

P0010 - A Camshaft Position Actuator A Control Circuit/Open Bank 1

Description:	This DTC sets when a low or high voltage on the VCT11 circuit is detected.		
Possible Causes:	• VCT11 circuit open • VCT11 circuit short to voltage • VCT11 circuit short to ground • VPWR circuit open • Damaged variable camshaft timing bank 1 solenoid 1 (VCT11)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-advanced. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.		
Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Variable camshaft timing bank 1 solenoid 1 (VCT11) valve stuck open • VCT11 circuit open • VCT11 circuit short to voltage • VCT11 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT11 phaser • Damaged camshaft position bank 1 sensor 1 (CMP11) • CMP11 sensor circuits open • CMP11 sensor circuits short to voltage • CMP11 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-retarded. This DTC sets when the
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	camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • variable camshaft timing bank 1 solenoid 1 (VCT11) valve stuck open • VCT11 circuit open • VCT11 circuit short to voltage • VCT11 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT11 phaser • Damaged camshaft position bank 1 sensor 1 (CMP11) • CMP11 sensor circuits open • CMP11 sensor circuits short to voltage • CMP11 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0013 - B Camshaft Position Actuator A Control Circuit/Open Bank 1

Description:	This DTC sets when a low or high voltage on the VCT12 circuit is detected. This DTC sets if the voltage exceeds a calibrated limit for a calibrated amount of time.		
Possible Causes:	• VCT12 circuit open • VCT12 circuit short to voltage • VCT12 circuit short to ground • VPWR circuit open • Damaged variable camshaft timing bank 1 solenoid 2 (VCT12)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0014 - B Camshaft Position Timing - Over-Advanced (Bank 1)

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-advanced. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.		
Possible Causes:	• VCT unit to camshaft alignment		

	• Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Variable camshaft timing bank 1 solenoid 2 (VCT12) valve stuck open • VCT12 circuit open • VCT12 circuit short to voltage • VCT12 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT12 phaser • Damaged camshaft position bank 1 sensor 2 (CMP12) • CMP12 sensor circuits open • CMP12 sensor circuits short to voltage • CMP12 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0015 - B Camshaft Position Timing - Over-Retarded (Bank 1)

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-retarded. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Variable camshaft timing bank 1 solenoid 2 (VCT12) valve stuck open • VCT12 circuit open • VCT12 circuit short to voltage • VCT12 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT12 phaser • Damaged camshaft position bank 1 sensor 2 (CMP12) • CMP12 sensor circuits open • CMP12 sensor circuits short to voltage • CMP12 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All | GO to Pinpoint Test [HK](#).**P0016 - Crankshaft Position - Camshaft Position Correlation (Bank 1 Sensor A)**

Description:	This DTC sets when a misalignment between the camshaft and crankshaft is detected. This DTC sets when the misalignment is 1 tooth or greater. This DTC can also set due to variable camshaft timing (VCT) system concerns (oil contamination or VCT solenoid stuck).		
Possible Causes:	• VCT unit to camshaft alignment • Excessive camshaft timing chain wear • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • variable camshaft timing bank 1 solenoid 1 (VCT11) stuck in position • VCT11 circuit open • VCT11 circuit short to voltage • VCT11 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT11 phaser • Damaged camshaft position bank 1 sensor 1 (CMP11) • CMP11 sensor circuits open • CMP11 sensor circuits short to voltage • CMP11 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all CMP sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0017 - Crankshaft Position - Camshaft Position Correlation (Bank 1 Sensor B)

Description:	This DTC sets when a misalignment between the camshaft and crankshaft is detected. This DTC sets when the misalignment is 1 tooth or greater. This DTC can also set due to variable camshaft timing (VCT) system concerns (oil contamination or VCT solenoid stuck).		
Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Variable camshaft timing bank 1 solenoid 2 (VCT12) stuck in position • VCT12 circuit open • VCT12 circuit short to voltage • VCT12 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit)		

	- Damaged VCT12 phaser - Damaged camshaft position bank 1 sensor 2 (CMP12) - CMP12 sensor circuits open - CMP12 sensor circuits short to voltage - CMP12 sensor circuits short to ground - Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all CMP sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	This DTC sets when a misalignment between the camshaft and crankshaft is detected. This DTC sets when the misalignment is 1 tooth or greater. This DTC can also set due to variable camshaft timing (VCT) system concerns (oil contamination or VCT solenoid stuck).		
Possible Causes:	- VCT unit to camshaft alignment - Excessive camshaft timing chain wear - Camshaft timing incorrectly set - Continuous oil flow to the VCT piston chamber - Erratic camshaft position due to low oil pressure - Oil flow restriction in the oil passages or the VCT valve body - variable camshaft timing bank 2 solenoid 1 (VCT21) stuck in position - VCT21 circuit open - VCT21 circuit short to voltage - VCT21 circuit short to ground - VPWR circuit open - Camshaft advance mechanism binding (VCT unit) - Damaged VCT21 phaser - Damaged camshaft position bank 2 sensor 1 (CMP21) - CMP21 sensor circuits open - CMP21 sensor circuits short to voltage - CMP21 sensor circuits short to ground - Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0019 - Crankshaft Position - Camshaft Position Correlation (Bank 2 Sensor B)

Description:	This DTC sets when a misalignment between the camshaft and crankshaft is detected. This DTC sets when the misalignment is 1 tooth or greater. This DTC can also set due to variable camshaft timing (VCT) system concerns (oil contamination or VCT solenoid stuck).		
Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • variable camshaft timing bank 2 solenoid 2 (VCT22) stuck in position • VCT22 circuit open • VCT22 circuit short to voltage • VCT22 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT22 phaser • Damaged camshaft position bank 2 sensor 2 (CMP22) • CMP22 sensor circuits open • CMP22 sensor circuits short to voltage • CMP22 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0020 - A Camshaft Position Actuator A Control Circuit/Open Bank 2

Description:	This DTC sets when a low or high voltage on the VCT21 circuit is detected. This DTC sets if the voltage exceeds a calibrated limit for a calibrated amount of time.		
Possible Causes:	• VCT21 circuit open • VCT21 circuit short to voltage • VCT21 circuit short to ground • VPWR circuit open • Damaged variable camshaft timing bank 2 solenoid 1 (VCT21)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-advanced. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.		

Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Variable camshaft timing bank 2 solenoid 1 (VCT21) valve stuck open • VCT21 circuit open • VCT21 circuit short to voltage • VCT21 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT21 phaser • Damaged camshaft position bank 2 sensor 1 (CMP21) • CMP21 sensor circuits open • CMP21 sensor circuits short to voltage • CMP21 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-retarded. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • variable camshaft timing bank 2 solenoid 1 (VCT21) valve stuck open • VCT21 circuit open • VCT21 circuit short to voltage • VCT21 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT21 phaser • Damaged camshaft position bank 2 sensor 1 (CMP21) • CMP21 sensor circuits open • CMP21 sensor circuits short to voltage • CMP21 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All | GO to Pinpoint Test [HK](#).**P0023 - B Camshaft Position Actuator A Control Circuit/Open Bank 2**

Description:	This DTC sets when a low or high voltage on the VCT22 circuit is detected. This DTC sets if the voltage exceeds a calibrated limit for a calibrated amount of time.		
Possible Causes:	• VCT22 circuit open • VCT22 circuit short to voltage • VCT22 circuit short to ground • VPWR circuit open • Damaged variable camshaft timing bank 2 solenoid 2 (VCT22)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0024 - B Camshaft Position Timing - Over-Advanced (Bank 2)

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-advanced. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.		
Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Variable camshaft timing bank 2 solenoid 2 (VCT22) valve stuck open • VCT22 circuit open • VCT22 circuit short to voltage • VCT22 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT22 phaser • Damaged camshaft position bank 2 sensor 2 (CMP22) • CMP22 sensor circuits open • CMP22 sensor circuits short to voltage • CMP22 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0025 - B Camshaft Position Timing - Over-Retarded (Bank 2)

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-retarded. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	• VCT unit to camshaft alignment • Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • variable camshaft timing bank 2 solenoid 2 (VCT22) valve stuck open • VCT22 circuit open • VCT22 circuit short to voltage • VCT22 circuit short to ground • VPWR circuit open • Camshaft advance mechanism binding (VCT unit) • Damaged VCT22 phaser • Damaged camshaft position bank 2 sensor 2 (CMP22) • CMP22 sensor circuits open • CMP22 sensor circuits short to voltage • CMP22 sensor circuits short to ground • Radio frequency interference		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all camshaft position (CMP) sensor DTCs first. If no CMP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	The PCM controls the heater ON and OFF duty cycle to maintain a calibrated temperature. This DTC sets when the sensor does not warm up to the required temperature in a calibrated amount of time. This DTC also sets when the PCM is not able to maintain the required temperature after the sensor is warm.		
Possible Causes:	• UO2S11 circuit open (if equipped) • UO2SGREF11 circuit open (if equipped) • UO2SHTR11 circuit open (if equipped) • UO2SHTR11 circuit short to voltage (if equipped) • HTR11 circuit open (if equipped) • HTR11 circuit short to ground (if equipped) • VPWR circuit open • Incorrect connections • Damaged or corroded pins • Exhaust temperature significantly higher than expected • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11) (if equipped) • Damaged HO2S11 (if equipped)		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

EcoSport 1.5L, KA		GO to Pinpoint Test DW .
All others		GO to Pinpoint Test DZ .

P0034 - Turbocharger/Supercharger Bypass Valve A Control Circuit Low

Description:	This DTC sets when the PCM detects a short to ground in the TCBY circuit.		
Possible Causes:	• Damaged turbocharger bypass (TCBY) valve • TCBY circuit short to ground • 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. This DTC only sets when the valve is commanded closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0035 - Turbocharger/Supercharger Bypass Valve A Control Circuit High

Description:	This DTC sets when the PCM detects an open circuit or high voltage in the TCBY circuit.		
Possible Causes:	• Damaged turbocharger bypass (TCBY) valve • TCBY circuit open • TCBY circuit short to voltage		
Diagnostic Aids:	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. This DTC only sets when the valve is commanded open.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0036 - HO2S Heater Control Circuit (Bank 1 Sensor 2)

Description:	The PCM controls the heated oxygen sensor bank 1, sensor 2 (HO2S12) heater ON and OFF duty cycle to maintain a calibrated temperature. This DTC sets when the sensor does not warm up to the required temperature in a calibrated amount of time. This DTC also sets when the PCM is not able to maintain the required temperature after the sensor is warm.		
Possible Causes:	• VPWR circuit open • HTR12 circuit open • HTR12 circuit short • Incorrect connections • Damaged or corroded pins		

	- Exhaust temperature significantly higher than expected - Damaged HO2S12		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0037 - HO2S Heater Control Circuit Low (Bank 1 Sensor 2)

Description:	The PCM controls the heated oxygen sensor bank 1, sensor 2 (HO2S12) heater ON and OFF duty cycle to maintain a calibrated temperature. This DTC sets when the sensor does not warm up to the required temperature in a calibrated amount of time. This DTC also sets when the PCM is not able to maintain the required temperature after the sensor is warm.		
Possible Causes:	- HTR12 circuit short - Incorrect connections - Damaged or corroded pins - Exhaust temperature significantly higher than expected - Damaged HO2S12		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0038 - HO2S Heater Control Circuit High (Bank 1 Sensor 2)

Description:	The PCM controls the heated oxygen sensor bank 1, sensor 2 (HO2S12) heater ON and OFF duty cycle to maintain a calibrated temperature. This DTC sets when the sensor does not warm up to the required temperature in a calibrated amount of time. This DTC also sets when the PCM is not able to maintain the required temperature after the sensor is warm.		
Possible Causes:	- HTR12 circuit short - Incorrect connections - Damaged or corroded pins - Exhaust temperature significantly higher than expected - Damaged HO2S12		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

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Description:	The heated oxygen sensor (HO2S) monitor determines if the universal HO2S signal response for a fuel shift corresponds to the correct engine bank. This DTC sets when there is no response from the universal HO2S being tested.		
Possible Causes:	• Crossed universal HO2S harness connectors • Crossed universal HO2S wiring at the harness connectors • Crossed universal HO2S wiring at the PCM connectors		
Diagnostic Aids:	Connect the universal HO2S connector to the correct bank.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

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

Description:	The heated oxygen sensor (HO2S) monitor determines if the HO2S signal response for a fuel shift corresponds to the correct engine bank. This DTC sets when there is no response from the HO2S being tested.		
Possible Causes:	• Crossed HO2S harness connectors • Crossed HO2S wiring at the harness connectors • Crossed HO2S wiring at the PCM connectors		
Diagnostic Aids:	Connect the HO2S connector to the correct bank.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	The PCM controls the universal heated oxygen sensor bank 2, sensor 1 (HO2S21) heater ON and OFF duty cycle to maintain a calibrated temperature. This DTC sets when the sensor does not warm up to the required temperature in a calibrated amount of time. This DTC also sets when the PCM is not able to maintain the required temperature after the sensor is warm.		
Possible Causes:	• UO2S21 circuit open • UO2SGREF21 circuit open • UO2SHTR21 circuit open • UO2SHTR21 circuit short to voltage • VPWR circuit open • Incorrect connections • Damaged or corroded pins • Exhaust temperature significantly higher than expected • Damaged universal HO2S21		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P0053 - HO2S Heater Resistance (Bank 1 Sensor 1)

Description:	This DTC sets when the heater current requirements are too low or too high in the UO2SHTR11 circuit (if equipped) or HTR11 circuit (if equipped).		
Possible Causes:	• VPWR circuit open • UO2SHTR11 circuit open (if equipped) • UO2SHTR11 circuit short (if equipped) • HTR11 circuit open (if equipped) • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11) (if equipped) • Damaged HO2S11 (if equipped)		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport 1.5L, KA	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test DZ .		

P0054 - HO2S Heater Resistance (Bank 1 Sensor 2)

Description:	This DTC sets when the heater current requirements are too low or too high in the HTR12 circuit.		
Possible Causes:	• VPWR circuit open • HTR12 circuit open • HTR12 heater circuit short • Damaged HO2S12 heater		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0056 - HO2S Heater Control Circuit (Bank 2 Sensor 2)

Description:	The PCM controls the heated oxygen sensor bank 2, sensor 2 (HO2S22) heater ON and OFF duty cycle to maintain a calibrated temperature. This DTC sets when the sensor does not warm up to the required temperature in a calibrated amount of time. This DTC also sets when the PCM is not able to maintain the required temperature after the sensor is warm.		
Possible Causes:	• VPWR circuit open • HTR22 circuit open • HTR22 circuit short • Incorrect connections • Damaged or corroded pins • Exhaust temperature significantly higher than expected		

	Damaged HO2S22		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0059 - HO2S Heater Resistance (Bank 2 Sensor 1)

Description:	This DTC sets when the heater current requirements are too low or too high in the UO2SHTR21 circuit.		
Possible Causes:	- VPWR circuit open - UO2SHTR21 circuit open - UO2SHTR21 circuit short - Damaged universal HO2S21 heater		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P0060 - HO2S Heater Resistance (Bank 2 Sensor 2)

Description:	This DTC sets when the heater current requirements are too low or too high in the HTR22 circuit.		
Possible Causes:	- VPWR circuit open - HTR22 circuit open - HTR22 circuit short - Damaged HO2S22 heater		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0068 - MAP / MAF - Throttle Position Correlation

Description:	The PCM monitors a vehicle operation rationality check by comparing the throttle position (TP) sensor to the mass airflow (MAF) sensor readings (if equipped) or to the manifold absolute pressure (MAP) sensor readings (if equipped). This continuous memory DTC sets when during a key ON, engine running (KOER) self-test, the comparison of the readings are not consistent with the calibrated load values.		
Possible Causes:	- Air leak at any connection or line of the intake air system components before or after the electronic throttle body (ETB) - Leak in the positive crankcase ventilation (PCV) system - TP sensor not seated correctly - Damaged MAF sensor (if equipped)		

	- Damaged MAP sensor (if equipped) - Damaged TP sensor		
Diagnostic Aids:	An intake air system leak at a hose, line or connection of any intake air system or PCV system component may cause this DTC to set. Check for other DTCs. Diagnose all other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

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

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

P0074 - Ambient Air Temperature Sensor Circuit A Intermittent/Erratic

Description:	This DTC sets when the ambient air temperature (AAT) sensor signal changes beyond the minimum or maximum calibrated limit.			
Possible Causes:	• AAT circuit intermittent open • AAT circuit intermittent short to voltage • AAT circuit intermittent short to ground • Damaged AAT sensor			
Diagnostic Aids:	Check the harness and connection. Monitor the sensor PID while wiggling and bending the harness from the sensor to the PCM.			
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 charge air cooler temperature (CACT) sensor value does not correlate with the intake air temperature (IAT) sensor value or the intake air temperature 2 (IAT2) sensor value at ignition ON after a calibrated soak period (typically 6 to 8 hours). If the IAT2 sensor is not present, the engine coolant temperature (ECT) sensor value or the cylinder head temperature (CHT) sensor value is used for the rationality test. This DTC also sets if the CACT sensor value exceeds the maximum calibrated temperature threshold while driving.			
Possible Causes:	• Damaged CACT sensor • Contaminated or restricted CACT sensor • Slow responding CACT sensor			
Diagnostic Aids:	Check temperature values while engine is at ambient temperature, cold soak the engine for a minimum of 6 hours if necessary. Check airflow through charge air cooler (CAC), remove debris if necessary. 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 DN .		

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

Description:	This DTC sets when the charge air cooler temperature (CACT) is greater than a calibrated value or a short to ground is detected in the CACT circuit.			
Possible Causes:	• Damaged charge air cooler temperature (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:	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. 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 DN .		

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

Description:	This DTC sets when the charge air cooler temperature (CACT) is lower than a calibrated value or an open or short to voltage is detected in the CACT circuit.		
Possible Causes:	• Damaged charge air cooler temperature (CACT) sensor • CACT circuit open • CACT circuit short to voltage • SIGRTN circuit open • Output from the charge air cooler (CAC) is colder than the calibrated threshold		
Diagnostic Aids:	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. 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 DN .		

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

For Mustang, 5.2L	
Description:	This DTC sets when the fuel rail pressure requested by the PCM is greater than the fuel rail pressure delivered, by more than a calibrated threshold for greater than a calibrated length of time.
Possible Causes:	• Low fuel pressure • Low or no fuel • FRP circuit concerns • Damaged FRP sensor
Diagnostic Aids:	
For All Others	
Description:	The PCM regulates the fuel rail pressure by controlling the fuel volume regulator. This DTC sets when the PCM is no longer capable of maintaining the fuel pressure within the calibrated parameters.
Possible Causes:	• Fuel filter restricted or dirty • Fuel supply line restricted • Damaged fuel pump module • Damaged fuel injection pump

Diagnostic Aids:	Diagnose any FRP and FVR circuit DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Mustang 5.2L	GO to Pinpoint Test DD .		
All others	GO to Pinpoint Test HP .		

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

For Mustang, 5.2L			
Description:	This DTC sets when the fuel rail pressure requested by the PCM is less than the fuel rail pressure delivered, by more than a calibrated threshold for greater than a calibrated length of time.		
Possible Causes:	• High fuel pressure • FRP circuit concerns • Damaged FRP sensor		
Diagnostic Aids:			
For All Others			
Description:	The PCM regulates the fuel rail pressure by controlling the fuel volume regulator. This DTC sets when the PCM is no longer capable of maintaining the fuel pressure within the calibrated parameters.		
Possible Causes:	• Damaged fuel injection pump		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Mustang 5.2L	GO to Pinpoint Test DD .		
All others	GO to Pinpoint Test HP .		

P008A - Low Pressure Fuel System Pressure - Too Low

Description:	This DTC sets when the low pressure fuel system pressure falls below an expected threshold.		
Possible Causes:	• Low or no fuel • Low fuel pressure • Damaged fuel pressure sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HC .		

P008B - Low Pressure Fuel System Pressure - Too High

Description:	This DTC sets when the low pressure fuel system pressure rises above an expected threshold.		
Possible Causes:	• High fuel pressure • Damaged fuel pressure sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HC .		

P0096 - Intake Air Temperature Sensor 2 Circuit Range/Performance (Bank 1)

Description:	This DTC sets when the intake air temperature 2 (IAT2) sensor value does not correlate with the charge air cooler temperature (CACT) sensor value or the intake air temperature (IAT) sensor value at ignition ON after a calibrated soak period (typically 6 to 8 hours). This DTC also sets if the IAT2 sensor value exceeds the maximum calibrated temperature threshold while driving.		
Possible Causes:	• Slow responding IAT2 sensor • Damaged IAT2 sensor		
Diagnostic Aids:	Aftermarket heaters that are attached to the engine, transmission or battery may cause DTC P0096 to set in cold weather climates after a 6 hour soak period. 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 DN .		

P0097 - Intake Air Temperature Sensor 2 Circuit Low (Bank 1)

Description:	This DTC sets when the intake air temperature 2 (IAT2) sensor signal is less than the self-test minimum. The IAT2 sensor minimum is 0.2 volt.		
Possible Causes:	• IAT2 circuit short to ground • Incorrect harness connection • Damaged IAT2 sensor		
Diagnostic Aids:	Monitor the IAT2 sensor PID value. A typical IAT2 sensor temperature should be greater than the IAT sensor temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DN .		

P0098 - Intake Air Temperature Sensor 2 Circuit High (Bank 1)

Description:	This DTC sets when the intake air temperature 2 (IAT2) sensor signal is greater than the self-test maximum. The IAT2 sensor maximum is 4.6 volts.		
Possible Causes:	• IAT2 circuit open • IAT2 circuit short to voltage • Incorrect harness connection • Damaged IAT2 sensor		
Diagnostic Aids:	Monitor the IAT2 sensor PID value. A typical IAT2 sensor temperature should be greater than the IAT sensor temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DN .		

P00AB - Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 2)

Description:	This DTC sets when DTC P0111 is not present and the intake air temperature bank 2, sensor 1 (IAT21) value does not correlate with the intake air temperature bank 1, sensor 1 (IAT11) value at ignition ON after a calibrated soak period (typically 6 to 8 hours). The intake air temperature 2 (IAT2) and charge air cooler temperature (CACT) value is used for the rationality test. This DTC also sets if the IAT21 sensor value exceeds the maximum calibrated temperature threshold while driving at a low load and a speed greater than 56 kmH (35 MPH).		
Possible Causes:	• Slow responding IAT21 sensor • Damaged IAT21 sensor • Damaged harness or connector		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

P00AC - Intake Air Temperature Sensor 1 Circuit Low (Bank 2)

Description:	This DTC sets when the intake air temperature bank 2, sensor 1 (IAT21) sensor signal is less than the self-test minimum.		
Possible Causes:	• IAT21 circuit short to ground • Damaged IAT21 sensor • Incorrect harness connection		
Diagnostic Aids:	An IAT21 sensor PID 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 DA .		

P00AD - Intake Air Temperature Sensor 1 Circuit High (Bank 2)

Description:	This DTC sets when the intake air temperature bank 2, sensor 1 (IAT21) sensor signal is greater than the self-test maximum.		
Possible Causes:	• IAT21 circuit open • IAT21 circuit short to voltage • Damaged IAT21 sensor • Incorrect harness connection		
Diagnostic Aids:	An IAT21 sensor PID reading greater than self-test maximum with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

P00BA - Low Fuel Pressure - Forced Limited Power

Description:	This DTC sets when the fuel delivery volume is less than the requested fuel delivery volume and the PCM has reduced engine power as a result.		
Possible Causes:	• Restricted fuel filter • Restricted fuel supply line • Damaged or worn fuel pump • Fuel sloshing at low fuel level • Sudden acceleration • Vehicle driven on hilly or steep inclines		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HC .		

P00BB - Fuel Injector Insufficient Flow - Forced Limited Power

Description:	This DTC sets when the requested fuel delivery volume is greater than the fuel injectors maximum delivery volume.		
Possible Causes:	• High ethanol content in the fuel tank • Customer driving habits • Restricted fuel filter • Restricted fuel supply line • Damaged or worn fuel pump		
Diagnostic Aids:	A high fuel ethanol content combined with pulling or carrying a heavy load up a steep grade could set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HC .		

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

Description:	This DTC sets when the MAF21 value is within the expected range for the current operating conditions, and the MAF11 value is less than the MAF21 value.		
Possible Causes:	• Bank 1 intake air system leak after the air filter • Damaged MAF11 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

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

Description:	This DTC sets when the MAF21 value is within the expected range for the current operating conditions, and the MAF11 value is greater than the MAF21 value.		
Possible Causes:	• Damaged MAF11 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P00BE - Mass Or Volume Air Flow B Circuit Range/Performance - Air Flow Too Low

Description:	This DTC sets when the MAF11 value is within the expected range for the current operating conditions, and the MAF21 value is less than the MAF11 value.		
Possible Causes:	• Bank 2 intake air system leak after the air filter • Damaged MAF21 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P00BF - Mass Or Volume Air Flow B Circuit Range/Performance - Air Flow Too High

Description:	This DTC sets when the MAF11 value is within the expected range for the current operating conditions, and the MAF21 value is greater than the MAF11 value.		

Possible Causes:	Damaged MAF21 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P00C1 - Turbocharger/Supercharger Bypass Valve B Control Circuit Low

Description:	This DTC sets when there is a short to ground in the TCBY2 circuit.		
Possible Causes:	- Damaged turbocharger bypass 2 (TCBY2) valve - TCBY2 circuit short to ground - 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. This DTC only sets when the valve is commanded closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P00C2 - Turbocharger/Supercharger Bypass Valve B Control Circuit High

Description:	This DTC sets when there is an open circuit or high voltage in the TCBY2 circuit.		
Possible Causes:	- Damaged turbocharger bypass 2 (TCBY2) valve - TCBY2 circuit open - TCBY2 circuit short to voltage		
Diagnostic Aids:	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. This DTC only sets when the valve is commanded open.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P00C6 - Fuel Rail Pressure Too Low - Engine Cranking (Bank 1)

Description:	The high pressure fuel system must reach a minimum pressure threshold before the engine can be started. This DTC sets if the high pressure fuel system cannot achieve this threshold within certain time and crankshaft rotation limits; the PCM attempts to start the engine at fuel pump assembly pressure.		
Possible Causes:	- Fuel filter restricted or dirty - Fuel supply line restricted - Damaged fuel pump module		

	Damaged fuel injection pump		
Diagnostic Aids:	Diagnose any fuel rail pressure (FRP) and FVR circuit DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HP .		

P00CE - Intake Air Temperature Measurement System - Multiple Sensor Correlation (Bank 1)

Description:	This DTC sets when the charge air cooler temperature (CACT), intake air temperature (IAT) and the intake air temperature 2 (IAT2) PIDs are each greater than 16.67°C (30°F) different from each other at start up or that each sensor is out of the calibrated range at engine start up after a soak period of at least 6 hours when a block heater is not used.		
Possible Causes:	- Damaged CACT, IAT or IAT2 sensors - Contaminated or restricted CACT, IAT or IAT2 sensors - Slow responding CACT, IAT or IAT2 sensors		
Diagnostic Aids:	Compare all sensor readings to the ambient temperature to determine which sensor is reading correctly. 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 DN .		

P00D2 - HO2S Heater Control Circuit Range/Performance (Bank 1 Sensor 2)

Description:	This DTC sets when the internal impedance of the heated oxygen sensor bank 1, sensor 2 (HO2S12) exceeds the calibrated threshold.		
Possible Causes:	- Incorrect connections - Damaged or corroded pins - Damaged HO2S12 heater		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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 .		

P00E2 - Charge Air Cooler Coolant Temperature Sensor A Intermittent/Erratic

Description:	This DTC sets when the charge air cooler (CAC) coolant temperature sensor signal changes from an in range value to beyond the minimum or maximum calibrated limit a calibrated number of times.		
Possible Causes:	• CACCTS circuit intermittent open • CACCTS circuit intermittent short to ground • CACCTS circuit intermittent short to voltage • Damaged CAC coolant temperature sensor • Damaged CAC coolant temperature sensor wiring		
Diagnostic Aids:	Check the harness and connection. Monitor the sensor PID while wiggling and bending the harness from the sensor to the PCM.		

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

P00FE - EVAP System Tank Vapor Line Restricted/Blocked

Description:	The PCM monitors the evaporative emission (EVAP) system for a restricted fuel vapor tube between the fuel tank pressure (FTP) sensor and the fuel tank. During the initial phase of the EVAP monitor, the PCM closes the canister vent and a vacuum develops in the fuel vapor tubes and lines and in the fuel tank. The PCM monitors the FTP sensor to determine the amount of vacuum and how quickly the vacuum increases. The rate at which the vacuum increases is compared to an expected value. If the vacuum increases quicker than expected, a restricted fuel vapor tube is suspected and an intrusive test is carried out in the final phase of the EVAP monitor. This DTC sets when the intrusive test confirms a restriction and the counter is incremented and the counter reaches a calibrated number of completions.		
Possible Causes:	- Restricted fuel vapor tube between the FTP sensor and the fuel tank - EVAP purge valve stuck partially open		
Diagnostic Aids:	Check the fuel vapor tube for a restriction between the FTP sensor and the fuel tank.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

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 0.5 seconds.		
Possible Causes:	- Damaged MAF sensor element - Intake air system components incorrectly connected		
Diagnostic Aids:	Install a new mass airflow/intake air temperature (MAF/IAT) sensor. 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.		

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

Description:	This DTC sets when the actual airflow is less or greater than the modeled airflow by greater than a calibrated value for 2.4 seconds.		
Possible Causes:	- Restricted airflow - Intake air system leak - Damaged mass airflow (MAF) 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 DC .		

P0102 - Mass Or Volume Air Flow Sensor A Circuit Low

Description:	This DTC sets when during key ON, engine running (KOER), the mass airflow (MAF) sensor output changes below a minimum calibrated limit for greater than a set period of time.		
Possible Causes:	• MAF circuit short to ground • Damaged MAF sensor		
Diagnostic Aids:	Make sure the MAF sensor connector is locked and seated correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P0103 - Mass Or Volume Air Flow Sensor A Circuit High

Description:	This DTC sets when the mass airflow (MAF) sensor output changes above a maximum calibrated limit while the engine is running.		
Possible Causes:	• MAF circuit open • MAF circuit short to voltage • Damaged MAF sensor		
Diagnostic Aids:	Make sure the MAF sensor connector is locked and seated correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P0104 - Mass Or Volume Air Flow Sensor A Circuit Intermittent

Description:	This DTC sets when a concern exists in the MAF circuit, or the air tube containing the mass airflow (MAF) sensor, causing an incorrect sensor output reading.		
Possible Causes:	• MAF circuit intermittent open • MAF circuit intermittent short to voltage		
Diagnostic Aids:	Check the MAF sensor tube for air leaks.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

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

For Vehicles With 2.7L, 3.0L, And 3.5L GTDI Engines			
Description:	This DTC sets when the MAP PID does not correlate with the BARO or the TCBP PID.		
Possible Causes:	• Slow responding manifold absolute pressure (MAP) sensor • Damaged MAP sensor		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Check for other DTCs and diagnose those first.		
For All Others			
Description:	This DTC sets when the manifold absolute pressure (MAP) sensor input does not correlate with an inferred MAP value. The inferred value is based on the mass airflow (MAF) sensor (if equipped).		
Possible Causes:	• Slow responding MAP sensor • Damaged MAP sensor • Damaged MAF sensor (if equipped)		
Diagnostic Aids:	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 DM .		

P0107 - Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Low

Description:	This DTC sets when the manifold absolute pressure (MAP) sensor operating voltage is below the minimum calibrated parameter of 0.024 volt.		
Possible Causes:	• MAP circuit short to ground • VREF circuit open • VREF circuit short to ground • Damaged MAP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P0108 - Manifold Absolute Pressure/Barometric Pressure Sensor Circuit High

Description:	This DTC sets when the manifold absolute pressure (MAP) sensor operating voltage is greater than the maximum allowable calibrated parameter of 4.96 volts.		
Possible Causes:	• VREF circuit short to voltage • MAP circuit open • MAP circuit short to voltage		

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

P0109 - Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Intermittent

Description:	This DTC sets when the manifold absolute pressure (MAP) sensor signal is intermittent.		
Possible Causes:	• MAP circuit intermittent open • MAP circuit intermittent short to voltage • MAP circuit intermittent short to ground • Damaged MAP sensor • Incorrect harness connections		
Diagnostic Aids:	Check the harness and connection.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P010A - Mass Or Volume Air Flow Sensor B Circuit

Description:	This DTC sets when the mass airflow bank 2, sensor 1 (MAF21) frequency changes below a minimum calibrated limit for greater than 0.5 seconds.		
Possible Causes:	• Damaged MAF21 sensor element • Intake air system components incorrectly connected		
Diagnostic Aids:	Install a new mass airflow bank 2, sensor 1/intake air temperature bank 2, sensor 1 (MAF21/IAT21). 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.		

P010C - Mass Or Volume Air Flow Sensor B Circuit Low

Description:	This DTC sets when during key ON, engine running (KOER), the mass airflow bank 2, sensor 1 (MAF21) output changes below a minimum calibrated limit for greater than a set period of time.		
Possible Causes:	• MAF21 circuit short to ground • Damaged MAF21 sensor		
Diagnostic Aids:	Make sure the mass airflow bank 2, sensor 1/intake air temperature bank 2, sensor 1 (MAF21/IAT21) connector is locked and seated correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P010D - Mass Or Volume Air Flow Sensor B Circuit High

Description:	This DTC sets when the mass airflow bank 2, sensor 1/intake air temperature bank 2, sensor 1 (MAF21/IAT21) output changes above a maximum calibrated limit while the engine is running.		
Possible Causes:	• MAF21 circuit open • MAF21 circuit short to voltage • Damaged MAF sensor		
Diagnostic Aids:	Make sure the mass airflow bank 2, sensor 1/intake air temperature bank 2, sensor 1 (MAF21/IAT21) connector is locked and seated correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P010E - Mass Or Volume Air Flow Sensor B Circuit Intermittent/Erratic

Description:	This DTC sets when a concern exists in the MAF21 circuit, or the air tube containing the mass airflow bank 2, sensor 1 (MAF21), causing an incorrect sensor output reading.		
Possible Causes:	• MAF21 circuit intermittent open • MAF21 circuit intermittent short to voltage		
Diagnostic Aids:	Check the mass airflow bank 2, sensor 1/intake air temperature bank 2, sensor 1 (MAF21/IAT21) tube for air leaks.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P010F - Mass Or Volume Air Flow Sensor A/B Correlation

Description:	This DTC sets when the MAF11 value combined with the MAF21 value is within an expected range for the current operating conditions, and the MAF11 value is greater than or less than the MAF21 value.		
Possible Causes:	• Intake air system restriction • Air filter restriction • Damaged MAF11 sensor • Damaged MAF21 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

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

For GTDI			
Description:	This DTC sets when the intake air temperature (IAT) sensor value does not correlate with the charge air cooler temperature (CACT) sensor value or the intake air temperature 2 (IAT2) sensor value at ignition ON after a calibrated soak period (typically 6 to 8 hours). If the IAT2 sensor is not present, the engine coolant temperature (ECT) sensor value or the cylinder head temperature (CHT) sensor value is used for the rationality test. This DTC also sets if the IAT sensor value exceeds the maximum calibrated temperature threshold while driving.		
Possible Causes:	• Slow responding IAT sensor • Damaged IAT sensor		
Diagnostic Aids:	The IAT sensor is located on the air filter housing.		
For All Others			
Description:	This DTC sets when the intake air temperature (IAT) sensor value does not correlate with the engine coolant temperature (ECT) sensor value or the cylinder head temperature (CHT) sensor value at ignition ON after a calibrated soak period (typically 6 to 8 hours). This DTC also sets if the IAT sensor value exceeds the maximum calibrated temperature threshold while driving.		
Possible Causes:	• Damaged 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
All	GO to Pinpoint Test DA .		

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

Description:	This DTC sets when the intake air temperature (IAT) sensor signal is less than the self-test minimum.		
Possible Causes:	• IAT circuit short to ground • Damaged IAT sensor • Incorrect harness connection		
Diagnostic Aids:	An IAT sensor PID 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 DA .		

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

Description:	This DTC sets when the intake air temperature (IAT) sensor signal is greater than the self-test maximum.		
Possible	• IAT circuit open		

Causes:	• IAT circuit short to voltage • Damaged IAT sensor • Incorrect harness connection		
Diagnostic Aids:	An IAT sensor PID reading greater than self-test maximum with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

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

Description:	This DTC sets when the intake air temperature (IAT) sensor signal was intermittent during the comprehensive component monitor (CCM).		
Possible Causes:	• IAT circuit intermittent open • IAT circuit intermittent short to voltage • IAT circuit intermittent short to ground • Damaged IAT sensor • Damaged harness connector • Damaged harness		
Diagnostic Aids:	Monitor the IAT sensor value on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

P0116 - Engine Coolant Temperature 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:	• Engine coolant temperature (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
Continental 2.0L,	GO to Pinpoint Test DX .		

Continental
2.7L,
Continental
3.0L,
Corsair,
EcoSport
1.0L,
EcoSport
1.5L,
EcoSport
2.0L,
Edge,
Escape/Kuga,
Explorer,
Fusion 1.5L,
Fusion 2.0L,
Fusion 2.7L,
KA,
MKZ,
Mustang
2.3L,
Nautilus,
Ranger,
Transit
Connect

All others

GO to Pinpoint Test [DL](#).

P0117 - Engine Coolant Temperature Sensor 1 Circuit Low

Description:	This DTC sets when the engine coolant temperature (ECT) sensor signal is less than the self-test minimum. The ECT sensor signal minimum is 121°C (250°F).		
Possible Causes:	- ECT circuit short to ground - Damaged ECT sensor - Incorrect harness connection		
Diagnostic Aids:	A concern is present if the ECT (TEMP) PID reading is greater than 121° C (250° F) with the ignition ON engine OFF or during any engine operating mode.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DX .		

P0118 - Engine Coolant Temperature Sensor 1 Circuit High

Description:	This DTC sets when the engine coolant temperature (ECT) sensor signal is greater than the self-test maximum. The ECT sensor signal maximum is -50° C (-58° F).		
Possible Causes:	ECT circuit open		

	- ECT circuit short to voltage - Incorrect harness connection - Damaged ECT sensor		
Diagnostic Aids:	A concern is present if the ECT (TEMP) PID reading is less than -50° C (-58° F) with the ignition ON engine OFF or during any engine operating mode.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DX .		

P0119 - Engine Coolant Temperature Sensor 1 Circuit Intermittent/Erratic

Description:	This DTC sets when the ECT circuit is intermittently open or shorted while the engine is running.		
Possible Causes:	- Damaged engine coolant temperature (ECT) sensor harness - Damaged ECT harness connector - Low engine coolant - Damaged ECT sensor		
Diagnostic Aids:	Monitor the engine coolant temperature or the cylinder head temperature on a scan tool, look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Continental 2.0L, Continental 2.7L, Continental 3.0L, Corsair, EcoSport 1.0L, EcoSport 1.5L, EcoSport 2.0L, Edge, Escape/Kuga, Explorer, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, KA, MKZ, Mustang 2.3L, Nautilus, Ranger, Transit Connect	GO to Pinpoint Test DX .		
All others	GO to Pinpoint Test DL .		

P011E - Engine Coolant Temperature 1 / Ambient Air Temperature Correlation

Description:	This DTC sets when the engine coolant temperature (ECT) and ambient air temperature (AAT) sensor readings differ by greater than a calibrated value.		
Possible Causes:	• Biased ECT or AAT sensor • Damaged ECT or AAT sensor • Damaged intake air temperature (IAT) sensor		
Diagnostic Aids:	Make sure the ECT, AAT and IAT sensor readings are within 18°C (32.4°F) of each other after 6 to 8 hours at a stabilized ambient temperature and the vehicle has not been in direct sunlight.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DX .		

P0120 - Throttle / Pedal Position Sensor / Switch A Circuit

Description:	This DTC sets when there is a concern with the electronic throttle control (ETC) throttle position signal.		
Possible Causes:	• Damaged TP sensor		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

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

Description:	This DTC sets when the PCM indicates the electronic throttle control (ETC) throttle position (TP) sensor 1 circuit is out of range in either the closed or wide open throttle (WOT) modes.		
Possible Causes:	• Obstruction in the throttle plate movement • TP circuit open • Self-test operator error (foot resting on the accelerator pedal during test) • Damaged TP sensor • Damaged throttle body		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P0122 - Throttle/Pedal Position Sensor/Switch A Circuit Low

Description:	This DTC sets when the electronic throttle control (ETC) TP1 signal is too low.		
Possible Causes:	• TP1 circuit open • TP1 circuit short to ground • Damaged TP1 sensor		
Diagnostic Aids:	This concern exhibits a symptom of limited power. A TP1 PID reading less than 0.25 volt in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P0123 - Throttle/Pedal Position Sensor/Switch A Circuit High

Description:	This DTC sets when the electronic throttle control (ETC) TP1 signal is too high.		
Possible Causes:	• TP1 circuit short to voltage • TP1 circuit short to VREF • ETCRTN circuit open • Damaged TP1 sensor		
Diagnostic Aids:	This concern exhibits a symptom of limited power. A TP1 PID reading greater than 4.75 volts in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P0124 - Throttle/Pedal Position Sensor/Switch A Intermittent

Description:	This DTC sets when the TP circuit is intermittently open or shorted.		
Possible Causes:	• TP circuit intermittent open • TP circuit intermittent short to ground • Damaged TP harness • Damaged TP harness connector • Damaged TP sensor		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P0125 - Insufficient Coolant Temp For Closed Loop Fuel Control

Description:	This DTC sets when the engine coolant temperature (ECT) or the cylinder head temperature (CHT) sensor has not achieved the required temperature level to enter closed loop operating conditions within a specified amount of time after starting the engine.		
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Possible Causes:	• Insufficient warm up time • Low engine coolant level • Leaking or stuck open thermostat • Damaged ECT sensor • Damaged CHT sensor		
Diagnostic Aids:	Compare the thermostat specification to the actual engine coolant temperature using the engine temperature PID (ECT or CHT). The temperature reading should be similar when the engine is at a normal operating temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Continental 2.0L, Continental 2.7L, Continental 3.0L, Corsair, EcoSport 1.0L, EcoSport 1.5L, EcoSport 2.0L, Edge, Escape/Kuga, Explorer, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, KA, MKZ, Mustang 2.3L, Nautilus, Ranger, Transit Connect	GO to Pinpoint Test DX .		
All others	GO to Pinpoint Test DL .		

P0127 - Intake Air Temperature (IAT) Too High

Description:	This DTC sets when the intake air temperature 2 (IAT2) sensor has detected a concern in the charge air cooler (CAC) system.		
Possible Causes:	• Low fluid level • Fluid leakage • CAC pump or relay failure		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test KP .
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P0128 - Coolant Thermostat (Coolant Temp 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.		
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
Continental 2.0L, Continental 2.7L, Continental 3.0L, Corsair, EcoSport 1.0L, EcoSport 1.5L, EcoSport 2.0L, Edge, Escape/Kuga, Explorer, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, KA, MKZ, Mustang 2.3L, Nautilus, Ranger, Transit Connect	GO to Pinpoint Test DX .		
All others	GO to Pinpoint Test DL .		

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

Description:	This DTC sets when the TCIP PID does not correlate within the calibrated threshold of the average of the BARO, the TCBP or the MAP PID.		
Possible Causes:	• Slow responding turbocharger inlet pressure and temperature (TCIPT) sensor • Damaged TCIPT sensor		
Diagnostic Aids:	Check the air filter element and housing for contamination, restriction or water intrusion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P012C - Turbocharger/Supercharger Inlet Pressure A Sensor Circuit Low

Description:	This DTC sets when the turbocharger inlet pressure (TCIP) value is less than the minimum calibrated threshold.		
Possible Causes:	• TCIP circuit open • TCIP circuit short to ground • VREF circuit open • VREF circuit short to ground • Damaged turbocharger inlet pressure and temperature (TCIPT) sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P012D - Turbocharger/Supercharger Inlet Pressure Sensor A Circuit High

Description:	This DTC sets when the turbocharger inlet pressure (TCIP) value is greater than the maximum calibrated threshold.		
Possible Causes:	• TCIP circuit open • TCIP circuit short to voltage • VREF circuit short to voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

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

Description:	This DTC sets when the manifold absolute pressure (MAP) sensor signal is intermittent.		
Possible Causes:			

		• MAP circuit intermittent open • MAP circuit intermittent short to voltage • MAP circuit intermittent short to ground • Damaged MAP sensor	
Diagnostic Aids:	Check the harness and connection.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P0130 - O2 Sensor Circuit (Bank 1 Sensor 1)

Description:	This DTC sets when a concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2S11 circuit open (if equipped) • UO2S11 circuit short to ground (if equipped) • UO2S11 circuit short to voltage (if equipped) • UO2SGREF11 circuit open (if equipped) • UO2SGREF11 circuit short to ground (if equipped) • UO2SGREF11 circuit short to voltage (if equipped) • UO2SPC11 circuit short to ground (if equipped) • UO2SPC11 circuit short to voltage (if equipped) • UO2SPCT11 circuit short to ground (if equipped) • UO2SPCT11 circuit short to voltage (if equipped) • HO2S11 circuit open (if equipped) • HO2S11 circuit short to ground (if equipped) • HO2S11 circuit short to voltage (if equipped) • Incorrect connections • Damaged or corroded pins • Exhaust temperature significantly higher than expected • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11) (if equipped) • Damaged HO2S11 (if equipped)		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport 1.5L, KA	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test DZ .		

P0131 - O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1)

Description:	This DTC sets when a concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2S11 circuit short to ground (if equipped) • UO2SGREF11 circuit short to ground (if equipped) • UO2SPC11 circuit short to ground (if equipped) • UO2SPCT11 circuit short to ground (if equipped) • HO2S11 circuit short to ground (if equipped) • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11) (if equipped)		

		Damaged HO2S11 (if equipped)	
Diagnostic Aids:	An engine stall condition or an extremely rich air to fuel ratio may set this DTC. Diagnose any engine stall or rich air to fuel ratio concerns before diagnosing this DTC. Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport 1.5L, KA	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test DZ .		

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

Description:	This DTC sets when an over voltage concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	- UO2S11 circuit short to voltage (if equipped) - UO2SGREF11 circuit short to voltage (if equipped) - UO2SPC11 circuit short to voltage (if equipped) - UO2SPCT11 circuit short to voltage (if equipped) - HO2S11 circuit short to voltage (if equipped)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport 1.5L, KA	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test DZ .		

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

Description:	The PCM monitors oxygen sensor response time by commanding a calibrated fuel control routine. This routine sets the air fuel ratio to a calibrated limit to produce a predictable oxygen sensor signal amplitude. This DTC sets when the oxygen sensor signal does not reach the predicted amplitude within a predetermined response time.		
Possible Causes:	- Exhaust leaks - Incorrect fueling - Mass airflow (MAF) sensor (if equipped) - Intake air leaks - Contaminated universal heated oxygen sensor bank 1, sensor 1 (HO2S11) (if equipped) - Contaminated HO2S11 (if equipped) - Deteriorating universal HO2S11 (if equipped) - Deteriorating HO2S11 (if equipped)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

EcoSport 1.5L, KA	GO to Pinpoint Test DW .
All others	GO to Pinpoint Test DZ .

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

Description:	If the sensor signal value is not changing from the default value, the PCM commands an oscillating air to fuel ratio attempting to detect some movement in the signal value. This DTC sets when the PCM is unable to detect movement in the sensor signal while the air to fuel ratio is oscillating.		
Possible Causes:	• UO2SPC11 circuit open (if equipped) • HO2S11 circuit open (if equipped) • Deteriorating universal heated oxygen sensor bank 1, sensor 1 (HO2S11) (if equipped) • Deteriorating HO2S11 (if equipped)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport 1.5L, KA	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test DZ .		

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

Description:	This DTC sets when an open or short circuit is detected or the heater current draw exceeds a calibrated limit.		
Possible Causes:	• UO2SHTR11 circuit open (if equipped) • UO2SHTR11 circuit short to voltage (if equipped) • HTR11 circuit open (if equipped) • HTR11 circuit short to voltage (if equipped) • VPWR circuit open • Low battery voltage • Water in the harness connector • Corrosion • Incorrect connections • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11) heater (if equipped) • Damaged HO2S11 heater (if equipped)		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport 1.5L, KA	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test DZ .		

P0136 - O2 Sensor Circuit (Bank 1 Sensor 2)

Description:	This DTC sets when a concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• HO2S12 circuit open • SIGRTN circuit open • Incorrect connections • Damaged or corroded pins • Exhaust temperature significantly higher than expected • Damaged heated oxygen sensor bank 1, sensor 2 (HO2S12)		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0137 - O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2)

Description:	This DTC sets when a concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• HO2S12 circuit open • HO2S12 circuit short to ground • Damaged heated oxygen sensor bank 1, sensor 2 (HO2S12)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	This DTC sets when an over voltage condition is present on the HO2S12 circuit.		
Possible Causes:	• HO2S12 circuit short to voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	The heated oxygen sensor (HO2S) monitor tracks the rate of voltage change during the rise and fall of the heated oxygen sensor bank 1, sensor 2 (HO2S12) signal. When the rate of voltage change is less than a calibrated value, the PCM begins to modify the fuel trim attempting to increase the HO2S voltage switch rate. This DTC sets when the PCM is at the allowable limit or has exceeded an allowable length of time for fuel trim modification, without detecting an acceptable rate of voltage change.		
Possible Causes:	- Exhaust leaks - Aftermarket accessories - Performance modifications - Contaminated HO2S12 - Deteriorating HO2S12 - Damaged HO2S12		
Diagnostic Aids:	Access the HO2S test results from the Generic OBD II menu to verify the DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	The heated oxygen sensor monitor measures the response rate of the rear heated oxygen sensor (HO2S) to a rich to lean transition. This DTC sets when the measured response rate is slower than the threshold value.		
Possible Causes:	Exhaust leaks before or near the HO2S12		
Diagnostic Aids:	This monitor is highly sensitive to exhaust leaks near the rear HO2S. Check for leaks in the exhaust system.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P013B - O2 Sensor Slow Response - Lean To Rich (Bank 1 Sensor 2)

Description:	During a deceleration fuel shut-off (DFSO) event, the PCM monitors how quickly the heated oxygen sensor bank 1, sensor 2 (HO2S12) switches from lean to rich. The measured rate of the lean to rich switch is compared to a calibrated fault threshold value. The measured rate of the lean to rich switch is compared to a calibrated fault threshold value. This DTC sets when the measured value is slower than the threshold value.		
Possible Causes:	- Exhaust leaks before or near the HO2S12 - Damaged HO2S12		
Diagnostic Aids:	Check for leaks in the exhaust system.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	The heated oxygen sensor monitor measures the response rate of the rear heated oxygen sensor (HO2S) to a rich to lean transition. This DTC sets when the measured response rate is slower than the threshold value.		
Possible Causes:	Exhaust leaks before or near the HO2S22		
Diagnostic Aids:	This monitor is highly sensitive to exhaust leaks near the rear HO2S. Check for leaks in the exhaust system.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P013E - O2 Sensor Delayed Response - Rich To Lean (Bank 1 Sensor 2)

Description:	During a deceleration fuel shut-off (DFSO) event, the PCM monitors the heated oxygen sensor bank 1, sensor 2 (HO2S12) signal to determine if the signal is stuck in range. The PCM expects the signal to exceed a calibrated rich or lean value within a calibrated amount of time. If the signal voltage remains less than the rich value after a number of occurrences, the PCM intrusively controls the fuel system rich over increasing time periods in an attempt to force the signal to greater than the calibrated rich value. This DTC sets when, after three consecutive intrusive attempts, the signal cannot be forced greater than the calibrated rich value. Also, if the signal voltage remains greater than the lean value after a calibrated amount of time with the fuel injectors off, a counter is incremented. This DTC sets when after three consecutive occurrences the signal is not less than the calibrated lean value.		
Possible Causes:	- Exhaust leaks before or near the HO2S12 - Aftermarket exhaust accessories or performance modifications - Ethanol content in the fuel - HO2S12 circuit intermittent - Damaged HO2S12		
Diagnostic Aids:	Check for leaks in the exhaust system. Check for an intermittent HO2S12 signal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	If the sensor signal value is not changing from the default value, the PCM commands an oscillating air to fuel ratio attempting to detect some movement in the signal value. This DTC sets when the PCM is unable to detect movement in the sensor signal while the air to fuel ratio is oscillating.		
Possible Causes:	- HO2S12 circuit open - Damaged heated oxygen sensor bank 1, sensor 2 (HO2S12)		
Diagnostic Aids:	An O2S12 PID switching across 0.45 volt from 0.2 to 0.9 volts indicates a normal switching HO2S.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	This DTC sets when an open or short circuit is detected or the heated oxygen sensor bank 1, sensor 2 (HO2S12) heater current draw exceeds a calibrated limit.		
Possible Causes:	• HTR12 circuit open • HTR12 circuit short to voltage • VPWR circuit open • GND circuit open • Low battery voltage • Water in the harness connector • Corrosion • Incorrect connections • Damaged HO2S12 heater		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0148 - Fuel Delivery Error

Description:	At least one bank is lean at wide open throttle (WOT).		
Possible Causes:	• Severely restricted fuel filter • Severely restricted fuel supply line • Damaged or worn fuel pump • Damaged or contaminated mass airflow (MAF) sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HC .		

P014A - O2 Sensor Delayed Response - Rich To Lean (Bank 2 Sensor 2)

Description:	During a deceleration fuel shut-off (DFSO) event, the PCM monitors the heated oxygen sensor bank 2, sensor 2 (HO2S22) signal to determine if the signal is stuck in range. The PCM expects the signal to exceed a calibrated rich or lean value within a calibrated amount of time. If the signal voltage remains less than the rich value after a number of occurrences, the PCM intrusively controls the fuel system rich over increasing time periods in an attempt to force the signal to greater than the calibrated rich value. This DTC sets when, after three consecutive intrusive attempts, the signal cannot be forced greater than the calibrated rich value. Also, if the signal voltage remains greater than the lean value after a calibrated amount of time with the fuel injectors off, a counter is incremented. This DTC sets when after three consecutive occurrences the signal is not less than the calibrated lean value.
Possible Causes:	• Exhaust leaks before or near the HO2S

	• Aftermarket exhaust accessories or performance modifications • Ethanol content in the fuel • HO2S22 circuit intermittent • Damaged HO2S22			
Diagnostic Aids:	Check for leaks in the exhaust system. Check for an intermittent HO2S22 signal.			
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 DW .			

P0150 - O2 Sensor Circuit (Bank 2 Sensor 1)

Description:	This DTC sets when a concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2S21 circuit open • UO2S21 circuit short to ground • UO2S21 circuit short to voltage • UO2SGREF21 circuit open • UO2SGREF21 circuit short to ground • UO2SGREF21 circuit short to voltage • UO2SPC21 circuit short to ground • UO2SPC21 circuit short to voltage • UO2SPCT21 circuit short to ground • UO2SPCT21 circuit short to voltage • Incorrect connections • Damaged or corroded pins • Exhaust temperature significantly higher than expected • Damaged universal heated oxygen sensor bank 2, sensor 1 (HO2S21) heater		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P0151 - O2 Sensor Circuit Low Voltage (Bank 2 Sensor 1)

Description:	This DTC sets when a concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2S21 circuit short to ground • UO2SGREF21 circuit short to ground • UO2SPC21 circuit short to ground • UO2SPCT21 circuit short to ground • Damaged universal heated oxygen sensor bank 2, sensor 1 (HO2S21)		
Diagnostic Aids:	An engine stall condition or an extremely rich air to fuel ratio may set this DTC. Diagnose any engine stall or rich air to fuel ratio concerns before diagnosing this DTC. Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test DZ .
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P0152 - O2 Sensor Circuit High Voltage (Bank 2 Sensor 1)

Description:	This DTC sets when an over voltage concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2S21 circuit short to voltage • UO2SGREF21 circuit short to voltage • UO2SPC21 circuit short to voltage • UO2SPCT21 circuit short to voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

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

Description:	The PCM monitors the universal heated oxygen sensor bank 2, sensor 1 (HO2S21) response time by commanding a calibrated fuel control routine. This routine sets the air to fuel ratio to a calibrated limit to produce a predictable oxygen sensor signal amplitude. This DTC sets when the oxygen sensor signal does not reach the predicted amplitude within a predetermined response time.		
Possible Causes:	• Exhaust leaks • Incorrect fueling • Intake air system leaks • Mass airflow (MAF) sensor (if equipped) • Contaminated universal HO2S21 • Deteriorating universal HO2S21		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

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

Description:	If the sensor signal value is not changing from the default value, the PCM commands an oscillating air to fuel ratio attempting to detect some movement in the signal value. This DTC sets when the PCM is unable to detect movement in the sensor signal while the air to fuel ratio is oscillating.		
Possible Causes:	• UO2SPC21 circuit open • Contaminated universal heated oxygen sensor bank 2, sensor 1 (HO2S21)		
Diagnostic Aids:			

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

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

Description:	This DTC sets when an open or short circuit is detected or the universal heated oxygen sensor bank 2, sensor 1 (HO2S21) heater current draw exceeds a calibrated limit.		
Possible Causes:	• UO2SHTR21 circuit open • UO2SHTR21 circuit short to voltage • VPWR circuit open • Low battery voltage • Water in the harness connector • Corrosion • Incorrect connections • Damaged universal HO2S21 heater		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P0157 - O2 Sensor Circuit Low Voltage (Bank 2 Sensor 2)

Description:	This DTC sets when a concern is detected with one of the circuits used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• HO2S22 circuit open • HO2S22 circuit short to ground • Damaged heated oxygen sensor bank 2, sensor 2 (HO2S22)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	This DTC sets when an over voltage condition is present on the HO2S22 circuit.		
Possible Causes:	• HO2S22 circuit short to voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	The heated oxygen sensor (HO2S) monitor tracks the rate of voltage change during the rise and fall of the heated oxygen sensor bank 2, sensor 2 (HO2S22) signal. When the rate of voltage change is less than a calibrated value, the PCM begins to modify the fuel trim attempting to increase the HO2S voltage switch rate. This DTC sets when the PCM is at the allowable limit or has exceeded an allowable length of time for fuel trim modification, without detecting an acceptable rate of voltage change.		
Possible Causes:	• Exhaust leaks • Aftermarket accessories • Performance modifications • Contaminated HO2S22 • Deteriorating HO2S22 • Damaged HO2S22		
Diagnostic Aids:	Access the HO2S test results from the Generic OBD II menu to verify the DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

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

Description:	This DTC sets when an open or short circuit is detected or the universal heated oxygen sensor bank 2, sensor 2 (HO2S22) heater current draw exceeds a calibrated limit.		
Possible Causes:	• HTR22 circuit open • HTR22 circuit short to voltage • VPWR circuit open • GND circuit open • Low battery voltage • Water in the harness connector • Corrosion • Incorrect connections • Damaged HO2S22 heater		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P016A - Excessive Time To Enter Closed Loop Air/Fuel Ratio Control

Description:	The heated oxygen sensor (HO2S) monitor tracks the rate of voltage change during the rise and fall of the HO2S signal. When the rate of voltage change is less than a calibrated value, the PCM begins to modify the fuel trim attempting to increase the HO2S voltage switch rate. This DTC sets when the PCM is at the allowable limit or has exceeded an allowable length of time for fuel trim modification, without detecting an acceptable rate of voltage change.		
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Possible Causes:	- Exhaust leaks - Aftermarket accessories - Performance modifications - Contaminated or deteriorating HO2S - Damaged HO2S		
Diagnostic Aids:	Access the HO2S test results from the scan tool to verify the DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P0171 - System Too Lean Bank 1

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a rich calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	- Ethanol content in the fuel - Fuel filter restricted or dirty - Damaged or worn fuel pump - Leaking fuel pump check valve - Leaking or contaminated fuel injectors - Low fuel pressure or running out of fuel - EVAP purge valve is leaking when the canister is clean - Fuel supply line restricted - Fuel rail pressure (FRP) sensor bias - Exhaust leaks in the exhaust manifold gasket or mating gaskets before or near the heated oxygen sensor (HO2S) - Air leaks after the mass airflow (MAF) sensor (if equipped) - Vacuum leaks - Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open - Incorrectly seated engine oil level indicator - Intake air turbulence due to incorrect air filter - Contaminated MAF sensor (if equipped) - Damaged MAF sensor (if equipped)		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P0172 - System Too Rich Bank 1

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a lean calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	- Leaking fuel injectors - Fuel return line restricted - Fuel rail pressure (FRP) sensor bias		

	• EVAP purge valve is leaking when the canister is full • Contaminated mass airflow (MAF) sensor (if equipped) • Damaged MAF sensor (if equipped) • Oil contaminated with fuel		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P0174 - System Too Lean Bank 2

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a rich calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.										
Possible Causes:	• Ethanol content in the fuel • Fuel filter restricted or dirty • Damaged or worn fuel pump • Leaking fuel pump check valve • Leaking or contaminated fuel injectors • Low fuel pressure or running out of fuel • EVAP purge valve is leaking when the canister is clean • Fuel supply line restricted • Fuel rail pressure (FRP) sensor bias • Exhaust leaks in the exhaust manifold gasket or mating gaskets before or near the heated oxygen sensor (HO2S) • Air leaks after the mass airflow (MAF) sensor (if equipped) • Vacuum leaks • Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open • Incorrectly seated engine oil level indicator • Intake air turbulence due to incorrect air filter • Contaminated MAF sensor (if equipped) • Damaged MAF sensor (if equipped)										
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.										
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>GO to Pinpoint Test H.</td><td></td><td></td></tr> </table>		Key On Engine Off	Key On Engine Running	Continuous Memory	All	GO to Pinpoint Test H .				
	Key On Engine Off	Key On Engine Running	Continuous Memory								
All	GO to Pinpoint Test H .										

P0175 - System Too Rich Bank 2

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a lean calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	• Leaking fuel injectors • Fuel return line restricted		

	- Fuel rail pressure (FRP) sensor bias - EVAP purge valve is leaking when the canister is full - Contaminated mass airflow (MAF) sensor (if equipped) - Damaged MAF sensor (if equipped) - Oil contaminated with fuel	
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.	
Application	Key On Engine Off	Key On Engine Running
All	GO to Pinpoint Test H .	Continuous Memory

P017C - Cylinder Head Temperature Sensor Circuit Low

Description:	This DTC sets when the CHT circuit is shorted to ground.	
Possible Causes:	- CHT circuit short to ground - Damaged cylinder head temperature (CHT) sensor - Incorrect harness connection	
Diagnostic Aids:	The DTC P0117 may also be reported when this DTC sets. Either of these DTCs illuminates the malfunction indicator lamp (MIL).	
Application	Key On Engine Off	Key On Engine Running
All	GO to Pinpoint Test DL .	Continuous Memory

P017D - Cylinder Head Temperature Sensor Circuit High

Description:	This DTC sets when a CHT circuit concern is detected.	
Possible Causes:	- CHT circuit open - CHT circuit short to voltage - Damaged cylinder head temperature (CHT) sensor - Incorrect harness connection	
Diagnostic Aids:	The DTC P0118 may also be reported when this DTC sets. Either of these DTCs illuminate the malfunction indicator lamp (MIL).	
Application	Key On Engine Off	Key On Engine Running
All	GO to Pinpoint Test DL .	Continuous Memory

P017E - Cylinder Head Temperature Sensor Circuit Intermittent/Erratic

Description:	This DTC sets when the CHT circuit becomes intermittently open or short while the engine is running.	
Possible Causes:	- Damaged cylinder head temperature (CHT) harness or connector - CHT circuit open	

		• CHT circuit short to ground • Low engine coolant • Damaged CHT sensor	
Diagnostic Aids:	Monitor the CHT PID on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P0181 - Fuel Temperature Sensor A Circuit Range/Performance

Description:	This DTC sets when the fuel rail pressure temperature (FRPT) sensor is out of self-test range.		
Possible Causes:	• Engine coolant temperature is less than the self-test threshold • Fuel rail temperature is less than the self-test threshold • Damaged fuel rail pressure temperature (FRPT) sensor		
Diagnostic Aids:	Check for other PCM DTCs. Diagnose all other PCM DTCs before continuing diagnosis. Bring the engine to normal operating temperature. Verify the engine coolant temperature is greater than 77°C (170°F) and the fuel rail temperature is greater than 10°C (50°F). 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.		

P0182 - Fuel Temperature Sensor A Circuit Low

Description:	This DTC sets when the PCM detects the FRT circuit is open or shorted to ground.		
Possible Causes:	• FRT circuit open • FRT circuit short to ground • VREF circuit open • VREF circuit short to ground • Low ambient temperature operation • Incorrect harness connection • Damaged fuel rail pressure temperature (FRPT) sensor		
Diagnostic Aids:	Verify the FRT PID and VREF values to determine an open or short.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P0183 - Fuel Temperature Sensor A Circuit High

Description:	This DTC sets when the PCM detects the FRT circuit is open or shorted to voltage.		
Possible Causes:	• FRT circuit open • FRT circuit short to voltage		

		• Incorrect harness connection • Damaged fuel rail pressure temperature (FRPT) sensor	
Diagnostic Aids:	Verify the FRT PID value to determine an open or short.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P018B - Fuel Pressure Sensor B Circuit Range/Performance

Description:	This DTC sets when the voltage is outside a calibrated limit for a calibrated amount of time during testing.		
Possible Causes:	• FLP signal erratic • Damaged fuel pressure sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P018C - Fuel Pressure Sensor B Circuit Low

Description:	This DTC sets when the PCM detects the FLP circuit is shorted to SIGRTN or ground.		
Possible Causes:	• FLP signal short to SIGRTN or GND • Damaged fuel pressure sensor		
Diagnostic Aids:	An FLP PID value during ignition ON, engine OFF, or ignition ON, engine running, less than 0.3 volt indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P018D - Fuel Pressure Sensor B Circuit High

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

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

Description:	This DTC sets when the PCM detects the FRP circuit is shorted to SIGRTN or ground.		
Possible Causes:	• FRP circuit short to SIGRTN or GND • Damaged FRP sensor		
Diagnostic Aids:	A FRP PID value during ignition ON, engine OFF or ignition ON, engine running less than 0.3 volt indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

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

Description:	This DTC sets when the PCM detects the FRP circuit is open or shorted to voltage.		
Possible Causes:	• FRP signal short to voltage • FRP signal open • Damaged FRP sensor		
Diagnostic Aids:	An FRP signal high condition can be caused by any number of conditions, including a short on FRP signal to VREF, an open FRP signal or signal return. The FRP signal line is pulled up by the PCM and VREF at the sensor, and down by the sensor through SIGRTN.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DD .		

P0201 - Cylinder 1 Injector A Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open (if equipped) • INJ1 circuit open • INJ1 circuit short to ground (direct injection vehicles) • INJ1 circuit short to voltage (direct injection vehicles) • INJ1RTN circuit open (if equipped) • INJ1RTN circuit short to ground (if equipped) • INJ1RTN circuit short to voltage (if equipped) • Damaged fuel injector 1		
Diagnostic Aids:	For direct injection vehicles, the INJ1_F PID flags a concern. For all others, the INJ1_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Aviator, Continental 2.0L,	GO to Pinpoint Test DI .		

Continental
2.7L,
Continental
3.0L,
Corsair 2.0L,
Corsair 2.3L,
EcoSport
1.0L,
EcoSport
2.0L,
Edge,
Escape/Kuga
1.5L,
Escape/Kuga
2.0L,
Expedition,
Explorer,
F-150,
Flex 3.5L
GTDI,
Ford GT,
Fusion 1.5L,
Fusion 2.0L,
Fusion 2.7L,
MKZ,
Mustang
2.3L,
Mustang
5.0L,
Nautilus,
Navigator,
Ranger 2.3L,
Transit,
Transit
Connect
1.0L,
Transit
Connect 2.0L

All others

GO to Pinpoint Test [KG](#).

P0202 - Cylinder 2 Injector A Circuit/Open

Description:

The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.

Possible Causes:

- VPWR circuit open (if equipped)
- INJ2 circuit open
- INJ2 circuit short to ground (direct injection vehicles)
- INJ2 circuit short to voltage (direct injection vehicles)
- INJ2RTN circuit open (if equipped)
- INJ2RTN circuit short to ground (if equipped)

- INJ2RTN circuit short to voltage (if equipped)
- Damaged fuel injector 2

Diagnostic Aids: For direct injection vehicles, the INJ2_F PID flags a concern. For all others, the INJ2_F PID flags equals YES.

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Aviator, Continental 2.0L, Continental 2.7L, Continental 3.0L, Corsair 2.0L, Corsair 2.3L, EcoSport 1.0L, EcoSport 2.0L, Edge, Escape/Kuga 1.5L, Escape/Kuga 2.0L, Expedition, Explorer, F-150, Flex 3.5L GTDI, Ford GT, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, MKZ, Mustang 2.3L, Mustang 5.0L, Nautilus, Navigator, Ranger 2.3L, Transit, Transit Connect 1.0L, Transit Connect 2.0L	GO to Pinpoint Test DI .		
All others	GO to Pinpoint Test KG .		

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open (if equipped) • INJ3 circuit open • INJ3 circuit short to ground (direct injection vehicles) • INJ3 circuit short to voltage (direct injection vehicles) • INJ3RTN circuit open (if equipped) • INJ3RTN circuit short to ground (if equipped) • INJ3RTN circuit short to voltage (if equipped) • Damaged fuel injector 3		
Diagnostic Aids:	For direct injection vehicles, the INJ3_F PID flags a concern. For all others, the INJ3_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Aviator, Continental 2.0L, Continental 2.7L, Continental 3.0L, Corsair 2.0L, Corsair 2.3L, EcoSport 1.0L, EcoSport 2.0L, Edge, Escape/Kuga 1.5L, Escape/Kuga 2.0L, Expedition, Explorer, F-150, Flex 3.5L GTDI, Ford GT, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, MKZ, Mustang 2.3L, Mustang 5.0L, Nautilus, Navigator, Ranger 2.3L, Transit,	GO to Pinpoint Test DI .		

Transit Connect 1.0L, Transit Connect 2.0L	
All others	GO to Pinpoint Test KG .

P0204 - Cylinder 4 Injector A Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open (if equipped) • INJ4 circuit open • INJ4 circuit short to ground (direct injection vehicles) • INJ4 circuit short to voltage (direct injection vehicles) • INJ4RTN circuit open (if equipped) • INJ4RTN circuit short to ground (if equipped) • INJ4RTN circuit short to voltage (if equipped) • Damaged fuel injector 4		
Diagnostic Aids:	For direct injection vehicles, the INJ4_F PID flags a concern. For all others, the INJ4_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Aviator, Continental 2.0L, Continental 2.7L, Continental 3.0L, Corsair 2.0L, Corsair 2.3L, EcoSport 1.0L, EcoSport 2.0L, Edge, Escape/Kuga 1.5L, Escape/Kuga 2.0L, Expedition, Explorer, F-150, Flex 3.5L GTDI, Ford GT, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L,	GO to Pinpoint Test DI .		

MKZ, Mustang 2.3L, Mustang 5.0L, Nautilus, Navigator, Ranger 2.3L, Transit, Transit Connect 1.0L, Transit Connect 2.0L		
All others		GO to Pinpoint Test KG .

P0205 - Cylinder 5 Injector A Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open (if equipped) • INJ5 circuit open • INJ5 circuit short to ground (direct injection vehicles) • INJ5 circuit short to voltage (direct injection vehicles) • INJ5RTN circuit open (if equipped) • INJ5RTN circuit short to ground (if equipped) • INJ5RTN circuit short to voltage (if equipped) • Damaged fuel injector 5		
Diagnostic Aids:	For direct injection vehicles, the INJ5_F PID flags a concern. For all others, the INJ5_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Aviator, Edge 2.7L, Expedition, Explorer, F-150, Flex 3.5L GTDI, Fusion 2.7L, MKZ 3.0L, Mustang 5.0L, Nautilus 2.7L, Navigator, Transit	GO to Pinpoint Test DI .		
All others	GO to Pinpoint Test KG .		

P0206 - Cylinder 6 Injector A Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open (if equipped) • INJ6 circuit open • INJ6 circuit short to ground (direct injection vehicles) • INJ6 circuit short to voltage (direct injection vehicles) • INJ6RTN circuit open (if equipped) • INJ6RTN circuit short to ground (if equipped) • INJ6RTN circuit short to voltage (if equipped) • Damaged fuel injector 6		
Diagnostic Aids:	For direct injection vehicles, the INJ6_F PID flags a concern. For all others, the INJ6_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Aviator, Edge 2.7L, Expedition, Explorer, F-150, Flex 3.5L GTDI, Fusion 2.7L, MKZ 3.0L, Mustang 5.0L, Nautilus 2.7L, Navigator, Transit	GO to Pinpoint Test DI .		
All others	GO to Pinpoint Test KG .		

P0207 - Cylinder 7 Injector A Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open (if equipped) • INJ7 circuit open • INJ7 circuit short to ground (direct injection vehicles) • INJ7 circuit short to voltage (direct injection vehicles) • INJ7RTN circuit open (if equipped) • INJ7RTN circuit short to ground (if equipped) • INJ7RTN circuit short to voltage (if equipped) • Damaged fuel injector 7		

Diagnostic Aids:	For direct injection vehicles, the INJ7_F PID flags a concern. For all others, the INJ7_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-150, Mustang 5.0L	GO to Pinpoint Test DI .		
All others	GO to Pinpoint Test KG .		

P0208 - Cylinder 8 Injector A Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open (if equipped) • INJ8 circuit open • INJ8 circuit short to ground (direct injection vehicles) • INJ8 circuit short to voltage (direct injection vehicles) • INJ8RTN circuit open (if equipped) • INJ8RTN circuit short to ground (if equipped) • INJ8RTN circuit short to voltage (if equipped) • Damaged fuel injector 8		
Diagnostic Aids:	For direct injection vehicles, the INJ8_F PID flags a concern. For all others, the INJ8_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
F-150, Mustang 5.0L	GO to Pinpoint Test DI .		
All others	GO to Pinpoint Test KG .		

P0217 - Engine Coolant Over Temperature Condition

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-03, Engine Cooling to diagnose the engine overheats 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.		

P0218 - Transmission Fluid Temperature Sensor A Over Temperature Condition

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.		

P0219 - Engine Overspeed 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. This DTC sets when the RPM exceeds the calibrated limit set within the PCM. For additional information on the engine RPM limiter, refer to Section 1, Powertrain Control Software.		
Possible Causes:	• Wheel slippage (water, ice, mud, and snow) • Excessive engine RPM in NEUTRAL or operated in the incorrect transmission gear • High engine RPM with engine temperature within a calibrated limit of an overheating condition (GTDI engine)		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. If DTC P1285 or P1299 is present, disregard DTC P0219 at this time. Diagnose DTC P1285 or P1299 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.		

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

Description:	This DTC sets when the PCM indicates the electronic throttle control (ETC) throttle position (TP) sensor 2 circuit is out of range in either the closed or wide open throttle (WOT) modes.		
Possible Causes:	• Obstruction in the throttle plate movement • TP circuit open • Self-test operator error (foot resting on the accelerator pedal during test) • Damaged TP sensor • Damaged throttle body		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

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

Description:	This DTC sets when the electronic throttle control (ETC) throttle position 2 (TP2) signal is too low.		
Possible Causes:	• TP2 circuit open		

		- TP2 circuit short to ground - Damaged TP2 sensor	
Diagnostic Aids:	This concern exhibits a symptom of limited power. A TP2 PID reading less than 0.25 volt in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

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

Description:	This DTC sets when the electronic throttle control (ETC) throttle position (TP) sensor signal is too high.		
Possible Causes:	- TP2 circuit short to voltage - TP2 circuit short to VREF - TP2 circuit open - ETCRTN circuit open - Damaged TP2 sensor		
Diagnostic Aids:	This concern exhibits a symptom of limited power. A TP2 PID reading greater than 4.75 volts in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P0230 - Fuel Pump Primary Circuit

Description:	This DTC sets when a concern is detected on the FP or FPRPWR circuits.		
Possible Causes:	- FP circuit open - FP circuit short - FPRPWR circuit open - FPRPWR circuit short - Damaged fuel pump relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P0231 - Fuel Pump Secondary Circuit Low

Description:	This DTC sets when the fuel pump (FP) is commanded ON and the PCM does not detect voltage on the FPM circuit.		
Possible Causes:	- B+ circuit to the FP relay open - Damaged FP relay - FPPWR circuit between the FP relay and its connection to the FPM circuit open		

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

P0232 - Fuel Pump Secondary Circuit High

Description:	This DTC sets when the PCM detects voltage on the FPM circuit while the fuel pump (FP) is commanded OFF. The FPM circuit is wired to a pull-up voltage inside the PCM. The FPM circuit goes high if, with the ignition ON, engine OFF and the FP commanded OFF, the FPM/FPPWR circuit loses its path to ground through the FP. The FPM circuit also goes high if the FPM/FPPWR circuit is short to voltage.		
Possible Causes:	• Open circuit between the FP and the FPM connection to the FPPWR circuit • FP ground intermittently open • FP electrically open • FP secondary circuits short to voltage • FP relay contacts always closed		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P0234 - Turbocharger/Supercharger A Overboost Condition

For Ford GT	
Description:	This DTC sets when the turbocharger system TCBP PID value is greater than a calibrated threshold, or the turbocharger system TCBP PID value is greater than the TCBP desired value for a calibrated length of time. This DTC may also set if the calculated turbocharger turbine speed is greater than a calibrated threshold, or the calculated turbocharger turbine speed difference between bank 1 and bank 2 is greater than a calibrated threshold.
Possible Causes:	• Damaged wastegate adjusting rod • Wastegate stuck closed • Incorrect wastegate adjustment TC wastegate regulating solenoid valve stuck • Damaged turbocharger (TC) wastegate regulating valve solenoid • TC wastegate regulating solenoid valve stuck • TC wastegate regulating solenoid valve control hose or vent leak or restriction • Substantial restriction of bank 1 or bank 2 air filter, charge air cooler CAC, or CAC tubing
Diagnostic Aids:	Check tubing for restrictions, cracks and incorrect fitting connections. Check the turbocharger wastegate regulating valve solenoid for correct operation.
For All Others	
Description:	This DTC sets when the turbocharger system TCBP PID value is greater than a calibrated threshold, or the turbocharger system TCBP PID value is greater than the TCBP desired value for a calibrated length of time.
Possible Causes:	• Damaged wastegate adjusting rod • Wastegate stuck closed • Incorrect wastegate adjustment TC wastegate regulating solenoid valve stuck

	- Damaged turbocharger (TC) wastegate regulating valve solenoid - TC wastegate regulating solenoid valve stuck - TC wastegate regulating solenoid valve control hose or vent leak or restriction		
Diagnostic Aids:	Check tubing for restrictions, cracks and incorrect fitting connections. Check the turbocharger wastegate regulating valve solenoid for correct operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0235 - Turbocharger/Supercharger Boost Sensor A Circuit

Description:	This DTC sets when the turbocharger boost pressure (TCBP) sensor circuit voltage is greater than or less than a calibrated threshold.		
Possible Causes:	- TCBP circuit concerns - Damaged TCBP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

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

Description:	This DTC sets when the TCBP PID does not correlate with the BARO or the MAP PID.		
Possible Causes:	- Damaged turbocharger boost pressure (TCBP) sensor - Contaminated or restricted TCBP sensor - Slow responding TCBP sensor		
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 DM .		

P0237 - Turbocharger/Supercharger Boost Sensor A Circuit Low

Description:	This DTC sets when there is a short to ground in the TCBP circuit.		
Possible Causes:	- TCBP circuit short to ground - Damaged turbocharger boost pressure (TCBP) sensor - Damaged harness connector - Damaged harness		
Diagnostic	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due		

Aids:	to contact with other components. 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 DM .		

P0238 - Turbocharger/Supercharger Boost Sensor A Circuit High

Description:	This DTC sets when there is an open circuit or high voltage in the TCBP circuit.		
Possible Causes:	• TCBP circuit open • TCBP circuit short to voltage • Damaged turbocharger boost pressure (TCBP) sensor		
Diagnostic Aids:	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. 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 DM .		

P023A - Charge Air Cooler Coolant Pump Control Circuit/Open

Description:	This DTC sets when the CAC circuit is open or an internal failure of the charge air cooler (CAC) pump occurs.		
Possible Causes:	• CAC circuit open • Damaged CAC pump		
Diagnostic Aids:	A CAC circuit open condition will result in the CAC pump 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 CAC circuit is shorted to ground or an internal failure of the charge air cooler (CAC) pump occurs.		
Possible Causes:	• CAC circuit short to ground • Damaged CAC pump		
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 CAC circuit is shorted to voltage or an internal failure of the charge air cooler (CAC) pump occurs.		
Possible Causes:	• CAC circuit short to voltage • Damaged CAC pump		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KP .		

P0243 - Turbocharger/Supercharger Wastegate Actuator A

Description:	This DTC sets when the TCWGM1+ and TCWGM1- circuits are reversed.		
Possible Causes:	• TCWGM1 circuits are cross wired		
Diagnostic Aids:	Verify the TCWGM1+ and TCWGM1- circuit positions are correct in the harness connector, REPAIR as necessary.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0244 - Turbocharger/Supercharger Wastegate Actuator A Range/Performance

Description:	This DTC sets when the turbocharger wastegate motor 1 is slow to respond to the commanded position.		
Possible Causes:	• Damaged or restricted wastegate motor linkage • Damaged turbocharger wastegate motor 1 • Damaged harness connector • Damaged harness		
Diagnostic Aids:	Inspect the wastegate motor linkage for physical damage or binding.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0245 - Turbocharger/Supercharger Wastegate Actuator A Low

Description:	This DTC sets when there is a short to ground in the TCWRVS circuit.
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Possible Causes:	• TCWRVS circuit short to ground • Damaged turbocharger wastegate regulating valve solenoid • 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. This DTC only sets when the solenoid valve is energized.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0246 - Turbocharger/Supercharger Wastegate Actuator A High

Description:	This DTC sets when there is an open circuit or high voltage in the TCWRVS circuit.		
Possible Causes:	• TCWRVS circuit open • TCWRVS circuit short to voltage • Damaged turbocharger wastegate regulating valve solenoid		
Diagnostic Aids:	Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. This DTC only sets when the solenoid is not energized.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0247 - Turbocharger/Supercharger Wastegate Actuator B

Description:	This DTC sets when the TCWGM2+ and TCWGM2- circuits are reversed.		
Possible Causes:	• TCWGM2 motor circuits are cross wired		
Diagnostic Aids:	Verify the TCWGM2+ and TCWGM2- circuit positions are correct in the harness connector, REPAIR as necessary.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0248 - Turbocharger/Supercharger Wastegate Actuator B Range/Performance

Description:	This DTC sets when the turbocharger wastegate motor 2 is slow to respond to the commanded position.		
Possible Causes:	• Damaged or restricted wastegate motor linkage • Damaged turbocharger wastegate motor 2 • Damaged harness connector		

		Damaged harness	
Diagnostic Aids:	Inspect the wastegate motor linkage for physical damage or binding.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P0249 - Turbocharger/Supercharger Wastegate Actuator B Low

Description:	This DTC sets when there is a short to ground in the TCWRVS circuit.		
Possible Causes:	- TCWRVS circuit short to ground - Damaged turbocharger wastegate regulating valve solenoid - 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 HN .		

P0250 - Turbocharger/Supercharger Wastegate Actuator B High

Description:	This DTC sets when there is an open circuit or high voltage in the TCWRVS circuit.		
Possible Causes:	- TCWRVS circuit open - TCWRVS circuit short to voltage - Damaged turbocharger wastegate regulating valve solenoid - 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 HN .		

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:	Check for any harness concerns.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P025B - Fuel Pump Module A Control Circuit Range/Performance

Description:	The fuel pump control module monitors the duty cycle and frequency of the signal it receives from the PCM. The fuel pump control module determines if the signal from the PCM on the FPC circuit is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module sends a 20% duty cycle signal on the FPM circuit to report the concern to the PCM. This DTC sets when the fuel pump control module is still reporting that it is receiving an invalid duty cycle or frequency from the PCM after a calibrated amount of time.		
Possible Causes:	• FPC circuit open or short to ground • FPC circuit short to voltage • Radio frequency interference or electromagnetic interference • Damaged fuel pump control module • Damaged PCM		
Diagnostic Aids:	Check the harness for routing, alterations, incorrect shielding, or electrical interference from other systems.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

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:	Check for any harness concerns.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

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:	Check for any harness concerns.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P025E - Turbocharger/Supercharger Boost Sensor A Intermittent/Erratic

Description:	This DTC sets when there are intermittent events in the TCBP circuit during a single drive cycle.		
Possible Causes:	- TCBP circuit intermittent open - TCBP circuit intermittent short to voltage - TCBP circuit intermittent short to ground - Damaged turbocharger boost pressure (TCBP) 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. 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 DN .		

P026A - Charge Air Cooler Efficiency Below Threshold

Description:	This DTC sets when the temperature differential between the intake air temperature 2 (IAT2) sensor value and the charge air cooler temperature (CACT) sensor value is less than a calibrated value.		
Possible Causes:	- Low coolant - Cooling system concern - Biased IAT2 sensor - Biased CACT sensor - Damaged charge air cooler (CAC)		
Diagnostic Aids:	Check for any cooling system concerns.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KP .		

P027B - Fuel Pump Module B Control Circuit Range/Performance

Description:	The fuel pump control module 2 monitors the duty cycle and frequency of the signal it receives from the PCM. The fuel pump control module 2 determines if the signal from the PCM on the FPC circuit is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module 2 sends a		
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	20% duty cycle signal on the FPM2 circuit to report the concern to the PCM. This DTC sets when the fuel pump control module 2 is still reporting that it is receiving an invalid duty cycle or frequency from the PCM after a calibrated amount of time.		
Possible Causes:	- FPC circuit open or short to ground - FPC circuit short to voltage - Radio frequency interference or electromagnetic interference - Damaged fuel pump control module 2 - Damaged PCM		
Diagnostic Aids:	Check the harness for routing, alterations, incorrect shielding, or electrical interference from other systems.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P028D - Charge Air Cooler Cooling Fan Control Circuit Low

Description:	This DTC sets when the PCM detects an open circuit or a short to ground in the CACCF circuit.		
Possible Causes:	- Damaged charge air cooler (CAC) fan relay - CACCF circuit short to ground - CACCF circuit open - 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 KE .		

P028E - Charge Air Cooler Cooling Fan Control Circuit High

Description:	This DTC sets when the PCM detects a short to voltage in the CACCF circuit.		
Possible Causes:	- Damaged charge air cooler (CAC) fan relay - CACCF circuit short to voltage - 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 KE .		

P0297 - Vehicle Overspeed Condition

Description:	This DTC sets when the vehicle has been operated in a manner which caused the vehicle speed to exceed a calibration limit. The vehicle speed is continuously monitored and evaluated by the PCM. For additional information on the vehicle speed limiter, refer to Section 1, Powertrain Control Software .		
Possible Causes:	Vehicle driven at a high rate of speed		
Diagnostic Aids:	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.		

P0298 - Engine Oil Over Temperature Condition

Description:	This DTC sets when the engine oil temperature protection strategy in the PCM has been activated. This temporarily prohibits high engine speed operation by disabling injectors, to reduce the risk of engine damage from high engine oil temperature. The PCM uses an oil algorithm to determine actual engine oil temperature.		
Possible Causes:	- Very high engine RPM for an extended period of time - Overheating condition - Base engine concerns		
Diagnostic Aids:	The engine is operating in high RPM range due to incorrect gear selection. This may cause a lack/loss of power or surge. For Ford GT, check for other module DTCs and diagnose those first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DY .		

P0299 - Turbocharger/Supercharger A Underboost Condition

Description:	This DTC sets when the actual TCBP value is less than the desired TCBP value by 27.6 kPa (4 psi) or more for 5 seconds, indicating an under boost condition.		
Possible Causes:	- Damaged turbocharger wastegate regulating valve solenoid - TC wastegate regulating solenoid valve stuck - Wastegate stuck open - Wastegate control hose open or restricted - Air leak between turbocharger and throttle		
Diagnostic Aids:	Check tubing for restrictions, cracks and incorrect fitting connections. Check the turbocharger wastegate regulating valve solenoid for correct operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

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 D1 .		

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 D1 .		

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 D1 .		

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 DI .		

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 DI .		

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 DI .		

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 DI .		

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 DI .		

P0300 - Random Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in multiple cylinders or the PCM cannot identify which cylinder is misfiring.		
Possible Causes:	• Damaged camshaft position (CMP) sensor • Low fuel (less than 1/8 tank) • Stuck open exhaust gas recirculation (EGR) valve • Restricted EGR passages • Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	One or more EGR passages may be restricted.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0301 - Cylinder 1 Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in cylinder 1.		
Possible Causes:	• Ignition system • Fuel injector 1 • Running out of fuel • EVAP purge valve • Fuel pressure • Evaporative emission system • Exhaust gas recirculation (EGR) system • Base engine • Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause. The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0302 - Cylinder 2 Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in cylinder 2.		
Possible Causes:	• Ignition system • Fuel injector 2 • Running out of fuel • EVAP purge valve • Fuel pressure • Evaporative emission system • Exhaust gas recirculation (EGR) system • Base engine • Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause. The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0303 - Cylinder 3 Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in cylinder 3.		
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Possible Causes:	• Ignition system • Fuel injector 3 • Running out of fuel • EVAP purge valve • Fuel pressure • Evaporative emission system • Exhaust gas recirculation (EGR) system • Base engine • Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause. The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0304 - Cylinder 4 Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in cylinder 4.		
Possible Causes:	• Ignition system • Fuel injector 4 • Running out of fuel • EVAP purge valve • Fuel pressure • Evaporative emission system • Exhaust gas recirculation (EGR) system • Base engine • Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause. The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0305 - Cylinder 5 Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in cylinder 5.		
Possible Causes:	• Ignition system • Fuel injector 5 • Running out of fuel • EVAP purge valve • Fuel pressure • Evaporative emission system		

	- Exhaust gas recirculation (EGR) system - Base engine - Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause. The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0306 - Cylinder 6 Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in cylinder 6.		
Possible Causes:	• Ignition system • Fuel injector 6 • Running out of fuel • EVAP purge valve • Fuel pressure • Evaporative emission system • Exhaust gas recirculation (EGR) system • Base engine • Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause. The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0307 - Cylinder 7 Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in cylinder 7.		
Possible Causes:	- Ignition system - Fuel injector 7 - Running out of fuel - EVAP purge valve - Fuel pressure - Evaporative emission system - Exhaust gas recirculation (EGR) system - Base engine - Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause.		

	The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0308 - Cylinder 8 Misfire Detected

Description:	This DTC sets when the misfire detection monitor detects an engine misfire in cylinder 8.		
Possible Causes:	• Ignition system • Fuel injector 8 • Running out of fuel • EVAP purge valve • Fuel pressure • Evaporative emission system • Exhaust gas recirculation (EGR) system • Base engine • Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		
Diagnostic Aids:	Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause. The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0313 - Misfire Detected With Low Fuel

Description:	This DTC sets when an engine misfire fault is detected with low fuel level.		
Possible Causes:	• Customer driving habits • Low fuel or no fuel in tank (less than 1/8 tank)		
Diagnostic Aids:	Verify the fuel level is above 1/8 before diagnosing engine misfire DTCs.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0315 - Crankshaft Position System Variation Not Learned

Description:	The PCM has not learned the crankshaft pulse wheel tooth spacing. This DTC disables the misfire monitor.		
Possible Causes:	• Aftermarket performance products • Misfire monitor neutral profile correction has not been relearned since the last mechanical repair		

	• PCM reprogramming • PCM replacement • Internal PCM non-volatile random access memory (NVRAM) error		
Diagnostic Aids:	The misfire monitor neutral profile correction must be relearned after any engine rotational component installation or repair. Carry out the Misfire Monitor Neutral Profile Correction procedure using the scan tool. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Neutral Profile Correction.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0316 - Misfire Detected On Startup (First 1000 Revolutions)

Description:	This DTC sets in addition to any type B misfire DTC which occurs in the first 1,000 revolution test interval following engine start.		
Possible Causes:	• Damaged crankshaft position (CKP) sensor • Damaged ignition system • Damaged fuel injectors • Running out of fuel • Fuel quality • Base engine		
Diagnostic Aids:	Freeze frame data and the DTC P03xx are also stored, indicating which cylinder the misfire occurred.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HD .		

P0320 - Ignition/Distributor Engine Speed Input Circuit

Description:	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 when the camshaft speed exceeds the equivalent speed of engine idle.		
Possible Causes:	• CKP+ circuit intermittent open (VR type) • CKP- circuit intermittent open (VR type) • CKP circuit intermittent open (Hall effect) • VREF circuit intermittent open (Hall effect) • SIGRTN circuit intermittent open (Hall effect) • CKP+ circuit intermittent short to voltage (VR type) • CKP- circuit intermittent short to voltage (VR type) • CKP circuit intermittent short to voltage (Hall effect) • VREF circuit intermittent short to voltage (Hall effect) • SIGRTN circuit intermittent short to voltage (Hall effect) • CKP+ circuit intermittent short to ground (VR type) • CKP- circuit intermittent short to ground (VR type) • CKP circuit intermittent short to ground (Hall effect) • VREF circuit intermittent short to ground (Hall effect) • SIGRTN circuit intermittent short to ground (Hall effect) • CKP sensor incorrectly installed • Damaged CKP sensor • Incorrect, damaged or corroded connections		

		• Arcing secondary ignition components (coil, wires and plugs) • 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 • Incorrectly grounded high power aftermarket equipment	
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test A .	Continuous Memory

P0322 - Ignition/Distributor Engine Speed Input Circuit No Signal

Description:	This DTC sets when the crankshaft position (CKP) sensor profile ignition pickup (PIP) pulse is missing for greater than a calibrated number of camshaft revolutions when the camshaft speed exceeds the equivalent speed of engine idle.		
Possible Causes:	• CKP+ circuit intermittent open (VR type) • CKP- circuit open (VR type) • CKP circuit open (Hall effect) • VREF circuit open (Hall effect) • SIGRTN circuit open (Hall effect) • CKP+ circuit short to voltage (VR type) • CKP- circuit short to voltage (VR type) • CKP circuit short to voltage (Hall effect) • VREF circuit short to voltage (Hall effect) • SIGRTN circuit short to voltage (Hall effect) • CKP+ circuit short to ground (VR type) • CKP- circuit short to ground (VR type) • CKP circuit short to ground (Hall effect) • VREF circuit short to ground (Hall effect) • SIGRTN circuit short to ground (Hall effect) • Damaged CKP sensor • CKP sensor incorrectly installed • Incorrect, damaged or corroded connections		
Diagnostic Aids:	An inactive CKP signal causes a no start condition. 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
All		GO to Pinpoint Test A .	Continuous Memory

P0325 - Knock/Combustion Vibration Sensor 1 Circuit (Bank 1)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 1, sensor 1 (KS11) detects vibrations upon increase and decrease in engine RPM. The KS11 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS11 circuit open • KS11RTN circuit open • KS11 circuit short to voltage • KS11RTN circuit short to voltage • KS11 circuit short to ground		

	• KS11RTN circuit short to ground • Damaged KS11		
Diagnostic Aids:	A KS11 sensor voltage greater than 0.5 volt with the ignition ON, engine OFF, indicates a concern is present. The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

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

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 1, sensor 1 (KS11) detects vibrations upon increase and decrease in engine RPM. The KS11 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS11 circuit open • KS11RTN circuit open • KS11 circuit short to voltage • KS11RTN circuit short to voltage • KS11 circuit short to ground • KS11RTN circuit short to ground • Damaged KS11		
Diagnostic Aids:	A KS11 sensor voltage greater than 0.5 volt with the ignition ON, engine OFF, indicates a concern is present. The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P0327 - Knock/Combustion Vibration Sensor 1 Circuit Low (Bank1)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 1, sensor 1 (KS11) detects vibrations upon increase and decrease in engine RPM. The KS11 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS11 circuit open • KS11RTN circuit open • KS11 circuit short to ground • KS11RTN circuit short to ground • Damaged KS11		
Diagnostic Aids:	The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P0328 - Knock/Combustion Vibration Sensor 1 Circuit High (Bank 1)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 1, sensor 1 (KS11) detects vibrations upon increase and decrease in engine RPM. The KS11 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS11 circuit short to voltage • KS11RTN circuit short to voltage • Damaged KS11		
Diagnostic Aids:	The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P032A - Knock/Combustion Vibration Sensor 3 Circuit (Bank 1)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 1, sensor 2 (KS12) detects vibrations upon increase and decrease in engine RPM. The KS12 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS12 circuit open • KS12RTN circuit open • KS12 circuit short to voltage • KS12RTN circuit short to voltage • KS12 circuit short to ground • KS12RTN circuit short to ground • Damaged KS12		
Diagnostic Aids:	A KS12 sensor voltage greater than 0.5 volt with the ignition ON, engine OFF, indicates a concern is present. The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P032C - Knock/Combustion Vibration Sensor 3 Circuit Low (Bank1)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 1, sensor 2 (KS12) detects vibrations upon increase and decrease in engine RPM. The KS12 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS12 circuit open • KS12RTN circuit open • KS12 circuit short to ground • KS12RTN circuit short to ground • Damaged KS12		
Diagnostic Aids:	The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test DG .
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P032D - Knock/Combustion Vibration Sensor 3 Circuit High (Bank 1)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 1, sensor 2 (KS12) detects vibrations upon increase and decrease in engine RPM. The KS12 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS12 circuit short to voltage • KS12RTN circuit short to voltage • Damaged KS12		
Diagnostic Aids:	The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P0330 - Knock/Combustion Vibration Sensor 2 Circuit (Bank 2)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 2, sensor 1 (KS21) detects vibrations upon increase and decrease in engine RPM. The KS21 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS21 circuit open • KS21RTN circuit open • KS21 circuit short to voltage • KS21RTN circuit short to voltage • KS21 circuit short to ground • KS21RTN circuit short to ground • Damaged KS21		
Diagnostic Aids:	A KS21 sensor voltage greater than 0.5 volt with the ignition ON, engine OFF, indicates a concern is present. The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

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

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 2, sensor 1 (KS21) detects vibrations upon increase and decrease in engine RPM. The KS21 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS21 circuit open • KS21RTN circuit open • KS21 circuit short to voltage • KS21RTN circuit short to voltage		

	• KS21 circuit short to ground • KS21RTN circuit short to ground • Damaged KS21		
Diagnostic Aids:	A KS21 sensor voltage greater than 0.5 volt with the ignition ON, engine OFF, indicates a concern is present. The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P0332 - Knock/Combustion Vibration Sensor 2 Circuit Low (Bank 2)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 2, sensor 1 (KS21) detects vibrations upon increase and decrease in engine RPM. The KS21 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS21 circuit open • KS21RTN circuit open • KS21 circuit short to ground • KS21RTN circuit short to ground • Damaged KS21		
Diagnostic Aids:	The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P0333 - Knock/Combustion Vibration Sensor 2 Circuit High (Bank 2)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 2, sensor 1 (KS21) detects vibrations upon increase and decrease in engine RPM. The KS21 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS21 circuit short to voltage • KS21RTN circuit short to voltage • Damaged KS21		
Diagnostic Aids:	The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P0335 - Crankshaft Position Sensor A Circuit

Description:	This DTC sets when the crankshaft position (CKP) sensor profile ignition pickup (PIP) pulse is missing for greater than a calibrated number of camshaft revolutions when the camshaft speed exceeds the		
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	equivalent speed of engine idle or the starter motor is engaged.		
Possible Causes:	• CKP+ circuit intermittent open (VR type) • CKP- circuit open (VR type) • CKP circuit open (Hall effect type) • VREF circuit open (Hall effect type) • SIGRTN circuit open (Hall effect type) • CKP+ circuit short to voltage (VR type) • CKP- circuit short to voltage (VR type) • CKP circuit short to voltage (Hall effect type) • VREF circuit short to voltage (Hall effect type) • SIGRTN circuit short to voltage (Hall effect type) • CKP+ circuit short to ground (VR type) • CKP- circuit short to ground (VR type) • CKP circuit short to ground (Hall effect type) • VREF circuit short to ground (Hall effect type) • SIGRTN circuit short to ground (Hall effect type) • Damaged CKP sensor • CKP sensor incorrectly installed • Incorrect, damaged or corroded connections		
Diagnostic Aids:	An inactive CKP signal causes a no start condition. 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 JD .		

P0336 - Crankshaft Position Sensor A Circuit Range/Performance

Description:	This DTC sets when the input signal from the crankshaft position (CKP) sensor is erratic.		
Possible Causes:	• CKP circuit noise • Damaged CKP sensor connection • Damaged CKP sensor • Damaged crankshaft pulse wheel teeth		
Diagnostic Aids:	An inactive CKP signal causes a no start condition. 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 JD .		

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 when the camshaft speed exceeds the equivalent speed of engine idle or the starter motor is engaged.		
Possible Causes:	• CKP+ circuit intermittent open (VR type) • CKP- circuit intermittent open (VR type) • CKP circuit intermittent open (Hall effect type) • VREF circuit intermittent open (Hall effect type) • SIGRTN circuit intermittent open (Hall effect type) • CKP+ circuit intermittent short to voltage (VR type)		

	• CKP- circuit intermittent short to voltage (VR type) • CKP circuit intermittent short to voltage (Hall effect type) • VREF circuit intermittent short to voltage (Hall effect type) • SIGRTN circuit intermittent short to voltage (Hall effect type) • CKP+ circuit intermittent short to ground (VR type) • CKP- circuit intermittent short to ground (VR type) • CKP circuit intermittent short to ground (Hall effect type) • VREF circuit intermittent short to ground (Hall effect type) • SIGRTN circuit intermittent short to ground (Hall effect type) • CKP sensor incorrectly installed • Damaged CKP sensor • Incorrect, damaged or corroded connections • Arcing secondary ignition components (coil, wires and plugs) • 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 • Incorrectly grounded high power aftermarket equipment		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JD .		

P033A - Knock/Combustion Vibration Sensor 4 Circuit (Bank 2)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 2, sensor 2 (KS22) detects vibrations upon increase and decrease in engine RPM. The KS22 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS22 circuit open • KS22RTN circuit open • KS22 circuit short to voltage • KS22RTN circuit short to voltage • KS22 circuit short to ground • KS22RTN circuit short to ground • Damaged KS22		
Diagnostic Aids:	A KS22 sensor voltage greater than 0.5 volt with the ignition ON, engine OFF, indicates a concern is present. The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P033C - Knock/Combustion Vibration Sensor 4 Circuit Low (Bank 2)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 2, sensor 2 (KS22) detects vibrations upon increase and decrease in engine RPM. The KS22 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS22 circuit open • KS22RTN circuit open • KS22 circuit short to ground		

		• KS22RTN circuit short to ground • Damaged KS22	
Diagnostic Aids:	The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P033D - Knock/Combustion Vibration Sensor 4 Circuit High (Bank 2)

Description:	This DTC sets when the voltage goes outside a calibrated level. The knock sensor bank 2, sensor 2 (KS22) detects vibrations upon increase and decrease in engine RPM. The KS22 sensor generates a voltage based on this vibration.		
Possible Causes:	• KS22 circuit short to voltage • KS22RTN circuit short to voltage • Damaged KS22		
Diagnostic Aids:	The vehicle may need to be driven for several minutes to set this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

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 JD .		

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

Description:	This DTC sets when the CMP11 circuit signal cannot be detected. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• CMP11 circuit open • CMP11 circuit short to ground • CMP11 circuit short to voltage		

	• SIGRTN circuit open • CMP11 circuit shorted to other CMP circuits (2 or more CMP sensor systems) • Camshaft timing incorrectly set • Camshaft position sensor trigger wheel out of alignment • Damaged camshaft position bank 1 sensor 1 (CMP11) shielding • CMP11 sensor incorrectly installed • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged CMP11 sensor		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

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

Description:	This DTC sets when the CMP11 circuit has a noisy signal. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged camshaft phaser and sprocket • Damaged camshaft position bank 1 sensor 1 (CMP11) shielding • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0344 - Camshaft Position Sensor A Circuit Intermittent (Bank 1 Or Single Sensor)

Description:	This DTC sets when the CMP11 circuit signal is intermittent. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• Intermittent open circuit • Intermittent short circuit • Camshaft timing incorrectly set • Camshaft position sensor trigger wheel out of alignment • Damaged CMP sensor shielding • Incorrect harness connections • Corrosion • Continuous oil flow to the VCT piston chamber		

	• Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged camshaft position bank 1 sensor 1 (CMP11)						
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.						
Application	<table><tr><td>Key On Engine Off</td><td>Key On Engine Running</td><td>Continuous Memory</td></tr><tr><td>All</td><td>GO to Pinpoint Test DR.</td><td></td></tr></table>	Key On Engine Off	Key On Engine Running	Continuous Memory	All	GO to Pinpoint Test DR .	
Key On Engine Off	Key On Engine Running	Continuous Memory					
All	GO to Pinpoint Test DR .						

P0345 - Camshaft Position Sensor A Circuit (Bank 2)

Description:	This DTC sets when the CMP21 circuit signal cannot be detected. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .										
Possible Causes:	- CMP21 circuit open - CMP21 circuit short to ground - CMP21 circuit short to voltage - SIGRTN circuit open - CMP21 circuit shorted to other CMP circuits (2 or more CMP sensor systems) - Camshaft timing incorrectly set - Camshaft position sensor trigger wheel out of alignment - Damaged CMP sensor shielding - Camshaft position bank 2 sensor 1 (CMP21) incorrectly installed - Continuous oil flow to the VCT piston chamber - Erratic camshaft position due to low oil pressure - Oil flow restriction in the oil passages or the VCT valve body - Damaged CMP21 sensor										
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.										
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>GO to Pinpoint Test DR.</td><td></td><td></td></tr> </table>		Key On Engine Off	Key On Engine Running	Continuous Memory	All	GO to Pinpoint Test DR .				
	Key On Engine Off	Key On Engine Running	Continuous Memory								
All	GO to Pinpoint Test DR .										

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

Description:	This DTC sets when the CMP21 circuit has a noisy signal. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	- Radio frequency interference or electromagnetic interference - Damaged camshaft phaser and sprocket - Continuous oil flow to the VCT piston chamber - Erratic camshaft position due to low oil pressure - Oil flow restriction in the oil passages or the VCT valve body - Damaged camshaft position bank 2 sensor 1 (CMP21) shielding		
Diagnostic	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may		

Aids:	have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

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

Description:	This DTC sets when the CMP21 circuit signal is intermittent. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• Intermittent open circuit • Intermittent short circuit • Camshaft timing incorrectly set • Camshaft position sensor trigger wheel out of alignment • Damaged CMP sensor shielding • Incorrect harness connections • Corrosion • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged camshaft position bank 2 sensor 1 (CMP21)		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0351 - Ignition Coil A Primary Control Circuit/Open

Description:	This DTC sets when the PCM does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module PCM.		
Possible Causes:	• VPWR circuit open • VPWR circuit short to ground • COP1 circuit open • COP1 circuit short to voltage • COP1 circuit short to ground • Damaged COP		
Diagnostic Aids:	The DTC P0351 only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set the DTC P0351. The DTC P0301 does not set for a coil primary circuit malfunction. The DTC P0351 may set with or without the DTC P0301, however the DTC P0351 sets first. When this DTC is set, the PCM enters failure mode effects management (FMEP) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation, do not attempt to diagnose the injector with this DTC present. If a primary coil is damaged due to a harness short to ground the PCM will not be damaged. Do not replace the PCM without verifying the coil driver functionality.		

	Use the 12 volt non-powered test lamp to verify VPWR voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P0352 - Ignition Coil B Primary Control Circuit/Open

Description:	This DTC sets when the PCM does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module PCM.		
Possible Causes:	• VPWR circuit open • VPWR circuit short to ground • COP2 circuit open • COP2 circuit short to voltage • COP2 circuit short to ground • Damaged COP		
Diagnostic Aids:	The DTC P0352 only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set the DTC P0352. The DTC P0302 does not set for a coil primary circuit malfunction. The DTC P0352 may set with or without the DTC P0302, however the DTC P0352 sets first. When this DTC is set, the PCM enters failure mode effects management (FMEM) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation do not attempt to diagnose the injector with this DTC present. If a primary coil is damaged due to a harness short to ground the PCM will not be damaged. Do not replace the PCM without verifying the coil driver functionality. Use the 12 volt non-powered test lamp to verify VPWR voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P0353 - Ignition Coil C Primary Control Circuit/Open

Description:	This DTC sets when the PCM does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module PCM.		
Possible Causes:	• VPWR circuit open • VPWR circuit short to ground • COP3 circuit open • COP3 circuit short to voltage • COP3 circuit short to ground • Damaged COP		
Diagnostic Aids:	The DTC P0353 only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set the DTC P0353. The DTC P0303 does not set for a coil primary circuit malfunction. The DTC P0353 may set with or without the DTC P0303, however the DTC P0353 sets first. When this DTC is set, the PCM enters failure mode effects management (FMEM) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation, do not attempt to diagnose the injector with this DTC present. If a primary coil is damaged due to a harness short to ground the PCM will not be damaged. Do not replace the PCM without verifying the coil driver functionality.		

	Use the 12 volt non-powered test lamp to verify VPWR voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P0354 - Ignition Coil D Primary Control Circuit/Open

Description:	This DTC sets when the PCM does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module PCM.		
Possible Causes:	• VPWR circuit open • VPWR circuit short to ground • COP4 circuit open • COP4 circuit short to voltage • COP4 circuit short to ground • Damaged COP		
Diagnostic Aids:	The DTC P0354 only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set the DTC P0354. The DTC P0304 does not set for a coil primary circuit malfunction. The DTC P0354 may set with or without the DTC P0304, however the DTC P0354 sets first. When this DTC is set, the PCM enters failure mode effects management (FMEM) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation, do not attempt to diagnose the injector with this DTC present. If a primary coil is damaged due to a harness short to ground the PCM will not be damaged. Do not replace the PCM without verifying the coil driver functionality. Use the 12 volt non-powered test lamp to verify VPWR voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P0355 - Ignition Coil E Primary Control Circuit/Open

Description:	This DTC sets when the PCM does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module PCM.		
Possible Causes:	• VPWR circuit open • VPWR circuit short to ground • COP5 circuit open • COP5 circuit short to voltage • COP5 circuit short to ground • Damaged COP		
Diagnostic Aids:	The DTC P0355 only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set the DTC P0355. The DTC P0305 does not set for a coil primary circuit malfunction. The DTC P0355 may set with or without the DTC P0305, however the DTC P0355 sets first. When this DTC is set, the PCM enters failure mode effects management (FMEM) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation, do not attempt to diagnose the injector with this DTC present. If a primary coil is damaged due to a harness short to ground the PCM will not be damaged. Do not replace the PCM without verifying the coil driver functionality.		

	Use the 12 volt non-powered test lamp to verify VPWR voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P0356 - Ignition Coil F Primary Control Circuit/Open

Description:	This DTC sets when the PCM does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module PCM.		
Possible Causes:	• VPWR circuit open • VPWR circuit short to ground • COP6 circuit open • COP6 circuit short to voltage • COP6 circuit short to ground • Damaged COP		
Diagnostic Aids:	The DTC P0356 only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set the DTC P0356. The DTC P0306 does not set for a coil primary circuit malfunction. The DTC P0356 may set with or without the DTC P0306, however the DTC P0356 sets first. When this DTC is set, the PCM enters failure mode effects management (FMEM) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation, do not attempt to diagnose the injector with this DTC present. If a primary coil is damaged due to a harness short to ground the PCM will not be damaged. Do not replace the PCM without verifying the coil driver functionality. Use the 12 volt non-powered test lamp to verify VPWR voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P0357 - Ignition Coil G Primary Control Circuit/Open

Description:	This DTC sets when the PCM does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module PCM.		
Possible Causes:	• VPWR circuit open • VPWR circuit short to ground • COP7 circuit open • COP7 circuit short to voltage • COP7 circuit short to ground • Damaged COP		
Diagnostic Aids:	The DTC P0357 only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set the DTC P0357. The DTC P0307 does not set for a coil primary circuit malfunction. The DTC P0357 may set with or without the DTC P0307, however the DTC P0357 sets first. When this DTC is set, the PCM enters failure mode effects management (FMEM) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation, do not attempt to diagnose the injector with this DTC present. If a primary coil is damaged due to a harness short to ground the PCM will not be damaged. Do not replace the PCM without verifying the coil driver functionality.		

	Use the 12 volt non-powered test lamp to verify VPWR voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P0358 - Ignition Coil H Primary Control Circuit/Open

Description:	This DTC sets when the PCM does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module PCM.		
Possible Causes:	• VPWR circuit open • VPWR circuit short to ground • COP8 circuit open • COP8 circuit short to voltage • COP8 circuit short to ground • Damaged COP		
Diagnostic Aids:	The DTC P0358 only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set the DTC P0358. The DTC P0308 does not set for a coil primary circuit malfunction. The DTC P0358 may set with or without the DTC P0308, however the DTC P0358 sets first. When this DTC is set, the PCM enters failure mode effects management (FMEM) which shuts down the injector for the associated cylinder in order to protect the catalytic converter. This is normal operation, do not attempt to diagnose the injector with this DTC present. If a primary coil is damaged due to a harness short to ground the PCM will not be damaged. Do not replace the PCM without verifying the coil driver functionality. Use the 12 volt non-powered test lamp to verify VPWR voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P0365 - Camshaft Position Sensor B Circuit (Bank 1)

Description:	This DTC sets when the CMP11 (6.2L) or CMP12 (all others) circuit signal cannot be detected. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• CMP11 circuit open (6.2L) • CMP12 circuit open (all others) • CMP11 circuit short to ground (6.2L) • CMP12 circuit short to ground (all others) • CMP11 circuit short to voltage (6.2L) • CMP12 circuit short to voltage (all others) • SIGRTN circuit open • CMP11 circuit shorted to other CMP circuits (6.2L) • CMP12 circuit shorted to other CMP circuits (all others) • Camshaft timing incorrectly set • Camshaft position sensor trigger wheel out of alignment • Damaged camshaft position bank 1 sensor 1 (CMP11) shielding (6.2L) • Damaged camshaft position bank 1 sensor 2 (CMP12) shielding (all others) • CMP12 sensor incorrectly installed (6.2L) • CMP12 sensor incorrectly installed (all others)		

	• Damaged mechanical vacuum pump (F-150 2.7L, Transit 3.5L) • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged CMP11 sensor (6.2L) • Damaged CMP12 sensor (all others)		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. For F-150 2.7L and Transit 3.5L, check for a camshaft position sensor trigger wheel alignment concern and a damaged mechanical vacuum pump. Make sure the mechanical vacuum pump oil feed hole is not restricted. Repair as necessary. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0366 - Camshaft Position Sensor B Circuit Range/Performance (Bank 1)

Description:	This DTC sets when the CMP12 circuit has a noisy signal. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged camshaft phaser and sprocket • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged camshaft position bank 1 sensor 2 (CMP12) shielding		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0369 - Camshaft Position Sensor B Circuit Intermittent (Bank 1)

Description:	This DTC sets when the CMP11 (6.2L) or CMP12 (all others) circuit signal is intermittent. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	- Intermittent open circuit - Intermittent short circuit - Camshaft timing incorrectly set - Camshaft position sensor trigger wheel out of alignment - Damaged camshaft position bank 1 sensor 1 (CMP11) shielding (6.2L) - Damaged camshaft position bank 1 sensor 2 (CMP12) shielding (all others) - Incorrect harness connections - Corrosion - Damaged mechanical vacuum pump (F-150 2.7L, Transit 3.5L) - Continuous oil flow to the VCT piston chamber		

	• Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged CMP11 sensor (6.2L) • Damaged CMP12 sensor (all others)		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. For F-150 2.7L and Transit 3.5L, check for a camshaft position sensor trigger wheel alignment concern and a damaged mechanical vacuum pump. Make sure the mechanical vacuum pump oil feed hole is not restricted. Repair as necessary. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0390 - Camshaft Position Sensor B Circuit (Bank 2)

Description:	This DTC sets when the CMP21 (6.2L) or CMP22 (all others) circuit signal can not be detected. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• CMP21 circuit open (6.2L) • CMP22 circuit open (all others) • CMP21 circuit short to ground (6.2L) • CMP22 circuit short to ground (all others) • CMP21 circuit short to voltage (6.2L) • CMP22 circuit short to voltage (all others) • SIGRTN circuit open • CMP21 circuit shorted to other CMP circuits (6.2L) • CMP22 circuit shorted to other CMP circuits (all others) • Camshaft timing incorrectly set • Camshaft position sensor trigger wheel out of alignment • Damaged camshaft position bank 2 sensor 1 (CMP21) shielding (6.2L) • Damaged camshaft position bank 2 sensor 2 (CMP22) shielding (all others) • CMP21 sensor incorrectly installed (6.2L) • CMP22 sensor incorrectly installed (all others) • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged CMP21 sensor (6.2L) • Damaged CMP22 sensor (all others)		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0391 - Camshaft Position Sensor B Circuit Range/Performance (Bank 2)

Description:	This DTC sets when the CMP22 circuit has a noisy signal. For additional camshaft position (CMP) sensor
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	location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• Radio frequency interference or electromagnetic interference • Damaged camshaft phaser and sprocket • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged camshaft position bank 2 sensor 2 (CMP) shielding		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0394 - Camshaft Position Sensor B Circuit Intermittent (Bank 2)

Description:	This DTC sets when the CMP21 (6.2L) or CMP22 (all others) circuit signal is intermittent. For additional camshaft position (CMP) sensor location information, refer to Section 1, Engine Control Components .		
Possible Causes:	• Intermittent open circuit • Intermittent short circuit • Camshaft timing incorrectly set • Camshaft position sensor trigger wheel out of alignment • Damaged camshaft position bank 2 sensor 1 (CMP21) shielding (6.2L) • Damaged camshaft position bank 2 sensor 2 (CMP22) shielding (all others) • Incorrect harness connections • Corrosion • Continuous oil flow to the VCT piston chamber • Erratic camshaft position due to low oil pressure • Oil flow restriction in the oil passages or the VCT valve body • Damaged CMP21 sensor (6.2L) • Damaged CMP22 sensor (all others)		
Diagnostic Aids:	Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, to check the engine timing and VCT phasers.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DR .		

P0400 - EGR A Flow

Description:	The exhaust gas recirculation (EGR) system is monitored once per drive cycle at high and low load conditions. This DTC sets when a concern is detected by PCM calculations indicating the EGR flow is less or greater than expected.		
Possible Causes:	• EGR valve stuck open or closed • EGR connector not seated correctly		

	• VPWR circuit open • EGRMC circuit open • EGRMC circuit short to voltage • EGRMC circuit short to ground • Vacuum signal to manifold absolute pressure (MAP) sensor restricted or leaking • Mass airflow (MAF) sensor signal erroneous • Carbon build up in the EGR valve seat area • Damaged EGR valve		
Diagnostic Aids:	The following sensors input data to the PCM for correct operation of the EGR system: engine coolant temperature (ECT), crankshaft position (CKP), intake air temperature (IAT), MAF, throttle position (TP), MAP and vehicle speed sensor (VSS). Diagnose any DTC relating to these sensors prior to addressing this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KD .		

P0401 - EGR A Flow Insufficient Detected

Description:	The exhaust gas recirculation (EGR) system is monitored during steady state driving conditions while the EGR is commanded on. This DTC sets when the signal from the differential pressure feedback EGR sensor indicates that EGR flow is less than the desired minimum.		
Possible Causes:	• EGR flow path restricted • VREF circuit open • SIGRTN circuit open • Differential pressure feedback EGR sensor downstream hose is off or restricted • Differential pressure feedback EGR sensor hoses are both off • Differential pressure feedback EGR sensor hoses are reversed • Damaged EGR orifice tube		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HE .		

P0402 - EGR A Flow Excessive Detected

Description:	The exhaust gas recirculation (EGR) system is monitored for undesired EGR flow during idle. The EGR monitor looks at the differential pressure feedback EGR (DPFE) signal at idle and compares it to the stored signal measured during ignition ON, engine OFF. This DTC sets when the signal at idle is greater than at ignition ON, engine OFF by a calibrated amount.			
Possible Causes:	• Restricted EGR tube • Slow responding differential pressure feedback EGR sensor • Damaged differential pressure feedback EGR sensor			
Diagnostic Aids:	A DPFEGR PID reading that is greater at idle than during KOEO by 0.5 volt or a rough engine idle may indicate a concern.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test HE .		

P0403 - EGR A Control Circuit/Open

Description:	The exhaust gas recirculation (EGR) system is continuously monitored to check the four electric EGR motor coils, circuits, and the PCM for opens, shorts to voltage and ground. If a concern is detected, the EGR system is disabled and additional monitoring is suspended for the remainder of the drive until the next drive cycle.		
Possible Causes:	• Electric EGR stepper motor windings open • Electric EGR connector not seated correctly • EGRMC circuit open • EGRMC circuit short to voltage • EGRMC circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KD .		

P0404 - EGR A Control Circuit Range/Performance

Description:	This DTC sets when the exhaust gas recirculation (EGR) valve is at a position other than commanded.		
Possible Causes:	• EGRVCL circuit open • EGRVCH circuit open • EGRVCL and EGRVCH circuits are cross wired • EGRVCL and EGRVCH circuits are shorted together • Debris restricting the EGR valve movement • Binding or stuck EGR valve • Damaged EGR valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KD .		

P0405 - EGR Sensor A Circuit Low

Description:	The exhaust gas recirculation (EGR) monitor checks the EGR valve position sensor signal to the PCM for low voltage. This DTC sets when the average voltage to the PCM drops to a voltage less than the minimum calibrated value.		
Possible Causes:	• Damaged EGR valve • VREF circuit open • SIGRTN circuit open • EGRVP circuit open • EGRVP circuit short to voltage • EGRVP circuit short to ground		

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

P0406 - EGR Sensor A Circuit High

Description:	The exhaust gas recirculation (EGR) monitor checks the EGR valve position sensor signal to the PCM for high voltage. This DTC sets when the average voltage to the PCM exceeds the maximum calibrated value.		
Possible Causes:	• Damaged EGR valve • VREF circuit open • SIGRTN circuit open • EGRVP circuit open • EGRVP circuit short to voltage • EGRVP circuit short to ground		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test KD .	
		Continuous Memory	

P041B - EGR Temperature Sensor B Circuit Range/Performance

Description:	This DTC sets when the exhaust gas recirculation temperature bank 1, sensor 2 (EGRT12) temperature is less than or 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:	• Damaged EGRT12 sensor		
Diagnostic Aids:	Diagnose any engine coolant temperature (ECT) or intake air temperature 2 (IAT2) sensor related concerns before diagnosing this DTC.		
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test DS .	
		Continuous Memory	

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 • Exhaust gas recirculation (EGR) cooler system concern • Damaged EGRT12 sensor		

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

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 • SIGRTN circuit open • Damaged EGRT12 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DS .		

P0420 - Catalyst System Efficiency Below Threshold (Bank 1)

Description:	This DTC sets when the bank 1 catalyst system efficiency is below the acceptable threshold.		
Possible Causes:	• Damaged heated oxygen sensor (HO2S) • Exhaust leaks • Damaged exhaust manifold • Damaged catalytic converter • Oil contamination • Cylinder misfiring • Downstream HO2S wires incorrectly connected • Damaged exhaust system pipe • Damaged muffler and tailpipe assembly • Leaking fuel injector • Oil contamination of the catalyst • Damaged turbocharger • Base engine concerns		
Diagnostic Aids:	Under normal closed loop fuel conditions, high efficiency catalysts have oxygen storage capability. As catalyst efficiency deteriorates, its ability to store oxygen declines. Refer to Section 1, Catalyst Efficiency Monitor, for additional information. Diagnose any base engine concerns. Refer to the Workshop Manual Section 303-00, Engine System.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HF .		

P042E - EGR A Control Stuck Open

Description:	This DTC sets when the exhaust gas recirculation (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:	• EGRVCL circuit open • EGRVCH circuit open • EGRVCL and EGRVCH circuits are cross wired • EGRVCL and EGRVCH circuits are shorted together • Debris restricting the EGR valve movement • Binding or stuck EGR valve • Damaged EGR valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KD .		

P042F - EGR A Control Stuck Closed

Description:	This DTC sets when the exhaust gas recirculation (EGR) setpoint is more than a specified threshold, the actual EGR position is less than a specified threshold, and the EGR control limit is more than a specified limit.		
Possible Causes:	• EGRVCL circuit open • EGRVCH circuit open • EGRVCL and EGRVCH circuits are cross wired • EGRVCL and EGRVCH circuits are shorted together • Debris restricting the EGR valve movement • Binding or stuck EGR valve • Damaged EGR valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KD .		

P0430 - Catalyst System Efficiency Below Threshold (Bank 2)

Description:	This DTC sets when the bank 2 catalyst system efficiency is below the acceptable threshold.		
Possible Causes:	• Damaged heated oxygen sensor (HO2S) • Exhaust leaks • Damaged exhaust manifold • Damaged catalytic converter • Oil contamination • Cylinder misfiring • Downstream HO2S wires incorrectly connected • Damaged exhaust system pipe • Damaged muffler and tailpipe assembly		

	- Leaking fuel injector - Oil contamination of the catalyst - Damaged turbocharger - Base engine concerns		
Diagnostic Aids:	Under normal closed loop fuel conditions, high efficiency catalysts have oxygen storage capability. As catalyst efficiency deteriorates, its ability to store oxygen declines. Refer to Section 1, Catalyst Efficiency Monitor, for additional information. Diagnose any base engine concerns. Refer to the Workshop Manual Section 303-00, Engine System.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HF .		

P043E - EVAP System Leak Detection Reference Orifice Low Flow

Description:	This DTC sets when an evaporative emission (EVAP) leak detection control module internal concern is present.		
Possible Causes:	Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P043F - EVAP System Leak Detection Reference Orifice High Flow

Description:	This DTC sets when an evaporative emission (EVAP) leak detection control module internal concern is present.		
Possible Causes:	Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0442 - EVAP System Leak Detected (Small Leak)

Description:	This DTC sets when a small fuel vapor leak is detected by the EVAP running loss monitor test.		
Possible Causes:	- Aftermarket EVAP hardware that does not conform to the required specifications - Small holes or cuts in the fuel vapor hoses or tubes - EVAP canister vent valve stays partially open on closed command - Damaged, missing or loosely installed fuel filler cap (if equipped) - Capless fuel tank filler pipe damaged or not sealed correctly (if equipped) - Loose fuel vapor hose or tube connections to the EVAP system components		

	EVAP system component seals leaking at or near the EVAP purge valve, fuel tank pressure (FTP) sensor, EVAP canister vent valve, fuel vapor control valve tube assembly or fuel vapor vent valve assembly		
Diagnostic Aids:	Check for a missing fuel filler cap or the integrity of the cap (if equipped). Verify the capless fuel tank filler pipe is sealed correctly (if equipped). Install and remove the supplemental fueling adapter five times in the capless fuel tank filler pipe to clear debris on the seal. Refer to the Owner Literature for the location of the supplemental fueling adapter in the vehicle. Check for loose or damaged vapor hoses. Visually inspect the EVAP canister inlet port, EVAP canister vent valve filter, and canister vent hose assembly for contamination or debris.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0443 - EVAP System Purge Control Valve A Circuit

Description:	This DTC sets when the signal moves outside the minimum or maximum limit for the commanded state.		
Possible Causes:	- VPWR circuit open - EVAPCP circuit open - EVAPCP circuit short to ground - EVAPCP circuit short to voltage - Damaged EVAP purge valve		
Diagnostic Aids:	To verify normal function, monitor the EVMV PID or EVAPCP PID and the signal voltage (PCM control side). With the valve closed, the EVMV indicates 0 mA (0% duty cycle for EVAPCP) and voltage approximately equal to battery voltage. When the valve is commanded fully open, EVMV indicates 1,000 mA (100% duty cycle for EVAPCP) and a voltage drop of 3 volts minimum is normal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0446 - EVAP System Vent Control Circuit

Description:	This DTC sets when the signal moves outside the minimum or maximum allowable calibrated parameters for a specified EVAP canister vent valve duty cycle by PCM command.		
Possible Causes:	- VPWR circuit open - KAPWR circuit open - CANV circuit open - CANV circuit short to ground - CANV circuit short to voltage - CANV circuit short to KAPWR - Damaged EVAP canister vent valve		
Diagnostic Aids:	To verify normal function, monitor the EVAP canister vent valve signal PID EVAPCV and the signal voltage (PCM control side). With the valve open, EVAPCV indicates 0% duty cycle and a voltage approximately equal to battery voltage. When the valve is commanded fully closed, EVAPCV indicates 100% duty cycle, and a minimum voltage drop of 4 volts is normal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P044C - EGR Sensor C Circuit Low

Description:	The exhaust gas recirculation (EGR) monitor checks the differential pressure feedback EGR sensor signal to the PCM for low voltage. This DTC sets when the average voltage to the PCM drops to a voltage less than the minimum calibrated value.		
Possible Causes:	• VREF circuit open • SIGRTN circuit open • DPFE circuit open • DPFE circuit short to voltage • DPFE circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HE .		

P044D - EGR Sensor C Circuit High

Description:	The exhaust gas recirculation (EGR) monitor checks the differential pressure feedback EGR sensor signal to the PCM for high voltage. This DTC sets when the average voltage to the PCM exceeds the maximum calibrated value.		
Possible Causes:	• VREF circuit open • SIGRTN circuit open • DPFE circuit open • DPFE circuit short to voltage • DPFE circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HE .		

P0451 - EVAP System Pressure Sensor / Switch A Circuit Range / Performance

Description:	This DTC sets when a fuel tank pressure (FTP) sensor range (offset) concern is detected. The FTP sensor output is offset by greater than 1.7 inches of water or less than -1.7 inches of water.		
Possible Causes:	• FTP circuit intermittent open • FTP circuit intermittent short • FTP sensor intermittent open • FTP sensor intermittent short • Contaminated FTP sensor • Damaged FTP sensor		

Diagnostic Aids:	With the FTP sensor at atmospheric pressure, the FTP PID normally indicates 0 inches of water. Remove the fuel filler cap or, for vehicles with a capless fuel filler pipe, install the supplemental refueling adaptor provided with the vehicle to open the capless fuel tank filler pipe. After installing the supplemental refueling adaptor or removing the fuel filler cap, wait one minute to allow the pressure in the fuel tank to equalize with the ambient air pressure before accessing the PID.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0452 - EVAP System Pressure Sensor / Switch A Circuit Low

Description:	This DTC sets when the fuel tank pressure (FTP) sensor signal average drops below a minimum allowable calibrated parameter.		
Possible Causes:	• Contamination internal to the FTP sensor connector • FTP circuit open • VREF circuit open • FTP circuit short to ground • FTP circuit short to SIGRTN • Damaged FTP sensor		
Diagnostic Aids:	An FTP voltage PID reading less than 0.22 volt in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0453 - EVAP System Pressure Sensor / Switch A Circuit High

Description:	This DTC sets when the fuel tank pressure (FTP) sensor signal average jumps above a minimum allowable calibrated parameter.		
Possible Causes:	• Contamination internal to the FTP sensor connector • FTP circuit open • FTP circuit short to voltage • VREF circuit short to voltage • SIGRTN circuit open • Damaged FTP sensor		
Diagnostic Aids:	An FTP voltage PID reading greater than 4.85 volts with the ignition ON, engine OFF or with the ignition ON, engine running, indicates a concern is present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0454 - EVAP System Pressure Sensor / Switch A Circuit Intermittent

Description:	This DTC sets when the fuel tank pressure changes greater than 14 inches of water in 0.10 seconds.		
Possible			

Causes:	• FTP circuit intermittent open • FTP circuit intermittent short • FTP sensor intermittent open • FTP sensor intermittent short • Contaminated FTP sensor • Damaged FTP sensor		
Diagnostic Aids:	Monitor the FTP PID and note if it changes from greater than 15 inches of water to less than minus (-) 15 inches of water often in 1 minute.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0455 - EVAP System Leak Detected (Large Leak)

Description:	The PCM monitors the complete evaporative emission (EVAP) control system for no purge flow, the presence of a large fuel vapor leak, or multiple small fuel vapor leaks. This DTC sets when no purge flow, which is attributed to fuel vapor restrictions, a large fuel vapor leak, or multiple fuel vapor leaks are detected by the EVAP running loss monitor test with the engine running, but not at idle.		
Possible Causes:	• Damaged, missing or loosely installed fuel filler cap (if equipped) • Aftermarket EVAP hardware that does not conform to the required specifications • Disconnected or cracked fuel EVAP canister tube, EVAP canister purge outlet tube, or EVAP return tube • EVAP purge valve stuck closed • Slow responding EVAP purge valve • Capless fuel tank filler pipe damaged or not sealed correctly (if equipped) • Restrictions in the fuel vapor hoses or tubes • Loose fuel vapor hose or tube connections to the EVAP system components • EVAP canister vent valve stuck open • Damaged fuel tank pressure (FTP) sensor • Damaged EVAP canister		
Diagnostic Aids:	Check for audible vacuum noise or significant fuel odor in the engine compartment or near the EVAP canister and fuel tank. Verify the capless fuel tank filler pipe is sealed correctly. Install and remove the supplemental fueling adapter five times in the capless fuel tank filler pipe to clear debris on the seal. Refer to the Owner Literature for the location of the supplemental fueling adapter in the vehicle.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0456 - EVAP System Leak Detected (Very Small Leak)

Description:	This DTC sets when a very small fuel vapor leak is detected by the engine off natural vacuum (EONV) leak check monitor. Refer to Section 1, Evaporative Emission (EVAP) Leak Check Monitor , Engine Off Natural Vacuum (EONV) Leak Check Monitor for additional information.		
Possible Causes:	• Very small holes or cuts in the fuel vapor hoses or tubes • Loose fuel vapor hose or tube connections to the EVAP system components • EVAP system component seals leaking		
Diagnostic Aids:	Check for a missing fuel filler cap or the integrity of the cap (if equipped). Verify the capless fuel tank filler pipe is sealed correctly (if equipped). Install and remove the supplemental fueling adapter five times in the capless fuel tank filler pipe to clear debris on the seal. Refer to the Owner Literature for the location of the		

	supplemental fueling adapter in the vehicle. Check for loose or damaged vapor hoses. Visually inspect the EVAP canister inlet port, EVAP canister vent valve filter, and EVAP canister vent hose assembly for contamination or debris.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

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

Description:	The PCM continuously monitors the fuel level and retains the last updated value prior to the ignition switch being placed in the OFF position. After the ignition switch is placed in the ON position a new fuel level is taken and compared to the level recorded at ignition OFF. If the fuel level has increased, a flag is set in the PCM indicating the vehicle was refueled. This DTC sets when the evaporative emission (EVAP) monitor detects a gross leak while the refueling flag is set and a loose fuel filler cap (if equipped) or an incorrectly sealed capless fuel tank filler pipe (if equipped) is suspected. On most vehicles, when the DTC sets, a message on the instrument panel cluster (IPC) displays to instruct the driver to check the fuel cap or capless fuel tank filler pipe (if equipped).		
Possible Causes:	• Damaged, missing, or loosely installed fuel filler cap (if equipped) • Capless fuel tank filler pipe damaged or not sealed correctly (if equipped)		
Diagnostic Aids:	Check for a missing fuel filler cap or the integrity of the cap (if equipped). Verify the capless fuel tank filler pipe is sealed correctly (if equipped). Install and remove the supplemental fueling adapter five times in the capless fuel tank filler pipe to clear debris on the seal. Refer to the Owner Literature for the location of the supplemental fueling adapter in the vehicle. If OK, clear the continuous memory DTCs and test the system for correct operation.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0460 - Fuel Level Sensor A Circuit

Description:	The PCM calculates the amount of fuel used during operation. This DTC sets when the FLI signal does not change or does not correspond with the calculated fuel usage. For vehicles with a dual container (saddle type) fuel tank, either fuel level sensor may set this DTC.		
Possible Causes:	• Stuck float arm • Fuel level is always greater than 95% due to refueling patterns • Fuel level is always less than 5% due to refueling patterns • Fuel level is always at the same level between 3% and 97% full due to refueling patterns • Fuel pump (FP) module concern • Damaged instrument panel cluster (IPC)		
Diagnostic Aids:	Check with the customer for driving and fueling habits that would keep the fuel level at approximately the same value. Monitor the FLI PIDs while attempting to move the fuel level float by adding or removing fuel as necessary.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0461 - Fuel Level Sensor A Circuit Range/Performance

Description:	This DTC sets when the FLI signal repeatedly moves in and out of range, exceeding the minimum or maximum allowable calibrated parameters for a specified fuel fill percentage in the fuel tank. For vehicles with a dual container (saddle type) fuel tank, either fuel level sensor may set this DTC.		
Possible Causes:			
Diagnostic Aids:	Verify aftermarket equipment does not generate radio frequency interference or electromagnetic interference which may cause noisy FLI input signal.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0462 - Fuel Level Sensor A Circuit Low

Description:	This DTC sets when the FLI signal is less than the minimum allowable calibrated parameter for a specified fuel fill percentage in the fuel tank.		
Possible Causes:	• Empty fuel tank • Incorrectly installed fuel gauge • Fuel pump (FP) module concern • Damaged instrument panel cluster (IPC) • Damaged fuel gauge		
Diagnostic Aids:	Monitor the FLI PIDs with the ignition ON, engine running. A concern is present if the FLI percentage PID is at 25% fill and the FLI voltage PIDs is less than 0.90 volt with a non-matching fuel gauge or the FLI percentage PIDs is at 75% fill and the FLI voltage PIDs is greater than 2.45 volts with a non-matching fuel gauge.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P0463 - Fuel Level Sensor A Circuit High

Description:	This DTC sets when the FLI signal is greater than the maximum allowable calibrated parameter for a specified fuel fill percentage in the fuel tank.		
Possible Causes:	• Overfilled fuel tank • Fuel pump (FP) module concern • Incorrectly installed fuel gauge • Damaged instrument panel cluster (IPC) • Damaged fuel gauge		
Diagnostic Aids:	Monitor the FLI PIDs in ignition ON, engine running. A concern is present if the FLI percentage PID is at 25% fill and the FLI voltage PID is less than 0.90 volt with a non-matching fuel gauge or the FLI percentage PID is at 75% fill and the FLI voltage PID is greater than 2.45 volts with a non-matching fuel gauge.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P046D - EGR Sensor A Circuit Intermittent/Erratic

Description:	The exhaust gas recirculation (EGR) monitor checks the EGR valve position signal to the PCM for high and low voltage. This DTC sets when the average voltage to the PCM exceeds the maximum or minimum calibrated value.		
Possible Causes:	• Damaged EGR valve • VREF circuit open • SIGRTN circuit open • EGRVP circuit open • EGRVP circuit short to voltage • EGRVP circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KD .		

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 exhaust gas recirculation (EGR) orifice tube • Damaged EP sensor • Incorrectly installed EP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DT .		

P0472 - Exhaust Pressure Sensor A Circuit Low

Description:	This DTC sets when the exhaust pressure (EP) sensor signal is less than the PCM self test minimum.		
Possible Causes:	• VREF circuit open • EP circuit open • EP circuit short to ground • Damaged EP sensor • Incorrect harness connection		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DT .		

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:	• SIGRTN circuit open • EP circuit open • EP circuit short to voltage • Damaged EP sensor • Incorrect harness connection		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DT .		

P0480 - Fan 1 Control Circuit**For Relay Controlled Electric Cooling Fan**

Description:	This DTC sets when the PCM grounds the LFC circuit and excessive current draw is detected on the LFC circuit; or with the LFC circuit not grounded by the PCM the voltage is not detected on the LFC circuit. The PCM expects to detect VPWR voltage coming through the low speed fan control (FC) relay coil to the LFC circuit.
Possible Causes:	• LFC circuit open • LFC circuit short • VPWR circuit to the LFC relay open • Damaged LFC relay
Diagnostic Aids:	When the LFC_F PID reads YES, a concern is present. A short to voltage can only be detected when the PCM is grounding the LFC circuit.

For Variable Speed Electric Cooling Fan

Description:	This DTC sets if the PCM detects the voltage on the FCV circuit is not within the expected range.
Possible Causes:	• FCV circuit open • FCV circuit short • B+ or ground circuit concern to cooling fan • VPWR open to cooling fan (if applicable) • Damaged cooling fan module
Diagnostic Aids:	

For Cooling Fan Clutch

Description:	This DTC sets if the PCM detects the voltage on the FCV circuit is not within the expected range.
Possible Causes:	• FCV circuit open • FCV circuit short • Damaged cooling fan clutch solenoid
Diagnostic	

Aids:				
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
Continental, EcoSport, Edge, Expedition, F-150, Flex, Fusion, KA, MKZ, Mustang, Nautilus, Navigator, Ranger 2.5L, Transit		GO to Pinpoint Test KF .		
Aviator, Corsair, Escape/Kuga, Explorer, Ford GT, Transit Connect		GO to Pinpoint Test KN .		
E-Series, F-Series Super Duty, Motorhome / Stripped Chassis / Step Van, Ranger 2.3L		GO to Pinpoint Test HV .		

P0481 - Fan 2 Control Circuit

Description:	This DTC sets when the HFC output is commanded on (grounded) and excessive current draw is detected on the HFC circuit; or when the HFC circuit is commanded off and voltage is not detected on the HFC circuit. The PCM expects to detect VPWR voltage through the high speed fan control (FC) relay coil to the HFC circuit.			
Possible Causes:	• HFC circuit open • HFC circuit short • VPWR circuit to the HFC relay open • Damaged HFC relay			
Diagnostic Aids:	When the HFC_F PID reads YES, a concern is present. An open circuit or short to ground can only be detected when the PCM is not grounding the HFC circuit. A short to voltage can only be detected when the PCM is grounding the HFC circuit.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test KF .		

P0482 - Fan 3 Control Circuit

Description:	This DTC sets when the MFC output is commanded on (grounded) and excessive current draw is detected on the MFC circuit; or when the MFC circuit is commanded off and voltage is not detected on the MFC circuit. The PCM expects to detect VPWR voltage through the medium speed fan control (FC) relay coil to the MFC circuit.		
Possible Causes:	• MFC circuit open • MFC circuit short • VPWR circuit to the MFC relay open • Damaged MFC relay		
Diagnostic Aids:	When the MFC_F PID reads YES, a concern is present. An open circuit or short to ground can only be detected when the PCM is not grounding the MFC circuit. A short to voltage can only be detected when the PCM is grounding the MFC circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KF .		

P0496 - EVAP System High Purge Flow

Description:	This DTC sets when the evaporative emission (EVAP) running loss monitor detects excessive fuel tank vacuum with the engine running, but not at idle.		
Possible Causes:	• EVAP purge valve stuck open • Restrictions or kinks in the EVAP canister tube or EVAP canister purge outlet tube between the fuel tank, the EVAP purge valve and the EVAP canister • Fuel filler cap stuck closed, preventing vacuum relief (if equipped) • Capless fuel tank filler pipe damaged, preventing vacuum relief (if equipped) • Contaminated fuel vapor elbow on the EVAP canister • Restricted EVAP canister • EVAP canister vent valve stuck partially or fully closed • Restricted EVAP canister vent valve filter • VREF circuit open • Damaged FTP sensor		
Diagnostic Aids:	Visually inspect the EVAP canister inlet port, EVAP canister vent valve filter, and EVAP canister vent hose assembly for contamination or debris. Check EVAP purge valve for vacuum leak.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P04DB - Crankcase Ventilation System Disconnected

Description:	This DTC sets when the crankcase pressure sensor is disconnected.		
Possible Causes:	• Disconnected hose from crankcase to one side of the crankcase pressure sensor		

		• Disconnected hose from intake manifold to one side of the crankcase pressure sensor • Damaged or pinched PCV hose o-ring seal • Damaged oil level indicator o-ring seal • Incorrectly installed oil level indicator • Incorrectly installed oil cap • Disconnected or damaged vacuum lines between the engine and any vacuum operated components	
Diagnostic Aids:		Verify the integrity of the PCV system.	
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test HG .	Continuous Memory

P04EA - EVAP System Small Leak Detected - Fuel Tank Side

Description:	This DTC sets when a fuel vapor leak from an opening as small as 1.016 mm (0.040 in) is detected between the capless fuel filler pipe and the fuel tank isolation valve.		
Possible Causes:	• Small holes or cuts in the fuel vapor hoses or tubes between the capless fuel filler pipe and the fuel tank isolation valve • Damaged capless fuel tank filler pipe • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test HX .	Continuous Memory

P04EB - EVAP System Small Leak Detected - Fresh Air Side

Description:	This DTC sets when a fuel vapor leak from an opening as small as 1.016 mm (0.040 in) is detected between the evaporative emission (EVAP) leak detection control module and the fuel tank isolation valve.		
Possible Causes:	• Small holes or cuts in the fuel vapor hoses or tubes between the EVAP leak detection control module and the fuel tank isolation valve • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test HX .	Continuous Memory

P04ED - EVAP System Large Leak Detected - Fresh Air Side

Description:	The evaporative emission (EVAP) system is monitored for no purge flow, the presence of a large fuel vapor leak, or multiple small fuel vapor leaks between the EVAP leak detection control module and the fuel		
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	tank isolation valve. This DTC sets when no purge flow, which is attributed to fuel vapor restrictions, a large fuel vapor leak, or multiple fuel vapor leaks are detected by the EVAP monitor.		
Possible Causes:	• Restriction in the fuel vapor vent hose • EVAP purge valve stuck closed • Incorrect fuel vapor hose or tube connections to the EVAP system components • Damaged EVAP leak detection control module • Damaged EVAP canister		
Diagnostic Aids:	Check for audible vacuum noise or significant fuel odor in the engine compartment or near the EVAP canister.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P04EE - EVAP System Very Small Leak Detected - Fuel Tank Side

Description:	This DTC sets when a fuel vapor leak from an opening as small as 0.508 mm (0.020 inch) is detected between the capless fuel filler pipe and the fuel tank isolation valve.		
Possible Causes:	• Very small holes or cuts in the fuel vapor hoses or tubes between the capless fuel filler pipe and the fuel tank isolation valve • Damaged capless fuel tank filler pipe • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P04EF - EVAP System Very Small Leak Detected - Fresh Air Side

Description:	This DTC sets when a fuel vapor leak from an opening as small as 0.508 mm (0.020 inch) is detected between the evaporative emission (EVAP) leak detection control module and the fuel tank isolation valve.		
Possible Causes:	• Very small holes or cuts in the fuel vapor hoses or tubes between the EVAP leak detection control module and the fuel tank isolation valve • Damaged EVAP purge valve • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P04F0 - EVAP System High Load Purge Line A Performance

Description:	The EVAP check valve test is performed during minimal boost conditions, once per drive cycle, when entry conditions are met. This DTC sets when the fuel tank pressure exceeds a calibrated amount within a specified amount of time during the test (single path check valve), or when the fuel tank vacuum is less than a calibrated amount within a specified amount of time or when the fuel tank pressure exceeds a calibrated amount within a specified amount of time during the test (dual path check valve).		
Possible Causes:	• Incorrect EVAP system hose or line connections • Restricted EVAP ejector connections at the intake air system • Stuck open EVAP check valve • Stuck closed EVAP check valve • Damaged EVAP ejector • Damaged EVAP check valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P04FA - EGR A Control Temperature Too High

Description:	This DTC sets when the exhaust gas recirculation (EGR) valve position and speed of position is greater than a specified limit.		
Possible Causes:	• Damaged EGR valve • VREF circuit open • SIGRTN circuit open • EGRVP circuit open • EGRVP circuit short to voltage • EGRVP circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KD .		

P0500 - Vehicle Speed Sensor A

Description:	This DTC sets when an error in the vehicle speed information is detected. Vehicle speed data is received from either the VSS or the anti-lock brake system (ABS) module. If the engine RPM is above the torque converter stall speed (automatic transmission) and the engine load is high, it can be inferred that the vehicle must be moving. If there is insufficient vehicle speed data input to the PCM, a concern is indicated and this DTC sets. On most vehicle applications the malfunction indicator lamp (MIL) illuminates when this DTC sets.		
Possible Causes:	• VSS+ circuit open (VR type) • VSS- circuit open (VR type) • VSS circuit open (Hall effect type) • VSS circuit short to ground (Hall effect type) • VSS circuit short to voltage (Hall effect type) • Damaged drive mechanism for VSS • Damaged VSS • Damaged wheel speed sensors		

	Damaged wheel speed sensor harness circuits		
Diagnostic Aids:	Monitor the VSS PID while driving the vehicle. This DTC sets when a sudden loss of vehicle speed signal over a period of time is detected. If vehicle speed data is lost, check the source of the vehicle speed input: VSS or ABS.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport, F-650 / F-750, F-Series Super Duty, Fusion, KA, Motorhome / Stripped Chassis / Step Van, Ranger	GO to Pinpoint Test DF .		
Manual Transmission	GO to Pinpoint Test DP .		
Automatic Transmission	The PCM uses information from the ABS module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		

P0503 - Vehicle Speed Sensor A Intermittent/Erratic/High

Description:	This DTC sets when an incorrect or noisy VSS signal is detected. Vehicle speed data is received from either the VSS or the anti-lock brake system (ABS) module.		
Possible Causes:	- Noisy VSS input signal from radio frequency interference or electromagnetic interference external sources, such as ignition components or the charging circuit - Damaged VSS or driven gears - Damaged VSS wiring harness or connectors - Concern in the modules or circuits connected to the VSS circuit - Aftermarket accessories		
Diagnostic Aids:	Monitor the VSS PID while driving the vehicle, and check for intermittent vehicle speed indication. Verify the ignition and charging systems are functioning correctly.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport, F-650 / F-750, F-Series Super Duty, Fusion, KA, Motorhome / Stripped Chassis / Step Van, Ranger	GO to Pinpoint Test DF .		
Manual Transmission	GO to Pinpoint Test DP .		
All others	The PCM uses information from the ABS module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		

P0505 - Idle Control System

Description:	This DTC sets when the desired RPM could not be reached or controlled during the key ON, engine running (KOER), self-test.		
Possible Causes:	• Failure mode effects management (FMEM) condition is present • Intake air restriction • Exhaust restriction • Sludged throttle body • Vacuum leaks • Damaged electronic throttle body (ETB)		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose other DTCs first. If no other DTCs are present, inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTC and carry out the KOER, self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P0506 - Idle Control System - RPM Lower Than Expected

Description:	This DTC sets when the engine idle speed is less than the desired RPM.		
Possible Causes:	• Intake air restriction • Vacuum leaks • Exhaust restriction • Engine mechanical concern • Sludged throttle body • Damaged electronic throttle body (ETB)		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose other DTCs first. If no other DTCs are present, inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTC and carry out the key ON, engine running (KOER), self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P0507 - Idle Control System - RPM Higher Than Expected

Description:	This DTC sets when the engine idle speed is greater than the desired RPM.		
Possible Causes:	• Intake air leak after throttle body • Vacuum leaks • Damaged evaporative emission (EVAP) system • Exhaust gas recirculation (EGR) valve leaks vacuum • Damaged electronic throttle body (ETB)		
Diagnostic	This DTC is informational only and it may be accompanied by other DTCs. Diagnose other DTCs first. If		

Aids:	no other DTCs are present, inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTC and repeat the self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P050A - Cold Start Idle Control System Performance

Description:	This DTC sets when the difference between desired and actual engine speed exceeds the calibrated threshold.		
Possible Causes:	• Intake air restriction • Exhaust restriction • Engine mechanical concern • Damaged or sludged electronic throttle body (ETB) • Vacuum leaks		
Diagnostic Aids:	Disregard the freeze frame data. Freeze frame data does not apply to the cold start monitor. This DTC is informational only and may be accompanied by other DTCs. Diagnose other DTCs first. If no other DTCs are present, inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTCs and verify the engine coolant temperature is below 37.8°C (100°F). Allow the vehicle to soak for 2 to 3 hours if necessary for the engine coolant temperature to fall below 37.8°C (100°F). Start the engine without touching the accelerator pedal and allow the engine to idle for 6 minutes in park. If no DTCs are present and the malfunction indicator lamp (MIL) is not illuminated after idling for 6 minutes, carry out the key ON, engine running (KOER), self-test to confirm that no DTCs are present and the repair is complete.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P050B - Cold Start Ignition Timing Performance

Description:	This DTC sets when the difference between desired and commanded spark timing exceeds the calibrated threshold.		
Possible Causes:	• Intake air restriction • Exhaust restriction • Engine mechanical concern • Damaged or sludged electronic throttle body (ETB) • Vacuum leaks		
Diagnostic Aids:	Disregard the freeze frame data. Freeze frame data does not apply to the cold start monitor. This DTC is informational only and may be accompanied by other DTCs. Diagnose other DTCs first. If no other DTCs are present, inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTCs and verify the engine coolant temperature is below 37.8°C (100°F). Allow the vehicle to soak for 2 to 3 hours if necessary for the engine coolant temperature to fall below 37.8°C (100°F). Start the engine without touching the accelerator pedal and allow the engine to idle for 6 minutes in park. If no DTCs are present and the malfunction indicator lamp (MIL) is not illuminated after idling for 6 minutes, carry out the key ON, engine running (KOER), self-test to confirm that no DTCs are present and the repair is complete.		

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 catalyst warm up temperature during a cold start. The PCM then compares the actual catalyst temperature to the expected catalyst temperature model. The difference between the actual and expected temperatures is a ratio. This DTC sets when this ratio exceeds the calibrated value and the malfunction indicator lamp (MIL) illuminates.		
Possible Causes:	• Intake air restriction • Exhaust restriction • Engine mechanical concern • Damaged or sludged electronic throttle body (ETB) • Vacuum leaks		
Diagnostic Aids:	Disregard the freeze frame data. Freeze frame data does not apply to the cold start monitor. This DTC is informational only and may be accompanied by other DTCs. Diagnose other DTCs first. If no other DTCs are present, inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTCs and verify the engine coolant temperature is below 37.8°C (100°F). Allow the vehicle to soak for 2 to 3 hours if necessary for the engine coolant temperature to fall below 37.8°C (100°F). Start the engine without touching the accelerator pedal and allow the engine to idle for 6 minutes in park. If no DTCs are present and the malfunction indicator lamp (MIL) is not illuminated after idling for 6 minutes, carry out the key ON, engine running (KOER), self-test to confirm that no DTCs are present and the repair is complete.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P051A - Crankcase Pressure Sensor A Circuit

Description:	This DTC sets when the crankcase pressure sensor voltage is greater than or less than a calibrated value.		
Possible Causes:	• CKCP circuit concerns • Damaged crankcase pressure sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HG .		

P051B - Crankcase Pressure Sensor Circuit Range/Performance

Description:	This DTC sets when the crankcase pressure sensor is greater than or less than an expected value for the current operating conditions.
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Possible Causes:	• Crankcase pressure sensor is not within a calibrated range during key ON, engine OFF • Crankcase pressure sensor voltage indicates high pressure • Crankcase pressure sensor voltage indicates high vacuum at low airflow • Leak in the positive crankcase ventilation (PCV) system • Damaged crankcase pressure sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HG .		

P051C - Crankcase Pressure Sensor Circuit Low

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

P051D - Crankcase Pressure Sensor Circuit High

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

P051E - Crankcase Pressure Sensor A Circuit Intermittent/Erratic

Description:	This DTC sets when the crankcase pressure sensor voltage is intermittently above the maximum value or intermittently below the minimum value for a calibrated threshold .		
Possible Causes:	• CKCP circuit concerns • Damaged crankcase pressure sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test HG .
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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 HV .		

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

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-advanced during cold start up. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.		
Possible Causes:	- Camshaft timing incorrectly set - Continuous oil flow to the VCT piston chamber - Variable camshaft timing bank 1 solenoid 1 (VCT11) valve stuck open - Camshaft advance mechanism binding (VCT unit)		
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-retarded during cold start up. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	- Camshaft timing incorrectly set - Continuous oil flow to the VCT piston chamber - Variable camshaft timing bank 1 solenoid 1 (VCT11) valve stuck open - Camshaft advance mechanism binding (VCT unit)		

Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-advanced during cold start up. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.		
Possible Causes:	• Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • variable camshaft timing bank 2 solenoid 1 (VCT21) valve stuck open • Camshaft advance mechanism binding (VCT unit)		
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

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

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-retarded during cold start up. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	• Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Variable camshaft timing bank 2 solenoid 1 (VCT21) valve stuck open • Camshaft advance mechanism binding (VCT unit)		
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P053F - Cold Start Fuel Pressure Performance Bank 1

Description:	The PCM monitors fuel rail pressure to control split injection. This DTC sets when the fuel rail pressure
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	falls outside a calibrated threshold limit for controlling split injection during a cold start.		
Possible Causes:	• Restricted fuel filter • Restricted fuel supply line • Damaged fuel pump assembly • Damaged fuel injection pump		
Diagnostic Aids:	Diagnose any FRP and FVR circuit DTCs first. Various engine driveability symptoms, including no start, hard start, rough idle, and backfiring may occur as a result of this DTC setting. This DTC may be accompanied by other DTCs, particularly P0087, P0088, or P00C6. Freeze frame data is not applicable to the cold start emission reduction monitor. For additional information, refer to Section 1, Cold Start Emission Reduction Monitor.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HP .		

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

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 RB .		

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 RB .		

P0547 - Exhaust Gas Temperature Sensor Circuit (Bank 2 Sensor 1)

Description:	The PCM monitors the operation of the exhaust gas temperature bank 2, sensor 1 (EGT21) to determine if the EGT21 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 EGT21 sensor temperature does not correlate to the modeled temperature of 170°C (338°F).		
Possible Causes:	• Exhaust leaks • Excessive soot build up on EGT21 sensor • Damaged EGT21 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RB .		

P0548 - Exhaust Gas Temperature Sensor Circuit Low (Bank 2 Sensor 1)

Description:	This DTC sets when the exhaust gas temperature bank 2, sensor 1 (EGT21) voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	• EGT21 circuit short to SIGRTN • EGT21 circuit short to ground • Damaged EGT21 sensor		
Diagnostic Aids:	An EGT21_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 RB .		

P0549 - Exhaust Gas Temperature Sensor Circuit High (Bank 2 Sensor 1)

Description:	This DTC sets when the exhaust gas temperature bank 2, sensor 1 (EGT21) voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• EGT21 circuit open • EGT21 circuit short to voltage • Damaged EGT21 sensor		
Diagnostic Aids:	An EGT21_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 RB .		

P054A - Cold Start Exhaust B Camshaft Position Timing Over-Advanced (Bank 1)

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-advanced during cold start up. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.		
Possible Causes:	• Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Variable camshaft timing bank 1 solenoid 2 (VCT12) valve stuck open • Camshaft advance mechanism binding (VCT unit)		
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P054B - Cold Start Exhaust B Camshaft Position Timing Over-Retarded (Bank 1)

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-retarded during cold start up. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	• Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Variable camshaft timing bank 1 solenoid 2 (VCT12) valve stuck open • Camshaft advance mechanism binding (VCT unit)		
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test HK .
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P054C - Cold Start Exhaust B Camshaft Position Timing Over-Advanced (Bank 2)

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-advanced during cold start up. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in an advanced position.		
Possible Causes:	• Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Variable camshaft timing bank 2 solenoid 2 (VCT22) valve stuck open • Camshaft advance mechanism binding (VCT unit)		
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P054D - Cold Start Exhaust B Camshaft Position Timing Over-Retarded (Bank 2)

Description:	This DTC sets when the variable camshaft timing (VCT) position is over-retarded during cold start up. This DTC sets when the camshaft timing exceeds a maximum calibrated value or remains in a retarded position.		
Possible Causes:	• Camshaft timing incorrectly set • Continuous oil flow to the VCT piston chamber • Variable camshaft timing bank 2 solenoid 2 (VCT22) valve stuck open • Camshaft advance mechanism binding (VCT unit)		
Diagnostic Aids:	This DTC is a functional check of the VCT unit. Diagnose any base engine concerns related to the engine oil pressure or engine timing. Refer to the Workshop Manual Section 303-00, Engine System, Oil Pressure Test, to check the engine oil pressure. Refer to the Workshop Manual Section 303-01, Engine, Timing Drive Components, to check the engine timing.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HK .		

P0600 - Serial Communication Link

Description:	This DTC sets when there is an internal PCM communication error.
Possible Causes:	• Aftermarket performance products • Radio frequency interference or electromagnetic interference • Module programming error • Software incompatibility issue • Damaged PCM

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

P0602 - Powertrain Control Module Programming Error

Description:	This DTC sets when there is a programming error within the vehicle identification (VID) block.		
Possible Causes:	• VID data corrupted by the scan tool during VID reprogramming		
Diagnostic Aids:	Program the VID block. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Making Changes to the VID Block. If the PCM does not allow reprogramming of the VID block, reflashing of the PCM is required.		
Application		Key On Engine Off	Key On Engine Running
All		Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.	
			Continuous Memory

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

Description:	This DTC sets when the PCM has experienced an internal memory concern. However, there are external items that can cause this DTC.		
Possible Causes:	• Reprogramming • Battery terminal corrosion • KAPWR to PCM interrupt/open • Incorrect battery connection		
Diagnostic Aids:	If KAPWR is interrupted to the PCM because of a battery or PCM disconnect, this DTC can be generated on the first power-up.		
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test QB .	
			Continuous Memory

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

Description:	This DTC sets when the PCM RAM has been corrupted.		
Possible Causes:	• Module reprogramming • Aftermarket performance products • Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Check for aftermarket performance products. 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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P0605 - Internal Control Module Read Only Memory (ROM) Error

Description:	The PCM ROM has been corrupted.		
Possible Causes:	• An attempt was made to change the calibration • Module programming error • Aftermarket performance products • Damaged PCM		
Diagnostic Aids:	Reprogram the vehicle identification (VID) block. Check for other DTCs or drive symptoms for further action. Check for aftermarket performance products. If it is necessary to install a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the (VID) Block for a Replacement PCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0606 - Control Module Processor

Description:	This DTC sets when there is an internal PCM communication error.		
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. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0607 - Control Module Performance

Description:	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 returns 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. 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 occurs in the PCM.		
Possible Causes:	• Aftermarket performance products • Module programming error • Software incompatibility issue		
Diagnostic Aids:	Verify the PCM is at the latest calibration level.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P060B - Internal Control Module A/D Processing Performance

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

P060C - Internal Control Module Main Processor Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• Aftermarket performance products • Module programming error • Software incompatibility issue • Damaged PCM		
Diagnostic Aids:	Verify the PCM is at the latest calibration level.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P060D - Internal Control Module Accelerator Pedal Position Performance

Description:	This DTC sets when an error occurs in the PCM. This DTC sets when the PCM detects a concern identifying an issue with an accelerator pedal position (APP) sensor signal or with processing the brake pedal sensor input.		
Possible Causes:	• Module programming error • Damaged APP sensor • Damaged PCM		
Diagnostic Aids:	An APP1 or APP2 PID value 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 DK .		

P0610 - Control Module Vehicle Options Error

Description:	This DTC sets when one or more of the PCM VID Block fields were configured incorrectly.		
Possible Causes:	• Module reprogramming • Aftermarket performance products • Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Check for aftermarket performance products. 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.		

P061A - Internal Control Module Torque Performance

Description:	This DTC sets when a calculation error occurs in the PCM.		
Possible Causes:	• Aftermarket performance products • Incorrect tire size • Incorrect axle ratio • Incorrect vehicle identification (VID) block programming • Module programming error		
Diagnostic Aids:	Check for sensor and circuit related DTCs. Do not install a new electronic throttle body (ETB) for this DTC. The presence of this DTC may indicate that the vehicle is operating in failure mode and may experience a loss of power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P061B - Internal Control Module Torque Calculation Performance

Description:	This DTC sets when a calculation error occurs in the PCM.		
Possible Causes:	• Aftermarket performance products • Incorrect tire size • Incorrect axle ratio • Incorrect vehicle identification (VID) block programming • Module programming error		
Diagnostic Aids:	Check for sensor and circuit related DTCs. Do not install a new electronic throttle body (ETB) for this DTC. The presence of this DTC may indicate that the vehicle is operating in failure mode and may experience a loss of power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P061C - Internal Control Module Engine RPM Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• CKP circuit open • CKP circuit short • CKP circuit intermittent • CMP circuit open • CMP circuit short • CMP circuit intermittent • Damaged crankshaft position (CKP) sensor • Damaged camshaft position (CMP) sensor		
Diagnostic Aids:	Verify correct operation of the CKP and CMP sensors and related circuits. The presence of this DTC may indicate that the vehicle is operating in failure mode and may experience a loss of power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P061D - Internal Control Module Engine Air Mass Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• Aftermarket performance products • Software incompatibility issue		
Diagnostic Aids:	An intake air system leak at a hose, line or connection of any intake air system component may cause this DTC to set. Aftermarket modifications to the intake air system may cause this DTC to set. Verify the PCM is at the latest calibration level.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P061E - Internal Control Module Brake Signal Performance**For Fusion, 1.5LFusion,, 2.0LMKZ, 2.0L**

Description:	This DTC sets when the PCM no longer receives a signal from the anti-lock brake system (ABS) module.
Possible Causes:	• Communication error
Diagnostic Aids:	Check for other ABS DTCs or ABS related symptoms. Diagnose all other ABS DTCs or ABS related symptoms first. 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), Programming the VID Block for a Replacement PCM.

For All Others

Description:	This DTC sets when an incorrect brake pedal position (BPP) sensor signal is received by the PCM. This DTC also sets when an internal PCM communication error occurs in the PCM.		
Possible Causes:	• Incorrectly adjusted BPP sensor • Damaged BPP sensor • Damaged PCM		
Diagnostic Aids:	Check for an incorrectly adjusted BPP sensor. Refer to Workshop Manual Section 417-01, Exterior Lighting. 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.		

P061F - Internal Control Module Throttle Actuator Controller Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• Aftermarket performance products • Incorrect tire size • Incorrect axle ratio • Incorrect vehicle identification (VID) block programming • Module programming error		
Diagnostic Aids:	Verify correct operation of the electronic throttle control (ETC) components and related circuits.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P0627 - Fuel Pump A Control Circuit/Open

Description:	The fuel pump control module monitors the fuel pump module and secondary circuits for a concern. If the fuel pump control module detects a concern with the fuel pump module or secondary circuits, the fuel pump control module sends an 80% duty cycle signal on the fuel pump monitor (FPM) circuit to report the
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	concern to the PCM. This DTC sets when the fuel pump control module is still reporting a concern with the fuel pump module or secondary circuits after a calibrated amount of time.		
Possible Causes:	• FPPWR circuit open • FPPWR circuit short to ground • FPRTN circuit open • FPPWR circuit short to voltage • FPRTN circuit short to voltage • Damaged fuel pump assembly • Damaged fuel pump control module		
Diagnostic Aids:	Check for any harness concerns. The fuel pump control module controls the speed of the fuel pump module by supplying a variable voltage to the fuel pump module on the FPPWR circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

P062B - Internal Control Module Fuel Injector Control Performance

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• Aftermarket performance products • Module programming error • Damaged fuel injector		
Diagnostic Aids:	The presence of this DTC may indicate that the vehicle is operating in failure mode and may experience a loss of power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P062C - Internal Control Module Vehicle Speed Performance

Description:	This DTC sets when the PCM does not receive a valid vehicle speed or wheel speed signal.		
Possible Causes:	• Output shaft speed (OSS) sensor concern • Anti-lock brake system (ABS) concern		
Diagnostic Aids:	Diagnose all vehicle communication concerns, ABS DTCs, ABS related DTCs in other modules, TCM DTCs, or TCM related DTCs in other modules, before diagnosing this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P062F - Internal Control Module EEPROM Error

Description:	The PCM read only memory (ROM) has been corrupted.		
Possible			

Causes:	• Aftermarket performance products • An attempt was made to change the calibration • PCM programming error • PCM internal software error • Damaged PCM		
Diagnostic Aids:	Check for other DTCs and diagnose those first. Check for aftermarket performance products. Reprogram or update the calibration. Clear the DTCs and repeat the self-test. If the DTC is retrieved again, carry out the passive anti-theft system (PATS) parameter reset. Clear the DTCs and 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.		

P0630 - VIN Not Programmed Or Incompatible - ECM/PCM

Description:	This DTC sets when the PCM detects various VID data that is out of a specified acceptable range.		
Possible Causes:			
Diagnostic Aids:	The PCM did not receive a valid vehicle identification number (VIN) during reprogramming. Check for all other module DTCs or related symptoms. Diagnose all other module DTCs before diagnosing this DTC. Reprogram the BCM, instrument cluster, and PCM using as built data. 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.		

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:	This DTC sets due to an under voltage condition on the VREF circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P0643 - Sensor Reference Voltage A Circuit High

Description:	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:	This DTC sets due to an over voltage condition on the VREF circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

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.		

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

Description:	The PCM monitors the application specific integrated circuit that controls and monitors the universal heated oxygen sensor bank 1, sensor 1 (HO2S11). This DTC sets when the PCM detects an internal circuit or communication concern.		
Possible Causes:	- Damaged universal HO2S11 wiring - Damaged PCM		
Diagnostic Aids:	Check for other DTCs and diagnose those first. Check for intermittent universal HO2S wiring concerns. Check the universal HO2S wiring between the PCM and the sensor for damage. Check for aftermarket performance products. Reprogram or update the calibration. 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).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

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

Description:	The PCM monitors the application specific integrated circuit that controls and monitors the universal heated oxygen sensor bank 2, sensor 1 (HO2S21). This DTC sets when the PCM detects an internal circuit or communication concern.		
Possible Causes:	- Damaged universal HO2S21 wiring - Damaged PCM		
Diagnostic Aids:	Check for other DTCs and diagnose those first. Check for intermittent universal HO2S wiring concerns. Check the universal HO2S wiring between the PCM and the sensor for damage. Check for aftermarket		

performance products.

Reprogram or update the calibration. 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 \(EEPROM\)](#).

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

P064F - Unauthorized Software/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. Check for aftermarket performance products. 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.		

P0652 - Sensor Reference Voltage B Circuit Low

Description:	This DTC sets when the electronic throttle control reference voltage (ETCREF) circuit is less than VREF minimum.		
Possible Causes:	• ETCREF circuit short to ground • Damaged sensor • Incorrect harness connection		
Diagnostic Aids:	This DTC sets due to an under voltage condition on the ETCREF circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test C .		

P0653 - Sensor Reference Voltage B Circuit High

Description:	This DTC sets when the electronic throttle control reference voltage (ETCREF) circuit is greater than VREF maximum.		
Possible Causes:	• ETCREF circuit short to voltage • Damaged sensor • Incorrect harness connection		
Diagnostic Aids:	This DTC sets due to an over voltage condition on the ETCREF circuit.		

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

P0685 - ECM/PCM Power Relay Control Circuit/Open

Description:	This DTC sets when the ignition switch position run (ISP-R) circuit indicates the ignition is in the OFF, ACC, or LOCK position, and the amount of time the PCM remains powered through the PCM power relay exceeds a predetermined amount of time.		
Possible Causes:	• PCMRC circuit short to ground • Damaged PCM power relay		
Diagnostic Aids:	Ability to communicate with the PCM when the ignition is in the OFF, ACC, or LOCK position indicates a hard fault.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P0686 - ECM/PCM Power Relay Control Circuit Low

Description:	This DTC sets when the ignition switch position run (ISP-R) circuit indicates the ignition is in the OFF, ACC, or LOCK position, and the amount of time the PCM remains powered through the PCM power relay exceeds a predetermined amount of time.		
Possible Causes:	• PCMRC circuit short to ground • Damaged PCM		
Diagnostic Aids:	Ability to communicate with the PCM when the ignition is in the OFF, ACC, or LOCK position indicates a hard fault.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P0687 - ECM/PCM Power Relay Control Circuit High

Description:	This DTC sets when the ignition switch position run (ISP-R) circuit indicates the ignition is in the OFF, ACC, or LOCK position, and the amount of time the PCM remains powered through the PCM power relay exceeds a predetermined amount of time.		
Possible Causes:	• PCMRC circuit short to voltage • Damaged PCM power relay		
Diagnostic Aids:	Ability to communicate with the PCM when the ignition is in the OFF, ACC, or LOCK position indicates a hard fault.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P0689 - ECM/PCM Power Relay Sense Circuit Low

Description:	This DTC sets when the ISP-R and the INJPWRM circuit voltages do not correspond for a calibrated period of time.		
Possible Causes:	• Ignition circuit fuse • ISP-R circuit open • ISP-R circuit short to ground • VPWR circuit short to voltage • INJPWR circuit short to voltage • Damaged ignition switch • Damaged fuel pump relay • Damaged PCM power relay		
Diagnostic Aids:	The INJPWRM PID voltage reading should be 0 volts when the ignition is in the OFF, ACC or LOCK position.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

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

Description:	This DTC sets when the non volatile random access memory (NVRAM) write did not complete successfully after the ignition key was turned OFF, prior to PCM shutdown. This DTC also sets when the PCM power relay is de-energized too early.		
Possible Causes:	• PCMRC circuit open • PCM power relay • Low battery voltage		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P0690 - ECM/PCM Power Relay Sense Circuit High

Description:	This DTC sets when the voltage on the ISP-R and the INJPWRM or VPWR circuits do not correspond for a calibrated period of time.		
Possible Causes:	• ISP-R circuit short to voltage • VPWR circuit open • INJPWRM circuit open • Damaged fuel pump relay • Damaged PCM power relay		
Diagnostic			

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

P06A6 - Sensor Reference Voltage A Circuit Range/Performance

Description:	This DTC sets when the VREF circuit is not within a calibrated voltage range.			
Possible Causes:	• VREF circuit short to voltage • VREF circuit short to ground • Damaged sensor			
Diagnostic Aids:	Check for other DTCs. Diagnose all other DTCs first.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test C .		

P06A7 - Sensor Reference Voltage B Circuit Range/Performance

Description:	This DTC sets when the VREF circuit is not within a calibrated voltage range.			
Possible Causes:	• VREF circuit short to voltage • VREF circuit short to ground • Damaged sensor			
Diagnostic Aids:	Check for other DTCs. Diagnose all other DTCs first.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test C .		

P06A8 - Sensor Reference Voltage C Circuit Range/Performance

Description:	This DTC sets when the VREF circuit is not within a calibrated voltage range.			
Possible Causes:	• VREF circuit short to voltage • VREF circuit short to ground • Damaged sensor			
Diagnostic Aids:	Check for other DTCs. Diagnose all other DTCs first.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test C .		

P06B6 - Internal Control Module Knock Sensor Processor 1 Performance

Description:	This DTC sets when the PCM has detected an error condition or communication concern with the knock sensor (KS) processor integrated circuit.		
Possible Causes:	• Aftermarket accessories • Aftermarket performance modifications		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all other DTCs first. If no other DTCs are present, verify no base engine concerns are present before continuing with diagnosis. Refer to the Workshop Manual Section 303-00, Engine System. Inspect the ignition coils and spark plug wires for correct connections. Inspect the ignition coils and boot for carbon tracking, damage, or incorrectly installed boots. Inspect the spark plugs for damage, wear, carbon tracking or deposits and correct spark plug gap. 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.		

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

Description:	This DTC sets when a concern with the ability of the PCM to correctly store permanent DTCs is present.		
Possible Causes:	• Low battery voltage • Battery or charging system concern • VPWR circuit intermittently short • VPWR circuit intermittently open • PWRGND circuit intermittently open • Damaged run/start relay		
Diagnostic Aids:	Check for other DTCs and diagnose those first. Check for aftermarket performance products. Check for an electrical or charging system concern. If an updated calibration is available, update the calibration to the latest level. If an updated calibration is not available, clear the DTCs and repeat the self-test. If this DTC is retrieved after a PCM reprogramming, turn the ignition OFF and allow the PCM to complete a normal power down sequence. 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.		

P06D1 - Internal Control Module Ignition Coil Control Module Performance

Description:	This DTC sets when the PCM has detected an error with the ignition coil driver and diagnostic circuit.		
Possible Causes:	• Aftermarket performance products • Damaged PCM		
Diagnostic Aids:	Check for other DTCs and diagnose those first. Check for aftermarket performance products. If an updated calibration is available, update the calibration to the latest level. If an updated calibration is not available, clear the DTCs and 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.		

P0704 - Clutch Switch Input Circuit

Description:	This DTC sets when the clutch pedal voltage value does not change from high to low when the clutch pedal is applied.		
Possible Causes:	• CPP circuit short to voltage • Damaged clutch pedal position (CPP) switch • SIGRTN circuit open		
Diagnostic Aids:	When the clutch pedal is applied and then released, the clutch pedal switch voltage should cycle.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .		

P0720 - Output Shaft Speed Sensor Circuit

Description:	This DTC sets when the OSS sensor signal input exceeds the calibrated threshold. The OSS sensor provides a signal to the PCM based on the speed of the output shaft of the transmission.		
Possible Causes:	• OSS circuit short to ground • OSS circuit short to voltage • OSS circuit open • Damaged OSS sensor		
Diagnostic Aids:	Verify the sensor signal output varies with the vehicle speed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	GO to Pinpoint Test DP .		
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, to continue diagnosis.		

P0721 - Output Shaft Speed Sensor Circuit Range/Performance

Description:	This DTC sets when the OSS sensor signal input exceeds the calibrated threshold or has excessive electrical noise. The OSS signal is very sensitive to electrical noise. This electrical noise distorts the OSS input to the PCM.		
Possible Causes:	• Incorrect OSS wiring harness routing • Aftermarket accessories • OSS wiring damaged		

		OSS wiring insulation wear	
Diagnostic Aids:	Check the routing of the OSS wiring harness. Check the OSS wiring and the OSS connector for damage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	GO to Pinpoint Test DP .		
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, to continue diagnosis.		

P0722 - Output Shaft Speed Sensor Circuit No Signal

Description:	This DTC sets when the OSS sensor signal is missing upon the initial movement of the vehicle.		
Possible Causes:	- Damaged OSS connector - Damaged OSS sensor - Incorrectly installed OSS sensor - OSS wiring harness intermittent short - OSS wiring harness open		
Diagnostic Aids:	Check the wiring, connector, and OSS sensor for damage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	GO to Pinpoint Test DP .		
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, to continue diagnosis.		

P0723 - Output Shaft Speed Sensor Circuit Intermittent

Description:	This DTC sets when the OSS sensor signal provided to the PCM is irregular or interrupted.		
Possible Causes:	- OSS connector not correctly seated - OSS circuit intermittently short - OSS circuit intermittently open - Damaged OSS connector - OSS sensor not installed correctly - Damaged OSS sensor		
Diagnostic Aids:	Verify OSS harness and connector integrity. Verify correct installation of the OSS sensor.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	GO to Pinpoint Test DP .		
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, to continue diagnosis.		

P0830 - Clutch Pedal Switch A Circuit

Description:	The PCM monitors the clutch pedal position (CPP) bottom of travel (CPP-BT) switch only during the calibrated engine speed range (cranking speed range). This DTC sets when the CPP-BT switch does not indicate that the clutch is disengaged (clutch pedal pressed) when the engine is cranked.		
Possible Causes:	• Damaged CPP-BT switch • Damaged CPP-BT harness • GND circuit open to the CPP-BT switch • Vehicle push-started with the clutch engaged (clutch pedal released) • Aftermarket remote starting device		
Diagnostic Aids:	Verify the vehicle was not push started with the clutch engaged. Check for aftermarket equipment such as remote starting devices which may bypass the CPP switch when cranking the engine. Refer to the Workshop Manual Section 303-06, Starting System, The Engine Does Not Crank to diagnose the symptom no start, no crank.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P0833 - Clutch Pedal Switch B Circuit

Description:	The PCM monitors the clutch pedal position top of travel (CPP-TT) switch only during the calibrated engine speed range (cranking speed range). This DTC sets when the CPP-TT does not indicate that the clutch is disengaged (clutch pedal pressed) when the engine is cranked.		
Possible Causes:	• Damaged CPP-TT switch • Damaged CPP-TT harness • GND circuit open to the CPP-TT switch • Vehicle push-started with the clutch engaged (clutch pedal released) • Aftermarket remote starting device		
Diagnostic Aids:	Verify the vehicle was not push started with the clutch engaged. Check for aftermarket equipment such as remote starting devices which may bypass the CPP-TT switch when cranking the engine. Refer to the Workshop Manual Section 419-03, Cruise Control, the speed control does not disengage when the clutch pedal is applied 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.		

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:	• CPP circuit open • CPP circuit short to ground • Damaged clutch pedal position (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 .
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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:	• CPP circuit open • CPP circuit short to voltage • Damaged clutch pedal position (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 .		

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:	• CPP circuit open • CPP circuit short to ground • Damaged clutch pedal position (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:	• Clutch pedal position (CPP) sensor assembly is binding • CPP 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.
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Possible Causes:	• CPP sensor circuit concerns • Damaged clutch pedal position (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 .		

P1001 - KOER Not Able To Complete, KOER Aborted

Description:	This non-malfunction indicator lamp (MIL) 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.		

P100F - Wastegate Control Pressure/BARO Correlation

Description:	This DTC sets when the difference between the wastegate vacuum sensor reading is greater than the barometric pressure (BARO) sensor, manifold absolute pressure (MAP) sensor and the turbocharger boost pressure (TCBP) sensor readings by a calibrated threshold at key ON, engine OFF (KOEO), and the fault timer has exceeded the calibrated time threshold.		
Possible Causes:	• Contaminated or restricted wastegate vacuum sensor • Restricted wastegate actuator control tube • Restricted vent tube from the turbocharger wastegate regulating valve to the intake air tube • Damaged wastegate vacuum sensor		
Diagnostic Aids:	The typical sensor difference threshold is 8.47 kPa (1.23 psi) and time threshold is 5 seconds.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P1011 - Wastegate Control Pressure Sensor Circuit Range/Performance

Description:	This DTC sets when the wastegate vacuum sensor reading has exceeded the atmospheric pressure by greater than a calibrated threshold and the fault timer has exceeded the calibrated time threshold.		
Possible Causes:	• Damaged wastegate vacuum sensor		

Diagnostic Aids:	The typical maximum threshold is 10.16 kPa (1.47 psi) and time threshold is 5 seconds.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P1012 - Wastegate Control Pressure Sensor Circuit Low

Description:	This DTC sets when the wastegate vacuum sensor reading is less than a calibrated threshold and the fault timer has exceeded the calibrated time threshold indicating a short to SIGRTN or ground.		
Possible Causes:	• WVS circuit short to ground • Damaged wastegate vacuum sensor		
Diagnostic Aids:	The typical minimum threshold is 0.2V and time threshold is 5 seconds.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P1013 - Wastegate Control Pressure Sensor Circuit High

Description:	This DTC sets when the wastegate vacuum sensor reading is greater than a calibrated threshold and the fault timer has exceeded the calibrated time threshold indicating an open circuit or a short to voltage.		
Possible Causes:	• WVS circuit open • WVS circuit short to voltage • Damaged wastegate vacuum sensor		
Diagnostic Aids:	The typical maximum threshold is 4.93 V and time threshold is 5 seconds.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P1014 - Wastegate Control Pressure Sensor Circuit Intermittent/Erratic

Description:	This DTC sets when the wastegate vacuum sensor reading is less than or greater than the minimum or maximum calibrated thresholds and the fault counter has exceeded the calibrated count threshold indicating an intermittent open or short circuit.		
Possible Causes:	• WVS circuit intermittent open • WVS circuit intermittent short to voltage • WVS circuit intermittent short to ground • Damaged wiring or harness connector • Damaged wastegate vacuum sensor		
Diagnostic Aids:	The typical minimum and maximum threshold is 0.2 V and 4.93 V and the count threshold is 25.		

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

P1015 - Wastegate Control Pressure Lower Than Expected

Description:	This DTC sets when the measured wastegate vacuum sensor reading is less than the expected reading by greater than the calibrated threshold and the fault timer has exceeded the calibrated time threshold.		
Possible Causes:	• Restricted vent tube from the turbocharger wastegate regulating valve to the intake air tube • Damaged turbocharger wastegate regulating valve • Contaminated or restricted wastegate vacuum sensor • Damaged wastegate vacuum sensor		
Diagnostic Aids:	The typical difference threshold is 16.93 kPa (2.46 psi) and time threshold is 5 seconds.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P1016 - Wastegate Control Pressure Higher Than Expected

Description:	This DTC sets when the measured wastegate vacuum sensor reading is higher than the expected reading by greater than the calibrated threshold and the fault timer has exceeded the calibrated time threshold.		
Possible Causes:	• Leak in control tube between the turbocharger wastegate regulating valve and the wastegate actuator • Leak in the tube between the vacuum reservoir and the turbocharger wastegate regulating valve • Damaged turbocharger wastegate regulating valve		
Diagnostic Aids:	The typical difference threshold is 16.93 kPa (2.46 psi) and time threshold is 5 seconds.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P101F - Cylinder Head Temperature Sensor 1 Out Of Self Test Range

Description:	This DTC sets when the cylinder head temperature (CHT) sensor is out of self-test range. The engine is not at a normal operating temperature.		
Possible Causes:	• Cold engine • Engine overheating • Low engine coolant level		
Diagnostic Aids:	Bring the engine to operating temperature and repeat the self-test. If the engine overheats, check the cooling system. Refer to the Workshop Manual Section 303-03, Engine Cooling, to diagnose the engine overheats symptom.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	
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 Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
P1021 - Cylinder Head Temperature Sensor 2 Circuit Range/Performance

Description:	This DTC sets when the 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 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 cylinder head temperature at engine start exceeds the intake air temperature at engine start by greater than a calibrated value, typically 17°C (30°F). The cylinder head 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:	• Cylinder head temperature 2 (CHT2) sensor • Coolant system concern		
Diagnostic Aids:	Make sure the intake air temperature and the cylinder head temperature are similar when the engine is cold. Also make sure the 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 DL .		

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	Continuous Memory
All	GO to Pinpoint Test DL .		

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	Continuous Memory
All	GO to Pinpoint Test DL .		

P1024 - Cylinder Head Temperature Sensor 2 Circuit Intermittent/Erratic

Description:	This DTC sets when a CHT2 circuit concern is intermittently present while the engine is running.		
Possible Causes:	• Damaged CHT2 harness or connector • Damaged CHT2 sensor • CHT2 circuit open • CHT2 circuit short to ground		
Diagnostic Aids:	Monitor the CHT PID on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1025 - Cylinder Head Temperature Sensor 2 Out Of Self Test Range

Description:	This DTC sets when the cylinder head temperature 2 (CHT2) sensor is out of self-test range. The engine is not at a normal operating temperature.		
Possible Causes:	• Cold engine • Engine overheating • Low engine coolant level		
Diagnostic Aids:	Bring the engine to operating temperature and repeat the self-test. If the engine overheats, check the cooling system. Refer to the Workshop Manual Section 303-03, Engine Cooling, to diagnose the engine overheats 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.		

P1026 - Engine Coolant Temperature 1 / Cylinder Head Temperature 2 Correlation

Description:	This DTC sets when the engine coolant temperature (ECT) and cylinder head temperature 2 (CHT2) sensor readings differ by greater than a calibrated value.		
Possible Causes:	• Biased CHT2 sensor • Damaged CHT2 sensor		
Diagnostic Aids:	Make sure the ECT and CHT2 sensor readings are within 17°C (30°F) of each other after 6 hours at ambient temperature.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1030 - Cylinder 1 Fuel Injector Heater Circuit Low

Description:	This DTC sets when the PCM detects a concern with the FIH1 circuit.		
Possible Causes:	• FIH1 circuit open • FIH1 circuit short to ground • Damaged fuel injector heater 1		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AB .		

P1031 - Cylinder 1 Fuel Injector Heater Circuit High

Description:	This DTC sets when the PCM detects a concern with the FIH1 circuit.		
Possible Causes:	• FIH1 circuit open • FIH1 circuit short to voltage • Damaged fuel injector heater 1		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AB .		

P1032 - Cylinder 2 Fuel Injector Heater Circuit Low

Description:	This DTC sets when the PCM detects a concern with the FIH2 circuit.		
Possible Causes:	• FIH2 circuit open • FIH2 circuit short to ground • Damaged fuel injector heater 2		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AB .		

P1033 - Cylinder 2 Fuel Injector Heater Circuit High

Description:	This DTC sets when the PCM detects a concern with the FIH2 circuit.		
Possible Causes:			

		- FIH2 circuit open - FIH2 circuit short to voltage - Damaged fuel injector heater 2	
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test AB .	Continuous Memory

P1034 - Cylinder 3 Fuel Injector Heater Circuit Low

Description:	This DTC sets when the PCM detects a concern with the FIH3 circuit.		
Possible Causes:	- FIH3 circuit open - FIH3 circuit short to ground - Damaged fuel injector heater 3		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test AB .	Continuous Memory

P1035 - Cylinder 3 Fuel Injector Heater Circuit High

Description:	This DTC sets when the PCM detects a concern with the FIH3 circuit.		
Possible Causes:	- FIH3 circuit open - FIH3 circuit short to voltage - Damaged fuel injector heater 3		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test AB .	Continuous Memory

P1038 - Fuel Injector Heater Control Module Control Circuit

Description:	This DTC sets when the PCM detects a concern with the FIHC circuit.		
Possible Causes:	- FIHC circuit open - FIHC circuit short to ground - FIHC circuit short to voltage - Damaged fuel injector heater control module		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test AB .	Continuous Memory

P1039 - Fuel Injector Heater Control Module System Voltage

Description:	This DTC sets when the PCM detects the voltage on the battery voltage circuit is greater than or less than a calibrated range.		
Possible Causes:	• VBATT circuit open • VPWR circuit open • PWRGND circuit open • Low battery voltage • Charging system overcharging		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AB .		

P103A - Fuel Injector Heater Control Module Monitor Circuit

Description:	This DTC sets when the PCM detects a concern with the FIHM circuit.		
Possible Causes:	• FIHM circuit open • FIHM circuit short to ground • FIHM circuit short to voltage • Damaged fuel injector heater control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AB .		

P103B - Fuel Injector Heater Control Module Performance

Description:	This DTC sets when an error occurs in the fuel injector heater control module.		
Possible Causes:	• Damaged fuel injector heater control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test AB .		

P1100 - Mass Air Flow Sensor Circuit Intermittent

Description:	This DTC sets when the PCM has detected a sudden input change in the MAF sensor circuit through the comprehensive component monitor (CCM). If during the last 40 warm-up cycles in ignition ON, engine running, the PCM detects an input change beyond the minimum or maximum calibrated limit, a continuous memory DTC is stored.		
Possible Causes:	• MAF circuit intermittent open • MAF circuit intermittent short to voltage • MAF circuit intermittent short to ground • Damaged mass air flow (MAF) sensor • Damaged harness connector • Damaged harness		
Diagnostic Aids:	While accessing the MAF PID on the scan tool, lightly tap on the MAF sensor or wiggle the MAF sensor connector and harness. If the MAF PID suddenly changes, an intermittent fault is indicated.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DC .		

P1101 - Mass Air Flow Sensor Out Of Self Test Range

Description:	This DTC sets when during ignition ON, engine OFF, the mass air flow (MAF) sensor output signal is greater than a calibrated limit or during ignition ON, engine running, the MAF output signal is not within the calibrated range.		
Possible Causes:	• Low battery charge • MAF sensor partially connected • MAF sensor contamination • Damaged MAF sensor • Intake air leaks		
Diagnostic Aids:	Diagnose circuit DTCs before range or performance DTCs.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1104 - Internal Control Module MAP Sensor Performance

Description:	This DTC sets when the PCM detects the MAP signal is not within a calibrated range.		
Possible Causes:	• Damaged manifold absolute pressure (MAP) sensor harness or connector		
Diagnostic Aids:	Check for other DTCs and diagnose those first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

P1112 - Intake Air Temperature Circuit Intermittent

Description:	This DTC sets when the intake air temperature (IAT) sensor signal is intermittent.		
Possible Causes:	• IAT circuit intermittent open • IAT circuit intermittent short to voltage • IAT circuit intermittent short to ground • Damaged IAT sensor • Damaged harness connector • Damaged harness		
Diagnostic Aids:	Monitor the IAT PID on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DA .		

P1116 - Engine Coolant Temperature Sensor Out Of Self Test Range

Description:	This DTC sets when the engine coolant temperature (ECT) sensor is out of self-test range. The correct range is 0.3 to 3.7 volts.		
Possible Causes:	• Overheating condition • Damaged thermostat • Low engine coolant		
Diagnostic Aids:	The engine coolant temperature must be greater than 10°C (50°F) to pass the key ON engine OFF (KOEO) self-test and greater than 82°C (180°F) to pass the key ON engine running (KOER) self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1117 - Engine Coolant Temperature Sensor Circuit Intermittent

Description:	This DTC sets when the ECT circuit is intermittently open or short while the engine is running.		
Possible Causes:	• ECT circuit open • ECT circuit short to ground • Low engine coolant • Damaged engine coolant temperature (ECT) sensor harness or connector • Damaged ECT sensor		
Diagnostic Aids:	Monitor the ECT PID on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DX .		

P111B - Engine Coolant Warm-Up Not Detected

Description:	This DTC sets when the engine coolant temperature does not rise by a calibrated threshold value when
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	compared to the inferred engine coolant temperature.		
Possible Causes:	• Low engine coolant • Damaged heater core shut off valve • Damaged coolant bypass valve • Damaged ECT sensor		
Diagnostic Aids:	Verify the engine cooling system is operating correctly. Refer to the Workshop Manual Section 303-03, Engine Cooling.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DX .		

P1124 - Throttle Position Sensor A Out Of Self Test Range

Description:	During key ON engine OFF (KOEO) and key ON, engine running (KOER) self-tests, the PCM monitors the electronic throttle control (ETC) throttle position (TP) sensor inputs to determine if the TP1 and TP2 signals are less than an expected value. This DTC sets when TP1 or TP2 is greater than the expected value.		
Possible Causes:	• Accelerator pedal applied during KOEO or KOER self-test		
Diagnostic Aids:	Repeat the self-test without applying the accelerator pedal. Make sure the floor mat is not interfering with the accelerator pedal. Diagnose any TP circuit DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

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

Description:	The heated oxygen sensor (HO2S) monitor uses an exhaust temperature model to determine when the universal HO2S heaters are cycled ON. This DTC sets when the inferred exhaust temperature is below a minimum calibrated value.		
Possible Causes:	• Engine not operating long enough before carrying out the key ON, engine running (KOER) self-test • Exhaust system too cool		
Diagnostic Aids:	Monitor the universal HO2S heater PIDs to determine the ON or OFF state. The DTC P1127 is present if the exhaust is not hot.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P1137 - Lack Of HO2S12 Switches - Sensor Indicates Lean

Description:	The heated oxygen sensor bank 1, sensor 2 (HO2S12) is forced rich and lean and monitored by the PCM. This DTC sets when the PCM does not detect the output of the HO2S12 in a calibrated amount of time.		
Possible	• Pinched, shorted, and corroded wiring and pins		

Causes:	• Crossed HO2S12 wires • Exhaust leaks • Contaminated HO2S12 • Damaged HO2S12		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P1138 - Lack Of HO2S12 Switches - Sensor Indicates Rich

Description:	The heated oxygen sensor bank 1, sensor 2 (HO2S12) is forced rich and lean and monitored by the PCM. This DTC sets when the PCM does not detect the output of the HO2S12 in a calibrated amount of time.		
Possible Causes:	• Pinched, shorted, and corroded wiring and pins • Crossed HO2S12 wires • Exhaust leaks • Contaminated HO2S12 • Damaged HO2S12		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P1157 - Lack Of HO2S22 Switches - Sensor Indicates Lean

Description:	The heated oxygen sensor bank 2, sensor 2 (HO2S22) is forced rich and lean and monitored by the PCM. This DTC sets when the PCM does not detect the output of the HO2S22 in a calibrated amount of time.		
Possible Causes:	• Pinched, shorted, and corroded wiring and pins • Crossed HO2S22 wires • Exhaust leaks • Contaminated HO2S22 • Damaged HO2S22		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P1158 - Lack Of HO2S22 Switches - Sensor Indicates Rich

Description:	The heated oxygen sensor bank 2, sensor 2 (HO2S22) is forced rich and lean and monitored by the PCM. This DTC sets when the PCM does not detect the output of the HO2S22 in a calibrated amount of time.		
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Possible Causes:	• Pinched, shorted, and corroded wiring and pins • Crossed HO2S22 wires • Exhaust leaks • Contaminated HO2S22 • Damaged HO2S22		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P115E - Throttle Actuator Control Throttle Body Air Flow Trim At Max Limit

Description:	During idle, the PCM monitors the throttle angle and airflow. If the airflow is determined to be less than expected, the PCM adjusts the throttle angle to compensate. The airflow reduction is typically the result of engine deposit buildup around the throttle plate. This DTC sets when the PCM has reached the maximum allowed compensation and is no longer able to compensate for the buildup.		
Possible Causes:	• Engine deposits around the throttle plate		
Diagnostic Aids:	Install a new throttle body. 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.		

P117A - Engine Oil Overtemperature - Forced Limited Power

Description:	This DTC sets when the engine oil protection strategy is enabled when the engine oil temperature reaches a predetermined level in the PCM. The PCM then limits the engine RPMs until the engine oil temperature returns to normal.		
Possible Causes:	• Engine overheating • Low engine coolant • Loaded weight is greater than the maximum vehicle weight rating. Refer to the Owner's Literature for vehicle weight ratings.		
Diagnostic Aids:	This DTC is an informational DTC and may be set by an engine overheating concern. If the engine overheats, check the cooling system. Refer to the Workshop Manual Section 303-03, Engine Cooling, to diagnose the engine overheats 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.		

P1184 - Engine Oil Temperature Sensor Out of Self Test Range

Description:	This DTC sets when the EOT is out of self-test range.		
Possible Causes:			

	Engine oil temperature below self-test threshold		
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	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1227 - Wastegate Failed Closed (Over Pressure)

Description:	This DTC sets when the boost pressure is higher than desired.		
Possible Causes:	- Manifold absolute pressure (MAP) sensor concerns - Supercharger bypass actuator stuck closed		
Diagnostic Aids:	This DTC is informational only and it 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 KJ .		

P1228 - Wastegate Failed Open (Under Pressure)

Description:	This DTC sets when the boost pressure is lower than desired.		
Possible Causes:	- Manifold absolute pressure (MAP) sensor concerns - Supercharger bypass actuator stuck open		
Diagnostic Aids:	This DTC is informational only and 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 KJ .		

P1270 - Engine RPM Or Vehicle Speed Limiter Reached

Description:	This DTC sets when the vehicle has been operated in a manner which caused the engine or vehicle to exceed a calibration limit. The engine RPM and vehicle speed are continuously monitored and evaluated by the PCM. This DTC sets when the RPM or vehicle speed falls out of a calibrated range. For additional information on the engine RPM/vehicle speed limiter, refer to Section 1, Powertrain Control Software .		
Possible Causes:	- Wheel slippage (water, ice, mud, and snow) - Excessive engine RPM in NEUTRAL or operated in the wrong transmission gear - Vehicle driven at a high rate of speed		
Diagnostic Aids:	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.
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P1285 - Cylinder Head Over Temperature Condition

Description:	This DTC sets when an engine overheat condition was sensed by the cylinder head temperature (CHT) sensor.		
Possible Causes:	• Low engine coolant level • Base engine concerns • Engine cooling system concerns • CHT sensor concern		
Diagnostic Aids:	On some applications when this fault occurs the engine temperature warning indicator illuminates or forces the temperature gauge to the full H (hot) zone. The warning indicator can be triggered by either grounding the engine temperature warning circuit when wired to the PCM, or by sending a PCM network message to the instrument panel cluster (IPC).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1288 - Cylinder Head Temperature Sensor Out Of Self Test Range

Description:	This DTC sets when the cylinder head temperature (CHT) sensor is out of self-test range. The engine is not at a normal operating temperature.		
Possible Causes:	• Cold engine • Engine overheating • Low engine coolant level		
Diagnostic Aids:	Bring the engine to operating temperature. If cold, repeat the self-test. If the engine overheats, check the cooling system. Refer to the Workshop Manual Section 303-03, Engine Cooling, The Engine Overheats for cooling system 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.		

P1289 - Cylinder Head Temperature Sensor Circuit High

Description:	This DTC sets when a CHT circuit open concern is present.		
Possible Causes:	• CHT circuit open • CHT circuit short to voltage • Damaged cylinder head temperature (CHT) sensor wiring harness or connector • Damaged CHT sensor		
Diagnostic Aids:	The DTC P0118 may also be reported when this DTC sets. Either of these DTCs illuminate the malfunction indicator lamp (MIL).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All GO to Pinpoint Test [DL](#).**P128A - Cylinder Head Temperature Sensor Circuit Intermittent/Erratic**

Description:	This DTC sets when the CHT circuit is intermittently open or short while the engine is running.		
Possible Causes:	• CHT circuit open • CHT circuit short to ground • Damaged cylinder head temperature (CHT) sensor wiring harness or connector • Damaged CHT sensor		
Diagnostic Aids:	Monitor the CHT PID on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1290 - Cylinder Head Temperature Sensor Circuit Low

Description:	This DTC sets when a CHT circuit short to ground concern is present.		
Possible Causes:	• CHT circuit short to ground • Damaged cylinder head temperature (CHT) wiring harness or connector • Damaged CHT sensor		
Diagnostic Aids:	The DTC P0117 may also be reported when this DTC sets. Either of these DTCs illuminates the malfunction indicator lamp (MIL).		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DL .		

P1299 - Cylinder Head Over Temperature Protection Active

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-03, Engine Cooling to diagnose the engine overheats 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.		

P130D - Engine Knock/Combustion Performance - Forced Limited Power

Description:	This DTC sets when the knock control system (KCS) detects excessive pre-ignition. The knock sensor (KS) voltage exceeds a maximum value greater than a calibrated number of times within a set time period when pre-ignition is present.		
Possible Causes:	- Fuel quality - Base engine concerns - Cooling system concerns - Damaged spark plug - Incorrect or corroded connections on ignition system harness connectors - Lean fuel injector - Long term fuel trim at lean limits - Positive crankcase ventilation (PCV) system is leaking or stuck open - Oil overfilled - Oil and filter maintenance beyond recommended intervals - Excessive oil consumption - Charge air cooler (CAC) restriction		
Diagnostic Aids:	Engine performance may be limited to protect the engine if this DTC is set. This DTC may be accompanied by other DTCs. Diagnose all other DTCs first. If no other DTCs are present, verify no base engine concerns are present before continuing with diagnosis. Refer to the Workshop Manual Section 303-00, Engine System. The following driving conditions may cause this DTC to set: heavy acceleration from a stop, towing, carrying a heavy load or driving up a grade during a boost condition.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DG .		

P1336 - Crankshaft/Camshaft Sensor Range/Performance

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 JD .		

P1397 - System Voltage Out Of Self Test Range

Description:	This DTC sets when the 12-volt system voltage is too high or too low during the key ON engine OFF (KOEO) or key ON engine running (KOER) self-test. It sets if the system voltage falls below or exceeds the calibrated threshold at any time during the KOEO or KOER self-test.		
Possible Causes:	Battery or charging system concern		
Diagnostic Aids:	Make sure the battery voltage is between 11 and 18 volts before running a KOEO or KOER self-test. 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.		

P139A - EGR Sensor C Hoses Reversed

Description:	At idle, the exhaust gas recirculation (EGR) monitor commands the EGR valve closed and checks the differential pressure across the EGR tube orifice which should be zero to indicate the hoses are connected and not restricted. This DTC sets when the differential pressure indicated by the sensor exceeds a maximum threshold or falls below a minimum threshold.		
Possible Causes:	• The upstream hose is disconnected • The upstream hose is restricted • The downstream hose is disconnected • The downstream hose is restricted • The upstream hose and downstream hose are reversed • Restricted or damaged EGR tube		
Diagnostic Aids:	Look for signs of water or icing in the hose. Verify the hose connection and routing. Check the differential pressure feedback EGR sensor for correct mounting and function.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HE .		

P139B - EGR Sensor C Upstream Hose Off Or Plugged

Description:	At idle, the exhaust gas recirculation (EGR) monitor commands the EGR valve closed and checks the differential pressure across the EGR tube orifice which should be zero to indicate the hoses are connected and not restricted. This DTC sets when the differential pressure indicated by the sensor exceeds a maximum threshold or falls below a minimum threshold.		
Possible Causes:	• The upstream hose is disconnected • The upstream hose is restricted • Restricted or damaged EGR tube		
Diagnostic Aids:	Look for signs of water or icing in the hose. Verify the hose connection and routing. Check the differential pressure feedback EGR sensor for correct mounting and function.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HE .		

P139C - EGR Sensor C Downstream Hose Off Or Plugged

Description:	At idle, the exhaust gas recirculation (EGR) monitor commands the EGR valve closed and checks the differential pressure across the EGR tube orifice which should be zero to indicate the hoses are connected and not restricted. This DTC sets when the differential pressure indicated by the sensor exceeds a maximum threshold or falls below a minimum threshold.		
Possible Causes:	• The downstream hose is disconnected		

	• The downstream hose is restricted • Restricted or damaged EGR tube		
Diagnostic Aids:	Look for signs of water or icing in the hose. Verify the hose connection and routing. Check the differential pressure feedback EGR sensor for correct mounting and function.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HE .		

P1408 - EGR Flow Out Of Self Test Range

For Vehicles With DPFEGR

Description:	This test is carried out during the key ON, engine running (KOER) on demand self test only. The exhaust gas recirculation (EGR) system is commanded on at a fixed engine speed. This DTC sets when the measured EGR flow falls above or below the required calibration.
Possible Causes:	• VREF circuit open • SIGRTN circuit open • DPFE circuit open • DPFE circuit short to voltage • DPFE circuit short to ground • The upstream hose is disconnected • The upstream hose is restricted • The downstream hose is disconnected • The downstream hose is restricted • The upstream hose and downstream hose are reversed • Restricted or damaged EGR tube
Diagnostic Aids:	

For Vehicles With An Electric EGR

Description:	This test is carried out during the key ON, engine running (KOER) on demand self test only. The exhaust gas recirculation (EGR) system is commanded on at a fixed engine speed. This DTC sets when the measured EGR flow falls above or below the required calibration.
Possible Causes:	• EGR valve stuck open or closed • EGR connector not seated correctly • VPWR circuit open • EGRMC circuit open • EGRMC circuit short to voltage • EGRMC circuit short to ground • Vacuum signal to manifold absolute pressure (MAP) sensor restricted or leaking • Mass airflow (MAF) sensor signal erroneous • Carbon build up in the EGR valve seat area • Damaged EGR valve
Diagnostic Aids:	Use the output state control function of the scan tool and monitor the MAP and the EGRMDSD PIDs while commanding the EGR on. If EGR is introduced into the engine at idle, the RPM drops or stalls out.
Application	Key On Engine Off Key On Engine Running Continuous Memory
Corsair, Escape/Kuga 2.0L, Escape/Kuga 2.5L,	GO to Pinpoint Test HE .

Explorer 2.3L, Explorer 3.3L, F-150 2.7L, F-150 3.3L, Nautilus 2.0L, Ranger 2.3L, Transit 3.5L TiVCT	
Fusion 2.5L, Transit Connect 2.5L	GO to Pinpoint Test KD .

P144A - EVAP System Purge Vapor Line Restricted/Blocked

Description:	The PCM monitors the evaporative emission (EVAP) system for a restricted fuel vapor tube between the fuel tank pressure (FTP) sensor and the fuel tank. During the initial phase of the EVAP monitor, the PCM closes the canister vent and a vacuum develops in the fuel vapor tubes and lines and in the fuel tank. The PCM monitors the FTP sensor to determine the amount of vacuum and how quickly the vacuum increases. The rate at which the vacuum increases is compared to an expected value. If the vacuum increases quicker than expected, a restricted fuel vapor tube is suspected and an intrusive test is carried out in the final phase of the EVAP monitor. This DTC sets when the intrusive test confirms a restriction and the counter is incremented and the counter reaches a calibrated number of completions.		
Possible Causes:	- Restricted fuel vapor tube between the FTP sensor and the fuel tank - EVAP purge valve stuck partially open		
Diagnostic Aids:	Check the fuel vapor tube for a restriction between the FTP sensor and the fuel tank.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P144B - EVAP System Secondary Purge Vapor Line Restricted/Blocked

Description:	This DTC sets when the evaporative emission (EVAP) vent tube to the EVAP leak detection control module is restricted.		
Possible Causes:	- Restriction in the fuel vapor vent hose - Incorrect connections - Damaged or corroded connections - Damaged EVAP leak detection control module		
Diagnostic Aids:	Check for restrictions in the EVAP vent tube between the EVAP leak detection control module and the fresh air inlet. Inspect the connectors for signs of damage or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P144C - EVAP System Purge Flow Performance During Boost

Description:	The EVAP check valve test is performed during minimal boost conditions, once per drive cycle, when entry conditions are met. This DTC sets when the fuel tank pressure exceeds a calibrated amount within a specified amount of time during the test (single path check valve), or when the fuel tank vacuum is less than a calibrated amount within a specified amount of time or when the fuel tank pressure exceeds a calibrated amount within a specified amount of time during the test (dual path check valve).		
Possible Causes:	• Restricted EVAP ejector connections at the intake air system • Stuck open EVAP check valve • Stuck closed EVAP check valve • Damaged EVAP ejector • Damaged EVAP check valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P1450 - Unable To Bleed Up Fuel Tank Vacuum

Description:	This DTC sets when the evaporative emission (EVAP) running loss monitor detects excessive fuel tank vacuum with the engine running, but not at idle.		
Possible Causes:	• EVAP purge valve stuck open • Restrictions or kinks in the EVAP canister tube or EVAP canister purge outlet tube between the fuel tank, the EVAP purge valve and the EVAP canister • Fuel filler cap stuck closed, preventing vacuum relief (if equipped) • Capless fuel tank filler pipe damaged, preventing vacuum relief (if equipped) • Contaminated fuel vapor elbow on the EVAP canister • Restricted EVAP canister • EVAP canister vent valve stuck partially or fully closed • Restricted EVAP canister vent valve filter • VREF circuit open • Damaged FTP sensor		
Diagnostic Aids:	Visually inspect the EVAP canister inlet port, EVAP canister vent valve filter, and EVAP canister vent hose assembly for contamination or debris. Check EVAP purge valve for vacuum leak.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P1500 - Vehicle Speed Sensor

Description:	This DTC sets when a VSS concern interferes with other on board diagnostic (OBD) tests, such as the catalyst efficiency monitor, the EVAP monitor or the HO2S monitor. Presence of this DTC indicates the VSS input signal was intermittent.
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Possible Causes:	• Intermittent VSS connections • VSS harness circuits intermittent open • VSS harness circuits intermittent short • Damaged VSS		
Diagnostic Aids:	Check the wiring, connector, and sensor for damage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport, F-650 / F-750, F-Series Super Duty, Fusion, KA, Motorhome / Stripped Chassis / Step Van, Ranger	GO to Pinpoint Test DF .		
Manual Transmission	GO to Pinpoint Test DP .		
All others	The PCM uses information from the ABS control module and the TCM to calculate vehicle speed. Check these modules for DTCs.		

P1501 - Vehicle Speed Sensor Out Of Self Test Range

Description:	This DTC sets when the VSS input signal is out of self-test range. If the PCM detects a VSS input signal any time during the self-test, this DTC sets and the test aborts.		
Possible Causes:	• Electrical noise on the VSS input signal from radio frequency interference or electro magnetic interference • External sources, such as ignition wires, the charging circuit or aftermarket equipment		
Diagnostic Aids:	Verify the VSS input is 0 km/h (0 mph) when the vehicle transmission is in PARK.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport, F-650 / F-750, F-Series Super Duty, Fusion, KA, Motorhome / Stripped Chassis / Step Van, Ranger	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		
Manual Transmission	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		
All others	The PCM uses information from the ABS control module and the TCM to calculate vehicle speed. Check these modules for DTCs.		

P1502 - Vehicle Speed Sensor Intermittent

Description:	This DTC sets when there is a concern with the vehicle speed data. Vehicle speed data is received from either the VSS or anti-lock brake system (ABS) control module. This DTC sets the same way as P0500. However, it is intended to flash the transmission control indicator lamp (TCIL) for first time VSS circuit error.		
Possible Causes:	Noisy VSS input signal from the radio frequency interference/electromagnetic interference (RFI/EMI) external sources, such as ignition wires, the charging circuit or after market equipment		
Diagnostic Aids:	Verify the VSS input is 0 km/h (0 mph) when the vehicle transmission is in PARK.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
EcoSport, F-650 / F-750, F-Series Super Duty, Fusion, KA, Motorhome / Stripped Chassis / Step Van, Ranger	GO to Pinpoint Test DF .		
Manual Transmission	GO to Pinpoint Test DP .		
All others	The PCM uses information from the ABS module and the TCM to calculate vehicle speed. Check these modules for DTCs.		

P1548 - Engine Air Filter Restriction

Description:	This DTC sets when the airflow is out of range at various engine speeds and during wide open throttle (WOT) operation when compared to the calibrated value.		
Possible Causes:	- Intake air restriction - Clogged air filter		
Diagnostic Aids:	If this DTC sets, inspect the intake air system and replace the air filter if no restrictions 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.		

P1575 - Pedal Position Out Of Self Test Range

Description:	During key ON engine OFF (KOEO) self-test, the PCM monitors the accelerator pedal position (APP) sensor inputs to determine if the APP1 and APP2 signals are less than an expected value. This DTC sets when either APP1 or APP2 is greater than the expected value.		
Possible Causes:	Accelerator pedal applied during KOEO self-test		
Diagnostic Aids:	Repeat the self-test without applying the accelerator pedal. Make sure the floor mat is not interfering with the accelerator pedal. Diagnose any APP circuit DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P1584 - Throttle Control Detected ETB Malfunction

Description:	This DTC sets when the electronic throttle body (ETB) fails the self-test.		
Possible Causes:	- TAC motor circuit short to ground - TAC motor circuit short to voltage - Damaged ETB		
Diagnostic Aids:	This DTC 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 DV .		

P1588 - Throttle Control Detected Loss Of Return Spring

Description:	This DTC sets when the throttle does not return to the default (limp home) position.		
Possible Causes:	- Obstruction in the throttle plate movement - Damaged electronic throttle body (ETB)		
Diagnostic Aids:	Visually inspect the throttle plate for an obstruction.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P160A - Control Module Vehicle Options Reconfiguration Error

Description:	This DTC sets when the body control module (BCM) detects a mismatch in configuration data and programmable parameters between the PCM and BCM.		
Possible Causes:	- Module reprogramming - Aftermarket performance products - PCM		
Diagnostic Aids:	Reprogram or update the calibration. If the PCM already has the latest calibration, carry out the relearn vehicle data procedure on the scan tool. Check for other DTCs or drive symptoms for further action. Check		

for aftermarket performance products. 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.		

P162D - Internal Control Module Cruise Control Performance

Description:	This DTC sets when a calculation error occurs in the PCM.		
Possible Causes:	• Aftermarket performance products • Incorrect tire size • Incorrect axle ratio • Incorrect vehicle identification (VID) block programming • Module programming error		
Diagnostic Aids:	Check for sensor and circuit related DTCs. Do not install a new electronic throttle body (ETB) for this DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P162E - Internal Control Module PTO Control Performance

Description:	The DTC sets when the activation conditions of the power take off (PTO) are not met and the PTO is still being enabled by the PCM to run.		
Possible Causes:	• Module reprogramming • 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 FB .		

P162F - Starter Motor Disabled - Engine Crank Time Too Long

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:	This DTC may be accompanied by other DTCs. Diagnose all other DTCs first. Clear the DTCs and repeat the self-test. If the DTC is retrieved again, check for the cause of the excessive crank time.		

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

P1633 - Keep Alive Power Voltage Too Low

Description:	This DTC sets when the KAPWR circuit has experienced a voltage interrupt.		
Possible Causes:	• KAPWR circuit open • KAPWR intermittent		
Diagnostic Aids:	Loss of KAPWR to the PCM results in immediate malfunction indicator lamp (MIL) illumination and sets DTC P1633.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QB .		

P1635 - Tire/Axle 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 block. They must match the vehicle hardware.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1636 - Inductive Signature Chip Communication Error

Description:			
Possible Causes:			
Diagnostic Aids:	Check for other module DTCs and diagnose those first. 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.		

P1639 - Vehicle ID Block Corrupted, Not Programmed

Description:	This DTC sets when the VID block is not programmed or the information within is corrupt.		
Possible Causes:	• New PCM • Incorrect PCM • Incorrect VID configuration		
Diagnostic Aids:	Program the PCM to the most recent calibration available. The VID block must be programmed. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Making Changes to the VID Block.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

P1646 - Linear O2 Sensor Control Chip (Bank 1)

Description:	The PCM monitors the application specific integrated circuit that controls and monitors the universal heated oxygen sensor bank 1, sensor 1 (HO2S11). This DTC sets when the PCM detects an internal circuit or communication concern.		
Possible Causes:	• Damaged universal HO2S11 wiring • Damaged PCM		
Diagnostic Aids:	Check for other DTCs and diagnose those first. Check for intermittent universal HO2S wiring concerns. Check the universal HO2S wiring between the PCM and the sensor for damage. Check for aftermarket performance products. Reprogram or update the calibration. 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) .		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P1647 - Linear O2 Sensor Control Chip (Bank 2)

Description:	The PCM monitors the application specific integrated circuit that controls and monitors the universal heated oxygen sensor bank 2, sensor 1 (HO2S21). This DTC sets when the PCM detects an internal circuit or communication concern.		
Possible Causes:	• Damaged universal HO2S21 wiring • Damaged PCM		
Diagnostic Aids:	Check for other DTCs and diagnose those first. Check for intermittent universal HO2S wiring concerns. Check the universal HO2S wiring between the PCM and the sensor for damage. Check for aftermarket performance products. Reprogram or update the calibration. 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) .		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P164A - O2 Sensor Positive Current Trim Circuit Performance (Bank 1 Sensor 1)

Description:	A resistor is installed in the universal heated oxygen sensor bank 1, sensor 1 (HO2S11) connector for part to part variance. The PCM determines the value of this resistor by taking multiple measurements of the resistor during each ignition ON event. The PCM uses this value to compensate for the variance in the pumping current signal. This DTC sets when the PCM receives an inconsistent or erratic measurement of the resistor.		
Possible Causes:	• Corrosion • Incorrect connections • Damaged universal HO2S11		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P164B - O2 Sensor Positive Current Trim Circuit Performance (Bank 2 Sensor 1)

Description:	A resistor is installed in the universal heated oxygen sensor bank 2, sensor 1 (HO2S21) connector for part to part variance. The PCM determines the value of this resistor by taking multiple measurements of the resistor during each ignition ON event. The PCM uses this value to compensate for the variance in the pumping current signal. This DTC sets when the PCM receives an inconsistent or erratic measurement of the resistor.		
Possible Causes:	• Corrosion • Incorrect connections • Damaged universal HO2S21		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

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		
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 KC .		

P1674 - Control Module Software Corrupted

Description:	This DTC sets when an error occurs in the PCM.		
Possible Causes:	• Software incompatibility issue		
Diagnostic Aids:	Verify the PCM is at the latest calibration level.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QE .		

P1793 - Ignition Supply Malfunction

Description:	The ISP-R circuit is monitored for low and high voltage conditions. This DTC sets when the voltage is less than 7 volts or greater than 16 volts.		
Possible Causes:	• ISP-R circuit short to voltage • ISP-R circuit short to ground • Battery or charging system concern		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P1900 - Output Shaft Speed Sensor Circuit Intermittent

Description:	This DTC sets when the OSS sensor signal to the PCM is irregular or interrupted.		
Possible Causes:	• OSS sensor connector not correctly seated • OSS harness circuits intermittent open		

	• OSS harness circuits intermittent short • Damaged OSS sensor connector • OSS sensor damaged, or not installed correctly		
Diagnostic Aids:	Verify the OSS harness and connector integrity. Verify correct installation of the OSS sensor.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	GO to Pinpoint Test DP .		
Automatic Transmission	Refer to the Workshop Manual Section 307-01, Automatic Transmission, Pinpoint Test Output Shaft Speed Sensor to continue diagnosis.		

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:	• VSS+ circuit open • VSS- circuit open • VSS circuit short to ground • VSS circuit short to voltage • Damaged drive mechanism for VSS • Damaged VSS • 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
Manual Transmission	GO to Pinpoint Test DP .		
All others	The PCM uses information from the ABS module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		

P1935 - Brake Switch/Sensor Signal

Description:	The PCM continuously monitors the controller area network (CAN) for messages from the anti-lock brake system (ABS) module. This DTC sets when the PCM does not receive the ABS message within the defined amount of time.		
Possible Causes:	• Communication error		
Diagnostic Aids:	Check for other ABS DTCs or ABS related symptoms. Diagnose all other ABS DTCs or ABS related symptoms first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QA .		

P193F - Vehicle Speed Signal Intermittent

Description:	This DTC sets when the vehicle speed sensor (VSS) input signal was intermittent. This DTC sets when the PCM detects the vehicle speed signal has been interrupted several times during a drive cycle.		
Possible Causes:	• VSS connections intermittent • VSS circuits intermittent short • VSS circuits intermittent open • Damaged VSS		
Diagnostic Aids:	Check the wiring, connector, and sensor for damage.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Manual Transmission	GO to Pinpoint Test DP .		
All others	The PCM uses information from the anti-lock brake system (ABS) module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.		

P1A0C - Hybrid Powertrain Control Module - Engine Disabled

Description:	This DTC sets when the PCM indicates an engine concern, or the engine does not start within a calibrated maximum time.		
Possible Causes:			
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all other DTCs first. If no other DTCs are present, and a driveability symptom is present, including no start or misfiring, refer to Section 3, No Diagnostic Trouble Codes (DTCs) Present Symptom Chart Index to continue diagnosis by symptom. If there are no driveability symptoms present, return the vehicle to the customer with information about the DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

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

Description:	This DTC sets when the intake manifold runner control (IMRC) is commanded closed and the intake manifold runner control bank 1 (IMRC1) sensor indicates the IMRC is open.		
Possible Causes:	• IMRC1 circuit short to voltage • IMRC1 circuit short to SIGRTN • IMRC1 circuit short to ground • Damaged IMRC actuator • Damaged IMRC solenoid • Restricted vacuum hoses		

Diagnostic Aids:	The IMRC1 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

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

Description:	This DTC sets when the intake manifold runner control (IMRC) is commanded closed and the intake manifold runner control bank 2 (IMRC2) sensor indicates the IMRC is open.		
Possible Causes:	• IMRC2 circuit short to voltage • IMRC2 circuit short to SIGRTN • IMRC2 circuit short to ground • Damaged IMRC actuator • Damaged IMRC solenoid • Restricted vacuum hoses		
Diagnostic Aids:	The IMRC2 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

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

Description:	This DTC sets when the intake manifold runner control (IMRC) is commanded open and the intake manifold runner control bank 1 (IMRC1) sensor indicates the IMRC is closed.		
Possible Causes:	• IMRC circuit open • IMRC1 circuit open • IMRC1 circuit short to voltage • Damaged IMRC actuator • Damaged IMRC solenoid		
Diagnostic Aids:	The IMRC1 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

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

Description:	This DTC sets when the intake manifold runner control (IMRC) is commanded open and the intake manifold runner control bank 2 (IMRC2) sensor indicates the IMRC is closed.		
Possible Causes:	• IMRC circuit open • IMRC2 circuit open • IMRC2 circuit short to voltage		

		- Damaged IMRC actuator - Damaged IMRC solenoid	
Diagnostic Aids:	The IMRC2 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

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

Description:	This DTC sets when an open circuit is detected in the IMRC1A circuit.		
Possible Causes:	IMRC1A circuit open		
Diagnostic Aids:	The IMRC1 and IMRC2 sensor values should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2011 - Intake Manifold Runner Control Circuit/Open (Bank 2)

Description:	This DTC sets when an open circuit is detected in the IMRC2A circuit.		
Possible Causes:	IMRC2A circuit open		
Diagnostic Aids:	The IMRC1 and IMRC2 sensor values should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

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

Description:	This DTC sets when the IMRC1 circuit voltage is greater than, or less than, a calibrated value.		
Possible Causes:	- IMRC1 circuit open - Mechanical concern, damage or restriction of IMRC hardware		
Diagnostic Aids:	The IMRC1 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

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

Description:	This DTC sets when the intake manifold runner control bank 1 (IMRC1) sensor signal is greater than, or less than, an expected calibrated value during self-test.		
Possible Causes:	• Mechanical concern, damage or restriction of intake manifold runner control (IMRC) hardware • Restricted vacuum hoses		
Diagnostic Aids:	The IMRC1 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2016 - Intake Manifold Runner Position Sensor/Switch Circuit Low (Bank 1)

Description:	This DTC sets when the intake manifold runner control bank 1 (IMRC1) sensor circuit voltage is less than a calibrated value.		
Possible Causes:	• IMRC1 circuit open • IMRC1 circuit short to SIGRTN • IMRC1 circuit short to ground • Damaged IMRC1 sensor		
Diagnostic Aids:	The IMRC1 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2017 - Intake Manifold Runner Position Sensor/Switch Circuit High (Bank 1)

Description:	This DTC sets when the intake manifold runner control bank 1 (IMRC1) sensor circuit voltage is greater than a calibrated value.		
Possible Causes:	• Air filter restriction • Vacuum leaks • Restricted vacuum hoses • IMRC1 circuit short to voltage • Damaged IMRC1 solenoid • Damaged IMRC1 sensor		
Diagnostic Aids:	The IMRC1 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2019 - Intake Manifold Runner Position Sensor/Switch Circuit (Bank 2)

Description:	This DTC sets when the IMRC2 circuit voltage is greater than, or less than, a calibrated value.		
Possible Causes:	• IMRC2 circuit open • Mechanical concern, damage or restriction of IMRC hardware		
Diagnostic Aids:	The IMRC2 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2020 - Intake Manifold Runner Position Sensor/Switch Circuit Range/Performance (Bank 2)

Description:	This DTC sets when the intake manifold runner control bank 2 (IMRC2) sensor signal is greater than, or less than, an expected calibrated value during self-test.		
Possible Causes:	• Mechanical concern, damage or restriction of intake manifold runner control (IMRC) hardware • Restricted vacuum hoses		
Diagnostic Aids:	The IMRC2 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2021 - Intake Manifold Runner Position Sensor/Switch Circuit Low (Bank 2)

Description:	This DTC sets when the intake manifold runner control bank 2 (IMRC2) sensor circuit voltage is less than a calibrated value.		
Possible Causes:	• IMRC2 circuit open • IMRC2 circuit short to SIGRTN • IMRC2 circuit short to ground • Damaged IMRC2 sensor		
Diagnostic Aids:	The IMRC2 sensor value should change when the IMRC is commanded open or closed.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HU .		

P2022 - Intake Manifold Runner Position Sensor/Switch Circuit High (Bank 2)

Description:	This DTC sets when the intake manifold runner control bank 2 (IMRC2) sensor circuit voltage is greater than a calibrated value.		
Possible Causes:	• Air filter restriction • Vacuum leaks		

		• Restricted vacuum hoses • IMRC2 circuit short to voltage • Damaged IMRC2 solenoid • Damaged IMRC2 sensor	
Diagnostic Aids:	The IMRC2 sensor value should change when the IMRC is commanded open or closed.		
Application		Key On Engine Off Key On Engine Running Continuous Memory	
All		GO to Pinpoint Test HU .	

P2088 - A Camshaft Position Actuator Control Circuit Low (Bank 1)

Description:	This DTC sets when a low voltage on the VCT11 circuit exceeds a calibrated limit for a calibrated amount of time.		
Possible Causes:	• VCT11 circuit open • VCT11 circuit short to ground • VPWR circuit open • Damaged variable camshaft timing bank 1 solenoid 1 (VCT11)		
Diagnostic Aids:			
Application		Key On Engine Off Key On Engine Running Continuous Memory	
All		GO to Pinpoint Test HK .	

P2089 - A Camshaft Position Actuator Control Circuit High (Bank 1)

Description:	This DTC sets when a high voltage on the VCT11 circuit exceeds a calibrated limit for a calibrated amount of time.		
Possible Causes:	• VCT11 circuit open • VCT11 circuit short to voltage • VPWR circuit open • Damaged variable camshaft timing bank 1 solenoid 1 (VCT11)		
Diagnostic Aids:			
Application		Key On Engine Off Key On Engine Running Continuous Memory	
All		GO to Pinpoint Test HK .	

P2090 - B Camshaft Position Actuator Control Circuit Low (Bank 1)

Description:	This DTC sets when a low voltage on the VCT12 circuit exceeds a calibrated limit for a calibrated amount of time.		
Possible Causes:	• VCT12 circuit open		

		• VCT12 circuit short to ground • VPWR circuit open • Damaged variable camshaft timing bank 1 solenoid 2 (VCT12)	
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test HK .	Continuous Memory

P2091 - B Camshaft Position Actuator Control Circuit High (Bank 1)

Description:	This DTC sets when high voltage on the VCT12 circuit exceeds a calibrated limit for a calibrated amount of time.		
Possible Causes:	• VCT12 circuit open • VCT12 circuit short to voltage • VPWR circuit open • Damaged variable camshaft timing bank 1 solenoid 2 (VCT12)		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test HK .	Continuous Memory

P2096 - Post Catalyst Fuel Trim System Too Lean (Bank 1)

Description:	The PCM monitors the correction value from the heated oxygen sensor bank 1, sensor 2 (HO2S12) as part of the fore-aft oxygen sensor control routine. This DTC sets when the correction value is greater than a calibrated limit.		
Possible Causes:	• Corrosion • Incorrect connections • Exhaust leaks • Contaminated universal HO2S11		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test DZ .	Continuous Memory

P2097 - Post Catalyst Fuel Trim System Too Rich (Bank 1)

Description:	The PCM monitors the correction value from the heated oxygen sensor bank 1, sensor 2 (HO2S12) as part of the fore-aft oxygen sensor control routine. This DTC sets when the correction value is greater than a calibrated limit.		
Possible			

Causes:	• Corrosion • Incorrect connections • Exhaust leaks • Contaminated universal HO2S11		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2098 - Post Catalyst Fuel Trim System Too Lean (Bank 2)

Description:	The PCM monitors the correction value from the heated oxygen sensor bank 2, sensor 2 (HO2S22) as part of the fore-aft oxygen sensor control routine. This DTC sets when the correction value is greater than a calibrated limit.		
Possible Causes:	• Corrosion • Incorrect connections • Exhaust leaks • Contaminated universal HO2S21		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2099 - Post Catalyst Fuel Trim System Too Rich (Bank 2)

Description:	The PCM monitors the correction value from the heated oxygen sensor bank 2, sensor 2 (HO2S22) as part of the fore-aft oxygen sensor control routine. This DTC sets when the correction value is greater than a calibrated limit.		
Possible Causes:	• Corrosion • Incorrect connections • Exhaust leaks • Contaminated universal HO2S21		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2100 - Throttle Actuator A Control Motor Circuit / Open

Description:	This DTC sets when a PCM fault flag is set indicating the motor circuit is open.
Possible Causes:	

		• ETBTACM connector is disconnected • TACM+ circuit open • TACM+ circuit short to voltage • TACM- circuit open • TACM- circuit short to voltage • TACM+ and TACM- circuits are short together • TAC motor has an open winding • Damaged TAC motor	
Diagnostic Aids:	A TAC motor circuit PID reading may indicate a concern, if available.		
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test DV .	
		Continuous Memory	

P2101 - Throttle Actuator A Control Motor Circuit Range/Performance

Description:	This DTC sets when a PCM fault flag is set indicating the motor circuit is open.		
Possible Causes:	• TAC motor circuits are cross wired • Intake air system restrictions • Throttle plate restrictions		
Diagnostic Aids:	A TAC motor circuit PID reading may indicate a concern, if available.		
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test DV .	
		Continuous Memory	

P2107 - Throttle Actuator A Control Module Processor

Description:	This DTC sets when the electronic throttle control (ETC) area of the PCM failed the self-test. The concern could be the result of an incorrect throttle position command, or TAC motor wires shorted together.		
Possible Causes:	• TACM+ circuit short to ground • TACM+ circuit short to voltage • TACM- circuit short to ground • TACM- circuit short to voltage • Damaged electronic throttle body (ETB)		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose other DTCs first. A TAC motor circuit PID reading may indicate a concern, if available.		
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test DV .	
		Continuous Memory	

P2109 - Throttle/Pedal Position Sensor A Minimum Stop Performance

Description:	This DTC sets when the throttle plate does not reach the lower mechanical stop position within a calibrated amount of time.		
Possible			

Causes:	• Obstruction in the throttle plate movement • Damaged electronic throttle body (ETB)		
Diagnostic Aids:	Visually inspect the throttle plate for an obstruction.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2111 - Throttle Actuator A Control System - Stuck Open

Description:	This DTC sets when the PCM fault status indicates the throttle plate is at a greater angle than commanded.		
Possible Causes:	• Throttle body stuck open or binding • TACM+ circuit open • TACM- circuit open • TACM+ and TACM- circuits are cross wired • TACM+ and TACM- circuits are shorted together		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2112 - Throttle Actuator A Control System - Stuck Closed

Description:	This DTC sets when the fault status indicates the throttle plate is at a lower angle than commanded.		
Possible Causes:	• Throttle body stuck closed • Throttle body stuck binding • TACM+ circuit open • TACM- circuit open • TACM+ and TACM- circuits are cross wired • TACM+ and TACM- circuits are shorted together		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2118 - Throttle Actuator A Control Motor Current Range / Performance

Description:	This DTC sets when a concern is detected with the electronic throttle body (ETB) TACM circuits.		
Possible Causes:	• TACM+ circuit shorted to ground • TACM- circuit shorted to ground		

Diagnostic Aids:	Do not install a new electronic throttle body (ETB) for this DTC. Check for circuit related DTCs. Check for intermittent TACM+ circuit and TACM- circuit shorted to ground.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2119 - Throttle Actuator A Control Throttle Body Range/Performance

Description:	This DTC sets when the throttle plate is at an angle other than commanded.		
Possible Causes:	• Binding throttle body or stuck throttle plate • TACM+ circuit open • TACM- circuit open • TACM+ and TACM- circuits are cross wired • TACM+ and TACM- circuits are shorted together		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

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

Description:	This DTC sets when the accelerator pedal position 1 (APP1) is out of self-test range low.		
Possible Causes:	• APP1 circuit open • APP1 circuit short to ground • Damaged APP sensor		
Diagnostic Aids:	An APP1 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

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

Description:	This DTC sets when the accelerator pedal position 1 (APP1) is out of self-test range high.		
Possible Causes:	• APP1 circuit open • APP1 circuit short to voltage • Damaged APP sensor		
Diagnostic Aids:	An APP1 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

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

Description:	This DTC sets when the accelerator pedal position 2 (APP2) is out of self-test range low.		
Possible Causes:	• APP2 circuit open • APP2 circuit short to ground • Damaged APP sensor		
Diagnostic Aids:	An APP2 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

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

Description:	This DTC sets when the accelerator pedal position 2 (APP2) is out of self-test range high.		
Possible Causes:	• APP sensor assembly is binding • APP2 circuit short to voltage • Damaged APP sensor		
Diagnostic Aids:	An APP2 sensor PID reading may indicate a concern.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

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

Description:	This DTC sets when the PCM indicates that throttle position (TP) voltage PIDs TP1 and TP2 disagree by greater than a calibrated limit.		
Possible Causes:	• Corrosion • Incorrect connections • Damaged TP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

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

Description:	The PCM compares the accelerator pedal position (APP) sensor information from APP1 and APP2		
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	signals. This DTC sets when the APP sensor inputs APP1 and APP2 disagree on the position of the accelerator pedal by greater than an expected value.		
Possible Causes:	• APP sensor circuit concerns • Damaged APP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DK .		

P2149 - Fuel Injector Group B Supply Voltage Circuit/Open

Description:	This DTC sets when the injector relay voltage is less than the calibrated threshold. This DTC also sets when a concern is detected in the INJRLY circuit.		
Possible Causes:	• B+ circuit open • INJRLY circuit open • INJRLY circuit short to ground • INJRLY circuit short to voltage • Damaged injector relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P2163 - Throttle/Pedal Position Sensor A Maximum Stop Performance

Description:	This DTC sets when the throttle plate does not reach the upper mechanical stop position within a calibrated amount of time.		
Possible Causes:	• Obstruction in the throttle plate movement • Damaged electronic throttle body (ETB)		
Diagnostic Aids:	Visually inspect the throttle plate for an obstruction.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2176 - Throttle Actuator A Control System - Idle Position Not Learned

Description:	This DTC sets when the PCM is unable to learn the calibrated throttle positions.		
Possible Causes:	• Obstruction in the throttle plate movement • Damaged throttle actuator control (TAC) motor		

Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose other DTCs first. A TAC motor circuit PID reading may indicate a concern, if available.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

P2195 - O2 Sensor Signal Biased/Stuck Lean (Bank 1 Sensor 1)

Description:	A heated oxygen sensor bank 1, sensor 1 (HO2S11) indicating lean at the end of a test is trying to correct for an over lean condition. This DTC sets when the fuel control system no longer detects switching for a calibrated amount of time.		
Possible Causes:	• Water in the harness connector • UO2SPC11 circuit open (if equipped) • HO2S11 circuit open (if equipped) • Corrosion • Incorrect connections • Low fuel pressure or running out of fuel • EVAP purge valve stuck open • Biased MAP sensor signal (if equipped) • Incorrect learned ethanol content • Air leaks after the mass airflow (MAF) sensor (if equipped) • Contaminated MAF sensor (if equipped) • Vacuum leaks • Positive crankcase ventilation (PCV) system is leaking • Incorrectly seated engine oil level indicator • Leaking gasket • Camshaft timing • Exhaust leaks before or near the universal HO2S11 (if equipped) • Exhaust leaks before or near the HO2S11 (if equipped) • Damaged universal HO2S11 (if equipped) • Damaged HO2S11 (if equipped)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P2196 - O2 Sensor Signal Biased/Stuck Rich (Bank 1 Sensor 1)

Description:	A heated oxygen sensor bank 1, sensor 1 (HO2S11) indicating rich at the end of a test is trying to correct for an over rich condition. This DTC sets when the fuel control system no longer detects switching for a calibrated amount of time.		
Possible Causes:	• Water in the harness connector • UO2SPC11 circuit open (if equipped) • HO2S11 circuit open (if equipped) • Corrosion • Incorrect connections • Excessive fuel pressure • Leaking or contaminated fuel injectors • EVAP purge valve stuck open		

	• Biased MAP sensor signal (if equipped) • Incorrect learned ethanol content • Contaminated MAF sensor (if equipped) • Positive crankcase ventilation (PCV) system • Contaminated oil • Oil overfill • Camshaft timing • Damaged universal HO2S11 (if equipped) • Damaged HO2S11 (if equipped)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

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

Description:	A universal heated oxygen sensor bank 2, sensor 1 (HO2S21) indicating lean at the end of a test is trying to correct for an over lean condition. This DTC sets when the fuel control system no longer detects switching for a calibrated amount of time.		
Possible Causes:	• Water in the harness connector • UO2SPC21 circuit open • Corrosion • Incorrect connections • Low fuel pressure or running out of fuel • EVAP purge valve stuck open • Biased MAP sensor signal • Incorrect learned ethanol content • Air leaks after the mass airflow (MAF) sensor (if equipped) • Contaminated MAF sensor (if equipped) • Vacuum leaks • Positive crankcase ventilation (PCV) system is leaking • Incorrectly seated engine oil level indicator • Leaking gasket • Camshaft timing • Exhaust leaks before or near the universal HO2S21 • Damaged universal HO2S21		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

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

Description:	A universal heated oxygen sensor bank 2, sensor 1 (HO2S21) indicating rich at the end of a test is trying to correct for an over rich condition. This DTC sets when the fuel control system no longer detects switching for a calibrated amount of time.		
Possible Causes:	• Water in the harness connector • UO2SPC21 circuit open		

	• Corrosion • Incorrect connections • Excessive fuel pressure • Leaking or contaminated fuel injectors • EVAP purge valve stuck open • Biased MAP sensor signal • Incorrect learned ethanol content • Contaminated MAF sensor (if equipped) • Positive crankcase ventilation (PCV) system • Contaminated oil • Oil overfill • Camshaft timing • Damaged universal HO2S21	
Diagnostic Aids:		
Application	Key On Engine Off	Key On Engine Running
All	GO to Pinpoint Test H .	Continuous Memory

P219A - Bank 1 Air-Fuel Ratio Imbalance

Description:	The air to fuel imbalance monitor is designed to detect large differences in the air to fuel ratio between cylinders per engine bank. This DTC sets when the air to fuel ratio difference per cylinder is greater than a calculated amount.		
Possible Causes:	• Leaking or contaminated fuel injectors • Low fuel pressure or running out of fuel • Leaking EVAP purge valve • Exhaust or intake air system leaks • Exhaust gas recirculation (EGR) system • Positive crankcase ventilation (PCV) system is leaking • Ignition system • Incorrectly seated engine oil level indicator, tube or oil fill cap • Base engine concerns • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11)		
Diagnostic Aids:	The EGR port is restricted.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P219B - Bank 2 Air-Fuel Ratio Imbalance

Description:	The air to fuel imbalance monitor is designed to detect large differences in the air to fuel ratio between cylinders per engine bank. This DTC sets when the air to fuel ratio difference per cylinder is greater than a calculated amount.		
Possible Causes:	• Leaking or contaminated fuel injectors • Low fuel pressure or running out of fuel • Leaking EVAP purge valve • Exhaust or intake air system leaks • Positive crankcase ventilation (PCV) system is leaking		

	• Ignition system • Incorrectly seated engine oil level indicator, tube or oil fill cap • Base engine concerns • Damaged universal heated oxygen sensor bank 2, sensor 1 (HO2S21)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P219C - Cylinder 1 Air-Fuel Ratio Imbalance

Description:	The air to fuel ratio imbalance torque monitor is designed to detect minimal differences in the air to fuel ratio between cylinders. This DTC sets when the minimal air to fuel ratio difference in cylinder 1 is greater than a calculated amount.		
Possible Causes:	• Leaking or contaminated cylinder 1 fuel injector • External noise sources on the CKP circuit such as the charging circuit or aftermarket equipment • Electrical noise on the CKP circuit from radio frequency interference or electro magnetic interference • Low fuel pressure or running out of fuel • Leaking EVAP purge valve • Exhaust or intake air system leaks • Exhaust gas recirculation (EGR) system • Positive crankcase ventilation (PCV) system is leaking • Incorrectly seated engine oil level indicator, tube or oil fill cap • Base engine concerns		
Diagnostic Aids:	This DTC may be caused by other systems related to cylinder 1. Diagnose any other cylinder 1 related DTCs first. The crankshaft position (CKP) sensor signal is very sensitive to electrical noise. Check the routing of the CKP sensor wiring harness.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P219D - Cylinder 2 Air-Fuel Ratio Imbalance

Description:	The air to fuel ratio imbalance torque monitor is designed to detect minimal differences in the air to fuel ratio between cylinders. This DTC sets when the minimal air to fuel ratio difference in cylinder 2 is greater than a calculated amount.		
Possible Causes:	- Leaking or contaminated cylinder 2 fuel injector - External noise sources on the CKP circuit such as the charging circuit or aftermarket equipment - Electrical noise on the CKP circuit from radio frequency interference or electro magnetic interference - Low fuel pressure or running out of fuel - Leaking EVAP purge valve - Exhaust or intake air system leaks - Exhaust gas recirculation (EGR) system - Positive crankcase ventilation (PCV) system is leaking - Incorrectly seated engine oil level indicator, tube or oil fill cap - Base engine concerns		

Diagnostic Aids:	This DTC may be caused by other systems related to cylinder 2. Diagnose any other cylinder 2 related DTCs first. The crankshaft position (CKP) sensor signal is very sensitive to electrical noise. Check the routing of the CKP sensor wiring harness.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P219E - Cylinder 3 Air-Fuel Ratio Imbalance

Description:	The air to fuel ratio imbalance torque monitor is designed to detect minimal differences in the air to fuel ratio between cylinders. This DTC sets when the minimal air to fuel ratio difference in cylinder 3 is greater than a calculated amount.		
Possible Causes:	- Leaking or contaminated cylinder 3 fuel injector - External noise sources on the CKP circuit such as the charging circuit or aftermarket equipment - Electrical noise on the CKP circuit from radio frequency interference or electro magnetic interference - Low fuel pressure or running out of fuel - Leaking EVAP purge valve - Exhaust or intake air system leaks - Exhaust gas recirculation (EGR) system - Positive crankcase ventilation (PCV) system is leaking - Incorrectly seated engine oil level indicator, tube or oil fill cap - Base engine concerns		
Diagnostic Aids:	This DTC may be caused by other systems related to cylinder 3. Diagnose any other cylinder 3 related DTCs first. The crankshaft position (CKP) sensor signal is very sensitive to electrical noise. Check the routing of the CKP sensor wiring harness.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P219F - Cylinder 4 Air-Fuel Ratio Imbalance

Description:	The air to fuel ratio imbalance torque monitor is designed to detect minimal differences in the air to fuel ratio between cylinders. This DTC sets when the minimal air to fuel ratio difference in cylinder 4 is greater than a calculated amount.		
Possible Causes:	- Leaking or contaminated cylinder 4 fuel injector - External noise sources on the CKP circuit such as the charging circuit or aftermarket equipment - Electrical noise on the CKP circuit from radio frequency interference or electro magnetic interference - Low fuel pressure or running out of fuel - Leaking EVAP purge valve - Exhaust or intake air system leaks - Exhaust gas recirculation (EGR) system - Positive crankcase ventilation (PCV) system is leaking - Incorrectly seated engine oil level indicator, tube or oil fill cap - Base engine concerns		

Diagnostic Aids:	This DTC may be caused by other systems related to cylinder 4. Diagnose any other cylinder 4 related DTCs first. The crankshaft position (CKP) sensor signal is very sensitive to electrical noise. Check the routing of the CKP sensor wiring harness.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P21A0 - Cylinder 5 Air-Fuel Ratio Imbalance

Description:	The air to fuel ratio imbalance torque monitor is designed to detect minimal differences in the air to fuel ratio between cylinders. This DTC sets when the minimal air to fuel ratio difference in cylinder 5 is greater than a calculated amount.		
Possible Causes:	- Leaking or contaminated cylinder 5 fuel injector - External noise sources on the CKP circuit such as the charging circuit or aftermarket equipment - Electrical noise on the CKP circuit from radio frequency interference or electro magnetic interference - Low fuel pressure or running out of fuel - Leaking EVAP purge valve - Exhaust or intake air system leaks - Exhaust gas recirculation (EGR) system - Positive crankcase ventilation (PCV) system is leaking - Incorrectly seated engine oil level indicator, tube or oil fill cap - Base engine concerns		
Diagnostic Aids:	This DTC may be caused by other systems related to cylinder 5. Diagnose any other cylinder 5 related DTCs first. The crankshaft position (CKP) sensor signal is very sensitive to electrical noise. Check the routing of the CKP sensor wiring harness.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P21A1 - Cylinder 6 Air-Fuel Ratio Imbalance

Description:	The air to fuel ratio imbalance torque monitor is designed to detect minimal differences in the air to fuel ratio between cylinders. This DTC sets when the minimal air to fuel ratio difference in cylinder 6 is greater than a calculated amount.		
Possible Causes:	- Leaking or contaminated cylinder 6 fuel injector - External noise sources on the CKP circuit such as the charging circuit or aftermarket equipment - Electrical noise on the CKP circuit from radio frequency interference or electro magnetic interference - Low fuel pressure or running out of fuel - Leaking EVAP purge valve - Exhaust or intake air system leaks - Exhaust gas recirculation (EGR) system - Positive crankcase ventilation (PCV) system is leaking - Incorrectly seated engine oil level indicator, tube or oil fill cap - Base engine concerns		
Diagnostic Aids:	This DTC may be caused by other systems related to cylinder 6. Diagnose any other cylinder 6 related DTCs first.		

	The crankshaft position (CKP) sensor signal is very sensitive to electrical noise. Check the routing of the CKP sensor wiring harness.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P21CF - Cylinder 1 Injector B Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open • INJ1 circuit open • Damaged fuel injector 1		
Diagnostic Aids:	The INJ1_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P21D0 - Cylinder 2 Injector B Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open • INJ2 circuit open • Damaged fuel injector 2		
Diagnostic Aids:	The INJ2_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P21D1 - Cylinder 3 Injector B Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open • INJ3 circuit open • Damaged fuel injector 3		
Diagnostic Aids:	The INJ3_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test KG .
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P21D2 - Cylinder 4 Injector B Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open • INJ4 circuit open • Damaged fuel injector 4		
Diagnostic Aids:	The INJ4_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P21D3 - Cylinder 5 Injector B Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open • INJ5 circuit open • Damaged fuel injector 5		
Diagnostic Aids:	The INJ5_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P21D4 - Cylinder 6 Injector B Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open • INJ6 circuit open • Damaged fuel injector 6		
Diagnostic Aids:	The INJ6_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P21D5 - Cylinder 7 Injector B Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open • INJ7 circuit open • Damaged fuel injector 7		
Diagnostic Aids:	The INJ7_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P21D6 - Cylinder 8 Injector B Circuit/Open

Description:	The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the PCM. This DTC sets when the fuel injector circuitry is inoperative.		
Possible Causes:	• VPWR circuit open • INJ8 circuit open • Damaged fuel injector 8		
Diagnostic Aids:	The INJ8_F PID flags equals YES.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P2227 - Barometric Pressure Sensor A Circuit Range/Performance**For Vehicles With 2.7L, 3.0L, And 3.5L GTDI Engines**

Description:	This DTC sets when either of the following conditions are present. When the BARO PID does not correlate with the TCBP and the MAP PIDs at ignition ON, engine OFF. When the MAP and TCBP PIDs correlate with the engine running, but the TCBP PID does not correlate with the BARO PID at idle.
Possible Causes:	• Damaged BARO sensor • Damaged PCM
Diagnostic Aids:	This DTC is only operational between 1,000 feet below sea level to 15,000 feet above sea level, it should be disregarded if set outside the operational range.
For All Others	
Description:	This DTC sets when the BARO does not correlate with an inferred barometric pressure calculation based on the MAP or mass airflow (MAF) value.
Possible	• Damaged BARO sensor

Causes:	Damaged PCM		
Diagnostic Aids:	This DTC is only operational between 1,000 feet below sea level to 15,000 feet above sea level, it should be disregarded if set outside the operational range.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DQ .		

P2228 - Barometric Pressure Sensor A Circuit Low

Description:	This DTC sets when the barometric pressure (BARO) reading is abnormally low indicating an extreme high altitude.		
Possible Causes:	Damaged BARO sensor		
Diagnostic Aids:	When the BARO signal is less than the calibrated threshold for greater than 100 ms, a concern is indicated. This DTC is only operational between 1,000 feet below sea level to 15,000 feet above sea level, it should be disregarded if set outside the operational range.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DQ .		

P2229 - Barometric Pressure Sensor A Circuit High

Description:	This DTC sets when the barometric pressure (BARO) reading is abnormally high indicating an extreme low altitude.		
Possible Causes:	Damaged BARO sensor		
Diagnostic Aids:	When the BARO signal is greater than a calibrated threshold for greater than 100 ms, a concern is indicated. This DTC is only operational between 1,000 feet below sea level to 15,000 feet above sea level, it should be disregarded if set outside the operational range.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DQ .		

P2230 - Barometric Pressure Sensor A Circuit Intermittent/Erratic

Description:	This DTC sets when the BARO reading is intermittently above the maximum value or intermittently below the minimum value for a calibrated number of times.		
Possible Causes:	Damaged BARO sensor		
Diagnostic Aids:	When the BARO signal is greater than or less than a calibrated threshold for greater than 100 ms, a concern is indicated. This DTC is only operational between 1,000 feet below sea level to 15,000 feet above sea level, it should be disregarded if set outside the operational range.		

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

P2237 - O2 Sensor Positive Current Control Circuit/Open (Bank 1 Sensor 1)

Description:	This DTC sets when a concern is detected with the circuit used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2SPC11 circuit open • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2240 - O2 Sensor Positive Current Control Circuit/Open (Bank 2 Sensor 1)

Description:	This DTC sets when a concern is detected with the circuit used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2SPC21 circuit open • Damaged universal heated oxygen sensor bank 2, sensor 1 (HO2S21)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2243 - O2 Sensor Reference Voltage Circuit/Open (Bank 1 Sensor 1)

Description:	This DTC sets when a concern is detected with the circuit used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2S11 circuit open • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2247 - O2 Sensor Reference Voltage Circuit/Open (Bank 2 Sensor 1)

Description:	This DTC sets when a concern is detected with the circuit used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2S21 circuit open • Damaged universal heated oxygen sensor bank 2, sensor 1 (HO2S21)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2251 - O2 Sensor Negative Current Control Circuit/Open (Bank 1 Sensor 1)

Description:	This DTC sets when a concern is detected with the circuit used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2SGREF11 circuit open • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2254 - O2 Sensor Negative Current Control Circuit/Open (Bank 2 Sensor 1)

Description:	This DTC sets when a concern is detected with the circuit used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2SGREF21 circuit open • Damaged universal heated oxygen sensor bank 2, sensor 1 (HO2S21)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P226D - Particulate Filter Deteriorated/Missing Substrate Bank 1

Description:	This DTC sets when the PCM detects the particulate filter pressure to be lower than an expected threshold.		
Possible Causes:	• Damaged particulate filter		

		Damaged particulate filter pressure bank 1, sensor 1 hose	
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RA .		

P226E - Particulate Filter Deteriorated/Missing Substrate Bank 2

Description:	This DTC sets when the PCM detects the particulate filter pressure to be lower than an expected threshold.		
Possible Causes:	- Damaged particulate filter - Damaged particulate filter pressure bank 2, sensor 1 hose		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RA .		

P2270 - O2 Sensor Signal Biased/Stuck Lean (Bank 1 Sensor 2)

For CorsairEdgeEscape/Kuga, 2.0LExplorer, 2.3LNautilusRanger,, 2.3LTransit Connect, 2.0L

Description:	This DTC sets when the heated oxygen sensor bank 1, sensor 2 (HO2S12) signal is less than the calibrated rich value during the current key cycle and, after three consecutive intrusive events, the signal cannot be forced greater than the calibrated rich value.		
Possible Causes:	• Aftermarket exhaust accessories or performance modifications • Ethanol content in the fuel • HO2S12 circuit intermittent • Damaged HO2S12		
Diagnostic Aids:	Check for leaks in the exhaust system. Check for an intermittent HO2S12 signal.		
For All Others			
Description:	The heated oxygen sensor bank 1, sensor 2 (HO2S12) is forced rich and lean and monitored by the PCM. This DTC sets when the PCM does not detect the output of the HO2S12 in a calibrated amount of time.		
Possible Causes:	• Pinched, shorted, and corroded wiring and pins • Crossed HO2S12 wires • Exhaust leaks • Contaminated HO2S12 • Damaged HO2S12		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Corsair,	GO to Pinpoint Test DW .		

Edge, Escape/Kuga 2.0L, Explorer 2.3L, Nautilus, Ranger 2.3L, Transit Connect 2.0L	
All others	GO to Pinpoint Test H .

P2271 - O2 Sensor Signal Biased/Stuck Rich (Bank 1 Sensor 2)

For CorsairEdgeEscape/Kuga, 2.0LExplorer, 2.3LNautilusRanger,, 2.3LTransit Connect, 2.0L

Description:	This DTC sets when the heated oxygen sensor bank 1, sensor 2 (HO2S12) signal is greater than the calibrated lean value during the current key cycle and, after three consecutive intrusive events, the signal cannot be forced less than the calibrated lean value.
Possible Causes:	• Aftermarket exhaust accessories or performance modifications • Ethanol content in the fuel • HO2S12 circuit intermittent • Damaged HO2S12
Diagnostic Aids:	Check for leaks in the exhaust system. Check for an intermittent HO2S12 signal.

For All Others

Description:	The heated oxygen sensor bank 1, sensor 2 (HO2S12) is forced rich and lean and monitored by the PCM. This DTC sets when the PCM does not detect the output of the HO2S in a calibrated amount of time.
Possible Causes:	• Pinched, shorted, and corroded wiring and pins • Crossed HO2S12 wires • Exhaust leaks • Contaminated HO2S12 • Damaged HO2S12
Diagnostic Aids:	

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Corsair, Edge, Escape/Kuga 2.0L, Explorer 2.3L, Nautilus, Ranger 2.3L, Transit Connect 2.0L	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test H .		

P2272 - O2 Sensor Signal Biased/Stuck Lean (Bank 2 Sensor 2)**For Edge,, 2.7LNautilus, 2.7L**

Description: This DTC sets when the heated oxygen sensor bank 2, sensor 2 (HO2S22) signal is less than the calibrated rich value during the current key cycle and, after three consecutive intrusive events, the signal cannot be forced greater than the calibrated rich value.

Possible Causes:

- Aftermarket exhaust accessories or performance modifications
- Ethanol content in the fuel
- HO2S22 circuit intermittent
- Damaged HO2S22

Diagnostic Aids: Check for leaks in the exhaust system. Check for an intermittent HO2S22 signal.

For All Others

Description: The heated oxygen sensor bank 2, sensor 2 (HO2S22) is forced rich and lean and monitored by the PCM. This DTC sets when the PCM does not detect the output of the HO2S22 in a calibrated amount of time.

Possible Causes:

- Pinched, shorted, and corroded wiring and pins
- Crossed HO2S22 wires
- Exhaust leaks
- Contaminated HO2S22
- Damaged HO2S22

Diagnostic Aids:

Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Edge 2.7L, Nautilus 2.7L	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test H .		

P2273 - O2 Sensor Signal Biased/Stuck Rich (Bank 2 Sensor 2)**For Edge,, 2.7LNautilus, 2.7L**

Description: This DTC sets when the heated oxygen sensor bank 2, sensor 2 (HO2S22) signal is greater than the calibrated lean value during the current key cycle and, after three consecutive intrusive events, the signal cannot be forced less than the calibrated lean value.

Possible Causes:

- Aftermarket exhaust accessories or performance modifications
- Ethanol content in the fuel
- HO2S22 circuit intermittent
- Damaged HO2S22

Diagnostic Aids: Check for leaks in the exhaust system. Check for an intermittent HO2S22 signal.

For All Others

Description: The heated oxygen sensor bank 2, sensor 2 (HO2S22) is forced rich and lean and monitored by the PCM. This DTC sets when the PCM does not detect the output of the HO2S22 in a calibrated amount of time.

Possible

Causes:	• Pinched, shorted, and corroded wiring and pins • Crossed HO2S22 wires • Exhaust leaks • Contaminated HO2S22 • Damaged HO2S22		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
Edge 2.7L, Nautilus 2.7L	GO to Pinpoint Test DW .		
All others	GO to Pinpoint Test H .		

P2282 - Air Leak Between Throttle Body And Intake Valve

Description:	This DTC sets when the PCM detects an air leak that exceeds a calibrated limit for greater than 5 seconds. If the airflow entering the engine exceeds the airflow through the throttle, a leak is detected and this diagnostic fails.		
Possible Causes:	• Unmetered air leaks between throttle body and intake valves • Air leaks at the intake manifold • Positive crankcase ventilation (PCV) system is leaking		
Diagnostic Aids:	Verify the integrity of the PCV system. Refer to Section 1, Positive Crankcase Ventilation (PCV) System for system information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HG .		

P2297 - O2 Sensor Out Of Range During Deceleration (Bank 1, Sensor 1)

Description:	During a deceleration fuel shut-off (DFSO) event, the PCM monitors how quickly the rear heated oxygen sensor (HO2S) switches from rich to lean. The measured rate of the rich to lean switch is compared to a calibrated threshold value. The threshold value takes into account the level of oxygen in the catalyst, which has an impact on how quickly the rich to lean switch occurs. This DTC sets when the measured value for the HO2S11 is slower than the measured value of the HO2S12.		
Possible Causes:	• Exhaust leaks before or near the HO2S • Damaged HO2S		
Diagnostic Aids:	Check for leaks in the exhaust system.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P2300 - Ignition Coil A Primary Control Circuit Low

Description:	This DTC sets when there is a short to ground in the COP1 (COP) circuit.		
Possible Causes:	• COP1 circuit short to ground • Damaged COP • Damaged ignition coil wiring harness		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2301 - Ignition Coil A Primary Control Circuit High

Description:	This DTC sets when there is a short to voltage in the COP1 (COP) circuit.		
Possible Causes:	• COP1 circuit short to voltage • Damaged COP • Damaged ignition coil wiring harness		
Diagnostic Aids:	On some vehicles, when the COP circuit is shorted to voltage, the PCM will disable the COP until the concern is no longer present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2303 - Ignition Coil B Primary Control Circuit Low

Description:	This DTC sets when there is a short to ground in the COP2 (COP) circuit.		
Possible Causes:	• COP2 circuit short to ground • Damaged COP • Damaged ignition coil wiring harness		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2304 - Ignition Coil B Primary Control Circuit High

Description:	This DTC sets when there is a short to voltage in the COP2 (COP) circuit.		
Possible Causes:	• COP2 circuit short to voltage • Damaged COP • Damaged ignition coil wiring harness		
Diagnostic Aids:	On some vehicles, when the COP circuit is shorted to voltage, the PCM will disable the COP until the concern is no longer present.		

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

P2306 - Ignition Coil C Primary Control Circuit Low

Description:	This DTC sets when there is a short to ground in the COP3 circuit.		
Possible Causes:	• COP3 circuit short to ground • Damaged ignition coil • Damaged ignition coil wiring harness		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2307 - Ignition Coil C Primary Control Circuit High

Description:	This DTC sets when there is a short to voltage in the COP3 circuit.		
Possible Causes:	• COP3 circuit short to voltage • Damaged ignition coil • Damaged ignition coil wiring harness		
Diagnostic Aids:	On some vehicles, when the COP circuit is shorted to voltage, the PCM will disable the COP until the concern is no longer present.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2309 - Ignition Coil D Primary Control Circuit Low

Description:	This DTC sets when there is a short to ground in the COP4 circuit.		
Possible Causes:	• COP4 circuit short to ground • Damaged ignition coil • Damaged ignition coil wiring harness		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2310 - Ignition Coil D Primary Control Circuit High

Description:	This DTC sets when there is a short to voltage in the COP4 circuit.		
Possible Causes:	• COP4 circuit short to voltage • Damaged ignition coil • Damaged ignition coil wiring harness		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2312 - Ignition Coil E Primary Control Circuit Low

Description:	This DTC sets when there is a short to ground in the COP5 circuit.		
Possible Causes:	• COP5 circuit short to ground • Damaged ignition coil • Damaged ignition coil wiring harness		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2313 - Ignition Coil E Primary Control Circuit High

Description:	This DTC sets when there is a short to voltage in the COP5 circuit.		
Possible Causes:	• COP5 circuit short to voltage • Damaged ignition coil • Damaged ignition coil wiring harness		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2315 - Ignition Coil F Primary Control Circuit Low

Description:	This DTC sets when there is a short to ground in the COP6 circuit.		
Possible Causes:	• COP6 circuit short to ground • Damaged ignition coil • Damaged ignition coil wiring harness		
Diagnostic Aids:			

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

P2316 - Ignition Coil F Primary Control Circuit High

Description:	This DTC sets when there is a short to voltage in the COP6 circuit.		
Possible Causes:	• COP6 circuit short to voltage • Damaged ignition coil • Damaged ignition coil wiring harness		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JF .		

P2401 - EVAP System Leak Detection Pump Control Circuit Low

Description:	This DTC sets when a concern is detected with the evaporative emission (EVAP) leak detection control module vacuum pump circuits.		
Possible Causes:	• VPWR circuit open • EVAPLDP circuit open • EVAPLDP circuit short to ground • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P2402 - EVAP System Leak Detection Pump Control Circuit High

Description:	This DTC sets when a concern is detected with the evaporative emission (EVAP) leak detection control module vacuum pump circuits.		
Possible Causes:	• EVAPLDP circuit short to voltage • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P2418 - EVAP System Switching Valve Control Circuit/Open

Description:	This DTC sets when the signal moves outside the minimum or maximum limit for the commanded state of the evaporative emission (EVAP) vapor blocking valve.		
Possible Causes:	• VPWR circuit open • VBV circuit open • VBV circuit short to ground • Damaged EVAP vapor blocking valve		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P242F - Particulate Filter Restriction - Ash Accumulation (Bank 1)

Description:	This DTC sets when the PCM detects the particulate filter pressure to be higher than an expected threshold.		
Possible Causes:	• Particulate filter ash accumulation		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RA .		

P243A - Particulate Filter Restriction - Ash Accumulation (Bank 2)

Description:	This DTC sets when the PCM detects the particulate filter pressure to be higher than an expected threshold.		
Possible Causes:	• Particulate filter ash accumulation		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RA .		

P243B - Particulate Filter Restriction - Forced Limited Power (Bank 2)

Description:	The PCM monitors the particulate filter for a high restriction. This DTC sets during normal vehicle operation when the particulate filter pressure is greater than a calibrated amount.		
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Possible Causes:	Excessive amount of soot or ash in the 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 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 RA .		

P2450 - EVAP System Switching Valve Performance/Stuck Open

Description:	The PCM commands the evaporative emission (EVAP) vapor blocking valve closed while vacuum is present in the fuel tank. If the valve does not close, the vacuum in the tank is quickly lost. This DTC sets when the rate of vacuum loss is greater than a calibrated threshold.		
Possible Causes:	- Contaminated EVAP vapor blocking valve - EVAP vapor blocking valve stuck open - Damaged EVAP vapor blocking valve		
Diagnostic Aids:	Retrieve all continuous memory and on-demand self-test DTCs from the PCM. Diagnose any circuit related EVAP vapor blocking valve DTCs before diagnosing this performance DTC. Visually inspect the EVAP canister inlet port, EVAP canister vent valve filter, fresh air hose and canister vent hose assembly for restrictions, contamination or debris.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P2451 - EVAP System Switching Valve Stuck Closed

Description:	The PCM commands the fuel tank isolation valve (FTIV) open while a vacuum is present in the fuel tank. If the FTIV does not open, the vacuum in the tank remains. This DTC sets when the rate of loss is less than a calibrated threshold.		
Possible Causes:	- Contaminated fuel tank isolation valve - FTIV stuck closed - Damaged fuel tank isolation valve		
Diagnostic Aids:	Retrieve all continuous memory and on-demand self-test DTCs from the PCM. Diagnose and repair circuit DTC P2418 or any FTP sensor concerns before diagnosing this performance DTC.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P2452 - Particulate Filter Pressure Sensor A Circuit

Description:	The PCM monitors the rationality of the particulate filter pressure bank 1, sensor 1, immediately after engine shutdown. This DTC sets when the PID value exceeds ambient pressure by a calibrated threshold.		
Possible Causes:	• PFP11 circuit short to voltage • Damaged particulate filter pressure bank 1, sensor 1		
Diagnostic Aids:	This DTC may set with other DTCs. Diagnose the other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2453 - Particulate Filter Pressure Sensor A Circuit Range/Performance

Description:	The PCM monitors the rationality of the particulate filter pressure bank 1, sensor 1, by comparing the measured pressure to a calibrated threshold pressure at the current flow rate, and comparing the rate of change in pressure with a calibrated threshold with increasing flow. The PCM compares the sensor offset calculated before and after the engine is running with a calibrated threshold. This DTC sets when the pressure is greater than a calibrated threshold during low flow, the change in pressure is greater than a calibrated threshold during a flow increase, or the sensor offset is greater than a calibrated threshold.		
Possible Causes:	• Restricted particulate filter pressure bank 1, sensor 1 port • Damaged particulate filter pressure bank 1, sensor 1 hose • Damaged particulate filter pressure bank 1, sensor 1 • Disconnected particulate filter sensor bank 1, sensor 1 hose		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2454 - Particulate Filter Pressure Sensor A Circuit Low

Description:	This DTC sets when the particulate filter pressure sensor bank 1, sensor 1, voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	• PFP11 circuit short to ground • VREF circuit open • Damaged 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 .		

P2455 - Particulate Filter Pressure Sensor A Circuit High

Description:	This DTC sets when the particulate filter pressure sensor bank 1, sensor 1, voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• PFP11 circuit open • PFP11 circuit short to voltage • SIGRTN circuit open • Damaged 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 .		

P2456 - Particulate Filter Pressure Sensor Circuit A Intermittent/Erratic

Description:	This DTC sets when the particulate filter pressure bank 1, sensor 1, signal changes beyond the minimum or maximum calibrated limit.		
Possible Causes:	• PFP11 circuit intermittent open • PFP11 circuit intermittent short to voltage • PFP11 circuit intermittent short to ground • Damaged particulate filter pressure bank 1, sensor 1		
Diagnostic Aids:	Check the harness and connection. Monitor the sensor PID while wiggling and bending the harness from the sensor to the PCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

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 • Exhaust gas recirculation (EGR) cooler restriction • Biased EGRT12 sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HE .		

P245E - Particulate Filter Pressure Sensor B Circuit

Description:	The PCM monitors the rationality of the particulate filter pressure bank 2, sensor 1, immediately after engine shutdown. This DTC sets when the PID value exceeds ambient pressure by a calibrated threshold.		
Possible Causes:	• PFP21 circuit short to voltage • Damaged particulate filter pressure bank 2, sensor 1		
Diagnostic Aids:	This DTC may set with other DTCs. Diagnose the other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P245F - Particulate Filter Pressure Sensor B Circuit Range/Performance

Description:	The PCM monitors the rationality of the particulate filter pressure bank 2, sensor 1, by comparing the measured pressure to a calibrated threshold pressure at the current flow rate, and comparing the rate of change in pressure with a calibrated threshold with increasing flow. The PCM compares the sensor offset calculated before and after the engine is running with a calibrated threshold. This DTC sets when the pressure is greater than a calibrated threshold during low flow, the change in pressure is greater than a calibrated threshold during a flow increase, or the sensor offset is greater than a calibrated threshold.		
Possible Causes:	• Restricted particulate filter pressure bank 2, sensor 1 port • Damaged particulate filter sensor bank 2, sensor 1 hose • Damaged particulate filter sensor bank 2, sensor 1 • Disconnected particulate filter sensor bank 2, sensor 1 hose		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2460 - Particulate Filter Pressure Sensor B Circuit Low

Description:	This DTC sets when the particulate filter pressure sensor bank 2, sensor 1, voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	• PFP21 circuit short to ground • VREF circuit open • Damaged particulate filter sensor bank 2, sensor 1		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2461 - Particulate Filter Pressure Sensor B Circuit High

Description:	This DTC sets when the particulate filter pressure sensor bank 2, sensor 1, voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• PFP21 circuit open • PFP21 circuit short to voltage • SIGRTN circuit open • Damaged particulate filter sensor bank 2, sensor 1		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2462 - Particulate Filter Pressure Sensor Circuit B Intermittent/Erratic

Description:	This DTC sets when the particulate filter pressure bank 2, sensor 1, signal changes beyond the minimum or maximum calibrated limit.		
Possible Causes:	• PFP21 circuit intermittent open • PFP21 circuit intermittent short to voltage • PFP21 circuit intermittent short to ground • Damaged particulate filter sensor bank 2, sensor 1		
Diagnostic Aids:	Check the harness and connection. Monitor the sensor PID while wiggling and bending the harness from the sensor to the PCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P246C - Particulate Filter Restriction - Forced Limited Power (Bank 1)

Description:	The PCM monitors the particulate filter for a high restriction. This DTC sets during normal vehicle operation when the particulate filter pressure is greater than a calibrated amount.		
Possible Causes:	• Excessive amount of soot or ash in the 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 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 RA .		

P24B9 - EVAP System Leak Detection Pump Pressure Sensor Circuit Range/Performance

Description:	This DTC sets when the evaporative emission (EVAP) leak detection control module pressure sensor signal is out of range.		
Possible Causes:	• EVAPLDPPR circuit intermittent open • EVAPLDPPR circuit intermittent short • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P24BA - EVAP System Leak Detection Pump Pressure Sensor Circuit Low

Description:	This DTC sets when the evaporative emission (EVAP) leak detection control module pressure sensor signal is less than a minimum allowable calibrated parameter.		
Possible Causes:	• EVAPLDPPR circuit open • EVAPLDPPR circuit short to ground • EVAPLDPPR circuit short to SIGRTN • VREF circuit open • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P24BB - EVAP System Leak Detection Pump Pressure Sensor Circuit High

Description:	This DTC sets when the evaporative emission (EVAP) leak detection control module pressure sensor signal is greater than a maximum allowable calibrated parameter.		
Possible Causes:	• EVAPLDPPR circuit short to voltage • VREF circuit short to voltage • SIGRTN circuit open • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P24BC - EVAP System Leak Detection Pump Pressure Sensor Circuit Intermittent

Description:	This DTC sets when an intermittent concern is detected with the evaporative emission (EVAP) leak detection control module pressure sensor circuits.		
Possible Causes:	• VREF circuit intermittent connection • EVAPLDPPR circuit intermittent connection • SIGRTN circuit intermittent connection • Incorrect connections • Corrosion • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P24BE - EVAP System Leak Detection Pump Vacuum Switching Valve Control Circuit Low

Description:	This DTC sets when a concern is detected with the evaporative emission (EVAP) leak detection control module switching valve circuits.		
Possible Causes:	• VPWR circuit open • EVAPLDPSV circuit open • EVAPLDPSV circuit short to ground • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P24BF - EVAP System Leak Detection Pump Vacuum Switching Valve Control Circuit High

Description:	This DTC sets when a concern is detected with the evaporative emission (EVAP) leak detection control module switching valve circuits.		
Possible Causes:	• EVAPLDPSV circuit short to voltage • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P24C0 - EVAP System Leak Detection Pump Vacuum Switching Valve Stuck On

Description:	This DTC sets when the evaporative emission (EVAP) leak detection control module switching valve is stuck closed.		
Possible Causes:	• EVAPLDPSV circuit short to ground • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P24C1 - EVAP System Leak Detection Pump Vacuum Switching Valve Performance/Stuck Off

Description:	This DTC sets when a the evaporative emission (EVAP) leak detection control module switching valve is stuck open.		
Possible Causes:	• VPWR circuit open • EVAPLDPSV circuit open • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P2510 - ECM / PCM Power Relay Sense Circuit Range/Performance

Description:	The ISP-R and the INJPWRM circuits are monitored for correlation. This DTC sets when the voltage on the ISP-R and the INJPWRM circuit voltages do not correspond for a calibrated period of time.		
Possible Causes:	• Ignition circuit fuse • ISP-R circuit open • ISP-R circuit short to ground • Fuel injector VPWR circuit short to voltage • Fuel injector INJPWR circuit short to voltage • Damaged ignition switch • Damaged fuel pump relay • Damaged PCM power relay		
Diagnostic Aids:	The INJPWRM PID voltage reading should be 0 volts when the ignition is in the OFF, ACC or LOCK position.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

P25B3 - Turbocharger/Supercharger Wastegate A Stuck Open

Description:	This DTC sets when the turbocharger wastegate 1 is at a greater angle than commanded.			
Possible Causes:	• Turbocharger wastegate 1 stuck open • Turbocharger wastegate 1 linkage binding • TCWGM1- circuit open • TCWGM1+ circuit open • TCWGM1+ and TCWGM1- circuits are shorted together			
Diagnostic Aids:	Check the turbocharger wastegate motor linkage for restrictions.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test HN .		

P25B4 - Turbocharger/Supercharger Wastegate A Stuck Closed

Description:	This DTC sets when the turbocharger wastegate 1 is at a lower angle than commanded.			
Possible Causes:	• Turbocharger wastegate 1 stuck closed • Turbocharger wastegate 1 linkage binding • TCWGM1- circuit open • TCWGM1+ circuit open • TCWGM1+ and TCWGM1- circuits are shorted together			
Diagnostic Aids:	Check the turbocharger wastegate motor linkage for restrictions.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test HN .		

P25B5 - Turbocharger/Supercharger Wastegate B Stuck Open

Description:	This DTC sets when the turbocharger wastegate 2 is at a greater angle than commanded.			
Possible Causes:	• Turbocharger wastegate 2 stuck open • Turbocharger wastegate 2 linkage binding • TCWGM2- circuit open • TCWGM2+ circuit open • TCWGM2+ and TCWGM2- circuits are shorted together			
Diagnostic Aids:	Check the turbocharger wastegate motor linkage for restrictions.			
Application		Key On Engine Off	Key On Engine Running	Continuous Memory
All		GO to Pinpoint Test HN .		

P25B6 - Turbocharger/Supercharger Wastegate B Stuck Closed

Description:	This DTC sets when the turbocharger wastegate 2 is at a lower angle than commanded.			
Possible Causes:	• Turbocharger wastegate 2 stuck closed			

		• Turbocharger wastegate 2 linkage binding • TCWGM2- circuit open • TCWGM2+ circuit open • TCWGM2+ and TCWGM2- circuits are shorted together	
Diagnostic Aids:	Check the turbocharger wastegate motor linkage for restrictions.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HN .		

P260F - EVAP System Monitoring Processor Performance

Description:	This DTC sets when a concern is detected internal to the PCM. The microprocessor that controls the engine off natural vacuum (EONV) leak check monitor is separate from the main processor within the PCM.		
Possible Causes:	• Module communications network concerns • PCM calibration level		
Diagnostic Aids:	Verify the PCM is at the latest calibration level. Reprogram if necessary.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P2610 - ECM/PCM Engine Off Timer Performance

Description:	This DTC sets when the difference between the engine off time and the central processing unit (CPU) time exceeds a calibrated limit for a calibrated amount of time.		
Possible Causes:	• Incorrect or intermittent battery cable connections • KAPWR circuit to PCM concern • Engine coolant temperature (ECT) sensor concern • Engine cooling system concerns • Engine stall • Rapid ignition key cycle • Module communications network concerns		
Diagnostic Aids:	This DTC may set with other DTCs. Check for all other DTCs and diagnose those first. If DTC P2610 sets after a module programming, disregard this DTC. Clear the DTCs and repeat the PCM self-test.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QB .		

P2617 - Crankshaft Position Output Circuit/Open

Description:	This DTC sets when PCM detects that the crankshaft position (CKP) sensor bias voltage is less than the calibrated minimum or greater than the calibrated maximum calculated threshold.		
Possible			

Causes:	• CKP+ circuit open • CKP+ circuit intermittent open • CKP- circuit open • CKP- circuit intermittent open • CKP+ circuit short to voltage • CKP+ circuit intermittent short to voltage • CKP- circuit short to voltage • CKP- circuit intermittent short to voltage • CKP+ circuit short to ground • CKP+ circuit intermittent short to ground • CKP- circuit short to ground • CKP- circuit intermittent short to ground • CKP sensor incorrectly installed • Damaged CKP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test JD .		

P2626 - O2 Sensor Positive Current Trim Circuit / Open (Bank 1 Sensor 1)

Description:	During deceleration fuel shut-off (DFSO) the PCM monitors the integrity of the UO2SPCT11 circuit by comparing the actual oxygen sensor voltage signal to an expected oxygen sensor voltage signal. This DTC sets when the actual oxygen sensor voltage exceeds the maximum expected voltage threshold for a specified amount of time.		
Possible Causes:	• Corrosion • Incorrect connections • UO2SPCT11 circuit open		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2627 - O2 Sensor Positive Current Trim Circuit Low (Bank 1 Sensor 1)

Description:	A resistor is installed in the universal heated oxygen sensor (HO2S) connector for part to part variance. The PCM determines the value of this resistor by taking multiple measurements of the resistor during each ignition ON event. The PCM uses this value in order to compensate for the variance in the pumping current signal. This DTC sets when the PCM determines the resistance value is too high.		
Possible Causes:	• UO2SPCT11 circuit open • UO2SPCT11 circuit short to ground • Contaminated universal heated oxygen sensor bank 1, sensor 1 (HO2S11) • Damaged universal HO2S11		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All | GO to Pinpoint Test [DZ](#).**P2628 - O2 Sensor Positive Current Trim Circuit High (Bank 1 Sensor 1)**

Description:	This DTC sets when a concern is detected with the circuit used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2SPCT11 circuit short to voltage • Damaged universal heated oxygen sensor bank 1, sensor 1 (HO2S11)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2629 - O2 Sensor Positive Current Trim Circuit / Open (Bank 2 Sensor 1)

Description:	During deceleration fuel shut-off (DFSO) the PCM monitors the integrity of the UO2SPCT21 circuit by comparing the actual oxygen sensor voltage signal to an expected oxygen sensor voltage signal. This DTC sets when the actual oxygen sensor voltage exceeds the maximum expected voltage threshold for a specified amount of time.		
Possible Causes:	• Corrosion • Incorrect connections • UO2SPCT21 circuit open		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2630 - O2 Sensor Positive Current Trim Circuit Low (Bank 2 Sensor 1)

Description:	A resistor is installed in the universal heated oxygen sensor (HO2S) connector for part to part variance. The powertrain control module (PCM) determines the value of this resistor by taking multiple measurements of the resistor during each ignition ON event. The PCM uses this value in order to compensate for the variance in the pumping current signal. This DTC sets when the PCM determines the resistance value is too high.		
Possible Causes:	• UO2SPCT21 circuit open • UO2SPCT21 circuit short to ground • Contaminated universal heated oxygen sensor bank 2, sensor 1 (HO2S21) • Damaged universal HO2S21		
Diagnostic Aids:			

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

P2631 - O2 Sensor Positive Current Trim Circuit High (Bank 2 Sensor 1)

Description:	This DTC sets when a concern is detected with the circuit used to determine the oxygen content in the exhaust gas.		
Possible Causes:	• UO2SPCT21 circuit short to voltage • Damaged universal heated oxygen sensor bank 2, sensor 1 (HO2S21)		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DZ .		

P2632 - Fuel Pump B Control Circuit/Open

Description:	The fuel pump control module 2 monitors the fuel pump module and secondary circuits for a concern. If the fuel pump control module 2 detects a concern with the fuel pump module or secondary circuits, the fuel pump control module 2 sends an 80% duty cycle signal on the fuel pump monitor 2 (FPM2) circuit to report the concern to the PCM. This DTC sets when the fuel pump control module 2 is still reporting a concern with the fuel pump module or secondary circuits after a calibrated amount of time.		
Possible Causes:	• FP2PWR circuit open or short to ground • FP2RTN circuit open • FP2PWR circuit short to voltage • FP2RTN circuit short to voltage • Damaged fuel pump module • Damaged fuel pump control module 2		
Diagnostic Aids:	Check for any harness concerns. The fuel pump control module 2 controls the speed of the fuel pump assembly by supplying a variable voltage to the fuel pump assembly on the FPPWR2 circuit.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

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		
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.		

P26C4 - Internal Control Module Clutch Pedal Performance

Description:	This DTC sets when the PCM detects a concern with the clutch pedal position (CPP) sensor signal.		
Possible Causes:	• Damaged harness connector • Water in the harness connector • Corrosion		
Diagnostic Aids:	This DTC may be accompanied by other DTCs. Diagnose all other clutch pedal position (CPP) sensor DTCs first. If no other CPP sensor related DTCs are present, continue to follow diagnosis for this DTC. This DTC is a functional check of the CPP sensor input for the auto start stop system. Refer to Section 1, Powertrain Control Software , Auto Start Stop for additional information.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test TA .		

P26EA - Fuel Pump Control Module B

Description:	This DTC sets when the fuel pump control module 2 detects an internal concern.		
Possible Causes:	• Damaged fuel pump control module 2		
Diagnostic Aids:	Clear the PCM DTCs. Repeat the self-test. If the DTC is retrieved again, install a new fuel pump control module 2. 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.		

P2A01 - O2 Sensor Circuit Range/Performance (Bank 1 Sensor 2)

Description:	This DTC sets when the heated oxygen sensor bank 1, sensor 2 (HO2S12) voltage is out of range low for a calibrated period of time.		
Possible Causes:	• Crossed HO2S12 and SIGRTN circuits • Corrosion • Incorrect connections • Contaminated HO2S12 • Deteriorating HO2S12 • Damaged HO2S12		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P2A04 - O2 Sensor Circuit Range/Performance (Bank 2 Sensor 2)

Description:	This DTC sets when the heated oxygen sensor bank 2, sensor 2 (HO2S22) voltage is out of range low for a calibrated period of time.		
Possible Causes:	• Crossed HO2S22 and SIGRTN circuits • Corrosion • Incorrect connections • Contaminated HO2S22 • Deteriorating HO2S22 • Damaged HO2S22		
Diagnostic Aids:	Inspect the connectors for signs of damage, water intrusion or corrosion.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DW .		

P2AB7 - Wastegate Position Sensor A Circuit

Description:	This DTC sets when the TCWP1 circuit voltage is greater than or less than a calibrated threshold.		
Possible Causes:	• Damaged or restricted wastegate motor linkage • TCWP1 circuit open • TCWP1 circuit short to ground • TCWP1 circuit short to voltage • Damaged turbocharger wastegate position 1 sensor • Damaged harness connector		
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 HN .		

P2AB8 - Wastegate Position Sensor A Circuit Low

Description:	This DTC sets when the turbocharger wastegate position 1 sensor is out of self-test range low.		
Possible Causes:	• Damaged or restricted wastegate motor linkage • TCWP1 circuit open • TCWP1 circuit short to ground • Damaged turbocharger wastegate position 1 sensor		
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 HN .
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P2AB9 - Wastegate Position Sensor A Circuit High

Description:	This DTC sets when the turbocharger wastegate position 1 sensor is out of self-test range high.		
Possible Causes:	• Damaged or restricted wastegate motor linkage • TCWP1 circuit open • TCWP1 circuit short to voltage • Damaged turbocharger wastegate position 1 sensor		
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 HN .	

P2ABA - Wastegate Position Sensor B Circuit

Description:	This DTC sets when the TCWP2 circuit voltage is greater than or less than a calibrated threshold.		
Possible Causes:	• Damaged or restricted wastegate motor linkage • TCWP2 circuit open • TCWP2 circuit short to ground • TCWP2 circuit short to voltage • Damaged turbocharger wastegate position 2 sensor • Damaged harness connector		
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 HN .	

P2ABB - Wastegate Position Sensor B Circuit Low

Description:	This DTC sets when the turbocharger wastegate position 2 sensor is out of self-test range low.		
Possible Causes:	• Damaged or restricted wastegate motor linkage • TCWP2 circuit open • TCWP2 circuit short to ground • Damaged turbocharger wastegate position 2 sensor		
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 HN .	

P2ABC - Wastegate Position Sensor B Circuit High

Description:	This DTC sets when the turbocharger wastegate position 2 sensor is out of self-test range high.		
Possible Causes:	• Damaged or restricted wastegate motor linkage • TCWP2 circuit open • TCWP2 circuit short to voltage • Damaged turbocharger wastegate position 2 sensor		
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 HN .		

P2ABD - Turbocharger/Supercharger Wastegate Actuator A Driver Current/Temperature Too High

Description:	This DTC sets when the turbocharger wastegate motor 1 driver current is greater than a calibrated threshold.		
Possible Causes:	• TCWGM1+ circuit short to ground • TCWGM1- circuit short to ground • Turbocharger wastegate motor 1 shorted internally		
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 HN .		

P2ABE - Turbocharger/Supercharger Wastegate Actuator B Driver Current/Temperature Too High

Description:	This DTC sets when the turbocharger wastegate motor 2 driver current is greater than a calibrated threshold.		
Possible Causes:	• TCWGM2+ circuit short to ground • TCWGM2- circuit short to ground • Turbocharger wastegate motor 2 shorted internally		
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 HN .		

P2BEC - Fuel Control System A Too Lean Bank 1

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a rich calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	• Ethanol content in the fuel • Fuel filter restricted or dirty • Damaged or worn fuel pump • Leaking fuel pump check valve • Leaking or contaminated fuel injectors • Low fuel pressure or running out of fuel • EVAP purge valve is leaking when the canister is clean • Fuel supply line restricted • Fuel rail pressure (FRP) sensor bias • Exhaust leaks in the exhaust manifold gasket or mating gaskets before or near the heated oxygen sensor (HO2S) • Vacuum leaks • Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open • Incorrectly seated engine oil level indicator • Intake air turbulence due to incorrect air filter		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P2BED - Fuel Control System A Too Rich Bank 1

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a lean calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	• Leaking fuel injectors • Fuel return line restricted • Fuel rail pressure (FRP) sensor bias • EVAP purge valve is leaking when the canister is full • Oil contaminated with fuel		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P2BEE - Fuel Control System A Too Lean Bank 2

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a rich calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel		
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	Trim for additional information.		
Possible Causes:	- Ethanol content in the fuel - Fuel filter restricted or dirty - Damaged or worn fuel pump - Leaking fuel pump check valve - Leaking or contaminated fuel injectors - Low fuel pressure or running out of fuel - EVAP purge valve is leaking when the canister is clean - Fuel supply line restricted - Fuel rail pressure (FRP) sensor bias - Exhaust leaks in the exhaust manifold gasket or mating gaskets before or near the heated oxygen sensor (HO2S) - Vacuum leaks - Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open - Incorrectly seated engine oil level indicator - Intake air turbulence due to incorrect air filter		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P2BEF - Fuel Control System A Too Rich Bank 2

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a lean calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	- Leaking fuel injectors - Fuel return line restricted - Fuel rail pressure (FRP) sensor bias - EVAP purge valve is leaking when the canister is full - Oil contaminated with fuel		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P2BF0 - Fuel Control System B Too Lean Bank 1

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a rich calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	- Ethanol content in the fuel - Fuel filter restricted or dirty		

	- Damaged or worn fuel pump - Leaking fuel pump check valve - Leaking or contaminated fuel injectors - Low fuel pressure or running out of fuel - EVAP purge valve is leaking when the canister is clean - Fuel supply line restricted - Fuel rail pressure (FRP) sensor bias - Exhaust leaks in the exhaust manifold gasket or mating gaskets before or near the heated oxygen sensor (HO2S) - Vacuum leaks - Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open - Incorrectly seated engine oil level indicator - Intake air turbulence due to incorrect air filter		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P2BF1 - Fuel Control System B Too Rich Bank 1

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a lean calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	- Leaking fuel injectors - Fuel return line restricted - Fuel rail pressure (FRP) sensor bias - EVAP purge valve is leaking when the canister is full - Oil contaminated with fuel		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P2BF2 - Fuel Control System B Too Lean Bank 2

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a rich calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	- Ethanol content in the fuel - Fuel filter restricted or dirty - Damaged or worn fuel pump - Leaking fuel pump check valve - Leaking or contaminated fuel injectors - Low fuel pressure or running out of fuel		

	• EVAP purge valve is leaking when the canister is clean • Fuel supply line restricted • Fuel rail pressure (FRP) sensor bias • Exhaust leaks in the exhaust manifold gasket or mating gaskets before or near the heated oxygen sensor (HO2S) • Vacuum leaks • Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open • Incorrectly seated engine oil level indicator • Intake air turbulence due to incorrect air filter						
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.						
Application	<table><tr><td>Key On Engine Off</td><td>Key On Engine Running</td><td>Continuous Memory</td></tr><tr><td>All</td><td>GO to Pinpoint Test H.</td><td></td></tr></table>	Key On Engine Off	Key On Engine Running	Continuous Memory	All	GO to Pinpoint Test H .	
Key On Engine Off	Key On Engine Running	Continuous Memory					
All	GO to Pinpoint Test H .						

P2BF3 - Fuel Control System B Too Rich Bank 2

Description:	The adaptive fuel strategy continuously monitors the fuel delivery hardware. This DTC sets when the adaptive fuel tables reach a lean calibrated limit. Refer to Section 1, Powertrain Control Software , Fuel Trim for additional information.		
Possible Causes:	• Leaking fuel injectors • Fuel return line restricted • Fuel rail pressure (FRP) sensor bias • EVAP purge valve is leaking when the canister is full • Oil contaminated with fuel		
Diagnostic Aids:	View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques , for additional information and the appropriate pinpoint test for specific concern identification.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test H .		

P2C27 - Fuel Injector Group B Supply Sense Circuit Low

Description:	This DTC sets when the injector relay voltage is less than the calibrated threshold. This DTC also sets when a concern is detected in the INJRLY circuit or the INJPWRM circuit.		
Possible Causes:	• INJPWRM circuit open • INJPWRM circuit short to ground • INJRLY circuit short to ground • Damaged injector relay		
Diagnostic Aids:			
Application		Key On Engine Off	Key On Engine Running
All		GO to Pinpoint Test KG .	Continuous Memory

P2C28 - Fuel Injector Group B Supply Sense Circuit High

Description:	This DTC sets when the INJRLY circuit voltage is more than the calibrated threshold. This DTC also sets when the INJPWRM circuit voltage is more than the calibrated threshold.		
Possible Causes:	• INJPWRM circuit short to voltage • INJRLY circuit short to voltage • Damaged injector relay		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KG .		

P2CE5 - Particulate Filter Pressure Sensor C Circuit

Description:	This DTC sets when the particulate filter pressure bank 1, sensor 2 has detected a circuit concern or internal communication concern.		
Possible Causes:	• PFP12 circuit concerns • Damaged particulate filter pressure bank 1, sensor 2		
Diagnostic Aids:	This DTC may set with other DTCs. Diagnose the other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CE6 - Particulate Filter Pressure Sensor C Circuit Range/Performance

Description:	The PCM monitors the rationality of the particulate filter pressure bank 1, sensor 2, by comparing the measured pressure to a calibrated threshold pressure at the current flow rate, and comparing the rate of change in pressure with a calibrated threshold with increasing flow. The PCM compares the sensor offset calculated before and after the engine is running with a calibrated threshold. This DTC sets when the pressure is greater than a calibrated threshold during low flow, the change in pressure is greater than a calibrated threshold during a flow increase, or the sensor offset is greater than a calibrated threshold.		
Possible Causes:	• Restricted particulate filter pressure bank 1, sensor 2 port • Damaged particulate filter pressure bank 1, sensor 2 hose • Damaged particulate filter pressure bank 1, sensor 2 • Disconnected particulate filter sensor bank 1, sensor 2 hose		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CE7 - Particulate Filter Pressure Sensor C Circuit Low

Description:	This DTC sets when the particulate filter pressure sensor bank 1, sensor 2, voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	• PFP12 circuit short to ground • VREF circuit open • Damaged particulate filter pressure bank 1, sensor 2		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CE8 - Particulate Filter Pressure Sensor C Circuit High

Description:	This DTC sets when the particulate filter pressure sensor bank 1, sensor 2, voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• PFP12 circuit open • PFP12 circuit short to voltage • SIGRTN circuit open • Damaged particulate filter pressure bank 1, sensor 2		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CE9 - Particulate Filter Pressure Sensor Circuit C Intermittent/Erratic

Description:	This DTC sets when the particulate filter pressure bank 1, sensor 2, signal changes beyond the minimum or maximum calibrated limit.		
Possible Causes:	• PFP12 circuit intermittent open • PFP12 circuit intermittent short to voltage • PFP12 circuit intermittent short to ground • Damaged particulate filter pressure bank 1, sensor 2		
Diagnostic Aids:	Check the harness and connection. Monitor the sensor PID while wiggling and bending the harness from the sensor to the PCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CEA - Particulate Filter Pressure Sensor D Circuit

Description:	This DTC sets when the particulate filter pressure bank 2, sensor 2 has detected a circuit concern or internal communication concern.		
Possible Causes:	• PFP22 circuit concerns • Damaged particulate filter pressure bank 2, sensor 2		
Diagnostic Aids:	This DTC may set with other DTCs. Diagnose the other DTCs first.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CEB - Particulate Filter Pressure Sensor D Circuit Range/Performance

Description:	The PCM monitors the rationality of the particulate filter pressure bank 2, sensor 2, by comparing the measured pressure to a calibrated threshold pressure at the current flow rate, and comparing the rate of change in pressure with a calibrated threshold with increasing flow. The PCM compares the sensor offset calculated before and after the engine is running with a calibrated threshold. This DTC sets when the pressure is greater than a calibrated threshold during low flow, the change in pressure is greater than a calibrated threshold during a flow increase, or the sensor offset is greater than a calibrated threshold.		
Possible Causes:	• Restricted particulate filter pressure bank 2, sensor 2 port • Damaged particulate filter pressure bank 2, sensor 2 hose • Damaged particulate filter pressure bank 2, sensor 2 • Disconnected particulate filter sensor bank 2, sensor 2 hose		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CEC - Particulate Filter Pressure Sensor D Circuit Low

Description:	This DTC sets when the particulate filter pressure sensor bank 2, sensor 2, voltage is less than 0.10 volt for greater than 15 seconds.		
Possible Causes:	• PFP22 circuit short to ground • VREF circuit open • Damaged particulate filter pressure bank 2, sensor 2		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CED - Particulate Filter Pressure Sensor D Circuit High

Description:	This DTC sets when the particulate filter pressure sensor bank 2, sensor 2, voltage is greater than 4.90 volts for greater than 15 seconds.		
Possible Causes:	• PFP22 circuit open • PFP22 circuit short to voltage • SIGRTN circuit open • Damaged particulate filter pressure bank 2, sensor 2		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2CEE - Particulate Filter Pressure Sensor Circuit D Intermittent/Erratic

Description:	This DTC sets when the particulate filter pressure bank 2, sensor 2, signal changes beyond the minimum or maximum calibrated limit.		
Possible Causes:	• PFP22 circuit intermittent open • PFP22 circuit intermittent short to voltage • PFP22 circuit intermittent short to ground • Damaged particulate filter pressure bank 2, sensor 2		
Diagnostic Aids:	Check the harness and connection. Monitor the sensor PID while wiggling and bending the harness from the sensor to the PCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

P2DDA - EVAP System Leak Detection Pump Performance/Stuck Off

Description:	This DTC sets when a concern is detected with the evaporative emission (EVAP) leak detection control module vacuum pump circuits.		
Possible Causes:	• VPWR circuit open • EVAPLDP circuit open • EVAPLDP circuit short to ground • EVAPLDP circuit short to voltage • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P2DDB - EVAP System Leak Detection Pump Stuck On

Description:	This DTC sets when a concern is detected with the evaporative emission (EVAP) leak detection control module vacuum pump circuits.		
Possible Causes:	• VPWR circuit open • EVAPLDP circuit open • EVAPLDP circuit short to ground • EVAPLDP circuit short to voltage • Damaged EVAP leak detection control module		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HX .		

P3401 - Cylinder 1 Deactivation/Intake Valve Control Circuit/Open

Description:	This DTC sets when a low or high voltage on the CDC1 circuit is detected.		
Possible Causes:	• CDC1 circuit open • CDC1 circuit short to voltage • CDC1 circuit short to ground • VPWR circuit open • Damaged cylinder deactivation solenoid		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KH .		

P3402 - Cylinder 1 Deactivation/Intake Valve Control Circuit Performance

Description:	This DTC sets when the PCM detects an inconsistent or erratic signal.		
Possible Causes:	• Corrosion • Incorrect connections • Damaged cylinder deactivation solenoid		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KH .		

P3403 - Cylinder 1 Deactivation/Intake Valve Control Circuit Low

Description:	This DTC sets when a lower than expected voltage on the CDC1 circuit is detected.		
Possible Causes:	• CDC1 circuit open • CDC1 circuit short to ground • VPWR circuit open • Damaged cylinder deactivation solenoid		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KH .		

P3404 - Cylinder 1 Deactivation/Intake Valve Control Circuit High

Description:	This DTC sets when a higher than expected voltage on the CDC1 circuit is detected.		
Possible Causes:	• CDC1 circuit open • CDC1 circuit short to voltage • Damaged cylinder deactivation solenoid		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KH .		

Pxxxx -

Description:			
Possible Causes:			
Diagnostic Aids:	For Pxxxx DTCs not listed in this chart, refer to the customer's symptom to determine the applicable Workshop Manual section for 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.		

U0046 - Vehicle Communication Bus C

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

U0101 - Lost Communication With TCM

Description:	The PCM continuously monitors the controller area network (CAN) for messages from the transmission control module (TCM). This DTC sets when the PCM does not receive the TCM message within the defined amount of time.		
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 QA .		

U0104 - Lost Communication With Cruise Control Module

Description:	The PCM continuously monitors for messages from the cruise control module. This DTC sets when the PCM does not receive the cruise control module message within the defined amount of time.		
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 QA .		

U0109 - Lost Communication With Fuel Pump Control Module A

Description:	The PCM monitors the fuel pump monitor (FPM) circuit for the presence of a duty cycled signal. If the FPM circuit is fixed at a low or high voltage, the PCM begins to increment a counter. 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 inertia fuel shutoff (IFS) switch (if equipped) • Damaged fuel pump control module relay		
Diagnostic Aids:	Check if the inertia fuel shutoff (IFS) switch is tripped.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

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

Description:	The PCM continuously monitors the controller area network (CAN) for messages from the ABS. This DTC sets when the PCM fails to receive the ABS message within the defined amount of time.		
Possible Causes:	• 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 QA .		

U0138 - Lost Communication With All Terrain Control Module

Description:	The PCM continuously monitors the controller area network (CAN) for messages from the all terrain control module (ATCM). This DTC sets when the PCM does not receive the ATCM message within the defined amount of time.		
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 QA .		

U0140 - Lost Communication With Body Control Module

Description:	The PCM continuously monitors controller area network (CAN) for messages from body control module (BCM). This DTC sets when the PCM does not receive the BCM message within the defined amount of time.		
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 QA .		

U0155 - Lost Communication With Instrument Panel Cluster (IPC) Control Module

Description:	The PCM continuously monitors the controller area network (CAN) for messages from the instrument panel cluster (IPC) module. This DTC sets when the PCM does not receive the IPC message within the defined amount of time.		
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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 QA .		

U016C - Lost Communication With Fuel Pump Control Module B

Description:	The PCM monitors the FPM2 circuit for the presence of a duty cycled signal. If the FPM2 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 FPM2 circuit after a calibrated amount of time.		
Possible Causes:	• FPM2 circuit open or short to ground • FPM2 circuit short to voltage • VPWR fuel circuit open • GND circuit open • Damaged fuel pump control module relay 2		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

U0212 - Lost Communication With Steering Column Control Module

Description:	The PCM continuously monitors the controller area network (CAN) for messages from the steering angle sensor. This DTC sets when the PCM does not receive the steering angle sensor message within the defined amount of time.		
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 QA .		

U028x -

Description:			
Possible Causes:			
Diagnostic Aids:	Refer to the Workshop Manual Section 303-14, Electronic Engine Controls, PCM DTC Chart, to continue diagnosis.		

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

U0298 - Lost Communication With DC/DC Converter Control Module A

Description:	The PCM continuously monitors the controller area network (CAN) for messages from the DC to DC convertor control module. This DTC sets when the PCM does not receive the DC to DC convertor control module message within the defined amount of time.		
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 QA .		

U0300 - Internal Control Module Software Incompatibility

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

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

U0415 - Invalid Data Received From Anti-Lock Brake System (ABS) Control Module 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 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 QA .		

U0422 - Invalid Data Received From Body 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 all other module DTCs or related symptoms. Diagnose all other module DTCs before diagnosing this DTC. Reprogram the BCM, instrument cluster, and PCM using as built data. 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.		

U0423 - Invalid Data Received From Instrument Panel Cluster 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 [QA](#).**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 bank 1, sensor 1.		
Possible Causes:	• PFP11 circuit concerns • Damaged 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 .		

U0602 - Lost Communication With Particulate Filter Pressure Sensor B

Description:	This DTC sets when the PCM no longer receives a signal from the particulate filter pressure bank 2, sensor 1.		
Possible Causes:	• PFP21 circuit concerns • Damaged particulate filter sensor bank 2, sensor 1		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

U0606 - Lost Communication With Throttle/Pedal Position Sensor/Switch A

Description:	This DTC sets when the PCM no longer receives a signal from the throttle position (TP) sensor.		
Possible Causes:	• TP circuit concerns • Damaged TP sensor		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

U060B - Lost Communication With Turbocharger/Supercharger Boost Sensor A

Description:	This DTC sets when the PCM no longer receives a signal from the turbocharger boost pressure
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	(TCBP) sensor.		
Possible Causes:	• TCBP circuit concerns • Damaged TCBP sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DM .		

U060E - Lost Communication With Crankcase Pressure Sensor

Description:	This DTC sets when the PCM no longer receives a signal from the crankcase pressure sensor.		
Possible Causes:	• CKCP circuit concerns • Damaged crankcase pressure sensor		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test HG .		

U0696 - Lost Communication With Particulate Filter Pressure Sensor C

Description:	This DTC sets when the PCM no longer receives a signal from the particulate filter pressure bank 1, sensor 2.		
Possible Causes:	• PFP12 circuit concerns • Damaged particulate filter pressure bank 1, sensor 2		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test RC .		

U0697 - Lost Communication With Particulate Filter Pressure Sensor D

Description:	This DTC sets when the PCM no longer receives a signal from the particulate filter pressure bank 2, sensor 2.		
Possible Causes:	• PFP22 circuit concerns • Damaged particulate filter sensor bank 2, sensor 2		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory

All	GO to Pinpoint Test RC .
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U1011 - Invalid Internal Control Module Monitoring Data Received From ECM/PCM

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 receiving module logs a DTC related to the invalid data concern.		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QA .		

U1012 - Invalid Internal Control Module Monitoring Data Received From Anti-Lock Brake System (ABS) 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 receiving module logs a DTC related to the invalid data concern.		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QA .		

U1013 - Invalid Internal Control Module Monitoring 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 receiving module logs a DTC related to the invalid data concern.		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test QA .		

U1039 - SCP (J1850) Invalid Or Missing Data For Vehicle Speed

Description:	Network DTC(s) occur during module to module communication concerns.		
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 QA .		

U2100 - Initial Configuration Not Complete

Description:	This DTC sets when there is a programming error within the vehicle identification (VID) block.		
Possible Causes:	VID data corrupted by the scan tool during VID reprogramming		
Diagnostic Aids:	Program the VID block. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Making Changes to the VID Block. If the PCM does not allow reprogramming of the VID block, reflashing of the PCM is required.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

U2101 - Control Module Configuration Incompatible

Description:	This DTC sets when the PCM RAM has been corrupted.		
Possible Causes:	- Module reprogramming - Aftermarket performance products - Damaged PCM		
Diagnostic Aids:	Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Check for aftermarket performance products. If necessary to install 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.		

U210B - Lost Communication Between Fuel Pump Control Module A And Restraints Control Module

Description:	The fuel pump control module monitors the duty cycle and frequency of the signal it receives from the restraints control module (RCM). The fuel pump control module determines if the signal on the ENS circuit from the RCM is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module sends a 40% duty cycle signal on the FPM circuit to report the concern to the PCM. This		
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	DTC sets when the fuel pump control module is still reporting that it is receiving an invalid duty cycle or frequency from the RCM after a calibrated amount of time.		
Possible Causes:	• ENS circuit open or short to ground • ENS circuit short to voltage • Radio frequency interference or electromagnetic interference • Damaged fuel pump control module • Damaged RCM		
Diagnostic Aids:	Check the harness for routing, alterations, incorrect shielding, or electrical interference from other systems. The ENS is used to notify the fuel pump control module of an event requiring the fuel pump to be disabled. The fuel pump control module monitors the ENS signal by sending a 12V low current signal on the ENS circuit to the RCM.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test KC .		

U210F - Throttle/Pedal Position Sensor/Switch A Communication Circuit Low

Description:	This DTC sets when the electronic throttle control (ETC) throttle position (TP) signal is too low.		
Possible Causes:	• TP circuit short to ground • Damaged TP sensor		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

U2110 - Throttle/Pedal Position Sensor/Switch A Communication Circuit High

Description:	This DTC sets when the electronic throttle control (ETC) throttle position (TP) signal is too high.		
Possible Causes:	• TP circuit open • TP circuit short to voltage • TP circuit short to VREF • ETCRTN circuit open • Damaged TP sensor		
Diagnostic Aids:	This concern exhibits a symptom of limited power.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test DV .		

U2200 - Control Module Configuration Memory Corrupt

Description:	This DTC sets when there is a programming error within the vehicle identification (VID) block.		
Possible			

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

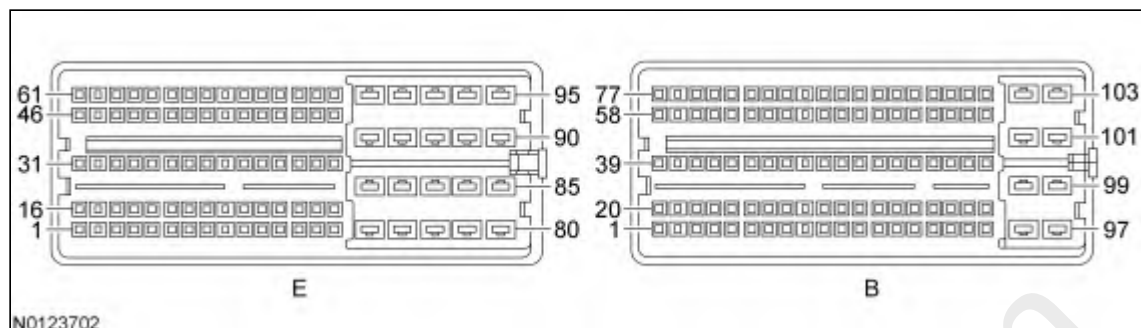
U300C - Ignition Input Off/On/Start

Description:	The PCM monitors the ignition key state. This DTC sets when the key state is not available.		
Possible Causes:	• ISP-R circuit open • ISP-R circuit short to ground		
Diagnostic Aids:			
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	GO to Pinpoint Test B .		

Uxxxx - Network Communication Diagnostic Trouble Code (DTC)

Description:	Powertrain related DTC from another 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 Diagnostic Trouble Codes (DTC) Index to continue diagnosis.		
Application	Key On Engine Off	Key On Engine Running	Continuous Memory
All	Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.		

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1.0L EcoSport**198 Pin PCM****Typical Diagnostic Reference Values**

Inputs	Component/PID Only	Measured/PID Values				Units Measured/PID
		KOEO	Hot Idle	48 KM/H (30 MPH)	89 KM/H (55 MPH)	
AAT	AAT Sensor	16 (60.8)	16 (60.8)	16 (60.8)	16 (60.8)	DEG C (DEG F)
AAT_V	AAT Sensor	2.95	2.79	3.14	3.19	VOLTS
AC_REQ	PID	NO	NO	NO	NO	YES/NO
APP	APP Sensor	0	0	21	14	%
APP1	APP Sensor	0.81	0.81	1.49	1.27	VOLTS
APP1 (APP_D)	APP Sensor	16	16	29	25	%
APP2	APP Sensor	0.41	0.41	0.75	0.64	VOLTS
APP2 (APP_E)	APP Sensor	8	8	15	13	%
APP_MAXDIFF	PID	0	0	0	0	DEG
APP_MODE	PID	NO PEDAL	NO PEDAL	PART PEDAL	PART PEDAL	NO PEDAL/ PART PEDAL
BARO	PID	99 (14.36)	99 (14.36)	99 (14.36)	99 (14.36)	kPa (PSI)/
BARO_V	PID	3 94	3 94	3 94	3 94	VOLTS
BOO1	BPP Switch	FALSE	FALSE	FALSE	FALSE	TRUE/FALSE
BOO2	BPP Switch	FALSE	FALSE	FALSE	FALSE	TRUE/FALSE
BRKOV RD_POSS	PID	9	9	10	10	NUMERIC VALUE
BRKOV R_ACTION	PID	0	0	0	0	NUMERIC VALUE

Inputs	Component/PID Only	Measured/PID Values				Units Measured/PID
		KOEO	Hot Idle	48 KM/H (30 MPH)	89 KM/H (55 MPH)	
CHT2	CHT2 Sensor	86 (186.8)	86 (186.8)	108 (226.4)	124 (255.2)	DEG C (DEG F)
CHT2_V	CHT2 Sensor	0.65	0.64	3.08	2.96	VOLTS
CLRDIST	PID	1 (0.62)	1 (0.62)	2 (1.24)	4 (2.49)	KM (MILES)
CPP_BOT	CPP Switch	NO	NO	NO	NO	YES/NO
CRNKCAS_PR	Crankcase Pressure Sensor	0 (0)	0.02 (0)	0.06 (0.01)	0.10 (0.01)	Pa (PSI)
CRNKCAS_P_V	Crankcase Pressure Sensor	0	3.94	3.95	3.97	VOLTS
DECHOKE	PID	YES	NO	NO	NO	YES/NO
DIST_BRKOV	PID	13 (8.08) (E)	13 (8.08) (E)	14 (8.70) (E)	17 (10.56) (E)	KM (MILES)
DTCCNT	PID	2	2	2	2	Numeric Value
ECT	ECT Sensor	78 (172.4)	77 (170.6)	91 (195.8)	92 (197.6)	DEG C (DEG F)
ECT1_V	ECT Sensor	0.84	0.86	0.60	0.59	VOLTS
EQ_RAT11	PID	0	1	1.01	1	Numeric Value
ETC_ACT	PID	14.41	4.86	12.89	32.08	DEG
ETC_TRIM	PID	-0.16	-0.16	-0.25	-0.25	DEG
FLI	Fuel Level Sensor	83 (H)	82 (H)	77 (H)	82 (H)	%
FPM	PID	40	40	40	40	%
FRP	FRP Sensor	4230 (613.51)	3010 (436.56)	3130 (453.97)	11610 (1683.89)	kPa (PSI)
FRT_A	FRT Sensor	16 (60.8)	16 (60.8)	16 (60.8)	16 (60.8)	DEG C (DEG F)
FRT_V	FRT Sensor	0	0	0	0	VOLTS
FTP_V	FTP Sensor	2.63	2.63	1.62	2.34	VOLTS
HTRCM11	HO2S11 Sensor	0	0	1.41	1.41	A
HTRCM12	HO2S12 Sensor	0	0	1.55	1.55	A
IAT	IAT Sensor	39 (102.2)	36 (96.8)	19 (66.2)	18 (64.4)	DEG C (DEG F)
IAT1_V	IAT Sensor	1.80	1.93	2.69	2.75	VOLTS
IAT2_V	IAT2 Sensor	1.50	1.59	2.41	2.46	VOLTS
KNK_CNTR_CYL1	PID	0	0	0	0	COUNT
KNK_CNTR_CYL2	PID	0	0	0	0	COUNT
KNK_CNTR_CYL3	PID	0	0	0	0	COUNT
KNOCK_1	KS1 Sensor	198	54	34	60	COUNT
LOAD	PID	0.00 (I)	31	18	48	%
LONGFT1	PID	(I)	-20 TO +20	-20 TO +20	-20 TO +20	%