

Diagnostic Trouble Code (DTC) Charts and Descriptions

Note: Refer to the applicable Workshop Manual section to diagnose the body and chassis DTCs.

P0010 - Intake Camshaft Position Actuator Circuit/Open (Bank 1)

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) circuit to the PCM for high and low voltage. The test fails if the voltage exceeds or falls below a calibrated limit for a calibrated amount of time.			
Possible Causes: <ul style="list-style-type: none"> • Open or short in the VCT circuit • Open VPWR circuit • Open or short in the VCT solenoid valve 			
Diagnostic Aids: This DTC is a circuit check. Testing should include the harness and solenoid coil.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0011 - Intake Camshaft Position Timing - Over-Advanced (Bank 1)

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for an over-advanced camshaft timing. The test fails when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.			
Possible Causes: <ul style="list-style-type: none"> • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • VCT solenoid valve stuck open • Open or short in the VCT circuit • Open VPWR circuit • Camshaft advance mechanism binding (VCT unit) • Damaged VCT phaser • Damaged camshaft position (CMP) sensor • Open or short in the CMP sensor circuits • Radio frequency interference (RFI) interference 			
Diagnostic Aids: This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing and VCT phasers.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HK .	GO to Pinpoint Test HK .

P0012 - Intake Camshaft Position Timing - Over-Retarded (Bank 1)

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Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for over-retarded camshaft timing. The test fails when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.			
Possible Causes:			
<ul style="list-style-type: none"> • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • VCT solenoid valve stuck open • Open or short in the VCT circuit • Open VPWR circuit • Camshaft advance mechanism binding (VCT unit) • Damaged VCT phaser • Damaged camshaft position (CMP) sensor • Open or short in the CMP sensor circuits • Radio frequency interference (RFI) interference 			
Diagnostic Aids:			
<p>This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC.</p> <p>This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing and VCT phasers.</p>			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HK .	GO to Pinpoint Test HK .

P0016 - Crankshaft Position - Camshaft Position Correlation - Bank 1 Sensor A

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for a misalignment between the camshaft and crankshaft. The test fails when the misalignment is 1 tooth or greater. This DTC can also be set due to VCT system concerns (oil contamination or VCT solenoid stuck).			
Possible Causes:			
<ul style="list-style-type: none"> • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • VCT solenoid stuck in position • Open or short in the VCT circuit • Open VPWR circuit • Camshaft advance mechanism binding (VCT unit) • Damaged VCT phaser • Damaged camshaft position (CMP) sensor • Open or short in the CMP sensor circuits • Radio frequency interference (RFI) interference 			
Diagnostic Aids:			
<p>These DTCs may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for the DTC.</p> <p>This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing and VCT phasers.</p>			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HK .

P0018 - Crankshaft Position - Camshaft Position Correlation - Bank 2 Sensor A

Description: See the description for DTC P0016.			
Possible Causes: See the possible causes for DTC P0016.			
Diagnostic Aids: See the diagnostic aids for DTC P0016.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HK .

P0020 - Intake Camshaft Position Actuator Circuit/Open (Bank 2)

Description: See the description for DTC P0010.			
Possible Causes: See the possible causes for DTC P0010.			
Diagnostic Aids: See the diagnostic aids for DTC P0010.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0021 - Intake Camshaft Position Timing - Over-Advanced (Bank 2)

Description: See the description for DTC P0011.			
Possible Causes: See the possible causes for DTC P0011.			
Diagnostic Aids: See the diagnostic aids for DTC P0011.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HK .	GO to Pinpoint Test HK .

P0022 - Intake Camshaft Position Timing - Over-Retarded (Bank 2)

Description: See the description for DTC P0012.			
Possible Causes: See the possible causes for DTC P0012.			
Diagnostic Aids: See the diagnostic aids for DTC P0012.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HK .	GO to Pinpoint Test HK .

P0030 - HO2S Heater Control Circuit (Bank 1, Sensor 1)

Description: The powertrain control module (PCM) monitors the heater in the heated oxygen sensor (HO2S) for correct operation. The PCM controls the heater on/off duty cycle to maintain a temperature of 780°C (1,436°F). The test fails when the sensor does not warm up to the required temperature in a calibrated amount of time. The test also fails when the PCM is not able to maintain the required temperature after the sensor is warm.			

Possible Causes:	<ul style="list-style-type: none"> • Open UO2S circuit • Open UO2SGREF circuit • Open UO2SHTR circuit • UO2SHTR circuit short to voltage • Loose connection, and damaged or corroded terminals • Exhaust temperature significantly higher than expected • Damaged universal HO2S 		
Diagnostic Aids:	Inspect the connectors for signs of damage, water ingress, or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DZ .	GO to Pinpoint Test DZ .

P0040 - Oxygen Sensor Signals Swapped Bank 1 Sensor 1/Bank 2 Sensor 1

Description:	The heated oxygen sensor (HO2S) monitor determines if the HO2S signal response for a fuel shift corresponds to the correct engine bank. The test fails when there is no response from the HO2S being tested.		
Possible Causes:	<ul style="list-style-type: none"> • Crossed HO2S harness connectors • Crossed HO2S wiring at the harness connectors • Crossed HO2S wiring at the PCM connectors 		
Diagnostic Aids:	Connect the HO2S connector to the correct bank.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, MKS, Navigator, Sable PZEV, Taurus PZEV, Taurus X PZEV	—	GO to Pinpoint Test DZ .	—
All others	—	GO to Pinpoint Test DW .	—

P0041 - Oxygen Sensor Signals Swapped Bank 1 Sensor 2/Bank 2 Sensor 2

Description:	The heated oxygen sensor (HO2S) monitor determines if the HO2S signal response for a fuel shift corresponds to the correct engine bank. The test fails when there is no response from the HO2S being tested.		
Possible Causes:	<ul style="list-style-type: none"> • Crossed HO2S harness connectors • Crossed HO2S wiring at the harness connectors • Crossed HO2S wiring at the PCM connectors 		
Diagnostic Aids:	Connect the HO2S connector to the correct bank.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DW .	—

P0050 - HO2S Heater Control Circuit (Bank 2, Sensor 1)

Description: See the description for DTC P0030.			
Possible Causes: See the possible causes for DTC P0030.			
Diagnostic Aids: See the diagnostic aids for DTC P0030.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DZ .	GO to Pinpoint Test DZ .

P0053 - HO2S Heater Resistance (Bank 1, Sensor 1)

Description: Heater current requirements too low or high in the heated oxygen sensor (HO2S) heater control circuit.			
Possible Causes: <ul style="list-style-type: none"> • VPWR circuit open • HO2S heater circuit open • HO2S heater circuit short in the harness • Damaged HO2S heater 			
Diagnostic Aids: Inspect the connectors for signs of damage, water ingress, or corrosion.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, MKS, Navigator, Sable PZEV, Taurus PZEV, Taurus X PZEV	GO to Pinpoint Test DZ .		
All others	GO to Pinpoint Test DW .		

P0054 - HO2S Heater Resistance (Bank 1, Sensor 2)

Description: See the description for DTC P0053.			
Possible Causes: See the possible causes for DTC P0053.			
Diagnostic Aids: See the diagnostic aids for DTC P0053.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0055 - HO2S Heater Resistance (Bank 1, Sensor 3)

Description: See the description for DTC P0053.			
Possible Causes: See the possible causes for DTC P0053.			
Diagnostic Aids: See the diagnostic aids for DTC P0053.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test DW.
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P0059 - HO2S Heater Resistance (Bank 2, Sensor 1)

Description: See the description for DTC P0053.			
Possible Causes: See the possible causes for DTC P0053.			
Diagnostic Aids: See the diagnostic aids for DTC P0053.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, MKS, Navigator, Sable PZEV, Taurus PZEV, Taurus X PZEV	GO to Pinpoint Test DZ.		
All others	GO to Pinpoint Test DW.		

P0060 - HO2S Heater Resistance (Bank 2, Sensor 2)

Description: See the description for DTC P0053.			
Possible Causes: See the possible causes for DTC P0053.			
Diagnostic Aids: See the diagnostic aids for DTC P0053.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW.		

P0068 - Manifold Absolute Pressure (MAP)/Mass Air Flow (MAF) - Throttle Position Correlation

Description: The powertrain control module (PCM) monitors a vehicle operation rationality check by comparing sensed throttle position to mass air flow readings. If during a key on engine running (KOER) self-test, the comparison of the throttle position (TP) sensor and MAF sensor readings are not consistent with the calibrated load values, the test fails and a DTC is stored in continuous memory.			
Possible Causes: <ul style="list-style-type: none"> • Air leak between MAF sensor and throttle body • Damaged MAF sensor • TP sensor not seated correctly • Damaged TP sensor 			
Diagnostic Aids: Diagnose any MAF or TP circuit DTCs first. Drive the vehicle and exercise the throttle and the TP sensor in all gears. A TP PID less than 4.82% (0.24 volt) with a LOAD PID greater than 55%, or a TP PID greater than 49.05% (2.44 volts) with a LOAD PID less than 30% indicates a concern is present.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Ranger	—	GO to Pinpoint Test DH.	GO to Pinpoint Test DH.
All others	—	GO to Pinpoint Test DV.	GO to Pinpoint Test DV.

P0097 - Intake Air Temperature Sensor 2 Circuit Low

Description:	Indicates the sensor signal is less than the self-test minimum. The intake air temperature 2 (IAT2) sensor minimum is 0.2 volt.		
Possible Causes:	<ul style="list-style-type: none"> ● Grounded circuit in the harness ● Incorrect harness connection ● Damaged sensor 		
Diagnostic Aids:	Monitor the IAT2 PID value. A typical IAT2 temperature should be greater than the IAT1 temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DU .		

P0098 - Intake Air Temperature Sensor 2 Circuit High

Description:	Indicates the sensor signal is greater than the self-test maximum. The intake air temperature 2 (IAT2) sensor maximum is 4.6 volts.		
Possible Causes:	<ul style="list-style-type: none"> ● Open circuit in the harness ● Sensor signal short to voltage ● Incorrect harness connection ● Damaged sensor 		
Diagnostic Aids:	Monitor the IAT2 PID value. A typical IAT2 temperature should be greater than the IAT1 temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DU .		

P0102 - Mass or Volume Air Flow A Circuit Low

Description:	The mass air flow (MAF) sensor circuit is monitored by the powertrain control module (PCM) for low air flow (or voltage) input through the comprehensive component monitor (CCM). If during ignition on, engine running the air flow (or voltage) changes below a minimum calibrated limit, the test fails.		
Possible Causes:	<ul style="list-style-type: none"> ● MAF sensor disconnected ● MAF circuit open to PCM ● VPWR open to MAF sensor ● PWR GND open to the MAF sensor ● MAF RTN circuit open to PCM ● MAF circuit shorted to GND ● Intake air leak (near the MAF sensor) ● A closed throttle indication (throttle position [TP] sensor system) ● Damaged MAF sensor 		
Diagnostic Aids:	A MAF PID reading less than 0.24 volt in continuous memory or KOER indicates a hard fault.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DC .	GO to Pinpoint Test DC .

P0103 - Mass or Volume Air Flow A Circuit High

Description:	The mass air flow (MAF) sensor circuit is monitored by the powertrain control module (PCM) for high air flow (or voltage) input through the comprehensive component monitor (CCM). If during ignition on, engine off, or ignition on, engine running, the air flow (or voltage) changes above a maximum calibrated limit, the test fails.		
Possible Causes:	<ul style="list-style-type: none"> • MAF sensor screen is blocked • MAF circuit shorted to voltage • Damaged MAF sensor 		
Diagnostic Aids:	A MAF PID reading greater than 4.79 volts during KOER indicates a hard fault.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P0104 - Mass or Volume Air Flow A Circuit Intermittent/Erratic

Description:	A concern exists in the mass air flow (MAF) sensor A circuit, or the air tube containing the sensor, causing an incorrect air flow reading.		
Possible Causes:	<ul style="list-style-type: none"> • Intermittent circuit A open or short • Air leaks in the tube from the MAF to the throttle body 		
Diagnostic Aids:	Verify the integrity of the MAF sensor circuit A for an intermittent concern. Check the MAF sensor tube for air leaks.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DC .	GO to Pinpoint Test DC .

P0106 - Manifold Absolute Pressure (MAP/BARO) Sensor Range/Performance

Description:	MAP sensor input to the powertrain control module (PCM) is monitored and is not within the calibrated value.		
Possible Causes:	<ul style="list-style-type: none"> • Slow responding MAP sensor • Electrical circuit failure • Damaged MAP sensor 		
Diagnostic Aids:	The VREF voltage should be between 4.0 and 6.0 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P0107 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BARO) Sensor Low

Description:	MAP sensor operating voltage is below the minimum calibrated parameter of 0.024 volts.		
Possible Causes:	<ul style="list-style-type: none"> • Open in the circuit, or short to ground • VREF circuit open, or short to ground • Damaged MAP sensor 		
Diagnostic Aids:	The VREF voltage should be between 4.0 and 6.0 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test DM .
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P0108 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BARO) Sensor High

Description:	Sensor operating voltage is greater than 4.96 volts. As a result it failed above the maximum allowable calibrated parameter.		
Possible Causes:	<ul style="list-style-type: none"> • VREF shorted to VPWR • MAP signal shorted to VPWR • VREF should be less than 6.0 volts • Open circuit 		
Diagnostic Aids:	The VREF voltage should be between 4.0 and 6.0 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P0109 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BARO) Sensor Intermittent

Description:	The sensor signal to the powertrain control module (PCM) is failing intermittently.		
Possible Causes:	<ul style="list-style-type: none"> • Loose electrical connection • Damaged MAP sensor 		
Diagnostic Aids:	Check the harness and connection.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .	—	—

P0111 - Intake Air Temperature (IAT) Sensor 1 Circuit Range/Performance

Description:	<p>Indicates the IAT rationality test has failed. This DTC indicates that the IAT value is higher than a calibrated value and could prevent one or more on-board diagnostic (OBD) monitors from completing.</p> <p>The powertrain control module (PCM) runs this logic after an engine off and a calibrated soak period (typically 6 hours). This soak period allows IAT and engine coolant temperature (ECT) or cylinder head temperature (CHT) to stabilize and not differ by more than a calibrated value. DTC P0111 sets when the IAT at engine start exceeds the ECT or CHT by more than a calibrated value, typically 17°C (30°F).</p>		
Possible Causes:	<ul style="list-style-type: none"> • IAT Sensor 		
Diagnostic Aids:	Make sure the IAT and the CHT or ECT are similar when the engine is cold.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

P0112 - Intake Air Temperature (IAT) Sensor 1 Circuit Low

Description:	Indicates the sensor signal is less than the self-test minimum. The IAT sensor minimum is 0.2		

volt or 121°C (250°F).

Possible Causes:

- Grounded circuit in the harness
- Damaged sensor
- Incorrect harness connection

Diagnostic Aids: An IAT V PID reading less than 0.2 volt with ignition ON engine OFF or during any engine operating mode indicates a concern is present.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

P0113 - Intake Air Temperature (IAT) Sensor 1 Circuit High

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: Indicates the sensor signal is greater than the self-test maximum. The IAT sensor maximum is 4.6 volts or -50°C (-58°F).			
Possible Causes:			
<ul style="list-style-type: none">• Open circuit in the harness• Sensor signal short to voltage• Damaged sensor• Incorrect harness connection			
Diagnostic Aids: An IAT PID reading greater than 4.6 volts with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

P0114 - Intake Air Temperature (IAT) Sensor 1 Intermittent/Erratic

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: Indicates the sensor signal was intermittent during the comprehensive component monitor (CCM).			
Possible Causes:			
<ul style="list-style-type: none">• Damaged harness• Damaged sensor• Damaged harness connector			
Diagnostic Aids: Monitor the IAT on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

P0116 - Engine Coolant Temperature (ECT) Sensor 1 Circuit Range/Performance

Description: Indicates the engine coolant temperature rationality test has failed. This DTC indicates that the ECT or cylinder head temperature (CHT) value is higher than the calibrated value and could prevent one or more on-board diagnostic (OBD) monitors from completing. The powertrain control module (PCM) runs this logic after an engine off and a calibrated soak period (typically 6 hours). This soak period allows the intake air temperature (IAT) and the CHT or ECT to stabilize and not differ by more than a calibrated value. DTC P0116 sets when all of the following conditions are met: The ECT at engine start exceeds the IAT at engine start by more than a calibrated value, typically 17°C (30°F). The ECT exceeds a calibrated value, typically 107°C (225°F). The fuel system, heated oxygen and misfire monitors have not completed. The calibrated time to set DTC P0116 has expired.			
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Possible Causes:	<ul style="list-style-type: none"> • ECT or CHT sensor • Coolant system concern 		
Diagnostic Aids:	Make sure the IAT and the ECT are similar when the engine is cold. Also make sure the ECT or CHT sensor and the actual engine operating temperatures are the same.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Explorer 4.0L, Explorer Sport Trac 4.0L, Fusion 3.0L, Milan 3.0L, Mountaineer 4.0L, Mustang 4.0L, Ranger 4.0L	—	—	GO to Pinpoint Test DX .
All others	—	—	GO to Pinpoint Test DL .

P0117 - Engine Coolant Temperature (ECT) Sensor 1 Circuit Low

Description:	Indicates the sensor signal is less than the self-test minimum. The ECT sensor minimum is 0.2 volt or 121°C (250°F).		
Possible Causes:	<ul style="list-style-type: none"> • Grounded circuit in the harness • Damaged sensor • Incorrect harness connection 		
Diagnostic Aids:	A concern is present if an ECT PID reading less than 0.2 volt with the ignition ON engine OFF or during any engine operating mode.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DX .		

P0118 - Engine Coolant Temperature (ECT) Sensor 1 Circuit High

Description:	Indicates the sensor signal is greater than the self-test maximum. The ECT sensor maximum is 4.6 volts or -50°C (-58°F).		
Possible Causes:	<ul style="list-style-type: none"> • Open circuit in the harness • Sensor signal short to voltage • Incorrect harness connection • Damaged sensor 		
Diagnostic Aids:	An ECT PID reading greater than 4.6 volts with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DX .		

P0119 - Engine Coolant Temperature (ECT) Sensor 1 Circuit Intermittent/Erratic

Description:	Indicates the ECT circuit became intermittently open or shorted while the engine was running. On vehicles that are not equipped with an ECT sensor, the cylinder head temperature (CHT) sensor can be used and can set this DTC.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged harness 		

Causes:	<ul style="list-style-type: none"> • Damaged sensor • Damaged harness connector • Low engine coolant 		
Diagnostic Aids:	Monitor the ECT or the CHT on a scan tool, look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Explorer 4.0L, Explorer Sport Trac 4.0L, Fusion 3.0L, Milan 3.0L, Mountaineer 4.0L, Mustang 4.0L, Ranger 4.0L	—	—	GO to Pinpoint Test DX .
All others	—	—	GO to Pinpoint Test DL .

P0121 - Throttle/Pedal Position Sensor A Circuit Range/Performance

For Vehicles With an Idle Air Control (IAC) Valve			
Description:	The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for a non-closed throttle position at idle. The test fails if the key on engine running (KOER) self-test terminates upon placing the transmission gear selector in DRIVE or REVERSE or the TP closed throttle position is not achieved when closing the throttle (idle) after opening it (in PARK or NEUTRAL).		
Possible Causes:	<ul style="list-style-type: none"> • Binding throttle linkage • Damaged throttle body • TP circuit open to PCM • Damaged TP sensor • SIG RTN circuit open to the TP sensor 		
Diagnostic Aids:	Drive the vehicle, bring it to a stop, and turn the ignition to the OFF position. Start the engine, and run the KOER self-test at idle.		
For All others			
Description:	The electronic throttle control (ETC) throttle position (TP) sensor 1 circuit was flagged as a concern by the powertrain control module (PCM) indicating an out of range in either the closed or wide open throttle (WOT) modes.		
Possible Causes:	<ul style="list-style-type: none"> • Obstruction in the throttle plate movement • Damaged throttle body • TP circuit open to PCM • Damaged TP sensor • SIG RTN circuit open to the TP sensor • Self-test operator error (foot resting on the accelerator pedal during test) 		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Ranger		GO to Pinpoint Test DH .	
All others		GO to Pinpoint Test DV .	

P0122 - Throttle/Pedal Position Sensor A Circuit Low

For Vehicles With an Idle Air Control (IAC) Valve			

Description: The throttle position (TP) sensor circuit is monitored by the PCM for a high TP rotation angle (or voltage) input through the comprehensive component monitor (CCM). The test fails if the TP rotation angle (or voltage) changes above the maximum calibrated limit.			
Possible Causes: <ul style="list-style-type: none"> • TP sensor not seated correctly • TP circuit open to PCM • VREF open to TP sensor • TP circuit short to GND • Damaged TP sensor 			
Diagnostic Aids: This concern exhibits a symptom of limited power. A TP PID reading less than 3.42% (0.17 volt) in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.			
For All others			
Description: The electronic throttle control (ETC) throttle position (TP) sensor 1 circuit was flagged as a concern by the powertrain control module (PCM) indicating a low voltage or open circuit.			
Possible Causes: <ul style="list-style-type: none"> • Open ETC TP sensor harness • Short to ground in the ETC TP sensor harness • Damaged TP sensor • SIG RTN circuit open to the TP sensor 			
Diagnostic Aids: This concern exhibits a symptom of limited power. A TP1 PID reading less than 0.25 volt in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Ranger		GO to Pinpoint Test DH .	
All others		GO to Pinpoint Test DV .	

P0123 - Throttle/Pedal Position Sensor A Circuit High

For Vehicles With an Idle Air Control (IAC) Valve			
Description: The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for a high TP rotation angle (or voltage) input through the comprehensive component monitor (CCM). The test fails if the TP rotation angle (or voltage) changes above the maximum calibrated limit.			
Possible Causes: <ul style="list-style-type: none"> • TP sensor not seated correctly • TP sensor harness short to voltage • TP sensor harness short to VREF • SIG RTN circuit open to the TP sensor • Damaged TP sensor 			
Diagnostic Aids: A TP PID reading greater than 93% (4.65 volts) in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.			
For All Others			
Description: The electronic throttle control (ETC) throttle position (TP) sensor 1 circuit was flagged as a concern by the powertrain control module (PCM) indicating a high voltage.			
Possible Causes: <ul style="list-style-type: none"> • TP sensor harness short to voltage • TP sensor harness short to VREF • ETCRTN circuit open • Damaged TP sensor 			
Diagnostic Aids: Drive the vehicle, bring it to a stop, and turn the ignition to the OFF position. Start the engine and carry out the key on engine running (KOER) self-test at idle. Access the KOER DTCs on the scan tool. The TP1 signal is normally at a high voltage at closed throttle, and a lower voltage at wide open throttle (WOT) (opposite of TP2). A TP1 PID reading greater than 4.75 volts in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Ranger		GO to Pinpoint Test DH .	
All others		GO to Pinpoint Test DV .	

P0125 - Insufficient Coolant Temperature For Closed Loop Fuel Control

Description:	Indicates the engine coolant temperature (ECT) or the cylinder head temperature (CHT) sensor has not achieved the required temperature level to enter closed loop operating conditions within a specified amount of time after starting the engine.		
Possible Causes:	<ul style="list-style-type: none"> • Insufficient warm up time • Low engine coolant level • Leaking or stuck open thermostat • Damaged ECT sensor • Damaged CHT sensor 		
Diagnostic Aids:	Compare the thermostat specification to the actual ECT using the engine temperature PID (ECT or CHT). The temperature reading should be similar when the engine is at a normal operating temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Explorer 4.0L, Explorer Sport Trac 4.0L, Fusion 3.0L, Milan 3.0L, Mountaineer 4.0L, Mustang 4.0L, Ranger 4.0L	—	—	GO to Pinpoint Test DX .
All others	—	—	GO to Pinpoint Test DL .

P0127 - Intake Air Temperature (IAT) Too High

Description:	Indicates that the IAT2 sensor has detected a concern in the charge air cooler (CAC) system.		
Possible Causes:	<ul style="list-style-type: none"> • Blockage of heat exchangers • Low fluid level • Fluid leakage • CAC pump or relay failure • Crossed CAC coolant lines 		
Diagnostic Aids:	Monitor the IAT2 PID. A typical IAT2 temperature should be greater than the IAT1 temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DU .		

P0128 - Coolant Thermostat (Coolant Temperature Below Thermostat Regulating Temperature)

Description:	Indicates that the thermostat monitor has not achieved the required engine operating temperature within a specified amount of time after starting the engine.		
Possible Causes:	<ul style="list-style-type: none"> • Insufficient warm up time • Low engine coolant level • Leaking or stuck open thermostat • Damaged ECT sensor • Damaged CHT sensor 		

Diagnostic Aids: Refer to Section 1, [Thermostat Monitor](#) for system information.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Explorer 4.0L, Explorer Sport Trac 4.0L, Fusion 3.0L, Milan 3.0L, Mountaineer 4.0L, Mustang 4.0L, Ranger 4.0L	—	—	GO to Pinpoint Test DX .
All others	—	—	GO to Pinpoint Test DL .

P012B - Turbocharger/Supercharger Inlet Pressure Sensor Circuit Range/Performance

Description:	Manifold absolute pressure (MAP) sensor input to the powertrain control module (PCM) is monitored and is not within the calibrated value.		
Possible Causes:	<ul style="list-style-type: none"> • Slow responding MAP sensor • Electrical circuit failure • Damaged MAP sensor. 		
Diagnostic Aids:	The VREF voltage should be between 4.0 and 6.0 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P012C - Turbocharger/Supercharger Inlet Pressure Sensor Circuit Low

Description:	MAP sensor operating voltage is below the minimum calibrated parameter of 0.25 volt.		
Possible Causes:	<ul style="list-style-type: none"> • Open in the circuit, or short to ground • VREF circuit open, or short to ground • Damaged MAP sensor. 		
Diagnostic Aids:	VREF voltage should be between 4.0 and 6.0 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P012D - Turbocharger/Supercharger Inlet Pressure Sensor Circuit High

Description:	Manifold absolute pressure (MAP) sensor operating voltage is above the maximum calibrated parameter of 5 volts.		
Possible Causes:	<ul style="list-style-type: none"> • VREF shorted to VPWR • MAP signal shorted to VPWR • VREF circuit short to voltage • Open circuit 		
Diagnostic Aids:	VREF should be greater than 4.0 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P012E - Turbocharger/Supercharger Inlet Pressure Sensor Circuit Intermittent/Erratic

Description:	The sensor signal to the powertrain control module (PCM) is intermittent.		
Possible Causes:	<ul style="list-style-type: none"> • Loose electrical connection • Damaged manifold absolute pressure (MAP) sensor 		
Diagnostic Aids:	Check the harness and connection.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P0130 - O2 Circuit (Bank 1, Sensor 1)

Description:	The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a circuit concern. The test fails when the PCM detects a concern with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	<ul style="list-style-type: none"> • Open UO2S circuit • Open UO2SGREF circuit • UO2S circuit short to voltage or ground • UO2SGREF circuit short to voltage or ground • UO2SPC circuit short to voltage or ground • UO2SPCT circuit short to voltage or ground • Damaged universal HO2S 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DZ .	GO to Pinpoint Test DZ .

P0132 - O2 Circuit High Voltage (Bank 1, Sensor 1)

Description:	The heated oxygen sensor (HO2S) signals are monitored for an over voltage condition. The code is set when the HO2S signal voltage is 1.5 volts or greater.		
Possible Causes:	<ul style="list-style-type: none"> • Short to VPWR in the harness or HO2S 		
Diagnostic Aids:	An HO2S PID switching across 0.45 volt from 0.2 to 0.9 volt indicates a normal switching HO2S. An HO2S PID voltage of 1.5 volts or greater indicates a short to voltage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0133 - O2 Circuit Slow Response (Bank 1, Sensor 1)

Description:	For the Flex, MKS, Sable PZEV, Taurus PZEV, Taurus X PZEV, the powertrain control module (PCM) commands an air/fuel ratio that changes in the shape of a square wave. The PCM calculates the length of the resulting signal from the HO2S. The test fails when the length of the signal is less than a calibrated limit.		

For all others, the PCM checks the HO2S signal frequency and amplitude. The test fails when the frequency and amplitude less than a calibrated limit.

- Possible Causes:**
- Contaminated HO2S
 - Exhaust leaks
 - Short/open wiring
 - Incorrect fueling
 - MAF sensor
 - Deteriorating HO2S
 - Inlet air leaks

Diagnostic Aids: Access the HO2S test results from the generic OBD menu to verify the DTC.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, MKS, Navigator, Sable PZEV, Taurus PZEV, Taurus X PZEV	—	—	GO to Pinpoint Test DZ .
All others	—	—	GO to Pinpoint Test DW .

P0134 - O2 Circuit No Activity Detected (Bank 1, Sensor 1)

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
<p>Description: The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a lack of movement concern. If the sensor signal value is not changing from the default value, the PCM commands an oscillating air/fuel ratio attempting to detect some movement in the signal value. The test fails when the PCM is unable to detect movement in the sensor signal while the air/fuel ratio is oscillating.</p>			
<p>Possible Causes:</p> <ul style="list-style-type: none"> ● Open UO2SPC circuit ● Damaged universal HO2S 			
<p>Diagnostic Aids:</p>			
All	—	GO to Pinpoint Test DZ .	GO to Pinpoint Test DZ .

P0135 - O2 Heater Circuit (Bank 1, Sensor 1)

<p>Description: During testing the heated oxygen sensor (HO2S) heaters are checked for open and short circuits and excessive current draw. The test fails when the current draw exceeds a calibrated limit or an open or short circuit is detected.</p>			
<p>Possible Causes:</p> <ul style="list-style-type: none"> ● Vacuum hose disconnected on exhaust gas recirculation (EGR) system module (ESM) applications ● Short to VPWR in the harness or HO2S ● Water in the harness connector ● Open VPWR circuit ● Open UO2SHTR circuit 			

- Open GND circuit
- Low battery voltage
- Corrosion or poor mating terminals and wiring
- Damaged HO2S heater

Diagnostic Aids: Inspect the connectors for signs of damage, water ingress, or corrosion.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, MKS, Navigator, Sable PZEV, Taurus PZEV, Taurus X PZEV	GO to Pinpoint Test DZ .		
All others	GO to Pinpoint Test DW .		

P0138 - O2 Circuit High Voltage (Bank 1, Sensor 2)

Description:	See the description for DTC P0132.		
Possible Causes:	See the possible causes for DTC P0132.		
Diagnostic Aids:	See the diagnostic aids for DTC P0132.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0139 - O2 Circuit Slow Response (Bank 1, Sensor 2)

Description:	The heated oxygen sensor (HO2S) monitor tracks the rate of voltage change during the rise and fall of the HO2S signal. When the rate of voltage change is less than a calibrated value, the powertrain control module (PCM) begins to modify the fuel trim attempting to increase the HO2S voltage switch rate. The DTC sets when the PCM is at the allowable limit or has exceeded an allowable length of time for fuel trim modification, without detecting an acceptable rate of voltage change.		
Possible Causes:	<ul style="list-style-type: none"> • Contaminated or damaged HO2S • Deteriorating HO2S • Exhaust leaks • Aftermarket accessories • Performance modifications 		
Diagnostic Aids:	Access the HO2S test results from the generic OBD menu to verify the DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DW .

P013A - O2 Sensor Slow Response - Rich to Lean (Bank 1, Sensor 2)

Description: During a deceleration fuel shut-off (DFSO) event, the powertrain control module (PCM) monitors how quickly the rear heated oxygen sensor (HO2S) switches from rich to lean. The measured rate of the rich to lean switch is compared to a calibrated fault threshold value. The threshold value takes into account the level of oxygen in the catalyst, which has an impact on how quickly the rich to lean switch occurs. The test fails when the measured value is slower than the threshold value.			
Possible Causes:		<ul style="list-style-type: none"> • Exhaust leaks before or near the HO2S • Damaged HO2S 	
Diagnostic Aids: Check for leaks in the exhaust system.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DW .

P013C - O2 Sensor Slow Response - Rich to Lean (Bank 2, Sensor 2)

Description: See the description for DTC P013A.			
Possible Causes: See the possible causes for DTC P013A.			
Diagnostic Aids: See the diagnostic aids for DTC P013A.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DW .

P013E - Sensor Delayed Response - Rich to Lean (Bank 1, Sensor 2)

Description: During a deceleration fuel shut-off (DFSO) event, the powertrain control module (PCM) monitors the rear heated oxygen sensor (HO2S) signal to determine if the signal is stuck in range. The PCM expects the signal to exceed a calibrated rich or lean value within a calibrated amount of time. If the signal voltage remains less than the rich value after a number of occurrences, the PCM intrusively controls the fuel system rich over increasing time periods in an attempt to force the signal to greater than the calibrated rich value. The test fails when after three consecutive intrusive attempts the signal cannot be forced greater than the calibrated rich value. Also, if the signal voltage remains greater than the lean value after a calibrated amount of time with the fuel injectors off, a counter is incremented. The test fails when after three consecutive occurrences the signal is not less than the calibrated lean value.			
Possible Causes:		<ul style="list-style-type: none"> • Exhaust leaks before or near the HO2S • Aftermarket exhaust accessories or performance modifications • Ethanol content in the fuel • Circuit intermittent • Damaged HO2S 	
Diagnostic Aids: Check for leaks in the exhaust system. Check for an intermittent HO2S signal.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DW .

P0141 - O2 Heater Circuit (Bank 1, Sensor 2)

Description: See the description for DTC P0135.			
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Possible Causes: See the possible causes for DTC P0135.			
Diagnostic Aids: Check the HO2S electrical connector for damage, corrosion, and water intrusion. Damaged HO2S heater.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0144 - O2 Circuit High Voltage (Bank 1, Sensor 3)

Description: See the description for DTC P0132.			
Possible Causes: See the possible causes for DTC P0132.			
Diagnostic Aids: See the diagnostic aids for DTC P0132.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0147 - O2 Heater Circuit (Bank 1, Sensor 3)

Description: See the description for DTC P0135.			
Possible Causes: See the possible causes for DTC P0135.			
Diagnostic Aids: See the diagnostic aids for DTC P0135.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0148 - Fuel Delivery Error

Description: At least one bank is lean at wide open throttle (WOT).			
Possible Causes: <ul style="list-style-type: none"> ● Severely restricted fuel filter ● Severely restricted fuel supply line ● Damaged or worn fuel pump ● Damaged or contaminated mass air flow (MAF) sensor 			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HC .

P014A - Sensor Delayed Response - Rich to Lean (Bank 2, Sensor 2)

Description: See the description for DTC P013E.			
Possible Causes: See the possible causes for DTC P013E.			
Diagnostic Aids: See the diagnostic aids for DTC P013E.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	—	—	GO to Pinpoint Test DW.
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P0150 - O2 Circuit (Bank 2, Sensor 1)

Description: See the description for DTC P0130.			
Possible Causes: See the possible causes for DTC P0130.			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DZ.	GO to Pinpoint Test DZ.

P0152 - O2 Circuit High Voltage (Bank 2, Sensor 1)

Description: See the description for DTC P0132.			
Possible Causes: See the possible causes for DTC P0132.			
Diagnostic Aids: See the diagnostic aids for DTC P0132.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DW.	GO to Pinpoint Test DW.

P0153 - O2 Circuit Slow Response (Bank 2, Sensor 1)

Description: See the description for DTC P0133.			
Possible Causes: See the possible causes for DTC P0133.			
Diagnostic Aids: See the diagnostic aids for DTC P0133.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, MKS, Navigator, Sable PZEV, Taurus PZEV, Taurus X PZEV	—	—	GO to Pinpoint Test DZ.
All others	—	—	GO to Pinpoint Test DW.

P0154 - O2 Circuit No Activity Detected (Bank 2, Sensor 1)

Description: See the description for DTC P0134.			
Possible Causes: See the possible causes for DTC P0134.			
Diagnostic Aids:			

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DZ .	GO to Pinpoint Test DZ .

P0155 - O2 Heater Circuit (Bank 2, Sensor 1)

Description: See the description for DTC P0135.			
Possible Causes: See the possible causes for DTC P0135.			
Diagnostic Aids: See the diagnostic aids for DTC P0135.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, MKS, Navigator, Sable PZEV, Taurus PZEV, Taurus X PZEV	GO to Pinpoint Test DZ .		
All others	GO to Pinpoint Test DW .		

P0158 - O2 Circuit High Voltage (Bank 2, Sensor 2)

Description: See the description for DTC P0132.			
Possible Causes: See the possible causes for DTC P0132.			
Diagnostic Aids: See the diagnostic aids for DTC P0132.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DW .	GO to Pinpoint Test DW .

P0159 - O2 Circuit Slow Response (Bank 2, Sensor 2)

Description: See the description for DTC P0139.			
Possible Causes: See the possible causes for DTC P0139.			
Diagnostic Aids: See the diagnostic aids for DTC P0139.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DW .

P0161 - O2 Heater Circuit (Bank 2, Sensor 2)

Description: See the description for DTC P0135.			
Possible Causes: See the possible causes for DTC P0135.			

Diagnostic Aids:	<ul style="list-style-type: none"> • Check the HO2S electrical connector for damage, corrosion, and water intrusion. • Damaged HO2S heater 		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0171 - System Too Lean (Bank 1)

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. The test fails when the adaptive fuel tables reach a rich calibrated limit. Refer to Section 1, Powertrain Control Software Fuel Trim for more information.		
Possible Causes:	<p>Fuel System:</p> <ul style="list-style-type: none"> • Ethanol content in the fuel • Fuel filter plugged or dirty • Damaged or worn fuel pump • Leaking fuel pump check valve • Leaking/contaminated fuel injectors • Low fuel pressure or running out of fuel • Evaporative emission (EVAP) canister purge valve is leaking when the canister is clean • Fuel supply line restricted • Fuel rail pressure (FRP) sensor bias <p>Exhaust System:</p> <ul style="list-style-type: none"> • Exhaust leaks in the exhaust manifold gasket or mating gaskets before or near the heated oxygen sensor (HO2S) <p>EGR System:</p> <ul style="list-style-type: none"> • Vacuum hose disconnected on exhaust gas recirculation (EGR) system module (ESM) applications • EGR valve tube/gasket leak • EGR vacuum regulator solenoid leak <p>Intake Air System:</p> <ul style="list-style-type: none"> • Air leaks after the mass air flow (MAF) sensor • Vacuum leaks • Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open • Incorrectly seated engine oil dipstick • Intake air turbulence due to incorrect air filter • Damaged or contaminated MAF sensor 		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques for more information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test H .

P0172 - System Too Rich (Bank 1)

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. The test fails when the adaptive fuel tables reach a lean calibrated limit. Refer to Section 1, Powertrain Control		
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[Software](#) Fuel Trim for more information.

Possible Causes:	<p>Fuel System:</p> <ul style="list-style-type: none"> Leaking fuel injectors Fuel return line restricted Fuel rail pressure (FRP) sensor bias EVAP canister purge valve is leaking when the canister is full <p>Base Engine:</p> <ul style="list-style-type: none"> Engine oil contamination <p>Intake Air System:</p> <ul style="list-style-type: none"> Damaged or contaminated mass air flow (MAF) sensor 		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques for more information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test H .

P0174 - System Too Lean (Bank 2)

Description:	See the description for DTC P0171.		
Possible Causes:	See the possible causes for DTC P0171.		
Diagnostic Aids:	See the diagnostic aids for DTC P0171.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test H .

P0175 - System Too Rich (Bank 2)

Description:	See the description for DTC P0172.		
Possible Causes:	See the possible causes for DTC P0172.		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques for more information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test H .

P0180 - Fuel Temperature Sensor A Circuit

Description:	The comprehensive component monitor (CCM) monitors the fuel temperature sensor circuit to the powertrain control module (PCM) for low and high voltage. The test fails if the voltage falls		

below or exceeds a calibrated limit and amount of time during testing.			
Possible Causes:	<ul style="list-style-type: none"> • Open or short in the harness • Low ambient temperature operation • Incorrect harness connection • Damaged fuel temperature sensor 		
Diagnostic Aids:	Verify the FRT PID value to determine an open or short.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P0181 - Fuel Temperature Sensor A Circuit Range/Performance

Description:	The comprehensive component monitor (CCM) monitors the fuel temperature sensor for acceptable operating temperature. The test fails if the voltage falls below or exceeds a calibrated limit, for a calibrated amount of time during testing.		
Possible Causes:	<ul style="list-style-type: none"> • Open or short in the harness • Low ambient temperature operation • Incorrect harness connection • Damaged fuel temperature sensor • Damaged powertrain control module (PCM) 		
Diagnostic Aids:	Verify the FRT PID value to determine an open or short.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .	GO to Pinpoint Test DD .	—

P0182 - Fuel Temperature Sensor A Circuit Low

Description:	The comprehensive component monitor (CCM) monitors the fuel temperature sensor circuit to the powertrain control module (PCM) for low voltage. The test fails if the voltage falls below a calibrated limit for a calibrated amount of time during testing.		
Possible Causes:	<ul style="list-style-type: none"> • Short in the harness • VREF open or short • Low ambient temperature operation • Incorrect harness connection • Damaged fuel temperature sensor 		
Diagnostic Aids:	Verify the FRT PID and VREF values to determine an open or short.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P0183 - Fuel Temperature Sensor A Circuit High

Description:	The comprehensive component monitor (CCM) monitors the fuel temperature sensor circuit to the powertrain control module (PCM) for high voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time during testing.		
Possible Causes:	<ul style="list-style-type: none"> • Open circuit • Open or short to voltage in the harness 		

- Incorrect harness connection
- Damaged fuel temperature sensor

Diagnostic Aids: Verify the FRT PID value to determine an open or short.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P0190 - Fuel Rail Pressure Sensor A Circuit

Description:	The comprehensive component monitor (CCM) monitors the fuel rail pressure (FRP) sensor to the powertrain control module (PCM) for VREF voltage. The test fails when the VREF voltage from the PCM drops to a voltage less than a minimum calibrated value.		
Possible Causes:	<ul style="list-style-type: none"> • VREF open in harness • VREF open in sensor • Vacuum leaks 		
Diagnostic Aids:	Verify a VREF voltage between 4 and 6 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DD .

P0191 - Fuel Rail Pressure Sensor A Circuit Range/Performance

Description:	The comprehensive component monitor (CCM) checks the fuel rail pressure (FRP) sensor for an acceptable fuel pressure. The test fails when the difference between the FRP requested by the PCM and the FRP delivered exceeds 138 kPa (20 psi) for more than 8 seconds.		
Possible Causes:	<ul style="list-style-type: none"> • High fuel pressure • Low fuel pressure • Damaged FRP sensor • Excessive resistance in the circuit • Vacuum leaks • Low or no fuel 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P0192 - Fuel Rail Pressure Sensor A Circuit Low

Description:	The comprehensive component monitor (CCM) monitors the fuel rail pressure (FRP) sensor circuit to the powertrain control module (PCM) for low voltage. The test fails if the voltage falls below a calibrated limit for a calibrated amount of time during testing.		
Possible Causes:	<ul style="list-style-type: none"> • FRP signal short to SIG RTN or PWR GND • Damaged FRP sensor 		
Diagnostic Aids:	A FRP PID value during ignition ON, engine OFF or ignition ON, engine running less than 0.3 volt indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All

GO to Pinpoint Test [DD](#).**P0193 - Fuel Rail Pressure Sensor A Circuit High**

Description:	The comprehensive component monitor (CCM) monitors the fuel rail pressure (FRP) sensor circuit to the powertrain control module (PCM) for high voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time during testing.		
Possible Causes:	<ul style="list-style-type: none"> ● FRP signal short to VREF or VPWR ● FRP signal open ● Damaged FRP sensor 		
Diagnostic Aids:	An FRP signal high condition can be caused by any number of conditions, including a short on FRP signal to VREF, a more positive voltage level, an open FRP signal or signal return. The FRP signal line is pulled up by the PCM and VREF at the sensor, and down by the sensor through SIGRTN.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P0196 - Engine Oil Temperature (EOT) Sensor Circuit Range/Performance

Description:	Indicates the value from the EOT sensor is not within the powertrain control module (PCM) predicted engine oil temperature range, based on other PCM inputs.		
Possible Causes:	<ul style="list-style-type: none"> ● Engine not at operating temperature ● Cooling system problem or stuck thermostat ● EOT circuit failure 		
Diagnostic Aids:	The EOT rationality test looks for the EOT sensor value to be within a calibrated delta of the PCM predicted engine oil temperature. Make sure the EOT sensor reading is similar to the engine temperature. If the EOT reading greatly differs from engine temperature, check the EOT circuitry for correct operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DY .		

P0197 - Engine Oil Temperature (EOT) Sensor Circuit Low

Description:	Indicates EOT signal voltage is low (high temperature).		
Possible Causes:	<ul style="list-style-type: none"> ● Damaged harness ● Damaged harness connector ● Damaged sensor 		
Diagnostic Aids:	An EOT PID reading less than 0.2 volt with the ignition on engine off or during any engine operating mode indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DY .		

P0198 - Engine Oil Temperature (EOT) Sensor Circuit High

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Description: Indicates EOT signal voltage is high (low temperature).			
Possible Causes:		<ul style="list-style-type: none"> • Damaged harness • Damaged harness connector • Damaged sensor 	
Diagnostic Aids: An EOT PID reading greater than 4.5 volts with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DY .		

P020x - Injector Circuit/Open - Cylinder X

Description: Note: x represents injector numbers 1 through 9. The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the powertrain control module (PCM). The test fails when the fuel injector circuitry is inoperative.			
Possible Causes:		<ul style="list-style-type: none"> • Open circuit • Damaged fuel injector • Damaged PCM 	
Diagnostic Aids: PID Data Monitor INJx_F fault flags equals YES. This DTC is set when a concern is detected between the PCM and the fuel injector.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P0210 - Injector Circuit/Open - Cylinder 10

Description: See the description for DTC P020x.			
Possible Causes: See the possible causes for DTC P020x.			
Diagnostic Aids: See the diagnostic aids for DTC P020x.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P0217 - Engine Coolant Over-Temperature Condition

Description: Indicates an engine overheat condition was detected by the engine temperature sensor (CHT or ECT depending how the vehicle is equipped).			
Possible Causes:		<ul style="list-style-type: none"> • Engine cooling system concerns • Low engine coolant level. • Base engine concerns 	
Diagnostic Aids: Monitor the engine temperature PID (CHT or ECT) for an overheat condition. Typical engine temperature should be close to cooling system thermostat specification.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DX .		

P0218 - Transmission Fluid Temperature Over-Temperature Condition

Description:	Indicates a transmission overheat condition was sensed by the transmission fluid temperature (TFT) sensor.		
Possible Causes:	<ul style="list-style-type: none"> • Low transmission fluid level • Transmission cooling system concerns 		
Diagnostic Aids:	Monitor the transmission temperature PID TFT for an overheat condition.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission Cooling Symptom Chart to continue diagnosis.		

P0219 - Engine Over Speed Condition

Description:	Indicates the vehicle has been operated in a manner which caused the engine speed to exceed a calibrated limit. The engine RPM is continuously monitored and evaluated by the powertrain control module (PCM). The DTC sets when the RPM exceeds the calibrated limit set within the PCM. For additional information on the engine RPM limiter, refer to Section 1, Powertrain Control Software .		
Possible Causes:	<ul style="list-style-type: none"> • Wheel slippage (water, ice, mud, and snow) • Excessive engine RPM in NEUTRAL or operated in the wrong transmission gear 		
Diagnostic Aids:	The DTC indicates the vehicle has been operated in a manner which caused the engine speed to exceed a calibrated limit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test ND .

P0221 - Throttle/Pedal Position Sensor/Switch B Circuit Range/Performance

Description:	The electronic throttle control (ETC) throttle position (TP) sensor 2 circuit was flagged as a concern by the powertrain control module (PCM) indicating an out of range in either the closed or wide open throttle (WOT) modes.		
Possible Causes:	<ul style="list-style-type: none"> • Binding throttle linkage • Damaged throttle body • TP circuit open to PCM • Damaged TP sensor • SIG RTN circuit open to the TP sensor • Self-test operator error (foot resting on the accelerator pedal during test) 		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P0222 - Throttle/Pedal Position Sensor/Switch B Circuit Low

Description:	The electronic throttle control (ETC) throttle position (TP) sensor 2 circuit was flagged as a concern by the powertrain control module (PCM) indicating a low voltage, or open circuit.		

Possible Causes:	<ul style="list-style-type: none"> • Open ETC TP sensor harness • Short to ground in the ETC TP sensor harness • Damaged TP sensor • SIG RTN circuit open to the TP sensor 		
Diagnostic Aids:	This concern exhibits a symptom of limited power. A TP2 PID reading less than 0.25 volt in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P0223 - Throttle/Pedal Position Sensor/Switch B Circuit High

Description:	The electronic throttle control (ETC) throttle position (TP) sensor 2 circuit was flagged as a concern by the powertrain control module (PCM) indicating a high voltage.		
Possible Causes:	<ul style="list-style-type: none"> • TP sensor harness short to voltage • TP sensor harness short to VREF • TP2 circuit open • ETCRTN circuit open • Damaged TP sensor 		
Diagnostic Aids:	This concern exhibits a symptom of limited power. A TP2 PID reading greater than 4.75 volts in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P0230 - Fuel Pump Primary Circuit

Description:	The powertrain control module (PCM) monitors the fuel pump (FP) circuit output from the PCM. The test fails when the FP output is commanded ON (grounded) and excessive current draw is detected on the FP circuit. The test also fails when the FP output is commanded OFF and voltage is not detected on the FP circuit. The PCM expects to detect VPWR voltage coming through the fuel pump relay coil to the FP circuit.		
Possible Causes:	<ul style="list-style-type: none"> • Open or shorted (FP) circuit • Open VPWR circuit to the fuel pump relay • Damaged fuel pump relay • Damaged PCM 		
Diagnostic Aids:	A concern is present when the FP_F PID reads YES. An open circuit or short to ground can only be detected with the fuel pump commanded OFF. A short to voltage can only be detected with the fuel pump commanded ON. During the key on engine off (KOEO) and key on engine running (KOER) self-test, the fuel pump output command is cycled on and off.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P0231 - Fuel Pump Secondary Circuit Low

Description:	The powertrain control module (PCM) monitors the fuel pump monitor (FPM) circuit. The test fails if the PCM commands the fuel pump ON and B+ voltage is not detected on the FPM circuit.		
Possible Causes:	<ul style="list-style-type: none"> • Open B+ circuit to the fuel pump relay • Open FP PWR circuit between the fuel pump relay and its connection to the FPM circuit 		

- Damaged fuel pump relay

Diagnostic Aids: During the key on engine off (KOEO) self-test, the PCM commands the fuel pump ON so this test can be carried out.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P0232 - Fuel Pump Secondary Circuit High

Description: The powertrain control module (PCM) monitors the fuel pump monitor (FPM) circuit. This test fails when the PCM detects voltage on the FPM circuit while the fuel pump is commanded OFF. The FPM circuit is wired to a pull-up voltage inside the PCM. The FPM circuit goes high if, with the ignition ON, engine OFF and the fuel pump commanded OFF, the FPM/FP PWR circuit loses its path to ground through the fuel pump. The FPM circuit also goes high if the FPM/FP PWR circuit is short to voltage.			
Possible Causes: <ul style="list-style-type: none"> • Inertia fuel shutoff (IFS) switch not reset or electrically open • Open circuit between the fuel pump and the FPM connection to the FP PWR circuit • Poor fuel pump ground • Fuel pump electrically open • Fuel pump secondary circuits short to voltage • Fuel pump relay contacts always closed • Open FPM circuit between the PCM and the connection to the FP PWR circuit 			
Diagnostic Aids: Continuous memory P0232 can be set if the IFS switch is tripped then reset, or if the fuel pump circuit is activated when the PCM expected the circuit to be off. This DTC may set during a fuel system test or prime procedure.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P025A - Fuel Pump Module Control Circuit/Open

Description: The powertrain control module (PCM) monitors the fuel pump command (FPC) circuit for a concern. When the PCM commands the fuel pump (FP) ON, the PCM is able to detect a short to voltage on the FPC circuit. When the PCM commands the FP OFF, the PCM is able to detect an open circuit or a short to ground on the FPC circuit. The test fails if the voltage is less than or greater than a calibrated limit, for a calibrated amount of time.			
Possible Causes: <ul style="list-style-type: none"> • FPC circuit open or short to ground • FPC circuit short to voltage • Damaged fuel pump control module 			
Diagnostic Aids: Check for any harness concerns.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P025B - Fuel Pump Module Control Circuit Range/Performance

Description: The fuel pump control module monitors the duty cycle and frequency of the signal it receives from the powertrain control module (PCM). The fuel pump control module determines if the signal from the PCM on the fuel pump command (FPC) circuit is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module sends a 20%			
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duty cycle signal on the fuel pump monitor (FPM) circuit to report the concern to the PCM. The test fails when the fuel pump control module is still reporting that it is receiving an invalid duty cycle or frequency from the PCM after a calibrated amount of time.

Possible Causes:	<ul style="list-style-type: none"> • FPC circuit open or short to ground • FPC circuit short to voltage • Radio frequency interference/electromagnetic interference (RFI/EMI) • Damaged fuel pump control module • Damaged PCM 		
Diagnostic Aids:	Check the harness for routing, alterations, incorrect shielding, or electrical interference from other systems.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P0297 - Vehicle Over Speed Condition

Description:	Indicates the vehicle has been operated in a manner which caused the vehicle speed to exceed a calibration limit. The vehicle speed is continuously monitored and evaluated by the powertrain control module (PCM). The DTC is set when the vehicle speed exceeds the calibrated limit set within the PCM. For additional information on the vehicle speed limiter, refer to Section 1, Powertrain Control Software .		
Possible Causes:	<ul style="list-style-type: none"> • Vehicle driven at a high rate of speed 		
Diagnostic Aids:	The DTC indicates the vehicle has been operated in a manner which caused the engine speed to exceed a calibrated limit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test ND .

P0298 - Engine Oil Over Temperature Condition

Description:	Indicates the engine oil temperature protection strategy in the powertrain control module (PCM) has been activated. This temporarily prohibits high engine speed operation by disabling injectors, to reduce the risk of engine damage from high engine oil temperature. On engines equipped with an oil temperature sensor, the PCM reads oil temperature to determine if it is excessive. When an oil temperature sensor is not present, the PCM uses an oil algorithm to determine actual temperature. Engine shutdown strategy function is the same on vehicles with and without oil temperature sensors.		
Possible Causes:	<ul style="list-style-type: none"> • Very high engine RPM for an extended period of time • Overheating condition • Damaged engine oil temperature (EOT) sensor or circuit (vehicles with an EOT sensor) • Base engine concerns 		
Diagnostic Aids:	The engine is operating in high RPM range due to incorrect gear selection. This may cause a lack/loss of power or surge.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DY .

P0300 - Random Misfire Detected

Description:	The random misfire DTC indicates multiple cylinders are misfiring or the powertrain control		
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module (PCM) cannot identify which cylinder is misfiring.			
Possible Causes:	<ul style="list-style-type: none"> • Camshaft position (CMP) sensor • Low fuel (less than 1/8 tank) • Stuck open exhaust gas recirculation (EGR) valve • Blocked EGR passages 		
Diagnostic Aids:	One or more EGR passages may be blocked or partially blocked. If this is the case the misfire detection monitor indicates the EGR port to check for possible blockage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HD .

P030x - Cylinder x Misfire Detected

Description:	NOTE: x represents cylinder numbers 1 through 9. The misfire detection monitor is designed to monitor engine misfire and identify the specific cylinder in which the misfire has occurred. Misfire is defined as lack of combustion in a cylinder due to absence of spark, poor fuel metering, poor compression, or any other cause.		
Possible Causes:	<ul style="list-style-type: none"> • Ignition system • Fuel injectors • Running out of fuel • Evaporative emission (EVAP) canister purge valve • Fuel pressure • Evaporative emission system • Exhaust gas recirculation (EGR) system • Base engine 		
Diagnostic Aids:	The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HD .

P0310 - Cylinder 10 Misfire Detected

Description:	See the description for DTC P030x.		
Possible Causes:	See the possible causes for DTC P030x.		
Diagnostic Aids:	See the diagnostic aids for DTC P030x.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HD .

P0315 - Crankshaft Position System Variation Not Learned.

Description:	The powertrain control module (PCM) is unable to learn and correct for mechanical inaccuracies in crankshaft pulse wheel tooth spacing. This DTC disables the misfire monitor.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged crankshaft pulse wheel teeth • Damaged crankshaft position (CKP) sensor 		
Diagnostic Aids:	Requires visual inspection of the CKP sensor and the crankshaft pulse wheel teeth for damage.		

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HD .

P0316 - Misfire Detected On Startup (First 1000 Revolutions)

Description:	DTC P0316 is set in addition to any type B misfire DTC which occurs in the first 1,000 revolution test interval following engine start.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged crankshaft position (CKP) sensor • Ignition system • Fuel injectors • Running out of fuel • Fuel quality • Base engine • Damaged powertrain control module (PCM) 		
Diagnostic Aids:	Freeze frame data and the DTC P03xx are also stored, indicating which cylinder the misfire occurred.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HD .

P0320 - Ignition/Distributor Engine Speed Input Circuit

Description:	The ignition engine speed sensor input signal to powertrain control module (PCM) is continuously monitored. The test fails when the signal indicates two successive erratic profile ignition pickup (PIP) pulses occurred.		
Possible Causes:	<ul style="list-style-type: none"> • Loose wires/connectors • Arcing secondary ignition components (coil, wires and plugs) • On-board transmitter (2-way radio) 		
Diagnostic Aids:	The DTC indicates two successive erratic PIP pulses occurred.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test NC .

P0325 - Knock Sensor 1 Circuit (Bank 1).

Description:	The knock sensor (KS) detects vibrations upon increase and decrease in engine RPM. The knock sensor generates a voltage based on this vibration. A DTC is set if the voltage goes outside a calibrated level.		
Possible Causes:	<ul style="list-style-type: none"> • KS circuit short to GND • KS sensor circuit short to voltage • KS circuit open • Damaged KS 		
Diagnostic Aids:	A knock sensor voltage greater than 0.5 volt with the ignition ON engine OFF indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DG .	GO to Pinpoint Test DG .

P0326 - Knock Sensor 1 Circuit Range/Performance (Bank 1)

Description: See the description for DTC P0325.			
Possible Causes: See the possible causes for DTC P0325.			
Diagnostic Aids: See the diagnostic aids for DTC P0325.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DG .	GO to Pinpoint Test DG .

P0330 - Knock Sensor 2 Circuit (Bank 2).

Description: See the description for DTC P0325.			
Possible Causes: See the possible causes for DTC P0325.			
Diagnostic Aids: See the diagnostic aids for DTC P0325.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DG .	GO to Pinpoint Test DG .

P0331 - Knock Sensor 2 Circuit Range/Performance (Bank 2)

Description: See the description for DTC P0325.			
Possible Causes: See the possible causes for DTC P0325.			
Diagnostic Aids: See the diagnostic aids for DTC P0325.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test DG .	GO to Pinpoint Test DG .

P0340 - Camshaft Position Sensor A Circuit (Bank 1 or single sensor)

Description: The test fails when the powertrain control module (PCM) can no longer detect the signal from the camshaft position (CMP) sensor on bank 1.			
Possible Causes:	<ul style="list-style-type: none"> • CMP circuit open • CMP circuit short to GND • CMP circuit short to voltage • SIG RTN open (VR sensor) • CMP GND open (Hall-effect sensor) • CMP circuit short to CMP2 circuit (if equipped) • CMP incorrectly installed (Hall-effect sensor) • Damaged CMP sensor shielding • Damaged CMP sensor • Damaged PCM 		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0341 - Camshaft Position Sensor A Circuit Range/Performance (Bank 1 or single sensor)

Description:	The powertrain control module (PCM) monitors the camshaft position (CMP) sensor for a noisy signal.		
Possible Causes:	<ul style="list-style-type: none"> • Radio frequency interference/electromagnetic interference (RFI/EMI) • Damaged camshaft phaser and sprocket 		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DR .

P0344 - Camshaft Position Sensor A Circuit Intermittent (Bank 1 or single sensor)

Description:	The test fails when the powertrain control module (PCM) detects an intermittent signal from the camshaft position (CMP) sensor.		
Possible Causes:	<ul style="list-style-type: none"> • Intermittent open circuit • Intermittent short circuit • Damaged sensor shielding • Damaged sensor 		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DR .

P0345 - Camshaft Position Sensor A Circuit (Bank 2)

Description:	The test fails when the powertrain control module (PCM) can no longer detect the signal from the camshaft position (CMP) sensor on bank 2.		
Possible Causes:	See the possible causes for DTC P0340.		
Diagnostic Aids:	See the diagnostic aids for DTC P0340.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0346 - Camshaft Position Sensor A Circuit Range/Performance (Bank 2)

Description:	See the description for DTC P0341.		
Possible Causes:	See the possible causes for DTC P0341.		
Diagnostic Aids:	See the diagnostic aids for DTC P0341.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DR .

P0349 - Camshaft Position Sensor A Circuit Intermittent (Bank 2)

Description: See the description for DTC P0344.			
Possible Causes: See the possible causes for DTC P0344.			
Diagnostic Aids: See the diagnostic aids for DTC P0344.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DR .

P0350 - Ignition Coil Primary/Secondary Circuit

Description: Each ignition primary circuit is continuously monitored. The test fails when the powertrain control module (PCM) does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module (integrated in the PCM).			
Possible Causes: <ul style="list-style-type: none"> • Open or short in the ignition START/RUN circuit • Open coil driver circuit • Coil driver circuit short to ground • Damaged coil • Coil driver circuit short to VPWR 			
Diagnostic Aids: <p>A P035x diagnostic trouble code (DTC) only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set a P035x DTC. A P030x DTC does not set for a coil primary circuit malfunction. A P035x DTC may set with or without a P030x DTC; however a P035x DTC sets first.</p> <p>When this DTC is set, the powertrain control module (PCM) enters failure mode effects management (FMEM) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation; do not attempt to diagnose the injector with this DTC present.</p> <p>If a primary coil is damaged due to a harness short to ground the powertrain control module (PCM) will not be damaged. Do not replace the PCM with out verifying the coil driver functionality.</p> <p>Use the 12-volt non-powered test lamp to verify START/RUN voltage at the ignition coil harness connector.</p> <p>Check the coil driver circuit for open, short to VPWR, or short to ground.</p>			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JE .		

P0351 - Ignition Coil A Primary/Secondary Circuit

Description: See the description for DTC P0350.			
Possible Causes: See the possible causes for DTC P0350.			
Diagnostic Aids: See the diagnostic aids for DTC P0350.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Coil-on-plug (COP) ignition testing	—	GO to Pinpoint Test JF .	GO to Pinpoint Test JF .
Coil pack ignition testing	—	GO to Pinpoint Test JE .	GO to Pinpoint Test JE .

P0352 - Ignition Coil B Primary/Secondary Circuit

Description:	See the description for DTC P0350.		
Possible Causes:	See the possible causes for DTC P0350.		
Diagnostic Aids:	See the diagnostic aids for DTC P0350.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Coil-on-plug (COP) ignition testing	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.
Coil pack ignition testing	—	GO to Pinpoint Test JE.	GO to Pinpoint Test JE.

P0353 - Ignition Coil C Primary/Secondary Circuit

Description:	See the description for DTC P0350.		
Possible Causes:	See the possible causes for DTC P0350.		
Diagnostic Aids:	See the diagnostic aids for DTC P0350.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Coil-on-plug (COP) ignition testing	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.
Coil pack ignition testing	—	GO to Pinpoint Test JE.	GO to Pinpoint Test JE.

P0354 - Ignition Coil D Primary/Secondary Circuit

Description:	See the description for DTC P0350.		
Possible Causes:	See the possible causes for DTC P0350.		
Diagnostic Aids:	See the diagnostic aids for DTC P0350.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Coil-on-plug (COP) ignition testing	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.
Coil pack ignition testing	—	GO to Pinpoint Test JE.	GO to Pinpoint Test JE.

P0355 - Ignition Coil E Primary/Secondary Circuit

Description:	See the description for DTC P0350.		
Possible Causes:	See the possible causes for DTC P0350.		
Diagnostic Aids:	See the diagnostic aids for DTC P0350.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.

P0356 - Ignition Coil F Primary/Secondary Circuit

Description:	See the description for DTC P0350.		

Possible Causes: See the possible causes for DTC P0350.			
Diagnostic Aids: See the diagnostic aids for DTC P0350.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.

P0357 - Ignition Coil G Primary/Secondary Circuit

Description: See the description for DTC P0350.			
Possible Causes: See the possible causes for DTC P0350.			
Diagnostic Aids: See the diagnostic aids for DTC P0350.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.

P0358 - Ignition Coil H Primary/Secondary Circuit

Description: See the description for DTC P0350.			
Possible Causes: See the possible causes for DTC P0350.			
Diagnostic Aids: See the diagnostic aids for DTC P0350.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.

P0359 - Ignition Coil I Primary/Secondary Circuit

Description: See the description for DTC P0350.			
Possible Causes: See the possible causes for DTC P0350.			
Diagnostic Aids: See the diagnostic aids for DTC P0350.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.

P0360 - Ignition Coil J Primary/Secondary Circuit

Description: See the description for DTC P0350.			
Possible Causes: See the possible causes for DTC P0350.			
Diagnostic Aids: See the diagnostic aids for DTC P0350.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test JF.	GO to Pinpoint Test JF.

P0400 - Exhaust Gas Recirculation (EGR) Flow

Description: The electric EGR (EEGR) system is monitored once per drive cycle at high and low load conditions. The test fails when a concern is detected by powertrain control module (PCM) calculations indicating the EGR flow is less or greater than expected.			
Possible Causes: <ul style="list-style-type: none"> • EEGR valve stuck open or closed • Connector to EEGR not seated • EEGR motor winding circuits short or open • No voltage to the EEGR • Harness open or short to voltage or ground • Vacuum signal to manifold absolute pressure (MAP) restricted or leaking • Mass air flow (MAF) sensor signal erroneous • Carbon build up in the EEGR valve seat area • One or more sensors is not responding or is out of range 			
Diagnostic Aids: All of the following sensors input data to the PCM for correct operation of the EEGR system: engine coolant temperature (ECT), crankshaft position (CKP), intake air temperature (IAT), MAF, throttle position (TP), MAP. Any DTC relating to these sensors must be resolved prior to addressing DTC P0400.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KD .		

P0401 - Exhaust Gas Recirculation (EGR) Flow Insufficient Detected

Description: The EGR system is monitored during steady state driving conditions while the EGR is commanded on. The test fails when the signal from the differential pressure feedback EGR sensor indicates that EGR flow is less than the desired minimum.			
Possible Causes: <ul style="list-style-type: none"> • Vacuum supply • EGR valve stuck closed • EGR valve leaks vacuum • EGR flow path restricted • EVR circuit short to voltage • VREF open to differential pressure feedback EGR sensor • Differential pressure feedback EGR sensor downstream hose is off or plugged • EVR circuit open • VPWR open to EGR vacuum regulator solenoid • Differential pressure feedback EGR sensor hoses are both off • Differential pressure feedback EGR sensor hoses are reversed • Damaged EGR orifice tube • Damaged EGR vacuum regulator solenoid 			
Diagnostic Aids: Carry out the key on engine running (KOER) self-test and look for DTC P1408 as an indication of a hard fault. If DTC P1408 is not present, look for contamination, restrictions, leaks, and intermittent concerns.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Crown Victoria, E-Series, Explorer 4.0L, Explorer Sport Trac 4.0L, F-150 4.6L 2V, F-Super Duty 6.8L, Grand Marquis, Mountaineer 4.0L, Mustang 4.0L, Mustang 5.4L, Town Car	—	—	GO to Pinpoint Test HH .

All others	—	—	GO to Pinpoint Test HE .
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P0402 - Exhaust Gas Recirculation (EGR) Flow Excessive Detected

Description:	The EGR system is monitored for undesired EGR flow during idle. The EGR monitor looks at the differential pressure feedback EGR (DPFE) signal at idle and compares it to the stored signal measured during ignition on engine off. The test does not pass when the signal at idle is greater than at ignition on engine off by a calibrated amount.		
Possible Causes:	<ul style="list-style-type: none"> • EGR valve stuck open • Plugged EGR vacuum regulator solenoid vent • Plugged EGR tube • Slow responding differential pressure feedback EGR sensor • Damaged differential pressure feedback EGR sensor. • Incorrect vacuum hose connection • Plugged vacuum hoses • EVR circuit short to ground • Damaged EGR vacuum regulator solenoid 		
Diagnostic Aids:	A DPFEGR PID reading that is greater at idle than during KOEO by 0.5 volt or a rough engine idle may indicate a hard fault.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Crown Victoria, E-Series, Explorer 4.0L, Explorer Sport Trac 4.0L, F-150 4.6L 2V, F-Super Duty 6.8L, Grand Marquis, Mountaineer 4.0L, Mustang 4.0L, Mustang 5.4L, Town Car	—	GO to Pinpoint Test HH .	GO to Pinpoint Test HH .
All others	—	GO to Pinpoint Test HE .	GO to Pinpoint Test HE .

P0403 - Exhaust Gas Recirculation (EGR) Control Circuit

For Vehicles With an Electric EGR (EEGR)			
Description:	The EEGR system is continuously monitored to check the four EEGR motor coils, circuits, and the powertrain control module (PCM) for opens, shorts to voltage and ground. If a concern is detected, the EEGR system is disabled and additional monitoring is suspended for the remainder of the drive until the next drive cycle.		
Possible Causes:	<ul style="list-style-type: none"> • EEGR motor windings open • Connector to EEGR not seated • Open circuit in the harness from the PCM to the EEGR • Short circuit in the EEGR motor • Short circuit in the harness from the PCM to the EEGR • PCM 		
Diagnostic Aids:			
For All Others			

Description: This test checks the electrical function of the EGR vacuum regulator solenoid. The test fails when the EVR circuit voltage is either too high or too low when compared to the expected voltage range. The EGR system must be enabled for the test to be completed.			
Possible Causes:			
<ul style="list-style-type: none"> • EVR circuit open • EVR circuit short to voltage or ground • VPWR open to EGR vacuum regulator solenoid • EGR vacuum regulator solenoid • PCM 			
Diagnostic Aids: The EGR vacuum regulator solenoid resistance is between 26 and 40 ohms.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Crown Victoria, E-Series, Explorer 4.0L, Explorer Sport Trac 4.0L, F-150 4.6L 2V, F-Super Duty 6.8L, Grand Marquis, Mountaineer 4.0L, Mustang 4.0L, Mustang 5.4L, Town Car	GO to Pinpoint Test HH .		
Escape/Mariner, Focus, Fusion, Milan, Ranger 2.3L	GO to Pinpoint Test KD .		
All others	GO to Pinpoint Test HE .		

P0405 - Exhaust Gas Recirculation (EGR) Sensor A Circuit Low

Description: The EGR monitor checks the differential pressure feedback EGR sensor signal to the powertrain control module (PCM) for low voltage. The test fails when the average voltage to the PCM drops to a voltage less than the minimum calibrated value.			
Possible Causes:			
<ul style="list-style-type: none"> • Differential pressure feedback EGR circuit short to ground • Damaged differential pressure feedback EGR sensor. • VREF circuit short to ground 			
Diagnostic Aids: A DPFEGR PID reading less than 0.05 volt with the ignition ON, engine OFF or running indicates a hard fault.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Crown Victoria, E-Series, Explorer 4.0L, Explorer Sport Trac 4.0L, F-150 4.6L 2V, F-Super Duty 6.8L, Grand Marquis, Mountaineer 4.0L, Mustang 4.0L, Mustang 5.4L, Town Car	GO to Pinpoint Test HH .		
All others	GO to Pinpoint Test HE .		

P0406 - Exhaust Gas Recirculation (EGR) Sensor A Circuit High

Description:	The EGR monitor checks the EGR sensor signal to the powertrain control module (PCM) for high voltage. The test fails when the average voltage to the PCM exceeds the maximum calibrated value.		
Possible Causes:	<ul style="list-style-type: none"> • Differential pressure feedback EGR circuit open • VREF circuit short to voltage • Damaged differential pressure feedback EGR sensor. • Differential pressure feedback EGR circuit short to voltage • SIG RTN circuit open 		
Diagnostic Aids:	A DPFEGR PID reading greater than 4.5 volts with the ignition ON, engine OFF or running indicates a hard fault.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Crown Victoria, E-Series, Explorer 4.0L, Explorer Sport Trac 4.0L, F-150 4.6L 2V, F-Super Duty 6.8L, Grand Marquis, Mountaineer 4.0L, Mustang 4.0L, Mustang 5.4L, Town Car	GO to Pinpoint Test HH .		
All others	GO to Pinpoint Test HE .		

P0410 - Secondary Air Injection (AIR) System

Description:	The AIR system detected a lack of air flow with the secondary AIR pump ON.		
Possible Causes:	<ul style="list-style-type: none"> • AIR inlet hose leak. • AIR inlet hose disconnected. 		
Diagnostic Aids:	Measured air flow is less than expected. Visually inspect the secondary AIR inlet hose.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HM .		

P0412 - Secondary Air Injection (AIR) System - Switching Valve A Circuit

Description:	On the primary side of the AIR relay, open and short faults on the AIR command circuit are detected during normal operation by the powertrain control module (PCM) output driver.		
Possible Causes:	<ul style="list-style-type: none"> • Short to voltage or ground in the AIR command circuit • Open in the AIR command circuit • AIR bypass solenoid fault • AIR relay fault 		
Diagnostic Aids:	For intermittent faults use the AIR PCM output driver fault PID (AIRF) during a harness wiggle test with the AIR PCM output driver in OFF and ON states. The AIR PCM output driver fault PID		

AIRF instantly detects open circuits and shorts to ground with the PCM output driver off. The AIR PCM output driver fault PID AIRF instantly detects open circuits and shorts to ground with the PCM output driver off. The AIR PCM output driver fault PID AIRF instantly detects a short to voltage or low resistance load with the PCM output driver on. Use the OTM to toggle the PCM output driver from OFF to ON.

Refer to Section 2, [Output Test Mode \(OTM\)](#).

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HM .		

P0420 - Catalyst System Efficiency Below Threshold (Bank 1)

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HE .

Description: Indicates the bank 1 catalyst system efficiency is below the acceptable threshold.

Possible Causes:

- Use of leaded fuel
- Damaged heated oxygen sensor (HO2S)
- Out of range engine coolant temperature (ECT) sensor
- High fuel pressure
- Damaged exhaust manifold
- Damaged catalytic converter
- Oil contamination
- Cylinder misfiring
- Downstream HO2S wires incorrectly connected
- Damaged exhaust system pipe
- Damaged muffler/tailpipe assembly
- Retarded spark timing
- Leaking fuel injector

Diagnostic Aids: The signal line lengths of the downstream HO2Ss are compared against the signal line lengths of the upstream HO2Ss. Under normal closed loop fuel conditions, high efficiency catalysts have oxygen storage which reduces the frequency and amplitude of the downstream HO2S as compared with an upstream HO2S signal. As catalyst efficiency deteriorates, its ability to store oxygen declines and the downstream HO2S signal has an increased amplitude and frequency, approaching the amplitude and frequency of the upstream HO2S. Once beyond an acceptable limit the DTC is set.
Vehicles with universal HO2Ss compare the signal line length of the downstream HO2Ss to an expected signal line length of the downstream HO2Ss with a deteriorated catalytic converter.

P0430 - Catalyst System Efficiency Below Threshold (Bank 2)

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HF .

Description: Indicates the bank 2 catalyst system efficiency is below the acceptable threshold.

Possible Causes: See the possible causes for DTC P0420.

Diagnostic Aids: See the diagnostic aids for DTC P0420.

P0442 - Evaporative Emission System Leak Detected (Small Leak)

Description: The powertrain control module (PCM) monitors the complete evaporative emission (EVAP) control system for the presence of a small fuel vapor leak. System failure occurs when a fuel			
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vapor leak from an opening as small as 1.016 mm (0.040 in) is detected by the EVAP running loss monitor test.

- Possible Causes:**
- Aftermarket EVAP hardware that does not conform to the required specifications
 - Small holes or cuts in the fuel vapor hoses/tubes
 - Canister vent solenoid stays partially open on closed command
 - Damaged, missing or loosely installed fuel filler cap
 - Capless fuel tank filler pipe damaged or not sealed correctly (if equipped)
 - Loose fuel vapor hose/tube connections to the EVAP system components
 - EVAP system component seals leaking at or near the EVAP canister purge valve, fuel tank pressure sensor, canister vent (CV) solenoid, fuel vapor control valve tube assembly or fuel vapor vent valve assembly

Diagnostic Aids: Check for a missing fuel filler cap or the integrity of the cap. Verify the capless fuel tank filler pipe is sealed correctly (if equipped).
Check for loose or damaged vapor hoses. Visually inspect the EVAP canister inlet port, CV solenoid filter, and canister vent hose assembly for contamination or debris.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HX .

P0443 - Evaporative Emission System Purge Control Valve Circuit

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
<p>Description: The powertrain control module (PCM) monitors the state of the evaporative emission (EVAP) canister purge valve circuit output driver. The test fails when the signal moves outside the minimum or maximum limit for the commanded state.</p>			
<p>Possible Causes:</p> <ul style="list-style-type: none"> • VPWR circuit open • EVAP canister purge valve circuit short to GND • Damaged EVAP canister purge valve • EVAP canister purge valve circuit open • EVAP canister purge valve circuit short to VPWR • Damaged PCM 			
<p>Diagnostic Aids: To verify normal function, monitor the EVAP canister purge valve signal PID EVMV or EVAPCP and the signal voltage (PCM control side). With the valve closed, the EVMV indicates 0 mA (0% duty cycle for EVAPCP) and voltage approximately equal to battery voltage. When the valve is commanded fully open, EVMV indicates 1,000 mA (100% duty cycle for EVAPCP) and a voltage drop of 3 volts minimum is normal. Output test mode may be used to switch output on/off to verify function.</p>			
All	—	—	GO to Pinpoint Test HX .

P0446 - Evaporative Emission System Vent Control Circuit

<p>Description: Monitors the canister vent (CV) solenoid circuit for an electrical failure. The test fails when the signal moves outside the minimum or maximum allowable calibrated parameters for a specified canister vent duty cycle by powertrain control module (PCM) command.</p>			
<p>Possible Causes:</p> <ul style="list-style-type: none"> • VPWR circuit open • KAPWR circuit open (vehicles equipped with engine off natural vacuum (EONV) EVAP leak check monitor) • CV solenoid circuit short to PWR GND or CHASSIS GND • Damaged CV solenoid • CV solenoid circuit open • CV solenoid circuit short to VPWR • CV solenoid circuit short to KAPWR (vehicles equipped with engine off natural vacuum (EONV) EVAP leak check monitor) • Damaged PCM 			

Diagnostic Aids: To verify normal functioning, monitor the EVAP canister vent solenoid signal PID EVAPCV and the signal voltage (PCM control side). With the valve open, EVAPCV indicates 0% duty cycle and a voltage approximately equal to battery voltage. When the valve is commanded fully closed, EVAPCV indicates 100% duty cycle, and a minimum voltage drop of 4 volts is normal. Output test mode (OTM) may be used to switch output on/off to verify function.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0451 - Evaporative Emission System Pressure Sensor/Switch Range/Performance

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

Description: This DTC sets for a fuel tank pressure (FTP) sensor range (offset) concern. The FTP sensor output is offset by greater than 1.7 inches of water or less than -1.7 inches of water.

Possible Causes:

- Intermittent open or short in the FTP sensor or the FTP sensor signal
- Contaminated or damaged sensor
- Damaged powertrain control module (PCM)

Diagnostic Aids: With the FTP sensor at atmospheric pressure, the FTP PID normally indicates 0 inches of water.

P0452 - Evaporative Emission System Pressure Sensor/Switch Low

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

Description: The powertrain control module (PCM) monitors the evaporative emission (EVAP) control system fuel tank pressure (FTP) sensor input signal to the PCM. The test fails when the signal average drops below a minimum allowable calibrated parameter.

Possible Causes:

- Contamination internal to the FTP sensor connector
- FTP circuit short to GND or SIG RTN
- Damaged FTP sensor

Diagnostic Aids: An FTP voltage parameter identification (PID) reading less than 0.22 volt with the ignition on, engine off or ignition on, engine running, indicates a concern is present.

P0453 - Evaporative Emission System Pressure Sensor/Switch High

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

Description: The powertrain control module (PCM) monitors the evaporative emission (EVAP) control system fuel tank pressure (FTP) sensor input signal to the PCM. The test fails when the signal average jumps above a minimum allowable calibrated parameter.

Possible Causes:

- FTP circuit open
- VREF short to VPWR
- FTP circuit short to VREF or VPWR
- SIG RTN circuit open
- Damaged FTP sensor

Diagnostic Aids: An FTP voltage parameter identification (PID) reading greater than 4.85 volts with the ignition on, engine off or ignition on, engine running, indicates a concern is present.

P0454 - Evaporative Emission System Pressure Sensor/Switch Intermittent

Description:	The fuel tank pressure changes greater than 14 inches of water in 0.10 seconds.		
Possible Causes:	<ul style="list-style-type: none"> • Intermittent open or short in the fuel tank pressure (FTP) sensor or the FTP sensor signal • Contaminated or damaged sensor 		
Diagnostic Aids:	Monitor the FTP PID and note if it changes from above 15 inches of water to below minus (-) 15 inches of water often in 1 minute.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test Z .

P0455 - Evaporative Emission System Leak Detected (Gross Leak/No Flow)

Description:	The powertrain control module (PCM) monitors the complete evaporative emission (EVAP) control system for no purge flow, the presence of a large fuel vapor leak, or multiple small fuel vapor leaks. System failure occurs when no purge flow, which is attributed to fuel vapor blockages or restrictions, a large fuel vapor leak, or multiple fuel vapor leaks are detected by the EVAP running loss monitor test with the engine running, but not at idle.		
Possible Causes:	<ul style="list-style-type: none"> • Aftermarket EVAP hardware that does not conform to the required specifications • Disconnected or cracked fuel EVAP canister tube, EVAP canister purge outlet tube, or EVAP return tube • EVAP canister purge valve stuck closed • Damaged EVAP canister • Damaged, missing or loosely installed fuel filler cap • Capless fuel tank filler pipe damaged or not sealed correctly (if equipped) • Loose fuel vapor hose/tube connections to the EVAP system components • Blockages or restrictions in the fuel vapor hoses/tubes • Fuel vapor control valve tube assembly or fuel vapor vent valve assembly blocked • Canister vent (CV) solenoid stuck open • Mechanically inoperative fuel tank pressure (FTP) sensor 		
Diagnostic Aids:	Check for audible vacuum noise or significant fuel odor in the engine compartment or near the EVAP canister and fuel tank.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HX .

P0456 - Evaporative Emission System Leak Detected (Very Small Leak)

Description:	The powertrain control module (PCM) monitors the complete evaporative emission (EVAP) control system for the presence of a very small fuel vapor leak. The system failure occurs when a fuel vapor leak from an opening as small as 0.508 mm (0.020 inch) is detected by the EVAP running loss monitor test.		
Possible Causes:	<ul style="list-style-type: none"> • Very small holes or cuts in the fuel vapor hoses/tubes • Loose fuel vapor hose/tube connections to the EVAP system components • EVAP system component seals leaking. See the Possible Causes for DTC P0442 		
Diagnostic Aids:	Check for a missing fuel filler cap or the integrity of the cap. Verify the capless fuel tank filler pipe is sealed correctly (if equipped). Check for loose or damaged vapor hoses. Visually inspect the EVAP canister inlet port, CV solenoid filter, and canister vent hose assembly for contamination or debris.		

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HX .

P0457 - Evaporative Emission System Leak Detected (Fuel Cap Loose/Off)

Description: The powertrain control module (PCM) continuously monitors the fuel level and retains the last updated value prior to the ignition switch being placed in the OFF position. After the ignition switch is placed in the ON position a new fuel level is taken and compared to the level recorded at ignition off. If the fuel level has increased, a flag is set in the PCM indicating the vehicle was refueled. If the evaporative emission (EVAP) monitor detects a gross leak while the refueling flag is set, a loose fuel filler cap or an incorrectly sealed fuel tank filler pipe (if equipped) is suspected and the DTC is set. On most vehicles when the DTC sets, either the check fuel cap indicator illuminates or a message on the instrument cluster displays to instruct the driver to check the fuel cap or capless fuel tank filler pipe (if equipped).			
Possible Causes:		<ul style="list-style-type: none"> • Damaged, missing, or loosely installed fuel filler cap • Capless fuel tank filler pipe damaged or not sealed correctly (if equipped) 	
Diagnostic Aids:		Check for a missing fuel filler cap or the integrity of the cap. Verify the capless fuel tank filler pipe is sealed correctly (if equipped). If OK, clear the continuous memory DTCs and test the system for correct operation.	
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HX .

P0460 - Fuel Level Sensor A Circuit

Description: The powertrain control module (PCM) monitors the fuel level input (FLI) communications network message for a concern. The test fails when the PCM determines that the value of the FLI signal is stuck. The PCM calculates the amount of fuel used during operation. If the FLI signal does not change or does not correspond with the calculated fuel usage, the DTC is set.			
Possible Causes:		<ul style="list-style-type: none"> • Stuck float arm • Fuel level is always greater than 95% due to refueling patterns • Fuel level is always less than 5% due to refueling patterns • Fuel level is always at the same level between 3% and 97% full due to refueling patterns • Fuel pump (FP) module concern • Damaged instrument panel cluster (IPC) (E-Series, MKS) • Damaged instrument cluster (IC) 	
Diagnostic Aids:		Check with the customer for driving and fueling habits that would keep the fuel level at approximately the same value. Monitor the FLI PIDs while attempting to move the fuel level float by adding or removing fuel as necessary.	
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0461 - Fuel Level Sensor A Circuit Range/Performance

Description: The powertrain control module (PCM) monitors the fuel level input (FLI) communications network message for a concern. The test fails when the FLI signal repeatedly moves in and out of range, exceeding the minimum or maximum allowable calibrated parameters for a specified fuel fill percentage in the fuel tank.			
Possible Causes:		<ul style="list-style-type: none"> • Excessive electrical noise • Intermittent open circuit 	

Diagnostic Aids:	Verify aftermarket equipment does not generate the radio frequency interference / electromagnetic interference (RFI/EMI) which may cause noisy FLI input signal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0462 - Fuel Level Sensor A Circuit Low

Description:	The powertrain control module (PCM) monitors the fuel level input (FLI) communications network message for a concern. The test fails when the FLI signal is less than the minimum allowable calibrated parameter for a specified fuel fill percentage in the fuel tank.		
Possible Causes:	<ul style="list-style-type: none"> • Empty fuel tank • Fuel pump (FP) module concern • Incorrectly installed fuel gauge • Damaged instrument panel cluster (IPC) (E-Series, MKS) • Damaged instrument cluster (IC) • Damaged fuel gauge • FLI circuit short to ground 		
Diagnostic Aids:	Monitor the FLI PIDs in ignition ON, engine running. A concern is present if the FLI percentage PID is at 25% fill and the FLI voltage PID is less than 0.90 volt with a non-matching fuel gauge or the FLI percentage PID is at 75% fill and the FLI voltage PID is greater than 2.45 volts with a non-matching fuel gauge.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0463 - Fuel Level Sensor A Circuit High

Description:	The powertrain control module (PCM) monitors the fuel level input (FLI) communications network message for a concern. The test fails when the FLI signal is greater than the maximum allowable calibrated parameter for a specified fuel fill percentage in the fuel tank.		
Possible Causes:	<ul style="list-style-type: none"> • Fuel pump (FP) module concern • Incorrectly installed fuel gauge • Damaged instrument panel cluster (IPC) (E-Series, MKS) • Damaged instrument cluster (IC) • FLI circuit open • FLI short to VPWR • Overfilled fuel tank • Damaged fuel gauge 		
Diagnostic Aids:	See the diagnostic aids for DTC P0462.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0480 - Fan 1 Control Circuit

For Relay Controlled Electric Cooling Fan			
Description:	Monitors the low fan control (LFC) primary circuit output from the powertrain control module (PCM). The test fails when the PCM grounds the LFC circuit and excessive current draw is detected on the LFC circuit; or with the LFC circuit not grounded by the PCM the voltage is		

not detected on the LFC circuit (the PCM expects to detect VPWR voltage coming through the low speed fan control relay coil to the LFC circuit).

- Possible Causes:**
- Open or short LFC circuit
 - Open VPWR circuit to the low speed FC relay
 - Damaged low speed FC relay

Diagnostic Aids: When the LFC PID reads YES, a concern is currently present. During the key on engine off (KOEO) self-test, the cooling fan is cycled on and off. A short to voltage can only be detected when the PCM is grounding the LFC circuit. During the KOEO and key on engine running (KOER) self-test, the LFC circuit is cycled on and off.

For Variable Speed Electric Cooling Fan

Description: This test checks the fan control variable (FCV) output circuit. The DTC sets if the powertrain control module (PCM) detects the voltage on the FCV circuit is not within the expected range.

- Possible Causes:**
- FCV circuit open or short
 - B+ or ground circuit concern to cooling fan
 - VPWR open to cooling fan (if applicable)
 - Damaged cooling fan module

Diagnostic Aids: During the key on engine off (KOEO) self-test, the cooling fan is cycled on and off.

For Cooling Fan Clutch

Description: This test checks the fan control variable (FCV) output circuit for the cooling fan clutch. The DTC sets if the powertrain control module (PCM) detects the voltage on the FCV circuit is not within the expected range.

- Possible Causes:**
- FCV circuit open in the harness
 - FCV circuit short to voltage or ground in the harness
 - Damaged cooling fan clutch solenoid.

Diagnostic Aids: During the key on engine off (KOEO) self-test, the cooling fan is cycled on and off.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
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Escape/Mariner, Focus, Mustang, Ranger 2.3L	GO to Pinpoint Test KF .		
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Crown Victoria, Edge, Flex, Fusion, Milan, MKS, MKX, MKZ, Sable, Taurus, Taurus X, Town Car	GO to Pinpoint Test KN .		
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Expedition, Navigator, Mountaineer, F-150, Explorer, Explorer Sport Trac	GO to Pinpoint Test HV .		
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P0481 - Fan 2 Control Circuit

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Description: Monitors the High Fan Control (HFC) primary circuit output from the powertrain control module (PCM). The test fails, when the HFC output is commanded on (grounded) and excessive current draw is detected on the HFC circuit; or when the HFC circuit is commanded off and voltage is not detected on the HFC circuit (the PCM expects to detect VPWR voltage through the high speed FC relay coil to the HFC circuit).			
Possible Causes:		<ul style="list-style-type: none"> • Open or short HFC circuit • Open VPWR circuit to the high speed FC relay • Damaged high speed FC relay 	
Diagnostic Aids: When the High Fan Control Fault (HFCF) PID reads YES, a concern is currently present. An open circuit or short to ground can only be detected when the PCM is not grounding the HFC circuit. A short to voltage can only be detected when the PCM is grounding the HFC circuit. During the key on engine off (KOEO) and key on engine running (KOER) self-test, the HFC circuit is cycled on and off.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KF .		

P0482 - Fan 3 Control Circuit

Description: Monitors the Medium Fan Control (MFC) primary circuit output from the powertrain control module (PCM). The test fails, when the MFC output is commanded on (grounded) and excessive current draw is detected on the MFC circuit; or when the MFC circuit is commanded off and voltage is not detected on the MFC circuit (the PCM expects to detect IGN START/RUN voltage through the medium speed FC relay coil to the MFC circuit).			
Possible Causes:		<ul style="list-style-type: none"> • Open or short MFC circuit • Open IGN START/RUN circuit to the medium speed FC relay • Damaged medium speed FC relay 	
Diagnostic Aids: When the Medium Fan Control Fault (MFCF) PID reads YES, a concern is currently present. MFCF. An open circuit or short to ground can only be detected when the PCM is not grounding the MFC circuit. A short to voltage can only be detected when the PCM is grounding the MFC circuit. During the key on engine off (KOEO) and key on engine running (KOER) self-test, the MFC circuit is cycled on and off. Use output test mode to command the low speed/high speed fan on. The PCM also activates the medium speed fan output.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KF .		

P0483 - Fan Performance

For Vehicles Equipped With Electronic Fan Clutch			
Description: If the cooling fan clutch fan is binding, or the powertrain control module (PCM) detects the fan speed is at or near 0 RPM, the DTC is set.			
Possible Causes:		<ul style="list-style-type: none"> • Cooling fan motor mechanical concerns • Obstruction or binding conditions 	
Diagnostic Aids: Check for a mechanical concern with the cooling fan motor or for obstructions limiting the cooling fan motor operation.			
For All others			
Description: The PCM controls the fan speed and operation using a duty cycle output on the fan control variable (FCV) circuit.			
Possible Causes:		<ul style="list-style-type: none"> • Cooling fan motor mechanical concerns • Obstruction or binding conditions • Overheated controller 	

Diagnostic Aids:	Check for a mechanical concern with the cooling fan motor or for obstructions limiting the cooling fan motor operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Expedition, Navigator, Mountaineer, F-150, Explorer, Explorer Sport Trac	—	—	GO to Pinpoint Test HV .
All others	—	—	GO to Pinpoint Test KN .

P0491 - Secondary Air Injection (AIR) System Insufficient Flow (Bank 1)

Description:	The AIR system detected that there was insufficient mass air flow change during pump switching (ON/OFF).		
Possible Causes:	<ul style="list-style-type: none"> ● Secondary AIR pump with no or low air flow. ● Secondary AIR bypass solenoid leaking/blocked or stuck open/closed. ● Secondary AIR diverter valve leaking/blocked or stuck open/closed. ● Secondary AIR air hose restricted. ● Secondary AIR vacuum hoses restricted or leaking. 		
Diagnostic Aids:	Measured air flow is less than expected. Visually inspect the secondary AIR inlet hose.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HM .	GO to Pinpoint Test HM .

P0500 - Vehicle Speed Sensor (VSS) A

Description:	Indicates the powertrain control module (PCM) detected an error in the vehicle speed information. Vehicle speed data is received from either the VSS, the transfer case speed sensor (TCSS) or the anti-lock brake system (ABS) control module. If the engine RPM is above the torque converter stall speed (automatic transmission) and the engine load is high, it can be inferred that the vehicle must be moving. If there is insufficient vehicle speed data input, a concern is indicated and a DTC is set. On most vehicle applications the malfunction indicator lamp (MIL) is illuminated when this DTC is set.		
Possible Causes:	<ul style="list-style-type: none"> ● Open in the VSS+/VSS- harness circuit ● Open in the TCSS signal or the TCSS signal return harness circuit ● Short to GND in the VSS harness circuit ● Short to GND in the TCSS harness circuit ● Short to PWR in the VSS harness circuit ● Short to PWR in the TCSS harness circuit ● Damaged drive mechanism for VSS or TCSS ● Damaged VSS or TCSS ● Damaged wheel speed sensors ● Damaged wheel speed sensor harness circuits ● Damage in the module(s) connected to the VSS/VSS circuit ● Open or short in the vehicle speed circuit VSS signal between the ABS VSS signal output and the VSS signal inputs to the PCM and other modules (F-Super Duty) 		
Diagnostic Aids:	Monitor the VSS PID while driving the vehicle. This DTC is set when the PCM detects a sudden loss of vehicle speed signal over a period of time. If vehicle speed data is lost, check the source of the vehicle speed input: VSS, TCSS or ABS. On some manual shift-on-the-fly (MSOF) applications, VSS and TCSS PID can be monitored. However if no TCSS PID is available and VSS PID is zero, TCSS circuitry frequency must be checked for loss of sensor signal. If another vehicle electronic module has generated the P0500 and the vehicle does not receive its vehicle		

speed input from the VSS, TCSS or ABS, check the PCM for output shaft speed (OSS) sensor DTCs. On OSS applications the PCM uses the OSS to calculate the vehicle speed. If no OSS DTCs are found check for correct PCM configuration, tire size and axle ratio.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-Super Duty	GO to Pinpoint Test DF .		
Expedition, Flex, MKS, Navigator, Taurus, Taurus X	The powertrain control module (PCM) uses information from the anti lock brake system (ABS) module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		
All others	GO to Pinpoint Test DP .		

P0503 - Vehicle Speed Sensor (VSS) A Intermittent/Erratic/High

Description:	Indicates poor or noisy VSS performance. Vehicle speed data is received from either the VSS, the transfer case speed sensor (TCSS), or the anti lock brake system (ABS) control module.		
Possible Causes:	<ul style="list-style-type: none"> ● Noisy VSS/TCSS input signal from the radio frequency interference / electromagnetic interference (RFI/EMI) external sources, such as ignition components or the charging circuit ● Damaged VSS or driven gears ● Damaged TCSS ● Damaged wiring harness or connectors ● Concern in the module(s) or circuit connected to the VSS/TCSS circuit ● Aftermarket add-on 		
Diagnostic Aids:	Monitor the VSS PID while driving the vehicle, and check for intermittent vehicle speed indication. Verify the ignition and charging systems are functioning correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-Super Duty	GO to Pinpoint Test DF .		
Expedition, Flex, MKS, Navigator, Sable, Taurus, Taurus X	The powertrain control module (PCM) uses information from the anti lock brake system (ABS) module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		
All others	GO to Pinpoint Test DP .		

P0504 - Brake Switch Correlation

Description:	The PCM does a comparison test between the brake pedal switch (BPS) and the brake pedal position (BPP) switch.		
Possible Causes:	<ul style="list-style-type: none"> ● Damaged brake switch ● Open or short in the BPS circuit ● Open or short in the BPP circuit 		
Diagnostic Aids:	Check the state of PID BPS and PID BPP. BPS is normally closed and BPP is normally open.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FD .		

P0505 - Idle Air Control (IAC) System

For Vehicles With an Idle Air Control (IAC) Valve			
Description: The powertrain control module (PCM) attempts to control engine speed during the key on, engine running (KOER) self-test. The test fails when the desired RPM could not be reached or controlled during the self-test.			
Possible Causes: <ul style="list-style-type: none"> ● IAC circuit open ● VPWR to IAC solenoid open ● B+ or VPWR to IAC solenoid open ● Air inlet is plugged ● IAC circuit shorted to PWR ● Damaged IAC valve 			
Diagnostic Aids:			
For All others			
Description: The powertrain control module (PCM) attempts to control engine speed during the key on, engine running (KOER) self-test. The test fails when the desired RPM could not be reached or controlled during the self-test.			
Possible Causes: <ul style="list-style-type: none"> ● Failure mode effects management (FMEM) condition is present ● Intake air restriction ● Exhaust restriction ● Sludged throttle body ● Vacuum leaks ● Damaged electronic throttle body (ETB) ● Damaged PCM 			
Diagnostic Aids: This DTC may be accompanied by other DTCs. Diagnose other DTCs first. If other DTCs are not present inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTC and carry out the KOER self-test.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Ranger		GO to Pinpoint Test KE .	
All others		GO to Pinpoint Test HU .	

P0506 - Idle Air Control (IAC) System RPM Lower Than Expected

For Vehicles With an Idle Air Control (IAC) Valve			
Description: This DTC is set when the powertrain control module (PCM) detects an engine idle speed that is less than the desired RPM.			
Possible Causes: <ul style="list-style-type: none"> ● IAC circuit open ● Air inlet is plugged ● B+ or VPWR to IAC solenoid open ● Damaged or incorrect IAC valve ● IAC valve stuck closed ● VPWR to IAC solenoid open ● IAC circuit shorted to PWR 			
Diagnostic Aids: Disconnect the IAC valve and look for little or no change in engine RPM as an indication of a stuck or damaged valve.			
For All others			
Description: This DTC is set when the powertrain control module (PCM) detects an engine idle speed that is less than the desired RPM.			
Possible Causes: <ul style="list-style-type: none"> ● Intake air restriction ● Vacuum leaks 			

- Exhaust restriction
- Engine mechanical concern
- Sludged throttle body
- Damaged electronic throttle body (ETB)
- Damaged PCM

Diagnostic Aids: This DTC may be accompanied by other DTCs. Diagnose other DTCs first. If other DTCs are not present inspect the intake air system for air restrictions and damage. If no concerns are present, clear the DTC and carry out the KOER self-test.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Ranger		GO to Pinpoint Test KE .	
All others		GO to Pinpoint Test HU .	

P0507 - Idle Air Control (IAC) System RPM Higher Than Expected

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
For Vehicles With an Idle Air Control (IAC) Valve			
Description: This DTC is set when the powertrain control module (PCM) detects an engine idle speed that is greater than the desired RPM.			
Possible Causes: <ul style="list-style-type: none"> • IAC circuit shorted to ground • Damaged or incorrect IAC valve • IAC valve stuck open • Intake air leak after throttle body • Vacuum leaks • Damaged EVAP system • EGR valve leaks vacuum 			
Diagnostic Aids: Disconnect the IAC valve and look for little or no change in engine RPM as an indication of a stuck or damaged valve.			
For All others			
Description: This DTC is set when the powertrain control module (PCM) detects an engine idle speed that is greater than the desired RPM.			
Possible Causes: <ul style="list-style-type: none"> • Intake air leak after throttle body • Vacuum leaks • Damaged EVAP system • EGR valve leaks vacuum • Damaged electronic throttle body (ETB) • Damaged PCM 			
Diagnostic Aids: This DTC is informational only and it may be accompanied by other DTCs. Diagnose other DTCs first. If other DTCs are not present inspect the intake air system for air or vacuum leaks and damage. If no concerns are present, clear the DTC and repeat the self-test.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Ranger		GO to Pinpoint Test KE .	
All others	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P050A - Cold Start Idle Air Control Performance

Description: The cold start emission reduction monitor has detected an airflow performance deficiency. The cold start emission reduction monitor validates the operation of the components of the system required to achieve the cold start emission reduction strategy, retarded spark timing (P050B) and elevated idle airflow (P050A). When the idle airflow test portion of the cold start emission reduction strategy is enabled, the idle air control system requests a higher idle RPM to increase the engine airflow. The cold start emission reduction monitor compares the actual airflow measured by the mass air flow (MAF) sensor to the requested powertrain control module (PCM)			
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airflow. The DTC sets when the airflow is less than the calibrated limit.

- Possible Causes:**
- Damaged intake air system tubes
 - Restricted air filter
 - Restricted or blocked idle air control or intake passages
 - Air or vacuum leaks
 - Base engine problem

Diagnostic Aids: This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose other DTCs first. If other DTCs are not present inspect the intake air system for air restrictions and damage. If no concerns are present, clear the DTCs and repeat the self-test. The cold start emission reduction monitor runs during a cold start. Before repeating the self-test, a 2 to 3 hour soak period is required for the cold start emission reduction monitor to run at start up.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P050B - Cold Start Ignition Timing Performance

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: The cold start ignition timing performance has a functional response test of actual spark timing angle actual versus commanded spark timing in the powertrain control module (PCM).			
Possible Causes: <ul style="list-style-type: none"> • Spark timing • Spark capture circuit • Spark timing monitor • Spark capture circuit monitor 			
Diagnostic Aids: Diagnose all other powertrain related DTCs first.			
Vehicles with coil pack ignition system	GO to Pinpoint Test JC .		
All others	GO to Pinpoint Test JB .		

P050E - Cold Start Engine Exhaust Temperature Out of Range

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
For Vehicles With an Idle Air Control (IAC) Valve			
Description: The powertrain control module (PCM) attempts to control engine speed during the key on, engine running (KOER) self-test. The test fails when the desired RPM could not be reached or controlled during the self-test.			
Possible Causes: <ul style="list-style-type: none"> • IAC circuit open • VPWR to IAC solenoid open • B+ or VPWR to IAC solenoid open • Air inlet is plugged • IAC circuit shorted to PWR • Damaged IAC valve 			
Diagnostic Aids:			
For All others			
Description: The powertrain control module (PCM) calculates the actual catalyst warm up temperature during a cold start. The PCM then compares the actual temperature to the expected catalyst temperature model. The difference between the actual and expected temperatures is a ratio. When this ratio exceeds the calibrated value this DTC is set and the malfunction indicator lamp (MIL) illuminates.			

Possible Causes:	<ul style="list-style-type: none"> • Intake air restriction • Exhaust restriction • Engine mechanical concern • Damaged or sludged electronic throttle body (ETB) • Vacuum leaks • Damaged PCM
Diagnostic Aids:	This DTC is informational only and it may be accompanied by other DTCs. Diagnose other DTCs first. If other DTCs are not present inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTC and carry out the key ON, engine running (KOER) self-test.
Application	Key On Engine Off Key On Engine Running Continuous Memory
Ranger	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
All others	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

P0511 - Idle Air Control (IAC) Circuit

Description:	This DTC is set when the powertrain control module (PCM) detects an electrical load failure on the IAC output circuit.		
Possible Causes:	<ul style="list-style-type: none"> • IAC circuit open • VPWR to IAC solenoid open • B+ or VPWR to IAC solenoid open • IAC circuit shorted to PWR • Damaged IAC valve • IAC circuit short to GND 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KE .		

P0512 - Starter Request Circuit

Description:	Indicates the one touch integrated starting system voltage circuit to the starter relay has a short to voltage.		
Possible Causes:	<ul style="list-style-type: none"> • Short to voltage 		
Diagnostic Aids:	Refer to the Workshop Manual Section 303-06 Starting System, PCM DTC Chart, to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0528 - Fan Speed Sensor Circuit No Signal

Description:	The powertrain control module (PCM) uses the fan speed sensor (FSS) input to monitor the cooling fan clutch speed. If the indicated fan speed is lower than the calibrated value during the key on engine running (KOER) self-test, the DTC is set.		
Possible Causes:	<ul style="list-style-type: none"> • FSS VPWR circuit open in the harness • FSS PWRGND circuit open in the harness 		

- FSS circuit open in the harness
- FSS circuit short to voltage or ground in the harness
- Damaged FSS sensor.
- Damaged PCM

Diagnostic Aids: Visually inspect the cooling fan clutch for damage or obstruction.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HV .		

P052A - Cold Start Camshaft Position Timing Over-Advanced (Bank 1)

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HK .	GO to Pinpoint Test HK .

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for an over-advanced camshaft timing during cold start up. The test fails when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.

Possible Causes:

- Camshaft timing incorrectly set
- Continuous oil flow to the VCT piston chamber
- VCT solenoid valve stuck open
- Camshaft advance mechanism binding (VCT unit)

Diagnostic Aids: This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.

P052B - Cold Start Camshaft Position Timing Over-Retarded (Bank 1)

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HK .	GO to Pinpoint Test HK .

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for over-retarded camshaft timing during cold start up. The test fails when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.

Possible Causes:

- Camshaft timing incorrectly set
- Continuous oil flow to the VCT piston chamber
- VCT solenoid valve stuck open
- Camshaft advance mechanism binding (VCT unit)

Diagnostic Aids: This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.

P052C - Cold Start Camshaft Position Timing Over-Advanced (Bank 2)

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for an over-advanced camshaft timing during cold start up. The test fails when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.			
Possible Causes:			
<ul style="list-style-type: none"> • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber 			

		<ul style="list-style-type: none"> • VCT solenoid valve stuck open • Camshaft advance mechanism binding (VCT unit) 	
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HK .	GO to Pinpoint Test HK .

P052D - Cold Start Camshaft Position Timing Over-Retarded (Bank 2)

Description:	The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for over-retarded camshaft timing during cold start up. The test fails when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	<ul style="list-style-type: none"> • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • VCT solenoid valve stuck open • Camshaft advance mechanism binding (VCT unit) 		
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HK .	GO to Pinpoint Test HK .

P0532 - A/C Pressure Refrigerant Sensor A Circuit Low

Description:	The air conditioning pressure (ACP) transducer sensor inputs a voltage to the powertrain control module (PCM). If the voltage is below the calibrated level the DTC sets.		
Possible Causes:	<ul style="list-style-type: none"> • ACP transducer sensor circuit short to GND or SIGRTN • VREF circuit open • Open ACP transducer sensor circuit • Damaged ACP transducer sensor 		
Diagnostic Aids:	Verify the VREF voltage is between 4 and 6 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test DS .	

P0533 - A/C Refrigerant Pressure Sensor A Circuit High

Description:	The air conditioning pressure (ACP) transducer sensor inputs a voltage to the powertrain control module (PCM). If the voltage is above a calibrated level the DTC sets.		
Possible Causes:	<ul style="list-style-type: none"> • ACP transducer sensor circuit short to PWR • Open ACP transducer sensor circuit • ACP transducer sensor circuit short to VREF • Damaged ACP transducer sensor 		
Diagnostic Aids:	Verify the VREF voltage is between 4 and 6 volts.		

Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DS .		

P0534 - A/C Refrigerant Charge Loss

Description: Indicates frequent A/C compressor clutch cycling.			
Possible Causes:	<ul style="list-style-type: none"> • Mechanical A/C system concern (such as low refrigerant charge, damaged A/C cycling switch) • Intermittent open between the cycling pressure switch and the powertrain control module (PCM) • Intermittent open in the IGN RUN circuit to cycling pressure switch (if applicable) 		
Diagnostic Aids:	This test is designed to protect the transmission. In some strategies, the PCM unlocks the torque converter during A/C clutch engagement. If a concern is present that results in frequent A/C clutch cycling, damage could occur if the torque converter is cycled at these intervals. This test detects this condition, sets the DTC and prevents the torque converter from excessive cycling.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test KM .

P0537 - A/C Evaporator Temperature Sensor Circuit Low

Description: Indicates the air conditioning evaporator temperature (ACET) signal input was less than the self-test minimum. The self-test minimum is 0.13 volt.			
Possible Causes:	<ul style="list-style-type: none"> • ACET circuit short to ground or SIG RTN • Damaged ACET sensor 		
Diagnostic Aids:	The powertrain control module (PCM) sources a low current 5 volts on the ACET circuit (this voltage can be measured with the sensor disconnected). As the A/C evaporator air temperature changes, the ACET circuit resistance to SIG RTN (ground) changes (which changes the voltage the PCM detects). When the ACET signal is detected below the self-test minimum, check for shorts to the SIG RTN or ground, which would pull the voltage low.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DJ .		

P0538 - A/C Evaporator Temperature Sensor Circuit High

Description: Indicates the air conditioning evaporator temperature (ACET) signal input was greater than the self-test maximum. The self-test maximum is 4.5 volts.			
Possible Causes:	<ul style="list-style-type: none"> • ACET circuit open • SIG RTN circuit open to the ACET sensor • ACET circuit short to voltage (VREF) • Damaged ACET sensor 		
Diagnostic Aids:	The powertrain control module (PCM) sources a low current 5 volts on the ACET circuit (this voltage can be measured with the sensor disconnected). As the A/C evaporator air temperature changes, the ACET circuit resistance to SIG RTN (ground) changes (which changes the voltage the PCM detects). When the ACET signal is detected above the self-test maximum, check for open circuits (ACET or SIG RTN), which would cause the voltage to remain high. Although not as probable, also check for a short to voltage (VREF).		

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DJ .		

P053A - Positive Crankcase Ventilation (PCV) Heater Control Circuit / Open

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HG .

Description: This DTC sets when the powertrain control module (PCM) detects a positive crankcase ventilation (PCV) heater circuit failure.

Possible Causes:

- Open or shorted PCV circuit
- Damaged PCV heater assembly

Diagnostic Aids: Make sure the PCV valve is correct for the engine application and the PCV heater connector is correctly connected.

P0552 - Power Steering Pressure (PSP) Sensor/Switch Circuit Low

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DT .		

Description: Indicates the PSP sensor input signal was less than the self-test minimum.

Possible Causes:

- PSP sensor damaged
- SIG RTN circuit open
- VREF circuit open or shorted
- PSP sensor signal circuit open or shorted

Diagnostic Aids: View the PSP PID to monitor the PSP input.

P0553 - Power Steering Pressure (PSP) Sensor Circuit High Input

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DT .		

Description: Indicates the PSP sensor input signal was greater than the self-test maximum.

Possible Causes:

- PSP sensor damaged
- VREF circuit shorted to voltage
- PSP sensor signal circuit open
- PSP sensor signal circuit shorted to voltage

Diagnostic Aids: View the PSP PID to monitor the PSP input.

P0562 - System Voltage Low

Description:	This DTC is set when the powertrain control module (PCM) detects low system voltage.		
Possible Causes:	<ul style="list-style-type: none"> • Charging system concern 		
Diagnostic	System voltage is monitored by the PCM. When the voltage is above or below a calibrated		

Aids:	value, an internal counter increments until a DTC is set.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B.		

P0563 - System Voltage High

Description:	This DTC is set when the powertrain control module (PCM) detects high system voltage.		
Possible Causes:	<ul style="list-style-type: none"> • Charging system concern 		
Diagnostic Aids:	System voltage is monitored by the PCM. When the voltage is above or below a calibrated value, an internal counter increments until a DTC is set.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B.		

P0571 - Brake Switch A Circuit

Description:	The purpose of this DTC is to check whether the brake switch has toggled or not during the Key On Engine Running (KOER) test.		
Possible Causes:	<ul style="list-style-type: none"> • Open or short in the BPP circuit • Open or short in the stoplamp circuits • Concern in module(s) connected to the BPP circuit • Damaged brake switch • Misadjusted brake switch 		
Diagnostic Aids:	Using the scan tool, check the BPP/BOO PID. The BPP/BOO PID should toggle on and off with brake pedal activation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FD.		

P0572 - Brake Switch A Circuit Low

Description:	This DTC indicates the brake switch is stuck in the ON position.		
Possible Causes:	<ul style="list-style-type: none"> • Open or short in the BPP circuit • Open or short in the stoplamp circuits • Damaged brake switch • Incorrectly adjusted brake switch 		
Diagnostic Aids:	Using the scan tool, check the BPP/BOO PID. The BPP/BOO PID should toggle on and off with brake pedal activation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FD.		

P0573 - Brake Switch A Circuit High

Description:	This DTC indicates the brake switch is stuck in the OFF position.		

Possible Causes:	<ul style="list-style-type: none"> • Open or short in the BPP circuit • Open or short in the stoplamp circuits • Damaged brake switch • Misadjusted brake switch
Diagnostic Aids:	Using the scan tool, check the BPP/BOO PID. The BPP/BOO PID should toggle on and off with brake pedal activation.
Application	Key On Engine Off Key On Engine Running Continuous Memory
All	GO to Pinpoint Test FD .

P0579 - Cruise Control Multifunction Input A Circuit Range / Performance

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 310-03, Speed Control.		

P0581 - Cruise Control Multifunction Input A Circuit High

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 310-03, Speed Control.		

P0600 - Serial Communication Link

Description:	Indicates an error occurred in the powertrain control module (PCM). This DTC may be set alone or in combination with P2105.		
Possible Causes:	<ul style="list-style-type: none"> • Software incompatibility issue • Damaged PCM 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P0602 - Powertrain Control Module (PCM) Programming Error

Description:	This DTC indicates a programming error within the vehicle ID (VID) block.		
Possible Causes:	<ul style="list-style-type: none"> • VID data corrupted by the scan tool during VID reprogramming 		

Diagnostic Aids:	The VID block must be programmed. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Making Changes to the VID Block. If the PCM does not allow reprogramming of the VID block, reflashing of the PCM is required.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0603 - Internal Control Module Keep Alive Memory (KAM) Error

Description:	Indicates the powertrain control module (PCM) has experienced an internal memory concern. However, there are external items that can cause this DTC.		
Possible Causes:	<ul style="list-style-type: none"> • Reprogramming • Battery terminal corrosion • KAPWR to PCM interrupt/open • Loose battery connection 		
Diagnostic Aids:	If KAPWR is interrupted to the PCM because of a battery or PCM disconnect, this DTC can be generated on the first power-up.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QB .	—	GO to Pinpoint Test QB .

P0604 - Internal Control Module Random Access Memory (RAM) Error

Description:	Indicates the powertrain control module (PCM) RAM has been corrupted.		
Possible Causes:	<ul style="list-style-type: none"> • Module reprogramming • Aftermarket performance products. • PCM 		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new PCM. If it is necessary to install a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0605 - Internal Control Module Read Only Memory (ROM) Error

Description:	The powertrain control module (PCM) ROM has been corrupted.		
Possible Causes:	<ul style="list-style-type: none"> • An attempt was made to change the calibration • Module programming error • Aftermarket performance products • PCM 		
Diagnostic Aids:	Reprogram the vehicle identification VID block (use as built data). Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new powertrain control module (PCM). If it is necessary to install a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0606 - Control Module Processor

Description: This DTC indicates an internal powertrain control module (PCM) communication error.			
Possible Causes: <ul style="list-style-type: none"> • Module programming error • Aftermarket performance products • PCM 			
Diagnostic Aids: Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0607 - Control Module Performance

Description: Indicates that the powertrain control module (PCM) internal central processing unit (CPU) has encountered an error. The PCM monitors itself and carries out internal checks of its own CPU. If any of these checks returns an incorrect value, the DTC is set.			
Possible Causes: <ul style="list-style-type: none"> • Module programming error • Aftermarket performance products • PCM 			
Diagnostic Aids: Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P060A - Internal Control Module Monitoring Processor Performance

Description: Indicates an error occurred in the powertrain control module (PCM). This DTC may set in combination with P2105.			
Possible Causes: <ul style="list-style-type: none"> • Software incompatibility issue • Damaged PCM 			
Diagnostic Aids: Verify the PCM is at the latest calibration level.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P060B - Internal Control Module A/D Processing Performance

Description: Indicates an error occurred in the powertrain control module (PCM). This DTC may set in combination with P2104 or P2110.			
Possible Causes: <ul style="list-style-type: none"> • Damaged PCM 			
Diagnostic Aids: Inspect the harness for damage. Verify correct operation of the sensors using VREF and related circuits.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P060C - Internal Control Module Main Processor Performance

Description: Indicates an error occurred in the powertrain control module (PCM).			
Possible Causes: <ul style="list-style-type: none"> • Software incompatibility issue • Damaged PCM 			
Diagnostic Aids: Verify the PCM is at the latest calibration level.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P060D - Internal Control Module Accelerator Pedal Position Performance

Description: Indicates an error occurred in the powertrain control module (PCM). If the PCM detects a concern identifying an issue with an accelerator pedal position (APP) sensor signal or with processing the brake pedal sensor input, the DTC is set.			
Possible Causes: <ul style="list-style-type: none"> • Damaged PCM 			
Diagnostic Aids: Verify the PCM is at the latest calibration level.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P0610 - Control Module Vehicle Options Error

Description: Indicates a powertrain control module (PCM) vehicle options error.			
Possible Causes: <ul style="list-style-type: none"> • Module reprogramming • Aftermarket performance products • PCM 			
Diagnostic Aids: Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new PCM. If it is necessary to install a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P061B - Internal Control Module Torque Calculation Performance

Description:	Indicates a calculation error occurred in the powertrain control module (PCM).		
Possible Causes:			
Diagnostic Aids:	Check for sensor and circuit related DTCs. Do not install a new electronic throttle body (ETB) for this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P061C - Internal Control Module Engine RPM Performance

Description:	Indicates a calculation error occurred in the powertrain control module (PCM).		
Possible Causes:	<ul style="list-style-type: none">• Crankshaft position (CKP) sensor circuit is open or short• CKP sensor circuit intermittent• Damaged CKP sensor• Camshaft position (CMP) sensor circuit is open or short• CMP sensor circuit intermittent• Damaged CMP sensor• Damaged PCM		
Diagnostic Aids:	Verify correct operation of the CKP and CMP sensors and related circuits.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P061D - Internal Control Module Engine Air Mass Performance

Description:	Indicates an error occurred in the powertrain control module (PCM).		
Possible Causes:	<ul style="list-style-type: none">• Software incompatibility issue• Damaged PCM		
Diagnostic Aids:	Verify the PCM is at the latest calibration level.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P061F - Internal Control Module Throttle Actuator Controller Performance

Description:	Indicates an error occurred in the powertrain control module (PCM).		
Possible Causes:			
Diagnostic Aids:	Verify correct operation of the electronic throttle control (ETC) components and related circuits.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P0620 - Generator Control Circuit

Description:	The powertrain control module (PCM) reads the GENLI and sends a DTC through the network when the signal frequency of GENLI indicates a concern.		
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0622 - Generator Field Terminal Circuit

Description:	The powertrain control module (PCM) monitors the generator load from the generator/regulator in the form of frequency. The frequency range is determined by the temperature of the voltage regulator, where 97% indicates a full load, and less than 6% indicates no load.		
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0625 - Generator Field Terminal Circuit Low

Description:	The powertrain control module (PCM) monitors generator load from the generator/regulator in the form of frequency. The concern indicates the input is lower than the load should be in normal operation. The load input could be low when no generator output exists.		
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0626 - Generator Field Terminal Circuit High

Description:	The powertrain control module (PCM) monitors generator load from the generator/regulator in the form of frequency. The concern indicates the input is higher than the load should be in normal operation. The load input could be high when a battery short to ground exists.		
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.		

Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0627 - Fuel Pump A Control Circuit/Open

Description: The fuel pump control module monitors the fuel pump module and secondary circuits for a concern. If the fuel pump control module detects a concern with the fuel pump module or secondary circuits, the fuel pump control module sends an 80% duty cycle signal on the fuel pump monitor (FPM) circuit to report the concern to the PCM. The test fails when the fuel pump control module is still reporting a concern with the fuel pump module or secondary circuits after a calibrated amount of time.			
Possible Causes:			
<ul style="list-style-type: none"> ● FPPWR circuit open or short to ground ● FPRTN circuit open ● FPPWR circuit short to voltage ● FPRTN circuit short to voltage ● Damaged fuel pump module ● Damaged fuel pump control module 			
Diagnostic Aids: Check for any harness concerns. The fuel pump control module controls the speed of the fuel pump module by supplying a variable voltage to the fuel pump module on the FPPWR circuit.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P062C - Internal Control Module Vehicle Speed Performance

Description: Indicates an error occurred in the powertrain control module (PCM).			
Possible Causes:			
<ul style="list-style-type: none"> ● Module communications network concerns ● Output shaft speed (OSS) sensor concern ● Turbine shaft speed (TSS) sensor concern ● Anti-lock brake system (ABS) concern 			
Diagnostic Aids: Repair any ABS DTCs, ABS-related DTCs in other modules, or vehicle communication concerns.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P062F - Internal Control Module EEPROM Error

Description:			
Possible Causes:			
Diagnostic Aids: Refer to the Workshop Manual Section 419-10, Multifunction Electronic Modules, Diagnostic Trouble Code (DTC) Chart to diagnose the DTC.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0642 - Sensor Reference Voltage A Circuit Low

Description:	Indicates the reference voltage (VREF) circuit is less than VREF minimum.		
Possible Causes:	<ul style="list-style-type: none">• VREF circuit short to ground• Damaged sensor• Incorrect harness connection		
Diagnostic Aids:	This DTC is set due to an under voltage condition on the VREF circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P0643 - Sensor Reference Voltage A Circuit High

Description:	Indicates the reference voltage (VREF) circuit is greater than VREF maximum.		
Possible Causes:	<ul style="list-style-type: none">• VREF circuit short to voltage• Damaged sensor• Incorrect harness connection		
Diagnostic Aids:	This DTC sets due to an over voltage condition on the VREF circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P0645 - Air Conditioning Clutch Relay (A/CCR) Control Circuit

Description:	Monitors the A/CCR circuit output from the powertrain control module (PCM). The test fails when the PCM grounds the A/CCR circuit, excessive current draw is detected on the A/CCR circuit; or, with the A/CCR circuit not grounded by the PCM, voltage is not detected on the A/CCR circuit (the PCM expects to detect VPWR voltage coming through the A/CCR relay coil to the A/CCR circuit).		
Possible Causes:	<ul style="list-style-type: none">• Open or short A/CCR circuit• Damaged A/CCR relay• Open VPWR circuit to the A/CCR relay		
Diagnostic Aids:	The A/CCR control circuit can be monitored using the WACF and WAC PID. When the WACF PID reads YES, a concern is present. An open circuit or short to ground can only be detected when the PCM is not grounding the circuit. A short to voltage can only be detected when the PCM is grounding the circuit. During the key on engine off (KOEO) and key on engine running (KOER) self-test, the WAC circuit is cycled on and off. Verify the A/C and the defrost were OFF during the KOEO and KOER self-tests. Check ACCS PID to verify. If the vehicle is not equipped with A/C, ignore DTC P0645.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KM .		

P064D - Internal Control Module O2 Sensor Processor Performance - Bank 1

Description:	The powertrain control module (PCM) monitors the application-specific integrated circuit that controls and monitors the heated oxygen sensor (HO2S). The test fails when the PCM detects		

an internal circuit or communication concern.

Possible Causes:

- Damaged PCM

Diagnostic Aids: Internal PCM concern.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .		

P064E - Internal Control Module O2 Sensor Processor Performance - Bank 2

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: See the description for DTC P064D.			
Possible Causes: See the possible causes for DTC P064D.			
Diagnostic Aids: See the diagnostic aids for DTC P064D.			
All	Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .		

P0657 - Actuator Supply Voltage A Circuit/Open

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: Voltage to all transmission solenoids has been interrupted.			
Possible Causes:			
Diagnostic Aids: Refer to the Workshop Manual Section 307-01, Automatic Transmission, Diagnostic Trouble Code (DTC) Index to continue diagnosis.			
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission, Diagnostic Trouble Code (DTC) Index to continue diagnosis.		

P065B - Generator Control Circuit Range/Performance

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: The powertrain control module (PCM) reads the GENLI and sends a DTC through the network when the signal frequency of GENLI indicates a concern.			
Possible Causes:			
Diagnostic Aids:			
All	Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.		

P0660 - Intake Manifold Tuning Valve (IMTV) Control Circuit Open - Bank 1

Description: The IMTV system is monitored for failure during continuous, key on engine off (KOEO), or key on engine running (KOER) self-tests. The test fails when the signal is more or less than an expected calibrated range.			
Possible Causes:		<ul style="list-style-type: none"> • IMTV signal circuit open, shorted to PWR GND or SIG RTN • Damaged IMTV actuator 	
Diagnostic Aids: An IMTVM PID reading may indicate a fault.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P0663 - Intake Manifold Tuning Valve (IMTV) Control Circuit Open - Bank 2

Description: The IMTV system is monitored for failure during continuous, key on engine off (KOEO), or key on engine running (KOER) self-tests. The test fails when the signal is more or less than an expected calibrated range.			
Possible Causes:		<ul style="list-style-type: none"> • IMTV signal circuit open, shorted to PWR GND or SIG RTN • Damaged IMTV actuator 	
Diagnostic Aids: An IMTVM PID reading may indicate a fault.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P0685 - Electronic Control Module (ECM)/Powertrain Control Module (PCM) Power Relay Control Circuit/Open

Description: This DTC sets when the ignition switch position run (ISP-R) circuit indicates the ignition is in the OFF, ACC, or LOCK position, and the amount of time the PCM remains powered through the PCM power relay exceeds a predetermined amount of time.			
Possible Causes:		<ul style="list-style-type: none"> • PCM relay control (PCMRC) circuit short to ground in the harness • Damaged PCM power relay 	
Diagnostic Aids: Ability to communicate with the PCM when the ignition is in the OFF, ACC, or LOCK position indicates a hard fault.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P0689 - Electronic Control Module (ECM)/Powertrain Control Module (PCM) Power Relay Sense Circuit Low

Description: The powertrain control module (PCM) monitors the voltage on the ignition switch position run (ISP-R) and the fuel injector power monitor (INJPWRM) circuits. This DTC sets when the voltage on the ISP-R and the INJPWRM circuit voltages do not correspond for a calibrated			

period of time.

- Possible Causes:**
- Ignition circuit fuse
 - ISP-R circuit open in the harness
 - ISP-R circuit short to ground in the harness
 - Fuel injector voltage power (VPWR) circuit short to voltage
 - Fuel injector power monitor (INJPWR) circuit short to voltage
 - Damaged ignition switch
 - Damaged fuel pump relay
 - Damaged PCM power relay

Diagnostic Aids: The INJPWRM PID voltage reading should be 0 volts when the ignition is in the OFF, ACC or LOCK position.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P0690 - Electronic Control Module (ECM)/Powertrain Control Module (PCM) Power Relay Sense Circuit High

Description:	The powertrain control module (PCM) monitors the voltage on the ignition switch position run (ISP-R) and the fuel injector power monitor (INJPWRM) circuits. This DTC sets when the voltage on the ISP-R and the INJPWRM circuit voltages do not correspond for a calibrated period of time.		
Possible Causes:	<ul style="list-style-type: none"> • ISP-R circuit short to voltage in the harness • Fuel injector voltage power (VPWR) circuit open • Fuel injector power monitor (INJPWR) circuit open • Damaged ignition switch • Damaged fuel pump relay • Damaged PCM power relay 		
Diagnostic Aids:	The INJPWRM PID voltage should be greater than 10.5 V when the ignition is in the ON position.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P06B8 - Internal Control Module Non-Volatile Random Access Memory (NVRAM) Error

Description:	This DTC indicates a concern with the ability of the powertrain control module (PCM) to correctly store permanent DTCs.		
Possible Causes:			
Diagnostic Aids:	<p>Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products.</p> <p>If an updated calibration is available, update the calibration to the latest level. Clear the DTCs and drive the vehicle.</p> <p>If an updated calibration is not available, install a new PCM.</p> <p>Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the VID Block for a Replacement PCM.</p>		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0703 - Brake Switch B Input Circuit

Description: Indicates the powertrain control module (PCM) did not receive a brake pedal position (BPP) input.			
Possible Causes: <ul style="list-style-type: none"> • Open or short in the BPP circuit • Open or short in the stoplamp circuits • Damage in module(s) connected to the BPP circuit. • Damaged brake switch • Misadjusted brake switch 			
Diagnostic Aids: Check for correct function of the stoplamps. Using a scan tool, check the BPP PID. The stoplamps and PID should toggle on and off with brake pedal activation.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Town Car	Verify the brake pedal was applied and released during the key on engine running (KOER) self-test. For additional concerns, refer to the Workshop Manual Section 417-01, Exterior Lighting.		
Expedition, Navigator	Verify the brake pedal was applied and released during the key on engine running (KOER) self-test. For additional concerns, refer to the Workshop Manual Section 206-09, Anti-Lock Control.		
All others	GO to Pinpoint Test FD .		

P0704 - Clutch Switch Input Circuit

Description: When the clutch pedal is applied the voltage goes to low. If the powertrain control module (PCM) does not see this change from high to low the DTC is set.			
Possible Causes: <ul style="list-style-type: none"> • Clutch pedal position (CPP) circuit short to voltage • Damaged CPP switch • CPP circuit open in the SIGRTN 			
Diagnostic Aids: When the clutch pedal is applied and then released, the switch voltage should cycle.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .	—	GO to Pinpoint Test TA .

P0705 - Transmission Range Sensor A Circuit (PRNDL) Input

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P0707 - Transmission Range Sensor A Circuit Low

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.
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P0708 - Transmission Range Sensor A Circuit High

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P071x - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P0720 - Output Shaft Speed (OSS) Sensor Circuit

Description:	The OSS sensor inputs a signal to the powertrain control module (PCM) based on the speed of the output shaft of the transmission.		
Possible Causes:	<ul style="list-style-type: none"> • OSS sensor circuit short to GND • OSS sensor circuit short to PWR • OSS sensor circuit open • Damaged OSS sensor 		
Diagnostic Aids:	Verify the sensor signal output varies with the vehicle speed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	—	—	GO to Pinpoint Test DP .
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, Diagnostic Trouble Code (DTC) Index to continue diagnosis.		

P0721 - Output Shaft Speed (OSS) Sensor Circuit Range/Performance

Description:	The OSS sensor signal is very sensitive to noise. This noise distorts the input to the powertrain control module (PCM).		
Possible Causes:	<ul style="list-style-type: none"> • Wiring misrouted • Aftermarket add-on • Wiring damaged • Wiring insulation wear 		
Diagnostic Aids:	Check the routing of the harness.		

Check the wiring and the connector for damage.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	—	—	GO to Pinpoint Test DP .
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, Diagnostic Trouble Code (DTC) Index to continue diagnosis.		

P0722 - Output Shaft Speed (OSS) Sensor Circuit No Signal

Description: The OSS sensor failed to provide a signal to the powertrain control module (PCM) upon initial movement of vehicle.			
Possible Causes: <ul style="list-style-type: none"> • Damaged OSS connector • Damaged OSS sensor, or not installed correctly • Harness intermittently shorted or open 			
Diagnostic Aids: Check the wiring, connector, and sensor for damage.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	—	—	GO to Pinpoint Test DP .
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, Diagnostic Trouble Code (DTC) Index to continue diagnosis.		

P0723 - Output Shaft Speed (OSS) Sensor Circuit Intermittent

Description: The OSS sensor signal to the powertrain control module (PCM) is irregular or interrupted.			
Possible Causes: <ul style="list-style-type: none"> • Harness connector not correctly seated • Harness intermittently shorted or open • Harness connector damaged • OSS sensor damaged, or not installed correctly 			
Diagnostic Aids: Verify harness and connector integrity. Verify correct installation of the OSS sensor.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	—	—	GO to Pinpoint Test DP .
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, Diagnostic Trouble Code (DTC) Index to continue diagnosis.		

P073x - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P074x - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P075x - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P076x - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P077x - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P078x - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.
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P079x - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P0815 - Upshift Switch Circuit

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P0830 - Clutch Pedal Switch A Circuit

Description:	The powertrain control module (PCM) monitors the clutch pedal position bottom of travel (CPP-BT) switch only during the calibrated engine speed range (cranking speed range). This DTC sets when the CPP-BT switch does not indicate that the clutch is disengaged (clutch pedal pressed) when the engine is cranked.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged CPP-BT switch • Damaged CPP-BT harness • Open PWRGND circuit to the CPP-BT switch • Vehicle push-started with the clutch engaged (clutch pedal released) • Aftermarket remote starting device 		
Diagnostic Aids:	Verify that the vehicle was not push-started with the clutch engaged. Check for aftermarket equipment such as remote starting devices which may bypass the clutch pedal position switch when cranking the engine.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 303-06, Starting System to diagnose the symptom no start, no crank.		

P0833 - Clutch Pedal Switch B Circuit

Description:	The powertrain control module (PCM) monitors the clutch pedal position top of travel (CPP-TT) switch only during the calibrated engine speed range (cranking speed range). This DTC sets when the CPP-TT does not indicate that the clutch is disengaged (clutch pedal pressed) when the engine is cranked.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged CPP-TT switch 		

Causes:	<ul style="list-style-type: none"> • Damaged CPP-TT harness • Open PWRGND circuit to the CPP-TT switch • Vehicle push-started with the clutch engaged (clutch pedal released) • Aftermarket remote starting device 		
Diagnostic Aids:	Verify that the vehicle was not push-started with the clutch engaged. Check for aftermarket equipment such as remote starting devices which may bypass the clutch pedal position switch when cranking the engine.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 310-03, Speed Control Symptom Chart.		

P0840 - Transmission Fluid Pressure Sensor/Switch A Circuit

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P09xx - Transmission Code

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P1000 - On-Board Diagnostic (OBD) Systems Readiness Test Not Complete

Description: The OBD monitors are carried out during the OBD drive cycle. This DTC is stored in continuous memory if any of the OBD monitors do not carry out their full diagnostic check.			
Possible Causes:	<ul style="list-style-type: none"> • The vehicle is new from the factory • Battery or powertrain control module (PCM) had recently been disconnected • An OBD monitor concern occurred before completion of an OBD drive cycle • PCM DTCs have recently been cleared with a scan tool • Power take off (PTO) circuit concern or PTO is on during testing. 		
Diagnostic Aids:	This DTC, inspection/maintenance (I/M) readiness function is part of the PCM strategy. A battery disconnection or clearing codes using a scan tool results in the various I/M readiness bits being set to a not-ready condition. As each non-continuous OBD monitor completes a full diagnostic check, the I/M readiness bit associated with that monitor is set to a ready condition. This may take one or two drive cycles based on whether concerns are detected or not. The readiness bits for comprehensive component monitoring (CCM), misfire and fuel system monitoring are considered complete once all the non-continuous monitors have been evaluated. Because the EVAP system monitor requires certain ambient conditions to run, special logic can bypass the monitor for the purpose of clearing the EVAP and I/M readiness bit, due to continued presence of these extreme conditions. DTC P1000 does not need to be cleared from the PCM except to pass an I/M test. The malfunction indicator lamp (MIL) flashes after a period of time with the ignition in the RUN position (engine not running) if DTC P1000 is set.		

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	See Note 1	See Note 1	GO to Pinpoint Test QC .

P1001 - Key On Engine Running (KOER) Not Able To Complete, KOER Aborted

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
<p>Description: This non-malfunction indicator lamp (MIL) DTC is set when the KOER self-test does not complete in the time allowed.</p> <p>Possible Causes:</p> <ul style="list-style-type: none"> • Incorrect self-test procedure • Unexpected response from the self-test monitors • RPM out of specification <p>Diagnostic Aids: Carry out the KOEO self-test. Refer to Section 3, GO to Pinpoint Test QT.</p>			
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1100 - Mass Air Flow (MAF) Sensor Circuit Intermittent

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
<p>Description: The MAF sensor circuit is monitored by the powertrain control module (PCM) for sudden voltage (or air flow) input change through the comprehensive component monitor (CCM). If during the last 40 warm-up cycles in key on, engine running (KOER) the PCM detects a voltage (or air flow) change beyond the minimum or maximum calibrated limit, a continuous memory DTC is stored.</p> <p>Possible Causes:</p> <ul style="list-style-type: none"> • Poor continuity through the MAF sensor connectors • Poor continuity through the MAF sensor harness • Intermittent open or short inside the MAF sensor <p>Diagnostic Aids: While accessing the MAF PID on the scan tool, lightly tap on the MAF sensor or wiggle the MAF sensor connector and harness. If the MAF PID suddenly changes below 0.23 volt or above 4.60 volts, an intermittent fault is indicated.</p>			
All	GO to Pinpoint Test DC .		

P1101 - Mass Air Flow (MAF) Sensor Out of Self-Test Range

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
<p>Description: The MAF sensor circuit is monitored by the powertrain control module (PCM) for an out of range air flow (or voltage) input. If, during ignition on engine off, the air flow voltage signal is greater than 0.27 volt the test fails. Likewise, if, during ignition on engine running, the air flow voltage signal is not within 0.46 volt to 2.44 volts, the test fails.</p> <p>Possible Causes:</p> <ul style="list-style-type: none"> • Low battery charge • MAF sensor partially connected • MAF sensor contamination • PWR GND open to the MAF sensor • MAF RTN circuit open to PCM • Damaged MAF sensor <p>Diagnostic Aids: A MAF PID reading greater than 0.27 volt (KOEO) or a MAF PID reading outside the 0.46 volt to 2.44 volts range (KOER) indicates a hard fault.</p>			
All	GO to Pinpoint Test DC .	GO to Pinpoint Test DC .	—

P1112 - Intake Air Temperature (IAT) Circuit Intermittent

Description:	Indicates the IAT sensor signal was intermittent.		
Possible Causes:	<ul style="list-style-type: none"> ● Damaged harness ● Damaged sensor ● Damaged harness connector 		
Diagnostic Aids:	Monitor the IAT on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DA .

P1114 - Intake Air Temperature 2 (IAT2) Circuit Low (Supercharged/Turbocharged engines)

Description:	Indicates the sensor signal is less than the self-test minimum. The IAT2 sensor minimum is 0.2 volt.		
Possible Causes:	<ul style="list-style-type: none"> ● Grounded circuit in the harness ● Incorrect harness connection ● Damaged sensor 		
Diagnostic Aids:	Monitor the IAT2 PID value. A typical IAT2 temperature should be greater than the IAT1 temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DU .		

P1115 - Intake Air Temperature 2 (IAT2) Circuit High (Supercharged/Turbocharged engines)

Description:	Indicates the sensor signal is greater than the self-test maximum. The IAT2 sensor maximum is 4.6 volts.		
Possible Causes:	<ul style="list-style-type: none"> ● Open circuit in the harness ● Sensor signal short to voltage ● Incorrect harness connection ● Damaged sensor 		
Diagnostic Aids:	Monitor the IAT2 PID value. A typical IAT2 temperature should be greater than the IAT1 temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DU .		

P1116 - Engine Coolant Temperature (ECT) Sensor Out of Self-Test Range

Description:	Indicates the ECT sensor is out of self-test range. The correct range is 0.3 to 3.7 volts.		
Possible Causes:	<ul style="list-style-type: none"> ● Overheating condition ● Damaged thermostat ● Damaged ECT sensor ● Low engine coolant 		

- Damaged harness connector

Diagnostic Aids: The ECT must be greater than 10°C (50°F) to pass the key on engine off (KOEO) self-test and greater than 82°C (180°F) to pass the key on engine running (KOER) self-test.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Vehicles with only a (CHT) sensor	GO to Pinpoint Test DL .	GO to Pinpoint Test DL .	—
All others	GO to Pinpoint Test DX .	GO to Pinpoint Test DX .	—

P1117 - Engine Coolant Temperature (ECT) Sensor Circuit Intermittent

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DX .

Description: Indicates the ECT circuit became intermittently open or shorted while the engine was running.

Possible Causes:

- Damaged harness
- Damaged sensor
- Damaged harness connector
- Low engine coolant

Diagnostic Aids: Monitor the ECT on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.

P1120 - Throttle Position Sensor A Out Of Range Low (Ratch Too Low)

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All			GO to Pinpoint Test DH .

Description: The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for a low TP rotation angle or voltage input below the closed throttle position through the comprehensive component monitor (CCM). The test fails if the TP rotation angle or voltage remains within the calibrated self-test range, but falls between 3.42-9.85% (0.17-0.49 volt).

Possible Causes:

- TP circuit with frayed wires
- Corrosion or loose connection on the TP circuit connectors and pins
- VREF open to TP sensor
- VREF short to SIG RTN

Diagnostic Aids: A TP PID between 3.42-9.85% (0.17-0.49 volt) in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.

P1124 - Throttle Position Sensor A Out Of Self-Test Range

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
For Vehicles With an Idle Air Control (IAC) Valve			
Description: The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for an out of range TP rotation angle or voltage input. The test fails if the TP rotation angle or voltage reading is less than 13.27% (0.66 volt) or greater than 23.52% (1.17 volts).			
Possible Causes:			
<ul style="list-style-type: none"> • Binding or bent throttle linkage • TP sensor not seated correctly • Throttle plate below closed throttle position • Throttle plate/screw misadjusted • Damaged TP sensor 			

Diagnostic Aids:	The TP PID reading not between 13.27-23.52% (0.66-1.17 volts) in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.		
For All others			
Description:	During key on engine off (KOEO) and key on engine running (KOER) self-tests, the powertrain control module (PCM) monitors the electronic throttle control (ETC) throttle position (TP) sensor inputs to determine if the TP1 and TP2 signals are less than an expected value. If either TP1 or TP2 is greater than the expected value, the DTC is set.		
Possible Causes:	<ul style="list-style-type: none"> Accelerator pedal applied during KOEO or KOER self-test 		
Diagnostic Aids:	Repeat the self-test without applying the accelerator pedal. Make sure the floor mat is not interfering with the accelerator pedal. Diagnose any TP circuit DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Ranger	GO to Pinpoint Test DH .	GO to Pinpoint Test DH .	—
All others	GO to Pinpoint Test DV .	GO to Pinpoint Test DV .	—

P1127 - Exhaust Temperature Out of Range, O2 Sensor Tests Not Completed

Description:	The heated oxygen sensor (HO2S) monitor uses an exhaust temperature model to determine when the HO2S heaters are cycled ON. The test fails when the inferred exhaust temperature is below a minimum calibrated value.		
Possible Causes:	<ul style="list-style-type: none"> Engine not operating long enough prior to carrying out the key on engine running (KOER) self-test Exhaust system too cool 		
Diagnostic Aids:	Monitor the HO2S heater PIDs to determine their ON/OFF state. DTC P1127 is present if the exhaust is not hot.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, MKS, Navigator, Sable PZEV, Taurus PZEV, Taurus X PZEV	—	GO to Pinpoint Test DZ .	—
All others	—	GO to Pinpoint Test DW .	—

P115E - Throttle Actuator Control (TAC) Throttle Body Air Flow Trim at Max Limit

Description:	During idle, the powertrain control module (PCM) monitors the throttle angle and air flow. If the air flow is determined to be less than expected, the PCM adjusts the throttle angle to compensate. The air flow reduction is typically the result of engine deposit buildup around the throttle plate. This DTC indicates the PCM has reached the maximum allowed compensation and is no longer able to compensate for the buildup.		
Possible Causes:	<ul style="list-style-type: none"> Engine deposits around the throttle plate 		
Diagnostic Aids:			

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Install a new throttle body. Refer to the Workshop Manual Section 303-04, Fuel Charging and Controls.		

P117A - Engine Oil Over Temperature — Forced Limited Power

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: Indicates the engine oil protection strategy is enabled when the engine oil temperature (EOT) reaches a predetermined level in the powertrain control module (PCM). The PCM then limits the engine RPMs until the EOT returns to normal.			
Possible Causes: <ul style="list-style-type: none"> • Engine overheating • Low engine coolant • Loaded weight is greater than the maximum vehicle weight rating. Refer to Owner's Literature for vehicle weight ratings. 			
Diagnostic Aids: This DTC is an informational DTC and may be set by an engine overheating concern. If the engine overheats, check the cooling system. Refer to the Workshop Manual Section 303-03, Engine Cooling for cooling system diagnosis.			
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1184 - Engine Oil Temperature (EOT) Sensor Out of Self-Test Range

Description: Indicates the EOT signal was out of self-test range.			
Possible Causes: <ul style="list-style-type: none"> • Damaged harness • Damaged sensor • Damaged harness connector 			
Diagnostic Aids: The engine should be at operating temperature before carrying out the self-test.			
All	GO to Pinpoint Test DY .		

P1227 - Wastegate Failed Closed (Over pressure)

Description: Indicates that boost pressure is continuously higher than desired.			
Possible Causes: <ul style="list-style-type: none"> • EGR valve • MAF sensor • MAP sensor • Supercharger bypass actuator stuck closed • Supercharger 			
Diagnostic Aids: This DTC is informational only and it may be accompanied by other DTCs. Diagnose other DTCs first.			
All	—	—	GO to Pinpoint Test KJ .

P1228 - Wastegate Failed Open (Under pressure)

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Description: Indicates that boost pressure is continuously lower than desired.			
Possible Causes:		<ul style="list-style-type: none"> • EGR valve • MAF sensor • MAP sensor • Supercharger bypass actuator stuck open • Supercharger 	
Diagnostic Aids: This DTC is informational only and it may be accompanied by other DTCs. Diagnose other DTCs first.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test KJ .

P1229 - Charge Air Cooler (CAC) Pump Driver

Description: This DTC sets when the powertrain control module (PCM) commands the supercharger CAC pump to operate but no current is detected.			
Possible Causes:		<ul style="list-style-type: none"> • CAC pump motor open circuit • CAC pump relay coil open • Open circuit between the relay and pump • CAC pump motor shorted • Open circuit between the PCM and the relay • Poor CAC pump ground connection 	
Diagnostic Aids: Check for voltage at the relay. Check the fuse in the voltage circuit. Check the ground connection of the CAC pump motor.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KP .		

P1233 - Fuel Pump Driver Module Disabled or Off Line

Description: The powertrain control module (PCM) monitors the fuel pump monitor (FPM) circuit from the fuel pump driver module (FPDM). With the ignition ON, engine OFF or ignition ON, engine running the FPDM continuously sends a duty cycle signal to the PCM through the FPM circuit. The test fails if the PCM stops receiving the duty cycle signal.			
Possible Causes:		<ul style="list-style-type: none"> • Inertia fuel shutoff (IFS) switch needs to be reset • Open FPDM ground circuit • Open circuit to FPDM PWR RLY • Open FPDM PWR circuit • Open or short FPM circuit (engine should start) • Damaged IFS switch • Damaged FPDM PWR RLY • Damaged FPDM 	
Diagnostic Aids: The PCM expects to see one of the following duty cycle signals from the FPDM on the FPM circuit: 1) 50% (500 ms on, 500 ms off), all OK. 2) 25% (250 ms on, 750 ms off), FPDM did not receive a fuel pump (FP) duty cycle command from the PCM, or the duty cycle that was received was invalid. 3) 75% (750 ms on, 250 off), the FPDM detected a concern in the circuits between the FPDM and the fuel pump.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KB .		

P1234 - Fuel Pump Driver Module Disabled or Off Line

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Description: The powertrain control module (PCM) monitors the fuel pump monitor 2 (FPM2) circuit from the fuel pump driver module 2 (FPDM2). With the ignition ON, engine OFF or ignition ON, engine running the FPDM2 continuously sends a duty cycle signal to the PCM through the FPM2 circuit. The test fails if the PCM stops receiving the duty cycle signal.			
Possible Causes:		<ul style="list-style-type: none"> ● Inertia fuel shutoff (IFS) switch needs to be reset ● Open FPDM2 ground circuit ● Open circuit to FPDM2 PWR RLY ● Open FPDM2 PWR circuit ● Open or short FPM2 circuit (engine should start) ● Damaged IFS switch ● Damaged FPDM2 PWR RLY ● Damaged FPDM2 	
Diagnostic Aids: The PCM expects to see one of the following duty cycle signals from the FPDM2 on the FPM2 circuit: 1) 50% (500 ms on, 500 ms off), all OK. 2) 25% (250 ms on, 750 ms off), the FPDM2 did not receive a fuel pump (FP) duty cycle command from the PCM, or the duty cycle that was received was invalid. 3) 75% (750 ms on, 250 off), the FPDM2 detected a concern in the circuits between the FPDM2 and the fuel pump.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KB .		

P1235 - Fuel Pump Control Out Of Range

Description: This DTC indicates the fuel pump driver module (FPDM) detected an invalid or missing fuel pump (FP) duty cycle signal on the fuel pump control (FPC) circuit from the powertrain control module (PCM). The FPDM sends a message to the PCM through the fuel pump monitor (FPM) circuit, indicating this concern was detected. The PCM sets the DTC when the message is received.			
Possible Causes:		<ul style="list-style-type: none"> ● FPC circuit open or short ● Electronic throttle control (ETC) system concern. Check for ETC DTCs ● Damaged FPDM ● Damaged PCM 	
Diagnostic Aids: The FPDM sends a 25% duty cycle (250 ms on, 750 ms off) through the FPM circuit to the PCM while the concern is being detected by the FPDM. If the concern is no longer detected, the FPDM returns to sending an all OK (50% duty cycle) message to the PCM. For ETC applications, check if ETC DTC P2105 is present. An ETC system concern could cause DTC P1235, and should be diagnosed first.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KB .		

P1236 - Fuel Pump Control Out Of Range

Description: This DTC indicates the fuel pump driver module 2 (FPDM2) detected an invalid or missing fuel pump (FP) duty cycle signal on the fuel pump control (FPC) circuit from the powertrain control module (PCM). The FPDM2 sends a message to the PCM through the fuel pump monitor 2 (FPM2) circuit, indicating this concern was detected. The PCM sets the DTC when the message is received.			
Possible Causes:		<ul style="list-style-type: none"> ● FPC circuit open or short ● Damaged FPDM2 ● Damaged PCM 	
Diagnostic Aids: The FPDM2 sends a 25% duty cycle (250 ms on, 750 ms off) through the FPM2 circuit to the PCM while the concern is being detected by the FPDM2. If the concern is no longer detected,			

the FPDM2 returns to sending an all OK (50% duty cycle) message to the PCM.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KB .		

P1237 - Fuel Pump Secondary Circuit

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KB .		

Description:	This DTC indicates the fuel pump driver module (FPDM) detected a fuel pump secondary circuit concern. The FPDM sends a message to the powertrain control module (PCM) through the fuel pump monitor (FPM) circuit indicating this concern was detected. The PCM sets the DTC when the message is received.
Possible Causes:	<ul style="list-style-type: none"> • Open or short FP PWR circuit • Open FP RTN circuit to FPDM • Open or short circuit in the fuel pump • Locked fuel pump rotor • Damaged FPDM
Diagnostic Aids:	The FPDM sends a 75% duty cycle (750 ms on, 250 ms off) through the FPM circuit to the PCM while the concern is being detected by the FPDM. If the concern is no longer detected, the PCM returns to sending an all OK (50% duty cycle) message to the PCM. The FPDM controls pump speed by supplying a variable ground on the FP RTN circuit.

P1238 - Fuel Pump Secondary Circuit

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KB .		

Description:	This DTC indicates the fuel pump driver module (FPDM2) detected a fuel pump secondary circuit concern. The FPDM2 sends a message to the powertrain control module (PCM) through the fuel pump monitor (FPM2) circuit, indicating this concern was detected. The PCM sets the DTC when the message is received.
Possible Causes:	<ul style="list-style-type: none"> • Open or short FP2PWR circuit • Open FP2RTN circuit to FPDM2 • Open or short circuit in the fuel pump • Locked fuel pump rotor • Damaged FPDM2
Diagnostic Aids:	The FPDM2 sends a 75% duty cycle (750 ms on, 250 ms off) through the FPM2 circuit to the PCM while the concern is being detected by the FPDM2. If the concern is no longer detected, the PCM returns to sending an all OK (50% duty cycle) message to the PCM. The FPDM2 controls pump speed by supplying a variable ground on the FP2RTN circuit.

P1244 - Alternator Load High Input

Description:	The powertrain control module (PCM) monitors generator load from the generator/regulator in the form of frequency. The concern indicates the input is higher than the load should be in normal operation. The load input could be high when a battery short to ground exists.
Possible Causes:	
Diagnostic	Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1245 - Alternator Load Low Input

Description:	The powertrain control module (PCM) monitors generator load from the generator/regulator in the form of frequency. The concern indicates the input is lower than the load should be in normal operation. The load input could be low when no generator output exists.		
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1246 - Alternator Load Input

Description:	The powertrain control module (PCM) monitors the generator load from the generator/regulator in the form of frequency. The frequency range is determined by the temperature of the voltage regulator, where 97% indicates a full load, and less than 6% indicates no load.		
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1260 - Theft Detected, Vehicle Immobilized

Description:	This DTC can be set if the passive anti-theft system (PATS) has determined a theft condition existed and the engine is disabled or an engine start was attempted using a non-PATS key. This DTC is a good indicator to check the PATS for DTCs. This DTC can also be set when a new instrument cluster (IC) or powertrain control module (PCM) is installed without correctly programming either module even if the vehicle is not equipped with PATS.		
Possible Causes:	<ul style="list-style-type: none"> • Incorrectly programmed PCM • Incorrectly programmed IC • Previous theft condition • Anti-theft system concern 		
Diagnostic Aids:	Theft indicator flashing rapidly or on solid when the ignition is in the ON position. Check the anti-theft system for DTCs. Refer to the Workshop Manual Section 419-01 Anti-Theft, Diagnostic Trouble Code (DTC) Charts to continue diagnosis. If a new IC or PCM is installed without correctly programming either module, the parameters must be reset in both modules. Refer to the Workshop Manual Section 419-01 Anti-Theft, Passive Anti-Theft System (PATS) Parameter Reset, to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

P1270 - Engine RPM or Vehicle Speed Limiter Reached

Description:	Indicates the vehicle has been operated in a manner which caused the engine or vehicle to exceed a calibration limit. The engine RPM and vehicle speed are continuously monitored and evaluated by the powertrain control module (PCM). The DTC is set when the RPM or vehicle speed falls out of a calibrated range. For additional information on the engine RPM/vehicle speed limiter, refer to Section 1, Powertrain Control Software .		
Possible Causes:	<ul style="list-style-type: none"> • Wheel slippage (water, ice, mud, and snow) • Excessive engine RPM in NEUTRAL or operated in the wrong transmission gear • Vehicle driven at a high rate of speed 		
Diagnostic Aids:	The DTC indicates the vehicle was operated in a manner which caused the engine RPM or vehicle speed to exceed a calibrated limit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test ND .

P1285 - Cylinder Head Over Temperature Condition

Description:	Indicates an engine overheat condition was sensed by the cylinder head temperature (CHT) sensor.		
Possible Causes:	<ul style="list-style-type: none"> • Low engine coolant level • Base engine concerns • Engine cooling system concerns • CHT sensor concern 		
Diagnostic Aids:	On some applications when this fault occurs the engine temperature warning indicator illuminates or forces the temperature gauge to the full H (hot) zone. The warning indicator can be triggered by either grounding the engine temperature warning circuit when wired to the powertrain control module (PCM), or by sending a PCM network message to the instrument cluster (IC).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1288 - Cylinder Head Temperature (CHT) Sensor Out of Self-Test Range

Description:	Indicates the CHT sensor is out of self-test range. The engine is not at a normal operating temperature.		
Possible Causes:	<ul style="list-style-type: none"> • Cold engine • Engine overheating • Damaged harness connector • Low engine coolant level • Damaged CHT sensor 		
Diagnostic Aids:	Bring the engine to operating temperature. If cold, repeat the self-test. If the engine overheats, check the cooling system. Refer to the Workshop Manual Section 303-03, Engine Cooling for cooling system diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1289 - Cylinder Head Temperature (CHT) Sensor Circuit High

Description: Indicates a CHT sensor circuit open.			
Possible Causes: <ul style="list-style-type: none"> • Open CHT sensor circuit • CHT sensor circuit short to voltage • Damaged CHT sensor • Incorrect harness connection 			
Diagnostic Aids: A CHT V PID reading of greater than 4.6 volts with ignition ON engine OFF, or during any engine operating mode, indicates a concern is present. DTC P0118 may also be reported when this DTC is set. Either of these DTCs activate the MIL.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P128A - Cylinder Head Temperature (CHT) Sensor Circuit Intermittent/Erratic

Description: Indicates the CHT circuit became intermittently open or shorted while the engine was running.			
Possible Causes: <ul style="list-style-type: none"> • Damaged harness or connector • Damaged sensor 			
Diagnostic Aids: Monitor the CHT on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DL .

P1290 - Cylinder Head Temperature (CHT) Sensor Circuit Low

Description: Indicates a CHT sensor circuit short to ground.			
Possible Causes: <ul style="list-style-type: none"> • Grounded circuit in CHT harness • Damaged CHT sensor • Incorrect harness connection 			
Diagnostic Aids: A CHT V PID value reading of less than 0.2 volt with the ignition ON engine OFF, or during any engine operating mode, indicates a concern is present. The DTC P0117 may also be reported when this DTC is set. Either of these DTCs activates the malfunction indicator lamp (MIL).			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1299 - Cylinder Head Over Temperature Protection Active

Description: Indicates an engine overheat condition was detected by the cylinder head temperature (CHT) sensor. A failure mode effects management (FMEM) strategy called fail-safe cooling was activated to cool the engine.			
Possible Causes: <ul style="list-style-type: none"> • Engine cooling system concerns • Low engine coolant level • Base engine concerns 			

Diagnostic Aids: Refer to Section 1, [Powertrain Control Software](#), for more information on the fail-safe cooling strategy and cylinder head temperature sensor.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1336 - Crankshaft/Camshaft Sensor Range/Performance

Description:	The input signal to the powertrain control module (PCM) from the crankshaft position (CKP) sensor or the camshaft position (CMP) sensor is erratic.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged CKP sensor • Damaged CMP sensor • Base engine concerns • Harness concerns 		
Diagnostic Aids:	Check the harness for routing, alterations, incorrect shielding, or electrical interference from other systems.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test JD .

P1397 - System Voltage Out Of Self -Test Range

Description:	This DTC indicates that the 12-volt system voltage is too high or too low during the key on engine off (KOEO) or key on engine running (KOER) self-test. It sets if the system voltage falls below or exceeds the calibrated threshold at any time during the KOEO or KOER self-test.		
Possible Causes:	<ul style="list-style-type: none"> • Battery or charging system concern. 		
Diagnostic Aids:	Make sure the battery voltage is between 11 and 18 volts before running a KOEO or KOER self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 414-00, Charging System to diagnose the battery is discharged or battery voltage is low symptom or the charging system overcharges (battery voltage is greater than 15.5 volts) symptom.		

P1405 - Differential Pressure Feedback Sensor Upstream Hose Off or Plugged

Description:	While driving, the exhaust gas recirculation (EGR) monitor commands the EGR valve closed and checks the differential pressure across the EGR orifice. The test fails when the signal from the differential pressure feedback EGR sensor indicates EGR flow is in the negative direction.		
Possible Causes:	<ul style="list-style-type: none"> • The upstream hose is disconnected • The upstream hose is plugged (ice) • Plugged or damaged EGR tube 		
Diagnostic Aids:	Look for signs of water or icing in the hose. Verify the hose connection and routing (no excessive dips). Check the differential pressure feedback EGR sensor for correct mounting and function. View the DPFEGR PID while applying and releasing vacuum directly to the sensor with a hand pump.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HE .	GO to Pinpoint Test HE .

P1406 - Differential Pressure Feedback Sensor Downstream Hose Off or Plugged

Description:	While driving, the exhaust gas recirculation (EGR) monitor commands the EGR valve closed and checks the differential pressure across the EGR orifice. The test fails when the signal from the differential pressure feedback EGR sensor continues to indicate EGR flow even after the EGR valve is commanded closed.		
Possible Causes:	<ul style="list-style-type: none"> • Downstream hose is disconnected • Downstream hose is plugged (ice) • Plugged or damaged EGR tube 		
Diagnostic Aids:	Look for signs of water or icing in the hose. Verify the hose connection and routing (no excessive dips). Check the differential pressure feedback EGR sensor for correct mounting and function. View the DPFEGR PID while applying and releasing vacuum directly to the sensor with a hand pump.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HE .		

P1408 - Exhaust Gas Recirculation (EGR) Flow Out of Self-Test Range (Non-MIL)

Description:	This test is carried out during the key on engine running (KOER) on demand self-test only. The EGR system is commanded on at a fixed engine speed. The test does not pass and the DTC is set when the measured EGR flow falls above or below the required calibration.		
Possible Causes:	<ul style="list-style-type: none"> • For electric EGR (EEGR) system, see possible causes for DTC P0400. • For vacuum activated systems, see the possible causes for DTC P0401. 		
Diagnostic Aids:	For EEGR, use the output state control function of the scan tool and monitor the manifold absolute pressure (MAP) PID and the EEGR PID (EGRMDS) while commanding the EEGR on. If EGR is introduced into the engine at idle, the RPM drops or stalls out. For vacuum systems see diagnostic aids for DTC P0401.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Escape/Mariner, Focus, Fusion, Milan, Ranger 2.3L	—	GO to Pinpoint Test KD .	—
Crown Victoria, E-Series, Explorer 4.0L, Explorer Sport Trac 4.0L, F-150 4.6L 2V, F-Super Duty 6.8L, Grand Marquis, Mountaineer 4.0L, Mustang 4.0L, Mustang 5.4L, Town Car	—	GO to Pinpoint Test HH .	—
All others	—	GO to Pinpoint Test HE .	—

P1409 - Exhaust Gas Recirculation (EGR) Vacuum Regulator Solenoid Circuit

Description: This test checks the electrical function of the EGR vacuum regulator solenoid. The test fails when the EVR circuit voltage is either too high or too low when compared to the expected voltage range. The EGR system must be enabled for the test to be completed.			
Possible Causes:		<ul style="list-style-type: none"> • EVR circuit open • EVR circuit short to voltage or ground • VPWR open to EGR vacuum regulator solenoid • Damaged EGR vacuum regulator solenoid 	
Diagnostic Aids:		The EGR vacuum regulator solenoid resistance is between 26 and 40 ohms.	
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Crown Victoria, E-Series, Explorer 4.0L, Explorer Sport Trac 4.0L, F-150 4.6L 2V, F-Super Duty 6.8L, Grand Marquis, Mountaineer 4.0L, Mustang 4.0L, Mustang 5.4L, Town Car	GO to Pinpoint Test HH .		
All others	GO to Pinpoint Test HE .		

P1436 - A/C Evaporator Air Temperature Circuit Low

Description: Indicates the air conditioning evaporator temperature (ACET) signal input was less than the self-test minimum. The self-test minimum is 0.13 volt.			
Possible Causes:		<ul style="list-style-type: none"> • ACET circuit short to ground or SIG RTN • Damaged ACET sensor 	
Diagnostic Aids:		The powertrain control module (PCM) sources a low current 5 volt reference on the ACET circuit (this voltage can be measured with the sensor disconnected). As the A/C evaporator air temperature changes, the ACET circuit resistance to SIG RTN (ground) changes (which changes the voltage the PCM detects). When the ACET signal is detected below the self-test minimum, check for shorts to SIG RTN or ground which would pull the voltage low.	
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DJ .		

P1437 - A/C Evaporator Air Temperature Circuit High

Description: Indicates the air conditioning evaporator temperature (ACET) signal input was greater than the self-test maximum. The self-test maximum is 4.5 volts.			
Possible Causes:		<ul style="list-style-type: none"> • ACET circuit open • SIGRTN circuit open to ACET sensor • ACET circuit short to voltage (VREF) • Damaged ACET sensor 	
Diagnostic Aids:		The powertrain control module (PCM) sources a low current 5 volt reference on the ACET circuit (this voltage can be measured with the sensor disconnected). As the A/C evaporator air temperature changes, the ACET circuit resistance to SIG RTN (ground) changes (which	

changes the voltage the PCM detects). When the ACET signal is detected above the self-test maximum, check for open circuits (ACET or SIG RTN), which would cause the voltage to remain high. Although not as probable, also check for a short to voltage (VREF).

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DJ .		

P144A - Evaporative Emission System Purge Vapor Line Restricted/Blocked

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HX .

Description: The powertrain control module (PCM) monitors the evaporative emission (EVAP) system for a blocked fuel vapor tube between the fuel tank pressure (FTP) sensor and the fuel tank. During the initial phase of the EVAP monitor, the PCM closes the canister vent and a vacuum develops in the fuel vapor tubes and lines and in the fuel tank. The PCM monitors the FTP sensor to determine the amount of vacuum and how quickly the vacuum increases. The rate at which the vacuum increases is compared to an expected value. If the vacuum increases quicker than expected, a blocked fuel vapor tube is suspected and an intrusive test is carried out in the final phase of the EVAP monitor. If the intrusive test confirms a blockage a counter is incremented and once the counter reaches a calibrated number of completions, the DTC is set.

Possible Causes:

- Blocked fuel vapor tube between the FTP sensor and the fuel tank

Diagnostic Aids: Check the fuel vapor tube for blockage between the fuel tank pressure FTP sensor and the fuel tank.

P1450 - Unable to Bleed Up Fuel Tank Vacuum

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test HX .

Description: Monitors the fuel vapor vacuum and pressure in the fuel tank. System failure occurs when the evaporative emission (EVAP) running loss monitor detects excessive fuel tank vacuum with the engine running, but not at idle.

Possible Causes:

- Blockages or kinks in the EVAP canister tube or EVAP canister purge outlet tube between the fuel tank, the EVAP canister purge valve and the EVAP canister
- Fuel filler cap stuck closed, preventing vacuum relief
- Capless fuel tank filler pipe damaged, preventing vacuum relief (if equipped)
- Contaminated fuel vapor elbow on the EVAP canister
- Restricted EVAP canister
- Canister vent (CV) solenoid stuck partially or fully open
- Plugged CV solenoid filter
- EVAP canister purge valve stuck open
- VREF circuit open in the harness near the fuel tank pressure (FTP) sensor, the FTP sensor or the powertrain control module (PCM)
- Damaged FTP sensor

Diagnostic Aids: Visually inspect the EVAP canister inlet port, CV solenoid filter, and canister vent hose assembly for contamination or debris.
Check EVAP canister purge valve for vacuum leak.

P1451 - Evaporative Emission System Vent Control Circuit

Application	Key On Engine Off	Key On Engine Running	Continuous Memory

Description: Monitors the canister vent (CV) solenoid circuit for an electrical failure. The test fails when the signal moves outside the minimum or maximum allowable calibrated parameters for a specified canister vent duty cycle by powertrain control module (PCM) command.			
Possible Causes:		<ul style="list-style-type: none"> • VPWR circuit open • CV solenoid circuit short to PWR GND or CHASSIS GND • Damaged CV solenoid • CV solenoid circuit open • CV solenoid circuit short to VPWR 	
Diagnostic Aids: To verify normal functioning, monitor the evaporative emission (EVAP) CV solenoid signal PID EVAPCV and the signal voltage on the PCM control side. With the valve open, the EVAPCV PID indicates 0% duty cycle and a voltage approximately equal to battery voltage. When the valve is commanded fully closed, the EVAPCV PID indicates 100% duty cycle, and a minimum voltage drop of 4 volts is normal. Output test mode (OTM) may be used to switch the output on and off to verify function.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P145E - PCV Heater Control B Circuit

Description: This DTC sets when the powertrain control module (PCM) detects a positive crankcase ventilation (PCV) heater circuit failure.			
Possible Causes:		<ul style="list-style-type: none"> • Open or shorted PCV circuit • Damaged PCV heater assembly 	
Diagnostic Aids: Make sure the PCV valve is correct for the engine application and the PCV heater connector is correctly connected.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HG .	—	—

P1460 - Wide Open Throttle A/C Cutout Circuit

Description: Monitors the A/CCR circuit output from the powertrain control module (PCM). The test fails when the PCM grounds the A/CCR circuit, excessive current draw is detected on the A/CCR circuit; or, with the A/CCR circuit not grounded by the PCM, voltage is not detected on the A/CCR circuit (the PCM expects to detect VPWR voltage coming through the A/CCR relay coil to the A/CCR circuit).			
Possible Causes:		<ul style="list-style-type: none"> • Open or short A/CCR circuit • Damaged A/CCR relay • Open VPWR circuit to the A/CCR relay 	
Diagnostic Aids: The A/CCR control circuit can be monitored using the WACF and WAC PID. When the WACF PID reads YES, a concern is present. An open circuit or short to ground can only be detected when the PCM is not grounding the circuit. A short to voltage can only be detected when the PCM is grounding the circuit. During the key ON engine OFF (KOEO) and the key OFF engine running (KOER) self-test, the WAC circuit is cycled on and off. Verify the A/C and the defrost were off during KOEO and KOER self-test (Check the A/CCR PID to verify). If the vehicle is not equipped with A/C, ignore DTC P1460.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KM .		

P1461 - A/C Pressure Sensor Circuit High

Description:	The air conditioning pressure (ACP) sensor inputs a voltage to the PCM. If the voltage is above a calibrated level the DTC sets.		
Possible Causes:	<ul style="list-style-type: none"> • ACP sensor circuit short to PWR • ACP circuit open • ACP circuit short to VREF • Damaged ACP sensor 		
Diagnostic Aids:	Verify a VREF voltage between 4 and 6 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DS .		

P1462 - Air Conditioning Pressure (A/CP) Sensor Low Voltage Detected

Description:	The air conditioning pressure (ACP) transducer sensor inputs a voltage to the powertrain control module (PCM). If the voltage is below the calibrated level the DTC sets.		
Possible Causes:	<ul style="list-style-type: none"> • ACP circuit short to GND or SIGRTN • VREF circuit open • Open ACP circuit • Damaged ACP sensor 		
Diagnostic Aids:	Verify a VREF voltage between 4 and 6 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DS .		

P1463 - Air Conditioning Pressure Sensor (A/CP) Insufficient Pressure Change

Description:	Each time the A/C clutch engages, the powertrain control module (PCM) is looking for a pressure change in the refrigerant. If the change in pressure is outside of the calibration the DTC sets.		
Possible Causes:	<ul style="list-style-type: none"> • A/C system mechanical failure • Open ACP or VREF circuit • A/C sensor damaged • A/C system electrical failure • A/C clutch always engaged 		
Diagnostic Aids:	Verify the A/C system function, including refrigerant charge. Refer to the Workshop Manual Section 412-00, Climate Control System, Refrigerant System Tests to verify pressure changes.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DS .

P1464 - A/C Demand Out Of Self-Test Range

Description:	The DTC sets when the powertrain control module (PCM) receives a request for A/C during the self-test.		

Possible Causes:	<ul style="list-style-type: none"> • A/C or defrost on during self-test • A/CCS circuit short to voltage • Damaged A/C demand switch • Damaged WAC relay 		
Diagnostic Aids:	If the A/C or defrost was on during self-test, turn the A/C or defrost off and repeat the self-test. An A/C request to the PCM may come through the communication link or on a dedicated hardwire circuit from the A/C switch.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KM .	GO to Pinpoint Test KM .	—

P1469 - Rapid A/C Cycling

Description:	Indicates frequent A/C compressor clutch cycling.		
Possible Causes:	<ul style="list-style-type: none"> • Mechanical A/C system concern (such as low refrigerant charge, damaged A/C cycling switch) • Intermittent open between the cycling pressure switch and the powertrain control module (PCM) • Intermittent open in the IGN RUN circuit to cycling pressure switch (if applicable) 		
Diagnostic Aids:	This test is designed to protect the transmission. In some strategies, the PCM unlocks the torque converter during A/C clutch engagement. If a concern is present that results in frequent A/C clutch cycling, damage could occur if the torque converter is cycled at these intervals. This test detects this condition, sets the DTC and prevents the torque converter from excessive cycling.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test KM .

P1474 - Fan Control Primary Circuit

Description:	Monitors the Low Fan Control (LFC) primary circuit output from the powertrain control module (PCM). The test fails if the PCM grounds the LFC circuit, excessive current draw is detected on the LFC circuit, or with the LFC circuit not grounded by the PCM, voltage is not detected on the LFC circuit (the PCM expects to detect VPWR voltage coming through the low speed FC relay coil to the LFC circuit).		
Possible Causes:	<ul style="list-style-type: none"> • Open or short LFC circuit • Open VPWR circuit to the low speed FC relay • Damaged low speed FC relay 		
Diagnostic Aids:	<p>When the LFCF PID reads YES, a concern is currently present.</p> <p>An open circuit or short to ground can only be detected when the PCM is not grounding the LFC circuit.</p> <p>A short to voltage can only be detected when the PCM is grounding the LFC circuit.</p> <p>During the key on engine off (KOEO) and key on engine running (KOER) self-test, the LFC circuit is cycled on and off.</p>		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KF .		

P1477 - Additional Fan Relay Circuit

Description:	Monitors the Medium Fan Control (MFC) primary circuit output from the powertrain control		
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module (PCM). The test fails if the MFC output commanded on (grounded), excessive current draw is detected on the MFC circuit or, with the MFC circuit commanded off, voltage is not detected on the MFC circuit (the PCM expects to detect IGN START/RUN voltage through the medium speed FC relay coil to the MFC circuit).

- Possible Causes:**
- Open or short MFC circuit
 - Open IGN START/RUN circuit to the medium speed FC relay
 - Damaged medium speed FC relay

Diagnostic Aids: When the MFCF PID reads YES, a concern is currently present.
 An open circuit or short to ground can only be detected when the PCM is not grounding the MFC circuit.
 A short to voltage can only be detected when the PCM is grounding the MFC circuit.
 During the key on engine off (KOEO) and key on engine running (KOER) self-test, the MFC circuit is cycled on and off.
 When using output test mode on a scan tool, and commanding the low speed fan on, the PCM also activates the medium speed fan output.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KF .		

P1479 - High Fan Control Primary Circuit

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: Monitors the High Fan Control (HFC) primary circuit output from the powertrain control module (PCM). The test fails if the HFC output commanded on (grounded), excessive current draw is detected on the HFC circuit or, with the HFC circuit commanded off, voltage is not detected on the HFC circuit (the PCM expects to detect VPWR voltage through the high speed FC relay coil to the HFC circuit).			
Possible Causes: <ul style="list-style-type: none"> • Open or short HFC circuit • Open VPWR circuit to the high speed FC relay • Damaged high speed FC relay 			
Diagnostic Aids: When the HFCF PID reads YES, a concern is currently present. An open circuit or short to ground can only be detected when the PCM is not grounding the HFC circuit. A short to voltage can only be detected when the PCM is grounding the HFC circuit. During the key on engine off (KOEO) and key on engine running (KOER) self-test, the HFC circuit is cycled on and off.			
All	GO to Pinpoint Test KF .		

P1489 - PCV Heater Control Circuit

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: This DTC sets when the powertrain control module (PCM) detects a positive crankcase ventilation (PCV) heater circuit failure.			
Possible Causes: <ul style="list-style-type: none"> • Open or shorted PCV circuit. • Damaged PCV heater assembly 			
Diagnostic Aids: Make sure the PCV valve is correct for the engine application and the PCV heater connector is correctly connected.			
All	GO to Pinpoint Test HG .		

P1500 - Vehicle Speed Sensor (VSS)

Description: Indicates the VSS input signal was intermittent. This DTC is set when a VSS concern interferes with other on-board diagnostics (OBD) tests, such as the catalyst efficiency monitor, the EVAP monitor or the HO2S monitor.			
Possible Causes: <ul style="list-style-type: none"> • Intermittent VSS connections • Intermittent open in the VSS harness circuit(s) • Intermittent short in VSS harness circuit(s) • Damaged VSS 			
Diagnostic Aids: Check the wiring, connector, and sensor for damage.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-Super Duty	GO to Pinpoint Test DF .		
Expedition, Flex, MKS, Navigator, Sable, Taurus, Taurus X	The powertrain control module (PCM) uses information from the anti-lock brake system (ABS) module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		
All others	GO to Pinpoint Test DP .		

P1501 - Vehicle Speed Sensor (VSS) Out of Self-Test Range

Description: Indicates the VSS input signal is out of self-test range. If the powertrain control module (PCM) detects a VSS input signal any time during the self-test, DTC P1501 is set and the test aborts.			
Possible Causes: <ul style="list-style-type: none"> • Noise on the VSS input signal from the radio frequency interference/electro magnetic interference (RFI/EMI) • External sources, such as ignition wires, the charging circuit or aftermarket equipment 			
Diagnostic Aids: Verify the VSS input is 0 km/h (0 mph) when the vehicle transmission is in PARK.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-Super Duty	GO to Pinpoint Test DF .	GO to Pinpoint Test DF .	—
Expedition, Flex, MKS, Navigator, Sable, Taurus, Taurus X	The powertrain control module (PCM) uses information from the anti-lock brake system (ABS) module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		
All others	GO to Pinpoint Test DP .	GO to Pinpoint Test DP .	—

P1502 - Vehicle Speed Sensor (VSS) Intermittent

Description: Indicates the powertrain control module (PCM) detected an error in the vehicle speed information. Vehicle speed data is received from either the VSS, transfer case speed sensor (TCSS) or anti-lock brake system (ABS) control module. This DTC is set the same way as P0500. However, it is intended to flash the transmission control indicator lamp (TCIL) for first time VSS circuit error.			
Possible Causes: See the possible causes for DTC P0500.			

Diagnostic Aids: See the diagnostic aids for DTC P0500.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-Super Duty	GO to Pinpoint Test DF .		
Expedition, Flex, MKS, Navigator, Sable, Taurus, Taurus X	The powertrain control module (PCM) uses information from the anti-lock brake system (ABS) module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		
All others	GO to Pinpoint Test DP .		

P1504 - Idle Air Control (IAC) Circuit

Description:	This DTC is set when the powertrain control module (PCM) detects an electrical load failure on the IAC output circuit.		
Possible Causes:	<ul style="list-style-type: none"> • IAC circuit open • VPWR to IAC solenoid open • IAC circuit short to voltage • IAC circuit short to GND • Damaged IAC valve 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KE .		

P1506 - Idle Air Control (IAC) Overspeed Error

Description:	This DTC is set when the powertrain control module (PCM) detects an engine idle speed that is greater than the desired RPM.		
Possible Causes:	<ul style="list-style-type: none"> • IAC circuit short to GND • Damaged IAC valve • IAC valve stuck open • Intake air leak after throttle body • Vacuum leaks • Damaged EVAP system 		
Diagnostic Aids:	Disconnect the IAC valve and look for little or no change in engine RPM as an indication of a stuck or damaged valve.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KE .		

P1507 - Idle Air Control (IAC) Underspeed Error

Description:	This DTC is set when the powertrain control module (PCM) detects an engine idle speed that is less than the desired RPM.		
Possible Causes:	<ul style="list-style-type: none"> • IAC circuit open 		

Causes:	<ul style="list-style-type: none"> • Air inlet is plugged • Damaged or incorrect IAC valve • IAC valve stuck closed • VPWR to IAC solenoid open • IAC circuit short to voltage 		
Diagnostic Aids:	Disconnect the IAC valve and look for little or no change in engine RPM as an indication of a stuck or damaged valve.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KE .		

P1548 - Engine Air Filter Restriction

Description:	The powertrain control module (PCM) monitors the manifold absolute pressure (MAP) at various engine speeds during wide open throttle (WOT) operation, and compares the information to a calibrated value. If the air flow is out of range, the DTC is set.		
Possible Causes:	<ul style="list-style-type: none"> • Intake air restriction • Clogged air filter 		
Diagnostic Aids:	If this DTC is set, inspect the intake air system and replace the air filter if no obstructions are found.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 303-12 for air filter replacement.		

P1550 - Power Steering Pressure (PSP) Sensor Out of Self-Test Range

Description:	The PSP sensor input signal to the powertrain control module (PCM) is continuously monitored. The test fails when the signal falls out of a maximum or minimum calibrated range.		
Possible Causes:	<ul style="list-style-type: none"> • Steering wheel not turned during self-test. • PSP sensor or circuit damaged • Power steering concern 		
Diagnostic Aids:	The DTC indicates the PSP sensor is out of self-test range.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DT .	GO to Pinpoint Test DT .	—

P1561 - Brake Line Pressure Sensor Circuit

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 206-10, Auxiliary Brake System, Powertrain Control Module (PCM) DTC Chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1572 - Brake Pedal Switch Circuit

Description:	Indicates the brake input rationality test for brake pedal position (BPP) and brake pressure switch (BPS) has detected a concern. One or both inputs to the powertrain control module (PCM) did not change state when expected. On some vehicles with stability assist, the BPP switch is connected to the anti lock brake system (ABS) module and the ABS generates a driver brake application signal, which is then sent to the PCM.		
Possible Causes:	<ul style="list-style-type: none"> • Misadjusted brake switches, BPP or BPS • Blown fuse • Damaged BPP switch • Damaged BPS switch • Open or short in the BPP circuit • Open or short in the DBA circuit • Open or short in the BPS circuit 		
Diagnostic Aids:	DTC P1572 sets when the PCM does not sense the correct sequence of the brake pedal input signal from both the BPP and BPS switches when the brake pedal is pressed and released.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test FD .

P1575 - Pedal Position Out Of Self Test Range

Description:	During key on engine off (KOEO) self-test, the powertrain control module (PCM) monitors the accelerator pedal position (APP) sensor inputs to determine if the APP1 and APP2 signals are less than an expected value. If either APP1 or APP2 is greater than the expected value, the DTC is set.		
Possible Causes:	<ul style="list-style-type: none"> • Accelerator pedal applied during KOEO self-test 		
Diagnostic Aids:	Repeat the self-test without applying the accelerator pedal. Make sure the floor mat is not interfering with the accelerator pedal. Diagnose any APP circuit DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .	—	—

P1633 - Keep Alive Power (KAPWR) Voltage Too Low

Description:	Indicates the KAPWR circuit has experienced a voltage interrupt.		
Possible Causes:	<ul style="list-style-type: none"> • Open KAPWR circuit • Intermittent KAPWR 		
Diagnostic Aids:	Loss of KAPWR to the powertrain control module (PCM) results in immediate malfunction indicator lamp (MIL) illumination and DTC P1633.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QB .		

P1635 - Tire/Axle Ratio Out of Acceptable Range

Description:	This DTC indicates the tire and axle information contained in the vehicle ID block (VID) does not match the vehicle hardware.		

Possible Causes:	<ul style="list-style-type: none"> • Incorrect tire size • Incorrect axle ratio • Incorrect VID configuration parameters
Diagnostic Aids:	Using the scan tool, view the tire and axle parameters within the VID. They must match the vehicle hardware.
Application	Key On Engine Off Key On Engine Running Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

P1636 - Inductive Signature Chip Communication Error

Description:	Indicates the powertrain control module (PCM) has lost communication with the inductive signature chip.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged PCM 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	DTC P1636 indicates the PCM has lost communication with the inductive signature chip. Install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.		

P1639 - Vehicle ID (VID) Block Corrupted, Not Programmed

Description:	This DTC indicates the VID block is not programmed or the information within is corrupt.		
Possible Causes:	<ul style="list-style-type: none"> • New powertrain control module (PCM) • Incorrect PCM • Incorrect VID configuration 		
Diagnostic Aids:	Program the PCM to the most recent calibration available.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	The VID block must be programmed. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Making Changes to the VID Block.		

P1640 - Powertrain DTCs Available in Another Module

Description:	Vehicles using a secondary engine control module can request that the powertrain control module (PCM) illuminate the malfunction indicator lamp (MIL) when a failure occurs which affects emissions.		
Possible Causes:	<ul style="list-style-type: none"> • DTCs stored in a secondary module, which requested the MIL to be turned on 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1646 - Linear O2 Sensor Control Chip (Bank 1)

Description: The powertrain control module (PCM) monitors the application-specific integrated circuit that controls and monitors the heated oxygen sensor (HO2S). The test fails when the PCM detects an internal circuit or communication concern.			
Possible Causes: <ul style="list-style-type: none"> • Damaged PCM 			
Diagnostic Aids: Internal PCM concern.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .		

P1647 - Linear O2 Sensor Control Chip (Bank 2)

Description: See the description for DTC P1646.			
Possible Causes: See the possible causes for DTC P1646.			
Diagnostic Aids: See the diagnostic aids for DTC P1646.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .		

P1650 - Power Steering Pressure (PSP) Switch Out of Self-Test Range

Description: In the key on engine off (KOEO) self-test, this DTC indicates the PSP input to the powertrain control module (PCM) is high. In the key on engine running (KOER) self-test, this DTC indicates the PSP input did not change state.			
Possible Causes: <ul style="list-style-type: none"> • The steering wheel must be turned during KOER self-test • PSP switch/shorting bar damaged • SIG RTN circuit open • PSP circuit open or shorted to SIGRTN 			
Diagnostic Aids: Check if the vehicle was towed or a power steering repair was carried out. Observe the PSP PID while checking the wires for intermittent concerns.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FF .	GO to Pinpoint Test FF .	—

P1651 - Power Steering Pressure (PSP) Switch Input

Description: The powertrain control module (PCM) counts the number of vehicle speed transitions from 0 to a calibrated speed. After a calibrated number of speed transitions, the PCM expects the PSP			

input to change. This DTC is set if the transition is not detected.			
Possible Causes:	<ul style="list-style-type: none"> • Vehicle towed with the engine running • The power steering hydraulic concern was repaired but the DTC was not erased • PSP switch/shorting bar damaged • SIG RTN circuit open • PSP circuit open or shorted to SIGRTN 		
Diagnostic Aids:	Check if the vehicle was towed or a power steering repair was carried out. Observe the PSP PID while checking the wires for intermittent concerns.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test FE .

P1674 - Control Module Software Corrupted

Description:	Indicates an error occurred in the powertrain control module (PCM). This DTC is set in combination with P2105.		
Possible Causes:	<ul style="list-style-type: none"> • Software incompatibility issue • Damaged PCM 		
Diagnostic Aids:	Verify the PCM is at the latest calibration level.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

P1703 - Brake Switch Out of Self-Test Range

Description:	Indicates that during the key on engine off (KOEO) self-test, the brake pedal position (BPP) signal was high, or during the key on engine running (KOER) self-test, the BPP signal did not cycle high and low.		
Possible Causes:	<ul style="list-style-type: none"> • Open or short in the BPP circuit • Open or short in the stoplamp circuits • Concern in module(s) connected to the BPP circuit • Damaged brake switch • Incorrectly adjusted brake switch 		
Diagnostic Aids:	Check for correct function of the stoplamps. Using the scan tool, check the BPP PID. The stoplamps and PID should toggle on and off with brake pedal activation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FD .		

P1705 - Transmission Range Sensor Out of Self-Test Range

Description:	The transmission range circuit is not indicating PARK/NEUTRAL during self-test.		
Possible Causes:	<ul style="list-style-type: none"> • Gear selector not in PARK/NEUTRAL 		
Diagnostic Aids:	Verify the gear selector is in PARK/NEUTRAL.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission, External Controls		

P1709 - Park/Neutral Position (PNP) Switch Out of Self-Test Range

Description:	This DTC indicates that the voltage is high when it should be low.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged PNP or Clutch Pedal Position (CPP) switch • PNP/CPP circuit short to PWR • PNP/CPP circuit open in the SIGRTN 		
Diagnostic Aids:	When activating either the PNP or CPP switch, the voltage should cycle from 5 volts to low.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission, External Controls Symptom Chart to continue diagnosis.		

P1729 - 4x4L Switch

Description:	The 4x4L switch is an on/off switch. If the powertrain control module (PCM) does not sense appropriate voltage when the switch is cycled on and off, a DTC sets for mechanical shift on the fly (MSOF) systems.		
Possible Causes:	<ul style="list-style-type: none"> • The 4x4L harness between the PCM and the 4x4L switch is open or shorted • Damaged 4x4L switch 		
Diagnostic Aids:	Verify the 4x4L switch cycles on/off.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 308-07A, Four-Wheel Drive Systems, Mechanical Shift Symptom Chart to continue diagnosis.		

P1780 - Transmission Control Switch (TCS) Out of Self-Test Range

Description:	During key on engine running (KOER) self-test the TCS must be cycled, or a DTC is set.		
Possible Causes:	<ul style="list-style-type: none"> • TCS not cycled during the self-test. • TCS circuit short or open • Damaged TCS switch 		
Diagnostic Aids:	Verify the TCS switch cycles on/off.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TB .		

P1781 - 4x4L Switch Out of Self-Test Range

Description:	The 4x4L switch is an on/off switch. If the powertrain control module (PCM) does not sense low voltage when the switch is on, the DTC sets.		
Possible Causes:	<ul style="list-style-type: none"> • 4x4L harness open or shorted • Damaged electronic shift module 		

Diagnostic Aids: Verify the 4x4L switch cycles on/off.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 308-07A, Four-Wheel Drive Systems, Symptom Chart-Electronic Shift to continue diagnosis.		

P17xx -

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission.		

P18xx -

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 308-07A, Four-Wheel Drive Systems.		

P1900 - Output Shaft Speed (OSS) Sensor Circuit Intermittent

Description: The OSS sensor signal to the powertrain control module (PCM) is irregular or interrupted.			
Possible Causes: <ul style="list-style-type: none"> • Harness connector not correctly seated • Harness intermittently shorted or open • Harness connector damaged • OSS sensor damaged, or not installed correctly 			
Diagnostic Aids: Verify harness and connector integrity. Verify correct installation of the OSS sensor.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	GO to Pinpoint Test DP .		
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, Pinpoint Test Output Shaft Speed Sensor to continue diagnosis.		

P1901 - Turbine Shaft Speed (TSS) Sensor Circuit Intermittent

Description: The TSS sensor signal to the powertrain control module (PCM) is irregular or interrupted.			
Possible <ul style="list-style-type: none"> • Harness connector not correctly seated 			

Causes:	<ul style="list-style-type: none"> • Harness intermittently shorted or open • Harness connector damaged • TSS sensor damaged or not installed correctly 		
Diagnostic Aids:	Verify harness and connector integrity. Verify correct installation of the TSS sensor.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 307-01, Automatic Transmission, Pinpoint Test Turbine Shaft Speed Sensor to continue diagnosis.		

P2004 - Intake Manifold Runner Control (IMRC) Stuck Open (Bank 1)

Description:	This DTC is set when the IMRC is commanded closed, but the IMRC monitor indicates open.		
Possible Causes:	<ul style="list-style-type: none"> • IMRC monitor signal circuit shorted to PWR GND or SIG RTN • Damaged IMRC actuator or solenoid • Blocked vacuum hoses 		
Diagnostic Aids:	Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2005 - Intake Manifold Runner Control (IMRC) Stuck Open (Bank 2)

Description:	This DTC is set when the IMRC is commanded closed, but the IMRC monitor indicates open.		
Possible Causes:	<ul style="list-style-type: none"> • IMRC monitor signal circuit shorted to PWR GND or SIG RTN • Damaged IMRC actuator or solenoid • Damaged PCM • Blocked vacuum hoses 		
Diagnostic Aids:	An IMRCM PID reading near approximately 1 volt at closed throttle may indicate a fault.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2006 - Intake Manifold Runner Control (IMRC) Stuck Closed (Bank 1)

Description:	This DTC is set when the IMRC is commanded open, but the IMRC monitor indicates closed.		
Possible Causes:	<ul style="list-style-type: none"> • IMRC monitor circuit open • IMRC control circuit open • IMRC monitor circuit short to VREF • Damaged IMRC actuator or solenoid 		
Diagnostic Aids:	Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2007 - Intake Manifold Runner Control (IMRC) Stuck Closed (Bank 2)

Description:	This DTC is set when the IMRC is commanded open, but the IMRC monitor indicates closed.		
Possible Causes:	<ul style="list-style-type: none"> • IMRC monitor circuit open • IMRC control circuit open • IMRC monitor circuit short to VREF • Damaged IMRC actuator or solenoid 		
Diagnostic Aids:	Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2008 - Intake Manifold Runner Control (IMRC) Circuit Open (Bank 1)

Description:	This DTC indicates a failure in the IMRC primary control circuit.		
Possible Causes:	<ul style="list-style-type: none"> • IMRC control circuit open 		
Diagnostic Aids:	Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2014 - Intake Manifold Runner Position Sensor/Switch Circuit (Bank 1)

Description:	The intake manifold runner control (IMRC) system is monitored for failure during continuous or key on engine off (KOEO) self-test. Each DTC distinguishes the corresponding bank for IMRC actuator assemblies with dual monitor switches. The test fails when the signal on the monitor pin is outside an expected calibrated range.		
Possible Causes:	<ul style="list-style-type: none"> • IMRC monitor circuit open • Mechanical concern - bind, seize, damage or obstruction of IMRC hardware 		
Diagnostic Aids:	Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2015 - Intake Manifold Runner Position Sensor/Switch Circuit Range/Performance (Bank 1)

Description:	The intake manifold runner control (IMRC) system is monitored for failures. Each DTC distinguishes the corresponding bank. The test fails when the system detects the presence of a broken or persistently out of range linkage.		
Possible Causes:	<ul style="list-style-type: none"> • Mechanical concern - bind, seize, damage, or obstruction of IMRC hardware 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test HU .
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P2020 - Intake Manifold Runner Position Sensor/Switch Circuit Range/Performance (Bank 2)

Description: See the description for DTC P2015.			
Possible Causes: See the possible causes for DTC P2015.			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2065 - Fuel Level Sensor B Circuit

Description: Fuel level information is sent to the powertrain control module (PCM) on the communication link.			
Possible Causes:	<ul style="list-style-type: none"> • Communication link concern • Damaged instrument panel cluster (IPC) (E-Series, MKS) • Damaged instrument cluster (IC) • Damaged PCM 		
Diagnostic Aids:	Refer to the Workshop Manual Section 413-01, Instrumentation, Message Center, and Warning Chimes for fuel level indicator diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 413-01, Instrumentation, Message Center, and Warning Chimes to diagnose the incorrect fuel gauge indication symptom.		

P2066 - Fuel Level Sensor B Circuit Range/Performance

Description: See the description for DTC P2065.			
Possible Causes:	See the possible causes for DTC P2065.		
Diagnostic Aids:	See the diagnostic aids for DTC P2065.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 413-01, Instrumentation, Message Center, and Warning Chimes to diagnose the incorrect fuel gauge indication symptom.		

P2067 - Fuel Level Sensor B Circuit Low

Description: See the description for DTC P2065.			
Possible Causes:	See the possible causes for DTC P2065.		
Diagnostic Aids:	See the diagnostic aids for DTC P2065.		

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 413-01, Instrumentation, Message Center, and Warning Chimes to diagnose the incorrect fuel gauge indication symptom.		

P2068 - Fuel Level Sensor B Circuit High

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 413-01, Instrumentation, Message Center, and Warning Chimes to diagnose the incorrect fuel gauge indication symptom.		

Description:	See the description for DTC P2065.		
Possible Causes:	See the possible causes for DTC P2065.		
Diagnostic Aids:	See the diagnostic aids for DTC P2065.		

P2070 - Intake Manifold Tuning Valve (IMTV) Stuck Open Bank 1

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HU .	GO to Pinpoint Test HU .

Description:	The IMTV system is monitored for failure during continuous, key on engine off (KOEO), or key on engine running (KOER) self-tests. The test fails when the signal is more or less than an expected calibrated range.		
Possible Causes:	<ul style="list-style-type: none"> • IMTV signal circuit shorted to PWR GND or SIG RTN • Damaged IMRC actuator 		
Diagnostic Aids:	An IMTVM PID reading may indicate a fault.		

P2071 - Intake Manifold Tuning Valve (IMTV) Stuck Closed Bank 1

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test HU .	GO to Pinpoint Test HU .

Description:	The IMTV system is monitored for failure during continuous, key on engine off (KOEO), or key on engine running (KOER) self-tests. The test fails when the signal is more or less than an expected calibrated range.		
Possible Causes:	<ul style="list-style-type: none"> • IMTV signal circuit shorted to PWR GND or SIG RTN • Damaged IMRC actuator • IMTV circuit open 		
Diagnostic Aids:	An IMTVM PID reading may indicate a fault.		

P2072 - Throttle Actuator Control (TAC) System - Ice Breakage

Description:	This DTC only identifies that the strategy has carried out several open and close cycles to		
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remove potential ice build up. This DTC does not imply any system concerns, only that the mode has occurred, and that mode may be causing a long start time.

Possible Causes:

- Ice or oil in the intake air system could be the result of a positive crankcase ventilation (PCV) system concern

Diagnostic Aids: Do not install a new electronic throttle body (ETB) for this DTC. Check the PCV system for evidence of water or ice. Disconnect the intake air fresh air plenum from the throttle body. Check for water or oily residue at the PCV fresh air port. Disconnect the tube at the valve cover and check the tube for ice obstruction/ice. Start the engine and, to check the PCV system, place a piece of cardboard on the crankcase vent in the rocker cover. If the cardboard is held on the crankcase vent and fumes are not exiting, reconnect the tube to the valve cover and the intake air port. If the test passes, the PCV system is OK. If the cardboard is not held in place, turn off the engine and check the PCV valve side of the system for ice or obstruction and repair as necessary. If no obstruction is found there, isolate and repair any obstruction in the intake manifold connection. If no obstruction is found there, make sure the PCV coolant heater is functional and repair as necessary. If no concern is present, make sure the PCV valve is allowing the correct vacuum flow and repair as necessary.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2096 - Post Catalyst Fuel Trim System Too Lean Bank 1

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: The powertrain control module (PCM) monitors the correction value from downstream heated oxygen sensor (HO2S) as part of the fore-aft oxygen sensor control routine. The test fails when the correction value is greater than a calibrated limit.			
Possible Causes: <ul style="list-style-type: none"> • Loose connection, and damaged or corroded terminals • Exhaust leaks • Contaminated HO2S 			
Diagnostic Aids: Inspect the connectors for signs of damage, water ingress, or corrosion.			
All	—	—	GO to Pinpoint Test DZ .

P2097 - Post Catalyst Fuel Trim System Too Rich Bank 1

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: See the description for DTC P2096.			
Possible Causes: See the possible causes for DTC P2096.			
Diagnostic Aids: See the diagnostic aids for DTC P2096.			
All	—	—	GO to Pinpoint Test DZ .

P2098 - Post Catalyst Fuel Trim System Too Lean Bank 2

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Description: See the description for DTC P2096.			
Possible Causes: See the possible causes for DTC P2096.			
Diagnostic Aids: See the diagnostic aids for DTC P2096.			
All	—	—	GO to Pinpoint Test DZ .

All	—	—	GO to Pinpoint Test DZ .
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P2099 - Post Catalyst Fuel Trim System Too Rich Bank 2

Description: See the description for DTC P2096.			
Possible Causes: See the possible causes for DTC P2096.			
Diagnostic Aids: See the diagnostic aids for DTC P2096.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test DZ .

P2100 - Throttle Actuator Control (TAC) Motor Circuit/Open

Description: A powertrain control module (PCM) fault flag is set indicating the motor circuit is open and may require cycling the ignition.			
Possible Causes:	<ul style="list-style-type: none"> • TAC motor has an open winding • TAC motor is damaged • TAC motor harness is open • TAC motor harness is short to PWR • TAC motor harness circuits are short together • TAC motor harness connector is unplugged 		
Diagnostic Aids:	A TAC motor circuit PID reading may indicate a concern, if available.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2101 - Throttle Actuator Control (TAC) Motor Range/Performance

Description: A powertrain control module (PCM) fault flag is set indicating the motor circuit is open and may require cycling the ignition.			
Possible Causes:	<ul style="list-style-type: none"> • TAC motor circuits are cross-wired 		
Diagnostic Aids:	A TAC motor circuit PID reading may indicate a concern, if available.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2104 - Throttle Actuator Control (TAC) System - Forced Idle

Description: The TAC system is in the failure mode effects management (FMEM) mode of forced idle.			
Possible Causes:			
Diagnostic Aids:	This DTC is an informational DTC and may be set in combination with a number of other DTCs which are causing the FMEM. Diagnose other DTCs first.		

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P2105 - Throttle Actuator Control (TAC) System - Forced Engine Shutdown

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		
Description: The TAC system is in the failure mode effects management (FMEM) mode of forced engine shutdown.			
Possible Causes:			
Diagnostic Aids: This DTC is an informational DTC and may be set in combination with a number of other DTCs which are causing the FMEM. Diagnose other DTCs first.			

P2107 - Throttle Actuator Control (TAC) Module Processor

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		
Description: The electronic throttle control (ETC) area of the powertrain control module (PCM) failed the self-test. The concern could be the result of an incorrect throttle position (TP) command, or TAC motor wires shorted together.			
Possible Causes: <ul style="list-style-type: none"> • TAC motor harness circuit short to ground • TAC motor harness circuit short to voltage • Damaged electronic throttle body (ETB) • Damaged PCM 			
Diagnostic Aids: This DTC may be accompanied by other DTCs. If DTC P2110 is present along with other DTCs, disregard DTCs P2107 and P2110 at this time. Diagnose other DTCs first. A TAC motor circuit PID reading may indicate a concern, if available.			

P2110 - Throttle Actuator Control (TAC) System - Forced Limited RPM

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		
Description: The TAC system is in the failure mode effects management (FMEM) mode of forced limited RPM.			
Possible Causes:			
Diagnostic Aids: This DTC is an informational DTC and may be set in combination with a number of other DTCs which are causing the FMEM. Diagnose other DTCs first.			

P2111 - Throttle Actuator Control (TAC) System - Stuck Open

Description: This powertrain control module (PCM) fault status indicates the throttle plate is at a greater			
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angle than commanded.

Possible Causes:	<ul style="list-style-type: none"> ● Binding throttle body, stuck open ● TAC motor circuit open ● TAC motor circuits are cross-wired ● TAC motor harness circuits are shorted together ● Damaged PCM
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Diagnostic Aids:

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

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:	<ul style="list-style-type: none"> ● Binding throttle body, stuck closed ● TAC motor circuit open ● TAC motor circuits are cross-wired ● TAC motor harness circuits are shorted together ● Damaged PCM 		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2121 - Throttle/Pedal Position Sensor/Switch D Circuit Range/Performance

Description:	The accelerator pedal position (APP) sensor fault flag is set for sensor 1 by the powertrain control module (PCM), indicating the signal is out of the normal self-test operating range.		
Possible Causes:	<ul style="list-style-type: none"> ● APP sensor 1 is open, or short to ground or voltage ● APP sensor signal circuits are short together ● Damaged APP sensor ● Damaged PCM 		
Diagnostic Aids:	An APP1 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P2122 - Throttle/Pedal Position Sensor/Switch D Circuit Low

Description:	The accelerator pedal position (APP) sensor 1 is out of self-test range low.		
Possible Causes:	<ul style="list-style-type: none"> ● APP sensor harness open (ETC system with a 2-track APP sensor) ● APP sensor harness short to ground ● Damaged APP sensor 		
Diagnostic Aids:	An APP1 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test DK .
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P2123 - Throttle/Pedal Position Sensor/Switch D Circuit High

Description:	The accelerator pedal position (APP) sensor 1 is out of self-test range high.		
Possible Causes:	<ul style="list-style-type: none"> • APP sensor harness open (ETC system with a 3-track APP sensor) • APP sensor harness is short to VREF • Damaged APP sensor 		
Diagnostic Aids:	An APP1 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P2126 - Throttle/Pedal Position Sensor/Switch E Circuit Range/Performance

Description:	The accelerator pedal position (APP) sensor fault flag is set for sensor 2 by the powertrain control module (PCM), indicating the signal is out of the normal self-test operating range.		
Possible Causes:	<ul style="list-style-type: none"> • APP sensor assembly is binding • Damaged APP sensor • Damaged PCM 		
Diagnostic Aids:	An APP2 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P2127 - Throttle/Pedal Position Sensor/Switch E Circuit Low

Description:	The accelerator pedal position (APP) sensor 2 is out of self-test range low.		
Possible Causes:	<ul style="list-style-type: none"> • APP sensor circuit is short to ground • APP sensor circuit is open • Damaged APP sensor 		
Diagnostic Aids:	An APP2 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P2128 - Throttle/Pedal Position Sensor/Switch E Circuit High

Description:	The accelerator pedal position (APP) sensor 2 is out of self-test range high.		
Possible Causes:	<ul style="list-style-type: none"> • APP sensor assembly is binding • APP sensor harness is short to voltage • Damaged APP sensor 		
Diagnostic Aids:	An APP2 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test DK .
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P2131 - Throttle/Pedal Position Sensor/Switch F Circuit Range/Performance

Description: The accelerator pedal position (APP) sensor fault flag is set for sensor 3 by the powertrain control module (PCM), indicating the signal is out of the normal self-test operating range.			
Possible Causes: <ul style="list-style-type: none"> • APP sensor assembly is binding • Damaged APP sensor • Damaged PCM 			
Diagnostic Aids: An APP3 sensor PID reading may indicate a concern.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P2132 - Throttle/Pedal Position Sensor/Switch F Circuit Low

Description: The accelerator pedal position (APP) sensor 3 is out of self-test range low.			
Possible Causes: <ul style="list-style-type: none"> • APP sensor assembly is binding • APP sensor circuit is open • APP sensor harness short to ground • Damaged APP sensor 			
Diagnostic Aids: An APP3 sensor PID reading may indicate a concern.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P2133 - Throttle/Pedal Position Sensor/Switch F Circuit High

Description: The accelerator pedal position (APP) sensor 3 is out of self-test range high.			
Possible Causes: <ul style="list-style-type: none"> • APP sensor assembly is binding • APP sensor harness is short to voltage • Damaged APP sensor 			
Diagnostic Aids: An APP3 sensor PID reading may indicate a concern.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P2135 - Throttle/Pedal Position Sensor/Switch A/B Voltage Correlation

Description: The powertrain control module (PCM) flagged a concern indicating that throttle position (TP) 1 and TP2 disagree by more than a calibrated limit.			
Possible Causes: <ul style="list-style-type: none"> • TP sensor shorted internally to VREF • TP sensor harness is short to voltage • TP sensor signal wires are short together • Damaged TP sensor 			

Diagnostic Aids: Compare the TP1 and TP2 PID values for a full sweep and correlation. Refer to the chart in pinpoint test DV. Check the wiring harness for an open or a short circuit. Check the TP sensor for an internal open or short circuit.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2138 - Throttle/Pedal Position Sensor/Switch D/E Voltage Correlation

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

Description: The powertrain control module (PCM) monitors the accelerator pedal position (APP) sensor for a concern. The PCM compares the accelerator pedal position information from the APP sensor inputs, APP1 and APP2. If the APP sensor inputs APP1 and APP2 disagree on the position of the accelerator pedal by more than an expected value, the DTC is set.

Possible Causes:

- APP sensor circuit concerns
- Damaged APP sensor.

Diagnostic Aids: Monitor the APP_MAXDIFF PID while applying and releasing the accelerator pedal.

P2195 - O2 Sensor Signal Biased/Stuck Lean - Bank 1, Sensor 1

<p>Description: A heated oxygen sensor (HO2S) indicating lean at the end of a test is trying to correct for an over-rich condition. The test fails when the fuel control system no longer detects switching for a calibrated amount of time.</p>			
<p>Possible Causes:</p> <p>Electrical:</p> <ul style="list-style-type: none"> • Short to VPWR in the harness or HO2S • Water in the harness connector • Open/shorted HO2S circuit • Open UO2SPC circuit • Corrosion or incorrect harness connections • Damaged HO2S • Damaged powertrain control module (PCM) <p>Fuel System:</p> <ul style="list-style-type: none"> • Excessive fuel pressure • Leaking/contaminated fuel injectors • Leaking fuel pressure regulator • Low fuel pressure or running out of fuel • Vapor recovery system <p>Intake Air System:</p> <ul style="list-style-type: none"> • Air leaks after the mass air flow (MAF) sensor • Vacuum leaks • Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open • Incorrectly seated engine oil dipstick <p>Exhaust Gas Recirculation (EGR) System:</p> <ul style="list-style-type: none"> • Leaking gasket • Stuck EGR valve 			

- Leaking diaphragm or EGR vacuum regulator

Base Engine:

- Oil overfill
- Camshaft timing
- Cylinder compression
- Exhaust leaks before or near the HO2S

Diagnostic Aids:

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test H.	GO to Pinpoint Test H.

P2196 - O2 Sensor Signal Biased/Stuck Rich - Bank 1, Sensor 1

Description:	A heated oxygen sensor (HO2S) indicating rich at the end of a test is trying to correct for an over-lean condition. The test fails when the fuel control system no longer detects switching for a calibrated amount of time.		
Possible Causes:	See the possible causes for DTC P2195.		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H.		

P2197 - O2 Sensor Signal Biased/Stuck Lean - Bank 2, Sensor 1

Description:	See the description for DTC P2195.		
Possible Causes:	See the possible causes for DTC P2195.		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test H.	GO to Pinpoint Test H.

P2198 - O2 Sensor Signal Biased/Stuck Rich - Bank 2, Sensor 1

Description:	See the description for DTC P2196.		
Possible Causes:	See the possible causes for DTC P2195.		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H.		

P2257 - Secondary Air Injection (AIR) System Control A Circuit Low

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Description: The AIR system monitor circuit is low, indicating the secondary AIR pump is off although the secondary AIR pump was commanded on by the powertrain control module (PCM).			
Possible Causes: <ul style="list-style-type: none"> • Open B+ circuit • Open VPWR circuit • Open voltage circuit between the AIR relay and the secondary AIR pump • Damaged AIR relay 			
Diagnostic Aids: The AIR monitor circuit PCM input contains a pull up voltage through a resistance internal to the PCM. This voltage is normally held low by the resistance path through the secondary AIR pump when the secondary AIR pump is off. A single electrical open circuit component such as an AIR relay coil in this multi-component circuit is not detected by the PCM output driver, yet it sets DTC P2257.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HM .		

P2258 - Secondary Air Injection (AIR) System Control A Circuit High

Description: The AIR system monitor circuit is high, indicating the secondary AIR pump is on although the secondary AIR pump was commanded off by the powertrain control module (PCM).			
Possible Causes: <ul style="list-style-type: none"> • AIR relay fault - stuck closed • Secondary AIR pump fault - circuit open in motor • Open ground to secondary AIR pump • Open AIR monitor circuit between the secondary AIR pump and the PCM • Short to voltage in the AIR relay to secondary AIR pump voltage circuit 			
Diagnostic Aids: The AIR monitor circuit PCM input contains a pull up voltage through a resistance internal to the PCM. This voltage is normally held low by the resistance path through the secondary AIR pump when the secondary AIR pump is off.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HM .		

P2270 - O2 Sensor Signal Stuck Lean - Bank 1, Sensor 2

Description: The downstream heated oxygen sensor (HO2S) is forced rich and lean and monitored by the powertrain control module (PCM). The test fails if the PCM does not detect the output of the HO2S in a calibrated amount of time.			
Possible Causes: <ul style="list-style-type: none"> • Pinched, shorted, and corroded wiring and pins • Crossed HO2S wires • Exhaust leaks • Contaminated or damaged HO2S 			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test H .	GO to Pinpoint Test H .

P2271 - O2 Sensor Signal Stuck Rich - Bank 1, Sensor 2

Description: See the description for DTC P2270.			
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Possible Causes: See the possible causes for DTC P2270.			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test H.	GO to Pinpoint Test H.

P2272 - O2 Sensor Signal Stuck Lean - Bank 2, Sensor 2

Description: See the description for DTC P2270.			
Possible Causes: See the possible causes for DTC P2270.			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test H.	GO to Pinpoint Test H.

P2273 - O2 Sensor Signal Stuck Rich - Bank 2, Sensor 2

Description: See the description for DTC P2270.			
Possible Causes: See the possible causes for DTC P2270.			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test H.	GO to Pinpoint Test H.

P2274 - O2 Sensor Signal Stuck Lean - Bank 1, Sensor 3

Description: See the description for DTC P2270.			
Possible Causes: See the possible causes for DTC P2270.			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test H.	GO to Pinpoint Test H.

P2275 - O2 Sensor Signal Stuck Rich - Bank 1, Sensor 3

Description: See the description for DTC P2270.			
Possible Causes: See the possible causes for DTC P2270.			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	GO to Pinpoint Test H.	GO to Pinpoint Test H.

P2448 - Secondary Air Injection System High Airflow (Bank 1)

Description:	The AIR system detects excessive mass air flow change with the pump on and a rich exhaust system air fuel ratio.		
Possible Causes:	<ul style="list-style-type: none"> • AIR outlet hose leak. • AIR outlet hose is disconnected. 		
Diagnostic Aids:	Measured air flow is less than expected. Visually inspect the secondary AIR inlet hose.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HM .		

P260F - Evaporative System Monitoring Processor Performance

Description:	This DTC sets when a concern is detected internal to the powertrain control module (PCM). The microprocessor that controls the engine off natural vacuum (EONV) leak check monitor is separate from the main processor within the PCM.		
Possible Causes:	<ul style="list-style-type: none"> • Module communications network concerns • PCM calibration level • Damaged PCM 		
Diagnostic Aids:	Verify the PCM is at the latest calibration level. Reprogram if necessary.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P2610 - Electronic Control Module (ECM)/Powertrain Control Module (PCM) Internal Engine Off Timer Performance

Description:	Indicates an error in the internal PCM engine off timer processor.		
Possible Causes:	<ul style="list-style-type: none"> • Battery cables loose or intermittent connections • Keep alive power (KAPWR) circuit to PCM concern • Engine coolant temperature (ECT) sensor • Engine cooling system concerns • Electrical interference around vehicle or PCM 		
Diagnostic Aids:	Verify the PCM is at the latest calibration level.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QB .		

Pxxxx -

Description:			
Possible Causes:			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	For Pxxxx DTCs not listed in this chart, refer to the customer's symptom to determine the applicable Workshop Manual section for diagnosis.
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U0101 - Lost Communication With Transaxle Control Module (TCM)

Description:	The powertrain control module (PCM) continuously monitors the controller area network (CAN) for messages from the TCM. This DTC sets when the PCM does not receive the TCM message within the defined amount of time.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged CAN communication bus circuit 		
Diagnostic Aids:	Network DTC concerns occur during module-to-module communication. Refer to the Workshop Manual Section 418-00, Module Communications Network to diagnose the transmission control module (TCM) does not respond to the scan tool symptom.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

U0109 - Lost Communication With Fuel Pump Control Module

Description:	The powertrain control module (PCM) monitors the fuel pump monitor (FPM) circuit for the presence of a duty cycled signal. If the FPM circuit is fixed at a low or high voltage, the PCM begins to increment a counter. The test fails when the PCM is still not detecting a duty cycled signal on the FPM circuit after a calibrated amount of time.		
Possible Causes:	<ul style="list-style-type: none"> • FPM circuit open or short to ground • FPM circuit short to voltage • VPWR fuel circuit open • PWRGND circuit open • Damaged inertia fuel shutoff (IFS) switch (if equipped) • Damaged fuel pump control module relay 		
Diagnostic Aids:	Check if the inertia fuel shutoff (IFS) switch is tripped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

U0121 - Lost Communication With Anti-lock Brake System (ABS) Control Module

Description:	The powertrain control module (PCM) continuously monitors the controller area network (CAN) for messages from the ABS. This DTC sets when the PCM fails to receive the ABS message within the defined amount of time.		
Possible Causes:	<ul style="list-style-type: none"> • Damaged CAN communication bus circuit 		
Diagnostic Aids:	Network DTC concerns occur during module-to-module communication. Refer to the Workshop Manual Section 418-00, Module Communications Network, to diagnose the anti-lock brake system (ABS) module does not respond to the scan tool symptom.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—		

U0155 - Lost Communication With Instrument Panel Cluster Control Module

Description: Missing message concerns are logged by a module upon failure to receive a message from another module within a defined retry period.			
Possible Causes: <ul style="list-style-type: none"> ● Open VPWR circuit to the sending module ● Open GND circuit to the sending module ● Open network circuits to the sending module 			
Diagnostic Aids: Carry out the diagnostics for the associated network module.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
E-Series, MKS	Refer to the Workshop Manual Section 413-01, Instrumentation, Message Center, and Warning Chimes to diagnose the instrument panel cluster (IPC) does not respond to the scan tool symptom.		
All others	Refer to the Workshop Manual Section 413-01, Instrumentation, Message Center, and Warning Chimes to diagnose the instrument cluster (IC) does not respond to the scan tool symptom.		

U0300 - Internal Control Module Software Incompatibility

Description: This DTC indicates there are incompatible software levels within the powertrain control module (PCM) that control the electronic throttle control (ETC) system. The ETC system uses multiple microprocessors within the PCM, each having its own software level and function. The microprocessors must have the correct level of software in order to communicate and function together.			
Possible Causes:			
Diagnostic Aids: Verify the PCM is at the latest calibration level.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	—	—	GO to Pinpoint Test QE .

U1039 - SCP (J1850) Invalid or Missing Data for Vehicle Speed

Description:			
Possible Causes: Network DTC(s) occur during module-to-module communication concerns. Two types of network concerns can be categorized: <ul style="list-style-type: none"> ● Invalid data network concerns - data is transferred within the normal inter-module message, but contains known invalid data. The transmitting module logs a DTC related to the invalid data concern. ● Missing message network concerns - missing message concerns are logged by the module upon failure to receive a message from another module within a defined retry period. 			
Diagnostic Aids: Carry out the on-board diagnostics for the associated network module.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Workshop Manual Section 418-00, Module Communications Network to diagnose the no international standards organization (ISO) 9141 network communication symptom or the anti-lock brake system (ABS) module does not respond to the scan tool		

symptom.

U210B - Lost Communication Between Fuel Pump Control Module and Restraints Control Module

Description: The fuel pump control module monitors the duty cycle and frequency of the signal it receives from the restraints control module (RCM). The fuel pump control module determines if the signal on the event notification signal (ENS) circuit from the RCM is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module sends a 40% duty cycle signal on the fuel pump monitor (FPM) circuit to report the concern to the PCM. The test fails when the fuel pump control module is still reporting that it is receiving an invalid duty cycle or frequency from the RCM after a calibrated amount of time.			
Possible Causes: <ul style="list-style-type: none"> • ENS circuit open or short to ground • ENS circuit short to voltage • Radio frequency interference/electromagnetic interference (RFI/EMI) • Damaged fuel pump control module • Damaged RCM 			
Diagnostic Aids: Check the harness for routing, alterations, incorrect shielding, or electrical interference from other systems. The ENS is used to notify the fuel pump control module of an event requiring the fuel pump to be disabled. This signal is used instead of an inertia fuel shutoff (IFS) switch. The fuel pump control module monitors the ENS signal by sending a 12V low current signal on the ENS circuit to the RCM.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

Uxxxx - Network Communication Diagnostic Trouble Code (DTC)

Description: Powertrain related DTC from another module.			
Possible Causes: <ul style="list-style-type: none"> • Communication error 			
Diagnostic Aids: Network DTC concerns occur during module-to-module communication. Refer to the Workshop Manual Section 418-00 Module Communications Network, Communication Network Diagnostic Trouble Codes (DTC) Index to continue diagnosis.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

Note: 'x' equals any number 0 through 9 or letter A through F.

Note 1: DTC P1000 is ignored in the key on engine off (KOEO) and key on engine running (KOER) self-tests. Disregard DTC P1000 and continue as directed.

