caution

- After the inspection, unlock the bonnet lock. If closing the bonnet with the bonnet lock locked, the bonnet lock and/or bonnet striker may be broken.



A6E8120W003

THEFT-DETERRENT SYSTEM

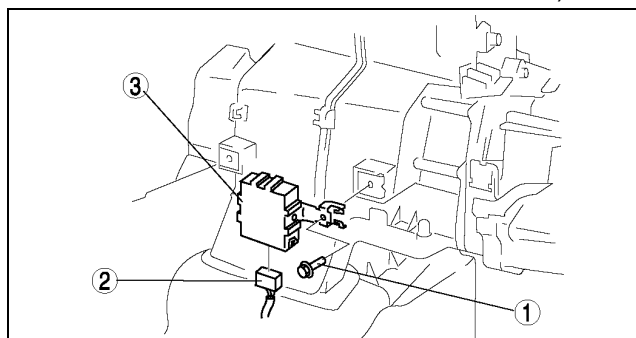
THEFT-DETERRENT CONTROL MODULE REMOVAL/INSTALLATION

A6E812067790W01

1. Disconnect the negative battery cable.
2. Remove the center panel module. (See [T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION](#).)
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Theft-deterrent control module

4. Install in the reverse order of removal.



A6E8120W001

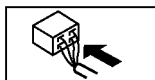
THEFT-DETERRENT CONTROL MODULE INSPECTION

A6E812067790W02

1. Remove the theft-deterrent control module without disconnecting the connectors.
2. Measure the voltage at the theft-deterrent control module terminals as indicated below.
3. Disconnect the theft-deterrent control module connector before inspecting for continuity at terminals L, Q, S, T, and V.
4. If not as specified, inspect the parts listed under "Action."
 - If the parts and wiring harnesses are okay but the system still does not work properly, replace the theft-deterrent control module.

Terminal Voltage Table (Reference)

THEFT-DETERRENT CONTROL MODULE CONNECTOR													
W	U	S	Q	O	M	K	I	G	E	C	A		
X	V	T	R	P	N	L	J	H	F	D	B		



A6E8120W004

Terminal	Signal	Connected to	Test condition	Voltage (V)/continuity	Action
A	—	—	—	—	—
B	IG1	METER IG 15 A fuse	Ignition switch at ON position	B+	• Inspect ignition switch (See T-20 IGNITION SWITCH INSPECTION) • Inspect METER IG 15 A fuse • Inspect related harness
			Ignition switch at LOCK or ACC position	Below 1.0	
C	Power supply	ROOM 15 A fuse	Under any condition	B+	• Inspect ROOM 15 A fuse • Inspect related harness
D	—	—	—	—	—
E	—	—	—	—	—
F	Intruder sensor power supply	Intruder sensor	Theft-deterrent system pre-arming or arming	B+	• Inspect related harness
			Other	Below 1.0	
G	Security light on/off	Security light	Security light on	Below 2.0	• Inspect security light • Inspect related harness
			Security light off	B+	
H	Hazard warning signal output	Flasher unit	Theft-deterrent system alarm: Active	Alternates between below 1.0 and B+	• Inspect flasher unit (See T-44 FLASHER UNIT INSPECTION) • Inspect related harness
			Theft-deterrent system alarm: Other	B+	

THEFT-DETERRENT SYSTEM

Terminal	Signal	Connected to	Test condition	Voltage (V)/continuity	Action
I	Theft-deterrent siren on/off	Theft-deterrent siren	Theft-deterrent system alarm: Active	Alternates between below 1.0 and B+	Inspect related harness
			Theft-deterrent system alarm: Other	B+	
J	- Theft-deterrent system recognition signal output - Keyless entry system operation signal input	Door lock timer unit	Under any condition	B+	- Inspect door lock timer unit (See S-34 DOOR LOCK TIMER UNIT INSPECTION) - Inspect related harness
K	Horn on/off	Horn relay	Theft-deterrent system alarm: Other	B+	- Inspect horn relay (See T-24 RELAY INSPECTION) - Inspect related harness
			Theft-deterrent system alarm: Active	Alternates between below 1.0 and B+	
L	Theft-deterrent control module ground	GND	Under any condition: inspect for continuity to ground	Yes	Inspect GND
M	Key reminder switch on/off	Key reminder switch	Key reminder switch on (key inserted)	B+	- Inspect key reminder switch (See T-21 KEY REMINDER SWITCH INSPECTION) - Inspect related harness
			Key reminder switch off (key removed)	Below 1.0	
N	—	—	—	—	—
O	Intruder sensor on/off	Intruder sensor	Theft-deterrent system pre-arming or arming	Alternates between below 1.0 and B+	Inspect related harness
P	—	—	—	—	—
Q	Bonnet open/closed	Bonnet switch	Bonnet switch on: inspect for continuity to ground	Yes	- Inspect bonnet switch (See T-85 BONNET SWITCH INSPECTION) - Inspect related harness
			Bonnet switch off: inspect for continuity to ground	No	
R	Trunk compartment light switch/cargo compartment light switch on/off	- Trunk compartment light switch - Cargo compartment light switch	Trunk compartment light switch/cargo compartment light switch on	Below 1.0	- Inspect trunk compartment light switch (See T-51 TRUNK COMPARTMENT LIGHT SWITCH INSPECTION) - Inspect cargo compartment light switch (See T-50 CARGO COMPARTMENT LIGHT SWITCH INSPECTION) - Inspect related harness
			Trunk compartment light switch/cargo compartment light switch off	B+	
S	Door open/closed	Door switch	Any door open: inspect for continuity to ground	Yes	- Inspect door switch (See T-52 DOOR SWITCH INSPECTION) - Inspect related harness
			All doors closed: inspect for continuity to ground	No	

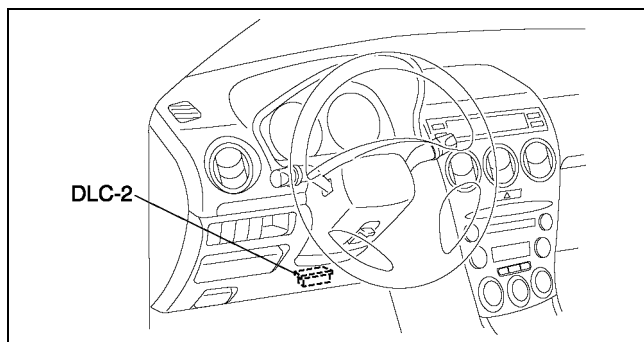
T

THEFT-DETERRENT SYSTEM

Terminal	Signal	Connected to	Test condition	Voltage (V)/continuity	Action
T	Lock/unlock	- Passenger's door lock-link switch - Rear door lock-link switch	Passenger's and rear door lock-link switch locked: inspect for continuity to ground	No	- Inspect passenger's or rear door lock-link switch (See S-30 FRONT DOOR LOCK ACTUATOR INSPECTION) (See S-32 REAR DOOR LOCK ACTUATOR INSPECTION) - Inspect related harness
			Passenger's or any rear door lock-link switch unlocked: inspect for continuity to ground	Yes	
U	—	—	—	—	—
V	Lock/unlock	Driver's door lock-link switch	Driver's door lock-link switch locked: inspect for continuity to ground	No	- Inspect driver's door lock-link switch (See S-30 FRONT DOOR LOCK ACTUATOR INSPECTION) - Inspect related harness
			Driver's door lock-link switch unlocked: inspect for continuity to ground	Yes	
W	Engine speed	- ABS (ABS/TCS) HU/CM (with ABS (ABS/TCS)) - DSC HU/CM (with DSC)	(See T-88 W Terminal Inspection)	—	- Inspect ABS (ABS/TCS) HU/CM (See P-29 ABS (ABS/TCS) HU/CM INSPECTION) - Inspect DSC HU/CM (See P-40 DSC HU/CM INSPECTION) - Inspect related harness
X	—	—	—	—	—

W Terminal Inspection

1. Connect **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Access and monitor RPM of PID using **SST** (WDS or equivalent).
 - If engine speed signal normal, go to next step.
 - If engine speed signal abnormal, inspect the ABS (ABS/TCS) HU/CM, DSC HU/CM and related wiring harness.
3. Inspect for continuity between the ABS (ABS/TCS) HU/CM terminal X and the theft-deterrent control module terminal W, or DSC HU/CM terminal AB and the theft-deterrent control module terminal W using an ohmmeter.
 - If not continuity, replace the related wiring harness.
 - If wiring harness is normal, replace the theft-deterrent control.



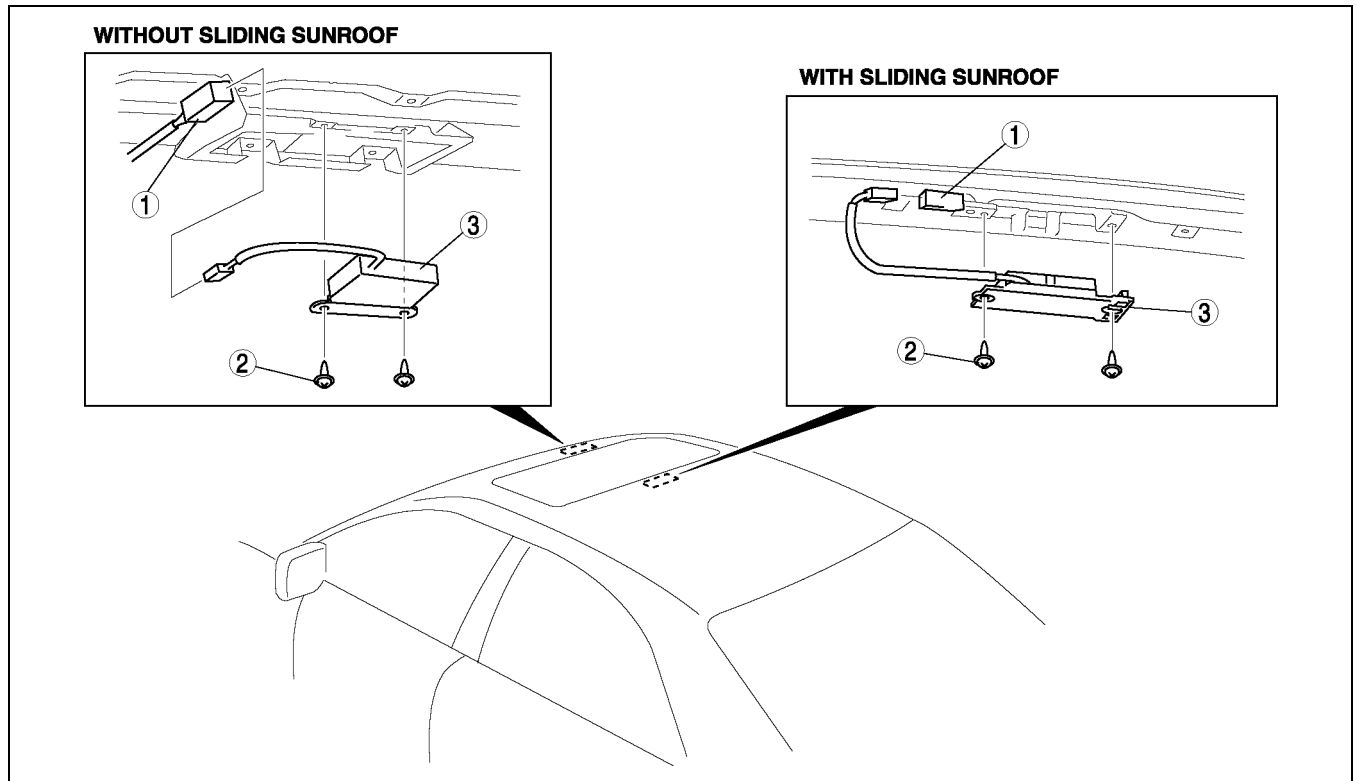
A6E3970W002

THEFT-DETERRENT SYSTEM

INTRUDER SENSOR REMOVAL/INSTALLATION

A6E812000172W01

1. Disconnect the negative battery cable.
2. Remove the headliner.
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



A6E8120W005

1	Connector
2	Screw

3	Intruder sensor

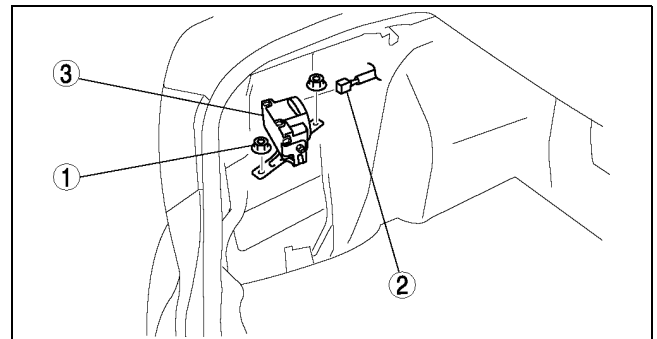
THEFT-DETERRENT SIREN REMOVAL/INSTALLATION

A6E812000173W01

1. Disconnect the negative battery cable.
2. Remove the left side trunk side trim.
3. Remove in the order indicated in the table.

1	Nut
2	Connector
3	theft-deterrent siren

4. Install in the reverse order of removal.



A6E8120W006

IMMOBILIZER SYSTEM

IMMOBILIZER SYSTEM

COIL REMOVAL/INSTALLATION

A6E812267004W01

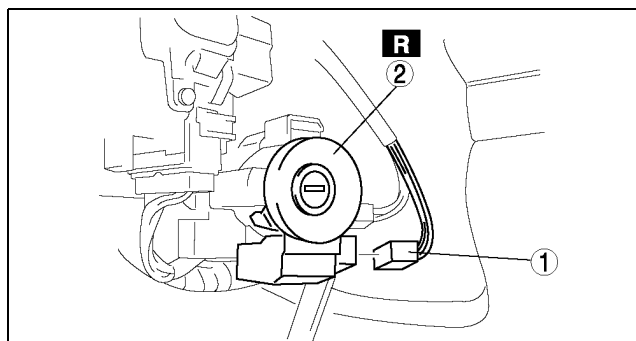
Note

- Do not remove the coil unless you are replacing it.
- When only the coil is replaced, the immobilizer system reprogram procedure is not necessary.

1. Disconnect the negative battery cable.
2. Remove the column cover.
3. Remove in the order indicated in the table.

1	Connector
2	Coil

4. Install in the reverse order of removal.



A6E8122W001

IMMOBILIZER SYSTEM REPROGRAM PROCEDURE

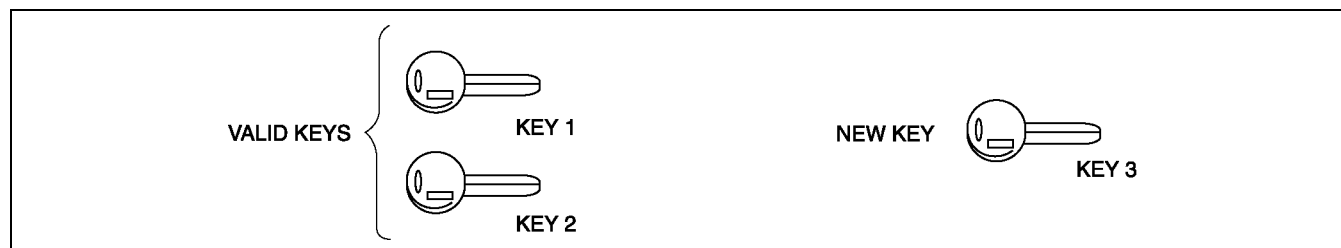
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Note

- When an error occurs during the reprogram procedures, except when the PCM is replaced, repeat the procedure from Step 1. If you still cannot reprogram, confirm how many keys can start the engine. Then, perform the key replacement or addition reprogram procedure according to the valid key number.
- To make a copy of the key or replace the immobilizer system component parts (the key(s), and/or PCM), the customer should bring all keys to the dealer. This is because the previously programmed key IDs are erased when reprogramming the key IDs into the PCM.
- The PCM cannot be changed from one car to another. If an PCM is replaced with one from another car, the engine will not start.
- The PCM should not be newly replaced as a trial during troubleshooting. If this is done, the ID and code word will be programmed into the new unit and it cannot be used for other cars even if you find that the old unit was normal.
- The immobilizer system cannot be deactivated.
- Confirm that all keys registered can start the engine after the reprogram procedure. When confirming, wait for **more than 5 seconds** before inserting the next key.
- When the customer does not need to register more than two keys, the following procedures can be stopped after registering two keys.

Key Replacement or Addition

When the customer has two or more valid keys



A6E8122W003

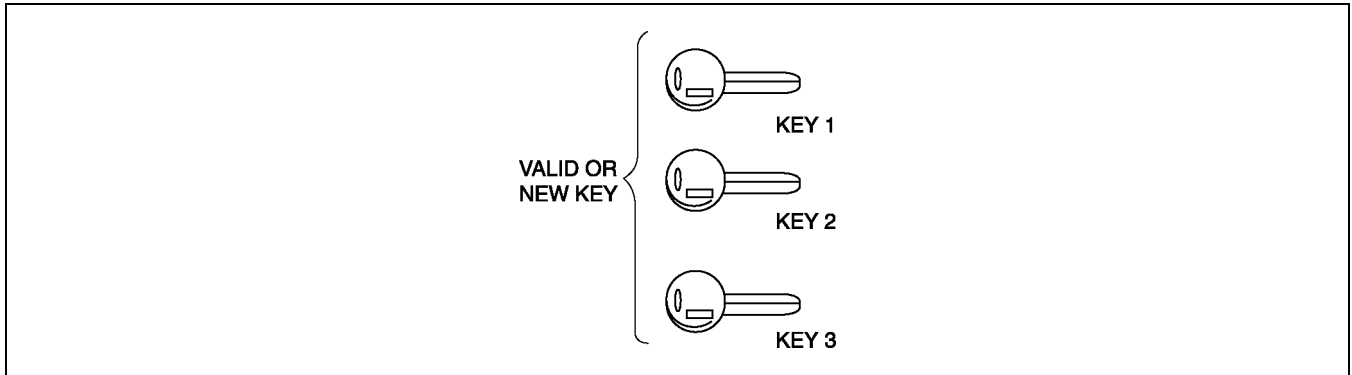
Note

- If no specific time interval is given, each step should be performed **within 30 seconds** of the previous step.

IMMOBILIZER SYSTEM

1. Cut new transponder-equipped key(s).
2. Using key 1, turn ignition switch to ON position.
 - (1) Observe illumination of security light in instrument cluster.
 - (2) After the security light turns off, turn key 1 to LOCK position **within 2 seconds** and remove it from the steering lock.
3. Repeat Step 2 with key 2.
4. Repeat Step 2 with key 3.
5. If there are 4—8 keys (valid and/or new keys), repeat Step 2.

When the customer has only one or no valid key



A6E8122W002

1. Cut new transponder equipped key(s) if necessary.
2. Connect the **SST** (WDS or equivalent).
3. Using key 1, turn ignition switch to ON position.
 - Valid key: The security light illuminates, then turns off after **approx. 3 seconds**.
 - New key: The security light illuminates. After **approx. 1 minute** DTC B1601 (DTC 15) is output
- (1) Perform security access approval. (See [T-92 Security Access Procedure](#).)
- (2) Select "Ignition Key Code Erase".

Note

- Do not select any other command from this menu.

- (3) Turn key 1 to LOCK position for **more than 1 second**.
- (4) Turn key 1 to ON position for **more than 1 second**. (After **approx. 1 minute** DTC B1213 (DTC 21) is output.)
- (5) Verify the security light is illuminated, then turn key 1 to LOCK position.
- (6) Remove key 1 from steering lock.
4. Using key 2, turn ignition switch to ON position for **more than 1 second**. Observe that security light illuminates (for **approx. 3 seconds**).
 - (1) Verify the security light is illuminated, then turn key 2 to LOCK position and remove from steering lock.
5. Repeat Step 4 with key 3.
6. If there are 4—8 keys (valid and/or new keys), repeat Step 5.
7. After reprogramming, clear DTCs of PCM with **SST** (WDS or equivalent).

PCM Replacement

- After PCM replacement, refer to the procedure for "When the customer has only one or no valid key", and perform registration. (See [T-91 When the customer has only one or no valid key](#).)

T

IMMOBILIZER SYSTEM

Enabling/Disabling Key Reprogramming Without Using SST (WDS or Equivalent)

Note

- With this function, the need for use of the **SST** (WDS or equivalent) to perform key registration when following the "When the customer has two or more valid keys" procedure can be optionally inhibited or prohibited. This function is provided to prohibit drivers from performing the reprogram procedure on vehicles owned by rental car companies or other large vehicle fleet owners.

1. Connect the **SST** (WDS or equivalent).
2. Using valid or new key, turn ignition switch to ON position.
3. Perform security access approval. (See [T-92 Security Access Procedure](#).)
4. Select "Customer Spare Key Programming Enable/Disable".
 - Enable: Key registration can be performed without using the **SST** (WDS or equivalent).
 - Disable: Key registration can only be performed using the **SST** (WDS or equivalent).

Note

- At the time of new vehicle delivery, the function is set on "Enable".

Security Access Procedure

Note

- When using a **SST** (WDS or equivalent) or equivalent to perform "Ignition Key Code Erase" or "Customer Spare Key Programming Enable/Disable", it is necessary to obtain security access approval.

1. Connect the **SST** (WDS or equivalent).
2. Select "Tool box", "Body", "Security", and then "PATS Functions" (in this order).
3. The **SST** (WDS or equivalent). will read out an outcode depending on the designated procedure.
4. Access the Mazda official website to obtain the incode that corresponds to the outcode. Refer to Service Information Ref. No. A001/02 for details of this procedure.
5. Input the incode to the **SST** (WDS or equivalent).

AUDIO AND NAVIGATION SYSTEM

AUDIO AND NAVIGATION SYSTEM

ANTI-THEFT SYSTEM

A6E81246900W01

Alarm Conditions

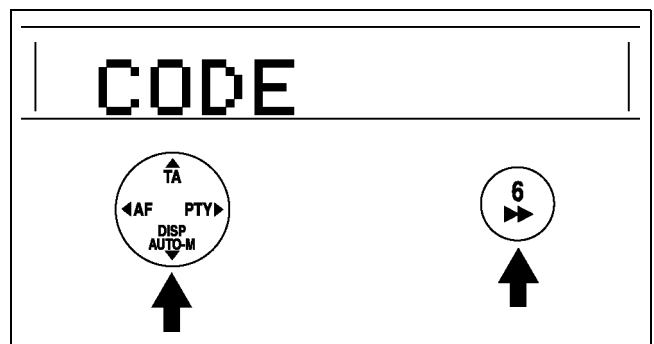
- If the anti-theft system protection has been activated, any one of the following conditions will trigger the system:
 - Disconnected battery cable
 - Discharged battery
 - Disconnected audio unit connectors
- If the system is triggered, the audio unit will then be inoperative when it is reconnected to a power source, and “code” will flash on the display until the preselected code number is input. If the anti-theft system is triggered, follow the procedures in “Canceling Anti-theft Operation” to reset the unit.

Operation	Reference
Input code number to activate anti-theft system	Setting the Code Number
Delete previous code number and set new number	Canceling the Code Number
Resume audio unit operation after anti-theft system is triggered	Canceling Anti-theft Operation

Setting the Code Number

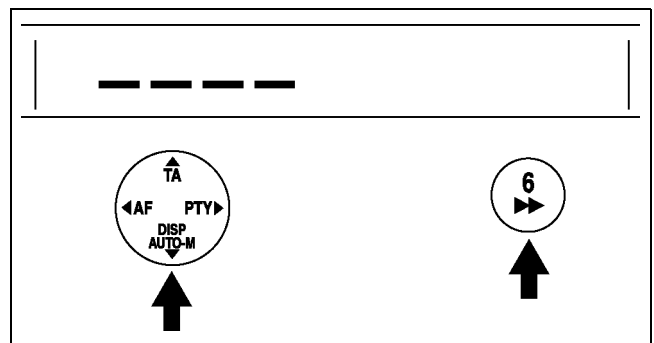
Complete each step (Steps 1–3) **within 10 seconds** or the setting procedure will be canceled.

1. Turn the ignition switch to ACC position and then turn off the audio unit.
2. First press the AUTO-M button, then simultaneously press channel button 6 for **approximately 2 seconds** until “CODE” appears on the display.



A6E8124W025

3. Press the AUTO-M button again, then simultaneously press channel button 6 until bars appear on the display.
4. Select a personal code number and record it before inputting it. If the number is input and then forgotten, it cannot be canceled, and if the unit is disconnected again, the audio unit will be inoperative.

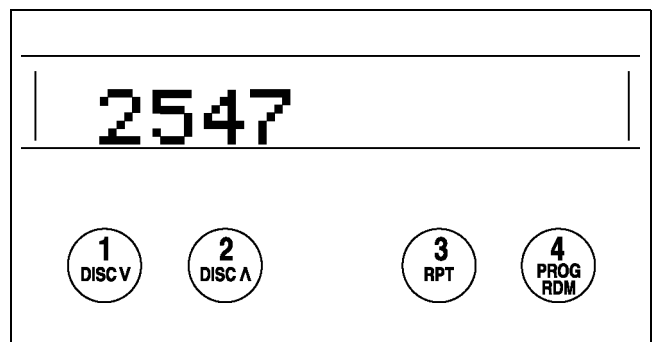


A6E8124W026

5. Use channel buttons 1–4 to input the selected code number. Press button 1 for the first digit, 2 for the second, 3 for the third, and 4 for the last digit. Input the number **within 10 seconds**. If the display is deleted, repeat the procedure from Step 1.

Note

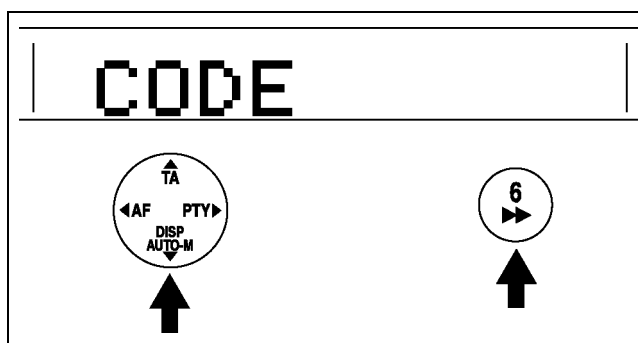
- Perform Step 6 **within 10 seconds** after Step 5.



A6E8124W027

AUDIO AND NAVIGATION SYSTEM

6. With the code number displayed, press the AUTO-M button, then simultaneously press channel button 6 for **approximately 2 seconds**. "CODE" will be displayed for **approximately 5 seconds**. After it disappears, the code number is set.
7. If "Err" (error) appears on the display, repeat the procedure from Step 1. If input error is repeated three times, turn the ignition switch to LOCK position and repeat the procedure from Step 1.

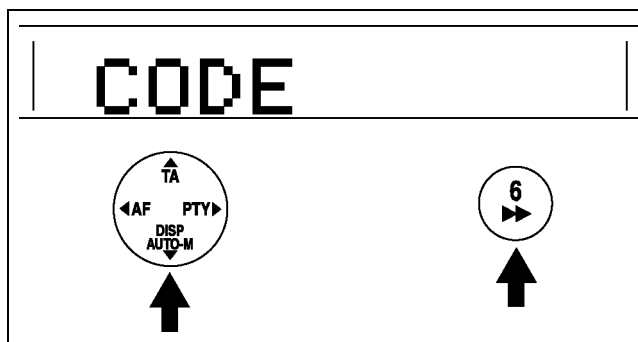


A6E8124W025

Canceling the Code Number

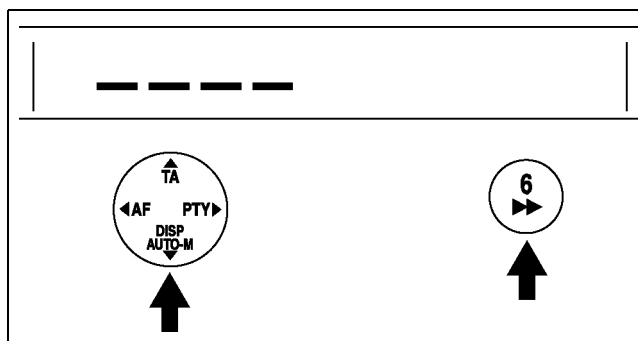
Complete each step (Steps 1–3) **within 10 seconds** or the canceling procedure will be canceled.

1. Turn the ignition switch to ACC position and then turn off the audio unit.
2. First press the AUTO-M button, then simultaneously press channel button 6 for **approximately 2 seconds** until "CODE" appears on the display.



A6E8124W025

3. Press the AUTO-M button again, then simultaneously press channel button 6 until bars appear on the display.

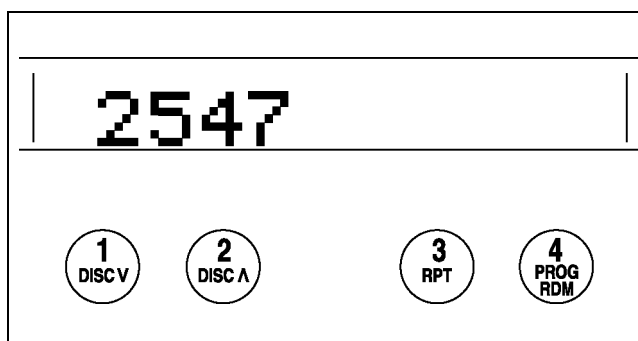


A6E8124W026

4. Use channel buttons 1–4 to input the current code number. Press button 1 for the first digit, 2 for the second, 3 for the third, and 4 for the last digit. Input the number **within 10 seconds**. If the display is deleted, repeat the procedure from Step 1.

Note

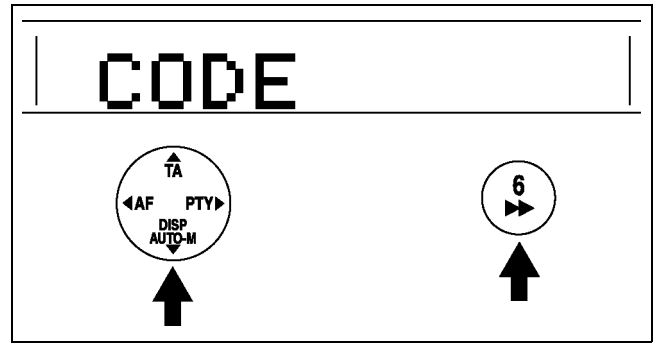
- Perform Step 5 **within 10 seconds** after Step 4.



A6E8124W027

AUDIO AND NAVIGATION SYSTEM

5. With the code number displayed, press the AUTO-M button, then simultaneously press channel button 6 for **approximately 2 seconds**. "CODE" will be displayed for **approximately 5 seconds**. After it disappears, the code number is canceled.
6. If "Err" (error) appears on the display, repeat the procedure from Step 4.



A6E8124W025

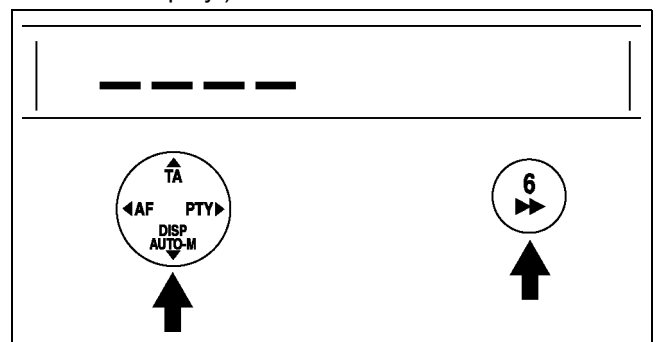
Canceling Anti-theft Operation

Properly input the selected code number to deactivate the anti-theft system and resume normal audio operation.

1. Turn the ignition switch to ACC position. ("CODE" will flash on the display.)
2. First press the AUTO-M button, then simultaneously press channel button 6 for **approximately 2 seconds** until bars appears on the display.

Note

- Perform Step 3 **within 10 seconds** after Step 2.

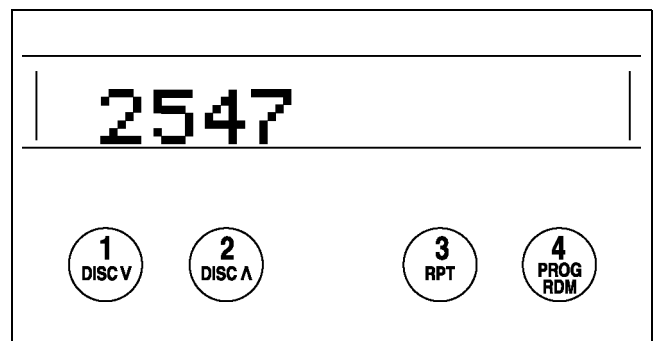


A6E8124W026

3. Use channel buttons 1–4 to input the selected code number. Press button 1 for the first digit, 2 for the second, 3 for the third, and 4 for the last digit. Input the number **within 10 seconds**. If the display is deleted, repeat the procedure from Step 1.

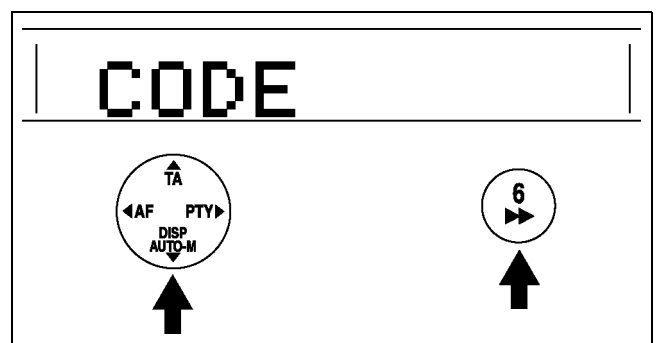
Caution

- **Three consecutive errors, including turning the ignition switch to LOCK position and disconnecting the audio unit, will activate the anti-theft system and render the audio unit completely inoperative.**



A6E8124W027

4. With the code number displayed, press the AUTO-M button, then simultaneously press channel button 6 for **approximately 2 seconds**. "CODE" will flash for **approximately 5 seconds**.
5. If "Err" (error) appears on the display, repeat the procedure from Step 1.



A6E8124W025

AUDIO AND NAVIGATION SYSTEM

CENTER PANEL MODULE REMOVAL/INSTALLATION

A6E812466900W02

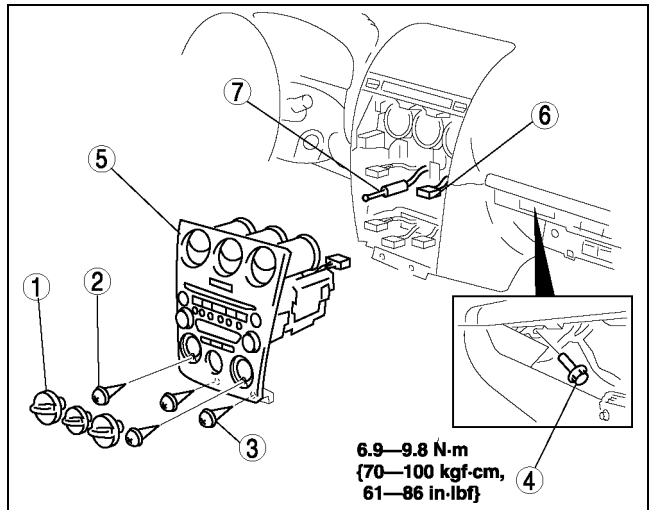
1. Cancel the anti-theft operation. (with anti-theft system) (See [T-93 ANTI-THEFT SYSTEM.](#))
2. Disconnect the negative battery cable.
3. Remove the glove compartment.
4. Remove the rear console.
5. Remove in the order indicated in the table.

1	Dial (manual A/C only)
2	Screw (manual A/C only)
3	Screw
4	Bolt
5	Center panel module (See T-96 Center Panel Module Removal Note)
6	Connector
7	Antenna feeder

6. Install in the reverse order of removal.

Caution

- Make certain that the wiring harness and antenna feeder are not caught between the unit and dashboard. If the harness or the antenna feeder is caught between the unit and dashboard, it may cause trouble or malfunctions.

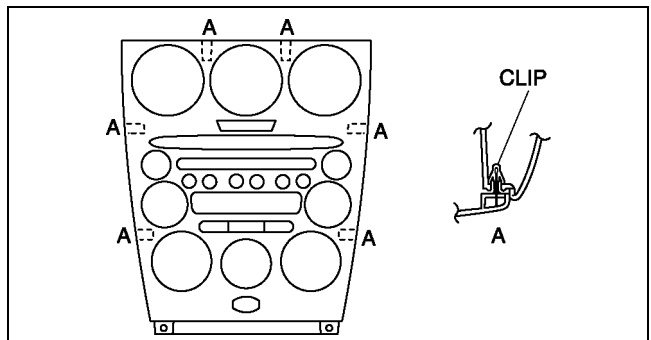


A6E8124W020

7. Operate the anti-theft system by setting the code number. (with anti-theft system) (See [T-93 ANTI-THEFT SYSTEM.](#))

Center Panel Module Removal Note

1. Pull the center panel module toward you, then disengage clip A from the dashboard, and remove the center panel module.



A6E8124W029

AUDIO AND NAVIGATION SYSTEM

CENTER PANEL MODULE DISASSEMBLY/ASSEMBLY

A6E812466900W03

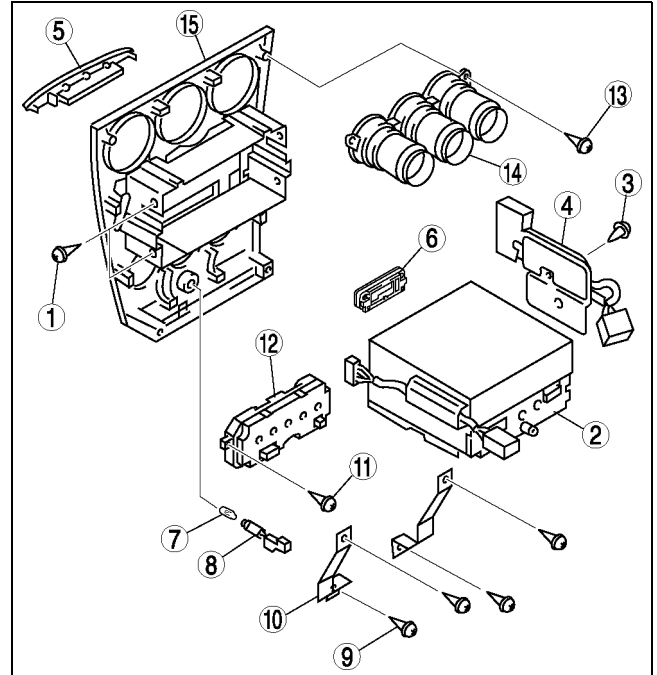
Caution

- Before disassembling the center panel module, spread a cloth on the floor to put the disassembled parts on. This protects the surface of the panel from scratches or dirt.

1. Remove the center panel module. (See [T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION.](#))
2. Remove in the order indicated in the table.

1	Screw
2	Audio unit
3	Screw
4	Circuit board (manual A/C only)
5	Cover (upper module)
6	Cover (lower module)
7	Passenger-side air bag cut indicator light bulb
8	Socket
9	Screw
10	Bracket
11	Screw
12	Climate control unit (auto A/C only)
13	Screw
14	Ventilator grille
15	Center panel

3. Install in the reverse order of removal.



A6E8124W012

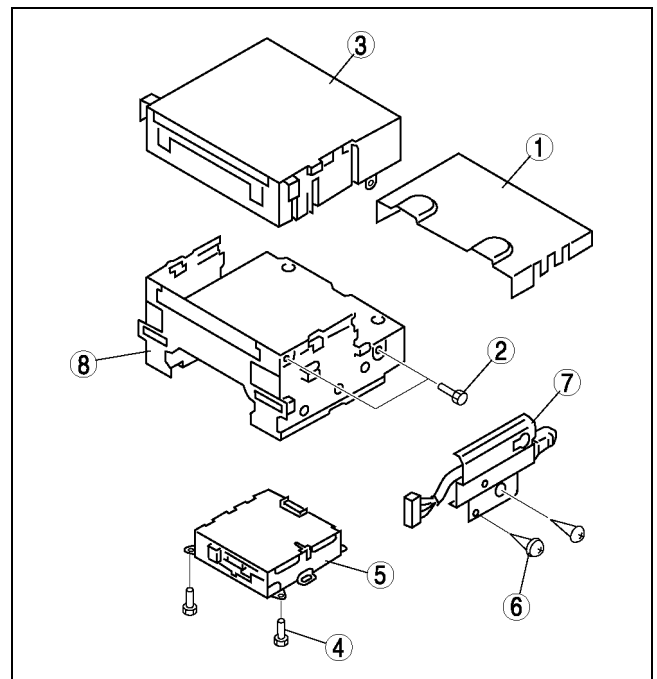
AUDIO UNIT DISASSEMBLY/ASSEMBLY

A6E812466900W04

1. Remove the audio unit. (See [T-97 CENTER PANEL MODULE DISASSEMBLY/ASSEMBLY.](#))
2. Disassemble in the order indicated in the table.

1	Cover (without upper module)
2	Screw
3	Upper module
4	Screw
5	Lower module
6	Screw
7	Wiring harness
8	Base unit

3. Assemble in the reverse order of disassembly.



A6E8124W013

AUDIO AND NAVIGATION SYSTEM

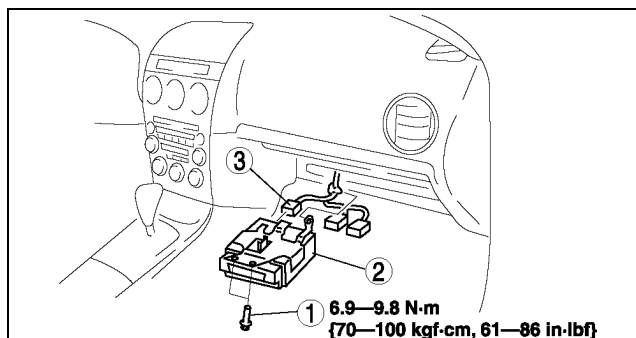
CAR-NAVIGATION UNIT REMOVAL/INSTALLATION

A6E812466902W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove in the order indicated in the table.

1	Bolt
2	Car-navigation unit (See T-98 Car-navigation Unit Installation Note)
3	Connector

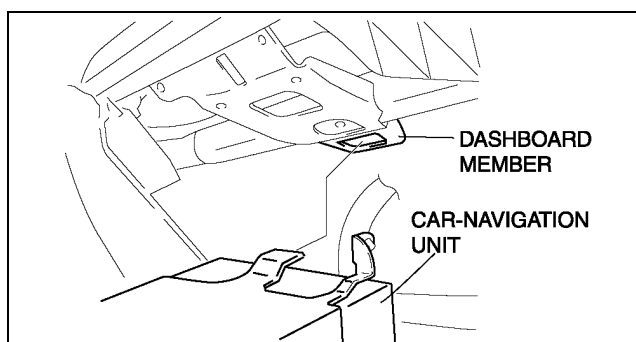
4. Install in the reverse order of removal.



A6E8124W015

Car-navigation Unit Installation Note

1. Insert the car-navigation unit bracket into the dashboard member hole, and with the car-navigation unit fixed in place install the bolt.



A6E8124W016

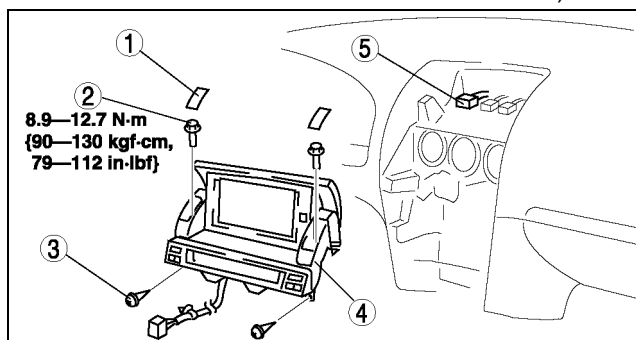
LCD UNIT REMOVAL/INSTALLATION

A6E812466902W02

1. Disconnect the negative battery cable.
2. Remove the center panel module. (See [T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION.](#))
3. Remove in the order indicated in the table.

1	Cover
2	Bolt
3	Screw
4	LCD unit (See T-98 LCD Unit Removal Note)
5	Connector

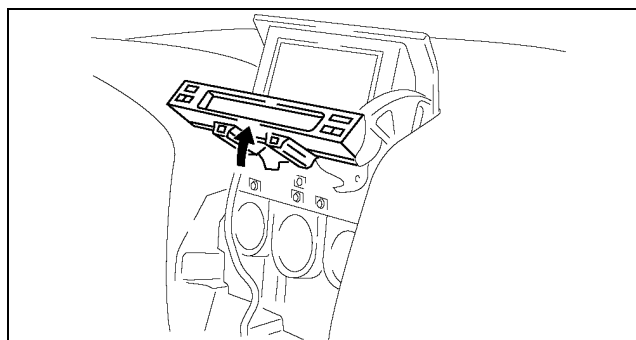
4. Install in the reverse order of removal.



A6E8124W014

LCD Unit Removal Note

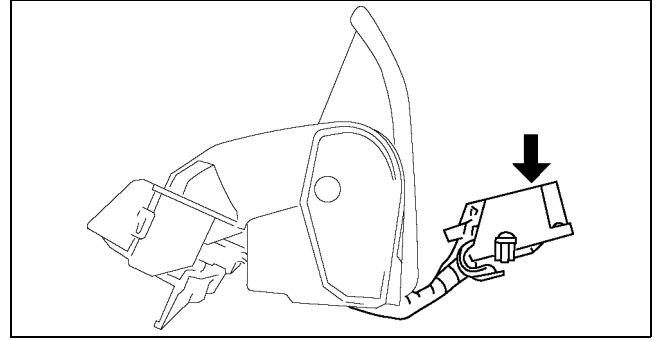
1. Pull up the front part of the LCD unit.



A6E8124W017

AUDIO AND NAVIGATION SYSTEM

- While pressing down the unit behind the LCD unit, pull the LCD unit out from the dashboard.



A6E8124W018

AUDIO CONTROL SWITCH REMOVAL/INSTALLATION

A6E812400148W01

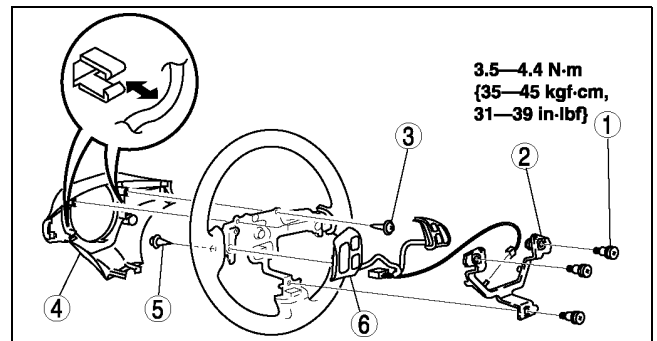
Note

- The audio control switch and the cruise control switch use a common connector.

- Disconnect the negative battery cable.
- Remove the driver-side air bag module. (See [T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)
- Remove the steering wheel.
- Remove in the order indicated in the table.

1	Bolt
2	Bracket
3	Screw
4	Cover
5	Screw
6	Audio control switch/cruise control switch

- Install in the reverse order of removal.



A6E8124W019

T

AUDIO AND NAVIGATION SYSTEM

AUDIO CONTROL SWITCH INSPECTION

A6E812400148W02

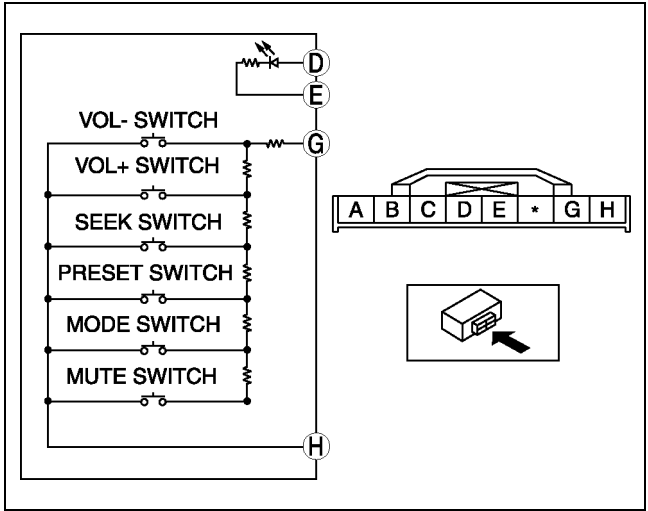
1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See [T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
3. Disconnect the audio control switch connector.
4. Measure the resistance and inspect for continuity between the cruise control switch terminals using an ohmmeter.
 - If not as specified, replace the cruise control switch.

○—○: Resistance ○—|—○: Diode

Switch position	Terminal			
	D	E	G	H
VOL- switch held at on	○— —○		○—○R ₁	
VOL+ switch held at on	○— —○		○—○R ₂	
SEEK+ switch held at on	○— —○		○—○R ₃	
PRESET switch held at on	○— —○		○—○R ₄	
MODE switch held at on	○— —○		○—○R ₅	
MUTE switch held at on	○— —○		○—○R ₆	
Neutral	○— —○		○—○R ₇	

R₁: 51—56 ohms R₂: 140—153 ohms
R₃: 287—314 ohms R₄: 535—588 ohms
R₅: 987—1086 ohms R₆: 1.94—2.13 kilohms
R₇: 4.08—5.29 kilohms

A6E8124W028



A6E8124W043

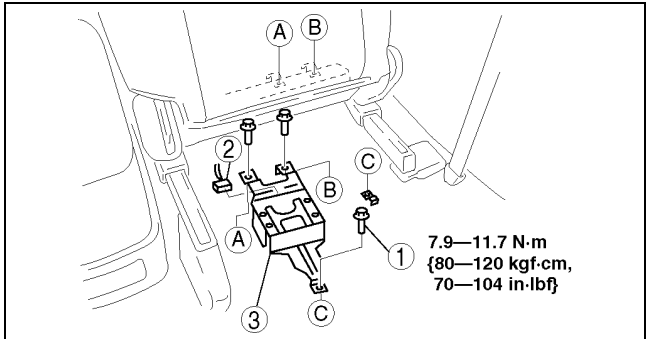
AUDIO AMPLIFIER REMOVAL/INSTALLATION

A6E812466910W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Audio amplifier

3. Install in the reverse order of removal.



A6E8124W010

AUDIO AND NAVIGATION SYSTEM

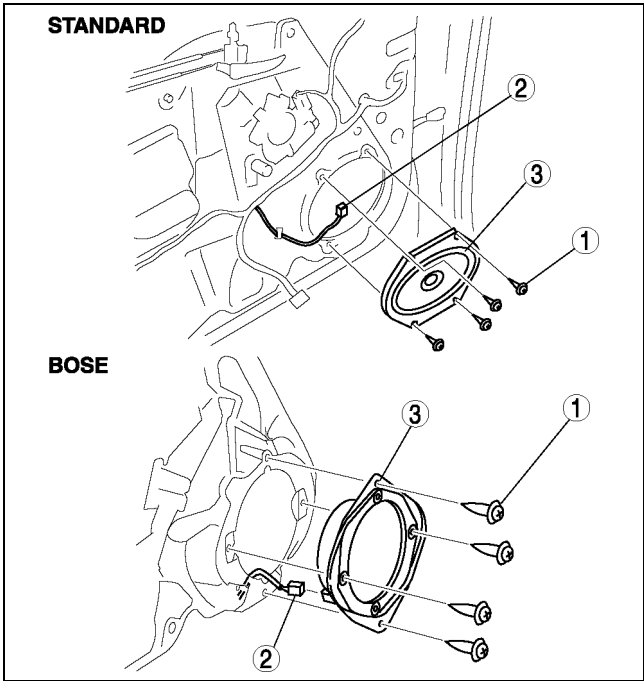
FRONT DOOR SPEAKER REMOVAL/INSTALLATION

A6E812466960W01

1. Disconnect the negative battery cable.
2. Remove the front door trim.
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Front door speaker (See T-101 Front Door Speaker Installation Note)

4. Install in the reverse order of removal.



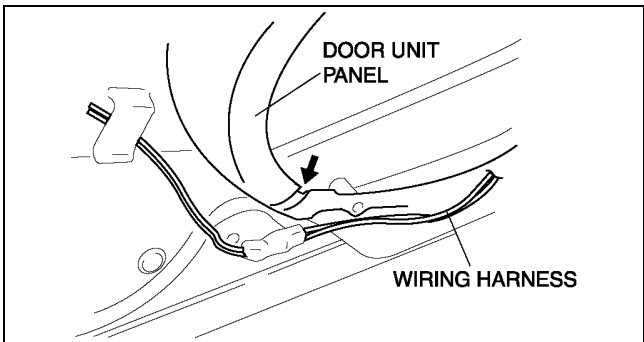
A6E8124W001

Front Door Speaker Installation Note

1. Attach the speaker with the wiring harness placed in the groove of the door unit panel.

Caution

- If the speaker is attached with the harness placed outside of the groove, the wiring harness might be broken.



A6E8124W002

FRONT DOOR SPEAKER INSPECTION

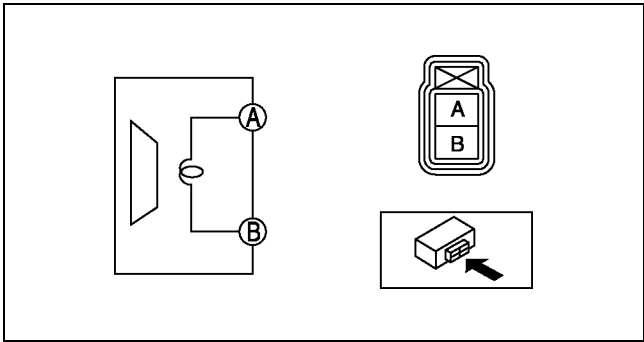
A6E812466960W02

1. Inspect for resistance between the front door speaker terminals using an ohmmeter.
 - If not as specified, replace the front door speaker.

Test condition	Terminal	
	A	B
Under any condition	○	○ R

$\text{---}\text{---}\text{---}$: Resistance
 R: 4 ohms (standard)
 2 ohms (BOSE)

A6E8124W032



A6E8124W040

2. To verify that the front door speaker outputs sound, apply voltage to the front door speaker and release using a 1.5-V battery.
 - If not outputs sound, replace the front door speaker.

AUDIO AND NAVIGATION SYSTEM

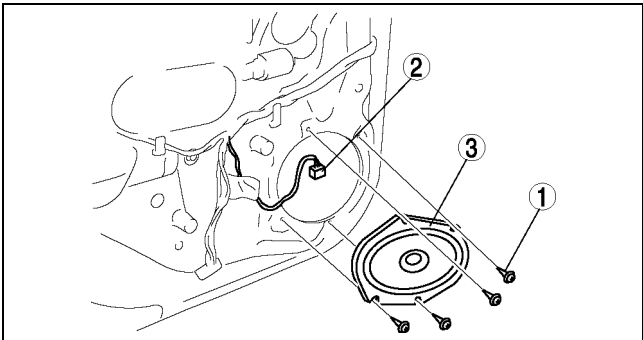
REAR DOOR SPEAKER REMOVAL/INSTALLATION

A6E812466964W01

1. Disconnect the negative battery cable.
2. Remove the rear door trim.
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Rear door speaker (See T-102 Rear Door Speaker Installation Note)

4. Install in the reverse order of removal.



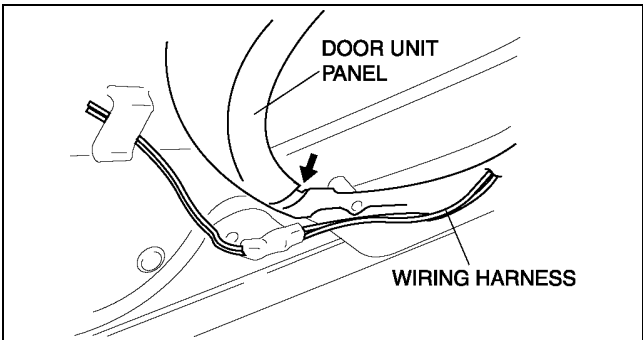
A6E8124W003

Rear Door Speaker Installation Note

1. Attach the speaker with the wiring harness placed in the groove of the door unit panel.

Caution

- If the speaker is attached with the harness placed outside of the groove, the wiring harness might be broken.



A6E8124W002

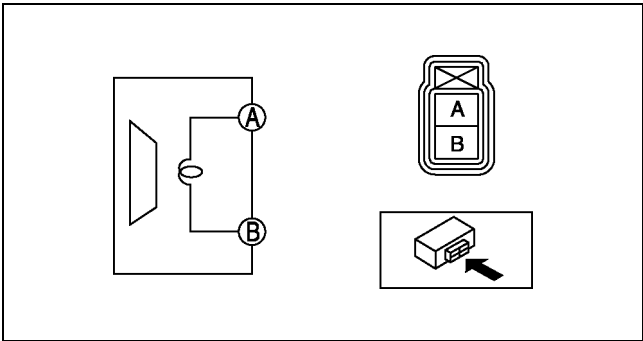
REAR DOOR SPEAKER INSPECTION

A6E812466964W02

1. Inspect for resistance between the rear door speaker terminals using an ohmmeter.
 - If not as specified, replace the rear door speaker.

Test condition	Terminal	
	A	B
Under any condition	○—○	○—○
R: 4 ohms (standard) 2 ohms (BOSE)		

○—○ : Resistance



A6E8124W040

2. To verify that the rear door speaker outputs sound, apply voltage to the rear door speaker and release using a 1.5-V battery.
 - If not outputs sound, replace the rear door speaker.

AUDIO AND NAVIGATION SYSTEM

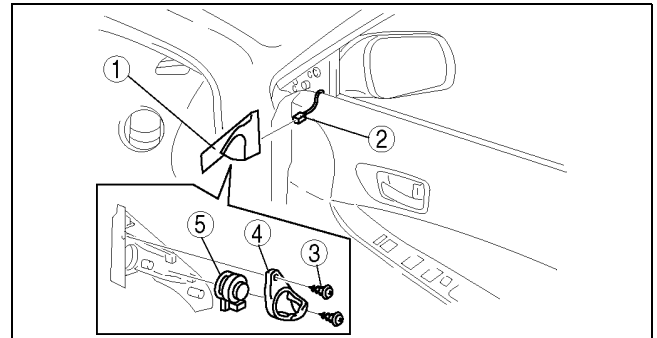
TWEETER REMOVAL/INSTALLATION

A6E812468966W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Inner garnish
2	Connector
3	Screw
4	Cover
5	Tweeter

3. Install in the reverse order of removal.



A6E8124W004

TWEETER INSPECTION

A6E812468966W02

1. Inspect for resistance between the tweeter terminals using an ohmmeter.
 - If not as specified, replace the tweeter.

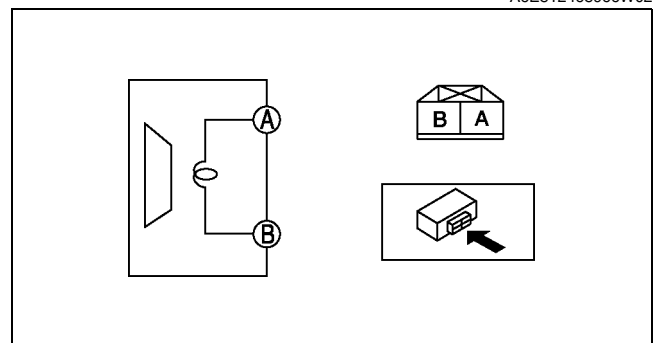
○—○ : Resistance

Test condition	Terminal	
	A	B
Under any condition	○—○	R

R: 3.2 ohms

A6E8124W033

2. To verify that the tweeter outputs sound, apply voltage to the tweeter and release using a 1.5-V battery.
 - If not outputs sound, replace the tweeter.



A6E8124W041

WOOFER REMOVAL/INSTALLATION

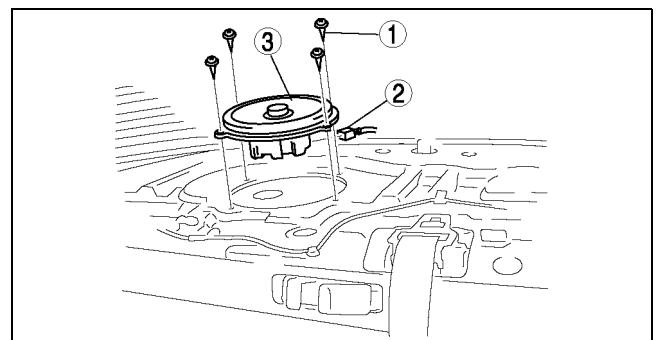
A6E812468967W01

4SD

1. Disconnect the negative battery cable.
2. Remove the rear package trim.
3. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Woofers

4. Install in the reverse order of removal.



A6E8124W005

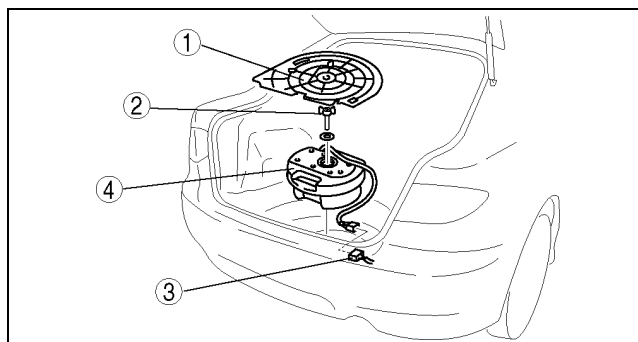
AUDIO AND NAVIGATION SYSTEM

5HB

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Temporary spare tire cover
2	Wing bolt
3	Connector
4	Woofer

3. Install in the reverse order of removal.



A6E8124W006

WOOFER INSPECTION

1. Inspect for continuity between the audio amplifier connector terminals and woofer connector terminals using an ohmmeter.
 - If not as specified, replace the related wiring harnesses.

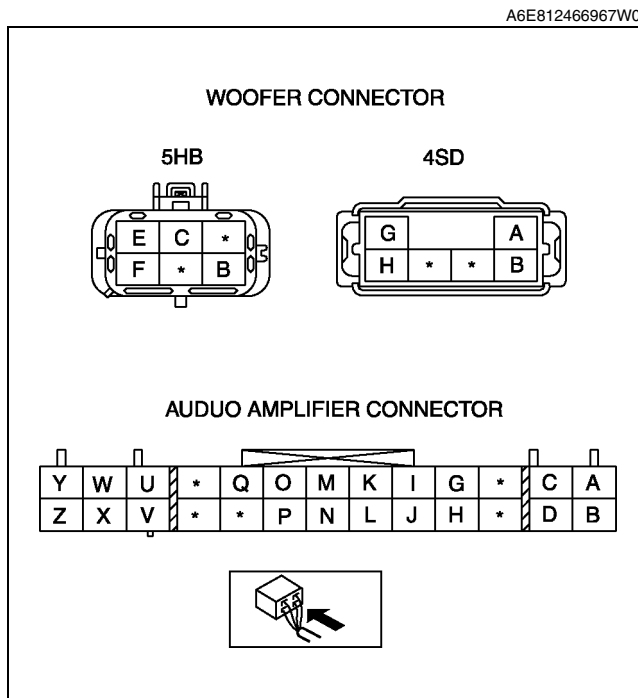
○—○: Continuity

Test condition	Terminal			
	Audio amplifier connector		Woofer connector	
	O	P	(E), [G]	(F), [H]
Under any condition	○—	○—	○—	○—

(): 5HB []: 4SD

A6E8124W024

2. Verify that there is battery positive voltage at the woofer connector terminal A (4SD) or C (5HB) using a voltmeter.
 - If not as specified, replace the related wiring harness.
3. Inspect continuity between the woofer connector terminal B and body ground using an ohmmeter.
 - If not as specified, replace the related wiring harness.
 - If as specified, replace the woofer.



A6E8124W046

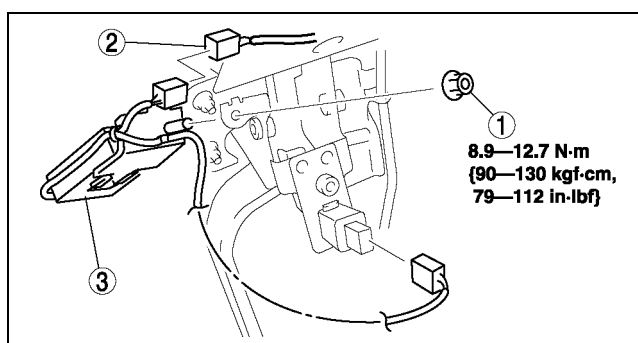
NOISE FILTER REMOVAL/INSTALLATION

Brake Light Noise Filter

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Nut
2	Connector
3	Noise filter

3. Install in the reverse order of removal.



A6E8124W008

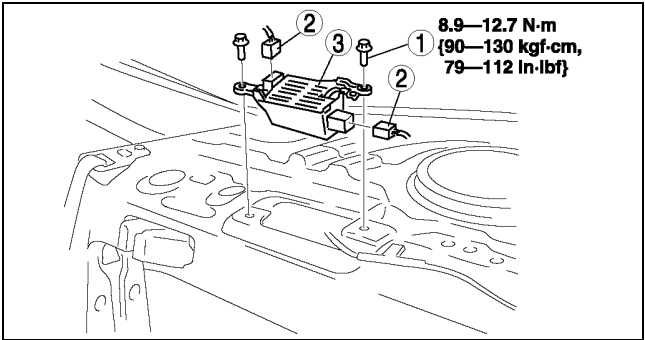
AUDIO AND NAVIGATION SYSTEM

Rear Window Defroster Noise Filter

1. Disconnect the negative battery cable.
2. Remove the rear package trim.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Noise filter

4. Install in the reverse order of removal.



A6E8124W009

NOISE FILTER INSPECTION

Brake Light Noise Filter

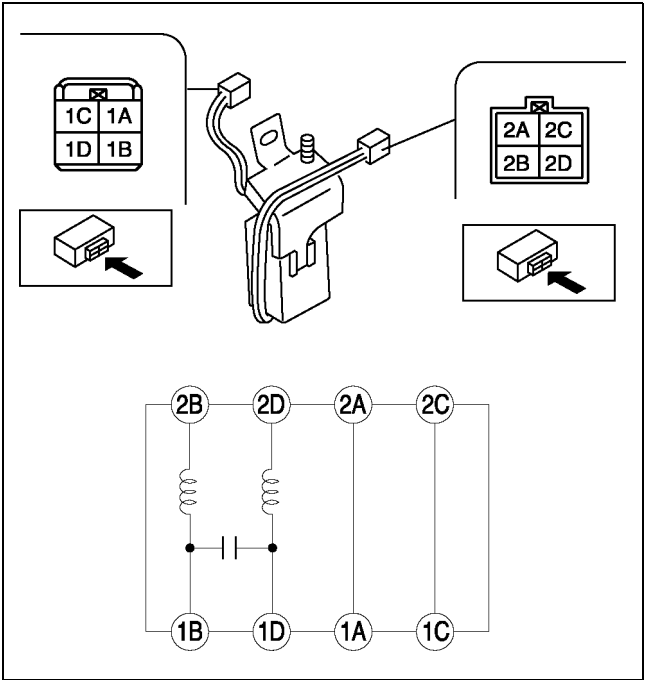
1. Inspect for resistance and continuity between the noise filter terminals using an ohmmeter.
 - If not as specified, replace the noise filter.

○—Ω—○: Resistance ○—○: Continuity

Test condition	Terminal							
	1A	1B	1C	1D	2A	2B	2C	2D
Under any condition	○				○			
		○		—Ω—	R	○		
			○				○	
				○	—Ω—	R		○

R: 0.1 ohms

A6E8124W035



A6E8124W034

T

AUDIO AND NAVIGATION SYSTEM

Rear Window Defroster Noise Filter

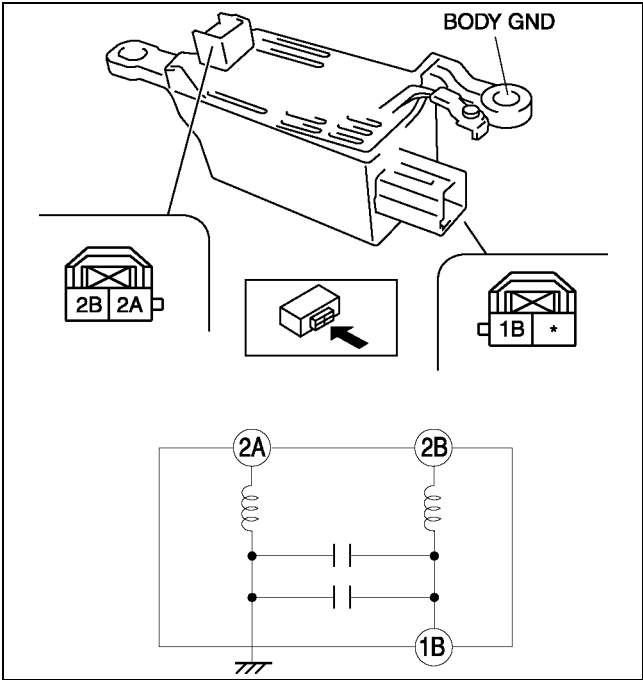
1. Inspect for resistance and continuity between the noise filter terminals using an ohmmeter.
 - If not as specified, replace the noise filter.

○—R—○: Resistance

Test condition	Terminal			
	Body GND	1B	2A	2B
Under any condition	○—R—○	○—R—○		
			○—R—○	

R: 0.1 ohms

A6E8124W037



A6E8124W036

CONDENSER REMOVAL/INSTALLATION

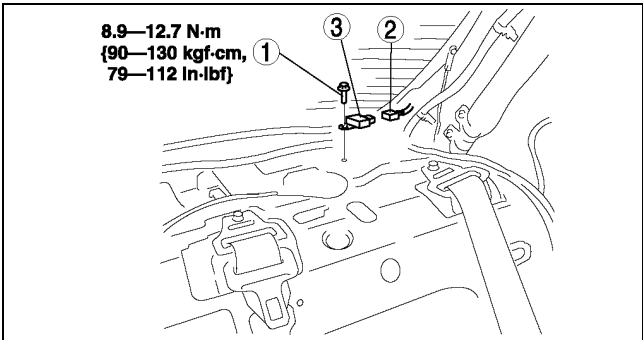
4SD

1. Disconnect the negative battery cable.
2. Remove the rear package trim.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Condenser

4. Install in the reverse order of removal.

A6E812466869W03



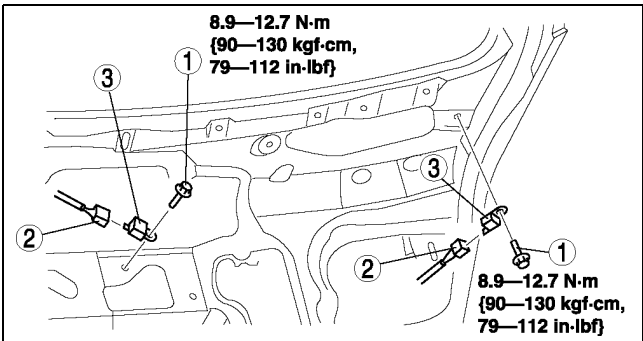
A6E8124W007

5HB

1. Disconnect the negative battery cable.
2. Remove the liftgate lower trim.
3. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Condenser

4. Install in the reverse order of removal.



A6E8124W021

AUDIO AND NAVIGATION SYSTEM

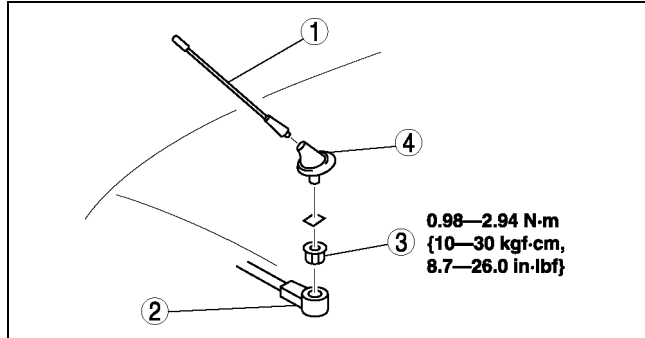
CENTER ROOF ANTENNA REMOVAL/INSTALLATION

A6E812466939W01

1. Disconnect the negative battery cable.
2. Remove the headliner. (See [S-96 HEADLINER REMOVAL/INSTALLATION](#).)
3. Remove in the order indicated in the table.

1	Antenna rod
2	Antenna feeder
3	Nut
4	Center roof antenna

4. Install in the reverse order of removal.
5. After installation, verify that the rubber of the center roof antenna is installed to the roof panel with no space between them.



A6E8124W023

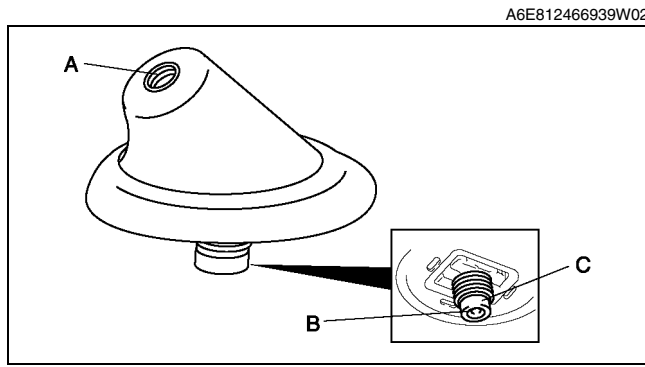
CENTER ROOF ANTENNA INSPECTION

1. Verify that there is no continuity between the center roof antenna terminals A and C using an ohmmeter.
2. Inspect for continuity between the center roof antenna terminals using an ohmmeter.
 - If not as specified, replace the center roof antenna.

○—○: Continuity

Test condition	Terminal	
	A	B
Under any condition	○—○	○—○

A6E8124W031



A6E812466939W02

A6E8124W048

T

GLASS ANTENNA INSPECTION

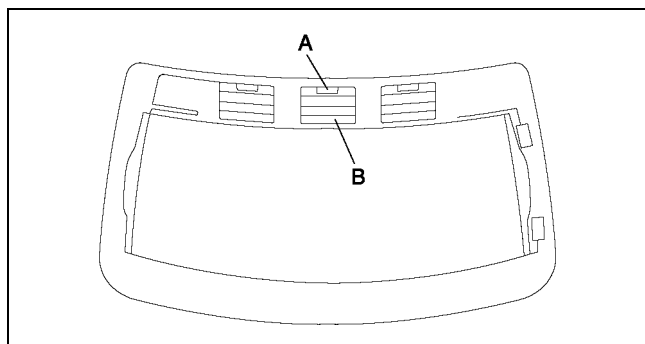
A6E812466931W01

1. Inspect the glass antenna for damage visually.
2. Inspect for continuity between the glass antenna terminals using an ohmmeter.
 - If not as specified, repair the glass antenna. (See [S-63 FILAMENT REPAIR](#).)

○—○: Continuity

Test condition	Terminal	
	A	B
Under any condition	○—○	○—○

A6E8124W031



A6E8124W030

AUDIO AND NAVIGATION SYSTEM

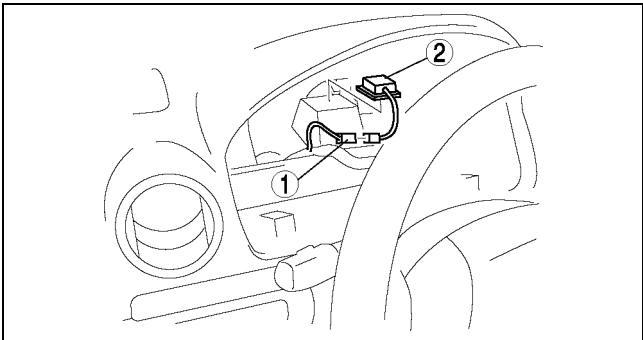
GPS ANTENNA REMOVAL/INSTALLATION

A6E812466936W01

- 1. Disconnect the negative battery cable.
- 2. Remove the instrument cluster.
- 3. Remove in the order indicated in the table.

1	Connector
2	GPS antenna

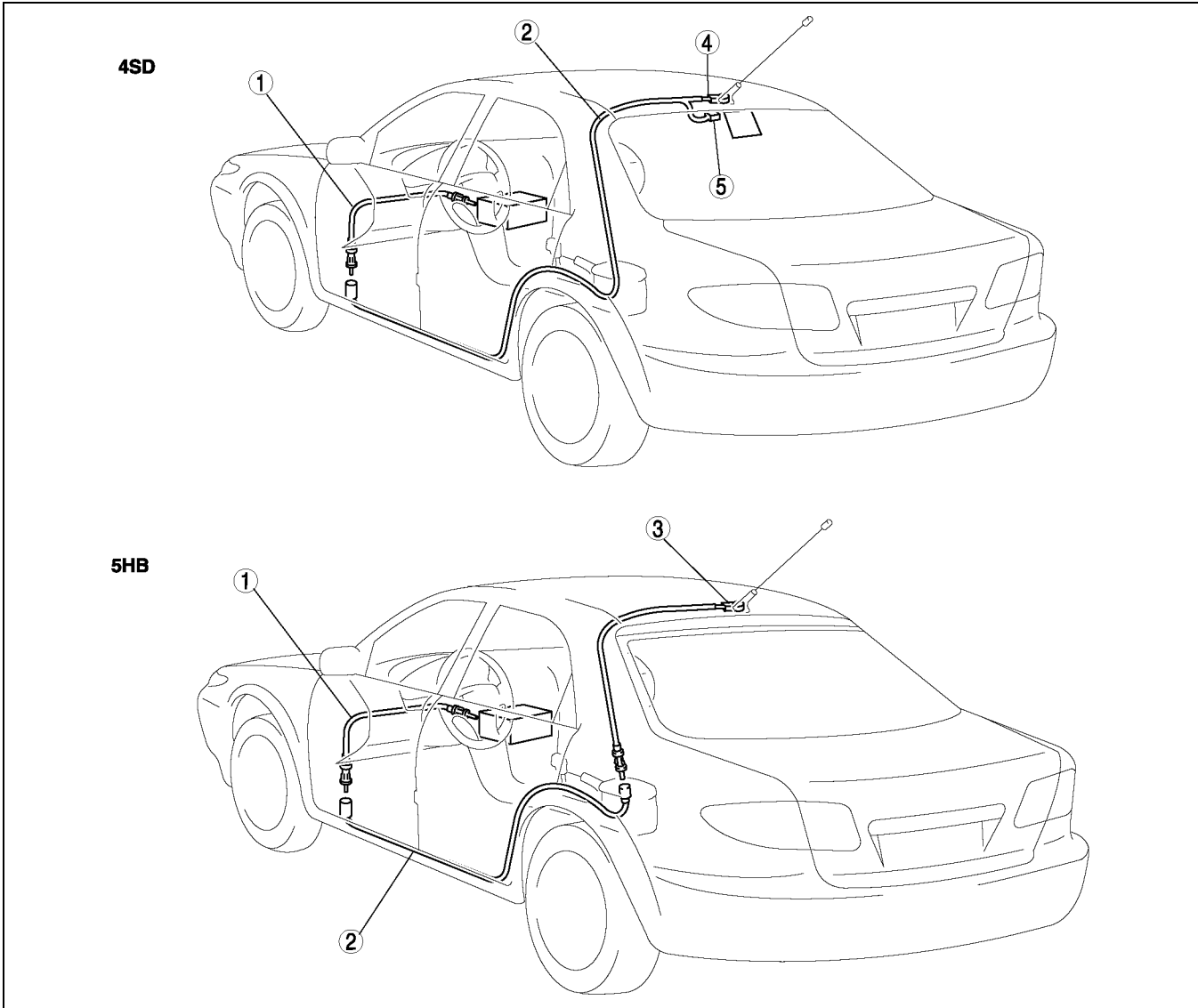
- 4. Install in the reverse order of removal.



A6E8124W022

ANTENNA FEEDER LOCATION

A6E812466941W01



A6E8124W038

1	Front antenna feeder
2	Rear antenna feeder No.1
3	Rear antenna feeder No.2

4	With center roof antenna
5	With glass antenna

AUDIO AND NAVIGATION SYSTEM

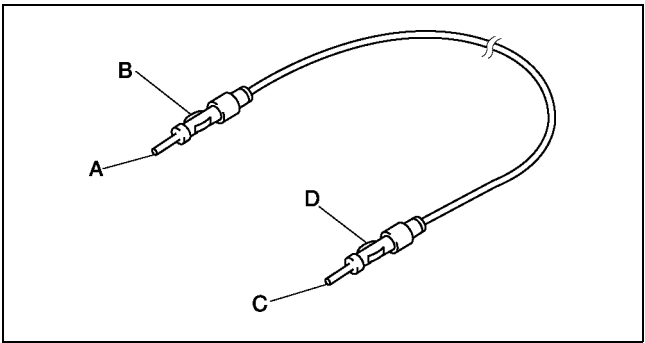
FRONT ANTENNA FEEDER INSPECTION

1. Verify that there is no continuity between the front antenna feeder terminals A and B using an ohmmeter.
2. Inspect for continuity between the front antenna feeder terminals using an ohmmeter.
 - If not as specified, replace the instrument panel harness.

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○		○	
2		○		○

A6E8124W047

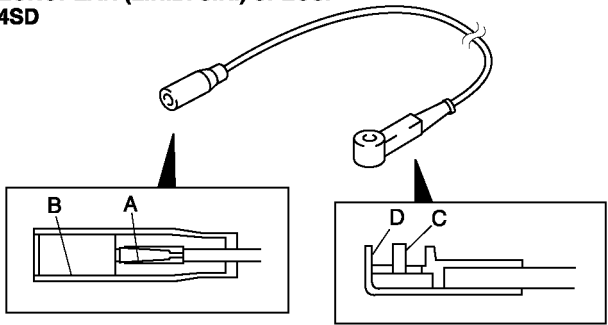


REAR ANTENNA FEEDER INSPECTION

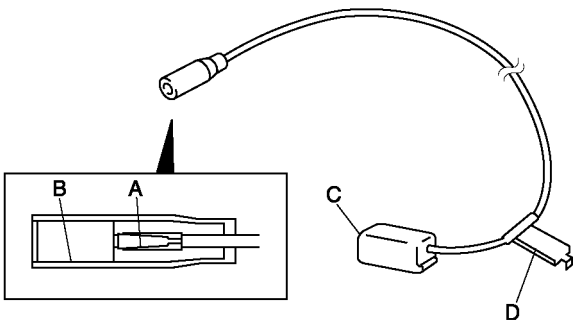
1. Verify that there is no continuity between antenna feeder terminals A and B using an ohmmeter.

A6E812466942W01

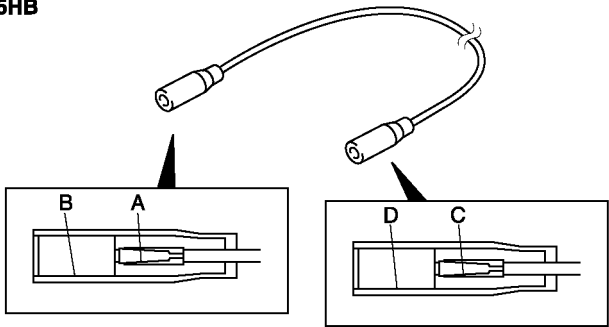
REAR ANTENNA FEEDER NO.1
EUROPEAN (L.H.D. U.K.) SPECS.
4SD



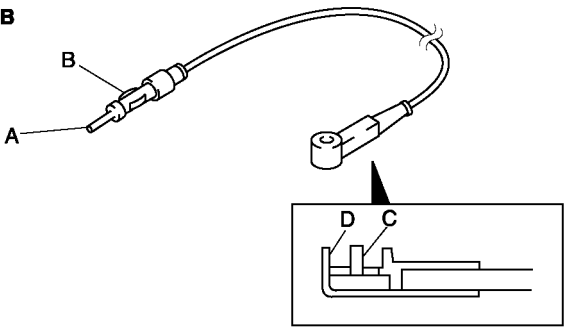
REAR ANTENNA FEEDER NO.1
GENERAL (L.H.D.) SPECS.
4SD



REAR ANTENNA FEEDER NO.1
5HB



REAR ANTENNA FEEDER NO.2
5HB



A6E8124W042

2. Inspect for continuity between the antenna feeder terminals using an ohmmeter.
 - If not as specified, replace the rear harness.

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○		○	
2		○		○

A6E8124W047

CRUISE CONTROL SYSTEM

CRUISE CONTROL SYSTEM

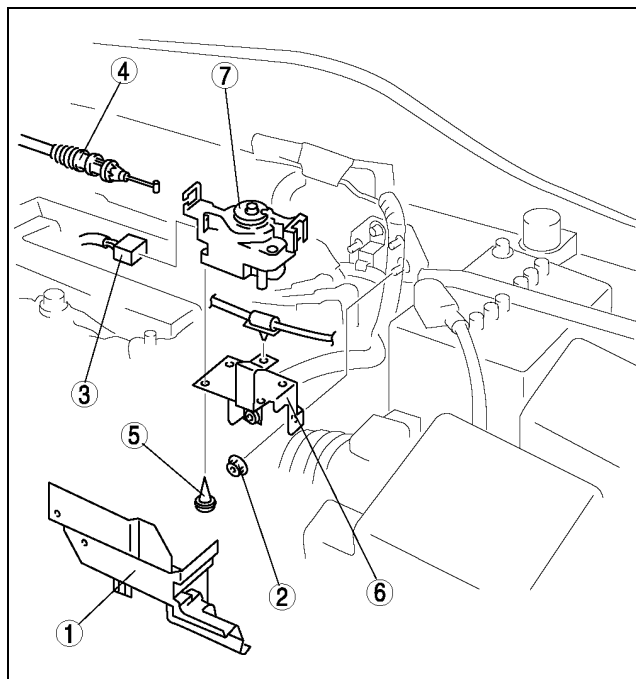
CRUISE ACTUATOR REMOVAL/INSTALLATION

A6E812866310W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Cover (See T-110 Cover Removal Note)
2	Nut
3	Connector
4	Actuator cable (See T-112 ACTUATOR CABLE REMOVAL) (See T-114 ACTUATOR CABLE INSTALLATION)
5	Screw
6	Bracket
7	Cruise actuator

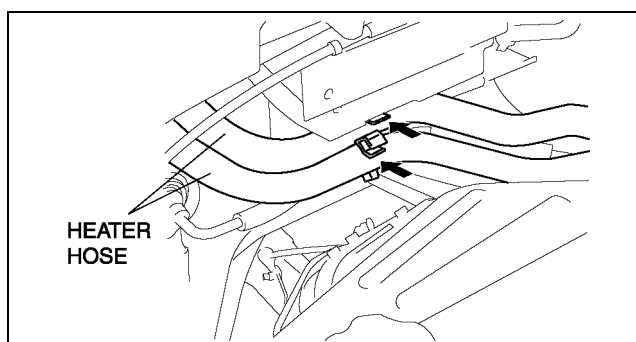
3. Install in the reverse order of removal.



A6E8128W001

Cover Removal Note

1. Unclamp the clips of the heater hoses at the front of the cover.



A6E8128W002

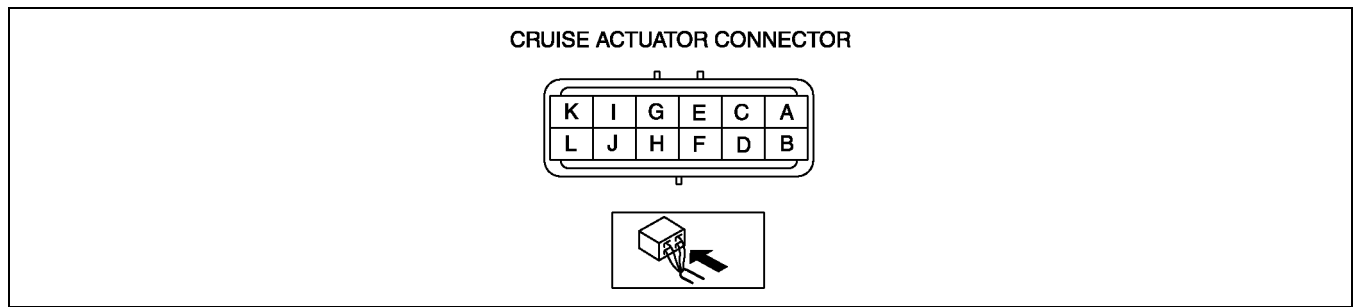
CRUISE ACTUATOR INSPECTION

A6E812866310W02

1. Disconnect the cruise actuator connector.
2. Measure the voltage, continuity and resistance at the cruise actuator terminals as indicated below.
 - If not as specified, inspect the parts listed under "Action."
 - If the parts and wiring harnesses are okay but the system still does not work properly, replace the cruise actuator.

CRUISE CONTROL SYSTEM

Terminal Voltage Table (Reference)



A6E8128W013

Terminal	Signal		Connected to	Test condition		Voltage (V) /Continuity	Action
A	Vehicle speed		- DSC HU/CM (with DSC) - ABS (ABS/TCS) HU/CM (with ABS (ABS/TCS))	1. Ignition switch at ON position and cruise control main switch held at on. 2. Front tire rotating		Alternates below 1.0 and 5	- Inspect METER IG 15 A fuse - Inspect DSC HU/CM (See P-40 DSC HU/CM INSPECTION) - Inspect ABS (ABS / TCS) HU/CM (See P-29 ABS (ABS/TCS) HU/CM INSPECTION) - Inspect related harness
B	—		—	—		—	—
C	Brake switch on/off		Brake switch	Depress brake pedal	B+	Below 1.0	- Inspect brake switch (See P-8 BRAKE SWITCH INSPECTION) - Inspect related harness
				Replace brake pedal			
D	—		—	—		—	—
E	O/D control (ATX only)		PCM	Ignition switch at ON position		B+	- Inspect PCM (See F-45 PCM INSPECTION) - Inspect related harness
F	MTX	Clutch switch on/off	Clutch switch	Inspect for continuity to ground	Depress clutch switch	Yes	- Inspect clutch switch - Inspect related harness
					Other	No	
	ATX	Selector lever position	TR switch	Inspect for continuity to ground	Selector lever at N or P position	Yes	- Inspect TR switch (See K-14 TRANSAXLE RANGE (TR) SWITCH INSPECTION) - Inspect starter - Inspect related harness
					Other	No	
G	Cruise set indicator light output		Cruise set indicator light	Ignition switch at ON position		B+	- Inspect METER IG 15 A fuse - Inspect instrument cluster - Inspect related harness
				Ignition switch at LOCK position or ACC position		Below 1.0	
H	Cruise main indicator light output		Cruise main indicator light	Under any condition: inspect for continuity to ground		Yes	- Inspect instrument cluster - Inspect related harness
I	Cruise actuator ground		GND	Under any condition: inspect for continuity to ground		Yes	Inspect GND

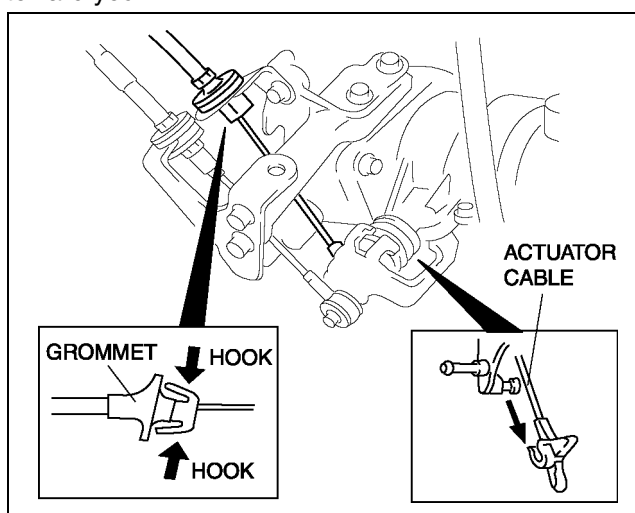
CRUISE CONTROL SYSTEM

Terminal	Signal	Connected to	Test condition		Voltage (V) /Continuity	Action
J	Cruise control switch position	Cruise control switch	Inspect for resistance	Cruise control main switch held at on	0 ohm	- Inspect cruise control switch (See T-116 CRUISE CONTROL SWITCH INSPECTION) - Inspect related harness
				SET/COAST switch held at on	Approx. 680 ohms	
				RESUME/ACCEL switch held at on	Approx. 2200 ohms	
				CANCEL switch held at on	Approx. 120 ohms	
K	Brake switch on/off	Brake switch 2	Ignition switch at ON position	Depress brake pedal	Below 1.0	- Inspect brake switch 2 (See P-8 BRAKE SWITCH INSPECTION) - Inspect related harness
				Other	B+	
L	IG1	METER IG 15 A fuse	Ignition switch at ON position		B+	- Inspect METER IG 15 A fuse - Inspect related harness
			Ignition switch at LOCK position or ACC position		Below 1.0	

ACTUATOR CABLE REMOVAL

A6E812866311W01

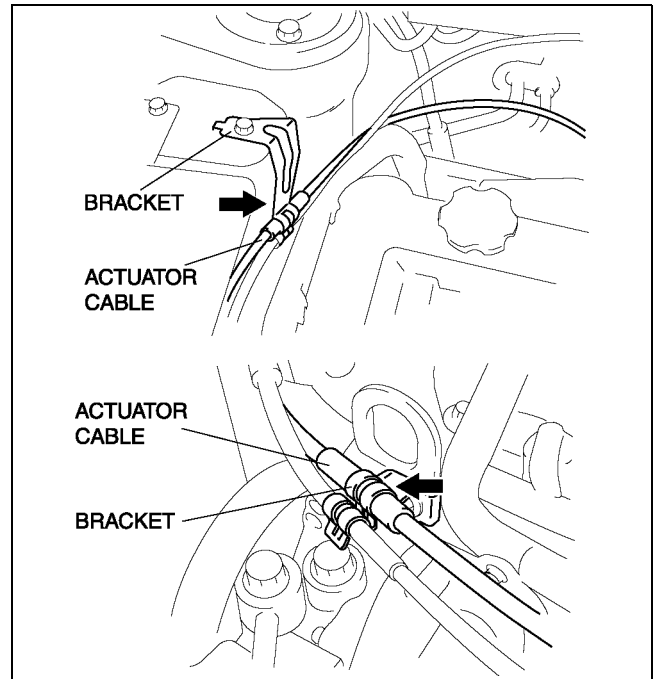
1. Remove the plug hole plate.
2. Remove the cover from the cruise actuator. (See [T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION.](#))
3. Remove the installation nut and pull the cruise actuator toward you.
4. Move the throttle, and remove the end fitting of the actuator cable from the throttle.
5. Squeeze the hooks of the grommet, and remove the actuator cable.



A6E8128W007

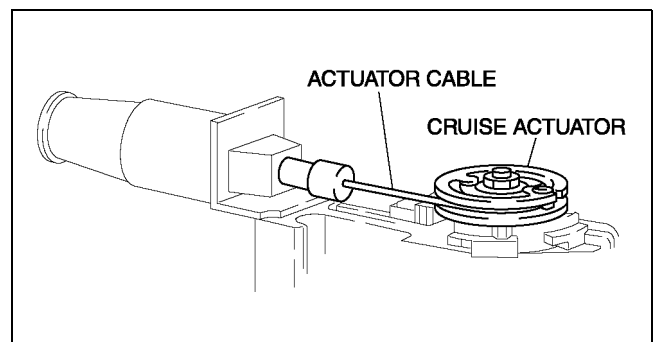
CRUISE CONTROL SYSTEM

6. Remove the actuator cable from the bracket



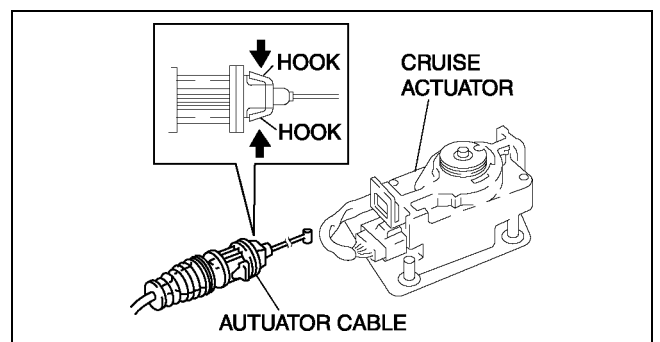
A6E8128W004

7. Remove the end fitting of the actuator cable from the cruise actuator.



A6E8128W005

8. Squeeze the hooks of the grommet, and remove it from the cruise actuator.
9. Remove the actuator cable.



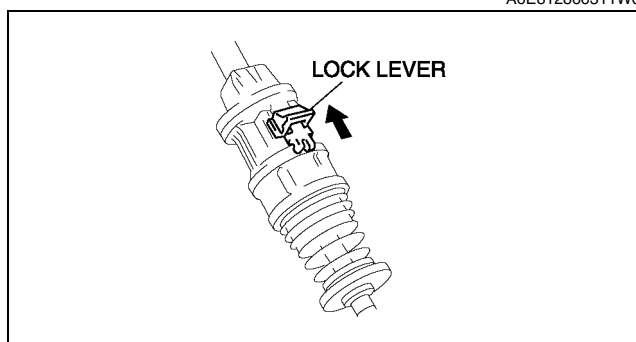
A6E8128W006

CRUISE CONTROL SYSTEM

ACTUATOR CABLE INSTALLATION

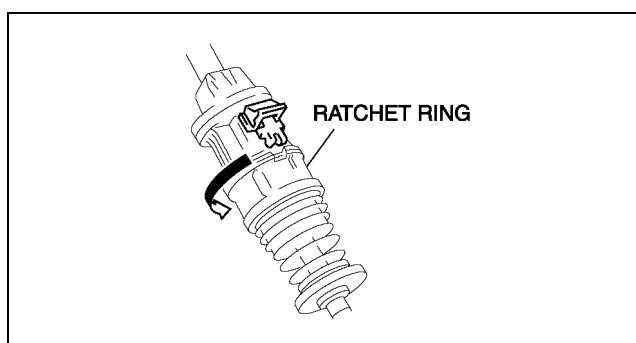
1. Slide the lock lever in the direction shown by the arrow to unlock the adjuster.

A6E812866311W02



A6E8128W009

2. Turn the ratchet ring to release lock in the direction shown by the arrow.



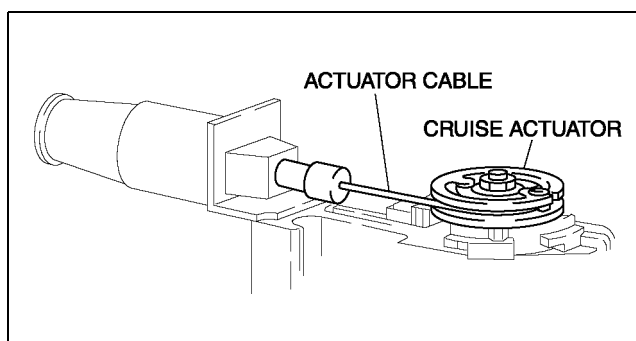
A6E8128W010

3. Install the actuator cable to the cruise actuator.

Caution

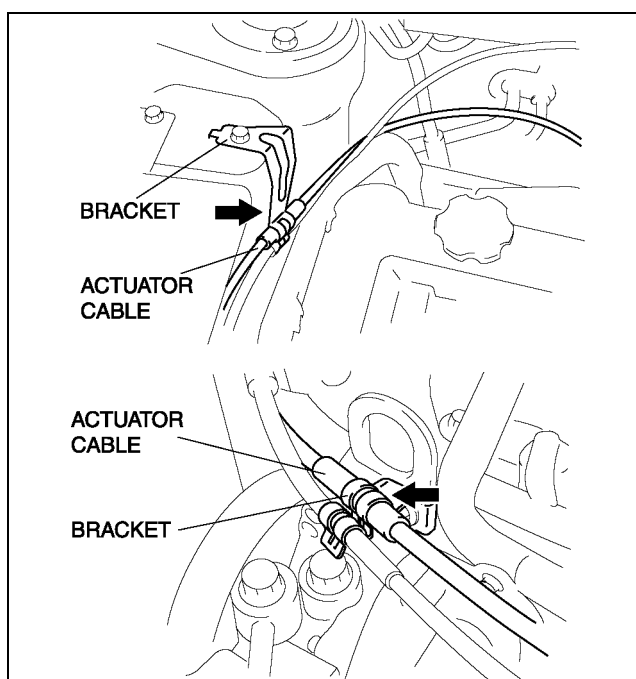
- Due to the possibility of actuator cable damage, make sure there is no twisting in the cable when installing.

4. Install the cruise actuator. (See [T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION](#).)



A6E8128W005

5. Pass the actuator cable under the accelerator cable.
6. Install the actuator cable to the bracket.



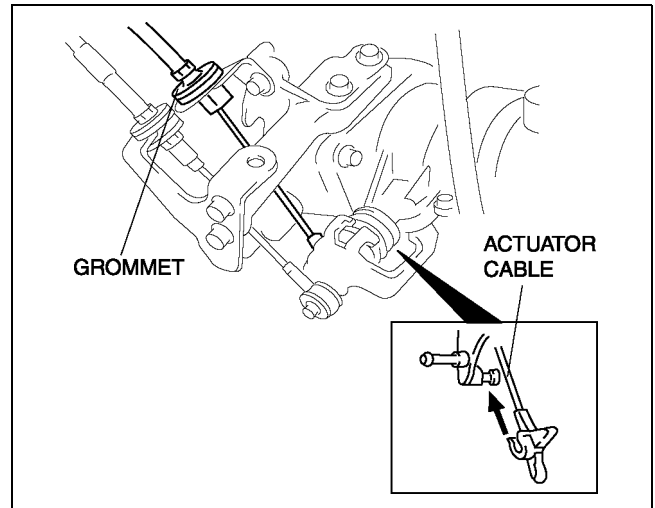
A6E8128W004

CRUISE CONTROL SYSTEM

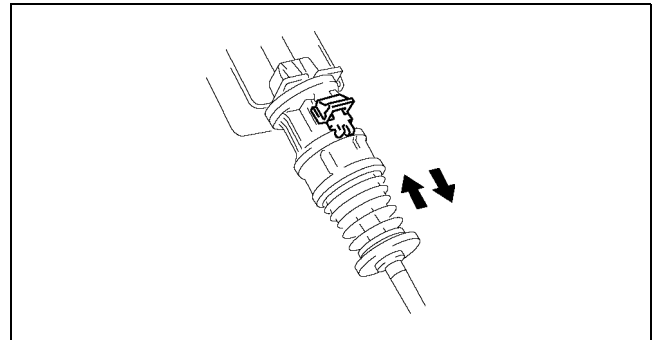
7. Install the grommet to the cable bracket.
8. Move the throttle, and install the end fitting of the actuator cable to the throttle.

Caution

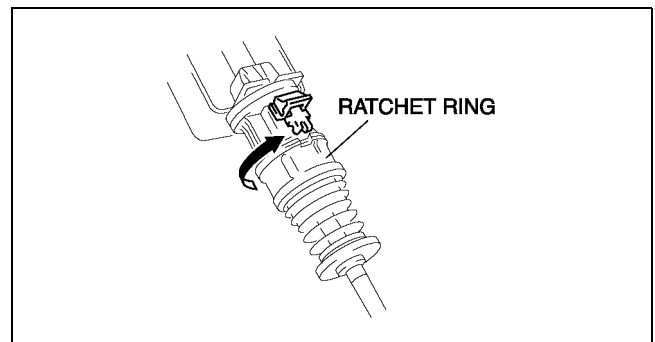
- Due to the possibility of actuator cable damage, make sure there is no twisting in the cable when installing.



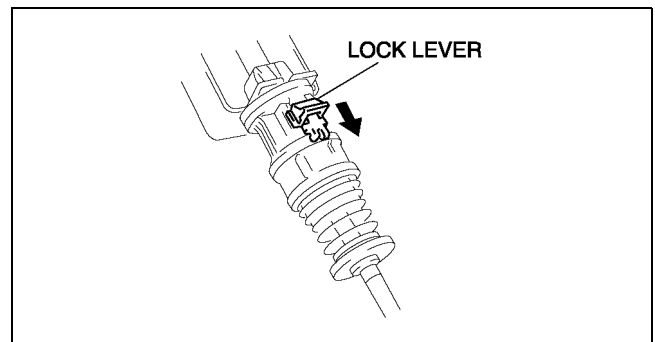
9. To adjust the free play, push or pull the actuator cable directly behind the spring **two times**.



10. Turn the ratchet ring in the direction shown by the arrow to lock it.



11. Slide the lock lever in the direction shown by the arrow to lock the adjuster.
12. Install the cover to the cruise actuator.
13. Install the plug hole plate.



CRUISE CONTROL SWITCH REMOVAL/INSTALLATION

Note

- The audio control switch and the cruise control switch use a common connector.
- (See [T-99 AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.](#))

CRUISE CONTROL SYSTEM

CRUISE CONTROL SWITCH INSPECTION

A6E812866341W02

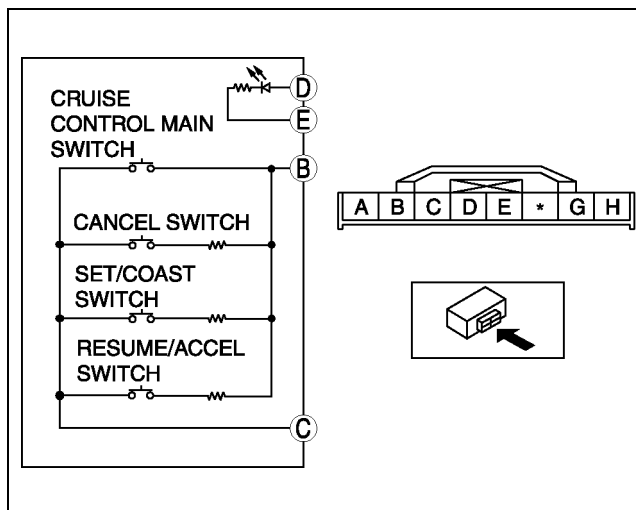
1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See [T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)
3. Disconnect the cruise control switch connector.
4. Inspect for resistance and continuity between the cruise control switch terminals using an ohmmeter.
 - If not as specified, replace the cruise control switch.

○—○: Continuity ○○: Resistance ○○: Diode

Switch position	Terminal			
	B	C	D	E
Cruise control main switch held at on	○—○		○○	
CANCEL switch held at on	○○	R ₁	○○	
SET/COAST switch held at on	○○	R ₂	○○	
RESUME/ACCEL switch held at on	○○	R ₃	○○	
Neutral			○○	

R₁: 120—122 ohms R₂: 677—693 ohms

R₃: 2.16—2.24 kilohms



A6E8128W012

A6E8128W006

AIR BAG SYSTEM

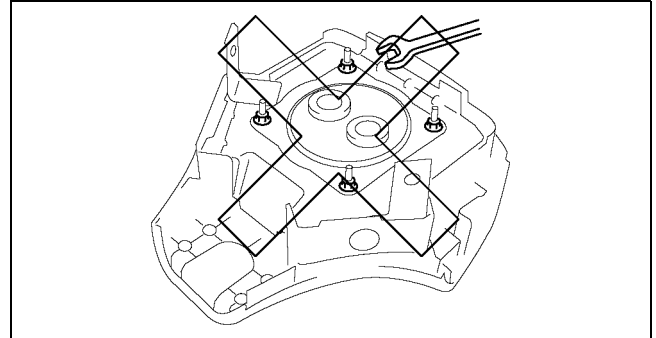
AIR BAG SYSTEM

SERVICE WARNINGS

A6E813001046W01

Component Disassembly

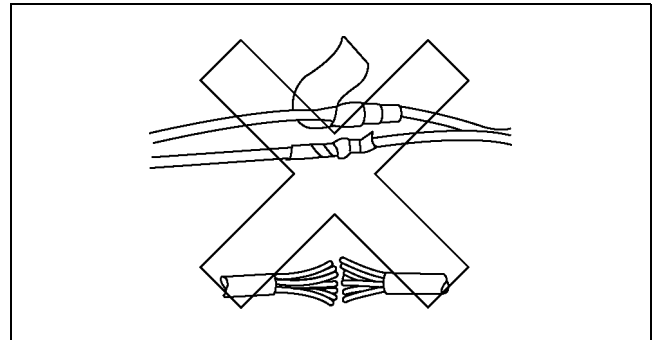
- Disassembling and reassembling the components of the air bag system can render the system inoperative, which may result in serious injury or death in the event of an accident. Do not disassemble any air bag system components.



A6E8130W044

Wiring Harness Repair

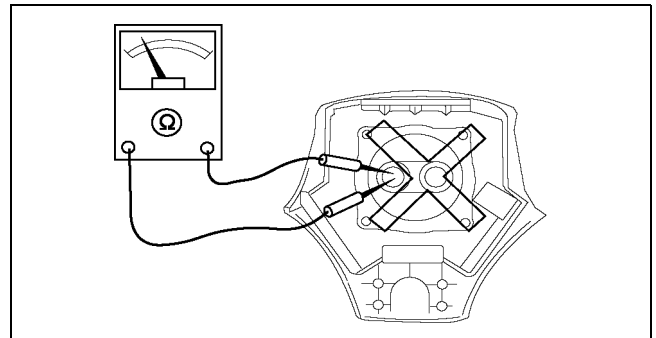
- Incorrectly repairing an air bag system wiring harness can accidentally deploy the air bag module or pre-tensioner seat belt, which can cause serious injury. If a problem is found in the system wiring, replace the wiring harness. Do not try to repair it.



A6E8130W045

Air Bag Module Inspection

- Inspecting an air bag module using an ohmmeter can deploy the air bag module, which may cause serious injury. Do not use an ohmmeter to inspect an air bag module. Always use the on-board diagnostic to diagnose the air bag module for malfunctions.



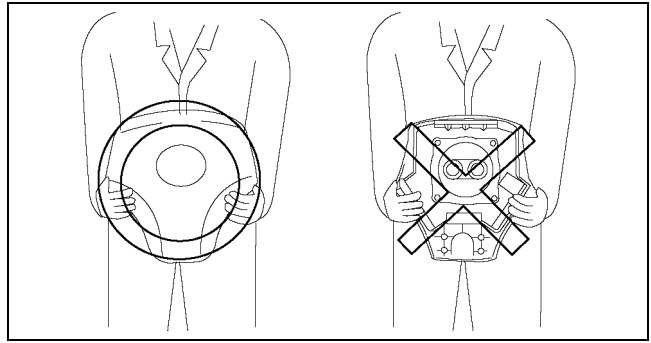
A6E8130W024

T

AIR BAG SYSTEM

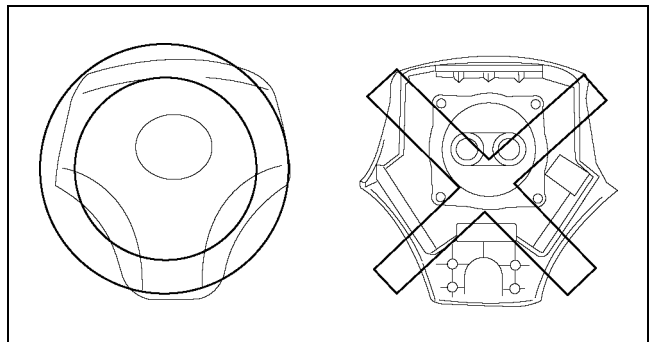
Air Bag Module Handling

- A live (undeployed) air bag module may accidentally deploy when it is handled and cause serious injury. When carrying a live (undeployed) air bag module, point the front surface away from your body to lessen the chance of injury in case it deploys.



A6E8130W022

- A live (undeployed) air bag module placed face down on a surface is dangerous. If the air bag module deploys, the motion of the module can cause serious injury. Always face the front surface up to reduce the motion of the module in case it accidentally deploys.



A6E8130W021

Side Air Bag Module Handling

- When the side air bag module deploys due to a collision, the interior of the seat back (pad, frame, etc.) may become damaged. If the seat back is reused and the side air bag module does not deploy properly, a serious accident may result. When the side air bag module deploys, always replace both the side air bag module and the seat back (pad, frame, trim) with new parts. After service, confirm that the seat operates normally and that the harness is positioned properly.

SAS Unit Handling

- Disconnecting the SAS unit connector or removing the SAS unit with the ignition switch at ON position can cause the air bag modules to deploy, which may seriously injure you. Before disconnecting the SAS unit connector or removing the SAS unit, turn the ignition switch to LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS unit to deplete its stored power.
- Connecting the SAS unit connector without firmly installing the SAS unit to the vehicle is dangerous. The crash sensor inside the control module may send an electrical signal to the air bag modules. This will deploy the air bag modules, which may result in serious injury. Therefore, before connecting the connector, firmly mount the control module to the vehicle.
- For vehicles with a single point sensor, once an air bag module is deployed due to an accident or other causes, the SAS unit must be replaced with a new one even if the used one does not have any external signs of damage. The used SAS unit may have been damaged internally which may cause improper operation, resulting in major injuries or even death. The used single point SAS unit cannot be bench-checked or self-checked.

Crash Zone Sensor Handling

- Disconnecting the crash zone sensor connector or removing the crash zone sensor with the ignition switch at ON position can cause the crash zone sensor to operate and the air bag modules and pre-tensioner seat belts to deploy, which may seriously injure you. Before disconnecting the crash zone sensor connector or removing the crash zone sensor, always turn the ignition switch to LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS control module to deplete its stored power.
- If the crash zone sensor is subjected to shock or the sensor is disassembled, the air bag modules and pre-tensioner seat belts may operate (deploy) suddenly and cause injury, or it may fail to operate normally and cause a serious accident. Do not subject the crash zone sensor to shock or disassemble the sensor.
- Because a sensor is built into the crash zone sensor, when the air bag modules and pre-tensioner seat belts operate (deploys), there may be a problem, such as an internal malfunction, even if there is not any external damage or deformation. If the crash zone sensor is reused, the air bag modules and pre-tensioner seat belts may fail to operate normally and cause a serious injury. Always replace the crash zone sensor with a new part. The crash zone sensor cannot be bench-checked or self-checked.

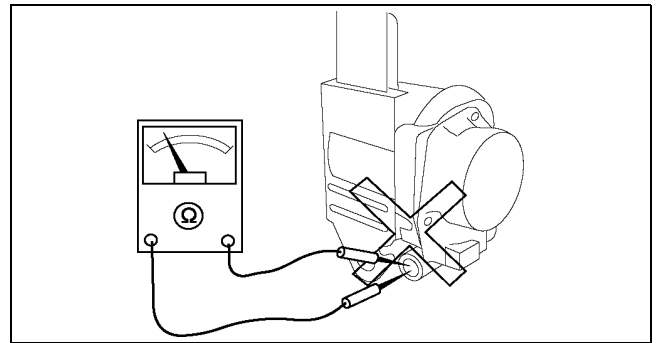
AIR BAG SYSTEM

Side Air Bag Sensor Handling

- Disconnecting the side air bag sensor connector or removing the side air bag sensor with the ignition switch at ON position can cause the side air bag sensor to operate and the side air bag module to deploy, which may seriously injure you. Before disconnecting the side air bag sensor connector or removing the side air bag sensor, always turn the ignition switch to LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS control module to deplete its stored power.
- If the side air bag sensor is subjected to shock or the sensor is disassembled, the side air bag module may operate (deploy) suddenly and cause injury, or it may fail to operate normally and cause a serious accident. Do not subject the side air bag sensor to shock or disassemble the sensor.
- Because a sensor is built into the side air bag sensor, when the side air bag module operates (deploys), there may be a problem, such as an internal malfunction, even if there is not any external damage or deformation. If the side air bag sensor is reused, the side air bag module may fail to operate normally and cause a serious injury. Always replace the side air bag sensor with a new part. The side air bag sensor cannot be bench-checked or self-checked.

Pre-tensioner Seat Belt Inspection

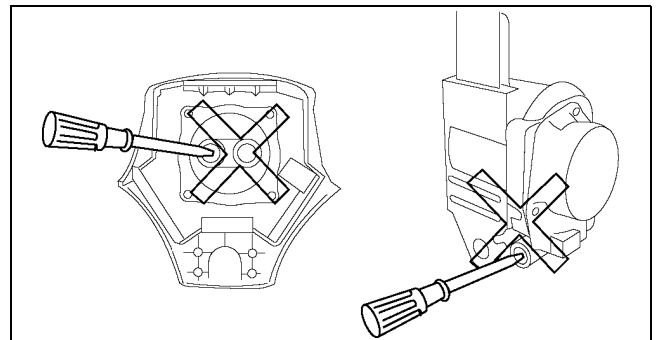
- Inspecting a pre-tensioner seat belt using an ohmmeter can deploy the pre-tensioner seat belt, which can cause serious injury. Do not use an ohmmeter to inspect the pre-tensioner seat belt. Always use the on-board diagnostic to diagnose the pre-tensioner seat belt for malfunctions.



A6E8130W025

Component Handling

- Oil, grease, water, etc on components may cause the air bag modules and pre-tensioner seat belts to fall to deploy in an accident, which may cause serious injury. Do not allow oil, grease, water, etc., on components.
- Inserting a screwdriver, etc., into the connector of an air bag module or a pre-tensioner seat belt may damage the connector and cause the air bag module or the pre-tensioner seat belt to deploy improperly, which may cause serious injury. Do not insert any foreign objects into the connector.



A6E8130W023

Component Reuse

- Even if an air bag module or a pre-tensioner seat belt does not deploy in a collision and does not have any external signs of damage, it may have been damaged internally, which may cause improper operation. Improper operation may cause serious injury. Always self-check the undamaged air bag module or pre-tensioner seat belt to determine whether it can be reused.

T

AIR BAG SYSTEM

DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION

A6E813057010W01

Warning

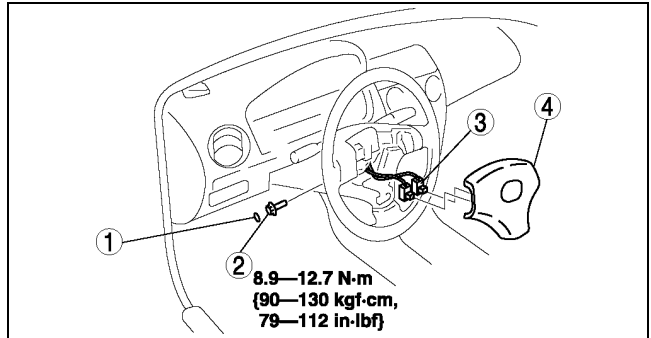
- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See T-117 SERVICE WARNINGS.)
- Due to the adoption of 2-step deployment control in both the driver-side air bag module, depending on the impact force, it is possible that inflator No. 2 might not deploy. In such cases, before disposing of the air bag module, make sure to follow the inflator deployment procedures and verify complete deployment of inflator No. 1 and 2.

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove in the order indicated in the table.

1	Cover
2	Bolt
3	Connector (See T-120 Connector Removal Note)
4	Driver-side air bag module

4. Install in the reverse order of removal.
5. Turn the ignition switch to ON position.
6. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.

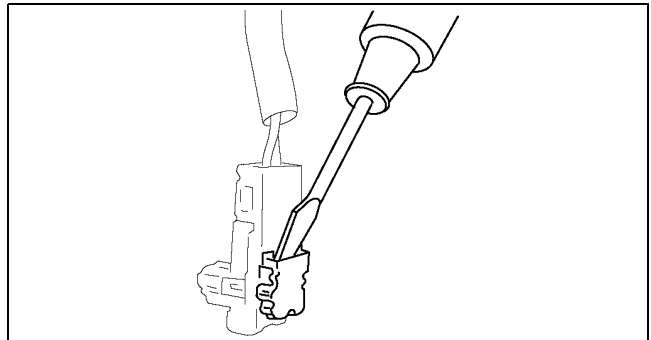
- If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.



A6E8130W001

Connector Removal Note

1. Using a flathead screwdriver, pry out the connector's stopper plate.
2. Disconnect the connector.



A6E8130W002

AIR BAG SYSTEM

PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION

A6E813057050W01

Warning

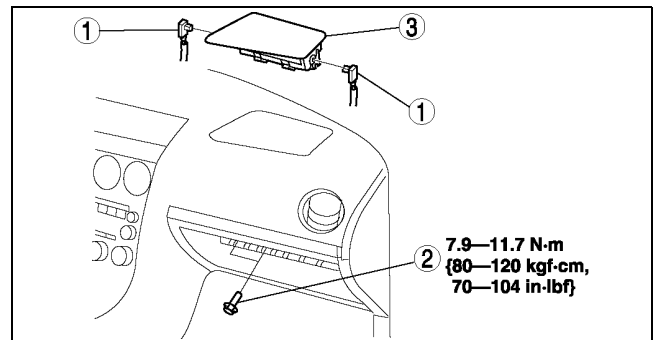
- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See T-117 SERVICE WARNINGS.)
- Due to the adoption of 2-step deployment control in both the passenger-side air bag module, depending on the impact force, it is possible that inflator No. 2 might not deploy. In such cases, before disposing of the air bag module, make sure to follow the inflator deployment procedures and verify complete deployment of inflator No. 1 and 2.

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the glove compartment.
4. Remove in the order indicated in the table.

1	Connector (See T-121 Connector Removal Note)
2	Bolt
3	Passenger-side air bag module

5. Install in the reverse order of removal.
6. Turn the ignition switch to ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.

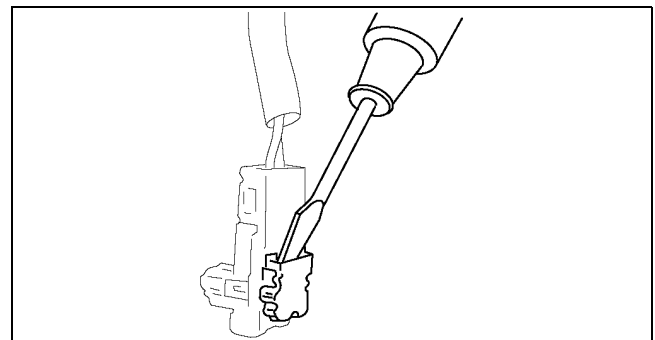
- If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.



A6E8130W003

Connector Removal Note

1. Using a flathead screwdriver, pry out the connector's stopper plate.
2. Disconnect the connector.



A6E8130W002

SIDE AIR BAG MODULE REMOVAL/INSTALLATION

A6E813000147W01

Warning

- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See T-117 SERVICE WARNINGS.)

Warning

- If the side air bag module is installed with debris in the seat back, the foreign material may be scattered when the side air bag module operates (deploys), causing injury. Verify that there is no foreign material in the seat back before installing the side air bag module.

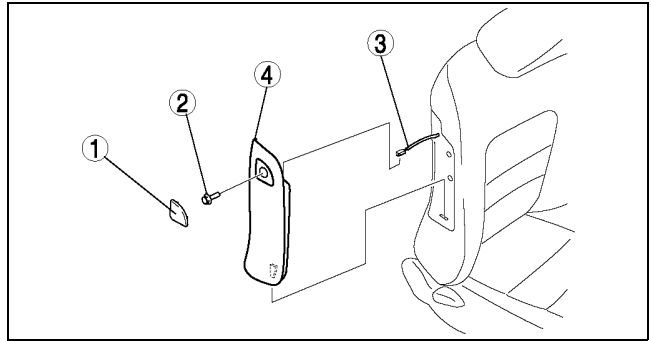
AIR BAG SYSTEM

1. Remove in the order indicated in the table.

1	Cover
2	Bolt
3	Connector (See T-122 Connector Removal Note)
4	Side air bag module

2. Install in the reverse order of removal.
3. Turn the ignition switch to ON position.
4. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.

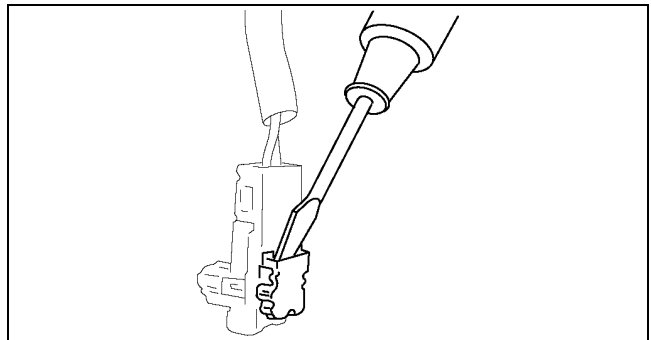
- If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.



A6E8130W004

Connector Removal Note

1. Using a flathead screwdriver, pry out the connector's stopper plate.
2. Disconnect the connector.



A6E8130W002

CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION

A6E813000171W01

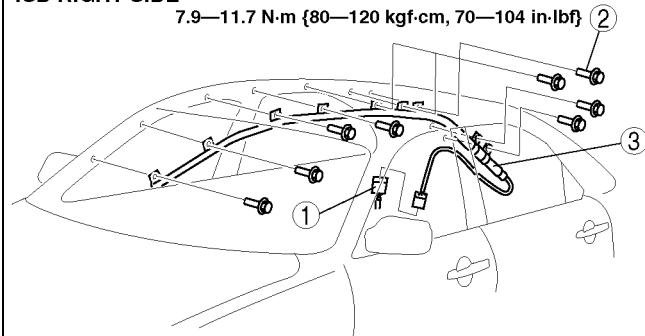
Warning

- **Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the air bag module. (See [T-117 SERVICE WARNINGS](#).)**

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the headliner.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Turn the ignition switch to ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
 - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.

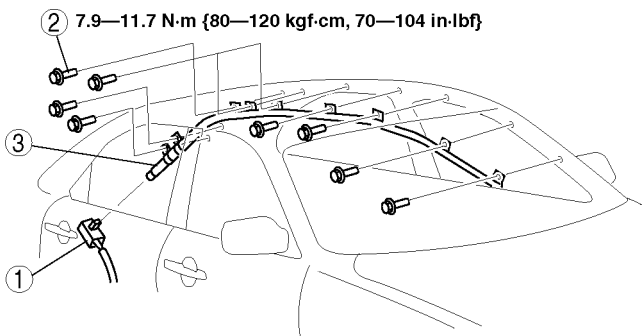
4SD RIGHT SIDE

7.9—11.7 N·m {80—120 kgf·cm, 70—104 in·lbf}



4SD LEFT SIDE AND 5HB

7.9—11.7 N·m {80—120 kgf·cm, 70—104 in·lbf}



A6E8130W026

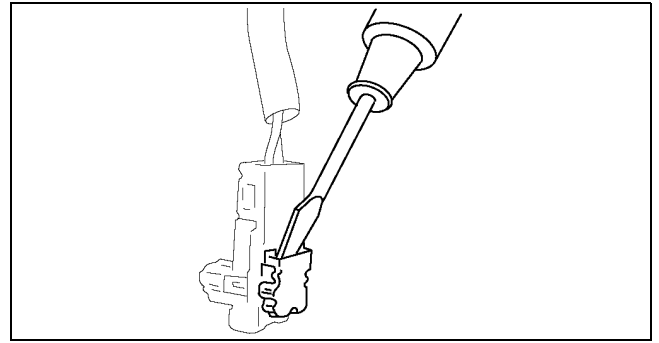
1	Connector (See T-123 Connector Removal Note)
2	Bolt

3	Curtain air bag module (See T-123 Curtain Air Bag Module Installation Note (4SD Right Side))

AIR BAG SYSTEM

Connector Removal Note

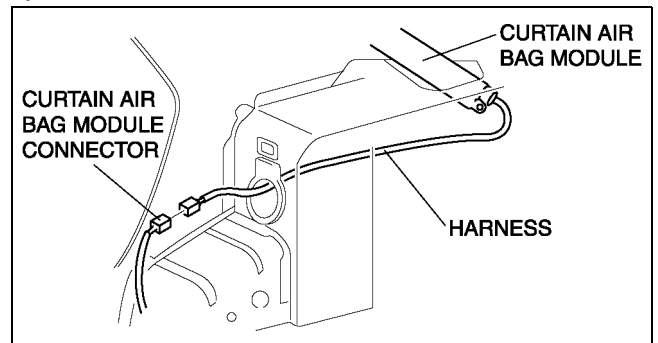
1. Using a flathead screwdriver, pry out the connector's stopper plate.
2. Disconnect the connector.



A6E8130W002

Curtain Air Bag Module Installation Note (4SD Right Side)

1. Pass the curtain air bag module harness through the hole in the body.



A6E8130W056

CRASH ZONE SENSOR REMOVAL/INSTALLATION

A6E813000145W01

Warning

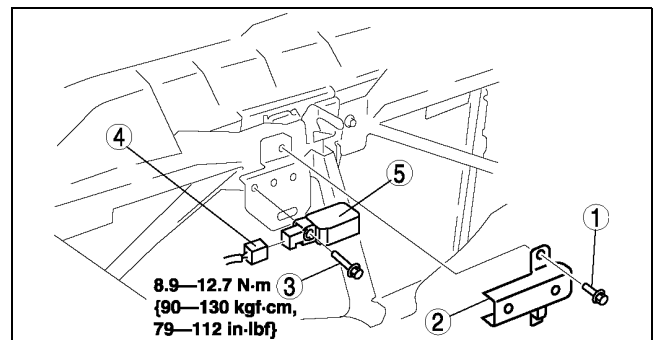
- Handling the crash zone sensor improperly can accidentally deploy the air bag module and pre-tensioner seat belt, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the crash zone sensor. (See [T-117 SERVICE WARNINGS](#).)

1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the radiator grille.
4. Remove in the order indicated in the table.

1	Bolt
2	Cover
3	Bolt
4	Connector
5	Crash zone sensor

5. Install in the reverse order of removal.
6. Turn the ignition switch to ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.

- If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic function.



A6E8130W007

SIDE AIR BAG SENSOR REMOVAL/INSTALLATION

A6E813000146W01

Warning

- Handling the side air bag sensor improperly can accidentally deploy the side air bag module, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling the side air bag sensor. (See [T-117 SERVICE WARNINGS](#).)

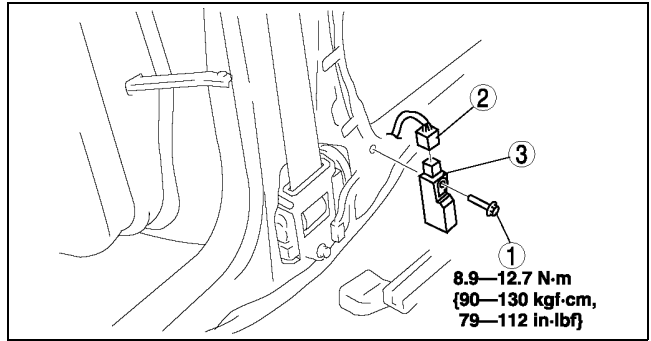
1. Turn the ignition switch to LOCK position.
2. Disconnect the negative battery cable and wait for **more than 1 minute**.
3. Remove the B-pillar lower trim.

AIR BAG SYSTEM

4. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	Side air bag sensor

5. Install in the reverse order of removal.
6. Turn the ignition switch to ON position.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
 - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic function.



A6E8130W005

SAS UNIT REMOVAL/INSTALLATION

A6E813057030W01

Warning

- Handling the SAS unit improperly can accidentally deploy the air bag modules and pre-tensioner seat belt, which may seriously injure you. Read **AIR BAG SYSTEM SERVICE WARNINGS** before handling the SAS unit. (See **T-117 SERVICE WARNINGS**.)

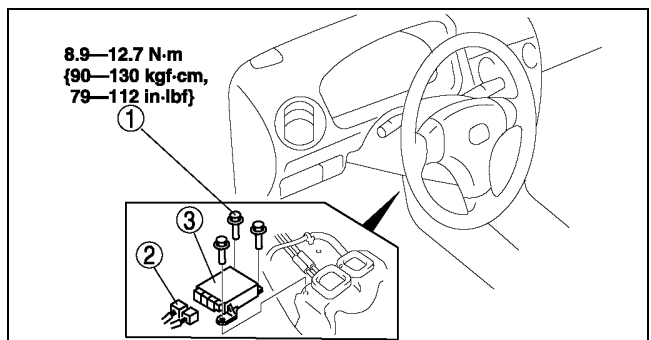
Caution

- When replacing the SAS unit, configuration procedure must be done before removing the SAS unit. If configuration is not completed before removing the SAS unit, DTC B1921 will be detected.

1. Configure the SAS unit (when only replacing it). (See **T-124 SAS UNIT CONFIGURATION**.)
2. Turn the ignition switch to LOCK position.
3. Disconnect the negative battery cable and wait for **more than 1 minute**.
4. Partially peel off the floor covering.
5. Remove in the order indicated in the table.

1	Bolt
2	Connector
3	SAS unit

6. Install in the reverse order of removal.
7. Turn the ignition switch to ON position.
8. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
 - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.



A6E8130W006

SAS UNIT CONFIGURATION

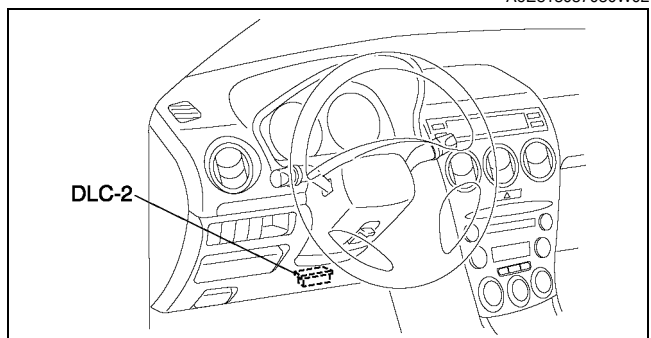
A6E813057030W02

1. Connect the **SST** (WDS or equivalent) to the DLC-2.
2. Input vehicle information following the directions on the screen.
3. Select "Module programming".
4. Select "Programmable module installation".
5. Select the following items and perform procedures according to directions on the screen.

Items

- "RCM"

6. Retrieve DTCs by the **SST** (WDS or equivalent), then verify that there is no DTC present.
 - If DTC is present, perform applicable DTC inspection.



A6E3970W002

AIR BAG SYSTEM

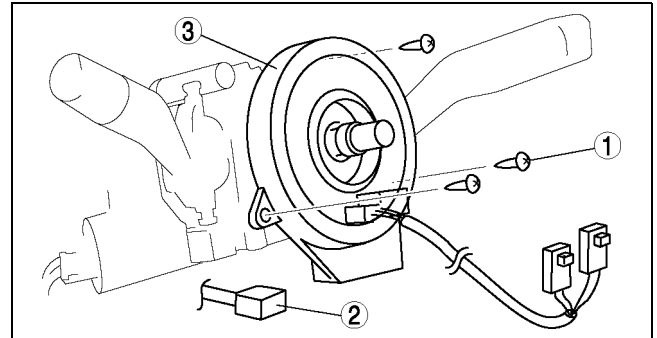
CLOCK SPRING REMOVAL/INSTALLATION

A6E813066123W01

1. Disconnect the negative battery cable.
2. Remove the driver-side air bag module. (See [T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
3. Remove the steering wheel. (See [N-7 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
4. Remove the column cover.
5. Remove in the order indicated in the table.

1	Screw
2	Connector
3	Clock spring (See T-125 Clock Spring Installation Note)

6. Install in the reverse order of removal.
7. Verify that the air bag system warning light illuminates for **approximately 6 seconds** and then goes off.
 - If the air bag system warning light does not operate in the manner described above, there are malfunctions in the system. Inspect the system using the on-board diagnostic.



A6E8130W008

Clock Spring Installation Note

Caution

- If the clock spring is not adjusted, the spring wire in the clock spring will break due to overtension when the steering wheel is turned. Always adjust the clock spring after installing it.
- Adjust the clock spring after installing it. (See [T-125 CLOCK SPRING ADJUSTMENT.](#))

CLOCK SPRING ADJUSTMENT

A6E813066123W02

Note

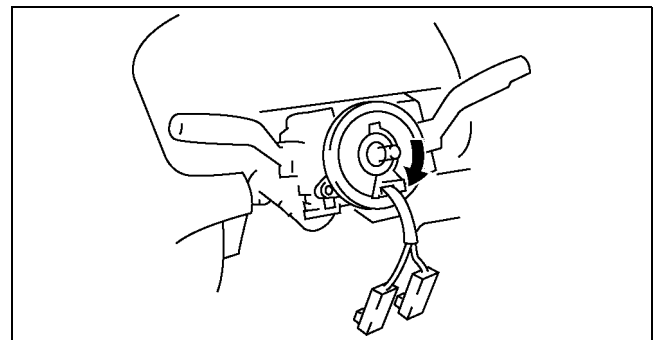
- The adjustment procedure is also specified on the caution label of the clock spring.

1. Set the front wheels straight ahead.

Caution

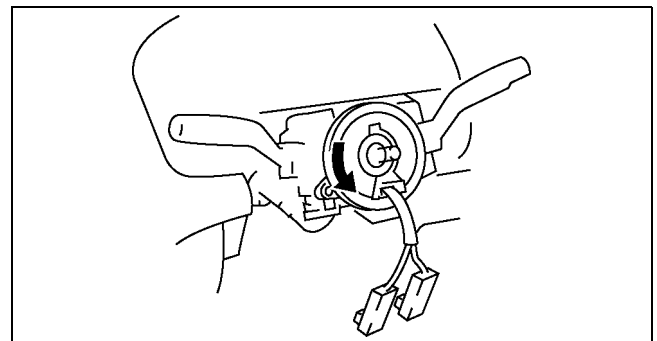
- The clock spring will break if over-wound. Do not forcibly turn the clock spring.

2. Turn the clock spring clockwise until it stops.



A6E8130W046

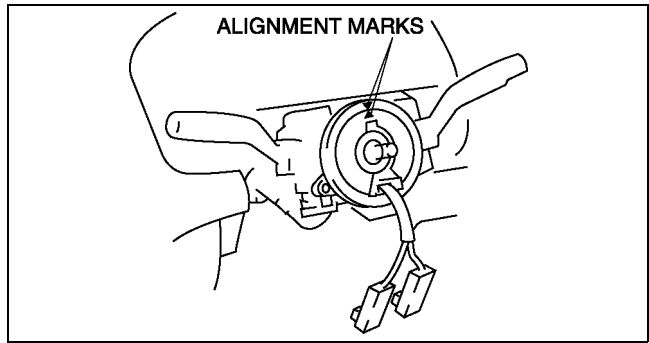
3. Turn the clock spring counterclockwise **2 3/4 turns**.



A6E8130W047

AIR BAG SYSTEM

- Align the mark on the clock spring with the mark on the outer housing.



A6E8130W048

CLOCK SPRING INSPECTION

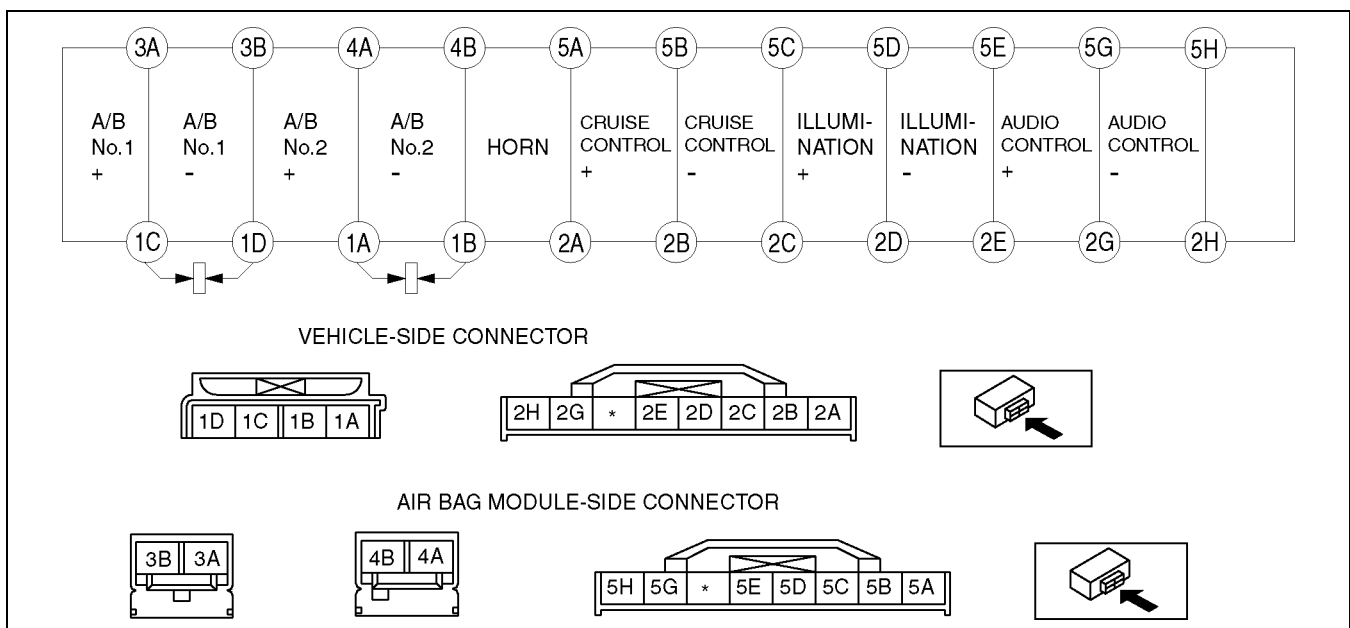
- Remove the clock spring.
- Inspect for continuity between the clock spring terminals using an ohmmeter.
 - If not as specified, replace the clock spring.

A6E813066123W03

○—○: Continuity

Test condition	Terminal																					
	1A	1B	1C	1D	2A	2B	2C	2D	2E	2G	2H	3A	3B	4A	4B	5A	5B	5C	5D	5E	5G	5H
Under any condition	○	○												○	○							
			○	○								○	○									
					○											○						
						○											○					
							○											○				
								○											○			
									○											○		
										○											○	

A6E8130W009



A6E8130W010

Note

- When the vehicle-side connector of clock spring is disconnected, the terminals 1A, 1B, 1C and 1D are shorted to prevent unexpected deployment of the air bag module. When it is connected, the terminals are open.

AIR BAG SYSTEM

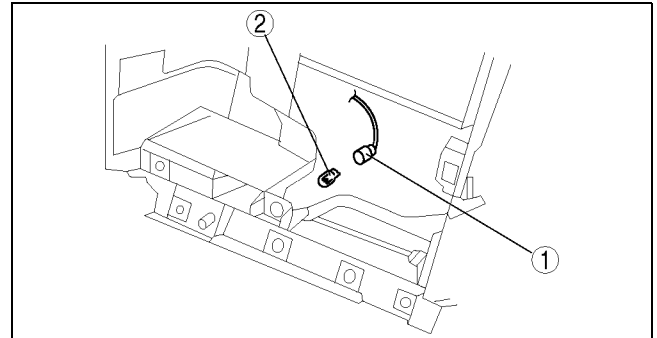
PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT REMOVAL/INSTALLATION

A6E813001046W02

1. Remove the center panel module. (See [T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION](#).)
2. Remove in the order indicated in the table.

1	Socket
2	Passenger-side air bag cut-off indicator light bulb

3. Install in the reverse order of removal.



A6E8130W057

AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES

A6E813057000W01

Warning

- A live (undeployed) air bag module and pre-tensioner seat belt may accidentally deploy when it is disposed of and cause serious injury. Do not dispose of a live (undeployed) air bag module and pre-tensioner seat belt. If the SSTs (Deployment tool and Adapter harness) are not available, consult the nearest Mazda representative for assistance.

Caution

- Deploying the air bag modules and pre-tensioner seat belts inside the vehicle may cause damage to the vehicle interior. When the vehicle is not to be scrapped, always deploy the air bag modules and pre-tensioner seat belts outside the vehicle.
- When the vehicle is to be scrapped, deploy the air bag modules and pre-tensioner seat belts inside the vehicle. (See [T-127 Deployment Procedure for Inside of Vehicle \(Only When Vehicle Is To Be Scrapped\)](#).)
- When the vehicle is not to be scrapped, deploy the air bag modules and pre-tensioner seat belts outside the vehicle. (See [T-131 Deployment Procedure for Outside of Vehicle](#).)

Note

- When disposing of deployed air bag module and pre-tensioner seat belt, refer to the disposal procedure, (See [T-139 AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES](#).)

Deployment Procedure for Inside of Vehicle (Only When Vehicle Is To Be Scrapped)

1. Inspect the SST (Deployment tool). (See [T-140 INSPECTION OF SST \(DEPLOYMENT TOOL\)](#).)
2. Move the vehicle to an open space, away from strong winds, and close all of the vehicle's doors and windows.
3. Turn the ignition switch to LOCK position.
4. Disconnect the negative battery cable and wait for **more than 1 minute**.
5. Follow the appropriate procedure for deploying the driver-side air bag module, passenger-side air bag module, side air bag module, curtain air bag module, or pre-tensioner seat belt.

Driver-side air bag module

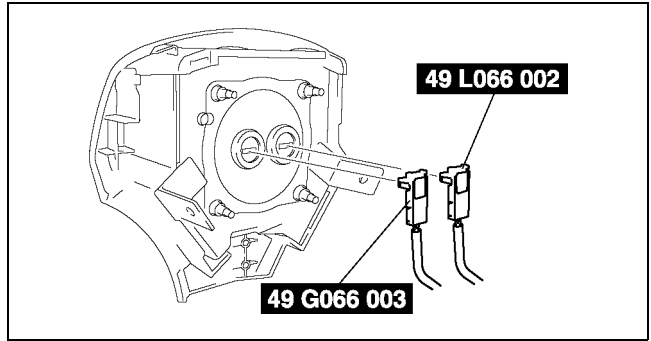
Warning

- Driver-side air bag module is the dual inflator type. When the inflators are forced to be deployed simultaneously, one of them may fail to deploy. When disposing the air bag module, the inflators may be deployed accidentally. Make sure to deploy the inflators sequentially, following the procedures below.

1. Remove the driver-side air bag module. (See [T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)

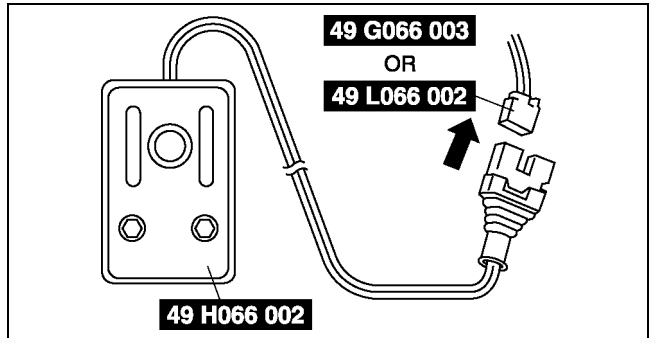
AIR BAG SYSTEM

2. Connect the SST (Adapter harness) to the driver-side air bag module as shown in the figure.
3. Install the driver-side air bag module. (See [T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)



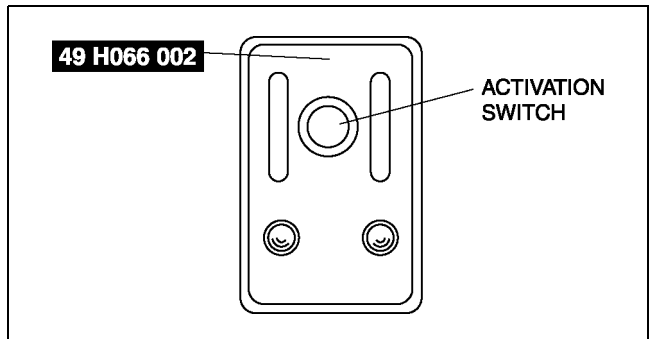
A6E8130W011

4. Connect the **SST** (Deployment tool) to the SST (Adapter harness).
5. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
6. Verify that the red light on the **SST** (Deployment tool) is illuminated.
7. Make sure all persons are standing **at least 6 m {20 ft}** away from the vehicle.



A6E8130W050

8. Press the activation switch on the **SST** (Deployment tool) to deploy the driver-side air bag module.
9. Disconnect the **SST** (Deployment tool) from the **SST** (Adapter harness).
10. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
11. Perform steps 5 through 8, in order to deploy the driver-side air bag module.



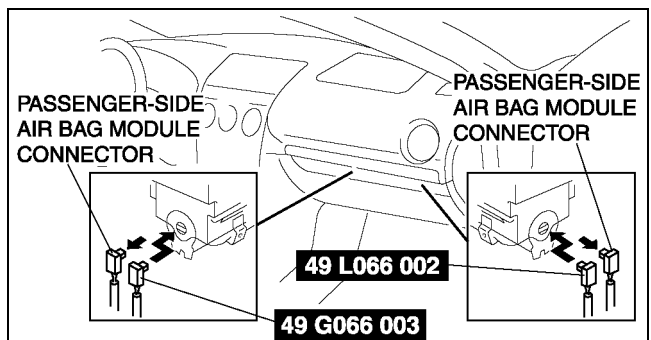
A6E8130W028

Passenger-side air bag module

Warning

- **Passenger-side air bag module is the dual inflator type. When the inflators are forced to be deployed simultaneously, one of them may fail to deploy. When disposing the air bag module, the inflators may be deployed accidentally. Make sure to deploy the inflators sequentially, following the procedures below.**

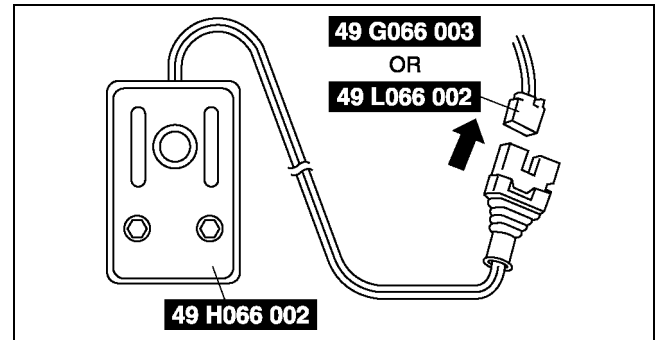
1. Remove the glove compartment.
2. Disconnect the passenger-side air bag module connector.
3. Connect the **SST** (Adapter harness) to the passenger-side air bag module as shown in the figure.



A6E8130W014

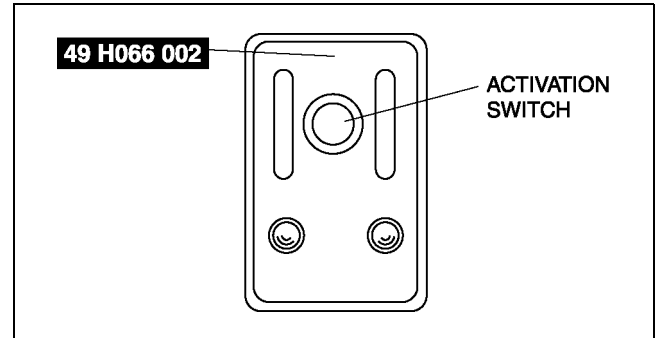
AIR BAG SYSTEM

4. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
5. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
6. Verify that the red light on the **SST** (Deployment tool) is illuminated.
7. Make sure all persons are standing **at least 6 m {20 ft}** away from the vehicle.



A6E8130W050

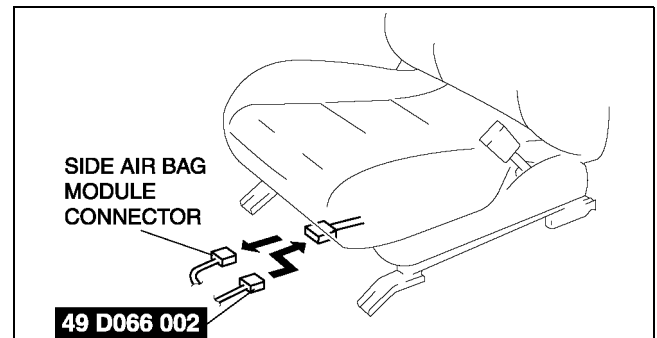
8. Press the activation switch on the **SST** (Deployment tool) to deploy the passenger-side air bag module.
9. Disconnect the **SST** (Deployment tool) from the **SST** (Adapter harness).
10. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
11. Perform steps 5 through 8, in order to deploy the passenger-side air bag module.



A6E8130W028

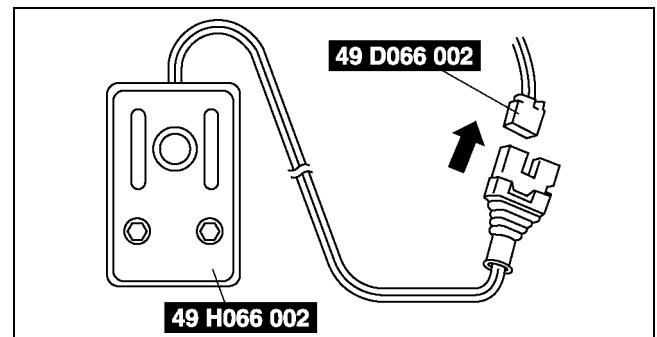
Side air bag module

1. Disconnect the side air bag module connector.
2. Connect the **SST** (Adapter harness) to the side air bag module.



A6E8130W029

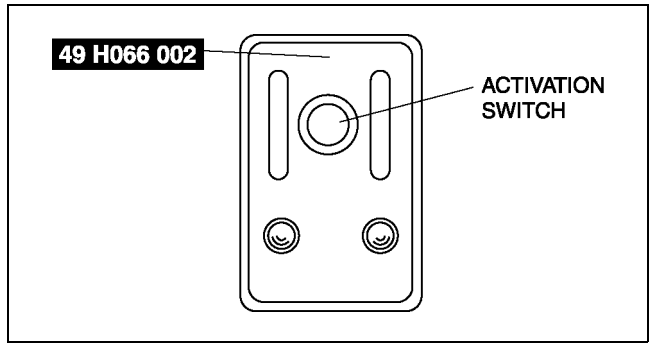
3. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
4. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
5. Verify that the red light on the **SST** (Deployment tool) is illuminated.
6. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W027

AIR BAG SYSTEM

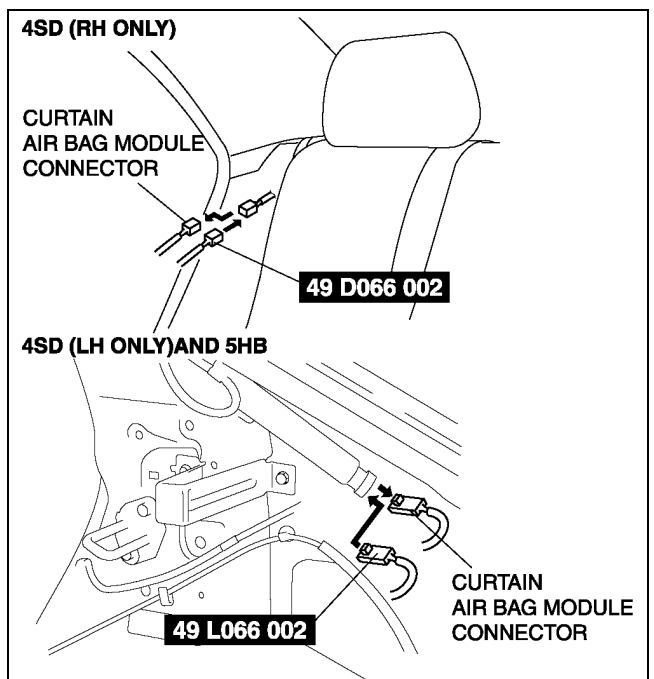
7. Press the activation switch on the **SST** (Deployment tool) to deploy the side air bag module.



A6E8130W028

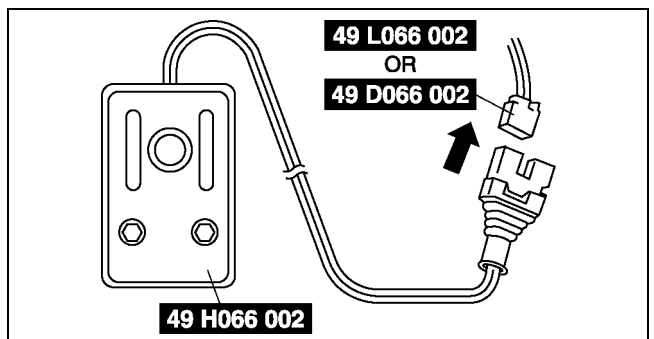
Curtain air bag module

1. Remove the side tire house trim. (4SD)
2. Remove the side trunk side trim. (5HB)
3. Disconnect the curtain air bag module connector.
4. Connect the **SST** (Adapter harness) to the curtain air bag module.



A6E8130W012

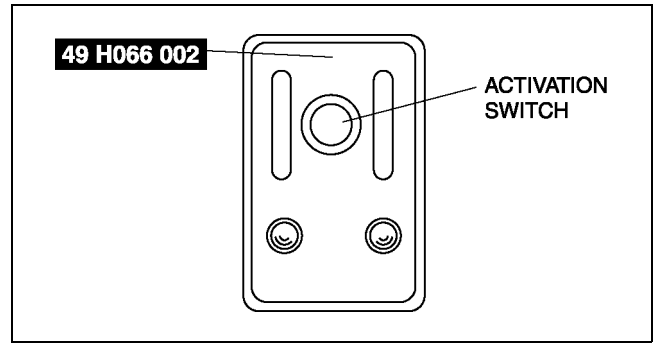
5. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
6. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
7. Verify that the red light on the **SST** (Deployment tool) is illuminated.
8. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W051

AIR BAG SYSTEM

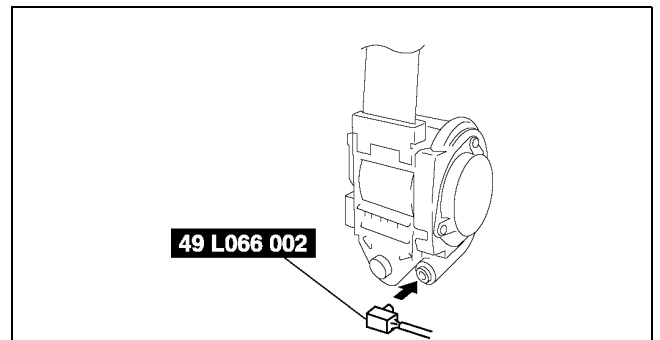
9. Press the activation switch on the **SST** (Deployment tool) to deploy the curtain air bag module.



A6E8130W028

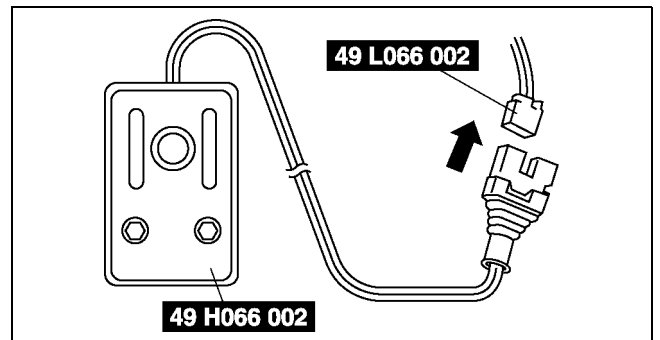
Pre-tensioner seat belt

1. Remove the B-pillar lower trim.
2. Remove the pre-tensioner seat belt and connect the **SST** (Adapter harness) to it as shown in the figure. (See [S-100 FRONT SEAT BELT REMOVAL/INSTALLATION.](#))
3. Install the pre-tensioner seat belt.



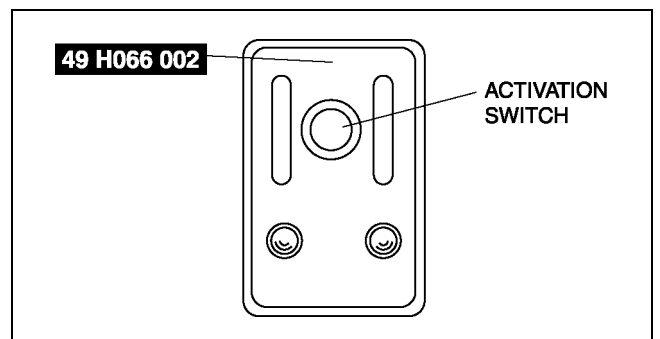
A6E8130W030

4. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
5. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
6. Verify that the red light on the **SST** (Deployment tool) is illuminated.
7. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W052

8. Press the activation switch on the **SST** (Deployment tool) to deploy the pre-tensioner seat belt.



A6E8130W028

Deployment Procedure for Outside of Vehicle

1. Inspect the **SST** (Deployment tool). (See [T-140 INSPECTION OF SST \(DEPLOYMENT TOOL\).](#))
2. Turn the ignition switch to LOCK position.
3. Disconnect the negative battery cable and wait for **more than 1 minute**.
4. Follow the appropriate procedure for deploying the driver-side air bag module, passenger-side air bag module, side air bag module, curtain air bag module, or pre-tensioner seat belt.

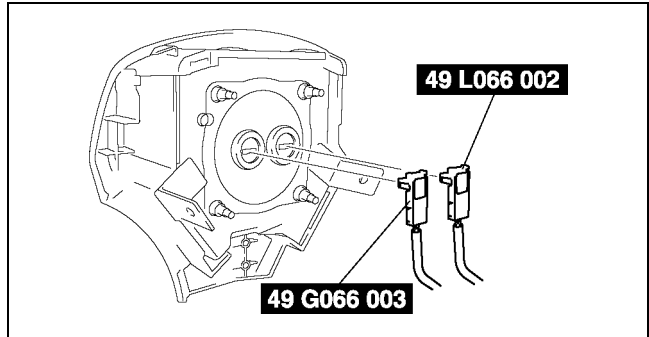
AIR BAG SYSTEM

Driver-side air bag module

Warning

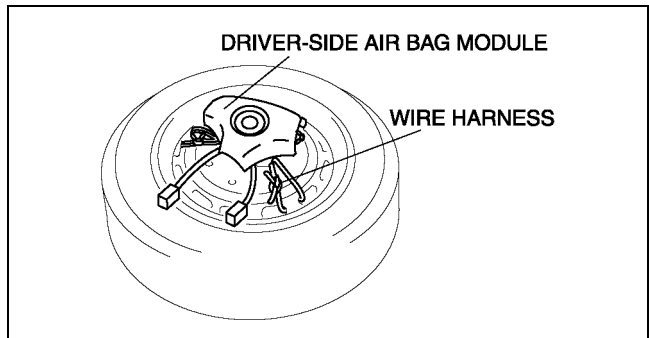
- Driver-side air bag module is the dual inflator type. When the inflators are forced to be deployed simultaneously, one of them may fail to deploy. When disposing the air bag module, the inflators may be deployed accidentally. Make sure to deploy the inflators sequentially, following the procedures below.

1. Remove the driver-side air bag module. (See [T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
2. Connect the **SST** (Adapter harness) to the driver-side air bag module as shown in the figure,



A6E8130W011

3. Place the driver-side air bag module on the center of the tire wheel with the module facing up. To secure the air bag module to the tire wheel, wrap the wire harness through the wheel and around the bolt installation hole at least four times.

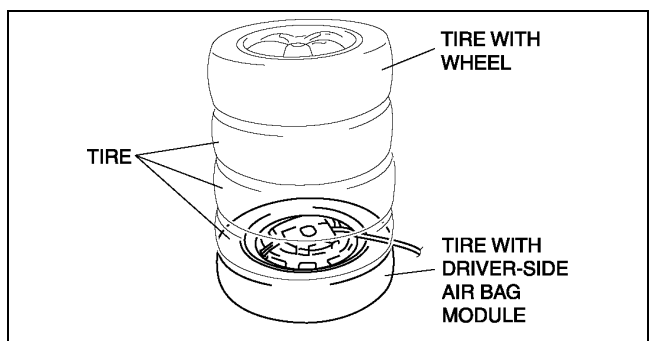


A6E8130W031

Warning

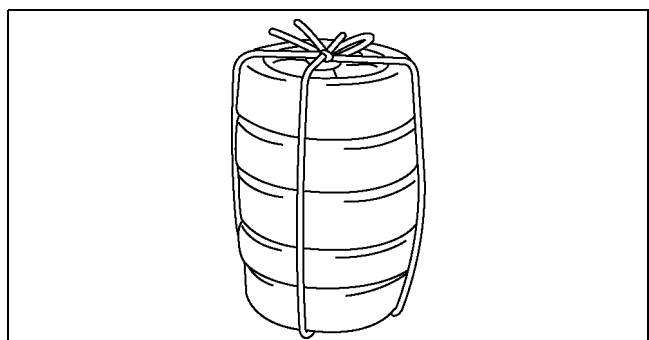
- If the air bag module is not properly installed to the tire wheel, serious injury may occur when the module is deployed. When installing the air bag module to the tire wheel, make sure the module is facing up.

4. Stack three tires on top of the tire with the air bag module. Stack another tire that has a wheel on top of the four tires.



A6E8130W033

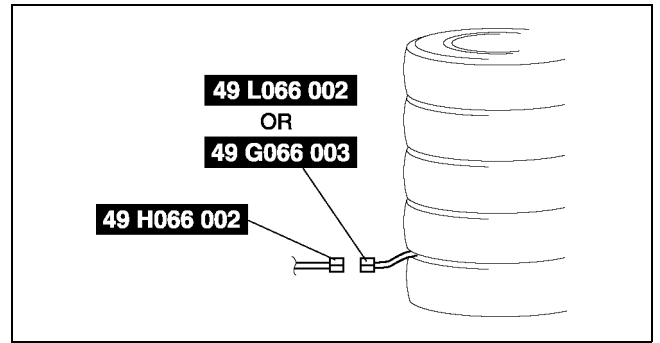
5. Tie all tires together with wire.



A6E8130W034

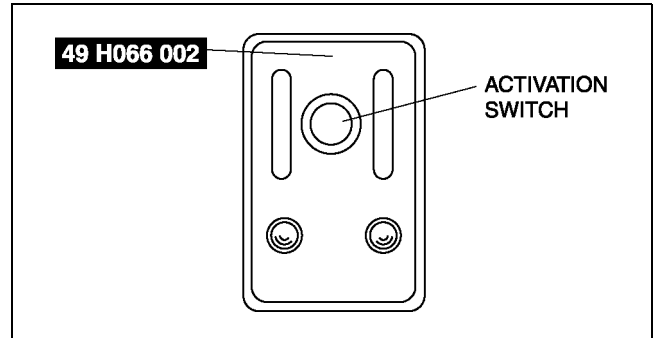
AIR BAG SYSTEM

6. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
7. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
8. Verify that the red light on the **SST** (Deployment tool) is illuminated.
9. Make sure all persons are standing **at least 6 m {20 ft}** away from the vehicle.



A6E8130W032

10. Press the activation switch on the **SST** (Deployment tool) to deploy the driver-side air bag module.
11. Disconnect the **SST** (Deployment tool) from the **SST** (Adapter harness).
12. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
13. Perform steps 7 through 10, in order to deploy the driver-side air bag module.



A6E8130W028

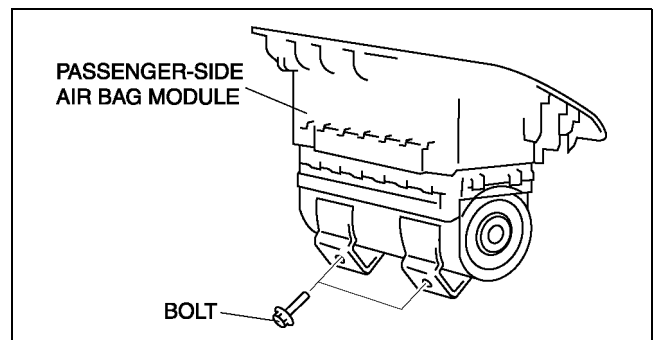
Passenger-side air bag module

Warning

- **Passenger-side air bag module is the dual inflator type. When the inflators are forced to be deployed simultaneously, one of them may fail to deploy. When disposing the air bag module, the inflators may be deployed accidentally. Make sure to deploy the inflators sequentially, following the procedures below.**

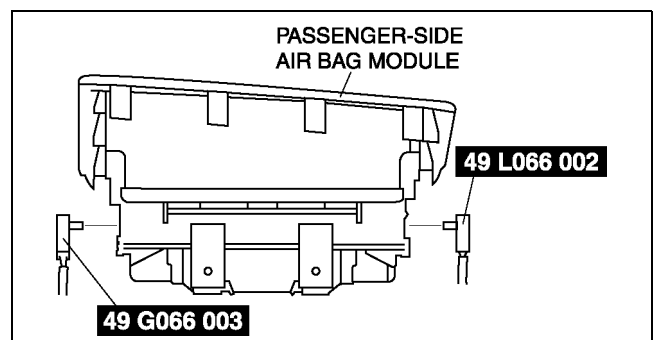
T

1. Remove the passenger-side air bag module. (See [T-121 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)
2. Install the bolts to the passenger-side air bag module.



A6E8130W035

3. Connect the **SST** (Adapter harness) to the passenger-side air bag module as shown in the figure.



A6E8130W015

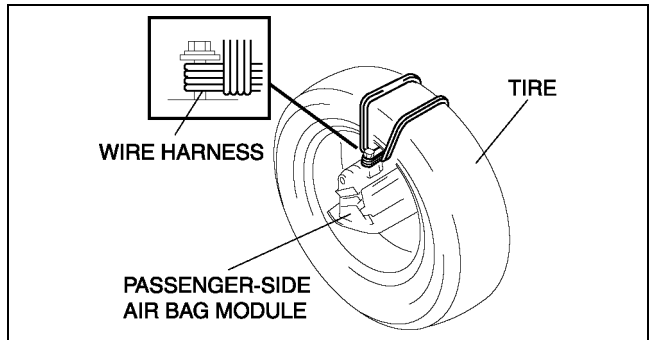
AIR BAG SYSTEM

4. Tie the passenger-side air bag module to the tire with the module facing the center of the tire. Wrap the wire harness through the tire and around the bolts **at least four times**.

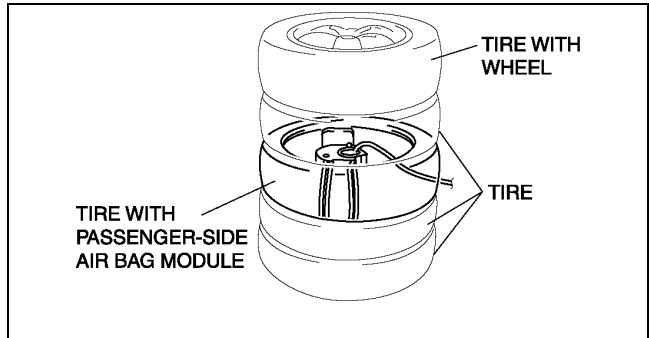
Warning

- If the air bag module is not properly installed to the tire, serious injury may occur when the module is deployed. When installing the air bag module to the tire, make sure the module is facing the center of the tire.

5. Stack the tire with the passenger-side air bag module on top of two tires. Stack another tire that has a wheel on top of the four tires.

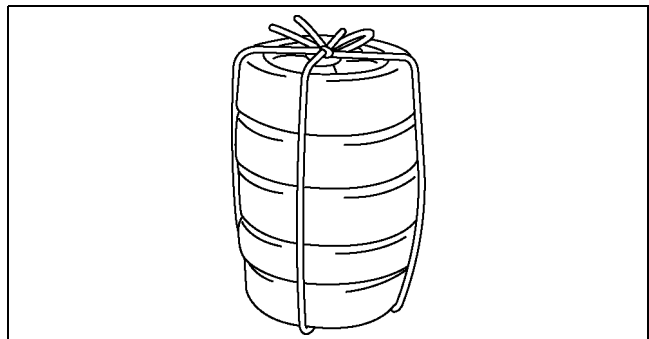


A6E8130W036



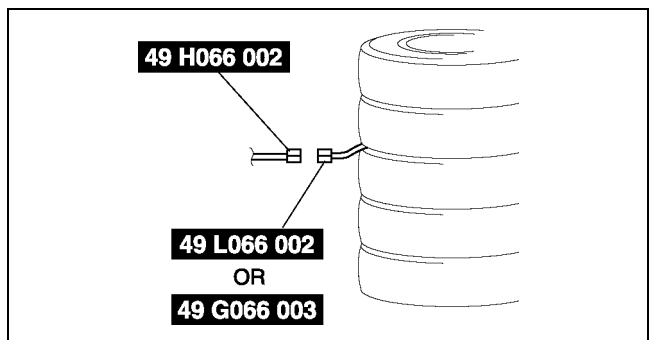
A6E8130W037

6. Tie all tires together with wire.



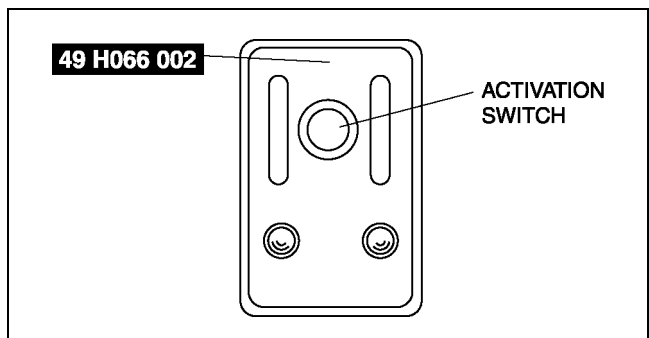
A6E8130W034

7. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
8. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
9. Verify that the red light on the **SST** (Deployment tool) is illuminated.
10. Make sure all persons are standing **at least 6 m {20 ft}** away from the vehicle.



A6E8130W038

11. Press the activation switch on the **SST** (Deployment tool) to deploy the passenger-side air bag module.
12. Disconnect the **SST** (Deployment tool) from the **SST** (Adapter harness).
13. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
14. Perform steps 8 through 11, in order to deploy the passenger-side air bag module.

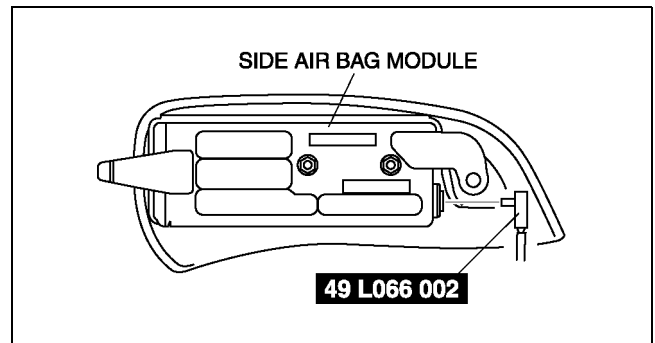


A6E8130W028

AIR BAG SYSTEM

Side air bag module

1. Remove the side air bag module. (See [T-121 SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
2. Connect the **SST** (Adapter harness) to the side air bag module as shown in the figure.

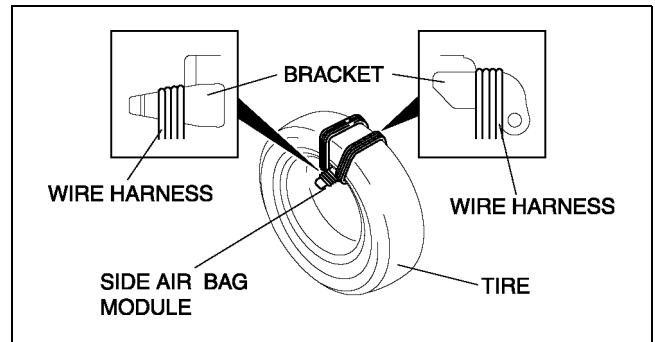


A6E8130W016

3. Tie the side air bag module to the tire with the module facing the center of the tire. Wrap the wire harness through the tire and around the bracket at least four times.

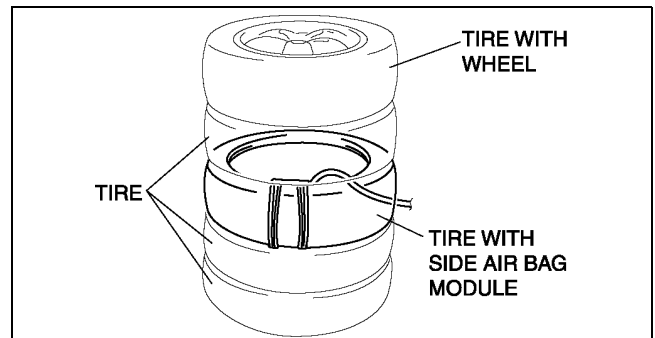
Warning

- If the air bag module is not properly installed to the tire, serious injury may occur when the module is deployed. When installing the air bag module to the tire, make sure the module is facing the center of the tire.



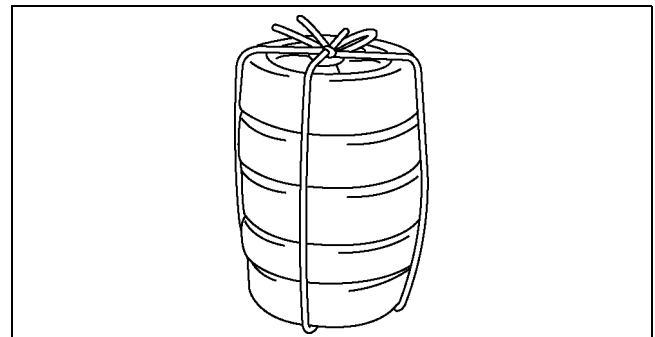
A6E8130W017

4. Stack the tire with the side air bag module on top of two tires. Stack a tire on top of three tires. Stack another tire that has a wheel on top of the four tires.



A6E8130W053

5. Tie all tires together with wire.

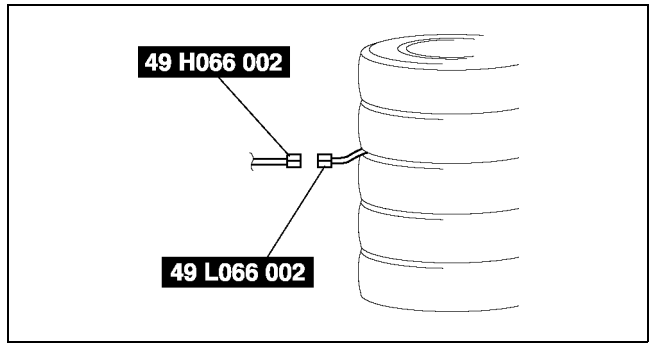


A6E8130W034

T

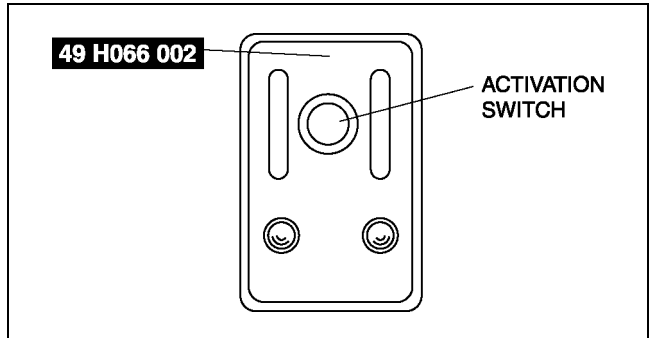
AIR BAG SYSTEM

6. Control the **SST** (Deployment tool) to the **SST** (Adapter harness).
7. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
8. Verify that the red light on the **SST** (Deployment tool) is illuminated.
9. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W054

10. Press the activation switch on the **SST** (Deployment tool) to deploy the side air bag module.



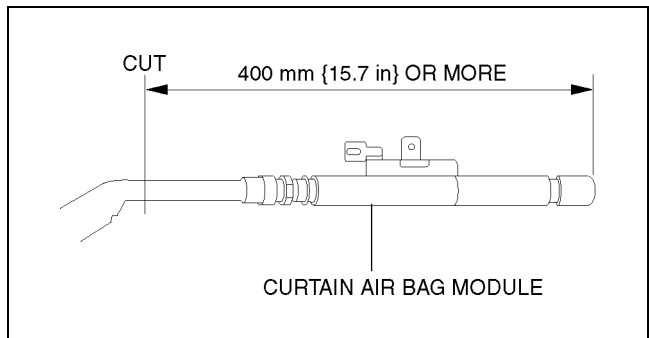
A6E8130W028

Curtain air bag module

1. Remove the curtain air bag module. (See [T-122 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION.](#))
2. Secure the curtain air bag module in a vise, and cut off the deployment section, as shown in the figure.

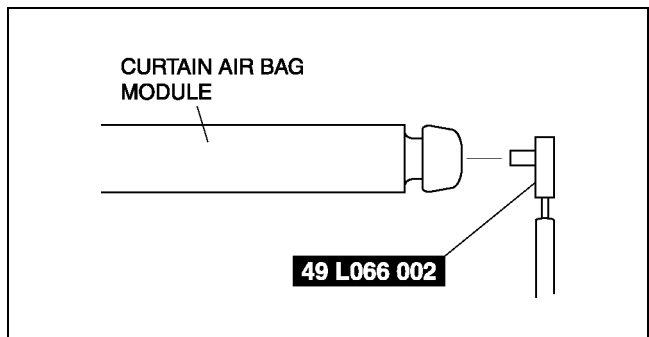
Warning

- Be sure not to collapse the pipe on the side where it is cut. If it is collapsed, the interior pressure of the pipe will build up and can cause it to explode during air bag module deployment.



A6E8130W013

3. Connect the **SST** (Adapter harness) to the curtain air bag module as shown in the figure. (5HB)



A6E8130W040

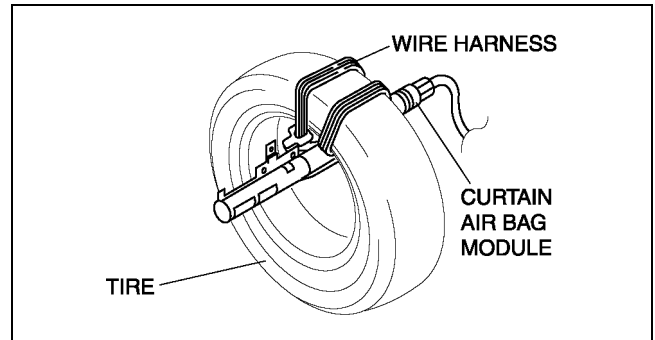
AIR BAG SYSTEM

4. Tie the side air bag module to the tire with the module facing the center of the tire. Wrap the wire harness through the tire and around the bracket at least four times.

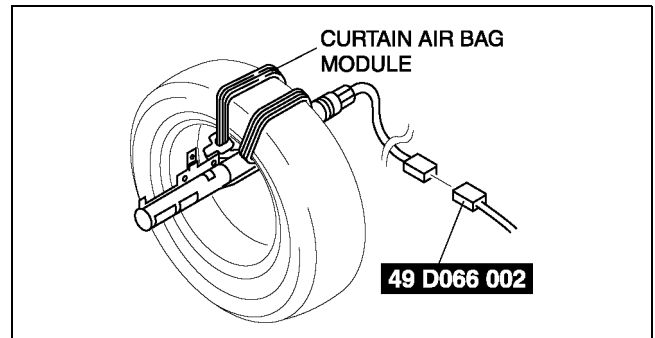
Warning

- If the air bag module is not properly installed to the tire, serious injury may occur when the module is deployed. When installing the air bag module to the tire, make sure the module is facing the downward.

5. Connect the **SST** (Adapter harness) to the curtain air bag module as shown in the figure. (4SD, RH only)

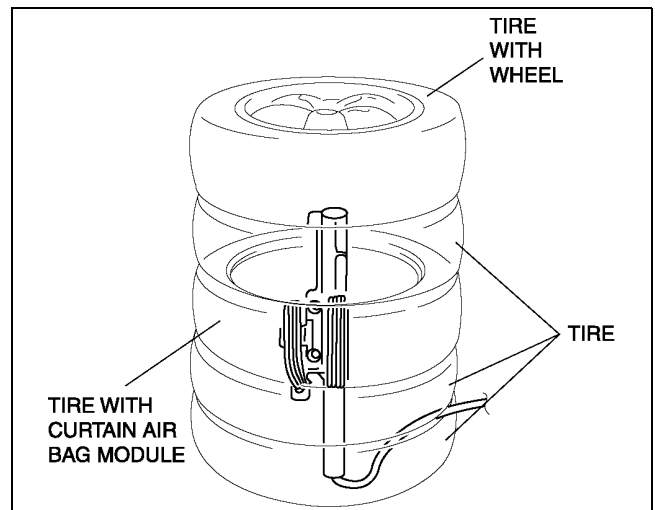


A6E8130W018



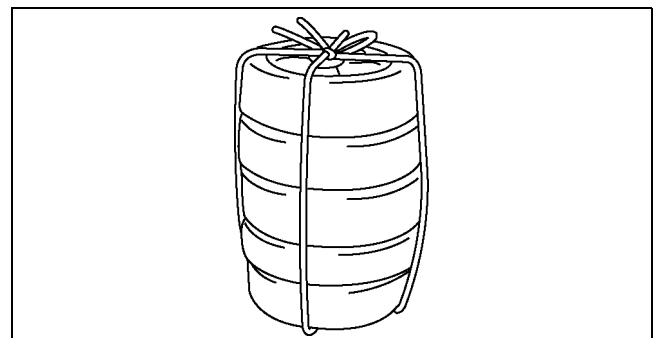
A6E8130W019

6. Stack the tire with the curtain air bag module on top of two tires. Stack a tire on top of three tires. Stack another tire that has a wheel on top of the four tires.



A6E8130W020

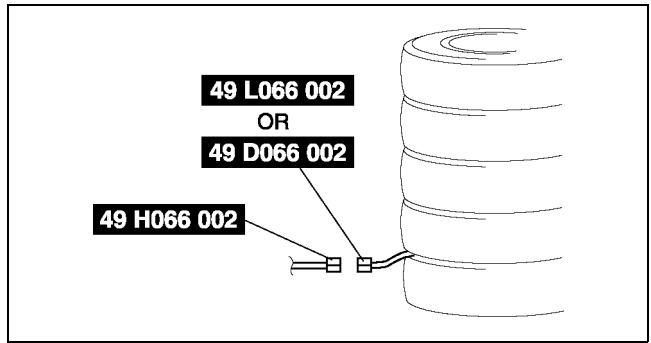
7. Tie all tires together with wire.



A6E8130W034

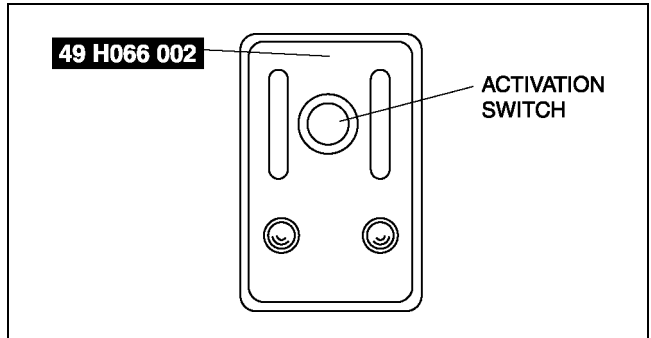
AIR BAG SYSTEM

8. Control the **SST** (Deployment tool) to the **SST** (Adapter harness).
9. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
10. Verify that the red light on the **SST** (Deployment tool) is illuminated.
11. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W055

12. Press the activation switch on the **SST** (Deployment tool) to deploy the curtain air bag module.



A6E8130W028

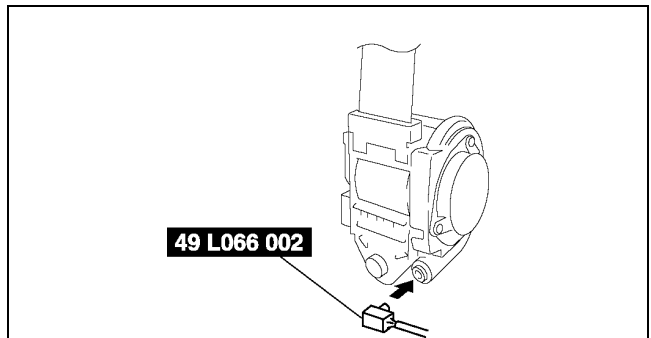
Pre-tensioner seat belt

1. Remove the pre-tensioner seat belt. (See [S-100 FRONT SEAT BELT REMOVAL/INSTALLATION.](#))

Warning

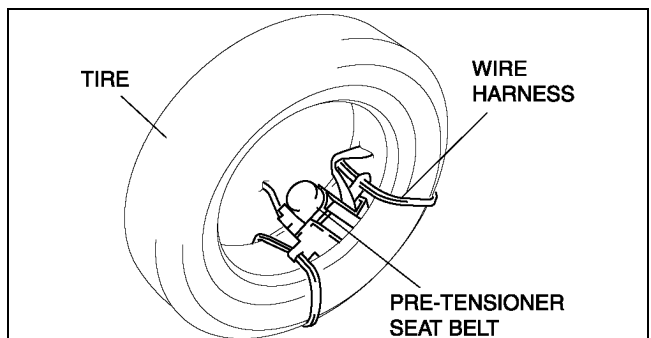
- If the pre-tensioner seat belt is not properly installed to the tire, serious injury may occur when the pre-tensioner part is deployed. When installing the pre-tensioner seat belt to the tire, make sure the pre-tensioner part is inside the tire.

2. Connect the **SST** (Adapter harness) to the pre-tensioner seat belt as shown in the figure.



A6E8130W030

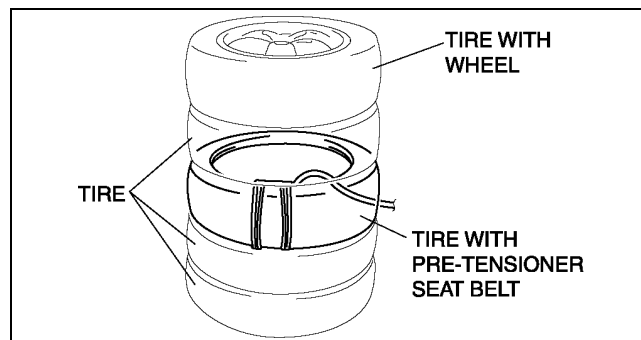
3. With the pre-tensioner part inside the tire, tie the pre-tensioner seat belt to the tire. Wrap the wire harness through the tire and around the pre-tensioner seat belt **at least four times**.



A6E8130W041

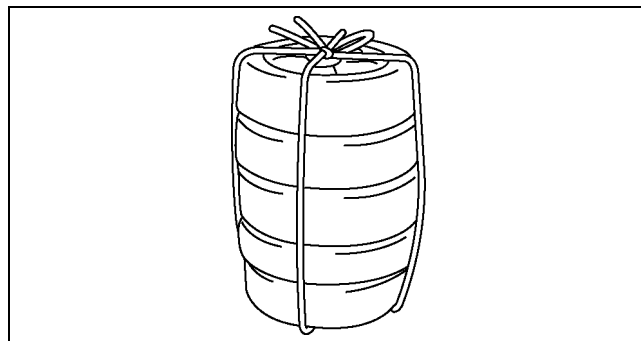
AIR BAG SYSTEM

4. Stack the tire with the pre-tensioner seat belt on top of two tires. Stack a tire on top of the three tires. Stack another tire that has a wheel on top of the four tires.



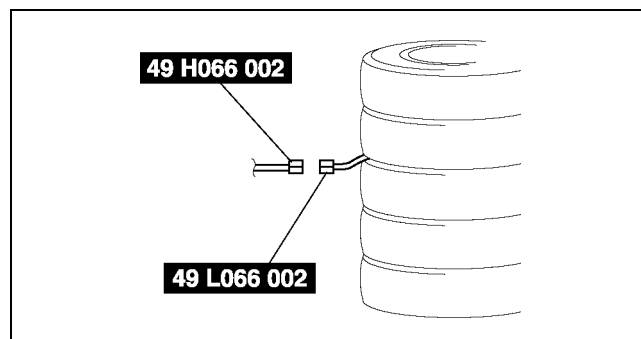
A6E8130W039

5. Tie all tires together with wire.



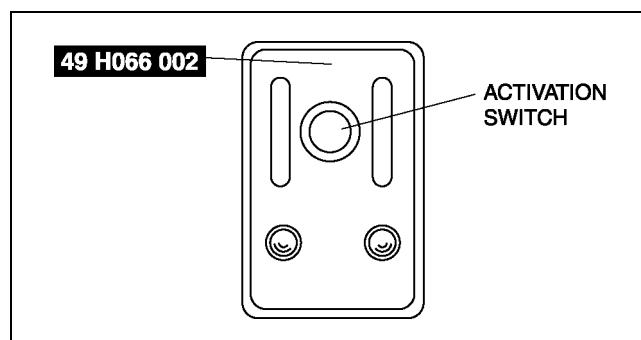
A6E8130W034

6. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).
7. Connect the red clip of the **SST** (Deployment tool) to the positive battery terminal and the black clip to the negative battery terminal.
8. Verify that the red light on the **SST** (Deployment tool) is illuminated.
9. Make sure all persons are standing **at least 6 m {20 ft}** from the vehicle.



A6E8130W054

10. Press the activation switch on the **SST** (Deployment tool) to deploy the pre-tensioner seat belt.



A6E8130W028

AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES

A6E813057000W02

Warning

- Before scrapping a vehicle with a live (undeployed) air bag module and pre-tensioner seat belt, deploy the air bag module and pre-tensioner seat belt. Never dispose of a live (undeployed) air bag module and pre-tensioner seat belt.
- The air bag module and the pre-tensioner seat belt are very hot immediately after they are deployed. You can get burned. Do not touch the air bag module and pre-tensioner seat belt for at least 15 minutes after deployment.
- Pouring water on the deployed air bag module and pre-tensioner seat belt is dangerous. The water will mix with the residual gases to form a gas that can make breathing difficult. Do not pour water on the deployed air bag module and pre-tensioner seat belt.

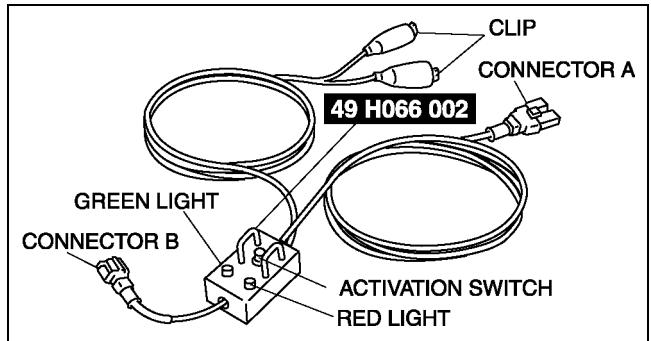
AIR BAG SYSTEM

- The deployed air bag module and pre-tensioner seat belt may contain deposits of sodium hydroxide, a caustic byproduct of the gas-generated combustion. If this substance gets into your eyes or on your hands, it can cause irritation and itching. When handling the deployed air bag module and pre-tensioner seat belt, wear gloves and safety glasses.
- Due to the adoption of 2-step deployment control in both the driver and passenger-side air bag modules, depending on the impact force, it is possible that inflator No. 2 might not deploy. In such cases, before disposing of the air bag module, make sure to follow the inflator deployment procedures and verify complete deployment of inflator No. 1 and 2.

1. Put on gloves and safety glasses.
2. Put the deployed air bag module or pre-tensioner seat belt in a plastic bag, seal it, and then dispose of it.
3. Wash your hands after removing your gloves.

INSPECTION OF SST (DEPLOYMENT TOOL)

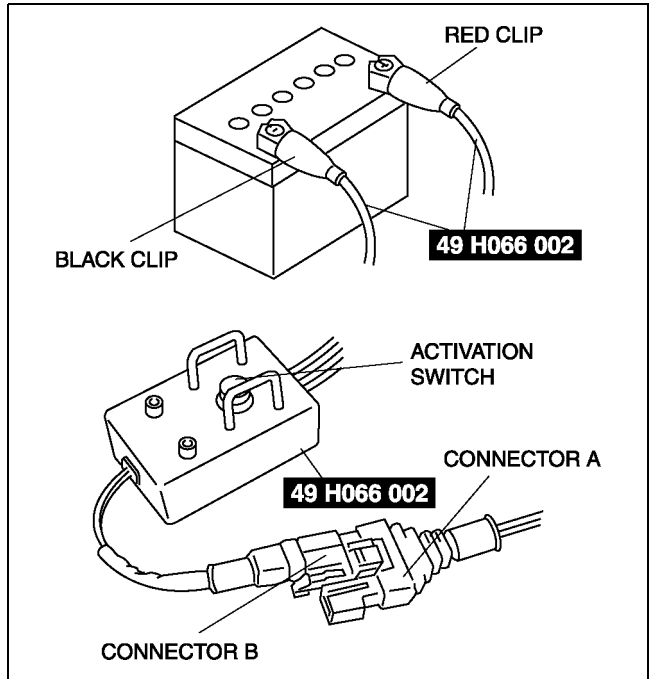
- Use the **SST** (Deployment tool) to deploy a live (undeployed) air bag module or pre-tensioner seat belt before disposing of it.
- Before using the **SST** (Deployment tool), inspect its operation.



Inspection Procedure

1. Follow the steps below to verify that the SST (Deployment tool) is operating correctly.
 - If not as specified, do not use the **SST** (Deployment tool) because it may cause the air bag module or pre-tensioner seat belt to unexpectedly deploy upon connection to the air bag module or pre-tensioner seat belt.

Step	Inspection procedure	Light condition	
		Green	Red
1	Connect red clip to positive battery terminal and black clip to negative battery terminal.	On	Off
2	Connect connectors A and B of SST (Deployment tool).	Off	On
3	Press activation switch.	On	Off



ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

MULTIPLEX COMMUNICATION SYSTEM

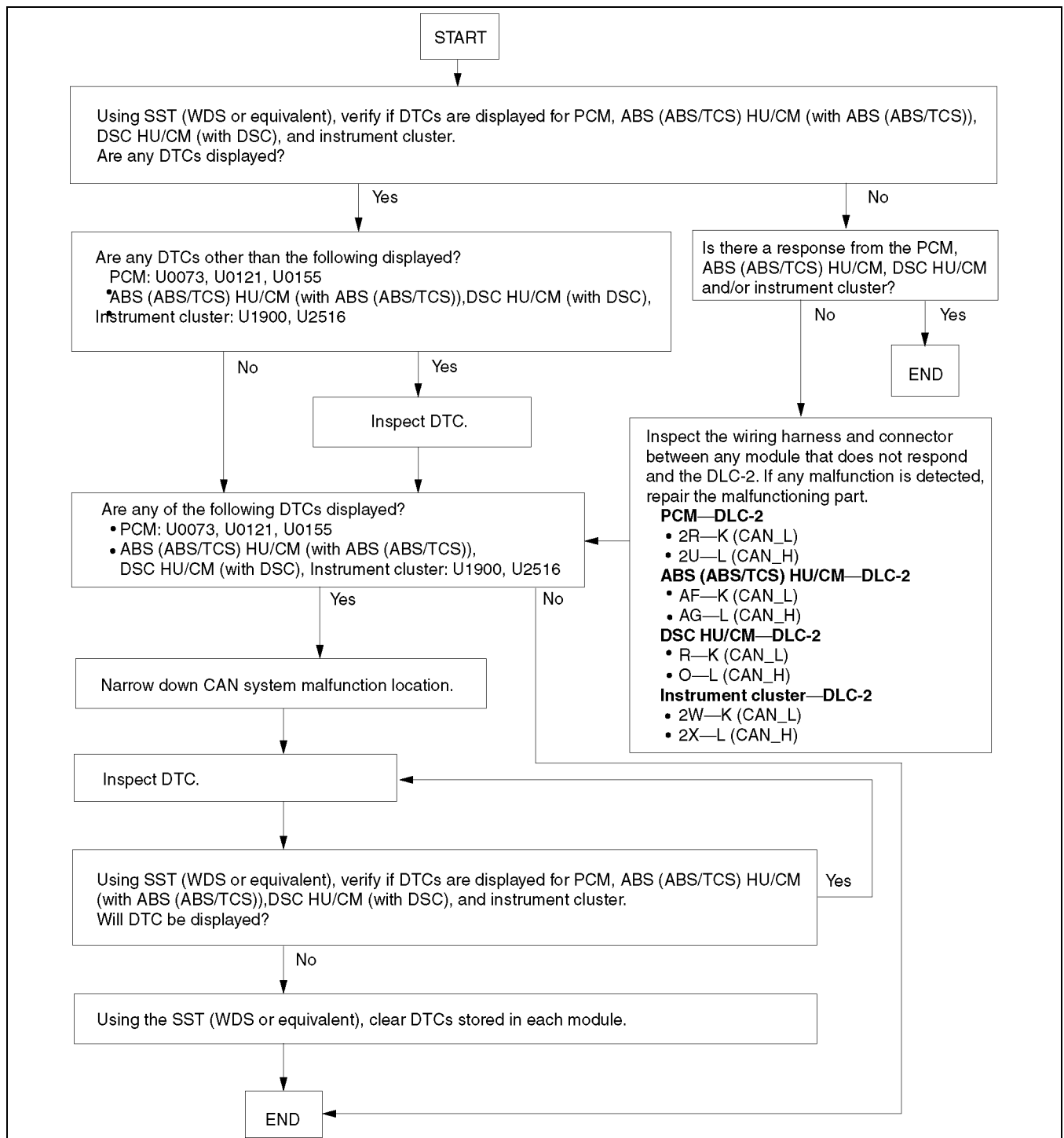
A6E816255430W01

Outline

- In case the controller area network (CAN) system is malfunctioning, read the DTCs of the following modules, using the **SST** (WDS or equivalent) to determine the malfunctioning system.
 - PCM
 - DSC HU/CM (with DSC)
 - ABS (ABS/TCS) HU/CM (with ABS (ABS/TCS))
 - Instrument cluster

Flowchart

- Use the following flowchart to verify the cause of the trouble.



A6E8162W001

ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

DTC TABLE

A6E816255430W02

DTC	Malfunction location	Related module	Page
U0073	CAN system communication error	PCM	(See T-144 DTC U0073, U1900, U2516)
U0121	Communication error to ABS (ABS/TCS) HU/CM or DSC HU/CM		—
U0155	Communication error to instrument cluster		—
U1900	CAN system communication error	- ABS (ABS/TCS) HU/CM (with ABS (ABS/TCS)) - DSC HU/CM (with DSC) - Instrument cluster	(See T-144 DTC U0073, U1900, U2516)
U2516	CAN system wiring harness open and short circuit		

PID/DATA MONITOR TABLE

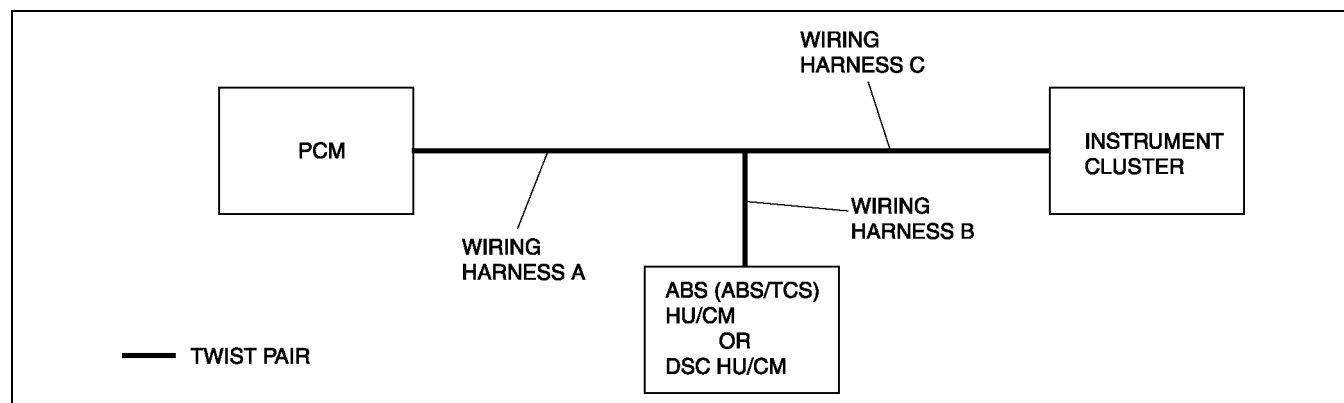
A6E816255430W03

PID name (definition)	Condition	Specification	Related module	Terminal
IC_MSG (Missing message from the instrument cluster)	Present	Circuit in the instrument cluster is normal.	ABS (ABS/TCS) HU/CM or DSC HU/CM	• ABS (ABS/TCS) HU/CM: O, R • DSC HU/CM: AF, AG • Instrument cluster: 2W, 2X
	Not Present	Circuit in the instrument cluster is abnormal.		
ABS_MSG (Missing message from the ABS (ABS/TCS) HU/CM or DSC HU/CM)	Present	Circuit in the ABS (ABS/TCS) HU/CM or DSC HU/CM is normal.	Instrument cluster	
	Not Present	Circuit in the ABS (ABS/TCS) HU/CM or DSC HU/CM is abnormal.		
PCM_MSG (Missing message from the PCM)	Present	Circuit in the PCM is normal.	• ABS (ABS/TCS) HU/CM or DSC HU/CM • Instrument cluster	
	Not Present	Circuit in the PCM is abnormal.		

PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION

A6E816255430W04

System Wiring Diagram



A6E8162W002

ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

PCM

1. Check the display of DTC U0121 and/or U0155, using the **SST** (WDS or equivalent). (See [T-142 DTC TABLE.](#))
2. Referring to the following table, determine the malfunctioning part of the CAN system.

X: Normal

—: Communication error

Module	Communication status		Malfunction location
	• ABS (ABS/TCS) HU/CM • DSC HU/CM	Instrument cluster	
PCM	—	—	• Wiring harness A • PCM
	—	X	• Wiring harness B • ABS (ABS/TCS) HU/CM • DSC HU/CM
	X	—	• Wiring harness C • Instrument cluster

ABS/TCS HU/CM or DSC HU/CM

1. Access and monitor the “PCM MSG” and “IC MSG” of PID using the **SST** (WDS or equivalent).
2. Referring to the PID/DATA MONITOR, confirm the display status of the PID. (See [T-142 PID/DATA MONITOR TABLE.](#))
3. Referring to the following table, determine the malfunctioning part of the CAN system.

X: Normal

—: Communication error

Module	Communication status		Malfunction location
	PCM	Instrument cluster	
• ABS (ABS/TCS) HU/CM • DSC HU/CM	—	—	• Wiring harness B • ABS (ABS/TCS) HU/CM • DSC HU/CM
	—	X	• Wiring harness A • PCM
	X	—	• Wiring harness C • Instrument cluster

Instrument Cluster

1. Access and monitor the “PCM MSG” and “ABS MSG” of PID using the **SST** (WDS or equivalent).
2. Referring to the PID/DATA MONITOR, confirm the display status of the PID. (See [T-142 PID/DATA MONITOR TABLE.](#))
3. Referring to the following table, determine the malfunctioning part of the CAN system.

X: Normal

—: Communication error

Module	Communication status		Malfunction location
	PCM	• ABS (ABS/TCS) HU/CM • DSC HU/CM	
Instrument cluster	—	—	• Wiring harness C • Instrument cluster
	—	X	• Wiring harness A • PCM
	X	—	• Wiring harness B • ABS (ABS/TCS) HU/CM • DSC HU/CM

ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

DTC U0073, U1900, U2516

A6E816255430W05

DTC	U0073	CAN system communication error
	U1900	
	U2516	
DETECTION CONDITION		Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - CAN system related harness malfunction - Related module communication error
POSSIBLE CAUSE		- Open or short circuit in wiring harness - Malfunction of connectors between PCM, ABS (ABS/TCS) HU/CM or DSC HU/CM and Instrument cluster - PCM malfunction - ABS (ABS/TCS) HU/CM malfunction (with ABS (ABS/TCS)) - DSC HU/CM malfunction (with DSC) - Instrument cluster malfunction

```

graph LR
    PCM[PCM] ---|WIRING HARNESS A| Bus
    Bus ---|WIRING HARNESS B| ABS[ABS (ABS/TCS) HU/CM OR DSC HU/CM]
    Bus ---|WIRING HARNESS C| IC[INSTRUMENT CLUSTER]
    style Bus width:0px,height:0px
  
```

— TWIST PAIR

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	DETERMINING THE LOCATION OF A MALFUNCTION - Determine the malfunctioning part of the CAN system. (See T-142 PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION) - Is the malfunctioning part the wiring harness C or the instrument cluster?	Yes	Go to Step 4.
		No	Go to next step.
2	DETERMINING THE LOCATION OF A MALFUNCTION - Is the malfunctioning part the wiring harness B or the ABS (ABS/TCS) HU/CM? (with ABS (ABS/TCS)) - Is the malfunctioning part the wiring harness B or the DSC HU/CM? (with DSC)	Yes	Go to Step 8.
		No	Go to next step.
3	DETERMINING THE LOCATION OF A MALFUNCTION Is the malfunctioning part the wiring harness A or the PCM?	Yes	Go to Step 12.
		No	Troubleshooting completed.
4	INSPECT INSTRUMENT CLUSTER CONNECTOR - Disconnect negative battery cable. - Disconnect instrument cluster connector. - Is poor connection detection bars of instrument cluster connector okay?	Yes	Go to next step.
		No	Replace wiring harness.
5	Is vehicle equipped with DSC?	Yes	Go to next step.
		No	Go to Step 7.

ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

STEP	INSPECTION	ACTION	
6	INSPECT WIRING HARNESS BETWEEN DSC HU/CM AND INSTRUMENT CLUSTER - Disconnect DSC HU/CM connector. - Inspect following wiring harness between DSC HU/CM and instrument cluster terminals for short to ground, short power supply, and open circuit: — AF—2W (CAN_L) — AG—2X (CAN_H) - Is wiring harness okay?	Yes	Replace instrument cluster, then go to Step 16.
		No	Replace wiring harness.
7	INSPECT WIRING HARNESS BETWEEN ABS (ABS/TCS) HU/CM AND INSTRUMENT CLUSTER - Disconnect ABS (ABS/TCS) HU/CM connector. - Inspect following wiring harness between ABS (ABS/TCS) HU/CM and instrument cluster terminals for short to ground, short power supply, and open circuit: — R—2W (CAN_L) — O—2X (CAN_H) - Is wiring harness okay?	Yes	Replace instrument cluster, then go to Step 16.
		No	Replace wiring harness.
8	INSPECT ABS (ABS/TCS) HU/CM OR DSC HU/CM CONNECTOR - Disconnect negative battery cable. - Disconnect ABS (ABS/TCS) HU/CM or DSC HU/CM connector. - Is poor connection detection bars of ABS (ABS/TCS) HU/CM or DSC HU/CM connector okay?	Yes	Go to next step.
		No	Replace wiring harness.
9	Is vehicle equipped with DSC?	Yes	Go to next step.
		No	Go to Step 11.
10	INSPECT WIRING HARNESS BETWEEN DSC HU/CM AND INSTRUMENT CLUSTER - Disconnect instrument cluster connector. - Inspect following wiring harness between DSC HU/CM and instrument cluster terminals for short to ground, short power supply, and open circuit: — AF—2W (CAN_L) — AG—2X (CAN_H) - Is wiring harness okay?	Yes	Replace DSC HU/CM , then go to Step 16.
		No	Replace wiring harness.
11	INSPECT WIRING HARNESS BETWEEN ABS (ABS/TCS) HU/CM AND INSTRUMENT CLUSTER - Disconnect instrument cluster connector. - Inspect following wiring harness between ABS (ABS/TCS) HU/CM and instrument cluster terminals for short to ground, short power supply, and open circuit: — R—2W (CAN_L) — O—2X (CAN_H) - Is wiring harness okay?	Yes	Replace ABS (ABS/TCS) HU/CM , then go to Step 16.
		No	Replace wiring harness.
12	INSPECT PCM CONNECTOR - Disconnect negative battery cable. - Disconnect PCM connector. - Is poor connection detection bars of PCM connector okay?	Yes	Go to next step.
		No	Replace wiring harness.
13	Is vehicle equipped with DSC?	Yes	Go to next step.
		No	Go to Step 15.

ON-BOARD DIAGNOSTIC [MULTIPLEX COMMUNICATION SYSTEM]

STEP	INSPECTION	ACTION	
14	INSPECT WIRING HARNESS BETWEEN PCM AND DSC HU/CM • Disconnect negative battery cable. • Disconnect DSC HU/CM connector. • Inspect following wiring harness between PCM and DSC HU/CM terminals for short to ground, short power supply, and open circuit: — 2R—AF (CAN_L) — 2U—AG (CAN_H) • Is wiring harness okay?	Yes	Replace PCM, then go to Step 16.
		No	Replace wiring harness.
15	INSPECT WIRING HARNESS BETWEEN PCM AND ABS (ABS/TCS) HU/CM • Disconnect negative battery cable. • Disconnect ABS (ABS/TCS) HU/CM connector. • Inspect following wiring harness between PCM and ABS (ABS/TCS) HU/CM terminals for short to ground, short power supply, and open circuit: — 2R—R (CAN_L) — 2U—O (CAN_H) • Is wiring harness okay?	Yes	Replace PCM, then go to next step.
		No	Replace wiring harness.
16	CHECK DTC INDICATE • Connect PCM connector. • Connect ABS (ABS/TCS) HU/CM or DSC HU/CM connector. • Connect instrument cluster connector. • Clear DTC from module memory using SST (WDS or equivalent). • Perform KOEO/KOER self-test. • Are DTCs U0073, U1900 and/or U2516 indicated?	Yes	Repeat from Step 1.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

FOREWORD

A6E816467000W01

Outline

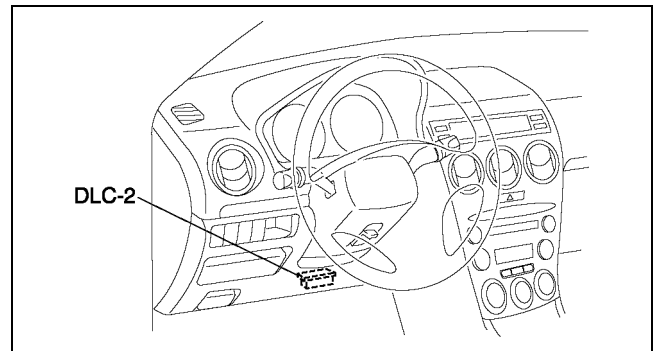
- The OBD (on-board diagnostic) test inspects the integrity and function of the headlight auto leveling system and output the results when requested by the specific tests.
- OBD test also:
 - Provides a quick inspection of the headlight auto leveling system.
 - Is usually performed at the start of each diagnostic procedure.
 - Provides verification after repairs to ensure that no other faults occurred during service.
- Diagnostic DTC can be read/cleared, using the **SST** (WDS or equivalent).

Read/clear diagnostic results

- This function allows you to read or clear DTCs in the auto leveling control unit (main) memory.

Reading DTCs Procedure Using WDS or equivalent

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector.
2. Retrieve DTC by WDS or equivalent.



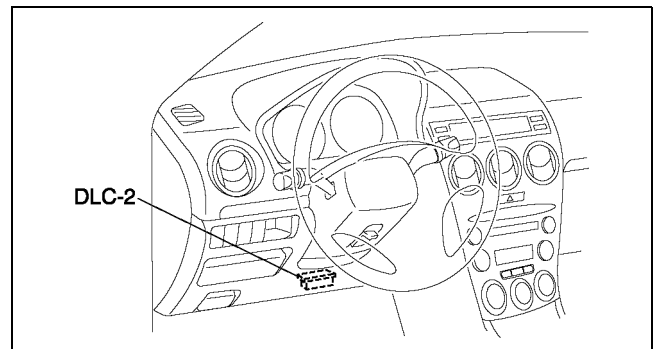
A6E3970W002

Clearing DTCs Procedures Using WDS or equivalent

1. After repairs have been made, perform the **DTCs reading procedure**.
2. Erase DTC by WDS or equivalent.
3. Ensure that the customer's concern has been resolved.

Active Command Modes Procedure

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector.
2. Turn the ignition switch to ON (Engine OFF) or start engine.
3. Turn on the headlight (low-beam).
4. Activate active command modes using WDS or equivalent.



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ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

DTC TABLE

A6E816467000W02

- DTCs are common for present and past malfunction diagnosis.

DTC	Description	Page
B1342	Auto leveling control unit system.	(See T-148 DTC B1342)
B2141	Configuration setting system for auto leveling control unit.	(See T-148 DTC B2141, B2477)
B2390	Communication system between auto leveling control unit (main) and auto leveling control unit (sub).	(See T-149 DTC B2390)
B2477	Auto leveling control unit setting system.	—
B2607	Auto leveling control unit controlling system.	(See T-151 DTC B2607)
B2615	Front auto leveling sensor or rear auto leveling sensors power supply system.	(See T-153 DTC B2615)
B2616	Front auto leveling sensor signal system.	(See T-155 DTC B2616)
B2619	Rear auto leveling sensor signal system.	(See T-157 DTC B2619)
B2626	Headlight zero setting system for auto leveling control unit.	(See T-158 DTC B2626, B2477)
B2735	Headlight leveling actuator signal system.	(See T-159 DTC B2735)

DTC B1342

A6E816467000W03

DTC B1342	Auto leveling control unit system.
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Auto leveling control unit does not work properly.
POSSIBLE CAUSE	- Auto leveling control unit malfunction - Poor fit of auto leveling control unit

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT AUTO LEVELING CONTROL UNIT CONNECTION - Check fit of auto leveling control unit. - Is condition of the fit okay?	Yes Replace auto leveling control unit. (See T-30 DISCHARGE HEADLIGHT CONTROL UNIT REMOVAL/INSTALLATION)
		No After correcting fit, clear DTC and check DTC again. If DTC is displayed again, replace auto leveling control unit. (See T-30 DISCHARGE HEADLIGHT CONTROL UNIT REMOVAL/INSTALLATION)

DTC B2141, B2477

A6E816467000W04

DTC B2141, B2477	Configuration setting system for auto leveling control unit.
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Configuration for auto leveling control unit is not set.
POSSIBLE CAUSE	Configuration for auto leveling control unit is not set or the setting is invalid

Diagnostic procedure

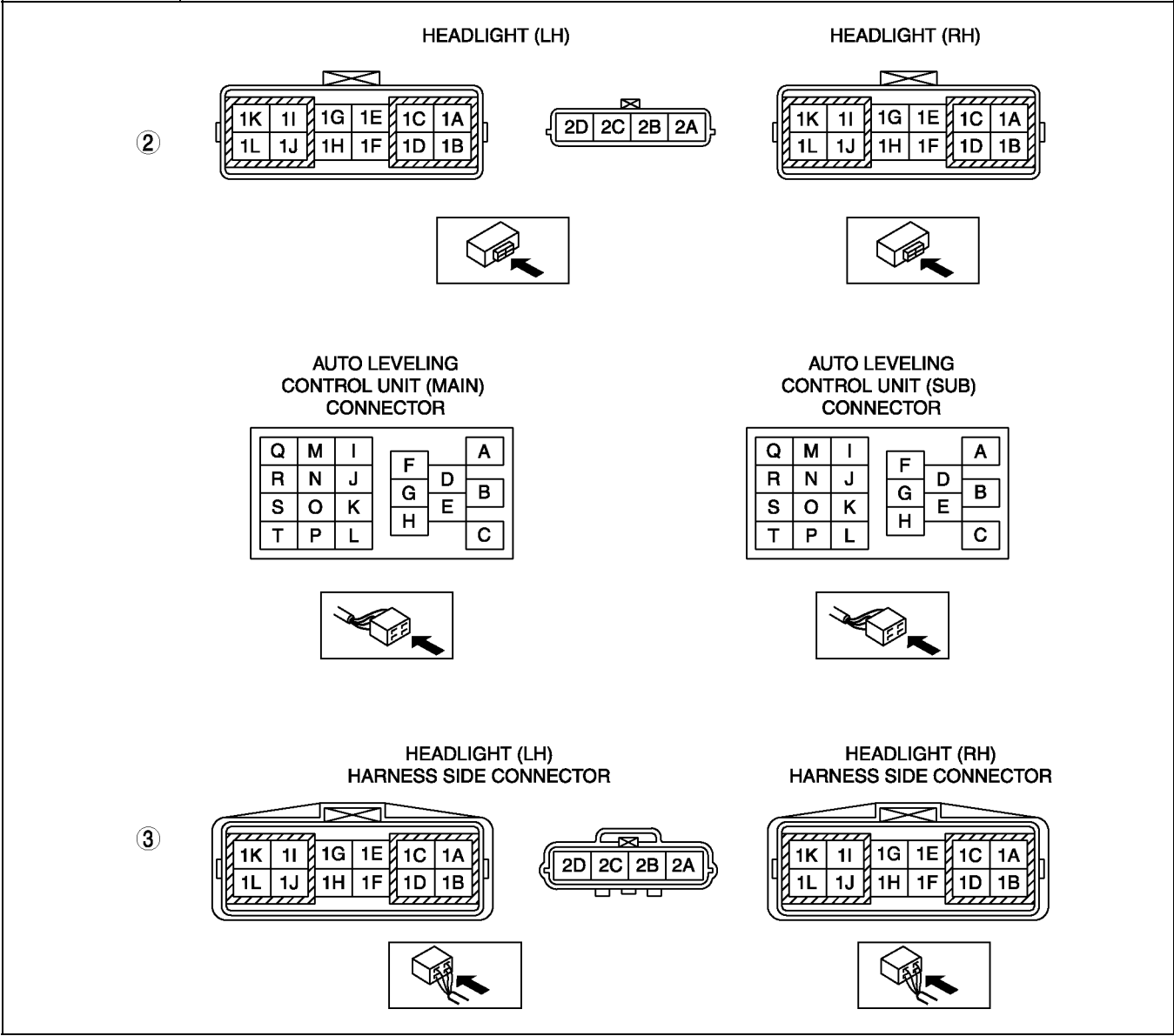
ACTION
Check connections of each sensor and the unit. Then connect WDS or equivalent and perform configuration. (See T-30 AUTO LEVELING CONTROL UNIT CONFIGURATION)

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

DTC B2390

A6E816467000W05

DTC B2390	Communication system between auto leveling control unit (main) and auto leveling control unit (sub).
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to "Discharge headlight service warnings." (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Communication between auto leveling control unit (main) and auto leveling control unit (sub) is not performed.
POSSIBLE CAUSE	- Auto leveling control unit (main) malfunction - Open or shortcircuit in wiring harness between auto leveling control unit (main) and auto leveling control unit (sub)



ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

Diagnostic procedure

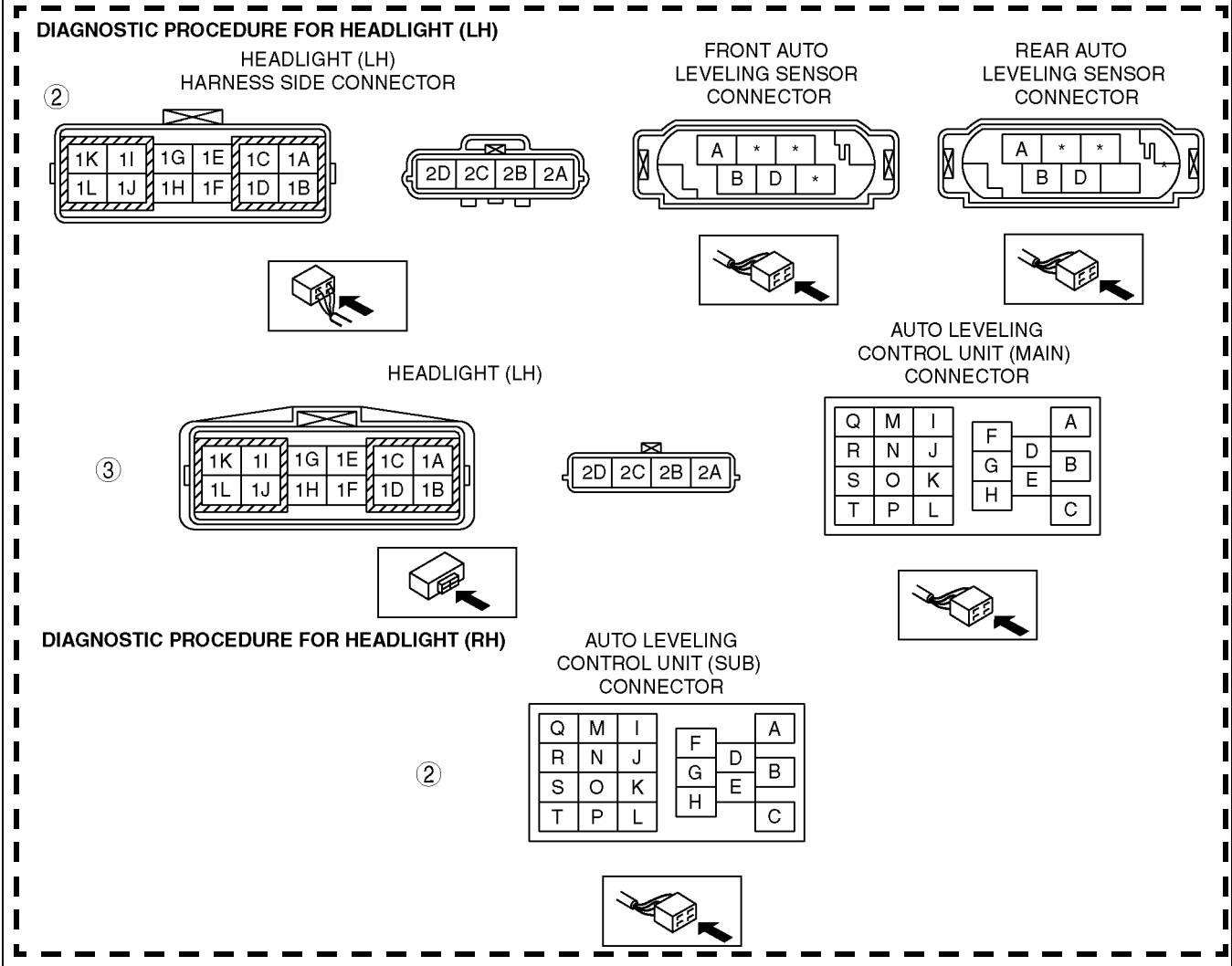
STEP	INSPECTION	ACTION	
1	INSPECT CONNECTOR CONNECTION - Check fit of auto leveling control units and headlight connectors on both sides (auto leveling control unit (main) and (sub)). - Are installation condition and fit okay?	Yes	Go to next step.
		No	After correcting fit, clear DTC and check DTC again. If DTC is displayed again, go to next step.
2	INSPECT HEADLIGHT (LH) AND HEADLIGHT (RH) - Disconnect auto leveling control unit (main) connector (20-pin) and headlight (LH) connector (12-pin) and auto leveling control unit (sub) connector (20-pin) and headlight (RH) connector (12-pin). - Is there continuity between the following connectors? - Auto leveling control unit (main) connector (terminal I) and headlight (LH) connector (terminal 1F) - Auto leveling control unit (sub) connector (terminal P) and headlight (RH) connector (terminal 1F)	Yes	Go to next step.
		No	Possible cause is an open circuit in headlight. Replace headlight (LH) or headlight (RH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)
3	INSPECT WIRING HARNESS BETWEEN HEADLIGHT (LH) CONNECTOR AND HEADLIGHT (RH) CONNECTOR - Disconnect headlight (LH) connector (12-pin) and headlight (RH) connector (12-pin). - Is there continuity between the following connectors? - Headlight (LH) connector (terminal 1F) and headlight (RH) connector (terminal 1F)	Yes	Repair auto leveling control unit (main). (See T-30 DISCHARGE HEADLIGHT CONTROL UNIT REMOVAL/INSTALLATION)
		No	Repair or replace wiring harness between headlight (LH) and headlight (RH).

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

DTC B2607

A6E816467000W06

DTC B2607	Auto leveling control unit controlling system.
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Operation of auto leveling control unit (main) and auto leveling control unit (sub) are reversed.
POSSIBLE CAUSE	- Mounting of auto leveling control unit (main) and auto leveling control unit (sub) changed - Poor fit of auto leveling control unit - Headlight malfunction - Open or short circuit in wiring harness between auto leveling sensors and headlight (LH)



Remark: In this case other DTCs can be reported for wrong side.

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

Diagnostic procedure for headlight (LH)

STEP	INSPECTION		ACTION
1	INSPECT CONNECTION - Check fit of auto leveling control unit and fit of connectors. - Is fit okay?.	Yes	Go to next step.
		No	After correcting fit, clear DTC and check DTC again. If DTC is displayed again, go to next step.
2	INSPECT WIRING HARNESS BETWEEN AUTO LEVELING SENSOR CONNECTORS AND HEADLIGHT (LH) CONNECTOR - Disconnect front and rear auto leveling sensor connector (6-pin) and headlight (LH) connector (4-pin). - Is there no continuity between the following connectors? - Headlight (LH) connector (terminal 2C) and front auto leveling sensor connector (terminal A) - Headlight (LH) connector (terminal 2D) and front auto leveling sensor connector (terminal D)	Yes	Go to next step.
		No	Repair or replace wiring harness between front auto leveling sensor and headlight (LH).
3	INSPECT HEADLIGHT (LH) - Disconnect auto leveling control unit (main) connector (20-pin) and headlight (LH) connector (4-pin). - Is there no continuity between the following connectors? - Headlight (LH) connector (terminal 2B) and auto leveling control unit (main) connector (terminal H) - Headlight (LH) connector (terminal 2A) and auto leveling control unit (main) connector (terminal F)	Yes	Clear DTC and check DTC again. If DTC is displayed again, replace auto leveling control unit. (See T-30 DISCHARGE HEADLIGHT CONTROL UNIT REMOVAL/INSTALLATION)
		No	Replace headlight (LH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)

Diagnostic procedure for headlight (RH)

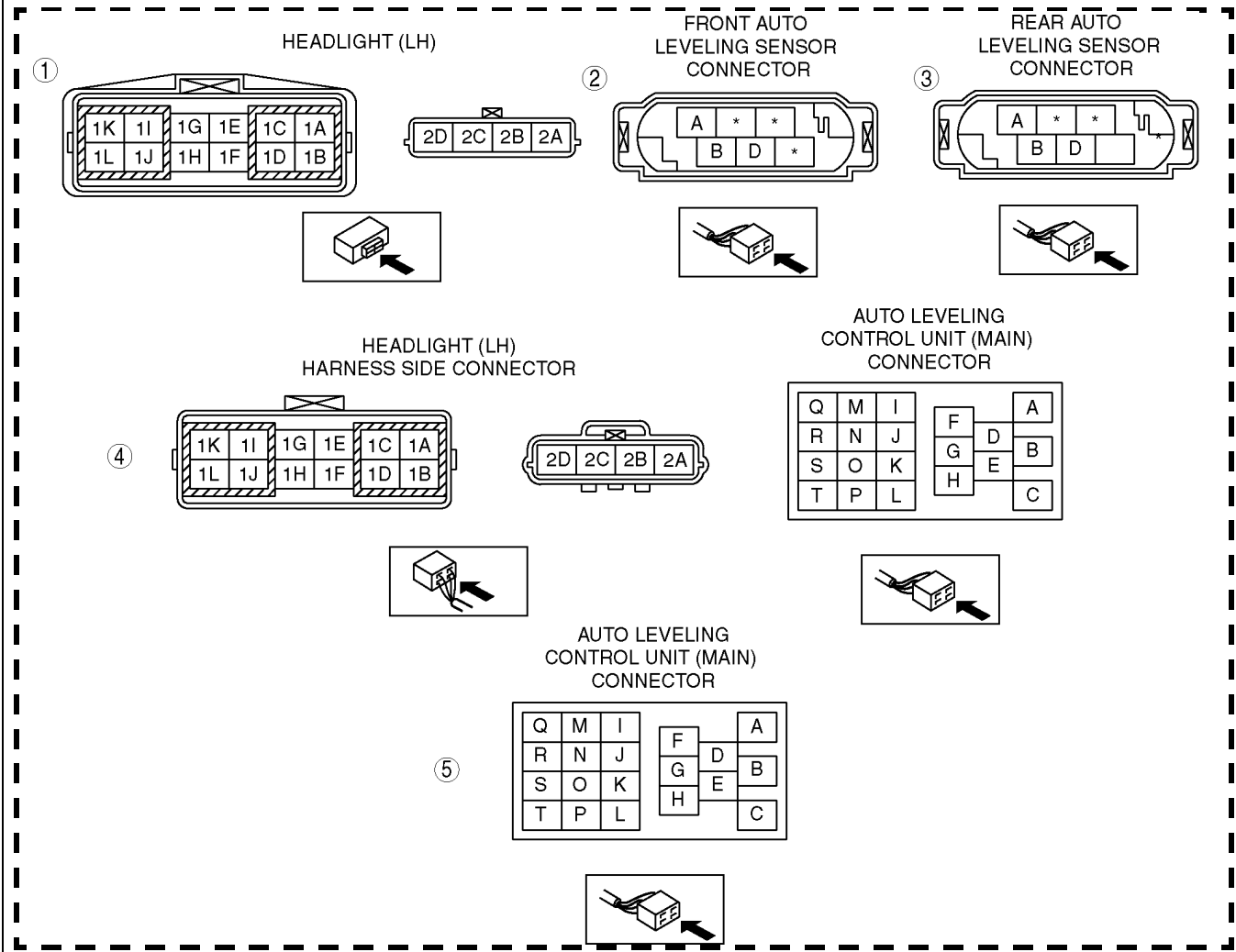
STEP	INSPECTION		ACTION
1	INSPECT CONNECTION - Check fit of auto leveling control unit. - Is fit okay?.	Yes	Go to next step.
		No	After correcting fit, clear DTC and check DTC again. If DTC is displayed again, go to next step.
2	INSPECT HEADLIGHT (RH) - Disconnect auto leveling control unit (sub) connector (20-pin). - Is there no continuity between the following connectors? - Terminals F and K	Yes	Clear DTC and check DTC again. If DTC is displayed again, replace auto leveling control unit. (See T-30 DISCHARGE HEADLIGHT CONTROL UNIT REMOVAL/INSTALLATION)
		No	Replace headlight (LH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

DTC B2615

A6E816467000W07

DTC B2615	Front or rear auto leveling sensors power supply system.
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Front auto leveling sensor or rear auto leveling sensor supply voltage (5 V), which is generated by auto leveling control unit (main), is incorrect.
POSSIBLE CAUSE	- Front auto leveling sensor malfunction - Rear auto leveling sensor malfunction - Auto leveling control unit malfunction - Short circuit in wiring harness between front auto leveling sensor and headlight (LH) - Short circuit in wiring harness between rear auto leveling sensor and headlight (LH) - Headlight (LH) malfunction



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ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

Diagnostic procedure

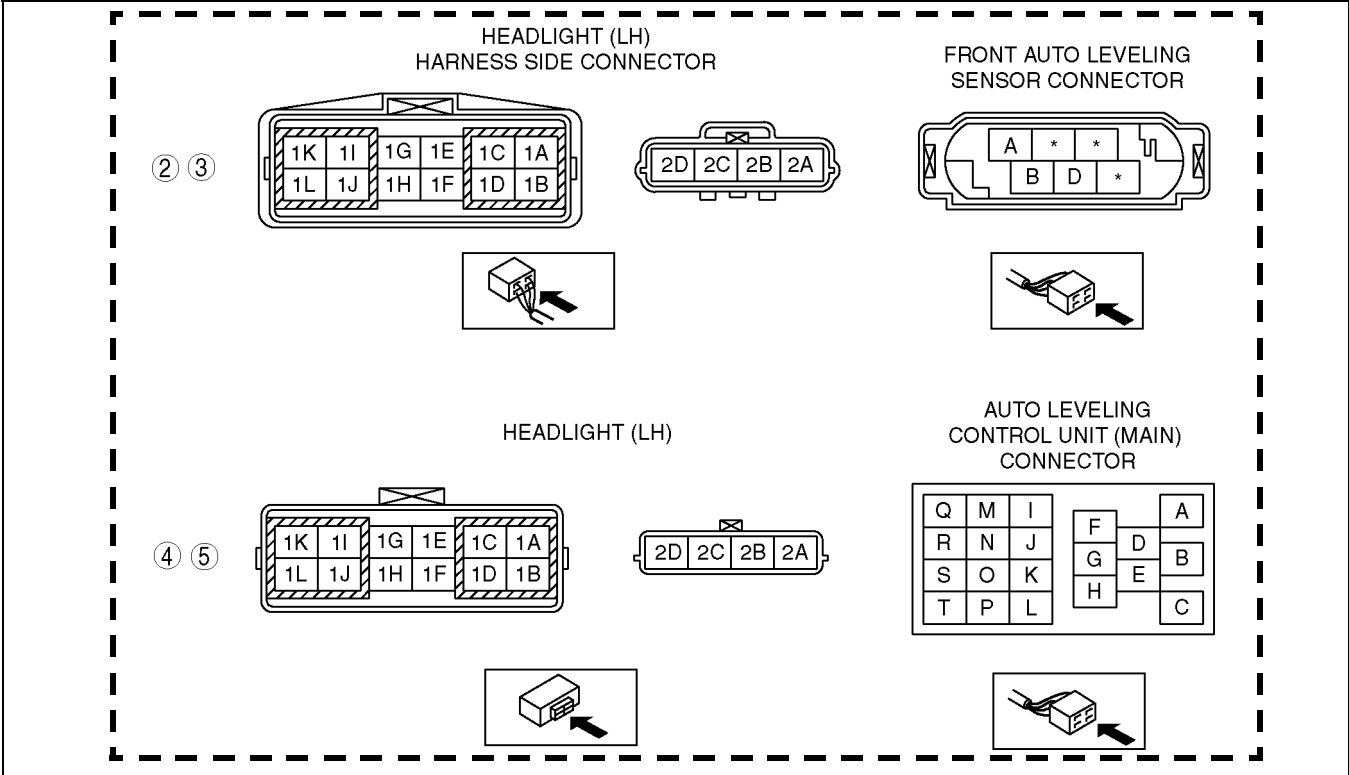
STEP	INSPECTION	ACTION	
1	INSPECT POWER SUPPLY CIRCUIT OF HEADLIGHT (LH) - Disconnect headlight (LH) connector (4-pin). - Turn the ignition switch to ON. - Measure voltage at headlight (LH) connector terminal 2A. - Is voltage approximately 5 V?	Yes	Go to next step.
		No	Go to step 4.
2	INSPECT POWER SUPPLY CIRCUIT OF FRONT AUTO LEVELING SENSOR - Turn the ignition switch to OFF and connect headlight (LH) connector (4-pin) again. - Disconnect front auto leveling sensor connector (6-pin). - Measure voltage at front auto leveling sensor connector terminal D. - Is voltage approximately 5 V?	Yes	Replace front auto leveling sensor. (See T-32 FRONT AUTO LEVELING SENSOR REMOVAL/INSTALLATION) After replacement, clear DTC and check DTC again. If DTC is displayed again, go to next step.
		No	Repair or replace wiring harness between front auto leveling sensor and headlight (LH).
3	INSPECT POWER SUPPLY CIRCUIT OF REAR AUTO LEVELING SENSOR - Disconnect rear auto leveling sensor connector. - Measure voltage at rear auto leveling sensor connector terminal D. - Is voltage approximately 5 V?	Yes	Replace front auto leveling sensor. (See T-32 REAR AUTO LEVELING SENSOR REMOVAL/INSTALLATION) After replacement, clear DTC and check DTC again. If DTC is displayed again, go to next step.
		No	Repair or replace wiring harness between rear auto leveling sensor and headlight (LH).
4	INSPECT HEADLIGHT (LH) - Disconnect auto leveling control unit (main) connector (20-pin) and headlight (LH) connector (4-pin). - Is there continuity between the following connectors? - Auto leveling control unit (main) connector (terminal K) and headlight (LH) connector (terminal 2A)	Yes	Go to next step.
		No	Possible cause is an open circuit in headlight (LH). Replace headlight (LH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)
5	INSPECT HEADLIGHT (LH) - Disconnect auto leveling control unit (main) connector (20-pin). - Is there no continuity between the following connectors? - Terminals K and E - Terminals K and D - Terminals K and L	Yes	Replace auto leveling control unit. (See T-30 DISCHARGE HEADLIGHT CONTROL UNIT REMOVAL/INSTALLATION)
		No	Possible cause is an open circuit in headlight (LH). Replace headlight (LH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

DTC B2616

A6E816467000W08

DTC B2616	Front auto leveling sensor signal system.
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Output signal is not sent from the front auto leveling sensor.
POSSIBLE CAUS	- Front auto leveling sensor malfunction - Open or short circuit in wiring harness between front auto leveling sensor and headlight (LH) - Headlight (LH) malfunction



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ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT FRONT LEVELING SENSOR CONNECTION - Check installation condition of front auto leveling sensor and fit of connector. - Are installation condition and fit okay?	Yes	Go to next step.
		No	After correcting fit, clear DTC and check DTC again. If DTC is displayed again, go to next step.
2	INSPECT WIRING HARNESS BETWEEN FRONT AUTO LEVELING SENSOR CONNECTOR AND HEADLIGHT (LH) CONNECTOR - Disconnect front auto leveling sensor connector (6-pin) and headlight (LH) connector (4-pin). - Is there continuity between the following connectors? - Front auto leveling sensor connector (terminal B) and headlight (LH) connector (terminal 2C)	Yes	Go to next step.
		No	Repair or replace wiring harness between front auto leveling sensor and headlight (LH).
3	INSPECT WIRING HARNESS BETWEEN FRONT AUTO LEVELING SENSOR CONNECTOR AND HEADLIGHT (LH) CONNECTOR - Disconnect front auto leveling sensor connector (6-pin) and headlight (LH) connector (4-pin). - Is there no continuity between the following connectors? - Front auto leveling sensor connector (terminal B) and headlight (LH) connector (terminal 2B) - Front auto leveling sensor connector (terminal B) and headlight (LH) connector (terminal 2A)	Yes	Go to next step.
		No	Repair or replace wiring harness between front auto leveling sensor and headlight (LH).
4	INSPECT HEADLIGHT (LH) - Disconnect auto leveling control unit (main) connector (20-pin) and headlight (LH) connector (4-pin). - Is there continuity between the following connectors? - Auto leveling control unit (main) connector (terminal H) and headlight (LH) connector (terminal 2C)	Yes	Go to next step.
		No	Possible cause is an open circuit in headlight (LH). Replace headlight (LH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)
5	INSPECT HEADLIGHT (LH) - Disconnect auto leveling control unit (main) connector (20-pin) and headlight (LH) connector (4-pin). - Is there continuity between the following connectors? - Auto leveling control unit (main) connector (terminal G) and headlight (LH) connector (terminal 2C) - Auto leveling control unit (main) connector (terminal K) and headlight (LH) connector (terminal 2C) - Auto leveling control unit (main) connector (terminal E) and headlight (LH) connector (terminal 2C)	Yes	Replace front auto leveling sensor. (See T-32 FRONT AUTO LEVELING SENSOR REMOVAL/INSTALLATION)
		No	Possible cause is an open circuit in headlight (LH). Replace headlight (LH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

DTC B2619

A6E816467000W09

DTC B2619	Rear auto leveling sensor signal system.
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Output signal is not sent from the rear auto leveling sensor.
POSSIBLE CAUSE	- Rear auto leveling sensor malfunction - Open or short circuit in wiring harness between rear auto leveling sensor and headlight (LH) - Headlight (LH) malfunction
HEADLIGHT (LH) HARNESS SIDE CONNECTOR REAR AUTO LEVELING SENSOR CONNECTOR HEADLIGHT (LH) AUTO LEVELING CONTROL UNIT (MAIN) CONNECTOR	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT REAR LEVELING SENSOR CONNECTION - Check installation condition of rear auto leveling sensor and fit of connector. - Are installation condition and fit okay?	Yes	Go to next step.
		No	After correcting fit, clear DTC and check DTC again. If DTC is displayed again, go to next step.
2	INSPECT WIRING HARNESS BETWEEN REAR AUTO LEVELING SENSOR CONNECTOR AND HEADLIGHT (LH) CONNECTOR - Disconnect rear auto leveling sensor connector (6-pin) and headlight (LH) connector (4-pin). - Is there continuity between the following connectors? — Rear auto leveling sensor connector (terminal B) and headlight (LH) connector (terminal 2D)	Yes	Go to next step.
		No	Repair or replace wiring harness between rear auto leveling sensor and headlight (LH).

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

STEP	INSPECTION	ACTION	
3	INSPECT WIRING HARNESS BETWEEN REAR AUTO LEVELING SENSOR CONNECTOR AND HEADLIGHT (LH) CONNECTOR - Disconnect rear auto leveling sensor connector (6-pin) and headlight (LH) connector (4-pin). - Is there no continuity between the following connectors? — Rear auto leveling sensor connector (terminal B) and headlight (LH) connector (terminal 2B) — Rear auto leveling sensor connector (terminal B) and headlight (LH) connector (terminal 2A)	Yes	Go to next step.
		No	Repair or replace wiring harness between rear auto leveling sensor and headlight (LH).
4	INSPECT HEADLIGHT (LH) - Disconnect auto leveling control unit (main) connector (20-pin) and headlight (LH) connector (4-pin). - Is there continuity between the following connectors? — Auto leveling control unit (main) connector (terminal F) and headlight (LH) connector (terminal 2D)	Yes	Go to next step.
		No	Possible cause is an open circuit in headlight (LH). Replace headlight (LH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)
5	INSPECT HEADLIGHT (LH) - Disconnect auto leveling control unit (main) connector (20-pin) and headlight (LH) connector (4-pin). - Is there continuity between the following connectors? — Auto leveling control unit (main) connector (terminal G) and headlight (LH) connector (terminal 2D) — Auto leveling control unit (main) connector (terminal K) and headlight (LH) connector (terminal 2D) — Auto leveling control unit (main) connector (terminal E) and headlight (LH) connector (terminal 2D)	Yes	Replace rear auto leveling sensor. (See T-32 REAR AUTO LEVELING SENSOR REMOVAL/INSTALLATION)
		No	Possible cause is an open circuit in headlight (LH). Replace headlight (LH). (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)

DTC B2626, B2477

A6E816467000W10

DTC B2626, B2477	Headlight zeroset system for auto leveling control unit.
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Headlight zeroset for auto leveling control unit is not set.
POSSIBLE CAUSE	Headlight zeroset for auto leveling control unit is not set or the setting is invalid

Diagnostic procedure

ACTION
Check connections of each sensor and the unit. Then connect WDS or equivalent and perform headlight zeroset. (See T-31 HEADLIGHT ZEROSET)

ON-BOARD DIAGNOSTIC [HEADLIGHT AUTO LEVELING SYSTEM]

DTC B2735

A6E816467000W11

DTC B2735	Headlight leveling actuator signal system.
DETECTION CONDITION	Warning incorrect servicing of the auto leveling control unit could result in electrical shock because the unit is integrated with the discharge headlight control unit. Before servicing the auto leveling control unit, always refer to “Discharge headlight service warnings.” (See T-25 DISCHARGE HEADLIGHT SERVICE WARNINGS) Output signal to headlight leveling actuator is abnormal.
POSSIBLE CAUSE	- Headlight leveling actuator malfunction - Auto leveling control unit malfunction - Headlight malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT CONNECTOR CONNECTION - Check fit of auto leveling control unit. - Is condition of the fit okay?	Yes	Possible cause is headlight wiring harness malfunction or malfunctioning headlight leveling acuator. Replace headlight and go to next step. (See T-26 FRONT COMBINATION LIGHT REMOVAL/INSTALLATION)
		No	After correcting fit, clear DTC and check DTC again. If DTC is displayed again, go to next step.
2	Does headlight leveling actuator work properly?	Yes	Troubleshooting completed.
		No	Replace auto leveling control unit. (See T-30 DISCHARGE HEADLIGHT CONTROL UNIT REMOVAL/INSTALLATION)

ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

FOREWORD

A6E817067000W01

Caution

- When the engine does not start or stalls and the following DTCs are not indicated, go to engine symptom troubleshooting.

Note

- When the immobilizer system is defective, the engine cannot be started.
- If engine condition is normal but light stays on, inspect for short circuit between security light. Repair or replace the wiring harness if necessary.

- Turn the ignition switch to START position **for 2 seconds**, then back to ON position.
- Wait for **1 minute**.
- Verify the security light condition and read the DTC if indicated.
- Verify the DTC with WDS or equivalent.
- If the DTC is indicated, go to troubleshooting referring to the DTC table.

DTC TABLE

A6E817067000W02

DTC		Security light flashing pattern	Description	Page
WDS or equivalent	Security light			
B1681	11		Coil signal is not received.	(See T-161 DTC B1681)
B2103	12		Coil not connected.	(See T-162 DTC B2103)
B1600	13		ID number signal is not input into PCM.	(See T-163 DTC B1600)
B2431			Transponder programming failure.	(See T-163 DTC B2431)
B1602	14		PCM received invalid format of ID number from transponder.	(See T-163 DTC B1602)
B1601	15		PCM received incorrect ID number from transponder.	(See T-164 DTC B1601)
B1213	21		Number of valid keys is below minimum.	(See T-164 DTC B1213)
B1342	—	—	PCM is defective.	(See T-164 DTC B1342)

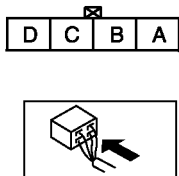
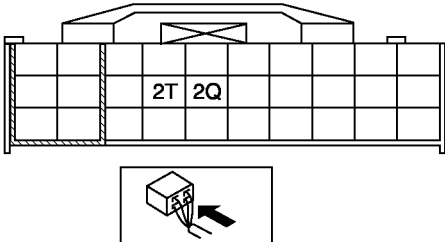
ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

Note

- Perform the following if the security light stays on:
 - If gasoline engine stalls, go to symptom troubleshooting NO.11 “ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES” in. (See [F-204 NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES.](#))
 - If gasoline engine won't start, go to symptom troubleshooting NO.6 “CRANKS NORMALLY BUT WILL NOT START” in. (See [F-195 NO.6 CRANKS NORMALLY BUT WILL NOT START.](#))
 - If engine condition is normal but light stays on, inspect for continuity between the following wiring harness and body ground: security light and PCM connector terminal 2W. Repair or replace the wiring harness.

DTC B1681

A6E817067000W03

DTC B1681	Coil signal is not received.
POSSIBLE CAUSE	• Defective coil • Defective PCM • Defective wiring harness
COIL CONNECTOR  PCM HARNESS SIDE CONNECTOR 	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT POWER SUPPLY CIRCUIT OF COIL • Disconnect coil connector. • Turn ignition switch to ON position. • Measure voltage at terminal D of coil connector. • Is voltage more than 10 V?	Yes	Go to next step.
		No	Repair wiring harness.
2	INSPECT WIRING HARNESS BETWEEN COIL AND GROUND • Turn ignition switch to OFF position. • Inspect wiring harness between coil connector terminal C and ground for following. — Short to power supply — Open circuit • Is wiring harness okay?	Yes	Go to next step.
		No	Repair wiring harness.
3	INSPECT COIL INPUT SIGNAL CIRCUIT • Connect coil connector. • Turn ignition switch to ON position. • Measure voltage at terminal B of coil connector. • Is voltage more than 9 V?	Yes	Go to Step 5.
		No	Go to next step.
4	INSPECT COIL INPUT SIGNAL CIRCUIT • Turn ignition switch to OFF position. • Disconnect coil connector. • Measure resistance between coil connector terminal B and ground. • Is resistance more than 10 kilohms?	Yes	Go to Step 12.
		No	Repair wiring harness.
5	INSPECT COMMUNICATION CIRCUIT (INPUT) FOR CONTINUITY • Disconnect coil and PCM connectors. • Is there continuity between coil connector terminal B and PCM terminal 2T?	Yes	Go to next step.
		No	Repair wiring harness.

ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

STEP	INSPECTION	ACTION	
6	INSPECT COIL OUTPUT SIGNAL CIRCUIT - Connect coil and PCM connectors. - Turn ignition switch to ON position. - Measure voltage at terminal A of coil connector. - Is voltage more than 9 V?	Yes	Go to Step 10.
		No	Go to next step.
7	INSPECT COIL OUTPUT SIGNAL CIRCUIT - Turn ignition switch to OFF position. - Disconnect PCM connector. - Measure resistance between PCM connector terminal 2Q and ground. - Is resistance more than 10 kilohms?	Yes	Go to Step 9.
		No	Go to next step.
8	INSPECT COIL OUTPUT SIGNAL CIRCUIT FOR SHORT TO GND - Disconnect coil connector. - Measure resistance between coil connector terminal A and ground. - Is resistance more than 10 kilohms?	Yes	Replace coil. (See T-90 COIL REMOVAL/INSTALLATION)
		No	Repair wiring harness.
9	INSPECT COMMUNICATION CIRCUIT (OUTPUT) FOR CONTINUITY - Disconnect coil and PCM connectors. - Is there continuity between coil connector terminal A and PCM terminal 2Q?	Yes	Replace PCM and reprogram immobilizer system. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Repair wiring harness.
10	INSPECT COMMUNICATION CIRCUIT (OUTPUT) FOR CONTINUITY - Disconnect coil and PCM connectors. - Is there continuity between coil connector terminal A and PCM terminal 2Q?	Yes	Replace coil. (See T-90 COIL REMOVAL/INSTALLATION)
		No	Go to next step.
11	INSPECT COIL OUTPUT CIRCUIT FOR SHORT TO POWER SUPPLY - Disconnect coil connector. - Measure voltage at terminal A of coil connector. - Is there voltage?	Yes	Repair wiring harness.
		No	Replace PCM and reprogram immobilizer system. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
12	INSPECT PCM - Turn ignition switch from LOCK position to START position for 2 seconds. - Does security light indicate DTC B1681 again?	Yes	Replace PCM and reprogram immobilizer system. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No	Troubleshooting is completed.

DTC B2103

A6E817067000W04

DTC B2103	Coil not connected.
POSSIBLE CAUSE	- Defective Coil - Poor connection of coil connector

Diagnostic procedure

STEP	INSPECTION	ACTION	
—	INSPECT CONNECTOR CONNECTION Is connector of coil and PCM connected securely?	Yes	Replace coil. (See T-90 COIL REMOVAL/INSTALLATION)
		No	Connect connector securely.

ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

DTC B1600

A6E817067000W05

DTC B1600	ID number is not input into PCM.
POSSIBLE CAUSE	- No transponder in the key - Defective transponder in the key (ID number is not output.)

Diagnostic procedure

STEP	INSPECTION	ACTION
1	REPROGRAM NEW KEY - Register new key. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE) - Clear DTCs with WDS or equivalent. - Turn ignition switch to ON position with new key. Note - Two or more valid keys are held in a manner of not interfering each other. - Does security light indicate DTC B1600 again?	Yes Go to next step.
		No Immobilizer system is okay.
2	INSPECT FOR OTHER PROPER KEYS Does engine start with other proper keys?	Yes Dispose of defective key. Duplicate key if necessary. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No Go to next step.
3	INSPECT PCM - Turn ignition switch from LOCK position to START position For 2 seconds. - Does security light indicate DTC B1600 again?	Yes Replace PCM and reprogram immobilizer system. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No Troubleshooting is completed.

DTC B2431

A6E817067000W06

DTC B2431	ID number programing failure.
POSSIBLE CAUSE	The procedure fails to program the transponder into PCM

Diagnostic procedure

STEP	INSPECTION	ACTION
—	—	Go to ID number input procedure. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)

DTC B1602

A6E817067000W07

DTC B1602	PCM received invalid format of ID number from key (transponder)
POSSIBLE CAUSE	- Defective transponder in the key - Defective coil - Defective PCM

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT FOR OTHER PROPER KEYS Does engine start with other proper keys?	Yes Dispose of defective key. Duplicate key if necessary. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No Go to next step.
2	INSPECT COIL - Replace coil. (See T-90 COIL REMOVAL/ INSTALLATION) - Does engine start?	Yes Coil was defective.
		No Replace PCM and reprogram immobilizer system. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)

ON-BOARD DIAGNOSTIC [IMMOBILIZER SYSTEM]

DTC B1601

A6E817067000W08

DTC B1601	PCM received incorrect ID number from key (transponder).
POSSIBLE CAUSE	Defective transponder in the key

Diagnostic procedure

STEP	INSPECTION	ACTION
—	INSPECT KEYS - Turn ignition switch to ON position with first encoded key for 3 seconds. - Turn ignition switch to ON position with second encoded key for 3 seconds. - Turn ignition switch to START position with second encoded key. - Does engine start?	Yes Immobilizer system is okay.
		No Replace PCM and reprogram immobilizer system. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)

DTC B1213

A6E817067000W09

DTC B1213	Number of valid keys is below minimum.
POSSIBLE CAUSE	Less than two valid keys

Diagnostic procedure

STEP	INSPECTION	ACTION
—	REPROGRAM NEW KEY - Register new key. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE) Note - Two or more valid keys are necessary to start engine. - After reprogramming, does the security light illuminate for approximately 3 seconds and then go out?	Yes Troubleshooting is completed.
		No Reprogram immobilizer system again.

DTC B1342

A6E817067000W10

DTC B1342	PCM is defective
POSSIBLE CAUSE	Defective PCM

Diagnostic procedure

STEP	INSPECTION	ACTION
—	INSPECT PCM - Clear DTCs with WDS or equivalent. - Does security light indicate DTC B1342 again.	Yes Replace PCM and reprogram immobilizer system. (See T-90 IMMOBILIZER SYSTEM REPROGRAM PROCEDURE)
		No Connect connectors properly.

ON-BOARD DIAGNOSTIC [AUDIO]

ON-BOARD DIAGNOSTIC [AUDIO]

STARTING PROCEDURE FOR ON-BOARD DIAGNOSTIC TEST MODE

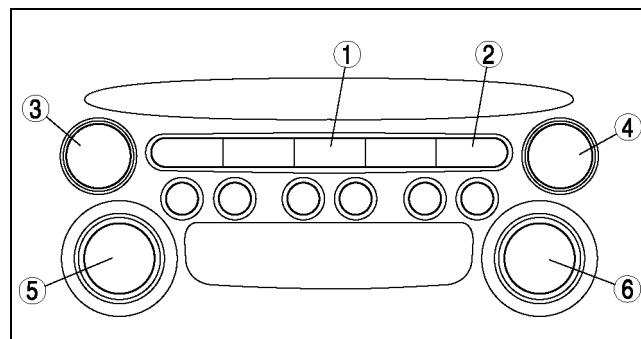
A6E817566900W01

Note

- All DTCs displayed in the on-board diagnostic test mode should be entered in the Audio Repair Order Form.

- Turn the ignition switch to the ACC or ON position.
- First press the POWER button, then simultaneously press the AM button and TAPE/MD button for **2 seconds or more**.

1	AM button
2	TAPE/MD button
3	SEEK button (type A)
4	SEEK button (type B)
5	POWER button (type A)
6	POWER button (type B)



A6E8175W010

Note

- If several DTCs are in the memory, they can be displayed by the SEEK button.

- To stop the on-board diagnostic test mode, turn the ignition switch to the LOCK position.

SUPPLIER IDENTIFICATION PROCEDURE

A6E817566900W02

Note

- When asking the supplier (service center) for repair or replacement, verify which supplier the module belongs to and enter in the Audio Repair Order Form.

Identification With Printed Numbers/Label

- Remove the audio unit.
- Verify the supplier name written on the label attached on each module.

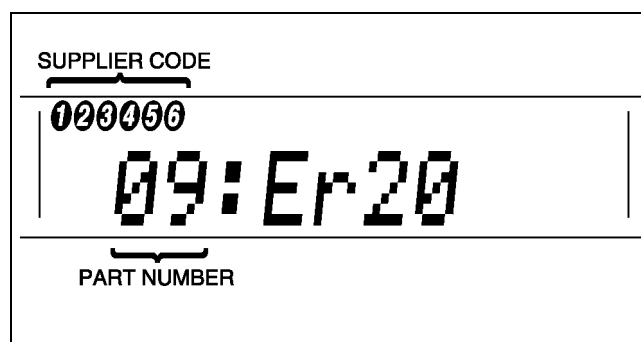
Identification With On-board Diagnostic Test Mode

- Start the on-board diagnostic test mode.
- Verify the part number and supplier code displayed in the LCD.

Note

- When no DTCs are in the memory, part numbers and supplier codes will not be displayed.

Part number	Part name
00	Cassette deck (lower module)
03	CD player (upper module)
05	CD changer (external type)
06	CD changer (upper module)
07	MD player (lower module)
09	Base unit



A6E8175W008

Supplier code	Supplier name
1	FMS Audio
2	Panasonic
3	Clarion

ON-BOARD DIAGNOSTIC [AUDIO]

DTC CLEARING PROCEDURE

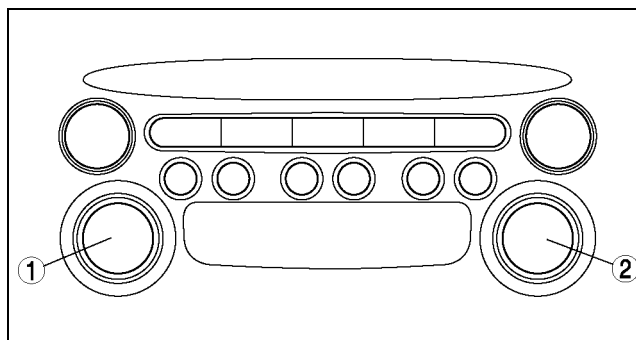
A6E817566900W03

1. Start the on-board diagnostic test mode.
2. First press the POWER button, then simultaneously press AUDIO CONT button for **2 seconds or more**.

1	POWER button (type A)
	AUDIO CONT button (type B)
2	AUDIO CONT button (type A)
	POWER button (type B)

Caution

- Before clearing the DTCs, be sure to enter all of them displayed in the on-board diagnostic test mode in the Audio Repair Order Form.



A6E8175W009

3. To stop the on-board diagnostic test mode, turn the ignition switch to the LOCK position.

DTC TABLE

A6E817566900W04

Screen display		Malfunction location	Page
DTC	Output signal		
09:Er22	—	Base unit (peripheral circuit)	(See T-166 DTC 09:ER22)
09:Er20	—	Power supply circuit of base unit	(See T-167 DTC 09:ER20)
00:Er10	—	Cassette deck—base unit communication line	(See T-168 DTC 00:ER10)
03:Er10	—	CD player—base unit communication line	(See T-168 DTC 03:ER10)
05:Er10	—	CD changer (external type)—base unit communication line	(See T-169 DTC 05:ER10)
06:Er10	—	CD changer (upper module)—base unit communication line	(See T-169 DTC 06:ER10)
07:Er10	—	MD player—base unit communication line	(See T-170 DTC 07:ER10)
03:Er01	—	CD player	(See T-170 DTC 03:ER01)
03:Er02	CHECK* ¹ CD* ²	CD player	(See T-170 DTC 03:ER02)
03:Er07	CHECK* ¹ CD* ²	CD player	(See T-171 DTC 03:ER07)
00:Er01	—	Cassette deck	(See T-171 DTC 00:ER01)
00:Er03	—	Cassette deck	(See T-172 DTC 00:ER03)
00:Er04	CHECK* ¹ TAPE* ²	Cassette tape	(See T-172 DTC 00:ER04)
05:Er01	—	CD changer (external type)	(See T-172 DTC 05:ER01)
05:Er07	CHECK* ¹ CD* ²	CD changer (external type)	(See T-173 DTC 05:ER07)
06:Er01	—	CD changer (upper module)	(See T-173 DTC 06:ER01)
06:Er02	CHECK* ¹ CD* ²	CD changer (upper module)	(See T-174 DTC 06:ER02)
06:Er07	CHECK* ¹ CD* ²	CD changer (upper module)	(See T-174 DTC 06:ER07)
07:Er01	—	MD player	(See T-175 DTC 07:ER01)
07:Er02	CHECK* ¹ MD* ²	MD player	(See T-175 DTC 07:ER02)
07:Er07	CHECK* ¹ MD* ²	MD player	(See T-176 DTC 07:ER07)
NO Err	—	No stored DTCs	—

*1,*2: When an error occurs, the error messages are displayed three times in the order of *1 and *2, respectively.

DTC 09:ER22

A6E817566900W05

DTC 09:Er22	Base unit (peripheral circuit)
DETECTION CONDITION	• Base unit detects malfunction in its inner circuit (related to tuner).
POSSIBLE CAUSE	• Base unit malfunction

ON-BOARD DIAGNOSTIC [AUDIO]

Diagnostic procedure

INSPECTION	ACTION
INSPECT BASE UNIT - Clear DTC. - Turn on radio and operate it for 3 seconds or more. - Start on-board diagnostic test mode. - Is DTC 09:Er22 displayed?	Yes: Replace base unit. No: Troubleshooting completed.

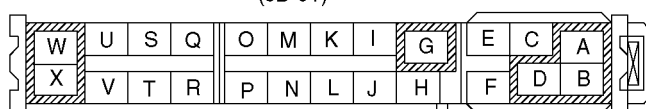
DTC 09:ER20

A6E817566900W06

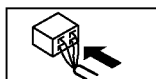
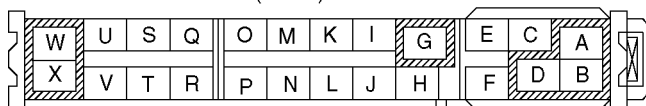
DTC 09:Er20	Power supply circuit of base unit
DETECTION CONDITION	Voltage detected at base unit terminals 1B and 1R is less than 8.5 V, or more than 16 V (must not be 16V).
POSSIBLE CAUSE	- Weak battery - Malfunction in wiring harness between battery and base unit

FUSE BLOCK CONNECTOR

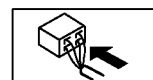
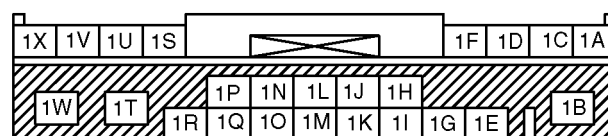
(JB-01)



(JB-02)



BASE UNIT CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT FUSE - Remove MIRROR 5 A fuse and ROOM 15 A fuse. - Inspect MIRROR 5 A fuse and ROOM 15 A fuse. - Are fuses okay?	Yes: Go to next step.
		No: Replace fuse.
2	INSPECT BATTERY - Measure battery voltage. - Is voltage 8.5 V —16 V?	Yes: Go to next step.
		No: Battery is weak. Inspect charge/discharge system.
3	INSPECT WIRING HARNESS BETWEEN BATTERY AND FUSE BLOCK - Turn ignition switch to ACC position. - Measure voltage at fuse block connector (JB-01) terminals B and fuse block connector (JB-02) terminals D. - voltage 8.5 V —16 V?	Yes: Go to next step.
		No: Repair wiring harness between battery and fuse block.
4	INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND BASE UNIT - Install MIRROR 5 A fuse and ROOM 15 A fuse. - Measure voltage at base unit connector terminals 1B and 1R. - Is voltage 8.5 V —16 V?	Yes: Go to next step.
		No: Repair wiring harness between fuse block and base unit.
5	INSPECT BASE UNIT - Clear DTC. - Turn ignition switch to ACC or ON position and hold for 30 seconds or more. - Start on-board diagnostic test mode. - Is DTC 09:Er20 displayed?	Yes: Replace base unit.
		No: Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AUDIO]

DTC 00:Er10

A6E817566900W07

DTC 00:Er10	Cassette deck—base unit communication line
DETECTION CONDITION	Base unit detects communication error with cassette deck.
POSSIBLE CAUSE	- Malfunction of connectors between base unit and cassette deck - Cassette deck malfunction - Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT CONNECTOR - Remove cassette deck and inspect connector for the following. - Deformation of pin - Poor connection of female terminal - Pinching of foreign material - Is connector okay?	Yes	Go to next step.
		No	Repair connector, then go to next step.
2	VERIFY THAT CASSETTE DECK IS INSTALLED WITH BASE UNIT - Install cassette deck and verify its installation condition. - Is cassette deck securely installed?	Yes	Go to next step.
		No	Securely install cassette deck, then go to next step.
3	INSPECT CASSETTE DECK - Clear DTC. - Turn ignition switch to ACC or ON position and hold for 3 seconds or more. - Start on-board diagnostic test mode. - Is DTC 00:Er10 displayed?	Yes	Replace base unit and cassette deck.
		No	Troubleshooting completed.

DTC 03:Er10

A6E817566900W08

DTC 03:Er10	CD player—base unit communication line
DETECTION CONDITION	Base unit detects communication error with CD player.
POSSIBLE CAUSE	- Malfunction of connectors between base unit and CD player - CD player malfunction - Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT CONNECTOR - Remove CD player and inspect connector for the following. - Deformation of pin - Poor connection of female terminal - Pinching of foreign material - Is connector okay?	Yes	Go to next step.
		No	Repair connector, then go to next step.
2	VERIFY THAT CD PLAYER IS INSTALLED WITH BASE UNIT - Install CD player and verify its installation condition. - Is CD player securely installed?	Yes	Go to next step.
		No	Securely install CD player, then go to next step.
3	INSPECT CD PLAYER - Clear DTC. - Turn ignition switch to ACC or ON position and hold for 3 seconds or more. - Start on-board diagnostic test mode. - Is DTC 03:Er10 displayed?	Yes	Replace base unit and CD player.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AUDIO]

DTC 05:Er10

A6E817566900W09

DTC 05:Er10	CD changer (external type)—base unit communication line
DETECTION CONDITION	Base unit detects communication error with CD changer (external type).
POSSIBLE CAUSE	- Malfunction of connectors between base unit and CD changer (external type) - CD changer (external type) malfunction - Base unit malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT CONNECTOR - Inspect base unit and CD changer (external type) connectors for connection. - Are connectors securely connected?	Yes Go to next step.
		No Reconnect connector, then go to next step.
2	INSPECT WIRING HARNESS BETWEEN CD CHANGER (EXTERNAL TYPE) AND BASE UNIT - Inspect wiring harness between base unit and CD changer (external type). - Is wiring harness okay?	Yes Go to next step.
		No Securely install CD changer (external type), then go to next step.
3	INSPECT CD CHANGER (EXTERNAL TYPE) - Clear DTC. - Turn ignition switch to ACC or ON position and hold for 3 seconds or more. - Start on-board diagnostic test mode. - Is DTC 05:Er10 displayed?	Yes Replace base unit and CD changer (external type).
		No Troubleshooting completed.

DTC 06:Er10

A6E817566900W10

DTC 06:Er10	CD changer (upper module)—base unit communication line
DETECTION CONDITION	Base unit detects communication error with CD changer (upper module).
POSSIBLE CAUSE	- Malfunction of connectors between base unit and CD changer (upper module) - CD changer (upper module) malfunction - Base unit malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT CONNECTOR - Remove CD changer (upper module) and inspect connector for the following. - Deformation of pin - Poor connection of female terminal - Pinching of foreign material - Is connector okay?	Yes Go to next step.
		No Repair connector, then go to next step.
2	VERIFY THAT CD CHANGER (UPPER MODULE) IS INSTALLED WITH BASE UNIT - Install CD changer (upper module) and verify its installation condition. - Is CD changer (upper module) securely installed?	Yes Go to next step.
		No Securely install CD changer (upper module), then go to next step.
3	INSPECT CD CHANGER (UPPER MODULE) - Clear DTC. - Turn ignition switch to ACC or ON position and hold for 3 seconds or more. - Start on-board diagnostic test mode. - Is DTC 06:Er10 displayed?	Yes Replace base unit and CD changer (upper module).
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AUDIO]

DTC 07:ER10

A6E817566900W11

DTC 07:Er10	MD player—base unit communication line
DETECTION CONDITION	Base unit detects communication error with MD player.
POSSIBLE CAUSE	- Malfunction of connectors between base unit and MD player - MD player malfunction - Base unit malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT CONNECTOR - Remove MD player and inspect connector for the following. - Deformation of pin - Poor connection of female terminal - Pinching of foreign material - Is connector okay?	Yes	Go to next step.
		No	Repair connector, then go to next step.
2	VERIFY THAT MD PLAYER IS INSTALLED WITH BASE UNIT - Install MD player and verify its installation condition. - Is MD player securely installed?	Yes	Go to next step.
		No	Securely install MD player, then go to next step.
3	INSPECT MD PLAYER - Clear DTC. - Turn ignition switch to ACC or ON position and hold for 3 seconds or more. - Start on-board diagnostic test mode. - Is DTC 07:Er10 displayed?	Yes	Replace base unit and MD player.
		No	Troubleshooting completed.

DTC 03:ER01

A6E817566900W12

DTC 03:Er01	CD player
DETECTION CONDITION	CD player cannot implement insert and eject commands.
POSSIBLE CAUSE	- Defective CD (broken or foreign material stuck/attached) - CD player malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	Is CD able to be ejected?	Yes	Go to next step.
		No	Replace CD player.
2	INSPECT CD - Inspect condition of CD where error has occurred. - Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.
3	INSPECT CD PLAYER - Clear DTC. - Insert and eject CD with no defect. - Start on-board diagnostic test mode. - Is DTC 03:Er01 displayed?	Yes	Replace CD player.
		No	Troubleshooting completed.

DTC 03:ER02

A6E817566900W13

DTC 03:Er02	CD player
DETECTION CONDITION	Note - When error occurs, error message "CHECK CD" is displayed in the LCD. - Cannot play CD normally or change tracks.
POSSIBLE CAUSE	- Defective CD (scratches or dirt) - CD player malfunction

ON-BOARD DIAGNOSTIC [AUDIO]

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY WHETHER MALFUNCTION IS IN CD PLAYER OR CD - Play CD and select other song (change tracks). - Does CD player change tracks?	Yes	Go to Step 3.
		No	Not able to change particular tracks.
			Not able to change any tracks.
			Go to next step.
			Change CD and perform track-change again. - If CD player changes tracks, then go to Step 3. - If not, replace CD player.
2	INSPECT CD - Inspect condition of CD where error has occurred. - Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.
3	INSPECT CD PLAYER - Clear DTC. - Play CD and select other song (change tracks). - Start on-board diagnostic test mode. - Is DTC 03:Er02 displayed?	Yes	Replace CD player.
		No	Troubleshooting completed.

DTC 03:ER07

A6E817566900W14

DTC 03:Er07	CD player
DETECTION CONDITION	Note - When error occurs, error message "CHECK CD" is displayed in the LCD. - Base unit detects CD reading error.
POSSIBLE CAUSE	- Defective CD (scratches or dirt) - CD player malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT CD - Inspect condition of CD where error has occurred. - Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.
2	INSPECT CD PLAYER - Clear DTC. - Insert and play CD with no defect. - Start on-board diagnostic test mode. - Is DTC 03:Er07 displayed?	Yes	Replace CD player.
		No	Troubleshooting completed.

DTC 00:ER01

A6E817566900W15

DTC 00:Er01	Cassette deck
DETECTION CONDITION	Cassette deck cannot implement insert and eject commands.
POSSIBLE CAUSE	- Defective cassette tape (deformation, broken, or foreign material stuck/attached) - Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	Is cassette tape able to be ejected?	Yes	Go to next step.
		No	Replace cassette deck.
2	INSPECT CASSETTE TAPE - Inspect condition of cassette tape where error has occurred. - Is cassette tape okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace cassette tape, then go to next step.

ON-BOARD DIAGNOSTIC [AUDIO]

STEP	INSPECTION	ACTION
3	INSPECT CASSETTE DECK • Clear DTC. • Insert and eject cassette tape with no defect. • Start on-board diagnostic test mode. • Is DTC 00:Er01 displayed?	Yes Replace cassette deck.
		No Troubleshooting completed.

DTC 00:ER03

A6E817566900W16

DTC 00:Er03	Cassette deck
DETECTION CONDITION	• Base unit detects that reel built into cassette deck does not operate.
POSSIBLE CAUSE	• Defective cassette tape (tape slack, pinched tape in internal cassette deck) • Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT CASSETTE TAPE • Inspect condition of cassette tape where error has occurred. • Is cassette tape okay?	Yes Go to next step.
		No Repair (remove tape slack or repair pinched tape) or replace cassette tape, then go to next step.
2	INSPECT CASSETTE DECK • Clear DTC. • Insert cassette tape with no defect. • Play cassette tape for 20 seconds or more. • Start on-board diagnostic test mode. • Is DTC 00:Er03 displayed?	Yes Replace cassette deck.
		No Troubleshooting completed.

DTC 00:ER04

A6E817566900W17

DTC 00:Er04	Cassette tape
DETECTION CONDITION	Note • When error occurs, error message "CHECK TAPE" is displayed in the LCD. • Cassette tape is worn out.
POSSIBLE CAUSE	• Tape wear • Cassette deck malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT CASSETTE TAPE • Inspect condition of cassette tape where error has occurred. • Is cassette tape okay?	Yes Go to next step.
		No Replace cassette tape, then go to next step.
2	INSPECT CASSETTE DECK • Clear DTC. • Insert cassette tape with no defect. • Play cassette tape for 20 seconds or more. • Start on-board diagnostic test mode. • Is DTC 00:Er04 displayed?	Yes Replace cassette deck.
		No Troubleshooting completed.

DTC 05:ER01

A6E817566900W18

DTC 05:Er01	CD changer (external type)
DETECTION CONDITION	• Changer function does not operate.
POSSIBLE CAUSE	• Defective CD (broken or foreign material) • Magazine malfunction • CD changer (external type) malfunction

ON-BOARD DIAGNOSTIC [AUDIO]

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY WHETHER MALFUNCTION IS IN CD CHANGER OR OTHER PARTS - Operate changer function. - Is function okay?	Yes	Go to Step 4.
		No	Not able to change particular CD.
			Not able to change any CD.
2	INSPECT CD - Inspect condition of CD where error has occurred. - Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.
3	INSPECT MAGAZINE - Inspect magazine. - Is magazine okay?	Yes	Go to next step.
		No	Repair or replace magazine, then go to next step.
4	INSPECT CD CHANGER (EXTERNAL TYPE) - Clear DTC. - Operate changer. - Start on-board diagnostic test mode. - Is DTC 05:Er01 displayed?	Yes	Replace CD changer (external type).
		No	Troubleshooting completed.

DTC 05:ER07

A6E817566900W19

DTC 05:Er07	CD changer (external type)
DETECTION CONDITION	Note - When error occurs, error message "CHECK CD" is displayed in the LCD. - Base unit detects CD reading error.
POSSIBLE CAUSE	- Defective CD (scratches or dirt) - CD changer (external type) malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY WHETHER MALFUNCTION IS IN CD CHANGER OR OTHER PARTS - Play all CD in magazine. - Is CD changer able to read them properly?	Yes	Go to Step 3.
		No	Not able to change particular CD.
			Not able to change any CD.
2	INSPECT CD - Inspect condition of CD where error has occurred. - Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.
3	INSPECT CD CHANGER (EXTERNAL TYPE) - Clear DTC. - Insert and play CD with no defect. - Start on-board diagnostic test mode. - Is DTC 05:Er07 displayed?	Yes	Replace CD changer (external type).
		No	Troubleshooting completed.

DTC 06:ER01

A6E817566900W20

DTC 06:Er01	CD changer (upper module)
DETECTION CONDITION	CD changer (upper module) cannot implement insert, eject, and disc change commands.
POSSIBLE CAUSE	- Defective CD (broken or foreign material stuck/attached) - CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	Is CD able to be ejected?	Yes	Go to next step.
		No	Replace CD changer (upper module).
2	INSPECT CD - Inspect condition of CD where error has occurred. - Is CD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace CD, then go to next step.

ON-BOARD DIAGNOSTIC [AUDIO]

STEP	INSPECTION	ACTION
3	INSPECT CD CHANGER (UPPER MODULE) • Clear DTC. • Insert and eject CD with no defect. • Start on-board diagnostic test mode. • Is DTC 06:Er01 displayed?	Yes Replace CD changer (upper module).
		No Troubleshooting completed.

DTC 06:ER02

A6E817566900W21

DTC 06:Er02	CD changer (upper module)
DETECTION CONDITION	Note • When error occurs, error message "CHECK CD" is displayed in the LCD. • Cannot play CD normally or change tracks.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY WHETHER MALFUNCTION IS IN CD CHANGER (UPPER MODULE) OR CD • Play all CDs in changer and select other song (change tracks). • Is CD changer able to change tracks?	Yes Go to Step 3.
		No Not able to change particular tracks. Go to next step.
		No Not able to change any tracks. Change CD and perform track-change again. • If CD changer changes tracks, go to Step 3. • If not, replace CD changer (upper module).
2	INSPECT CD • Inspect condition of CD where error has occurred. • Is CD okay?	Yes Go to next step.
		No Repair (remove foreign material) or replace CD, then go to next step.
3	INSPECT CD CHANGER (UPPER MODULE) • Clear DTC. • Play CD and select other song (change tracks). • Start on-board diagnostic test mode. • Is DTC 06:Er02 displayed?	Yes Replace CD changer (upper module).
		No Troubleshooting completed.

DTC 06:ER07

A6E817566900W22

DTC 06:Er07	CD changer (upper module)
DETECTION CONDITION	Note • When error occurs, error message "CHECK CD" is displayed in the LCD. • Base unit detects CD reading error.
POSSIBLE CAUSE	• Defective CD (scratches or dirt) • CD changer (upper module) malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY WHETHER MALFUNCTION IS IN CD CHANGER (UPPER MODULE) OR CD • Play all CDs in changer. • Is CD changer able to read them properly?	Yes Go to Step 3.
		No Not able to read particular CD. Go to next step.
		No Not able to read any CD. Go to Step 3.
2	INSPECT CD • Inspect condition of CD where error has occurred. • Is CD okay?	Yes Go to next step.
		No Repair (remove foreign material) or replace CD, then go to next step.

ON-BOARD DIAGNOSTIC [AUDIO]

STEP	INSPECTION	ACTION
3	INSPECT CD CHANGER (UPPER MODULE) - Clear DTC. - Insert and play CD for 12 seconds or more. - Start on-board diagnostic test mode. - Is DTC 06:Er07 displayed?	Yes Replace CD changer (upper module).
		No Troubleshooting completed.

DTC 07:ER01

A6E817566900W23

DTC 07:Er01	MD player
DETECTION CONDITION	MD player cannot implement insert and eject commands.
POSSIBLE CAUSE	- Defective MD (broken or foreign material stuck/attached) - MD player malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Is MD able to be ejected?	Yes Go to next step.
		No Replace MD player.
2	INSPECT MD - Inspect condition of MD where error has occurred. - Is MD okay?	Yes Go to next step.
		No Repair (remove foreign material) or replace MD, then go to next step.
3	INSPECT MD PLAYER - Clear DTC. - Insert and eject MD with no defect. - Start on-board diagnostic test mode. - Is DTC 07:Er01 displayed?	Yes Replace MD player.
		No Troubleshooting completed.

DTC 07:ER02

A6E817566900W24

DTC 07:Er02	MD player
DETECTION CONDITION	Note - When error occurs, error message "CHECK MD" is displayed in the LCD. - Cannot play MD normally or change tracks.
POSSIBLE CAUSE	- Defective MD (scratches or dirt) - MD player malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY WHETHER MALFUNCTION IS IN MD PLAYER OR MD - Play MD and select other song (change tracks). - Is MD player able to change tracks?	Yes Go to Step 3.
		Not able to change particular tracks. Go to next step.
		Not able to change any tracks. Change MD and perform track-change again. - If MD player changes tracks, then go to Step 3. - If not, replace MD player.
2	INSPECT MD - Inspect condition of MD where error has occurred. - Is MD okay?	Yes Go to next step.
		No Repair (remove foreign material) or replace MD, then go to next step.
3	INSPECT MD PLAYER - Clear DTC. - Play MD and select other song (change tracks). - Start on-board diagnostic test mode. - Is DTC 07:Er02 displayed?	Yes Replace MD player.
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AUDIO]

DTC 07:Er07

A6E817566900W25

DTC 07:Er07	MD player
DETECTION CONDITION	Note - When error occurs, error message "CHECK MD" is displayed in the LCD. - Base unit detects MD reading error.
POSSIBLE CAUSE	- Defective MD (scratches or dirt) - MD player malfunction

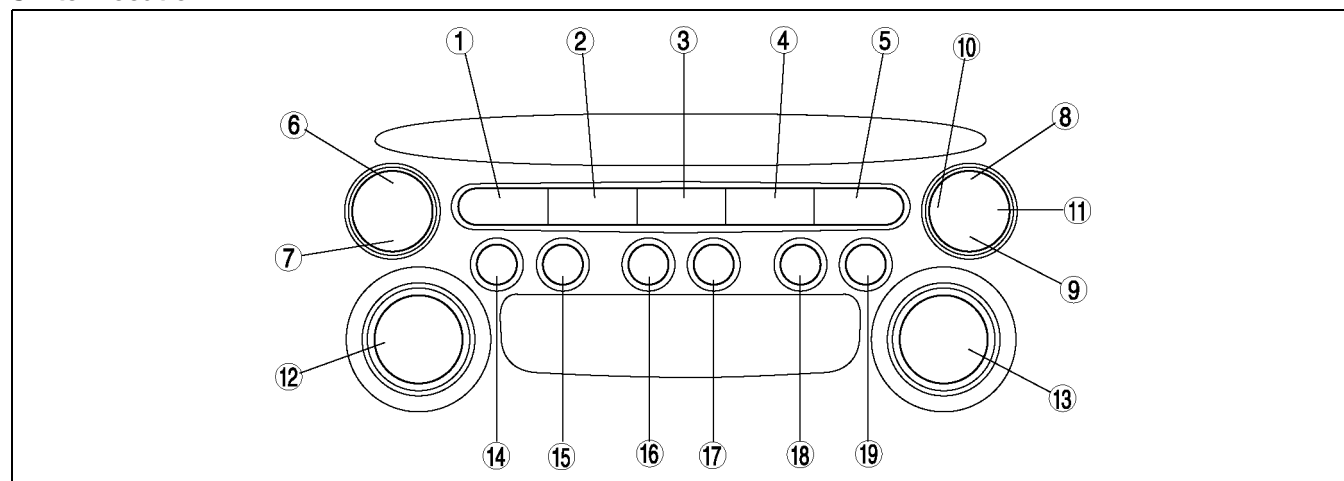
Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT MD - Inspect condition of MD where error has occurred. - Is MD okay?	Yes	Go to next step.
		No	Repair (remove foreign material) or replace MD, then go to next step.
2	INSPECT MD PLAYER - Clear DTC. - Insert and play MD for 12 seconds or more. - Start on-board diagnostic test mode. - Is DTC 07:Er07 displayed?	Yes	Replace MD player.
		No	Troubleshooting completed.

DIAGNOSTIC ASSIST FUNCTION

A6E817566900W26

Structural View Switch location



A6E8175W001

1	FM1 button
2	FM2 button
3	AM button
4	CD button
5	TAPE/MD button
6	SEEK button (upper) (type A)
	SCAN button (type B)
7	SEEK button (lower) (type A)
	AUTO-M button (type B)
8	TA button (type A)
	SEEK button (upper) (type B)
9	AUTO-M button (type A)
	SEEK button (lower) (type B)

10	AF button (type A)
11	PYT button (type A)
12	POWER button (type A)
	AUDIO CONT button (type B)
13	AUDIO CONT button (type A)
	POWER button (type B)
14	Preset button "1"
15	Preset button "2"
16	Preset button "3"
17	Preset button "4"
18	Preset button "5"
19	Preset button "6"

ON-BOARD DIAGNOSTIC [AUDIO]

LCD Inspection

1. With audio on, first press the POWER button, then simultaneously press the SEEK button (upper) for **approximately 1 second**.
2. Inspect the LCD according to the following table:

Inspection	Display	Action	
Start LCD inspection mode.		Characters displayed in LCD are not truncated or faint.	LCD is okay.
		Other than above.	Replace base unit.

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Button Inspection

1. With audio on, first press the POWER button, then simultaneously press the TAPE/MD button for **approximately 1 second**.
2. Inspect the button according to the following table:

Inspection	Display	Action	
• Start button inspection mode. • Press the all buttons.	—	Buzzer sounds.	Button is okay.
		Buzzer does not sound.	Replace base unit.

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Speaker Inspection

1. With audio on, first press the POWER button, then simultaneously press the AUTO-M button for **approximately 1 second**.
2. Inspect the speaker according to the following table:

Inspection	Display	Action	
• Start speaker inspection mode. • Does each speaker output sound in the following order? 1. Left front door speaker and tweeter 2. Right front door speaker and tweeter 3. Right rear door speaker and woofer 4. Left rear rear door speaker and woofer	—	Yes	Speakers and wiring harness between base unit and speakers are okay.
		No	Inspect the following parts. • Malfunctioning speaker • Wiring harness between base unit and malfunctioning speaker

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Radio Reception Condition Inspection

1. With audio on and at radio mode, first press the POWER button, then simultaneously press the preset button "2" for **approximately 1 second**.
2. Inspect the radio reception condition according to the following table:

Inspection	Display	Action
Start radio reception condition inspection mode.	NORMAL S-METER 5 S-METER 9	Antenna, antenna feeder, and base unit are okay.
	S-METER 3 S-METER 4	Change frequency (channel) and inspect again.
	MALFUNCTIONING S-METER 0 S-METER 2	Inspect antenna and antenna feeder. • If either one of them is not okay, replace malfunctioning part. • If both are okay, replace base unit.

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

ON-BOARD DIAGNOSTIC [AUDIO]

Audio Amplifier (External) Inspection

1. With audio on, first press the POWER button, then simultaneously press the SCAN button for **approximately 1 second**.
2. Inspect the audio amplifier (external) according to the following table:

Inspection	Display	Action	
Start audio amplifier (external) inspection mode.	NORMAL	Speakers output sound.	System is okay.
	AMP-ON AUDIO AMPLIFIER OPERATING SIGNAL IS OUTPUT	Speakers do not output sound.	Inspect following parts. - Audio amplifier (external) - Speakers - Woofer relay - Wiring harness (base unit—audio amplifier (external)—Woofer relay)
	MALFUNCTIONING AMP-OFF AUDIO AMPLIFIER OPERATING SIGNAL IS NOT OUTPUT	Replace base unit.	

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

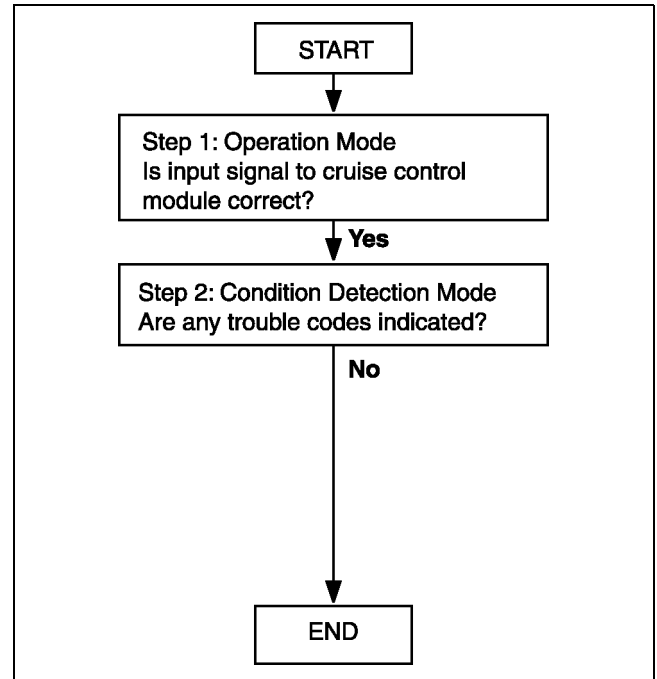
FOREWORD

A6E817266350W01

Outline

- There are two on-board diagnostic functions: Operation mode, which inspects for and indicates correct operation of the input signals to the control module, and condition detection mode, which indicates troubles in the system.
- The two functions can be done using either of the following methods:
 - Verifying the flashing pattern of the cruise set indicator light in the instrument cluster.

Inspection Order



A6E8172W001

INSPECTION OF DTCS FOR OPERATION MODE

A6E817266350W02

Note

- The cruise set indicator light will illuminate **for 3 seconds**, when operation mode is on.
- If the cruise set indicator light does not illuminate **for 3 seconds** (Operation mode is not on), the following may be the cause of the malfunction:
 - Cruise actuator ignition power supply fuse
 - Cruise set indicator light power supply fuse
 - Cruise control switch
 - Cruise control main switch
 - Clock spring for air bag system
 - Print plate in instrument cluster
 - Cruise set indicator light bulb
 - Cruise actuator
 - Open or short circuit in following wiring harnesses:
 - Between cruise set indicator light and cruise actuator terminal G
 - Between fuse block and cruise actuator terminal L
 - Between fuse block and instrument cluster
 - Between cruise actuator and clock spring
 - Between clock spring and cruise control switch
 - Open circuit in following wiring harnesses:
 - Between cruise actuator terminal I and ground
 - Between clock spring and ground

1. Turn the ignition switch to the ON position.
2. Verify that the cruise control main switch is off.

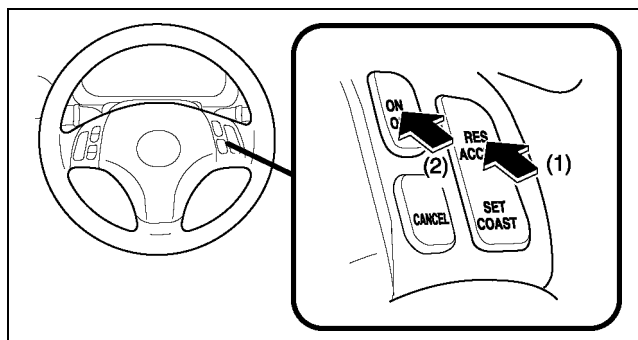
ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

3. Press and hold the RESUME/ACCEL switch on (1), and turn on the cruise control main switch (2). Keep the RESUME/ACCEL switch on for **3 seconds or more** after the cruise control main switch released. (The cruise set indicator light will illuminate for **3 seconds**, showing that the system inspection has started.)

4. Operate each switch as described in the operation code list and note the operation code list pattern.

- If the cruise set indicator light does not flash, inspect the corresponding system area.
- If it flashes, the corresponding DTC(s) will be indicated and mode can be judged normal.

5. The operation mode is canceled by turning the ignition switch to LOCK position or turning off the cruise control main switch.



A6E8172W002

Operation Code List

Operation	DTC	Output pattern	Diagnosed circuit	Page
Turn SET/COAST switch on	21		Cruise control switch (SET/COAST switch)	(See T-181 DTC 21)
Turn RESUME/ACCEL switch on	22		Cruise control switch (RESUME/ACCEL switch)	(See T-181 DTC 22)
Depress brake pedal	31		Brake switch	(See T-182 DTC 31)
MTX: Depress clutch pedal ATX: Shift selector lever to P or N position	35		MTX: Clutch switch ATX: TR switch	(See T-183 DTC 35)
Drive vehicle above 40 km/h {25 mph}	37		Vehicle speed sensor	(See T-184 DTC 37)

Inspection of Diagnostic Trouble Codes

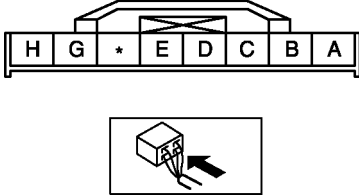
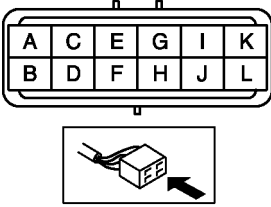
Foreword

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

DTC 21

A6E817266350W03

DTC 21	Cruise control switch (SET/COAST switch)
DETECTION CONDITION	Resistance detected between cruise actuator connector terminal J and ground is other than approximately 680 ohms.
POSSIBLE CAUSE	- Cruise actuator malfunction - Cruise control switch malfunction - Clock spring malfunction - Open circuit in wiring harness between clock spring and ground - Open or short circuit in wiring harness between cruise actuator and clock spring
CLOCK SPRING CONNECTOR  CRUISE ACTUATOR CONNECTOR (SHORT CODE) 	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT SIGNAL LINE OF CRUISE CONTROL SWITCH POSITION - Disconnect cruise actuator connector. - Turn SET/COAST switch on. - Is resistance at cruise actuator connector terminal J approximately 680 ohms?	Yes	Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)
		No	Go to next step.
2	INSPECT CRUISE CONTROL SWITCH - Inspect cruise control switch. (See T-116 CRUISE CONTROL SWITCH INSPECTION) - Is cruise control switch okay?	Yes	Go to next step.
		No	Replace cruise control switch. (See T-115 CRUISE CONTROL SWITCH REMOVAL/INSTALLATION)
3	INSPECT CLOCK SPRING - Inspect clock spring. (See T-126 CLOCK SPRING INSPECTION) - Is clock spring okay?	Yes	Go to next step.
		No	Replace clock spring. (See T-125 CLOCK SPRING REMOVAL/INSTALLATION)
4	INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND GROUND FOR CONTINUITY - Disconnect cruise control switch connector. - Is there continuity between clock spring connector terminal C and ground?	Yes	Repair wiring harness. (cruise actuator—clock spring)
		No	Repair wiring harness. (clock spring—ground)

DTC 22

A6E817266350W04

DTC 22	Cruise control switch (RESUME/ACCEL switch)
DETECTION CONDITION	Resistance detected between cruise actuator connector terminal J and ground is other than approximately 2.2 kilohms.
POSSIBLE CAUSE	- Cruise actuator malfunction - Cruise control switch malfunction

Diagnostic procedure

INSPECTION		ACTION
INSPECT CRUISE CONTROL SWITCH - Inspect cruise control switch. (See T-116 CRUISE CONTROL SWITCH INSPECTION) - Is cruise control switch okay?	Yes	Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)
	No	Replace cruise control switch. (See T-115 CRUISE CONTROL SWITCH REMOVAL/INSTALLATION)

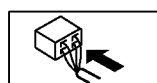
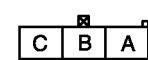
ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

DTC 31

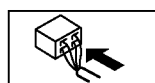
A6E817266350W05

DTC 31	Brake switch
DETECTION CONDITION	Voltage detected at cruise actuator connector terminal C is not approximately 12 V or voltage detected at cruise actuator connector terminal K is not approximately 0 V.
POSSIBLE CAUSE	- Burnt STOP 15 A fuse - Cruise actuator malfunction - Brake switch and/or brake switch 2 malfunction - Open circuit in wiring harness between STOP 15 A fuse and brake switch - Open circuit in wiring harness between brake switch and cruise actuator terminal C - Short circuit in wiring harness between brake switch 2 and cruise actuator terminal K

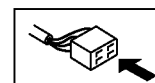
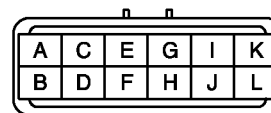
BRAKE LIGHT CONNECTOR



BRAKE SWITCH CONNECTOR



CRUISE ACTUATOR CONNECTOR (SHORT CODE)



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY WHICH BRAKE SWITCH CIRCUIT IS MALFUNCTIONING Does brake light illuminate when brake pedal depressed?	Yes Go to Step 6.
		No Go to next step.
2	INSPECT STOP 15 A FUSE FOR FUSION Is STOP 15 A fuse okay?	Yes Go to next step.
		No Replace fuse after inspecting and repairing wiring harness.
* 3	INSPECT WIRING HARNESS BETWEEN STOP 15 A FUSE AND BRAKE SWITCH FOR CONTINUITY - Depress brake pedal. - Is voltage at brake switch connector terminal D approximately 12 V?	Yes Go to Step 5.
		No Go to next step.
* 4	INSPECT WIRING HARNESS BETWEEN STOP 15 A FUSE AND BRAKE SWITCH FOR CONTINUITY Is voltage at brake switch connector terminal B approximately 12 V?	Yes Inspect brake switch. (See P-8 BRAKE SWITCH INSPECTION)
		No Repair wiring harness. (STOP 15 A fuse—Brake switch)
* 5	INSPECT WIRING HARNESS BETWEEN BRAKE SWITCH AND BRAKE LIGHT FOR CONTINUITY - Depress brake pedal. - Is voltage at brake light connector terminal (power supply side) approximately 12 V?	Yes Inspect following electrical parts. - Brake light bulb - Wiring harness between brake light and ground
		No Repair wiring harness. (Brake switch—Brake light)
* 6	INSPECT WIRING HARNESS BETWEEN BRAKE SWITCH AND CRUISE ACTUATOR FOR CONTINUITY - Depress brake pedal. - Is voltage at cruise actuator connector terminal C approximately 12 V?	Yes Go to next step.
		No Repair wiring harness. (Cruise actuator—Brake switch)

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

STEP	INSPECTION	ACTION
* 7	VERIFY WHICH IS MALFUNCTIONING, CRUISE ACTUATOR AND WIRING HARNESS (BRAKE SWITCH 2 AND CRUISE ACTUATOR) OR BRAKE SWITCH 2 - Disconnect brake switch connector. - Turn ignition switch ON position. - Is voltage at brake switch connector terminal B approximately 12 V?	Yes Go to next step.
		No Inspect brake switch 2. (See P-8 BRAKE SWITCH INSPECTION)
* 8	INSPECT WIRING HARNESS BETWEEN BRAKE SWITCH 2 AND CRUISE ACTUATOR FOR SHORT TO POWER SUPPLY - Turn ignition switch to LOCK position. - Disconnect cruise actuator connector. - Turn ignition switch ON position. - Is voltage at cruise actuator connector terminal K approximately 12 V?	Yes Repair wiring harness. (Cruise actuator—Brake switch 2)
		No Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)

DTC 35

A6E817266350W06

DTC 35	Clutch switch (MTX), TR switch (ATX)
DETECTION CONDITION	Voltage detected at cruise actuator connector terminal F is not approximately 0 V.
POSSIBLE CAUSE	- Cruise actuator malfunction - Starter relay malfunction (ATX) - Clutch switch malfunction (MTX) - TR switch malfunction (ATX) - Open circuit in wiring harness between PCM and clutch switch (MTX) - Open circuit in wiring harness between starter relay and TR switch (ATX) - Open circuit in wiring harness between cruise actuator and clutch switch (MTX) or TR switch (ATX)
TR SWITCH CONNECTOR (ATX) CLUTCH SWITCH CONNECTOR (MTX) CRUISE ACTUATOR CONNECTOR (SHORT CODE)	

Diagnostic procedure

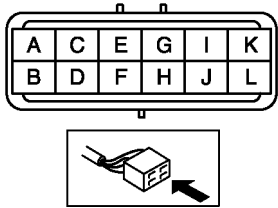
STEP	INSPECTION	ACTION
1	Does vehicle has MTX?	Yes Go to next step.
		No Go to step 5.
2	INSPECT CLUTCH SWITCH Is clutch switch okay?	Yes Go to next step.
		No Replace clutch switch.
* 3	INSPECT WIRING HARNESS BETWEEN CLUTCH SWITCH AND GROUND FOR CONTINUITY - Disconnect clutch switch connector. - Is there continuity between clutch switch connector terminal B and ground?	Yes Go to next step.
		No Repair wiring harness. (Clutch switch—ground)
* 4	INSPECT WIRING HARNESS BETWEEN CRUISE ACTUATOR AND CLUTCH SWITCH FOR CONTINUITY - Disconnect cruise actuator connector. - Is there continuity between cruise actuator connector terminal F and clutch switch connector terminal A?	Yes Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)
		No Repair wiring harness. (Cruise actuator—clutch switch)

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

STEP	INSPECTION	ACTION	
5	INSPECT TR SWITCH - Inspect TR switch. (See K-14 TRANSAXLE RANGE (TR) SWITCH INSPECTION) - Is TR switch okay?	Yes	Go to next step.
		No	Repair TR switch. (See K-15 TRANSAXLE RANGE (TR) SWITCH REMOVAL/INSTALLATION)
* 6	INSPECT WIRING HARNESS BETWEEN TR SWITCH AND GROUND FOR CONTINUITY - Disconnect TR switch connector. - Is there continuity between TR switch connector terminal A and ground?	Yes	Go to next step.
		No	Repair wiring harness (TR switch—ground) or inspect starter.
* 7	INSPECT WIRING HARNESS BETWEEN CRUISE ACTUATOR AND TR SWITCH FOR CONTINUITY - Disconnect cruise actuator connector. - Is there continuity between cruise actuator connector terminal F and TR switch connector terminal F?	Yes	Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)
		No	Repair wiring harness. (cruise actuator—TR switch)

DTC 37

A6E817266350W07

DTC 37	Vehicle speed sensor
DETECTION CONDITION	Vehicle speed signal is not detected at cruise actuator connector terminal A.
POSSIBLE CAUSE	- Cruise actuator malfunction - DSC HU/CM (with ABS/TCS HU/CM) - Open or short circuit in wiring harness between ABS/TCS cruise actuator and DSC HU/CM (without DSC: ABS/TCS HU/CM)
CRUISE ACTUATOR CONNECTOR (SHORT CODE) 	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT SPEEDOMETER OPERATION Does speedometer operate correctly?	Yes	Go to next step.
		No	Perform instrument cluster input/output check mode. (See T-75 INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE)
2	INSPECT PCM ON-BOARD DIAGNOSTIC - Drive the vehicle at more than 40 km/h {25 mph}. - Check the DTC for PCM ON-BOARD DIAGNOSTIC. - Is DTC P0500 displayed?	Yes	Go to applicable DTC inspection.
		No	Go to next step.
* 3	VERIFY WHICH IS MALFUNCTIONING, WIRING HARNESS WITH DSC OR CRUISE ACTUATOR - Disconnect cruise actuator connector and DSC HU/CM connector. - Is there continuity between cruise actuator connector terminal A and DSC HU/CM connector terminal AE? With ABS/TCS - Disconnect cruise actuator connector and ABS/TCS HU/CM connector. - Is there continuity between cruise actuator connector terminal A and ABS/TCS connector terminal V?	Yes	Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)
		No	Repair wiring harness. With DSC (DSC HU/CM—Cruise actuator) With ABS/TCS (ABS/TCS HU/CM—Cruise actuator)

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

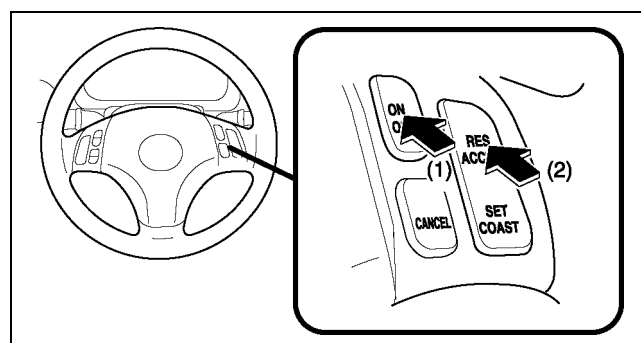
INSPECTION OF DTCS FOR CONDITION DETECTION MODE

A6E817266350W08

Note

- The cruise set indicator light will illuminate **for 3 seconds**, when condition detection mode is on.
- If the RESUME/ACCEL switch on the cruise control switch is malfunctioning, the cruise set indicator light will not give a correct indication when you inspect the system.

1. Drive the vehicle at **30 km/h {19 mph} or more**.
2. Press on the cruise control main switch (1).
3. Operate each of the cruise control switches.
4. Stop the vehicle and let it idle.
5. Turn and hold the RESUME/ACCEL switch on **for at least 3 seconds** (2). The cruise set indicator light will illuminate **for 3 seconds**, and then go off **for at least 2 seconds**. Thus, the condition detection mode begins.
 - If a DTC is indicated, inspect the corresponding system area.
 - If normal, DTC(s) will not be indicated.
6. The condition detection mode is canceled by turning the ignition switch to LOCK position or turning off the cruise control main switch.



A6E8172W013

Condition Code List

DTC	Output pattern	Diagnosed circuit	Page
01		Cruise actuator (Drive circuit)	(See T-186 DTC 01)
05		Brake switch	(See T-186 DTC 05)
07		Brake switch Brake switch 2	(See T-186 DTC 07)
11		Cruise control switch (SET/COAST switch)	(See T-187 DTC 11)
12		Cruise control switch (RESUME/ACCEL switch)	(See T-187 DTC 12)
13		Cruise control switch (Ground circuit)	(See T-188 DTC 13)
15		Cruise actuator (Control circuit)	(See T-188 DTC 15)

Note

- When two or more DTCs are indicated, inspect the malfunction with the smallest number first.

Inspection of Diagnostic Trouble Codes

Foreword

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

DTC 01

A6E817266350W09

DTC 01	Cruise actuator (Drive circuit)
DETECTION CONDITION	Malfunction in cruise actuator circuit (drive circuit)
POSSIBLE CAUSE	Cruise actuator malfunction

Diagnostic procedure

ACTION	
REPLACE CRUISE ACTUATOR IF IT IS MALFUNCTIONING	
Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)	

DTC 05

A6E817266350W10

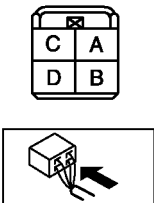
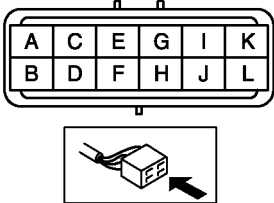
DTC 05	Brake switch
DETECTION CONDITION	Voltage detected at cruise actuator connector terminal C is always approximately 0 V.
POSSIBLE CAUSE	Cruise actuator malfunction

Diagnostic procedure

INSPECTION		ACTION
INSPECT DTC FOR OPERATION MODE Was operation mode for DTC 31 performed?	Yes	Perform operation mode for DTC 31 on-board diagnostic again. Even if no malfunction is detected in operation mode, if DTC 05 is indicated in condition detection mode on-board diagnostic, replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)
	No	Perform operation mode for DTC 31.

DTC 07

A6E817266350W11

DTC 07	Brake switch Brake switch 2
DETECTION CONDITION	- Voltage detected at cruise actuator connector terminal C or K is always approximately 12 V. - Voltage detected at cruise actuator connector terminal K is always approximately 0 V.
POSSIBLE CAUSE	- METER IG15 A fuse burnt out - Brake switch and/or brake switch 2 malfunction - Cruise actuator malfunction - Open circuit in wiring harness between STOP 15 A fuse and brake switch - Open or short circuit in wiring harness between brake switch and cruise actuator terminal C - Open circuit in wiring harness between brake switch 2 and METER IG15 A fuse - Open or short circuit in wiring harness between cruise actuator terminal K and brake switch 2
BRAKE SWITCH CONNECTOR  CRUISE ACTUATOR CONNECTOR (SHORT CODE) 	

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT BRAKE SWITCH - Disconnect brake switch connector. - Inspect brake switch. (See P-8 BRAKE SWITCH INSPECTION) - Is brake switch okay?	Yes Go to next step.
		No Replace brake switch.
2	INSPECT BRAKE SWITCH 2 - Inspect brake switch 2. (See P-8 BRAKE SWITCH INSPECTION) - Is brake switch okay?	Yes Go to next step.
		No Replace brake switch.
3	INSPECT WIRING HARNESS BETWEEN BRAKE SWITCH AND CRUISE ACTUATOR FOR CONTINUITY - Disconnect cruise actuator connector. - Is there continuity between brake switch connector D and cruise actuator connector C.	Yes Go to next step.
		No Repair wiring harness. (Cruise actuator—Brake switch)
4	INSPECT WIRING HARNESS BETWEEN BRAKE SWITCH 2 AND CRUISE ACTUATOR FOR SHORT TO POWER SUPPLY - Connect brake switch connector. - Turn ignition switch ON position. - Is voltage at cruise actuator connector terminal K approximately 12 V?	Yes Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/ INSTALLATION)
		No Repair wiring harness. (Cruise actuator—Brake switch 2)

DTC 11

A6E817266350W12

DTC 11	Cruise control switch (SET/COAST switch)
DETECTION CONDITION	Resistance detected between cruise actuator connector terminal J and ground is always approximately 680 ohms.
POSSIBLE CAUSE	- Cruise actuator malfunction - Cruise control switch malfunction

Diagnostic procedure

INSPECTION	ACTION
INSPECT DTC FOR OPERATION MODE Was operation mode for DTC 21 performed?	Yes Perform operation mode for DTC 21 on-board diagnostic again. Even if no malfunction is detected in operation mode, if DTC 11 is indicated in condition detection mode on-board diagnostic, replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/ INSTALLATION)
	No Perform operation mode for DTC 21.

DTC 12

A6E817266350W13

DTC 12	Cruise control switch (RESUME/ACCEL switch)
DETECTION CONDITION	Resistance detected between cruise actuator connector terminal J and ground is always approximately 2.2 kilohms.
POSSIBLE CAUSE	Cruise actuator malfunction

Diagnostic procedure

INSPECTION	ACTION
INSPECT DTC FOR OPERATION MODE Was operation mode for DTC 22 performed?	Yes Perform operation mode for DTC 22 on-board diagnostic again. Even if no malfunction is detected in operation mode, if DTC 12 is indicated in condition detection mode on-board diagnostic, replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/ INSTALLATION)
	No Perform operation mode for DTC 22.

ON-BOARD DIAGNOSTIC [CRUISE CONTROL SYSTEM]

DTC 13

A6E817266350W14

DTC 13	Cruise control switch (ground circuit)
DETECTION CONDITION	Resistance detected between cruise actuator connector terminal J and ground is always approximately 0 ohm.
POSSIBLE CAUSE	Cruise actuator malfunction

Diagnostic procedure

INSPECTION		ACTION
INSPECT DTC FOR OPERATION MODE Was operation mode for DTCs 21 and 22 performed?	Yes	Perform operation mode for DTCs 21 and 22 on-board diagnostic again. Even if no malfunction is detected in operation mode, if DTC 13 is indicated in condition detection mode on-board diagnostic, replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)
	No	Perform operation mode for DTCs 21 and 22.

DTC 15

A6E817266350W15

DTC 15	Cruise actuator (control circuit)
DETECTION CONDITION	Malfunction in cruise actuator circuit (control circuit)
POSSIBLE CAUSE	Cruise actuator malfunction

Diagnostic procedure

ACTION
REPLACE CRUISE ACTUATOR IF IT IS MALFUNCTIONING Replace cruise actuator. (See T-110 CRUISE ACTUATOR REMOVAL/INSTALLATION)

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

FOREWORD

A6E817401046W01

Outline

- The OBD (on-board diagnostic) test inspects the integrity and function of the air bag system and outputs the results when requested by the specific tests.
- OBD test also:
 - Provides a quick inspection of the air bag system.
 - Is usually performed at the start of each diagnostic procedure.
 - Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into three tests:
 - Read/clear diagnostic results
 - PID/data monitor and record
 - Active command mode
- Diagnostic DTC can be read/cleared, using the **SST** (WDS or equivalent).

Note

- When the air bag system is malfunctioning, turn the ignition switch to the ON position to display the current DTC, using the air bag system warning light on the instrument cluster. However this light is strictly for reference. Make sure to inspect the system, using the **SST** (WDS or equivalent).

Read/clear diagnostic results

- This function allows you to read or clear DTCs in the SAS unit memory.

PID/data monitor and record

- This function allows you access certain data values, input signals, calculated values, and system status information.

Active command modes

- This function allows you to control devices through WDS or equivalent.

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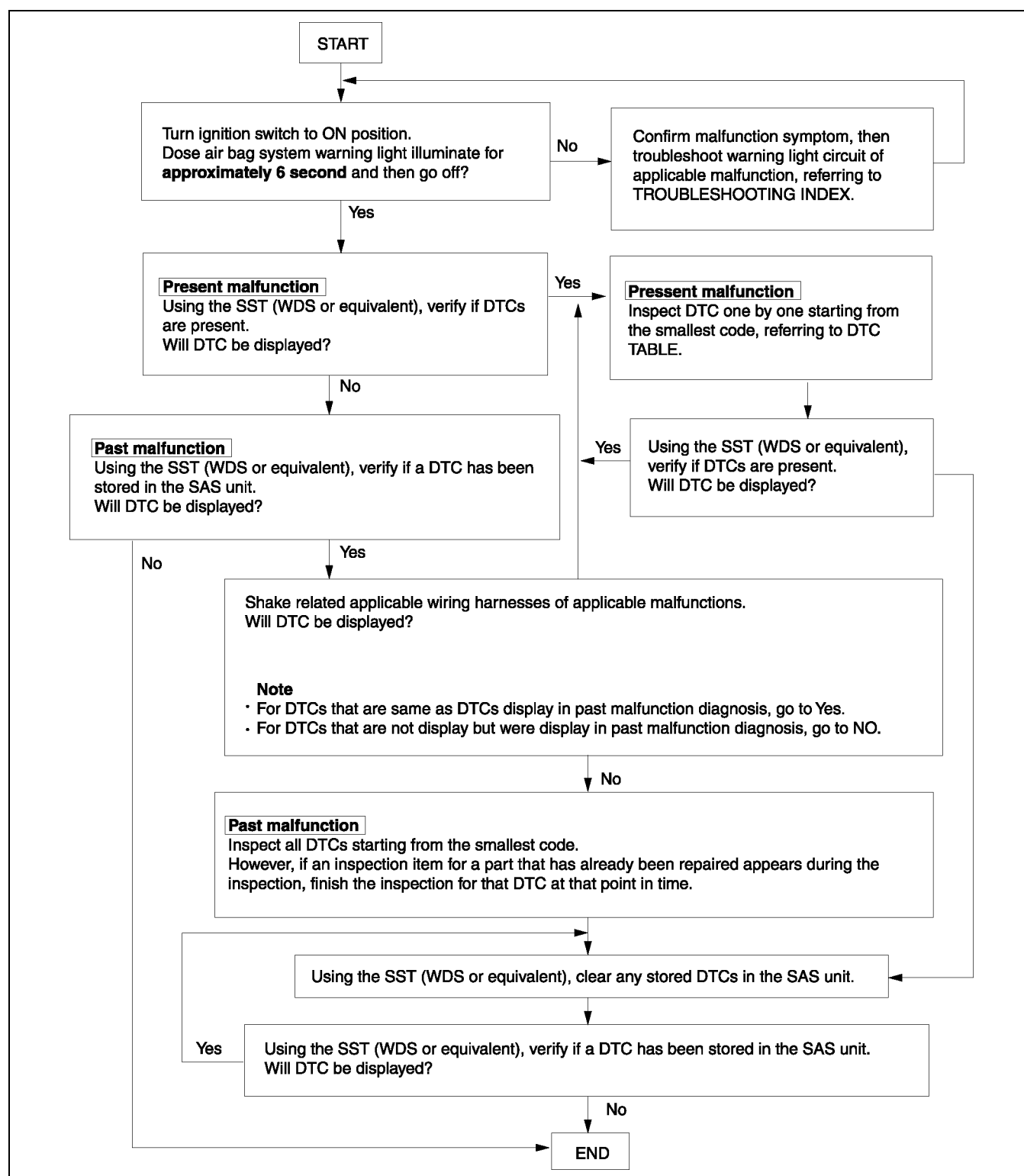
ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

Flowchart

- Use the following flowchart to verify the cause of the trouble.

Note

- While performing the inspection of the past malfunction code, the applicable DTCs may be added to memory by removing or disconnecting the related parts. Inspect only the DTCs that were indicated before inspecting.
- When DTCs of present malfunction are no longer output after present and/or past malfunctions have been repaired, be sure to perform past malfunction display cancellation to prevent repair of malfunctions that have already been repaired.

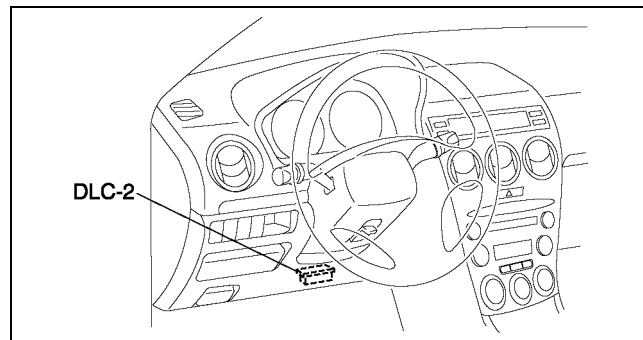


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ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTCs Reading Procedure

1. Connect **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Retrieve DTC using **SST** (WDS or equivalent).



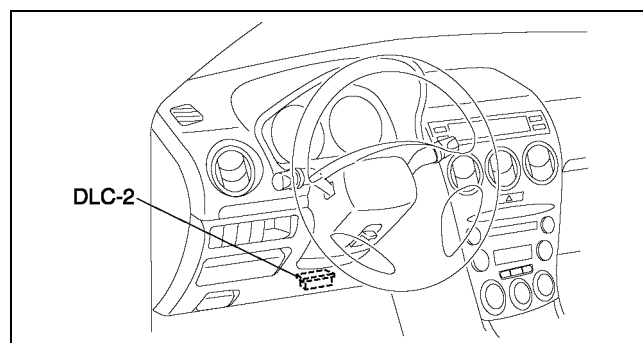
A6E3970W002

Clearing DTCs Procedure

1. After repairs have been made, perform the **DTCs reading procedure**.
2. Erase DTCs using **SST** (WDS or equivalent).
3. Ensure that the customer's concern has been resolved.

PID/Data Monitor and Record Procedure

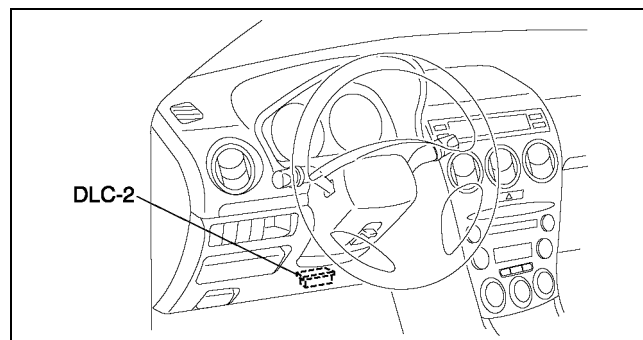
1. Connect **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Access and monitor PIDs using **SST** (WDS or equivalent).



A6E3970W002

Active Command Mode Procedure

1. Connect **SST** (WDS or equivalent) to the vehicle DLC-2 16-pin connector.
2. Turn the ignition switch to ON position.
3. Activate active command mode using **SST** (WDS or equivalent).



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ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC TABLE

A6E817401046W02

- DTCs are common for present and past malfunction diagnosis.

Note

- When DTCs not shown in the DTC table are displayed, replace the SAS unit.
- If the air bag system warning light does not illuminate or remains illuminated when the ignition switch is turned to ON position, inspect and repair the air bag system warning light circuitry and then confirm that the air bag system warning light is operational.
- The air bag system warning light will flash the DTC pattern for five cycles, and then will remain illuminated until the ignition switch is turned to the LOCK position.

DTC					Malfunction location	Page
WDS or equivalent	Air bag system warning light					
	Flashing pattern		Priority ranking			
B1231	13		3	SAS unit activation (deployment) control freeze	(See T-198 DTC B1231)	
B1342	12		2	SAS unit	(See T-198 DTC B1342)	
	—	Air bag system warning light is illuminated all the time.	1	SAS unit (DTC 12 detection circuit malfunction)		
B1869	—	Air bag system warning light is illuminated all the time.	1	Air bag system warning light system circuit open	(See T-198 DTC B1869, B1870)	
	—	Air bag system warning light is illuminated does not illuminate.	—	Air bag system warning light system circuit short to ground		
B1870	—	Air bag system warning light is illuminated all the time.	1	Air bag system warning light system circuit short to power supply		
B1871	47		19	Occupancy sensor system (communication error)	(See T-200 DTC B1871)	
	48		20	Occupancy sensor system (sensor internal circuit abnormal)		
B1877	33		13	Driver-side pre-tensioner seat belt system resistance high	(See T-202 DTC B1877, B1878, B1879, B1885)	
B1878				Driver-side pre-tensioner seat belt system circuit short to power supply		
B1879				Driver-side pre-tensioner seat belt system circuit short to ground		
B1881	34		12	Passenger-side pre-tensioner seat belt system resistance high	(See T-203 DTC B1881, B1882, B1883, B1886)	
B1882				Passenger-side pre-tensioner seat belt system circuit short to power supply		
B1883				Passenger-side pre-tensioner seat belt system short to ground		
B1884	18		18	Passenger-side air bag cut-off indicator light system circuit open or short to ground	(See T-205 DTC B1884, B1890)	

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

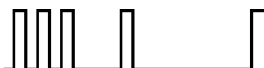
DTC				Malfunction location	Page
WDS or equivalent	Air bag system warning light				
	Flashing pattern		Priority ranking		
B1885	33		13	Driver-side pre-tensioner seat belt system resistance low	(See T-202 DTC B1877, B1878, B1879, B1885)
B1886	34		12	Passenger-side pre-tensioner seat belt system resistance low	(See T-203 DTC B1881, B1882, B1883, B1886)
B1890	18		18	Passenger-side air bag cut-off indicator light system circuit short to power supply	(See T-205 DTC B1884, B1890)
B1913	19		11	Driver-side air bag module (inflator No.1) system circuit short to ground	(See T-208 DTC B1913, B1916, B1932, B1934)
	21		10	Passenger-side air bag module (inflator No.1) system circuit short to ground	(See T-210 DTC B1913, B1925, B1933, B1935)
B1916	19		11	Driver-side air bag module (inflator No.1) system circuit short to power supply	(See T-208 DTC B1913, B1916, B1932, B1934)
B1921	14		4	Deployment prohibited because configuration is not set	(See T-211 DTC B1921)
B1925	21		10	Passenger-side air bag module (inflator No.1) system circuit short to power supply	(See T-210 DTC B1913, B1925, B1933, B1935)
B1932	19		11	Driver-side air bag module (inflator No.1) system resistance high	(See T-208 DTC B1913, B1916, B1932, B1934)
B1933	21		10	Passenger-side air bag module (inflator No.1) system resistance high	(See T-210 DTC B1913, B1925, B1933, B1935)
B1934	19		11	Driver-side air bag module (inflator No.1) system resistance low	(See T-208 DTC B1913, B1916, B1932, B1934)
B1935	21		10	Passenger-side air bag module (inflator No.1) system resistance low	(See T-210 DTC B1913, B1925, B1933, B1935)
B1992	22		15	Driver-side side air bag module system circuit short to power supply	(See T-212 DTC B1992, B1993, B1994, B1995)
B1993				Driver-side side air bag module system circuit short to ground	
B1994				Driver-side side air bag module system resistance high	
B1995				Driver-side side air bag module system resistance low	

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ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC				Malfunction location	Page
WDS or equivalent	Air bag system warning light				
	Flashing pattern		Priority ranking		
B1996	23		14	Passenger-side side air bag module system circuit short to power supply	(See T-213 DTC B1996, B1997, B1998, B1999)
B1997				Passenger-side side air bag module system circuit short to ground	
B1998				Passenger-side side air bag module system resistance high	
B1999				Passenger-side side air bag module system resistance low	
B2228	19		11	Driver-side air bag module (inflator No.2) system circuit short to ground	(See T-215 DTC B2228, B2230, B2232, B2234)
B2229	21		10	Passenger-side air bag module (inflator No.2) system circuit short to ground	(See T-217 DTC B2229, B2231, B2233, B2235)
B2230	19		11	Driver-side air bag module (inflator No.2) system circuit short to power supply	(See T-215 DTC B2228, B2230, B2232, B2234)
B2231	21		10	Passenger-side air bag module (inflator No.2) system circuit short to power supply	(See T-217 DTC B2229, B2231, B2233, B2235)
B2232	19		11	Driver-side air bag module (inflator No.2) system resistance high	(See T-215 DTC B2228, B2230, B2232, B2234)
B2233	21		10	Passenger-side air bag module (inflator No.2) system resistance high	(See T-217 DTC B2229, B2231, B2233, B2235)
B2234	19		11	Driver-side air bag module (inflator No.2) system resistance low	(See T-215 DTC B2228, B2230, B2232, B2234)
B2235	21		10	Passenger-side air bag module (inflator No.2) system resistance low	(See T-217 DTC B2229, B2231, B2233, B2235)
B2296	42		9	Crash zone sensor system (communication error, sensor internal circuit abnormal)	(See T-218 DTC B2296)
B2444	43		8	Driver-side side air bag sensor system (sensor internal circuit abnormal)	(See T-220 DTC B2444, U2017)
B2445	44		7	Passenger-side side air bag sensor system (sensor internal circuit abnormal)	(See T-222 DTC B2445, U2018)
B2477	54		5	Configuration error	(See T-224 DTC B2477)

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC			Malfunction location	Page	
WDS or equivalent	Air bag system warning light				
	Flashing pattern	Priority ranking			
B2773	24		17	Driver-side curtain air bag module system resistance low	(See T-224 DTC B2773, B2774, B2775, B2776)
B2774				Driver-side curtain air bag module system resistance high	
B2775				Driver-side curtain air bag module system circuit short to ground	
B2776				Driver-side curtain air bag module system circuit short to power supply	
B2777	25		16	Passenger-side curtain air bag module system resistance low	(See T-226 DTC B2777, B2778, B2779, B2780)
B2778				Passenger-side curtain air bag module system resistance high	
B2779				Passenger-side curtain air bag module system circuit short to ground	
B2780				Passenger-side curtain air bag module system circuit short to power supply	
B2867	31		6	SAS unit connector poor connection	(See T-227 DTC B2867)
U2017	43		8	Driver-side side air bag sensor system (communication error)	(See T-220 DTC B2444, U2017)
U2018	44		7	Passenger-side side air bag sensor system (communication error)	(See T-222 DTC B2445, U2018)

PID/DATA MONITOR TABLE

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PID name (definition)	Unit/condition	Condition/specification	SAS unit terminal
CONT_RCM (Number of continuous DTC)	—	- DTC is detected: 1—255 - DTC is not detected: 0	—
D_ABAGR2 (Driver-side air bag module (inflator No.2) resistance)	ohm	Under any condition: 1.5—3.7 ohm	1G, 1J
D_CRSH_S (Driver-side side air bag sensor state)	OK/ COMM FAIL/ INT FAIL	- Sensor normal: OK - Sensor communication error: COMM FAIL - Sensor internal circuit abnormal: INT FAIL	2Z, 2AA
DABAGR (Driver-side air bag module (inflator No.1) resistance)	ohm	Under any condition: 1.5—3.7 ohm	1S, 1V
DR_CURTN (Driver-side curtain air bag module resistance)	ohm	Under any condition: 1.4—3.2 ohm	2V, 2Y
DR_PTENS (Driver-side pre-tensioner seat belt resistance)	ohm	Under any condition: 1.5—3.1 ohm	2P, 2S
DS_AB (Driver-side side air bag module resistance)	ohm	Under any condition: 1.4—3.2 ohm	2M, 2O

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

PID name (definition)	Unit/condition	Condition/specification	SAS unit terminal
DS_AB_ST (Driver-side side air bag module circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2M, 2O
DS_CURT_ST (Driver-side curtain air bag module circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2V, 2Y
DS1_STAT (Driver-side air bag module (inflator No.1) circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	1S, 1V
DS2_STAT (Driver-side air bag module (inflator No.2) circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	1G, 1J
DSB_P_ST (On demand driver-side pre-tensioner seat belt circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2P, 2S
DSSBLT_PF (Driver-side pre-tensioner seat belt circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2P, 2S
FRNT_CRSHSNSR (Crash zone sensor state)	OK/ COMM FAIL/ INT FAIL	- Sensor normal: OK - Sensor communication error: COMM FAIL - Sensor internal circuit abnormal: INT FAIL	1B, 1C
OD_D_CRSH (On demand driver-side side air bag sensor state)	OK/ COMM FAIL/ INT FAIL	- Sensor normal: OK - Sensor communication error: COMM FAIL - Sensor internal circuit abnormal: INT FAIL	2Z, 2AA
OD_D_CURT (On demand driver-side curtain air bag module circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2V, 2Y
OD_DAB1_ST (On demand driver-side air bag module (inflator No.1) circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	1S, 1V
OD_DAB2_ST (On demand driver-side air bag module (inflator No.2) circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	1G, 1J
OD_DSAB_ST (On demand driver-side side air bag circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2M, 2O
OD_F_CRSH (On demand crash zone sensor state)	OK/ COMM FAIL/ INT FAIL	- Sensor normal: OK - Sensor communication error: COMM FAIL - Sensor internal circuit abnormal: INT FAIL	1B, 1C
OD_P_CRSH (On demand passenger-side side air bag sensor state)	OK/ COMM FAIL/ INT FAIL	- Sensor normal: OK - Sensor communication error: COMM FAIL - Sensor internal circuit abnormal: INT FAIL	2B, 2C
OD_P_CURT (On demand passenger-side curtain air bag module circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2A, 2D
OD_PAB1ST (On demand passenger-side air bag module (inflator No.1) circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	1M, 1P
OD_PAB2_ST (On demand passenger-side air bag module (inflator No.2) circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	1A, 1D

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

PID name (definition)	Unit/condition	Condition/specification	SAS unit terminal
OD_P_PSAB_ST (On demand passenger-side side air bag sensor circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2I, 2L
P_ABAGR2 (Passenger-side air bag module (inflator No.2) resistance)	ohm	Under any condition: 1.4—2.9 ohm	1A, 1D
P_PTENSFLT (Passenger-side pre-tensioner seat belt circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2G, 2J
PABAGR (Passenger-side air bag module (inflator No.1) resistance)	ohm	Under any condition: 1.4—2.9 ohm	1M, 1P
PCRSH_SNSR (Passenger-side side air bag sensor state)	OK/ COMM FAIL/ INT FAIL	- Sensor normal: OK - Sensor communication error: COMM FAIL - Sensor internal circuit abnormal: INT FAIL	2B, 2C
PS_AB (Passenger-side side air bag module resistance)	ohm	Under any condition: 1.4—3.2 ohm	2I, 2L
PS_AB_ST (Passenger-side side air bag sensor circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2I, 2L
PS_CURTIN (Passenger-side curtain air bag module resistance)	ohm	Under any condition: 1.4—3.2 ohm	2A, 2B
PS_CURT_ST (Passenger-side curtain air bag module circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2A, 2D
PS_PTENS (Passenger-side pre-tensioner seat belt resistance)	ohm	Under any condition: 1.5—3.1 ohm	2G, 2J
PS1_STAT (Passenger-side air bag module (inflator No.1) circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	1M, 1P
PS2_STAT (Passenger-side air bag module (inflator No.2) circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	1A, 1D
PSB_P_ST (On demand passenger-side pre-tensioner seat belt circuit state)	NORMAL/ OPEN/ SHRT GND/ SHRT B+	- Related wiring harness normal: NORMAL - Related wiring harness circuit open: OPEN - Related wiring harness short to ground: SHRT GND - Related wiring harness short to power supply: SHRT B+	2G, 2J
RCM_VOLT (System IG1 voltage value)	V	- Ignition switch to ON position: B+ - Other: 0 V	1W

ACTIVE COMMAND MODE TABLE

A6E817401046W04

Command name	Definition	Operation
WRNLAMPCHM	Air bag system warning light	ON/OFF

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B1231

A6E817401046W05

DTC B1231	SAS unit activation (deployment) control freeze
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - SAS unit determined collision

Diagnostic procedure

ACTION
Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION)

DTC B1342

A6E817401046W06

DTC B1342	SAS unit
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Malfunction in SAS unit inner circuit
POSSIBLE CAUSE	SAS unit malfunction

Diagnostic procedure

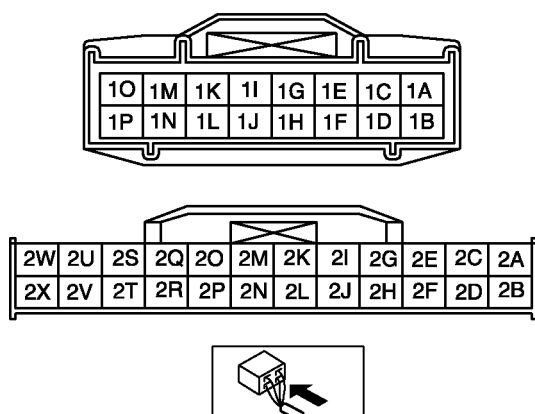
ACTION
Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION)

DTC B1869, B1870

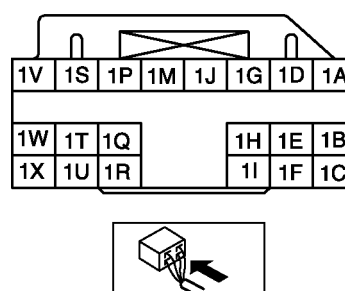
A6E817401046W07

DTC	B1869	Air bag system warning light system circuit open or short to ground
	B1870	Air bag system warning light system circuit short to power supply
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Malfunction in air bag system warning light circuit	
POSSIBLE CAUSE	- METER IG 15 A fuse malfunction - Instrument cluster malfunction - Malfunction of connectors between instrument cluster and SAS unit - Open or short circuit in wiring harness between METER IG 15 A fuse and instrument cluster - Open or short circuit in wiring harness between instrument cluster and SAS unit - SAS unit malfunction	

INSTRUMENT CLUSTER CONNECTOR



SAS UNIT CONNECTOR



ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

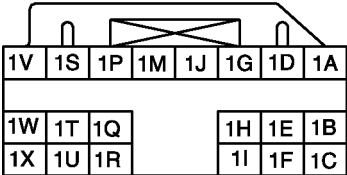
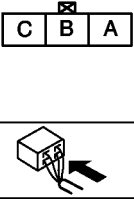
Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT METER IG 15 A FUSE • Turn ignition switch to LOCK position. • Disconnect negative battery cable. • Remove METER IG 15 A fuse. • Is fuse okay?	Yes	Reinstall METER IG 15 A fuse, then go to next step.
		No	Replace METER IG 15 A fuse.
2	INSPECT FOR CONTINUITY BETWEEN METER IG 15 A FUSE AND INSTRUMENT CLUSTER • Connect negative battery cable. • Turn ignition switch to ON position. • Measure voltage at instrument cluster connector terminal 2V. • Is voltage more than 9 V?	Yes	Go to next step.
		No	Repair wiring harness.
3	INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND SAS UNIT Warning • Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for more than 1 minute. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Remove B-pillar lower trims. (Vehicle with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS unit connectors. • Disconnect instrument cluster. • Inspect following wiring harness between SAS unit and instrument cluster terminals for short to ground, short to power supply, and open circuit: — 1T—1O • Is wiring harness okay?	Yes	Go to next step.
		No	Replace wiring harness.
4	INSPECT AIR BAG SYSTEM WARNING LIGHT • Connect instrument cluster. • Turn ignition switch to ON position. • Is air bag system warning light illuminated?	Yes	Go to next step.
		No	Replace instrument cluster. (See T-72 INSTRUMENT CLUSTER REMOVAL/INSTALLATION)
5	INSPECT AIR BAG SYSTEM WARNING LIGHT • Using a jumper wire, cause a short circuit between instrument cluster terminal 1O and ground. • Does air bag system warning light go out?	Yes	[Present malfunction diagnosis] Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) [Past malfunction diagnosis] Troubleshooting completed.
		No	Replace instrument cluster. (See T-72 INSTRUMENT CLUSTER REMOVAL/INSTALLATION)

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B1871

A6E817401046W08

DTC B1871	Occupancy sensor system (communication error, sensor internal circuit abnormal)
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Malfunction in wiring harness between SAS unit and occupancy sensor - Malfunction in occupancy sensor circuit
POSSIBLE CAUSE	- Open or short circuit in wiring harness between METER IG 15 A fuse and occupancy sensor - Open or short circuit in wiring harness between SAS unit and occupancy sensor - Open circuit in wiring harness between occupancy sensor and ground - Occupancy sensor malfunction - SAS unit malfunction
SAS UNIT CONNECTOR  OCCUPANCY SENSOR CONNECTOR 	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	• Is vehicle equipped with passenger-side air bag cut-off function?	Yes	Go to next step.
		No	[Present malfunction diagnosis] Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) [Past malfunction diagnosis] Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

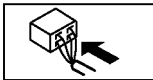
STEP	INSPECTION	ACTION	
2	INSPECT WIRING HARNESS BETWEEN OCCUPANCY SENSOR AND SAS UNIT Warning - Handling air bag system components improperly can accidentally deploy air bag modules, and pre-tensioner seat belts which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Remove B-pillar lower trim. (Vehicle with pre-tensioner seat belt) - Disconnect drive- and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Disconnect occupancy sensor connector. - Connect negative battery cable. - Inspect following wiring harness between SAS unit and occupancy sensor terminals for short to ground, short to power supply, and open circuit: — 1I—B - Is wiring harness okay?	Yes	Go to next step.
		No	Replace wiring harness.
3	INSPECT WIRING HARNESS BETWEEN METER IG 15 A FUSE AND OCCUPANCY SENSOR - Connect negative battery cable. - Turn ignition switch to ON position. - Measure voltage at occupancy connector terminal A. - Is voltage more than 9V?	Yes	[Present malfunction diagnosis] Go to next step. [Past malfunction diagnosis] Troubleshooting completed.
		No	Replace wiring harness.
4	VERIFY WHETHER MALFUNCTION IS IN OCCUPANCY SENSOR OR SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect all SAS unit connectors. - Connect drive- and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Connect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) - Connect passenger-side air bag module connector. - Connect clock spring connector. - Connect occupancy sensor connector. - Short occupancy sensor connector terminal B to ground. - Connect negative battery cable. - Turn ignition switch to ON position. - Is DTC B1871 indicated?	Yes	Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace seat cushion. (See S-106 FRONT SEAT DISASSEMBLY/ASSEMBLY)

T

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B1877, B1878, B1879, B1885

A6E817401046W09

DTC	B1877	Driver-side pre-tensioner seat belt system resistance high
	B1878	Driver-side pre-tensioner seat belt system circuit short to power supply
	B1879	Driver-side pre-tensioner seat belt system circuit short to ground
	B1885	Driver-side pre-tensioner seat belt system resistance low
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.5—3.1 ohm) detected in driver-side pre-tensioner seat belt circuit - Malfunction in wiring harness between driver-side pre-tensioner seat belt and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between driver-side pre-tensioner seat belt and SAS unit - Driver-side pre-tensioner seat belt malfunction - SAS unit malfunction	
DRIVER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR 		

Diagnostic procedure

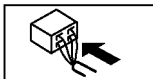
STEP	INSPECTION		ACTION
1	INSPECT DRIVER-SIDE PRE-TENSIONER SEAT BELT - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DR_PTENS - Is resistant value of driver-side pre-tensioner seat belt normal? — Resistance: 1.5—3.1 ohm	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Go to next step.
2	INSPECT DRIVER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove driver's side B-pillar lower trim. - Disconnect driver-side pre-tensioner seat belt connector. - Is there cracking or chipping in driver-side pre-tensioner seat belt connector?	Yes	Replace wiring harness.
		No	Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

STEP	INSPECTION	ACTION
3	VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE PRE-TENSIONER SEAT BELT OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to driver-side pre-tensioner seat belt connector terminal A and B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DSB_P_ST - Is related wiring harness normal?	Yes Replace driver-side pre-tensioner seat belt. (See S-100 FRONT SEAT BELT REMOVAL/INSTALLATION)
		No Replace wiring harness, then go to next step.
4	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect driver-side pre-tensioner seat belt connector. - Are DTCs B1877, B1878, B1879 and/or B1885 indicated?	Yes Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No Troubleshooting completed.

DTC B1881, B1882, B1883, B1886

A6E817401046W10

DTC	B1881	Passenger-side pre-tensioner seat belt system resistance high
	B1882	Passenger-side pre-tensioner seat belt system circuit short to power supply
	B1883	Passenger-side pre-tensioner seat belt system circuit short to ground
	B1886	Passenger-side pre-tensioner seat belt system resistance low
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.5—3.1 ohm) detected in passenger-side pre-tensioner seat belt circuit - Malfunction in wiring harness between passenger-side pre-tensioner seat belt and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between passenger-side pre-tensioner seat belt and SAS unit - Passenger-side pre-tensioner seat belt malfunction - SAS unit malfunction	
PASSENGER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR 		

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

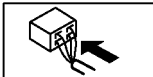
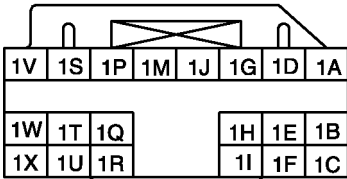
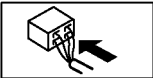
Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT PASSENGER-SIDE PRE-TENSIONER SEAT BELT - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — PS_PTENS - Is resistant value of passenger-side pre-tensioner seat belt normal? — Resistance: 1.5—3.1 ohm	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Go to next step.
2	INSPECT PASSENGER-SIDE PRE-TENSIONER SEAT BELT CONNECTOR Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove passenger's side B-pillar lower trim. - Disconnect passenger-side pre-tensioner seat belt connector. - Is there cracking or chipping in passenger-side pre-tensioner seat belt connector?	Yes	Replace wiring harness.
		No	Go to next step.
3	VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE PRE-TENSIONER SEAT BELT OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to passenger-side pre-tensioner seat belt connector terminal A and B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — PSB_P_ST - Is related wiring harness normal?	Yes	Replace passenger-side pre-tensioner seat belt. (See S-100 FRONT SEAT BELT REMOVAL/INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect passenger-side pre-tensioner seat belt connector. - Are DTCs B1881, B1882, B1883 and/or B1886 indicated?	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B1884, B1890

A6E817401046W11

DTC	B1884	Passenger-side air bag cut-off indicator light system circuit open or short to ground
	B1890	Passenger-side air bag cut-off indicator light system circuit short to power supply
DETECTION CONDITION	Warning • Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. • Malfunction in passenger-side air bag cut-off indicator light circuit	
POSSIBLE CAUSE	• Open or short circuit in wiring harness between SAS unit and passenger-side air bag cut-off indicator light • Open circuit in wiring harness between METER IG 15 A fuse and passenger-side air bag cut-off indicator light • Passenger-side air bag cut-off indicator light malfunction • SAS unit malfunction	
SAS UNIT CONNECTOR  PASSENGER-SIDR AIR BAG CUT-OFF INDICATOR LIGHT 		

Diagnostic procedure

STEP	INSPECTION	ACTION
1	Is vehicle equipped with passenger-side air bag cut-off function?	Yes [Present malfunction diagnosis] Go to next step. [Past malfunction diagnosis] Go to Step 4.
		No [Present malfunction diagnosis] Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) [Past malfunction diagnosis] Troubleshooting completed.
2	INSPECT OPERATION OF PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT - Turn ignition switch to LOCK position and wait for more than 1 minute. - Turn ignition switch to ON position. - Does passenger-side air bag cut-off indicator light illuminate?	Yes Go to next step.
		No Go to Step 6.
3	INSPECT OPERATION OF PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT Without child restraint seat on passenger's seat, does passenger-side air bag cut-off indicator light go off after approximately 6 seconds?	Yes Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION)
		No Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

STEP	INSPECTION	ACTION	
4	INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT AND SAS UNIT Warning - Handling air bag system components improperly can accidentally deploy air bag modules, and pre-tensioner seat belts which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Remove B-pillar lower trim. (Vehicle with pre-tensioner seat belt) - Disconnect drive- and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Connect negative battery cable. - Turn ignition switch to ON position. - Measure voltage at 1U of SAS unit connector terminal. - Is voltage more than 9V?	Yes	[Present malfunction diagnosis] Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) [Past malfunction diagnosis] Go to next step.
		No	Go to next step.
5	INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT AND SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable. - Remove center panel module. (See T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION) - Inspect following wiring harness between passenger-side air bag cut-off indicator light and SAS unit terminals for short to ground: — A—1U - Is wiring harness okay?	Yes	[Present malfunction diagnosis] Replace passenger-side air bag cut-off indicator light. [Past malfunction diagnosis] Go to next step.
		No	Replace wiring harness.
6	INSPECT PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT BULB - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minutes. - Remove center panel module. (See T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION) - Remove passenger-side air bag cut-off indicator light bulb. - Is passenger-side air bag cut-off indicator light bulb okay?	Yes	Reinstall passenger-side air bag cut-off indicator light bulb, then go to next step.
		No	Replace passenger-side air bag cut-off indicator light bulb.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

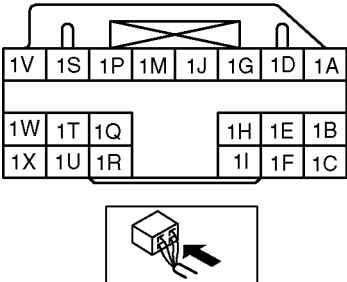
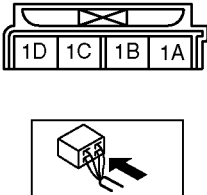
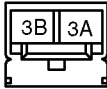
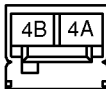
STEP	INSPECTION	ACTION	
7	INSPECT PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minutes. - Remove center panel module. (See T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION) - Inspect continuity wiring harness between passenger-side air bag cut-off indicator light terminals A and B. - Is passenger-side air bag cut-off indicator light normal?	Yes	Go to next step.
		No	Replace passenger-side air bag cut-off indicator light .
8	INSPECT FOR CONTINUITY BETWEEN METER IG 15 A FUSE AND PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT - Connect negative battery cable. - Turn ignition switch to ON position. - Measure voltage at terminal B of passenger-side air bag cut-off indicator light connector. - Is voltage more than 9V?	Yes	Go to next step.
		No	Replace wiring harness.
9	INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT AND SAS UNIT Warning Handling air bag system components improperly can accidentally deploy air bag modules, and pre-tensioner seat belts which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Remove B-pillar lower trims. (Vehicle with pre-tensioner seat belt) - Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Inspect following wiring harness between passenger-side air bag cut-off indicator light and SAS unit terminals for short to ground or open circuit: — A—1U - Is wiring harness okay?	Yes	[Present malfunction diagnosis] Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) [Part malfunction diagnosis] Troubleshooting completed.
		No	Replace wiring harness.

T

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B1913, B1916, B1932, B1934

A6E817401046W12

DTC	B1913	Driver-side air bag module (inflator No.1) system circuit short to ground
	B1916	Driver-side air bag module (inflator No.1) system circuit short to power supply
	B1932	Driver-side air bag module (inflator No.1) system resistance high
	B1934	Driver-side air bag module (inflator No.1) system resistance low
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.5—3.7 ohm) detected in driver-side air bag module (inflator No.1) circuit - Malfunction in wiring harness between driver-side air bag module (inflator No.1) and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between clock spring and SAS unit - Clock spring malfunction - Driver-side air bag module (inflator No.1) malfunction - SAS unit malfunction	
SAS UNIT CONNECTOR  CLOCK SPRING CONNECTOR  DRIVER-SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING) INFLATOR NO.1  INFLATOR NO.2 		

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.1) - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DABAGR - Is resistant value of driver-side air bag module normal? — Resistance: 1.5—3.7 ohm	Yes	[Present malfunction diagnosis] Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) [Part malfunction diagnosis] Troubleshooting completed.
		No	Go to next step.
2	INSPECT DRIVER-SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING) Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove driver-side air bag module. - Is there cracking or chipping in driver-side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

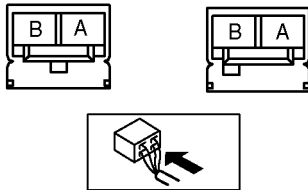
STEP	INSPECTION	ACTION	
3	VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.1) OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to driver-side air bag module (inflator No.1) connector terminal 3A and 3B, and driver-side air bag module (inflator No.2) connector terminal 4A and 4B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — OD_DAB1_ST - Is related wiring harness normal?	Yes	Replace driver-side air bag module. (See T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Go to next step.
4	INSPECT CLOCK SPRING - Inspect clock spring. (See T-126 CLOCK SPRING INSPECTION) - Is clock spring normal?	Yes	Go to next step.
		No	Replace clock spring. (See T-125 CLOCK SPRING REMOVAL/INSTALLATION)
5	INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicle with curtain air bag) - Remove B-pillar lower trim. (Vehicle with pre-tensioner seat belt) - Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Inspect following wiring harnesses between SAS unit and clock spring terminals for short to ground, short to power supply, and open circuit: — 1S—1D — 1V—1C - Is wiring harness okay?	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Replace wiring harnesses.

T

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B1913, B1925, B1933, B1935

A6E817401046W13

DTC	B1913	Passenger-side air bag module (inflator No.1) system circuit short to ground
	B1925	Passenger-side air bag module (inflator No.1) system circuit short to power supply
	B1933	Passenger-side air bag module (inflator No.1) system resistance high
	B1935	Passenger-side air bag module (inflator No.1) system resistance low
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.4—2.9 ohm) detected in passenger-side air bag module (inflator No.1) circuit - Malfunction in wiring harness between passenger-side air bag module (inflator No.1) and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between passenger-side air bag module (inflator No.1) and SAS unit - Passenger-side air bag module (inflator No.1) malfunction - SAS unit malfunction	
PASSENGER-SIDE AIR BAG MODULE CONNECTOR INFLATOR NO.1 INFLATOR NO.2 		

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — PABAGR - Is resistant value of passenger-side air bag module normal? — Resistance: 1.4—2.9 ohm	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Go to next step.
2	INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) CONNECTOR Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Is there cracking or chipping in passenger-side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

STEP	INSPECTION	ACTION
3	VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to passenger-side air bag module (inflator No.1) connector terminal A and B, and passenger-side air bag module (inflator No.2) connector terminal A and B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DO_PAB1ST - Is related wiring harness normal?	Yes Replace passenger-side air bag module. (See T-121 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No Replace wiring harness, then go to next step.
4	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect passenger-side air bag module connector. - Are DTCs B1913, B1925, B1933 and/or B1935 indicated?	Yes Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No Troubleshooting completed.

DTC B1921

A6E817401046W14

DTC B1921	Deployment prohibited because configuration is not set
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - SAS unit configuration has not been set
POSSIBLE CAUSE	- SAS unit configuration has not been set - SAS unit malfunction

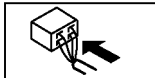
Diagnostic procedure

INSPECTION	ACTION
CONFIGURATION - Configure SAS unit, using SST (WDS or equivalent). - Is DTC B1921 indicated?	Yes [Present malfunction diagnosis] Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) [Past malfunction diagnosis] Troubleshooting completed.
	No Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B1992, B1993, B1994, B1995

A6E817401046W15

DTC	B1992	Driver-side side air bag module system circuit short to power supply
	B1993	Driver-side side air bag module system circuit short to ground
	B1994	Driver-side side air bag module system resistance high
	B1995	Driver-side side air bag module system resistance low
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.4—3.2 ohm) detected in driver-side side air bag module circuit - Malfunction in wiring harness between driver-side side air bag module and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between driver-side side air bag module and SAS unit - Driver-side side air bag module malfunction - SAS unit malfunction	
DRIVER-SIDE SIDE AIR BAG MODULE CONNECTOR 		

Diagnostic procedure

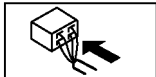
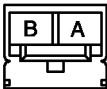
STEP	INSPECTION	ACTION	
1	INSPECT DRIVER-SIDE SIDE AIR BAG MODULE - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DS_AB - Is resistant value of driver-side side air bag module normal? — Resistance: 1.4—3.2 ohm	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Go to next step.
2	INSPECT DRIVER-SIDE SIDE AIR BAG MODULE CONNECTOR Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove driver-side side air bag module. - Is there cracking or chipping in driver-side side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

STEP	INSPECTION	ACTION
3	VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE SIDE AIR BAG MODULE OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to driver-side side air bag module connector terminal A and B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — OD_DSAB_ST - Is related wiring harness normal?	Yes Replace driver-side side air bag module. (See T-121 SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No Replace wiring harness, then go to next step.
4	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect driver-side side air bag module connector. - Are DTCs B1992, B1993, B1994 and/or B1995 indicated?	Yes Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No Troubleshooting completed.

DTC B1996, B1997, B1998, B1999

A6E817401046W16

DTC	B1996	Passenger-side side air bag module system circuit short to power supply
	B1997	Passenger-side side air bag module system circuit short to ground
	B1998	Passenger-side side air bag module system resistance high
	B1999	Passenger-side side air bag module system resistance low
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.4—3.2 ohm) detected in passenger-side side air bag module circuit - Malfunction in wiring harness between passenger-side side air bag module and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between passenger-side side air bag module and SAS unit - Passenger-side side air bag module malfunction - SAS unit malfunction	
PASSENGER-SIDE SIDE AIR BAG MODULE CONNECTOR 		

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT PASSENGER-SIDE SIDE AIR BAG MODULE - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — PS_AB - Is resistant value of passenger-side side air bag module normal? — Resistance: 1.4—3.2 ohm	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Go to next step.
2	INSPECT PASSENGER-SIDE SIDE AIR BAG MODULE CONNECTOR Warning Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove passenger-side side air bag module. - Is there cracking or chipping in passenger-side side air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.
3	VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE SIDE AIR BAG MODULE OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to passenger-side side air bag module connector terminal A and B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DSB_P_ST - Is related wiring harness normal?	Yes	Replace passenger-side side air bag module. (See T-121 SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect passenger-side side air bag module connector. - Are DTCs B1996, B1997, B1998 and/or B1999 indicated?	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B2228, B2230, B2232, B2234

A6E817401046W17

DTC	B2228	Driver-side air bag module (inflator No.2) system circuit short to ground
	B2230	Driver-side air bag module (inflator No.2) system circuit short to power supply
	B2232	Driver-side air bag module (inflator No.2) system resistance high
	B2234	Driver-side air bag module (inflator No.2) system resistance low
DETECTION CONDITION Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.5—3.7 ohm) detected in driver-side air bag module (inflator No.2) circuit - Malfunction in wiring harness between driver-side air bag module (inflator No.2) and SAS unit		
POSSIBLE CAUSE - Open or short circuit in wiring harness between clock spring and SAS unit - Clock spring malfunction - Driver-side air bag module (inflator No.2) malfunction - SAS unit malfunction		
SAS UNIT CONNECTOR CLOCK SPRING CONNECTOR DRIVER-SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING) INFLATOR NO.1 INFLATOR NO.2		

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.2) - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — D_ABAGR2 - Is resistant value of driver-side air bag module normal? — Resistance: 1.5—3.7 ohm	Yes Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No Go to next step.
2	INSPECT DRIVER-SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING) Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove driver-side air bag module. - Is there cracking or chipping in driver-side air bag module connector?	Yes Replace wiring harness.
		No Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

STEP	INSPECTION	ACTION	
3	VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE AIR BAG MODULE (INFLATOR NO.2) OR RELATED WIRING HARNESS • Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to driver-side air bag module (inflator No.1) connector terminal 3A and 3B, and driver-side air bag module (inflator No.2) connector terminal 4A and 4B. • Set resistance of SST (Fuel and thermometer checker) to 2 ohm. • Connect negative battery cable. • Turn ignition switch to ON position. • Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — OD_DAB2_ST • Is related wiring harness normal?	Yes	Replace driver-side air bag module. (See T-120 DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Go to next step.
4	INSPECT CLOCK SPRING • Inspect clock spring. (See T-126 CLOCK SPRING INSPECTION) • Is clock spring normal?	Yes	Go to next step.
		No	Replace clock spring. (See T-125 CLOCK SPRING REMOVAL/INSTALLATION)
5	INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS UNIT • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for more than 1 minute. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicle with curtain air bag) • Remove B-pillar lower trim. (Vehicle with pre-tensioner seat belt) • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS unit connectors. • Inspect following wiring harnesses between SAS unit and clock spring terminals for short to ground, short to power supply, and open circuit: — 1G—1B — 1J—1A • Is wiring harness okay?	Yes	Present malfunction diagnosis: • Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: • Troubleshooting completed.
		No	Replace wiring harnesses.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

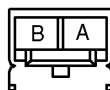
DTC B2229, B2231, B2233, B2235

A6E817401046W18

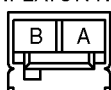
DTC	B2229	Passenger-side air bag module (inflator No.2) system circuit short to ground
	B2231	Passenger-side air bag module (inflator No.2) system circuit short to power supply
	B2233	Passenger-side air bag module (inflator No.2) system resistance high
	B2235	Passenger-side air bag module (inflator No.2) system resistance low
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.4—2.9 ohm) detected in passenger-side air bag module circuit - Malfunction in wiring harness between passenger-side air bag module (inflator No.2) and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between passenger-side air bag module (inflator No.2) and SAS unit - Passenger-side air bag module (inflator No.2) malfunction - SAS unit malfunction	

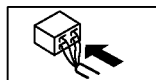
PASSENGER-SIDE AIR BAG MODULE CONNECTOR

INFLATOR NO.1



INFLATOR NO.2





Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) - P_ABAGR2 - Is resistant value of passenger-side air bag module normal? - Resistance: 1.4—2.9 ohm	Yes Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No Go to next step.
2	INSPECT PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) CONNECTOR Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Is there cracking or chipping in passenger-side air bag module connector?	Yes Replace wiring harness.
		No Go to next step.

T

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

STEP	INSPECTION	ACTION	
3	VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to passenger-side air bag module (inflator No.1) connector terminal A and B, and passenger-side air bag module (inflator No.2) connector terminal A and B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DO_PAB2ST - Is related wiring harness normal?	Yes	Replace passenger-side air bag module. (See T-121 PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect passenger-side air bag module connector. - Are DTCs B2229, B2231, B2233 and/or B2235 indicated?	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Troubleshooting completed.

DTC B2296

A6E817401046W19

DTC B2296	Crash zone sensor system (communication error, sensor internal circuit abnormal)
DETECTION CONDITION	Warning Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.
	- Malfunction in wiring harness between crash zone sensor and SAS unit - Malfunction in crash zone sensor circuit
POSSIBLE CAUSE	- Open or short circuit in wiring harness between crash zone sensor and SAS unit - SAS unit malfunction - Crash zone sensor malfunction
SAS UNIT CONNECTOR CRASH ZONE SENSOR CONNECTOR	

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT CRASH ZONE SENSOR - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — OD_F_CRSH - Is crash zone sensor normal?	Yes Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No Go to next step.
2	INSPECT WIRING HARNESS BETWEEN CRASH ZONE SENSOR AND SAS UNIT Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicle with curtain air bag) - Remove B-pillar lower trim. (Vehicle with pre-tensioner seat belt) - Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Disconnect crash zone sensor connector. - Connect negative battery cable. - Inspect following wiring harnesses between SAS unit and crash zone sensor terminals for short to ground, short to power supply, and open circuit: — 1B—A — 1C—B - Is wiring harness okay?	Yes Replace crash zone sensor, then go to next step. (See T-123 CRASH ZONE SENSOR REMOVAL/INSTALLATION)
		No Replace wiring harnesses.
3	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect all SAS unit connectors. - Connect crash zone sensor connector. - Is DTC B2296 indicated?	Yes Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No Troubleshooting completed.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B2444, U2017

A6E817401046W20

DTC	B2444	Driver-side side air bag sensor system (sensor internal circuit abnormal)
	U2017	Driver-side side air bag sensor system (communication error)
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Malfunction in wiring harness between driver-side side air bag sensor and SAS unit - Malfunction in driver-side side air bag sensor circuit	
	POSSIBLE CAUSE - Open or short circuit in wiring harness between driver-side side air bag sensor and SAS unit - Driver-side side air bag sensor malfunction - SAS unit malfunction	
SAS UNIT CONNECTOR 2Y 2V 2S 2P 2M 2J 2G 2D 2A 2Z 2W 2T 2H 2E 2B 2AA 2X 2U 2R 2O 2L 2I 2F 2C DRIVER-SIDE SIDE AIR BAG SENSOR CONNECTOR B A		

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT DRIVER-SIDE SIDE AIR BAG SENSOR - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — OD_D_CRSH - Is driver-side side air bag sensor normal?	Present malfunction diagnosis: Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION)
		Past malfunction diagnosis: Troubleshooting completed.
		Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

STEP	INSPECTION	ACTION	
2	INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR BAG SENSOR AND SAS UNIT Warning • Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for more than 1 minute. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicle with curtain air bag) • Remove B-pillar lower trim. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS unit connectors. • Disconnect driver-side side air bag sensor connector. • Connect negative battery cable. • Inspect following wiring harnesses between SAS unit and driver-side side air bag sensor terminals for short to ground, short to power supply, and open circuit: — 2Z—A — 2AA—B • Is wiring harness okay?	Yes	Replace driver-side side air bag sensor, then go to next step. (See T-123 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
		No	Replace wiring harnesses.
3	INSPECT SAS UNIT • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for more than 1 minute. • Connect all SAS unit connectors. • Connect driver-side side air bag sensor connector. • Are DTCs B2444 and/or U2017 indicated?	Yes	Present malfunction diagnosis: • Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: • Troubleshooting completed.
		No	Troubleshooting completed.

T

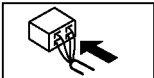
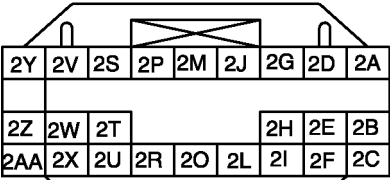
ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B2445, U2018

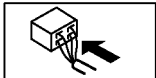
A6E817401046W21

DTC	B2445	Passenger-side side air bag sensor system (sensor internal circuit abnormal)
	U2018	Passenger-side side air bag sensor system (communication error)
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Malfunction in wiring harness between passenger-side side air bag sensor and SAS unit - Malfunction in passenger-side side air bag sensor circuit	
	POSSIBLE CAUSE	- Open or short circuit in wiring harness between passenger-side side air bag sensor and SAS unit - Passenger-side side air bag sensor malfunction - SAS unit malfunction

SAS UNIT CONNECTOR



PASSENGER-SIDE SIDE AIR
BAG SENSOR CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT PASSENGER-SIDE SIDE AIR BAG SENSOR - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — OD_P_CRSH - Is passenger-side side air bag sensor normal?	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

STEP	INSPECTION	ACTION	
2	INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG SENSOR AND SAS UNIT Warning • Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for more than 1 minute. • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicle with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicle with curtain air bag) • Remove B-pillar lower trim. • Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS unit connectors. • Disconnect passenger-side side air bag sensor connector. • Connect negative battery cable. • Inspect following wiring harnesses between SAS unit and passenger-side side air bag sensor terminals for short to ground, short to power supply, and open circuit: — 2B—A — 2C—B • Is wiring harness okay?	Yes	Replace passenger-side side air bag sensor, then go to next step. (See T-123 SIDE AIR BAG SENSOR REMOVAL/INSTALLATION)
		No	Replace wiring harnesses.
3	INSPECT SAS UNIT • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for more than 1 minute. • Connect all SAS unit connectors. • Connect passenger-side side air bag sensor connector. • Are DTCs B2445 and/or U2018 indicated?	Yes	Present malfunction diagnosis: • Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: • Troubleshooting completed.
		No	Troubleshooting completed.

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ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B2477

A6E817401046W22

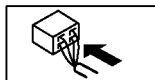
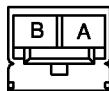
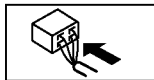
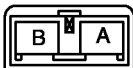
DTC B2477	SAS unit configuration error
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - SAS unit configuration not set correctly
POSSIBLE CAUSE	- SAS unit configuration error - SAS unit malfunction

Diagnostic procedure

INSPECTION		ACTION
CONFIGURATION - Configure SAS unit, using SST (WDS or equivalent). - Is DTC B2477 indicated?	Yes	[Present malfunction diagnosis] Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) [Past malfunction diagnosis] Troubleshooting completed.
	No	Troubleshooting completed.

DTC B2773, B2774, B2775, B2776

A6E817401046W23

DTC	B2773	Driver-side curtain air bag module system resistance low
	B2774	Driver-side curtain air bag module system resistance high
	B2775	Driver-side curtain air bag module system circuit short to ground
	B2776	Driver-side curtain air bag module system circuit short to power supply
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.4—3.2 ohm) detected in driver-side curtain air bag module circuit - Malfunction in wiring harness between driver-side curtain air bag module and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between driver-side curtain air bag module and SAS unit - Driver-side curtain air bag module malfunction - SAS unit malfunction	
DRIVER-SIDE CURTAIN AIR BAG MODULE CONNECTOR L.H.D. AND R.H.D. 5HB  R.H.D. 4SD 		

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT DRIVER-SIDE CURTAIN AIR BAG MODULE - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DR_CURTN - Is resistant value of driver-side curtain air bag module normal? — Resistance: 1.4—3.2 ohm	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

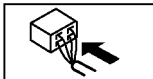
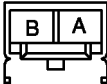
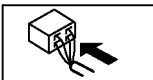
STEP	INSPECTION	ACTION	
2	INSPECT DRIVER-SIDE CURTAIN AIR BAG MODULE CONNECTOR Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Disconnect driver-side curtain air bag module connector. - Is there cracking or chipping in driver-side curtain air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.
3	VERIFY WHETHER MALFUNCTION IS IN DRIVER-SIDE CURTAIN AIR BAG MODULE OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to driver-side curtain air bag module connector terminal A and B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DO_D_CURT - Is related wiring harness normal?	Yes	Replace driver-side curtain air bag module. (See T-122 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect driver-side curtain air bag module connector. - Are DTCs B2773, B2774, B2775 and/or B2776 indicated?	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Troubleshooting completed.

T

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

DTC B2777, B2778, B2779, B2780

A6E817401046W24

DTC	B2777	Passenger-side curtain air bag module system resistance low
	B2778	Passenger-side curtain air bag module system resistance high
	B2779	Passenger-side curtain air bag module system circuit short to ground
	B2780	Passenger-side curtain air bag module system circuit short to power supply
DETECTION CONDITION	Warning - Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure. - Abnormal resistance (other than 1.4—3.2 ohm) detected in passenger-side curtain air bag module circuit - Malfunction in wiring harness between passenger-side curtain air bag module and SAS unit	
POSSIBLE CAUSE	- Open or short circuit in wiring harness between passenger-side curtain air bag module and SAS unit - Passenger-side curtain air bag module malfunction - SAS unit malfunction	
PASSENGER-SIDE CURTAIN AIR BAG MODULE CONNECTOR L.H.D. 5HB AND R.H.D.  L.H.D. 4SD 		

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT PASSENGER-SIDE CURTAIN AIR BAG MODULE - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — PC_CURTN - Is resistant value of passenger-side curtain air bag module normal? — Resistance: 1.4—3.2 ohm	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Go to next step.
2	INSPECT PASSENGER-SIDE CURTAIN AIR BAG MODULE CONNECTOR Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Disconnect passenger-side curtain air bag module connector. - Is there cracking or chipping in passenger-side curtain air bag module connector?	Yes	Replace wiring harness.
		No	Go to next step.

ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

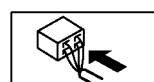
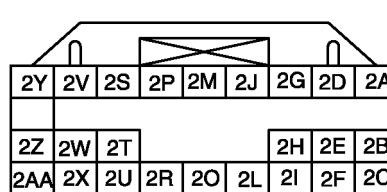
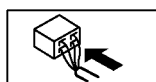
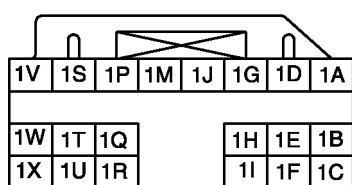
STEP	INSPECTION	ACTION	
3	VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE CURTAIN AIR BAG MODULE OR RELATED WIRING HARNESS - Connect leads of SST (Fuel and thermometer checker) or apply 2 ohm resistor to passenger-side curtain air bag module connector terminal A and B. - Set resistance of SST (Fuel and thermometer checker) to 2 ohm. - Connect negative battery cable. - Turn ignition switch to ON position. - Check following PID/DATA monitor, using SST (WDS or equivalent). (See T-195 PID/DATA MONITOR TABLE) — DO_P_CURT - Is related wiring harness normal?	Yes	Replace passenger-side curtain air bag module. (See T-122 CURTAIN AIR BAG MODULE REMOVAL/INSTALLATION)
		No	Replace wiring harness, then go to next step.
4	INSPECT SAS UNIT - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect passenger-side curtain air bag module connector. - Are DTCs B2777, B2778, B2779 and/or B2780 indicated?	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Troubleshooting completed.

DTC B2867

A6E817401046W25

DTC B2867	SAS unit connector poor connection
DETECTION CONDITION	Warning Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.
	There is no continuity between poor connection detector bar terminals of SAS unit.
POSSIBLE CAUSE	- Poor connection of any SAS unit connectors - Malfunction of any SAS unit connectors - SAS unit malfunction

SAS UNIT CONNECTOR



ON-BOARD DIAGNOSTIC [AIR BAG SYSTEM]

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY THAT ALL SAS UNIT CONNECTORS ARE CONNECTED WITH SAS UNIT Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Turn up floor covering. - Are all SAS unit connectors securely connected?	Yes	Go to next step.
		No	Reconnect connector properly.
2	INSPECT ALL SAS UNIT CONNECTORS - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Remove B-pillar lower trims. (Vehicle with pre-tensioner seat belt) - Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Disconnect all SAS unit connectors. - Are poor connection detector bars of all SAS unit connectors okay?	Yes	Present malfunction diagnosis: - Replace SAS unit. (See T-124 SAS UNIT REMOVAL/INSTALLATION) Past malfunction diagnosis: - Troubleshooting completed.
		No	Replace wiring harnesses.

TROUBLESHOOTING

TROUBLESHOOTING

CAR-NAVIGATION SYSTEM

A6E818066000W01

Troubleshooting Index

- Use the chart below verify the trouble in order to diagnose the appropriate area.

No.	Malfunction symptom
1	While vehicle is in reverse, vehicle locator mark goes forward.
2	In navigation mode, vehicle locator mark skips.
3	Even when headlight switch is turned on, daytime screen does not change to night time screen. (Front and rear combination lights operate normally.)

NO.1 WHILE VEHICLE IS IN REVERSE, VEHICLE LOCATOR MARK GOES FORWARD.

A6E818066000W02

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

1	While vehicle is in reverse, vehicle locator mark goes forward.
TROUBLESHOOTING HINTS • Malfunction in shift position (R range (ATX) or reverse position (MTX)) signal line of car-navigation unit. — Car-navigation unit malfunction — Malfunction in wiring harness between car-navigation unit and transaxle range switch — Transaxle range switch malfunction	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	• While the vehicle is in reverse, are back-up lights illuminated?	Yes: Go to next step. No: Repair back-up light circuit, then go to next step.
2*	• Disconnect car-navigation unit connector (16-pin). • Turn ignition switch to ON position. • Shift selector lever to R range (ATX) or reverse position (MTX). • Measure voltage at the following terminal of car-navigation unit connector (16-pin, harness side): — Terminal 2L (Shift position (R range (ATX) or reverse position (MTX)) signal) • Is voltage 9 V or more?	Yes: Replace car-navigation unit (available at Clarion service center) or get it repaired at Panasonic Service center, then go to next step. No: ATX • Inspect wiring harness between car-navigation unit (16-pin, terminal 2L) and transaxle range switch, then go to next step. MTX • Inspect wiring harness between car-navigation unit (16-pin, terminal 2L) and back-up light switch, then go to next step.
3	• Does vehicle locator mark indicate actual position of vehicle?	Yes: Complete troubleshooting, then explain repairs to customer. No: Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.2 IN NAVIGATION MODE, VEHICLE LOCATOR MARK SKIPS.

A6E818066000W03

2	In navigation mode, vehicle locator mark skips.
TROUBLESHOOTING HINTS • Malfunction in vehicle speed signal line of car-navigation unit. — Car-navigation unit malfunction — ABS (ABS/TCS) HU/CM malfunction (with ABS (ABS/TCS)) — DSC HU/CM malfunction (with DSC) — Malfunction in wiring harness between car-navigation unit and instrument cluster	

TROUBLESHOOTING

Diagnostic procedure

STEP	INSPECTION	ACTION
1	- Disconnect car-navigation unit connector (16-pin). - Jack up vehicle and run engine at low speed. - Measure voltage at the following terminal of car-navigation unit connector (16-pin): — Terminal 2H (Vehicle speed signal) - Is voltage approx. 2.5 V (reference)? Note - Vehicle speed signal is in electrical pulses of approx. 0 V to 5 V.	Yes Replace car-navigation unit (available at Clarion service center) or get it repaired at Panasonic service center, then go to Step 4.
		No Go to next step.
2*	- Disconnect ABS (ABS/TCS) HU/CM connector (28-pin) or DSC HU/CM connector (34-pin). - Is there continuity between car-navigation unit connector (16-pin) terminal 2H and ABS (ABS/TCS) HU/CM connector (28-pin) terminal V, or car-navigation unit connector (16-pin) terminal 2H and DSC HU/CM connector (34-pin) terminal AE?	Yes Go to next step.
		No Repair wiring harness between car-navigation unit and ABS (ABS/TCS) HU/CM, or car-navigation unit and DSC HU/CM, then go to Step 4.
3	- Inspect wiring harness between car-navigation unit connector (16-pin) terminal 2H and and ABS (ABS/TCS) HU/CM connector (28-pin) terminal V, or car-navigation unit connector (16-pin) terminal 2H and DSC HU/CM connector (34-pin) terminal AE for short to ground. - Is there short to ground?	Yes Repair wiring harness between car-navigation unit and ABS (ABS/TCS) HU/CM, or car-navigation unit and DSC HU/CM, then go to next step.
		No Replace instrument cluster, then go to next step.
4	Does vehicle locator mark operate normally?	Yes Complete troubleshooting, then explain repairs to customer.
		No Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.3 EVEN WHEN HEADLIGHT SWITCH IS TURNED ON, DAYTIME SCREEN DOES NOT CHANGE TO NIGHT TIME SCREEN. (FRONT AND REAR COMBINATION LIGHTS OPERATE NORMALLY.)

A6E818066000W04

3	Even when headlight switch is turned on, daytime screen does not change to night time screen. (Front and rear combination lights operate normally.)
TROUBLESHOOTING HINTS - Malfunction in TNS (+) signal line of LCD unit — LCD unit malfunction — Malfunction in wiring harness between LCD unit and TNS relay	

Diagnostic procedure

STEP	INSPECTION	ACTION
1*	- Turn headlight switch on. - Measure voltage at the following terminal of LCD unit connector (24-pin): — Terminal 1V (TNS (+) signal) - Is voltage 10 V or more?	Yes Replace LCD unit (available at Panasonic service center) or get it repaired at Panasonic service center, then go to next step.
		No Repair wiring harness between LCD unit and TNS relay, then go to next step.
2	When headlight switch is turned on, does daytime screen change to night time screen?	Yes Complete troubleshooting, then explain repairs to customer.
		No Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

AIR BAG SYSTEM

A6E818001046W01

Troubleshooting Index

- Use the chart below verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	Troubleshooting item	Description	Page
1	Air bag system warning light does not illuminate.	Malfunction in air bag system warning circuit (short to ground).	(See T-231 NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE)

TROUBLESHOOTING

No.	Troubleshooting item	Description	Page
2	Air bag system warning light is illuminated all the time.	Malfunction in air bag system warning circuit (open circuit or short to power supply).	(See T-232 NO.2 AIR BAG SYSTEM WARNING LIGHT IS ILLUMINATED ALL THE TIME)
3	Passenger-side air bag cut-off indicator light does not illuminate.	Malfunction in passenger-side air bag cut-off indicator light circuit (open circuit or short to power supply).	(See T-235 NO.3 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT DOES NOT ILLUMINATE)
4	Passenger-side air bag cut-off indicator light is illuminated all the time.	Malfunction in passenger-side air bag cut-off indicator light circuit (short to ground).	(See T-237 NO.4 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT IS ILLUMINATED ALL THE TIME)

NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE

A6E818001046W02

1	Air bag system warning light does not illuminate.
DETECTION CONDITION	Malfunction in air bag system warning light circuit (short to ground)
POSSIBLE CAUSE	- SAS unit malfunction - Instrument cluster (print plate) malfunction - Short to ground circuit in wiring harness between instrument cluster and SAS unit

Diagnostic Procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	INSPECT OTHER WARNING AND INDICATOR LIGHTS CIRCUIT IN INSTRUMENT CLUSTER - Turn ignition switch to ON position. - Do other warning and indicator lights illuminate?	Yes Turn ignition switch to LOCK position, then go to next step.
		No Inspect instrument cluster power supply system and ground system, then go to Step 5.
2	INSPECT SAS UNIT Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Remove B-pillar lower trims. (Vehicle with pre-tensioner seat belt) - Disconnect driver- and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Connect negative battery cable. - Turn ignition switch to ON position. - Do air bag system warning light illuminate?	Yes Replace SAS unit, then go to Step 5. (See T-124 SAS UNIT REMOVAL/INSTALLATION)
		No Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
*3	INSPECT WIRING HARNESS BETWEEN SAS UNIT AND INSTRUMENT CLUSTER FOR SHORT TO GROUND - Turn ignition switch to LOCK position. - Disconnect negative battery cable. - Disconnect instrument cluster connector. - Is there continuity between terminal 1O of instrument cluster connector and ground?	Yes	Replace wiring harness, then go to Step 5.
		No	Go to next step.
4	INSPECT INSTRUMENT CLUSTER - Connect instrument cluster connector. - Connect instrument cluster connector terminal 1O to ground, then reconnect connector. - Connect negative battery cable. - Does air bag system warning light illuminate with ignition switch ON?	Yes	Replace instrument cluster, then go to next step. (See T-72 INSTRUMENT CLUSTER REMOVAL/INSTALLATION)
		No	Go to next step.
5	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect all SAS unit connectors. - Connect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) - Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Connect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) - Connect passenger-side air bag module connector. - Connect clock spring connector. - Connect negative battery cable. - Turn ignition switch to ON position. - Does air bag system warning light operate properly?	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.2 AIR BAG SYSTEM WARNING LIGHT IS ILLUMINATED ALL THE TIME

A6E818001046W03

2	Air bag system warning light is illuminated all the time.	
DETECTION CONDITION	Malfunction in air bag system warning light circuit (open circuit or short to power supply).	
POSSIBLE CAUSE	- Weak battery - SAS unit malfunction - Instrument cluster (print plate) malfunction - No connection in SAS unit connector - Poor contact in instrument cluster connector (16-pin) - Open or short to power supply circuit in wiring harness between instrument cluster and SAS unit - Poor contact at terminals 1T, 1X and/or 1W of SAS unit connector - Poor contact in wiring harness between terminal 1X of SAS unit connector and ground - Poor contact in wiring harness between AIR BAG 15 A fuse and terminal 1W of SAS unit	

Diagnostic Procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION	
1	INSPECT BATTERY - Measure voltage of battery. - Is voltage more than 9 V?	Yes	Go to next step.
		No	Battery is weak. Inspect charge/discharge system, then go to Step 10. (See G-4 BATTERY INSPECTION)

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
2	VERIFY THAT SAS unit CONNECTOR IS CONNECTED Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read AIR BAG SYSTEM SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Turn up floor covering. - Are all SAS unit connectors securely connected?	Yes	Go to next step.
		No	Reconnect connector properly, then go to Step 10.
* 3	INSPECT WIRING HARNESS BETWEEN SAS UNIT AND INSTRUMENT CLUSTER FOR CONTINUITY - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Remove B-pillar lower trims. (Vehicle with pre-tensioner seat belt) - Disconnect driver- and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Disconnect instrument cluster connector. - Is there continuity between SAS unit connector terminal 1T and instrument cluster connector terminal 1O?	Yes	Go to next step.
		No	Replace wiring harness, then go to Step 10.
* 4	INSPECT WIRING HARNESS BETWEEN SAS UNIT AND INSTRUMENT CLUSTER FOR SHORT TO POWER SUPPLY - Connect negative battery cable. - Turn ignition switch to ON position. - Measure voltage at instrument cluster connector terminal 1O. - Is voltage more than approximately 9 V?	Yes	Replace wiring harness, then go to Step 10.
		No	Go to next step.
5	CHECK TO SEE WHETHER MALFUNCTION IS IN AIR BAG SYSTEM WARNING LIGHT IN INSTRUMENT CLUSTER - Connect instrument cluster connector terminal 1O to ground, then reconnect connector. - Does air bag system warning light illuminate with ignition switch ON?	Yes	Replace instrument cluster, then go to Step 9. (See T-72 INSTRUMENT CLUSTER REMOVAL/INSTALLATION)
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
6	INSPECT POWER SUPPLY CIRCUIT OF SAS UNIT (TERMINAL 1W) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Connect all SAS unit connectors. - Connect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) - Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Connect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) - Connect passenger-side air bag module connector. - Connect clock spring connector. - Inspect voltage for PID/DATA monitor RCM VOLT item using SST (WDS or equivalent). - Is voltage of at least either terminal more than 9 V?	Yes	Go to Step 9.
		No	Go to next step.
7	INSPECT WIRING HARNESS BETWEEN BATTERY AND FUSE BLOCK - Remove driver-side front side trim. - Remove fuse block without disconnecting connectors. - Turn ignition switch to ON position. - Measure voltage at terminals D (JB-01) of fuse block connector. - Is voltage of at least either terminal more than 9 V?	Yes	Go to next step.
		No	Repair wiring harnesses, then go to Step 10.
8	INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND SAS UNIT - Measure voltage at terminals G (JB-03) of fuse block connector. - Is voltage of at least either terminal more than 9 V?	Yes	Repair wiring harnesses, then go to Step 10.
		No	Inspect fuse block, then go to Step 10.
9	VERIFY THAT SAS UNIT CONNECTOR TERMINAL 1X IS GROUND - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Remove B-pillar lower trim. (Vehicle with pre-tensioner seat belt) - Disconnect driver and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Inspect wiring harness between SAS unit connector terminal 1X and ground for following: - Short to power supply - Open circuit - Is wiring harness okay?	Yes	Replace SAS unit, then go to next step. (See T-124 SAS UNIT REMOVAL/INSTALLATION)
		No	Replace wiring harnesses, then go to next step.

TROUBLESHOOTING

STEP	INSPECTION	ACTION
10	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for more than 1 minute. • Connect all SAS unit connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Connect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Connect passenger-side air bag module connector. • Connect clock spring connector. • Connect instrument cluster connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Does air bag system warning light operate properly?	Yes Complete troubleshooting, then explain repairs to customer.
		No Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.3 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT DOES NOT ILLUMINATE

A6E818001046W04

3	Passenger-side air bag cut-off indicator light does not illuminate
DETECTION CONDITION	Malfunction in passenger-side air bag cut-off indicator light circuit (open circuit or short to power supply)
POSSIBLE CAUSE	• SAS unit malfunction • Passenger-side air bag cut-off indicator light bulb malfunction • Open or short to power supply circuit in wiring harness between passenger-side air bag cut-off indicator light and SAS unit • Poor contact at terminals 1U 1X and/or 1W of SAS unit connector • Poor contact at terminals 1I of SAS unit connector • Poor contact in wiring harness between terminal 1X of SAS unit connector and ground • Poor contact or short circuits in wiring harness between METER IG 15 A fuse and SAS unit, between AIR BAG 15 A fuse and SAS unit at the time

Diagnostic Procedure

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	INSPECT PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT BULB • Disconnect negative battery cable. • Remove center panel module. (See T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION) • Is passenger-side air bag cut-off indicator light bulb functional?	Yes Reinstall it properly, then go to next step.
		No Replace bulb, then go to Step 5.

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
*2	INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT AND SAS UNIT FOR CONTINUITY Warning - Handling air bag system components improperly can accidentally deploy air bag modules and pre-tensioner seat belts, which may seriously injure you. Read SERVICE WARNINGS before handling air bag system components. (See T-117 SERVICE WARNINGS) - Turn ignition switch to LOCK position. - Disconnect negative battery cable and wait for more than 1 minute. - Remove column cover. - Disconnect clock spring connector. - Remove glove compartment. - Disconnect passenger-side air bag module connector. - Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) - Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) - Remove B-pillar lower trims. (Vehicle with pre-tensioner seat belt) - Disconnect driver- and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) - Turn up floor covering. - Disconnect all SAS unit connectors. - Is there continuity between terminal 1U of SAS unit connector and terminal A of passenger-side air bag cut-off indicator light?	Yes	Go to next step.
		No	Replace wiring harness, then go to Step 5.
*3	INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT AND SAS UNIT FOR SHORT TO POWER SUPPLY - Connect negative battery cable. - Turn ignition switch to ON position. - Measure voltage at terminal A of passenger-side air bag cut-off indicator light connector. - Is voltage more than approximately 9 V?	Yes	Replace wiring harness, then go to Step 5.
		No	Go to next step.
4	CHECK TO SEE WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT OR SAS UNIT - Connect SAS unit connector terminal 1U to ground. - Does passenger-side air bag cut-off indicator light illuminate with ignition switch on?	Yes	Replace SAS unit, then go to next step. (See T-124 SAS UNIT REMOVAL/INSTALLATION)
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	ACTION
5	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR • Turn ignition switch to LOCK position. • Disconnect negative battery cable and wait for more than 1 minute. • Connect all SAS unit connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Connect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Connect passenger-side air bag module connector. • Connect clock spring connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Does passenger-side air bag cut-off indicator light operate properly?	Yes Complete troubleshooting, then explain repairs to customer.
		No Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.4 PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT IS ILLUMINATED ALL THE TIME

A6E818001046W05

4	Passenger-side air bag cut-off indicator light is illuminated all the time.
DETECTION CONDITION	Malfunction in passenger-side air bag cut-off indicator light circuit (short to ground).
POSSIBLE CAUSE	• SAS unit malfunction • Short to ground circuit in wiring harness between passenger-side air bag cut-off indicator light and SAS unit

Diagnostic Procedure

T

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
*1	INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG CUT-OFF INDICATOR LIGHT AND SAS UNIT FOR SHORT TO GROUND • Remove center panel module. (See T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION) • Remove column cover. • Disconnect clock spring connector. • Remove glove compartment. • Disconnect passenger-side air bag module connector. • Disconnect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Disconnect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Remove B-pillar lower trims. (Vehicle with pre-tensioner seat belt) • Disconnect driver- and passenger-side pre-tensioner seat belt connectors. (Vehicle with pre-tensioner seat belt) • Turn up floor covering. • Disconnect all SAS unit connectors. • Is there continuity between terminal 1U of SAS unit connector and ground?	Yes Replace wiring harness, then go to next step.
		No Replace SAS unit, then go to next step. (See T-124 SAS UNIT REMOVAL/INSTALLATION)

TROUBLESHOOTING

STEP	INSPECTION	ACTION
2	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR • Connect all SAS unit connectors. • Connect driver and passenger-side pre-tensioner seat belt connectors. (Vehicles with pre-tensioner seat belt) • Connect driver and passenger-side curtain air bag module connectors. (Vehicles with curtain air bag) • Connect driver and passenger-side side air bag module connectors. (Vehicles with side air bag) • Connect passenger-side air bag module connector. • Connect clock spring connector. • Connect negative battery cable. • Turn ignition switch to ON position. • Does passenger-side air bag cut-off indicator light operate properly?	Yes
		No
		Complete troubleshooting, then explain repairs to customer. Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

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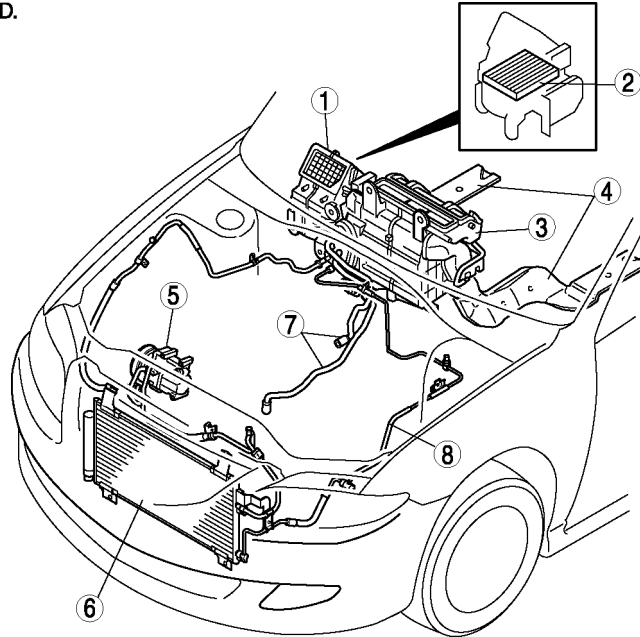
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BASIC SYSTEM

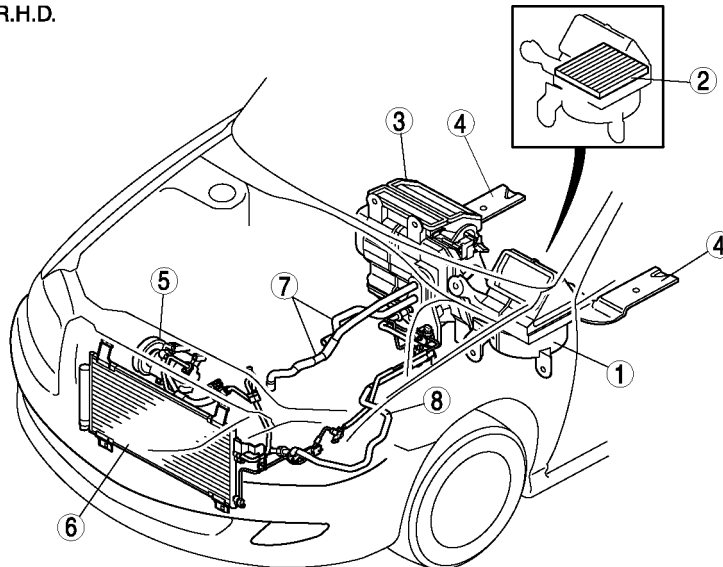
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A6E8500W001

R.H.D.



A6E8500W002

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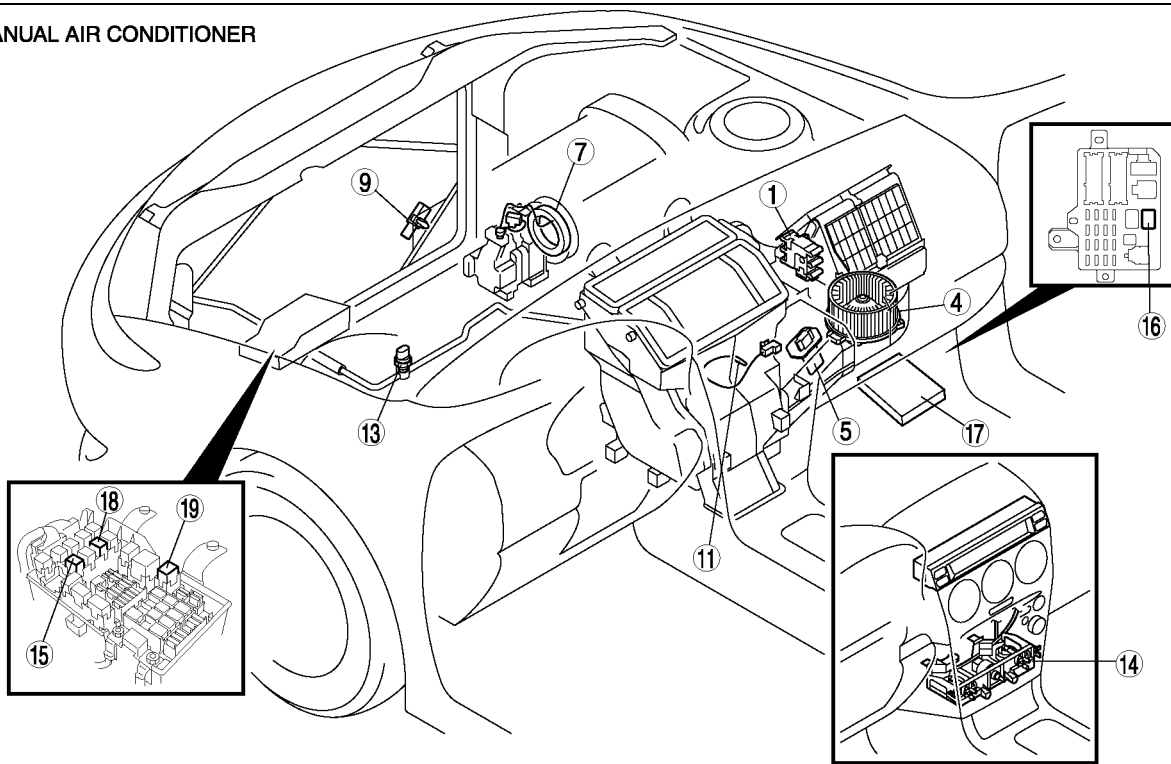
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CONTROL SYSTEM

L.H.D.

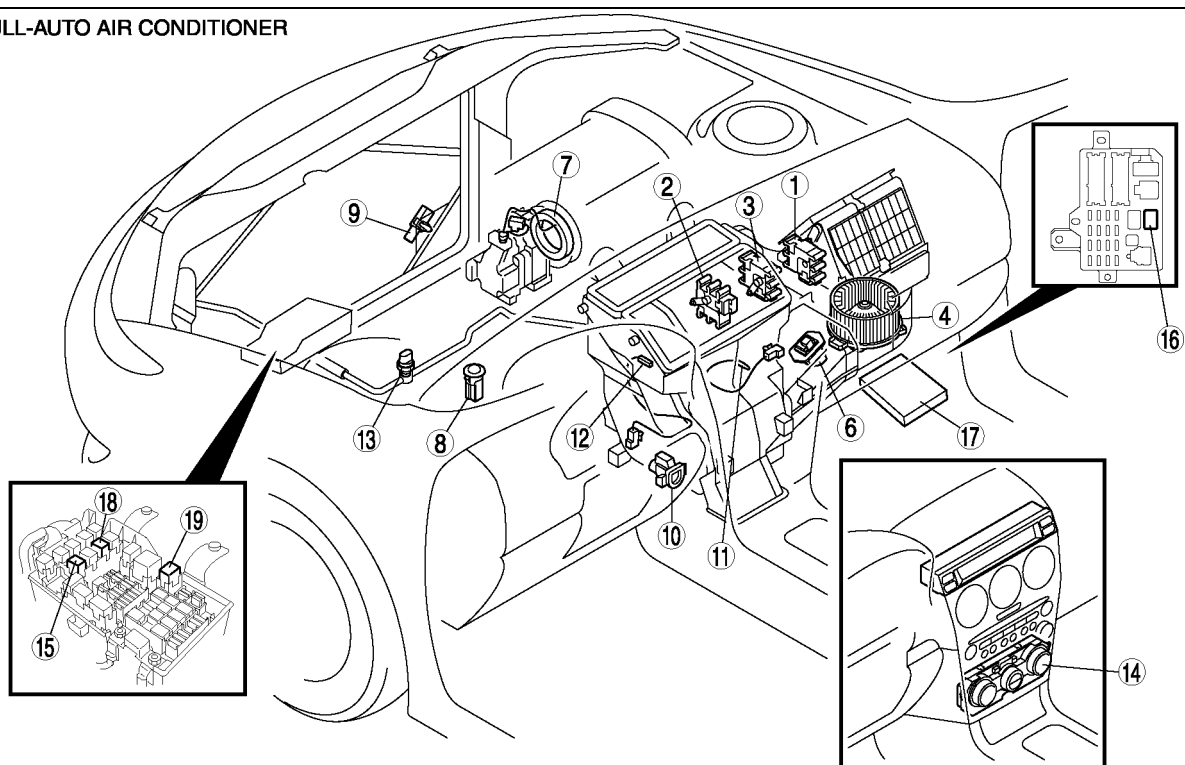
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MANUAL AIR CONDITIONER



A6E8500W003

FULL-AUTO AIR CONDITIONER



A6E8500W004

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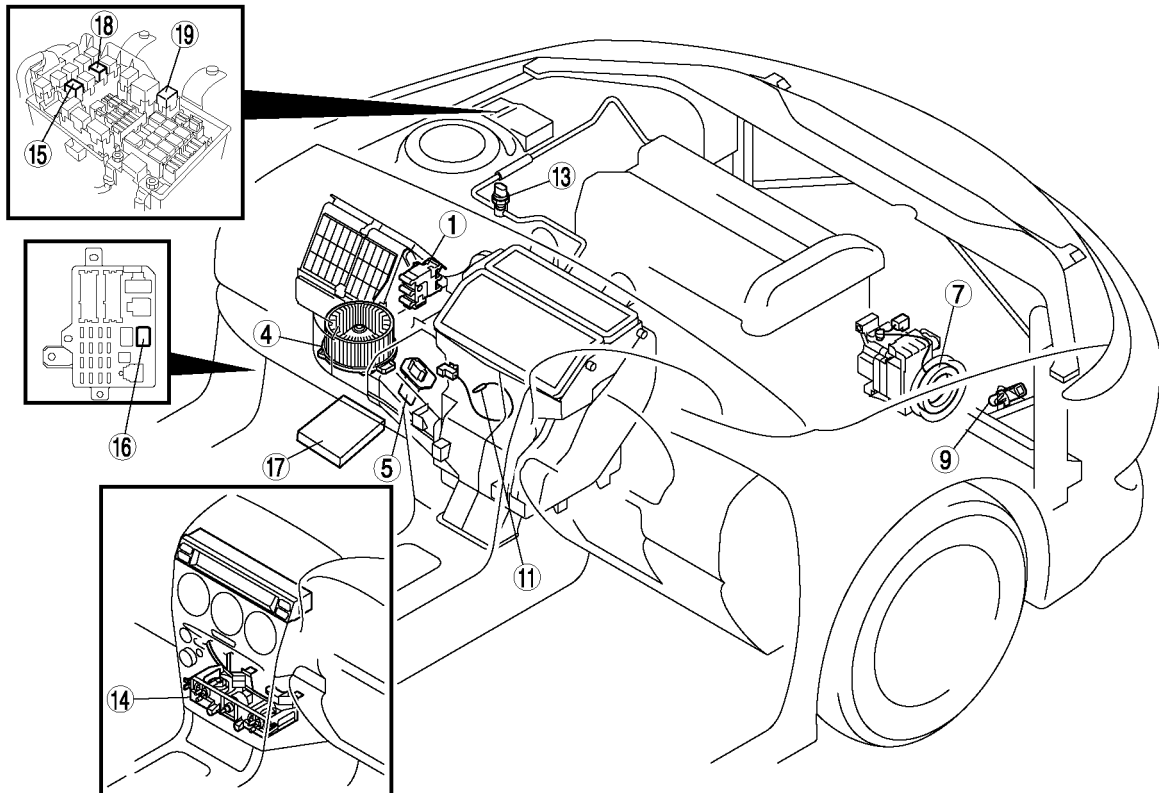
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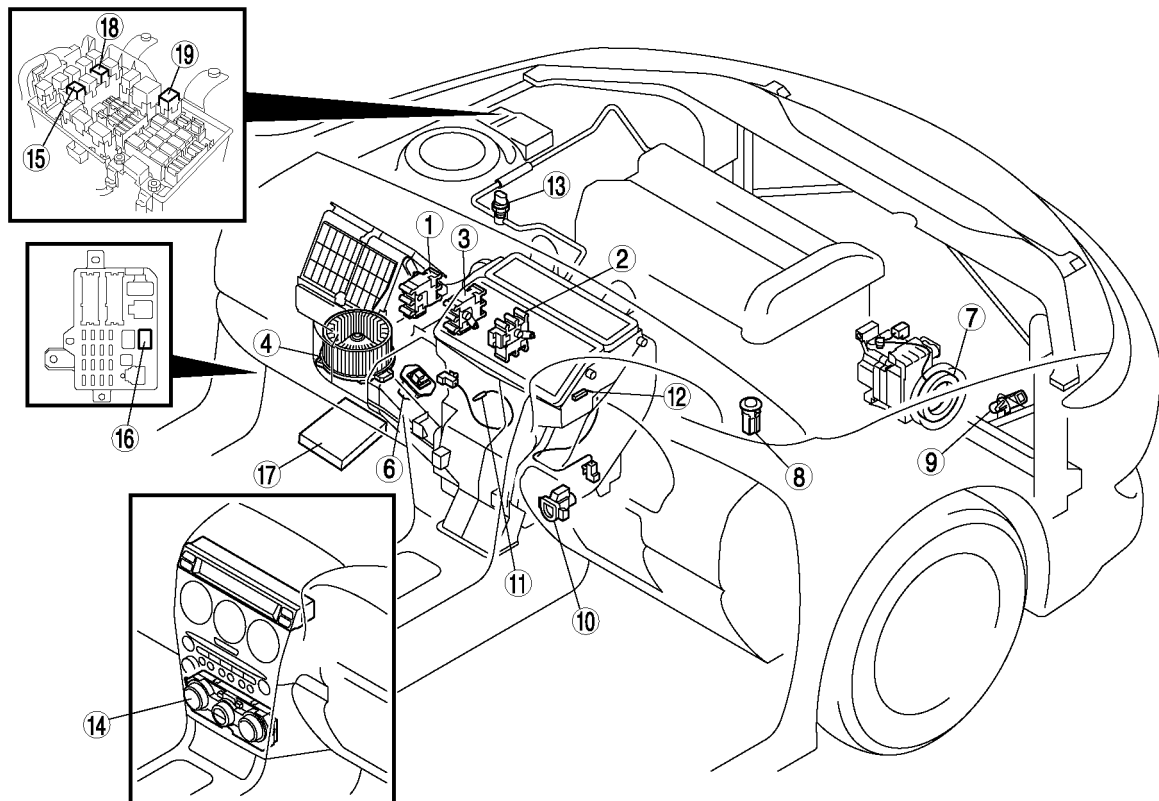
R.H.D.

MANUAL AIR CONDITIONER



A6E8500W005

FULL-AUTO AIR CONDITIONER



A6E8500W006

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8	Solar radiation sensor (See U-39 SOLAR RADIATION SENSOR REMOVAL/INSTALLATION) (See U-39 SOLAR RADIATION SENSOR INSPECTION)
9	Ambient temperature sensor (See U-39 AMBIENT TEMPERATURE SENSOR REMOVAL/INSTALLATION) (See U-40 AMBIENT TEMPERATURE SENSOR INSPECTION)

10	Cabin temperature sensor (See U-40 CABIN TEMPERATURE SENSOR REMOVAL/INSTALLATION) (See U-41 CABIN TEMPERATURE SENSOR INSPECTION)
11	Evaporator temperature sensor (See U-41 EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION) (See U-41 EVAPORATOR TEMPERATURE SENSOR INSPECTION)
12	Water temperature sensor (See U-42 WATER TEMPERATURE SENSOR REMOVAL/INSTALLATION) (See U-42 WATER TEMPERATURE SENSOR INSPECTION)
13	Refrigerant pressure switch (See U-42 REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION) (See U-43 REFRIGERANT PRESSURE SWITCH INSPECTION)
14	Climate control unit (See U-44 CLIMATE CONTROL UNIT REMOVAL) (See U-45 CLIMATE CONTROL UNIT INSTALLATION) (See U-45 CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY) (See U-46 CLIMATE CONTROL UNIT WIRE ADJUSTMENT) (See U-47 CLIMATE CONTROL UNIT INSPECTION)
15	A/C relay (See T-24 RELAY INSPECTION)
16	Blower relay (See T-24 RELAY INSPECTION)
17	PCM (See F-45 PCM INSPECTION)
18	Rear window defroster relay (See T-24 RELAY INSPECTION)
19	TNS relay (See T-24 RELAY INSPECTION)

SERVICE WARNINGS , SERVICE CAUTION

SERVICE WARNINGS

HANDLING REFRIGERANT

A6E851001039W01

- Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, we urge use of recovery/recycling/recharging equipment when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.
- Do not perform pressure test or leak test for R-134a service equipment and/or vehicle air conditioning system using compressed air. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.
- Do not allow the refrigerant to leak near fire or any kind of heat. A poisonous gas may be generated if the refrigerant gas contacts fire or heat such as from cigarettes and heaters. When carrying out any operation that can cause refrigerant leakage, extinguish or remove the above-mentioned heat sources and maintain adequate ventilation.
- Handling liquid refrigerant is dangerous. A drop of it on the skin can result in localized frostbite. When handling the refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.

STORING REFRIGERANT

A6E851001039W02

- The refrigerant container is highly pressurized. If it is subjected to high heat, it could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Store the refrigerant at temperatures below 40 °C {104 °F}.

SERVICE CAUTIONS

HANDLING INSUFFICIENT REFRIGERANT LEVEL

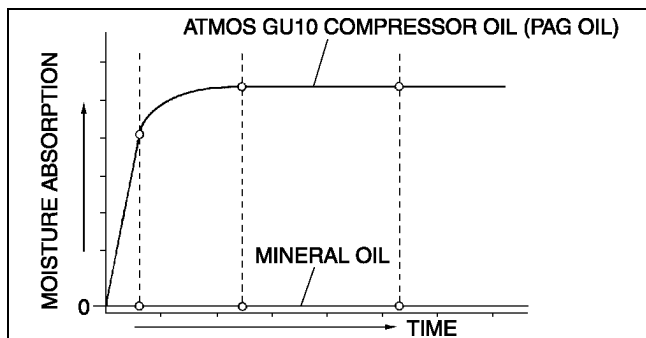
A6E851201039W02

- If an insufficient refrigerant level is detected at troubleshooting, do not charge (add) the refrigerant. Because an accurate amount of refrigerant cannot be determined from the pressure indicated on the manifold gauge, never charge the refrigerant. If there is too much or too little refrigerant from the refilling, there may be secondary problems such as damage to the refrigerant cycle parts, or a decrease of cooling performance. Therefore, if it is determined that the refrigerant level is insufficient, completely remove refrigerant from the refrigerant cycle and refill with refrigerant to the specified amount.

HANDLING COMPRESSOR OIL

A6E851201039W01

- Use only ATMOS GU10 compressor oil for this vehicle. Using a PAG oil other than ATMOS GU10 compressor oil can damage the A/C compressor.
- Do not spill ATMOS GU10 compressor oil on the vehicle. A drop of compressor oil on the vehicle surface can eat away at the paint. If oil gets on the vehicle, wipe it off immediately.
- ATMOS GU10 compressor oil (PAG oil) has a higher moisture absorption efficiency than the previously used mineral oil. If moisture mixes with the compressor oil, the refrigerant system could be damaged. Therefore, install caps immediately after using the compressor oil or removing refrigerant system parts to prevent moisture absorption.



A6E8512W001

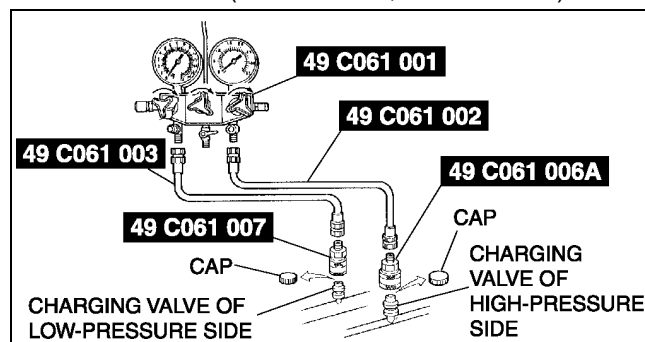
REFRIGERANT SYSTEM SERVICE PROCEDURES

REFRIGERANT SYSTEM SERVICE PROCEDURES

GAS CHARGING SET INSTALLATION

A6E851401039W01

1. Fully close the valves of the **SST** (49 C061 001).
2. Connect the **SSTs** (49 C061 002, 49 C061 003) to the high- and low-pressure side joints of the **SST** (49 C061 001).
3. Connect the **SSTs** (49 C061 006A, 49 C061 007) to the ends of the **SSTs** (49 C061 002, 49 C061 003).
4. Connect the **SSTs** (49 C061 006A, 49 C061 007) to the charging valves.



A6E8514W003

RECOVERY

A6E851478834W01

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

CHARGING

A6E851478834W02

Caution

- Do not exceed the specification when charging the system with refrigerant. Doing so will decrease the efficiency of the air conditioner or damage the refrigeration cycle parts.

Charging Recycled R-134a Refrigerant

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

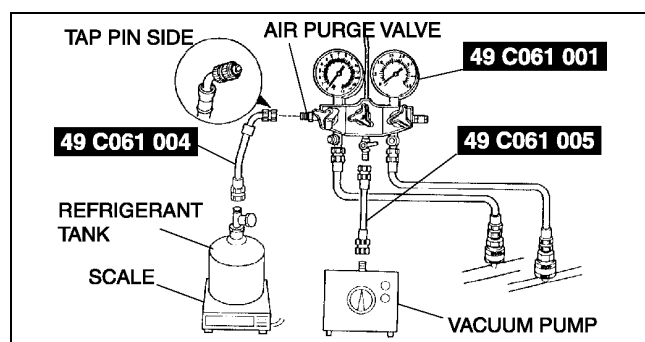
Charging Preparation

1. Install the **SSTs** (gas charging set).
2. Connect the tap pin side of the **SST** (49 C061 004) to the air purge valve of the **SST** (49C061 001).
3. Connect the **SST** (49 C061 005) to the center joint of the **SST** (49 C061 001).
4. Connect the **SST** (49 C061 005) to the vacuum pump.
5. Connect the **SST** (49 C061 004) to the refrigerant tank.
6. Place the refrigerant tank on the scale.

Regular amount of refrigerant (approximate quantity)

470 g {16.6 oz}: L.H.D.

430 g {15.2 oz}: R.H.D.



A6E8514W004

REFRIGERANT SYSTEM SERVICE PROCEDURES

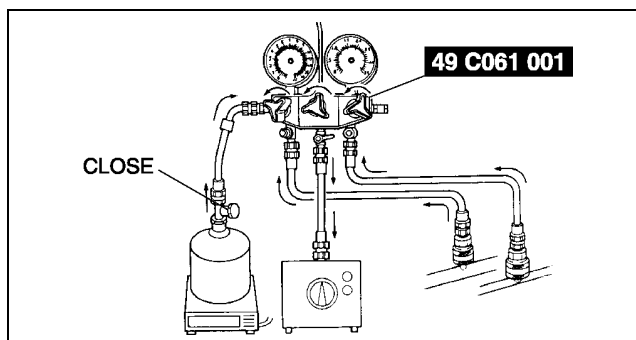
Evacuation

1. Open all the valves of the **SST (49 C061 001)**.

Caution

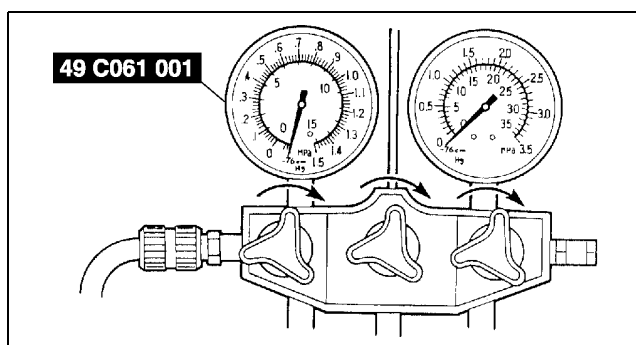
- Close the **SST (49 C061 001)** valve immediately after stopping the vacuum pump. If the valve is left open, the vacuum pump oil will flow back into the refrigeration cycle and cause a decrease in the efficiency of the air conditioner.

2. Start the vacuum pump and let it operate for **15 minutes**.



A6E8514W005

3. Verify that high- and low-pressure side readings of the **SST (49 C061 001)** are at **-101 kPa {-760 mmHg, -29.9 inHg}**. Close each valve of the **SST (49 C061 001)**.



A6E8514W006

Airtightness Check

1. Stop the vacuum pump and wait for **5 minutes**.
2. Check the high- and low-pressure side readings of the **SST (49 C061 001)**.
 - If the reading has changed, inspect for leakage and go to Evacuation. (See [U-10 Evacuation.](#))
 - If the reading has not changed, go to Charging New R-134a Refrigerant. (See [U-10 Charging New R-134a Refrigerant.](#))

Charging New R-134a Refrigerant

1. Open the valve of the refrigerant tank.
2. Weigh the refrigerant tank to charge the suitable amount of refrigerant.

Warning

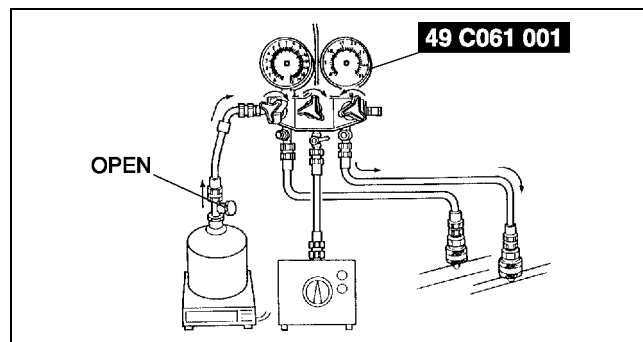
- If the refrigerant system is charged with a large amount of refrigerant when inspecting for gas leakage, and if any leakage should occur, the refrigerant will be released into the atmosphere. In order to prevent the accidental release of refrigerant which can destroy the ozone layer in the stratosphere, follow the proper procedures and charge with only a small amount of refrigerant when inspecting for gas leakage.
- If charging the system with refrigerant using service cans, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.

Caution

- Always being charging of refrigerant from the high-pressure side. If changing is begun from the low-pressure side, the vanes of the A/C compressor will not be released and abnormal noise may result.

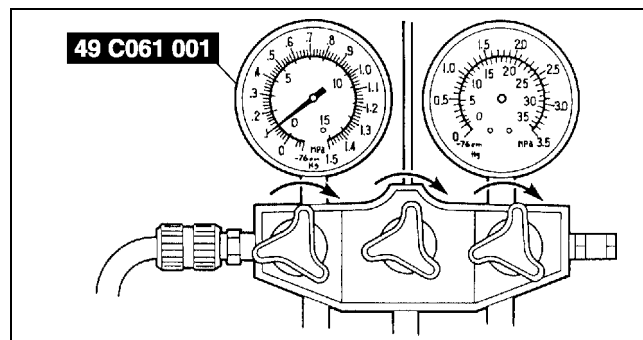
REFRIGERANT SYSTEM SERVICE PROCEDURES

3. Open the high-pressure side valve of the **SST** (49 C061 001).



A6E8514W007

4. When the low-pressure side reading increases to **0.098 MPa {1.0 kgf/cm², 14 psi}**, close the high-pressure side valve of the **SST** (49 C061 001).
5. Inspect for leakage from the cooler pipe/hose connections using the **SST** (gas leak tester).
 - If there is no leakage, go to Step 7.
 - If leakage is found at a loose joint, tighten the joint, then go to next step.
6. Inspect for leakage again.
 - If there is no leakage after tightening the joint, go to next step.
 - If there is still a leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from evacuation.

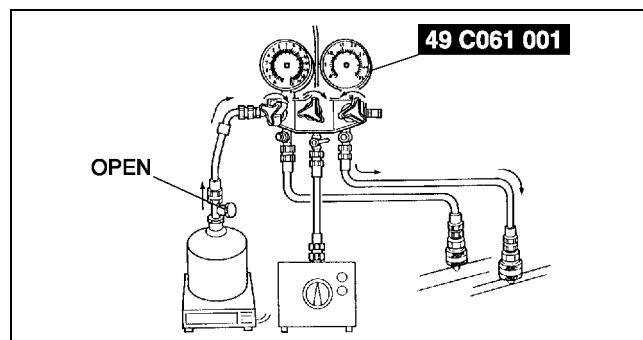


A6E8514W008

Warning

- If charging the system with refrigerant using service cans, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.

7. Open the high-pressure side valve of the **SST** (49 C061 001) and charge with refrigerant until the weight of refrigerant tank has decreased **250 g {8.83 oz}** from the amount in Step 2.

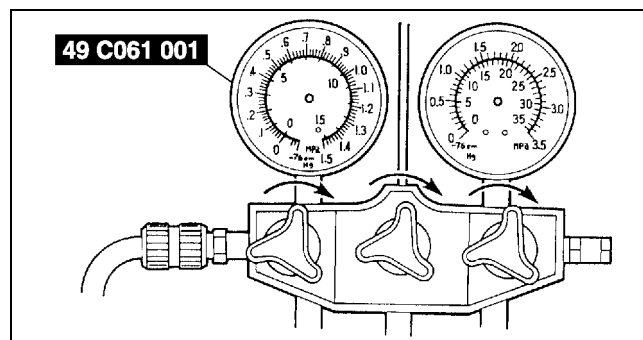


A6E8514W007

8. Close the high-pressure side valve of the **SST** (49 C061 001).

Warning

- If charging the system with refrigerant using service cans, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.

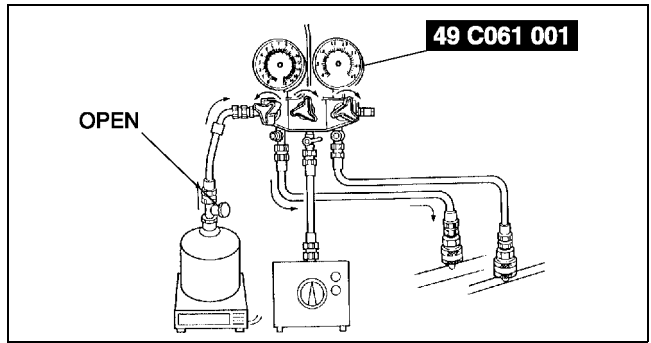


A6E8514W009

9. Start the engine and actuate the A/C compressor.

REFRIGERANT SYSTEM SERVICE PROCEDURES

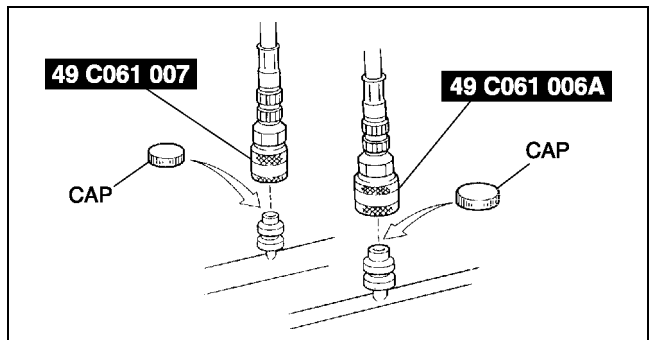
10. Open the low-pressure side valve of the **SST** (49 C061 001) and charge with refrigerant until the weight of the refrigerant tank has decreased regular amount from the amount in Step 2.
11. Close the low-pressure side valve of the **SST** (49 C061 001) and the valve of the refrigerant tank.
12. Stop the engine and A/C compressor.



A6E8514W010

Leak Test

1. Inspect for leakage using the **SST** (gas leak tester).
 - If there is no leakage, go to Step 3.
 - If leakage is found at a loose joint, tighten the joint, then go to next step.
2. Inspect for leakage again.
 - If there is no leakage after tightening the joint, go to next step.
 - If there is still leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from evacuation.
3. Disconnect the **SSTs** (49 C061 006A, 49 C061 007) from the charging valves.
4. Install the caps to the charging valves.



A6E8514W011

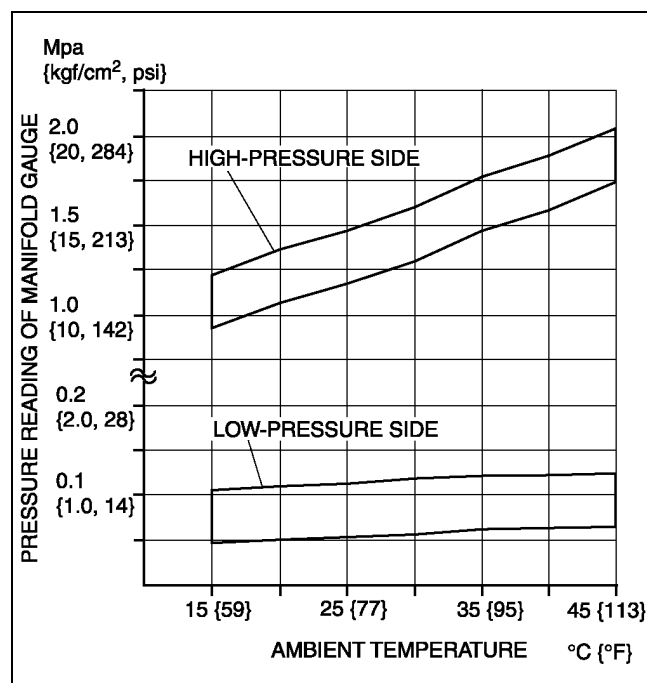
REFRIGERANT PRESSURE CHECK

1. Install the **SSTs** (gas charging set).
2. Warm up the engine and run it at a constant **1,500 rpm**.
3. Set the fan speed to MAX HI.
4. Turn the A/C switch on.
5. Set the RECIRCULATE mode.
6. Set the temperature control to MAX COLD.
7. Set the VENT mode.
8. Close all the doors and all the windows.
9. Measure the ambient temperature and the high- and low-pressure side reading of the **SST** (49 C061 001).

A6E851478834W03

REFRIGERANT SYSTEM SERVICE PROCEDURES

10. Verify that the intersection of the pressure reading of the **SST** (49 C061 001) and ambient temperature is in the shaded zone.
 - If not as specified, troubleshoot the refrigerant system. (See [U-64 TROUBLESHOOTING INDEX](#).)



A6E8514W001

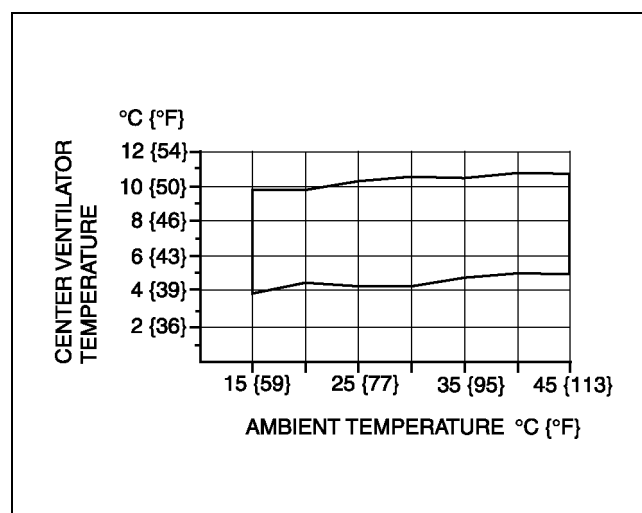
REFRIGERANT SYSTEM PERFORMANCE TEST

A6E851401039W02

1. Perform refrigerant pressure check. (See [U-12 REFRIGERANT PRESSURE CHECK](#).)
 - If they are correct, go to next step.
 - If not as specified, troubleshoot the refrigerant system. (See [U-64 TROUBLESHOOTING INDEX](#).)
2. Place a dry-bulb thermometer in the driver-side center ventilator outlet.
3. Warm up the engine and run it at a constant **1,500 rpm**.
4. Set the fan speed to MAX HI.
5. Turn the A/C switch on.
6. Set the RECIRCULATE mode.
7. Set the temperature control to MAX COLD.
8. Set the VENT mode.
9. Close all the doors and all the windows.
10. Wait until the air conditioner output temperature stabilizes.

Stabilized condition

- The A/C compressor is repeatedly turned on and off based on the A/C compressor control of center panel (manual air conditioner) or climate control unit (full-auto air conditioner).
11. Record driver-side center ventilator outlet temperature.
 12. Determine and record ambient temperature.
 13. Verify that the temperature reading is in the shaded zone.
 - If the performance is not within the shaded zone, troubleshoot the refrigerant system. (See [U-64 TROUBLESHOOTING INDEX](#).)



A6E8514W002

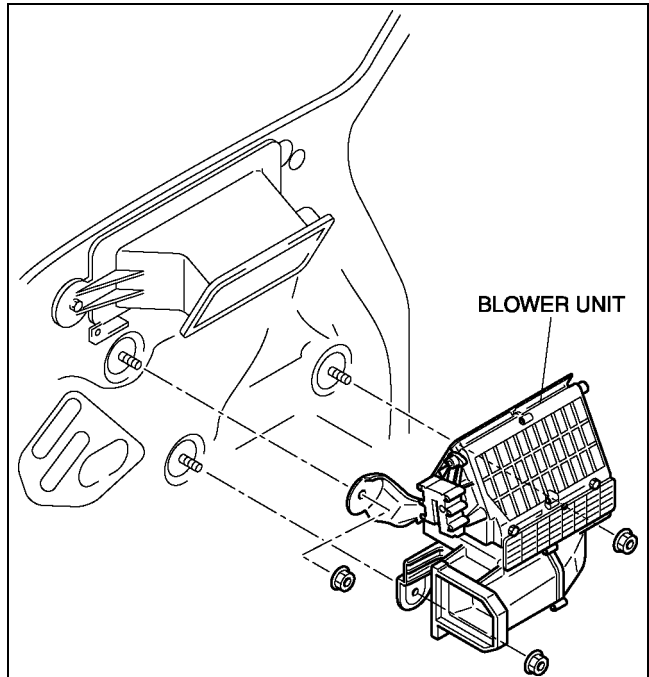
BASIC SYSTEM

BASIC SYSTEM

BLOWER UNIT REMOVAL/INSTALLATION

A6E851661140W01

1. Disconnect the negative battery cable.
2. Remove the dashboard. (See [S-82 DASHBOARD REMOVAL/INSTALLATION.](#))
3. Remove the A/C unit. (See [U-15 A/C UNIT REMOVAL/INSTALLATION.](#))
4. Remove the blower unit.
5. Install in the reverse order of removal.



A6E8516W001

BLOWER UNIT DISASSEMBLY/ASSEMBLY

A6E851661140W02

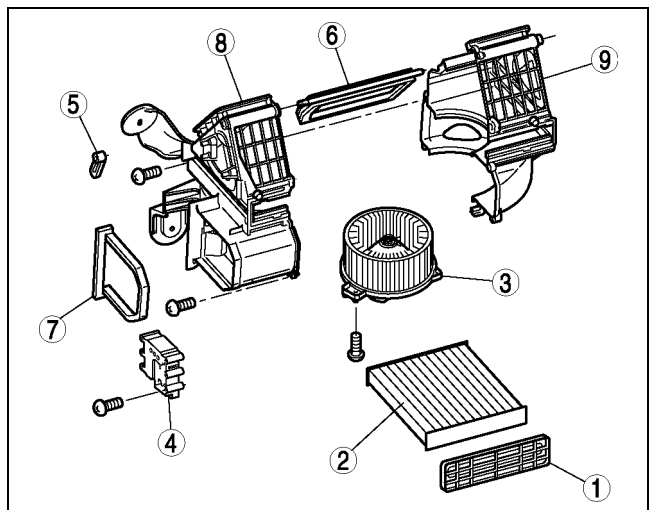
1. Disassemble in the order indicated in the table.

Caution

- Apply only the specified grease to the link. Otherwise abnormal noise or improper operation may result.

1	Air filter cover
2	Air filter
3	Blower motor
4	Air intake actuator
5	Air intake crank
6	Air intake door
7	Polyurethane protector
8	Blower case (1)
9	Blower case (2)

2. Assemble in the reverse order of disassembly.



A6E8516W002

BASIC SYSTEM

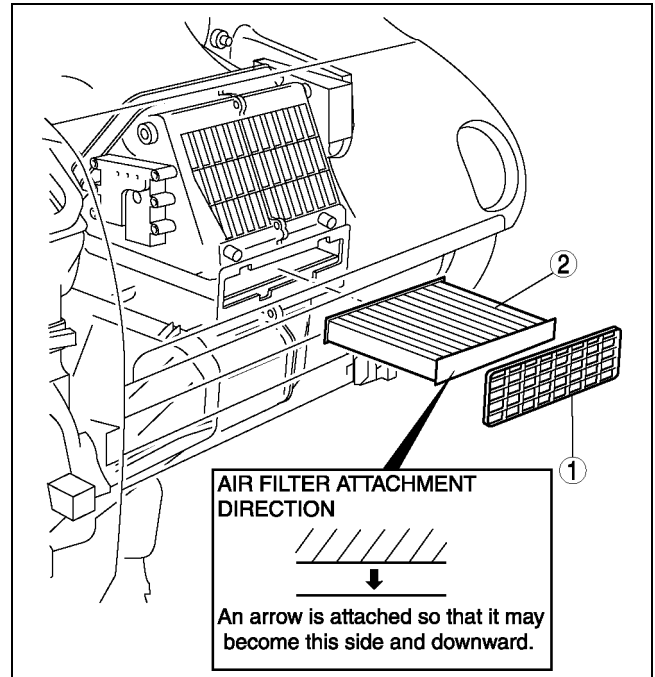
AIR FILTER REMOVAL/INSTALLATION

A6E851661140W03

1. Remove the glove compartment.
2. Remove in the order indicated in the table.

1	Air filter cover
2	Air filter

3. Install in the reverse order of removal.



A6E8516W018

AIR FILTER INSPECTION

A6E851661140W04

1. Remove the air filter.
2. Inspect the air filter.
 - If the air filter is damaged, excessively dirty, or foul smelling, replace the air filter.

Note

- The air filter cannot be reused by cleaning it with water or compressed air.
- Replace the air filter at the following interval, depending on operating conditions.

Destinations	Type	Interval (year or km {miles})
Europe (L.H.D. U.K.) specs.	Aldehyde, pollen, and a dust removal	1 or 20,000 {12,500}
	Pollen, and a dust removal	2 or 40,000 {25,000}
GCC specs.	—	1 or 20,000 {12,500}

A/C UNIT REMOVAL/INSTALLATION

A6E851661130W01

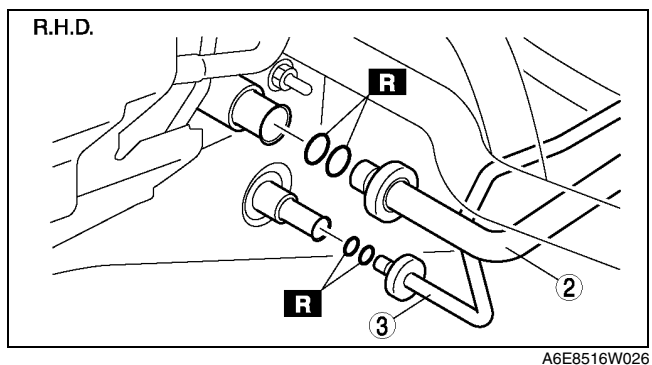
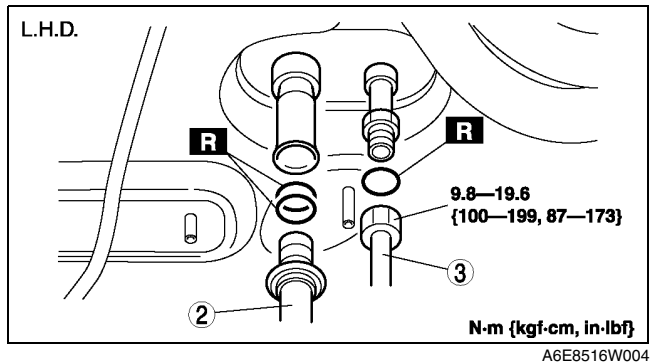
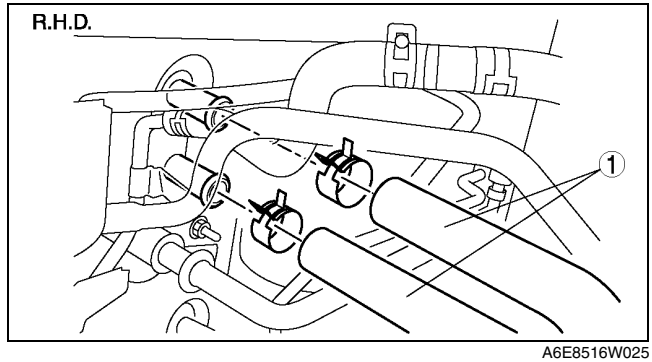
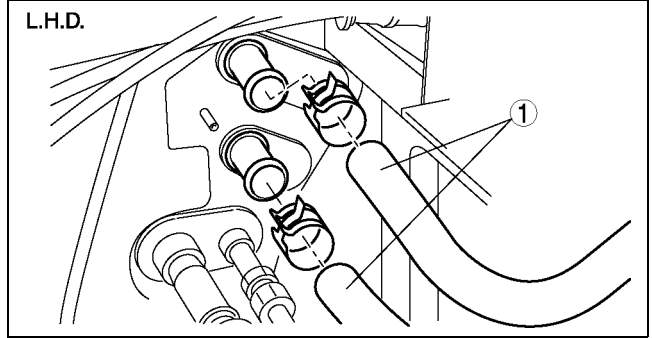
1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See [U-9 RECOVERY.](#)) (See [U-9 CHARGING.](#))
3. Drain the engine coolant. (See [E-3 ENGINE COOLANT REPLACEMENT.](#))
4. Remove the dashboard. (See [S-82 DASHBOARD REMOVAL/INSTALLATION.](#))
5. Remove the theft-deterrent control module. (See [T-86 THEFT-DETERRENT CONTROL MODULE REMOVAL/INSTALLATION.](#))

Caution

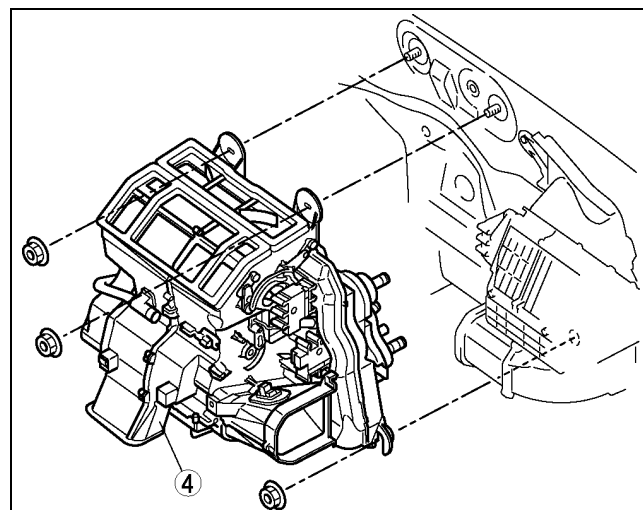
- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.

BASIC SYSTEM

6. Remove in the order indicated in the table. Do not allow compressor oil to spill.



BASIC SYSTEM



A6E8516W019

1	Heater hose
2	Cooler hose (Lo) (L.H.D.) or cooler pipe No.4 (R.H.D.) (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)
3	Cooler pipe No.3 (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)
4	A/C unit (See U-17 A/C Unit Installation Note)

7. Install in the reverse order of removal.

8. Perform the refrigerant system performance test. (See [U-13 REFRIGERANT SYSTEM PERFORMANCE TEST](#).)

A/C Unit Installation Note

1. When installing a new A/C unit or evaporator, add a supplemental amount of ATMOS GU10 compressor oil into the refrigerant cycle.

Supplemental amount (approximate quantity)
25 ml {25 cc, 0.8 fl oz}

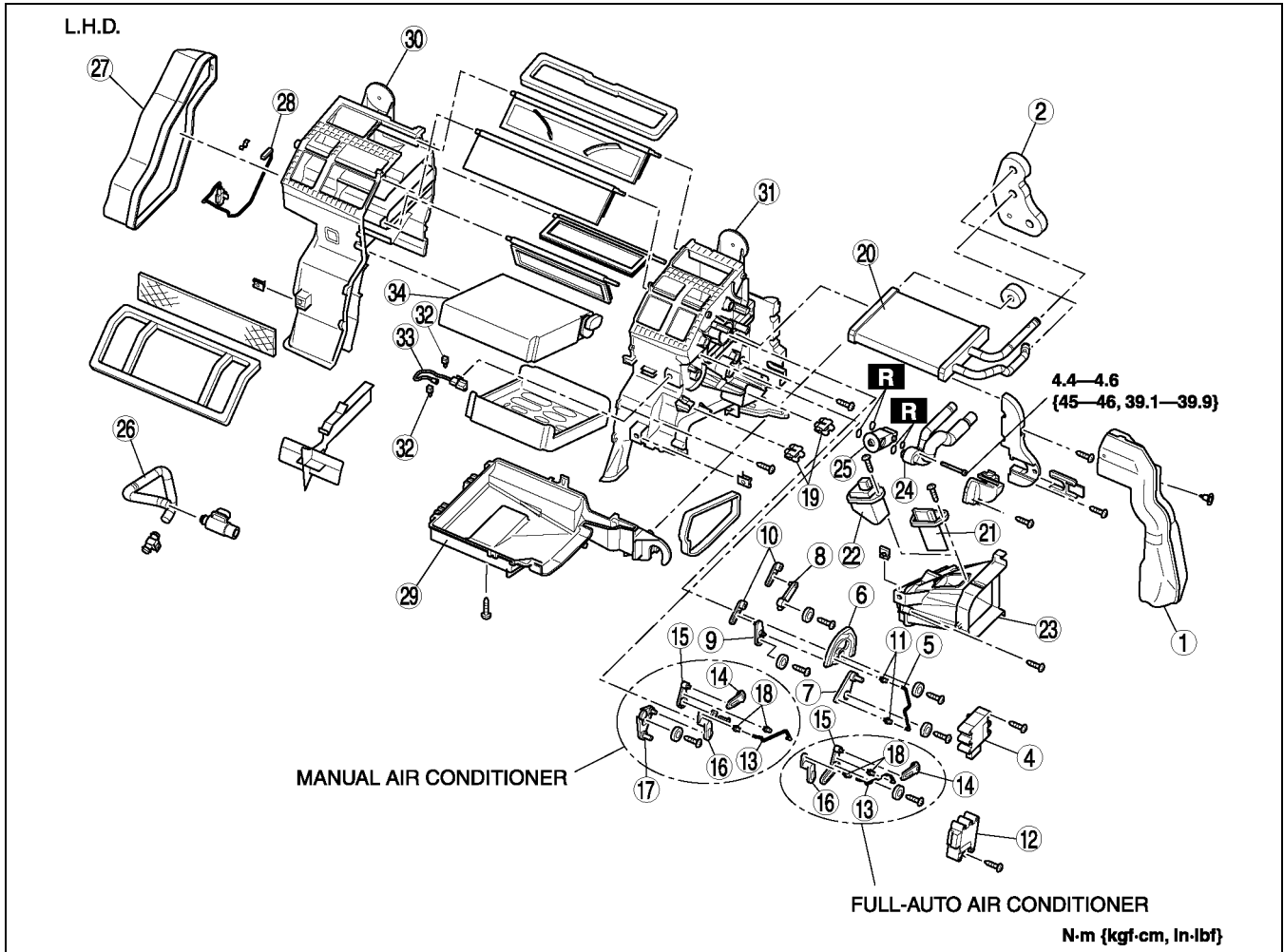
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BASIC SYSTEM

A/C UNIT DISASSEMBLY/ASSEMBLY

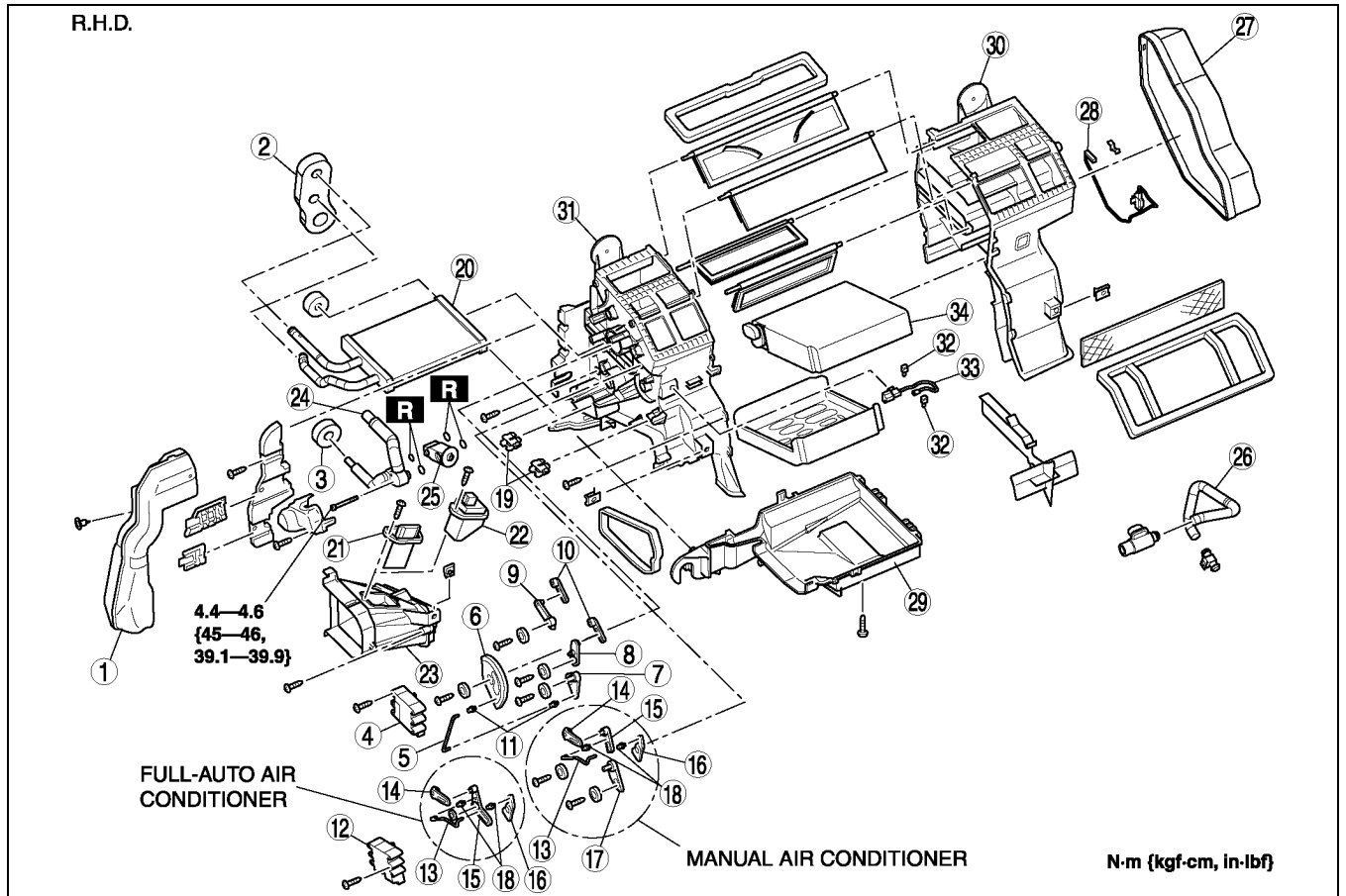
A6E851661130W02

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



A6E8516W005

BASIC SYSTEM



A6E8516W006

1	Duct (1)
2	Polyurethane protector (1)
3	Polyurethane protector (2) (R.H.D.)
4	Airflow mode actuator (full-auto air conditioner)
5	Airflow mode rod (manual air conditioner)
6	Airflow mode main link
7	Airflow mode sub link (1) (manual air conditioner)
8	Airflow mode sub link (2)
9	Airflow mode sub link (3)
10	Airflow mode crank
11	Airflow mode rod holder (manual air conditioner)
12	Air mix actuator (full-auto air conditioner)
13	Air mix rod
14	Air mix crank (1)
15	Air mix link (1)
16	Air mix crank (2)
17	Air mix link (2) (manual air conditioner)
18	Air mix rod holder
19	Wire clamp (manual air conditioner)

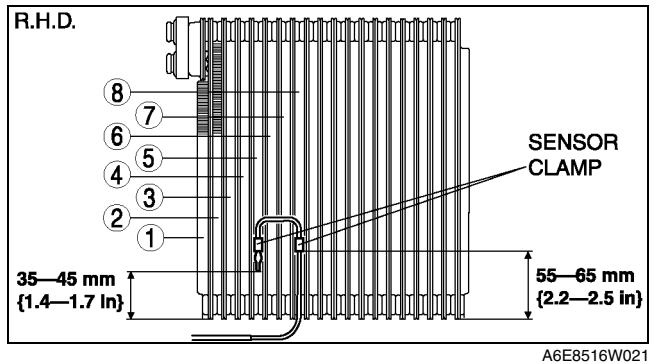
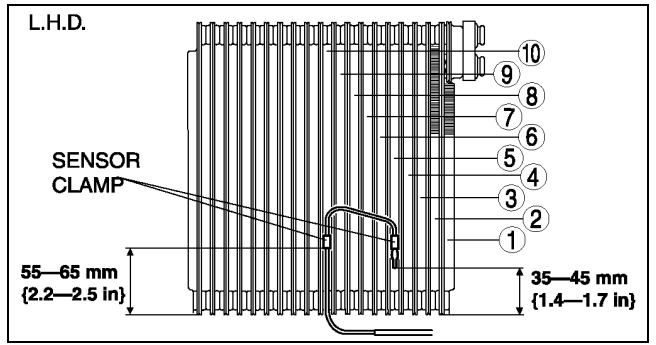
20	Heater core
21	Resistor (manual air conditioner)
22	Power MOS FET (full-auto air conditioner)
23	Duct (2)
24	Outlet pipe (See U-21 Outlet Pipe Assembly Note)
25	Expansion valve (See U-20 Expansion Valve Assembly Note)
26	Air hose
27	Duct (3)
28	Water temperature sensor (full-auto air conditioner)
29	A/C case (3)
30	A/C case (1)
31	A/C case (2)
32	Sensor clamp (See U-20 Sensor Clamp Assembly Note)
33	Evaporator temperature sensor (See U-20 Evaporator Temperature Sensor Assembly Note)
34	Evaporator

U

BASIC SYSTEM

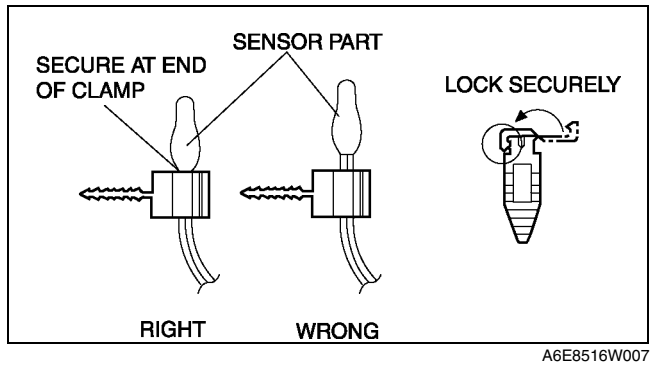
Evaporator Temperature Sensor Assembly Note

1. Assemble the evaporator temperature sensor as shown in the figure.



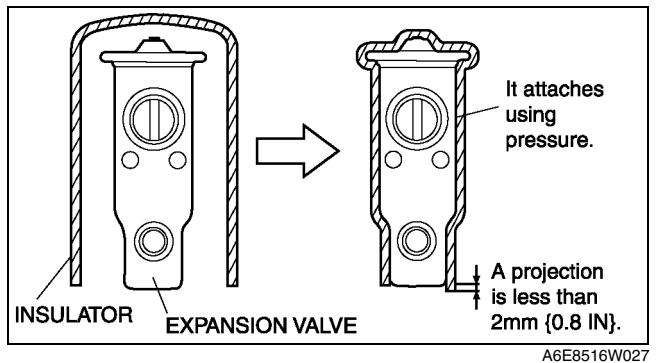
Sensor Clamp Assembly Note

1. Attach the sensor clamp as shown in the figure.



Expansion Valve Assembly Note

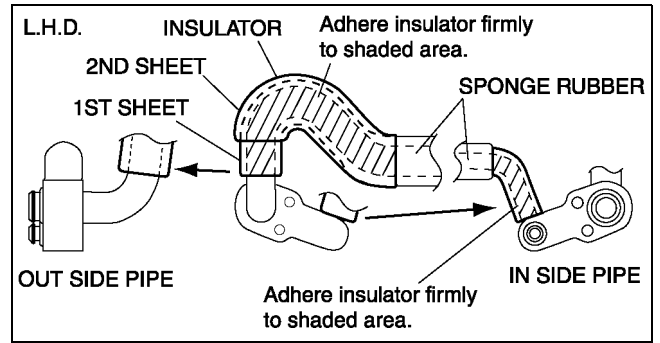
1. Attach the insulator as shown in the figure.



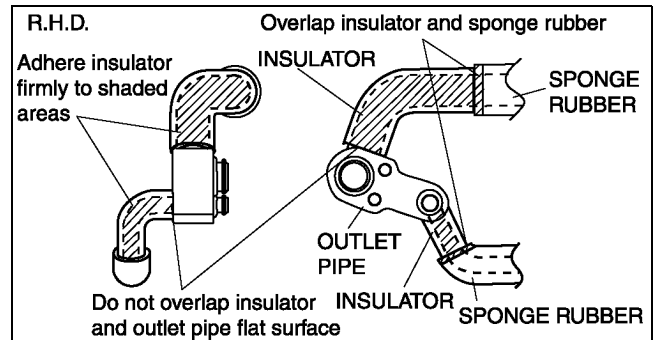
BASIC SYSTEM

Outlet Pipe Assembly Note

1. Wrap the insulator around the outlet pipe as shown in the figure.



A6E8516W028



A6E8516W031

EXPANSION VALVE REMOVAL/INSTALLATION

A6E851661130W03

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See [U-9 RECOVERY.](#)) (See [U-9 CHARGING.](#))

Caution

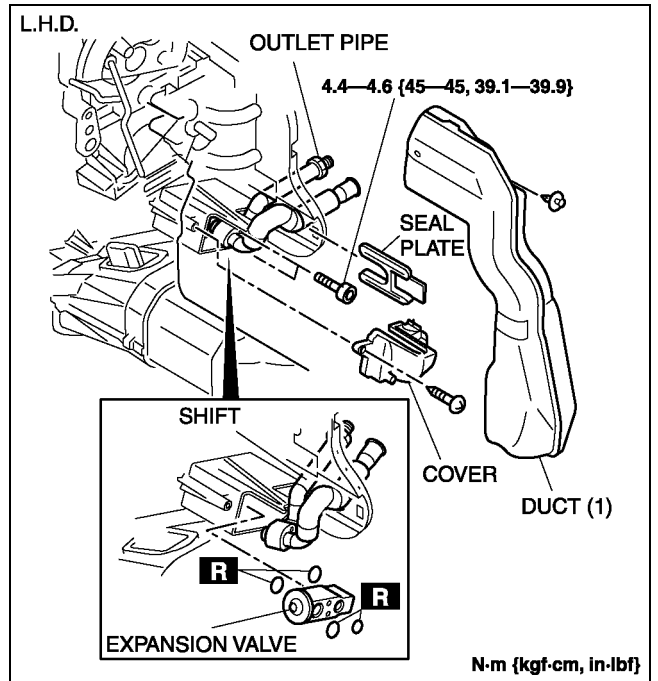
- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.

3. Disconnect the cooler hose (Lo) (L.H.D) or cooler pipe No.4 (R.H.D.) and cooler pipe No.3. (See [U-25 REFRIGERANT LINES REMOVAL/INSTALLATION.](#))
4. Remove the dashboard. (See [S-82 DASHBOARD REMOVAL/INSTALLATION.](#))
5. Remove the duct (1).
6. Remove the air mix actuator. (Full-auto air conditioner)
7. Remove the screws and cover.
8. Remove the one plate (L.H.D.) or two plates (R.H.D.).
9. Remove the bolts and shift the outlet pipe. Do not allow compressor oil to spill.

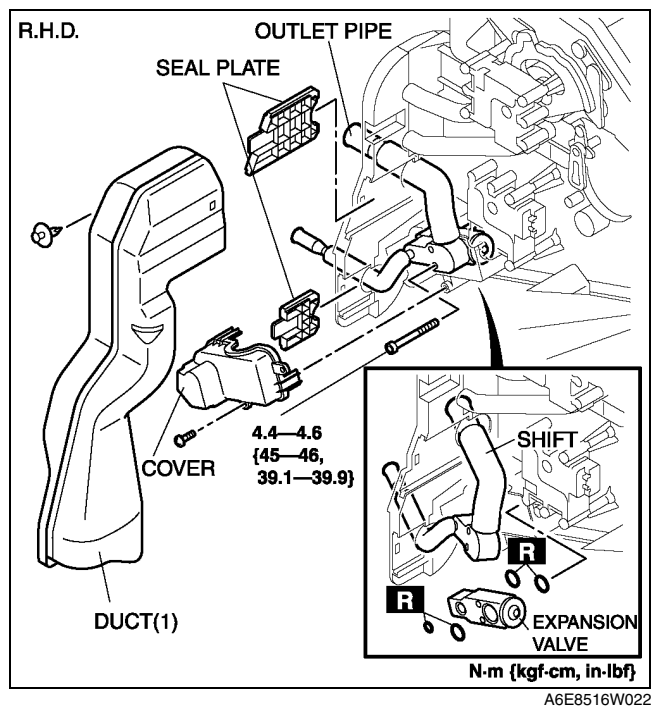
U

BASIC SYSTEM

10. Remove the expansion valve. Do not allow compressor oil to spill.



11. Install in the reverse order of removal.
12. Perform the refrigerant system performance test. (See [U-13 REFRIGERANT SYSTEM PERFORMANCE TEST.](#))



EVAPORATOR INSPECTION

1. Remove the A/C unit. (See [U-15 A/C UNIT REMOVAL/INSTALLATION.](#))
2. Remove the evaporator from the A/C unit.
3. Inspect for cracks, damage, and oil leakage.
 - If any problems are found, replace the evaporator.
4. Inspect for bent fins.
 - If any are bent, use a flathead screwdriver to straighten them.

A6E851661810W01

BASIC SYSTEM

HEATER CORE INSPECTION

A6E851661910W01

1. Remove the A/C unit. (See [U-15 A/C UNIT REMOVAL/INSTALLATION.](#))
2. Remove the heater core from the A/C unit.
3. Inspect for cracks, damage, and coolant leakage.
 - If any problems are found, replace the heater core.
4. Inspect for bent fins.
 - If any are bent, use a flathead screwdriver to straighten them.
5. Verify that the heater core inlet and outlet pipe are not distorted or damaged.
 - Repair with pliers if necessary.

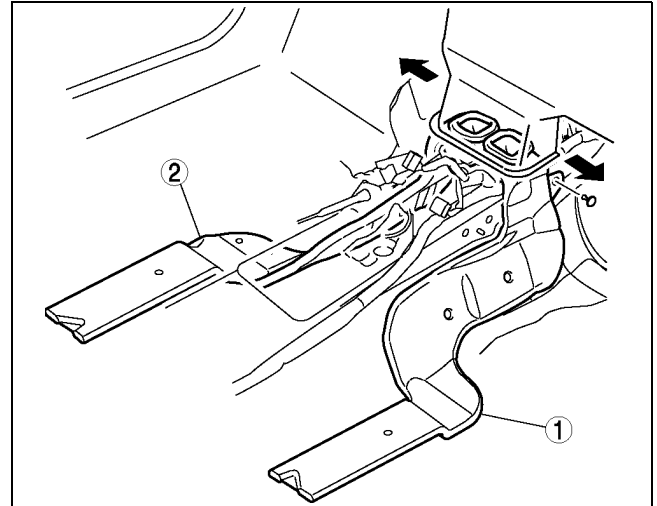
REAR HEAT DUCT REMOVAL/INSTALLATION

A6E851661273W01

1. Turn over the front floor covering. (See [S-99 FRONT FLOOR COVERING REMOVAL/INSTALLATION.](#))
2. Remove in the order indicated in the table.

1	Rear heat duct (Right)
2	Rear heat duct (Left)

3. Install in the reverse order of removal.



A6E8516W011

A/C COMPRESSOR REMOVAL/INSTALLATION

A6E851661450W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See [U-9 RECOVERY.](#)) (See [U-9 CHARGING.](#))
3. Remove the right side splash shield and mudguard (L.H.D. only).
4. Loosen the drive belt and remove it.

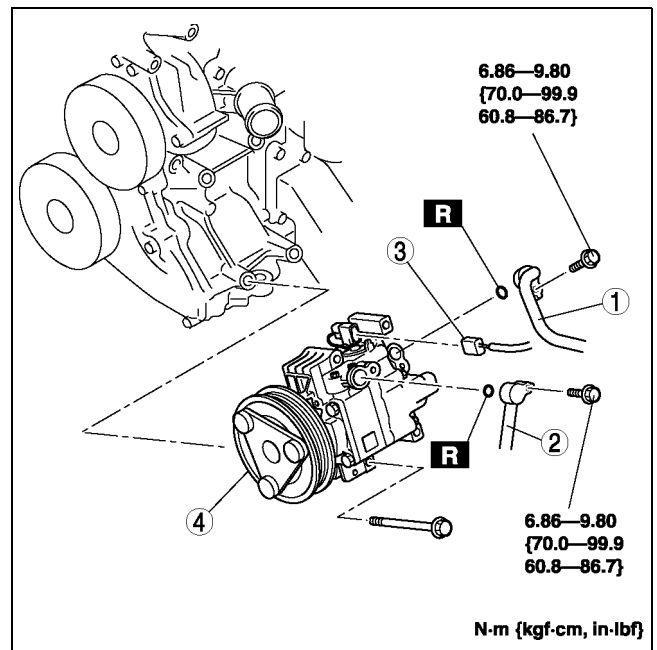
Caution

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.

5. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Cooler hose (HI) (See U-29 Refrigerant Lines Installation Note)
2	Cooler pipe No.4 (L.H.D.) or cooler hose (LO) (R.H.D.) (See U-29 Refrigerant Lines Installation Note)
3	Magnetic clutch connector
4	A/C compressor (See U-24 A/C Compressor Installation Note)

6. Install in the reverse order of removal.
7. Adjust the drive belt.
8. Perform the refrigerant system performance test.
(See [U-13 REFRIGERANT SYSTEM PERFORMANCE TEST.](#))



A6E8516W012

BASIC SYSTEM

A/C Compressor Installation Note

1. Remove the following amount of compressor oil from the new A/C compressor when replacing the A/C compressor.

Compressor oil to be removed (approximate quantity)

120 ml {120 cc, 4.06 fl oz} – [compressor oil from old A/C compressor + 15 ml {15 cc, 0.5 fl oz}]

CONDENSER REMOVAL/INSTALLATION

A6E851661480W01

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See [U-9 RECOVERY.](#)) (See [U-9 CHARGING.](#))
3. Remove the shroud panel. (See [S-119 SHROUD PANEL REMOVAL/INSTALLATION.](#))

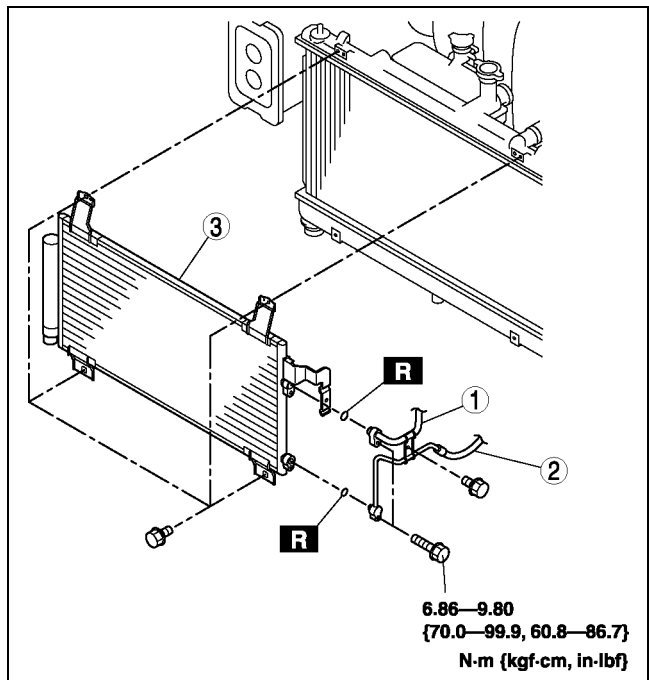
Caution

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.

4. Remove in the order indicated in the table. Do not allow compressor oil to spill.

1	Cooler pipe No.1 (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)
2	Cooler pipe No.2 (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)
3	Condenser (See U-24 Condenser Installation Note)

5. Install in the reverse order of removal.
6. Perform the refrigerant system performance test.
(See [U-13 REFRIGERANT SYSTEM PERFORMANCE TEST.](#))



A6E8516W013

Condenser Installation Note

1. When installing a new condenser, add a supplemental amount of ATMOS GU10 compressor oil inlet the refrigerant cycle.

Supplemental amount (approximate quantity)

20 ml {20 cc, 0.7 fl oz}

CONDENSER INSPECTION

A6E851661480W02

1. Inspect for cracks, damage, and oil leakage.
 - If any are found, replace the condenser.
2. Inspect for fins clogged by dust.
 - If any are clogged, remove the dust from the fins.
3. Inspect for bent fins.
 - If any are bent, use a flathead screwdriver to straighten them.

BASIC SYSTEM

REFRIGERANT LINES REMOVAL/INSTALLATION

A6E851661460W01

1. Remove the battery.
2. Discharge the refrigerant from the system. (See [U-9 RECOVERY.](#)) (See [U-9 CHARGING.](#))
3. Remove the washer tank. (L.H.D. only) (See [T-58 WASHER TANK REMOVAL/INSTALLATION.](#))
4. Remove the air cleaner cover, air cleaner element and air cleaner case. (See [F-10 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION.](#))
5. Remove the charcoal canister.
6. Remove the No.3 engine mount. (L.H.D. only)
7. Remove the shroud panel. (See [S-119 SHROUD PANEL REMOVAL/INSTALLATION.](#))
8. Remove the right splash shield.
9. Remove the right mud guard. (L.H.D. only)

Caution

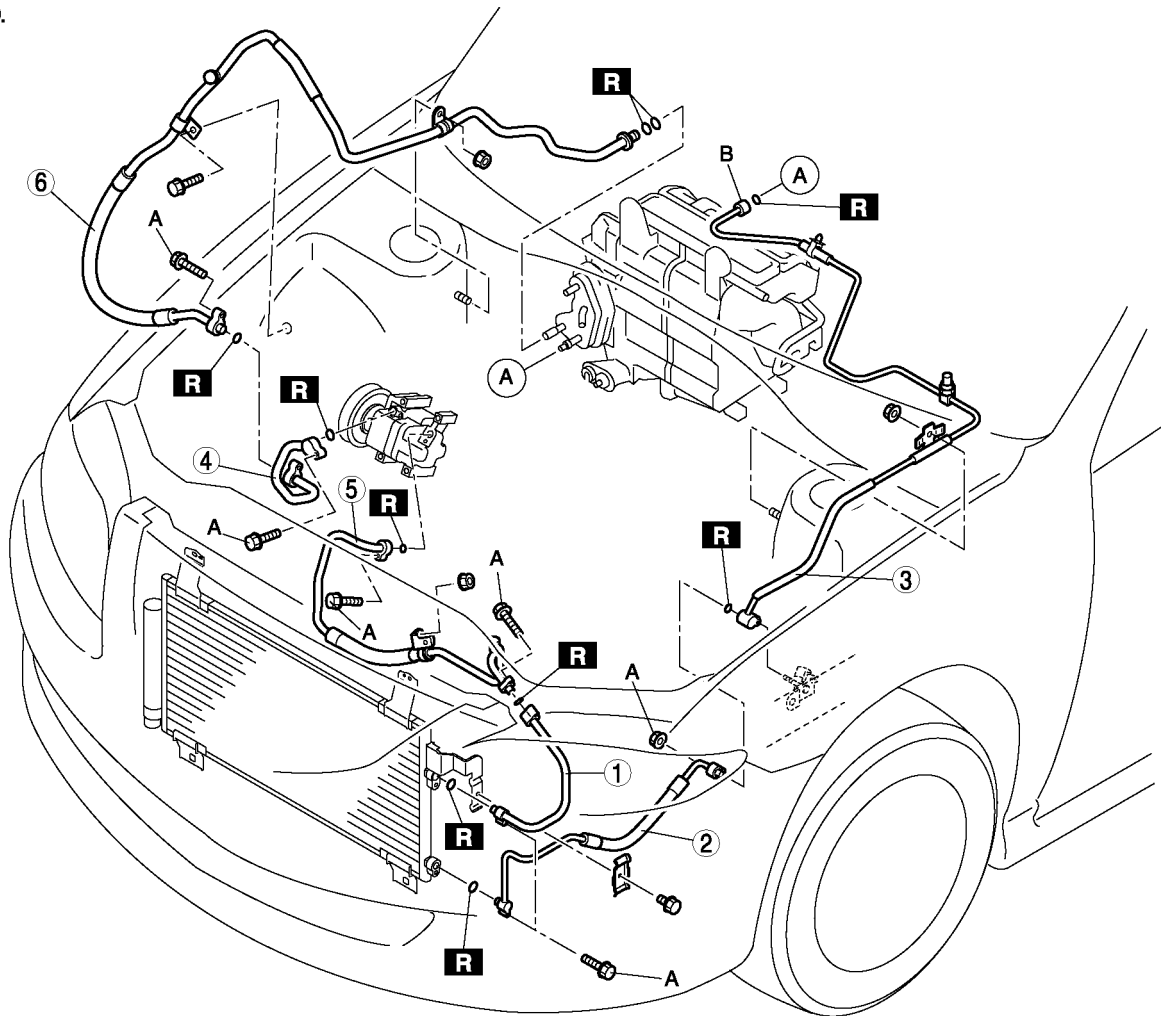
- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise will occur. Always immediately plug all open fittings after removing any refrigeration cycle parts to keep moisture or foreign material out of the cycle.

10. Remove in the order indicated in the table. Do not allow compressor oil to spill.
11. Install in the reverse order of removal.

BASIC SYSTEM

12. Perform the refrigerant system performance test. (See [U-13 REFRIGERANT SYSTEM PERFORMANCE TEST.](#))

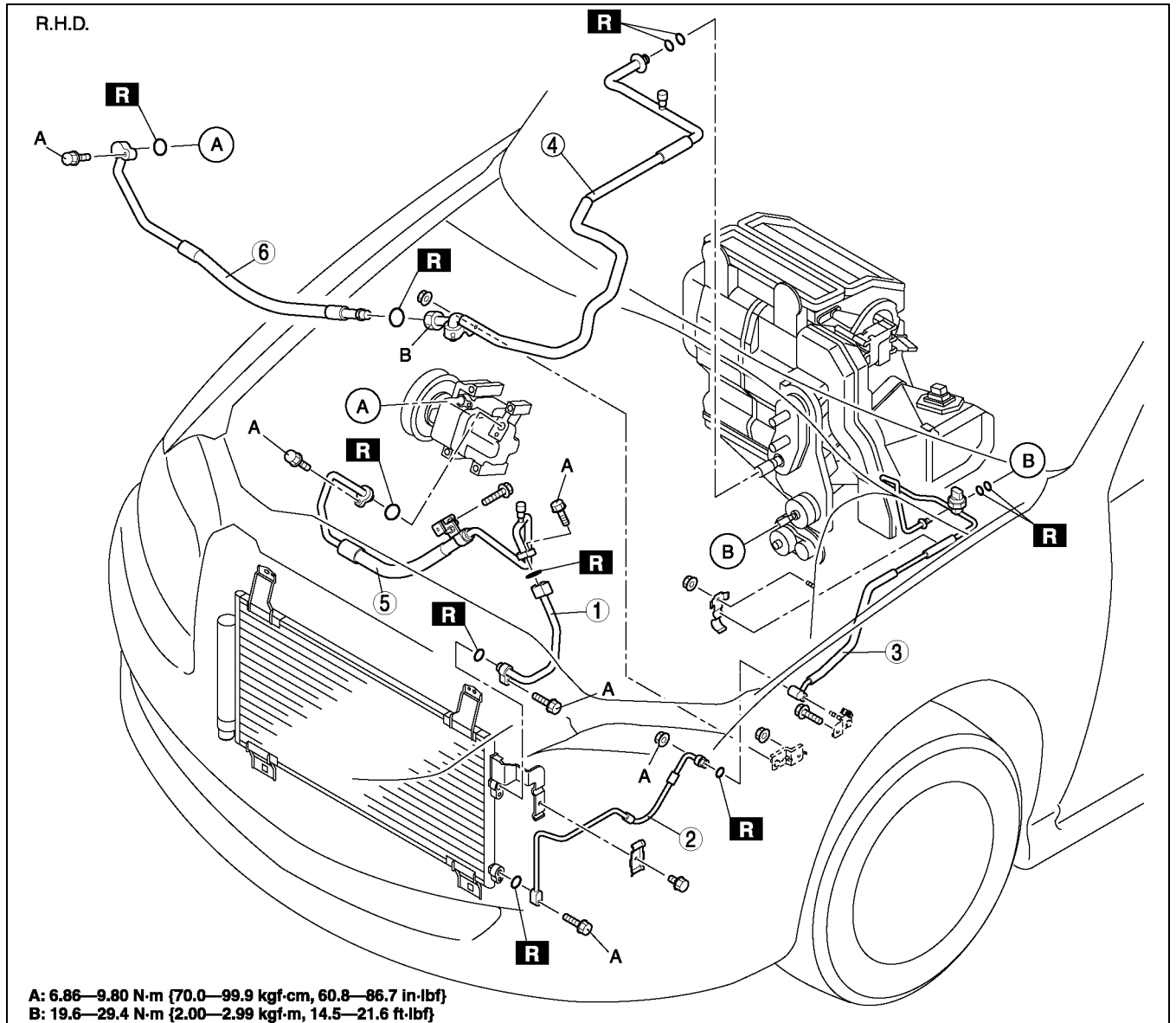
L.H.D.



A: 6.86—9.80 N·m {70.0—99.9 kgf·cm, 60.8—86.7 in·lbf}
B: 9.80—19.6 N·m {100—199 kgf·cm, 87—173 in·lbf}

A6E8516W029

BASIC SYSTEM



A6E8516W030

1	Cooler pipe No.1 (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)
2	Cooler pipe No.2 (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)
3	Cooler pipe No.3 (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)

4	Cooler pipe No.4 (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)
5	Cooler hose (HI) (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)
6	Cooler hose (LO) (See U-28 Refrigerant Lines Removal Note) (See U-29 Refrigerant Lines Installation Note)

BASIC SYSTEM

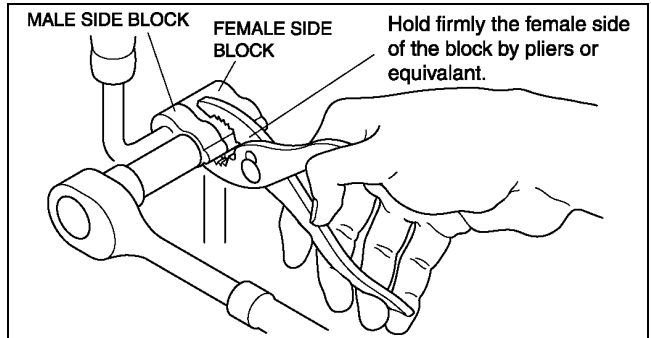
Refrigerant Lines Removal Note

Nut joint type

1. Loosen the nut using two spanners, then remove the cooler pipe or hose.

Block joint type

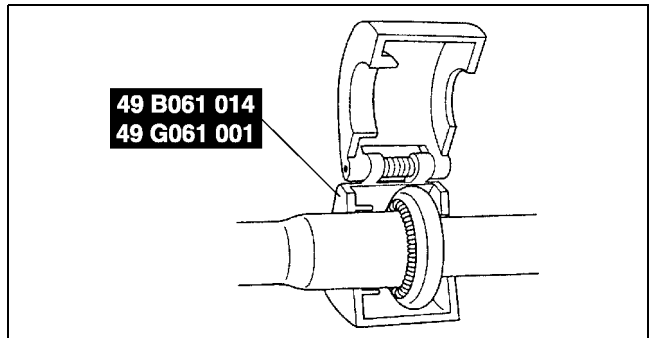
1. Disconnect the block joint type pipes by grasping female side of the block with pliers or similar tool and holding firmly, then remove the connection bolt or nut.



A6E8516W023

Spring-lock coupling type

1. Set the SST.

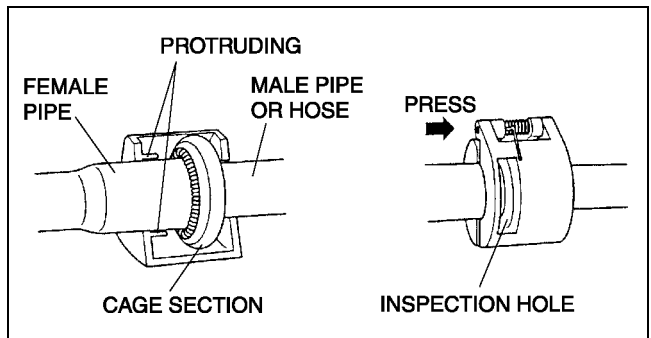


A6E8516W014

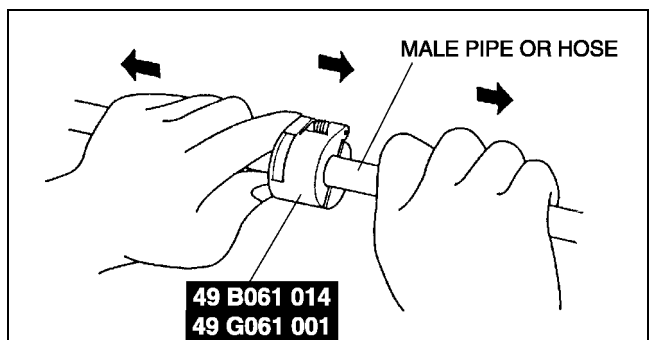
2. While looking through the inspection hole of the SST, insert the protruding part of the SST until it makes contact with the cage section.
3. Use the SST to disconnect the male pipe or hose from the female by pulling the male pipe or hose.

Note

- The male pipe or hose can be disconnected easily from the female pipe by pulling from the male pipe or hose while maintaining the pressure of the protruding part of the SST.



A6E8516W015



A6E8516W016

BASIC SYSTEM

Refrigerant Lines Installation Note

1. When installing a new cooler pipe No.4 or cooler hose (LO), add a supplemental amount of ATMOS GU10 compressor oil into the refrigeration cycle.

Supplemental amount (approximate quantity)

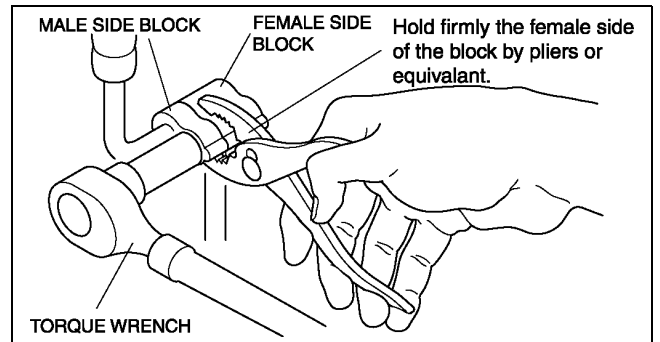
5 ml {5 cc, 0.2 fl oz}: Cooler pipe No.4

10 ml {10 cc, 0.3 fl oz}: Cooler hose (LO)

2. Apply compressor oil to the O-rings and connect the joints.
3. Tighten the joints.

Nut or block joint type

1. Tighten the nut or bolt of joint by hand.
2. Tighten the joint to the specified torque. If it is a nut joint, tighten the nut with a spanner and torque wrench.
3. Connect the block joint type pipes by grasping the female side of the block with pliers or similar tool and holding firmly, then tighten the connection bolt or nut with a torque wrench.



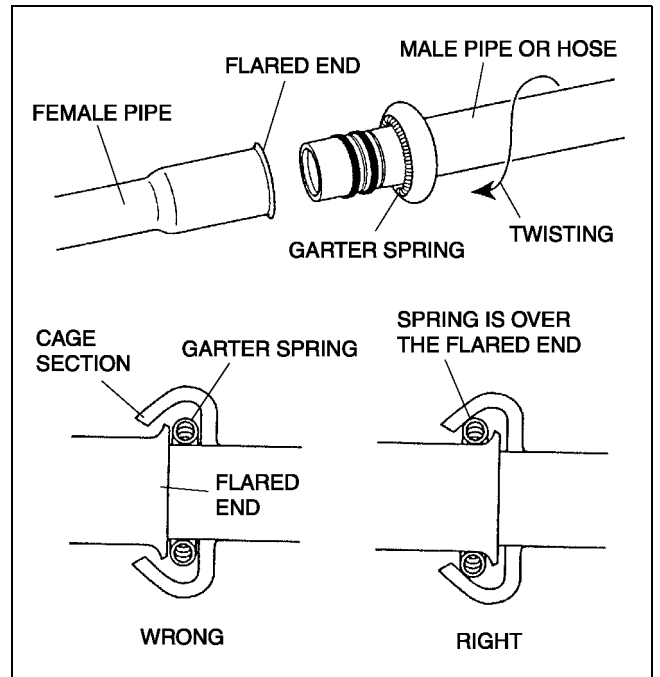
A6E8516W024

Spring-lock coupling type

1. Connect the male pipe or hose by twisting it onto female pipe until the garter spring at the male pipe or hose is over the flared end of female pipe.

Note

- When the male pipe or hose is replaced, the indicator ring comes out after connecting to indicate that it is locked.



A6E8516W017

CONTROL SYSTEM

CONTROL SYSTEM

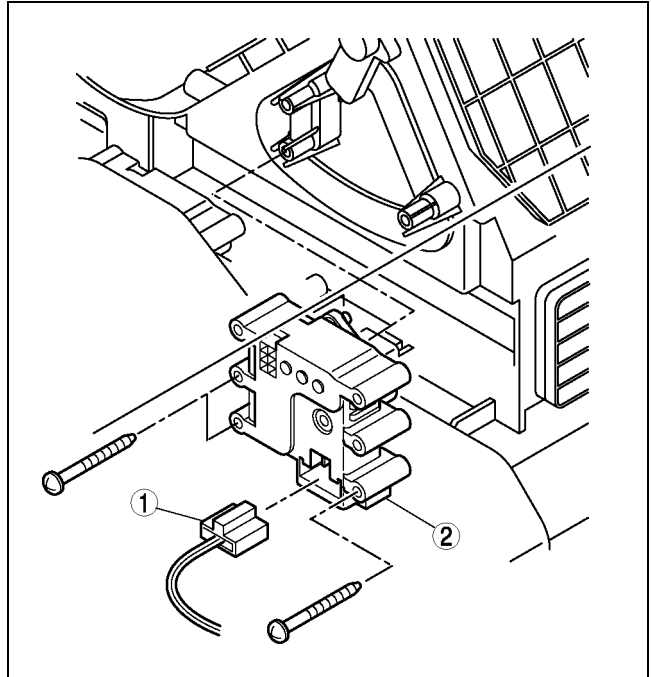
AIR INTAKE ACTUATOR REMOVAL/INSTALLATION

A6E854061060W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the car navigation unit. (See [T-98 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.

1	Air intake actuator connector
2	Air intake actuator

5. Install in the reverse order of removal.



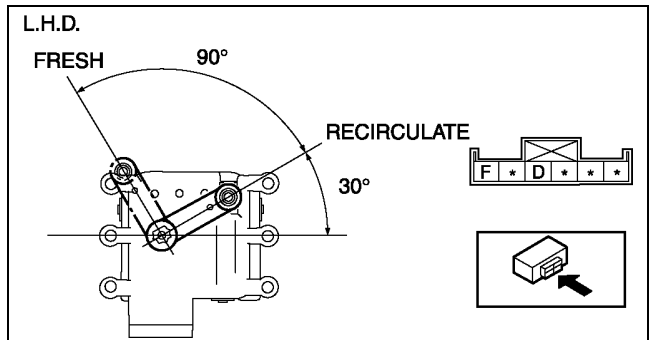
A6E8540W001

AIR INTAKE ACTUATOR INSPECTION

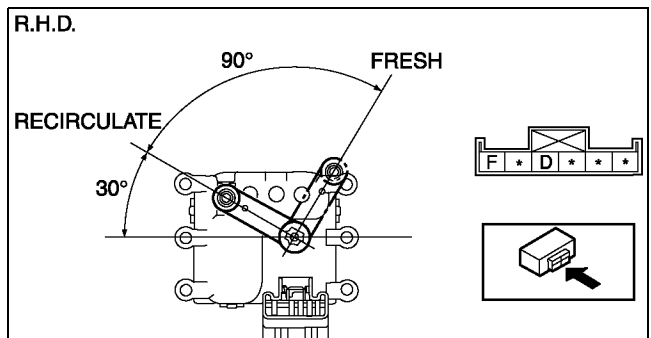
A6E854061060W02

1. Connect battery positive voltage to terminal D or F and ground to terminal F or D of the air intake actuator.
2. Verify that the air intake actuator operates as shown below.
 - If not as specified, replace the air intake actuator.

Connection		Movement
B+	GND	
D	F	RECIRCULATE→FRESH
F	D	FRESH→RECIRCULATE

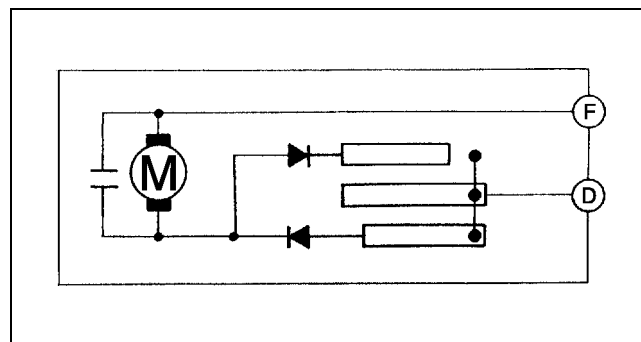


A6E8540W002



A6E8540W003

CONTROL SYSTEM



A6E8540W043

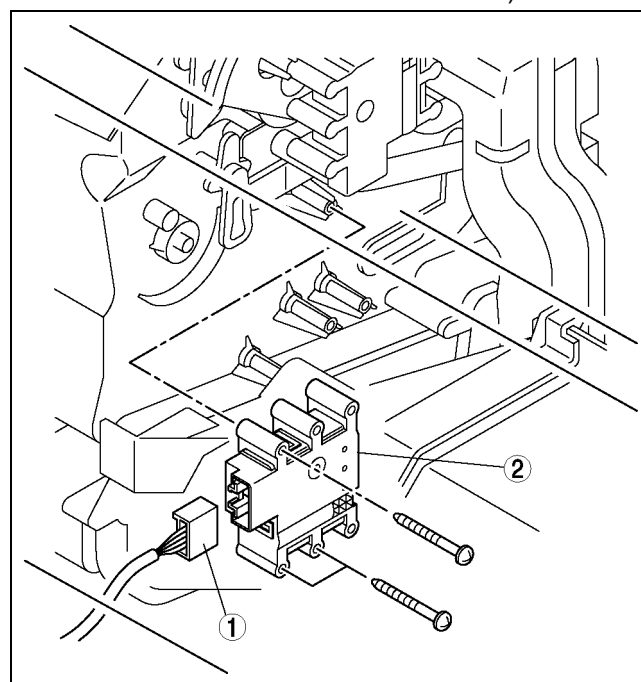
AIR MIX ACTUATOR REMOVAL/INSTALLATION

A6E854061415W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the car navigation unit. (See [T-98 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.

1	Air mix actuator connector
2	Air mix actuator

5. Install in the reverse order of removal.



A6E8540W004

U

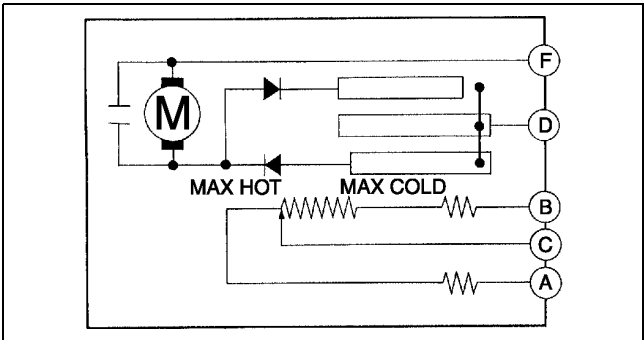
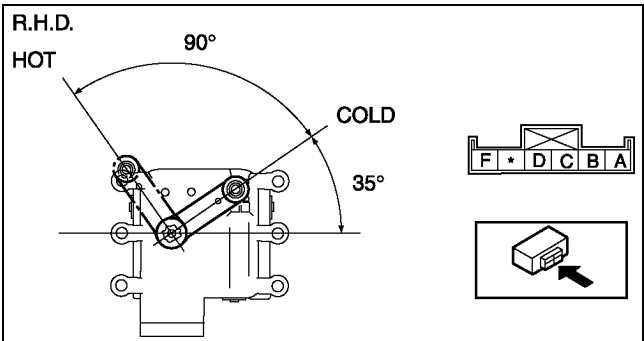
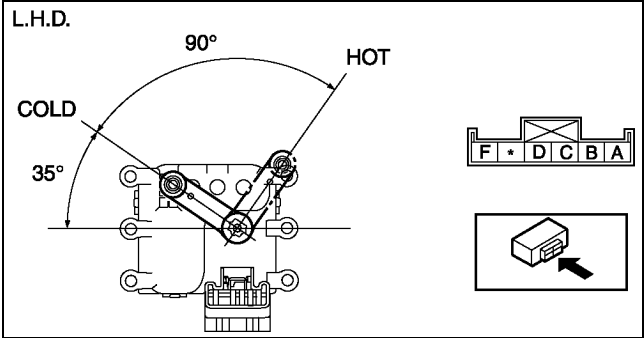
CONTROL SYSTEM

AIR MIX ACTUATOR INSPECTION

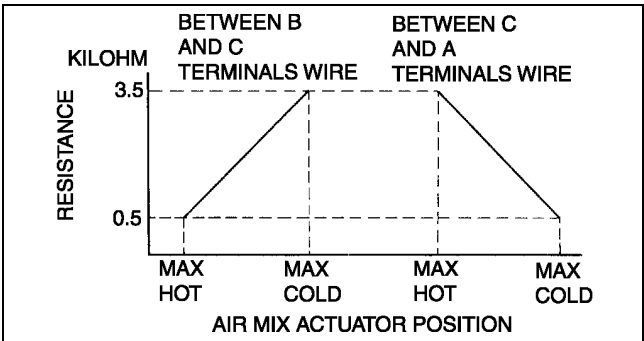
A6E854061415W02

1. Connect battery positive voltage to terminal D or F and ground to terminal F or D of the air mix actuator.
2. Verify that the air mix actuator operates as shown below.
 - If not as specified, replace the air mix actuator.

Connection		Movement
B+	GND	
D	F	COLD→HOT
F	D	HOT→COLD



3. Verify that the resistance between the terminals of the air mix actuator are as shown in the graph.
 - If not as specified, replace the air mix actuator.



CONTROL SYSTEM

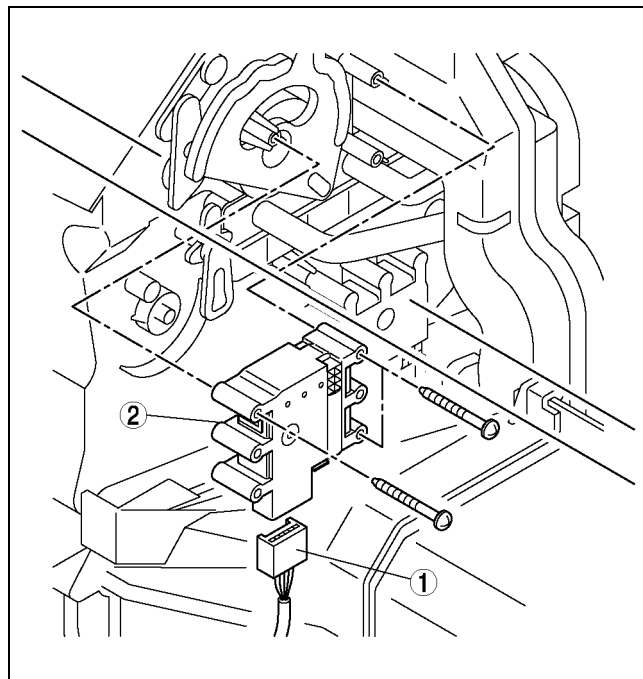
AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION

A6E854061070W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the car navigation unit. (See [T-98 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.

1	Airflow mode actuator connector
2	Airflow mode actuator

5. Install in the reverse order of removal.



A6E8540W007

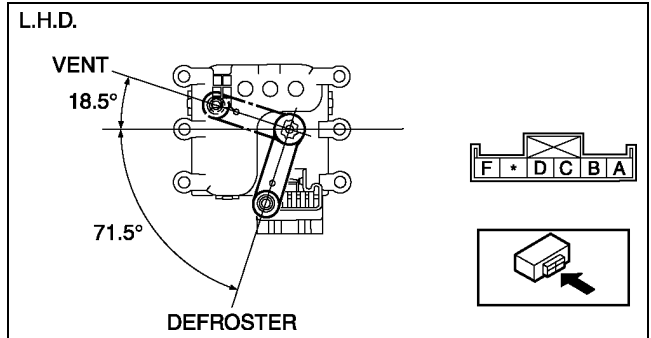
CONTROL SYSTEM

AIRFLOW MODE ACTUATOR INSPECTION

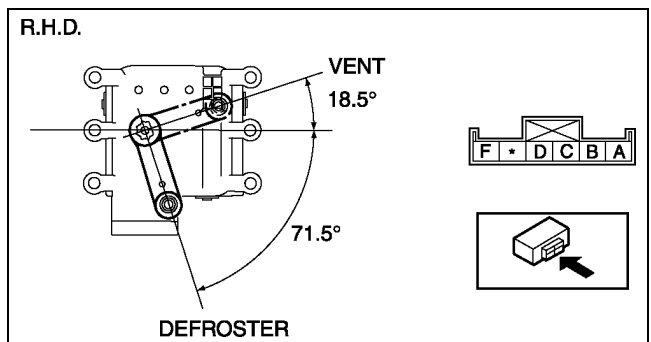
A6E854061070W02

1. Connect battery positive voltage to terminal D or F and ground to terminal F or D of the airflow mode actuator.
2. Verify that the airflow mode actuator operates as shown below.
 - If not as specified, replace the airflow mode actuator.

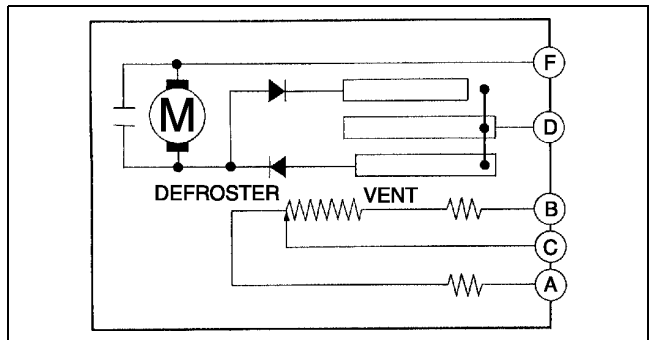
Connection		Movement
B+	GND	
D	F	DEFROSTER → VENT
F	D	VENT → DEFROSTER



A6E8540W008

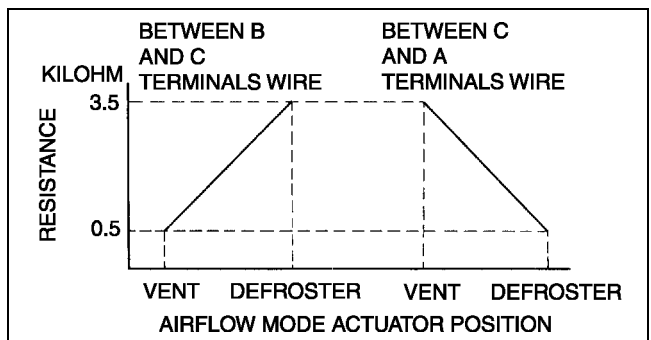


A6E8540W009



A6E8540W046

3. Verify that the resistance between the terminals of the airflow mode actuator is as shown in the graph.
 - If not as specified, replace the airflow mode actuator.



A6E8540W047

CONTROL SYSTEM

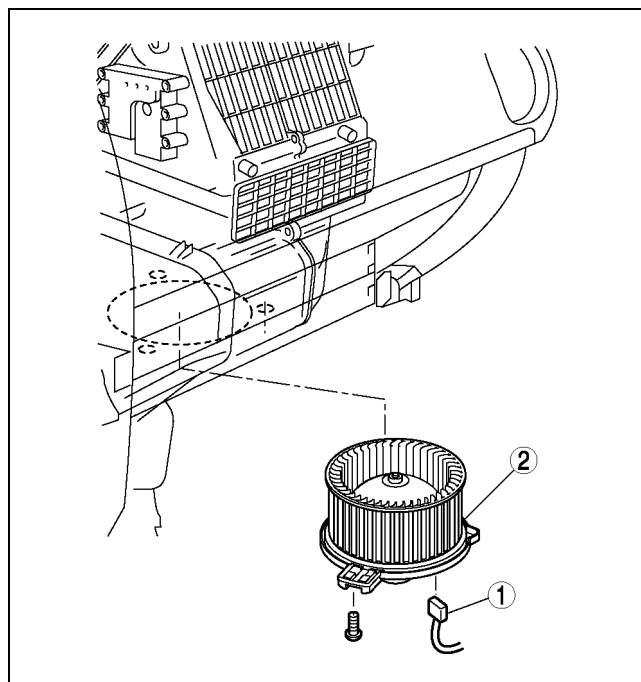
BLOWER MOTOR REMOVAL/INSTALLATION

A6E854061140W01

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Blower motor connector
2	Blower motor

3. Install in the reverse order of removal.

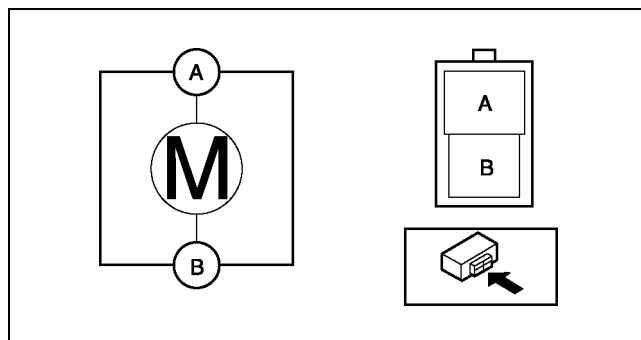


A6E8540W060

BLOWER MOTOR INSPECTION

A6E854061140W02

1. Connect battery positive voltage to terminal A and ground to terminal B of the blower motor and verify its operation.
 - If not as specified, replace the blower motor.



A6E8540W010

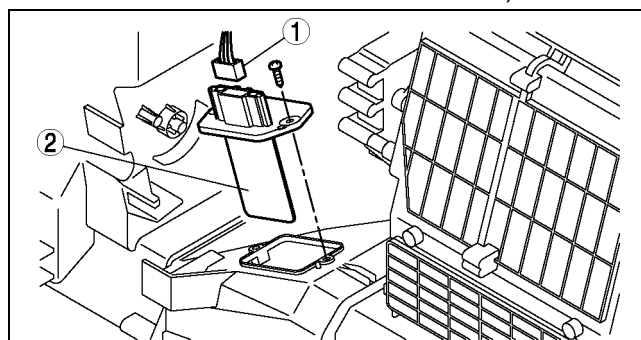
RESISTOR REMOVAL/INSTALLATION

A6E854061215W01

1. Disconnect the negative battery cable.
2. Remove the glove compartment.
3. Remove the car navigation unit. (See [T-98 CAR-NAVIGATION UNIT REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.

1	Resistor connector
2	Resistor

5. Install in the reverse order of removal.



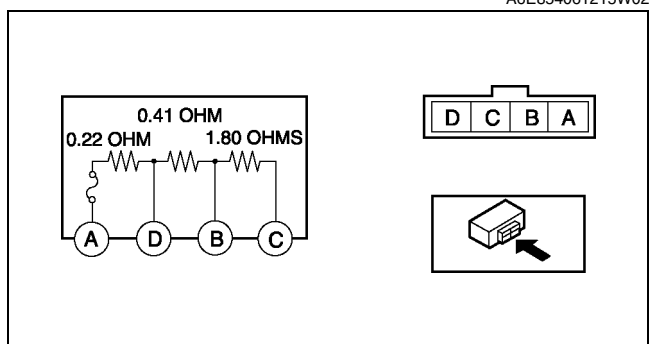
A6E8540W011

CONTROL SYSTEM

RESISTOR INSPECTION

- Verify that the resistance between the terminals of the resistor is as shown in the table.
 - If not as specified, replace the resistor.

Terminal	Resistance (ohm)
A—D	0.21—0.23
A—B	0.60—0.68
A—C	2.29—2.62



A6E8540W012

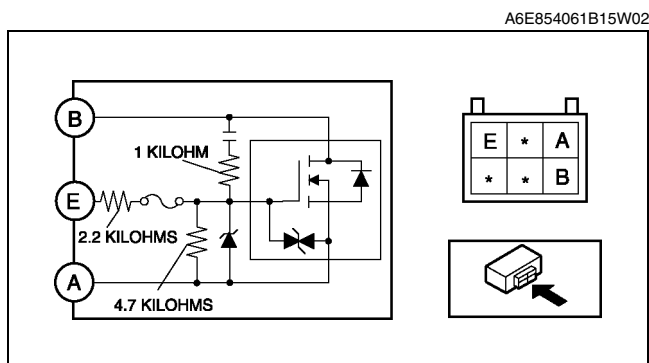
POWER MOS FET REMOVAL/INSTALLATION

(See [U-35 RESISTOR REMOVAL/INSTALLATION](#).)

POWER MOS FET INSPECTION

- Verify that the resistance between the terminals of the power MOS FET is as shown in the table.
 - If not as specified, replace the power MOS FET.

Ohmmeter lead		Resistance (kilohm)
+	-	
A	B	∞
A	E	6.9
B	A	Continuity
B	E	Continuity
E	A	6.9
E	B	∞



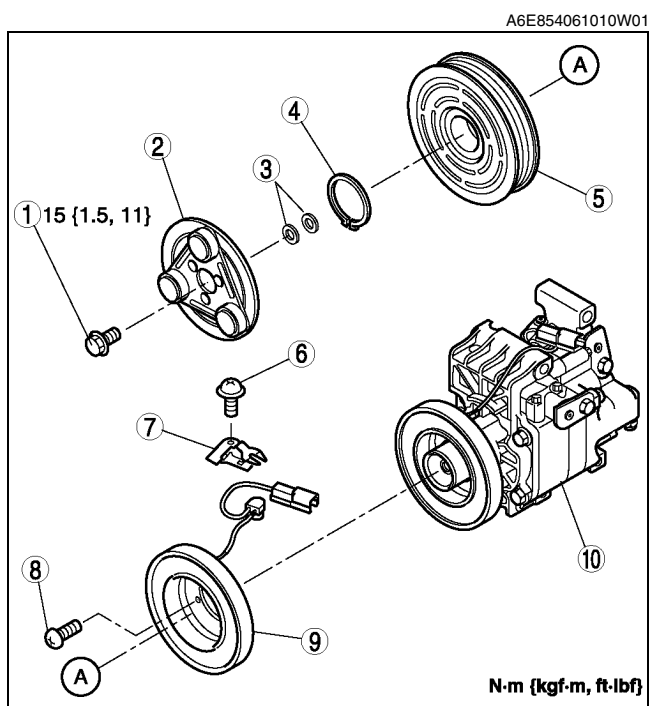
A6E8540W013

MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY

- Disassemble in the order indicated in the table.

1	Bolt (See U-37 Bolt Removal/Installation Note)
2	Pressure plate
3	Shim
4	Snap ring (See U-37 Snap Ring Installation Note)
5	A/C compressor pulley
6	Screw (See U-37 Screw Installation Note)
7	Clamp (See U-37 Clamp Installation Note)
8	Screw (See U-37 Screw Installation Note)
9	Stator and thermal protector (See U-37 Stator and Thermal Protector Removal Note) (See U-37 Stator and Thermal Protector Installation Note)
10	A/C compressor body

- Assemble in the reverse order of disassembly.
- Adjust the magnetic clutch clearance. (See [U-38 MAGNETIC CLUTCH ADJUSTMENT](#).)

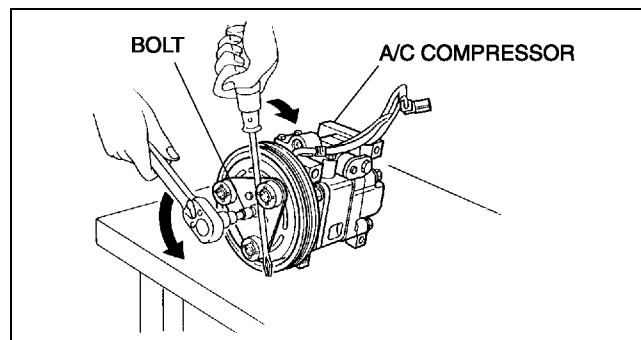


A6E8540W014

CONTROL SYSTEM

Bolt Removal/Installation Note

1. When removing or installing the bolt, hold the pressure plate in place as shown in the figure.
2. When installing a new A/C compressor body, replace the bolt.



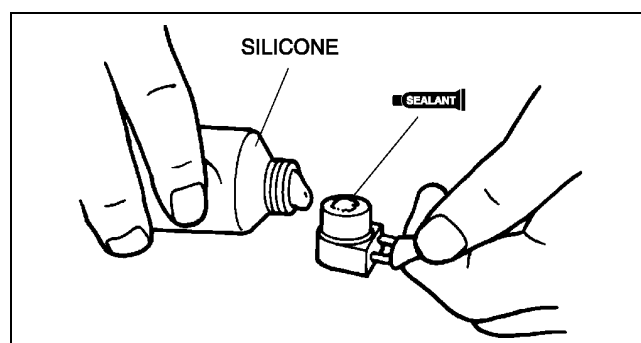
A6E8540W048

Stator and Thermal Protector Removal Note

1. After removing the stator and thermal protector, completely remove the silicone adhering to the A/C compressor side.

Stator and Thermal Protector Installation Note

1. Apply **approximately 1 g {0.04 oz}** of silicone (Shin-Etsu Silicone KE-347W or similar) to the contact surface of the thermal protector, then thoroughly install it onto the A/C compressor, leaving no gaps.



A6E8540W049

Screw Installation Note

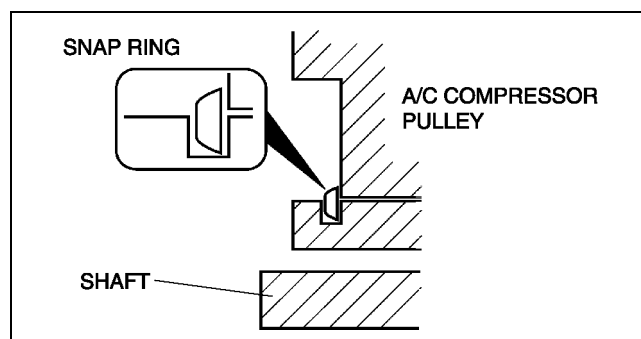
1. When installing a new stator and thermal protector, replace the screw.

Clamp Installation Note

1. When installing a new stator and thermal protector, replace the clamp.

Snap Ring Installation Note

1. When installing a new pressure plate, A/C compressor pulley, stator, or A/C compressor body, replace the snap ring.



A6E8540W050

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CONTROL SYSTEM

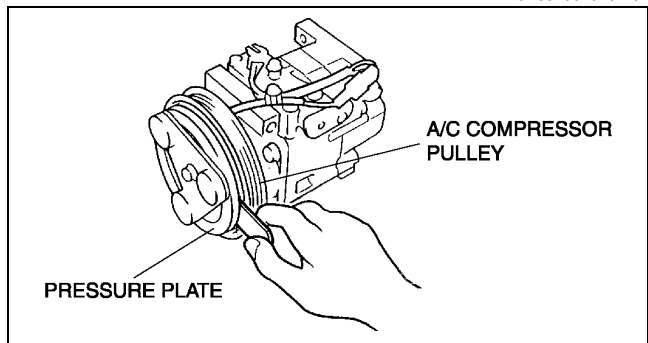
MAGNETIC CLUTCH ADJUSTMENT

1. Measure the clearance around the entire circumference between the pressure plate and A/C compressor pulley using a thickness gauge.
2. Verify that the clearance is within the specification.
 - If not within the specification, remove the pressure plate and adjust the clearance by changing the shim (**0.2 mm {0.008 in}**, **0.5 mm {0.02 in}**) or the number of shims.

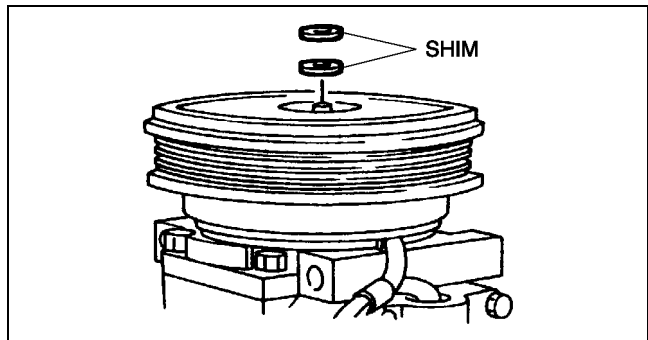
Clearance

0.3—0.5 mm {0.012—0.019 in}

A6E854061010W02



A6E8540W051

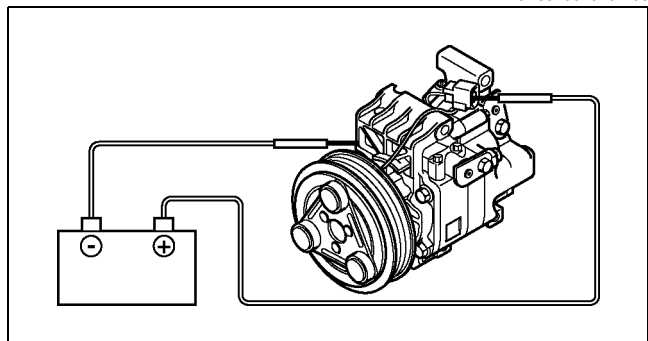


A6E8540W052

MAGNETIC CLUTCH INSPECTION

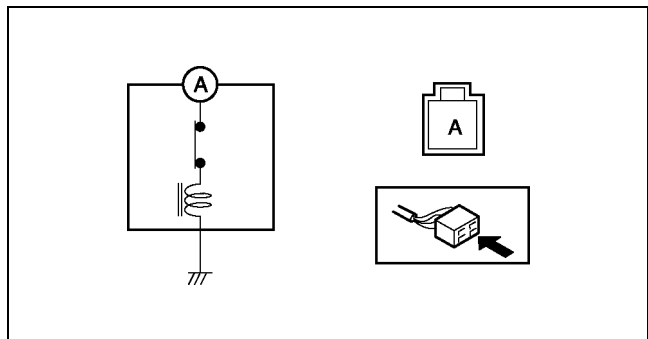
1. Connect battery positive voltage to terminal A of magnetic clutch and ground to A/C compressor body.

A6E854061010W03



A6E8540W015

2. Verify that the magnetic clutch operates.
 - If not as specified, replace the stator and thermal protector.



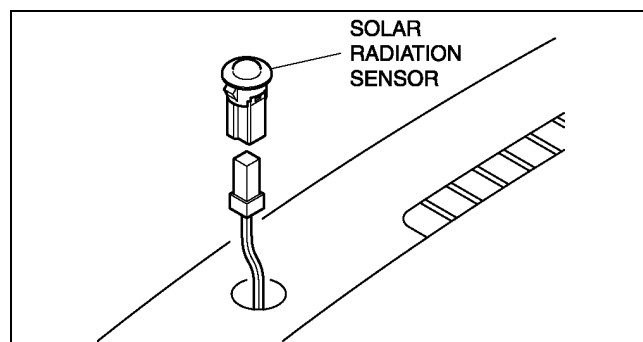
A6E8540W016

CONTROL SYSTEM

SOLAR RADIATION SENSOR REMOVAL/INSTALLATION

A6E854061751W01

1. Disconnect the negative battery cable.
2. Remove the solar radiation sensor from the dashboard using a tape-wrapped flathead screwdriver.
3. Install in the reverse order of removal.

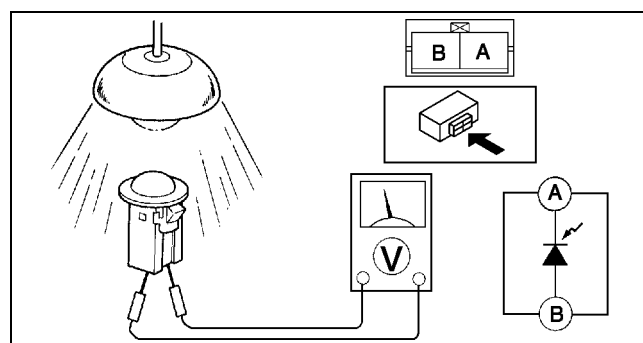


A6E8540W017

SOLAR RADIATION SENSOR INSPECTION

A6E854061751W02

1. Shine an incandescent light (**60 W**) on the solar radiation sensor from a distance of **approximately 100 mm {3.94 in}**.
2. Connect positive (+) lead to terminal A and negative (–) lead to terminal B of the solar radiation sensor.
 - If the output voltage is not **above 0.45 V**, replace the solar radiation sensor.



A6E8540W058

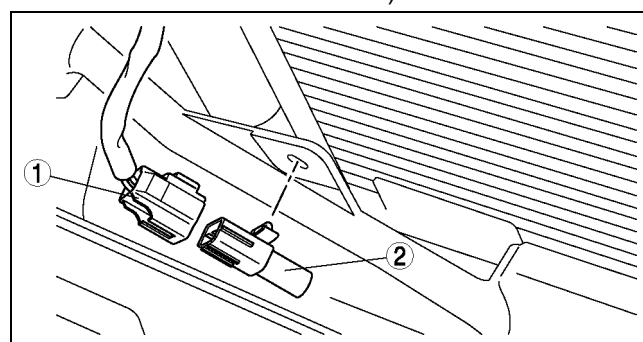
AMBIENT TEMPERATURE SENSOR REMOVAL/INSTALLATION

A6E854061764W01

1. Disconnect the negative battery cable.
2. Remove the radiator grille. (See [S-50 RADIATOR GRILLE REMOVAL/INSTALLATION](#).)
3. Remove in the order indicated in the table.

1	Ambient temperature sensor connector
2	Ambient temperature sensor

4. Install in the reverse order of removal.



A6E8540W018

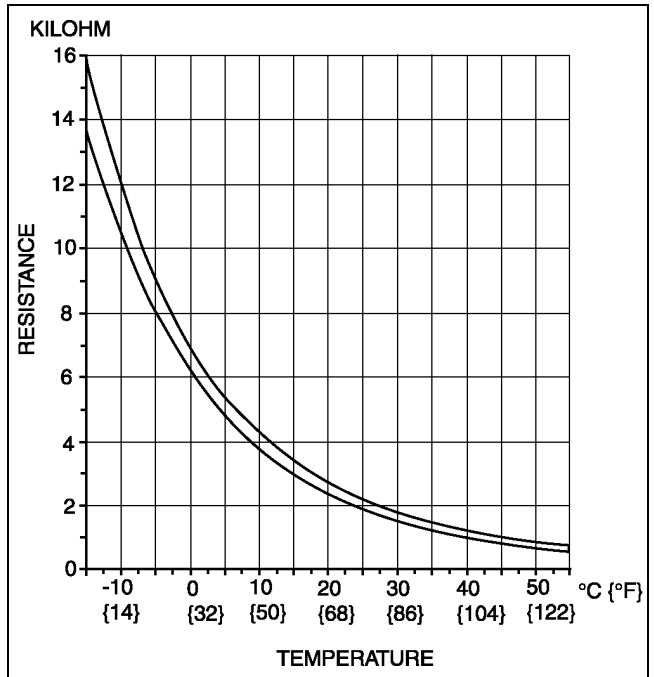
U

CONTROL SYSTEM

AMBIENT TEMPERATURE SENSOR INSPECTION

A6E854061764W02

1. Measure the temperature around the ambient temperature sensor.
2. Measure the resistance between terminals of the ambient temperature sensor.
 - If the resistance is not as shown in the graph, replace the ambient temperature sensor.



A6E8540W019

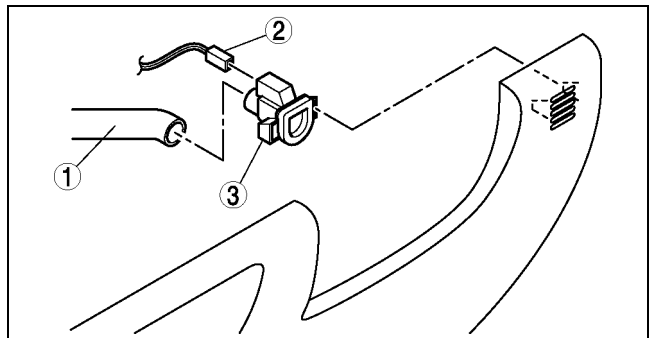
CABIN TEMPERATURE SENSOR REMOVAL/INSTALLATION

A6E854061757W01

1. Disconnect the negative battery cable.
2. Remove the lower panel. (See [S-84 LOWER PANEL REMOVAL/INSTALLATION.](#))
3. Remove in the order indicated in the table.

1	Air hose
2	Cabin temperature sensor connector
3	Cabin temperature sensor

4. Install in the reverse order of removal.



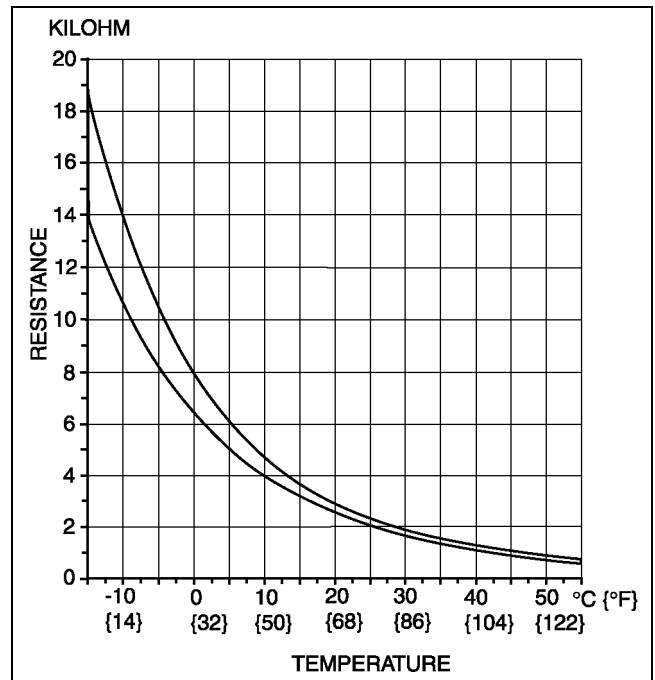
A6E8540W020

CONTROL SYSTEM

CABIN TEMPERATURE SENSOR INSPECTION

A6E854061757W02

1. Measure the temperature around the cabin temperature sensor.
2. Measure the resistance between terminals of the cabin temperature sensor.
 - If the resistance is not as shown in the graph, replace the cabin temperature sensor.



A6E8540W021

EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION

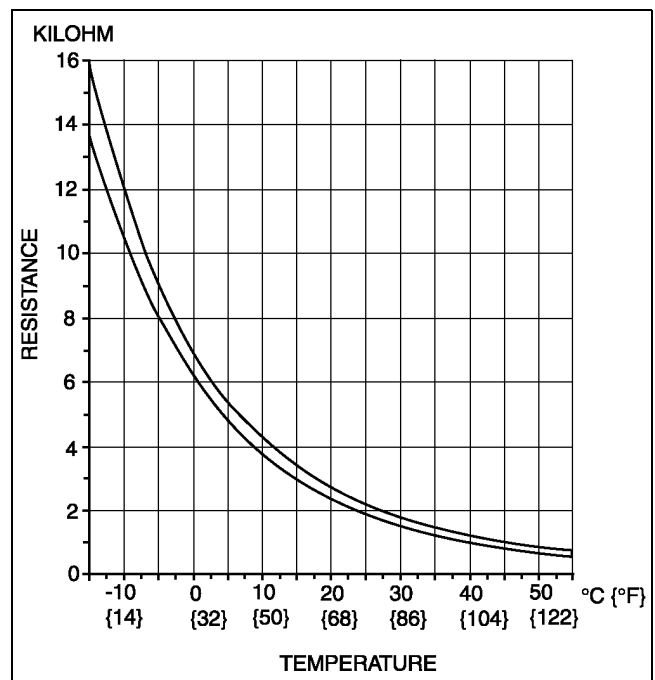
A6E854061022W01

1. Remove the evaporator temperature sensor from the A/C unit. (See [U-18 A/C UNIT DISASSEMBLY/ASSEMBLY](#).)

EVAPORATOR TEMPERATURE SENSOR INSPECTION

A6E854061022W02

1. Turn the AUTO switch on.
2. Set the temperature control at MAX COLD (Turn the left).
3. Turn the A/C switch.
4. Set the RECIRCULATE mode.
5. Close all doors and windows.
6. Wait for **5 minutes**.
7. Remove the glove compartment.
8. Disconnect the evaporator temperature sensor.
9. Measure the temperature at the blower inlet.
10. Measure the resistance between terminals of the evaporator temperature sensor.
 - If the resistance is not as shown in the graph, replace the evaporator temperature sensor.



A6E8540W019

CONTROL SYSTEM

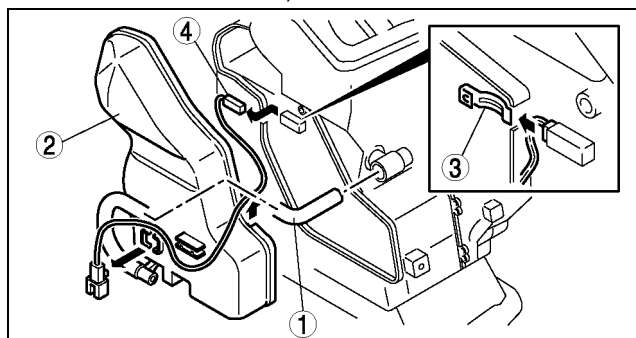
WATER TEMPERATURE SENSOR REMOVAL/INSTALLATION

A6E854061752W01

1. Disconnect the negative battery cable.
2. Remove the dashboard. (See [S-82 DASHBOARD REMOVAL/INSTALLATION.](#))
3. Remove in the order indicated in the table.

1	Air hose
2	Duct (3)
3	Plate spring
4	Water temperature sensor

4. Install in the reverse order of removal.

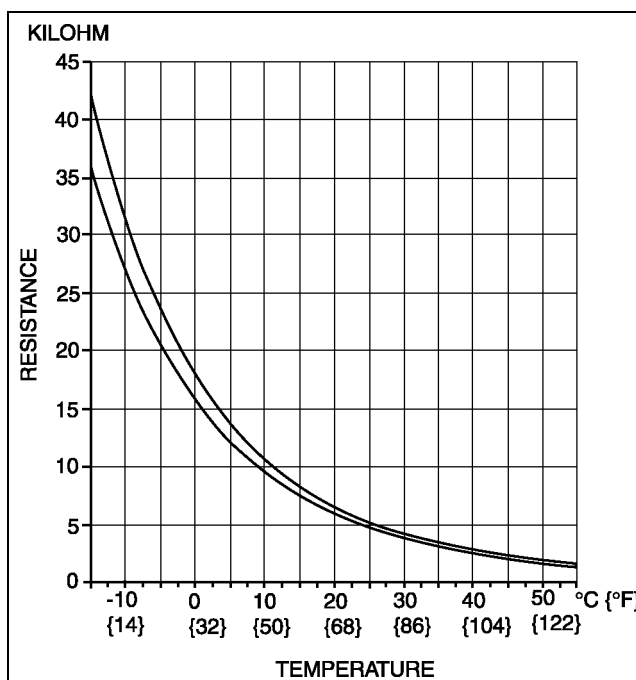


A6E8540W023

WATER TEMPERATURE SENSOR INSPECTION

A6E854061752W02

1. Measure the temperature around the water temperature sensor.
2. Measure the resistance between terminals of the water temperature sensor.
 - If the resistance is not as shown in the graph, replace the water temperature sensor.



A6E8540W024

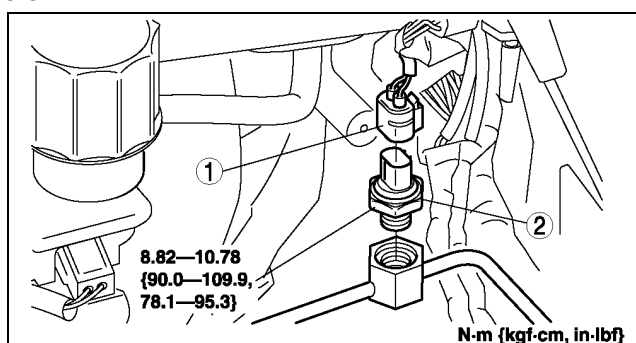
REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION

A6E854061503W01

1. Remove the battery.
2. Discharge the refrigerant from the system. (See [U-9 RECOVERY.](#)) (See [U-9 CHARGING.](#))
3. Loosen the refrigerant pressure switch using two spanners.
4. Remove in the order indicated in the table.

1	Refrigerant pressure switch connector
2	Refrigerant pressure switch (See U-42 Refrigerant Pressure Switch Installation Note)

5. Install in the reverse order of removal.



A6E8540W025

Refrigerant Pressure Switch Installation Note

1. Apply compressor oil to O-ring and connect the joint.

U-42

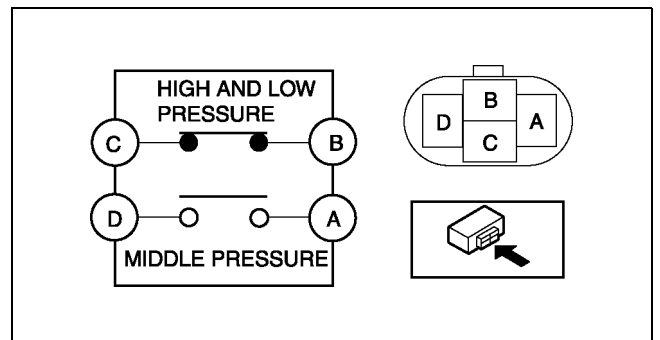
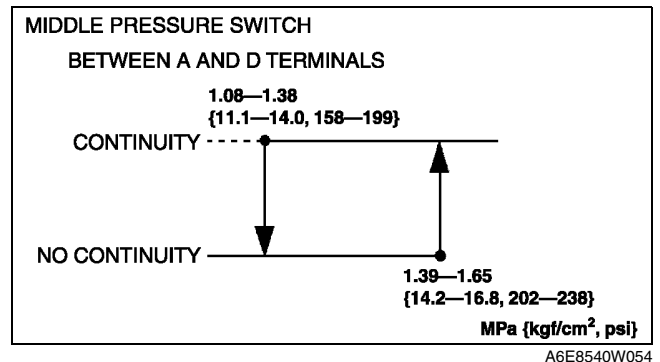
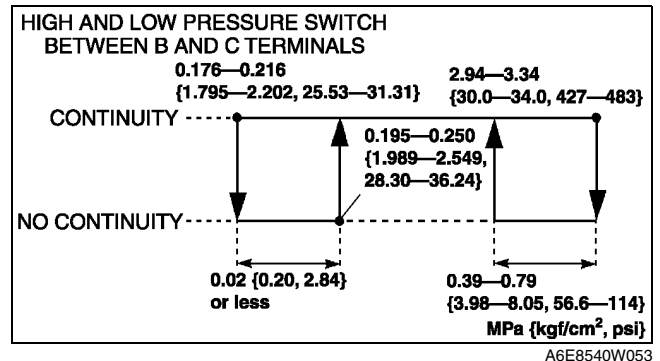
CONTROL SYSTEM

REFRIGERANT PRESSURE SWITCH INSPECTION

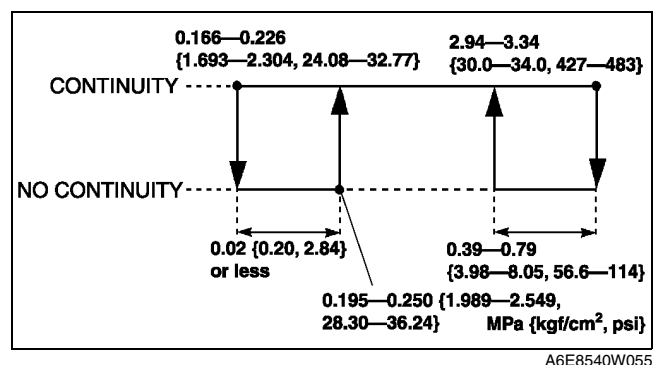
A6E854061503W02

1. Install the **SST** (gas charging set).
2. Disconnect the refrigerant pressure switch connector.
3. Verify the high-pressure side reading of the **SST** (manifold gauge) and continuity between the terminals of the refrigerant pressure switch.
 - If not as specified, replace the refrigerant pressure switch.

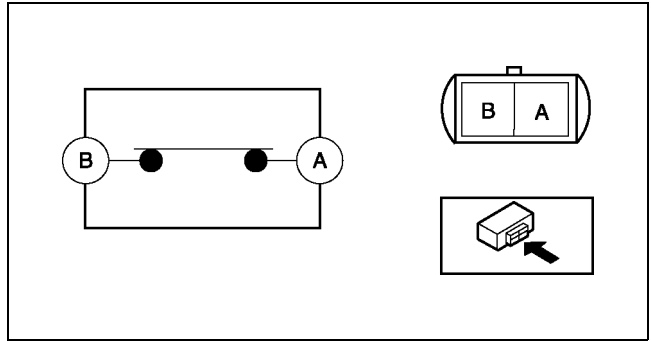
Triple-pressure Type



Dual-pressure Type



CONTROL SYSTEM

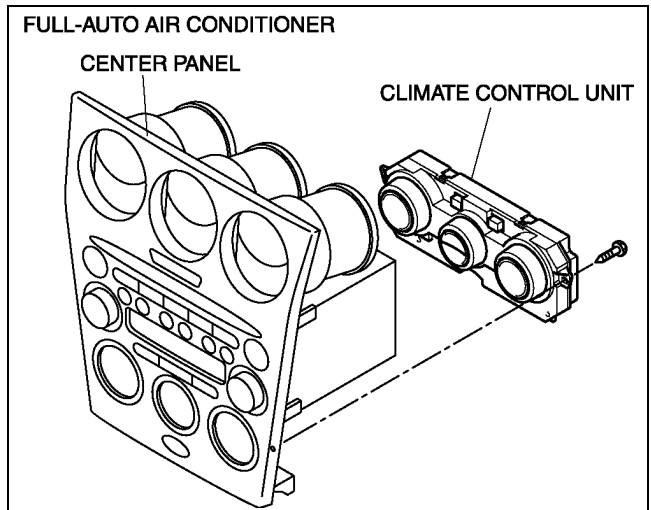


A6E8540W027

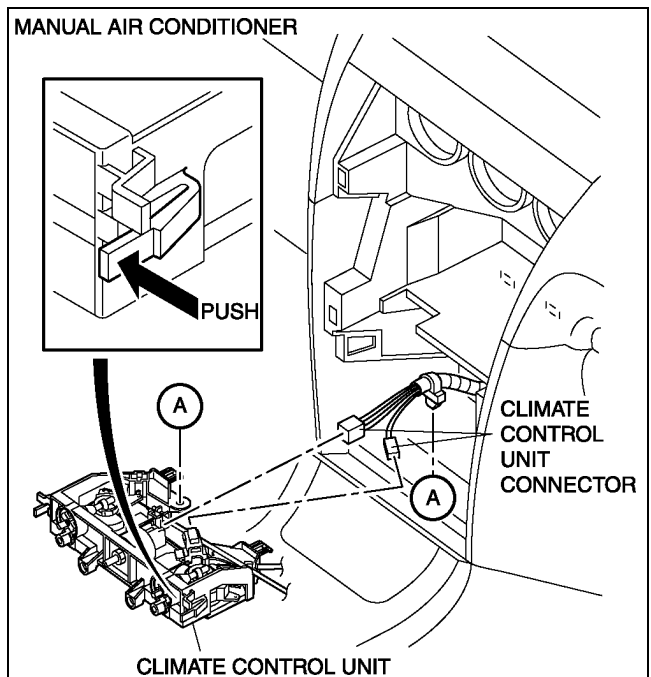
CLIMATE CONTROL UNIT REMOVAL

A6E854061190W03

1. Disconnect the negative battery cable.
2. Disconnect the air mix and airflow mode wires from each wire clamp and link. (Manual air conditioner)
3. Remove the center panel. (See [T-96 CENTER PANEL MODULE REMOVAL/INSTALLATION.](#))
4. Remove the screws and climate control unit. (Full-auto air conditioner)
5. Release the hook and pull the climate control unit toward you. (Manual air conditioner)
6. Disconnect the climate control unit connectors and remove the climate control unit. (Manual air conditioner)



A6E8540W028

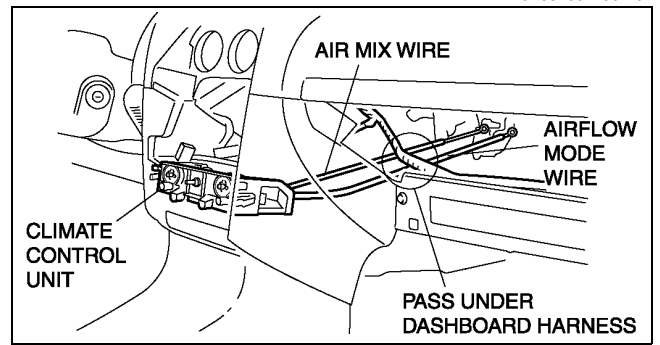


A6E8540W059

CONTROL SYSTEM

CLIMATE CONTROL UNIT INSTALLATION

1. Pass each wire through the following routes then connect to A/C unit. (Manual air conditioner)
2. Connect the climate control unit connectors. (Manual air conditioner)
3. Install the climate control unit to the center panel. (Full-auto air conditioner)
4. Install the center panel.
5. Adjust the climate control unit wires. (Manual air conditioner) (See [U-46 CLIMATE CONTROL UNIT WIRE ADJUSTMENT.](#))
6. Connect the negative battery cable.



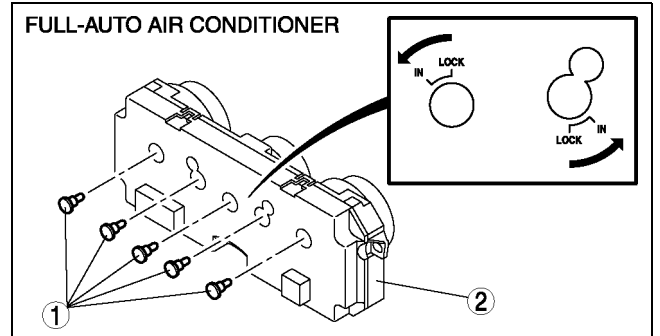
A6E8540W029

CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

1	Illumination bulb
2	Body

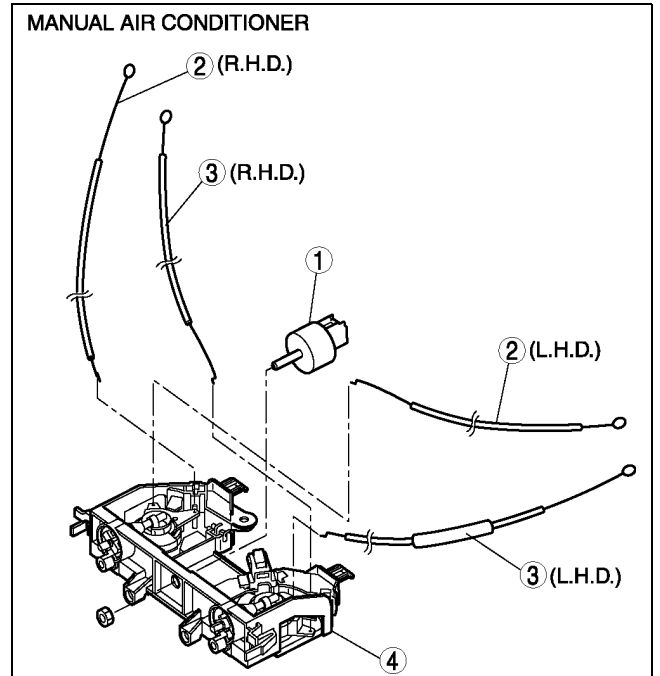
A6E854061190W01



A6E8540W061

1	Fan switch
2	Air mix wire (See U-46 Wire Disassembly Note) (See U-46 Wire Assembly Note)
3	Airflow mode wire (See U-46 Wire Disassembly Note) (See U-46 Wire Assembly Note)
4	Body

2. Assemble in the reverse order of disassembly.

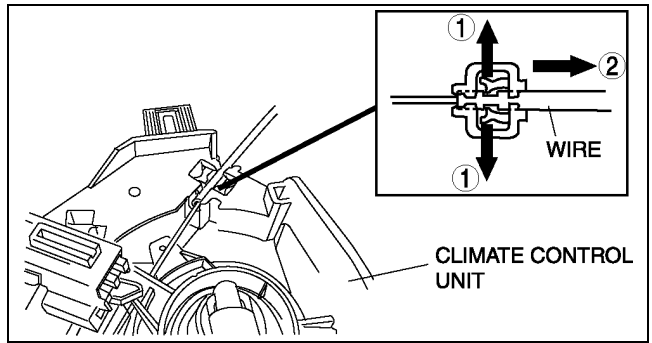


A6E8540W030

CONTROL SYSTEM

Wire Disassembly Note

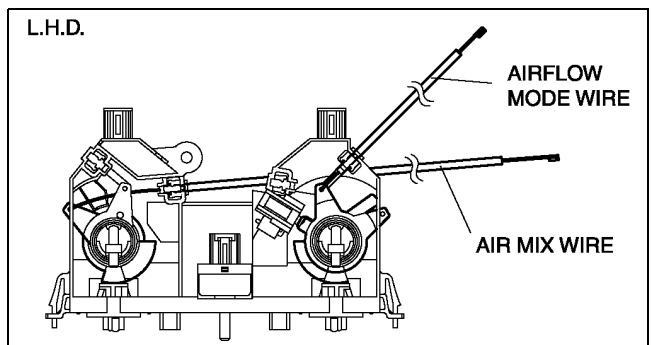
1. Disassemble the wires in the shown in the figure.



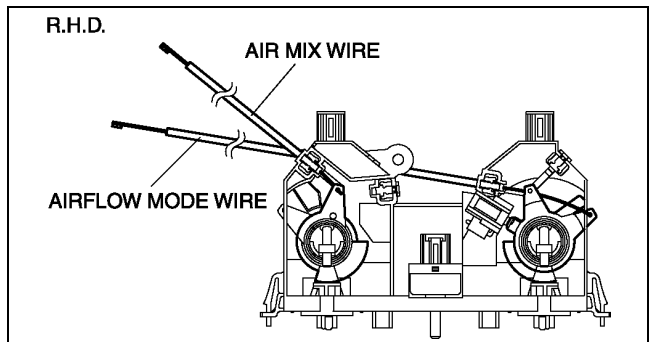
A6E8540W031

Wire Assembly Note

1. Assemble the wires to the position as shown in the figure.



A6E8540W032



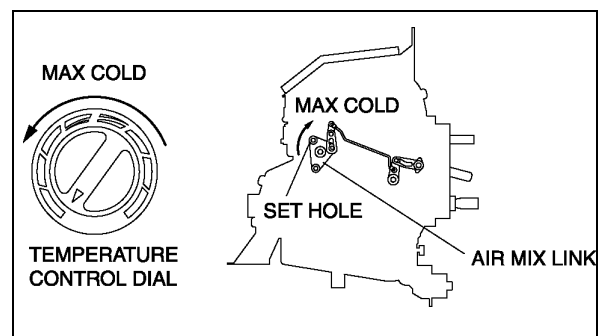
A6E8540W033

CLIMATE CONTROL UNIT WIRE ADJUSTMENT

Air Mix Wire

1. Set the temperature control dial at max cold.
2. Set the air mix link to max cold in the direction shown by the arrow and insert a screwdriver at the set hole.
3. Connect the air mix wire to air mix link.
4. Clamp the air mix wire to wire clamp.
5. Verify that the temperature control dial moves its full stroke.

A6E854061190W05



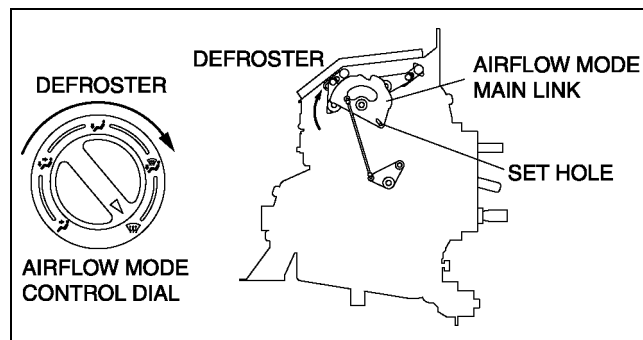
A6E8540W034

Airflow Mode Wire

1. Set the airflow mode control dial at defroster.

CONTROL SYSTEM

- Set the airflow mode main link to defroster in the direction shown by the arrow and insert a screwdriver at the set hole.
- Connect the airflow mode wire to airflow mode main link.
- Clamp the airflow mode wire to wire clamp.
- Verify that the airflow mode control dial moves its full stroke.



A6E8540W035

CLIMATE CONTROL UNIT INSPECTION

A6E854061190W02

Full-auto Air Conditioner

- Connect the all center panel connectors.
- Turn the ignition switch to ON position.
- Measure the voltage at each climate control unit terminal and refer to the terminal voltage list.
 - If not as specified, inspect the parts listed under "Action" and the related wiring harness.
 - If there is any malfunction, replace the climate control unit.

Terminal Voltage List (Reference)

1W	1U	1S	1Q	1O	1M	1K	1I	*	1E	1C	1A	2K	2I	2G	2E	2C	2A
1X	*	1T	*	1P	*	*	*	*	1F	*	1B	2L	*	2H	2F	2D	2B

A6E8540W038

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1A	Blower motor feedback signal	- Blower motor - Power MOS FET	Fan switch is OFF	12	- Inspect for continuity or short circuit (Climate control unit—blower motor: 1A—B) (Climate control unit—power MOS FET: 1A—B, 1C—E) (Blower motor—blower relay: A—C) (Blower relay—fuse: D—BLOWER 40 A fuse) - Inspect for continuity (Power MOS FET—ground: A—GND) (Blower relay—ground: A—GND) - Inspect power MOS FET - Inspect blower motor - Inspect blower relay - Inspect BLOWER 40 A fuse - Replace power MOS FET
			Fan switch is at manual LO	7.8	
			Fan switch is at manual HI	0.2	
1B	+5 V	- Air mix actuator - Airflow mode actuator - Solar radiation sensor	Ignition switch at ON position	5.0	- Inspect for short circuit (Climate control unit— air mix actuator, airflow mode actuator, solar radiation sensor: 1B—B, B, A) - Inspect air mix actuator - Inspect airflow mode actuator - Inspect solar radiation sensor - Inspect terminal voltage of climate control unit connector (2H, 2L)
			Ignition switch at LOCK position	Below 1.0	Replace climate control unit

U

CONTROL SYSTEM

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1C	Blower motor control signal	Power MOS FET	Fan switch is OFF	Below 1.0	Inspect terminal voltage of climate control unit (1A)
			Fan switch is at manual LO	4.1	
			Fan switch is at manual HI	7.9	
1D	—	—	—	—	—
1E	Rear window defroster SW signal	Rear window defroster relay	Rear window defroster switch is off	12	- Inspect for continuity or short circuit (Climate control unit—rear window defroster relay: 1E—E) - Inspect rear window defroster relay
			Rear window defroster switch is on	Below 1.0	- Inspect terminal voltage of climate control unit (1H, 1L) - Inspect audio switch panel
1F	On-board diagnostic signal	A/C check connector	Terminal A of A/C check connector is shorted.	Below 1.0	Inspect for continuity (Climate control unit—A/C check connector: 1F—A)
			Other	5.4	- Inspect short circuit (Climate control unit—A/C check connector: 1F—A) - Inspect terminal voltage of climate control unit (2H, 2L)
1G	—	—	—	—	—
1H	—	—	—	—	—
1I	GND	- Cabin temperature sensor - Evaporator temperature sensor - Ambient temperature sensor - Water temperature sensor - Air mix actuator - Airflow mode actuator	Under any condition	Below 1.0	Inspect terminal voltage of climate control unit (2L)
1J	—	—	—	—	—
1K	Ambient temperature sensor input	Ambient temperature sensor	Depends on temperature surrounding sensor	See Figure 2	- Inspect for continuity (Climate control unit—ambient temperature sensor: 1K—B, 1I—A) - Inspect for short circuit (Climate control unit—ambient temperature sensor: 1K—B) - Inspect ambient temperature sensor - Inspect terminal voltage of climate control unit (2H, 2L)
1L	—	—	—	—	—
1M	Cabin temperature sensor input	Cabin temperature sensor	Depends on temperature surrounding sensor	See Figure 3	- Inspect for continuity (Climate control unit—cabin temperature sensor: 1M—B, 1I—A) - Inspect for short circuit (Climate control unit—cabin temperature sensor: 1M—B) - Inspect cabin temperature sensor - Inspect terminal voltage of climate control unit (2H, 2L)
1N	—	—	—	—	—

CONTROL SYSTEM

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1O	Water temperature sensor input	Water temperature sensor	Depends on temperature surrounding sensor	See Figure 4	- Inspect for continuity (Climate control unit—water temperature sensor: 1O—A, 1I—B) - Inspect for short circuit (Climate control unit—water temperature sensor: 1O—A) - Inspect water temperature sensor - Inspect terminal voltage of climate control unit (2H, 2L)
1P	A/C	Refrigerant pressure switch	Fan switch at OFF	12	- Inspect for continuity or short circuit (Climate control unit—refrigerant pressure switch: 1P—A (Dual-pressure type), 1P—C (Triple-pressure type)) (Refrigerant pressure switch—PCM: B—1AC) - Inspect refrigerant pressure switch - Inspect PCM terminal voltage (1AC) (See F-45 PCM INSPECTION)
			Fan switch at 1st position, A/C switch ON	Below 1.0	Inspect terminal voltage of climate control unit (2H, 2L)
1Q	Evaporator temperature sensor input signal	Evaporator temperature sensor	Depends on temperature surrounding sensor	See Figure 1	- Inspect for continuity (Climate control unit—evaporator temperature sensor: 1Q—A, 1I—B) - Inspect for short circuit (Climate control unit—evaporator temperature sensor: 1Q—A) - Inspect evaporator temperature sensor - Inspect terminal voltage of climate control unit (2H, 2L)
1R	—	—	—	—	—
1S	Solar radiation sensor input	Solar radiation sensor	Incandescent light (60W) shining on solar radiation sensor from distance of approx. 100mm {3.9 in}	4.0	- Inspect for continuity or short circuit (Climate control unit—solar radiation sensor: 1S—B, 1B—A) - Inspect terminal voltage of climate control unit (1B) - Inspect solar radiation sensor
			Light to solar radiation sensor block	Below 1.0	
1T	GND	Ground	Under any condition	Below 1.0	- Inspect for continuity (Climate control unit—ground: 1T—GND) - Inspect center panel
1U	Potentiometer signal	Air mix actuator	Set temperature at MAX COLD	0.6	- Inspect for continuity or short circuit (Climate control unit—air mix actuator: 1U—C) - Inspect air mix actuator - Inspect terminal voltage of climate control unit (1B)
			Set temperature at MAX HOT	4.3	
1V	—	—	—	—	—

CONTROL SYSTEM

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1W	Potentiometer signal	Airflow mode actuator	VENT mode	4.3	- Inspect for continuity or short circuit (Climate control unit—airflow mode actuator: 1W—C) - Inspect airflow mode actuator - Inspect terminal voltage of climate control unit (1B)
			BI-LEVEL mode	3.3	
			HEAT mode	2.3	
			HEAT/DEF mode	1.5	
			DEFROSTER mode	0.6	
1X	Hazard warning SW signal	Hazard warning switch	Hazard warning switch is off	12	- Inspect for continuity or short circuit (Climate control unit—flasher unit: 1X—H) - Inspect flasher unit
			Hazard warning switch is on	Below 1.0	- Inspect terminal voltage of climate control unit (1T) - Inspect center panel
2A	Panel light control signal	Panel light control switch	Headlight switch ON and panel light control switch at max. illumination	0.2	- Inspect for continuity (Climate control unit—panel light control switch: 2A—C) (Panel light control switch—ground: C—GND) - Inspect panel light control switch
			Headlight switch ON and panel light control switch at min. illumination	10.2	Inspect for short circuit (Climate control unit—panel light control switch: 2A—C)
2B	TNS signal	TNS relay	Headlight switch OFF	Below 1.0	- Inspect for short circuit (Climate control unit—TNS relay: 2B—D) - Inspect TNS relay - Inspect headlight switch
			Headlight switch ON	12	- Inspect for continuity or short circuit (Climate control unit—TNS relay: 2B—D) - Inspect TNS relay - Inspect headlight switch
2C	Motor drive signal	Air mix actuator	Moving to COLD	12	- Inspect for continuity or short circuit (Climate control unit—air mix actuator: 2D—D, 2C—F) - Inspect air mix actuator
			Moving to HOT	Below 1.0	
2D	Motor drive signal	Air mix actuator	Moving to HOT	12	- Inspect for continuity or short circuit (Climate control unit—air mix actuator: 2C—F, 2D—D) - Inspect air mix actuator
			Moving to COLD	Below 1.0	
2E	Motor drive signal	Airflow mode actuator	Moving to DEFROSTER	12	- Inspect for continuity or short circuit (Climate control unit—airflow mode actuator: 2E—F, 2G—D) - Inspect airflow mode actuator
			Moving to VENT	Below 1.0	
2F	Backup power supply	ROOM 15 A fuse	Under any condition	B+	- Inspect for continuity or short circuit (Climate control unit—fuse: 2F—ROOM 15 A fuse) - Inspect ROOM 15 A fuse
2G	Motor drive signal	Airflow mode actuator	Moving to VENT	12	- Inspect for continuity or short circuit (Climate control unit—airflow mode actuator: 2G—D, 2E—F) - Inspect airflow mode actuator
			Moving to DEFROSTER	Below 1.0	

CONTROL SYSTEM

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
2H	IG2	A/C 15 A fuse	Ignition switch at ON position	B+	- Inspect for continuity or short circuit (Climate control unit—fuse: 2H—A/C 15 A fuse) - Inspect A/C 15 A fuse
			Ignition switch at LOCK position	Below 1.0	Inspect for short circuit (Climate control unit—fuse: 2H—A/C 15 A fuse)
2I	Motor drive signal	Air intake actuator	Moving to RECIRCULATE	12	- Inspect for continuity or short circuit (Climate control unit—air intake actuator: 2I—F, 2K—D) - Inspect air intake actuator
			Moving to FRESH	Below 1.0	
2J	—	—	—	—	—
2K	Motor drive signal	Air intake actuator	Moving to FRESH	12	- Inspect for continuity or short circuit (Climate control unit—air intake actuator: 2K—D, 2I—F) - Inspect air intake actuator
			Moving to RECIRCULATE	Below 1.0	
2L	GND	Ground	Under any condition	Below 1.0	Inspect for continuity (Climate control unit—ground: 2L—GND)

Figure 1 (Evaporator temperature sensor)

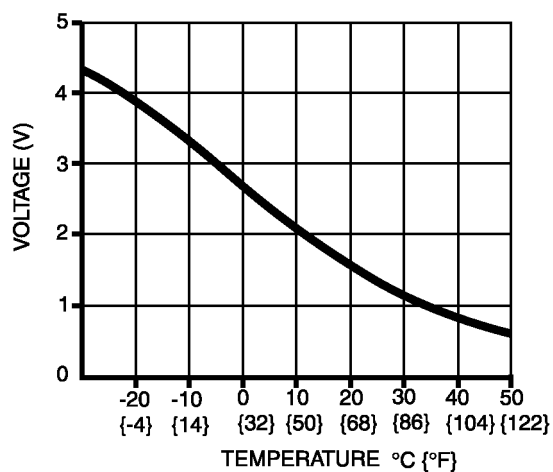


Figure 2 (Ambient temperature sensor)

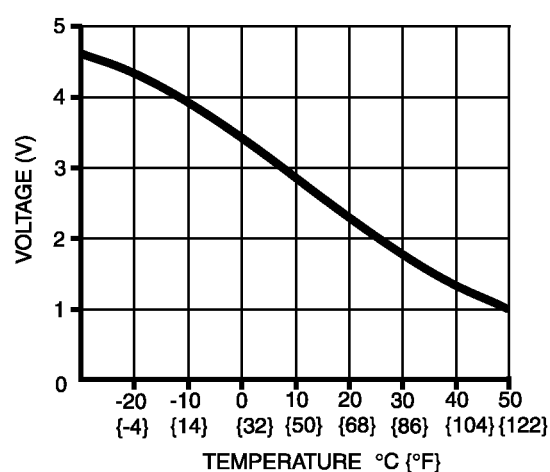


Figure 3 (Cabin temperature sensor)

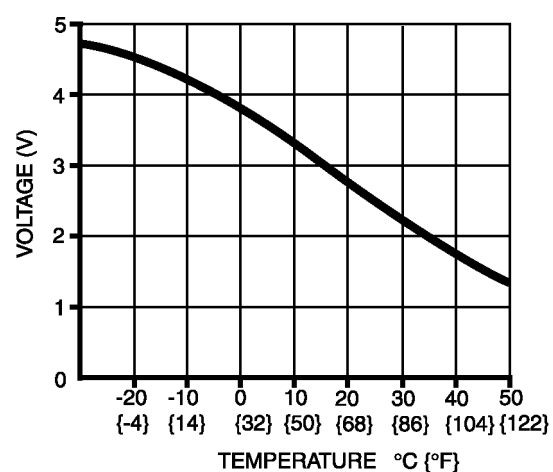
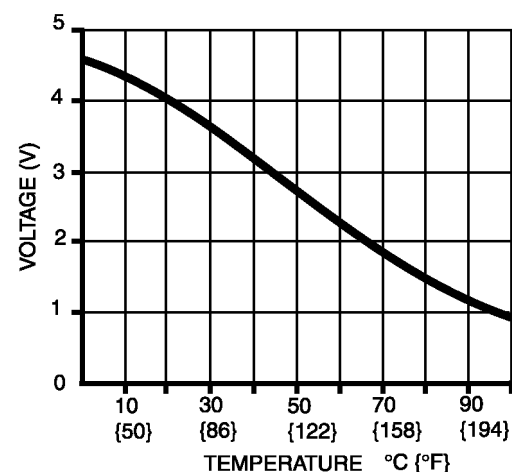


Figure 4 (Water temperature sensor)



CONTROL SYSTEM

FAN SWITCH INSPECTION

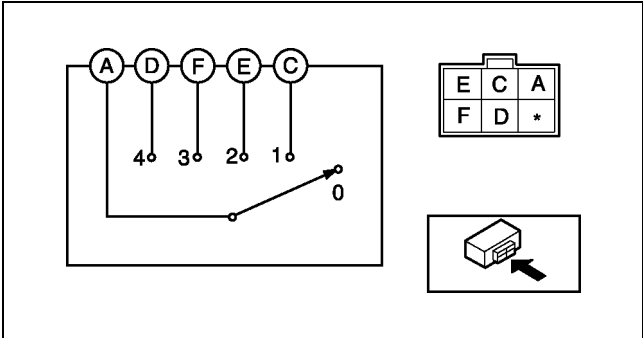
A6E854061050W01

1. Remove the climate control unit.
2. Inspect for continuity between the fan switch terminals using an ohmmeter.
 - If not as specified, replace the fan switch.

○—○ : Continuity

Switch position	Terminal				
	A	C	D	E	F
0					
1	○—○				
2	○—○			○—○	
3	○—○				○—○
4	○—○		○—○		

A6E8540W056



A6E8540W036

DEFROSTER SWITCH INSPECTION

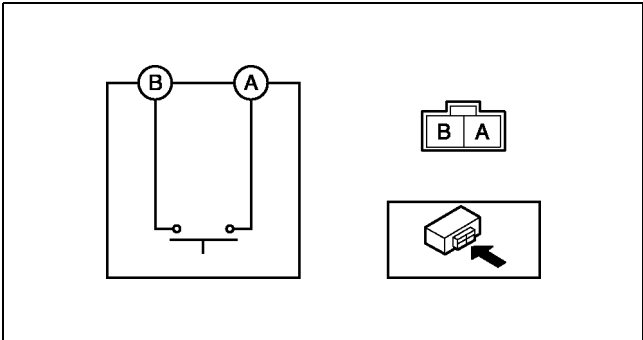
A6E854061050W02

1. Remove the climate control unit.
2. Inspect for continuity between the defroster switch terminals using an ohmmeter.
 - If not as specified, replace the climate control unit.

○—○ : Continuity

Switch position	Terminal	
	A	B
OFF		
ON	○—○	○—○

A6E8540W057



A6E8540W037

ON-BOARD DIAGNOSTIC

ON-BOARD DIAGNOSTIC

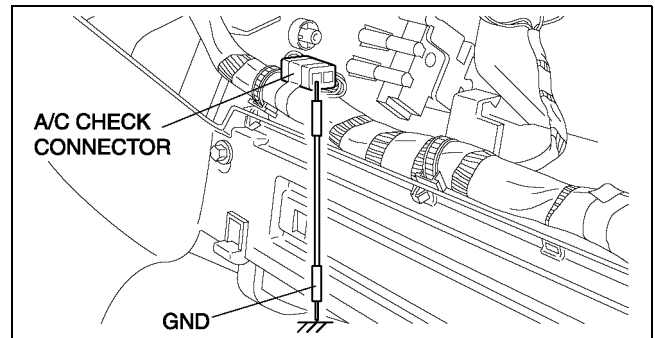
DIAGNOSTIC TROUBLE CODE NUMBER INSPECTION

A6E857001038W01

1. Remove the glove compartment.
2. Short the A/C check connector to the GND terminal using a jumper wire.
3. Shine a **60 W** incandescent light from a height of **approximately 100 mm {3.9 in}** onto the solar radiation sensor.

Note

- When incandescent light does not shine on the solar radiation sensor, the climate control unit determines a malfunction and indicates a diagnostic trouble code "02".



A6E8570W004

4. Turn the ignition switch to ON position.
5. Read DTCs from the flashing of the rear defroster indicator light on the climate control unit. Carry out DTC inspection. (present and past failure indication modes)
 - When the system is normal, the rear defroster indicator light does not flash.
 - If any of the diagnostic trouble codes are indicated, carry out troubleshooting according to the code.
6. After completion of repairs, erase all diagnostic trouble code(s) from memory. (See [U-53 Erasing Past Failure Memory](#).)
7. Remove the jumper wire.

Present Failure Indication Mode

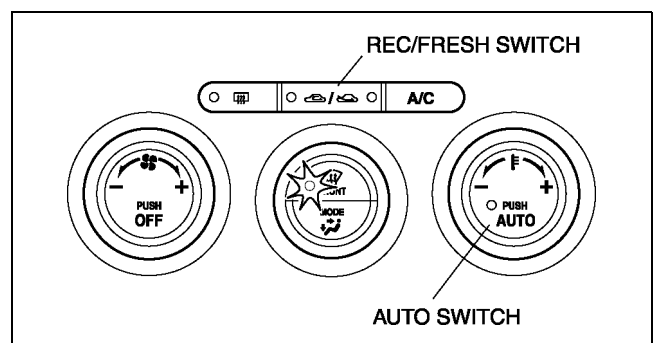
- The on-board diagnostic function display the present failure indication mode directly after start up. In present failure indication mode, present failures in the control system circuits (open, short circuits) are detected, and the flashing of the rear defroster indicator light on the climate control unit indicates the DTCs.
 - If a diagnostic trouble code is indicated, refer to the following diagnostic trouble code table and inspect the appropriate system.

Past Failure Indication Mode

- While in present failure indication mode, press the A/C switch to change to the past failure indication mode. In past failure indication mode, past failures (intermittent problems) in the input sensor circuits (open, short circuits) are detected, and the flashing of the rear defroster indicator light on the climate control unit indicates the DTCs.
 - If a diagnostic trouble code is indicated, refer to the following diagnostic trouble code table and inspect the appropriate system. (Disconnections and short circuits are memorized in the same system even if either occurs only once.)
 - If the A/C switch is pressed again while in past failure indication mode, the on-board diagnostic function will return to present failure indication mode.

Erasing Past Failure Memory

- When DTCs are displayed in the past failure indication mode, they remain in the memory after the failed systems are corrected. Consequently, the next time the past failure indication mode is used, the same past failure DTCs will be indicated by the flashing of the rear defroster indicator light on the climate control unit. Therefore, erase the past failure memory after correcting all failed systems. To erase the past failure memory, press the AUTO switch and REC/FRESH switch on the climate control unit at the same time while in past failure indication mode. If erased, the rear defroster indicator light flashes once.



A6E8570W001

ON-BOARD DIAGNOSTIC

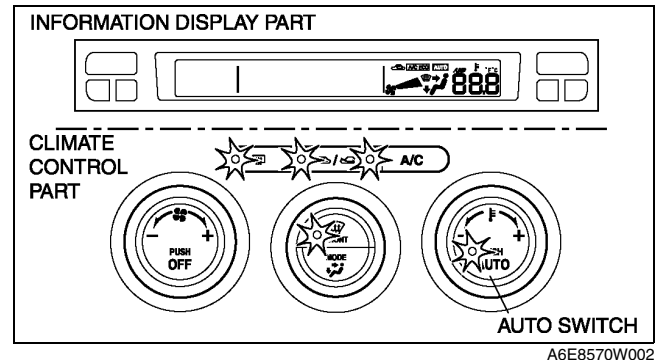
DTC Table

No.	Indicator pattern	Diagnosed circuit
02	ON OFF	Solar radiation sensor (present)
06	ON OFF	Cabin temperature sensor (present)
07	ON OFF	Cabin temperature sensor (past)
10	ON OFF	Evaporator temperature sensor (present)
11	ON OFF	Evaporator temperature sensor (past)
12	ON OFF	Ambient temperature sensor (present)
13	ON OFF	Ambient temperature sensor (past)
14	ON OFF	Water temperature sensor (present)
15	ON OFF	Water temperature sensor (past)
18	ON OFF	Air mix actuator [potentiometer] (present)
19	ON OFF	Air mix actuator [potentiometer] (past)
21	ON OFF	Airflow mode actuator [potentiometer] (present)
22	ON OFF	Airflow mode actuator [potentiometer] (past)
58	ON OFF	Air mix actuator [motor lock] (past)
59	ON OFF	Airflow mode actuator [motor lock] (past)

ON-BOARD DIAGNOSTIC

Output Device Operation Check Mode Inspection

1. Warm up the engine.
2. Turn the ignition switch to LOCK position.
3. Start up the on-board diagnostic function (present failure indication mode).
4. Press the AUTO switch.
5. Verify that all the indicator lights of the climate control unit and center panel (climate control part) illuminate for **4 seconds**.
6. Verify the operation of the each output device when changing steps by pressing the REC/FRESH switch, and referring to the output device operation check chart.
 - If not as specified, inspect the malfunctioning system.

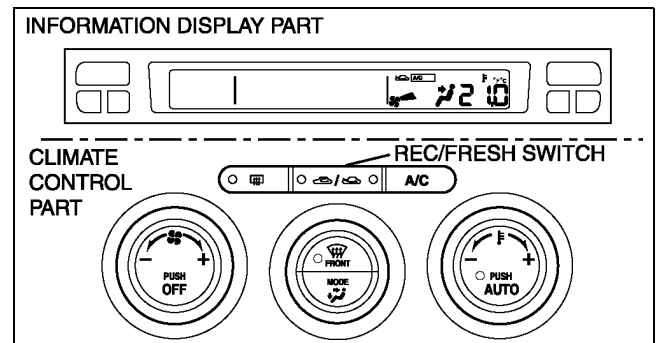


A6E8570W002

Note

- If the AUTO switch is pressed again, the on-board diagnostic function will return to present failure indication mode.

7. Turn the ignition switch to LOCK position to end the on-board diagnostic function.



A6E8570W003

Output device operation check table

Step	Operating device	Operating conditions	Monitor*	Other device conditions
1	Blower motor speed		1	• Air mix actuator operation — 50% • Airflow mode actuator operation — VENT • Air intake actuator operation — FRESH • A/C compressor operation — ON
2	Air mix actuator operation		21.0 20.5 20.0	• Blower motor speed — 3rd • Airflow mode actuator operation — VENT • Air intake actuator operation — FRESH • A/C compressor operation — ON

ON-BOARD DIAGNOSTIC

Step	Operating device	Operating conditions	Monitor [*]	Other device conditions
3	Airflow mode actuator operation		3	- Blower motor speed — 3rd - Air mix actuator operation — 50% - Air intake actuator operation — FRESH - A/C compressor operation — ON
4	Air intake actuator operation		4	- Blower motor speed — 3rd - Air mix actuator operation — 0% - Airflow mode actuator operation — VENT
	A/C compressor operation			

* : Shown on the information display according to step.

DTC 02

A6E857001038W02

DTC 02	Solar radiation sensor system inspection
POSSIBLE CAUSE	- Solar radiation sensor malfunction - Climate control unit malfunction - Open or short circuit between solar radiation sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	- Inspect solar radiation sensor. - Is it okay?	Yes Go to next step.
		No Replace solar radiation sensor.
2	- Disconnect climate control unit connector (24-pin) and solar radiation sensor connector. - Is there continuity between following terminals of climate control unit connector (24-pin) and terminal solar radiation sensor connector? — 1S—B — 1B—A	Yes Go to next step.
		No Repair wiring harness.
3	Is there short circuit to ground between terminal 1S of climate control unit connector (24-pin) and terminal B of solar radiation sensor connector?	Yes Repair wiring harness.
		No Replace climate control unit.

DTC 06

A6E857001038W03

DTC 06	Cabin temperature sensor system inspection
POSSIBLE CAUSE	- Cabin temperature sensor malfunction - Climate control unit malfunction - Open or short circuit between cabin temperature sensor and climate control unit

ON-BOARD DIAGNOSTIC

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	Is resistance between terminals 1I and 1M of climate control unit connector (24-pin) as indicated below? — 137 ohms—220 kilohms	Yes Replace climate control unit.
		No Go to next step.
2	- Inspect cabin temperature sensor. - Is it okay?	Yes Repair wiring harness.
		No Replace cabin temperature sensor.

DTC 07

A6E857001038W04

DTC 07	Cabin temperature sensor system inspection
POSSIBLE CAUSE	- Cabin temperature sensor malfunction - Climate control unit malfunction - Open or short circuit between cabin temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	- Inspect cabin temperature sensor. - Is it okay?	Yes Go to next step.
		No Replace cabin temperature sensor.
2	- Disconnect climate control unit connector (24-pin) and cabin temperature sensor connector. - Is there open circuit between the following terminals of climate control unit connector (24-pin) and cabin temperature sensor connector? — 1I—A — 1M—B	Yes Repair wiring harness.
		No Go to next step.
3	Is there short circuit to ground between terminal 1M of climate control unit connector (24-pin) and B of cabin temperature sensor connector?	Yes Repair wiring harness.
		No Connect climate control unit connector, then go to next step.
4	- Turn the ignition switch to ON position. - Measure voltage at terminal the following terminal 1M of climate control unit connector (24-pin). - Is voltage approximately 5V?	Yes This system is normal at present. (Erase the past failure from memory.)
		No Replace climate control unit.

DTC 10

A6E857001038W05

DTC 10	Evaporator temperature sensor system inspection
POSSIBLE CAUSE	- Evaporator temperature sensor malfunction - Climate control unit malfunction - Open or short circuit between evaporator temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	Is resistance between terminals 1I and 1Q of climate control unit connector (24-pin) as indicated below? — 128 ohms—179 kilohms	Yes Replace climate control unit.
		No Go to next step.
2	- Inspect evaporator temperature sensor. - Is it okay?	Yes Repair wiring harness.
		No Replace evaporator temperature sensor.

DTC 11

A6E857001038W06

DTC 11	Evaporator temperature sensor system inspection
POSSIBLE CAUSE	- Evaporator temperature sensor malfunction - Climate control unit malfunction - Open or short circuit between evaporator temperature sensor and climate control unit

ON-BOARD DIAGNOSTIC

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	- Inspect evaporator temperature sensor. - Is it okay?	Yes	Go to next step.
		No	Replace evaporator temperature sensor.
2	- Disconnect climate control unit connector (24-pin) and evaporator temperature sensor connector. - Is there open circuit between following terminals of climate control unit connector (24-pin) and evaporator temperature sensor connector? — 1Q—B — 1I—A	Yes	Repair wiring harness.
		No	Go to next step.
3	Is there short circuit to ground between terminal 1Q of climate control unit connector (24-pin) and terminal B of evaporator temperature sensor connector?	Yes	Repair wiring harness.
		No	Connect climate control unit connector, then go to next step.
4	- Turn ignition switch to ON position. - Measure voltage at terminal 1Q of climate control unit connector (24-pin). - Is voltage approximately 5 V?	Yes	This system is normal at present. (Erase the past failure from memory.)
		No	Replace climate control unit.

DTC 12

A6E857001038W07

DTC 12	Ambient temperature sensor system inspection
POSSIBLE CAUSE	- Ambient temperature sensor malfunction - Climate control unit malfunction - Open or short circuit between ambient temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	Is resistance between terminals 1I and 1K of climate control unit connector (24-pin) as indicated below? — 122 ohms—182 kilohms	Yes	Replace climate control unit.
		No	Go to next step.
2	- Inspect ambient temperature sensor. - Is it okay?	Yes	Repair wiring harness.
		No	Replace ambient temperature sensor.

DTC 13

A6E857001038W08

DTC 13	Ambient temperature sensor system inspection
POSSIBLE CAUSE	- Ambient temperature sensor malfunction - Climate control unit malfunction - Open or short circuit between ambient temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	- Inspect ambient temperature sensor. - Is it okay?	Yes	Go to next step.
		No	Replace ambient temperature sensor.
2	- Disconnect climate control unit connector (24-pin) and ambient temperature sensor connector. - Is there open circuit between following terminals of climate control unit connector (24-pin) and ambient temperature sensor connector? — 1K—B — 1I—A	Yes	Repair wiring harness.
		No	Go to next step.
3	Is there short circuit to ground between terminal 1K of climate control unit connector (24-pin) and terminal B of ambient temperature sensor connector?	Yes	Repair wiring harness.
		No	Connect climate control unit connector, then go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
4	- Turn ignition switch to ON position. - Measure voltage at terminal 1K of climate control unit connector (24-pin). - Is voltage approximately 5 V?	Yes This system is normal at present. (Erase the past failure from memory.)
		No Replace climate control unit.

DTC 14

A6E857001038W09

DTC 14	Water temperature sensor system inspection
POSSIBLE CAUSE	- Water temperature sensor malfunction - Climate control unit malfunction - Open or short circuit between water temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	- Is resistance between terminals 1I and 1O of climate control unit connector (24-pin) as indicated below? 112 ohms—110 kilohms	Yes Replace climate control unit.
		No Go to next step.
2	- Inspect water temperature sensor. - Is it okay?	Yes Repair wiring harness.
		No Replace water temperature sensor.

DTC 15

A6E857001038W10

DTC 15	Water temperature sensor system inspection
POSSIBLE CAUSE	- Water temperature sensor malfunction - Climate control unit malfunction - Open or short circuit between water temperature sensor and climate control unit

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	Is water temperature sensor normal?	Yes Go to next step.
		No Replace water temperature sensor.
2	- Disconnect climate control unit connector (24-pin) and water temperature sensor connector. - Is there open circuit between following terminals of climate control unit connector (24-pin) and water temperature sensor connector? — 1O—A — 1I—B	Yes Repair wiring harness.
		No Go to next step.
3	Is there short circuit to ground between terminal 1O of climate control unit connector (24-pin) and terminal A of water temperature sensor connector?	Yes Repair wiring harness.
		No Connect climate control unit connector and go to next step.
4	- Turn the ignition switch to ON position. - Is voltage at terminal 1O of climate control unit connector (24-pin) above 5 V?	Yes This system is normal at present. (Erase the past failure from memory.)
		No Replace climate control unit.

DTC 18

A6E857001038W11

DTC 18	Air mix actuator (potentiometer) system inspection
POSSIBLE CAUSE	- Air mix actuator malfunction - Climate control unit malfunction - Open circuit between air mix actuator and climate control unit - Short circuit between air mix actuator (terminal C) and climate control unit (terminal 1U: 24-pin)

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	- Inspect air mix actuator. - Is it okay?	Yes Go to next step.
		No Replace air mix actuator.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
2	- Disconnect airflow mode actuator connector. - Is resistance between terminals 1U and 1I of climate control unit connector (24-pin) more than 387 ohms?	Yes	Go to next step.
		No	Repair wiring harness. (Short circuit)
3	- Disconnect climate control unit connector (24-pin). - Is resistance between terminals 1B and 1I of climate control unit connector (24-pin) less than 4.8 kilohms?	Yes	Go to next step.
		No	Repair wiring harness. (Open circuit)
4	Is resistance between terminals 1B and 1U of climate control unit connector (24-pin) less than 4.2 kilohms?	Yes	Replace climate control unit.
		No	Repair wiring harness. (Open circuit)

DTC 19

A6E857001038W12

DTC 19	Air mix actuator (potentiometer) system inspection
POSSIBLE CAUSE	- Air mix actuator malfunction - Climate control unit malfunction - Open circuit between air mix actuator and climate control unit - Short circuit between air mix actuator (terminal C) and climate control unit (terminal 1U: 24-pin)

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	- Inspect air mix actuator. - Is it okay?	Yes	Go to next step.
		No	Replace air mix actuator.
2	- Disconnect climate control unit connector (24-pin) and air mix actuator connector. - Is there open circuit between following terminals of climate control unit connector (24-pin) and air mix actuator connector? — 1B—B — 1U—C — 1I—A	Yes	Repair wiring harness.
		No	Go to next step.
3	Is there short circuit to ground between terminal 1U of climate control unit connector (24-pin) and terminal C of air mix actuator connector?	Yes	Repair wiring harness.
		No	This system is normal at present. (Erase the past failure from memory.)

DTC 21

A6E857001038W13

DTC 21	Airflow mode actuator (potentiometer) system inspection
POSSIBLE CAUSE	- Airflow mode actuator malfunction - Climate control unit malfunction - Open circuit between airflow mode actuator and climate control unit - Short circuit between airflow mode actuator (terminal C) and climate control unit (terminal 1W: 24-pin)

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	- Inspect airflow mode actuator. - Is it okay?	Yes	Go to next step.
		No	Replace airflow mode actuator.
2	- Disconnect air mix actuator connector. - Is resistance between terminals 1W and 1I of climate control unit connector (24-pin) more than 387 ohms?	Yes	Go to next step.
		No	Repair wiring harness. (Short circuit)
3	- Disconnect climate control unit connector (24-pin). - Is resistance between terminals 1B and 1I of climate control unit connector (24-pin) less than 4.8 kilohms?	Yes	Go to next step.
		No	Repair wiring harness. (Open circuit)
4	Is resistance between terminals 1B and 1W of climate control unit connector (24-pin) less than 4.2 kilohms?	Yes	Replace climate control unit.
		No	Repair wiring harness. (Open circuit)

ON-BOARD DIAGNOSTIC

DTC 22

A6E857001038W14

DTC 22	Airflow mode actuator (potentiometer) system inspection
POSSIBLE CAUSE	• Airflow mode actuator malfunction • Climate control unit malfunction • Open circuit between airflow mode actuator and climate control unit • Short circuit between airflow mode actuator (terminal C) and climate control unit (terminal 1W: 24-pin)

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	• Inspect airflow mode actuator. • Is it okay?	Yes Go to next step.
		No Replace airflow mode actuator.
2	• Disconnect climate control unit connector (24-pin) and air mix actuator connector. • Is there open circuit between following terminals of climate control unit connector (24-pin) and airflow mode actuator connector? — 1B—B — 1W—C — 1I—A	Yes Repair wiring harness.
		No Go to next step.
3	• Is there short circuit to ground between terminal 1W of climate control unit connector (24-pin) and terminal C of airflow mode actuator connector?	Yes Repair wiring harness.
		No This system is normal at present. (Erase the past failure from memory.)

DTC 58

A6E857001038W15

DTC 58	Air mix actuator (motor lock) system inspection
POSSIBLE CAUSE	• Air mix actuator malfunction • A/C unit (air mix link and/or air mix crank) malfunction • Climate control unit malfunction • Open or short circuit between air mix actuator and climate control unit

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	• Disconnect air mix actuator connector. • Connect battery positive voltage to terminal D (or terminal F) and ground to terminal F (or terminal D) of air mix actuator connector. • Does air mix actuator operate?	Yes Connect air mix actuator connector, then go to Step 3.
		No Go to next step.
2	• Remove air mix actuator. • Operate air mix link by hand. • Does air mix link operate smoothly?	Yes Replace air mix actuator.
		No Replace air mix link and/or air mix crank.
3	• Disconnect climate control unit connect (12-pin). • Connect battery positive voltage to terminal 2D (or terminal 2C) and ground to terminal 2C (or terminal 2D) of climate control unit connector (24-pin). • Does air mix actuator operate?	Yes Replace climate control unit.
		No Repair wiring harness.

DTC 59

A6E857001038W16

DTC 59	Airflow mode actuator (motor lock) system inspection
POSSIBLE CAUSE	• Airflow mode actuator malfunction • A/C unit (airflow mode links and/or airflow mode cranks) malfunction • Climate control unit malfunction • Open or short circuit between airflow mode actuator and climate control unit

ON-BOARD DIAGNOSTIC

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	- Disconnect airflow mode actuator connector. - Connect battery positive voltage to terminal D (or terminal F) and ground to terminal F (or terminal D) of airflow mode actuator connector. - Does airflow mode actuator operate?	Yes	Connect airflow mode actuator connector, then go to Step 3.
		No	Go to next step.
2	- Remove airflow mode actuator. - Operate airflow mode main link by hand. - Does airflow mode main link operate smoothly?	Yes	Replace airflow mode actuator.
		No	Replace airflow mode links and/or airflow mode cranks.
3	- Disconnect climate control unit connect (12-pin). - Connect battery positive voltage to terminal 2G (or terminal 2E) and ground to terminal 2E (or terminal 2G) of climate control unit connector (24-pin). - Does airflow mode actuator operate?	Yes	Replace climate control unit.
		No	Repair wiring harness.

DTC 02, 18, 21 (WHEN TWO OR MORE DTCS ARE INDICATED AT THE SAME TIME)

A6E857001038W17

DTC 02, 18, 21	Climate control unit (+5 V power supply) inspection
POSSIBLE CAUSE	- Climate control unit malfunction - Short circuit between climate control unit and solar radiation sensor - Short circuit between climate control unit and air mix actuator - Short circuit between climate control unit and airflow mode actuator - Open circuit between climate control unit and solar radiation sensor - Open circuit between climate control unit and air mix actuator - Open circuit between climate control unit and airflow mode actuator

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	- Disconnect climate control unit coconnector (24-pin) and airflow mode actuator connector. - Is there continuity between terminal 1B of climate control unit connector (24-pin) and terminal B of airflow mode actuator connector?	Yes	Go to next step.
		No	Repair wiring harness.
2	Is there short circuit to ground between terminal 1B of climate control unit connector (24-pin) and terminal B of airflow mode actuator connector?	Yes	Repair wiring harness.
		No	Go to next step.
3	Is there short circuit to ground between terminal 1B of climate control unit connector (24-pin) and terminal B of air mix actuator connector?	Yes	Repair wiring harness.
		No	Go to next step.
4	Is there short circuit to ground between terminal 1B of climate control unit connector (24-pin) and terminal A of solar radiation sensor connector?	Yes	Repair wiring harness.
		No	Replace climate control unit.

DTC 06, 10, 12, 14, 18, 21 (WHEN TWO OR MORE DTCS ARE INDICATED AT THE SAME TIME)

A6E857001038W18

DTC 06, 10, 12, 18, 21	Climate control unit (+5V power supply or sensor ground system) or sensor ground system inspection
POSSIBLE CAUSE	- Climate control unit malfunction - Open circuit between climate control unit and each temperature sensor - Open circuit between climate control unit and air mix actuator - Open circuit between climate control unit and airflow mode actuator

ON-BOARD DIAGNOSTIC

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	- Disconnect climate control unit connector (24-pin) and evaporator temperature sensor connector. - Is there continuity between terminal 1I of climate control unit connector (24-pin) and terminal A of evaporator temperature sensor connector?	Yes Replace climate control unit.
		No Repair wiring harness.

DTC 07, 11, 13, 15, 19, 22 (WHEN TWO OR MORE DTCS ARE INDICATED AT THE SAME TIME)

A6E857001038W19

DTC 07, 11, 13, 15, 19, 22	Climate control unit (+5V power supply or sensor ground system) or sensor ground system inspection
POSSIBLE CAUSE	- Climate control unit malfunction - Open circuit between climate control unit each temperature sensor - Open circuit between climate control unit and air mix actuator - Open circuit between climate control unit and airflow mode actuator

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	- Disconnect climate control unit connector (24-pin) and evaporator temperature sensor connector. - Is there open circuit between terminal 1I of climate control unit connector (24-pin) and terminal A of evaporator temperature sensor connector?	Yes Repair wiring harness.
		No This system is normal at present. (Erase the past failure from memory.)

DTC 19, 22 (WHEN TWO OR MORE DTCS ARE INDICATED AT THE SAME TIME)

A6E857001038W20

DTC 19, 22	Climate control unit (+5V power supply) inspection
POSSIBLE CAUSE	- Climate control unit malfunction - Short circuit between climate control unit and solar radiation sensor - Short circuit between climate control unit and air mix actuator - Short circuit between climate control unit and airflow mode actuator - Open circuit between climate control unit and solar radiation sensor - Open circuit between climate control unit and air mix actuator - Open circuit between climate control unit and airflow mode actuator

Diagnostic Procedure

STEP	INSPECTION	ACTION
1	- Disconnect climate control unit connector (24-pin) and airflow mode actuator connector. - Is there open circuit between terminal 1B of climate control unit connector (24-pin) or terminal B of airflow mode actuator connector?	Yes Repair wiring harness.
		No Go to next step.
2	Is there short circuit to ground between terminal 1B of climate control unit connector (24-pin) and terminal B of airflow mode actuator connector?	Yes Repair wiring harness.
		No Go to next step.
3	Is there short circuit to ground between terminal 1B of climate control unit connector (24-pin) and terminal B of air mix actuator connector?	Yes Repair wiring harness.
		No Go to next step.
4	Is there short circuit to ground between terminal 1B of climate control unit connector (24-pin) and terminal A of solar radiation sensor connector?	Yes Repair wiring harness.
		No This system is normal at present. (Erase the past failure from memory.)

TROUBLESHOOTING

TROUBLESHOOTING

FOREWORD

A6E858001038W01

- The areas for inspection (steps) are given according to various circuit malfunctions. Use the following chart to verify the symptoms of the trouble in order to diagnose the appropriate area.

TROUBLESHOOTING INDEX

A6E858001038W02

No.	TROUBLESHOOTING ITEM	DESCRIPTION
1	Insufficient air (or no air) blown from vents.	Problem with each vent and/or duct.
2	Amount of air blown from vents does not change. (Full-auto air conditioner)	Malfunction in blower system.
3	Amount of air blown from vents does not change. (Manual air conditioner)	Malfunction in blower system.
4	Air intake mode does not change.	Air intake mode does not change when switching REC/FRESH mode.
5	No temperature control with climate control unit.	Malfunction in A/C unit and/or climate control unit air mix system.
6	Windshield fogged.	- A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes. - Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.
7	Air from vents not cold enough.	Magnetic clutch operates but A/C system malfunctions.
8	No cool air.	Magnetic clutch does not operate.
9	Noise while operating A/C system.	Noise from magnetic clutch, A/C compressor, hose or refrigerant line.

TROUBLESHOOTING

NO.1 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS

A6E858001038W03

1	Insufficient air (or no air) blown from vents.
DESCRIPTION	Problem with each vent and/or duct.
POSSIBLE CAUSE	- Malfunction in VENT mode system (Steps 1—4) - Malfunction in HEAT mode system (Step 5) - Malfunction in DEFROSTER mode system (Steps 6—8)

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT TO SEE WHETHER MALFUNCTION IS IN VENT MODE OR OTHER MODES Does air blow out when in VENT mode?	Yes Go to Step 4.
		No Go to next step.
2	INSPECT VENT Is vent clogged?	Yes Remove obstruction, then go to Step 8.
		No Go to next step.
3	VERIFY THAT DUCT IN DASHBOARD IS INSTALLED Is duct in dashboard properly installed?	Yes Inspect duct for clogging, deformity and air leakage, then go to Step 8.
		No Install duct securely in the proper position, then go to Step 8.
4	INSPECT TO SEE WHETHER MALFUNCTION IS IN HEAT MODE OR DEFROSTER MODE Does air blow out when in HEAT mode?	Yes Go to next step.
		No Inspect vent for clogging, then go to Step 8.
5	INSPECT DEFROSTER MODE Does air blow out when in DEFROSTER mode?	Yes Operation is okay. Recheck malfunction symptoms.
		No Go to next step.
6	INSPECT VENT Is vent clogged?	Yes Remove obstruction, then go to Step 8.
		No Go to next step.
7	VERIFY THAT DEFROSTER DUCT IS INSTALLED Is defroster duct properly installed?	Yes Inspect duct for clogging, deformity, and air leakage, then go to next step.
		No Install duct securely in proper position, then go to next step.
8	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR Does air blow out?	Yes Troubleshooting completed. Explain repairs to customer.
		No Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.2 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

A6E858001038W04

Full-auto Air Conditioner

2	Amount of air blown from vents does not change.
DESCRIPTION	Malfunction in blower system.
POSSIBLE CAUSE	- Malfunction in blower unit (Steps 3, 4, 12) - Malfunction in blower motor (Steps 5—9) - Malfunction in power MOS FET system (Steps 10, 11, 13, 14) - Malfunction in climate control unit (Step 15)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT BLOWER 40 A FUSE - Inspect BLOWER 40 A fuse. - Is it okay?	Yes Go to next step.
		No Replace fuse, then go to Step 15. If fuse burns out immediately, go to next step.
2	INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR ELSEWHERE - Turn ignition switch to ON position. - Recirculate air inside vehicle. - Does blower unit fan rotate smoothly?	Yes Go to Step 4.
		No Go to next step.
3	INSPECT BLOWER UNIT INTAKE VENT Is intake vent of blower unit clogged?	Yes Remove obstruction, then go to Step 15.
		No Inspect if there are any obstruction in passage between blower unit to A/C unit, then go to Step 15.

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
4*	INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER RELAY SYSTEM OR POWER MOS FET SYSTEM • Turn ignition switch to ON position. • Test voltage at the following terminal of blower motor. — Terminal B (blower motor operation signal) • Is voltage approximately 12 V?	Yes	Go to Step 8.
		No	Go to next step.
5*	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN FUSE BLOCK AND BLOWER RELAY) OR ELSEWHERE • Test voltage at the following terminal of blower relay. — Terminal A (IG2 signal) — Terminal C (B+ signal) • Is voltage approximately 12 V?	Yes	Go to next step.
		No	Repair wiring harness between blower relay and BLOWER 40 A fuse, then go to Step 15.
6*	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER RELAY AND GROUND) OR ELSEWHERE • Test voltage at the following terminal of blower relay. — Terminal E (GND signal) • Is voltage approximately 0 V?	Yes	Go to next step.
		No	Repair wiring harness between blower relay and ground, then go to Step 15.
7*	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER RELAY AND BLOWER MOTOR) OR BLOWER RELAY • Test voltage at the following terminal of blower relay. — Terminal D (blower motor operation signal) • Is voltage approximately 12 V?	Yes	Repair wiring harness between blower relay and blower motor, then go to Step 15.
		No	Replace blower relay, then go to Step 15.
8*	INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER MOTOR OR ELSEWHERE • Test voltage at the following terminal of blower motor. — Terminal B (blower motor operation signal) • Is voltage approximately 12 V?	Yes	Go to next step.
		No	Inspect blower motor, then go to Step 15.
9*	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER MOTOR AND POWER MOS FET) OR ELSEWHERE • Test voltage at the following terminal of power MOS FET. — Terminal C (blower motor operation signal) • Is voltage approximately 12 V?	Yes	Go to next step.
		No	Repair wiring harness between blower motor and power MOS FET, then go to Step 15.
10*	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN POWER MOS FET AND GROUND) OR ELSEWHERE • Test voltage at the following terminal of power MOS FET. — Terminal A (blower motor operation signal) • Is voltage approximately 0 V?	Yes	Go to next step.
		No	Repair wiring harness between power MOS FET and ground, then go to Step 15.
11	INSPECT BLOWER UNIT • Inspect fan in blower unit. — Is fan free of interference with blower unit case? — Is fan free of foreign material and obstruction? • Is fan okay?	Yes	Go to next step.
		No	Remove obstruction, repair or replace fan and blower unit case, then go to Step 15.

ON-BOARD DIAGNOSTIC, TROUBLESHOOTING

STEP	INSPECTION	ACTION
12*	INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER MOS FET OR ELSEWHERE - Disconnect power MOS FET connector. - Test voltage at the following terminal of power MOS FET. - Terminal B (blower motor control signal) - Is voltage approximately 10 V?	Yes Replace power MOS FET, then go to Step 15.
		No Go to next step.
13*	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN POWER MOS FET AND CLIMATE CONTROL UNIT) OR ELSEWHERE - Turn ignition switch to LOCK position. - Disconnect climate control unit connector. - Inspect for continuity at the following terminals between power MOS FET and climate control unit. - Terminal B—1C (24-pin, blower motor control signal) - Terminal C—1A (24-pin, blower motor feedback signal) - Is there continuity?	Yes Go to next step.
		No Repair wiring harness between power MOS FET and climate control unit, then go to Step 15.
14*	INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (SHORT TO GROUND BETWEEN POWER MOS FET AND CLIMATE CONTROL UNIT) - Inspect for continuity at the following terminal between power MOS FET and ground. - Terminal B (blower motor control signal)—ground - Is there continuity?	Yes Repair wiring harness between power MOS FET and ground, then go to next step.
		No Replace climate control unit, then go to next step.
15	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR Is air discharged from vent?	Yes Troubleshooting completed. Explain repairs to customer.
		No Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.3 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

A6E858001038W05

Manual Air Conditioner

3	Amount of air blown from vents does not change.
DESCRIPTION	Malfunction in blower system.
POSSIBLE CAUSE	- Blower relay, blower motor, resistor, fan switch malfunction (Step 1) - Blower unit malfunction (Steps 2—4)

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT BLOWER SYSTEM - Inspect the following systems and electrical parts. - Blower relay - Blower motor - Resistor - Fan switch - Related wiring harnesses - Are they okay?	Yes Go to next step.
		No Repair or replace malfunctioning part, then go to Step 5.
2	CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR ELSEWHERE - Turn ignition switch to ON position. - Turn fan switch on. - Recirculate air inside vehicle. - Does fan in blower unit rotate smoothly?	Yes Go to Step 4.
		No Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
3	INSPECT BLOWER UNIT - Inspect fan in blower unit. - Is fan free of interference from blower unit case? - Is fan free of foreign material and obstructions? - Is fan okay?	Yes	Go to next step.
		No	Remove obstruction, repair or replace fan and blower unit case, then go to Step 5.
4	INSPECT BLOWER UNIT INTAKE VENT Is blower unit intake vent clogged?	Yes	Remove obstruction, then go to next step.
		No	Inspect if there are any obstructions in passage between blower unit and A/C unit, then go to next step.
5	VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.4 AIR INTAKE MODE DOES NOT CHANGE

A6E858001038W06

4	Air intake mode does not change.
DESCRIPTION	Air intake mode does not change when switching REC/FRESH mode.
POSSIBLE CAUSE	- Malfunction in air intake actuator (Steps 1—6) - Malfunction in air intake door (Step 7)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION	ACTION	
1*	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR, WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE - Turn ignition switch to ON position. - Test voltages at the following terminals of climate control unit. - Terminal 2K (12-pin, FRESH motor drive signal) - Terminal 2I (12-pin, RECIRCULATE motor drive signal) (See U-47 Full-auto Air Conditioner) - Are voltages okay?	Yes	Go to next step.
		No	Go to Step 3.
2*	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) - Test voltages at the following terminals of air intake actuator. - Terminal D (FRESH motor drive signal) - Terminal F (RECIRCULATE motor drive signal) - Are voltages as shown below? - Terminal D: approximately 0.5 V during RECIRCULATE and approximately 10 V during FRESH - Terminal F: approximately 10 V during RECIRCULATE and approximately 0.5 V during FRESH	Yes	Replace air intake actuator, then go to Step 8.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 8.

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
3	INSPECT TO SEE WHETHER MALFUNCTION IS IN AIR INTAKE ACTUATOR OR ELSEWHERE • Disconnect air intake actuator connector. • Test voltages at the following terminals of climate control unit. — Terminal 2K (12-pin, FRESH motor drive signal) — Terminal 2I (12-pin, RECIRCULATE motor drive signal) (See U-47 Full-auto Air Conditioner) • Are voltages okay?	Yes	Inspect air intake actuator, then go to Step 8.
		No	Go to next step.
4	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE • Disconnect climate control unit connector. • Test voltages at the following terminals of climate control unit. — Terminal 2K (12-pin, FRESH motor drive signal) — Terminal 2I (12-pin, RECIRCULATE motor drive signal) • Are voltages approximately 0 V?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 8.
5	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO GROUND BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE • Turn ignition switch to LOCK position. • Inspect for continuity at the following terminals between climate control unit and ground. — Terminal 2K (12-pin, FRESH motor drive signal) — Terminal 2I (12-pin, RECIRCULATE motor drive signal) • Is there continuity?	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 8.
		No	Go to next step.
6	INSPECT AIR INTAKE LINK • Inspect air intake links. — Is there grease on link? — Are links securely and properly installed? — Are links free of obstructions and hindrances? • Are above items okay?	Yes	Go to next step.
		No	Apply grease to links. If any links are damaged, replace air intake actuator, then go to Step 8.
7	INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR AIR INTAKE DOOR • Inspect blower unit air intake door. — Is door free of obstructions, cracks, and damage? — Are doors securely and properly installed? • Are above items okay?	Yes	Replace climate control unit, then go to next step.
		No	Remove obstruction, or install doors in proper position. If any doors are cracked or damaged, replace them, then go to next step.
8	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR • Does air intake mode change smoothly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

TROUBLESHOOTING

NO.5 NO TEMPERATURE CONTROL WITH CLIMATE CONTROL UNIT

A6E858001038W07

5	No temperature control with climate control unit.
DESCRIPTION	Malfunction in A/C unit and/or climate control unit air mix system.
POSSIBLE CAUSE	- A/C unit air mix link, air mix crank, air mix rod, air mix wire, wire clamp malfunction (Steps 2, 3) - Climate control unit rack-and-pinion, air mix wire malfunction (Step 4) - A/C unit air mix door malfunction (Steps 5, 6) - Heater piping malfunction (Step 7)

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT COOLANT TEMPERATURE Is coolant sufficiently warmed up?	Yes	Go to next step.
		No	Warm engine up, then go to Step 8.
2	INSPECT A/C UNIT AIR MIX SYSTEM - Inspect A/C unit air mix links, air mix cranks, air mix rods, air mix actuator or wire clamp. - Is there grease on links and cranks? - Are links, cranks, and rods securely installed in their proper positions? - Is wire clamp free of deformation? - Are above items okay?	Yes	Go to next step.
		No	Apply grease or install links, cranks, and rods securely in their proper positions, repair or replace air mix actuator or wire clamp, then go to Step 8.
3	VERIFY THAT AIR MIX WIRE FROM A/C UNIT IS POSITIONED SECURELY AND CORRECTLY (IF AVAILABLE) Is air mix wire securely installed in the correct position in relation to A/C unit air mix links?	Yes	Go to next step.
		No	Adjust air mix wire or install securely in correct position, then go to Step 8.
4	INSPECT CLIMATE CONTROL UNIT - Inspect climate control unit. (See U-47 CLIMATE CONTROL UNIT INSPECTION) - Is climate control unit okay?	Yes	Go to next step.
		No	Repair or replace climate control unit, then go to Step 8.
5	INSPECT A/C UNIT Is there any foreign material or obstruction in A/C unit air mix doors?	Yes	Remove obstruction, then go to Step 8.
		No	Go to next step.
6	INSPECT A/C UNIT AIR MIX DOORS Is A/C unit air mix door securely and properly installed?	Yes	Inspect air mix door for cracks or damage, then go to next step.
		No	Install air mix door securely in proper position, then go to next step.
7	INSPECT HEATER LINES - Inspect heater lines. - Is heater piping free of damage and cracks? - Are heater piping connections free of engine coolant leakage? - Are heater piping connections securely tightened? - Are heater piping installation points on A/C unit free of engine coolant leakage? - Are above items okay?	Yes	Operation is okay. Recheck malfunction symptoms.
		No	If heater piping connections is loosed, tighten connections with specified torque. Repair or replace heater piping, then go to next step.
8	VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR Does unit operate in every temperature setting?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.6 WINDSHIELD FOGGED

A6E858001038W08

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

6	Windshield fogged.
DESCRIPTION	- A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes. - Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.

TROUBLESHOOTING

POSSIBLE CAUSE	- Climate control unit (B+ signal) system malfunction (Steps 2, 4, 5) - Air intake actuator malfunction (Steps 3, 7) - Climate control unit (RECIRCULATE, FRESH signal) system malfunction (Steps 9—11) - Malfunction in blower unit air intake doors (Steps 12, 13)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	COOL AIR BLOW OUT INSPECTION When both A/C and fan switch in climate control unit are on, does cool air blow out from front vent?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index No.8.
2	INSPECT CLIMATE CONTROL UNIT POWER SUPPLY FUSE FOR B+ SIGNAL Is climate control unit power supply fuse for B+ signal okay?	Yes	Go to next step.
		No	Inspect for a short to ground on blown fuse circuit. Repair or replace as necessary. Install appropriate amperage fuse.
3	INSPECT AIR INTAKE ACTUATOR - Inspect air intake actuator. - Is there grease on link? - Is link securely and properly positioned? - Is link free of obstructions? - Are above items okay?	Yes	Go to next step.
		No	Apply grease or install link properly and securely, remove obstruction, then go to Step 14.
*4	INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT FOR CONTINUITY - Disconnect climate control unit connector (12-pin). - Turn ignition switch to ON position. - Test voltage at climate control unit connector terminal F (B+ signal). - Is voltage approximately 12 V?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and climate control unit, then go to Step 14.
*5	INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND GROUND FOR VOLTAGE - Test voltage at climate control unit connector terminal 2L (Ground). - Is voltage approximately 0V?	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and ground, then go to Step 14.
6	VERIFY WHETHER MALFUNCTION IS IN BLOWER UNIT AIR INTAKE DOOR OR ELSEWHERE - Turn ignition switch to LOCK position. - Connect climate control unit connector (12-pin). - Remove air intake actuator. - Turn ignition switch to ON position. - Set fan switch to 4th position. - Does air intake mode (RECIRCULATE, FRESH) change smoothly when air intake link is operated by hand?	Yes	Go to next step.
		No	Go to Step 12.
7	INSPECT AIR INTAKE ACTUATOR - Inspect air intake actuator. (See U-30 AIR INTAKE ACTUATOR INSPECTION) - Is it okay?	Yes	Go to next step.
		No	Replace air intake actuator, go to Step 14.
8	INSPECT AIR INTAKE SELECTOR SWITCH AND DEFROSTER SWITCH IN CLIMATE CONTROL UNIT - Test voltage at climate control unit connector (12-pin) terminals 2K and 2I. - Is it okay?	Yes	Go to next step.
		No	Replace climate control unit, then go to Step 14.

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
*9	INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR CONTINUITY - Turn ignition switch to LOCK position. - Is there continuity between following climate control unit connector (12-pin) terminal and air intake actuator connector terminal? - Terminal D —Terminal 2K (FRESH signal) - Terminal F —Terminal 2I (RECIRCULATE signal)	Yes	Go to next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
*10	INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO GROUND - Is there continuity between following climate control unit connector (12-pin) terminal and ground? - Terminal 2K (FRESH signal) - Terminal 2I (RECIRCULATE signal)	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
		No	Go to next step.
*11	INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO B+ - Turn ignition switch to ON position - Test voltage at following climate control unit connector (12-pin) terminal. - Terminal 2K (FRESH signal) - Terminal 2I (RECIRCULATE signal) - Is voltage approximately 12 V?	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
		No	Replace climate control unit, then go to Step 14.
12	INSPECT BLOWER UNIT AIR INTAKE DOOR Is there any foreign material or obstruction in blower unit air intake door?	Yes	Remove obstruction, then go to Step 14.
		No	Go to next step.
13	VERIFY THAT BLOWER UNIT AIR INTAKE DOOR IS POSITIONED SECURELY AND PROPERLY Is blower unit air intake door securely and properly positioned?	Yes	Inspect air intake door for cracks or damage, then go to next step.
		No	Install air intake door securely in proper position, then go to next step.
14	VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR Does malfunction disappear?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.7 AIR FROM VENTS COLD ENOUGH

A6E858001038W09

7	Air from vents not cold enough.	
DESCRIPTION	Magnetic clutch operates but A/C system malfunctions.	
POSSIBLE CAUSE	- Drive belt malfunction (Step 2) - Malfunction in blower unit or condenser (Steps 4, 5) - Malfunction in receiver/drier or expansion valve (valve closes too much) (Steps 8, 9) - Malfunction in refrigerant lines (Steps 10, 11) - A/C compressor system malfunction, insufficient compressor oil (Steps 15, 16) - Over filling of compressor oil, malfunction in expansion valve or A/C unit air mix link system (Steps 17—19)	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	INSPECT DRIVE BELT - Inspect drive belt. (See B-3 DRIVE BELT INSPECTION) - Is it okay?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 20.
2	INSPECT REFRIGERANT SYSTEM PERFORMANCE - Perform refrigerant system performance test. (See U-13 REFRIGERANT SYSTEM PERFORMANCE TEST) - Is operation normal?	Yes	Operation is normal. (Recheck malfunction symptoms.)
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION	ACTION	
3	CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT INTAKE AND CONDENSER OR ELSEWHERE Are refrigerant high-pressure and low-pressure values both high?	Yes	Go to next step.
		No	Go to Step 6.
4	INSPECT BLOWER UNIT INTAKE Is blower unit intake clogged?	Yes	Remove obstruction, then go to Step 20. (If air does not reach evaporator within A/C unit, heat exchange does not occur and refrigerant pressure becomes high. Therefore, removal of obstruction is necessary.)
		No	Go to next step.
5	INSPECT CONDENSER - Inspect condenser. (See U-24 CONDENSER INSPECTION) - Is it okay?	Yes	Adjust refrigerant to specified amount, then go to Step 20. (Excessive amount of refrigerant.)
		No	Replace condenser, or repair and clean condenser fins, then go to Step 20.
6	CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, RECEIVER/DRIER AND REFRIGERANT LINES OR ELSEWHERE Are refrigerant high-pressure and low-pressure values low?	Yes	Go to next step.
		No	Go to Step 14.
7	CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE AND RECEIVER/DRIER OR ELSEWHERE Immediately after A/C compressor operates, does refrigerant high-pressure value momentarily rise to correct value, then fall and stay below it? (Is there negative pressure on low-pressure side?)	Yes	Go to next step.
		No	Go to Step 10.
8	CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR RECEIVER/DRIER - Turn A/C switch off and let air conditioner stop for 10 minutes. - Start engine. - Turn both A/C switch and fan switch on. - Does malfunction occur after A/C compressor turns on?	Yes	Go to next step.
		No	Replace condenser and vacuum refrigerant line more than 30 minutes by vacuum pump, add refrigerant to specified level, then go to Step 20. (Since water has intermixed in receiver/drier and it is saturated, replacement is necessary.)
9	VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY Is expansion valve heat-sensing tube within A/C unit securely installed in proper position?	Yes	Replace expansion valve, then go to Step 20. (Since valve closes too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to Step 20.
10	INSPECT REFRIGERANT LINES - Inspect refrigerant lines. - Is piping free of damage and cracks? - Are piping connections free of oil grime? (Visual inspection) - Are piping connections free of gas leakage? - Are piping installation points on condenser free of gas leakage? - Are piping installation points on receiver/drier free of gas leakage? - Are piping installation points on A/C compressor free of gas leakage? - Are piping installation points on A/C unit free of gas leakage? - Perform gas leak inspection using gas leak tester. - Are above items okay?	Yes	Go to next step.
		No	If piping or A/C component(s) are damaged or cracked, replace them. Then go to Step 20. If there is no damage, go to Step 13.
11	INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR GAS LEAKAGE Are piping connections for evaporator in A/C unit free of gas leakage?	Yes	If the vane makes a noise, add 10 ml {10 cc, 0.34 fl oz} of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Adjust refrigerant to specified amount, then go to Step 20.
		No	If piping is damaged or cracked, replace it. Then go to Step 20. If there is no damage, go to next step.

TROUBLESHOOTING

STEP	INSPECTION		ACTION
12	INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR LOOSE Are piping connections for evaporator in A/C unit loose?	Yes	Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.
		No	If the vane makes a noise, add 10 ml {10 cc, 0.34 fl oz} of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
13	INSPECT PIPING CONNECTIONS FOR LOOSE Are piping connections loose?	Yes	Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.
		No	If the vane makes a noise, add 10 ml {10 cc, 0.34 fl oz} of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
14	CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, AIR MIX ACTUATOR AND COMPRESSOR OIL OR ELSEWHERE Does refrigerant high-pressure value hardly increase?	Yes	Go to next step. (Pressure hardly increases.)
		No	Go to Step 17.
15	CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT AND A/C COMPRESSOR OR ELSEWHERE When engine is racing, does high-pressure value increase?	Yes	Return to Step 3.
		No	Go to next step.
16	CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT OR A/C COMPRESSOR After compressor oil is replenished each 10 ml {10 cc, 0.34 fl oz}, does high-pressure value increase?	Yes	Troubleshooting completed. (Explain to customer that cause was insufficient compressor oil.)
		No	Replace A/C compressor, then go to Step 20. (Cause is defective A/C compressor.)
17	CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR ELSEWHERE Is only refrigerant low-pressure value high?	Yes	Go to Step 19.
		No	Go to next step.
18	VERIFY THAT AIR MIX IS INSTALLED SECURELY AND PROPERLY Are A/C unit air mix links, air mix cranks, and air mix rods securely and properly installed?	Yes	Set fan switch to 4th position. Turn A/C switch on. Set FRESH mode. Set temperature control to MAX COLD. Set VENT mode. (1) Start and run the engine at 1,500 rpm for 10 minutes . (2) Run the engine at idle for 1 minute . (3) Within 12 seconds , idle → 4,000 rpm → idle. Perform cycle 5 times . (4) Run the engine at idle for 30 seconds . (5) Drain the compressor oil completely from the A/C compressor and verify the amount. - If there is approximately 90 ml {90 cc, 3.0 fl oz} of compressor oil, go to Step 20. - If there is more than 90 ml {90 cc, 3.0 fl oz} of compressor oil, remove surplus oil and fill A/C compressor with 90 ml {90 cc, 3.0 fl oz} of compressor oil. Repeat Steps (1) to (5). (Cause is excessive amount of compressor oil.)
		No	Repair or install links, cranks and rods securely in proper position, then go to Step 20.
19	VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY Is expansion valve heat-sensing tube within A/C unit securely installed in proper position?	Yes	Replace expansion valve, then go to next step. (Since valve opens too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to next step.
20	VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR Does cool air blow out? (Are results of refrigerant system performance test okay?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

TROUBLESHOOTING

NO.8 NO COOL AIR

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8	No cool air
DESCRIPTION	• Magnetic clutch does not operate.
POSSIBLE CAUSE	• Malfunction in PCM A/C cut control system (Step 3) • Malfunction in climate control unit (Step 4) • Malfunction in refrigerant pressure switch (Steps 5, 7—9) • Malfunction in PCM (A/C signal) (Step 6) • Malfunction in PCM (IG1 signal) (Steps 10, 11) • Malfunction in A/C compressor (Step 12) • Malfunction in A/C relay (Steps 13—15) • Malfunction in evaporator temperature sensor (Step 16)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT AIR BLOW OUT • Does air blow out?	Yes
		No
2	INSPECT A/C COMPRESSOR OPERATION • Start engine. • Turn A/C switch and fan switch on. • Does A/C compressor operate?	Yes
		No
3	INSPECT FOR DTC IN PCM • Inspect for DTCs related to the PCM on-board diagnostic system. • Are any DTCs displayed?	Yes
		No
4	INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR ELSEWHERE • Does cool air blow out when terminal 1P of climate control unit connector (24-pin, A/C signal) is grounded?	Yes
		No
5*	INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C SIGNAL CIRCUIT (BETWEEN REFRIGERANT PRESSURE SWITCH AND PCM) OR ELSEWHERE • Test voltage at following terminal of refrigerant pressure switch. — Terminal B (A/C signal) • Is voltage approximately 12 V?	Yes
		No
6*	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN REFRIGERANT PRESSURE SWITCH AND PCM) OR PCM • Test voltage at A/C signal terminal of PCM. • Is voltage approximately 12 V?	Yes
		No
7	INSPECT TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH, REFRIGERANT AMOUNT, OR ELSEWHERE • Does cool air blow out when terminals A and B of refrigerant pressure switch connector are shorted?	Yes
		No
8*	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN REFRIGERANT PRESSURE SWITCH AND CLIMATE CONTROL UNIT) OR ELSEWHERE • Test voltage at following terminal of climate control unit. — Terminal 1P (24-pin, A/C signal) • Is voltage approximately 12 V?	Yes
		No

TROUBLESHOOTING

STEP	INSPECTION		ACTION
9	INSPECT TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH OR REFRIGERANT AMOUNT - Inspect refrigerant pressure switch. - Is it okay?	Yes	If refrigerant amount is empty, replace condenser, vacuum refrigerant line more than 30 minutes by vacuum pump, and add refrigerant to specified level, then go to Step 17.
		No	Replace refrigerant pressure switch, then go to Step 17.
10	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN A/C CONTROL SIGNAL CIRCUIT (BETWEEN A/C RELAY AND PCM) OR ELSEWHERE Does cool air blow out when terminal E of A/C relay connector (A/C control signal) is grounded?	Yes	Release short, then go to next step.
		No	Go to Step 12.
11*	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN PCM OR WIRING HARNESS (BETWEEN A/C RELAY AND PCM) - Test voltage at the A/C relay control signal terminal of PCM. - Is voltage approximately 12 V?	Yes	Inspect PCM, then go to Step 17.
		No	Repair wiring harness between A/C relay and PCM, then go to Step 17.
12*	INSPECT TO SEE WHETHER MALFUNCTION IS IN MAGNETIC CLUTCH OR ELSEWHERE - Test voltage at the following terminal of magnetic clutch thermal protector. - Terminal A (magnetic clutch operation signal) - Is voltage approximately 12 V?	Yes	Inspect magnetic clutch, then go to Step 17.
		No	Go to next step.
13	INSPECT FUSE Are A/C relay power supply fuses okay?	Yes	Go to next step.
		No	Replace fuse, then go to Step 17. If fuse burns out immediately, go to next step.
14	INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND A/C RELAY FOR LACK OF CONTINUITY - Test voltages at following terminals of A/C relay. - Terminal A (A/C relay control signal) - Terminal C (A/C control signal) - Are voltages approximately 12 V?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and A/C relay, then go to Step 17.
15	INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C RELAY OR WIRING HARNESS (BETWEEN A/C RELAY AND MAGNETIC CLUTCH) AND EVAPORATOR TEMPERATURE SENSOR - Test voltage at the following terminal of A/C relay. - Terminal D (magnetic clutch operation signal) - Is voltage approximately 12 V?	Yes	Inspect wiring harness between A/C relay and magnetic clutch. - If above wiring harness is OK, go to next step. - If above wiring harness malfunctions, repair wiring harness, then go to Step 17.
		No	Replace A/C relay, then go to Step 17.
16	INSPECT EVAPORATOR TEMPERATURE SENSOR - Inspect evaporator temperature sensor. - Is it okay?	Yes	Go to next step.
		No	Replace evaporator temperature sensor, then go to next step.
17	CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR Does cool air blow out? (Are the results of refrigerant system performance test okay?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.9 NOISE WHILE OPERATING A/C SYSTEM

A6E858001038W11

9	Noise while operating A/C system.
DESCRIPTION	Noise from magnetic clutch, A/C compressor, hose or refrigerant line.
POSSIBLE CAUSE	- Magnetic clutch operation noise (Step 4) - A/C compressor vane noise (Steps 5—13) - A/C compressor slippage noise (Steps 14—17) - Hose or refrigerant line interference noise (Step 18)

TROUBLESHOOTING

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	CHECK A/C COMPRESSOR VANE NOISE Is there a jingling, popping, beeping, or buzzing sound (A/C compressor vane noise)?	Yes	Go to Step 5.
		No	Go to next step.
2	INSPECT A/C COMPRESSOR SLIPPAGE NOISE Is there a squeaking or whirling sound (A/C compressor slippage noise)?	Yes	Go to Step 14.
		No	Go to next step.
3	INSPECT A/C COMPRESSOR INTERFERENCE NOISE Is there a rattling or vibrating sound (interference noise)?	Yes	Go to Step 18.
		No	Go to next step.
4	INSPECT MAGNETIC CLUTCH OPERATION NOISE Is there a clicking sound (magnetic clutch operation noise)?	Yes	Adjust clearance between pressure plate of magnetic clutch and A/C compressor pulley, then go to Step 19. (See U-38 MAGNETIC CLUTCH ADJUSTMENT)
		No	Condition is normal. (Recheck malfunction symptoms.)
5	INSPECT A/C COMPRESSOR NOISE TIME Is noise heard continuously for more than 3 seconds after A/C compressor comes on?	Yes	Go to next step.
		No	Condition is normal. (Noise occurs for 2—3 seconds immediately after A/C compressor turns on.)
6	INSPECT IDLE SPEED - Inspect idle speed. (See F-8 IDLE SPEED INSPECTION) - Is it okay?	Yes	Go to next step.
		No	Follow the repair instruction described in section F, then go to Step 19.
7	INSPECT REFRIGERANT AMOUNT - Inspect refrigerant amount. - Is it okay?	Yes	Go to Step 10.
		No	Go to next step.
8	INSPECT REFRIGERANT LINES - Inspect refrigerant lines. - Is piping free of damage and cracks? - Are piping connections free of oil grime? (Visual inspection) - Are piping connections free of gas leakage? - Are piping installation points on condenser free of gas leakage? - Are piping installation points on receiver/drier free of gas leakage? - Are piping installation points on A/C compressor free of gas leakage? - Are piping installation points on A/C unit free of gas leakage? - Perform gas leak inspection using gas leak tester. - Are above items okay?	Yes	Go to next step.
		No	If piping or A/C component(s) is damaged or cracked, replace then go to Step 19. If there is gas leakage, repair or replace connection and replace condenser*, then go to Step 19.
9	INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR GAS LEAKAGE Are piping connections for evaporator in A/C unit free of gas leakage?	Yes	Adjust refrigerant amount to specified level, then go to Step 19.
		No	If piping is damaged or cracked, replace then go to Step 19. If there is gas leakage, repair or replace connection and replace condenser*, then go to Step 19.
10	CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL OR ELSEWHERE - Add 20 ml {20 cc, 0.8 fl oz} of compressor oil. - Is noise heard when racing engine?	Yes	Go to next step.
		No	Troubleshooting completed. Explain repair to customer.
11	CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE - Drain compressor oil. - Is it contaminated with metal particles?	Yes	Go to next step.
		No	Replace A/C compressor, then go to Step 19.
12	CHECK TO SEE WHETHER MALFUNCTION IS SOMEWHERE IN A/C SYSTEM OR ELSEWHERE Is compressor oil whitish and mixed with water?	Yes	Replace entire A/C system (excluding heater), then go to Step 19.
		No	Go to next step.

TROUBLESHOOTING

STEP	INSPECTION		ACTION
13	INSPECT A/C COMPRESSOR OIL Is compressor oil darker than normal and contaminated with aluminum chips?	Yes	Replace A/C compressor and condenser, then go to Step 19. (Since A/C compressor may be worn and receiver/drier may be clogged, replacement of receiver/drier is necessary.)
		No	Condition is normal. Recheck malfunction symptoms.
14	CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE Is noise heard immediately after A/C compressor is stopped?	Yes	Replace A/C compressor, then go to Step 19. (A/C compressor discharge valve left open)
		No	Go to next step.
15	INSPECT DRIVE BELT - Inspect drive belt. (See B-3 DRIVE BELT INSPECTION) - Is it okay?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 19.
16	INSPECT DRIVE BELT CONDITION - Is drive belt worn? - Does it have foreign material imbedded in it, or have oil on it?	Yes	Remove obstruction, remove oil, or replace drive belt, then go to Step 19.
		No	Go to next step.
17	INSPECT MAGNETIC CLUTCH - Inspect magnetic clutch. (See U-38 MAGNETIC CLUTCH INSPECTION) - Is it okay?	Yes	Replace A/C compressor (excluding pressure plate, A/C compressor pulley, and stator), then go to Step 19.
		No	Replace magnetic clutch, then go to Step 19.
18	CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR REFRIGERANT LINES Is noise emitted from A/C compressor?	Yes	Visually inspect A/C compressor, replace appropriate parts if necessary, then go to next step.
		No	If noise is due to refrigerant lines, repair detached or missing clips, tighten loose bolts, then go to next step.
19	VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR Has A/C compressor noise stopped?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

* : If there is gas leakage, air enters into the A/C system. The desiccant within the receiver/drier absorbs the moisture from the air and becomes saturated. If the A/C system is used in this condition, the inside of the A/C compressor will begin to rust due to this moisture, which may cause lock up or noise to occur. Therefore, replacement of the receiver/drier is necessary.

TECHNICAL DATA

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TECHNICAL DATA

TECHNICAL DATA

ENGINE

A6E931001001W01

Item			Engine		
			L8	LF	L3
MECHANICAL					
valve clearance	(mm {in})	IN	0.22—0.28 {0.0087—0.0110}		
	[Engine cold]	EX	0.27—0.33 {0.0106—0.0130}		
Compression pressure	(kPa {kgf/cm ² , psi})	Standard	1,750 {17.8, 253} [300 rpm]	1,720 {17.5, 249} [300 rpm]	1,430 {14.6, 208} [290 rpm]
		Minimum	1,225 {12.492, 177.64} [300 rpm]	1,204 {12.277, 174.58} [300 rpm]	1,000 {10.197, 145.00} [290 rpm]
		Maximum difference between cylinders	196.1{2.0, 28}		
Cylinder head bolt length	(mm {in})	Standard	149.0—150.0 {5.86—5.90}		
		Minimum	150.5 {5.92}		
Pushing distance of the front oil seal		(mm {in})	0—0.5 {0—0.02} (from the edge of the engine front cover)		

LUBRICATION SYSTEM

A6E931001001W02

Note

- The maintenance intervals on scheduled maintenance table (See [GI-33 SCHEDULED MAINTENANCE TABLE](#)) can only be supported by the use of following oils.

Item		Engine		
		L8	LF	L3
Oil pressure		234—521 {2.39—5.31, 33.9—71} [3,000]		
Oil capacity	Oil replacement (L {US qt, Imp qt})	3.9 {4.0, 3.4}		
	Oil and oil filter replacement (L {US qt, Imp qt})	4.3 {4.5, 3.8}		
	Total (dry engine) (L {US qt, Imp qt})	4.6 {4.8, 4.0}		

Recommended engine oil

Item		Market		
		European countries		Except European countries
Engine oil	Grade	API SJ ACEA A1 or A3	API SL ILSAC GF-3	API SG, SH, SJ, SL ILSAC GF-2, GF-3
	Viscosity (SAE)	5W-30	5W-20	40, 30, 20, 20W-20, 10W-30, 10W-40, 10W-50, 20W-40, 15W-40, 20W-50, 15W-50, 5W-20, 5W-30
	Remarks	Mazda genuine DEXELIA oil	—	—

TECHNICAL DATA

COOLING SYSTEM

A6E931001001W03

Item			Engine			
			L8		LF	
Coolant capacity (L {US qt, Imp qt})			7.5 {7.9, 6.6}			
Radiator cap	Cap valve opening pressure (kPa {kgf/cm ² , psi})		113—142 {1.15—1.44, 16.4—20.6}			
Thermostat	Type		Wax, bottom-bypass			
	Initial-opening temperature (°C {°F})		80—84 {176—183}			
	Full-opening temperature (°C {°F})		90{194}			
	Full-open lift (mm {in})		8.0{0.32} min.			
Cooling fan	Type		Electrical			
	Blade	Number	Cooling fan No.1: 5, Cooling fan No.2: 7	(Except for Israel) Cooling fan No.1:5 Cooling fan No.2: 7	(For Israel) Cooling fan No.1:7 Cooling fan No.2: 5	Cooling fan No.1: 7, Cooling fan No.2: 5
		Outer diameter (mm {in})	300 {11.8}			320 {12.6}

FUEL AND EMISSION CONTROL SYSTEMS

A6E931001001W04

Item			Engine			
			L8	LF (ATX)	LF (MTX)	L3
Idle speed (rpm)			650—750 (700±50)	650—750 (700±50)	600—700 (650±50)	600—700 (650±50)
Ignition timing (BTDC°/rpm)			Approx. 10/700	Approx. 10/700	Approx. 10/650	Approx. 10/650
Idle-up speed	E/L ON		650—750 (700±50)	650—750 (700±50)	650—750 (700±50)	650—750 (700±50)
	A/C ON	refrigerant pressure switch (middle) OFF	700—800 (750±50)	650—750 (700±50)	700—800 (750±50)	700—800 (750±50)
		refrigerant pressure switch (middle) ON		700—800 (750±50)		
	P/S ON		700—800 (750±50)	650—750 (700±50)	650—750 (700±50)	650—750 (700±50)
CO concentration			Within the regulation			
HC concentration						
Fuel pressure (kPa {kgf/cm ² , psi})	Hold pressure		More than 408 {4.2, 59}	More than 408 {4.2, 59}	More than 408 {4.2, 59}	More than 408 {4.2, 59}
Fuel injector	Fuel leakage (drop/2 minutes)		Less than 1			
	Injection volume (ml {cc, fl oz}/15 sec.)		51—77 {51—77, 1.8—2.7}	64—84 {64—84, 2.3—3.0}	64—84 {64—84, 2.3—3.0}	73—96 {73—96, 2.6—3.3}
	Resistance (ohm) [20°C {68°F}]		11.4—12.6	11.4—12.6	11.4—12.6	11.4—12.6

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TECHNICAL DATA

ENGINE ELECTRICAL SYSTEM

A6E931001001W05

Item					Engine		
					L8	LF	L3
Battery	Electrolyte gravity				1.27—1.29		
	Back-up current* ¹ (mA)				Max. 20		
	Market	European spec.			50D20L, 75D26L		50D20L, 80D26L
		GCC spec.			46B24LS	46B24LS, 75D26L * ⁴	46B24LS
	Test load chart (A)	Battery type	46B24LS (36)		135		
			50D20L (48)		150		
			75D26L (52)		195		
			80D26L (55)		195		
	Slow charge (A)	Battery type (5-hour rate)	46B24LS (36)		3.5—4.5		
			50D20L (48)		4.0—5.0		
			75D26L (52)		5.0—6.0		
			80D26L (55)		5.5—6.5		
	Quick charge (A/30 min)	Battery type (5-hour rate)	46B24LS (36)		25		
			50D20L (48)		25		
			75D26L (52)		35		
			80D26L (55)		35		
Generator	Standard voltage (V)	Ignition switch ON	Terminal	B	B+		
				P	Below approx. 1		
				D	Approx. 0		
		Idle [20 °C {68 °F}]	Terminal	B	13—15		
				P	Approx. 3—8		
				D	* 3		
	Generated current* ² (Reference) (A)	Engine speed (rpm)		1000	0—80		
				2000	0—90		
Ignition coil	Resistance [20 °C {68 °F}]	Primary coil (ohm)		0.49—0.57			
		Secondary coil (kilohm)		9.5—11.1			
		Insulation resistance of case (megohm)		Above 10			
High-tension lead	Resistance (kilohm)	No.1 lead			9.84—22.96	9.84—22.96	
		No.2 lead					
		No.3 lead					
		No.4 lead					
Spark plug	Type	NGK			ITR6F—13		
Starter	No load test	Voltage (V)			11		
		Current (A)			Below 90		

*¹ : Back-up current is the constant flow of current present (for the audio unit, clock, PCM, etc.) when the ignition switch is off and with the ignition key removed.

*² : Must not be 0 A.

*³ : Turn the following electrical loads on and verify that the voltage reading increases.
—Headlights, blower motor, and rear window defroster

*⁴ : Intensely hot area

TECHNICAL DATA

CLUTCH

A6E931001024W01

Item				Specification
Clutch pedal	Height (with carpet)		mm {in}	L.H.D.: 226—222 {8.50—8.74}
				R.H.D.: 229—235 {9.02—9.25}
	Free play	Pedal free play	mm {in}	1.0—3.0 {0.04—0.11}
		Push rod free play at clutch pedal	mm {in}	0.1—0.5 {0.004—0.02} (Reference value)
	Disengagement point	Disengagement stroke	mm {in}	20 {0.79} (Reference value)
		Pedal stroke	mm {in}	130.7 {5.15} (Reference value)
Clutch cover	Diaphragm spring fingers	Depth	mm {in}	0.6 {0.024}
		Misalignment	mm {in}	0.6 {0.024}
	Maximum clearance of flatness of the pressure plate		mm {in}	0.5 {0.020}
Clutch disc	Minimum thickness		mm {in}	0.3 {0.012}
	Run out limit		mm {in}	0.7 {0.028}
Flywheel	Run out limit		mm {in}	0.1 {0.004}

MANUAL TRANSAXLE

A6E931001024W02

Item			Specification
Manual transaxle type			G35M-R
Transaxle oil	Grade		API service GL-4 or GL-5
	Viscosity	All-season	SAE 75W-90
		Above 10 °C {50 °F}	SAE 80W-90
	Capacity (L {US qt, Imp qt})		2.87 {3.03, 2.53}

AUTOMATIC TRANSAXLE

A6E931001024W03

Item				Specification
Transaxle type				FN4A-EL
ATF	Type			ATF M-V
Line pressure (kPa {kgf/cm ² , psi})	D, S, L range	Idle		330—470 {3.4—4.8, 48—68}
		Stall		1,160—1,320 {11.8—12.5, 168—191}
	R position	Idle		490—710 {5.0—7.2, 71—102}
		Stall		1,600—1,820 {16.3—18.6, 232—264}
Engine stall speed (rpm)	D, S, L range			2,000—2,600
	R position			2,000—2,600
Time lag (s)	N → D			0.4—0.7
	N → R			0.4—0.7
Transaxle range (TR) switch (ohm)	P position			4,085—4,515
	R position			1,425—1,575
	N position			713—788
	D range			371—410
	S range			190—210
	L range			87—96
Transaxle Fluid temperature (TFT) sensor (kilohm)	ATF temperature: -20 °C {-4 °F}			236—324
	ATF temperature: 0 °C {32 °F}			84.3—110
	ATF temperature: 20 °C {68 °F}			33.5—42.0
	ATF temperature: 40 °C {104 °F}			14.7—17.9
	ATF temperature: 60 °C {140 °F}			7.08—8.17
	ATF temperature: 80 °C {176 °F}			3.61—4.15
	ATF temperature: 100 °C {212 °F}			1.96—2.24
	ATF temperature: 120 °C {248 °F}			1.13—1.28
	ATF temperature: 130 °C {266 °F}			0.87—0.98

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TECHNICAL DATA

Item		Specification
Input/turbine speed sensor (ohm)	ATF temperature: -40—160 °C {-40—320 °F}	250—600
Vehicle speedometer sensor (VSS) (V)		4.5—5.5
Solenoid valve (ohm)	ATF temperature: -40—150 °C {-40—302 °F}	Shift solenoid A
		Shift solenoid B
		Shift solenoid C
		Shift solenoid D
		Shift solenoid E
		Pressure control

FRONT AND REAR AXLE

A6E931001018W01

Item		Specification		
		ATX	MTX	
FRONT AXLE				
Maximum wheel bearing play	(mm {in})	0.05 {0.002}		
REAR AXLE				
Maximum wheel bearing play	(mm {in})	0.05 {0.002}		
DRIVE SHAFT				
Shaft length (Air in boot at atmospheric pressure)	(mm {in})	Left side	674.5—684.5 {26.56—26.94}	677.7—687.7 {26.67—27.07} (L8, LF), 676.6—686.6 {26.64—27.03} (L3)
		Right side	631.2—641.2 {24.86—25.24}	628.6—638.6 {24.75—25.14}

STEERING SYSTEM

A6E931001034W01

Item		Specification
ENGINE SPEED SENSING POWER STEERING		
Steering wheel	Play (mm {in})	0—30 {0—1.18}
	Effort (N·m {kgf·cm, in·lbf})	7.8 {80, 58} max.
Steering shaft	Length (mm {in})	211.6 {8.3}
Steering gear	Tie-rod end	Rotation torque (N·m {kgf·cm, in·lbf})
		[Pull scale reading] (N {kgf, lbf})
	Tie rod	Swinging torque (N·m {kgf·cm, in·lbf})
		[Pull scale reading] (N {kgf, lbf})
	Steering rack	Runout (mm {in}) Large diameter portion
		Small diameter portion
Power steering oil pump	Oil pump fluid pressure (MPa {kgf·cm ² , psi})	
	Gear housing fluid pressure (MPa {kgf·cm ² , psi})	
Power steering system	Fluid	Type
		Capacity* (Approximate quantity) (L {US qt, Imp qt})

* : When reservoir tank is at maximum volume

TECHNICAL DATA

BRAKING SYSTEM

A6E931001020W01

Item		Specification
CONVENTIONAL BRAKE SYSTEM		
Brake pedal	Brake pedal height (mm {in})	R.H.D.: 172 {6.77} L.H.D.: 187 {7.36}
	Brake pedal play (mm {in})	0—3 {0—0.1}
	Pedal-to-floor clearance (Brake pedal when depressed at 588 N {60 kgf, 132 lbf}) (mm {in})	68 {2.7} min.
Power brake unit	Fluid pressure when pedal depressed at 200 N {20 kgf, 44 lbf} (kPa {kgf/cm ² , psi})	At 0 kPa {0 mmHg, 0 inHg} 590 {6.02, 85.6} min.
		At 66.7 kPa {500 mmHg, 19.7 inHg} 8,780 {89.53, 1,273} min.
Dual proportioning valve (without ABS)	Switching point (kPa {kgf/cm ² , psi})	2,450 {25, 355} ±200 {2, 29}
	Rear wheel pressure when master cylinder pressure is 5,880 kPa {60 kgf/cm ² , 853 psi} (kPa {kgf/cm ² , psi})	3,480 {35.5, 505} ±300 {3, 44}
Front disc brake	Minimum disc pad thickness (mm {in})	2.0 {0.079}
	Minimum disc plate thickness (mm {in})	22 {0.87}
	Disc plate runout limit (mm {in})	0.05 {0.002}
Rear disc brake	Minimum disc pad thickness (mm {in})	2.0 {0.079}
	Minimum disc plate thickness (mm {in})	8 {0.31}
	Disc plate runout limit (mm {in})	0.05 {0.002}
Brake fluid	Type	European (L.H.D. U.K.) specs.: SAE J1703, FMVSS 116 DOT3 OR DOT4 GCC specs.: SAE J1703, FMVSS 116 DOT3
PARKING BRAKE SYSTEM		
Parking brake lever	Lever stroke when pulled at 98 N {10 kgf, 22 lbf} (notches)	3—6

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TECHNICAL DATA

SUSPENSION

A6E931001013W01

Suspension

Item			Specification
Front wheel alignment (Unloaded) ^{*1}	Maximum steering angle	Inner	39°±3°
		Outer	31°±3°
	Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1±3 {0.04±0.12}
		(degree)	0°11'±0°22'
	Caster angle ^{*2} (Reference value)	normal	3°47'±1°
		height up ^{*3}	3°42'±1°
	Camber angle ^{*2} (Reference value)	normal	-0°17'±1°
		height up ^{*3}	-0°10'±1°
Rear wheel alignment (Unloaded) ^{*1}	Steering axis inclination (Reference value)	normal	5°28'
		height up ^{*3}	5°18'
	Total toe-in	(mm {in})	Tire: 2±4 {0.08±0.16}, Rim inner: 1±3 {0.04±0.12}
		(degree)	0°11'±0°22'
	Camber angle ^{*2}	normal	-1°13'±1°
		height up ^{*3}	-1°05'±1°
Ball joint rotation torque	Thrust angle		0°±0°48'
	Front upper arm	(N·m {kgf·cm, in·lbf})	1.5 (15.0, 13.2) max.
	Front lower arm (front)		1.18—2.23 (12.12—2.7, 10.5—19.7)
	Front lower arm (rear)		1.00—2.22 (10.2—22.6, 8.86—19.6)
Front and rear stabilizer control link rotation torque		(N·m {kgf·cm, in·lbf})	0.23—0.47 (2.4—4.7, 2.1—4.1)

^{*1} : Fuel tank full. Engine coolant and engine oil are at specified level. Spare tire, jack, and tools are in designated position. Adjust to the median when carrying out wheel alignment.

^{*2} : Difference between left and right must not exceed 1° 30'.

^{*3} : Distance between wheel center and fender brim is following. Front: 402 mm {15.8 in} (reference value) Rear: 392 mm {15.4 in} (reference value)

TECHNICAL DATA

Wheel and Tires

Item				Specification		
Standard tire and wheel						
Wheel	Size			15 × 6JJ	16 × 7JJ	17 × 7JJ
	Offset (mm {in})			50 {1.97}	55 {2.17}	
	Pitch circle diameter (mm {in})			114.3 {4.50}		
	Material			Steel	Aluminum alloy	
Tire	Size			195/65R15 91V	205/55R16 91V	215/45R17 87W
	Air pressure (kPa {kgf/cm ² , psi})	Front	Up to 4 persons	220 {2.2, 32}		
			Full load	240 {2.4, 35}		
		Rear	Up to 4 persons	220 {2.2, 32}		
			Full load	300 {3.1, 44}	270 {2.8, 39}	
	Remaining tread (mm {in})			1.6 {0.06}		
Wheel and tire	Wheel and tire runout (mm {in})		Radial direction	1.5 {0.06} max.		
			Lateral direction	2.5 {0.10} max.	2.0 {0.08} max.	
	Wheel imbalance (g {oz})		Knock-type* ² : 9 {0.32} max.	Adhesive-type* ¹ : 13 {0.46} max. Knock-type* ² : 8 {0.28} max.	Adhesive-type* ¹ : 11 {0.39} max. Knock-type* ² : 7 {0.25} max.	
Temporary spare tire						
Wheel	Size			15×4T		
	Offset (mm {in})			40 {1.57}		
	Pitch circle diameter (mm {in})			114.3 {4.50}		
	Material			Steel		
Tire	Size			T115/70 D15		
	Air pressure (kPa {kgf/cm ² , psi})			420 {4.2, 60}		
Wheel and tire	Wheel and tire runout (mm {in})		Radial direction	2.0 {0.08} max.		
			Lateral direction	2.5 {0.10} max.		

*¹ : Total weight exceeds 160 g {5.65 oz}.

*² : One balance weight: 60 g {2.12 oz} max. If the total weight exceeds 100 g {3.53 oz} on one side, rebalance after moving the tire around on the rim. Do not use 3 or more balance weights.

TECHNICAL DATA

BODY ELECTRICAL SYSTEM

A6E931001047W01

Item				Specifications
Exterior light bulb capacity (W)	Headlight	Low beam	Halogen type	55 × 2
			Discharge type	35 × 2
		High beam		55 × 2
	Parking light			5 × 2
	Front fog light			55 × 2
	Front turn light			21 × 2
	Front side turn light			5 × 2
	Brake light/taillight			21/5 × 2
	Rear turn light			21 × 2
	Back-up light			18.4 × 2
	Rear fog light			21 × 1
	License plate light			5 × 2
	High-mount brake light	4SD	In-vehicle-type	18.4 × 1
			Rear spoiler type	4 × 1
Interior light bulb capacity (W)	5HB			21 × 1
	Front map light			5 × 2
	Rear map light			5 × 2
	Trunk compartment light			5 × 1
	Cargo compartment light			5 × 1
	Courtesy light			5 × 2
	Ignition key illumination			1.4 × 1
	Ashtray illumination			1.4 × 1
	Glove compartment light			1.7 × 1

HEATER AND AIR CONDITIONER SYSTEMS

A6E931001038W01

Item			Specification
REFRIGERANT SYSTEM			
Refrigerant	Type		R-134a
	Regular amount (g {oz})	L.H.D.	470 {16.6}
		R.H.D.	430 {15.2}
BASIC SYSTEM			
A/C compressor	Lubricating oil	Type	ATMOS GU10
		Sealed volume (ml {cc, fl oz})	120 {120, 4.06}
CONTROL SYSTEM			
Magnetic clutch	Clearance	(mm {in})	0.3—0.5 {0.012—0.019}

SPECIAL TOOLS

- SPECIAL TOOLS ST-2
 - ENGINE ST-2
 - LUBRICATION SYSTEM ST-2
 - COOLING SYSTEM.....ST-2
 - FUEL AND EMISSION CONTROL SYSTEMS..ST-3
 - CLUTCH.....ST-3
 - MANUAL TRANSAXLE.....ST-3
 - AUTOMATIC TRANSAXLE.....ST-4
 - FRONT AND REAR AXLE ST-4
 - STEERING SYSTEM ST-6
 - BRAKING SYSTEM ST-7
 - SUSPENSION.....ST-8
 - BODY ST-8
 - BODY ELECTRICAL SYSTEM ST-9
 - HEATER AND AIR CONDITIONER SYSTEMS..ST-9

SPECIAL TOOLS

SPECIAL TOOLS

ENGINE

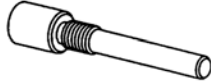
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Ford SSTs are marked with Ford SST number.

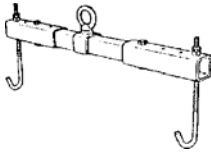
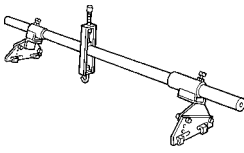
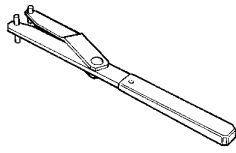
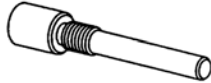
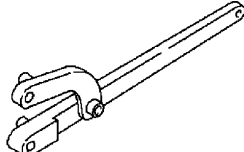
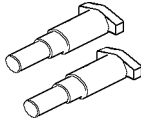
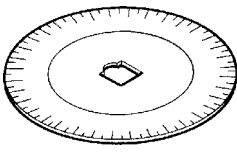
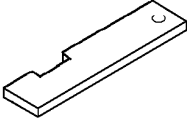
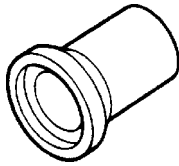
Example

1:49 JE01 061
2:303-507

Peg

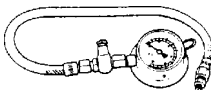
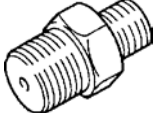
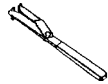


1: Mazda SST number
2: Ford SST number

49 L017 5A0 Support hanger set 	49 G017 5A0 Engine support set 	1:49 G032 354 2: – Adjusting wrench 
1:49 JE01 061 2:303-507 Peg 	1:49 UN20 5072 2:205-072 Holder 	1:49 UN20 507202 2:205-072-02 Adapter 
1:49 D032 316 2: – Protractor 	1:49 JE01 054 (Europe) 49 UN30 3376 (Except Europe) 2: 303-376 Plate 	1:49 H010 401 2: – Oil seal installer 

LUBRICATION SYSTEM

A6E941001001W02

49 0187 280A Oil pressure gauge 	49 E019 001 Adapter 	49 G032 354 Adjusting wrench 

COOLING SYSTEM

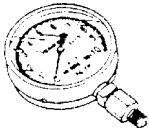
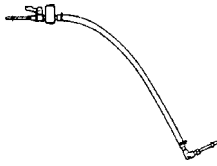
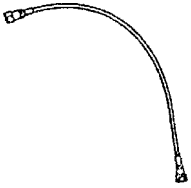
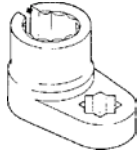
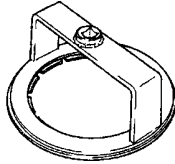
A6E941001001W03

WDS 	–	–

SPECIAL TOOLS

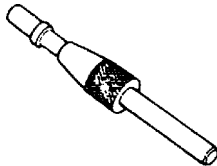
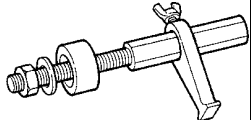
FUEL AND EMISSION CONTROL SYSTEMS

A6E941001001W04

49 B019 901B Oil Pressure Gauge 	49 N013 101A Body 	49 N013 102A Adapter Hose 
49 L018 001 O2 sensor wrench 	49 T042 001 Union wrench 	WDS 

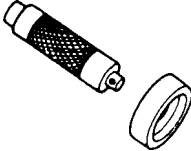
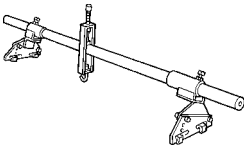
CLUTCH

A6E941001024W01

49 0259 770B Flare Nut Wrench 	49 SE01 310A Clutch Disc Centering Tool 	49 E011 1A0 Ring Gear Brake Set 

MANUAL TRANSAXLE

A6E941001024W02

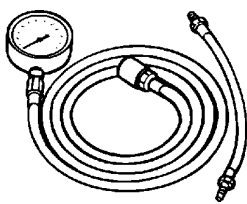
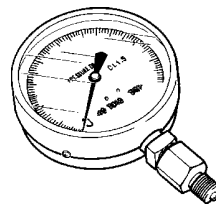
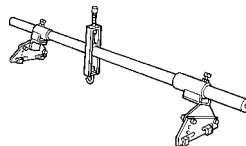
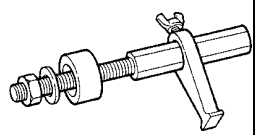
49 G030 795 Oil Seal Installer 	49 E017 5A0 Engine Support Set 	—

ST

SPECIAL TOOLS

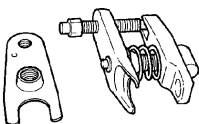
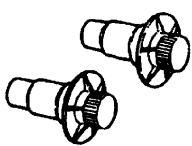
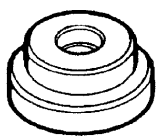
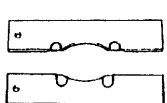
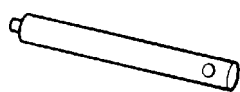
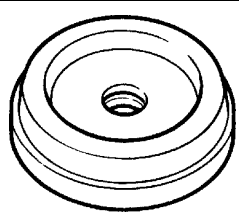
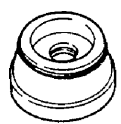
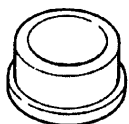
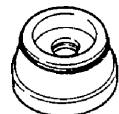
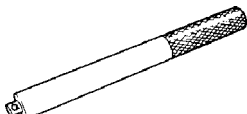
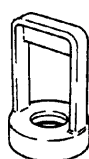
AUTOMATIC TRANSAXLE

A6E941001024W03

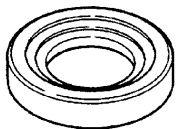
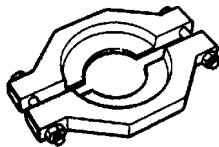
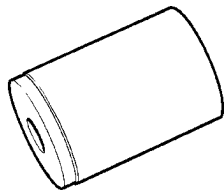
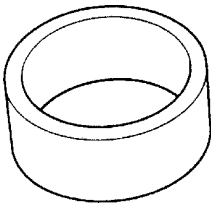
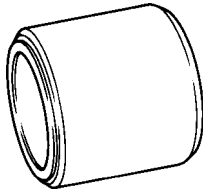
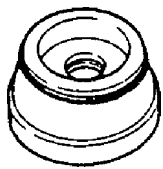
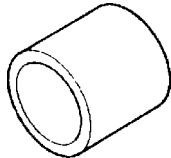
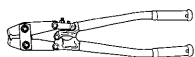
49 H019 002 Adapter 	49 0378 400C Oil Pressure Gauge Set 	49 B019 901B Oil Pressure Gauge 
49 G030 795 Oil Seal Installer 	WDS 	49 E017 5A0 Engine Support Set 
49 E011 1A0 Ring Gear Brake Set 	—	—

FRONT AND REAR AXLE

A6E941001018W01

49 0259 770B Flare Nut Wrench 	49 T028 3A0 Ball joint puller set 	49 G030 455 Diff. side gear holder 
49 G033 105 Attachment 	49 F026 103 Wheel hub puller 	49 G033 102 Handle 
49 G033 106 Attachment $\phi 80$ 	49 S033 101 Dust cover installer 	49 F027 009 Attachment $\phi 68$ & 77 
49 F027 004 Attachment $\phi 80$ 	49 F027 003 Handle 	49 B025 006A Sensor rotor installer 

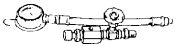
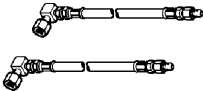
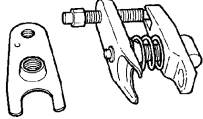
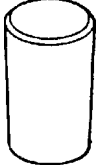
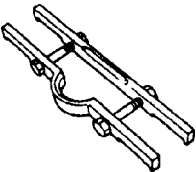
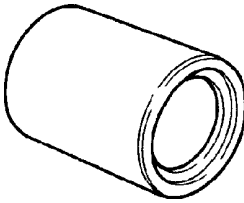
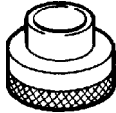
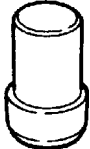
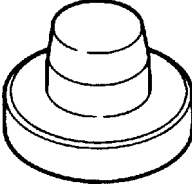
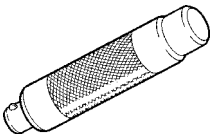
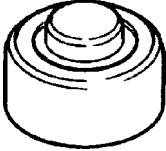
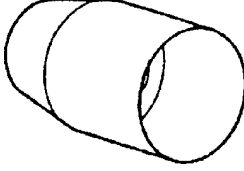
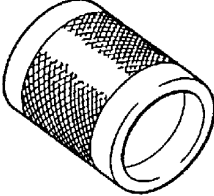
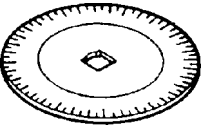
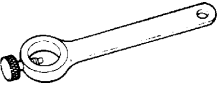
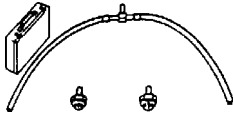
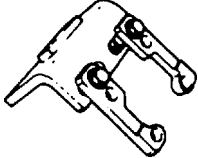
SPECIAL TOOLS

49 G026 105 Sensor rotor installer 	49 H027 002 Bearing remover 	49 W034 301 Support block 
49 S231 626 Support block 	49 B014 001 Oil seal installer 	49 B025 004 Dust seal installer 
49 F027 005 Attachment ø62 	49 W027 003 Bearing installer 	49 T025 001 Boot clamp crimper 

SPECIAL TOOLS

STEERING SYSTEM

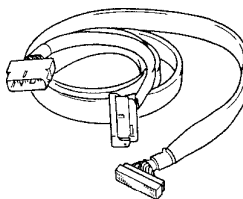
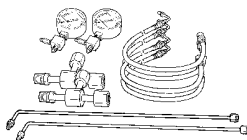
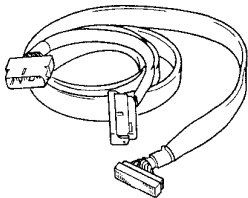
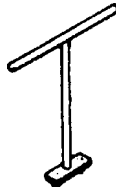
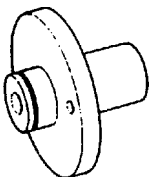
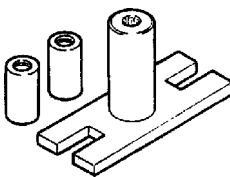
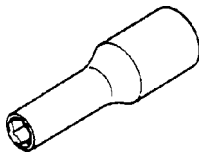
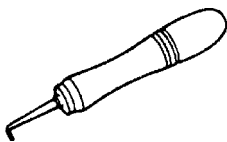
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49 1232 670B Power steering gauge set 	49 H002 671 Adapter 	49 G032 3A4 Power steering gauge adapter set 
49 T028 3A0 Ball joint puller set 	49 B032 320 Wrench 	49 B032 317 Bearing and oil seal remover 
49 F032 303 Handle 	49 B032 323 Rod seal remover body 	49 N032 319A Support plate 
49 B032 326 Outer box protector 	49 T028 301 Support plate 	49 B032 324 Rod seal protector body 
49 B032 325 Rod seal guide 	49 B032 331 Oil seal installer 	49 B001 797 Handle 
49 N032 320 Bearing installer 	49 E032 305 Slipper seal protector 	49 E032 306 Slipper seal former 
49 D032 316 Protractor 	49 0180 510B Preload measuring attachment 	49 G032 3A1 Joint host set 
49 F032 301 Power steering pump hanger 	49 F032 3A2 Installer set 	—

SPECIAL TOOLS

BRAKING SYSTEM

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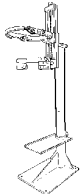
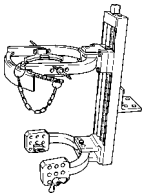
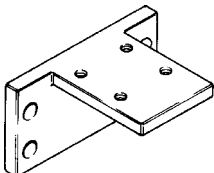
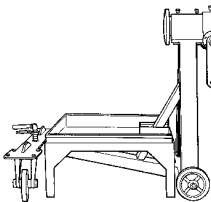
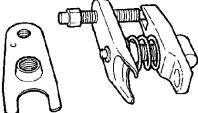
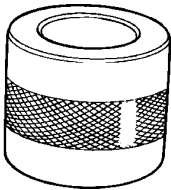
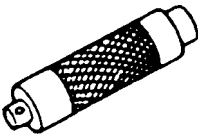
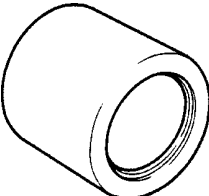
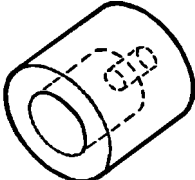
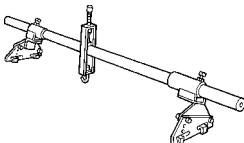
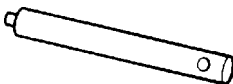
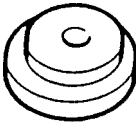
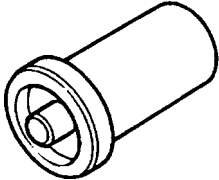
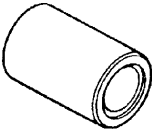
49 0259 770B Flare nut wrench 	49 G066 001 Adapter harness 	49 U043 0A0A Oil pressure gauge set 
49 C066 001 Adapter harness 	49 0221 600C Disc brake expand tool 	49 FA18 602 Disc brake piston wrench 
49 G043 001 Adjust gauge 	49 E043 003A Turning lock tool 	49 B043 004 Socket wrench 
49 0208 701A Boot air out tool 	WDS 	—

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SPECIAL TOOLS

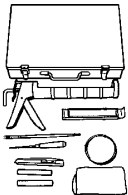
SUSPENSION

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49 T034 1A0 Coil spring compressor set 	49 T034 101 Coil spring compressor 	49 T034 105 Attachment 
49 0107 680A Engine stand 	49 T028 3A0 Ball joint puller set 	49 T034 202A Guide 
49 B034 216 Installer 	49 S120 620 Bearing installer 	49 T034 203 Attachment 
49 G030 797 Handle 	49 U034 204 Dust boot installer 	49 U027 005 Bearing installer 
49 G026 103 Support block 	49 E017 5A0 Engine support set 	49 G033 102 Handle 
49 G033 106 Attachment 	49 W034 308 Puller and installer 	49 8038 785A Dust boot installer 

BODY

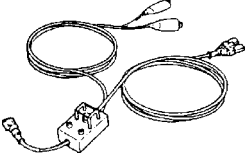
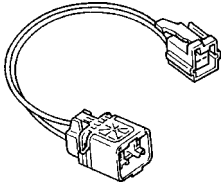
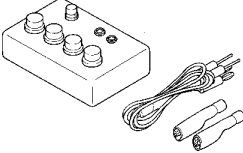
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49 0305 870A Window tool set 	49 G050 1A0 Sealant remover 	

SPECIAL TOOLS

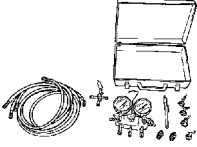
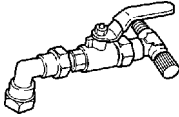
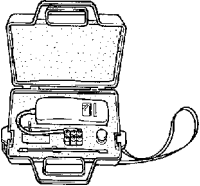
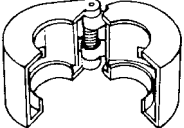
BODY ELECTRICAL SYSTEM

A6E941001047W02

49 H066 002 Deployment tool 	49 D066 002 Adapter harness 	49 G066 003 Adapter harness 
49 L066 002 Adapter harness 	49 N088 0A0 Fuel and Thermometer checker 	WDS 

HEATER AND AIR CONDITIONER SYSTEMS

A6E941001038W01

49 C061 0A0B Gas Charge Set 	49 C061 012 Anti-Back Flow Valve 	49 C061 013 Gas Leak Tester 
49 G061 001 Spring lock coupling disconnect tool 	—	—