

Repair Manual • 2AR-FE (Engine Control) • SFI System • P1603, P1605

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P1603Engine Stall HistoryP1605Rough Idling

DESCRIPTION

P1603

After starting the engine, this DTC is stored when the engine stops without the ignition switch being operated.

Using the Techstream, the conditions present when the DTC was stored can be confirmed by referring to the freeze frame data. Freeze frame data records engine conditions when a malfunction occurs. This information can be useful when troubleshooting.

It is necessary to check if the vehicle has run out of fuel before performing troubleshooting, as this DTC is also stored when the engine stalls due to running out of fuel.

P1605

This DTC is stored if the engine speed drops below the set speed.

Using the Techstream, the conditions present when the DTC was stored can be confirmed by referring to the freeze frame data. Freeze frame data records engine conditions when a malfunction occurs. This information can be useful when troubleshooting.

It is necessary to check if the vehicle ran out of fuel before performing troubleshooting, as this DTC is also stored when idling is unstable due to running out of fuel.

DTC No.	Detection Item	DTC Detection Condition	Trouble Area	MIL	Memory	Note
P1603	Engine Stall History	After monitoring for startability problems (P1604) finishes and 2 seconds or more elapse after starting the engine, with the engine running, the engine stops (the engine speed drops to 200 rpm or less) without the ignition switch being operated for 0.5 seconds or more (1 trip detection logic).	<ul style="list-style-type: none"> Air leak in intake system Purge VSV Brake booster assembly 	-	DTC stored	DTC for Mexico Models - Applies

DTC No.	Detection Item	DTC Detection Condition	Trouble Area	MIL	Memory	Note
			<ul style="list-style-type: none"> • Mass air flow meter sub-assembly • Engine coolant temperature sensor • Power supply circuit (purge VSV, air fuel ratio sensor, fuel injector assembly, ignition coil assembly) • Fuel pump • Fuel pump control circuit • Fuel line • PCV valve and hose • Camshaft timing oil control valve assembly • Knock control sensor • Ignition system • Thermostat • Air conditioning system • Power steering system • Electrical load signal system 			

DTC No.	Detection Item	DTC Detection Condition	Trouble Area	MIL	Memory	Note
			<ul style="list-style-type: none"> • Charging system • Automatic transaxle system • Park/Neutral position switch assembly • ECM • Immobiliser system • Wire harness or connector 			
P1605	Rough Idling	After 5 seconds or more elapse after starting the engine, with the engine running, the engine speed drops to 400 rpm or less (1 trip detection logic).	<ul style="list-style-type: none"> • Air leak in intake system • Purge VSV • Brake booster assembly • Mass air flow meter sub-assembly • Engine coolant temperature sensor • Power supply circuit (purge VSV, air fuel ratio sensor, fuel injector assembly, ignition coil assembly) • Fuel pump • Fuel pump control circuit 	-	DTC stored	DTC for Mexico Models - Applies

DTC No.	Detection Item	DTC Detection Condition	<ul style="list-style-type: none"> Fuel line Trouble Area PCV valve and hose Camshaft timing oil control valve assembly Knock control sensor Ignition system Thermostat Air conditioning system Power steering system Electrical load signal system Charging system Automatic transaxle system Park/Neutral position switch assembly ECM Immobiliser system Wire harness or connector 	MIL	Memory	Note

CAUTION / NOTICE / HINT**Hint:**

- In contrast to normal malfunction diagnosis for components, circuits and systems, DTCs P1603 and P1605 are used to determine the malfunctioning area from the problem symptoms and freeze frame data when the user mentions problems such as engine stall.

As these DTCs can be stored as a result of certain user actions, even if these DTCs are output, if the customer makes no mention of problems, clear these DTCs without performing any troubleshooting and return the vehicle to the customer.

- If any other DTCs are output, perform troubleshooting for those DTCs first.
- Use any information from the customer problem analysis about the condition of the vehicle at the time when the problem occurred (how the engine stopped, conditions when the engine was restarted, etc.) as a reference.

Symptom	Suspected Area
Engine vibration occurs and engine stops	Air fuel ratio abnormal
Engine stops with no engine vibration	Ignition system, injection stoppage, high load from external parts
Engine can be started with accelerator pedal depressed	Insufficient air volume
Rough idling after engine started	Air fuel ratio abnormal, abnormal combustion

- Read freeze frame data using the Techstream. Freeze frame data records engine conditions when a malfunction occurs. This information can be useful when troubleshooting.
- When confirming the freeze frame data, be sure to check all 5 sets of freeze frame data.

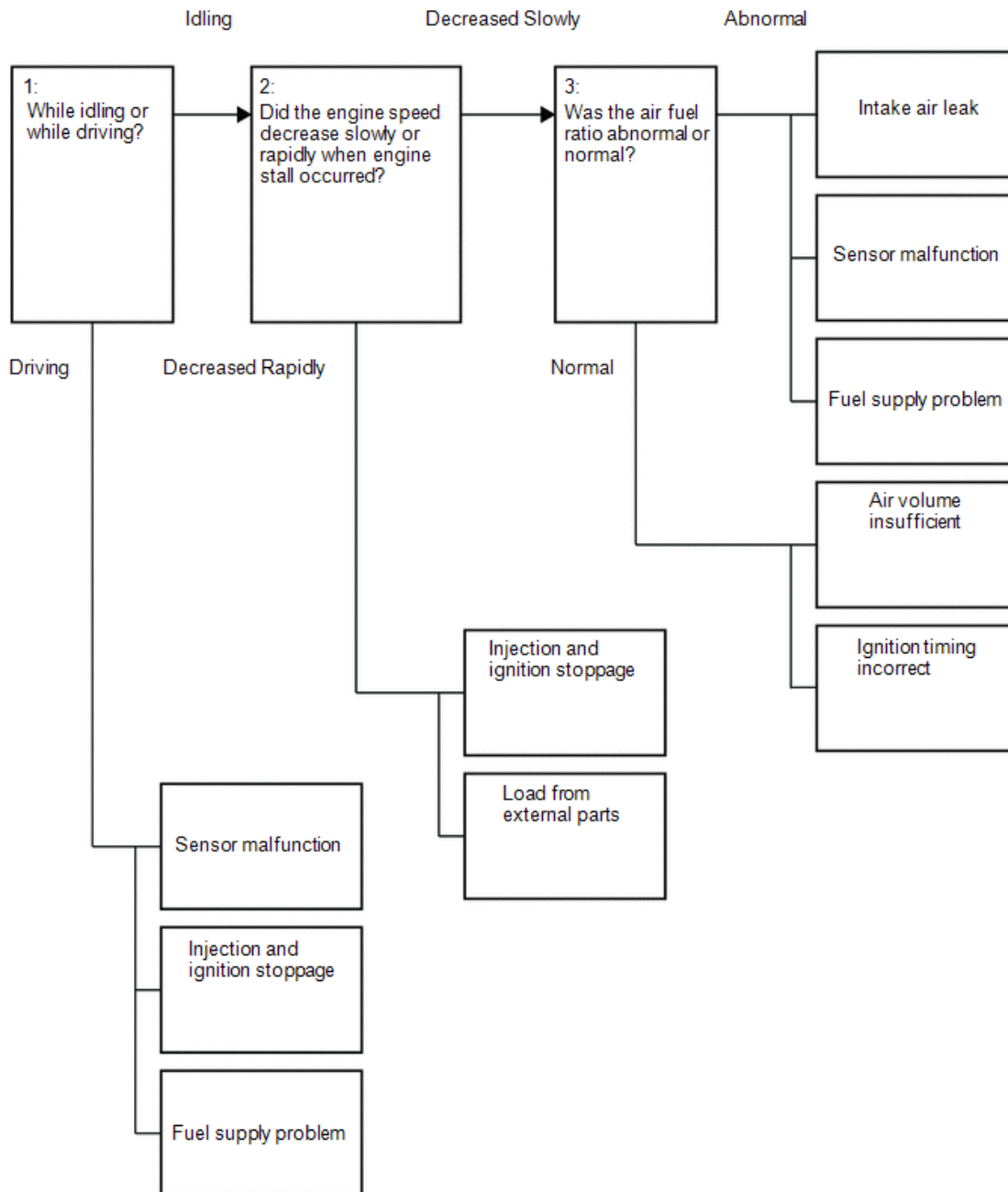
Click here [More Info](#)

- When DTC P1603 (Engine Stall History) is stored, DTC P1605 (Rough Idling) is also stored. When confirming freeze frame data, check DTC P1605. The ECM stores DTC P1605 first. Therefore, 5 sets of freeze frame data can be confirmed through DTC P1605, enabling the technician to obtain more information.
- When confirming freeze frame data, if there are multiple items related to the cause of the malfunction, perform troubleshooting for all related items.
- Try to operate the vehicle under the conditions recorded in the freeze frame data which were present when the malfunction occurred. Confirm the data at this time and the data when the engine is idling (engine warmed up, no load, and shift lever in D or N (neutral)) and compare these data with the freeze frame data.
- Inspections take into account the fact that the malfunction may not have reoccurred and place emphasis on checking the vehicle conditions present at the time when the malfunction occurred.
- When performing inspections, jiggle the relevant wire harnesses and connectors in an attempt to reproduce malfunctions that do not always occur.

Inspection flow

Using freeze frame data, narrow down the parts to be inspected according to the vehicle conditions at the time when the malfunction occurred.

P1603:



• **1:**

- If the engine stalled when the intake air volume was low (during idling or deceleration), there may be a decrease in torque due to an incorrect air fuel ratio, etc.
- If the engine stalled when the intake air volume was high (during driving or acceleration), there may be a major malfunction such as continuous misfire due to ignition stoppage, fuel injection stoppage, etc. and the torque drops to zero.

• **2:**

- If the engine speed decreased slowly, there may have been a decrease in torque due to an air fuel ratio that was incorrect (by approximately 20 to 30%), etc.

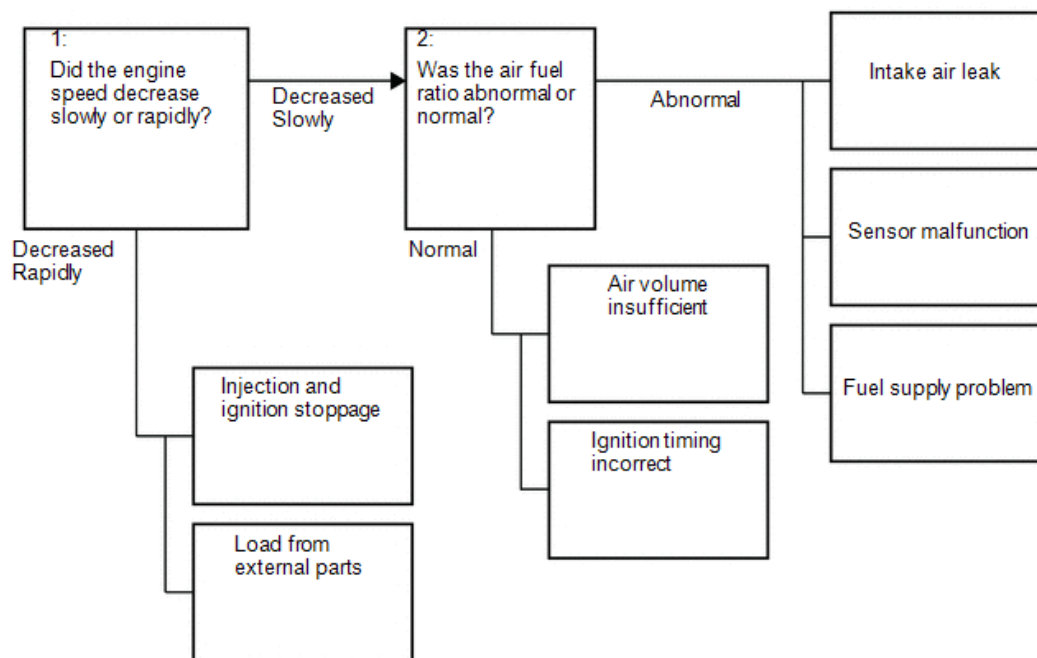
- If the engine speed decreased rapidly, there may have been a malfunction such as when the engine misfires almost continuously due to ignition stoppage, fuel injection stoppage, etc., or when the external load increases due to an external part malfunctioning.
- **3:**
- If the air fuel ratio is abnormal, there may have been an intake air leak, sensor malfunction, or fuel supply problem.
- If the vehicle was normal, the air volume may have been insufficient or the ignition timing may have been incorrect.

P1603 inspection flow: Narrow down the parts to be inspected according to the vehicle conditions at the time when the malfunction occurred (freeze frame data).

Vehicle State	Engine Speed	Suspected Area	Primary Parts to Inspect	Procedure	
Idling or decelerating	Slowly decreases and engine stalls	Ignition system abnormal	Igniter abnormal	<ul style="list-style-type: none"> • Power supply circuit • Ignition coil assembly • Spark plug 	10, 38, 53
		Air fuel ratio abnormal	Air suction	<ul style="list-style-type: none"> • Intake system connections • Purge VSV system • Brake booster assembly 	5 to 9
			Sensor malfunction (value from sensor too lean)	<ul style="list-style-type: none"> • Mass air flow meter sub-assembly • Engine coolant temperature sensor 	11 to 23
			Sensor malfunction (value from sensor too rich)	<ul style="list-style-type: none"> • Air fuel ratio sensor system • Thermostat 	39 to 51
			Fuel supply problem	<ul style="list-style-type: none"> • Fuel pump control circuit • Purge VSV system • Fuel line • ECM 	24 to 37

Vehicle State	Engine Speed	Suspected Area	Primary Parts to Inspect	Procedure	
		Intake air volume insufficient	Problem with air passage	<ul style="list-style-type: none"> Intake system connections Mass air flow meter sub-assembly Brake booster assembly PCV valve and hose Purge VSV system 	54 to 56
			Excessive valve overlap	<ul style="list-style-type: none"> Camshaft timing oil control valve assembly 	57 to 60
		Ignition timing incorrect	Does not operate as expected	<ul style="list-style-type: none"> Knock control sensor Engine coolant temperature sensor Mass air flow meter sub-assembly 	61 to 65
	Rapidly decreases and engine stalls	Ignition and injection stops (electrical system malfunction)	Power temporarily cut	<ul style="list-style-type: none"> Power supply circuit (fuel injector assembly, ignition coil assembly) 	66, 67
		External part malfunctioning	Increase in load	<ul style="list-style-type: none"> Air conditioning system Electrical load signal system Power steering system Automatic transaxle system Park/Neutral position switch assembly 	68 to 70
Accelerating	-	Crankshaft position sensor or camshaft position sensor malfunction	Power temporarily cut	<ul style="list-style-type: none"> Check DTCs 	1

Vehicle State	Engine Speed	Suspected Area	Primary Parts to Inspect	Procedure	
		Mass air flow meter	Foreign matter adhesion	<ul style="list-style-type: none"> Mass air flow meter sub-assembly 	71 to 74
		Ignition and injection stops (electrical system malfunction)	Power temporarily cut	<ul style="list-style-type: none"> Power supply circuit (fuel injector assembly, ignition coil assembly) 	75, 76
		Fuel supply problem	Fuel leak, clog	<ul style="list-style-type: none"> Fuel pump control circuit Fuel line 	77 to 81

P1605:

- **1:**

- If the engine speed decreased slowly, there may have been a decrease in torque due to an air fuel ratio that was incorrect (by approximately 20 to 30%), etc.

- If the engine speed decreased rapidly, there may have been a malfunction such as when the engine misfires almost continuously due to ignition stoppage, fuel injection stoppage, etc., or when the external load increases due to an external part malfunctioning.
- **2:**
- If the air fuel ratio is abnormal, there may have been an intake air leak, sensor malfunction, or fuel supply problem.
- If the vehicle was normal, the air volume may have been insufficient or the ignition timing may have been incorrect.

P1605 inspection flow: Narrow down the parts to be inspected according to the vehicle conditions at the time when the malfunction occurred (freeze frame data).

Engine Speed	Suspected Area	Primary Parts to Inspect	Procedure	
Slowly decreases	Ignition system abnormal	Igniter abnormal	<ul style="list-style-type: none"> • Power supply circuit • Ignition coil assembly • Spark plug 	10, 38, 53
	Air fuel ratio abnormal	Air suction	<ul style="list-style-type: none"> • Intake system connections • Purge VSV system • Brake booster assembly 	5 to 9
		Sensor malfunction (value from sensor too lean)	<ul style="list-style-type: none"> • Mass air flow meter sub-assembly • Engine coolant temperature sensor • Air fuel ratio sensor system • Thermostat 	11 to 23
		Sensor malfunction (value from sensor too rich)		39 to 51
		Fuel supply problem	<ul style="list-style-type: none"> • Fuel pump control circuit • Purge VSV system • Fuel line • ECM 	24 to 37

Engine Speed	Suspected Area	Primary Parts to Inspect	Procedure	
	Intake air volume insufficient	Problem with air passage	<ul style="list-style-type: none"> • Intake system connections • Mass air flow meter sub-assembly • Brake booster assembly • PCV valve and hose • Purge VSV system 	54 to 56
		Excessive valve overlap	<ul style="list-style-type: none"> • Camshaft timing oil control valve assembly 	57 to 60
	Ignition timing incorrect	Does not operate as expected	<ul style="list-style-type: none"> • Knock control sensor • Engine coolant temperature sensor • Mass air flow meter sub-assembly 	61 to 65
Rapidly decreases	Ignition and injection stops (electrical system malfunction)	Power temporarily cut	<ul style="list-style-type: none"> • Power supply circuit (fuel injector assembly, ignition coil assembly) 	66, 67
	External part malfunctioning	Increase in load	<ul style="list-style-type: none"> • Air conditioning system • Electrical load signal system • Power steering system • Automatic transaxle system • Park/Neutral position switch assembly 	68 to 70

NOTICE:

Inspect the fuses for circuits related to this system before performing the following procedure.

PROCEDURE

1. CHECK FOR ANY OTHER DTCS OUTPUT
 - a. Connect the Techstream to the DLC3.
 - b. Turn the ignition switch to ON.
 - c. Turn the Techstream on.

d. Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

e. Read the DTCs.

Powertrain > Engine and ECT > Trouble Codes

Result

Result	Proceed to
Only DTC P1603 and/or P1605 is output	A
DTCs other than P1603 and/or P1605 are output	B

Hint:

If any DTCs other than P1603 or P1605 are output, troubleshoot those DTCs first.

B ► GO TO DTC CHART [More Info](#)

A
▼

2. READ FREEZE FRAME DATA

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

OK

Immobiliser Fuel Cut is OFF.

Result

Result	Proceed to
Abnormal	A
Normal	B

B ► [GO TO STEP 4](#)[GO TO STEP 4](#)

A
▼

3. CHECK IMMOBILISER SYSTEM

- Connect the Techstream to the DLC3.
- Start the engine.

- c. Idle the engine.
- d. Turn the Techstream on.
- e. Enter the following menus: Powertrain / Engine and ECT / Data List / All Data / Immobiliser Communication and Immobiliser Fuel Cut.

Powertrain > Engine and ECT > Data List

Tester Display
Immobiliser Communication
Immobiliser Fuel Cut

- f. Check the Data List indication.

OK

Data List Item	Techstream Display
Immobiliser Communication	ON
Immobiliser Fuel Cut	OFF

Result

Result	Proceed to
OK	A
NG (w/ Smart Key System)	B
NG (w/o Smart Key System)	C

B	▶	CHECK IMMOBILISER SYSTEM More Info
C	▶	CHECK IMMOBILISER SYSTEM More Info

A
▼

4. READ FREEZE FRAME DATA

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

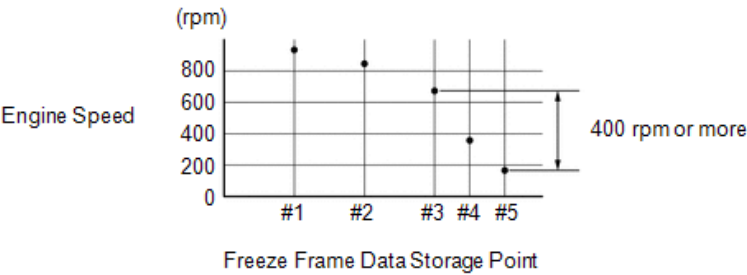
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Result

Problem Symptom	Freeze Frame Data Item for DTC P1605	Suspected Area	Proceed to	Engine Speed	Total of Short FT #1 and Long FT #1
	Closed Throttle Position SW				
When idling or decelerating, engine speed slowly decreases and engine stalls	All 5 sets of freeze frame data are ON	Decreases slowly*1	All 5 sets of freeze frame data are +15% or more*2	<ul style="list-style-type: none"> ■ Air suction ■ Sensor malfunction (value from sensor too lean) ■ Fuel supply problem 	A
			At least 1 of the 5 sets of freeze frame data is -15% or less*3	Sensor malfunction (value from sensor too rich)	B
			All 5 sets of freeze frame data are from -15% to +15%	<ul style="list-style-type: none"> ■ Intake air volume insufficient ■ Ignition timing incorrect 	C
When idling or decelerating, engine speed rapidly decreases and engine stalls		Decreases rapidly*1	-	<ul style="list-style-type: none"> ■ Injection stoppage, ignition stoppage ■ Load from external parts 	D

When accelerating or driving at constant speed and engine stalls*4	At least one is OFF	-	-	<div><div>■ Sensor malfunction</div><div>■ Injection stoppage, ignition stoppage</div><div>■ Fuel supply problem</div></div>	E
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Rapid Decrease in Engine Speed



Hint:

- *1: A rapid decrease in engine speed may have been caused by an electrical malfunction in the shared wiring of all or multiple cylinders, an increase in load from external parts, etc. The engine speed is considered to have decreased rapidly if either of the following conditions applies.

Otherwise, the engine speed is considered to have decreased slowly.

(a) In the freeze frame data, the decrease in engine speed from #3 to #5 is 400 rpm or higher.

(b) In the freeze frame data, the engine speed at #5 is 120 rpm or less.

- If the vehicle speed is 5 km/h (3 mph) or less and the difference between the Engine Speed and SPD (NT) is 100 rpm or less, inspect the automatic transaxle. (Depending on the rate of vehicle deceleration, the engine speed may have decreased due to the automatic transaxle lock-up release being late.)
- *2: When a DTC is stored, feedback compensation increases because the air fuel ratio is determined to be lean.
- *3: When a DTC is stored, feedback compensation decreases because the air fuel ratio is determined to be rich.
- *4: This item should be checked when DTC P1603 is output and is not necessary to check when only P1605 is output.

B	▶	GO TO STEP 38
C	▶	GO TO STEP 53

D	▶	GO TO STEP 66
E	▶	GO TO STEP 71

A

▼

5. CHECK INTAKE SYSTEM

- a. Check for air leakage in the intake system [vacuum hose disconnection, cracks, damaged gaskets, etc.].

Click here [More Info](#)

Hint:

- If the accelerator pedal is released after racing the engine, the inspection is easier to perform because the vacuum inside the intake pipes increases and the air suction noise becomes louder.
- If Short FT #1 and Long FT #1 are largely different from the normal values when idling (the intake air volume is small) and almost the same as the normal values when racing the engine (the intake air volume is high), air leakage may be present.

OK

There is no air suction.

Hint:

Perform "Inspection After Repair" after repairing or replacing the intake system.

Click here [More Info](#)

Result

Proceed to
OK
NG

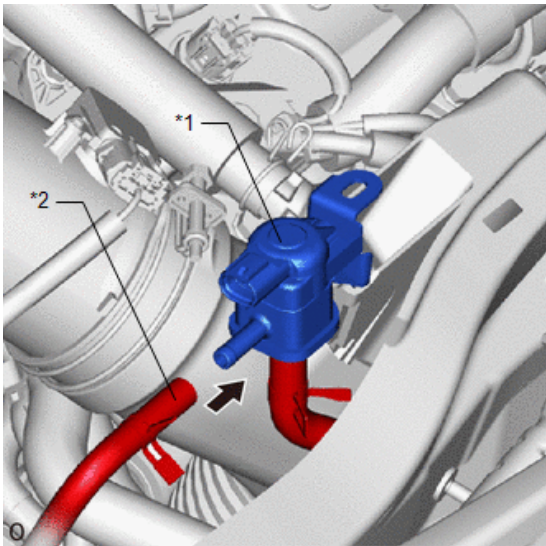
NG	▶	REPAIR OR REPLACE INTAKE SYSTEM
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OK

▼

6. CHECK PURGE VSV

- a. Disconnect the fuel vapor feed hose (on the canister side) of the purge VSV.



*1	Purge VSV
*2	Fuel Vapor Feed Hose (to Canister)

- b. Start the engine.
- c. Idle the engine.
- d. Disconnect the connector of the purge VSV.
- e. Check if air flows through the purge VSV.

OK

Air does not flow.

Hint:

When this inspection is performed, the MIL may illuminate. After finishing the inspection, check and clear the DTC.

Click here [More Info](#)

Result

Proceed to
OK
NG

NG

▶

REPLACE PURGE VSV [More Info](#)

OK

▼

7. READ FREEZE FRAME DATA

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.

- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
Stop Light Switch	At least 1 of the 5 sets of freeze frame data is ON	Air suction from brake booster assembly	A
	All 5 sets of freeze frame data are OFF	-	B

B

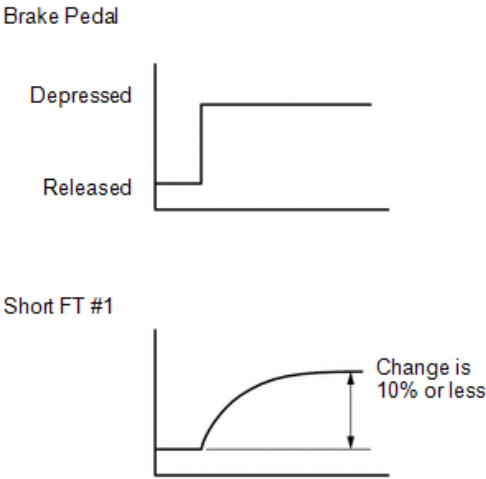
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[GO TO STEP 10GO TO STEP 10](#)

A

▼

8. READ VALUE USING TECHSTREAM (SHORT FT #1)
- a. Connect the Techstream to the DLC3.



- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Start the engine and warm it up until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- e. Idle the engine.

f. Using the Techstream, read the value of Short FT #1 in the Data List while depressing the brake pedal.

Powertrain > Engine and ECT > Data List

Tester Display

Short FT #1

Standard

Short FT #1 changes by +10% or less.

Result

Result	Proceed to
OK	A
NG	B

Hint:

When air leakage from the brake booster assembly is present, the feedback compensation increases because the air fuel ratio becomes lean.

B ▶

INSPECT BRAKE BOOSTER ASSEMBLY [More Info](#)

A

▼

9. PERFORM DRIVE TEST

- a. Connect the Techstream to the DLC3.
- b. Start the engine and warm it up until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- c. Idle the engine.
- d. Turn the Techstream on.
- e. Using the Techstream, read the value of Short FT #1 and Long FT #1 in the Data List.

Powertrain > Engine and ECT > Data List

Tester Display

Short FT #1

Long FT #1

Standard

Data List	Condition	Specified Condition
Short FT #1 + Long FT #1	The conditions of the vehicle are matched to those present when the problem occurs	-15 to +15%

Result

Result	Proceed to
OK	A
NG	B

B ► INSPECT BRAKE BOOSTER ASSEMBLY [More Info](#)

A
▼

10. CHECK IGNITION SYSTEM

- a. Perform ignition system On-vehicle Inspection.

Click here [More Info](#)

Hint:

Perform "Inspection After Repair" after repairing or replacing the ignition system.

Click here [More Info](#)

Result

Proceed to
OK
NG

NG ► REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA

OK
▼

11. READ FREEZE FRAME DATA

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
Calculate Load	Below 90% of the current value of the vehicle*1	Mass air flow meter sub-assembly	A
AFS Voltage B1S1	3.3 V or higher*2	<ul style="list-style-type: none"> Air fuel ratio sensor Wire harness or connector 	B

Hint:

- *1: If the mass air flow meter sub-assembly is malfunctioning and incorrectly measures the intake air volume to be less than the actual volume, the freeze frame data will show a low engine load value.
- *2: If the air fuel ratio sensor is malfunctioning and constantly outputs a value indicating the air fuel ratio is lean, the actual air fuel ratio will become rich and the engine may stall.

B ► [GO TO STEP 15](#)

A
▼

12. CHECK MASS AIR FLOW METER SUB-ASSEMBLY

- Remove the mass air flow meter sub-assembly.
- Check for foreign matter in the air flow passage of the mass air flow meter sub-assembly.

Result

Result	Proceed to
Visible foreign matter is not present	A
Visible foreign matter is present	B

Hint:

Perform "Inspection After Repair" after replacing the mass air flow meter sub-assembly.

Click here [More Info](#)

B ► REPLACE MASS AIR FLOW METER SUB-ASSEMBLY [More Info](#)

A
▼

13. CHECK HARNESS AND CONNECTOR (MASS AIR FLOW METER SUB-ASSEMBLY - ECM)

- Check the harnesses and connectors, referring to DTC P0102 procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG	▶	REPAIR OR REPLACE HARNESS OR CONNECTOR
----	---	----------------------------------------

OK
▼

14. PERFORM DRIVE TEST

- Connect the Techstream to the DLC3.
- Start the engine and warm it up until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- Idle the engine.
- Turn the Techstream on.
- Using the Techstream, read the value of Calculate Load in the Data List.

Powertrain > Engine and ECT > Data List

Tester Display
Calculate Load

Standard

Data List	Specified Condition
Calculate Load	90 to 110% of the current value of the vehicle

Result

Result	Proceed to
Abnormal	A
Normal	B

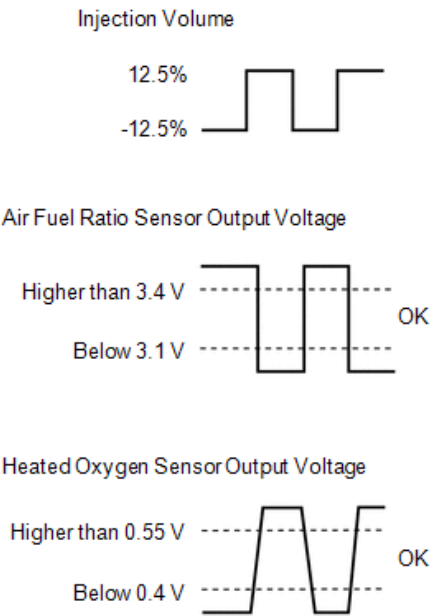
Hint:

Perform "Inspection After Repair" after replacing the mass air flow meter sub-assembly.

Click here [More Info](#)

A	▶	REPLACE MASS AIR FLOW METER SUB-ASSEMBLY More Info
B	▶	GO TO STEP 18GO TO STEP 18

15. PERFORM ACTIVE TEST USING TECHSTREAM (CONTROL THE INJECTION VOLUME FOR A/F SENSOR)
- a. Connect the Techstream to the DLC3.



- b. Start the engine, turn off all accessory switches and warm up the engine until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- c. Idle the engine.
- d. Turn the Techstream on.
- e. Enter the following menus: Powertrain / Engine and ECT / Active Test / Control the Injection Volume for A/F Sensor / All Data / AFS Voltage B1S1.

Powertrain > Engine and ECT > Active Test

Active Test Display
Control the Injection Volume for A/F Sensor

Data List Display**AFS Voltage B1S1**

- f. Read the output voltage from the air fuel ratio sensor when increasing and decreasing the fuel injection volume.

Standard

Techstream Display	Specified Condition
Control the Injection Volume for A/F Sensor (12.5%)	Air fuel ratio sensor output voltage is below 3.1 V
Control the Injection Volume for A/F Sensor (-12.5%)	Air fuel ratio sensor output voltage is higher than 3.4 V

Result

Result	Proceed to
Abnormal	A
Normal	B

Hint:

The air fuel ratio sensor has an output delay of a few seconds and the heated oxygen sensor has a maximum output delay of approximately 20 seconds.

B ► [GO TO STEP 18](#)

A
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16. CHECK TERMINAL VOLTAGE (POWER SOURCE OF AIR FUEL RATIO SENSOR)

- a. Check the harnesses and connectors, referring to DTC P0031 procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG

▶

REPAIR AIR FUEL RATIO SENSOR POWER SOURCE CIRCUIT [More Info](#)

OK

▼

17. CHECK HARNESS AND CONNECTOR (AIR FUEL RATIO SENSOR - ECM)
- a. Check the harnesses and connectors, referring to DTC P2237 procedure.

Click here [More Info](#)

- Hint:
- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.

■ Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG

▶

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

18. READ FREEZE FRAME DATA
- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Proceed to
Initial Engine Coolant Temp, Ambient Temp for A/C, Initial Intake Air Temp	Difference in temperature between each item is less than 10°C (18°F)*1	A
	Difference in temperature between each item is 10°C (18°F) or higher*2	B

- Hint:
- *1: A long time had elapsed after stopping the engine.

- *2: A long time had not elapsed after stopping the engine.

B

▶

[GO TO STEP 21](#)

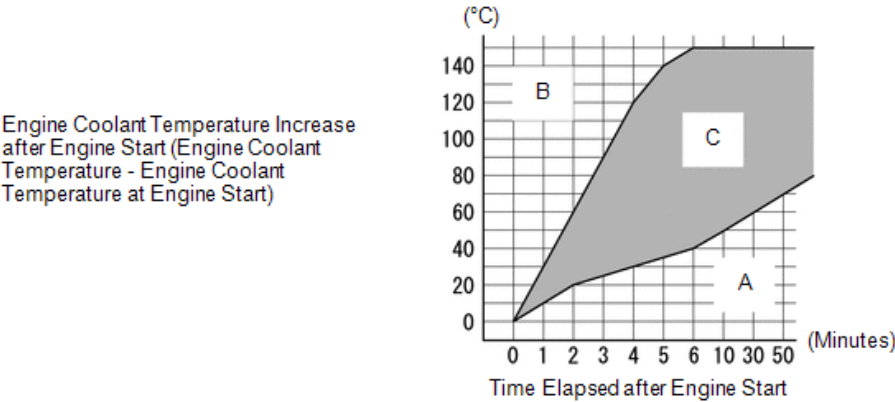
A

▼

19. READ FREEZE FRAME DATA

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)



Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
Initial Engine Coolant Temp, Coolant Temp, Engine Run Time	Range A	<ul style="list-style-type: none">▪ Engine coolant temperature sensor▪ Thermostat	A
	Range B	Engine coolant temperature sensor	B
	Range C	-	C

Hint:

This step is not directly related to engine stall.

B

▶

[GO TO STEP 22GO TO STEP 22](#)

C ► [GO TO STEP 24](#)[GO TO STEP 24](#)

A
▼

20. INSPECT THERMOSTAT

- a. Inspect the thermostat.

Click here [More Info](#)

Result

Result	Proceed to
Abnormal	A
Normal	B

A ► REPLACE THERMOSTAT [More Info](#)
B ► [GO TO STEP 22](#)[GO TO STEP 22](#)

21. READ FREEZE FRAME DATA

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
Coolant Temp	120°C (248°F) or higher	Engine coolant temperature sensor	A
	Engine coolant temperature is less than ambient temperature* by 15°C (27°F) or more	Engine coolant temperature sensor	
	Values are other than above	-	B

Hint:

*: Use an actual ambient temperature estimated from the Initial Intake Air, Ambient Temp for A/C, and (if possible) the weather when the DTC was detected.

B ► [GO TO STEP 24](#)[GO TO STEP 24](#)

A



22. INSPECT ENGINE COOLANT TEMPERATURE SENSOR

- a. Inspect the engine coolant temperature sensor.

Click here [More Info](#)

Result

Result	Proceed to
Normal	A
Abnormal	B

Hint:

Perform "Inspection After Repair" after replacing the engine coolant temperature sensor.

Click here [More Info](#)

B



REPLACE ENGINE COOLANT TEMPERATURE SENSOR [More Info](#)

A



23. CHECK HARNESS AND CONNECTOR (ENGINE COOLANT TEMPERATURE SENSOR - ECM)

- a. Disconnect the engine coolant temperature sensor connector.
- b. Disconnect the ECM connector.
- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
B4-2 (THW) - B77-95 (THW)	Always	Below 1 Ω
B4-1 (E2) - B77-96 (ETHW)	Always	Below 1 Ω
B4-2 (THW) or B77-95 (THW) - Body ground	Always	10 k Ω or higher

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to

Proceed to
OK
NG

NG	▶	REPAIR OR REPLACE HARNESS OR CONNECTOR
----	---	----------------------------------------

OK
▼

24. READ FREEZE FRAME DATA
- a. Connect the Techstream to the DLC3.

b. Turn the ignition switch to ON.

c. Turn the Techstream on.

d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
EVAP (Purge) VSV	At least 1 of the 5 sets of freeze frame data is not 0%	Purge VSV	A
	All 5 sets of freeze frame data are 0%	-	B

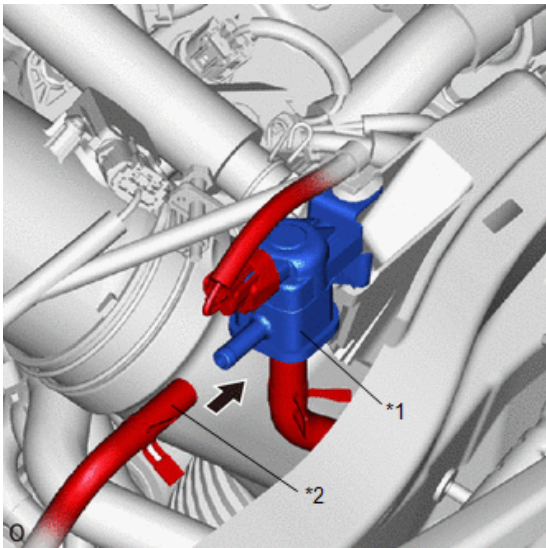
Hint:

If the purge VSV is stuck closed, air fuel ratio compensation by the purge VSV is incorrectly adjusted, and then the air fuel ratio becomes lean and the engine may stall.

B	▶	GO TO STEP 33
---	---	-------------------------------

A
▼

25. PERFORM ACTIVE TEST USING TECHSTREAM (ACTIVATE THE VSV FOR EVAP CONTROL)
- a. Disconnect the fuel vapor feed hose (on the canister side) of the purge VSV.



*1	Purge VSV
*2	Fuel Vapor Feed Hose (to Canister)

- b. Connect the Techstream to the DLC3.
- c. Start the engine.
- d. Turn the Techstream on.
- e. Enter the following menus: Powertrain / Engine and ECT / Active Test / Activate the VSV for Evap Control.

Powertrain > Engine and ECT > Active Test

Tester Display
Activate the VSV for Evap Control

- f. When purge VSV is operated using the Techstream, check whether the port of the purge VSV applies suction your finger.

OK

Techstream Operation	Specified Condition
ON	Purge VSV port applies suction to finger
OFF	Purge VSV port applies no suction to finger

Result

Result	Proceed to
Abnormal	A
Normal	B

Hint:

Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.

B

▶

GO TO STEP 33GO TO STEP 33

A

▼

26. INSPECT PURGE VSV
- a. Inspect the purge VSV.

Click here [More Info](#)

Result

Proceed to
OK
NG

NG

▶

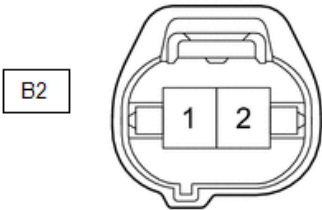
REPLACE PURGE VSV [More Info](#)

OK

▼

27. INSPECT TERMINAL VOLTAGE (POWER SOURCE OF PURGE VSV)
- a. Disconnect the purge VSV connector.

*a



*a	Front view of wire harness connector (to Purge VSV)
----	--------------------------------------------------------

- b. Turn the ignition switch to ON.
- c. Measure the voltage according to the value(s) in the table below.

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
B2-1 - Body ground	Ignition switch ON	11 to 14 V

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Result
OK
NG

NG	▶ REPAIR PURGE VSV POWER SOURCE CIRCUIT More Info
----	-------------------------------------------------------------------

OK
▼

28. CHECK HARNESS AND CONNECTOR (PURGE VSV - ECM)

- Disconnect the purge VSV connector.
- Disconnect the ECM connector.
- Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
B2-2 - B77-68 (PRG)	Always	Below 1 Ω
B2-2 or B77-68 (PRG) - Body ground	Always	10 k Ω or higher

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Result
OK
NG

NG	▶ REPAIR OR REPLACE HARNESS OR CONNECTOR
----	------------------------------------------

OK

▼

29. CLEAR DTC

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Clear the DTCs.

Click here [More Info](#)

Powertrain > Engine and ECT > Clear DTCs

Result

Proceed to

NEXT

NEXT

▼

30. READ VALUE USING TECHSTREAM (EVAP (PURGE) VSV)

- a. Connect the Techstream to the DLC3.
- b. Start the engine and warm it up until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- c. Idle the engine for 15 minutes or more.
- d. Turn the Techstream on.
- e. Using the Techstream, read the value of EVAP (Purge) VSV in the Data List.

Powertrain > Engine and ECT > Data List

Tester Display

EVAP (Purge) VSV

Standard

Data List	Specified Condition
EVAP (Purge) VSV	Value other than 0% is displayed

Result

Result	Proceed to
--------	------------

Result	Proceed to
Abnormal	A
Normal	B

B

▶

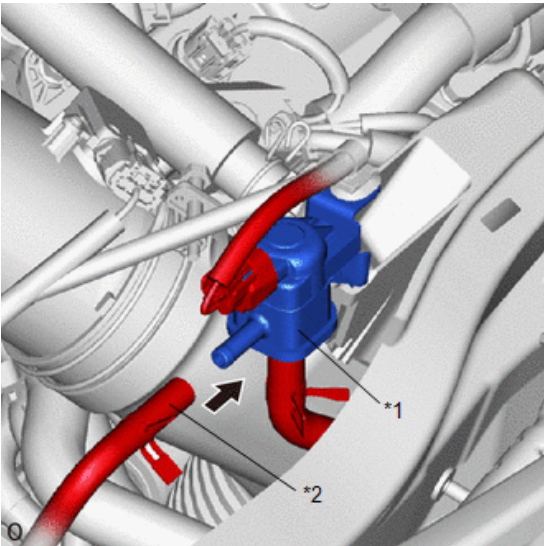
CHECK FOR INTERMITTENT PROBLEMS [More Info](#)

A

▼

31. PERFORM ACTIVE TEST USING TECHSTREAM (ACTIVATE THE VSV FOR EVAP CONTROL)

- a. Disconnect the fuel vapor feed hose (on the canister side) of the purge VSV.



*1	Purge VSV
*2	Fuel Vapor Feed Hose (to Canister)

- b. Connect the Techstream to the DLC3.
- c. Start the engine.
- d. Turn the Techstream on.
- e. Enter the following menus: Powertrain / Engine and ECT / Active Test / Activate the VSV for Evap Control.

Powertrain > Engine and ECT > Active Test

Tester Display
Activate the VSV for Evap Control

- f. When purge VSV is operated using the Techstream, check whether the port of the purge VSV applies suction your finger.

OK

Techstream Operation	Specified Condition
ON	Purge VSV port applies suction to finger
OFF	Purge VSV port applies no suction to finger

Result

Result	Proceed to
Abnormal	A
Normal	B

Hint:

Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.

B	▶	CHECK FOR INTERMITTENT PROBLEMS More Info
---	---	-----------------------------------------------------------

A
▼

32. CHECK CONNECTOR CONNECTION CONDITION (ECM)

- Check the ECM connector connection condition.

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

OK	▶	REPLACE ECM More Info
NG	▶	RECONNECT CONNECTOR CORRECTLY

33. PERFORM ACTIVE TEST USING TECHSTREAM (CONTROL THE FUEL PUMP / SPEED)

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Powertrain / Engine and ECT / Active Test / Control the Fuel Pump / Speed.

- w/ Fuel Pump Control ECU Assembly

Powertrain > Engine and ECT > Active Test

Tester Display

Control the Fuel Pump / Speed

- w/o Fuel Pump Control ECU Assembly

Powertrain > Engine and ECT > Active Test

Tester Display

Control the Fuel Pump / Speed

- e. Check whether the fuel pump operating sound occurs when performing the Active Test on the Techstream.

OK

Techstream Operation	Specified Condition
ON	Operating sound heard
OFF	Operating sound not heard

Result

Result	Proceed to
Abnormal	A
Normal	B

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- While performing the Active Test, make sure that there is no fuel leakage from the pipes, no signs that fuel has leaked, and no fuel smell.
- If the fuel pump operating noise is abnormal, proceed to step 34.

B ▶

[GO TO STEP 35](#)

A

▼

34. INSPECT FUEL PUMP

- a. Inspect the fuel pump.

Click here [More Info](#)**Hint:**

Perform "Inspection After Repair" after replacing the fuel pump.

Click here [More Info](#)

Result

Proceed to
OK
NG

OK	▶	CHECK FUEL PUMP CONTROL CIRCUIT More Info
NG	▶	REPLACE FUEL PUMP More Info

35. CHECK FUEL SYSTEM

a. Check the fuel system.

- Check the fuel pump operation.
- Check the fuel leaks.
- Check the fuel pressure.
- Perform the Active Test [Control the All Cylinders Fuel Cut].

Hint:

For the fuel system On-vehicle Inspection, refer to the following procedures.

Click here [More Info](#)

Result

Result	Proceed to
Abnormal	A
Normal	B

B	▶	CHECK FOR INTERMITTENT PROBLEMS More Info
---	---	-----------------------------------------------------------

A
▼

36. CHECK FUEL SYSTEM

a. Check for foreign matter such as iron particles around the fuel pump (fuel pump, fuel pump filter and inside the fuel tank), and for signs that the fuel pump was stuck.

Result

Result	Proceed to
There is no foreign matter and no signs that fuel pump was stuck	A

Result	Proceed to
There is foreign matter or signs that fuel pump was stuck	B

Hint:

If there is foreign matter such as iron particles on the fuel pump, fuel filter or fuel tank, remove the foreign matter.

B	▶	REPAIR OR REPLACE FUEL SYSTEM
---	---	-------------------------------

A
▼

37. CHECK FUEL SYSTEM**a. Check the fuel system.**

- Check the fuel pump operation.
- Check the fuel leaks.
- Check the fuel pressure.
- Perform the Active Test [Control the All Cylinders Fuel Cut].

Hint:

- For the fuel system On-vehicle Inspection, refer to the following procedures.

Click here [More Info](#)

- Perform "Inspection After Repair" after replacing the fuel pump.

Click here [More Info](#)

Result

Proceed to
OK
NG

OK	▶	END
NG	▶	REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA

38. CHECK IGNITION SYSTEM**a. Perform ignition system On-vehicle Inspection.**

Click here [More Info](#)

Hint:

Perform "Inspection After Repair" after repairing or replacing the ignition system.

Click here [More Info](#)

Result

Proceed to

OK

NG

NG ►

REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA

OK



39. READ FREEZE FRAME DATA

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
Calculate Load	110% or more of the current value of the vehicle*1	Mass air flow meter sub-assembly	A
AFS Voltage B1S1	Below 3.3 V*2	<ul style="list-style-type: none"> Air fuel ratio sensor Harness or connector 	B
Both freeze frame data items listed above	Values are other than above	-	C

Hint:

- *1: If the mass air flow meter sub-assembly is malfunctioning and incorrectly measures the intake air volume to be higher than the actual volume of air flowing through the intake manifold, the freeze frame data will show a high engine load value.
- *2: As the air fuel ratio sensor output is low before the sensor warms up, the value at that time cannot be used for diagnosis. If the air fuel ratio sensor is malfunctioning and constantly outputs a value indicating the air fuel ratio is rich, the actual air fuel ratio will become lean and the engine may stall.

B

▶

[GO TO STEP 43](#)[GO TO STEP 43](#)

C

▶

[GO TO STEP 46](#)[GO TO STEP 46](#)

A

▼

40. INSPECT MASS AIR FLOW METER SUB-ASSEMBLY

- a. Remove the mass air flow meter sub-assembly.

Click here

- b. Check for foreign matter in the air flow passage of the mass air flow meter sub-assembly.

Result

Result	Proceed to
Visible foreign matter is not present	A
Visible foreign matter is present	B

Hint:

Perform "Inspection After Repair" after replacing the mass air flow meter sub-assembly.

Click here [More Info](#)

B

▶

REPLACE MASS AIR FLOW METER SUB-ASSEMBLY [More Info](#)

A

▼

41. CHECK HARNESS AND CONNECTOR (MASS AIR FLOW METER SUB-ASSEMBLY - ECM)

- a. Check the harnesses and connectors, referring to DTC P0102 procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG

▶

REPAIR OR REPLACE HARNESS OR CONNECTOR

**42. PERFORM DRIVE TEST**

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Start the engine and warm it up until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- Idle the engine.
- Using the Techstream, read the value of Calculate Load in the Data List.

Powertrain > Engine and ECT > Data List

Tester Display
Calculate Load

Standard

Data List	Specified Condition
Calculate Load	90 to 110% of the current value of the vehicle

Hint:

Perform "Inspection After Repair" after replacing the mass air flow meter sub-assembly.

Click here [More Info](#)

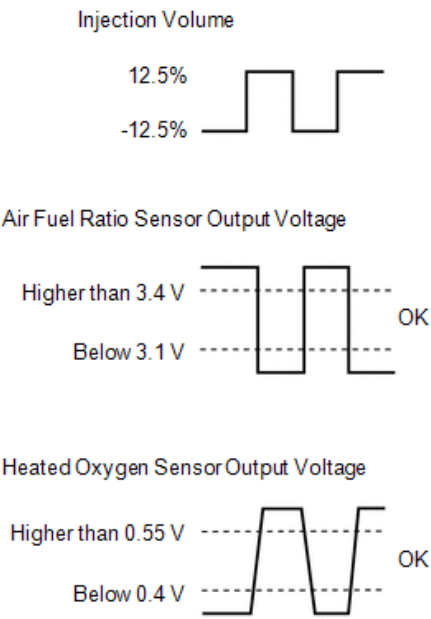
Result

Proceed to
OK
NG

NG	▶ REPLACE MASS AIR FLOW METER SUB-ASSEMBLY More Info
----	----------------------------------------------------------------------

**43. PERFORM ACTIVE TEST USING TECHSTREAM (CONTROL THE INJECTION VOLUME FOR A/F SENSOR)**

- Connect the Techstream to the DLC3.



- b. Start the engine, turn off all accessory switches and warm up the engine until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- c. Idle the engine.
- d. Turn the Techstream on.
- e. Enter the following menus: Powertrain / Engine and ECT / Active Test / Control the Injection Volume for A/F Sensor / All Data / AFS Voltage B1S1.

Powertrain > Engine and ECT > Active Test

Active Test Display
Control the Injection Volume for A/F Sensor

Data List Display
AFS Voltage B1S1

- f. Read the output voltage from the air fuel ratio sensor when increasing and decreasing the fuel injection volume.

Standard

Techstream Display	Specified Condition
Control the Injection Volume for A/F Sensor (12.5%)	Air fuel ratio sensor output voltage is below 3.1 V

Techstream Display	Specified Condition
Control the Injection Volume for A/F Sensor (-12.5%)	Air fuel ratio sensor output voltage is higher than 3.4 V

Result

Result	Proceed to
Abnormal	A
Normal	B

Hint:

The air fuel ratio sensor has an output delay of a few seconds and the heated oxygen sensor has a maximum output delay of approximately 20 seconds.

B ► [GO TO STEP 46](#)

A
▼

44. CHECK TERMINAL VOLTAGE (POWER SOURCE OF AIR FUEL RATIO SENSOR)

- a. Check the harnesses and connectors, referring to DTC P0031 procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG ► REPAIR AIR FUEL RATIO SENSOR POWER SOURCE CIRCUIT [More Info](#)

OK
▼

45. CHECK HARNESS AND CONNECTOR (AIR FUEL RATIO SENSOR - ECM)

- a. Check the harnesses and connectors, referring to DTC P2237 procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG	▶	REPAIR OR REPLACE HARNESS OR CONNECTOR
----	---	----------------------------------------

OK
▼

46. READ FREEZE FRAME DATA

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Proceed to
Initial Engine Coolant Temp, Ambient Temp for A/C, Initial Intake Air Temp	Difference in temperature between each item is less than 10°C (18°F)*1	A
	Difference in temperature between each item is 10°C (18°F) or higher*2	B

Hint:

- *1: A long time had elapsed after stopping the engine.
- *2: A long time had not elapsed after stopping the engine.

B	▶	GO TO STEP 49
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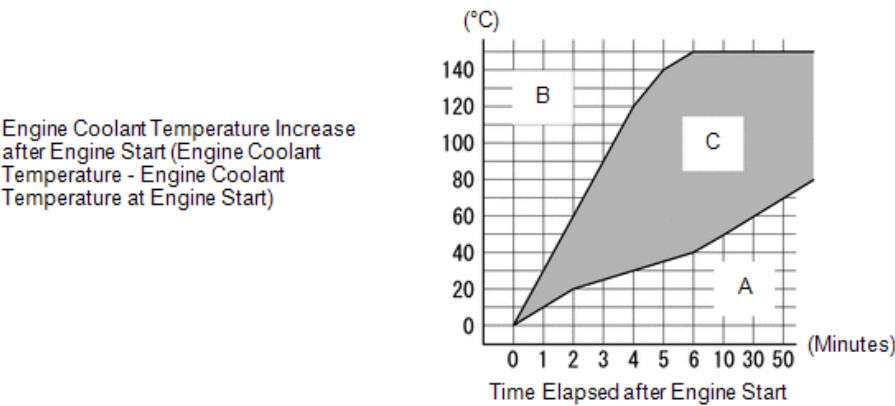
A
▼

47. READ FREEZE FRAME DATA

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.

- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)



Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
Initial Engine Coolant Temp, Coolant Temp, Engine Run Time	Range A	<div><div>■ Engine coolant temperature sensor</div><div>■ Thermostat</div></div>	A
	Range B	Engine coolant temperature	B
	Range C	-	C

Hint:

This step is not directly related to engine stall.

B

▶

[GO TO STEP 50](#)[GO TO STEP 50](#)

C

▶

[GO TO STEP 79](#)[GO TO STEP 79](#)

A

▼

48. INSPECT THERMOSTAT
- a. Inspect the thermostat.

Click here [More Info](#)

Result

Result	Proceed to
Abnormal	A
Normal	B

Hint:

This step is not directly related to engine stall.

A	▶	REPLACE THERMOSTAT More Info
B	▶	GO TO STEP 50 GO TO STEP 50

49. READ FREEZE FRAME DATA

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
Coolant Temp	120°C (248°F) or higher	Engine coolant temperature sensor	A
	Engine coolant temperature is less than ambient temperature* by 15°C (27°F) or more	Engine coolant temperature sensor	
	Values are other than above	-	B

Hint:

*: Use an actual ambient temperature estimated from the Initial Intake Air, Ambient Temp for A/C, and (if possible) the weather when the DTC was detected.

B	▶	GO TO STEP 52
---	---	-------------------------------

A
▼

50. INSPECT ENGINE COOLANT TEMPERATURE SENSOR

- Inspect the engine coolant temperature sensor.

Click here [More Info](#)

Hint:

Perform "Inspection After Repair" after replacing the engine coolant temperature sensor.

Click here [More Info](#)

Result

Result	Proceed to
Normal	A
Abnormal	B

B	▶	REPLACE ENGINE COOLANT TEMPERATURE SENSOR More Info
---	---	---------------------------------------------------------------------

A
▼

51. CHECK HARNESS AND CONNECTOR (ENGINE COOLANT TEMPERATURE SENSOR - ECM)

- a. Disconnect the engine coolant temperature sensor connector.
- b. Disconnect the ECM connector.
- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
B4-2 (THW) - B77-95 (THW)	Always	Below 1 Ω
B4-1 (E2) - B77-96 (ETHW)	Always	Below 1 Ω
B4-2 (THW) or B77-95 (THW) - Body ground	Always	10 k Ω or higher

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

OK	▶	CHECK FOR INTERMITTENT PROBLEMS More Info
NG	▶	REPAIR OR REPLACE HARNESS OR CONNECTOR

52. CLEAR DTC

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Clear the DTCs.

Powertrain > Engine and ECT > Clear DTCs

Result

Proceed to
NEXT

NEXT	▶	END
------	---	-----

53. CHECK IGNITION SYSTEM

- a. Perform ignition system On-vehicle Inspection.

Click here [More Info](#)

Hint:

Perform "Inspection After Repair" after repairing or replacing the ignition system.

Click here [More Info](#)

Result

Proceed to
OK
NG

NG	▶	REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA
----	---	------------------------------------------------------------

OK
▼

54. READ FREEZE FRAME DATA

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Result	Suspected Area	Proceed to
Total of ISC Learning Value and ISC Feedback Value	Below 80% of the current value of the vehicle	Intake air volume insufficient	A
	80% or higher of the current value of the vehicle		B

B ► [GO TO STEP 57](#)

A
▼

55. CHECK INTAKE SYSTEM

- a. Check for air leakage in the intake system [vacuum hose disconnection, cracks, damaged gaskets, etc.].

Click here [More Info](#)

Hint:

- If the accelerator pedal is released after racing the engine, the inspection is easier to perform because the vacuum inside the intake pipes increases and the air suction noise becomes louder.
- If Short FT #1 and Long FT #1 are largely different from the normal values when idling (the intake air volume is small) and almost the same as the normal values when racing the engine (the intake air volume is high), air leakage may be present.

OK

There is no air leakage.

Hint:

Perform "Inspection After Repair" after repairing or replacing the intake system.

Click here [More Info](#)

Result

Proceed to
OK
NG

NG ► REPAIR OR REPLACE INTAKE SYSTEM

OK
▼

56. CHECK INTAKE SYSTEM

a. Check the intake system.

- Inspect the brake booster assembly.

Click here [More Info](#)

- Inspect the mass air flow meter sub-assembly.

Click here [More Info](#)

- Check the PCV hose.

Click here [More Info](#)

- Inspect the PCV valve.

Click here [More Info](#)

- Inspect the purge VSV.

Click here [More Info](#)

Result

Result	Proceed to
Abnormal	A
Normal	B

Hint:

Perform "Inspection After Repair" after replacing the mass air flow meter sub-assembly.

Click here [More Info](#)

A	▶	REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA
B	▶	GO TO STEP 61GO TO STEP 61

57. PERFORM ACTIVE TEST USING TECHSTREAM (CONTROL THE VVT LINEAR (BANK1))

- a. Perform the Active Test, referring to DTC P0011 procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- When the results of the inspection using the Active Test are normal but the valve operating noise is abnormal, check the valve for any signs of problems.
- If the camshaft timing oil control valve assembly (for intake camshaft) is stuck at the advanced side, the valve overlap increases and combustion worsens due to the interval EGR which may cause rough idle or cause the engine to stall.

Result**Proceed to**

OK

NG

NG



REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (FOR INTAKE CAMSHAFT)

[More Info](#)

OK

**58. CHECK HARNESS AND CONNECTOR (CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (FOR INTAKE CAMSHAFT) - ECM)**

- a. Check the harnesses and connectors, referring to DTC P0010 procedure.

Click here [More Info](#)**Hint:**

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result**Proceed to**

OK

NG

NG



REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

**59. PERFORM ACTIVE TEST USING TECHSTREAM (CONTROL THE VVT EXHAUST LINEAR (BANK1))**

- a. Perform the Active Test, referring to DTC P0014 procedure.

Click here [More Info](#)**Hint:**

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- When the results of the inspection using the Active Test are normal but the valve operating noise is abnormal, check the valve for any signs of problems.
- If the camshaft timing oil control valve assembly (for exhaust camshaft) is stuck on, the valve overlap increases and combustion worsens due to the internal EGR which may

cause rough idle or cause the engine to stall.

Result

Proceed to
OK
NG

NG	▶	REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (FOR EXHAUST CAMSHAFT) More Info
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OK
▼



60. CHECK HARNESS AND CONNECTOR (CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (FOR EXHAUST CAMSHAFT) - ECM)

- Check the harnesses and connectors, referring to DTC P0013 procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG	▶	REPAIR OR REPLACE HARNESS OR CONNECTOR
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OK
▼



61. READ FREEZE FRAME DATA

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Suspected Area	Proceed to	Knock Correct Learn Value
IGN Advance			
Differs from the current value of the vehicle by 10 deg or more	Less than 3 deg(CA)	<ul style="list-style-type: none"> Engine coolant temperature sensor Mass air flow meter sub-assembly Knock control sensor 	A
	3 deg(CA) or more	-	
Differs from the current value of the vehicle by less than 10 deg	-	-	B

B ► CHECK FOR INTERMITTENT PROBLEMS [More Info](#)

A
▼

62. INSPECT ENGINE COOLANT TEMPERATURE SENSOR

- a. Inspect the engine coolant temperature sensor.

Click here [More Info](#)

Hint:

Perform "Inspection After Repair" after replacing the engine coolant temperature sensor.

Click here [More Info](#)

Result

Proceed to
OK
NG

NG ► REPLACE ENGINE COOLANT TEMPERATURE SENSOR [More Info](#)

OK
▼

63. CHECK HARNESS AND CONNECTOR (ENGINE COOLANT TEMPERATURE SENSOR - ECM)

- a. Disconnect the engine coolant temperature sensor connector.
- b. Disconnect the ECM connector.
- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
B4-2 (THW) - B77-95 (THW)	Always	Below 1 Ω
B4-1 (E2) - B77-96 (ETHW)	Always	Below 1 Ω
B4-2 (THW) or B77-95 (THW) - Body ground	Always	10 k Ω or higher

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG	▶ REPAIR OR REPLACE HARNESS OR CONNECTOR
----	------------------------------------------

OK
▼

64. INSPECT MASS AIR FLOW METER SUB-ASSEMBLY (INTAKE AIR TEMPERATURE SENSOR)

- a. Inspect the mass air flow meter sub-assembly.

Click here [More Info](#)

Hint:

- If the intake air temperature sent to the ECM is higher than the standard due to the mass air flow meter sub-assembly (intake air temperature sensor) malfunctioning, the ignition timing may become delayed.
- Perform "Inspection After Repair" after replacing the mass air flow meter sub-assembly.

Click here [More Info](#)

Result

Proceed to
OK

Proceed to
NG

NG	▶	REPLACE MASS AIR FLOW METER SUB-ASSEMBLY More Info
----	---	--------------------------------------------------------------------

OK
▼

65. READ VALUE USING TECHSTREAM (IGN ADVANCE AND KNOCK CORRECT LEARN VALUE)

- a. Connect the Techstream to the DLC3.
- b. Start the engine and warm it up until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- c. Turn the Techstream on.
- d. Idle the engine.
- e. Enter the following menus: Powertrain / Engine and ECT / Data List / IGN Advance and Knock Correct Learn Value.

Powertrain > Engine and ECT > Data List

Tester Display
IGN Advance
Knock Correct Learn Value

- f. Check the Data List indication.

Result

Data List	Proceed to	Knock Correct Learn Value
IGN Advance		
Differs from the current value of the vehicle by 10 deg or more	Less than 3 deg(CA)	A
	3 deg(CA) or more	
Differs from the current value of the vehicle by less than 10 deg	-	B

Hint:

If the results of the checks performed in steps 57 to 65 were all normal and the sum of ISC Feedback Value and ISC Learning Value in the Data List is 120% of the normal value or more, check for carbon

deposits in the throttle body assembly. If there are carbon deposits, clean them off to finish the troubleshooting procedure.

A	▶	CHECK KNOCK CONTROL SENSOR CIRCUIT More Info
B	▶	END

66. CHECK TERMINAL VOLTAGE (POWER SOURCE OF FUEL INJECTOR ASSEMBLY)

- a. Check the harness and connectors, referring to Fuel Injector Circuit procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.
- A rapid decrease in engine speed may have been caused by a malfunction in all or multiple cylinders. (There may be an electrical malfunction in the wiring shared by all the cylinders.)

Result

Proceed to
OK
NG

NG	▶	REPAIR FUEL INJECTOR ASSEMBLY POWER SOURCE CIRCUIT More Info
----	---	------------------------------------------------------------------------------

OK
▼

67. CHECK IGNITION SYSTEM

- a. Perform ignition system On-vehicle Inspection.

Click here [More Info](#)

Hint:

Perform "Inspection After Repair" after repairing or replacing the ignition system.

Click here [More Info](#)

Result

Proceed to
OK
NG

NG	▶	REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA
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68. CHECK FREEZE FRAME DATA

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605				
A/C Signal	Suspected Area	Proceed to	Air Conditioner FB Val	Power Steering Signal
A/C Signal display changes from OFF to ON*1	Value displayed for Air Conditioner FB Val increases	-	A/C system	A
	Value displayed for Air Conditioner FB Val does not increase	Does not change from OFF	-	B
		Changes from OFF to ON	Power steering system	
A/C Signal display does not change from OFF*1	-	Changes from OFF to ON		
		Does not change from OFF	-	

Hint:

- *1: Check not only the ON/OFF state of the air conditioner but also the change in air conditioner load.
- The normal value for the ISC learned value is engine displacement (liters) x 0.9.
- Even if the results are normal, the power steering system or A/C system may have been malfunctioning. If there are no problems with other parts, inspect the power steering system or A/C system.

A ▶

CHECK AIR CONDITIONING SYSTEM

◦ for Automatic Air Conditioning System

Click here [More Info](#)

◦ for Manual Air Conditioning System

Click here [More Info](#)

B

▼

69. CHECK FREEZE FRAME DATA
- a. Connect the Techstream to the DLC3.

b. Turn the ignition switch to ON.

c. Turn the Techstream on.

d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605					
Electrical Load Signal 1 (3) or Electric Load Feedback Val	Suspected Area	Proceed to	Electric Load Feedback Val	Difference between Engine Speed and SPD (NT)	Vehicle Speed
Electrical Load Signal 1 (3) display changes from OFF to ON*1, or value displayed for Electric Load Feedback Val increases*1	Value displayed for Electric Load Feedback Val changes	-	-	Electrical load signal circuit	C
	Value displayed for Electric Load Feedback Val does not change	At least 1 of the 5 sets of freeze frame data is less than 100 rpm	Less than 5 km/h (3 mph)	Automatic transaxle system	B
			5 km/h (3 mph) or more	-	A

Freeze Frame Data Item for DTC P1605					
Electrical Load Signal 1 (3) or Electric Load Feedback Val	Suspected Area	Proceed to	Electric Load Feedback Val	Difference between Engine Speed and SPD (NT)	Vehicle Speed
		All 5 sets of freeze frame data are 100 rpm or more	-	-	
Electrical Load Signal 1 (3) display does not change from OFF, or value displayed for Electric Load Feedback Val does not increase	-	At least 1 of the 5 sets of freeze frame data is less than 100 rpm	Less than 5 km/h (3 mph)	Automatic transaxle system	B
			5 km/h (3 mph) or more	-	A
		All 5 sets of freeze frame data are 100 rpm or more	-	-	

Hint:

- *1: If the Electrical Load Signal 1 (3) display changes from OFF to ON, or the "Electric Load Feedback Val" increases, it probably is a malfunction due to a change in electrical load. Check the generator and the continuity and connections between the generator and ECM.
- If the vehicle speed is 5 km/h (3 mph) or less and the difference between Engine Speed and SPD (NT) is 100 rpm or less, inspect the automatic transaxle. (Depending on the rate of vehicle deceleration, the engine speed may have decreased due to the automatic transaxle lock-up release being late.)
- The normal value for the ISC learned value is engine displacement (liters) x 0.9.
- Even if the results are normal, the electrical load signal system or automatic transaxle system may have been malfunctioning. If there are no problems with other parts, inspect the electrical load system or automatic transaxle system.

B

▶

CHECK AUTOMATIC TRANSAXLE SYSTEM

◦ for 2WD

Click here [More Info](#)

◦ for AWD

Click here [More Info](#)

C

▶

CHECK GENERATOR CIRCUIT [More Info](#)

A

▼

70. CHECK FREEZE FRAME DATA

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item for DTC P1605	Suspected Area	Proceed to	Neutral Position SW Signal
Shift SW Status (P Range) Shift SW Status (N Range)			
P and N position are both OFF in at least one data set	ON when shift lever in D or R	Park/Neutral position switch assembly	A
	OFF when shift lever in D or R	Automatic transaxle system	B
All 5 sets of freeze frame data are ON	-	-	C

Hint:

Even if the results are normal, the park/neutral position switch assembly or automatic transaxle system may have been malfunctioning. If there are no problems with other parts, inspect the park/neutral position switch assembly or automatic transaxle system.

A ▶	INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY <ul style="list-style-type: none"> ◦ for 2WD <p>Click here More Info</p> <ul style="list-style-type: none"> ◦ for AWD <p>Click here More Info</p>
B ▶	CHECK AUTOMATIC TRANSAXLE SYSTEM <ul style="list-style-type: none"> ◦ for 2WD <p>Click here More Info</p> <ul style="list-style-type: none"> ◦ for AWD <p>Click here More Info</p>
C ▶	CHECK FOR INTERMITTENT PROBLEMS More Info

71. CHECK FREEZE FRAME DATA

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Using the Techstream, confirm the vehicle conditions recorded in the freeze frame data which were present when the DTC was stored.

Click here [More Info](#)

Result

Freeze Frame Data Item	Result	Suspected Area	Proceed to
Throttle Sensor Position, Calculate Load	Calculate Load decreases while Throttle Sensor Position increases	Mass air flow meter sub-assembly	A
	Calculate Load does not decrease while Throttle Sensor Position increases	-	B

B ▶ [GO TO STEP 75](#)[GO TO STEP 75](#)

A
▼

72. INSPECT MASS AIR FLOW METER SUB-ASSEMBLY

- Remove the mass air flow meter sub-assembly.

Click here [More Info](#)

- b. Check for foreign matter in the air flow passage of the mass airflow meter sub-assembly.

Result

Result	Proceed to
Visible foreign matter is not present	A
Visible foreign matter is present	B

Hint:

Perform "Inspection After Repair" after replacing the mass air flow meter sub-assembly.

Click here [More Info](#)

B ► REPLACE MASS AIR FLOW METER SUB-ASSEMBLY [More Info](#)

A
▼

73. CHECK HARNESS AND CONNECTOR (MASS AIR FLOW METER SUB-ASSEMBLY - ECM)

- a. Check the harnesses and connectors, referring to DTC P0102 procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.

Result

Proceed to
OK
NG

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR

OK
▼

74. PERFORM DRIVE TEST

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Start the engine and warm it up until the engine coolant temperature stabilizes.

Hint:

The A/C switch and all accessory switches should be off.

- e. Idle the engine.
- f. Using the Techstream, read the value of Calculate Load in the Data List.

Powertrain > Engine and ECT > Data List

Tester Display
Calculate Load

Standard

Data List	Specified Condition
Calculate Load	90 to 110% of the current value of the vehicle

Hint:

Perform "Inspection After Repair" after replacing the mass air flow meter sub-assembly.

Click here [More Info](#)

Result

Proceed to
OK
NG

NG	▶ REPLACE MASS AIR FLOW METER SUB-ASSEMBLY More Info
----	----------------------------------------------------------------------

OK
▼

75. CHECK TERMINAL VOLTAGE (POWER SOURCE OF FUEL INJECTOR ASSEMBLY)

- a. Check the harness and connectors, referring to Fuel Injector Circuit procedure.

Click here [More Info](#)

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- Make sure there is not an excessive amount of force applied to the wire harness.
- A rapid decrease in engine speed may have been caused by a malfunction in all or multiple cylinders. (There may be an electrical malfunction in the wiring shared by all the cylinders.)

Result

Result
OK
NG

NG▶

REPAIR FUEL INJECTOR ASSEMBLY POWER SOURCE CIRCUIT [More Info](#)

OK

▼

76. CHECK IGNITION SYSTEM

- a. Perform ignition system On-vehicle Inspection.

Click here [More Info](#)

Hint:

Perform "Inspection After Repair" after repairing or replacing the ignition system.

Click here [More Info](#)

Proceed to

Result
OK
NG

NG▶

REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA

OK

▼

77. PERFORM ACTIVE TEST USING TECHSTREAM (CONTROL THE FUEL PUMP / SPEED)

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Powertrain / Engine and ECT / Active Test / Control the Fuel Pump / Speed.
 - w/ Fuel Pump Control ECU Assembly

Powertrain > Engine and ECT > Active Test

Tester Display
Control the Fuel Pump / Speed

- w/o Fuel Pump Control ECU Assembly

Powertrain > Engine and ECT > Active Test**Tester Display****Control the Fuel Pump / Speed**

- e. Check whether the fuel pump operating sound occurs when performing the Active Test on the Techstream.

Standard

Techstream Operation	Specified Condition
ON	Operating sound heard
OFF	Operating sound not heard

Result

Result	Proceed to
Abnormal	A
Normal	B

Hint:

- Jiggle the wire harness and connector to increase the likelihood of detecting malfunctions that do not always occur.
- While performing the Active Test, make sure that there is no fuel leakage from the pipes, no signs that fuel has leaked, and no fuel smell.
- If the fuel pump operating noise is abnormal, proceed to step 79.

B	▶	GO TO STEP 79
---	---	-------------------------------

A
▼

78. INSPECT FUEL PUMP

- a. Inspect the fuel pump.

Click here [More Info](#)

Hint:

Perform "Inspection After Repair" after replacing the fuel pump.

Click here [More Info](#)

Result**Proceed to**

Proceed to
OK
NG

OK	▶	CHECK FUEL PUMP CONTROL CIRCUIT More Info
NG	▶	REPLACE FUEL PUMP More Info

79. CHECK FUEL SYSTEM

a. Check the fuel system.

- Check the fuel pump operation.
- Check the fuel leaks.
- Check the fuel pressure.
- Perform the Active Test [Control the All Cylinder Fuel Cut].

Hint:

For the fuel system On-vehicle Inspection, refer to the following procedures.

Click here [More Info](#)

Result

Result	Proceed to
Abnormal	A
Normal	B

B	▶	CHECK FOR INTERMITTENT PROBLEMS More Info
---	---	-----------------------------------------------------------

A
▼

80. CHECK FUEL SYSTEM

- ### a. Check for foreign matter such as iron particles around the fuel pump (fuel pump, fuel pump filter and inside the fuel tank), and for signs that the fuel pump was stuck.

Result

Result	Proceed to
There is no foreign matter and no signs that fuel pump was stuck	A
There is foreign matter or signs that fuel pump was stuck	B

Hint:

If there is foreign matter such as iron particles on the fuel pump, fuel filter or fuel tank, remove the foreign matter.

B	▶	REPAIR OR REPLACE FUEL SYSTEM
---	---	-------------------------------

A
▼

81. CHECK FUEL SYSTEM

a. Check the fuel system.

- Check the fuel pump operation.
- Check the fuel leaks.
- Check the fuel pressure.
- Perform the Active Test [Control the All Cylinder Fuel Cut].

Hint:

- For the fuel system On-vehicle Inspection, refer to the following procedures.

Click here [More Info](#)

- Perform "Inspection After Repair" after replacing the fuel pump.

Click here [More Info](#)

Result

Proceed to
OK
NG

OK	▶	END
NG	▶	REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA

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