

Diagnostic Trouble Code (DTC) Charts and Descriptions

Note: An X equals any number 0 through 9 or the letter A through F.

Note: For TCM self-test and diagnostics, refer to the Workshop Manual Section 307-01 Automatic Transmission.

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

P0001 - Fuel Volume Regulator Control Circuit/Open

Description:	This DTC sets when the state of the output driver signal for the FVCV circuit moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	- FVCV circuit short to voltage - Damaged fuel volume control valve		
Diagnostic Aids:	A concern with the fuel volume control valve or FVCV circuit may cause an engine crank no start condition. This DTC indicates an intermittent concern if the engine starts and DTC P0001 is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test ME .		

P0002 - Fuel Volume Regulator Control Circuit Range/Performance

Description:	This DTC sets when the state of the output driver signal for the FVCV circuit moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	Damaged fuel volume control valve		
Diagnostic Aids:	This DTC sets when the temperature of PCM power stage driver is greater than 170°C (338°F).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test ME .		

P0003 - Fuel Volume Regulator Control Circuit Low

Description:	This DTC sets when the state of the output driver signal for the FVCV circuit moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	- FVCV circuit short to ground - Damaged fuel volume control valve		
Diagnostic Aids:	A concern with the fuel volume control valve or FVCV circuit may cause an engine crank no start condition. This DTC indicates an intermittent concern if the engine starts and DTC P0001 is present.		

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

P0004 - Fuel Volume Regulator Control Circuit High

Description:	This DTC sets when the state of the output driver signal for the FVCV circuit moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	• Damaged fuel volume control valve connector • FVCV circuit open • Damaged fuel volume control valve		
Diagnostic Aids:	A concern with the fuel volume control valve or FVCV circuit may cause an engine crank no start condition. This DTC indicates an intermittent concern if the engine starts and DTC P0001 is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test ME .		

P000E - Fuel Volume Regulator Control Exceeded Learning Limit

Description:	The fuel volume control valve parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum or maximum learning limits.		
Possible Causes:	• Low pressure fuel system • Damaged fuel volume control valve • Fuel injectors internal leakage		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

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

Description:	This DTC sets if the location of the gap on the crankshaft position (CKP) sensor wheel is greater than 6 degrees from the expected location on the camshaft position 11 (CMP11) sensor wheel for two detection attempts.		
Possible Causes:	• Damaged CKP sensor • Damaged CMP11 sensor • Missing CKP signal • Noisy CKP signal • Missing CMP signal • Noisy CMP signal • Base engine concerns		

Diagnostic Aids:	Verify the CKP sensor has been installed and aligned correctly.		
	Verify the CMP11 sensor has been installed and aligned correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test D .		

P003A - Turbocharger/Supercharger Boost Control A Position Exceeded Learning Limit

Description:	This DTC sets when the variable geometry turbocharger voltage control high (VGTVCH) circuit or the variable geometry turbocharger voltage control low (VGTVCL) circuit are not within an expected calibrated range for a calibrated length of time.		
Possible Causes:	• VGT Position sensor harness or connector. • VGT circuit open • VGT circuit short to ground • VGT circuit short to voltage • VGTVCL circuit intermittent • VGTVCH circuit intermittent • Damaged VGT actuator • Stuck or binding VGT		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P0045 - Turbocharger/Supercharger Boost Control A Circuit/Open

Description:	This DTC sets when the TCWRVS 11 circuit is not within the calibrated value.		
Possible Causes:	• TCWRVS 11 circuit open • Damaged turbocharger wastegate regulating valve bank 1 solenoid 1		
Diagnostic Aids:	This DTC can be set due to a turbocharger wastegate regulating valve solenoid concern or an incorrect connection to the turbocharger wastegate regulating valve solenoid.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P0046 - Turbo/Super Charger Boost Control Solenoid A Circuit Range/Performance

Description:	This DTC sets when the turbocharger actuator driver circuit is not within the calibrated value.		
Possible Causes:	• VGT circuit open • VGT circuit short to ground • VGT circuit short to voltage • Damaged turbocharger actuator		

Diagnostic Aids:	This DTC can be set due to a turbocharger actuator solenoid concern or an incorrect connection to the turbocharger actuator solenoid.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P0047 - Turbocharger/Supercharger Boost Control A Circuit Low

Description:	This DTC sets when the VGTVCH circuit voltage or the VGTVCL circuit voltage is less than a calibrated limit for greater than a calibrated amount of time.		
Possible Causes:	• VGTVCH circuit short to ground • VGTVCL circuit short to ground • Damaged variable geometry turbocharger (VGT) actuator		
Diagnostic Aids:	This DTC can be set due to a turbocharger actuator concern, a wiring harness concern, or an incorrect connection to the turbocharger actuator.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P0048 - Turbocharger/Supercharger Boost Control A Circuit high

Description:	This DTC sets when the VGTVCH circuit voltage or the VGTVCL circuit voltage is greater than a calibrated limit for greater than a calibrated amount of time.		
Possible Causes:	• VGTVCH circuit short to voltage • VGTVCH circuit open • VGTVCL circuit short to voltage • VGTVCL circuit open • Damaged variable geometry turbocharger (VGT) actuator		
Diagnostic Aids:	This DTC can be set due to a turbocharger actuator concern, a wiring harness concern, or an incorrect connection to the turbocharger actuator.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P0069 - MAP - Barometric Pressure Correlation

Description:	This DTC sets when the difference between the manifold absolute pressure (MAP) and barometric pressure (BARO) sensors is greater than the maximum calibrated limit.		
Possible Causes:	• Damaged BARO sensor • Damaged MAP sensor • Slow responding or biased MAP sensor • Slow responding or biased BARO sensor		

Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. If during KOEO the difference between the MAP and BARO sensors is greater than 4.5 kPa (0.65 psi) for greater than 5 seconds, a concern is indicated.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AU .		

P0070 - Ambient Air Temperature Sensor Circuit

Description:	This DTC sets when the ambient air temperature (AAT) sensor reading is greater than 71.1°C (160°F).		
Possible Causes:	- AAT circuit short to ground - Damaged AAT sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FA .		

P0071 - Ambient Air Temperature Sensor Circuit A Range/Performance

Description:	This DTC sets when the ambient air temperature (AAT) sensor reading does not correlate with the other temperature sensor readings at ignition ON. The PCM runs this logic after an engine off and a calibrated soak period, typically 6 - 8 hours. This soak period allows the AAT sensor and the other temperature sensors to stabilize and not differ by greater than a calibrated value, typically 18°C (32.4°F).		
Possible Causes:	Damaged AAT sensor		
Diagnostic Aids:	Make sure the AAT sensor reading and the other temperature sensor readings are similar when the engine is cold and the vehicle has not been in direct sun light.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FA .		

P0072 - Ambient Air Temperature Sensor Circuit A Low

Description:	This DTC sets when the ambient air temperature (AAT) sensor signal is less than the self-test minimum.		
Possible Causes:	- AAT circuit short to ground - Damaged AAT sensor		
Diagnostic Aids:	An AAT sensor reading less than the self-test minimum, 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 FA .
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P0073 - Ambient Air Temperature Sensor Circuit A High

Description:	This DTC sets when the ambient air temperature (AAT) sensor signal is greater than the self-test maximum.		
Possible Causes:	• AAT circuit open • AAT circuit short to voltage • Damaged AAT sensor		
Diagnostic Aids:	An AAT sensor reading less than the self-test minimum, 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 FA .		

P007B - Charge Air Cooler Temperature Sensor Circuit Range/Performance (Bank 1)

Description:	This DTC sets when the CAC_T PID does not correlate with the IAT11, AAT, ECT2 or the EGRTC PIDs at ignition on after an 8 hour soak period has been completed.		
Possible Causes:	• Slow responding CACT sensor • Damaged CACT sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check temperature values while engine is at ambient temperature, cold soak the engine for a minimum of 8 hours if necessary.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FB .		

P007C - Charge Air Cooler Temperature Sensor Circuit Low (Bank 1)

Description:	This DTC sets when the charge air cooler temperature is greater than the calibrated value for the charge air cooler temperature (CACT) sensor or a short to ground is detected in the CACT circuit.		
Possible Causes:	• Damaged CACT sensor • CACT circuit short to ground • VPWR circuit open • Low airflow through the charge air cooler (CAC) • Damaged harness connector • Damaged harness		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		

	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FB .		

P007D - Charge Air Cooler Temperature Sensor Circuit High (Bank 1)

Description:	This DTC sets when the charge air cooler temperature is lower than the calibrated value for the charge air cooler temperature (CACT) sensor or an open or short to voltage is detected in the CACT circuit.		
Possible Causes:	• Damaged CACT sensor • CACT circuit open • CACT circuit short to voltage • SIGRTN circuit open		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FB .		

P007E - Charge Air Cooler Temperature Sensor Intermittent/Erratic (Bank 1)

Description:	This DTC sets when the input signal to the PCM from the charge air cooler temperature (CACT) sensor is intermittent or erratic.		
Possible Causes:	• CACT circuit intermittently open • Damaged CACT sensor • Damaged harness connector • Damaged harness		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FB .		

P0087 - Fuel Rail/System Pressure - Too Low (Bank 1)

Description:	The PCM regulates the fuel rail pressure by controlling the fuel volume control valve and fuel pressure control valve. This DTC sets when the PCM is no longer capable of maintaining the fuel pressure.		
Possible			

Causes:	• Restricted fuel filter • Low pressure fuel system • Fuel pressure control valve stuck open • Fuel volume control valve stuck closed • Leaking fuel injector		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets when the fuel rail pressure exceeds the minimum calibrated threshold.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0088 - Fuel Rail/System Pressure - Too High (Bank 1)

Description:	The PCM regulates the fuel rail pressure by controlling the fuel volume control valve and fuel pressure control valve. This DTC sets when the PCM is no longer capable of maintaining the fuel pressure.		
Possible Causes:	• Fuel pressure control valve stuck closed • Damaged fuel rail pressure (FRP) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets when the fuel rail pressure exceeds the maximum calibrated threshold.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0089 - Fuel Pressure Regulator Performance

Description:	This DTC sets when the state of the output driver signal for the FPCV circuit moves outside the minimum or maximum limit for the commanded state or when the measured fuel rail pressure exceeds commanded fuel rail pressure by a calibrated limit.		
Possible Causes:	• Damaged fuel pressure control valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test ME .		

P008A - Low Pressure Fuel System Pressure - Too Low

Description:	This DTC sets when the low pressure fuel system pressure is less than 365 kPa (53 psi) for 60 seconds.		
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Possible Causes:	• Restricted fuel filter • Running out of fuel • Damaged fuel conditioning module • Fuel contaminated • FLP circuit short to voltage • Damaged fuel pressure and temperature sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Verify the fuel level, grade and quality is sufficient to support normal operation of the engine.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0090 - Fuel Pressure Regulator Control Circuit/Open

Description:	This DTC sets when the state of the output driver signal for the FPCV circuit moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	• FPCV circuit open • Damaged fuel pressure control valve		
Diagnostic Aids:	This DTC sets when there is an open in the FPCV circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test ME .		

P0091 - Fuel Pressure Regulator Control Circuit Low

Description:	This DTC sets when the state of the output driver signal for the FPCV circuit moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	• FPCV circuit short to ground • Damaged fuel pressure control valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets when there is a short to ground on the FPCV circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test ME .		

P0092 - Fuel Pressure Regulator Control Circuit High

Description:	This DTC sets when the state of the output driver signal for the FPCV circuit moves outside the minimum or maximum limit for the commanded state.		
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Possible Causes:	- FPCV circuit short to voltage - Damaged fuel pressure control valve		
Diagnostic Aids:	This DTC sets when there is a short to voltage on the FPCV circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test ME .		

P0093 - Fuel System Leak Detected - Large Leak

Description:	This DTC sets when the requested fuel volume control value exceeds a calibrated threshold indicating a large fuel system leak.		
Possible Causes:	Fuel system leak		
Diagnostic Aids:	The fuel pressure in the high pressure fuel system can be monitored by accessing the FRP_A PID on the scan tool. The PCM may disable the low pressure fuel pump causing a no start condition when this DTC sets.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P009A - Intake Air Temperature /Ambient Air Temperature Correlation

Description:	This DTC sets when the intake air temperature (IAT) sensor is greater than or less than the ambient air temperature (AAT) sensor reading by a calibrated value.		
Possible Causes:	- Biased IAT or AAT sensor - Damaged IAT or AAT sensor		
Diagnostic Aids:	Make sure the IAT, AAT and engine coolant temperature (ECT) sensor readings are within 18°C (32.4°F) of each other after 6 to 8 hours at a stabilized ambient temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test E .		

P009E - Fuel Pressure Relief Control Performance / Stuck Off

Description:	This DTC sets when the requested fuel volume control value exceeds a calibrated threshold indicating a stuck fuel pressure relief valve.		
Possible Causes:	Fuel pressure relief valve		
Diagnostic Aids:	INSTALL a new fuel pressure relief valve. Clear the PCM DTCs. Repeat the self-test.		

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

P009F - Fuel Pressure Relief Control Stuck On

Description:	This DTC sets when the requested fuel volume control value exceeds a calibrated threshold indicating a stuck fuel pressure relief valve.		
Possible Causes:	Fuel pressure relief valve		
Diagnostic Aids:	INSTALL a new fuel pressure relief valve. Clear the PCM DTCs. Repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P00BC - Mass Or Volume Air Flow A Circuit Range/Performance - Air Flow Too Low

Description:	This DTC sets when the measured airflow is 26 percent less than the calculated airflow for a calibrated period of time.		
Possible Causes:	- Exhaust gas recirculation (EGR) system leak - Damaged EGR valve - Intake air system leak between the air filter and the turbocharger - Intake air system restriction between the air filter and the turbocharger - Crankcase ventilation system leak - Biased mass airflow/intake air temperature (MAF/IAT) sensor - Damaged MAF/IAT sensor		
Diagnostic Aids:	The test for this DTC will only run once per drive cycle while the vehicle is at idle. The DTC P2073 may set with this DTC. Diagnose DTC P2073 before diagnosing DTC P00BC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P00BD - Mass Or Volume Air Flow A Circuit Range/Performance - Air Flow Too High

Description:	This DTC sets when the measured airflow is 18 percent greater than the calculated airflow for a calibrated period of time.		
Possible Causes:	- Charge air cooler (CAC) leak - Intake air system leak between the turbocharger and the intake manifold - Biased mass airflow/intake air temperature (MAF/IAT) sensor - Damaged MAF/IAT sensor		
Diagnostic Aids:	The test for this DTC will only run once per drive cycle while the vehicle is at idle. The DTC P2073 may set with this DTC. Diagnose DTC P2073 before diagnosing DTC P00BD.		

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

P00C7 - Intake Air Pressure Measurement System - Multiple Sensor Correlation (Bank 1)

Description:	This DTC sets when multiple air pressure sensor values are outside of a calibrated threshold.		
Possible Causes:	- Damaged barometric pressure (BARO) sensor connector - Damaged BARO sensor - Damaged manifold absolute pressure (MAP) sensor connector - Damaged MAP sensor - Damaged turbocharger/supercharger inlet pressure (TCIP) sensor connector - Damaged TCIP sensor		
Diagnostic Aids:	Monitor the TCIP (Pressure), MAP (Pressure) and BARO (Pressure) PIDs to determine which intake air pressure sensor values indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P00DF - Charge Air Cooler Coolant Temperature Sensor A Circuit Range/Performance

Description:	This DTC sets when the charge air cooler (CAC) coolant temperature sensor PID does not correlate with the IAT sensor or the ECT sensor PIDs at ignition ON or if the CAC coolant temperature PID reading is greater than a maximum calibrated value while driving.		
Possible Causes:	- Damaged CAC coolant temperature sensor - Slow responding CAC coolant temperature sensor		
Diagnostic Aids:	Check temperature values while engine is at ambient temperature, cold soak the engine for a minimum of 6 hours if necessary.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KP .		

P00E0 - Charge Air Cooler Coolant Temperature Sensor A Circuit Low

Description:	This DTC sets when the charge air cooler (CAC) coolant temperature is greater than a calibrated value or a short to ground is detected in the CACCTS circuit.		
Possible Causes:	- CACCTS circuit short to ground - Damaged CAC coolant temperature sensor		
Diagnostic Aids:	A CAC coolant temperature sensor reading less than the self-test minimum 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 KP .		

P00E1 - Charge Air Cooler Coolant Temperature Sensor A Circuit High

Description:	This DTC sets when the charge air cooler (CAC) coolant temperature is less than a calibrated value or a short to voltage is detected in the CACCTS circuit.		
Possible Causes:	• CACCTS circuit open • CACCTS circuit short to voltage • Damaged CAC coolant temperature sensor		
Diagnostic Aids:	A CAC coolant temperature sensor reading greater than the self-test maximum 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 KP .		

P00F2 - Humidity Sensor Circuit/Open

Description:	This DTC sets when the relative humidity sensor signal voltage is greater than the maximum calibrated limit.		
Possible Causes:	• Signal circuit open • Signal circuit short to voltage • Incorrect harness connection • Damaged relative humidity sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P00F3 - Humidity Sensor Circuit Range/Performance

Description:	This DTC sets when the Relative Humidity sensor input exceeds a calibrated threshold.		
Possible Causes:	• Slow responding relative humidity sensor • Damaged relative humidity sensor • Damaged harness or connector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P0100 - Mass Or Volume Air Flow Sensor A Circuit

Description:	This DTC sets when the mass airflow (MAF) sensor frequency changes below a minimum calibrated limit for greater than 1.5 seconds.		
Possible Causes:	- Intake air system components incorrectly connected - Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P0101 - Mass Or Volume Air Flow A Circuit Range/Performance

Description:	This DTC sets when the actual airflow is less than the modeled airflow by greater than a calibrated value for 4 seconds.		
Possible Causes:	- Intake air system restriction - Exhaust gas recirculation (EGR) system leak - Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	Check the MAF sensor for contamination and the intake air system for leaks.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P0102 - Mass Or Volume Air Flow Sensor A Circuit Low

Description:	This DTC sets when during ignition ON, engine running the sensor output changes below a minimum calibrated limit for greater than a set period of time.		
Possible Causes:	- MAF circuit short to ground - Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Make sure the MAF/IAT sensor connector is locked and seated correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P0103 - Mass Or Volume Air Flow Sensor A Circuit High

Description:	This DTC sets when during ignition ON, engine running the sensor output changes above a maximum		
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	calibrated limit.		
Possible Causes:	• MAF circuit open • MAF circuit short to voltage • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Make sure the MAF/IAT sensor connector is locked and seated correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P0105 - Manifold Absolute Pressure/Barometric Pressure Sensor Circuit

Description:	This DTC sets when the manifold absolute pressure (MAP) sensor is not within the PCM predicted range, based on other PCM inputs.		
Possible Causes:	• MAP circuit open • MAP circuit short to ground • MAP circuit short to voltage • SIGRTN circuit open • SIGRTN circuit short to voltage • Damaged MAP sensor • Stuck or binding variable geometry turbocharger		
Diagnostic Aids:	Check for correct turbocharger operation. Make sure the MAP sensor reading is similar to other PCM pressure inputs. If the MAP reading differs greatly from other engine pressure readings, check the MAP circuitry for correct operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test E .		

P0106 - Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Range/Performance

Description:	This DTC sets when the manifold absolute pressure (MAP) sensor input exceeds a calibrated threshold.		
Possible Causes:	• Slow responding MAP sensor • Damaged MAP sensor • Stuck or binding Variable Geometry Turbocharger		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Check for other DTCs and diagnose those first. Check for correct turbocharger operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test E .		

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

Description:	This DTC sets when the MAP signal voltage is lower than a specified value indicating an open circuit or a short to ground.		
Possible Causes:	• MAP circuit short to ground • VREF circuit open • VREF circuit short to ground • Damaged MAP sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. If the MAP sensor operating voltage is less than 0.1 volts for greater than 2 seconds, a concern is indicated.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test E .		

P0108 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BARO) Sensor High

Description:	This DTC sets when the MAP signal voltage is higher than a specified value indicating a short to voltage.		
Possible Causes:	• VREF circuit short to voltage • MAP circuit open • MAP circuit short to voltage • Damaged MAP sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. If the MAP sensor operating voltage is greater than 4.75 volts for greater than 2 seconds, a concern is indicated.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test E .		

P0110 - Intake Air Temperature Sensor 1 Circuit (Bank 1)

Description:	This DTC sets when the IAT11 PID reading is less than or greater than the calibrated range.		
Possible Causes:	• SIGNAL circuit open • SIGNAL circuit short to voltage • SIGNAL circuit short to ground • SIGNAL circuit intermittent • Incorrect harness connection • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test E .
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P0111 - Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 1)

Description:	This DTC sets when the IAT11 PID does not correlate with the AAT, CAC_T, ECT2 or the EGRTC PIDs at ignition ON after an 8 hour soak period has been completed.		
Possible Causes:	• Slow responding sensor • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	Make sure the IAT reading and the other temperature sensor readings are similar when the engine is cold.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-Series Super Duty	GO to Pinpoint Test J .		
All others	GO to Pinpoint Test E .		

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

Description:	This DTC sets when the intake air temperature (IAT) sensor signal voltage is less than the minimum calibrated limit.		
Possible Causes:	• IAT circuit short to ground • Incorrect harness connection • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	An IAT_V PID reading less than 0.1 volt with ignition ON, engine OFF or during any engine operating mode indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test E .		

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

Description:	This DTC sets when the intake air temperature (IAT) sensor signal voltage is greater than the maximum calibrated limit.		
Possible Causes:	• IAT circuit open • IAT circuit short to voltage • Incorrect harness connection • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	An IAT11_V PID reading greater than 4.75 volts with ignition ON, engine OFF or during any engine operating mode indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test E .		

P0115 - Engine Coolant Temperature Sensor 1 Circuit

Description:	This DTC sets when the engine coolant temperature (ECT) sensor signal falls below or exceeds the calibrated threshold.		
Possible Causes:	• Low engine coolant level • Damaged thermostat • Damaged ECT sensor • Damaged PCM		
Diagnostic Aids:	Make sure the intake air and engine coolant temperatures are similar when the engine is cold. Make sure the ECT sensor and the actual engine operating temperatures are the same.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test K .		

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

Description:	This DTC sets when the engine coolant temperature or cylinder head temperature value is higher than the calibrated value and could prevent one or more on board diagnostic (OBD) monitors from completing. The PCM runs this logic after an engine off and a calibrated soak period (typically 6 hours). This soak period allows the intake air temperature and the engine coolant temperature or cylinder head temperature to stabilize and not differ by greater than a calibrated value. This DTC sets when all of the following conditions are met: The engine coolant temperature at engine start exceeds the intake air temperature at engine start by greater than a calibrated value, typically 17°C (30°F). The engine coolant temperature 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 this DTC has expired.		
Possible Causes:	• ECT or cylinder head temperature (CHT) sensor • Coolant system concern		
Diagnostic Aids:	Make sure the intake air temperature and the engine coolant temperature or cylinder head temperature 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
All	GO to Pinpoint Test K .		

P0117 - Engine Coolant Temperature Sensor 1 Circuit Low

Description:	This DTC sets when the ECT circuit voltage is less than 0.2 volt.		
Possible Causes:	• ECT circuit short to ground • Damaged engine coolant temperature (ECT) sensor • Incorrect harness connection		

Diagnostic Aids:	An ECT1 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 K .		

P0118 - Engine Coolant Temperature Sensor 1 Circuit High

Description:	This DTC sets when the ECT circuit voltage is greater than 4.6 volts.		
Possible Causes:	- ECT circuit open - ECT circuit short to voltage - Damaged engine coolant temperature (ECT) sensor - Incorrect harness connection		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. An ECT1 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 K .		

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

Description:	This DTC sets when the thermostat monitor has not achieved the required engine operating temperature within a specified amount of time after starting the engine.		
Possible Causes:	- Insufficient warm up time - Low engine coolant level - Leaking or stuck open thermostat - Damaged engine coolant temperature (ECT) sensor - Damaged cylinder head temperature (CHT) sensor		
Diagnostic Aids:	Refer to Section 1, Thermostat Monitor for system information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test K .		

P012A - Turbocharger/Supercharger Inlet Pressure Sensor A Circuit

Description:	This DTC sets when the turbocharger inlet pressure (TCIP) sensor is not within the PCM predicted range, based on other PCM inputs.		
Possible Causes:	- SIGRTN circuit open - SIGRTN circuit short to voltage		

	• SIGNAL circuit open • SIGNAL circuit short to ground • SIGNAL circuit short to voltage • Damaged TCIP sensor		
Diagnostic Aids:	Make sure the TCIP sensor reading is similar to other PCM pressure inputs. If the TCIP reading differs greatly from other engine pressure readings, check the TCIP circuitry for correct operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P012F - Engine Coolant Temperature / Engine Oil Temperature Correlation

Description:	This DTC sets when the maximum difference between the engine coolant temperature and the engine oil temperature exceeds the calibrated threshold for a prescribed amount of time.		
Possible Causes:	• Low engine coolant level • Cooling system flow restriction • Cooling system pressure loss • Damaged engine coolant temperature (ECT) sensor • Damaged engine oil temperature (EOT) sensor		
Diagnostic Aids:	The threshold value varies between 11°C (20°F) and 17°C (30°F) depending on the speed and load applied to the vehicle. 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 AT .		

P0133 - O2 Sensor Circuit Slow Response (Bank1 Sensor 1)

Description:	The nitrogen oxide (NOx) module monitors the NOx sensor oxygen (O2) response time during the transition from an engine load to deceleration fuel shut off (DFSO). This DTC sets when the actual O2 signal value does not reach a predicted O2 signal value within a calibrated amount of time.		
Possible Causes:	• Corrosion • Incorrect connections • Damaged or contaminated NOx sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

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

Description:	The nitrogen oxides bank 1, sensor 2 (NOx12) module monitors the NOx12 sensor oxygen (O2) response time during the transition from an engine load to deceleration fuel shut off (DFSO). This DTC sets when		
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	the actual O2 signal value does not reach a predicted O2 signal value within a calibrated amount of time.		
Possible Causes:	• Corrosion • Incorrect connections • Contaminated NOx12 sensor • Damaged NOx12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P0140 - O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 2)

Description:	The nitrogen oxides bank 1, sensor 2 (NOx12) module monitors the NOx12 sensor oxygen (O2) signal for a lack of movement concern. This DTC sets when the actual O2 signal value does not change from the default O2 signal value.		
Possible Causes:	• Corrosion • Incorrect connections • Radio frequency interference or electromagnetic interference • Contaminated NOx12 sensor • Damaged NOx12 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P016D - Excessive Time To Enter Closed Loop Fuel Pressure Control

Description:	On every engine start with fuel temperature less than 40 °C (104 °F), the PCM checks the accuracy of the fuel rail pressure sensor by estimating the amount of effort required by the fuel pressure control valve to maintain pressure for a given fuel rail pressure reading. This DTC sets when the system is unable to successfully learn the effort required over a substantial period of time. This DTC indicates that some element of the fuel system is operating within plausible tolerances, but with too much variation to get a stable reading.		
Possible Causes:	• Damaged fuel pressure control valve • Damaged fuel volume control valve • Damaged FRP sensor • Damaged PCM		
Diagnostic Aids:	When in fuel pressure control valve operating mode, the system evaluates the control signal required for the fuel pressure control valve and adjusts to the expected value. This DTC sets if the new adjustment value is not learned in a given time.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0170 - Fuel Trim (Bank 1)

Description:	This DTC sets when the error in the air to fuel ratio exceeds a calibrated limit.		
Possible Causes:	• Restricted air filter • Biased or damaged mass airflow (MAF) sensor • Damaged fuel injector • Damaged exhaust gas recirculation (EGR) valve • Intake air system or crankcase ventilation system leak • Damaged fuel rail pressure sensor • Damaged fuel pressure control valve • Contaminated or damaged NOx12 sensor		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MX .		

P0171 - System Too Lean Bank 1

Description:	This DTC sets when the error in the air to fuel ratio exceeds a calibrated limit.		
Possible Causes:	• Restricted air filter • Biased or damaged mass airflow (MAF) sensor • Damaged fuel injector • Damaged exhaust gas recirculation (EGR) valve • Intake air system or crankcase ventilation system leak • Damaged fuel rail pressure sensor • Damaged fuel pressure control valve • Contaminated or damaged NOx12 sensor		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MX .		

P0172 - System Too Rich Bank 1

Description:	This DTC sets when the error in the air to fuel ratio exceeds a calibrated limit.		
Possible Causes:	• Restricted air filter • Biased or damaged mass airflow (MAF) sensor • Damaged fuel injector • Damaged exhaust gas recirculation (EGR) valve • Intake air system or crankcase ventilation system leak • Damaged fuel rail pressure sensor • Damaged fuel pressure control valve • Contaminated or damaged NOx12 sensor		

Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all other DTCs first.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test MX .		

P0180 - Fuel Temperature Sensor A Circuit

Description:	This DTC sets when the difference between the fuel rail temperature (FRT) sensor value and the PCM temperature value exceeds a calibrated value at engine start after a 6 hour soak.			
Possible Causes:	• FRT circuit open • FRT circuit short to ground • FRT circuit short to voltage • Damaged FRT sensor connection • Low ambient temperature operation • Damaged FRT sensor			
Diagnostic Aids:	Monitor the FRT voltage and temperature PIDs on a scan tool to isolate an open or short circuit from the system concern. Diagnose any FRT circuit related DTCs first.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test MC .		

P0181 - Fuel Temperature Sensor A Circuit Range/Performance

Description:	The PCM monitors the difference between the fuel pressure and temperature sensor and the charge air cooler temperature (CACT) sensor on engine start after a 6 hour soak. This DTC sets when the difference between the two temperatures exceeds a calibrated value.			
Possible Causes:	• FRT circuit open • FRT circuit short to ground • FRT circuit short to voltage • Damaged fuel pressure and temperature sensor connection • Low ambient temperature operation • Damaged fuel pressure and temperature sensor			
Diagnostic Aids:	Monitor the FRT voltage and temperature PIDs on a scan tool to isolate an open or short circuit from the system concern. Diagnose any FRT circuit related DTCs first.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test MC .		

P0182 - Fuel Temperature Sensor A Circuit Low

Description:	This DTC sets when the FRT voltage is lower than expected.			
Possible Causes:	• FRT circuit short to ground • Damaged fuel pressure and temperature sensor connection • Low ambient temperature operation			

	Damaged fuel pressure and temperature sensor		
Diagnostic Aids:	Monitor the FRT voltage and temperature PIDs on a scan tool to isolate an open or short circuit from the system concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MC .		

P0183 - Fuel Temperature Sensor A Circuit High

Description:	This DTC sets when the FRT voltage is higher than expected.		
Possible Causes:	- FRT circuit open - FRT circuit short to voltage - Damaged fuel pressure and temperature sensor connection - Damaged fuel pressure and temperature sensor		
Diagnostic Aids:	Monitor the FRT voltage and temperature PIDs on a scan tool to isolate an open or short circuit from the system concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MC .		

P0184 - Fuel Temperature Sensor A Circuit Intermittent

Description:	This DTC sets when the FRT signal to the PCM is intermittent or erratic.		
Possible Causes:	- FRT circuit intermittently open - Damaged harness connector - Damaged harness - Damaged FRT sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MC .		

P0191 - Fuel Rail Pressure Sensor Circuit Range/Performance (Bank 1)

Description:	This DTC sets when the fuel pressure falls below or exceeds a minimum or maximum calibrated value for a calibrated period of time.		
Possible Causes:	- High fuel pressure system - Fuel pressure control valve stuck closed - Damaged FRP sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		

	Monitor the FRP PID with the ignition ON, engine running. The correct FRP is between 34.47 MPa (5000 psi) and 48.26 MPa (7000 psi).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0192 - Fuel Rail Pressure Sensor Circuit Low (Bank 1)

Description:	This DTC sets when the FRP voltage is lower than expected.		
Possible Causes:	• FRP circuit short to ground • FRP circuit short to SIGRTN circuit • Damaged FRP sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Verify the VREF voltage at the FRP sensor is between 4.5 and 5.5 volts with the ignition ON, engine OFF.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MB .		

P0193 - Fuel Rail Pressure Sensor Circuit High (Bank 1)

Description:	This DTC sets when the FRP voltage is higher than expected.		
Possible Causes:	• FRP circuit open • FRP circuit short to voltage • FRP circuit short to VREF circuit • SIGRTN circuit open • VREF circuit open • VREF circuit short to SIGRTN circuit • VREF circuit short to ground • Damaged FRP sensor connector • Damaged FRP sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Verify the VREF voltage at the FRP sensor is between 4.5 and 5.5 volts with the ignition ON, engine OFF.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MB .		

P0194 - Fuel Rail Pressure Sensor A Circuit Intermittent/Erratic

Description:	This DTC sets when the FRP voltage is intermittent or erratic.		
Possible Causes:	• FRP circuit open		

	• FRP circuit short to voltage • FRP circuit short to VREF circuit • SIGRTN circuit open • VREF circuit open • VREF circuit short to SIGRTN circuit • VREF circuit short to ground • Damaged FRP sensor connector • Damaged FRP sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center. Monitor the FRP PID with the ignition ON, engine running. Check for an intermittent or erratic FRP sensor voltage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MB .		

P0195 - Engine Oil Temperature Sensor Circuit

Description:	This DTC sets when the engine oil temperature (EOT) sensor is not within the PCM predicted engine oil temperature range, based on other PCM inputs.		
Possible Causes:	• SIGRTN circuit open • SIGRTN circuit short to voltage • EOT circuit open • EOT circuit short to ground • EOT circuit short to voltage • Cooling system concern • Stuck thermostat • Damaged EOT sensor		
Diagnostic Aids:	The EOT rationality test looks for the EOT sensor value to be within a calibrated parameter of the PCM predicted engine oil temperature. Make sure the EOT sensor reading is similar to 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 L .		

P0196 - Engine Oil Temperature Sensor Circuit Range/Performance

Description:	This DTC sets when the engine oil temperature (EOT) sensor is not within the PCM predicted engine oil temperature range, based on other PCM inputs.		
Possible Causes:	• SIGRTN circuit open • SIGRTN circuit short to voltage • EOT circuit open • EOT circuit short to ground • EOT circuit short to voltage • Engine not at operating temperature • Cooling system concern • Stuck thermostat • Damaged EOT sensor		
Diagnostic	The EOT rationality test looks for the EOT sensor value to be within a calibrated parameter of the PCM		

Aids:	predicted engine oil temperature. Make sure the EOT sensor reading is similar to 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 L .		

P0197 - Engine Oil Temperature Sensor Circuit Low

Description:	This DTC sets when the engine oil temperature (EOT) sensor signal voltage is low.		
Possible Causes:	• EOT circuit short to ground • Damaged EOT harness • Damaged EOT harness connector • Damaged EOT sensor		
Diagnostic Aids:	An EOT 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 L .		

P0198 - Engine Oil Temperature Sensor Circuit High

Description:	This DTC sets when the engine oil temperature (EOT) sensor signal voltage is high.		
Possible Causes:	• EOT circuit short to voltage • EOT circuit open • SIGRTN circuit open • Damaged EOT harness • Damaged EOT harness connector • Damaged EOT sensor		
Diagnostic Aids:	An EOT PID reading greater than 4.76 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 L .		

P01C4 - Fuel Pressure Sensor A Circuit Range/Performance

Description:	This DTC sets when the FLP circuit voltage is not within a predicted range.		
Possible Causes:	• FLP circuit open • FLP circuit short to ground • FLP circuit short to voltage • Damaged fuel pressure and temperature sensor		
Diagnostic Aids:			

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

P01C5 - Fuel Pressure Sensor A Circuit Low

Description:	This DTC sets when the FLP circuit voltage is lower than a calibrated threshold.		
Possible Causes:	- FLP circuit short to ground - Damaged fuel pressure and temperature sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MD .		

P01C6 - Fuel Pressure Sensor A Circuit High

Description:	This DTC sets when the FLP circuit voltage is higher than a calibrated threshold.		
Possible Causes:	- FLP circuit open - FLP circuit short to voltage - Damaged fuel pressure and temperature sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MD .		

P0200 - Injector Circuit

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	- INJ circuit open - INJRTN circuit open - INJ circuit high resistance - INJRTN circuit high resistance - Damaged fuel injector connector - Damaged fuel injector - Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0201 - Cylinder 1 Injector A Circuit/Open

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ1 circuit open • INJ1RTN circuit open • INJ1 circuit high resistance • INJ1RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0202 - Cylinder 2 Injector A Circuit/Open

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ2 circuit open • INJ2RTN circuit open • INJ2 circuit high resistance • INJ2RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0203 - Cylinder 3 Injector A Circuit/Open

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ3 circuit open • INJ3RTN circuit open • INJ3 circuit high resistance • INJ3RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0204 - Cylinder 4 Injector A Circuit/Open

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ4 circuit open • INJ4RTN circuit open • INJ4 circuit high resistance • INJ4RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0205 - Cylinder 5 Injector A Circuit/Open

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ5 circuit open • INJ5RTN circuit open • INJ5 circuit high resistance • INJ5RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0206 - Cylinder 6 Injector A Circuit/Open

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ6 circuit open • INJ6RTN circuit open • INJ6 circuit high resistance • INJ6RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test P .
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P0207 - Cylinder 7 Injector A Circuit/Open

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ7 circuit open • INJ7RTN circuit open • INJ7 circuit high resistance • INJ7RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0208 - Cylinder 8 Injector A Circuit/Open

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ8 circuit open • INJ8RTN circuit open • INJ8 circuit high resistance • INJ8RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0219 - Engine Over Speed Condition

Description:	This DTC sets when 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 PCM. For additional information on the engine RPM limiter, refer to Section 1, Powertrain Control Software.		
Possible Causes:	• Wheel slippage (water, ice, mud, and snow) • Excessive engine RPM in NEUTRAL or operated in the incorrect transmission gear		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. If any other DTCs are present, disregard DTC P0219 at this time. Diagnose any other DTCs first. If there are no other symptoms, return the vehicle to the customer with information about the DTC.		

	If a symptom is present, refer to Section 3, No Diagnostic Trouble Codes (DTCs) Present Symptom Chart Index .		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0230 - Fuel Pump Primary Circuit

Description:	This DTC sets if the FPC circuit voltage is less than or greater than a calibrated limit, for a calibrated amount of time. With the fuel pump (FP) commanded ON, the PCM is able to detect an open, a short to ground or a short to voltage on the FPC circuit.		
Possible Causes:	- FPC circuit open or short to ground - FPC circuit short to voltage - VPWR circuit to the fuel pump control module open - Damaged fuel pump control module relay - Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0231 - Fuel Pump Secondary Circuit Low

Description:	If the FPM circuit is fixed at a low voltage, the PCM begins to increment a counter. This DTC sets when the PCM is still not detecting a duty cycled signal on the FPM circuit after a calibrated amount of time.		
Possible Causes:	- FPM circuit open or short to ground - VPWR circuit open - GND circuit open - Damaged fuel pump control module relay - Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0232 - Fuel Pump Secondary Circuit High

Description:	If the FPM circuit is fixed at a high voltage, the PCM begins to increment a counter. This DTC sets when the PCM is still not detecting a duty cycled signal on the FPM circuit after a calibrated amount of time.		
Possible Causes:	- FPM circuit short to voltage - VPWR circuit open - GND circuit open		

	- Damaged fuel pump control module relay - Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0234 - Turbocharger/Supercharger A Overboost Condition

Description:	This DTC sets when the indicated boost pressure is greater than the desired boost pressure by greater than a calibrated threshold.		
Possible Causes:	- The manifold absolute pressure (MAP) sensor is out of range high - Damaged turbocharger actuator - Turbocharger vanes sticking		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P0236 - Turbocharger/Supercharger Boost Sensor A Circuit Range/Performance

Description:	This DTC sets when either of the following conditions are present. When the EP PID value does not correlate with the BARO PID value and the MAP PID value at ignition ON, engine OFF. When the EP PID value does not correlate with the BARO PID value at idle and the exhaust pressure (EP) sensor and the manifold absolute pressure (MAP) sensor fail to correlate while driving.		
Possible Causes:	- Damaged exhaust pressure (EP) sensor - Contaminated or restricted EP sensor - Slow responding EP sensor - Damaged turbocharger		
Diagnostic Aids:	Check the intake air system for leaks and restrictions. This DTC may be accompanied by other DTCs. Check for other DTCs and diagnose those first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P0237 - Turbocharger/Supercharger Boost Sensor A Circuit Low

Description:	This DTC sets when the VGTP circuit voltage is less than the expected value.		
Possible Causes:	- VGTP circuit short to ground - VREF circuit open		

	• VREF circuit short to ground • Damaged variable geometry turbocharger (VGT) actuator		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P0238 - Turbocharger/Supercharger Boost Sensor A Circuit High

Description:	This DTC sets when the VGTP circuit voltage is greater than a calibrated limit for a specified amount of time.		
Possible Causes:	• VGTP circuit short to voltage • VREF circuit short to voltage • Damaged variable geometry turbocharger (VGT) actuator		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P023A - Charge Air Cooler Coolant Pump Control Circuit/Open

Description:	This DTC sets when the CACCP circuit is open or an internal failure of the Charge Air Cooler Coolant Pump CACCP occurs.		
Possible Causes:	• CACCP circuit open • Damaged CACCP		
Diagnostic Aids:	A CACCP circuit open condition will result in the CACCP running continuously.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KP .		

P023B - Charge Air Cooler Coolant Pump Control Circuit Low

Description:	This DTC sets when the CACCP circuit is shorted to ground or an internal failure of the Charge Air Cooler Coolant Pump (CACCP) occurs.		
Possible Causes:	• CACCP circuit short to ground • Damaged CACCP		
Diagnostic			

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

P023C - Charge Air Cooler Coolant Pump Control Circuit High

Description:	This DTC sets when the CACCP circuit is shorted to voltage or an internal failure of the Charge Air Cooler Coolant Pump (CACCP) occurs.		
Possible Causes:	• CACCP circuit short to voltage • Damaged CACCP		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KP .		

P025A - Fuel Pump Module A Control Circuit/Open

Description:	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. This DTC sets when the PCM detects the FPC circuit is open or shorted to voltage or ground.		
Possible Causes:	• FPC circuit open or short to ground • FPC circuit short to voltage • Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P025C - Fuel Pump Module A Control Circuit Low

Description:	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. This DTC sets when the PCM detects the FPC circuit is shorted to ground.		
Possible Causes:	• FPC circuit short to ground • Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All | GO to Pinpoint Test [MA](#).**P025D - Fuel Pump Module A Control Circuit High**

Description:	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. This DTC sets when the PCM detects the FPC circuit is open or shorted to voltage.		
Possible Causes:	• FPC circuit open or short to voltage • Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0261 - Cylinder 1 Injector A Circuit Low

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ1 circuit open • INJ1RTN circuit open • INJ1 circuit short to ground • INJ1 circuit high resistance • INJ1RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0262 - Cylinder 1 Injector A Circuit High

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ1 circuit short to voltage • INJ1RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0263 - Cylinder 1 Contribution/Balance

Description:	The PCM monitors the crankshaft speed and acceleration for each cylinder event. This DTC sets when the acceleration rate of the crankshaft is greater than or less than the calibrated value.		
Possible Causes:	• Base engine concerns • Damaged valve train assembly • Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0264 - Cylinder 2 Injector A Circuit Low

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ2 circuit open • INJ2RTN circuit open • INJ2 circuit short to ground • INJ2 circuit high resistance • INJ2RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0265 - Cylinder 2 Injector A Circuit High

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ2 circuit short to voltage • INJ2RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0266 - Cylinder 2 Contribution/Balance

Description:	The PCM monitors the crankshaft speed and acceleration for each cylinder event. This DTC sets when the acceleration rate of the crankshaft is greater than or less than the calibrated value.		
Possible Causes:	• Base engine concerns • Damaged valve train assembly • Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0267 - Cylinder 3 Injector A Circuit Low

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ3 circuit open • INJ3RTN circuit open • INJ3 circuit short to ground • INJ3 circuit high resistance • INJ3RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0268 - Cylinder 3 Injector A Circuit High

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ3 circuit short to voltage • INJ3RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0269 - Cylinder 3 Contribution/Balance

Description:	The PCM monitors the crankshaft speed and acceleration for each cylinder event. This DTC sets when the acceleration rate of the crankshaft is greater than or less than the calibrated value.		
Possible Causes:	• Base engine concerns • Damaged valve train assembly • Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P026A - Charge Air Cooler Efficiency Below Threshold

Description:	This DTC sets when the PCM detects that the modeled charge air cooler efficiency differs from the measured charge air cooler efficiency by greater than a calibrated value for 10 seconds.		
Possible Causes:	• Low charge air cooler (CAC) coolant level • Restricted CAC • Restricted CAC coolant inlet hose • Restricted CAC coolant outlet hose		
Diagnostic Aids:	Check the CAC system for low fluid level, cracked, restricted or misrouted coolant lines, cracked or restricted heat exchanger.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test FB .		

P026E - Charge Air Cooler Coolant Pump A Performance

Description:	The PCM monitors the Charge Air Cooler Coolant Pump (CACCP) circuit for the presence of a signal. If the signal is outside the calibrated limits the PCM will set this DTC after a calibrated amount of time.		
Possible Causes:	• Incorrect CACCP harness connection • CACCP circuit open or short to ground • CACCP circuit short to voltage • Damaged CACCP		
Diagnostic Aids:	Check the CACCP harness connection. Check for proper cooling system operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KP .		

P0270 - Cylinder 4 Injector A Circuit Low

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ4 circuit open • INJ4RTN circuit open • INJ4 circuit short to ground • INJ4 circuit high resistance • INJ4RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0271 - Cylinder 4 Injector A Circuit High

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ4 circuit short to voltage • INJ4RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0272 - Cylinder 4 Contribution/Balance

Description:	The PCM monitors the crankshaft speed and acceleration for each cylinder event. This DTC sets when the acceleration rate of the crankshaft is greater than or less than the calibrated value.		
Possible Causes:	• Base engine concerns • Damaged valve train assembly • Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0273 - Cylinder 5 Injector A Circuit Low

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ5 circuit open • INJ5RTN circuit open • INJ5 circuit short to ground • INJ5 circuit high resistance • INJ5RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0274 - Cylinder 5 Injector A Circuit High

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ5 circuit short to voltage • INJ5RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0275 - Cylinder 5 Contribution/Balance

Description:	The PCM monitors the crankshaft speed and acceleration for each cylinder event. This DTC sets when the acceleration rate of the crankshaft is greater than or less than the calibrated value.		
Possible Causes:	• Base engine concerns • Damaged valve train assembly • Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0276 - Cylinder 6 Injector A Circuit Low

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ6 circuit open • INJ6RTN circuit open • INJ6 circuit short to ground • INJ6 circuit high resistance • INJ6RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0277 - Cylinder 6 Injector A Circuit High

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ6 circuit short to voltage • INJ6RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0278 - Cylinder 6 Contribution/Balance

Description:	The PCM monitors the crankshaft speed and acceleration for each cylinder event. This DTC sets when the acceleration rate of the crankshaft is greater than or less than the calibrated value.		
Possible Causes:	• Base engine concerns • Damaged valve train assembly • Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0279 - Cylinder 7 Injector A Circuit Low

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ7 circuit open • INJ7RTN circuit open • INJ7 circuit short to ground • INJ7 circuit high resistance • INJ7RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P027A - Fuel Pump Module B Control Circuit/Open

Description:	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. This DTC sets when the PCM detects the FPC circuit is open or shorted to voltage or ground.		
Possible Causes:	• FPC circuit open or short to ground • FPC circuit short to voltage • Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P027C - Fuel Pump Module B Control Circuit Low

Description:	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. This DTC sets when the PCM detects the FPC circuit is shorted to ground.		
Possible Causes:	• FPC circuit short to ground • Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P027D - Fuel Pump Module B Control Circuit High

Description:	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. This DTC sets when the PCM detects the FPC circuit is open or shorted to voltage.		
Possible Causes:	- FPC circuit open or short to voltage - Damaged fuel pump control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0280 - Cylinder 7 Injector A Circuit High

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	- INJ7 circuit short to voltage - INJ7RTN circuit short to voltage - Damaged fuel injector connector - Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0281 - Cylinder 7 Contribution/Balance

Description:	The PCM monitors the crankshaft speed and acceleration for each cylinder event. This DTC sets when the acceleration rate of the crankshaft is greater than or less than the calibrated value.		
Possible Causes:	- Base engine concerns - Damaged valve train assembly - Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0282 - Cylinder 8 Injector A Circuit Low

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ8 circuit open • INJ8RTN circuit open • INJ8 circuit short to ground • INJ8 circuit high resistance • INJ8RTN circuit high resistance • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0283 - Cylinder 8 Injector A Circuit High

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ8 circuit short to voltage • INJ8RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P0284 - Cylinder 8 Contribution/Balance

Description:	The PCM monitors the crankshaft speed and acceleration for each cylinder event. This DTC sets when the acceleration rate of the crankshaft is greater than or less than the calibrated value.		
Possible Causes:	• Base engine concerns • Damaged valve train assembly • Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0299 - Turbocharger/Supercharger A Underboost Condition

Description:	This DTC sets when the PCM detects that the control effort to maintain the desired boost pressure is 10% greater than the calibrated threshold.		
Possible Causes:	• Turbocharger vanes sticking • Air leak between turbocharger and throttle • Charge air cooler (CAC) restriction		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check tubing for obstructions, cracks and incorrect fitting connections.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P029A - Cylinder 1 - Fuel Trim At Max Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	• Damaged fuel injector • Base engine concerns • Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P029B - Cylinder 1 - Fuel Trim At Min Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	• Damaged fuel injector • Base engine concerns • Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P029D - Cylinder 1 - Injector Leaking

Description:	This DTC sets when a leaking fuel injector for the corresponding cylinder is detected.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Check for other PCM DTCs or PCM related symptoms and diagnose those first. If no other PCM DTCs or PCM related symptoms are present, clear the DTCs and repeat the self-test. If this DTC is retrieved again, install a new fuel injector. Refer to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. Repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P029E - Cylinder 2 - Fuel Trim At Max Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	- Damaged fuel injector - Base engine concerns - Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P029F - Cylinder 2 - Fuel Trim At Min Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	- Damaged fuel injector - Base engine concerns - Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02A1 - Cylinder 2 - Injector Leaking

Description:	This DTC sets when a leaking fuel injector for the corresponding cylinder is detected.		
Possible Causes:	Damaged fuel injector		
Diagnostic	Check for other PCM DTCs or PCM related symptoms and diagnose those first. If no other PCM DTCs or		

Aids:	PCM related symptoms are present, clear the DTCs and repeat the self-test. If this DTC is retrieved again, install a new fuel injector. Refer to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. Repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P02A2 - Cylinder 3 - Fuel Trim At Max Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	• Damaged fuel injector • Base engine concerns • Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02A3 - Cylinder 3 - Fuel Trim At Min Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	• Damaged fuel injector • Base engine concerns • Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02A5 - Cylinder 3 - Injector Leaking

Description:	This DTC sets when a leaking fuel injector for the corresponding cylinder is detected.		
Possible Causes:	• Damaged fuel injector		
Diagnostic Aids:	Check for other PCM DTCs or PCM related symptoms and diagnose those first. If no other PCM DTCs or PCM related symptoms are present, clear the DTCs and repeat the self-test. If this DTC is retrieved again, install a new fuel injector. Refer to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. Repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P02A6 - Cylinder 4 - Fuel Trim At Max Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	• Damaged fuel injector • Base engine concerns • Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02A7 - Cylinder 4 - Fuel Trim At Min Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	• Damaged fuel injector • Base engine concerns • Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02A9 - Cylinder 4 - Injector Leaking

Description:	This DTC sets when a leaking fuel injector for the corresponding cylinder is detected.		
Possible Causes:	• Damaged fuel injector		
Diagnostic Aids:	Check for other PCM DTCs or PCM related symptoms and diagnose those first. If no other PCM DTCs or PCM related symptoms are present, clear the DTCs and repeat the self-test. If this DTC is retrieved again, install a new fuel injector. Refer to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. Repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P02AA - Cylinder 5 - Fuel Trim At Max Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	• Damaged fuel injector • Base engine concerns • Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02AB - Cylinder 5 - Fuel Trim At Min Limit

Description:	This DTC sets when the absolute value of the filtered ratio of error in fueling exceeds a calibrated limit.		
Possible Causes:	• Damaged fuel injector • Base engine concerns • Damaged fuel volume control valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02AD - Cylinder 5 - Injector Leaking

Description:	This DTC sets when a leaking fuel injector for the corresponding cylinder is detected.		
Possible Causes:	• Damaged fuel injector		
Diagnostic Aids:	Check for other PCM DTCs or PCM related symptoms and diagnose those first. If no other PCM DTCs or PCM related symptoms are present, clear the DTCs and repeat the self-test. If this DTC is retrieved again, install a new fuel injector. Refer to the Workshop Manual Section 303-04, Fuel Charging and Controls. Clear the PCM DTCs. Repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P02CC - Cylinder 1 Fuel Injector Offset Learning At Min Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	• Damaged fuel injector • Front end accessory drive components		

		• Drive line concerns	
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02CD - Cylinder 1 Fuel Injector Offset Learning At Max Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its maximum learning limit.		
Possible Causes:	• Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02CE - Cylinder 2 Fuel Injector Offset Learning At Min Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	• Damaged fuel injector • Front end accessory drive components • Drive line concerns		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02CF - Cylinder 2 Fuel Injector Offset Learning At Max Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its maximum learning limit.		
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Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D0 - Cylinder 3 Fuel Injector Offset Learning At Min Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	- Damaged fuel injector - Front end accessory drive components - Drive line concerns		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D1 - Cylinder 3 Fuel Injector Offset Learning At Max Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its maximum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D2 - Cylinder 4 Fuel Injector Offset Learning At Min Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
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Possible Causes:	- Damaged fuel injector - Front end accessory drive components - Drive line concerns		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D3 - Cylinder 4 Fuel Injector Offset Learning At Max Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its maximum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D4 - Cylinder 5 Fuel Injector Offset Learning At Min Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	- Damaged fuel injector - Front end accessory drive components - Drive line concerns		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D5 - Cylinder 5 Fuel Injector Offset Learning At Max Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction		
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	factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its maximum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D6 - Cylinder 6 Fuel Injector Offset Learning At Min Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	- Damaged fuel injector - Front end accessory drive components - Drive line concerns		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D7 - Cylinder 6 Fuel Injector Offset Learning At Max Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its maximum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D8 - Cylinder 7 Fuel Injector Offset Learning At Min Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine		
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	operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	• Damaged fuel injector • Front end accessory drive components • Drive line concerns		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02D9 - Cylinder 7 Fuel Injector Offset Learning At Max Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its maximum learning limit.		
Possible Causes:	• Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02DA - Cylinder 8 Fuel Injector Offset Learning At Min Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	• Damaged fuel injector • Front end accessory drive components • Drive line concerns		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02DB - Cylinder 8 Fuel Injector Offset Learning At Max Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its maximum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P02E0 - Diesel Intake Air Flow A Control Circuit/Open

Description:	This DTC sets when a concern with the intake throttle actual position versus the desired position is detected.		
Possible Causes:	- TACM+ circuit open - TACM- circuit open - Intake throttle actuator binding - Damaged intake throttle actuator		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P02E1 - Diesel Intake Air Flow Control Performance

Description:	This DTC sets when the PCM detects a concern with the intake throttle position versus the desired position, the throttle does not return to the open position when commanded or a broken return spring concern is present.		
Possible Causes:	Damaged intake throttle actuator		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check the intake throttle for a damaged return spring.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P02E2 - Diesel Intake Air Flow Control Circuit Low

Description:	This DTC sets when the PCM detects a short to ground in the TACM+ or TACM- circuit.		
Possible Causes:	• TACM+ circuit short to ground • TACM- circuit short to ground • Damaged intake throttle actuator		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P02E3 - Diesel Intake Air Flow Control Circuit High

Description:	This DTC sets when the PCM detects a short in the TACM+ circuit or the TACM- circuit.		
Possible Causes:	• TACM+ circuit short to ground • TACM- circuit short to voltage • Damaged intake throttle actuator		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P02E4 - Diesel Intake Air Flow A Control Stuck Open

Description:	This DTC sets when a concern with the intake throttle position versus the desired position is detected or the throttle is stuck open when commanded closed.		
Possible Causes:	• Damaged intake throttle actuator		
Diagnostic Aids:	Check for an intake throttle actuator stuck or binding concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P02E8 - Diesel Intake Air Flow Position Sensor Circuit Low

Description:	This DTC sets when the PCM detects a concern with the intake throttle actuator position circuitry.		
Possible Causes:	• TP circuit short to ground • Damaged intake throttle actuator		

Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P02E9 - Diesel Intake Air Flow Position Sensor Circuit High

Description:	This DTC sets when the PCM detects a concern with the intake throttle actuator position circuitry.		
Possible Causes:	• SIGRTN circuit open • TP circuit short to voltage • Damaged intake throttle actuator		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P02EC - Diesel Intake Airflow Control System - High Air Flow Detected

Description:	This DTC sets when the desired mass airflow versus the actual mass airflow measured from the mass airflow (MAF) sensor is outside a calibrated limit.		
Possible Causes:	• Aftermarket intake air system • Aftermarket exhaust system • Intake air system restriction • Exhaust system restriction • Turbocharger system concern • Damaged intake throttle actuator • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Diagnose all other powertrain related DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P02ED - Diesel Intake Airflow Control System - Low Air Flow Detected

Description:	This DTC sets when the desired mass airflow versus the actual mass airflow measured from the mass airflow (MAF) sensor is outside a calibrated limit.		
Possible			

Causes:	• Aftermarket intake air system • Aftermarket exhaust system • Intake air system restriction • Exhaust system restriction • Turbocharger system concern • Damaged intake throttle actuator • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Diagnose all other powertrain related DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P02EE - Cylinder 1 Injector Circuit Range/Performance

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ1 circuit open • INJ1 circuit short to ground • INJ1RTN circuit open • INJ1RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P02EF - Cylinder 2 Injector Circuit Range/Performance

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ2 circuit open • INJ2 circuit short to ground • INJ2RTN circuit open • INJ2RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P02F0 - Cylinder 3 Injector Circuit Range/Performance

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ3 circuit open • INJ3 circuit short to ground • INJ3RTN circuit open • INJ3RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P02F1 - Cylinder 4 Injector Circuit Range/Performance

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ4 circuit open • INJ4 circuit short to ground • INJ4RTN circuit open • INJ4RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P02F2 - Cylinder 5 Injector Circuit Range/Performance

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ5 circuit open • INJ5 circuit short to ground • INJ5RTN circuit open • INJ5RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P02F3 - Cylinder 6 Injector Circuit Range/Performance

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ6 circuit open • INJ6 circuit short to ground • INJ6RTN circuit open • INJ6RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P02F4 - Cylinder 7 Injector Circuit Range/Performance

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ7 circuit open • INJ7 circuit short to ground • INJ7RTN circuit open • INJ7RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P02F5 - Cylinder 8 Injector Circuit Range/Performance

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ8 circuit open • INJ8 circuit short to ground • INJ8RTN circuit open • INJ8RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P02FA - Diesel Intake Air Flow Position Sensor Minimum/Maximum Stop Performance

Description:	This DTC sets when the PCM detects a concern with the intake throttle offset learn. When the intake throttle offset learn is greater than the expected intake throttle offset a concern is indicated.		
Possible Causes:	• Damaged intake throttle position sensor • Binding or obstruction of intake throttle plate		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check the intake throttle for any binding or obstructions.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P0300 - Random Misfire Detected

Description:	This DTC sets when there is a full loss of combustion for a calibrated amount of time in greater than 1 cylinder.		
Possible Causes:	• Fuel concern • Damaged fuel injector • Damaged high pressure fuel injection pump • Base engine		
Diagnostic Aids:	Access the PCM and record the freeze frame data. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AR .		

P0301 - Cylinder 1 Misfire Detected

Description:	The PCM continuously monitors the crankshaft speed and acceleration for each cylinder event. When the deceleration is detected the PCM uses the crankshaft position (CKP) and the camshaft position (CMP) signal information to determine which cylinder misfired. This DTC sets when the misfire event occurred in the cylinder due to a poor cylinder compression, fuel delivery concern or mechanical engine concern.		
Possible Causes:	• Damaged fuel injector • Base engine concerns		
Diagnostic Aids:	Access the freeze frame data (if available) and record the DTC conditions. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set. A cylinder contribution DTC may also be present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AR .		

P0302 - Cylinder 2 Misfire Detected

Description:	The PCM continuously monitors the crankshaft speed and acceleration for each cylinder event. When the deceleration is detected the PCM uses the crankshaft position (CKP) and the camshaft position (CMP) signal information to determine which cylinder misfired. This DTC sets when the misfire event occurred in the cylinder due to a poor cylinder compression, fuel delivery concern or mechanical engine concern.		
Possible Causes:	• Damaged fuel injector • Base engine concerns		
Diagnostic Aids:	Access the freeze frame data (if available) and record the DTC conditions. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set. A cylinder contribution DTC may also be present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AR .		

P0303 - Cylinder 3 Misfire Detected

Description:	The PCM continuously monitors the crankshaft speed and acceleration for each cylinder event. When the deceleration is detected the PCM uses the crankshaft position (CKP) and the camshaft position (CMP) signal information to determine which cylinder misfired. This DTC sets when the misfire event occurred in the cylinder due to a poor cylinder compression, fuel delivery concern or mechanical engine concern.		
Possible Causes:	• Damaged fuel injector • Base engine concerns		
Diagnostic Aids:	Access the freeze frame data (if available) and record the DTC conditions. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set. A cylinder contribution DTC may also be present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AR .		

P0304 - Cylinder 4 Misfire Detected

Description:	The PCM continuously monitors the crankshaft speed and acceleration for each cylinder event. When the deceleration is detected the PCM uses the crankshaft position (CKP) and the camshaft position (CMP) signal information to determine which cylinder misfired. This DTC sets when the misfire event occurred in the cylinder due to a poor cylinder compression, fuel delivery concern or mechanical engine concern.		
Possible Causes:	• Damaged fuel injector • Base engine concerns		
Diagnostic Aids:	Access the freeze frame data (if available) and record the DTC conditions. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set. A cylinder contribution DTC may also be present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test AR .
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P0305 - Cylinder 5 Misfire Detected

Description:	The PCM continuously monitors the crankshaft speed and acceleration for each cylinder event. When the deceleration is detected the PCM uses the crankshaft position (CKP) and the camshaft position (CMP) signal information to determine which cylinder misfired. This DTC sets when the misfire event occurred in the cylinder due to a poor cylinder compression, fuel delivery concern or mechanical engine concern.		
Possible Causes:	- Damaged fuel injector - Base engine concerns		
Diagnostic Aids:	Access the freeze frame data (if available) and record the DTC conditions. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set. A cylinder contribution DTC may also be present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AR .		

P0306 - Cylinder 6 Misfire Detected

Description:	The PCM continuously monitors the crankshaft speed and acceleration for each cylinder event. When the deceleration is detected the PCM uses the crankshaft position (CKP) and the camshaft position (CMP) signal information to determine which cylinder misfired. This DTC sets when the misfire event occurred in the cylinder due to a poor cylinder compression, fuel delivery concern or mechanical engine concern.		
Possible Causes:	- Damaged fuel injector - Base engine concerns		
Diagnostic Aids:	Access the freeze frame data (if available) and record the DTC conditions. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set. A cylinder contribution DTC may also be present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AR .		

P0307 - Cylinder 7 Misfire Detected

Description:	The PCM continuously monitors the crankshaft speed and acceleration for each cylinder event. When the deceleration is detected the PCM uses the crankshaft position (CKP) and the camshaft position (CMP) signal information to determine which cylinder misfired. This DTC sets when the misfire event occurred in the cylinder due to a poor cylinder compression, fuel delivery concern or mechanical engine concern.		
Possible Causes:	- Damaged fuel injector - Base engine concerns		
Diagnostic Aids:	Access the freeze frame data (if available) and record the DTC conditions. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set. A cylinder contribution DTC may also be present.		

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

P0308 - Cylinder 8 Misfire Detected

Description:	The PCM continuously monitors the crankshaft speed and acceleration for each cylinder event. When the deceleration is detected the PCM uses the crankshaft position (CKP) and the camshaft position (CMP) signal information to determine which cylinder misfired. This DTC sets when the misfire event occurred in the cylinder due to a poor cylinder compression, fuel delivery concern or mechanical engine concern.		
Possible Causes:	• Damaged fuel injector • Base engine concerns		
Diagnostic Aids:	Access the freeze frame data (if available) and record the DTC conditions. The misfire freeze frame data may be used to determine the operating conditions when the misfire DTC was set. A cylinder contribution DTC may also be present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AR .		

P0315 - Crankshaft Position System Variation Not Learned

Description:	The PCM has not learned the crankshaft pulse wheel tooth spacing. This DTC disables the misfire monitor.		
Possible Causes:	• 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 D .		

P0335 - Crankshaft Position Sensor A Circuit

Description:	This DTC sets when the crankshaft position (CKP) sensor signal is missing for greater than a calibrated number of camshaft revolutions.		
Possible Causes:	• CKP circuit open • CKP circuit short to ground • CKP circuit short to voltage • SIGRTN circuit open • VREF circuit open • Damaged CKP sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until		

	the system warning message has cleared from the instrument cluster message center. Monitor the RPM PID while cranking the engine. A value of 0 RPM indicates a CKP concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test D .		

P0336 - Crankshaft Position Sensor A Circuit Range/Performance

Description:	This DTC sets when the input signal to the PCM from the crankshaft position (CKP) sensor is erratic.		
Possible Causes:	• CKP circuit noise • Damaged CKP sensor connection • Damaged CKP sensor • Damaged crankshaft pulse wheel		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Monitor the RPM PID while cranking the engine. A value of 0 RPM indicates a CKP concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test D .		

P0339 - Crankshaft Position Sensor A Circuit Intermittent

Description:	This DTC sets when several erratic profile ignition pickup (PIP) pulses have occurred in the crankshaft position (CKP) sensor signal within a calibrated time period or when the camshaft speed exceeds the equivalent speed of engine idle or the starter motor is engaged.		
Possible Causes:	• CKP circuit intermittent open • CKP circuit intermittent short to ground • CKP circuit intermittent short to voltage • VREF circuit intermittent open • VREF circuit intermittent short to ground • VREF circuit intermittent short to voltage • SIGRTN circuit intermittent open • SIGRTN circuit intermittent short to ground • SIGRTN circuit intermittent short to voltage • CKP sensor incorrectly installed • Damaged CKP sensor • Incorrect, damaged or corroded connections • Arcing relays or other high current devices (cooling fan or starter motor) • On board 2 way radio transceiver • Radio frequency interference or electromagnetic interference from an external source • Improperly grounded high power aftermarket equipment		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test D .		

P033F - Crankshaft/Camshaft Loss Of Synchronization

Description:	This DTC sets when the input signal from the crankshaft position (CKP) sensor or the camshaft position (CMP) sensor is erratic.		
Possible Causes:	• 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 D .		

P0340 - Camshaft Position Sensor A Circuit (Bank 1 Or Single Sensor)

Description:	This DTC sets when the PCM can no longer detect the signal from the camshaft position 11 (CMP11) sensor.		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged CMP11 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test V .		

P0341 - Camshaft Position Sensor A Circuit Range/Performance (Bank 1 Or Single Sensor)

Description:	The PCM monitors the camshaft position 11 (CMP11) sensor and crankshaft position (CKP) sensor signals during engine cranking. This DTC sets when the CMP11 signal is inactive while the CKP signal indicates the engine is rotating. The PCM also monitors the CMP11 sensor signal for electrical noise. This DTC sets when the electrical noise exceeds the calibrated threshold.		
Possible Causes:	• CMP11 circuit noise • CMP11 circuit open • CMP11 circuit short to ground • CMP11 circuit short to voltage • Corrosion • Incorrect connection • Damaged CMP11 sensor • Damaged flexplate		
Diagnostic Aids:	Monitor the CMP_F PID while cranking the engine.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All [GO to Pinpoint Test V.](#)**P0342 - Camshaft Position Sensor A Circuit Low (Bank 1 Or Single Sensor)**

Description:	This DTC sets when the PCM detects an open or a short to ground on the CMP11 circuit.		
Possible Causes:	• CMP11 circuit open • CMP11 circuit short to ground • Damaged CMP11 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test V.		

P0343 - Camshaft Position Sensor A Circuit High (Bank 1 Or Single Sensor)

Description:	This DTC sets when the PCM detects the CMP11 circuit signal is beyond the minimum or maximum calibrated limit.		
Possible Causes:	• CMP11 circuit noise • CMP11 circuit open • CMP11 circuit short to ground • CMP11 circuit short to voltage • Corrosion • Incorrect connection • Damaged CMP11 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test V.		

P034B - Crankshaft Position Sensor - Crankshaft Direction Incorrect

Description:	This DTC sets when the saved engine stop position and the detected engine start position differ by greater than 9 degrees, during engine restart in auto start stop mode. The engine position information is discarded and a camshaft position (CMP) sensor, crankshaft position (CKP) sensor synchronization process is carried out resulting in a longer restart condition in auto start stop mode.		
Possible Causes:	• CKP circuit noise • Damaged CKP sensor connection • CKP sensor incorrectly installed • Damaged crankshaft pulse wheel • Damaged CKP sensor		
Diagnostic Aids:	This DTC may be accompanied by other CKP sensor DTCs. Diagnose all other CKP sensor DTCs first. If no other CKP sensor DTCs are present, continue to follow diagnosis for this DTC.		

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

P0381 - Glow Plug/Heater Indicator Control Circuit/Open

Description:			
Possible Causes:			
Diagnostic Aids: Refer to the Workshop Manual Section 413-01 Instrumentation, Message Center, and Warning Chimes to diagnose the wait to start indicator is never/always on 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.		

P0384 - Glow Plug Control Module 1 Control Circuit High

Description: The glow plug control module (GPCM) monitors the system supply voltage. This DTC sets when the GPCM detects an over voltage condition.			
Possible Causes: • VBATT circuit short to voltage • Damaged GPCM			
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0401 - EGR A Flow Insufficient Detected

Description: This DTC sets when the pressure ratio of the manifold absolute pressure (MAP) sensor signal and the exhaust pressure (EP) sensor signal across the EGR valve is not as expected. The estimated EGR percent is less than the minimum limit for the operating conditions.			
Possible Causes: • Aftermarket intake systems or exhaust systems • Restricted airflow (intake or exhaust) • Restricted EGR cooler • EGR valve position sensor bias • EP sensor bias • MAP sensor bias • Damaged EGR valve			
Diagnostic Aids: The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P0402 - EGR A Flow Excessive Detected

Description:	This DTC sets when the pressure ratio of the manifold absolute pressure (MAP) sensor signal and the exhaust pressure (EP) sensor signal across the EGR valve is not as expected. The estimated EGR percent is greater than the maximum limit for the operating conditions.		
Possible Causes:	• Aftermarket intake systems or exhaust systems • Restricted airflow (intake or exhaust) • Charge air cooler (CAC) system leaks (hoses and cooler) • EGR valve position sensor bias • EP sensor bias • MAP sensor bias • Damaged EGR valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P0403 - EGR A Control Circuit/Open

Description:	This DTC sets when the PCM detects an EGR control circuit concern.		
Possible Causes:	• EGRVCL circuit short to ground • EGRVCH circuit short to ground • EGRVCL circuit short to voltage • EGRVCH circuit short to voltage • EGRVCL circuit open • EGRVCH circuit open • Damaged EGR valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P0404 - EGR A Control Circuit Range/Performance

Description:	This DTC sets when the EGRVCH circuit or the EGRVCL circuit are not within an expected calibrated range for a calibrate length of time.		
Possible Causes:	• EGRVCL circuit intermittent • EGRVCH circuit intermittent • Damaged EGR valve		
Diagnostic	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a		

Aids:	loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P0405 - EGR Sensor A Circuit Low

Description:	This DTC sets when the EGRVP circuit voltage is less than the expected value.		
Possible Causes:	• EGR circuit open • EGR circuit short to ground • VREF circuit open • Damaged exhaust gas recirculation valve position (EGRVP) sensor • Damaged EGR valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P0406 - EGR Sensor A Circuit High

Description:	This DTC sets when the EGRVP circuit voltage is greater than a calibrated limit for a specified amount of time. When the EGRVP is greater than a calibrated threshold, an increment counter advances for that drive cycle. This DTC sets once an increment counter reaches a calibrated limit.		
Possible Causes:	• EGR circuit short to voltage • Damaged exhaust gas recirculation valve position (EGRVP) sensor • Damaged EGR valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P040A - EGR Temperature Sensor A Circuit

Description:	This DTC sets when the exhaust gas recirculation temperature bank 1, sensor 1 (EGRT11) temperature is not within the PCM predicted temperature range, based on other PCM inputs.		
Possible Causes:	• EGRT11 circuit open • EGRT11 circuit short to ground • EGRT11 circuit short to voltage • SIGRTN circuit open		

	• SIGRTN circuit short to voltage • Damaged EGRT11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test WA .		

P040B - EGR Temperature Sensor A Circuit Range/Performance

Description:	This DTC sets when the exhaust gas recirculation temperature bank 1, sensor 1 (EGRT11) (Transit) or the exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12) (all others) temperature is less than or greater than a calibrated limit for a specified amount of time. When the change in the EGRT11 (Transit) or the EGRT12 (all others) is less than or greater than a calibrated threshold, an increment counter advances for that drive cycle.		
Possible Causes:	• Damaged EGRT11 sensor (Transit) • Damaged EGRT12 sensor (all others)		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test WA .		

P040C - EGR Temperature Sensor A Circuit Low

Description:	This DTC sets when the exhaust gas recirculation temperature bank 1, sensor 1 (EGRT11 (Transit) or the exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12) (all others) temperature is less than a calibrated limit for a specified amount of time. When the EGRT11 (Transit) or the EGRT12 (all others) is less than a calibrated threshold, an increment counter advances for that drive cycle.		
Possible Causes:	• EGRT11 circuit short to ground (Transit) • EGRT12 circuit short to ground (all others) • Damaged EGRT11 sensor (Transit) • Damaged EGRT12 sensor (all others)		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets when the EGRT12 sensor signal voltage is less than 0.1 volt for greater than 3 seconds.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test WA .		

P040D - EGR Temperature Sensor A Circuit High

Description:	This DTC sets when the exhaust gas recirculation temperature bank 1, sensor 1 (EGRT11) (Transit) or the exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12) (all others) temperature is greater than a calibrated limit for a specified amount of time. When the EGRT11 (Transit) or the EGRT12 (all others) is greater than a calibrated threshold, an increment counter advances for that drive cycle.		
Possible Causes:	• EGRT11 circuit short to voltage (Transit) • EGRT12 circuit short to voltage (all others) • EGRT11 circuit open (Transit) • EGRT12 circuit open (all others) • Damaged EGRT11 sensor (Transit) • Damaged EGRT12 sensor (all others)		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets when the EGRT12 sensor signal voltage is greater than 4.9 volts for greater than 3 seconds.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test WA .		

P041B - EGR Temperature Sensor B Circuit Range/Performance

Description:	This DTC sets when the exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12) (Transit) or the exhaust gas recirculation temperature bank 1, sensor 1 (EGRT11) (all others) temperature is less than or greater than a calibrated limit for a specified amount of time. When the change in the EGRT12 (Transit) or the EGRT11 (all others) is less than or greater than a calibrated threshold, an increment counter advances for that drive cycle.		
Possible Causes:	• Damaged EGRT12 sensor (Transit) • Damaged EGRT11 sensor (all others)		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test WA .		

P041C - EGR Temperature Sensor B Circuit Low

Description:	This DTC sets when the exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12) temperature is greater than a calibrated limit for a specified amount of time. When the change in the EGRT12 is less than or greater than a calibrated threshold, an increment counter advances for that drive cycle.		
Possible Causes:	• EGRT12 circuit short to ground • EGR cooler system concern • Damaged EGRT12 sensor		
Diagnostic	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss		

Aids:	of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test WA .		

P041D - EGR Temperature Sensor B Circuit High

Description:	This DTC sets when the exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12) temperature is less than a calibrated limit for a specified amount of time. When the EGRT12 is greater than a calibrated threshold, an increment counter advances for that drive cycle.		
Possible Causes:	• EGRT12 circuit short to voltage • EGRT12 circuit open • Damaged EGRT12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test WA .		

P0420 - Catalyst System Efficiency Below Threshold (Bank 1)

Description:	During a regeneration, the PCM expects the temperature across the OC to increase by a calibrated amount. This DTC sets when the increase in temperature is less than 40% of the expected maximum increase.		
Possible Causes:	• Damaged OC • Damaged fuel vaporizer glow plug system • Fuel injection concern • Fuel quality • Oil contamination • Plugged OC		
Diagnostic Aids:	Verify there are no concerns present with the fuel system and EGT sensors. Monitor the EGT11 and EGT12 PIDs to determine the temperature change across the OC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RA .		

P042E - EGR A Control Stuck Open

Description:	This DTC sets when the EGR setpoint is less than a specified threshold, the actual EGR position is greater than a specified threshold, and the EGR control limit is less than a specified limit.		
Possible Causes:	• Damaged EGR valve		

Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets when the PCM detects a stuck EGR valve by detecting a position control deviation that exceeds a calibrated threshold.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P0470 - Exhaust Pressure Sensor A Circuit

Description:	This DTC sets when the exhaust pressure (EP) sensor is not within the PCM predicted range, based on other PCM inputs.		
Possible Causes:	• EP circuit open • EP circuit short to ground • EP circuit short to voltage • SIGRTN circuit open • SIGRTN circuit short to voltage • Damaged EP sensor • Stuck or binding variable geometry turbocharger		
Diagnostic Aids:	Make sure the EP sensor reading is similar to other PCM pressure inputs. If the EP reading differs greatly from other engine pressure readings, check the EP circuitry for correct operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test X .		

P0471 - Exhaust Pressure Sensor A Circuit Range/Performance

Description:	This DTC sets when the exhaust pressure (EP) sensor signal is not within a calibrated value. The EP sensor reading should be greater than the barometric pressure (BARO) sensor reading by a calibrated threshold while the engine is running.		
Possible Causes:	• Restricted EP supply tube • Damaged EP sensor • Incorrectly installed EP sensor		
Diagnostic Aids:	Make sure the EP sensor is installed correctly and the EP tube is not restricted.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test X .		

P0472 - Exhaust Pressure Sensor A Circuit Low

Description:	This DTC sets when the exhaust pressure (EP) sensor signal is less than the self-test minimum.		
Possible Causes:	• VREF circuit open		

	• VREF circuit short to ground • Damaged EP sensor • Incorrect harness connection		
Diagnostic Aids:	An EBP PID reading less than 0.10 volt for greater than 2.0 seconds indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test X .		

P0473 - Exhaust Pressure Sensor A Circuit High

Description:	This DTC sets when the exhaust pressure (EP) sensor signal is greater than the self-test maximum.		
Possible Causes:	• EP circuit open • EP circuit short to voltage • Damaged EP sensor • Incorrect harness connection		
Diagnostic Aids:	An EBP PID reading greater than 4.8 volts for greater than 2.0 seconds indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test X .		

P0474 - Exhaust Pressure Sensor A Circuit Intermittent/Erratic

For All Others			
Description:	This DTC sets when the input signal to the PCM from the exhaust pressure (EP) sensor becomes intermittent or erratic.		
Possible Causes:	• EP circuit intermittently open • Damaged EP sensor • Damaged harness connector • Damaged harness		
Diagnostic Aids:	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test X .		

For F-150

Description:	This DTC sets when the input signal to the PCM from the exhaust pressure (EP) sensor becomes intermittent or erratic.		
Possible Causes:	• EP circuit intermittently open • Damaged EP sensor • Damaged harness connector • Damaged harness • Damaged Variable Geometry Turbocharger (VGT) harness • Damaged VGT harness connector • Damaged VGT actuator • Stuck or binding VGT turbocharger		

Diagnostic Aids:	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. Check for correct VGT turbocharger operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test X .		

P0480 - Fan 1 Control Circuit

For Transit Connect				
Description:	This DTC sets when the PCM detects an open FCV circuit.			
Possible Causes:	• FCV circuit open • Cooling fan			
Diagnostic Aids:	Check the FCV circuit for an open.			
For All Others				
Description:	This DTC sets when the PCM detects an open FCV circuit.			
Possible Causes:	• FCV circuit open • Cooling fan			
Diagnostic Aids:	Check the FCV circuit for an open.			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory	
Transit Connect	GO to Pinpoint Test KN .			
All others	GO to Pinpoint Test AH .			

P0483 - Fan Performance

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 higher than the calibrated value during continuous memory self-test, this DTC sets.		
Possible Causes:	• Mechanical binding • Damaged FSS		
Diagnostic Aids:	Check to see if fan rotates on clutch freely.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AH .		

P0488 - EGR Throttle Control Circuit A Range/Performance

Description:	This DTC sets when the PCM detects a concern with the intake throttle offset learn. When the intake throttle offset learn is greater than the expected intake throttle offset a concern is indicated.
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Possible Causes:	- Damaged intake throttle position sensor - Binding or obstruction of intake throttle plate.		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check the intake throttle for any binding or obstructions.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AX .		

P0489 - Exhaust Gas Recirculation (EGR) A Control Circuit Low

Description:	This DTC sets when the PCM detects an EGR control circuit concern.		
Possible Causes:	- EGRVCL circuit short to ground - EGRVCH circuit short to ground - Damaged EGR valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P0490 - Exhaust Gas Recirculation (EGR) A Control Circuit High

Description:	This DTC sets when the PCM detects an EGR control circuit concern.		
Possible Causes:	- EGRVCL circuit short to voltage - EGRVCH circuit short to voltage - Damaged EGR valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P0494 - Fan Speed Low

Description:	This DTC sets if the indicated fan speed is lower than the calibrated value during the key ON, engine running (KOER) self-test.		
Possible Causes:	Damaged FSS		

		Obstruction stopping fan from moving	
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 AH .		

P0495 - Fan Speed High

Description:	This DTC sets if the indicated fan speed is higher than the calibrated value during the key ON, engine running (KOER) self-test.		
Possible Causes:	- Mechanical binding - Damaged FSS		
Diagnostic Aids:	Check to see if the fan freely rotates on the clutch.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AH .		

P049D - EGR A Control Position Exceeded Learning Limit

Description:	This DTC sets when the EGRVCH circuit or the EGRVCL circuit are not within an expected calibrated range for a calibrate length of time.		
Possible Causes:	- EGRVCL circuit intermittent - EGRVCH circuit intermittent - Damaged EGR valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P04D7 - Exhaust Brake Input Circuit Intermittent/Erratic

Description:	This DTC sets when the EBIS circuit input to the PCM is intermittent or erratic for greater than a calibrated time.		
Possible Causes:	- EBIS circuit - Engine brake switch		
Diagnostic Aids:	Press and release the engine brake switch and verify the engine brake indicator in the instrument panel cluster (IPC) changes.		

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

P04D9 - Closed Loop EGR Control At Limit - Flow Too Low

Description:	This DTC sets when the estimated exhaust gas recirculation (EGR) percent is less than the minimum limit for the operating conditions.		
Possible Causes:	• Aftermarket intake systems or exhaust systems • Restricted airflow (intake or exhaust) • Restricted EGR cooler • EGR valve position sensor bias • Exhaust pressure (EP) sensor bias • Manifold absolute pressure (MAP) sensor bias • Damaged intake throttle actuator • Damaged EGR valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC is set when the pressure ratio of the MAP sensor signal and the EP sensor signal across the EGR valve is not as expected.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P04DA - Closed Loop EGR Control At Limit - Flow Too High

Description:	This DTC sets when the estimated exhaust gas recirculation (EGR) percent is greater than the maximum limit for the operating conditions.		
Possible Causes:	• Aftermarket intake systems or exhaust systems • Restricted airflow (intake or exhaust) • Charge air cooler (CAC) system leaks (hoses and cooler) • EGR valve position sensor bias • Exhaust pressure (EP) sensor bias • Manifold absolute pressure (MAP) sensor bias • Damaged intake throttle actuator • Damaged EGR valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC is set when the pressure ratio of the MAP sensor signal and the EP sensor signal across the EGR valve is not as expected.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P04DB - Crankcase Ventilation System Disconnected

Description:	This DTC sets when the crankcase ventilation sensor voltage is less than 2.5 V.		
Possible Causes:	• VBPWR circuit open		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P04E2 - Crankcase Ventilation Hose Connection Sensor Circuit Low

Description:	This DTC sets when the crankcase ventilation sensor voltage is less than 1 volt.		
Possible Causes:	• CRNKCSVT circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P04E3 - Crankcase Ventilation Hose Connection Sensor Circuit High

Description:	This DTC sets when the crankcase ventilation sensor voltage is greater than 4.9 volts.		
Possible Causes:	• CRNKCSVT circuit open • CRNKCSVT circuit short to voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P0500 - Vehicle Speed Sensor A

Description:	This DTC sets when the PCM detected an error in the vehicle speed information.		
Possible Causes:	• VSS circuit open • VSS circuit short to ground • VSS circuit short to voltage • Damaged ABS module • Damaged PCM		
Diagnostic Aids:	Monitor the VSS (SPD) PID while driving the vehicle.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

P0506 - Idle Control System - RPM Lower Than Expected

Description:	This DTC sets when the engine idle speed is less than the desired engine idle speed or the actual engine idle speed is greater than 100 revolutions per minute (RPM) below the desired RPM for greater than 5 seconds.		
Possible Causes:	• Intake air system restriction • Vacuum leaks • Exhaust system restriction • Engine mechanical concern • Sludged throttle body • Damaged intake throttle actuator		
Diagnostic Aids:	This DTC is informational only and it may be accompanied by other DTCs. Diagnose the other DTCs first. If other DTCs are not present, inspect the entire intake air system for restrictions, vacuum leaks, and damage. Repair as necessary. If no concerns are found, clear the DTCs. Repeat the self test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0507 - Idle Control System - RPM Higher Than Expected

Description:	This DTC sets when the engine idle speed that is greater than the desired engine idle speed or the actual engine idle speed is greater than 160 revolutions per minute (RPM) above the desired RPM for greater than 5 seconds.		
Possible Causes:	• Intake air system leak after the throttle body • Vacuum leaks • Damaged intake throttle actuator		
Diagnostic Aids:	This DTC is informational only and it may be accompanied by other DTCs. Diagnose the other DTCs first. If other DTCs are not present, inspect the entire intake air system for restrictions, vacuum leaks, and damage. Repair as necessary. If no concerns are found, clear the DTCs. Repeat the self test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P050E - Cold Start Engine Exhaust Temperature Too Low

Description:	The PCM calculates the actual oxidation catalytic converter (OC) warm up temperature during a cold start. The PCM then compares the actual OC temperature to the expected OC temperature model. The difference between the actual and expected temperatures is a ratio. When this ratio exceeds the calibrated value this DTC sets and the malfunction indicator lamp (MIL) illuminates.		
Possible Causes:	• Intake air system restriction • Exhaust restriction • Engine mechanical concern		

	• Vacuum leaks • Damaged exhaust gas temperature (EGT) sensor		
Diagnostic Aids:	This DTC sets when one or more EGT sensors indicate a value outside a calibrated threshold when compared to the catalyst temperature model. The PCM compares the values from the ambient air temperature (AAT), intake air temperature (IAT), and EGT sensors to the catalyst temperature model.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P0528 - Fan Speed Sensor Circuit No Signal

Description:	The PCM uses the fan speed sensor (FSS) input to monitor the cooling fan clutch speed. This DTC sets if the indicated fan speed is lower than the calibrated value during the key ON engine running (KOER) self-test.		
Possible Causes:	• FSS VPWR circuit open • FSS PWRGND circuit open • FSS circuit open • FSS circuit short • Damaged FSS		
Diagnostic Aids:	Visually inspect the cooling fan clutch for damage or restriction.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AH .		

P0529 - Fan Speed Sensor Circuit Intermittent

Description:	This DTC sets when the current fan speed differs from the previous calibrated fan speed by greater than a calibrated value.		
Possible Causes:	• FSS circuit intermittently open • Damaged FSS		
Diagnostic Aids:	View the FANSS PID to monitor the FSS input.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AH .		

P052F - Glow Plug Control Module 1 System Voltage

Description:	The glow plug control module (GPCM) monitors the system supply voltage. This DTC sets when the GPCM detects an under voltage or over voltage condition.		
Possible Causes:	• VBATT circuit open • VPWR circuit open		

		• Damaged GPCM	
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P053A - Positive Crankcase Ventilation Heater A Control Circuit /Open

Description:	This DTC sets when the PCM detects the actual CVHC circuit voltage is less than the desired voltage.		
Possible Causes:	• CVHC circuit open • CVHC circuit short to ground • VPWR circuit open • VPWR circuit short to ground • Damaged crankcase ventilation heater assembly		
Diagnostic Aids:	Make sure the crankcase ventilation heater connector is correctly connected.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P053B - Positive Crankcase Ventilation Heater A Control Circuit Low

Description:	This DTC sets when the state of the output driver signal for the CVHC circuit moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	• CVHC circuit short to ground • Damaged crankcase ventilation heater assembly		
Diagnostic Aids:	Make sure the crankcase ventilation heater connector is correctly connected.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P053C - Positive Crankcase Ventilation Heater A Control Circuit High

Description:	This DTC sets when the state of the output driver signal for the CVHC circuit moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	• CVHC circuit short to ground • VPWR circuit open • Damaged crankcase ventilation heater assembly		
Diagnostic	Make sure the crankcase ventilation heater connector is correctly connected.		

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

P0544 - Exhaust Gas Temperature Sensor Circuit - Bank 1 Sensor 1

Description:	The PCM monitors the operation of the exhaust gas temperature bank 1, sensor 1 (EGT11) to determine if the EGT11 sensor responds to the increase in temperature of the exhaust gas during vehicle operation. The PCM then compares the measured temperature to a modeled value. This DTC sets when, after 5 minutes of driving, following a 6 hour soak, the EGT11 sensor temperature does not correlate to the modeled temperature of 170°C (338°F).		
Possible Causes:	- Exhaust leaks - Excessive soot build up on EGT11 sensor - Damaged EGT11 sensor		
Diagnostic Aids:	Monitor the EGT11 PID between ignition ON, engine OFF and ignition ON, engine running for an indication of a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P0545 - Exhaust Gas Temperature Sensor Circuit Low - Bank 1 Sensor 1

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 1 (EGT11) voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	- EGT11 circuit short to SIGRTN - EGT11 circuit short to ground - Damaged EGT11 sensor		
Diagnostic Aids:	An EGT11_V PID value less than 0.10 volt indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P0546 - Exhaust Gas Temperature Sensor Circuit High - Bank 1 Sensor 1

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 1 (EGT11) voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	- EGT11 circuit open - EGT11 circuit short to voltage - Damaged EGT11 sensor		
Diagnostic Aids:	An EGT11_V PID value greater than 4.90 volts indicates a concern.		

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

P054E - Idle Control System - Fuel Quantity Lower Than Expected

Description:	This DTC sets when the fuel quantity needed for idle control is greater than 30% lower than the lowest expected fuel rate.		
Possible Causes:	• Intake air leak after the throttle body • Vacuum leaks • Damaged intake throttle actuator		
Diagnostic Aids:	The fuel pressure in the high pressure fuel system can be monitored by accessing the FRP_A PID on the scan tool.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P054F - Idle Control System - Fuel Quantity Higher Than Expected

Description:	This DTC sets when the fuel quantity needed for idle control is greater than 30% higher than the highest expected fuel rate.		
Possible Causes:	• Intake air system restriction • Vacuum leaks • Exhaust system restriction • Engine mechanical concern • Sludged throttle body • Damaged intake throttle actuator		
Diagnostic Aids:	The fuel pressure in the high pressure fuel system can be monitored by accessing the FRP_A PID on the scan tool.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P0562 - System Voltage Low

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0563 - System Voltage High

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P05EC - Cold Start Injection Timing Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• PCM reprogramming • Software incompatibility issue • Aftermarket performance products • Damaged PCM		
Diagnostic Aids:	This DTC is set when the PCM detects the communication of the internal processor has been compromised.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test YA .		

P0600 - Serial Communication Link

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• PCM reprogramming • Software incompatibility issue • Aftermarket performance products • Damaged PCM		
Diagnostic Aids:	This DTC is set when the PCM detects the communication of the internal processor has been compromised.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test YA .		

P0601 - Internal Control Module Memory Checksum Error

Description:	This DTC sets when the PCM central processor unit (CPU) internal checks return an incorrect value.		
Possible Causes:	• An attempt was made to change the calibration • Aftermarket performance products • Incorrect PCM calibration • Damaged PCM		

Diagnostic Aids:	Reprogram or update the calibration. Reprogram the vehicle identification VID block. 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	GO to Pinpoint Test Y .		

P0602 - Powertrain Control Module Programming Error

Description:	This DTC sets when a programming error within the vehicle identification (VID) block occurs.		
Possible Causes:	• VID data corrupted by the scan tool during VID reprogramming • PCM reprogramming • Damaged PCM		
Diagnostic Aids:	The VID block must be programmed. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming 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:	This DTC sets when the PCM has experienced an internal memory concern.		
Possible Causes:	• Reprogramming • Battery terminal corrosion • KAPWR circuit open • Incorrect battery connection		
Diagnostic Aids:	This DTC may set if the voltage to the PCM is interrupted due to a battery or PCM disconnect.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test Z .		

P0606 - Control Module Processor

Description:	This DTC sets when an internal PCM communication error occurs.		
Possible Causes:	• VPWR circuit open • PWRGND circuit open • Battery previously disconnected • PCM previously disconnected • Battery cables loose • Intermittent connections • Battery discharged		

	- Module communication error - Damaged 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	GO to Pinpoint Test Z .		

P0607 - Control Module Performance

Description:	This DTC sets when the PCM internal central processing unit (CPU) has encountered an error. The PCM monitors itself and carries out internal checks of its own CPU. This DTC sets if any of these checks return an incorrect value.		
Possible Causes:	- Module programming error - Aftermarket performance products - Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs and diagnose those first. 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:	This DTC sets when an error has occurred in the PCM.		
Possible Causes:	- Aftermarket performance products - PCM programming error - Software incompatibility issue - PCM internal software error		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test YA .		

P060B - Internal Control Module A/D Processing Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:			

		• PCM reprogramming • Damaged PCM	
Diagnostic Aids:	Check for other DTCs or drive symptoms for further action.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test YA .		

P060C - Internal Control Module Main Processor Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• Software incompatibility issue • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test YA .		

P060D - Internal Control Module Accelerator Pedal Position Performance

Description:	This DTC sets when a concern is detected with the accelerator pedal position (APP) sensor signal values and DTCs P2122, P2123, P2127, P2128, or P2138 are not set.		
Possible Causes:	• PCM programming error • Damaged APP sensor • Damaged PCM		
Diagnostic Aids:	An APP1_APP_D PID or APP2_APP_E PID reading may indicate a concern. 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 AG .		

P0610 - Control Module Vehicle Options Error

Description:	This DTC sets when a PCM vehicle options error has occurred.		
Possible Causes:	• Aftermarket performance products • PCM reprogramming • Corrupted vehicle identification (VID) data • PCM internal software error		
Diagnostic Aids:	This DTC sets when the PCM detects various VID data that is out of a specified acceptable range. 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.		

P0611 - Fuel Injector Control Module Performance

Description:	This DTC sets when the voltage necessary to control the fuel injectors is not within a calibrated range.			
Possible Causes:	• Aftermarket performance products • Damaged 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 installing a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P061A - Internal Control Module Torque Performance

Description:	This DTC sets when the measured engine torque value exceeds the maximum allowable engine torque value.			
Possible Causes:	• Aftermarket performance products • PCM programming error • Incorrect Tire Size / Axle Ratio Configuration			
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test YA .		

P061B - Internal Control Module Torque Calculation Performance

Description:	This DTC sets when a calculation error occurred in the PCM.			
Possible Causes:	• Aftermarket performance products • PCM programming error • Incorrect Tire Size / Axle Ratio Configuration • Damaged Fuel Injector			
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test YA .		

P061C - Internal Control Module Engine RPM Performance

Description:	This DTC sets when a calculation error occurred in the PCM.		
Possible Causes:	• PCM reprogramming • Damaged PCM • Damaged crankshaft position sensor (CKP) • Damaged camshaft position sensor (CMP)		
Diagnostic Aids:	Verify correct operation of the crankshaft position (CKP) sensor, camshaft position 11 (CMP11) sensor and related circuits. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test YA .		

P0627 - Fuel Pump A Control Circuit/Open

Description:	This DTC sets when the FPC output is commanded OFF and the FPC circuit voltage is lower than an expected threshold, when the PCM expects to detect B+ voltage coming through the fuel pump relay coil to the FPC circuit.		
Possible Causes:	• B+ circuit open • FPC circuit open • Damaged fuel pump relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0628 - Fuel Pump A Control Circuit Low

Description:	This DTC sets when the FPC output is commanded OFF and the FPC circuit voltage is lower than an expected threshold, when the PCM expects to detect B+ voltage coming through the fuel pump relay coil to the FPC circuit.		
Possible Causes:	• FPC circuit short to ground • Damaged fuel pump relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P0629 - Fuel Pump A Control Circuit High

Description:	This DTC sets when the FPC output is commanded ON and excessive current draw is detected on the FPC circuit.		
Possible Causes:	- FPC circuit short to voltage - Damaged fuel pump relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P062A - Fuel Pump A Control Circuit Range/Performance**For F-650 / F-750**

Description:	This DTC sets when the airbags deploy and the FPM circuit shows the fuel pump is energized, or if the FPC request and FPM feedback do not correlate.		
Possible Causes:	- FPC circuit short to voltage - Damaged fuel pump relay		
Diagnostic Aids:			
For All Others			
Description:	This DTC sets when the fuel pump control module sends an irrational fuel pump monitor duty cycle.		
Possible Causes:	Damaged fuel pump control module		
Diagnostic Aids:	Clear the PCM DTCs. Repeat the self-test. If the DTC is retrieved again, install a new fuel pump control module. Refer to the Workshop Manual Section 303-04, Fuel Charging And Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-650 / F-750	GO to Pinpoint Test MA .		
All others	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P062B - Internal Control Module Fuel Injector Control Performance

Description:	This DTC sets when the fuel injector energizing time is greater than the permitted energizing time after overrun demand by the driver.		
Possible Causes:	- Aftermarket performance products - PCM programming error - Damaged Fuel Injector		

Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test YA .		

P062C - Internal Control Module Vehicle Speed Performance

Description:	This DTC sets when a network communication error occurred in the PCM.		
Possible Causes:	- Module communications network concerns - Output shaft speed (OSS) sensor concern - Anti-lock brake system (ABS) concern		
Diagnostic Aids:	REPAIR any ABS or TCM DTCs. REPAIR any ABS or TCM related DTCs in other modules, or any vehicle communication concerns prior to diagnosing DTC P062C. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test YA .		

P062D - Fuel Injector Driver Circuit Performance (Bank 1)

Description:	The PCM continuously monitors the operation of the fuel injectors and corresponding circuits for cylinders 1, 2 and 3 (F-150), 1, 2, 3, 4 and 5 (Transit) and 1, 4, 6 and 7 (all others). This DTC sets when a short to ground or short to voltage condition for those cylinders is detected.		
Possible Causes:	- INJ1 circuit short to ground - INJ1RTN circuit short to ground - INJ1 circuit short to voltage - INJ1RTN circuit short to voltage - INJ2 circuit short to ground (F-150 and Transit) - INJ2RTN circuit short to ground (F-150 and Transit) - INJ2 circuit short to voltage (F-150 and Transit) - INJ2RTN circuit short to voltage (F-150 and Transit) - INJ3 circuit short to ground (F-150 and Transit) - INJ3RTN circuit short to ground (F-150 and Transit) - INJ3 circuit short to voltage (F-150 and Transit) - INJ3RTN circuit short to voltage (F-150 and Transit) - INJ4 circuit short to ground (F-650 / F-750, F-Series Super Duty and Transit) - INJ4RTN circuit short to ground (F-650 / F-750, F-Series Super Duty and Transit) - INJ4 circuit short to voltage (F-650 / F-750, F-Series Super Duty and Transit) - INJ4RTN circuit short to voltage (F-650 / F-750, F-Series Super Duty and Transit) - INJ5 circuit short to ground (Transit) - INJ5RTN circuit short to ground (Transit) - INJ5 circuit short to voltage (Transit) - INJ5RTN circuit short to voltage (Transit) - INJ6 circuit short to ground (F-650 / F-750 and F-Series Super Duty) - INJ6RTN circuit short to ground (F-650 / F-750 and F-Series Super Duty) - INJ6 circuit short to voltage (F-650 / F-750 and F-Series Super Duty) - INJ6RTN circuit short to voltage (F-650 / F-750 and F-Series Super Duty) - INJ7 circuit short to ground (F-650 / F-750 and F-Series Super Duty) - INJ7RTN circuit short to ground (F-650 / F-750 and F-Series Super Duty)		

	• INJ7 circuit short to voltage (F-650 / F-750 and F-Series Super Duty) • INJ7RTN circuit short to voltage (F-650 / F-750 and F-Series Super Duty) • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:	Monitor the INJ_F PID to determine which cylinder number has an injector or injector circuit concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P062E - Fuel Injector Driver Circuit Performance (Bank 2)

Description:	The PCM continuously monitors the operation of the fuel injectors and corresponding circuits for cylinders 4, 5 and 6 (F-150) and 2, 3, 5 and 8 (all others). This DTC sets when a short to ground or short to voltage condition for those cylinders is detected.		
Possible Causes:	• INJ2 circuit short to ground (F-650 / F-750 and F-Series Super Duty) • INJ2RTN circuit short to ground (F-650 / F-750 and F-Series Super Duty) • INJ2 circuit short to voltage (F-650 / F-750 and F-Series Super Duty) • INJ2RTN circuit short to voltage (F-650 / F-750 and F-Series Super Duty) • INJ3 circuit short to ground (F-650 / F-750 and F-Series Super Duty) • INJ3RTN circuit short to ground (F-650 / F-750 and F-Series Super Duty) • INJ3 circuit short to voltage (F-650 / F-750 and F-Series Super Duty) • INJ3RTN circuit short to voltage (F-650 / F-750 and F-Series Super Duty) • INJ4 circuit short to ground (F-150) • INJ4RTN circuit short to ground (F-150) • INJ4 circuit short to voltage (F-150) • INJ4RTN circuit short to voltage (F-150) • INJ5 circuit short to ground • INJ5RTN circuit short to ground • INJ5 circuit short to voltage • INJ5RTN circuit short to voltage • INJ6 circuit short to ground (F-150) • INJ6RTN circuit short to ground (F-150) • INJ6 circuit short to voltage (F-150) • INJ6RTN circuit short to voltage (F-150) • INJ8 circuit short to ground (F-650 / F-750 and F-Series Super Duty) • INJ8RTN circuit short to ground (F-650 / F-750 and F-Series Super Duty) • INJ8 circuit short to voltage (F-650 / F-750 and F-Series Super Duty) • INJ8RTN circuit short to voltage (F-650 / F-750 and F-Series Super Duty) • Damaged fuel injector • Damaged PCM		
Diagnostic Aids:	Monitor the INJ_F PID to determine which cylinder number has an injector or injector circuit concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P062F - Internal Control Module EEPROM Error

Description:	This DTC sets when the PCM read only memory (ROM) has been corrupted.
Possible Causes:	

		• PCMRC circuit open • PCMRC circuit short to ground • VPWR circuit open • VPWR circuit short to voltage • PCM reprogramming • Aftermarket performance products • PCM programming error • PCM internal software error • Damaged PCM • Damaged PCM power relay	
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test Y .	Continuous Memory

P062x -

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.		
Application		Key On Engine Off	Key On Engine Running
All		Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.	Continuous Memory

P0630 - VIN Not Programmed Or Incompatible - ECM/PCM

Description:	This DTC sets when the PCM does not receive a valid vehicle identification number (VIN) during reprogramming.		
Possible Causes:	• Vehicle configuration information has been improperly configured.		
Diagnostic Aids:	Reprogram the VIN. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming The VID Block For A Replacement PCM, to reprogram the PCM.		
Application		Key On Engine Off	Key On Engine Running
All		Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.	Continuous Memory

P0642 - Sensor Reference Voltage A Circuit Low

Description:	This DTC sets when the VREF circuit is less than VREF minimum.		
Possible Causes:	• VREF circuit short to ground • Damaged sensor • Incorrect harness connection		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
			Continuous Memory

All	GO to Pinpoint Test B .
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P0643 - Sensor Reference Voltage A Circuit High

Description:	This DTC sets when the VREF circuit is greater than VREF maximum.		
Possible Causes:	• VREF circuit short to voltage • Damaged sensor • Incorrect harness connection		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P064A - Fuel Pump Control Module A

Description:	This DTC sets when the fuel pump control module detects an internal concern.		
Possible Causes:	• Damaged fuel pump control module		
Diagnostic Aids:	Clear the PCM DTCs. Repeat the self-test. If the DTC is retrieved again, install a new fuel pump control module. Refer to the Workshop Manual Section 303-04, Fuel Charging And Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P064C - Glow Plug Control Module 1

Description:	This DTC sets when the glow plug control module (GPCM) indicates an internal software error has occurred.		
Possible Causes:	• An attempt was made to change the calibration • Aftermarket performance products • GPCM programming error • Internal GPCM error		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0652 - Sensor Reference Voltage B Circuit Low

Description:	This DTC sets when the VREF circuit is less than VREF minimum.		
Possible Causes:	• VREF circuit short to ground • Damaged sensor • Incorrect harness connection		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P0653 - Sensor Reference Voltage B Circuit High

Description:	This DTC sets when the VREF circuit is greater than VREF maximum.		
Possible Causes:	• VREF circuit short to voltage • Damaged sensor • Incorrect harness connection		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P0667 - Control Module Internal Temperature Sensor A Range/Performance

Description:	This DTC sets when the PCM internal temperature signal is out of self-test range.		
Possible Causes:	• Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs and diagnose those first. Clear the DTCs, repeat 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 PCM replacement.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0668 - Control Module Internal Temperature Sensor A Circuit Low

Description:	This DTC sets when the PCM internal temperature signal is out of self-test range low.		
Possible Causes:	• Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs and diagnose those first. Clear the DTCs, repeat 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 PCM replacement.		

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

P0669 - Control Module Internal Temperature Sensor A Circuit High

Description:	This DTC sets when the PCM internal temperature signal is out of self-test range high.		
Possible Causes:	Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs and diagnose those first. Clear the DTCs, repeat 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 PCM replacement.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P066A - Cylinder 1 Glow Plug Circuit Low

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	- Glow plug circuit short to ground - Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P066B - Cylinder 1 Glow Plug Circuit High

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	- Glow plug circuit open - Glow plug circuit short to voltage - Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P066C - Cylinder 2 Glow Plug Circuit Low

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit short to ground • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P066D - Cylinder 2 Glow Plug Circuit High

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P066E - Cylinder 3 Glow Plug Circuit Low

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit short to ground • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P066F - Cylinder 3 Glow Plug Circuit High

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0671 - Cylinder 1 Glow Plug Circuit/Open

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0672 - Cylinder 2 Glow Plug Circuit/Open

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0673 - Cylinder 3 Glow Plug Circuit/Open

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0674 - Cylinder 4 Glow Plug Circuit/Open

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0675 - Cylinder 5 Glow Plug Circuit/Open

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test AF .
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P0676 - Cylinder 6 Glow Plug Circuit/Open

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0677 - Cylinder 7 Glow Plug Circuit/Open

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0678 - Cylinder 8 Glow Plug Circuit/Open

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		

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

P067A - Cylinder 4 Glow Plug Circuit Low

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit short to ground • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P067B - Cylinder 4 Glow Plug Circuit High

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P067C - Cylinder 5 Glow Plug Circuit Low

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit short to ground • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P067D - Cylinder 5 Glow Plug Circuit High

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P067E - Cylinder 6 Glow Plug Circuit Low

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit short to ground • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P067F - Cylinder 6 Glow Plug Circuit High

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0685 - ECM/PCM Power Relay Control Circuit/Open

Description:	This DTC sets when the 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:	• PCMRC circuit open • PCMRC circuit short to voltage • Damaged PCM power relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AJ .		

P068A - ECM/PCM Power Relay De-Energized - Too Early

Description:	This DTC sets when the PCM power relay is de-energized too early.		
Possible Causes:	• PCMRC circuit open • PCMRC circuit short to voltage • Damaged PCM power relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AJ .		

P068B - ECM/PCM Power Relay De-Energized - Too Late

Description:	This DTC sets when the PCM power relay takes longer than a specified time threshold to de-energize after it was commanded off.		
Possible Causes:	• PCMRC circuit short to ground • Damaged PCM power relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AJ .		

P068C - Cylinder 7 Glow Plug Circuit Low

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit short to ground • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P068D - Cylinder 7 Glow Plug Circuit High

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P068E - Cylinder 8 Glow Plug Circuit Low

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit short to ground • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P068F - Cylinder 8 Glow Plug Circuit High

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
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Possible Causes:	• Glow plug circuit open • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P0691 - Fan 1 Control Circuit Low

Description:	This DTC sets when the PCM detects a short to ground on the FCV circuit.		
Possible Causes:	• FCV circuit short to ground • Damaged cooling fan		
Diagnostic Aids:	Check the FCV circuit for a short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AH .		

P0692 - Fan 1 Control Circuit High

Description:	This DTC sets when the PCM detects a short to voltage on the FCV circuit.		
Possible Causes:	• FCV circuit short to voltage • Damaged cooling fan		
Diagnostic Aids:	Check the FCV circuit for short to voltage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AH .		

P0693 - Fan 2 Control Circuit Low

Description:	This DTC sets when the PCM detects a short to ground on the HFC circuit.		
Possible Causes:	• HFC circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AH .		

P0694 - Fan 2 Control Circuit High

Description:	This DTC sets when the PCM detects a short to voltage on the HFC circuit.		
Possible Causes:	• HFC circuit short to voltage • HFC circuit open		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AH .		

P06A6 - Sensor Reference Voltage A Circuit Range/Performance

Description:	This DTC sets when the VREF circuit is out of range.		
Possible Causes:	• VREF circuit short to voltage • VREF circuit short to ground • VREF circuit open • Shorted sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets due to an out of range voltage condition on the VREF circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P06A7 - Sensor Reference Voltage B Circuit Range/Performance

Description:	This DTC sets when the VREF circuit is out of range.		
Possible Causes:	• VREF circuit short to voltage • VREF circuit short to ground • VREF circuit open • Shorted sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets due to an out of range voltage condition on the VREF circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P06A8 - Sensor Reference Voltage C Circuit Range/Performance

Description:	This DTC sets when the VREF circuit is out of range.		
Possible Causes:	• VREF circuit short to voltage • VREF circuit short to ground • VREF circuit open • Shorted sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets due to an out of range voltage condition on the VREF circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P06B9 - Cylinder 1 Glow Plug Circuit Range/Performance

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06BA - Cylinder 2 Glow Plug Circuit Range/Performance

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06BB - Cylinder 3 Glow Plug Circuit Range/Performance

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06BC - Cylinder 4 Glow Plug Circuit Range/Performance

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06BD - Cylinder 5 Glow Plug Circuit Range/Performance

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06BE - Cylinder 6 Glow Plug Circuit Range/Performance

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06BF - Cylinder 7 Glow Plug Circuit Range/Performance

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06C0 - Cylinder 8 Glow Plug Circuit Range/Performance

Description:	The PCM enables the glow plug control module (GPCM) during a self-test which monitors each individual glow plug and harness for concerns. This DTC sets when the GPCM detects a concern with a glow plug or the glow plug harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• Glow plug circuit open • Glow plug circuit short to ground • Glow plug circuit short to voltage • Damaged glow plug		
Diagnostic Aids:	Check the glow plug wire harness for an open or a short circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All		GO to Pinpoint Test AF .
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P06DF - Glow Plug Control Module 1 Memory Checksum Error

Description:	This DTC sets when the glow plug control module (GPCM) indicates an internal software error has occurred.		
Possible Causes:	• An attempt was made to change the calibration • Aftermarket performance products • GPCM programming error • Internal GPCM error		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06E5 - Glow Plug Control Module 1 Performance

Description:	This DTC sets when the glow plug control module (GPCM) indicates an internal software error has occurred.		
Possible Causes:	• An attempt was made to change the calibration • Aftermarket performance products • GPCM programming error • Internal GPCM error		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P06EA - NOX Sensor Processor Performance (Bank 1 Sensor 1)

Description:	This DTC sets when the nitrogen oxides bank 1, sensor 1 (NOx11) module internal temperature does not match the exhaust gas temperature bank 1, sensor 2 (EGT12) temperature after a 6 hour soak period. This DTC also sets when the NOx11 module has an internal error.		
Possible Causes:	• EGT12 wiring concern • EGT12 sensor out of range • NOx11 module exposed to excessive heat • NOx11 module wiring concern • Damaged NOx11 module		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		

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

P06EB - NOX Sensor Processor Performance (Bank 1 Sensor 2)

Description:	This DTC sets when the nitrogen oxides bank 1, sensor 2 (NOx12) module internal temperature does not match the exhaust gas temperature bank 1, sensor 4 (EGT14) temperature after a 6 hour soak period. This DTC also sets when the NOx12 module has an internal error.		
Possible Causes:	• EGT14 wiring concern • EGT14 sensor out of range • NOx12 module exposed to excessive heat • NOx12 module wiring concern • Damaged NOx12 module		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P06EF - Engine Restart Performance

Description:	This DTC sets when there has been at least 60 seconds of total accumulated cranking time without sufficient time allowed between crank attempts for the starter to cool down.		
Possible Causes:	• Repeated excessive attempts to start the engine • Vehicle is low on fuel • Battery or starter motor concerns		
Diagnostic Aids:	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	All Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P08A8 - Clutch Pedal Position Sensor A Circuit Range/Performance

Description:	This DTC sets when the CPP-TT circuit values are outside of a calibrated threshold for more than a calibrated time.		
Possible Causes:	• CPP sensor circuit concerns • Damaged CPP sensor		
Diagnostic Aids:	Monitor the CPP sensor PIDs while applying and releasing the clutch pedal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test TA .
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P08A9 - Clutch Pedal Position Sensor A Circuit Low

Description:	This DTC sets when the CPP1 signal is out of self-test range low.		
Possible Causes:	• CPP1 circuit open • CPP1 circuit short to ground • Damaged CPP sensor		
Diagnostic Aids:	A CPP1 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .		

P08AA - Clutch Pedal Position Sensor A Circuit High

Description:	This DTC sets when the CPP1 signal is out of self-test range high.		
Possible Causes:	• CPP1 circuit open • CPP1 circuit short to voltage • Damaged CPP sensor		
Diagnostic Aids:	A CPP1 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .		

P08B5 - Clutch Pedal Position Sensor A Circuit Range/Performance

Description:	This DTC sets when the CPP-BT circuit values are outside of a calibrated threshold for more than a calibrated time.		
Possible Causes:	• CPP sensor circuit concerns • Damaged CPP sensor		
Diagnostic Aids:	Monitor the CPP sensor PIDs while applying and releasing the clutch pedal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .		

P08B6 - Clutch Pedal Position Sensor B Circuit Low

Description:	This DTC sets when the CPP2 signal is out of self-test range low.		
Possible Causes:	• CPP2 circuit open • CPP2 circuit short to ground • Damaged CPP sensor		
Diagnostic Aids:	A CPP sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .		

P08B7 - Clutch Pedal Position Sensor B Circuit High

Description:	This DTC sets when the (CPP2) signal is out of self-test range high.		
Possible Causes:	• CPP sensor assembly is binding • CPP2 circuit short to voltage • Damaged CPP sensor		
Diagnostic Aids:	A CPP sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .		

P08B9 - Clutch Pedal Position Sensor A/B Correlation

Description:	This DTC sets when the CPP-BT and CPP-TT values are outside of a calibrated threshold.		
Possible Causes:	• CPP sensor circuit concerns • Damaged CPP sensor		
Diagnostic Aids:	Monitor the CPP sensor PIDs while applying and releasing the clutch pedal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .		

P0A09 - DC/DC Converter Status Circuit Low

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• Damaged PCM		
Diagnostic Aids:	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.
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P0A0F - Engine Failed To Start

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 501-14, Handles, Locks, Latches and Entry Systems, Diagnosis and Testing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0A10 - DC/DC Converter Status Circuit High

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	Damaged PCM		
Diagnostic Aids:	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		

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

Description:	This DTC sets when the KOER self-test does not complete in the time allowed.		
Possible Causes:	- Incorrect self-test procedure - Unexpected response from the self-test monitors - RPM out of specification		
Diagnostic Aids:	Carry out the KOEO self-test. Refer to Section 3, GO to Pinpoint Test QT .		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1022 - Cylinder Head Temperature Sensor 2 Circuit Low

Description:	This DTC sets when a CHT2 circuit concern is present.
Possible Causes:	

		• CHT2 circuit short to ground • Damaged CHT2 sensor • Incorrect CHT2 harness connection	
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test DL .	Continuous Memory

P1023 - Cylinder Head Temperature Sensor 2 Circuit High

Description:	This DTC sets when a CHT2 circuit concern is present.		
Possible Causes:	• CHT2 circuit open • CHT circuit short to voltage • Damaged CHT2 sensor • Incorrect CHT2 harness connection		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test DL .	Continuous Memory

P1102 - Mass Air Flow Sensor In Range But Lower Than Expected

Description:	This DTC sets when the airflow is less than the calibrated threshold based on the engine speed and torque.		
Possible Causes:	• Charge air cooler (CAC) restriction • CAC leak • Intake air system restriction • Intake air system leak • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. When the engine speed revolutions per minute (RPM) is 400 RPM to 3500 RPM the airflow should be greater than 0 to 210, airflow less than the minimum threshold value indicates a concern.		
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test J .	Continuous Memory

P1103 - Mass Air Flow Sensor In Range But Higher Than Expected

Description:	This DTC sets when the airflow is greater than the calibrated threshold based on the engine speed and torque.		
Possible	• Charge air cooler (CAC) restriction		

Causes:	• CAC leak • Intake air system restriction • Intake air system leak • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. When the engine speed revolutions per minute (RPM) is 600 RPM to 3500 RPM the airflow should be less than 300 to 1150, airflow greater than the maximum threshold value indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

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

Description:	This DTC sets when the ECT sensor is out of self-test range. The self-test range is greater than 0.3 volts and less than 3.7 volts.		
Possible Causes:	• Overheating condition • Low engine coolant level • Damaged thermostat • Damaged ECT circuit • Damaged ECT sensor • Damaged ECT connector		
Diagnostic Aids:	The engine coolant temperature must be greater than 10°C (50°F) to pass the key ON, engine OFF (KOEO) self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test K .		

P1140 - Water In Fuel Condition

Description:	The water in fuel (WIF) sensor is monitored by the PCM. This DTC sets when the PCM detects water in the fuel, and the WIF indicator lamp is illuminated.		
Possible Causes:	• Water in fuel condition • WIF circuit short to ground • Damaged WIF sensor		
Diagnostic Aids:	Drain a fuel sample from the fuel conditioning module and inspect for water or contaminants. If no water or contaminants are in the container, check for a circuit concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test O .		

P1177 - Synchronization

Description:	This DTC sets when there is an intermittent loss of camshaft to crankshaft synchronization for at least 5 or more occurrences with the engine running.		
Possible Causes:	• Damaged crankshaft position (CKP) sensor • Damaged ignition pulse crankshaft sensor ring • Damaged camshaft position 11 (CMP11) sensor • Damaged CMP11 sensor target wheel • Damaged PCM		
Diagnostic Aids:	The camshaft to crankshaft synchronization can be monitored by accessing the SYNC PID on the scan tool.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test D .		

P117B - Exhaust Gas Temperature Sensor Correlation - Bank 1

Description:	The powertrain control module (PCM) monitors the 4 exhaust gas temperature (EGT) sensors at key ON, engine OFF, following a 6-hour soak to determine if a concern is present. This PCM compares the values of the 4 EGT sensors to verify the sensors correlate to each other. The test fails when the temperature difference at one of the EGT sensors is greater than 50°C (122°F).		
Possible Causes:	• Corrosion or incorrect harness connection • Damaged EGT sensor		
Diagnostic Aids:	Monitor the EGT PIDs to determine which one of the 4 sensors does not correlate.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P1184 - Engine Oil Temperature Sensor Out Of Self-Test Range

Description:	This DTC sets when the engine oil temperature (EOT) sensor signal is out of self-test range.		
Possible Causes:	• EOT circuit open • EOT circuit short to ground • EOT circuit short to voltage • Damaged EOT sensor • Damaged harness • Damaged harness connector		
Diagnostic Aids:	The engine should be at operating temperature before carrying out the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test L .		

P1199 - Restraints Event - Fueling Disabled

Description:	This DTC sets when the body control module (BCM) detects a restraints event. The BCM depowers the fuel pump control module relay and the PCM ceases all fuel pump control module commands.		
Possible Causes:	• Restraints deployment event		
Diagnostic Aids:	This DTC is informational and may be accompanied by other DTCs. Diagnose other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P119F - Internal Control Module Fuel Pressure Control Performance

Description:	This DTC sets when the redundant calculation of fuel rail pressure does not match with the calculation of fuel rail pressure being used for fuel injection.		
Possible Causes:	• Aftermarket performance products • PCM programming error		
Diagnostic Aids:	Check for aftermarket performance products. If no aftermarket performance products are present, check for other DTCs or drive symptoms and diagnose those first. If no other DTCs are present, clear the DTC and repeat the self-test. If the DTC is retrieved again, reprogram or update the calibration as necessary. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1201 - Cylinder 1 Injector Circuit Open/Shorted

Description:	This DTC sets when the output amperage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ1 circuit open • INJ1 circuit short to ground • INJ1RTN circuit open • INJ1RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1202 - Cylinder 2 Injector Circuit Open/Shorted

Description:	This DTC sets when the output amperage of the fuel injector control circuit is outside of the calibrated limit.		
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Possible Causes:	• INJ2 circuit open • INJ2 circuit short to ground • INJ2RTN circuit open • INJ2RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1203 - Cylinder 3 Injector Circuit Open/Shorted

Description:	This DTC sets when the output amperage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ3 circuit open • INJ3 circuit short to ground • INJ3RTN circuit open • INJ3RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1204 - Cylinder 4 Injector Circuit Open/Shorted

Description:	This DTC sets when the output amperage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ4 circuit open • INJ4 circuit short to ground • INJ4RTN circuit open • INJ4RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1205 - Cylinder 5 Injector Circuit Open/Shorted

Description:	This DTC sets when the output amperage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ5 circuit open • INJ5 circuit short to ground • INJ5RTN circuit open • INJ5RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1206 - Cylinder 6 Injector Circuit Open/Shorted

Description:	This DTC sets when the output amperage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ6 circuit open • INJ6 circuit short to ground • INJ6RTN circuit open • INJ6RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1207 - Cylinder 7 Injector Circuit Open/Shorted

Description:	This DTC sets when the output amperage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ7 circuit open • INJ7 circuit short to ground • INJ7RTN circuit open • INJ7RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1208 - Cylinder 8 Injector Circuit Open/Shorted

Description:	This DTC sets when the output amperage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ8 circuit open • INJ8 circuit short to ground • INJ8RTN circuit open • INJ8RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P123E - NOX Sensor Communication Intermittent (Bank 1 Sensor 1)**For F-650 / F-750**

Description:	This DTC sets when the communication signal from the nitrogen oxides bank 1, sensor 1 (NOx11) module is no longer detected.
Possible Causes:	• Incorrect NOx11 module connection
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.

For All Others

Description:	This DTC sets when the DTC U029D is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.		
Possible Causes:			
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles , for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-650 / F-750	GO to Pinpoint Test RD .		
All others	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P123F - NOX Sensor Communication Intermittent (Bank 1 Sensor 2)

For F-650 / F-750

Description: This DTC sets when the communication signal from the nitrogen oxides bank 1, sensor 2 (NOx12) module is no longer detected.

Possible Causes:

- Incorrect NOx12 module connection

Diagnostic Aids: The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.

For All Others

Description: This DTC sets when the DTC U029E is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.

Possible Causes:

Diagnostic Aids: This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, [Drive Cycles](#), for additional information.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-650 / F-750	GO to Pinpoint Test RD .		
All others	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1247 - Turbocharger Boost Pressure Low

Description: This DTC sets when the indicated boost pressure is less than the desired boost pressure by greater than a calibrated value for a calibrated period of time.

Possible Causes:

- Intake air system leaks between the turbocharger and the intake manifold
- Variable geometry turbocharger (VGT) slow to respond
- VGT vanes stuck open

Diagnostic Aids: The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.
Check the tubing and components for cracks and incorrect fitting connections between the turbocharger and the intake manifold.

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

P1249 - Wastegate Control Valve Performance

Description: This DTC sets when the difference between the actual airflow value and the desired airflow value is greater than a calibrated threshold when the monitor runs at engine idle.

Possible Causes:

- Intake air system leak

Causes:			
Diagnostic Aids:	Check the intake air system for a leak.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P124C - Turbocharger/Supercharger A Boost System Performance during Self Test

Description:	This DTC sets when the indicated boost pressure is less than the calibrated value by greater than a calibrated threshold.		
Possible Causes:	• Charge air cooler (CAC) system leaks • Intake air system leaks • Exhaust system leaks • Manifold absolute pressure (MAP) sensor biased • Exhaust pressure (EP) sensor biased • Restriction in the EP sensor • Restriction in the EP tube • Variable geometry turbocharger (VGT) vanes sticking		
Diagnostic Aids:	If any exhaust gas recirculation (EGR) system DTCs are present with this DTC, it may be an indication of a restricted EP sensor or tube.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P1261 - Cylinder 1 High To Low Side Short

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ1 circuit short to INJ1RTN circuit • INJ1 circuit short to ground • INJ1RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1262 - Cylinder 2 High To Low Side Short

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ2 circuit short to INJ2RTN circuit • INJ2 circuit short to ground		

		• INJ2RTN circuit short to voltage • Damaged fuel injector	
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test P .	
			Continuous Memory

P1263 - Cylinder 3 High To Low Side Short

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ3 circuit short to INJ3RTN circuit • INJ3 circuit short to ground • INJ3RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1264 - Cylinder 4 High To Low Side Short

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.			
Possible Causes:	• INJ4 circuit short to INJ4RTN circuit • INJ4 circuit short to ground • INJ4RTN circuit short to voltage • Damaged fuel injector			
Diagnostic Aids:				
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test P .		

P1265 - Cylinder 5 High To Low Side Short

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit. • INJ5 circuit short to INJ5RTN circuit • INJ5 circuit short to ground • INJ5RTN circuit short to voltage • Damaged fuel injector
Possible Causes:	

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

P1266 - Cylinder 6 High To Low Side Short

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ6 circuit short to INJ6RTN circuit • INJ6 circuit short to ground • INJ6RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1267 - Cylinder 7 High To Low Side Short

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ7 circuit short to INJ7RTN circuit • INJ7 circuit short to ground • INJ7RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1268 - Cylinder 8 High To Low Side Short

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ8 circuit short to INJ8RTN circuit • INJ8 circuit short to ground • INJ8RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P126A - Cylinder 1 Injector Input Circuit

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ1 circuit open • INJ1 circuit short to ground • INJ1RTN circuit open • INJ1RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P126B - Cylinder 2 Injector Input Circuit

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ2 circuit open • INJ2 circuit short to ground • INJ2RTN circuit open • INJ2RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P126C - Cylinder 3 Injector Input Circuit

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ3 circuit open • INJ3 circuit short to ground • INJ3RTN circuit open • INJ3RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test P.
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P126D - Cylinder 4 Injector Input Circuit

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ4 circuit open • INJ4 circuit short to ground • INJ4RTN circuit open • INJ4RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P.		

P126E - Cylinder 5 Injector Input Circuit

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ5 circuit open • INJ5 circuit short to ground • INJ5RTN circuit open • INJ5RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P.		

P127A - Aborted KOER - Fuel Pressure Failure

Description:	This DTC sets when the key ON, engine running (KOER) self-test aborts because of the fuel rail pressure (FRP) is out of self-test range.		
Possible Causes:	• Low fuel pressure • Fuel injectors internal leakage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M.		

P1291 - Injector High Side Short To GND Or VBATT (Bank 1)

Description:	This DTC sets when a current differential between the fuel injector power circuit and fuel injector ground circuit is outside a calibrated limit. When diagnosing a fuel injector or fuel injector circuit concern, bank 1 refers to cylinder numbers 1, 4, 6 and 7.		
Possible Causes:	• INJ circuit short to voltage • INJ circuit short to ground • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1292 - Injector High Side Short To GND Or VBATT (Bank 2)

Description:	This DTC sets when a current differential between the fuel injector power circuit and fuel injector ground circuit is outside a calibrated limit. When diagnosing a fuel injector or fuel injector circuit concern, bank 2 refers to cylinder numbers 2, 3, 5 and 8.		
Possible Causes:	• INJ circuit short to voltage • INJ circuit short to ground • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1295 - Injector Multiple Faults - Bank 1

Description:	This DTC sets when the output voltage of the fuel injector control circuit is outside of the calibrated limit.		
Possible Causes:	• INJ1 circuit open • INJ2 circuit open • INJ3 circuit open • INJ4 circuit open • INJ5 circuit open • INJ1 circuit short to ground • INJ2 circuit short to ground • INJ3 circuit short to ground • INJ4 circuit short to ground • INJ5 circuit short to ground • INJ1RTN circuit open • INJ2RTN circuit open • INJ3RTN circuit open		

	• INJ4RTN circuit open • INJ5RTN circuit open • INJ1RTN circuit short to voltage • INJ2RTN circuit short to voltage • INJ3RTN circuit short to voltage • INJ4RTN circuit short to voltage • INJ5RTN circuit short to voltage • Damaged fuel injector connector • Damaged fuel injector			
Diagnostic Aids:	Monitor the INJ1_OFF, INJ2_OFF, INJ3_OFF, INJ4_OFF and INJ5_OFF PIDs to determine which cylinder number has a fuel injector circuit concern.			
Application	<table><tr><td>Key On Engine Off</td><td>Key On Engine Running</td><td>Continuous Memory</td></tr></table>	Key On Engine Off	Key On Engine Running	Continuous Memory
Key On Engine Off	Key On Engine Running	Continuous Memory		
All	GO to Pinpoint Test P .			

P130E (DCU) - Reductant Pump A Control Circuit Intermittent/Erratic

Description:	This DTC sets when the DTC P208A is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.			
Possible Causes:				
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles , for additional information.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P130E (PCM) - Reductant Pump A Control Circuit Intermittent/Erratic

Description:	This DTC sets when the RDPC circuit signal from the reductant pump is no longer detected.			
Possible Causes:	• Incorrect reductant pump connection			
Diagnostic Aids:	This DTC indicates the reductant pump may be disconnected. Check for correct connections. This DTC may set with other DTCs. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test RG .		

P132A - Turbocharger/Supercharger Boost Control A Electrical

Description:	This DTC sets when the PCM detects a VGTC circuit concern.		
Possible Causes:	• VGTC circuit open • VGTC circuit short to voltage • VGTC circuit short to ground • Damaged turbocharger actuator • Incorrect harness connection		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Verify the turbocharger actuator connector is correctly seated.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P132B - Turbocharger/Supercharger Boost Control A Performance

Description:	This DTC sets when the difference between the actual manifold absolute pressure (MAP) value and the desired MAP value is greater than a calibrated threshold when the monitor runs at engine idle.		
Possible Causes:	• Turbocharger actuator is not responding • Damaged MAP sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. A concern is indicated if the MAP value does not change from 1.0 kPa (0.15 psi) to 2.0 kPa (0.29 psi) during the completion of the intrusive monitor.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P138B - Glow Plug Control Module System Voltage

Description:	The glow plug control module (GPCM) monitors the system supply voltage. This DTC sets when the GPCM detects an under voltage or over voltage condition.		
Possible Causes:	• VPWR circuit open • VBATT circuit open • Damaged GPCM		
Diagnostic Aids:	Glow plug function is disabled when the system voltage is below 6.5 volts and above 16.5 volts.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P1397 - System Voltage Out Of Self Test Range

Description:			
Possible Causes:			
Diagnostic Aids:	Make sure the battery voltage is between 11 and 18 volts before running a key ON, engine OFF (KOEO) or key ON, engine running (KOER) self-test. Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1408 - Exhaust Gas Recirculation (EGR) Flow Out Of Self-Test Range

Description:	This DTC sets when the exhaust pressure (EP) sensor value is above or below the calibrated level when the EGR valve is commanded open during the key ON, engine running (KOER) self-test.		
Possible Causes:	• Aftermarket intake systems or exhaust systems • Intake air system restriction • Exhaust system restriction • Restricted EGR cooler • EGR valve position sensor bias • EP sensor bias • Manifold absolute pressure (MAP) sensor bias • Damaged EGR valve		
Diagnostic Aids:	Use the output state control function of the scan tool and monitor the EGRVP PID while commanding the EGR valve OPEN. If EGR flow is introduced into the engine at idle, the RPM will drop or the engine will stall.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test W .		

P145B - A/C Demand Not Activated During Self-Test

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1501 - Vehicle Speed Sensor Out Of Self Test Range

Description:	This DTC sets when the PCM detected an error in the vehicle speed information.		
Possible Causes:	• Damaged ABS module • Damaged PCM		

Diagnostic Aids:	Monitor the VSS (SPD) PID while driving the vehicle.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DF .		

P1548 - Engine Air Filter Restriction

Description:	This DTC sets when the manifold absolute pressure (MAP) is less than a calibrated value during high demand acceleration engine operating conditions.		
Possible Causes:	• Intake air system restriction • Clogged air filter		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. If this DTC is set, inspect the intake air system and replace the air filter if no obstructions are found. Refer to the Workshop Manual Section 303-12, Intake Air Distribution and Filtering for air filter replacement.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1551 - Cylinder 1 Injector Circuit Range/Performance

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ1 circuit open • INJ1 circuit short to ground • INJ1RTN circuit open • INJ1RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1552 - Cylinder 2 Injector Circuit Range/Performance

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ2 circuit open • INJ2 circuit short to ground • INJ2RTN circuit open • INJ2RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			

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

P1553 - Cylinder 3 Injector Circuit Range/Performance

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ3 circuit open • INJ3 circuit short to ground • INJ3RTN circuit open • INJ3RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1554 - Cylinder 4 Injector Circuit Range/Performance

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ4 circuit open • INJ circuit short to ground • INJ4RTN circuit open • INJ4RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1555 - Cylinder 5 Injector Circuit Range/Performance

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ5 circuit open • INJ5 circuit short to ground • INJ5RTN circuit open • INJ5RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1556 - Cylinder 6 Injector Circuit Range/Performance

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ6 circuit open • INJ6 circuit short to ground • INJ6RTN circuit open • INJ6RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1557 - Cylinder 7 Injector Circuit Range/Performance

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ7 circuit open • INJ7 circuit short to ground • INJ7RTN circuit open • INJ7RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1558 - Cylinder 8 Injector Circuit Range/Performance

Description:	This DTC sets when the output of the fuel injector circuits are not within a calibrated limit.		
Possible Causes:	• INJ8 circuit open • INJ8 circuit short to ground • INJ8RTN circuit open • INJ8RTN circuit short to voltage • Damaged fuel injector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P1575 - Pedal Position Out Of Self Test Range

Description:	During the key ON, engine OFF (KOEO) self-test, the PCM monitors the accelerator pedal position (APP) sensor signals to determine if the APP1 and APP2 signals are less than an expected value. This DTC sets when APP1 or APP2 is greater than the expected value.		
Possible Causes:	The accelerator pedal is applied during KOEO self-test		
Diagnostic Aids:	Make sure the floor mat is not interfering with the accelerator pedal. Repeat the self test without applying 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 AG .		

P160A - Control Module Vehicle Options Reconfiguration Error

Description:	This DTC sets when the PCM detects a vehicle option configuration concern.		
Possible Causes:	- Aftermarket performance products - PCM programming error - PCM internal software error - Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. If the PCM already has the latest calibration, carry out the RELEARN VEHICLE DATA procedure from the SERVICE FUNCTIONS menu on the scan tool. Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming The VID Block For A Replacement PCM, to reprogram the 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.		

P160C - Control Module Software Performance

Description:	This DTC sets when the PCM central processor unit (CPU) internal checks return an incorrect value.		
Possible Causes:	- VPWR circuit open - VPWR circuit short to ground - VPWR circuit intermittent - KAPWR circuit open - KAPWR circuit short to ground - Aftermarket performance products - Software incompatibility issue - PCM programming error - Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs and diagnose those first. 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.		

P161A - Incorrect Response From Immobilizer Control Module

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1635 - Tire/Axle Ratio Out Of Acceptable Range

Description:	This DTC sets when the tire and axle information contained in the vehicle identification (VID) block does not match the vehicle hardware.		
Possible Causes:	• 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.		

P1639 - Vehicle ID Block Corrupted, Not Programmed

Description:	This DTC sets when the vehicle identification (VID) block is not programmed or the information within is corrupt.		
Possible Causes:	• Module reprogramming		
Diagnostic Aids:	Using a scan tool, program the PCM to the most recent calibration available. 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) .		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P164C - Internal Control Module Start-Stop Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible			

Causes:	• Module programming error • Aftermarket performance products • Damaged PCM		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Check for other DTCs and diagnose those first. If no DTCs are present, continue to follow diagnosis for this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AA .		

P166A - Restraints Deployment Communication Circuit

Description:	This DTC sets when the PCM detects an open or short in the IES circuit.		
Possible Causes:	• IES circuit open • IES circuit short to ground • IES circuit short to voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P1671 - Secondary Fuel Pump Relay

Description:	This DTC sets when the PCM detects an open or short on the FP circuit between the PCM and fuel pump (FP) relay.		
Possible Causes:	• FP circuit open • FP circuit short to ground • Damaged FP relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

P167F - Non-OEM Calibration Detected

Description:	This DTC sets when the PCM has detected an unauthorized calibration.		
Possible Causes:	• Aftermarket accessories and performance modifications • PCM programming error		
Diagnostic Aids:	Reprogram or update the calibration. 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 PCM. If it is necessary to install a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .		
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P168F - Cold Start Injection System Performance

Description:	This DTC sets when an error occurs in the PCM.			
Possible Causes:	• PCM reprogramming • Software incompatibility issue • Aftermarket performance products • Damaged PCM			
Diagnostic Aids:	This DTC is set when the PCM detects the communication of the internal processor has been compromised.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test YA .		

P1705 - Transmission Range Sensor Out Of Self-Test Range

Description:				
Possible Causes:				
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

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

Description:				
Possible Causes:				
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls. Diagnostic Trouble Code (DTC) Charts.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1725 - Insufficient Engine Speed Increase During Self Test

Description:	This DTC sets when the PCM detects the engine speed is less than a calibrated speed during the key On,			
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	engine running (KOER) self-test. The (KOER) self-test aborts when the DTC sets.		
Possible Causes:			
Diagnostic Aids:	If the KOER self-test is aborted and this DTC is present, repeat the KOER self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1726 - Insufficient Engine Speed Decrease During Self Test

Description:	This DTC sets when the PCM detects the engine speed is greater than a calibrated speed during the key ON, engine running (KOER) self-test. The KOER self-test aborts when the DTC sets.		
Possible Causes:			
Diagnostic Aids:	If the KOER self-test is aborted and this DTC is present, repeat the KOER self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1934 - Vehicle Speed Signal

Description:	This DTC sets when there is a sudden loss of vehicle speed signal over a period of time. Vehicle speed data is received from either the transmission control module (TCM) or the anti-lock brake system (ABS) module.		
Possible Causes:	• Damaged wheel speed sensors • Damaged wheel speed sensor harness circuits		
Diagnostic Aids:	Monitor the VSS PID while driving the vehicle. If vehicle speed data is lost, check the TCM or ABS module for related DTCs.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DF .		

P2002 - Particulate Filter Efficiency Below Threshold (Bank 1)

Description:	The PCM monitors the diesel particulate filter efficiency by measuring the soot accumulation at the particulate matter bank 1, sensor 1 (PM11). This DTC sets when the PM11 reading exceeds the inferred reading for a calibrated soot level.		
Possible Causes:	• Aftermarket accessories and performance modifications • Damaged PM11 sensor • Damaged diesel particulate filter		
Diagnostic Aids:	Check for black smoke out of the exhaust system tailpipe, as well as black soot deposits in the tailpipe.		

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

P200C - Particulate Filter Over Temperature (Bank 1)

Description:	The PCM monitors the diesel particulate filter temperature using compared exhaust gas temperature (EGT) sensor values. This DTC sets when the diesel particulate filter temperature exceeds an expected threshold, if the temperature increase across any one catalyst exceeds 500°C (932°F), or if any EGT sensor downstream of the diesel particulate filter is disconnected.		
Possible Causes:	• Diesel particulate filter temperature too high • Exhaust catalyst temperatures too high • Disconnected EGT sensor • Damaged EGT sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P200E - Catalyst System Over Temperature (Bank 1)

Description:	The PCM monitors the exhaust gas temperature bank 1, sensor 2 (EGT12) and exhaust gas temperature bank 1, sensor 3 (EGT13) for an over temperature concern. If the EGT12 sensor temperature is greater than 830°C (1,526°F) or the EGT13 sensor temperature is greater than 950°C (1,742°F), the DTC is set. This DTC causes the PCM to immediately illuminate the malfunction indicator lamp (MIL) and enter a torque reduction failure mode effects management (FMEM), which may result in engine shutdown. Once the engine is shut down, the PCM prevents the engine from restarting for 1 hour. If the EGT13 sensor is not working, the engine will not start.		
Possible Causes:	• Diesel particulate filter regeneration occurred during heavy load and high ambient temperature conditions • Excessive amount of soot or ash in the diesel particulate filter • Damaged EGT12 sensor • Damaged EGT13 sensor • Coolant contamination of the exhaust system • Oil contamination of the exhaust system		
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. Check the EGT12 and EGT13 PIDs. If no other DTCs are present, the system is operating correctly at this time. Advise the customer of the conditions that may cause this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P202D (DCU) - Reductant Leakage

Description:	The reductant dosage control module monitors the reductant pump motor when the selective catalytic reduction (SCR) system is active but the reductant injector is closed. This DTC sets when the reductant dosage control module must output a duty cycle greater than 50% to the reductant pump motor to maintain system pressure.		
Possible Causes:	• Diesel exhaust fluid level is low • Damaged reductant pump assembly • Damaged reductant injector • Damaged reductant pressure line		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P202D (PCM) - Reductant Leakage

Description:	The PCM monitors the reductant pump motor when the selective catalytic reduction (SCR) system is active but the reductant injector is closed. This DTC sets when the PCM must output a duty cycle greater than 50% to the reductant pump motor to maintain system pressure.		
Possible Causes:	• Diesel exhaust fluid level is low • Damaged reductant pump assembly • Damaged reductant injector • Damaged reductant pressure line		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P202E (DCU) - Reductant Injection Valve Circuit Range/Performance (Bank 1 Unit 1)

Description:	This DTC sets when the DTC P2047 is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.		
Possible Causes:			
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles , for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P202E (PCM) - Reductant Injection Valve Circuit Range/Performance (Bank 1 Unit 1)

Description:	This DTC sets when voltage from the reductant injector is no longer detected.		
Possible Causes:	Incorrect reductant injector connection		
Diagnostic Aids:	This DTC indicates the reductant injector may be disconnected. Check for correct connections. This DTC may set with other DTCs. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P2031 - Exhaust Gas Temperature Sensor Circuit Bank 1 Sensor 2

Description:	The PCM monitors the operation of the exhaust gas temperature bank 1, sensor 2 (EGT12) to determine if the EGT12 sensor responds to the increase in temperature of the exhaust gas, during vehicle operation. The PCM then compares the measured temperature to a modeled value. This DTC sets when, after 5 minutes of driving, following a 6 hour soak, the EGT12 sensor temperature does not correlate to the modeled temperature of 150°C (302°F).		
Possible Causes:	- Exhaust leaks - Excessive soot or ash build up on sensor - Damaged EGT12 sensor		
Diagnostic Aids:	Monitor the EGT12 PID between ignition ON, engine OFF and ignition ON, engine running for an indication of a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2032 - Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 2

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 2 (EGT12) voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	- EGT12 circuit short to SIGRTN - EGT12 circuit short to ground - Damaged EGT12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. An EGT12_V PID value less than 0.10 volt indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2033 - Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 2

Description:	This DTC sets when the exhaust gas temperature sensor bank 1, sensor 2 (EGT12) voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• EGT12 circuit open • EGT12 circuit short to voltage • Damaged EGT12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information. An EGT12_V PID value greater than 4.90 volts indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P203A (DCU) - Reductant Level Sensor A Circuit

Description:	This DTC sets when the reductant dosage control module detects an open or short to voltage on the SIGRTN circuit.		
Possible Causes:	• SIGRTN circuit open • SIGRTN circuit short to voltage • Damaged reductant level sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument panel cluster (IPC) message center. Refer to Section 2, Drive Cycles for additional information. The reductant level sensor and reductant temperature sensor share a common ground. An open or short to voltage in this ground sets DTCs for both sensors.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P203A (PCM) - Reductant Level Sensor A Circuit

Description:	This DTC sets when the PCM detects an open or short to voltage on the RDLRTN circuit.		
Possible Causes:	• RDLRTN circuit open • RDLRTN circuit short to voltage • Damaged reductant level sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information. The reductant level sensor and reductant temperature sensor share a common ground. An open or short to voltage in this ground sets DTCs for both sensors.		

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

P203B (DCU) - Reductant Level Sensor A Circuit Range/Performance

Description:	This DTC sets when the reductant dosage control module detects an incorrect reading, such as RDL1 (top pin) indicating a full tank while RDL3 (bottom pin) is indicating an empty tank.		
Possible Causes:	• RDL1 circuit open • RDL1 circuit short to ground • RDL2 circuit open • RDL2 circuit short to ground • RDL3 circuit open • RDL3 circuit short to ground • Damaged reductant level sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P203B (PCM) - Reductant Level Sensor Circuit Range/Performance

Description:	This DTC sets when the PCM detects an irrational reading from the reductant level sensor, such as a reductant level greater than the reductant tank capacity.		
Possible Causes:	• Reductant level too low for accurate level reading • Communication error • Damaged reductant level sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P203C (DCU) - Reductant Level Sensor A Circuit Low

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL1 circuit short to ground • SIGRTN circuit short to ground • Damaged reductant level sensor		
Diagnostic	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss		

Aids:	of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P203C (PCM) - Reductant Level Sensor Circuit Low

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL1 circuit short to ground • RDL2 circuit short to ground • RDL3 circuit short to ground • RDLRTN circuit short to ground • Damaged reductant level sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P203D (DCU) - Reductant Level Sensor A Circuit High

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL1 circuit short to voltage • SIGRTN circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center. The reductant level sensor and reductant temperature sensor share a common ground. An open or short to voltage in this ground sets DTCs for both sensors.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P203D (PCM) - Reductant Level Sensor Circuit High

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL1 circuit short to voltage • RDLRTN circuit short to voltage		

Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. The reductant level sensor and reductant temperature sensor share a common ground. An open or short to voltage in this ground sets DTCs for both sensors.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P203E (DCU) - Reductant Level Sensor A Circuit Intermittent/Erratic

Description:	This DTC sets when the DTC P203A is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.		
Possible Causes:			
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles, for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P203E (PCM) - Reductant Level Sensor A Circuit Intermittent/Erratic

Description:	This DTC sets when a signal is no longer detected from the reductant level sensor.		
Possible Causes:	Incorrect reductant level sensor connection		
Diagnostic Aids:	This DTC indicates the reductant level sensor may be disconnected. Check for correct connections. This DTC may set with other DTCs. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P203F - Reductant Level Too Low

Description:	This DTC sets when the reductant level reaches a minimum amount and the PCM limits vehicle speed to 89 km/h (55 mph).		
Possible Causes:	Reductant level too low		
Diagnostic Aids:	This DTC clears when the PCM detects a refill event. Fill the reductant tank and carry out the SCR System Refill Activation on the scan tool.		

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

P2043 (DCU) - Reductant Temperature Sensor Circuit Range/Performance

Description:	The reductant dosage control module completes a plausibility check on the reductant temperature sensor after a 6 hour cold soak by comparing the reductant temperature signal to the ambient air temperature and engine coolant temperature signals on startup. This DTC sets when the reductant temperature difference compared to the ambient air temperature and engine coolant temperature is greater than 20°C (36°F).		
Possible Causes:	• Slow responding reductant temperature sensor • Damaged reductant temperature sensor		
Diagnostic Aids:	Diagnose and repair all circuit DTCs before diagnosing DTC P2043.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test R1 .		

P2043 (PCM) - Reductant Temperature Sensor Circuit Range/Performance

Description:	The PCM completes a plausibility check on the reductant temperature sensor after a 6 hour cold soak by comparing the reductant temperature signal to the ambient air temperature and engine coolant temperature signals on startup. This DTC sets when the reductant temperature difference compared to the ambient air temperature and engine coolant temperature is greater than 20°C (36°F).		
Possible Causes:	• Slow responding reductant temperature sensor • Damaged reductant temperature sensor		
Diagnostic Aids:	Diagnose and repair all circuit DTCs before diagnosing DTC P2043.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test R1 .		

P2044 - Reductant Temperature Sensor A Circuit Low

Description:	This DTC sets when the reductant temperature sensor voltage is less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDT circuit open • RDT circuit short to ground • Damaged reductant temperature sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test RI .
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P2045 - Reductant Temperature Sensor A Circuit High

Description:	This DTC sets when the reductant temperature sensor voltage is greater than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDT circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RI .		

P2047 (DCU) - Reductant Injection Valve Circuit/Open Bank 1 Unit 1

Description:	This DTC sets when the reductant injector voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDINJPWR circuit open • RDINJPWR circuit short to ground • RDINJPWR circuit short to voltage • RDINJGND circuit open • RDINJGND circuit short to ground • RDINJGND circuit short to voltage • Reductant injector open • Reductant injector short to ground • Reductant injector short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument panel cluster (IPC) message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P2047 (PCM) - Reductant Injection Valve Circuit/Open Bank 1 Unit 1

Description:	This DTC sets when the reductant injector voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDINJPWR circuit open • RDINJPWR circuit short to ground • RDINJPWR circuit short to voltage • RDINJGND circuit open • RDINJGND circuit short to ground		

	• RDINJGND circuit short to voltage • Reductant injector open • Reductant injector short to ground • Reductant injector short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P2048 (DCU) - Reductant Injection Valve Circuit Low (Bank 1 Unit 1)

Description:	This DTC sets when the reductant injector voltage is greater than or less than a calibrated limit for a calibrated amount of time.										
Possible Causes:	• RDINJPWR circuit short to ground • RDINJGND circuit short to ground										
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.										
Application	<table border="1"> <tr> <td></td><td>Key On Engine Off</td><td>Key On Engine Running</td><td>Continuous Memory</td></tr> <tr> <td>All</td><td></td><td>GO to Pinpoint Test RK.</td><td></td></tr> </table>		Key On Engine Off	Key On Engine Running	Continuous Memory	All		GO to Pinpoint Test RK .			
	Key On Engine Off	Key On Engine Running	Continuous Memory								
All		GO to Pinpoint Test RK .									

P2048 (PCM) - Reductant Injection Valve Circuit Low (Bank 1 Unit 1)

Description:	This DTC sets when the reductant injector voltage is greater than or less than a calibrated limit for a calibrated amount of time.										
Possible Causes:	• RDINJPWR circuit short to ground • RDINJGND circuit short to ground										
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.										
Application	<table border="1"> <tr> <td></td><td>Key On Engine Off</td><td>Key On Engine Running</td><td>Continuous Memory</td></tr> <tr> <td>All</td><td></td><td>GO to Pinpoint Test RK.</td><td></td></tr> </table>		Key On Engine Off	Key On Engine Running	Continuous Memory	All		GO to Pinpoint Test RK .			
	Key On Engine Off	Key On Engine Running	Continuous Memory								
All		GO to Pinpoint Test RK .									

P2049 (DCU) - Reductant Injection Valve Circuit High (Bank 1 Unit 1)

Description:	This DTC sets when the reductant injector voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDINJPWR circuit short to RDINJGND circuit • RDINJGND circuit short to voltage		

Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P2049 (PCM) - Reductant Injection Valve Circuit High (Bank 1 Unit 1)

Description:	This DTC sets when the reductant injector voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDINJPWR circuit short to RDINJGND circuit • RDINJGND circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P204B (DCU) - Reductant Pressure Sensor Circuit Range/Performance

Description:	The reductant dosage control module carries out a plausibility check on the reductant pressure sensor during startup after a successful purge cycle, when the reductant pressure line has been drained. This DTC sets when the reductant pressure sensor signal exceeds 30 kPa (4.4 psi).		
Possible Causes:	• Slow responding reductant pressure sensor • Damaged reductant pressure sensor		
Diagnostic Aids:	Diagnose and repair all circuit DTCs before diagnosing DTC P204B.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RF .		

P204B (PCM) - Reductant Pressure Sensor Circuit Range/Performance

Description:	The PCM carries out a plausibility check on the reductant pressure sensor during startup after a successful purge cycle, when the reductant pressure line has been drained. This DTC sets when the reductant pressure sensor signal exceeds 30 kPa (4.4 psi).		
Possible Causes:	• Slow responding reductant pressure sensor • Damaged reductant pressure sensor		
Diagnostic Aids:	Diagnose and repair all circuit DTCs before diagnosing DTC P204B.		

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

P204C (DCU) - Reductant Pressure Sensor Circuit Low

Description:	This DTC sets when the reductant pressure sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDP circuit open • RDP circuit short to ground • VREF circuit open • VREF circuit short to ground • Damaged reductant pressure sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument panel cluster (IPC) message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RF .		

P204C (PCM) - Reductant Pressure Sensor Circuit Low

Description:	This DTC sets when the reductant pressure sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDP circuit open • RDP circuit short to ground • VREF circuit open • VREF circuit short to ground • Damaged reductant pressure sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RF .		

P204D (DCU) - Reductant Pressure Sensor Circuit High

Description:	This DTC sets when the reductant pressure sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDP circuit short to voltage • VREF circuit short to voltage		

Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RF .		

P204D (PCM) - Reductant Pressure Sensor Circuit High

Description:	This DTC sets when the reductant pressure sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDP circuit short to voltage • VREF circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RF .		

P204E (DCU) - Reductant Pressure Sensor Circuit Intermittent/Erratic

Description:	This DTC sets when the DTC P204C is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.		
Possible Causes:			
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles, for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P204E (PCM) - Reductant Pressure Sensor Circuit Intermittent/Erratic

Description:	This DTC sets when a signal is no longer detected from the reductant pressure sensor.		
Possible Causes:	• Incorrect reductant pressure sensor connection		
Diagnostic Aids:	This DTC indicates the reductant pressure sensor may be disconnected. Check for correct connections. This DTC may set with other DTCs. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		

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

P204F - Reductant System Performance (Bank 1)

For Transit

Description:	This DTC sets when the PCM detects any reductant dosage control module (RDCM) DTCs.
Possible Causes:	RDCM DTCs present
Diagnostic Aids:	This DTC is informational only and may be accompanied by other DTCs. Diagnose all other PCM and RDCM DTCs first. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles, for additional information.

For All Others

Description:	The PCM monitors selective catalytic reduction (SCR) system performance by monitoring the rate of reductant flow and feedback from the nitrogen oxides bank 1, sensor 2 (NOx12). These values are compared to a calculated model. This DTC sets when the difference between the modeled and actual system performance exceeds a threshold and a restriction in the SCR system is suspect.		
Possible Causes:	- Restricted reductant pressure line - Restricted reductant filter		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Transit	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		
All others	GO to Pinpoint Test RG .		

P2054 - Reductant Injection Valve Circuit Low (Bank 1 Unit 2)

Description:	This DTC sets when the reductant injector voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	- RDINJPWR circuit short to ground - RDINJGND circuit short to ground		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P2055 - Reductant Injection Valve Circuit High (Bank 1 Unit 2)

Description:	This DTC sets when the reductant injector voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDINJPWR circuit short to RDINJGND circuit • RDINJGND circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P205B - Reductant Tank Temperature Sensor Circuit Range/Performance

Description:	The PCM completes a plausibility check on the reductant temperature sensor after a 6 hour cold soak by comparing the reductant tank temperature and reductant quality sensor temperature on startup. This DTC sets when the reductant tank temperature difference compared to the reductant quality sensor temperature is greater than 40°C (72°F).		
Possible Causes:	• Slow responding reductant temperature sensor • Damaged reductant temperature sensor		
Diagnostic Aids:	Diagnose and repair all circuit DTCs before diagnosing DTC P205B. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RI .		

P205C (DCU) - Reductant Tank Temperature Sensor Circuit Low

Description:	This DTC sets when the reductant temperature sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDT circuit open • RDT circuit short to ground • Damaged reductant temperature sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RI .		

P205C (PCM) - Reductant Tank Temperature Sensor Circuit Low

Description:	This DTC sets when the reductant temperature sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDT circuit open • RDT circuit short to ground • VREF circuit open • VREF circuit short to ground • Damaged reductant temperature sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RI .		

P205D (DCU) - Reductant Tank Temperature Sensor Circuit High

Description:	This DTC sets when the reductant temperature sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDT circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument panel cluster (IPC) message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RI .		

P205D (PCM) - Reductant Tank Temperature Sensor Circuit High

Description:	This DTC sets when the reductant temperature sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDT circuit short to voltage • VREF circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RI .		

P205E (DCU) - Reductant Tank Temperature Sensor Circuit Intermittent/Erratic

Description:	This DTC sets when the DTC P205D is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.		
Possible Causes:			
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles , for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P205E (PCM) - Reductant Tank Temperature Sensor Circuit Intermittent/Erratic

Description:	This DTC sets when a signal is no longer detected from the reductant temperature sensor.		
Possible Causes:	Incorrect reductant temperature sensor connection		
Diagnostic Aids:	This DTC indicates the reductant temperature sensor may be disconnected. Check for correct connections. This DTC may set with other DTCs. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RI .		

P206A - Reductant Quality Sensor

Description:	This DTC sets when the reductant quality module signal circuit is greater than or less than an expected value..		
Possible Causes:	- Damaged reductant quality module harness - Damaged reductant quality module		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P206B - Reductant Quality Sensor Range/Performance

Description:	This DTC sets when the reductant quality module sensor circuits are operating outside of an expected range for a calibrated amount of time.		
Possible Causes:	• Damaged reductant quality module harness • Damaged reductant quality module		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P206C - Reductant Quality Sensor Low

Description:	This DTC sets when the actual reductant quality module signal is less than the expected value for a calibrated amount of time.		
Possible Causes:	• Incorrect reductant concentration • Damaged reductant quality module harness • Damaged reductant quality module		
Diagnostic Aids:	Check the reductant sample for urea concentration and contamination using the appropriate test equipment. Refer to Section 1, Engine Control Components, Selective Catalytic Reduction (SCR) Catalyst for additional information. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P206D - Reductant Quality Sensor High

Description:	This DTC sets when the actual quality module signal is greater than the expected value for a calibrated amount of time.		
Possible Causes:	• Damaged reductant quality module harness • Damaged reductant quality module • Incorrect reductant concentration		
Diagnostic Aids:	Check the reductant sample for urea concentration and contamination using the appropriate test equipment. Refer to Section 1, Engine Control Components, Selective Catalytic Reduction (SCR) Catalyst for additional information. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		

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

P2073 - Manifold Absolute Pressure/Mass Air Flow - Throttle Position Correlation At Idle

Description:	This DTC sets when the final air mass adaption stored value at idle is greater than 15% above or below the calibrated threshold.		
Possible Causes:	• Charge air cooler (CAC) restriction • CAC leak • Crankcase ventilation system restriction • Crankcase ventilation system leak • Intake air system restriction • Intake air system leak • Biased mass airflow/intake air temperature (MAF/IAT) sensor • Damaged MAF/IAT sensor • Damaged exhaust gas recirculation (EGR) valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P2074 - Manifold Absolute Pressure/Mass Air Flow - Throttle Position Correlation At Higher Load

Description:	This DTC sets when the final air mass adaption stored value at higher load is greater than 15% above or below the calibrated threshold.		
Possible Causes:	• Charge air cooler (CAC) restriction • CAC leak • Crankcase ventilation system restriction • Crankcase ventilation system leak • Intake air system restriction • Intake air system leak • Biased mass airflow/intake air temperature (MAF/IAT) sensor • Damaged MAF/IAT sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

P207F - Reductant Quality Performance

Description:	The PCM monitors selective catalytic reduction (SCR) system performance using the nitrogen oxides bank 1, sensor 1 (NOx11) and the nitrogen oxides bank 1, sensor 2 (NOx12), in addition to other inputs. This DTC sets when overall NOx conversion drops suddenly.
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Possible Causes:	• Reductant quality • Damaged SCR system components • Damaged SCR catalyst • Biased NOx11 sensor • Biased NOx12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P2080 - Exhaust Gas Temperature Sensor Circuit Range/Performance (Bank 1 Sensor 1)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 1 (EGT11) is not within an expected calibrated range.		
Possible Causes:	• Incorrect connections • Damaged EGT11 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2084 - Exhaust Gas Temperature Sensor Circuit Range/Performance (Bank 1 Sensor 2)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 2 (EGT12) is not within an expected calibrated range.		
Possible Causes:	• Incorrect connections • Damaged EGT12 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2085 - Exhaust Gas Temperature Sensor Circuit Intermittent (Bank 1 Sensor 2)

For Transit			
Description:	This DTC sets when the DTC P2033 is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.		
Possible Causes:			

Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles , for additional information. For F-Series Super Duty, this DTC is present for 400 days after the exhaust system fluid fault message is cleared.		
For All Others			
Description:	This DTC sets when an intermittent concern is detected in the EGT12 circuit.		
Possible Causes:	• EGT12 circuit intermittent open • EGT12 circuit intermittent short to ground • EGT12 circuit intermittent short to voltage • Incorrect connections • Damaged exhaust gas temperature bank 1, sensor 2 (EGT12)		
Diagnostic Aids:	Harness routing, harness alterations, or incorrect shielding may have an intermittent impact on the EGT12 circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Transit	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		
All others	GO to Pinpoint Test RC .		

P208A (DCU) - Reductant Pump Control Circuit Open Load

Description:	This DTC sets when the reductant pump assembly voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDPC circuit open • RDPC circuit short to ground • RDPC circuit short to voltage • VPWR circuit open • VPWR circuit short to ground • VPWR circuit short to voltage • Reductant pump assembly open • Reductant pump assembly short to ground • Reductant pump assembly short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument panel cluster (IPC) message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test RG .	

P208A (PCM) - Reductant Pump Control Circuit Open Load

Description:	This DTC sets when the reductant pump assembly voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible			

Causes:	• RDPC circuit open • RDPC circuit short to ground • RDPC circuit short to voltage • VPWR circuit open • VPWR circuit short to ground • VPWR circuit short to voltage • Reductant pump assembly open • Reductant pump assembly short to ground • Reductant pump assembly short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P208B - Reductant Pump A Control Range/Performance

Description:	The PCM monitors the RDPC circuit for pump motor speed deviation. If the difference between the commanded and monitored pump speeds exceeds 300 rpm, this DTC sets and the selective catalytic reduction (SCR) system shuts down until the next key cycle.		
Possible Causes:	• High resistance in the VPWR circuit • High resistance in the GND circuit • Damaged reductant pump assembly		
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose other DTCs first. If no concerns are present, clear the DTCs and repeat the self-test. If this DTC is retrieved again with no other DTCs present, install a new reductant pump assembly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P208C (DCU) - Reductant Pump Control Circuit Low

Description:	This DTC sets when the reductant pump assembly voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDPC circuit open • RDPC circuit short to ground • VPWR circuit open • VPWR circuit short to ground		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P208C (PCM) - Reductant Pump Control Circuit Low

Description:	This DTC sets when the reductant pump assembly voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDPC circuit open • RDPC circuit short to ground • VPWR circuit open • VPWR circuit short to ground		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P208D (DCU) - Reductant Pump Control Circuit High

Description:	This DTC sets when the reductant pump assembly voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDPC circuit short to voltage • Damaged reductant pump assembly		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P208D (PCM) - Reductant Pump Control Circuit High

Description:	This DTC sets when the reductant pump assembly voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDPC circuit short to voltage • Damaged reductant pump assembly		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P208E (DCU) - Reductant Injection Valve Stuck Closed (Bank 1 Unit 1)

Description:	The reductant dosage control module monitors reductant injector needle movement by monitoring the amount of current necessary to fire the injector solenoid. When the needle has reached its upper limit, the current ripples. If this ripple does not occur, the injector needle is stuck. The reductant dosage control module then sets this DTC and shuts down the selective catalytic reduction (SCR) system until the next key cycle.		
Possible Causes:	Damaged reductant injector		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P208E (PCM) - Reductant Injection Valve Stuck Closed (Bank 1 Unit 1)

Description:	The PCM monitors reductant injector needle movement by monitoring the amount of current necessary to fire the injector solenoid. When the needle has reached its upper limit, the current ripples. If this ripple does not occur, the injector needle is stuck. The PCM then sets this DTC and shuts down the selective catalytic reduction (SCR) system until the next key cycle.		
Possible Causes:	Damaged reductant injector		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P209F (DCU) - Reductant Tank Heater Control Performance

Description:	The reductant tank heater and reductant temperature sensor are in close proximity in the reductant tank. The reductant dosage control module monitors reductant tank heater performance by monitoring the reductant temperature sensor signal. This DTC sets when the temperature does not rise greater than 0.5°C (0.9°F) within a certain time frame after tank heat is requested.		
Possible Causes:	Damaged reductant tank heater		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P209F (PCM) - Reductant Tank Heater Control Performance

Description:	The reductant tank heater and reductant temperature sensor are in close proximity in the reductant tank. The PCM monitors reductant tank heater performance by monitoring the reductant temperature sensor signal. This DTC sets when the temperature does not rise greater than 0.5°C (0.9°F) within a certain time frame after tank heat is requested.		
Possible Causes:	Damaged reductant tank heater		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20A0 (DCU) - Reductant Purge Control Valve Circuit Open Load

Description:	This DTC sets when the RDPGC circuit voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	- RDPGC circuit open - RDPGC circuit short to ground - RDPGC circuit short to voltage - VPWR circuit open - VPWR circuit short to ground - VPWR circuit short to voltage - Reductant purge valve open - Reductant purge valve short to ground - Reductant purge valve short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RE .		

P20A0 (PCM) - Reductant Purge Control Valve Circuit Open Load

Description:	This DTC sets when the RDPGC circuit voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	- RDPGC circuit open - RDPGC circuit short to ground - RDPGC circuit short to voltage - VPWR circuit open - VPWR circuit short to ground - VPWR circuit short to voltage - Reductant purge valve open - Reductant purge valve short to ground - Reductant purge valve short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until		

	the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RE .		

P20A1 - Reductant Purge Control Valve Performance

Description:	The PCM monitors reductant purge valve performance by monitoring the reductant pressure sensor. During a purge cycle, providing that the system pressure meets or exceeds 280 kPa (41 psi), if the system pressure does not drop by at least 230 kPa (33.3 psi), the PCM sets this DTC and shuts down the selective catalytic reduction (SCR) system.		
Possible Causes:	Damaged reductant purge valve		
Diagnostic Aids:	Verify the diesel exhaust fluid is full. Fill as necessary. Remove the reductant injector. Pressurize the system using the scan tool and carry out a visual inspection. If there are no external leaks and the reductant injector nozzle is not leaking, clear the DTCs and repeat the self-test. If DTC P20A1 is retrieved again, install a new reductant pump assembly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P20A2 (DCU) - Reductant Purge Control Valve Circuit Low

Description:	This DTC sets when the RDPGC circuit voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	- RDPGC circuit open - RDPGC circuit short to ground - VPWR circuit open - VPWR circuit short to ground - Damaged reductant purge valve		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RE .		

P20A2 (PCM) - Reductant Purge Control Valve Circuit Low

Description:	This DTC sets when the RDPGC circuit voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	- RDPGC circuit open - RDPGC circuit short to ground - VPWR circuit open		

	• VPWR circuit short to ground • Damaged reductant purge valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RE .		

P20A3 (DCU) - Reductant Purge Control Valve Circuit High

Description:	This DTC sets when the RDPGC circuit voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDPGC circuit short to voltage • Damaged reductant purge valve		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RE .		

P20A3 (PCM) - Reductant Purge Control Valve Circuit High

Description:	This DTC sets when the RDPGC circuit voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDPGC circuit short to voltage • Damaged reductant purge valve		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RE .		

P20A5 - Reductant Purge Control Valve A Stuck Closed

Description:	The reductant dosage control module monitors the system pressure during a purge cycle to make sure the pressure is decreasing. This DTC sets when the system pressure increases during a purge cycle, indicating the reductant purge valve is stuck closed.		
Possible Causes:	• Damaged reductant purge valve		

Diagnostic Aids:	Clear the RDCM and PCM DTCs. Carry out a drive cycle. Refer to Section 2, Drive Cycles . If this DTC sets again, install a new reductant pump assembly. Refer to the Workshop Manual Section 303-08, Engine Emission Control.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P20AD - Reductant Metering Unit Temperature Sensor Circuit Range/Performance

Description:	This DTC sets when the Reductant Metering Unit Temperature Sensor circuit value is greater than or less than a calibrated limit.		
Possible Causes:	• Damaged Reductant Metering Unit Temperature Sensor • Damaged Reductant Metering Unit wiring harness		
Diagnostic Aids:	This DTC sets when the temperature of Reductant Metering Unit is greater than 170°C (338°F).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RI .		

P20B9 (DCU) - Reductant Heater A Control Circuit/Open

Description:	This DTC sets when the reductant dosage control module detects an open in the RDHTRC1 circuit.		
Possible Causes:	• RDHTRC1 circuit open • Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20B9 (PCM) - Reductant Heater A Control Circuit/Open

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors each individual reductant heater and harness for concerns. The DTC sets when the GPCM detects a concern with a reductant heater or harness, and the GPCM sends a message to the PCM.		
Possible Causes:	• RDHTRC1 circuit open • Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		

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

P20BA (DCU) - Reductant Heater A Control Performance

Description:	The reductant dosage control module monitors the conductance of each reductant heater during peak power and compares this conductance to an expected threshold. This DTC sets when the reductant dosage control module detects that the reductant heater conductance is out of tolerance with this threshold.		
Possible Causes:	Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BA (PCM) - Reductant Heater A Control Performance

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the conductance of each reductant heater during peak power and compares this conductance to an expected threshold. When the GPCM detects that the reductant heater conductance is out of tolerance with this threshold, the GPCM sends a message to the PCM which sets this DTC.		
Possible Causes:	Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BB (DCU) - Reductant Heater A Control Circuit Low

Description:	This DTC sets when the reductant dosage control module detects that the RDHTRC1 circuit is drawing greater than 15 amps for greater than 250 milliseconds.		
Possible Causes:	- RDHTRC1 circuit short to ground - Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test RH .
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P20BB (PCM) - Reductant Heater A Control Circuit Low

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the RDHTRC1 circuit. When the GPCM detects that the RDHTRC1 circuit is drawing greater than 15 amps for greater than 250 milliseconds, a short to ground is suspect. The GPCM sends a message to the PCM, which sets this DTC.		
Possible Causes:	• RDHTRC1 circuit short to ground • Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BC (DCU) - Reductant Heater A Control Circuit High

Description:	This DTC sets when the reductant dosage control module detects that the RDHTRC1 circuit is drawing 0 amps for greater than 250 milliseconds.		
Possible Causes:	• RDHTRC1 circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BC (PCM) - Reductant Heater A Control Circuit High

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the reductant heater circuits. When the GPCM detects that the RDHTRC1 circuit is drawing 0 amps for greater than 250 milliseconds, a short to voltage is suspect. The GPCM sends a message to the PCM, which sets this DTC.		
Possible Causes:	• RDHTRC1 circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BD (DCU) - Reductant Heater B Control Circuit/Open

Description:	This DTC sets when the reductant dosage control module detects an open in the RDHTRC2 circuit.		
Possible Causes:	• RDHTRC2 circuit open • Damaged reductant pump assembly heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BD (PCM) - Reductant Heater B Control Circuit/Open

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors each individual reductant heater and harness for concerns. When the GPCM detects a concern with a reductant heater or harness, the GPCM sends a message to the PCM which sets this DTC.		
Possible Causes:	• RDHTRC2 circuit open • Damaged reductant pump assembly heater • Damaged reductant pressure line heater		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BE (DCU) - Reductant Heater B Control Performance

Description:	The reductant dosage control module monitors the conductance of each reductant heater during peak power and compares this conductance to an expected threshold. This DTC sets when the reductant dosage control module detects that the reductant heater conductance is out of tolerance with this threshold.		
Possible Causes:	• Damaged reductant pump assembly heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BE (PCM) - Reductant Heater B Control Performance

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the conductance of each reductant heater during peak power and compares this conductance to an expected threshold. When the GPCM detects that the reductant heater conductance is out of tolerance with this threshold, the GPCM sends a message to the PCM which sets this DTC.		
Possible Causes:	• Damaged reductant pump assembly heater • Damaged reductant pressure line heater		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BF (DCU) - Reductant Heater B Control Circuit Low

Description:	This DTC sets when the reductant dosage control module detects that the RDHTRC2 circuit is drawing greater than 15 amps for greater than 250 milliseconds.		
Possible Causes:	• RDHTRC2 circuit short to ground • Damaged reductant pump assembly heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20BF (PCM) - Reductant Heater B Control Circuit Low

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the RDHTRC2 circuit. When the GPCM detects that the RDHTRC2 circuit is drawing greater than 15 amps for greater than 250 milliseconds, a short to ground is suspect. The GPCM sends a message to the PCM, which sets this DTC.		
Possible Causes:	• RDHTRC2 circuit short to ground • Damaged reductant pressure line heater • Damaged reductant pump assembly heater		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C0 (DCU) - Reductant Heater B Control Circuit High

Description:	This DTC sets when the reductant dosage control module detects that the RDHTRC2 circuit is drawing 0 amps for greater than 250 milliseconds.		
Possible Causes:	RDHTRC2 circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C0 (PCM) - Reductant Heater B Control Circuit High

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the reductant heater circuits. When the GPCM detects that the RDHTRC2 circuit is drawing 0 amps for greater than 250 milliseconds, a short to voltage is suspect. The GPCM sends a message to the PCM, which sets this DTC.		
Possible Causes:	RDHTRC2 circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C1 (DCU) - Reductant Heater C Control Circuit/Open

Description:	This DTC sets when the reductant dosage control module detects an open in the RDHTRC3 circuit.		
Possible Causes:	- RDHTRC3 circuit open - Damaged reductant pressure line heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C1 (PCM) - Reductant Heater C Control Circuit/Open

Description:	The PCM carries out a functional key ON, engine running (KOER) self-test for the glow plug system.		
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	During that test the PCM enables the glow plug control module (GPCM) which monitors each individual reductant heater and harness for concerns. When the GPCM detects a concern with a reductant heater or harness, the GPCM sends a message to the PCM which sets this DTC.		
Possible Causes:	• RDHTRPWR circuit open • Damaged reductant heater relay		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C2 (DCU) - Reductant Heater C Control Performance

Description:	The reductant dosage control module monitors the conductance of each reductant heater during peak power and compares this conductance to an expected threshold. This DTC sets when the reductant dosage control module detects that the reductant heater conductance is out of tolerance with this threshold.		
Possible Causes:	• Damaged reductant pressure line heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C2 (PCM) - Reductant Heater C Control Performance

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the RDHTRPWR circuit. When the GPCM detects that the RDHTRPWR circuit is less than 5 volts, the GPCM sends a message to the PCM which sets this DTC.		
Possible Causes:	• RDHTRPWR circuit open • Damaged reductant heater relay		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C3 (DCU) - Reductant Heater C Control Circuit Low

Description:	This DTC sets when the reductant dosage control module detects that the RDHTRC3 circuit is drawing		
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	greater than 6 amps for greater than 250 milliseconds.		
Possible Causes:	• RDHTRC3 circuit short to ground • Damaged reductant pressure line heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C3 (PCM) - Reductant Heater C Control Circuit Low

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the RDHTRPWR circuit. When the GPCM detects that the RDHTRPWR circuit is drawing greater than 6 amps for greater than 250 milliseconds, a short to ground is suspect. The GPCM sends a message to the PCM, which sets this DTC.		
Possible Causes:	• RDHTRPWR circuit short to ground • Damaged reductant heater relay		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C4 (DCU) - Reductant Heater C Control Circuit High

Description:	This DTC sets when the reductant dosage control module detects that the RDHTRC3 circuit is drawing 0 amps for greater than 250 milliseconds.		
Possible Causes:	• RDHTRC3 circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20C4 (PCM) - Reductant Heater C Control Circuit High

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the reductant heater circuits. When the GPCM detects that the RDHTRPWR circuit is drawing 0 amps for greater than 250 milliseconds, a short to voltage is suspect. The GPCM sends a message to the PCM, which sets this DTC.		
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Possible Causes:	RDHTRPWR circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P20CC - Exhaust Aftertreatment Fuel Injector A Control Performance

Description:	This DTC sets when the PCM detects the VPC circuit voltage is outside an expected calibrated value.		
Possible Causes:	- VPC circuit open - VPC circuit short to ground - VPC circuit short to voltage - Damaged fuel vaporizer system fuel pump		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RL .		

P20D7 - Exhaust Aftertreatment Fuel Supply Control Circuit/Open

Description:	This DTC sets when the PCM detects an open on the VPC circuit.		
Possible Causes:	- VPC circuit open - Damaged fuel vaporizer system fuel pump		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RL .		

P20D9 - Exhaust Aftertreatment Fuel Supply Control Circuit Low

Description:	This DTC sets when the PCM detects a short to ground on the VPC circuit.		
Possible Causes:	- VPC circuit short to ground - Damaged fuel vaporizer system fuel pump		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RL .		

P20DA - Exhaust Aftertreatment Fuel Supply Control Circuit High

Description:	This DTC sets when the PCM detects a short to voltage on the VPC circuit.		
Possible Causes:	VPC circuit short to voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RL .		

P20E8 (DCU) - Reductant Pressure Too Low

Description:	The reductant dosage control module monitors reductant pressure as the system primes for injection. This DTC sets if the system pressure does not exceed 350 kPa (51 psi) within 45 seconds after the reductant pump starts.		
Possible Causes:	- Damaged reductant pump - Damaged reductant purge valve - Damaged reductant pressure line - Damaged reductant injector - Damaged reductant pressure sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P20E8 (PCM) - Reductant Pressure Too Low

Description:	The PCM monitors reductant pressure as the system primes for injection. If the system pressure does not exceed 350 kPa (51 psi) within 45 seconds after the reductant pump starts, this DTC sets.		
Possible Causes:	- Damaged reductant pump - Damaged reductant purge valve - Damaged reductant pressure line - Damaged reductant injector - Damaged reductant pressure sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P20E9 (DCU) - Reductant Pressure Too High

Description:	The reductant dosage control module continuously monitors selective catalytic reduction (SCR) system pressure during closed-loop operation. This DTC sets when the system pressure exceeds 650 kPa (88 psi) for 10 seconds, or 790 kPa (115 psi) for 1 second.		
Possible Causes:	• Damaged reductant injector • Damaged reductant pressure sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P20E9 (PCM) - Reductant Pressure Too High

Description:	The PCM continuously monitors selective catalytic reduction (SCR) system pressure during closed-loop operation. This DTC sets when the system pressure exceeds 650 kPa (88 psi) for 10 seconds, or 790 kPa (115 psi) for 1 second.		
Possible Causes:	• Damaged reductant injector • Damaged reductant pressure sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P20EA - Reductant Control Module Power Relay De-Energized Performance - Too Early

Description:	This DTC sets when the reductant dosage control module detects that the reductant dosage control module relay has opened before the reductant dosage control module could complete its shutdown sequence.		
Possible Causes:	• RDCMRC circuit open • Damaged reductant dosage control module relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RM .		

P20EB - Reductant Control Module Power Relay De-Energized Performance - Too Late

Description:	This DTC sets when the reductant dosage control module detects that the reductant dosage control module relay has closed before the command was given.		
Possible Causes:	• RDCMRC circuit short to ground • Damaged reductant dosage control module relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RM .		

P20EE - SCR NOX Catalyst Efficiency Below Threshold (Bank 1)

Description:	The efficiency of the selective catalytic reduction (SCR) catalyst to remove nitrogen oxides (NOx) from the exhaust gas is calculated based on the upstream and the downstream NOx measurements. This DTC sets when the SCR catalyst efficiency is below a calibrated threshold for a calibrated amount of time.		
Possible Causes:	• Reductant quality • SCR catalyst low efficiency • Damaged SCR catalyst		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P20FE - Reductant Metering Unit Performance

Description:	The reductant dosage control module monitors the resistance of the reductant injector coil and infers an operating temperature. This DTC sets when the reductant dosage control module detects an excessive temperature at the reductant injector.		
Possible Causes:	• High exhaust temperature • Damaged reductant injector		
Diagnostic Aids:	This DTC is informational and may set in conjunction with other DTCs. Diagnose other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P20FF (DCU) - Reductant Control Module Performance

Description:	This DTC sets when the reductant dosage control module has detected an internal concern.		
Possible Causes:	Damaged reductant dosage control module		
Diagnostic Aids:	This DTC may set in conjunction with other DTCs. Diagnose all other DTCs first. Clear the RDCM DTCs. Repeat the self-test. If this DTC sets again, install a new reductant dosage control module. Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P20FF (PCM) - Reductant Control Module Performance

Description:	This DTC sets when the reductant pump control module has detected an internal concern.		
Possible Causes:	Damaged reductant pump control module		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

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

Description:	This DTC sets when the accelerator pedal position (APP) sensor APP1 circuit voltage is less than 0.25 volts.		
Possible Causes:	- APP1 circuit short to ground - Damaged APP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AG .		

P2123 - Throttle/Pedal Position Sensor/Switch D Circuit High

Description:	This DTC sets when the accelerator pedal position (APP) sensor APP1 circuit voltage is greater than 4.75 volts.		
Possible Causes:	- APP1 circuit open - APP1 circuit short to voltage - Damaged APP sensor		

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

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

Description:	This DTC sets when the accelerator pedal position (APP) sensor APP2 circuit voltage is less than 0.25 volts.		
Possible Causes:	• APP2 circuit open • APP2 circuit short to ground • Damaged APP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AG .		

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

Description:	This DTC sets when the accelerator pedal position (APP) sensor APP2 circuit voltage is greater than 4.75 volts.		
Possible Causes:	• APP2 circuit short to voltage • Damaged APP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AG .		

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

Description:	This DTC sets when the accelerator pedal position (APP) sensor APP1 and APP2 circuit values do not agree on the position of the APP sensor.		
Possible Causes:	• APP1 circuit high resistance • APP2 circuit high resistance • Damaged APP sensor		
Diagnostic Aids:	Check the accelerator pedal for obstructions.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AG .		

P2147 - Fuel Injector Group A Supply Voltage Circuit Low

Description:	The PCM monitors the fuel injector driver supply voltage. This DTC sets when the PCM detects a driver under voltage condition.		
Possible Causes:	• VPWR circuit open • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P2148 - Fuel Injector Group A Supply Voltage Circuit High

Description:	The PCM monitors the fuel injector driver supply voltage. This DTC sets when the PCM detects a driver over voltage condition.		
Possible Causes:	• VPWR circuit short to voltage • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P214E - Reductant Pump A Current Too High

Description:	This DTC sets when the reductant pump control module detects excessive current draw on the reductant pump motor drive circuits.		
Possible Causes:	• RDPAP circuit short to ground • RDPBP circuit short to ground • RDPCP circuit short to ground • Damaged reductant pump assembly		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P214F (DCU) - Reductant Heater A Current Too High

Description:	This DTC sets when the reductant dosage control module (DCU) detects excessive current draw from the reductant tank heater.		
Possible Causes:	• RDHTRC1 circuit short to ground • Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P214F (PCM) - Reductant Heater A Current Too High

Description:	This DTC sets when the glow plug control module (GPCM) detects excessive current draw from the reductant tank heater.		
Possible Causes:	• RDHTRC1 circuit short to ground • Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P2150 - Fuel Injector Group B Supply Voltage Circuit Low

Description:	The PCM monitors the fuel injector driver supply voltage. This DTC sets when the PCM detects a driver under voltage condition.		
Possible Causes:	• VPWR circuit open • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P2151 - Fuel Injector Group B Supply Voltage Circuit High

Description:	The PCM monitors the fuel injector driver supply voltage. This DTC sets when the PCM detects a driver over voltage condition.		
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Possible Causes:	• VPWR circuit short to voltage • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P2153 - Fuel Injector Group C Supply Voltage Circuit Low

Description:	The PCM monitors the fuel injector driver supply voltage. This DTC sets when the PCM detects a driver under voltage condition.		
Possible Causes:	• VPWR circuit open • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P2154 - Fuel Injector Group C Supply Voltage Circuit High

Description:	The PCM monitors the fuel injector driver supply voltage. This DTC sets when the PCM detects a driver over voltage condition.		
Possible Causes:	• VPWR circuit short to voltage • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test P .		

P2182 - Engine Coolant Temperature Sensor 2 Circuit

Description:	This DTC sets when the secondary cooling system engine coolant temperature 2 (ECT2) sensor reading does not correlate with the other temperature sensor readings at ignition ON. The PCM runs this logic after an engine OFF and a calibrated soak period, typically 6 - 8 hours. This soak period allows the secondary cooling system ECT2 and the other temperature sensors to stabilize and not differ by greater than a calibrated value, typically 18°C (32.4°F).		
Possible Causes:	• Damaged secondary cooling system ECT2 sensor		
Diagnostic	Make sure the secondary cooling system ECT2 sensor reading and the other temperature sensor readings		

Aids:	are similar when the engine is cold.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test K .		

P2183 - Engine Coolant Temperature Sensor 2 Circuit Range/Performance

Description:	This DTC sets when the vehicle is driven between 800 and 2600RPM and the secondary cooling system engine coolant temperature 2 (ECT2) is greater than 20°C (68°F) below the Charge Air Cooler (CAC) outlet temperature. The time to set the DTC depends on the secondary cooling system and the intake air temperatures and can vary between 20 and 60 minutes.		
Possible Causes:	• Low engine coolant level • Damaged thermostat • Damaged secondary cooling system ECT2 sensor • Secondary cooling system ECT2 sensor wiring concern		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Make sure the intake air system and the secondary cooling system temperatures are similar when the engine is cold. Also make sure the secondary cooling system ECT2 sensor and the actual engine operating temperatures are the same.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test K .		

P2184 - Engine Coolant Temperature Sensor 2 Circuit Low

Description:	This DTC sets when the secondary cooling system engine coolant temperature 2 (ECT2) sensor value is less than the self-test minimum of 0.2 volt or 121°C (250°F).		
Possible Causes:	• ECT2 circuit short to ground • Damaged secondary cooling system ECT2 sensor • ECT2 wiring concern		
Diagnostic Aids:	An ECT2 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 K .		

P2185 - Engine Coolant Temperature Sensor 2 Circuit High

Description:	This DTC sets when the secondary cooling system engine coolant temperature 2 (ECT2) sensor value is greater than the self-test maximum of 4.6 volts or -50°C (-58°F).		
Possible Causes:	• ECT2 circuit open • ECT2 short to voltage		

	- Damaged secondary cooling system ECT2 sensor - ECT2 wiring concern		
Diagnostic Aids:	An ECT2 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 K .		

P218F (DCU) - Reductant No Flow Detected

Description:	The reductant dosage control module monitors selective catalytic reduction (SCR) system performance by monitoring the rate of reductant flow and feedback from the nitrogen oxides bank 1, sensor 2 (NOx12). These values are compared to a calculated model. This DTC sets when the difference between the modeled and actual system performance exceeds a threshold and a restriction in the SCR system is suspect.		
Possible Causes:	- Reductant pressure line restriction - Reductant filter restriction - Reductant injector restriction		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles , for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P218F (PCM) - Reductant No Flow Detected

Description:	The PCM monitors selective catalytic reduction (SCR) system performance by monitoring the rate of reductant flow and feedback from the nitrogen oxides bank 1, sensor 2 (NOx12). These values are compared to a calculated model. This DTC sets when the difference between the modeled and actual system performance exceeds a threshold and a restriction in the SCR system is suspect.		
Possible Causes:	- Reductant pressure line restriction - Reductant filter restriction - Reductant injector restriction		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P21AA - Reductant Level Sensor B Circuit Low

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL2 circuit short to ground • SIGRTN circuit short to ground • Damaged reductant level sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P21AB (DCU) - Reductant Level Sensor B Circuit High

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL2 circuit short to voltage • SIGRTN circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center. The reductant level sensor and reductant temperature sensor share a common ground. An open or short to voltage in this ground sets DTCs for both sensors.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P21AB (PCM) - Reductant Level Sensor B Circuit High

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL2 circuit short to voltage • RDLRTN circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. The reductant level sensor and reductant temperature sensor share a common ground. An open or short to voltage in this ground sets DTCs for both sensors.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P21AF - Reductant Level Sensor C Circuit Low

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL3 circuit short to ground • SIGRTN circuit short to ground • Damaged reductant level sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P21B0 (DCU) - Reductant Level Sensor C Circuit High

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL3 circuit short to voltage • SIGRTN circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center. The reductant level sensor and reductant temperature sensor share a common ground. An open or short to voltage in this ground sets DTCs for both sensors.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P21B0 (PCM) - Reductant Level Sensor C Circuit High

Description:	This DTC sets when the reductant level sensor voltage is greater than or less than a calibrated limit for a calibrated amount of time.		
Possible Causes:	• RDL3 circuit short to voltage • RDLRTN circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. The reductant level sensor and reductant temperature sensor share a common ground. An open or short to voltage in this ground sets DTCs for both sensors.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P21C2 - Reductant Heater Relay Control Circuit Open

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors each individual reductant heater and harness for concerns. When the GPCM detects a concern with a reductant heater relay or the RDHTRCTRL circuit, the GPCM sends a message to the PCM which sets this DTC.		
Possible Causes:	• RDHTRCTRL circuit open • Damaged reductant heater relay		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P21C3 - Reductant Heater Relay Control Circuit Low

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the RDHTRCTRL circuit. When the GPCM detects that the RDHTRCTRL circuit is drawing greater than 6 amps for greater than 250 milliseconds, a short to ground is suspect. The GPCM sends a message to the PCM, which sets this DTC.		
Possible Causes:	• RDHTRCTRL circuit short to ground • Damaged reductant heater relay		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P21C4 - Reductant Heater Relay Control Circuit High

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors the reductant heater circuits. When the GPCM detects that the RDHTRCTRL circuit is drawing 0 amps for greater than 250 milliseconds, a short to voltage is suspect. The GPCM sends a message to the PCM, which sets this DTC.		
Possible Causes:	• RDHTRCTRL circuit short to voltage • Damaged reductant heater relay		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P21C7 - Reductant Control Module Power Relay Control Circuit Open

Description:	The PCM enables the Glow Plug Control Module (GPCM) during a self-test which monitors each individual reductant heater and harness for concerns. When the GPCM detects a concern with a reductant heater relay or the RDHTRPWR circuit, the GPCM sends a message to the PCM which sets this DTC.		
Possible Causes:	• Damaged reductant heater relay • RDHTRPWR circuit open • RDHTRPWR circuit short to ground • RDHTRPWR circuit short to voltage		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P21CB (DCU) - Reductant Control Module Supply Voltage Low

Description:	This DTC sets when the reductant dosage control module detects an under voltage condition.		
Possible Causes:	• Battery voltage low • VPWR circuit open		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RM .		

P21CB (PCM) - Reductant Control Module Supply Voltage Low

Description:	This DTC sets when the reductant pump control module detects an under voltage condition.		
Possible Causes:	• Battery voltage low • VPWR circuit open		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P21CC (DCU) - Reductant Control Module Supply Voltage High

Description:	This DTC sets when the reductant dosage control module detects an over voltage condition.		
Possible Causes:	• Battery voltage out of range • The generator is overcharging		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RM .		

P21CC (PCM) - Reductant Control Module Supply Voltage High

Description:	This DTC sets when the reductant pump control module detects an over voltage condition.		
Possible Causes:	• Battery voltage out of range • The generator is overcharging		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

P21CD - Reductant Quality Module Supply Voltage Low

Description:	This DTC sets when the reductant quality module detects an under voltage condition.		
Possible Causes:	• Battery voltage low • VPWR circuit open		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P21DD (DCU) - Reductant Heater A Current Too Low

Description:	This DTC sets when the reductant dosage control module (DCU) detects insufficient current draw from the reductant tank heater.		
Possible Causes:	• RDHTRC1 circuit open • Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test RH .
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P21DD (PCM) - Reductant Heater A Current Too Low

Description:	This DTC sets when the glow plug control module (GPCM) detects insufficient current draw from the reductant tank heater.		
Possible Causes:	- RDHTRC1 circuit open - Damaged reductant tank heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P2200 - NOX Sensor Circuit (Bank 1 Sensor 1)

Description:	The nitrogen oxides bank 1, sensor 1 (NOx11) module monitors the NOx11 sensor for circuit concerns. This DTC sets when a concern is detected with one of the circuits used to determine the oxygen (O2) content or the NOx content in the exhaust gas.		
Possible Causes:	- Damaged NOx11 sensor harness - Damaged NOx11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P2201 - NOX Sensor Circuit Range/Performance (Bank 1 Sensor 1)

Description:	This DTC sets when the actual nitrogen oxides bank 1, sensor 1 (NOx11) sensor signal is less than the expected value for a calibrated amount of time.		
Possible Causes:	- Restricted air filter - Intake air system leak - Intake manifold leak - Crankcase ventilation system leak - EGR valve stuck open - Low secondary cooling system coolant level - Exhaust system leak - Corrosion - Incorrect connections - Contaminated mass airflow (MAF) sensor		

	- Contaminated NOx11 sensor - Damaged MAF sensor - Damaged fuel rail pressure (FRP) sensor - Damaged NOx11 sensor		
Diagnostic Aids:	Check for all other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P2204 - NOX Sensor Circuit Intermittent (Bank 1 Sensor 1)

For F-650 / F-750

Description:	This DTC sets when the communication signal from the nitrogen oxides bank 1, sensor 1 (NOx11) sensor is no longer detected.		
Possible Causes:	• Incorrect NOx11 sensor connection		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
For All Others			
Description:	This DTC sets when the DTC P2200 is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.		
Possible Causes:			
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles , for additional information. For F-Series Super Duty, this DTC is present for 400 days after the exhaust system fluid fault message is cleared.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-650 / F-750	GO to Pinpoint Test RD .		
All others	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2209 - NOX Sensor Heater Sense Circuit Range/Performance (Bank 1 Sensor 1)

Description:	This DTC sets when the PCM does not receive the nitrogen oxides bank 1, sensor 1 (NOx11) module message within a calibrated amount of time.		
Possible Causes:	Radio frequency interference or electromagnetic interference		
Diagnostic			

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

P220A - NOX Sensor Supply Voltage Circuit (Bank 1 Sensor 1)

Description:	This DTC sets when the nitrogen oxides bank 1, sensor 1 (NOx11) module detects the battery voltage is out of range.		
Possible Causes:	• VPWR circuit open • Battery voltage out of range • The generator is overcharging		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check the battery and charging system for correct operation. Refer to the Workshop Manual Section 414-00, Charging System.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P220B - NOX Sensor Supply Voltage Circuit (Bank 1 Sensor 2)

Description:	This DTC sets when the nitrogen oxides bank 1, sensor 2 (NOx12) module detects the battery voltage is out of range.		
Possible Causes:	• VPWR circuit open • Battery voltage out of range • The generator is overcharging		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Check the battery and charging system for correct operation. Refer to the Workshop Manual Section 414-00, Charging System.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P220E - NOX Sensor Heater Control Circuit Range/Performance (Bank 1 Sensor 1)

Description:	This DTC sets when the nitrogen oxides bank 1, sensor 1 (NOx11) sensor does not reach the required operating temperature in a calibrated amount of time or when the NOx11 module is not able to maintain the required operating temperature after the NOx11 sensor is warm.		
Possible Causes:	• Corrosion • Incorrect connections		

		Damaged NOx11 sensor	
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P220F - NOX Sensor Heater Control Circuit Range/Performance (Bank 1 Sensor 2)

Description:	This DTC sets when the nitrogen oxides bank 1, sensor 2 (NOx12) sensor does not reach the required operating temperature in a calibrated amount of time or when the NOx12 module is not able to maintain the required operating temperature after the NOx12 sensor is warm.		
Possible Causes:	- Corrosion - Incorrect connections - Damaged NOx12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P221C (DCU) - Reductant Heater B Current Too Low

Description:	This DTC sets when the reductant dosage control module (DCU) detects insufficient current draw from the reductant pressure line heater.		
Possible Causes:	- RDHTRC2 circuit open - Damaged reductant pressure line heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P221C (PCM) - Reductant Heater B Current Too Low

Description:	This DTC sets when the glow plug control module (GPCM) detects insufficient current draw from the reductant pressure line heater.		
Possible Causes:	- RDHTRC2 circuit open - Damaged reductant pressure line heater		

Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P221D (DCU) - Reductant Heater B Current Too High

Description:	This DTC sets when the reductant dosage control module (DCU) detects excessive current draw from the reductant pressure line heater.		
Possible Causes:	- RDHTRC2 circuit short to ground - Damaged reductant pressure line heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P221D (PCM) - Reductant Heater B Current Too High

Description:	This DTC sets when the glow plug control module (GPCM) detects excessive current draw from the reductant pressure line heater.		
Possible Causes:	- RDHTRC2 circuit short to ground - Damaged reductant pressure line heater		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RH .		

P2226 - Barometric Pressure Sensor A Circuit Range/Performance

Description:	This DTC sets when the barometric pressure (BARO) sensor message is not received from the PCM. The BARO sensor is integral to the PCM.		
Possible Causes:	Communication error		
Diagnostic Aids:	Check for other reductant dosage control module DTCs or reductant dosage control module related symptoms. Diagnose all other reductant dosage control module DTCs or reductant dosage control module related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

P2227 - Barometric Pressure Sensor A Circuit Range/Performance

Description:	This DTC sets when the signal from the barometric pressure (BARO) sensor is less than a calibrated value of 50 kPa (7.25 psi) at ignition ON, engine OFF. The BARO sensor is integral to the PCM.		
Possible Causes:	• Damaged BARO sensor • Damaged PCM		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Clear the PCM 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).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2228 - Barometric Pressure Circuit Low

Description:	This DTC sets when the signal from the barometric pressure (BARO) sensor is less than the minimum threshold for greater than 500 ms. The BARO sensor is integral to the PCM.		
Possible Causes:	• Damaged BARO sensor • Damaged PCM		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Clear the PCM 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).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2229 - Barometric Pressure Circuit High

Description:	This DTC sets when the signal from the barometric pressure (BARO) sensor is greater than the maximum threshold for greater than 500 ms. The BARO sensor is integral to the PCM.		
Possible Causes:	• BARO circuit short to voltage • Damaged BARO sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		

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

P225A - NOX Sensor Calibration Memory (Bank 1 Sensor 1)

Description:	This DTC sets when the PCM receives an incorrect calibration message from the nitrogen oxides bank 1, sensor 1 (NOx11) module.		
Possible Causes:	Incorrect calibration		
Diagnostic Aids:	Verify the NOx11 module is at the latest calibration level. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P225B - NOX Sensor Calibration Memory (Bank 1 Sensor 2)

Description:	This DTC sets when the PCM receives an incorrect calibration message from the nitrogen oxides bank 1, sensor 2 (NOx12) module.		
Possible Causes:	Incorrect calibration		
Diagnostic Aids:	Verify the NOx12 module is at the latest calibration level. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P2263 - Turbo/Super Charger Boost System Performance

Description:	This DTC sets when the indicated boost pressure is less than the calibrated value by greater than a calibrated threshold.		
Possible Causes:	- Charge air cooler (CAC) system leaks - Intake air system leaks - Exhaust system leaks - Manifold absolute pressure (MAP) sensor biased - Exhaust pressure (EP) sensor biased - Restriction in the EP sensor - Restriction in the EP tube - Variable geometry turbocharger (VGT) vanes sticking		

Diagnostic Aids:	If any exhaust gas recirculation (EGR) system DTCs are present with this DTC, it may be an indication of a restricted EP sensor or tube.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P2264 - Water In Fuel Sensor Circuit

Description:	This DTC sets when the PCM detects the WIF circuit voltage falls below or exceeds a calibrated threshold.		
Possible Causes:	• WIF circuit short to ground • WIF circuit short to voltage • WIF circuit short to SIGRTN circuit • Disconnected WIF sensor • Damaged WIF sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test O .		

P2266 - Water In Fuel Sensor A Circuit Low

Description:	This DTC sets when the PCM detects the WIF circuit is shorted to ground.		
Possible Causes:	• WIF circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test O .		

P2267 - Water In Fuel Sensor A Circuit High

Description:	This DTC sets when the PCM detects the WIF circuit is shorted to voltage.		
Possible Causes:	• WIF circuit short to voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test O .		

P2269 - Water In Fuel Condition

Description:	This DTC sets when the PCM detects water in the fuel and the water in fuel (WIF) indicator lamp is illuminated.		
Possible Causes:	• Water in fuel condition • WIF circuit short to ground • Damaged WIF sensor		
Diagnostic Aids:	Drain a fuel sample from the fuel conditioning module and inspect for water or contaminants. If no water or contaminants are in the container, check for a circuit concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test O .		

P226C - Turbocharger Boost Control A Slow Response

Description:	This DTC sets when the difference between the actual Manifold Absolute Pressure (MAP) value and the desired MAP value is greater than a calibrated threshold when the monitor runs.		
Possible Causes:	• Turbocharger actuator is not responding • Damaged MAP sensor • Air Induction leak		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. A concern is indicated if the MAP value does not change by a calibrated value in a calibrated amount of time during the completion of the monitor.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KA .		

P228D - Fuel Pressure Regulator 1 Exceeded Control Limits Pressure Too High

Description:	This DTC sets when the fuel rail pressure is greater than the calculated threshold.		
Possible Causes:	• Biased fuel rail pressure (FRP) sensor • Fuel volume control valve • Fuel injectors internal leakage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P228E - Fuel Pressure Regulator 1 Exceeded Learning Limits - Too Low

Description:	This DTC sets when the fuel rail pressure is 20% less than the calculated threshold.		
Possible Causes:	• Biased fuel rail pressure (FRP) sensor • Engine mechanical concern • Fuel pressure control valve sticking		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. The FRP sensor and fuel pressure control valve values can be monitored by accessing the FRP_A PID and the F_PCV PID.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P228F - Fuel Pressure Regulator 1 Exceeded Learning Limits - Too High

Description:	This DTC sets when the fuel rail pressure is 20% greater than the calculated threshold.		
Possible Causes:	• Biased fuel rail pressure (FRP) sensor • Engine mechanical concern • Fuel pressure control valve sticking		
Diagnostic Aids:	The FRP sensor and fuel pressure control valve values can be monitored by accessing the FRP_A PID and the F_PCV PID.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2291 - Injector Control Pressure Too Low - Engine Cranking

Description:	The PCM monitors the fuel rail pressure (FRP) during the engine cranking. This DTC sets when the FRP does not increase to the calibrated threshold while the engine is cranked.		
Possible Causes:	• FVCV circuit open • FVCV circuit short to voltage • FVCV circuit short to ground • FPCV circuit open • FPCV circuit short to voltage • FPCV circuit short to ground • VPWR circuit open • FRP circuit open • FRP circuit short to voltage • FRP circuit short to ground • VREF circuit open • SIGRTN circuit open • Poor fuel quality • Damaged fuel pressure control valve • Damaged fuel volume control valve • Damaged low pressure fuel pump • Damaged high pressure fuel injection pump • Damaged FRP sensor		

Diagnostic Aids:	The FRP sensor, fuel pressure control valve and fuel volume control valve values can be monitored by accessing the FRP_A PID, the F_PCV and the F_VCV PID.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P229E - NOX Sensor Circuit (Bank 1 Sensor 2)

Description:	This DTC sets when a concern with one of the circuits used to determine the oxygen (O2) content or the nitrogen oxide (NOx) content in the exhaust gas is detected.		
Possible Causes:	- Damaged nitrogen oxides bank 1, sensor 2 (NOx12) sensor harness - Damaged NOx12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P229F - NOX Sensor Circuit Range/Performance (Bank 1 Sensor 2)

Description:	This DTC sets when the actual nitrogen oxides bank 1, sensor 2 (NOx12) sensor signal value is not within the expected range for a calibrated amount of time.		
Possible Causes:	- Corrosion - Incorrect connections - Contaminated NOx12 sensor - Damaged NOx12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P22A2 - NOX Sensor Circuit Intermittent (Bank 1 Sensor 2)

For F-650 / F-750			
Description:	This DTC sets when the communication signal from the nitrogen oxides bank 1, sensor 2 (NOx12) sensor is no longer detected.		
Possible Causes:	Incorrect NOx12 sensor connection		
Diagnostic	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a		

Aids:	loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
For All Others			
Description:	This DTC sets when the DTC P229E is set. The exhaust fluid system fault message may be enabled in the instrument cluster message center for this DTC.		
Possible Causes:			
Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose all other DTCs first. The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles, for additional information. For F-Series Super Duty, this DTC is present for 400 days after the exhaust system fluid fault message is cleared.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-650 / F-750	GO to Pinpoint Test RD .		
All others	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P22A7 - NOX Sensor Heater Sense Circuit Range/Performance (Bank 1 Sensor 2)

Description:	This DTC sets when the PCM does not receive the nitrogen oxides bank 1, sensor 2 (NOx12) module message within a calibrated amount of time.		
Possible Causes:	• Corrosion • Incorrect connections • Damaged NOx12 sensor • Damaged NOx12 module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P22FF - SCR NOx Catalyst Inlet Temperature Too Low

Description:	The PCM compares several vehicle temperature sensor values to determine a calculated exhaust temperature at the inlet of the SCR catalyst. This DTC sets when the difference between the calculated temperature and the actual temperature measured at the exhaust gas temperature bank 1, sensor 2 (EGT12) sensor exceeds a calibrated threshold.		
Possible Causes:	• EGT12 circuit short to SIGRTN • EGT12 circuit short to ground • EGT12 circuit short to voltage • Exhaust leaks • Excessive soot or ash build up on sensor • Damaged EGT12 sensor		
Diagnostic	Monitor the EGT12 PID between ignition ON, engine OFF and ignition ON, engine running for an		

Aids:	indication of a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2425 - EGR Cooling Valve Control Circuit/Open

Description:	This DTC sets when a EGRCBV circuit concern is present.		
Possible Causes:	• EGRCBV circuit open • Damaged exhaust gas recirculation cooler bypass valve (EGRCBV) solenoid • Corrosion or incorrect harness connections		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AZ .		

P2426 - EGR Cooling Valve Control Circuit Low

Description:	This DTC sets when a EGRCBV circuit short to ground concern is present.		
Possible Causes:	• EGRCBV circuit short to ground • Damaged exhaust gas recirculation cooler bypass valve (EGRCBV) solenoid • Corrosion or incorrect harness connections		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AZ .		

P2427 - EGR Cooling Valve Control Circuit High

Description:	This DTC sets when a EGRCBV circuit short to voltage concern is present.		
Possible Causes:	• EGRCBV circuit short to voltage • Damaged exhaust gas recirculation cooler bypass valve (EGRCBV) solenoid • Corrosion or incorrect harness connections		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AZ .		

P242A - Exhaust Gas Temperature Sensor Circuit Bank 1 Sensor 3

Description:	The PCM monitors the operation of the exhaust gas temperature bank 1, sensor 3 (EGT13) to determine if the EGT13 sensor responds to the increase in temperature of the exhaust gas during vehicle operation. The PCM then compares the measured temperature to a modeled value. This DTC sets when, after 5 minutes of driving, following a 6 hour soak, the EGT13 sensor temperature does not correlate to the modeled temperature of 130°C (266°F).		
Possible Causes:	• Exhaust leaks • Excessive particulate matter build up on sensor • Damaged EGT13 sensor		
Diagnostic Aids:	Monitor the EGT13 PID between ignition ON, engine OFF and ignition ON, engine running for an indication of a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P242B - Exhaust Gas Temperature Sensor Circuit Range/Performance (Bank 1 Sensor 3)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 3 (EGT13) is not within an expected calibrated range.		
Possible Causes:	• Corrosion • Incorrect connections • Damaged EGT13 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P242C - Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 3

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 3 (EGT13) voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	• EGT13 circuit short to SIGRTN • EGT13 circuit short to ground • Damaged EGT13 sensor		
Diagnostic Aids:	An EGT13_V PID value less than 0.10 volt indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P242D - Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 3

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 3 (EGT13) voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• EGT13 circuit open • EGT13 circuit short to voltage • Damaged EGT13 sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. For Transit, drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information. For all others, drive the vehicle until the warning message has cleared from the instrument cluster message center. An EGT13_V PID value greater than 4.90 volts indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P242E - Exhaust Gas Temperature Sensor Circuit Intermittent/Erratic (Bank 1 Sensor 3)

Description:	This DTC sets when an intermittent concern is detected in the EGT13 circuit.		
Possible Causes:	• EGT13 circuit intermittent open • EGT13 circuit intermittent short to ground • EGT13 circuit intermittent short to voltage • Incorrect connections • Damaged exhaust gas temperature bank 1, sensor 3 (EGT13) sensor		
Diagnostic Aids:	Harness routing, harness alterations, or incorrect shielding may have an intermittent impact on the EGT13 circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P244A - Particulate Filter Differential Pressure Too Low (Bank 1)

Description:	This DTC sets when the measured diesel particulate filter differential pressure is less than a minimum value for a certain exhaust flow rate.		
Possible Causes:	• Exhaust leaks before or near the diesel particulate filter pressure bank 1, sensor 1 • Leaks in the diesel particulate filter pressure bank 1, sensor 1 connecting hose • Aftermarket accessories and performance modifications • Damaged diesel particulate filter • Damaged DPFP11 sensor		
Diagnostic	Check for leaks in the exhaust system. If a new diesel particulate filter was recently installed, verify the		

Aids:	diesel particulate filter parameter reset procedure was carried out.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P2452 - Particulate Filter Pressure Sensor A Circuit

Description:	The PCM monitors the rationality of the diesel particulate filter pressure bank 1, sensor 1, immediately after engine shutdown. This DTC sets when the DPF PID value exceeds ambient pressure by a calibrated threshold.		
Possible Causes:	• DPF11 circuit short to voltage • Damaged diesel particulate filter pressure bank 1, sensor 1		
Diagnostic Aids:	This DTC may set with other DTCs. Diagnose other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P2453 - Particulate Filter Pressure Sensor A Circuit Range/Performance

Description:	The PCM monitors the rationality of the diesel particulate filter pressure bank 1, sensor 1, by comparing the actual measured pressure to an inferred value based on engine load. This DTC sets when the DPF PID value does not correlate with the expected value.		
Possible Causes:	• Blocked diesel particulate filter pressure bank 1, sensor 1 port • Damaged diesel particulate filter pressure bank 1, sensor 1 hose • Damaged diesel particulate filter pressure bank 1, sensor 1		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P2454 - Particulate Filter Pressure Sensor A Circuit Low

Description:	This DTC sets when the diesel particulate filter pressure sensor bank 1, sensor 1, voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	• DPF11 circuit short to ground • VREF circuit open • Damaged diesel particulate filter pressure bank 1, sensor 1		
Diagnostic Aids:	A DPF_V PID less than 0.10 volt indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All ☐ GO to Pinpoint Test [RB](#).**P2455 - Particulate Filter Pressure Sensor A Circuit High**

Description:	This DTC sets when the diesel particulate filter pressure sensor bank 1, sensor 1, voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• DPF11 circuit open • DPF11 circuit short to voltage • SIGRTN circuit open • Damaged diesel particulate filter pressure bank 1, sensor 1		
Diagnostic Aids:	A DPF_V PID greater than 4.90 volts indicates a concern.		
Application	☐ Key On Engine Off	☐ Key On Engine Running	☐ Continuous Memory
All	GO to Pinpoint Test RB .		

P2457 - EGR Cooler A Efficiency Below Threshold

Description:	This DTC sets when the difference between the expected temperature of the exhaust gas and the actual exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12) value is greater than a calibrated amount.		
Possible Causes:	• Cooling system restriction • Cooling system low coolant level • Charge air cooler (CAC) restriction • EGR cooler restriction • Biased EGRT12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	☐ Key On Engine Off	☐ Key On Engine Running	☐ Continuous Memory
All	GO to Pinpoint Test AZ .		

P2459 - Particulate Filter Regeneration Frequency (Bank 1)

Description:	The PCM monitors the frequency of diesel particulate filter regenerations. This DTC sets when the average distance between the previous 3 diesel particulate filter regenerations is less than a calibrated limit.		
Possible Causes:	• Customer application • Diesel particulate filter is full of ash		
Diagnostic Aids:	Check for other DTCs. This DTC is stored in non-volatile memory and will not clear unless the diesel particulate filter parameters are reset. Carry out the diesel particulate filter parameter reset function on the scan tool to clear this DTC.		

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

P245A - EGR Cooler Bypass Control Circuit (Bank 1)

Description:	This DTC sets when a EGRCBV circuit concern is present.		
Possible Causes:	• EGRCBV circuit open • EGRCBV circuit short to ground • EGRCBV circuit short to voltage • Damaged exhaust gas recirculation cooler bypass valve (EGRCBV) solenoid.		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AZ .		

P245B - EGR Cooler Bypass Control Circuit Range/Performance (Bank 1)

Description:	This DTC sets when a EGRCBV circuit concern is present.		
Possible Causes:	• EGRCBV circuit open • EGRCBV circuit short to ground • EGRCBV circuit short to voltage • Damaged exhaust gas recirculation cooler bypass valve (EGRCBV) solenoid.		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AZ .		

P245C - EGR Cooler Bypass Control Circuit Low (Bank 1)

Description:	This DTC sets when a short to ground concern is detected in the EGRCBV circuit.		
Possible Causes:	• EGRCBV circuit short to ground • VPWR circuit short to ground • Damaged exhaust gas recirculation cooler bypass valve (EGRCBV) solenoid. • Damaged EGRCBV solenoid harness connector • Damaged EGRCBV solenoid harness		
Diagnostic Aids:	Verify the EGRCBV connector is correctly seated.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All | GO to Pinpoint Test [AZ](#).**P245D - EGR Cooler Bypass Control Circuit High (Bank 1)**

Description:	This DTC sets when a short to voltage is detected in the EGRCBV circuit.		
Possible Causes:	• EGRCBV circuit short to voltage • Damaged exhaust gas recirculation cooler bypass valve (EGRCBV) solenoid. • Damaged EGRCBV solenoid harness connector • Damaged EGRCBV solenoid harness		
Diagnostic Aids:	Verify the EGRCBV connector is correctly seated.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AZ .		

P2463 - Particulate Filter Restriction - Soot Accumulation (Bank 1)

Description:	The PCM monitors the diesel particulate filter for a very high restriction. This DTC sets during normal vehicle operation when the diesel particulate filter pressure is greater than a maximum amount.		
Possible Causes:	• Excessive amount of soot or ash in the diesel particulate filter		
Diagnostic Aids:	Excessive amount of soot or ash in the diesel particulate filter may be caused by extended engine idle operation after the DRIVE TO CLEAN EXHAUST message is displayed in the message center. Refer to the Owner's Literature for additional information on the message center DRIVE TO CLEAN EXHAUST message. Check for other DTCs.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P246C - Particulate Filter Restriction - Forced Limited Power (Bank 1)

Description:	The PCM monitors the diesel particulate filter for a high restriction. This DTC sets during normal vehicle operation when the diesel particulate filter pressure is greater than a calibrated amount. The PCM limits engine performance and sets the DTC.		
Possible Causes:	• Excessive amount of soot or ash in the diesel particulate filter		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Excessive amount of soot or ash in the diesel particulate filter may be caused by extended engine idle operation after the DRIVE TO CLEAN EXHAUST message is displayed in the message center. Refer to the Owner's Literature for additional information on the message center DRIVE TO CLEAN EXHAUST message. Check for other DTCs.		

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

P246D - Particulate Filter Pressure Sensor A/B Correlation

Description:	This DTC sets when the difference between the diesel particulate filter pressure bank 1, sensor 1 (DPFP11) and diesel particulate filter pressure bank 1, sensor 2 (DPFP12) is greater than a calibrated threshold.		
Possible Causes:	• DPF11 circuit open • DPF11 circuit short to ground • DPF11 circuit short to voltage • DPF12 circuit open • DPF12 circuit short to ground • DPF12 circuit short to voltage • Damaged DPFP11 sensor • Damaged DPFP12 sensor		
Diagnostic Aids:	This DTC is informational only and may be accompanied by other DTCs. Diagnose the other DTCs first. If other DTCs are not present, inspect the diesel particulate filter pressure sensors and hoses for restrictions, leaks, and damage. Repair as necessary. If no concerns are found, clear the DTCs. Repeat the self test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P246E - Exhaust Gas Temperature Sensor Circuit (Bank 1 Sensor 4)

Description:	The PCM monitors the operation of the exhaust gas temperature bank 1, sensor 4 (EGT14) to determine if the EGT14 sensor responds to the increase in temperature of the exhaust gas, during vehicle operation. The PCM then compares the measured temperature to a modeled value. This DTC sets when, after 5 minutes of driving, following a 6 hour soak, the EGT14 sensor temperature does not correlate to the modeled temperature of 110°C (230°F).		
Possible Causes:	• Exhaust leaks • Excessive particulate matter build up on sensor • Damaged EGT14 sensor		
Diagnostic Aids:	Monitor the EGT14 PID between ignition ON, engine OFF and ignition ON, engine running for an indication of a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P246F - Exhaust Gas Temperature Sensor Circuit Range/Performance (Bank 1 Sensor 4)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 4 (EGT14) is not within an expected calibrated range.
Possible	

Causes:	• Incorrect connections • Damaged EGT14 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2470 - Exhaust Gas Temperature Sensor Circuit Low (Bank 1 Sensor 4)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 4 (EGT14) voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	• EGT14 circuit short to SIGRTN • EGT14 circuit short to ground • Damaged EGT14 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. An EGT14_V PID value less than 0.10 volt indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2471 - Exhaust Gas Temperature Sensor Circuit High (Bank 1 Sensor 4)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 4 (EGT14) voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• EGT14 circuit open • EGT14 circuit short to voltage • Damaged EGT14 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. An EGT14_V PID value greater than 4.90 volts indicates a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2478 - Exhaust Gas Temperature Out Of Range (Bank 1 Sensor 1)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 1 (EGT11) temperature reads greater than 1100°C (2012°F).		
Possible			

Causes:	Damaged EGT11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2479 - Exhaust Gas Temperature Out Of Range (Bank 1 Sensor 2)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 2 (EGT12) temperature reads greater than 1100°C (2012°F).		
Possible Causes:	Damaged EGT12 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P247A - Exhaust Gas Temperature Out Of Range (Bank 1 Sensor 3)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 3 (EGT13) temperature reads greater than 1100°C (2012°F).		
Possible Causes:	Damaged EGT13 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P247B - Exhaust Gas Temperature Out Of Range (Bank 1 Sensor 4)

Description:	This DTC sets when the exhaust gas temperature bank 1, sensor 4 (EGT14) temperature reads greater than 1100°C (2012°F).		
Possible Causes:	Damaged EGT14 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test RC .
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P249C - SCR Time To Closed Loop

Description:	This DTC sets when the amount of time to enter closed loop control of the selective catalytic reduction (SCR) system is greater than a calibrated threshold.		
Possible Causes:	- Damaged exhaust gas temperature bank 1, sensor 2 (EGT12) sensor - Damaged exhaust gas temperature bank 1, sensor 3 (EGT13) sensor - Damaged exhaust gas temperature bank 1, sensor 4 (EGT14) sensor - Damaged SCR system components - Biased nitrogen oxides bank 1, sensor 2 (NOx12) sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low

Description:	The PCM adapts a closed loop correction factor to account for long term drift of the selective catalytic reduction (SCR) system. This correction factor is monitored continuously. This DTC sets when the correction factor reaches a negative threshold for 5 minutes.		
Possible Causes:	- Damaged SCR system components - Biased nitrogen oxides bank 1, sensor 2 (NOx12) sensor		
Diagnostic Aids:	This DTC is informational only and may be accompanied by other DTCs. Diagnose other DTCs first. If DTC P229F is present along with DTC P249D, diagnose DTC P229F first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High

Description:	The PCM adapts a closed loop correction factor to account for long term drift of the selective catalytic reduction (SCR) system. This correction factor is monitored continuously. This DTC sets when the correction factor reaches a positive threshold for 5 minutes.		
Possible Causes:	- Damaged SCR system components - Biased nitrogen oxides bank 1, sensor 2 (NOx12) sensor		
Diagnostic Aids:	This DTC is informational only and may be accompanied by other DTCs. Diagnose other DTCs first. If DTC P229F is present along with DTC P249E, diagnose DTC P229F first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RK .		

P249F - Excessive Time To Enter Closed Loop DPF Regeneration Control

Description:	The PCM monitors the diesel particulate filter to determine that closed loop control of a regeneration event occurs within a reasonable amount of time. This DTC sets when time in closed-loop operation is less than an expected threshold.		
Possible Causes:	• Damaged exhaust gas temperature bank 1, sensor 2 (EGT12) sensor • Fuel injection concern • Damaged diesel oxidation catalyst • Biased diesel particulate filter pressure bank 1, sensor 1 • Damaged diesel particulate filter pressure bank 1, sensor 1		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P24A0 - Closed Loop DPF Regeneration Control At Limit - Temperature Too Low

Description:	The PCM monitors the exhaust gas temperature bank 1, sensor 2 (EGT12) to make sure that diesel oxidation catalyst exit temperature is high enough to complete a regeneration. This DTC sets when the difference between the expected and actual diesel oxidation catalyst exit temperature exceeds 20°C (36°F).		
Possible Causes:	• Biased EGT12 sensor • Biased exhaust gas temperature bank 1, sensor 4 (EGT14) sensor • Damaged diesel oxidation catalyst • Damaged fuel vaporizer glow plug system • Fuel injection concern		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P24A2 - Particulate Filter Regeneration Incomplete (Bank 1)

Description:	This DTC sets when a regeneration is aborted due to duration and the calculated restriction of the diesel particulate filter remains above a threshold. After the first occurrence of an incomplete regeneration, the PCM will force another regeneration in 150 miles (241 km) unless a normal regeneration occurs first.		
Possible Causes:	• Exhaust system restriction • Damaged exhaust system • Restricted diesel particulate filter pressure bank 1, sensor 1 • Vehicle driven at very low speed for an extensive period		

Diagnostic Aids:	This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose other DTCs first. If no concerns are present, clear the DTCs and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24A5 - EGR Cooler Bypass Control Stuck/Open (Bank 1)

Description:	This DTC sets when the difference between the expected temperature of the exhaust gas and the actual exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12), value is greater than a calibrated amount.		
Possible Causes:	- Exhaust gas recirculation cooler bypass valve (EGRCBV) stuck closed - Damaged EGRCBV actuator - Damaged EGRCBV solenoid		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AZ .		

P24AE - Particulate Matter Sensor Circuit

Description:	The particulate matter bank 1, sensor 1 (PM11) module monitors the PM11 sensor for circuit concerns. This DTC sets when a concern is detected with one of the circuits used to determine the particulate matter content in the exhaust gas.		
Possible Causes:	- Damaged PM11 sensor harness - Damaged PM11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24AF - Particulate Matter Sensor Circuit Range/Performance

Description:	The particulate matter bank 1, sensor 1 (PM11) module monitors the PM11 sensor for circuit concerns. This DTC sets when the PM11 signal values fall outside of a calibrated threshold.		
Possible Causes:	- Contaminated PM11 sensor - Damaged PM11 sensor harness - Damaged PM11 sensor		
Diagnostic	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a		

Aids:	loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24B0 - Particulate Matter Sensor Circuit Low

Description:	This DTC sets when the actual particulate matter bank 1, sensor 1 (PM11) signal is less than the expected value for a calibrated amount of time.		
Possible Causes:	- Damaged PM11 sensor harness - Damaged PM11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24B1 - Particulate Matter Sensor Circuit High

Description:	This DTC sets when the actual particulate matter bank 1, sensor 1 (PM11) signal is greater than the expected value for a calibrated amount of time.		
Possible Causes:	- Damaged PM11 sensor harness - Damaged PM11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24B3 - Particulate Matter Sensor Heater Control Circuit/Open

Description:	This DTC sets when a concern is detected with the particulate matter bank 1, sensor 1 (PM11) heater circuits.		
Possible Causes:	- Damaged PM11 sensor harness - Damaged PM11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test RB .
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P24B4 - Particulate Matter Sensor Heater Control Circuit Range/Performance

Description:	This DTC sets when the particulate matter bank 1, sensor 1 (PM11) heater circuits are operating outside of an expected range for a calibrated amount of time.		
Possible Causes:	- Damaged PM11 sensor harness - Damaged PM11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24B6 - Particulate Matter Sensor Heater Control Circuit High

Description:	This DTC sets when the particulate matter bank 1, sensor 1 (PM11) heater control signal is greater than the expected value for a calibrated amount of time.		
Possible Causes:	- Damaged PM11 sensor harness - Damaged PM11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24B7 - Particulate Matter Sensor Heater Resistance

Description:	This DTC sets when the particulate matter bank 1, sensor 1 (PM11) module detects the PM11 heater circuit resistance is out of an expected range.		
Possible Causes:	- Damaged PM11 sensor harness - Damaged PM11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24C2 - Exhaust Gas Temperature Measurement System - Multiple Sensor Correlation Bank 1

Description:	This DTC sets when multiple exhaust gas temperature (EGT) sensor values are outside of a calibrated threshold.		
Possible Causes:	• Damaged EGT sensor connectors • Damaged EGT sensors		
Diagnostic Aids:	Monitor the EGT11 (TEMP), EGT12 (TEMP), EGT13 (TEMP), and EGT14 (TEMP) PIDs to determine which exhaust gas temperature sensor values indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P24C6 - Particulate Matter Sensor Temperature Circuit

Description:	This DTC sets when the particulate matter bank 1, sensor 1 (PM11) module detects a PM11 sensor temperature circuit concern.		
Possible Causes:	• Damaged PM11 sensor harness • Damaged PM11 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24C7 - Particulate Matter Sensor Temperature Circuit Range/Performance

Description:	This DTC sets when the particulate matter bank 1, sensor 1 (PM11) module detects a PM11 sensor temperature circuit plausibility check concern.		
Possible Causes:	• Damaged PM11 sensor harness • Damaged PM11 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24D0 - Particulate Matter Sensor Supply Voltage Circuit Low

Description:	This DTC sets when the particulate matter bank 1, sensor 1 (PM11) module detects a supply voltage concern.		
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Possible Causes:	• VPWR circuit open • Battery voltage out of range		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24D1 - Particulate Matter Sensor Regeneration Incomplete

Description:	This DTC sets when the particulate matter bank 1, sensor 1 (PM11) module detects a PM11 sensor regeneration concern.		
Possible Causes:	• Damaged PM11 sensor • Damaged exhaust system		
Diagnostic Aids:	Check the exhaust system for aftermarket modifications, obstructions or damage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P24DA - Particulate Matter Sensor Exhaust Sample Error Bank 1

Description:	This DTC sets when the particulate matter bank 1, sensor 1 (PM11) module detects a PM11 sensor sample error.		
Possible Causes:	• Damaged PM11 sensor • PM11 sensor blockage • PM11 sensor protection tube damaged		
Diagnostic Aids:	Carry out a visual inspection of the PM11 sensor and protection tube. Make sure the sensor and protection tube are undamaged and clear of obstructions.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P2507 - ECM/PCM Power Input Signal Low

Description:	This DTC sets when the PCM 5 volt power supply voltage is less than a calibrated threshold.		
Possible Causes:	• Charging system concern • Low battery voltage • Damaged PCM		
Diagnostic Aids:			

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

P2508 - ECM/PCM Power Input Signal High

Description:	This DTC sets when the PCM internal 5 volt power supply voltage is greater than a calibrated threshold.		
Possible Causes:	• Battery voltage high • Charging system concern • Damaged PCM		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AJ .		

P2539 - Low Pressure Fuel System Sensor Circuit

Description:	This DTC sets when the PCM does not detect a change in the fuel delivery pressure switch PID state after engine shutdown.		
Possible Causes:	• FDPS circuit open • FDPS circuit short to ground • Disconnected fuel delivery pressure switch • Damaged fuel delivery pressure switch		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MD .		

P2560 - Engine Coolant Level Low

Description:	This DTC sets when the value from the engine coolant temperature (ECT) sensor is not within the PCM predicted engine coolant temperature range, based on other PCM inputs.		
Possible Causes:	• Low engine coolant level • Damaged ECT sensor • Damaged ECT sensor harness • Damaged engine oil temperature (EOT) sensor • Damaged EOT sensor harness • Damaged or restricted engine oil cooler		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		

	Check the engine cooling system for a low coolant condition or other cooling system concern. Refer to the Workshop Manual Section 303-03, Engine Cooling, Diagnosis and Testing to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AT .		

P2564 - Turbocharger Boost Control Position Sensor A Circuit Low

Description:	This DTC sets when a variable geometry turbocharger position sensor (VGTP) circuit voltage is less than the expected value.		
Possible Causes:	• VGTP circuit open • VGTP circuit short to ground • VREF circuit open • Damaged VGTP sensor • Damaged turbocharger		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P2565 - Turbocharger Boost Control Position Sensor A Circuit High

Description:	This DTC sets when a variable geometry turbocharger position (VGTP) sensor circuit voltage is greater than a calibrated limit for a specified amount of time. When the VGTP is greater than a calibrated threshold, an increment counter advances for that drive cycle. This DTC sets once the increment counter reaches a calibrated limit.		
Possible Causes:	• VGTP circuit short to voltage • Damaged VGTP sensor • Damaged VGT actuator		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P2598 - Turbocharger Boost Control Position Sensor A Performance - Stuck Low

Description:	This DTC sets when the variable geometry turbocharger (VGT) setpoint is less than a specified threshold, the actual VGT position is greater than a specified threshold, and the VGT control limit is less than a specified limit.		
Possible Causes:	• Damaged VGT actuator		

	Damaged turbocharger		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. This DTC sets when the PCM detects a stuck VGT actuator by detecting a position control deviation that exceeds a calibrated threshold.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P259E - Turbocharger A Boost Control Position At Low Limit

Description:	This DTC sets when the variable geometry turbocharger (VGT) setpoint is less than a specific threshold, the actual VGT position is greater than a specified threshold, and the VGT control limit is less than a specified limit.		
Possible Causes:	Damaged variable geometry turbocharger (VGT) actuator		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AK .		

P259F - Turbocharger A Boost Control Position At High Limit

For Transit			
Description:	This DTC sets when the variable geometry turbocharger (VGT) setpoint is greater than a specific threshold, the actual VGT position is less than a specified threshold, and the VGT control limit is greater than a specified limit.		
Possible Causes:	• Damaged variable geometry turbocharger (VGT) actuator		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
For All Others			
Description:	This DTC sets when the VGT command is greater than a calibrated value for the current amount of boost pressure for more than a calibrated amount of time.		
Possible Causes:	• Intake air system leaks between the turbocharger and the intake manifold • Damaged MAP sensor • Turbocharger actuator is not responding • VGT vanes sticking		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		

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

P2610 - ECM/PCM Engine Off Timer Performance

Description:	This DTC sets when an error in the internal PCM engine off timer processor occurs.		
Possible Causes:	• KAPWR circuit open • KAPWR circuit short to ground • Battery cables loose • Intermittent battery cable connections • Engine cooling system concerns • Damaged Engine Coolant Temperature (ECT) sensor		
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 Z .		

P262A - Fuel Injector - Pilot Injection Not Learned

Description:	This DTC sets when the PCM is unable to learn any data for pilot injection correction for 100 seconds while the zero fuel calibration monitor entry conditions are satisfied.		
Possible Causes:	• Noisy fuel rail pressure (FRP) sensor • Noisy CKP signal		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P263C - Glow Plug Driver Performance

Description:	This DTC sets when the glow plug control module (GPCM) indicates an internal software error has occurred.		
Possible Causes:	• An attempt was made to change the calibration • Aftermarket performance products • GPCM programming error • Internal GPCM error		
Diagnostic Aids:			

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

P263D - Reductant Heater Driver Performance

Description:	This DTC sets when the glow plug control module (GPCM) indicates an internal software error has occurred.		
Possible Causes:	• An attempt was made to change the calibration • Aftermarket performance products • GPCM programming error • Internal GPCM error		
Diagnostic Aids:	Disconnect all GPCM connectors and inspect for damage such as pushed out pins or corrosion and repair as necessary. Connect all GPCM connectors. Clear the DTCs. Carry out the PCM self-test. If the DTC is retrieved again, turn the ignition OFF and wait for 2 minutes. Reprogram the GPCM or update the GPCM calibration. Clear the DTCs. Carry out the PCM self-test. If the DTC is retrieved again, install a new GPCM. Refer to the Workshop Manual Section 303-07, Glow Plug System. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P263E - Glow Plug Control Module 1 Over Temperature

Description:	This DTC sets when the glow plug control module (GPCM) indicates an internal software error has occurred.		
Possible Causes:	• An attempt was made to change the calibration • Aftermarket performance products • GPCM programming error • Internal GPCM error		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

P264F - Engine Serial Number Not Programmed Or Incompatible

Description:	This DTC sets when the PCM does not receive a valid engine serial number during reprogramming.		
Possible			

Causes:	- Engine serial number corrupted during vehicle identification (VID) reprogramming - PCM replacement - Damaged PCM		
Diagnostic Aids:	The VID block must be programmed. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming 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.		

P268A - Fuel Injector Calibration Not Learned/Programmed

Description:	This DTC sets when the fuel injector energizing time is greater than the permitted energizing time after overrun demand by the driver.		
Possible Causes:	- Aftermarket performance products - PCM programming error		
Diagnostic Aids:	Check for sensor and circuit related DTCs. 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 installing a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) .		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P268C - Cylinder 1 Injector Data Incompatible

Description:	Each injector has a code stored in the electronically erasable programmable read only memory (EEPROM) that provides information to the PCM about deviations of that fuel injector from a theoretical average fuel injector. This DTC sets when the fuel injector code is missing or invalid.		
Possible Causes:	Incorrectly programmed injector quantity adjustment value		
Diagnostic Aids:	Check for other DTCs and diagnose those first. If no other DTCs are present, update the injector quantity adjustment value in the PCM to match the value on the current fuel injector using a scan tool. Clear the DTCs and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P268D - Cylinder 2 Injector Data Incompatible

Description:	Each injector has a code stored in the electronically erasable programmable read only memory (EEPROM) that provides information to the PCM about deviations of that fuel injector from a theoretical average fuel injector. This DTC sets when the fuel injector code is missing or invalid.		
Possible Causes:	Incorrectly programmed injector quantity adjustment value		

Diagnostic Aids:	Check for other DTCs and diagnose those first. If no other DTCs are present, update the injector quantity adjustment value in the PCM to match the value on the current fuel injector using a scan tool. Clear the DTCs and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P268E - Cylinder 3 Injector Data Incompatible

Description:	Each injector has a code stored in the electronically erasable programmable read only memory (EEPROM) that provides information to the PCM about deviations of that fuel injector from a theoretical average fuel injector. This DTC sets when the fuel injector code is missing or invalid.		
Possible Causes:	Incorrectly programmed injector quantity adjustment value		
Diagnostic Aids:	Check for other DTCs and diagnose those first. If no other DTCs are present, update the injector quantity adjustment value in the PCM to match the value on the current fuel injector using a scan tool. Clear the DTCs and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P268F - Cylinder 4 Injector Data Incompatible

Description:	Each injector has a code stored in the electronically erasable programmable read only memory (EEPROM) that provides information to the PCM about deviations of that fuel injector from a theoretical average fuel injector. This DTC sets when the fuel injector code is missing or invalid.		
Possible Causes:	Incorrectly programmed injector quantity adjustment value		
Diagnostic Aids:	Check for other DTCs and diagnose those first. If no other DTCs are present, update the injector quantity adjustment value in the PCM to match the value on the current fuel injector using a scan tool. Clear the DTCs and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2690 - Cylinder 5 Injector Data Incompatible

Description:	Each injector has a code stored in the electronically erasable programmable read only memory (EEPROM) that provides information to the PCM about deviations of that fuel injector from a theoretical average fuel injector. This DTC sets when the fuel injector code is missing or invalid.		
Possible Causes:	Incorrectly programmed injector quantity adjustment value		
Diagnostic Aids:	Check for other DTCs and diagnose those first. If no other DTCs are present, update the injector quantity adjustment value in the PCM to match the value on the current fuel injector using a scan tool. Clear the DTCs and repeat the self-test.		

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

P2691 - Cylinder 6 Injector Data Incompatible

Description:	Each injector has a code stored in the electronically erasable programmable read only memory (EEPROM) that provides information to the PCM about deviations of that fuel injector from a theoretical average fuel injector. This DTC sets when the fuel injector code is missing or invalid.		
Possible Causes:	Incorrectly programmed injector quantity adjustment value		
Diagnostic Aids:	Check for other DTCs and diagnose those first. If no other DTCs are present, update the injector quantity adjustment value in the PCM to match the value on the current fuel injector using a scan tool. Clear the DTCs and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2692 - Cylinder 7 Injector Data Incompatible

Description:	Each injector has a code stored in the electronically erasable programmable read only memory (EEPROM) that provides information to the PCM about deviations of that fuel injector from a theoretical average fuel injector. This DTC sets when the fuel injector code is missing or invalid.		
Possible Causes:	Incorrectly programmed injector quantity adjustment value		
Diagnostic Aids:	Check for other DTCs and diagnose those first. If no other DTCs are present, update the injector quantity adjustment value in the PCM to match the value on the current fuel injector using a scan tool. Clear the DTCs and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2693 - Cylinder 8 Injector Data Incompatible

Description:	Each injector has a code stored in the electronically erasable programmable read only memory (EEPROM) that provides information to the PCM about deviations of that fuel injector from a theoretical average fuel injector. This DTC sets when the fuel injector code is missing or invalid.		
Possible Causes:	Incorrectly programmed injector quantity adjustment value		
Diagnostic Aids:	Check for other DTCs and diagnose those first. If no other DTCs are present, update the injector quantity adjustment value in the PCM to match the value on the current fuel injector using a scan tool. Clear the DTCs and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2698 - Exhaust Aftertreatment Fuel Injector A Performance

Description:	This DTC sets when the PCM detects an excessively rich condition in the exhaust stream when the fuel vaporizer system is not in operation, indicating a leaking fuel vaporizer system glow plug.		
Possible Causes:	Damaged fuel vaporizer system glow plug		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RL .		

P269B - Exhaust Aftertreatment Glow Plug Control Circuit/Open

Description:	This DTC sets when the PCM detects an open on the VGPRC circuit.		
Possible Causes:	- VGPRC circuit open - Damaged fuel vaporizer system glow plug relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RL .		

P269D - Exhaust Aftertreatment Glow Plug Control Circuit Low

Description:	This DTC sets when the PCM detects an open or short to ground on the VGPRC circuit.		
Possible Causes:	- VGPRC circuit open or short to ground - Damaged fuel vaporizer system glow plug relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RL .		

P269E - Exhaust Aftertreatment Glow Plug Control Circuit High

Description:	This DTC sets when the PCM detects a short to voltage on the VGPRC circuit.		
Possible Causes:	- VGPRC circuit short to voltage - Damaged fuel vaporizer system glow plug relay		

Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test RL .	

P26A0 - Exhaust Aftertreatment Glow Plug Performance

Description:	This DTC sets when the PCM detects an open or short to ground on the VGPRM circuit.		
Possible Causes:	• VPWR circuit open • VGPRM circuit open • VGPRM circuit short to ground • Damaged fuel vaporizer system glow plug relay		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test RL .	

P2A00 - O2 Sensor Circuit Range/Performance (Bank 1 Sensor 1)

Description:	The nitrogen oxides bank 1, sensor 1 (NOx11) module estimates the expected exhaust oxygen (O2) content during certain fuel, boost and exhaust gas recirculation (EGR) conditions. This DTC sets when the actual NOx11 sensor O2 signal value is not within the expected range for a calibrated amount of time.		
Possible Causes:	• Corrosion • Incorrect connections • Contaminated NOx11 sensor • Damaged NOx11 sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test RD .	

P2A01 - O2 Sensor Circuit Range/Performance (Bank 1 Sensor 2)

Description:	The nitrogen oxides bank 1, sensor 2 (NOx12) module estimates the expected exhaust oxygen (O2) content during certain fuel, boost and exhaust gas recirculation (EGR) conditions. This DTC sets when the actual NOx12 sensor O2 signal value is not within the expected range for a calibrated amount of time.		
Possible Causes:	• Corrosion • Incorrect connections • Contaminated NOx12 sensor • Damaged NOx12 sensor		

Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

P2B00 - Cylinder 1 Injection Pulse Performance

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B01 - Cylinder 2 Injection Pulse Performance

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B02 - Cylinder 3 Injection Pulse Performance

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the		

Aids:	power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B03 - Cylinder 4 Injection Pulse Performance

Description:	The. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B11 - Cylinder 1 Injection Pulse Offset Exceeded Learning Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B13 - Cylinder 2 Injection Pulse Offset Exceeded Learning Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		

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

P2B15 - Cylinder 3 Injection Pulse Offset Exceeded Learning Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B17 - Cylinder 4 Injection Pulse Offset Exceeded Learning Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B19 - Cylinder 5 Injection Pulse Offset Exceeded Learning Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test M .
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P2B1B - Cylinder 6 Injection Pulse Offset Exceeded Learning Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B1D - Cylinder 7 Injection Pulse Offset Exceeded Learning Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2B1F - Cylinder 8 Injection Pulse Offset Exceeded Learning Limit

Description:	The PCM monitors the operation of fuel system and calculates parameters necessary for an ideal engine operation. These parameters are stored in the adaptive strategy table. The table is used as a correction factor when controlling engine operation and corrects for wear or aging of components. This DTC sets when the adaptive strategy has reached its minimum learning limit.		
Possible Causes:	Damaged fuel injector		
Diagnostic Aids:	Carry out the power balance test to verify cylinders contribution. Disregard any DTCs set as a result of the power balance test. Single or inconsistent non-contributing power cylinder traces may be caused by a natural variation in a crankshaft speed and should be ignored.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test M .		

P2BA7 (DCU) - NOX Exceedence - Empty Reagent Tank

Description:	This DTC sets when the reductant level reaches a minimum amount.		
Possible Causes:	• Reductant level too low		
Diagnostic Aids:	Fill the reductant tank. This DTC clears when the reductant dosage control module detects a refill event.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2BA7 (PCM) - NOX Exceedence - Empty Reagent Tank

Description:	This DTC sets when the reductant level reaches a minimum amount.		
Possible Causes:	• Reductant level too low		
Diagnostic Aids:	Fill the reductant tank. This DTC clears when the PCM detects a refill event.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P2BA8 - NOx Exceedence - Interruption of Reductant Dosing Activity

Description:	This DTC sets when the reductant dosage is interrupted.		
Possible Causes:	• Frozen diesel exhaust fluid		
Diagnostic Aids:	Check for other DTCs and diagnose those first. This DTC may have been caused by frozen diesel exhaust fluid. Check the diesel exhaust fluid level. Clear the PCM DTCs. Repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P2BA9 - NOX Exceedence - Insufficient Reductant Quality

Description:	This DTC sets when the reductant concentration is less than a calibrated amount.		
Possible Causes:	• Incorrect Reductant concentration		

Diagnostic Aids:	This DTC clears when the reductant dosage control module detects a refill event.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

P2C3A - Cylinder Head Temperature Sensor B Circuit Low

Description:	This DTC sets when the CHT2 sensor circuit is shorted to ground.		
Possible Causes:	• CHT2 circuit short to ground • Damaged cylinder head temperature 2 (CHT2) sensor. • Incorrect harness connection		
Diagnostic Aids:	This DTC illuminates the malfunction indicator lamp (MIL).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P2C3B - Cylinder Head Temperature Sensor B Circuit High

Description:	This DTC sets when a CHT2 circuit concern is detected.		
Possible Causes:	• CHT2 circuit open • CHT2 circuit short to voltage • Damaged cylinder head temperature 2 (CHT2) sensor. • Incorrect harness connection		
Diagnostic Aids:	This DTC illuminates the malfunction indicator lamp (MIL).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

U0002 - High Speed CAN Communication Bus Performance

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

U0073 (DCU) - Control Module Communication Bus A Off

Description:	This DTC sets when the controller area network (CAN) between the reductant dosage control module and		
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	the data link connector (DLC) is open.		
Possible Causes:	• Communication error		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RM .		

U0073 (PCM) - Control Module Communication Bus A Off

Description:	This DTC sets when the controller area network (CAN) between the PCM and data link connector (DLC) is open.		
Possible Causes:	• Communication error		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Network DTC concerns occur during module-to-module communication. For additional description and operation of the vehicle communication network, refer to the Workshop Manual Section 418-00, Module Communications Network.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0074 - Control Module Communication Bus B Off

Description:	This DTC sets when the controller area network 2 (CAN2) between the PCM and glow plug control module (GPCM) is open.		
Possible Causes:	• Communication error		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center. Network DTC concerns occur during module-to-module communication. For additional description and operation of the vehicle communication network, refer to the Workshop Manual Section 418-00, Module Communications Network.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AF .		

U0100 - Lost Communication With ECM / PCM A

Description:	The reductant dosage control module continuously monitors the controller area network (CAN) for messages from the PCM. This DTC sets when the reductant dosage control module does not receive the PCM message within the defined amount of time.		

Possible Causes:	• Communication error		
Diagnostic Aids:	Check for other reductant dosage control module DTCs or reductant dosage control module related symptoms. Diagnose all other reductant dosage control module DTCs or reductant dosage control module related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RM .		

U0101 - Lost Communication With TCM

Description:	This DTC sets when the PCM does not receive the transmission control module (TCM) message within the defined amount of time.		
Possible Causes:	• 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 DTC Chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0102 - Lost Communication With Transfer Case Control Module

Description:	This DTC sets when the PCM receives invalid data from the transfer case control module.		
Possible Causes:	• 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 DTC chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0106 - Lost Communication With Glow Plug Control Module

Description:	This DTC sets when the PCM receives invalid data from the glow plug control module (GPCM).		
Possible Causes:	• 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 DTC Chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0109 - Lost Communication With Fuel Pump Control Module A

Description:	The PCM monitors the 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. This DTC sets when the PCM is still not detecting a duty cycled signal on the FPM circuit after a calibrated amount of time.		
Possible Causes:	- FPM circuit open or short to ground - FPM circuit short to voltage - VPWR fuel circuit open - GND circuit open - Damaged fuel pump control module relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MA .		

U010E - Lost Communication With Reductant Control Module

Description:	This DTC sets when the PCM does not receive the Reductant Control Module message within the defined amount of time.		
Possible Causes:	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 DTC Chart to continue diagnosis. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

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

Description:	This DTC sets when the PCM does not receive the ABS message within the defined amount of time.		
Possible Causes:	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 DTC Chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U012D - Lost Communication With Generator Control Module

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls, DTC Charts 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.		

U0140 - Lost Communication With Body Control Module

Description:	This DTC sets when the PCM receives invalid data from the body control module (BCM).		
Possible Causes:	• 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 DTC Chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0151 - Lost Communication With Restraints Control Module

Description:	This DTC sets when the PCM does not receive the restraints control module (RCM) message within the defined amount of time.		
Possible Causes:	• CAN circuit		
Diagnostic Aids:	Network DTC concerns occur during module to module communication. Refer to the Workshop Manual Section 418-00, Module Communications Network, Communication Network DTC Chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0155 - Lost Communication With Instrument Panel Cluster (IPC) Control Module

Description:	This DTC sets when the PCM does not receive the IPC control module message within the defined amount of time.		
Possible			

Causes:	• 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 DTC Chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0212 - Lost Communication With Steering Column Control Module

Description:	This DTC sets when the PCM receives invalid data from the steering column control module (SCCM).		
Possible Causes:	• Communication error		
Diagnostic Aids:	Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U029D - Lost Communication With NOX Sensor A

Description:	This DTC sets when the PCM does not receive the nitrogen oxides bank 1, sensor 1 (NOx11) module message within the defined amount of time.		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged NOx11 module		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. For F-650 / F-750, drive the vehicle until the system warning message has cleared from the instrument cluster message center. For all others, drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

U029E - Lost Communication With NOX Sensor B

Description:	This DTC sets when the PCM does not receive the nitrogen oxides bank 1, sensor 2 (NOx12) module message within the defined amount of time.		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged NOx12 module		
Diagnostic	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a		

Aids:	loss of power. After repair, the vehicle may still display a system warning message. For F-650 / F-750, drive the vehicle until the system warning message has cleared from the instrument cluster message center. For all others, drive the vehicle, while carrying out the appropriate drive cycle procedure, until the system warning message has cleared from the instrument cluster message center. Refer to Section 2, Drive Cycles for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

U02A2 - Lost Communication With Reductant Quality Module

Description:	This DTC sets when the PCM does not receive the reductant level sensor message within the defined amount of time.		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged reductant level sensor		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RJ .		

U02A3 - Lost Communication With PM Sensor

Description:	This DTC sets when the PCM does not receive the particulate matter bank 1, sensor 1 (PM11) module message within the defined amount of time.		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged PM11 module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

U0307 - Software Incompatibility With Glow Plug Control Module 1

Description:	This DTC sets when the PCM receives invalid data from the glow plug control module (GPCM).		
Possible Causes:	• GPCM software version • 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 DTC Chart to continue diagnosis.		

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

U030F - Software Incompatibility With Reductant Control Module

Description:	This DTC sets when the PCM receives invalid data from the Reductant Dosage Control Module (RDCM).		
Possible Causes:	• Communication error • RDCM software version		
Diagnostic Aids:	Verify the NOx11 module is at the latest calibration level. The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument panel cluster (IPC) message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0401 - Invalid Data Received From ECM/PCM A

Description:	Network DTC concerns occur during module to module communication.		
Possible Causes:	• 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:	Check for other reductant dosage control module DTCs or reductant dosage control module related symptoms. Diagnose all other reductant dosage control module DTCs or reductant dosage control module related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RM .		

U0402 - Invalid Data Received From TCM

Description:	Network DTC concerns occur during module to module communication.		
Possible Causes:	• 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:	Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first. Check for transmission control module (TCM) DTCs or TCM related symptoms. Diagnose all other TCM DTCs or TCM related symptoms first.		

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

U0407 - Invalid Data Received From Glow Plug Control Module 1

Description:	Network DTC concerns occur during module to module communication.		
Possible Causes:	- 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:	Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U040F - Invalid Data Received From Reductant Control Module

Description:	This DTC sets when the PCM detects an invalid message from the reductant pump control module.		
Possible Causes:	- RDPM circuit open - RDPM short to ground - Damaged reductant pump control module		
Diagnostic Aids:	The presence of this DTC may indicate the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RG .		

U0418 - Invalid Data Received From Brake System Control Module

Description:	This DTC sets when network DTC concerns occur during module to module communication.		
Possible Causes:	- 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:	Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first. Check for other anti-lock brake system (ABS) control module DTCs or ABS control module related symptoms. Diagnose all other ABS control module DTCs or ABS control module related symptoms first.		

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

U0419 - Invalid Data Received From Steering Effort Control Module

Description:	Network DTC concerns occur during module to module communication.		
Possible Causes:	- 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:	Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U041E - Invalid Data Received From All Wheel Drive Control Module

Description:	This DTC sets when network DTC concerns occur during module to module communication.		
Possible Causes:	- 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:	Network DTC concerns occur during module to module communication. Refer to the Workshop Manual Section 418-00, Module Communications Network, Communication Network DTC Chart to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U0422 - Invalid Data Received From Body Control Module

Description:	This DTC sets when network DTC concerns occur during module to module communication.		
Possible Causes:	- 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	Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related		

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

U0452 - Invalid Data Received From Restraints Control Module

Description:	This DTC sets when network DTC concerns occur during module to module communication.		
Possible Causes:	- 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:	Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		

U04A4 - Invalid Data Received From PM Sensor

Description:	This DTC sets when the PCM receives invalid data from the particulate matter bank 1, sensor 1 (PM11) module.		
Possible Causes:	- Radio frequency interference or electromagnetic interference - Damaged PM11 module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

U059E - Invalid Data Received From NOX Sensor A

Description:	This DTC sets when the PCM does not receive the correct information from the nitrogen oxides bank 1, sensor 1 (NOx11) module.		
Possible Causes:	- Radio frequency interference or electromagnetic interference - Damaged NOx11 module		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

U05A1 - NOX Sensor A Received Invalid Data From ECM/PCM

Description:	This DTC sets when the PCM does not receive the nitrogen oxides bank 1, sensor 1 (NOx11) module message within the defined amount of time.		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged NOx11 module		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

U05A2 - NOX Sensor B Received Invalid Data From ECM/PCM

Description:	This DTC sets when the PCM does not receive the nitrogen oxides bank 1, sensor 2 (NOx12) module message within the defined amount of time.		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged NOx12 module		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RD .		

U0601 - Lost Communication with Particulate Filter Pressure Sensor A

Description:	This DTC sets when the PCM no longer receives a signal from the Particulate Filter Pressure Sensor.		
Possible Causes:	• PFP11 circuit concerns • Damaged Particulate Filter Pressure Sensor		
Diagnostic Aids:	• Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

U0603 - Lost Communication With Fuel Pressure Sensor A

Description:	This DTC sets when the PCM no longer receives a signal from the Fuel Pressure and Temperature Sensor.		
Possible Causes:	• FLP circuit concerns • Damaged Fuel Pressure and Temperature Sensor		
Diagnostic Aids:	• Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MD .		

U0609 - Lost Communication With Manifold Absolute Pressure Sensor A

Description:	This DTC sets when the PCM no longer receives a signal from the manifold absolute pressure (MAP) sensor.		
Possible Causes:	• MAP circuit open • MAP circuit short to ground • MAP circuit short to voltage • Damaged MAP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test E .		

U060F - Lost Communication With Mass Or Volume Air Flow Sensor A

Description:	This DTC sets when the PCM does not receive the mass airflow (MAF) sensor message within the defined amount of time.		
Possible Causes:	• MAF circuit open • MAF circuit short to ground • MAF circuit short to voltage • VREF circuit open • SIGRTN circuit open • Damaged mass airflow/intake air temperature (MAF/IAT) sensor		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in derate mode and may experience a loss of power. After repair, the vehicle may still display a system warning message. Drive the vehicle until the system warning message has cleared from the instrument cluster message center.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

U0667 - Lost Communication With Engine Oil Pressure and Temperature Sensor A

Description:	This DTC sets when the PCM no longer receives a signal from the Engine Oil Pressure and Temperature Sensor.		
Possible Causes:	• EOPT circuit concerns • Damaged Engine Oil Pressure and Temperature Sensor		
Diagnostic Aids:	• Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test L .		

U0670 - Lost Communication With Fuel Temperature Sensor A

Description:	This DTC sets when the PCM no longer receives a signal from the Fuel Pressure and Temperature Sensor.		
Possible Causes:	• FLP circuit concerns • Damaged Fuel Pressure and Temperature Sensor		
Diagnostic Aids:	• Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test MC .		

U068B - Lost Communication with Turbocharger/Supercharger Inlet Pressure Sensor A

Description:	This DTC sets when the PCM no longer receives a signal from the turbocharger/supercharger inlet pressure (TCIP) Sensor.		
Possible Causes:	• SIGNAL circuit open • SIGNAL circuit short to ground • SIGNAL circuit short to voltage • Damaged TCIP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test J .		

U0691 - Lost Communication With Exhaust Pressure Sensor A

Description:	This DTC sets when the PCM no longer receives a signal from the exhaust pressure (EP) Sensor.		
Possible Causes:	• EP circuit open • EP circuit short to ground • EP circuit short to voltage • Damaged EP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test X .		

U1013 - Invalid Internal Control Module Monitoring Data Received From TCM

Description:	Network DTC concerns occur during module to module communication.		
Possible Causes:			
Diagnostic Aids:	Invalid data network concerns - data is transferred within the normal inter-module message, but contains known invalid data. The receiving module logs a DTC related to the invalid data concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AE .		