

PRODEMAND

YMMS: 2006 Ford Crown Victoria Base
 Engine: 4.6L Eng
 VIN:

Feb 11, 2021
 License:
 Odometer:

DTC P2112: THROTTLE ACTUATOR CONTROL (TAC) SYSTEM - STUCK CLOSED.

P2112 - THROTTLE ACTUATOR CONTROL (TAC) SYSTEM - STUCK CLOSED

Description:	This powertrain control module (PCM) fault status indicates the throttle plate is at a lower angle than commanded.		
Possible Causes:	• Binding throttle body, stuck closed • Damaged PCM		
Diagnostic Aids			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

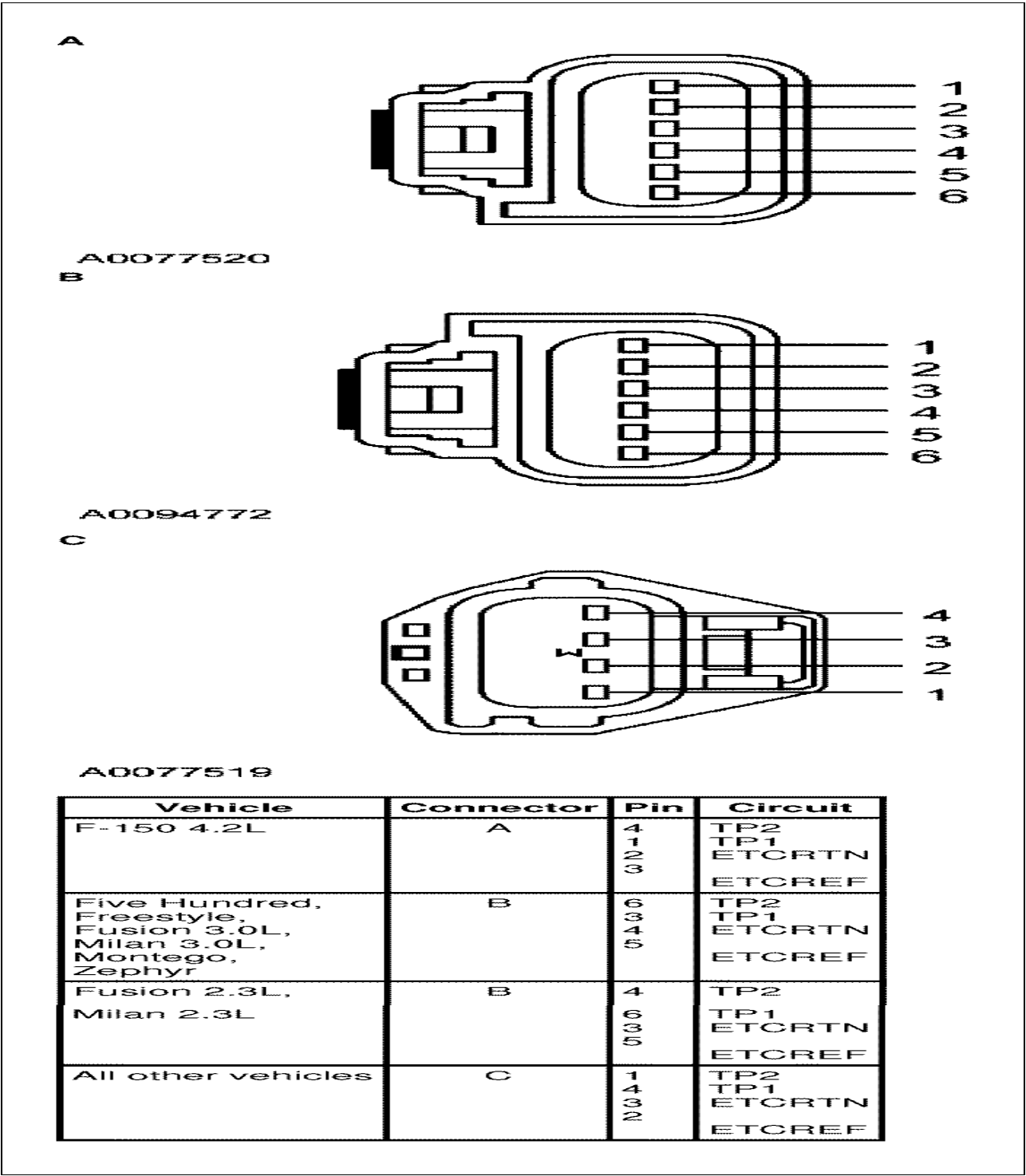
Introduction [PINPOINT TEST DV: THROTTLE BODY ASSEMBLY ELECTRONIC THROTTLE CONTROL (ETC)]

WARNING: SUBSTANTIAL OPENING AND CLOSING TORQUE IS APPLIED BY THIS SYSTEM. TO PREVENT INJURY, BE CAREFUL TO KEEP FINGERS AWAY FROM THROTTLE MECHANISM WHEN ACTUATED. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

This pinpoint test is intended to diagnose the following:

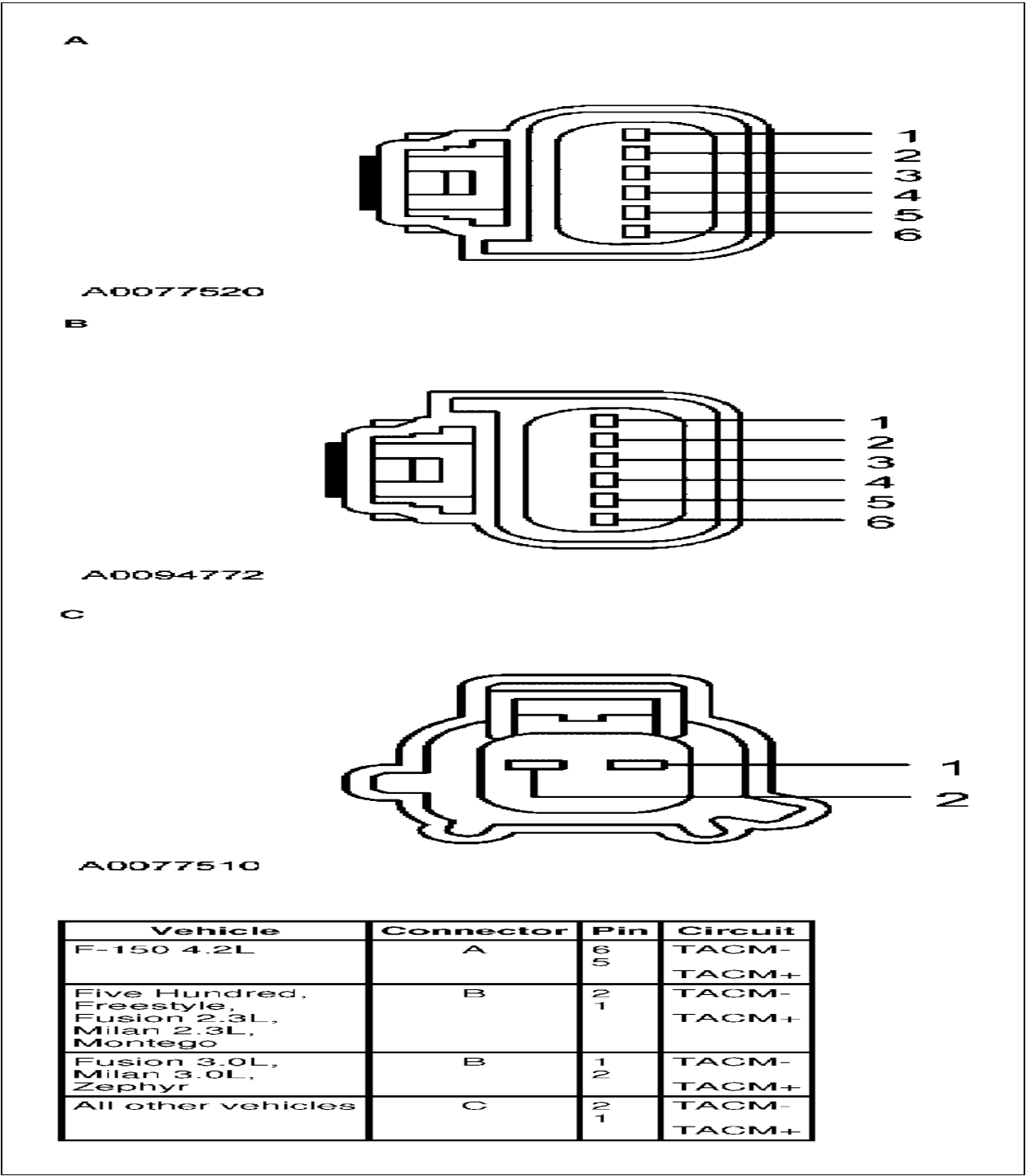
- electronic throttle body (ETB) (9F991)
- harness circuits: ETCRTN, ETCREF, TP1, TP2, TACM+, and TACM-
- powertrain control module (PCM) (12A650)

Fig 1: Electronic Throttle Body Throttle Position Sensor (ETBTPS) Connector



Courtesy of FORD MOTOR CO.

Fig 2: Electronic Throttle Body Throttle Actuator Control Motor (ETBTACM) Connector



Courtesy of FORD MOTOR CO.

Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to REFERENCE VALUES .
POWERTRAIN CONTROL MODULE CONNECTOR PINS AND CIRCUITS REFERENCE

Vehicle	Connector	Pin	Circuit
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E-Series 4.6L, E-Series 6.8L, E-Series 5.4L, F-Super Duty	170 Pin	B16, B4, E66	ETCREF
		B18, B6, E59	ETCRTN
		B35	VPWR
		B47	PWRGND
		E51	TACM-
		E34	TACM+
		E60	TP2
		E61	TP1
Expedition, F-150, Mark LT, Navigator	190 Pin	B21, B28, E66	ETCREF
		B58, B59, E59	ETCRTN
		B51	VPWR
		B67	PWRGND
		E51	TACM-
		E34	TACM+
		E60	TP2
		E61	TP1
Explorer, Mountaineer, Mustang	170 Pin	B24, B4, E66	ETCREF
		B43, B6, E59	ETCRTN
		B35	VPWR
		B47	PWRGND
		E51	TACM-
		E34	TACM+
		E60	TP2
		E61	TP1
Fusion, Milan, Zephyr	140 Pin	B21, B28, E66	ETCREF
		B59, B60, E59	ETCRTN
		B51	VPWR
		B67	PWRGND
		E51	TACM-
		E34	TACM+

		E60	TP2
		E61	TP1
LS	150 (60-32-58) Pin	B20, B23, E24	ETCREF
		B17, B5, E15	ETCRTN
		B32	VPWR
		B24	PWRGND
		E27	TACM-
		E35	TACM+
		E57	TP2
		E32	TP1
All other vehicles	150 (50-50-50) Pin	B24, B4, E18	ETCREF
		B41, B6, E7	ETCRTN
		B35	VPWR
		B47	PWRGND
		E48	TACM-
		E47	TACM+
		E29	TP2
		E19	TP1

Introduction [PINPOINT TEST Z: INTERMITTENT]

WARNING: CROWN VICTORIA POLICE INTERCEPTOR VEHICLES EQUIPPED WITH FIRE SUPPRESSION SYSTEM, REFER TO FIRE SUPPRESSION SYSTEM FOR IMPORTANT SAFETY WARNINGS . FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

This pinpoint test is intended to diagnose and isolate intermittent concerns for the following:

- all electronic engine control (EEC) subsystems

This chart is used to determine which test to run for the suspect circuit. PIDs corresponding to each circuit are listed. Some circuits do not have an associated PID or the PID may not be available and has to be measured with a digital multimeter (DMM). More specific information on the PID can be found in REFERENCE VALUES . If the vehicle has a coil pack system with a no start condition, carry out the ignition test.

PCM PIDS/SIGNALS

PCM/TCM PIDS/SIGNALS	Associated Circuit	Test Type
4X4	4X4	input
ACCS	A/CCS	input
ACCR (WAC)	ACCR	output
ACET	ACET	input
ACP, ACP V	ACPSW	input
AIR	AIR	output
AIRM	AIRM	input
APP1	APPS	input
APP2	APPS	input
APP3	APPS	input
BPS/BOO	BPS	input
CCS	CCS	output
Use Digital Multimeter	CD-A (primary)	output
Use Digital Multimeter	CD-B (primary)	output
Use Digital multimeter	CD-C (primary)	output
Use Digital Multimeter	CD-D (primary)	output
CHT, CHT V	CHT	input
CKP	CKP	input
CMP	CMP	input
CPP	CPP	input
CTO	CTO	output
DPFEGR	DPFE	input
ECT, ECT V	ECT	input
EGRMC1	EGRMC1	output
EGRMC2	EGRMC2	output
EGRMC3	EGRMC3	output
EGRMC4	EGRMC4	output
EGRMDSD	EGRMC	output
EGRVR	EGRVR	output
EOT, EOT V	EOT	input
EPC, EPC V	EPC	output
EVAPC V	CV	output

EVAPPDC	VMV	output
EVAPPF	VMV	output
EVAPPF	VMV	output
FLI, FLI V	FLI	input
FP	FP	output
FPM	FPM	input
FP M	FPM	input
FRP, FRP V	FRP	input
FRT	FRT	input
FTP, FTP V	FTP	input
GEN RC	GENRC	output
GENLI	GENLI	input
HFC	HFC	output
HOS11	HEGO	input
HOS12	HEGO	input
HOS13	HEGO	input
HTR11	HEGO	output
HTR12	HEGO	output
HTR13	HEGO	output
IAC	IAC	output
IAT, IAT V	IAT	input
IAT2, IAT2 V	IAT 2	input
IMRC	IMRC	output
IMRCM	IMRCM	input
IMTV1	IMTV1	output
IMTV2	IMTV2	output
KS1	KS1	input
KS2	KS2	input
LFC	LFC	output
MAF, MAF V	MAF	input
MAP V	MAP	input
OSS	OSS	input
PSP, PSPV	PSP	input

PSPT	PSP	input
PTO	PTO	input
SS1	SS1	output
SS2	SS2	output
SS3	SS3	output
SS4	SS4	output
TACM (+)	TACM (+)	output
TACM (-)	TACM (-)	output
TP1	TP1	input
TP2	TP2	input
TCC	TCC	output
TCIL	TCIL	output
TCS	TCS	input
TFT, TFT V	TFT	input
TP, TPV	TP	input
TSS/ISS	TSS	input
VCT1	VCT1	output
VCT2	VCT2	output
VPWR	VPWR	input
Use Digital Multimeter	VREF	output
Use Digital Multimeter	VSO	output
VSS	VSS+	input
WAC	WAC	output

Test Procedure [PINPOINT TEST DV: THROTTLE BODY ASSEMBLY ELECTRONIC THROTTLE CONTROL (ETC)]

DV1 CHECK FOR DTCS

Are DTCs P0068, P0121, P0122, P0123, P0221, P0222, P0223, P2100, P2101, P2107, P2111, P2112, or P2135 present?

Yes	No
For DTC P0068, GO to DV14. For DTCs P0121, P0122, P0123, P0221, P0222, P0223, P2111, or P2112, GO to DV2. For DTCs P2100 or P2107, GO to DV20. For DTC P2101, GO to DV26. For Fusion, Milan, and Zephyr with DTC	For all others, GO to DIAGNOSTIC TROUBLE CODE (DTC) CHARTS AND DESCRIPTIONS .

P2135, GO to DV5.
For all others with DTC P2135, GO to DV6.

DV2 CHECK THE TP OPEN AND CLOSED VOLTAGES

Key ON, engine OFF.

Access the PCM and monitor the TP1 and TP2 PIDs.

Press the accelerator pedal to the floor and release.

ELECTRONIC THROTTLE CONTROL THROTTLE POSITION SENSOR SIGNAL VOLTAGE
SPECIFICATION

Accelerator Pedal Position	TP1	TP2
Pedal fully released	3.7 - 4.7	0.3 - 1.9
Pedal fully applied	0.7 - 2.9	4.1 - 4.7

Are both PIDs within the chart ranges?

Yes	No
For DTCs P2111 or P2112, go to DV3. For all others, go to DV22.	For DTCs P211 or P2112, go to DV3. For all others, go to DV4.

DV3 CHECK FOR OBSTRUCTION OF THE THROTTLE BODY

WARNING: SUBSTANTIAL OPENING AND CLOSING TORQUE IS APPLIED BY THIS SYSTEM. TO PREVENT INJURY, BE CAREFUL TO KEEP FINGERS AWAY FROM THROTTLE MECHANISM WHEN ACTUATED. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

NOTE: Moving the throttle plate manually may cause DTC P2106 to set during the self-test.

Key in OFF position.

Remove the inlet tube from the throttle body.

Visually inspect for throttle plate obstructions or sludge.

Slowly, push the throttle plate to wide open and release.

Does the throttle plate move freely to wide open and back?

Yes	No
For continuous memory DTCs P0121, P0122, P0221, or P0222 alone or together, GO to DV4. For continuous memory DTCs P2100, P2101, P2107, P2111, or P2112 alone or together, GO to DV20.	ISOLATE and REPAIR the obstruction. CLEAR the DTCs. REPEAT the self-test.

For Fusion, Milan, and Zephyr with all other DTCs, GO to DV5.
For all others, GO to DV6.

DV4 CHECK THE VREF VOLTAGE TO TP

ETBTPS connector disconnected.

Key ON, engine OFF.

Measure the voltage between:

(+) ETBTPS Connector, Harness Side	(-) ETBTPS Connector, Harness Side
ETCREF	ETCRTN

Is the voltage between 4 - 6 V?

Yes	No
For Fusion, Milan, and Zephyr, GO to DV5. For all others, GO to DV6.	GO to Pinpoint Test C.

DV5 CHECK THE FUNCTIONALITY OF THE TP SENSOR

Key in OFF position.

ETBTPS connector disconnected.

For Fusion 2.3L and Milan 2.3L, measure the resistance between:

(+) ETBTPS Connector, Component Side	(-) ETBTPS Connector, Component Side	Minimum Resistance (ohms)	Maximum Resistance (ohms)
ETCREF	ETCRTN	2,000	4,000

For Fusion 3.0L, Milan 3.0L, and Zephyr:

(+) ETBTPS Connector, Component Side	(-) ETBTPS Connector, Component Side	Minimum Resistance (ohms)	Maximum Resistance (ohms)
TP1	ETCREF	380	987
TP1	ETCRTN	665	1890
TP2	ETCREF	608	1932
TP2	ETCRTN	390	1187
ETCREF	ETCRTN	475	1365

Are all the resistances within specifications?

Yes	No
GO to DV10.	INSTALL a new ETB. REFER to the appropriate FUEL CHARGING & CONTROLS article . CLEAR the DTCs. REPEAT the self-test.

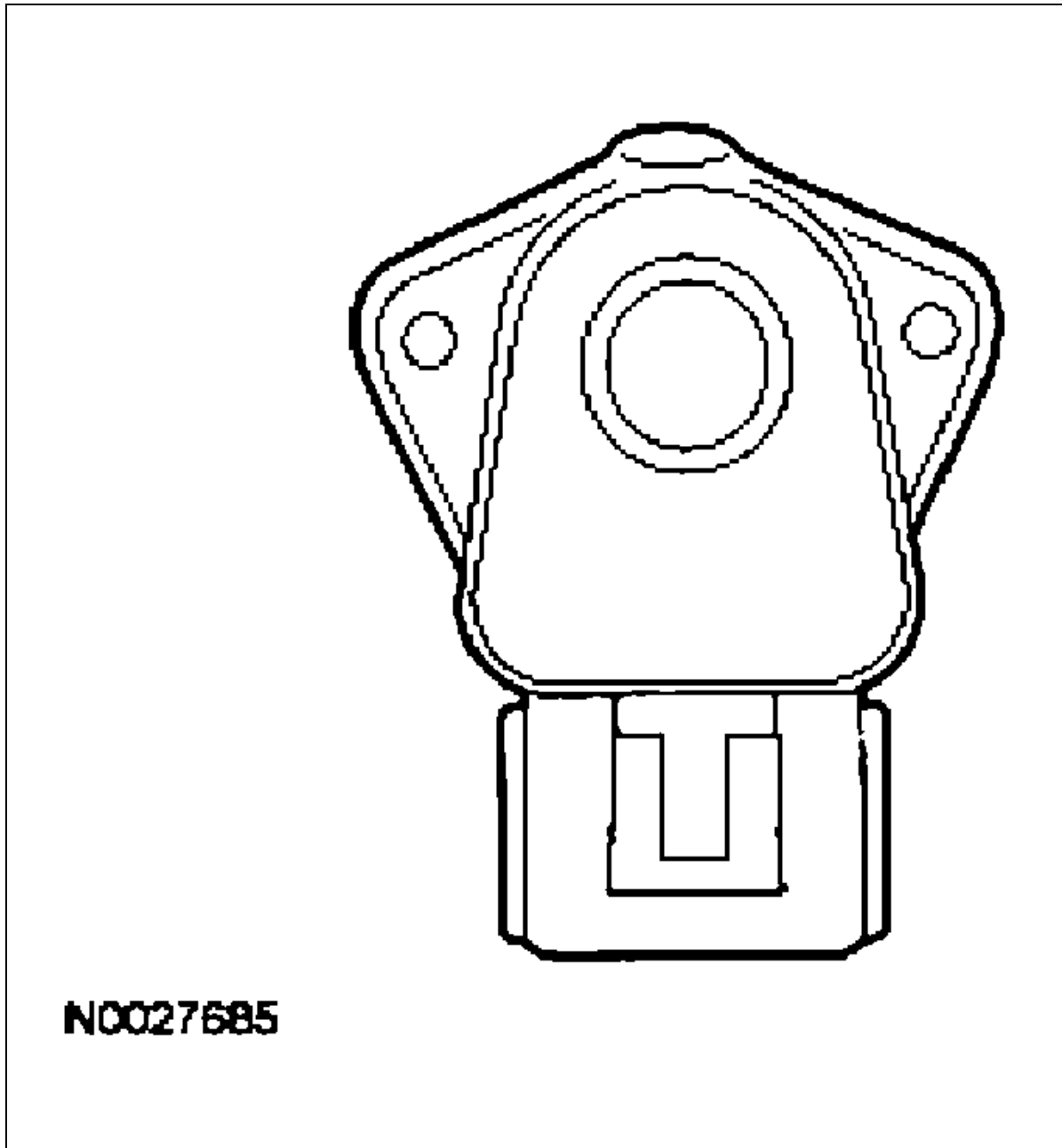
DV6 DETERMINE THE TYPE OF ETBTPS ON THE VEHICLE

NOTE: *There are 2 types of ETBTPS available. Compare the sensor housing of the ETBTPS on the vehicle to the illustrations.*

Key in OFF position.

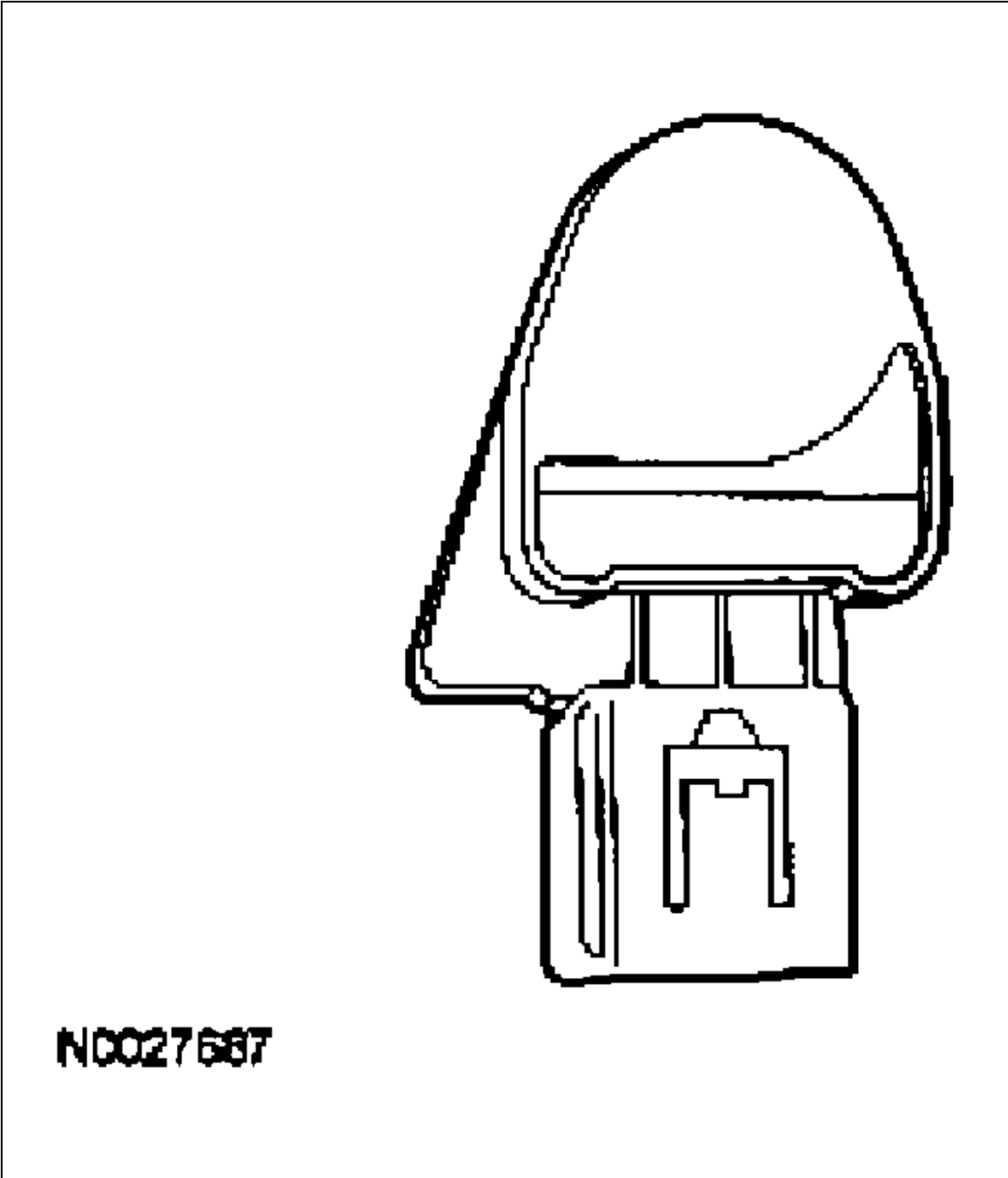
Determine if the vehicle is equipped with a Type I ETBTPS.

Fig 3: Identifying Type I Electronic Throttle Body Throttle Position Sensor (1 Of 2)



Courtesy of FORD MOTOR CO.

Fig 4: Identifying Type I Electronic Throttle Body Throttle Position Sensor (2 Of 2)



Courtesy of FORD MOTOR CO.

Is the vehicle equipped with a Type I ETBTPS?

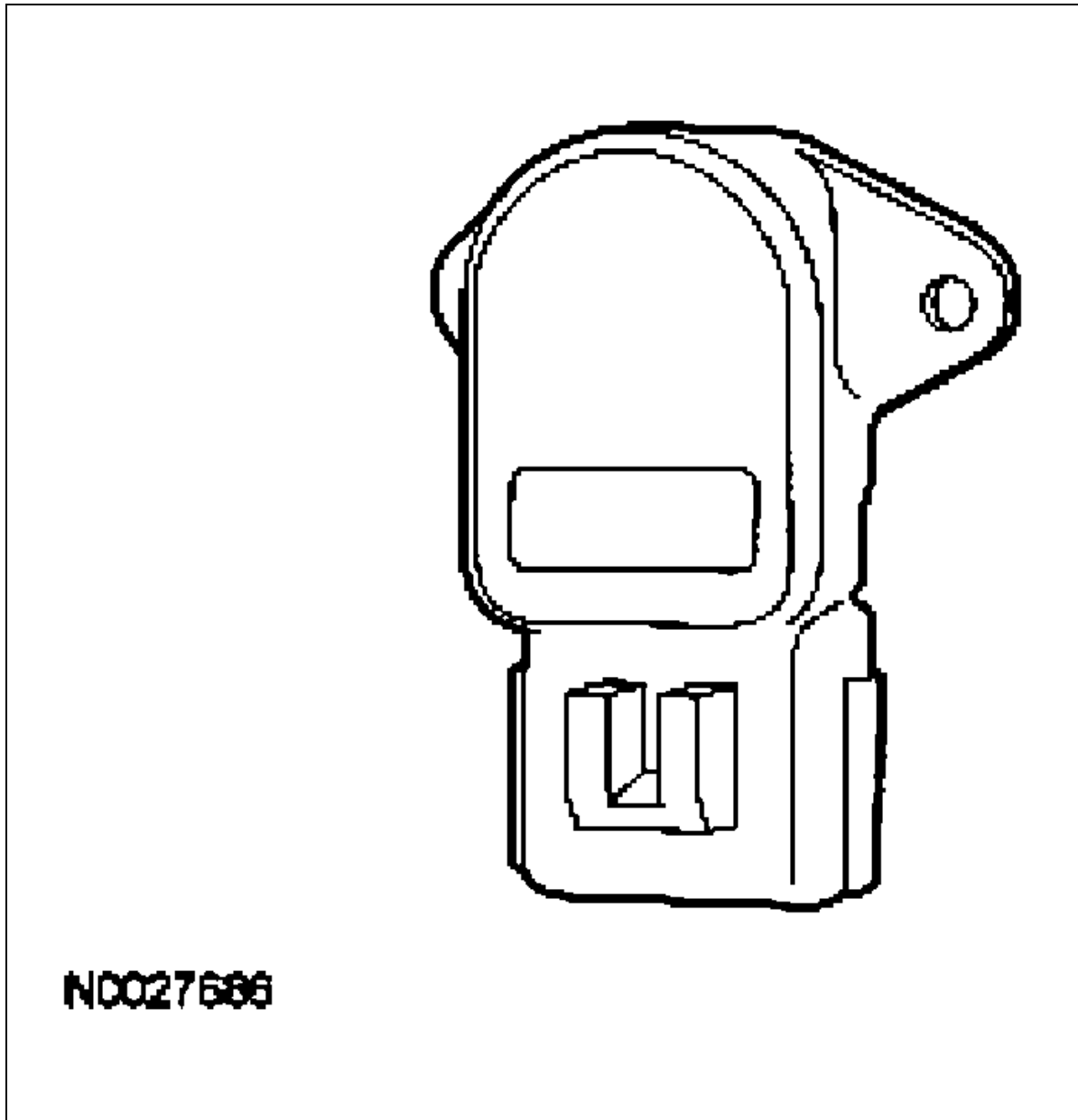
Yes	No
GO to DV8.	GO to DV7.

DV7 CHECK FOR A TYPE II ETBTPS

NOTE: *There are 2 types of ETBTPS available. Compare the sensor housing of the ETBTPS on the vehicle to the illustrations.*

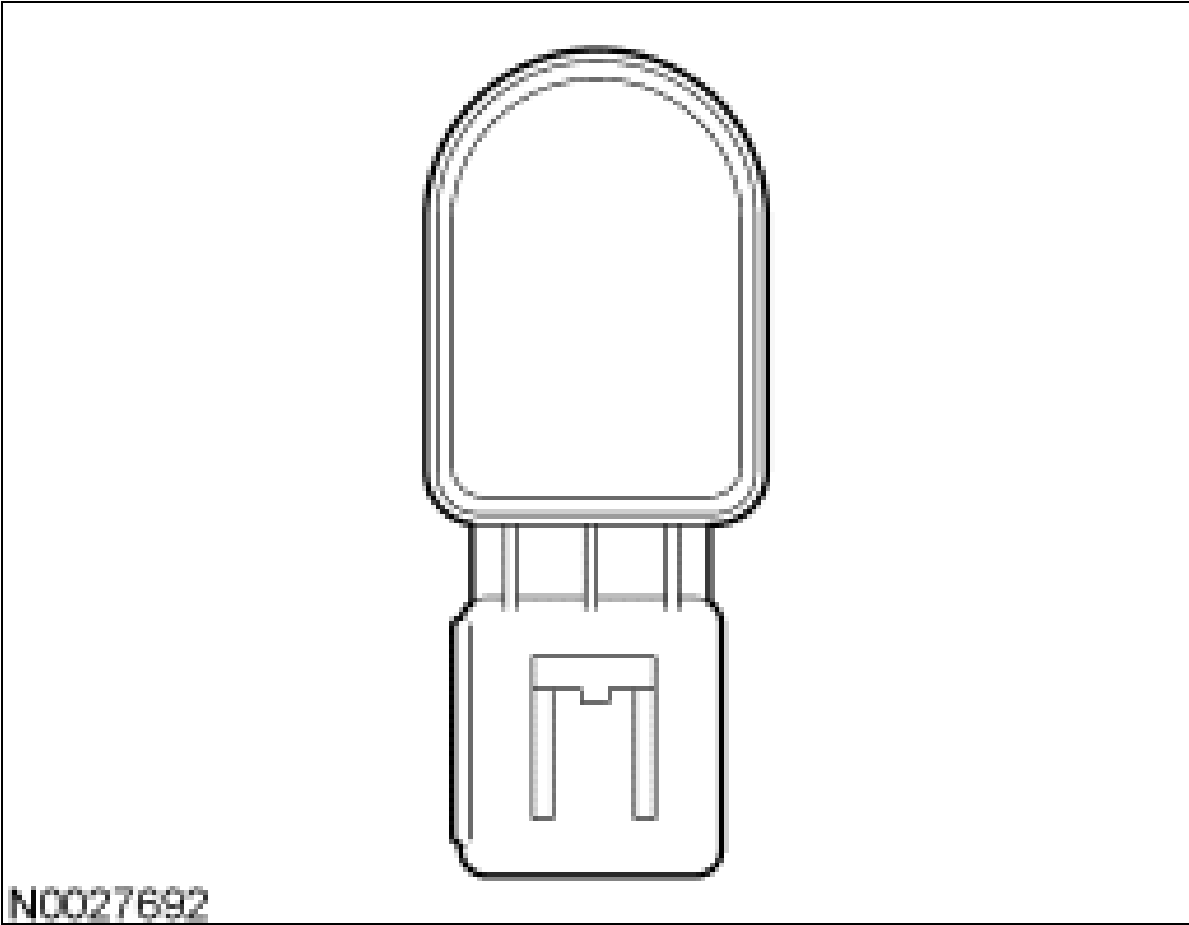
Determine if the vehicle is equipped with a Type II ETBTPS.

Fig 5: Identifying Type II Electronic Throttle Body Throttle Position Sensor (1 Of 2)



Courtesy of FORD MOTOR CO.

Fig 6: Identifying Type II Electronic Throttle Body Throttle Position Sensor (2 Of 2)



Courtesy of FORD MOTOR CO.

Is the vehicle equipped with a Type II ETBTPS?

Yes	No
GO to DV9.	GO to DV6.

DV8 CHECK THE RESISTANCE OF THE TYPE I ETBTPS

ETBTPS connector disconnected.

Measure the resistance between:

Type I

(+) ETBTPS Connector, Component Side	(-) ETBTPS Connector, Component Side	Minimum Resistance (ohms)	Maximum Resistance (ohms)
TP1	ETCREF	1,100	3,500
TP1	ETCRTN	2,500	5,900
TP2	ETCREF	1,800	4,900
TP2	ETCRTN	800	2,800
ETCREF	ETCRTN	1,800	4,900

Are all the resistances within the specifications?

Yes	No
GO to DV10.	For Five Hundred, Freestyle, Montego, and F-150 4.2L, INSTALL a new ETB. REFER to the appropriate FUEL CHARGING & CONTROLS article . CLEAR the DTCs. REPEAT the self-test. For all others, INSTALL a new ETBTPS. REFER to the appropriate ELECTRONIC ENGINE CONTROLS article . CLEAR the DTCs. REPEAT the self-test.

DV9 CHECK THE RESISTANCE OF THE TYPE II ETBTPS

ETBTPS connector disconnected.

Measure the resistance between:

Type II

(+) ETBTPS Connector, Component Side	(-) ETBTPS Connector, Component Side	Minimum Resistance (ohms)	Maximum Resistance (ohms)
TP1	ETCREF	700	1,800
TP1	ETCRTN	1,300	2,800
TP2	ETCREF	1,000	2,400
TP2	ETCRTN	500	1,500
ETCREF	ETCRTN	700	2,100

Are all the resistances within the specifications?

Yes	No
GO to DV10.	For Five Hundred, Freestyle, Montego, and F-150 4.2L, INSTALL a new ETB. REFER to the appropriate FUEL CHARGING & CONTROLS article . CLEAR the DTCs. REPEAT the self-test. For all others, INSTALL a new ETBTPS. REFER to the appropriate ELECTRONIC ENGINE CONTROLS article . CLEAR the DTCs. REPEAT the self-test.

DV10 CHECK THE TP1 AND TP2 CIRCUITS FOR A SHORT TO VOLTAGE IN THE HARNESS

PCM connector disconnected.

Key ON, engine OFF.

Measure the voltage between:

(+) ETBTPS Connector, Harness Side	(-)
TP1	Ground
TP2	Ground

Is any voltage present?

Yes	No
REPAIR the short circuit to PWR. CLEAR the DTCs. REPEAT the self-test.	GO to DV11.

DV11 CHECK THE TP1 AND TP2 CIRCUITS FOR AN OPEN IN THE HARNESS

Key in OFF position.

Measure the resistance between:

(+) ETBTPS Connector, Harness Side	(-) PCM Connector, Harness Side
TP1	TP1
TP2	TP2

Are the resistances less than 5 ohms?

Yes	No
GO to DV12.	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

DV12 CHECK THE TP1 AND TP2 CIRCUITS FOR A SHORT TO GROUND IN THE HARNESS

Measure the resistance between:

(+) ETBTPS Connector, Harness Side	(-) Vehicle Battery
TP1	Negative terminal
TP2	Negative terminal

Are the resistances greater than 10K ohms?

Yes	No
GO to DV13.	REPAIR the short circuit to GND. CLEAR the DTCs. REPEAT the self-test.

DV13 CHECK THE TPS CIRCUIT FOR A SHORT TOGETHER

Measure the resistance between:

(+) ETBTPS Connector, Harness Side	(-) ETBTPS Connector, Harness Side
TP1	TP2
TP1	ETCREF
TP1	ETCRTN
TP2	ETCREF
TP2	ETCRTN

Are the resistances greater than 10K ohms?

Yes	No
GO to DV14.	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

DV14 CHECK FOR A TP2 SIGNAL HIGH VERSUS LOAD WHILE DRIVING THE VEHICLE

ETBTPS connector connected.

PCM connector connected.

Key ON, engine running.

Access the PCM and monitor the TP2 and LOAD PIDs.

Drive the vehicle while exercising the throttle and ETCTP sensor and accessing the PIDS.

Is the TP2 PID greater than 2.44 volts and the LOAD PID less than 30%?

Yes	No
GO to DV15.	GO to DV16.

DV15 CHECK FOR INLET AIR LEAKS

Check the air inlet system for leaks.

Listen for air noise around the MAF sensor and throttle body while the engine is running.

Is a concern present?

Yes	No
REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.	GO to DV16.

DV16 CHECK FOR A TP2 SIGNAL LOW VERSUS LOAD WHILE DRIVING THE VEHICLE

Key ON, engine running.

Access the PCM and monitor the TP2 and LOAD PIDs.

Drive the vehicle while exercising the throttle and ETCTP sensor and accessing the PIDS.

Is the TP2 PID less than 0.24 volt and the LOAD PID greater than 55%?

Yes	No
GO to DV17.	GO to DV18.

DV17 CHECK FOR SELF-TEST DTCS

Key ON, engine OFF.

Clear the DTCs.

Drive the vehicle while exercising the throttle.

Retrieve the continuous memory DTCs.

Are any DTCs present?

Yes	No
GO to DV18.	Unable to duplicate or identify the concern at this time. GO to Pinpoint Test Z.

DV18 CHECK THE TP SENSOR OPERATION

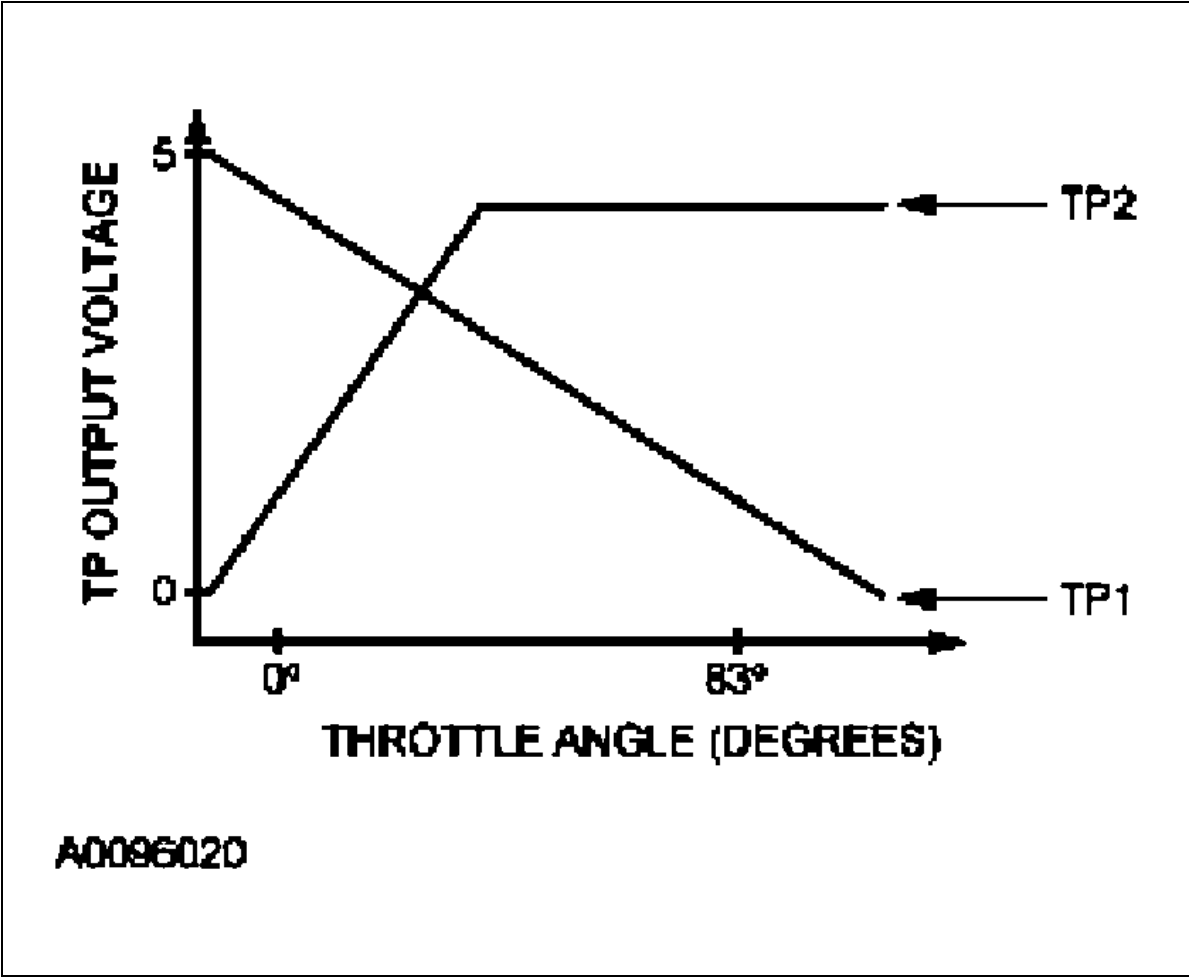
Key ON, engine OFF.

Access the PCM and monitor the TP1 and TP2 PIDs.

Slowly press the accelerator pedal from fully released to fully applied while observing the voltage readings.

Use the chart as a reference.

Fig 7: TP1 And TP2 Sensor Output Voltages



Courtesy of FORD MOTOR CO.

Do all signal values smoothly change when the accelerator is pressed?

Yes	No
For continuous memory DTC P0068, CHECK the mass air flow (MAF) and manifold absolute pressure (MAP) sensors and connectors for damage and corrosion. REPAIR as necessary.	For Five Hundred, Freestyle, Montego, and F-150 4.2L with DTC P2135, INSTALL a new ETB. REFER to the appropriate FUEL CHARGING & CONTROLS article . CLEAR the DTCs. REPEAT the self-test.
CLEAR the DTCs. REPEAT the self-test.	For all others with DTC P2135, INSTALL a new ETBTPS. REFER to the appropriate ELECTRONIC ENGINE CONTROLS article . CLEAR the DTCs. REPEAT the self-test.
For all others, GO to DV19.	For all others without DTC P2135, GO to DV29.

DV19 CHECK THE TPS CIRCUIT FOR AN INTERMITTENT CONCERN

Access the PCM and monitor the TP1 and TP2 PIDs.

Wiggle, shake, and bend the harness from the TP to the PCM.

Are the voltages between 0.49 - 4.65 V?

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Yes	No
GO to DV28.	REPAIR as necessary. If DTC P2100 or P2101 is present, GO to DV20.

DV20 CHECK THE TACM MOTOR VISUALLY

NOTE: Make sure the TACM harness connector is properly connected.

Key in OFF position.

Inspect the TACM for damaged housing, harness connector, and harness.

Are there any concerns with the TACM hardware?

Yes	No
INSTALL a new ETB. REFER to the appropriate FUEL CHARGING & CONTROLS article . CLEAR the DTCs. REPEAT the self-test.	GO to DV21.

DV21 CHECK THE TACM FOR A SHORT OR OPEN

ETBTACM connector disconnected.

Measure the resistance between:

(+) ETBTACM Connector, Component Side	(-) ETBTACM Connector, Component Side
TACM+	TACM-

Is the resistance between 1 ohm - 900 ohms?

Yes	No
GO to DV22.	INSTALL a new ETB. REFER to the appropriate FUEL CHARGING & CONTROLS article . CLEAR the DTCs. REPEAT the self-test.

DV22 CHECK THE TACM HARNESS FOR AN OPEN

PCM connector disconnected.

Measure the resistance between:

(+) ETBTACM Connector, Harness Side	(-) PCM Connector, Harness Side
TACM+	TACM+
TACM-	TACM-

Are the resistances less than 5 ohms?

Yes	No
GO to DV23.	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

DV23 CHECK THE HARNESS FOR A SHORT TO GND, PWR, ETCREF, AND ETCRTN

Measure the resistance between:

(+) ETBTACM Connector, Harness Side	(-) PCM Connector, Harness Side
TACM+	PWRGND
TACM+	VPWR
TACM+	ETCRTN
TACM+	ETCREF
TACM-	PWRGND
TACM-	ETCRTN
TACM-	VPWR
TACM-	ETCREF

Are the resistances greater than 10K ohms?

Yes	No
GO to DV24.	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

DV24 CHECK FOR TACM HARNESS CIRCUITS SHORTED TOGETHER

Measure the resistance between:

(+) ETBTACM Connector, Harness Side	(-) ETBTACM Connector, Harness Side
TACM+	TACM-

Is the resistance greater than 10K ohms?

Yes	No
GO to DV25.	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

DV25 CHECK FOR SELF-TEST CODES

ETBTACM connector connected.

PCM connector connected.

Key ON, engine OFF.

Carry out the self-test.

Is DTC P2101 present?

Yes	No
GO to DV26.	GO to DV28.

DV26 CHECK FOR PROPER TACM+ WIRING IN THE HARNESS CONNECTOR

Key in OFF position.

ETBTACM connector disconnected.

PCM connector disconnected.

Measure the resistance between:

(+) ETBTACM Connector, Harness Side	(-) PCM Connector, Harness Side
TACM+	TACM+

Is the resistance less than 5 ohms?

Yes	No
GO to DV27.	REPAIR the open circuit. WIRE the TACM harness connector per the TACM and PCM connector diagrams. CLEAR the DTCs. REPEAT the self-test.

DV27 CHECK FOR PROPER TACM- WIRING IN THE HARNESS CONNECTOR

Measure the resistance between:

(+) ETBTACM Connector, Harness Side	(-) PCM Connector, Harness Side
TACM-	TACM-

Is the resistance less than 5 ohms?

Yes	No
GO to DV29.	GO to DV28.

DV28 CHECK THE REPAIR THROUGH PROCEDURE

Key ON, engine OFF.

Record and clear the DTCs.

Cycle the accelerator pedal to the floor and back several times.

Check for self-test DTCs.

Are any ETC system related DTCs present?

Yes	No
GO to DV29.	GO to Pinpoint Test Z.

DV29 CHECK FOR CORRECT PCM OPERATION

Disconnect all the PCM connectors.

Visually inspect for:

pushed out pins

corrosion

Connect all the PCM connectors and make sure they seat correctly.

Carry out the PCM self-test and verify the concern is still present.

Is the concern still present?

Yes	No
INSTALL a new PCM. REFER to FLASH ELECTRICALLY ERASABLE PROGRAMMABLE	The system is operating correctly at this time. The concern may have been caused by a loose

READ ONLY MEMORY (EEPROM) .

or corroded connector.

Test Procedure [PINPOINT TEST Z: INTERMITTENT]**Z1 DIRECTION FOR INTERMITTENT DIAGNOSTIC PATH**

NOTE: Proceed with this step only if the powertrain control module (PCM) was not previously cleared. Record freeze frame data prior to clearing the PCM DTCs. Clearing the DTCs clears any freeze frame data and eliminates FMEM. This helps to recreate the original conditions that set the DTCs or caused the symptom.

Key ON, engine OFF.

Clear the PCM DTCs.

Are the PCM DTCs cleared?

Yes	No
GO to Z2.	RESET the keep alive memory (KAM). REFER to RESET THE KEEP ALIVE MEMORY (KAM) .

Z2 SELECT THE PIDS AND/OR SIGNALS RELATED TO THE SYSTEM

A list of related PIDs and/or signals are needed for use with the diagnostic tool to monitor the suspect areas. Obtain the customer symptom description. Use the Reference Value Symptom chart and proceed to the Reference Value PID/Signal Measurement chart located at the beginning of REFERENCE VALUES .

Highlight each available PID/signal recommended by the charts under the PID/signal selection menu on the diagnostic tool.

Are all available PIDs/signals related to the symptom selected?

Yes	No
GO to Z3.	REPEAT the test step. GO to Z2.

Z3 DECISION TO VERIFY THE SYMPTOM

NOTE: The path to symptom verification is optional, but is recommended for several reasons. For example: the vehicle is back for a repeat repair, or there is no DTC present.

Is a concern symptom detected?

Yes	No
GO to Z10.	GO to Z4.

Z4 COLLECT ANY SYMPTOM RELATED DATA TO AID IN VERIFICATION

NOTE: Only MIL codes trigger freeze frame data. Refer to the diagnostic tool instruction manual to retrieve the freeze frame information.

Prepare the freeze frame data for use with information from the SYMPTOM CHARTS .

Check for continuous memory DTCs that should have been recorded from an earlier pinpoint test.

Access the information from the customer information worksheet and the customer if available.

Access any other symptom related data available, such as TSBs.

Is all available data recorded?

Yes	No
GO to Z5.	GATHER as much data as possible to aid in isolating the intermittent concern area. REPEAT the test step. GO to Z4.

Z5 RECREATE THE SYMPTOM USING ALL AVAILABLE DATA

NOTE: To recreate the original conditions that set the DTC or caused the symptom, the vehicle may require driving.

With the diagnostic tool, select and monitor the same PIDs as displayed in freeze frame along with any previously selected PIDs/signals from step Z2. Using the freeze frame data recorded earlier, recreate the conditions described by each freeze frame PID. Pay special attention to ECT, LOAD, RPM and VSS. Also, use any available data from the customer, TSBs, and other sources to aid in producing the correct conditions for recreating the symptom.

When the symptom occurs, press the trigger to begin recording. Refer to the diagnostic tool instruction manual for information on the recorder function.

Can the symptom be recreated?

Yes	No
GO to Z10.	GO to Z6.

Z6 RECREATE THE SYMPTOM USING THE KOEO AND ROAD TEST PROCEDURE

NOTE: PIDs for output in the Reference Value Charts represent command values only. Circuit measurements with a digital multimeter indicate the actual output status. Therefore, in the case of a concern, the PID and circuit reading on the vehicle may not correspond with each other. PIDs for PCM/TCM circuits with a mismatch in the digital multimeter measurement indicate a possible PCM/TCM concern.

The road test is the last attempt to locate the area of concern before physically disturbing vehicle circuits.

The Intermittent Road Test Procedure is a set of instructions for monitoring PIDs/signals with a diagnostic tool and circuit measurements with a digital multimeter. This is done under 4 different conditions - key on/engine off, hot idle, 48 km/h (30 mph) and 88 km/h (55 mph). Use the typical diagnostic reference values from REFERENCE VALUES to compare with the actual vehicle.

Locate the correct Reference Value Chart in REFERENCE VALUES .

Setup the vehicle to measure the circuits with a digital multimeter and a diagnostic tool.

Connect a diagnostic tool to the DLC.

Key ON, engine OFF.

With the diagnostic tool, select and monitor PIDs and measure the circuits shown in the Reference Value Chart in REFERENCE VALUES .

Compare the diagnostic tool PIDs and digital multimeter values to the Reference Value Charts.

Are any values out of range?

Yes	No
GO to Z10.	GO to Z7.

Z7 RECREATE THE SYMPTOM USING THE HOT IDLE ROAD TEST PROCEDURE

NOTE: The engine temperature should be at least 87°C (189°F).

Key ON, engine running.

Continue to monitor the PIDs and circuits as in the previous step.

Are any values out of range?

Yes	No
GO to Z10.	GO to Z8.

Z8 RECREATE THE SYMPTOM USING THE 48 KM/H (30 MPH) SLOW CRUISE ROAD TEST PROCEDURE

Drive the vehicle on a preplanned route.

Continue to monitor the PIDs and circuits as in the previous step.

Are any values out of range?

Yes	No
GO to Z10.	GO to Z9.

Z9 RECREATE THE SYMPTOM USING 88 KM/H (55 MPH) HIGH CRUISE ROAD TEST PROCEDURE

Continue to drive the vehicle on the preplanned route.

Continue to monitor the PIDs and circuits as in the previous step.

Are any values out of range?

Yes	No
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GO to Z10.	It is now necessary to physically disturb the selected vehicle circuits in an attempt to recreate the intermittent concern. GO to Z10.
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Z10 SELECT THE CIRCUITS FROM THE PCM PIDS/SIGNALS CHART

NOTE: From the same chart, be sure to select and proceed with the appropriate test type.

NOTE: The Input Test should be used on sensing inputs such as temperature, position or oxygen.

NOTE: The Output Test should be used on output devices such as relays, coils or solenoids.

Remain in the PID/Signal selection menu with the diagnostic tool.

If the intermittent road test was used to verify the symptom, highlight the PIDs/signals that were displayed as a mismatch to the Reference Values from REFERENCE VALUES . Otherwise, highlight only the PIDs/signals from step Z2.

Proceed to the PCM PIDS/SIGNALS CHART located at the beginning of this test.

Match the selected PIDs/signals to the corresponding circuit in the chart. There may be more than one circuit to test. If a PID/signal recording was made with the diagnostic tool, it may be helpful to replay it at this time. Refer to the diagnostic tool instruction manual for recorder function information.

Has a test been chosen?

Yes	No
For the input test, GO to Z11. For the output test, GO to Z15.	To diagnose other driveability symptoms, REFER to SYMPTOM CHARTS .

Z11 KOEO INPUT TEST PROCEDURE FOR THE PCM/TCM SENSORS

WARNING: WHEN CARRYING OUT ANY TEST STEPS, ALWAYS BE AWARE OF HANDS, CLOTHING OR TOOLS NEAR COOLING FANS, BELTS OR HOT SURFACES. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

Using the circuits chosen from the PCM PIDS/SIGNALS Chart, select only the recommended PIDs/signals to monitor with the diagnostic tool. If a PID is not available for the circuit, use a digital multimeter to check the value.

Proceed to the area of the suspect wiring or component concern.

Key ON, engine OFF.

If the input is a switch type-component, turn it on manually.

Monitor the PID or digital multimeter while tapping on the component.

Monitor while wiggling the sensor harness wire from the component to the PCM/TCM.

Look for abrupt changes in the values. Compare these actual values to the Typical Diagnostic Reference Values in REFERENCE VALUES .

Are there abrupt changes in the PID values that do not compare with the REFERENCE VALUES ?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	GO to Z12.

Z12 KOER INPUT TEST PROCEDURE FOR THE PCM/TCM SENSORS

WARNING: WHEN CARRYING OUT ANY TEST STEPS,
ALWAYS BE AWARE OF HANDS, CLOTHING OR TOOLS NEAR
COOLING FANS, BELTS OR HOT SURFACES.
FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN
PERSONAL INJURY.

Key ON, engine running.

Continue to monitor the PIDs and circuits as in the previous step.

Proceed to the area of the suspect wiring or component concern.

If the input is a switch type-component, turn it on manually.

Monitor the PID or digital multimeter while tapping on the component.

Monitor while wiggling the sensor harness wire from the component to the PCM/TCM.

Look for abrupt changes in the values. Compare these actual values to the Typical Diagnostic Reference Values in REFERENCE VALUES .

Are any values fluctuating in and out of range?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	GO to Z13.

Z13 KOEO WATER SOAK TEST PROCEDURE FOR THE PCM/TCM SENSORS, EXCLUDING HIGH VOLTAGE CIRCUITS

WARNING: WHEN CARRYING OUT ANY TEST STEPS,
ALWAYS BE AWARE OF HANDS, CLOTHING OR TOOLS NEAR
COOLING FANS, BELTS OR HOT SURFACES.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

Key ON, engine OFF.

Continue to monitor the PIDs and circuits as in the previous step.

Proceed to the area of the suspect wiring or component concern.

If the input is a switch type-component, turn it on manually.

Monitor the PID or digital multimeter values while lightly spraying a water mist on the component.

Monitor while spraying the sensor harness wire from the component to the PCM/TCM.

Look for abrupt changes in the values. Compare these actual values to the Typical Diagnostic Reference Values in REFERENCE VALUES .

Are any values fluctuating in and out of range?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	GO to Z14.

Z14 KOER WATER SOAK TEST PROCEDURE FOR THE PCM/TCM SENSORS, EXCLUDING HIGH VOLTAGE CIRCUITS

WARNING: WHEN CARRYING OUT ANY TEST STEPS, ALWAYS BE AWARE OF HANDS, CLOTHING OR TOOLS NEAR COOLING FANS, BELTS OR HOT SURFACES.
FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

Key ON, engine running.

Continue to monitor the PIDs and circuits as in the previous step.

Proceed to the area of the suspect wiring or component concern.

If the input is a switch type-component, turn it on manually.

Monitor the PID or digital multimeter values while lightly spraying a water mist on the component.

Monitor while spraying the sensor harness wire from the component to the PCM/TCM.

Look for abrupt changes in the values. Compare these actual values to the Typical Diagnostic Reference Values in REFERENCE VALUES .

Are any values fluctuating in and out of range?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	GO to Z15.

Z15 KOER WATER SOAK TEST PROCEDURE FOR THE PCM SENSORS

WARNING: WHEN CARRYING OUT ANY TEST STEPS, ALWAYS BE AWARE OF HANDS, CLOTHING OR TOOLS NEAR COOLING FANS, BELTS OR HOT SURFACES. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

CAUTION: The cooling fans or the fuel pump may turn on during the next steps.

NOTE: Remember that PIDs selected from the PCM PIDS/SIGNALS Chart display commanded values only. A digital multimeter measurement is needed to display the actual values. Be sure to compare them. Look for fluctuations to occur during any part of the following test. The output state test may not control some outputs, such as injectors and ignition coils and may not be available for all actuators.

Using the circuits chosen from the PCM PIDS/SIGNALS Chart, select only the recommended PIDs/signals to monitor with the diagnostic tool. If a PID is not available for the circuit, use a digital multimeter to check the value.

Key ON, engine OFF.

With the diagnostic tool, turn on selected outputs using output state control. Refer to the diagnostic tool instruction manual.

Proceed to the area of the suspect wiring or component concern.

Monitor the PID or digital multimeter while tapping on the component.

Monitor while wiggling the sensor harness wire from the component to the PCM/TCM.

Look for abrupt changes in the values. Compare these actual values to the Typical Diagnostic Reference Values in REFERENCE VALUES .

Is there a mismatch between command and actual or are any values fluctuating in and out of range when compared to the Reference Value Charts in REFERENCE VALUES ?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	GO to Z16.

Z16 KOER OUTPUT TEST PROCEDURE FOR THE PCM/TCM ACTUATORS

WARNING: WHEN CARRYING OUT ANY TEST STEPS, ALWAYS BE AWARE OF HANDS, CLOTHING OR TOOLS NEAR COOLING FANS, BELTS OR HOT SURFACES.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

NOTE: Remember that PIDs selected from the PCM PIDS/SIGNALS Chart display commanded values only. A digital multimeter measurement is needed to display the actual values. Be sure to compare them. Look for fluctuations to occur during any part of the following test. The output state test may not control some outputs, such as injectors and ignition coils and may not be available for all actuators.

To test these output types, GO to Z18.
Key ON, engine running.
Proceed to the area of the suspect wiring or component concern.
Monitor the PIDs with the diagnostic tool and note the values. Compare the diagnostic tool values with values from a digital multimeter with the engine at idle. While tapping on the suspect component look for fluctuations in the values.
If a coil for a coil on plug application is suspect, turn off the key. Gain access to the coil and measure continuity from the spark plug terminal to the signal terminal while tapping the coil. A large fluctuation in resistance indicates an intermittent open or short.
Monitor while wiggling the sensor harness wire from the component to the PCM/TCM.
Look for abrupt changes in the values. Compare these actual values to the Typical Diagnostic Reference Values in REFERENCE VALUES .

Is there a diagnostic tool to digital multimeter value mismatch or an idle fluctuation?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	GO to Z17.

Z17 KOEO WATER SOAK TEST PROCEDURE FOR THE PCM/TCM ACTUATORS, EXCLUDING HIGH VOLTAGE CIRCUITS

WARNING: WHEN CARRYING OUT ANY TEST STEPS, ALWAYS BE AWARE OF HANDS, CLOTHING OR TOOLS NEAR COOLING FANS, BELTS OR HOT SURFACES.
FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

NOTE: Remember that PIDs selected from the PCM PIDS/SIGNALS Chart display commanded values only. A digital multimeter measurement is needed to display the actual

values. Be sure to compare them. Look for fluctuations to occur during any part of the following test. The output state test may not control some outputs, such as injectors and ignition coils and may not be available for all actuators.

To test these output types, GO to Z18.

Key ON, engine OFF.

With the diagnostic tool, turn on selected outputs using output state control. Refer to the diagnostic tool instruction manual.

Proceed to the area of the suspect wiring or component concern.

Monitor the PID or digital multimeter values while lightly spraying a water mist on the component.

Look for abrupt changes in the values. Compare these actual values to the Typical Diagnostic Reference Values in REFERENCE VALUES .

Is there a mismatch between command and actual or are any values fluctuating in and out of range when compared to the Reference Value Charts in REFERENCE VALUES ?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	GO to Z18.

Z18 KOER WATER SOAK TEST PROCEDURE FOR THE PCM/TCM ACTUATORS

WARNING: WHEN CARRYING OUT ANY TEST STEPS, ALWAYS BE AWARE OF HANDS, CLOTHING OR TOOLS NEAR COOLING FANS, BELTS OR HOT SURFACES. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

Key ON, engine running.

Using the circuits chosen from the PCM PIDS/SIGNALS Chart, select only the recommended PIDs/signals to monitor with the diagnostic tool. If a PID is not available for the circuit, use a digital multimeter to check the value.

Proceed to the area of the suspect wiring or component concern.

Monitor the PID or digital multimeter values while lightly spraying a water mist on the component.

Monitor while spraying the sensor harness wire from the component to the PCM/TCM.

Look for abrupt changes in the values. Compare these actual values to the Typical Diagnostic Reference Values in REFERENCE VALUES .

Is there a mismatch between command and actual or are any values fluctuating in and out of range when compared to the Reference Value Charts in REFERENCE VALUES ?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	GO to Z19.

Z19 INSPECT FOR INTERMITTENT MECHANICAL CONCERNS

NOTE: *It is possible for an intermittent mechanical concern to cause a good PCM/TCM system to react abnormally.*

An inspection of DTC related mechanical systems should have been carried out in an earlier section. If not, visually inspect at this time.

Look for possible vacuum lines, wires, cables, linkage or hoses that may become kinked, shorted or restricted during normal engine operation.

This may include engine/transmission gear changes, acceleration and deceleration, rough roads and various engine RPM and torque related conditions.

Is a mechanical concern detected?

Yes	No
REPAIR as necessary. VERIFY the repair. CLEAR the DTCs. REPEAT the self-test.	No additional testing available. Repeat test procedures as necessary. . A vehicle data recorder (VDR) or similar recorder may also be useful.

DIAGNOSTIC TROUBLE CODE (DTC) CHARTS AND DESCRIPTIONS

Question: 06 F250 5.4l 3V Variable Cam Timing

Question: Misfire when warm - '06 e250 5.4

Tip: P2107

more

NOTE: *Refer to the applicable service information to diagnose the body and chassis DTCs.*

DTC INDEX

DIAGNOSTIC TROUBLE CODES (DTC) LIST

DTC	Description
DTC P0010	INTAKE CAMSHAFT POSITION ACTUATOR CIRCUIT/OPEN (BANK 1)
DTC P0011	INTAKE CAMSHAFT POSITION TIMING - OVER-ADVANCED (BANK 1)
DTC P0012	INTAKE CAMSHAFT POSITION TIMING - OVER-RETARDED (BANK 1)

DTC P0016	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION - BANK 1 SENSOR A
DTC P0018	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION - BANK 2 SENSOR A
DTC P0020	INTAKE CAMSHAFT POSITION ACTUATOR CIRCUIT/OPEN (BANK 2)
DTC P0021	INTAKE CAMSHAFT POSITION TIMING - OVER-ADVANCED (BANK 2)
DTC P0022	INTAKE CAMSHAFT POSITION TIMING - OVER-RETARDED (BANK 2)
DTC P0040	OXYGEN SENSOR SIGNALS SWAPPED BANK 1 SENSOR 1/BANK 2 SENSOR 1
DTC P0041	OXYGEN SENSOR SIGNALS SWAPPED BANK 1 SENSOR 2/BANK 2 SENSOR 2
DTC P0053	HO2S HEATER RESISTANCE (BANK 1, SENSOR 1)
DTC P0054	HO2S HEATER RESISTANCE (BANK 1, SENSOR 2)
DTC P0055	HO2S HEATER RESISTANCE (BANK 1, SENSOR 3)
DTC P0059	HO2S HEATER RESISTANCE (BANK 2, SENSOR 1)
DTC P0060	HO2S HEATER RESISTANCE (BANK 2, SENSOR 2)
DTC P0068	MANIFOLD ABSOLUTE PRESSURE (MAP)/MASS AIR FLOW (MAF) - THROTTLE POSITION CORRELATION
DTC P0102	MASS OR VOLUME AIR FLOW A CIRCUIT LOW
DTC P0103	MASS OR VOLUME AIR FLOW A CIRCUIT HIGH
DTC P0104	MASS OR VOLUME AIR FLOW A CIRCUIT INTERMITTENT/ERRATIC
DTC P0106	MANIFOLD ABSOLUTE PRESSURE (MAP/BARO) SENSOR RANGE/PERFORMANCE
DTC P0107	MANIFOLD ABSOLUTE PRESSURE (MAP)/BAROMETRIC PRESSURE (BARO) SENSOR LOW
DTC P0108	MANIFOLD ABSOLUTE PRESSURE (MAP)/BAROMETRIC PRESSURE (BARO) SENSOR HIGH
DTC P0109	MANIFOLD ABSOLUTE PRESSURE (MAP)/BAROMETRIC PRESSURE (BARO) SENSOR INTERMITTENT
DTC	INTAKE AIR TEMPERATURE (IAT) SENSOR 1 CIRCUIT LOW

P0112	
DTC P0113	INTAKE AIR TEMPERATURE (IAT) SENSOR 1 CIRCUIT HIGH
DTC P0114	INTAKE AIR TEMPERATURE (IAT) SENSOR 1 INTERMITTENT/ERRATIC
DTC P0116	ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 CIRCUIT RANGE/PERFORMANCE
DTC P0117	ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 CIRCUIT LOW
DTC P0118	ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 CIRCUIT HIGH
DTC P0119	ENGINE COOLANT TEMPERATURE (ECT) SENSOR 1 CIRCUIT INTERMITTENT/ERRATIC
DTC P0121	THROTTLE/PEDAL POSITION SENSOR A CIRCUIT RANGE/PERFORMANCE
DTC P0122	THROTTLE/PEDAL POSITION SENSOR A CIRCUIT LOW
DTC P0123	THROTTLE/PEDAL POSITION SENSOR A CIRCUIT HIGH
DTC P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL
DTC P0127	INTAKE AIR TEMPERATURE (IAT) TOO HIGH
DTC P0128	COOLANT THERMOSTAT (COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)
DTC P0132	O2 CIRCUIT HIGH VOLTAGE (BANK 1, SENSOR 1)
DTC P0133	O2 CIRCUIT SLOW RESPONSE (BANK 1, SENSOR 1)
DTC P0135	O2 HEATER CIRCUIT (BANK 1, SENSOR 1)
DTC P0138	O2 CIRCUIT HIGH VOLTAGE (BANK 1, SENSOR 2)
DTC P0141	O2 HEATER CIRCUIT (BANK 1, SENSOR 2)
DTC P0144	O2 CIRCUIT HIGH VOLTAGE (BANK 1, SENSOR 3)
DTC P0147	O2 HEATER CIRCUIT (BANK 1, SENSOR 3)
DTC P0148	FUEL DELIVERY ERROR

DTC P0152	O2 CIRCUIT HIGH VOLTAGE (BANK 2, SENSOR 1)
DTC P0153	O2 CIRCUIT SLOW RESPONSE (BANK 2, SENSOR 1)
DTC P0155	O2 HEATER CIRCUIT (BANK 2, SENSOR 1)
DTC P0158	O2 CIRCUIT HIGH VOLTAGE (BANK 2, SENSOR 2)
DTC P0161	O2 HEATER CIRCUIT (BANK 2, SENSOR 2)
DTC P0171	SYSTEM TOO LEAN (BANK 1)
DTC P0172	SYSTEM TOO RICH (BANK 1)
DTC P0174	SYSTEM TOO LEAN (BANK 2)
DTC P0175	SYSTEM TOO RICH (BANK 2)
DTC P0180	FUEL TEMPERATURE SENSOR A CIRCUIT
DTC P0181	FUEL TEMPERATURE SENSOR A CIRCUIT RANGE/PERFORMANCE
DTC P0182	FUEL TEMPERATURE SENSOR A CIRCUIT LOW
DTC P0183	FUEL TEMPERATURE SENSOR A CIRCUIT HIGH
DTC P0190	FUEL RAIL PRESSURE SENSOR A CIRCUIT
DTC P0191	FUEL RAIL PRESSURE SENSOR A CIRCUIT RANGE/PERFORMANCE
DTC P0192	FUEL RAIL PRESSURE SENSOR A CIRCUIT LOW
DTC P0193	FUEL RAIL PRESSURE SENSOR A CIRCUIT HIGH
DTC P0196	ENGINE OIL TEMPERATURE (EOT) SENSOR CIRCUIT RANGE/PERFORMANCE
DTC P0197	ENGINE OIL TEMPERATURE (EOT) SENSOR CIRCUIT LOW
DTC P0198	ENGINE OIL TEMPERATURE (EOT) SENSOR CIRCUIT HIGH

DTC P020X	INJECTOR CIRCUIT/OPEN - CYLINDER X
DTC P0210	INJECTOR CIRCUIT/OPEN - CYLINDER 10
DTC P0217	ENGINE COOLANT OVER-TEMPERATURE CONDITION
DTC P0218	TRANSMISSION FLUID TEMPERATURE OVER-TEMPERATURE CONDITION
DTC P0219	ENGINE OVER SPEED CONDITION
DTC P0221	THROTTLE/PEDAL POSITION SENSOR/SWITCH B CIRCUIT RANGE/PERFORMANCE
DTC P0222	THROTTLE/PEDAL POSITION SENSOR/SWITCH B CIRCUIT LOW
DTC P0223	THROTTLE/PEDAL POSITION SENSOR/SWITCH B CIRCUIT HIGH
DTC P0230	FUEL PUMP PRIMARY CIRCUIT
DTC P0231	FUEL PUMP SECONDARY CIRCUIT LOW
DTC P0232	FUEL PUMP SECONDARY CIRCUIT HIGH
DTC P0234	TURBOCHARGER/SUPERCHARGER A OVERBOOST CONDITION
DTC P0243	TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID A
DTC P0261	CYLINDER 1 INJECTOR CIRCUIT LOW
DTC P0262	CYLINDER 1 INJECTOR CIRCUIT HIGH
DTC P0264	CYLINDER 2 INJECTOR CIRCUIT LOW
DTC P0265	CYLINDER 2 INJECTOR CIRCUIT HIGH
DTC P0267	CYLINDER 3 INJECTOR CIRCUIT LOW
DTC P0268	CYLINDER 3 INJECTOR CIRCUIT HIGH
DTC P0270	CYLINDER 4 INJECTOR CIRCUIT LOW
DTC	CYLINDER 4 INJECTOR CIRCUIT HIGH

P0271	
DTC P0273	CYLINDER 5 INJECTOR CIRCUIT LOW
DTC P0274	CYLINDER 5 INJECTOR CIRCUIT HIGH
DTC P0276	CYLINDER 6 INJECTOR CIRCUIT LOW
DTC P0277	CYLINDER 6 INJECTOR CIRCUIT HIGH
DTC P0279	CYLINDER 7 INJECTOR CIRCUIT LOW
DTC P0280	CYLINDER 7 INJECTOR CIRCUIT HIGH
DTC P0282	CYLINDER 8 INJECTOR CIRCUIT LOW
DTC P0283	CYLINDER 8 INJECTOR CIRCUIT HIGH
DTC P0297	VEHICLE OVER SPEED CONDITION
DTC P0298	ENGINE OIL OVER TEMPERATURE CONDITION
DTC P0300	RANDOM MISFIRE DETECTED
DTC P0301 - P0309	CYLINDER X MISFIRE DETECTED
DTC P0310	CYLINDER 10 MISFIRE DETECTED
DTC P0315	CRANKSHAFT POSITION SYSTEM VARIATION NOT LEARNED
DTC P0316	MISFIRE DETECTED ON STARTUP (FIRST 1000 REVOLUTIONS)
DTC P0320	IGNITION/DISTRIBUTOR ENGINE SPEED INPUT CIRCUIT
DTC P0325	KNOCK SENSOR 1 CIRCUIT (BANK 1)
DTC P0326	KNOCK SENSOR 1 CIRCUIT RANGE/PERFORMANCE (BANK 1)
DTC P0330	KNOCK SENSOR 2 CIRCUIT (BANK 2)
DTC	KNOCK SENSOR 2 CIRCUIT RANGE/PERFORMANCE (BANK 2)

P0331	
DTC P0340	CAMSHAFT POSITION SENSOR A CIRCUIT (BANK 1 OR SINGLE SENSOR)
DTC P0344	CAMSHAFT POSITION SENSOR A CIRCUIT INTERMITTENT (BANK 1 OR SINGLE SENSOR)
DTC P0345	CAMSHAFT POSITION SENSOR A CIRCUIT (BANK 2)
DTC P0349	CAMSHAFT POSITION SENSOR A CIRCUIT INTERMITTENT (BANK 2)
DTC P0350	IGNITION COIL PRIMARY/SECONDARY CIRCUIT
DTC P0351	IGNITION COIL A PRIMARY/SECONDARY CIRCUIT
DTC P0352	IGNITION COIL B PRIMARY/SECONDARY CIRCUIT
DTC P0353	IGNITION COIL C PRIMARY/SECONDARY CIRCUIT
DTC P0354	IGNITION COIL D PRIMARY/SECONDARY CIRCUIT
DTC P0355	IGNITION COIL E PRIMARY/SECONDARY CIRCUIT
DTC P0356	IGNITION COIL F PRIMARY/SECONDARY CIRCUIT
DTC P0357	IGNITION COIL G PRIMARY/SECONDARY CIRCUIT
DTC P0358	IGNITION COIL H PRIMARY/SECONDARY CIRCUIT
DTC P0359	IGNITION COIL I PRIMARY/SECONDARY CIRCUIT
DTC P0360	IGNITION COIL J PRIMARY/SECONDARY CIRCUIT
DTC P0400	EXHAUST GAS RECIRCULATION (EGR) FLOW
DTC P0401	EXHAUST GAS RECIRCULATION (EGR) FLOW INSUFFICIENT DETECTED
DTC P0402	EXHAUST GAS RECIRCULATION (EGR) FLOW EXCESSIVE DETECTED
DTC P0403	EXHAUST GAS RECIRCULATION (EGR) CONTROL CIRCUIT
DTC P0405	EXHAUST GAS RECIRCULATION (EGR) SENSOR A CIRCUIT LOW

DTC P0406	EXHAUST GAS RECIRCULATION (EGR) SENSOR A CIRCUIT HIGH
DTC P0410	SECONDARY AIR INJECTION (AIR) SYSTEM
DTC P0412	SECONDARY AIR INJECTION (AIR) SYSTEM - SWITCHING VALVE A CIRCUIT
DTC P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1)
DTC P0430	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 2)
DTC P0442	EVAPORATIVE EMISSION SYSTEM LEAK DETECTED (SMALL LEAK)
DTC P0443	EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT
DTC P0446	EVAPORATIVE EMISSION SYSTEM VENT CONTROL CIRCUIT
DTC P0451	EVAPORATIVE EMISSION SYSTEM PRESSURE SENSOR/SWITCH RANGE/PERFORMANCE
DTC P0452	EVAPORATIVE EMISSION SYSTEM PRESSURE SENSOR/SWITCH LOW
DTC P0453	EVAPORATIVE EMISSION SYSTEM PRESSURE SENSOR/SWITCH HIGH
DTC P0454	EVAPORATIVE EMISSION SYSTEM PRESSURE SENSOR/SWITCH INTERMITTENT
DTC P0455	EVAPORATIVE EMISSION SYSTEM LEAK DETECTED (GROSS LEAK/NO FLOW)
DTC P0456	EVAPORATIVE EMISSION SYSTEM LEAK DETECTED (VERY SMALL LEAK)
DTC P0457	EVAPORATIVE EMISSION SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF)
DTC P0460	FUEL LEVEL SENSOR A CIRCUIT
DTC P0461	FUEL LEVEL SENSOR A CIRCUIT RANGE/PERFORMANCE
DTC P0462	FUEL LEVEL SENSOR A CIRCUIT LOW
DTC P0463	FUEL LEVEL SENSOR A CIRCUIT HIGH
DTC P0480	FAN 1 CONTROL CIRCUIT

DTC P0481	HIGH FAN CONTROL (HFC)/FAN CONTROL 3 (FC3) PRIMARY CIRCUIT MALFUNCTION
DTC P0482	MEDIUM FAN CONTROL (MFC)/ FAN CONTROL 2 (FC2) PRIMARY CIRCUIT FAILURE
DTC P0483	VARIABLE FAN CONTROL (FC V) FAN PERFORMANCE
DTC P0491	SECONDARY AIR INJECTION (AIR) SYSTEM INSUFFICIENT FLOW (BANK 1)
DTC P0500	VEHICLE SPEED SENSOR (VSS) A
DTC P0503	VEHICLE SPEED SENSOR (VSS) A INTERMITTENT/ERRATIC/HIGH
DTC P0505	IDLE AIR CONTROL (IAC) SYSTEM
DTC P0506	IDLE AIR CONTROL (IAC) SYSTEM RPM LOWER THAN EXPECTED
DTC P0507	IDLE AIR CONTROL (IAC) SYSTEM RPM HIGHER THAN EXPECTED
DTC P050A	COLD START IDLE AIR CONTROL PERFORMANCE
DTC P050B	COLD START IGNITION TIMING PERFORMANCE
DTC P0511	IDLE AIR CONTROL (IAC) CIRCUIT
DTC P0528	FAN SPEED SENSOR CIRCUIT NO SIGNAL
DTC P0532	AIR CONDITIONING PRESSURE (ACP) SENSOR LOW VOLTAGE DETECTED
DTC P0533	AIR CONDITIONING PRESSURE (ACP) SENSOR HIGH VOLTAGE DETECTED
DTC P0534	LOW A/C CYCLING PERIOD
DTC P0537	A/C EVAPORATOR TEMPERATURE (ACET) CIRCUIT LOW INPUT
DTC P0538	A/C EVAPORATOR TEMPERATURE (ACET) CIRCUIT HIGH INPUT
DTC P0552	POWER STEERING PRESSURE (PSP) SENSOR/SWITCH CIRCUIT LOW
DTC P0553	POWER STEERING PRESSURE (PSP) SENSOR CIRCUIT HIGH INPUT
DTC	CRUISE CONTROL MULTIFUNCTION INPUT A CIRCUIT RANGE / PERFORMANCE

P0579	
DTC P0581	CRUISE CONTROL MULTIFUNCTION INPUT A CIRCUIT HIGH
DTC P0600	SERIAL COMMUNICATION LINK
DTC P0602	POWERTRAIN CONTROL MODULE (PCM) PROGRAMMING ERROR
DTC P0603	INTERNAL CONTROL MODULE KEEP ALIVE MEMORY (KAM) ERROR
DTC P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR
DTC P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR
DTC P0606	POWERTRAIN CONTROL MODULE (PCM) PROCESSOR
DTC P0607	CONTROL MODULE PERFORMANCE
DTC P060A	INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE
DTC P060B	INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE
DTC P060C	INTERNAL CONTROL MODULE MAIN PROCESSOR PERFORMANCE
DTC P0611	FUEL INJECTOR CONTROL MODULE PERFORMANCE
DTC P061B	INTERNAL CONTROL MODULE TORQUE CALCULATION PERFORMANCE
DTC P061C	INTERNAL CONTROL MODULE ENGINE RPM PERFORMANCE
DTC P061D	INTERNAL CONTROL MODULE ENGINE AIR MASS PERFORMANCE
DTC P061F	INTERNAL CONTROL MODULE THROTTLE ACTUATOR CONTROLLER PERFORMANCE
DTC P0620	GENERATOR CONTROL CIRCUIT
DTC P0622	GENERATOR FIELD TERMINAL CIRCUIT
DTC P0625	GENERATOR FIELD TERMINAL CIRCUIT LOW
DTC P0626	GENERATOR FIELD TERMINAL CIRCUIT HIGH

DTC P062C	INTERNAL CONTROL MODULE VEHICLE SPEED PERFORMANCE
DTC P062F	INTERNAL CONTROL MODULE EEPROM ERROR
DTC P0645	AIR CONDITIONING CLUTCH RELAY (A/CCR) PRIMARY CIRCUIT MALFUNCTION
DTC P0657	ACTUATOR SUPPLY VOLTAGE A CIRCUIT/OPEN
DTC P0660	INTAKE MANIFOLD TUNING VALVE (IMTV) CONTROL CIRCUIT OPEN - BANK 1
DTC P0685	ELECTRONIC CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM) POWER RELAY CONTROL CIRCUIT/OPEN
DTC P0689	ELECTRONIC CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM) POWER RELAY SENSE CIRCUIT LOW
DTC P0690	ELECTRONIC CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM) POWER RELAY SENSE CIRCUIT HIGH
DTC P0703	BRAKE SWITCH B INPUT CIRCUIT
DTC P0704	CLUTCH PEDAL POSITION (CPP) SWITCH MALFUNCTION
DTC P0705	TRANSMISSION RANGE SENSOR A CIRCUIT (PRNDL) INPUT
DTC P0707	TRANSMISSION RANGE SENSOR A CIRCUIT LOW
DTC P0708	TRANSMISSION RANGE SENSOR A CIRCUIT HIGH
DTC P071X	TRANSMISSION CODE
DTC P0720	OUTPUT SHAFT SPEED (OSS) SENSOR CIRCUIT
DTC P0721	OUTPUT SHAFT SPEED (OSS) SENSOR CIRCUIT RANGE/PERFORMANCE
DTC P0722	OUTPUT SHAFT SPEED (OSS) SENSOR CIRCUIT NO SIGNAL
DTC P0723	OUTPUT SHAFT SPEED (OSS) SENSOR CIRCUIT INTERMITTENT
DTC P073X	TRANSMISSION CODE
DTC P074X	TRANSMISSION CODE

DTC P075X	TRANSMISSION CODE
DTC P076X	TRANSMISSION CODE
DTC P077X	TRANSMISSION CODE
DTC P078X	TRANSMISSION CODE
DTC P079X	TRANSMISSION CODE
DTC P0815	UPSHIFT SWITCH CIRCUIT
DTC P0830	CLUTCH PEDAL SWITCH A CIRCUIT
DTC P0833	CLUTCH PEDAL SWITCH B CIRCUIT
DTC P0840	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH A CIRCUIT
DTC P09XX	TRANSMISSION CODE
DTC P1000	ON-BOARD DIAGNOSTIC (OBD) SYSTEMS READINESS TEST NOT COMPLETE
DTC P1001	KEY ON ENGINE RUNNING (KOER) NOT ABLE TO COMPLETE, KOER ABORTED
DTC P1100	MASS AIR FLOW (MAF) SENSOR CIRCUIT INTERMITTENT
DTC P1101	MASS AIR FLOW (MAF) SENSOR OUT OF SELF-TEST RANGE
DTC P1112	INTAKE AIR TEMPERATURE (IAT) CIRCUIT INTERMITTENT
DTC P1114	INTAKE AIR TEMPERATURE 2 (IAT2) CIRCUIT LOW (SUPERCHARGED/TURBOCHARGED ENGINES)
DTC P1115	INTAKE AIR TEMPERATURE 2 (IAT2) CIRCUIT HIGH (SUPERCHARGED/TURBOCHARGED ENGINES)
DTC P1116	ENGINE COOLANT TEMPERATURE (ECT) SENSOR OUT OF SELF-TEST RANGE
DTC P1117	ENGINE COOLANT TEMPERATURE (ECT) SENSOR CIRCUIT INTERMITTENT
DTC P1120	THROTTLE POSITION SENSOR A OUT OF RANGE LOW (RATCH TOO LOW)
DTC	THROTTLE POSITION SENSOR A OUT OF SELF-TEST RANGE

P1124	
DTC P1125	THROTTLE POSITION SENSOR A INTERMITTENT
DTC P1127	EXHAUST TEMPERATURE OUT OF RANGE, O2 SENSOR TESTS NOT COMPLETED
DTC P1156	FUEL SELECT SWITCH CIRCUIT
DTC P115E	THROTTLE ACTUATOR CONTROL (TAC) THROTTLE BODY AIR FLOW TRIM AT MAX LIMIT
DTC P117A	ENGINE OIL OVER TEMPERATURE - FORCED LIMITED POWER
DTC P1184	ENGINE OIL TEMPERATURE (EOT) SENSOR OUT OF SELF-TEST RANGE
DTC P1229	CHARGE AIR COOLER (CAC) PUMP DRIVER
DTC P1233	FUEL PUMP DRIVER MODULE DISABLED OR OFF LINE
DTC P1234	FUEL PUMP DRIVER MODULE DISABLED OR OFF LINE
DTC P1235	FUEL PUMP CONTROL OUT OF RANGE
DTC P1236	FUEL PUMP CONTROL OUT OF RANGE
DTC P1237	FUEL PUMP SECONDARY CIRCUIT
DTC P1238	FUEL PUMP SECONDARY CIRCUIT
DTC P1244	ALTERNATOR LOAD HIGH INPUT
DTC P1245	ALTERNATOR LOAD LOW INPUT
DTC P1246	ALTERNATOR LOAD INPUT
DTC P1260	THEFT DETECTED, VEHICLE IMMOBILIZED
DTC P1261	CYLINDER 1 HIGH TO LOW SIDE SHORT
DTC P1262	CYLINDER 2 HIGH TO LOW SIDE SHORT
DTC P1263	CYLINDER 3 HIGH TO LOW SIDE SHORT

DTC P1264	CYLINDER 4 HIGH TO LOW SIDE SHORT
DTC P1265	CYLINDER 5 HIGH TO LOW SIDE SHORT
DTC P1266	CYLINDER 6 HIGH TO LOW SIDE SHORT
DTC P1267	CYLINDER 7 HIGH TO LOW SIDE SHORT
DTC P1268	CYLINDER 8 HIGH TO LOW SIDE SHORT
DTC P1270	ENGINE RPM OR VEHICLE SPEED LIMITER REACHED
DTC P1271	CYLINDER 1 HIGH TO LOW SIDE OPEN
DTC P1272	CYLINDER 2 HIGH TO LOW SIDE OPEN
DTC P1273	CYLINDER 3 HIGH TO LOW SIDE OPEN
DTC P1274	CYLINDER 4 HIGH TO LOW SIDE OPEN
DTC P1275	CYLINDER 5 HIGH TO LOW SIDE OPEN
DTC P1276	CYLINDER 6 HIGH TO LOW SIDE OPEN
DTC P1277	CYLINDER 7 HIGH TO LOW SIDE OPEN
DTC P1278	CYLINDER 8 HIGH TO LOW SIDE OPEN
DTC P1285	CYLINDER HEAD OVER TEMPERATURE CONDITION
DTC P1288	CYLINDER HEAD TEMPERATURE (CHT) SENSOR OUT OF SELF-TEST RANGE
DTC P1289	CYLINDER HEAD TEMPERATURE (CHT) SENSOR CIRCUIT HIGH
DTC P128A	CYLINDER HEAD TEMPERATURE (CHT) SENSOR CIRCUIT INTERMITTENT/ERRATIC
DTC P1290	CYLINDER HEAD TEMPERATURE (CHT) SENSOR CIRCUIT LOW
DTC P1299	CYLINDER HEAD OVER TEMPERATURE PROTECTION ACTIVE

DTC P1309	MISFIRE MONITOR HARDWARE - CAMSHAFT POSITION SENSOR (CMP) MISALIGNED, CRANKSHAFT POSITION SENSOR (CKP)/CMP NOISE, POWERTRAIN CONTROL MODULE (PCM) AICE CHIP
DTC P1336	CRANKSHAFT/CAMSHAFT SENSOR RANGE/PERFORMANCE
DTC P1397	SYSTEM VOLTAGE OUT OF SELF-TEST RANGE
DTC P1405	DIFFERENTIAL PRESSURE FEEDBACK (DPF) SENSOR UPSTREAM HOSE OFF OR PLUGGED
DTC P1406	DIFFERENTIAL PRESSURE FEEDBACK (DPF) SENSOR DOWNSTREAM HOSE OFF OR PLUGGED
DTC P1408	EXHAUST GAS RECIRCULATION (EGR) FLOW OUT OF SELF-TEST RANGE (NON-MIL)
DTC P1409	EXHAUST GAS RECIRCULATION (EGR) VACUUM REGULATOR (EGRVR) SOLENOID CIRCUIT
DTC P1436	A/C EVAPORATOR TEMPERATURE (A/CET) CIRCUIT LOW INPUT
DTC P1437	A/C EVAPORATOR TEMPERATURE (A/CET) CIRCUIT HIGH INPUT
DTC P1443	EVAPORATIVE EMISSION SYSTEM CONTROL VALVE (LOW/NO FLOW)
DTC P1450	UNABLE TO BLEED UP FUEL TANK VACUUM
DTC P1451	EVAPORATIVE EMISSION SYSTEM VENT CONTROL CIRCUIT
DTC P1460	A/C CLUTCH RELAY (A/CCR) PRIMARY CIRCUIT MALFUNCTION (ALSO REFERRED TO AS WAC CIRCUIT)
DTC P1461	AIR CONDITIONING PRESSURE (A/CP) SENSOR HIGH VOLTAGE DETECTED
DTC P1462	AIR CONDITIONING PRESSURE (A/CP) SENSOR LOW VOLTAGE DETECTED
DTC P1463	AIR CONDITIONING PRESSURE SENSOR (A/CP) INSUFFICIENT PRESSURE CHANGE
DTC P1464	A/C DEMAND OUT OF SELF-TEST RANGE
DTC P1469	LOW A/C CYCLING PERIOD
DTC P1474	LOW FAN CONTROL (LFC)/FAN CONTROL 1 (FC1) PRIMARY CIRCUIT MALFUNCTION
DTC P1477	MEDIUM FAN CONTROL (MFC)/ FAN CONTROL 2 (FC2) PRIMARY CIRCUIT FAILURE

DTC P1479	HIGH FAN CONTROL (HFC)/FAN CONTROL 3 (FC3) PRIMARY CIRCUIT MALFUNCTION
DTC P1489	PCV HEATER CONTROL CIRCUIT
DTC P1500	VEHICLE SPEED SENSOR (VSS)
DTC P1501	VEHICLE SPEED SENSOR (VSS) OUT OF SELF-TEST RANGE
DTC P1502	VEHICLE SPEED SENSOR (VSS) INTERMITTENT
DTC P1504	IDLE AIR CONTROL (IAC) CIRCUIT
DTC P1506	IDLE AIR CONTROL (IAC) OVERSPEED ERROR
DTC P1507	IDLE AIR CONTROL (IAC) UNDERSPEED ERROR
DTC P1512	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK CLOSED (BANK 1)
DTC P1513	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK CLOSED (BANK 2)
DTC P1516	INTAKE MANIFOLD RUNNER CONTROL (IMRC) INPUT ERROR (BANK 1)
DTC P1517	INTAKE MANIFOLD RUNNER CONTROL (IMRC) INPUT ERROR (BANK 2)
DTC P1518	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK OPEN BANK 1
DTC P1519	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK CLOSED BANK 1
DTC P151A	INTAKE MANIFOLD RUNNER CONTROLLER PERFORMANCE
DTC P1520	INTAKE MANIFOLD RUNNER CONTROL (IMRC) CIRCUIT
DTC P1537	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK OPEN (BANK 1)
DTC P1538	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK OPEN (BANK 2)
DTC P1549	INTAKE MANIFOLD COMMUNICATION CONTROL (IMCC) CIRCUIT (BANK 1)
DTC P1550	POWER STEERING PRESSURE (PSP) SENSOR OUT OF SELF-TEST RANGE
DTC	SPEED CONTROL COMMAND SWITCH OUT OF RANGE HIGH

P1565	
DTC P1566	SPEED CONTROL COMMAND SWITCH OUT OF RANGE LOW
DTC P1567	SPEED CONTROL OUTPUT CIRCUIT
DTC P1568	SPEED CONTROL UNABLE TO HOLD SPEED
DTC P1572	BRAKE PEDAL SWITCH CIRCUIT
DTC P1576	PEDAL POSITION NOT AVAILABLE
DTC P1582	ELECTRONIC THROTTLE MONITOR DATA AVAILABLE
DTC P1633	KEEP ALIVE POWER (KAPWR) VOLTAGE TOO LOW
DTC P1635	TIRE/AXLE RATIO OUT OF ACCEPTABLE RANGE
DTC P1636	INDUCTIVE SIGNATURE CHIP COMMUNICATION ERROR
DTC P1639	VEHICLE ID (VID) BLOCK CORRUPTED, NOT PROGRAMMED
DTC P1640	POWERTRAIN DTCS AVAILABLE IN ANOTHER MODULE
DTC P1641	FUEL PUMP PRIMARY CIRCUIT
DTC P1650	POWER STEERING PRESSURE (PSP) SWITCH OUT OF SELF-TEST RANGE
DTC P1651	POWER STEERING PRESSURE (PSP) SWITCH INPUT
DTC P1674	CONTROL MODULE SOFTWARE CORRUPTED
DTC P1703	BRAKE SWITCH OUT OF SELF-TEST RANGE
DTC P1705	TRANSMISSION RANGE SENSOR OUT OF SELF-TEST RANGE
DTC P1709	PARK/NEUTRAL POSITION (PNP) SWITCH OUT OF SELF-TEST RANGE
DTC P1729	4X4L SWITCH CIRCUIT MALFUNCTION
DTC P1780	TRANSMISSION CONTROL SWITCH (TCS) OUT OF SELF-TEST RANGE

DTC P1781	4X4L SWITCH OUT OF SELF-TEST RANGE
DTC P17XX	-
DTC P18xx	-
DTC P1900	OUTPUT SHAFT SPEED (OSS) SENSOR CIRCUIT INTERMITTENT
DTC P1901	TURBINE SHAFT SPEED (TSS) SENSOR CIRCUIT INTERMITTENT
DTC P1910	REVERSE LAMP CONTROL CIRCUIT CONDITION
DTC P2004	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK OPEN (BANK 1)
DTC P2005	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK OPEN (BANK 2)
DTC P2006	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK CLOSED (BANK 1)
DTC P2007	INTAKE MANIFOLD RUNNER CONTROL (IMRC) STUCK CLOSED (BANK 2)
DTC P2008	INTAKE MANIFOLD RUNNER CONTROL (IMRC) CIRCUIT OPEN (BANK 1)
DTC P2014	INTAKE MANIFOLD RUNNER POSITION SENSOR/SWITCH CIRCUIT (BANK 1)
DTC P2015	INTAKE MANIFOLD RUNNER POSITION SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE (BANK 1)
DTC P2019	INTAKE MANIFOLD RUNNER POSITION SENSOR/SWITCH CIRCUIT (BANK 2)
DTC P2020	INTAKE MANIFOLD RUNNER POSITION SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE (BANK 2)
DTC P2065	FUEL LEVEL SENSOR B CIRCUIT
DTC P2066	FUEL LEVEL SENSOR B CIRCUIT RANGE/PERFORMANCE
DTC P2067	FUEL LEVEL SENSOR B CIRCUIT LOW
DTC P2068	FUEL LEVEL SENSOR B CIRCUIT HIGH
DTC P2070	INTAKE MANIFOLD TUNING VALVE (IMTV) STUCK OPEN BANK 1

DTC P2071	INTAKE MANIFOLD TUNING VALVE (IMTV) STUCK CLOSED BANK 1
DTC P2072	THROTTLE ACTUATOR CONTROL SYSTEM - ICE BREAKAGE
DTC P2100	THROTTLE ACTUATOR CONTROL (TAC) MOTOR CIRCUIT/OPEN
DTC P2101	THROTTLE ACTUATOR CONTROL (TAC) MOTOR RANGE/PERFORMANCE
DTC P2104	THROTTLE ACTUATOR CONTROL (TAC) SYSTEM - FORCED IDLE
DTC P2105	Throttle Actuator Control (TAC) System - Forced Engine Shutdown
DTC P2106	Throttle Actuator Control (TAC) System - Forced Limited Power
DTC P2107	Throttle Actuator Control (TAC) Motor Processor
DTC P2110	Throttle Actuator Control (TAC) System - Forced Limited RPM
DTC P2111	Throttle Actuator Control (TAC) System - Stuck Open
DTC P2112	Throttle Actuator Control (TAC) System - Stuck Closed.
DTC P2121	THROTTLE/PEDAL POSITION SENSOR/SWITCH D CIRCUIT RANGE/PERFORMANCE
DTC P2122	THROTTLE/PEDAL POSITION SENSOR/SWITCH D CIRCUIT LOW
DTC P2123	THROTTLE/PEDAL POSITION SENSOR/SWITCH D CIRCUIT HIGH
DTC P2126	THROTTLE/PEDAL POSITION SENSOR/SWITCH E CIRCUIT RANGE/PERFORMANCE
DTC P2127	THROTTLE/PEDAL POSITION SENSOR/SWITCH E CIRCUIT LOW
DTC P2128	THROTTLE/PEDAL POSITION SENSOR/SWITCH E CIRCUIT HIGH
DTC P2131	THROTTLE/PEDAL POSITION SENSOR/SWITCH F CIRCUIT RANGE/PERFORMANCE
DTC P2132	THROTTLE/PEDAL POSITION SENSOR/SWITCH F CIRCUIT LOW
DTC P2133	THROTTLE/PEDAL POSITION SENSOR/SWITCH F CIRCUIT HIGH
DTC	THROTTLE/PEDAL POSITION SENSOR/SWITCH A/B VOLTAGE CORRELATION

P2135	
DTC P2195	O2 SENSOR SIGNAL BIASED/STUCK LEAN - BANK 1, SENSOR 1
DTC P2196	O2 SENSOR SIGNAL BIASED/STUCK RICH - BANK 1, SENSOR 1
DTC P2197	O2 SENSOR SIGNAL BIASED/STUCK LEAN - BANK 2, SENSOR 1
DTC P2198	O2 SENSOR SIGNAL BIASED/STUCK RICH - BANK 2, SENSOR 1
DTC P2257	SECONDARY AIR INJECTION (AIR) SYSTEM CONTROL A CIRCUIT LOW
DTC P2258	SECONDARY AIR INJECTION (AIR) SYSTEM CONTROL A CIRCUIT HIGH
DTC P2270	O2 SENSOR SIGNAL STUCK LEAN - BANK 1, SENSOR 2
DTC P2271	O2 SENSOR SIGNAL STUCK RICH - BANK 1, SENSOR 2
DTC P2272	O2 SENSOR SIGNAL STUCK LEAN - BANK 2, SENSOR 2
DTC P2273	O2 SENSOR SIGNAL STUCK RICH - BANK 2, SENSOR 2
DTC P2274	O2 SENSOR SIGNAL STUCK LEAN - BANK 1, SENSOR 3
DTC P2275	O2 SENSOR SIGNAL STUCK RICH - BANK 1, SENSOR 3
DTC P2448	SECONDARY AIR INJECTION SYSTEM HIGH AIRFLOW (BANK 1)
DTC P260F	EVAPORATIVE SYSTEM MONITORING PROCESSOR PERFORMANCE
DTC U0101	LOST COMMUNICATION WITH TRANSAXLE CONTROL MODULE (TCM)
DTC U0121	LOST COMMUNICATION WITH THE ANTI-LOCK BRAKE SYSTEM (ABS) CONTROL MODULE
DTC U0133	LOST COMMUNICATION WITH ACTIVE ROLL CONTROL MODULE
DTC U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER CONTROL MODULE
DTC U0300	INTERNAL CONTROL MODULE SOFTWARE INCOMPATIBILITY
DTC U0434	INVALID DATA RECEIVED FROM ACTIVE ROLL CONTROL MODULE

DTC U1021	SCP INVALID OR MISSING DATA FOR AIR CONDITIONING CLUTCH
DTC U1039	SCP INVALID OR MISSING DATA FOR VEHICLE SPEED
DTC U1051	SCP INVALID OR MISSING DATA FOR BRAKES
DTC U1131	SCP INVALID OR MISSING DATA FOR FUEL SYSTEM
DTC U1147	SCP INVALID OR MISSING DATA FOR VEHICLE SECURITY
DTC U1262	SCP Communication Bus Fault - Perform Network Communication Test
DTC U1451	SCP Invalid or Missing Data for Anti-Theft module