SECTION 4

Powertrain DTC Charts and Descriptions

Contents

Diagnostic Trouble Code (DTC) Charts and Descriptions ...........4-1
### Diagnostic Trouble Code (DTC) Charts and Descriptions

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

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

#### P0001 - Fuel Volume Regulator Control Circuit/Open

<table>
<thead>
<tr>
<th>Description:</th>
<th>The powertrain control module (PCM) monitors the fuel volume regulator (FVR) and fuel volume regulator return (FVRRTN) circuits to the PCM for high and low voltage.</th>
</tr>
</thead>
</table>
| Possible Causes: | • Open in the FVR circuit  
• Open in the FVRRTN circuit  
• Open in the fuel volume regulator solenoid coil |
| Diagnostic Aids: | Application Key On Engine Off Key On Engine Running Continuous Memory |
| All | GO to Pinpoint Test HP. |

#### P0003 - Fuel Volume Regulator Control Circuit Low

<table>
<thead>
<tr>
<th>Description:</th>
<th>The powertrain control module (PCM) monitors the fuel volume regulator (FVR) and fuel volume regulator return (FVRRTN) circuits to the PCM for high and low voltage.</th>
</tr>
</thead>
</table>
| Possible Causes: | • FVR circuit short to ground  
• FVRRTN circuit short to ground |
| Diagnostic Aids: | A FVRRTN circuit short to ground may damage the solenoid coil. If P0001 is retrieved after a circuit repair, check the solenoid coil for an open circuit. |
| Application Key On Engine Off Key On Engine Running Continuous Memory | All | GO to Pinpoint Test HP. |

#### P0004 - Fuel Volume Regulator Control Circuit High

<table>
<thead>
<tr>
<th>Description:</th>
<th>The powertrain control module (PCM) monitors the fuel volume regulator (FVR) and fuel volume regulator return (FVRRTN) circuits to the PCM for high and low voltage.</th>
</tr>
</thead>
</table>
| Possible Causes: | • FVR circuit short to FVRRTN circuit  
• FVRRTN circuit short to voltage |
| Diagnostic Aids: | Application Key On Engine Off Key On Engine Running Continuous Memory |
| All | GO to Pinpoint Test HP. |

#### P000A - Intake A Camshaft Position Slow Response Bank 1

<table>
<thead>
<tr>
<th>Description:</th>
<th>The powertrain control module (PCM) monitors and evaluates the response of the actual position on a target position change. The setpoint and camshaft position are saved at the beginning of a setpoint change. If this change over time is large enough (gradient), the camshaft phasing change is evaluated. If the change after the diagnostic time is smaller than a threshold, a slow response is detected, and if the value is greater, then there is no concern. By detecting a concern, an antibounce counter is incremented otherwise the counter is decremented. If the counter exceeds an adjustable limit, this DTC sets.</th>
</tr>
</thead>
</table>
| Possible Causes: | • Erratic camshaft position due to low oil pressure  
• Oil flow restriction in the oil passages or the variable camshaft timing (VCT) valve body  
• Camshaft advance mechanism binding (VCT unit)  
• Damaged VCT phaser  
• Radio frequency interference (RFI) |

(Continued)
### P000A - Intake A Camshaft Position Slow Response Bank 1

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

### P000B - Exhaust B Camshaft Position Slow Response Bank 1

**Description:** The powertrain control module (PCM) monitors and evaluates the response of the actual position on a target position change. The setpoint and camshaft position are saved at the beginning of a setpoint change. If this change over time is large enough (gradient), the camshaft phasing change is evaluated. If the change after the diagnostic time is smaller than a threshold, a slow response is detected, and if the value is greater, then there is no concern. By detecting a concern, an antibounce counter is incremented otherwise the counter is decremented. If the counter exceeds an adjustable limit, this DTC sets.

**Possible Causes:**
- Erratic camshaft position due to low oil pressure
- Oil flow restriction in the oil passages or the variable camshaft timing (VCT) valve body
- Camshaft advance mechanism binding (VCT unit)
- Damaged VCT phaser
- Radio frequency interference (RFI)

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

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

**Description:** The powertrain control module (PCM) monitors the variable camshaft timing (VCT) circuit for high and low voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time.

**Possible Causes:**
- Open or short in the VCT circuit
- Open VPWR circuit
- Open or short in the VCT solenoid valve

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>
### P0011 - Intake Camshaft Position Timing - Over-Advanced (Bank 1)

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

**Possible Causes:**
- Camshaft timing incorrectly set
- Continuous oil flow to the VCT piston chamber
- Erratic camshaft position due to low oil pressure
- Oil flow restriction in the oil passages or the VCT valve body
- VCT solenoid valve stuck open
- Open or short in the VCT circuit
- Open VPWR circuit
- Camshaft advance mechanism binding (VCT unit)
- Damaged VCT phaser
- Damaged camshaft position (CMP) sensor
- Open or short in the CMP sensor circuits
- Radio frequency interference (RFI)

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

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<th>Application</th>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

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

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

**Possible Causes:**
- Camshaft timing incorrectly set
- Continuous oil flow to the VCT piston chamber
- Erratic camshaft position due to low oil pressure
- Oil flow restriction in the oil passages or the VCT valve body
- VCT solenoid valve stuck open
- Open or short in the VCT circuit
- Open VPWR circuit
- Camshaft advance mechanism binding (VCT unit)
- Damaged VCT phaser
- Damaged camshaft position (CMP) sensor
- Open or short in the CMP sensor circuits
- Radio frequency interference (RFI)

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

<table>
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<th>Application</th>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P0013 - Exhaust Camshaft Position Actuator Circuit/Open (Bank 1)

**Description:** The powertrain control module (PCM) monitors the variable camshaft timing (VCT) circuit for high and low voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time.

**Possible Causes:**
- Open or short in the VCT circuit
- Open VPWR circuit
- Open or short in the VCT solenoid valve

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

### P0014 - Exhaust Camshaft Position Timing - Over-Advanced (Bank 1)

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

**Possible Causes:**
- Camshaft timing incorrectly set
- Continuous oil flow to the VCT piston chamber
- Erratic camshaft position due to low oil pressure
- Oil flow restriction in the oil passages or the VCT valve body
- VCT solenoid valve stuck open
- Open or short in the VCT circuit
- Open VPWR circuit
- Camshaft advance mechanism binding (VCT unit)
- Damaged VCT phaser
- Damaged camshaft position (CMP) sensor
- Open or short in the CMP sensor circuits
- Radio frequency interference (RFI)

**Diagnostic Aids:** These DTCs 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 the DTC.

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
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<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

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

Possible Causes:
- Camshaft timing incorrectly set
- Continuous oil flow to the VCT piston chamber
- Erratic camshaft position due to low oil pressure
- Oil flow restriction in the oil passages or the VCT valve body
- VCT solenoid valve stuck open
- Open or short in the VCT circuit
- Open VPWR circuit
- Camshaft advance mechanism binding (VCT unit)
- Damaged VCT phaser
- Damaged camshaft position (CMP) sensor
- Open or short in the CMP sensor circuits
- Radio frequency interference (RFI)

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

Application
<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HK</td>
<td></td>
</tr>
</tbody>
</table>

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

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for a misalignment between the camshaft and crankshaft. The test fails when the misalignment is 1 tooth or greater. This DTC can also set due to VCT system concerns (oil contamination or VCT solenoid stuck).

Possible Causes:
- Camshaft timing incorrectly set
- Continuous oil flow to the VCT piston chamber
- Erratic camshaft position due to low oil pressure
- Oil flow restriction in the oil passages or the VCT valve body
- VCT solenoid stuck in position
- Open or short in the VCT circuit
- Open VPWR circuit
- Camshaft advance mechanism binding (VCT unit)
- Damaged VCT phaser
- Damaged camshaft position (CMP) sensor
- Open or short in the CMP sensor circuits
- Radio frequency interference (RFI)

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

Application
<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HK</td>
<td></td>
</tr>
</tbody>
</table>
P0017 - Crankshaft Position - Camshaft Position Correlation - Bank 1 Sensor B

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) position for a misalignment between the camshaft and crankshaft. The test fails when the misalignment is 1 tooth or greater. This DTC can also set due to VCT system concerns (oil contamination or VCT solenoid stuck).

Possible Causes:
- Camshaft timing incorrectly set
- Continuous oil flow to the VCT piston chamber
- Erratic camshaft position due to low oil pressure
- Oil flow restriction in the oil passages or the VCT valve body
- VCT solenoid stuck in position
- Open or short in the VCT circuit
- Open VPWR circuit
- Camshaft advance mechanism binding (VCT unit)
- Damaged VCT phaser
- Damaged camshaft position (CMP) sensor
- Open or short in the CMP sensor circuits
- Radio frequency interference (RFI)

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

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

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

Description: See the description for DTC P0016.

Possible Causes: See the possible causes for DTC P0016.

Diagnostic Aids: See the diagnostic aids for DTC P0016.

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

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

Description: See the description for DTC P0017.

Possible Causes: See the possible causes for DTC P0017.

Diagnostic Aids: See the diagnostic aids for DTC P0017.

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

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

Description: See the description for DTC P0010.

Possible Causes: See the possible causes for DTC P0010.

Diagnostic Aids: See the diagnostic aids for DTC P0010.

Application Key On Engine Off Key On Engine Running Continuous Memory
All GO to Pinpoint Test HK.
P0021 - Intake Camshaft Position Timing - Over-Advanced (Bank 2)

Description: See the description for DTC P0011.
Possible Causes: See the possible causes for DTC P0011.
Diagnostic Aids: See the diagnostic aids for DTC P0011.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>All GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

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

Description: See the description for DTC P0012.
Possible Causes: See the possible causes for DTC P0012.
Diagnostic Aids: See the diagnostic aids for DTC P0012.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>All GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

P0023 - Exhaust Camshaft Position Actuator Circuit/Open (Bank 2)

Description: See the description for DTC P0013.
Possible Causes: See the possible causes for DTC P0013.
Diagnostic Aids: See the diagnostic aids for DTC P0013.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>All GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

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

Description: See the description for DTC P0014.
Possible Causes: See the possible causes for DTC P0014.
Diagnostic Aids: See the diagnostic aids for DTC P0014.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>All GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

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

Description: See the description for DTC P0015.
Possible Causes: See the possible causes for DTC P0015.
Diagnostic Aids: See the diagnostic aids for DTC P0015.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>All GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

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

For Vehicles With Universal HO2S

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

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

**Possible Causes:**
- Open UO2S circuit
- Open UO2SGREF circuit
- Open UO2SHTR circuit
- UO2SHTR circuit short to voltage
- Incorrect connections
- Damaged or corroded terminals
- Exhaust temperature significantly higher than expected
- Damaged HO2S

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

**For Vehicles With HO2S (4-pin)**

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

**Possible Causes:**
- VPWR circuit open
- HO2S heater circuit open
- HO2S heater circuit short in the harness
- Incorrect connections
- Damaged or corroded terminals
- Exhaust temperature significantly higher than expected
- Damaged HO2S

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge,</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DZ.</td>
</tr>
<tr>
<td>Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test DW.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### P0031 - HO2S Heater Control Circuit Low (Bank 1, Sensor 1)

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

**Possible Causes:**
- HO2S heater circuit short in the harness
- Incorrect connections
- Damaged or corroded terminals
- Exhaust temperature significantly higher than expected
- Damaged HO2S

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

### P0032 - HO2S Heater Control Circuit High (Bank 1, Sensor 1)

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

**Possible Causes:**
- HO2S heater circuit short in the harness
- Incorrect connections
- Damaged or corroded terminals
- Exhaust temperature significantly higher than expected
- Damaged HO2S

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

### P0034 - Turbocharger/Supercharger Bypass Valve A Control Circuit Low

**Description:** The powertrain control module (PCM) continuously monitors the TCBY circuit for concerns. This DTC sets when the PCM detects a short to ground in the 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HN.</td>
</tr>
</tbody>
</table>

### P0035 - Turbocharger/Supercharger Bypass Valve A Control Circuit High

**Description:** The powertrain control module (PCM) continuously monitors the TCBY circuit for concerns. This DTC sets when the PCM detects an open circuit or high voltage in the circuit.

**Possible Causes:**
- Damaged turbocharger bypass (TCBY) valve
- TCBY circuit open or short to voltage

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0035 - Turbocharger/Supercharger Bypass Valve A Control Circuit High

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

Possible Causes:
- VPWR circuit open
- HO2S heater circuit open
- HO2S heater circuit short in the harness
- Incorrect connections
- Damaged or corroded terminals
- Exhaust temperature significantly higher than expected
- Damaged HO2S

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

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | GO to Pinpoint Test DW.

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

Description: See the description for DTC P0031.

Possible Causes: See the possible causes for DTC P0031.

Diagnostic Aids: See the diagnostic aids for DTC P0031.

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: See the description for DTC P0032.

Possible Causes: See the possible causes for DTC P0032.

Diagnostic Aids: See the diagnostic aids for DTC P0032.

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

Description: The heated oxygen sensor (HO2S) monitor determines if the HO2S signal response for a fuel shift corresponds to the correct engine bank. The test fails when there is no response from the HO2S being tested.

Possible Causes:
- 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.

(Continued)
### P0040 - Oxygen Sensor Signals Swapped Bank 1 Sensor 1/Bank 2 Sensor 1

<table>
<thead>
<tr>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</td>
</tr>
<tr>
<td>Key On Engine Off</td>
</tr>
<tr>
<td>All others</td>
</tr>
</tbody>
</table>

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

**Description:** The heated oxygen sensor (HO2S) monitor determines if the HO2S signal response for a fuel shift corresponds to the correct engine bank. The test fails when there is no response from the HO2S being tested.

**Possible Causes:**
- 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.

<table>
<thead>
<tr>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
</tr>
<tr>
<td>Key On Engine Off</td>
</tr>
<tr>
<td>All</td>
</tr>
</tbody>
</table>

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

**Description:** See the description for DTC P0030.

**Possible Causes:** See the possible causes for DTC P0030.

**Diagnostic Aids:** See the diagnostic aids for DTC P0030.

<table>
<thead>
<tr>
<th>Application</th>
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</thead>
<tbody>
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<td>All</td>
</tr>
<tr>
<td>Key On Engine Off</td>
</tr>
<tr>
<td>All</td>
</tr>
</tbody>
</table>

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

**Description:** Heater current requirements too low or high in the heated oxygen sensor (HO2S) heater control circuit.

**Possible Causes:**
- VPWR circuit open
- HO2S heater circuit open
- HO2S heater circuit short in the harness
- Damaged HO2S heater

(Continued)
## Diagnostic Trouble Code (DTC) Charts and Descriptions

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

<table>
<thead>
<tr>
<th>Diagnostic Aids:</th>
<th>Inspect the connectors for signs of damage, water ingress, or corrosion.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Key On Engine Off</td>
</tr>
<tr>
<td>Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</td>
<td></td>
</tr>
<tr>
<td>All others</td>
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</table>

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

<table>
<thead>
<tr>
<th>Description:</th>
<th>See the description for DTC P0053.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>See the possible causes for DTC P0053.</td>
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<tr>
<td>Diagnostic Aids:</td>
<td>See the diagnostic aids for DTC P0053.</td>
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<tr>
<td>Application</td>
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</table>

### P0059 - HO2S Heater Resistance (Bank 2, Sensor 1)

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
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<tr>
<td>Diagnostic Aids:</td>
<td>See the diagnostic aids for DTC P0053.</td>
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<tr>
<td>Application</td>
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</tr>
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<td>(Continued)</td>
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</tr>
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</table>
### P0059 - HO2S Heater Resistance (Bank 2, Sensor 1)

<table>
<thead>
<tr>
<th>Application</th>
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<th>Continuous Memory</th>
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<tr>
<td>Escape / Mariner</td>
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<tr>
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<tr>
<td>Taurus</td>
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</tbody>
</table>

All others: GO to Pinpoint Test DW.

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

**Description:** See the description for DTC P0053.

**Possible Causes:** See the possible causes for DTC P0053.

**Diagnostic Aids:** See the diagnostic aids for DTC P0053.

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

**For Vehicles With An Idle Air Control (IAC) Valve**

**Description:** The powertrain control module (PCM) monitors a vehicle operation rationality check by comparing sensed throttle position to mass air flow readings. If during a key ON, engine running (KOER) self-test, the comparison of the TP sensor and MAF sensor readings are not consistent with the calibrated load values, the test fails and a DTC is stored in continuous memory.

**Possible Causes:**
- Air leak between MAF sensor and throttle body
- Damaged MAF sensor
- TP sensor not seated correctly
- Damaged TP sensor

**Diagnostic Aids:** Diagnose any MAF or TP circuit DTCs first. Drive the vehicle and exercise the throttle and the TP sensor in all gears. A TP PID less than 4.82% (0.24 volt) with a LOAD PID greater than 55%, or a TP PID greater than 49.05% (2.44 volts) with a LOAD PID less than 30% indicates a concern is present.

**For All Others**

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

Description: The powertrain control module (PCM) monitors a vehicle operation rationality check by comparing sensed throttle position to mass air flow readings. If during a key ON, engine running (KOER) self-test, the comparison of the TP sensor and MAF sensor readings are not consistent with the calibrated load values, the test fails and a DTC is stored in continuous memory.

Possible Causes:
- Air leak between MAF sensor and throttle body.
- Damaged MAF sensor
- TP sensor not seated correctly
- Damaged TP sensor

Diagnostic Aids: Diagnose any MAF or TP DTCs first. For Fiesta, if the throttle plate is closed and the LOAD PID is greater than 35%, or with the TP_REL PID at 28% with the LOAD PID less than 30% indicates a concern is present. For all others, if the throttle plate is closed and the LOAD PID is greater than 55%, or with the throttle plate at wide open throttle (WOT) with the LOAD PID less than 30% indicates a concern is present.

Application

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>All others</td>
<td></td>
<td>GO to Pinpoint Test DV.</td>
</tr>
</tbody>
</table>

P0071 - Ambient Air Temperature Sensor Circuit Range/Performance

Description: The powertrain control module (PCM) continuously monitors this sensor for concerns. This DTC sets when the ambient air temperature (AAT) sensor reading does not correlate with the other temperature sensor readings at ignition ON. The PCM runs this logic after an engine off and a calibrated soak period, typically 6 - 8 hours. This soak period allows the AAT sensor and the other temperature sensors to stabilize and not differ by more 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

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test FA.</td>
</tr>
</tbody>
</table>

P0072 - Ambient Air Temperature Sensor Circuit Low

Description: The DTC indicates the sensor signal is less than the self-test minimum.

Possible Causes:
- AAT circuit short to ground
- Damaged AAT sensor

Diagnostic Aids: An AAT sensor reading less than the self test minimum with ignition ON engine OFF or during any engine operating mode indicates a concern is present.

Application

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test FA.</td>
</tr>
</tbody>
</table>

P0073 - Ambient Air Temperature Sensor Circuit High

Description: The DTC indicates the sensor signal is greater than the self-test maximum.

Possible Causes:
- AAT circuit open or short to voltage
- Damaged AAT sensor

Diagnostic Aids: An AAT 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

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test FA.</td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0074 - The sensor signal to the powertrain control module (PCM) is intermittent.

Description: The powertrain control module (PCM) continuously monitors the AAT circuit for concerns. If the PCM detects a sudden change in the AAT signal that changes beyond the minimum or maximum calibrated limit, the DTC sets.

Possible Causes: • Loose electrical connection
• 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.

All 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: The powertrain control module (PCM) continuously monitors this sensor for concerns. This DTC sets when the charge air cooler temperature (CAC_T) parameter identification (PID) does not correlate with the intake air temperature (IAT) or the intake air temperature 2 (IAT2) PIDs at ignition ON. It will also set if the IAT PID reading is greater than a maximum calibrated value while driving.

Possible Causes: • Damaged turbocharger boost pressure (TCBP)/charge air cooler temperature (CACT) sensor
• Contaminated or blocked TCBP/CACT sensor
• Slow responding TCBP/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 air flow through charge air cooler (CAC), remove debris if necessary. The TCBP/CACT sensor is a dual function pressure and temperature sensor located on the intake air tube between the CAC and the throttle body.

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

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

Description: The powertrain control module (PCM) continuously monitors the CACT circuit for concerns. The test fails when the temperature is greater than the calibrated value for the sensor or a short to ground is detected in the circuit.

Possible Causes: • Damaged turbocharger boost pressure (TCBP)/charge air cooler temperature (CACT) sensor
• CACT circuit short to ground
• VPWR circuit open
• Low air flow 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. The TCBP/CACT sensor is a dual function pressure and temperature sensor located on the intake air tube between the CAC and the throttle body.

All Key On Engine Off Key On Engine Running Continuous Memory
All GO to Pinpoint Test DN.
### Diagnostic Trouble Code (DTC) Charts and Descriptions

<table>
<thead>
<tr>
<th>DTC</th>
<th>Description</th>
<th>Possible Causes</th>
<th>Diagnostic Aids</th>
<th>Application Key</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
</table>
| P007D - Charge Air Cooler Temperature Sensor Circuit High (Bank 1) | The powertrain control module (PCM) continuously monitors the CACT circuit for concerns. The test fails when the temperature is lower than the calibrated value for the sensor or an open or short to voltage is detected in the circuit. | • Damaged turbocharger boost pressure (TCBP) sensor/charge air cooler temperature (CACT) sensor  
• CACT circuit open or short to voltage  
• SIGRTN circuit open  
• Output from the charge air cooler (CAC) is colder than the calibrated threshold | Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. The TCBP/CACT sensor is a dual function pressure and temperature sensor located on the intake air tube between the CAC and the throttle body. | On Engine Off | GO to Pinpoint Test DN. |

| P0087 - Fuel Rail/System Pressure - Too Low | The powertrain control module (PCM) regulates the fuel rail pressure by controlling the fuel volume regulator. When the PCM is no longer capable of maintaining the fuel pressure within the calibrated parameters, the DTC is set. | • Fuel filter plugged or dirty  
• Fuel supply line restricted  
• Damaged fuel pump module  
• Damaged fuel injection pump | Diagnose any FRP and FVR circuit DTCs first. | On Engine Off | GO to Pinpoint Test HP. |

| P0088 - Fuel Rail/System Pressure - Too High | The powertrain control module (PCM) regulates the fuel rail pressure by controlling the fuel volume regulator. When the PCM is no longer capable of maintaining the fuel pressure within the calibrated parameters, the DTC is set. | • Damaged fuel injection pump | | On Engine Off | GO to Pinpoint Test HP. |

| P0096 - Intake Air Temperature Sensor 2 Circuit Range/Performance (Bank 1) | The powertrain control module (PCM) continuously monitors this sensor for concerns. This DTC sets when the intake air temperature 2 (IAT2) parameter identification (PID) does not correlate with the charge air cooler temperature (CAC_T) or the intake air temperature (IAT) PIDs at ignition ON. It will also set if the IAT2 PID exceeds the maximum calibrated temperature threshold while driving. | • Slow responding manifold absolute pressure (MAP)/intake air temperature 2 (IAT2) sensor  
• Damaged MAP/IAT2 sensor | The MAP/IAT2 sensor is located on top of the intake manifold. | On Engine Off | GO to Pinpoint Test EA. |
P0097 - Intake Air Temperature Sensor 2 Circuit Low

**Description:** Indicates the sensor signal is less than the self-test minimum. The intake air temperature 2 (IAT2) sensor minimum is 0.2 volt.

**Possible Causes:**
- IAT2 circuit short to ground
- Incorrect harness connection
- Damaged IAT2 sensor

**Diagnostic Aids:** Monitor the IAT2 PID value. A typical IAT2 temperature should be greater than the IAT1 temperature.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flex 3.5L GTDI, MKS 3.5L, MKT 3.5L, Taurus 3.5L GTDI</td>
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</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DU.</td>
</tr>
</tbody>
</table>

P0098 - Intake Air Temperature Sensor 2 Circuit High

**Description:** Indicates the sensor signal is greater than the self-test maximum. The intake air temperature 2 (IAT2) sensor maximum is 4.6 volts.

**Possible Causes:**
- IAT2 circuit open or short to voltage
- Incorrect harness connection
- Damaged IAT2 sensor

**Diagnostic Aids:** Monitor the IAT2 PID value. A typical IAT2 temperature should be greater than the IAT1 temperature.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
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<tr>
<td>Flex 3.5L GTDI, MKS 3.5L, MKT 3.5L, Taurus 3.5L GTDI</td>
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</tr>
<tr>
<td>All others</td>
<td></td>
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</tr>
</tbody>
</table>

P009A - Intake Air Temperature /Ambient Air Temperature Correlation

**Description:** The DTC indicates that the intake air temperature (IAT) and ambient air temperature (AAT) sensor readings differ by more than a calibrated value.

**Possible Causes:**
- Biased IAT or AAT sensor
- Damaged IAT or AAT sensor

**Diagnostic Aids:** Make sure the IAT, AAT and engine coolant temperature (ECT) sensor readings are within 18°C (32.4°F) of each other after 6 to 8 hours at a stabilized ambient temperature.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
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<tbody>
<tr>
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</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

<table>
<thead>
<tr>
<th>DTC</th>
<th>Description</th>
<th>Possible Causes</th>
<th>Diagnostic Aids</th>
</tr>
</thead>
</table>
| **P00BA** - Low Fuel Pressure | Forced Limited Power | 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 | 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. |

| **P00C1** - Turbocharger/Supercharger Bypass Valve B Control Circuit Low |  | The powertrain control module (PCM) continuously monitors the TCBY2 circuit for concerns. This DTC sets when the PCM detects a short to ground in the 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 |  | The powertrain control module (PCM) continuously monitors the TCBY2 circuit for concerns. This DTC sets when the PCM detects an open circuit or high voltage in the circuit. | **Possible Causes:**  
- Damaged turbocharger bypass 2 (TCBY2) valve  
- TCBY2 circuit open or 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. |
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P00C6 - Fuel Rail Pressure Too Low - Engine Cranking

**Description:** The high pressure fuel system must reach a minimum pressure threshold before the engine can be started. If the high pressure fuel system cannot achieve this threshold within certain time and crankshaft rotation limits, the powertrain control module (PCM) attempts to start the engine at fuel pump module pressure and sets DTC P00C6.

**Possible Causes:**
- Fuel filter plugged or dirty
- Fuel supply line restricted
- Damaged fuel pump module
- Damaged fuel injection pump

**Diagnostic Aids:** Diagnose any FRP and FVR circuit DTCs first.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DD.</td>
</tr>
</tbody>
</table>

### P00CE - Intake Air Temperature Measurement System - Multiple Sensor Correlation

**Description:** The powertrain control module (PCM) monitors the intake air system for concerns at ignition start. The test fails when the intake air temperature (IAT), charge air cooler temperature (CAC_T) and the intake air temperature 2 (IAT2) parameter identifications (PIDs) are each more than 16.67°C (30°F) different from each other at start up. The DTC sets when the PCM detects 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 sensors
- Contaminated or blocked sensors
- Slow responding sensors

**Diagnostic Aids:** Compare all sensor readings to the ambient temperature to determine which sensor is reading correctly.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test EA.</td>
</tr>
</tbody>
</table>

### P0100 - Mass or Volume Air Flow A Circuit

**Description:** The powertrain control module (PCM) continuously monitors this sensor for concerns. The mass air flow (MAF) sensor is monitored for a low sensor frequency. This DTC sets if the sensor frequency changes below a minimum calibrated limit for greater than 0.5 seconds.

**Possible Causes:**
- Open MAF sensor element

**Diagnostic Aids:** Install a new MAF/IAT sensor. Refer to the Workshop Manual Section 303-14, Electronic Engine Controls.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P0101 - Mass or Volume Air Flow A Circuit Range/Performance

**Description:** The powertrain control module (PCM) continuously monitors the mass air flow (MAF) sensor for concerns. This DTC sets if the PCM detects that the actual air flow is less or greater than the modeled air flow by more than a calibrated value for 2.4 seconds.

**Possible Causes:**
- Restricted air flow
- Intake air leak
- Damaged MAF sensor

**Diagnostic Aids:** Check the MAF sensor for contamination and the intake air system for leaks.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DC.</td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0102 - Mass or Volume Air Flow A Circuit Low

| Description: | The mass air flow (MAF) sensor is monitored by the powertrain control module (PCM). This DTC sets if during key ON engine running (KOER) the sensor output changes below a minimum calibrated limit for greater than a set period of time. |
| Possible Causes: | • MAF circuit short to ground  
• Damaged 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 A Circuit High

| Description: | The mass air flow (MAF) sensor circuit is monitored by the powertrain control module (PCM). This DTC sets if during key ON engine running (KOER) the sensor output changes above a maximum calibrated limit. |
| Possible Causes: | • MAF circuit open or 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 A Circuit Intermittent/Erratic

| Description: | A concern exists in the mass air flow (MAF) sensor A circuit, or the air tube containing the sensor, causing an incorrect sensor output reading. |
| Possible Causes: | • Intermittent circuit A open or short |
| Diagnostic Aids: | Verify the integrity of the MAF sensor circuit A for an intermittent concern. Check the MAF sensor tube for air leaks. |

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

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

For Vehicles With 3.5L GTDI Engine

| Description: | The powertrain control module (PCM) continuously monitors this sensor for concerns. This DTC sets when the manifold absolute pressure (MAP) parameter identification (PID) does not correlate with the barometric pressure (BARO) or the throttle intake pressure (TIP_PRS_BOOST) PIDs at ignition ON. It will also set if the MAP and TIP_PRS_BOOST PIDs fail to correlate when running and the TIP_PRS_BOOST PID does not correlate with the BARO PID at idle. |
| Possible Causes: | • Slow responding manifold absolute pressure (MAP)/intake air temperature 2 (IAT2) sensor  
• Damaged MAP/IAT2 sensor |
| Diagnostic Aids: | The VREF voltage should be between 4.0 and 6.0 volts. |

For All Others

| Description: | MAP sensor input to the powertrain control module (PCM) is monitored and is not within the calibrated value. |
| Possible Causes: | • Slow responding MAP sensor  
• Damaged MAP sensor |
| Diagnostic Aids: | The VREF voltage should be between 4.0 and 6.0 volts. |

(Continued)
## Diagnostic Trouble Code (DTC) Charts and Descriptions

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flex 3.5L GTDI, MKS 3.5L, MKT 3.5L, Taurus 3.5L GTDI</td>
<td></td>
<td>GO to Pinpoint Test EA.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DM.</td>
</tr>
</tbody>
</table>

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

**Description:** MAP sensor operating voltage is below the minimum calibrated parameter of 0.024 volt.

**Possible Causes:**
- MAP circuit short to ground
- VREF circuit open or short to ground
- Damaged MAP sensor

**Diagnostic Aids:** The VREF voltage should be between 4.0 and 6.0 volts.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flex 3.5L GTDI, MKS 3.5L, MKT 3.5L, Taurus 3.5L GTDI</td>
<td></td>
<td>GO to Pinpoint Test DN.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DM.</td>
</tr>
</tbody>
</table>

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

**Description:** Sensor operating voltage is greater than 4.96 volts. As a result it failed above the maximum allowable calibrated parameter.

**Possible Causes:**
- VREF circuit short to voltage
- MAP circuit open or short to voltage
- Open circuit

**Diagnostic Aids:** The VREF voltage should be between 4.0 and 6.0 volts.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flex 3.5L GTDI, MKS 3.5L, MKT 3.5L, Taurus 3.5L GTDI</td>
<td></td>
<td>GO to Pinpoint Test DN.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DM.</td>
</tr>
</tbody>
</table>

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

**Description:** The sensor signal to the powertrain control module (PCM) is failing intermittently.

**Possible Causes:**
- Incorrect harness connections
- Damaged MAP sensor

**Diagnostic Aids:** Check the harness and connection.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flex 3.5L GTDI, MKS 3.5L, MKT 3.5L, Taurus 3.5L GTDI</td>
<td></td>
<td>GO to Pinpoint Test DN.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DM.</td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

For Vehicles With 3.5L GTDI Engine

Description: The powertrain control module (PCM) continuously monitors this sensor for concerns. This DTC sets when either of the following conditions are present. When the intake air temperature (IAT) parameter identification (PID) does not correlate with the charge air cooler temperature (CAC_T) or the intake air temperature 2 (IAT2) PIDs at ignition ON. When the IAT PID 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: Indicates the IAT rationality test has failed. This DTC indicates the IAT value is higher than a calibrated value and could prevent one or more on board diagnostic (OBD) monitors from completing.

The powertrain control module (PCM) runs this logic after an engine OFF and a calibrated soak period (typically 6 - 8 hours). This soak period allows IAT and other temperature sensors to stabilize and not differ by more than a calibrated value. DTC P0111 sets when the IAT at engine start exceeds the other temperature sensors by more than a calibrated value, typically 17°C (30°F).

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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flex 3.5L GTDI, MKS 3.5L, MKT 3.5L, Taurus 3.5L GTDI</td>
<td>GO to Pinpoint Test EA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test DA.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Description: The DTC indicates the sensor signal is less than the self-test minimum.

Possible Causes: • Grounded circuit in the harness
• Damaged IAT sensor
• Incorrect harness connection

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DA.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Description: The DTC indicates the sensor signal is greater than the self-test maximum.

Possible Causes: • Open circuit in the harness
• IAT signal circuit short to voltage
• Damaged IAT sensor
• Incorrect harness connection

Diagnostic Aids: An IAT PID reading greater than self test maximum with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DA.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
P0114 - Intake Air Temperature (IAT) Sensor 1 Intermittent/Erratic

**Description:** Indicates the sensor signal was intermittent during the comprehensive component monitor (CCM).

**Possible Causes:**
- Damaged harness
- Damaged IAT sensor
- Damaged harness connector

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

**Application**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DA.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Description:** Indicates the engine coolant temperature rationality test has failed. This DTC indicates the ECT or cylinder head temperature (CHT) value is higher than the calibrated value and could prevent one or more on board diagnostic (OBD) monitors from completing.

The powertrain control module (PCM) runs this logic after an engine off and a calibrated soak period (typically 6 hours). This soak period allows the intake air temperature (IAT) and the CHT or ECT to stabilize and not differ by more than a calibrated value. DTC P0116 sets when all of the following conditions are met:

- The ECT at engine start exceeds the IAT at engine start by more than a calibrated value, typically 17°C (30°F).
- The ECT exceeds a calibrated value, typically 107°C (225°F).
- The fuel system, heated oxygen and misfire monitors have not completed.
- The calibrated time to set DTC P0116 has expired.

**Possible Causes:**
- ECT or CHT sensor
- Coolant system concern

**Diagnostic Aids:** Make sure the IAT and the ECT are similar when the engine is cold. Also make sure the ECT or CHT sensor and the actual engine operating temperatures are the same.

**Application**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiesta, Ranger 4.0L</td>
<td>GO to Pinpoint Test DX.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test DX.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Description:** Indicates the sensor signal is less than the self-test minimum. The ECT sensor minimum is 0.2 volt or 121°C (250°F).

**Possible Causes:**
- Grounded circuit in the harness
- Damaged sensor
- Incorrect harness connection

**Diagnostic Aids:** A concern is present if an ECT PID reading less than 0.2 volt with the ignition ON engine OFF or during any engine operating mode.

**Application**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DX.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
P0118 - Engine Coolant Temperature (ECT) Sensor 1 Circuit High

**Description:** Indicates the sensor signal is greater than the self-test maximum. The ECT sensor maximum is 4.6 volts or -50°C (-58°F).

**Possible Causes:**
- Open circuit in the harness
- Sensor signal short to voltage
- Incorrect harness connection
- Damaged sensor

**Diagnostic Aids:** An ECT PID reading greater than 4.6 volts with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.

**Application** | **Key On Engine Off** | **Key On Engine Running** | **Continuous Memory**
--- | --- | --- | ---
All | | | GO to Pinpoint Test DX.

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

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

**Possible Causes:**
- Damaged harness
- Damaged sensor
- Damaged harness connector
- Low engine coolant

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

**Application** | **Key On Engine Off** | **Key On Engine Running** | **Continuous Memory**
--- | --- | --- | ---
Fiesta, Ranger 4.0L | | GO to Pinpoint Test DX. | 
All others | | GO to Pinpoint Test DL. | 

P011E - Engine Coolant Temperature 1/Ambient Air Temperature Correlation

**Description:** The DTC indicates that the engine coolant temperature (ECT) and ambient air temperature (AAT) sensor readings differ by more than a calibrated value.

**Possible Causes:**
- Biased ECT or AAT sensor
- Damaged ECT or AAT sensor
- Damaged IAT sensor

**Diagnostic Aids:** Make sure the ECT, AAT and intake air temperature (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 sun light.

**Application** | **Key On Engine Off** | **Key On Engine Running** | **Continuous Memory**
--- | --- | --- | ---
All | | | GO to Pinpoint Test DX.

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

**For Vehicles With An Idle Air Control (IAC) Valve**

**Description:** The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for a non-closed throttle position at idle. The test fails if the key ON, engine running (KOER) self-test terminates upon placing the transmission gear selector in DRIVE or REVERSE or the TP closed throttle position is not achieved when closing the throttle (idle) after opening it (in PARK or NEUTRAL).

(Continued)
# Diagnostic Trouble Code (DTC) Charts and Descriptions

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

### Possible Causes:
- Binding throttle linkage
- Damaged throttle body
- TP circuit open to PCM
- Damaged TP sensor
- SIG RTN circuit open to the TP sensor

### Diagnostic Aids:
Drive the vehicle, bring it to a stop, and turn the ignition to the OFF position. Start the engine, and run the KOER self-test at idle.

### For All Others
**Description:**
The electronic throttle control (ETC) throttle position (TP) sensor 1 circuit was flagged as a concern by the powertrain control module (PCM) indicating an out of range in either the closed or wide open throttle (WOT) modes.

**Possible Causes:**
- Obstruction in the throttle plate movement
- Damaged throttle body
- TP circuit open to PCM
- Damaged TP sensor
- Self-test operator error (foot resting on the accelerator pedal during test)

### Diagnostic Aids:
This concern exhibits a symptom of limited power.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranger</td>
<td></td>
<td>GO to Pinpoint Test DH.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td>GO to Pinpoint Test DV.</td>
<td></td>
</tr>
</tbody>
</table>

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

### For Vehicles With An Idle Air Control (IAC) Valve
**Description:**
The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for a high TP rotation angle (or voltage) input through the comprehensive component monitor (CCM). The test fails if the TP rotation angle (or voltage) changes above the maximum calibrated limit.

**Possible Causes:**
- TP sensor not seated correctly
- TP circuit open to PCM
- VREF open to TP sensor
- TP circuit short to ground
- Damaged TP sensor

### Diagnostic Aids:
This concern exhibits a symptom of limited power. A TP PID reading less than 3.42% (0.17 volt) in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.

### For All Others
**Description:**
The electronic throttle control (ETC) throttle position (TP) sensor 1 circuit was flagged as a concern by the powertrain control module (PCM) indicating a low voltage or open circuit.

**Possible Causes:**
- Open ETC TP sensor harness
- Short to ground in the ETC TP sensor harness
- Damaged TP sensor

### Diagnostic Aids:
This concern exhibits a symptom of limited power. For Fiesta, a TP1 PID reading less than 0.04 volt in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present. For all others, a TP1 PID reading less than 0.25 volt in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranger</td>
<td></td>
<td>GO to Pinpoint Test DH.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td>GO to Pinpoint Test DV.</td>
<td></td>
</tr>
</tbody>
</table>
### P0123 - Throttle/Pedal Position Sensor A Circuit High

**For Vehicles With An Idle Air Control (IAC) Valve**

**Description:** The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for a high TP rotation angle (or voltage) input through the comprehensive component monitor (CCM). The test fails if the TP rotation angle (or voltage) changes above the maximum calibrated limit.

**Possible Causes:**
- TP sensor not seated correctly
- TP sensor harness short to voltage
- TP sensor harness short to VREF
- SIG RTN circuit open to the TP sensor
- Damaged TP sensor

**Diagnostic Aids:** A TP PID reading greater than 93% (4.65 volts) in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.

**For All Others**

**Description:** The electronic throttle control (ETC) throttle position (TP) sensor 1 circuit was flagged as a concern by the powertrain control module (PCM) indicating a high voltage.

**Possible Causes:**
- TP sensor harness short to voltage
- TP sensor harness short to VREF
- ETCRTN circuit open
- Damaged TP 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranger</td>
<td>GO to Pinpoint Test DH.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test DV.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### P0125 - Insufficient Coolant Temperature For Closed Loop Fuel Control

**Description:** Indicates the engine coolant temperature (ECT) or the cylinder head temperature (CHT) sensor has not achieved the required temperature level to enter closed loop operating conditions within a specified amount of time after starting the engine.

**Possible Causes:**
- Insufficient warm up time
- Low engine coolant level
- Leaking or stuck open thermostat
- Damaged ECT sensor
- Damaged CHT sensor

**Diagnostic Aids:** Compare the thermostat specification to the actual ECT using the engine temperature PID (ECT or CHT). The temperature reading should be similar when the engine is at a normal operating temperature.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiesta, Ranger 4.0L</td>
<td></td>
<td>GO to Pinpoint Test DX.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td>GO to Pinpoint Test DL.</td>
<td></td>
</tr>
</tbody>
</table>
P0127 - Intake Air Temperature (IAT) Too High

Description: Indicates the intake air temperature (IAT2) sensor has detected a concern in the charge air cooler (CAC) system.

Possible Causes:
- Blockage of heat exchangers
- Low fluid level
- Fluid leakage
- CAC pump or relay failure
- Crossed CAC coolant lines

Diagnostic Aids: Monitor the IAT2 PID. A typical IAT2 temperature should be greater than the IAT1 temperature.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | | | GO to Pinpoint Test DU.

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

Description: Indicates the thermostat monitor has not achieved the required engine operating temperature within a specified amount of time after starting the engine.

Possible Causes:
- Insufficient warm up time
- Low engine coolant level
- Leaking or stuck open thermostat
- Damaged engine coolant temperature (ECT) sensor
- Damaged cylinder head temperature (CHT) sensor

Diagnostic Aids: Refer to Section 1, Thermostat Monitor for system information.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
Fiesta, Ranger 4.0L | | GO to Pinpoint Test DX. | 
All others | | | GO to Pinpoint Test DL.

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

Description: Manifold absolute pressure (MAP) sensor input to the powertrain control module (PCM) is monitored and is not within the calibrated value.

Possible Causes:
- Slow responding MAP sensor
- Damaged MAP sensor

Diagnostic Aids: The VREF voltage should be between 4.0 and 6.0 volts.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | | | GO to Pinpoint Test DM.

P012C - Turbocharger/Supercharger Inlet Pressure Sensor Circuit Low

Description: Manifold absolute pressure (MAP) sensor operating voltage is below the minimum calibrated parameter of 0.25 volt.

Possible Causes:
- Open in the circuit, or short to ground
- VREF circuit open, or short to ground
- Damaged MAP sensor

Diagnostic Aids: The VREF voltage should be between 4.0 and 6.0 volts.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | | | GO to Pinpoint Test DM.
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P012D - Turbocharger/Supercharger Inlet Pressure Sensor Circuit High

**Description:** Manifold absolute pressure (MAP) sensor operating voltage is above the maximum calibrated parameter of 5 volts.

**Possible Causes:**
- MAP signal short to voltage
- VREF circuit short to voltage
- Open circuit

**Diagnostic Aids:** The VREF voltage should be between 4.0 and 6.0 volts.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DM.</td>
</tr>
</tbody>
</table>

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

**Description:** The sensor signal to the powertrain control module (PCM) is intermittent.

**Possible Causes:**
- Loose electrical connection
- Damaged manifold absolute pressure (MAP) sensor

**Diagnostic Aids:** Check the harness and connection.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DM.</td>
</tr>
</tbody>
</table>

### P0130 - O2 Circuit (Bank 1, Sensor 1)

**For Vehicles With Universal HO2S**

**Description:** The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with one of the circuits used to determine the oxygen content in the exhaust gas.

**Possible Causes:**
- Open UO2S circuit
- Open UO2SGREF circuit
- UO2S circuit short to voltage or ground
- UO2SGREF circuit short to voltage or ground
- UO2SPC circuit short to voltage or ground
- UO2SPCT circuit short to voltage or ground
- Damaged HO2S

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DM.</td>
</tr>
</tbody>
</table>

**For Vehicles With HO2S (4-pin)**

**Description:** The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with one of the circuits used to determine the oxygen content in the exhaust gas.

**Possible Causes:**
- HO2S circuit open
- SIGRTN circuit open
- Incorrect connections
- Damaged or corroded terminals
- Exhaust temperature significantly higher than expected
- Damaged HO2S

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### P0130 - O2 Circuit (Bank 1, Sensor 1)

<table>
<thead>
<tr>
<th>Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</th>
<th>GO to Pinpoint Test DZ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

**For Vehicles With Universal HO2S**

**Description:** The powertrain control module (PCM) monitors the universal heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with one of the circuits used to determine the oxygen content in the exhaust gas.

**Possible Causes:**
- UO2S circuit short to ground
- UO2SPC circuit short to ground
- UO2SPCT circuit short to ground
- UO2SGREF circuit short to ground

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

---

**For Vehicles With HO2S (4-pin)**

**Description:** The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with the circuit used to determine the oxygen content in the exhaust gas.

**Possible Causes:**
- HO2S circuit open
- HO2S circuit short to ground
- Damaged HO2S sensor

**Diagnostic Aids:**
- Inspect the connectors for signs of damage, water ingress, or corrosion.
### Diagnostic Trouble Code (DTC) Charts and Descriptions

<table>
<thead>
<tr>
<th><strong>P0131 - O2 Circuit Low Voltage (Bank 1, Sensor 1)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</td>
</tr>
<tr>
<td>GO to Pinpoint Test DZ.</td>
</tr>
<tr>
<td>All others</td>
</tr>
<tr>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

#### For Vehicles With Universal HO2S

**Description:** The powertrain control module (PCM) monitors the universal heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with one of the circuits used to determine the oxygen content in the exhaust gas.

**Possible Causes:**
- UO2S circuit short to voltage
- UO2SPC circuit short to voltage
- UO2SPCT circuit short to voltage
- UO2SGREF circuit short to voltage

**Diagnostic Aids:**

#### For Vehicles With HO2S (4-pin)

**Description:** The heated oxygen sensor (HO2S) signals are monitored for an over voltage condition. For Fiesta, this DTC sets if the HO2S signal voltage is 1.1 volts or greater. For all others, this DTC sets if the HO2S signal voltage is 1.5 volts or greater.

**Possible Causes:**
- HO2S circuit short to voltage

**Diagnostic Aids:**
- An HO2S PID switching across 0.45 volt from 0.2 to 0.9 volts indicates a normal switching HO2S. For Fiesta, an HO2S PID voltage of 1.1 volts or greater indicates a short to voltage. For all others, an HO2S PID voltage of 1.5 volts or greater indicates a short to voltage.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
</table>
# Diagnostic Trouble Code (DTC) Charts and Descriptions

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

| Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus | GO to Pinpoint Test DZ. |
| All others | GO to Pinpoint Test DW. |

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

**Description:**
The powertrain control module (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. For vehicles with universal heated oxygen sensors (HO2S), the test fails if the oxygen sensor signal does not reach the predicted amplitude within a predetermined response time. For vehicles with heated oxygen sensors (HO2S), the test fails when the oxygen sensor amplitude is less than the predicted minimum amplitude limit.

**Possible Causes:**
- Contaminated HO2S
- Exhaust leaks
- Incorrect fueling
- Mass air flow (MAF) sensor
- Deteriorating HO2S
- Inlet air leaks

**Diagnostic Aids:**
Access the HO2S test results from the scan tool to verify the DTC.
### P0133 - O2 Circuit Slow Response (Bank 1, Sensor 1)

<table>
<thead>
<tr>
<th>Application</th>
<th>Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</th>
<th>GO to Pinpoint Test DZ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test DW.</td>
<td></td>
</tr>
</tbody>
</table>

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

**For Vehicles With Universal HO2S**

**Description:** The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a lack of movement concern. If the sensor signal value is not changing from the default value, the PCM commands an oscillating air/fuel ratio attempting to detect some movement in the signal value. The test fails when the PCM is unable to detect movement in the sensor signal while the air/fuel ratio is oscillating.

**Possible Causes:**
- Open UO2SPC circuit
- Damaged HO2S

**Diagnostic Aids:**

**For Vehicles With HO2S (4-pin)**

**Description:** The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a lack of movement concern. If the sensor signal value is not changing from the default value, the PCM commands an oscillating air/fuel ratio attempting to detect some movement in the signal value. The test fails when the PCM is unable to detect movement in the sensor signal while the air/fuel ratio is oscillating.

**Possible Causes:**
- HO2S circuit open
- Damaged HO2S sensor

**Diagnostic Aids:**

An HO2S 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***

(Continued)
### Diagnostic Trouble Code (DTC) Charts and Descriptions

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

<table>
<thead>
<tr>
<th>Description</th>
<th>GO to Pinpoint Test DZ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge,</td>
<td></td>
</tr>
<tr>
<td>Escape / Mariner</td>
<td></td>
</tr>
<tr>
<td>2.5L Automatic Transmission,</td>
<td></td>
</tr>
<tr>
<td>Escape / Mariner</td>
<td></td>
</tr>
<tr>
<td>3.0L, E-Series 4.6L,</td>
<td></td>
</tr>
<tr>
<td>E-Series 5.4L, Expedition,</td>
<td></td>
</tr>
<tr>
<td>F-150, Flex, F-Series Super Duty,</td>
<td></td>
</tr>
<tr>
<td>Fusion 2.5L, Fusion 3.0L, Milan,</td>
<td></td>
</tr>
<tr>
<td>MKS, MKT, MKX, Mustang, Navigator,</td>
<td></td>
</tr>
<tr>
<td>Taurus</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description:</th>
<th>During testing the heated oxygen sensor (HO2S) heaters are checked for open and short circuits and excessive current draw. The test fails when the current draw exceeds a calibrated limit or an open or short circuit is detected.</th>
</tr>
</thead>
</table>
| Possible Causes: | • UO2SHTR circuit short to voltage  
• Water in the harness connector  
• Open VPWR circuit  
• Open UO2SHTR circuit  
• Open GND circuit  
• Low battery voltage  
• Corrosion  
• Incorrect connections  
• Damaged HO2S heater |
| Diagnostic Aids: | Inspect the connectors for signs of damage, water ingress, or corrosion. |

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
</table>

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

<table>
<thead>
<tr>
<th>Edge, Escape / Mariner</th>
<th>GO to Pinpoint Test DZ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5L Automatic</td>
<td></td>
</tr>
<tr>
<td>Transmission, Escape / Mariner</td>
<td></td>
</tr>
<tr>
<td>3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

P0136 - O2 Circuit (Bank 1, Sensor 2)

Description: This DTC sets when the PCM detects a concern with one of the circuits used to determine the oxygen content in the exhaust gas.

Possible Causes:
- HO2S circuit open
- SIGRTN circuit open
- Incorrect connections
- Damaged or corroded terminals
- Exhaust temperature significantly higher than expected
- Damaged HO2S

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

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

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

Description: The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with the circuit used to determine the oxygen content in the exhaust gas.

Possible Causes:
- HO2S circuit open
- HO2S circuit short to ground
- Damaged HO2S sensor

Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
<td></td>
</tr>
</tbody>
</table>
# Diagnostic Trouble Code (DTC) Charts and Descriptions

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

| Description | See the description for DTC P0132. |
| Possible Causes | See the possible causes for DTC P0132. |
| Diagnostic Aids | See the diagnostic aids for DTC P0132. |

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

| Description | The heated oxygen sensor (HO2S) monitor tracks the rate of voltage change during the rise and fall of the HO2S signal. When the rate of voltage change is less than a calibrated value, the powertrain control module (PCM) begins to modify the fuel trim attempting to increase the HO2S voltage switch rate. The DTC sets when the PCM is at the allowable limit or has exceeded an allowable length of time for fuel trim modification, without detecting an acceptable rate of voltage change. |
| Possible Causes | • Contaminated or damaged HO2S  
• Deteriorating HO2S  
• Exhaust leaks  
• Aftermarket accessories  
• Performance modifications |
| Diagnostic Aids | Access the HO2S test results from the Generic OBD-II menu to verify the DTC. |

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

| Description | During a deceleration fuel shut-off (DFSO) event, the powertrain control module (PCM) monitors how quickly the rear heated oxygen sensor (HO2S) switches from rich to lean. The measured rate of the rich to lean switch is compared to a calibrated fault threshold value. The threshold value takes into account the level of oxygen in the catalyst, which has an impact on how quickly the rich to lean switch occurs. The test fails when the measured value is slower than the threshold value. |
| Possible Causes | • Exhaust leaks before or near the HO2S  
• Damaged HO2S |
| Diagnostic Aids | Check for leaks in the exhaust system. |

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

**P013B - O2 Sensor Slow Response - Lean to Rich Bank 1, Sensor 2**

| Description | During a deceleration fuel shut-off (DFSO) event, the powertrain control module (PCM) monitors how quickly the rear heated oxygen sensor (HO2S) switches from 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 if the measured value is slower than the threshold value. |
| Possible Causes | • Exhaust leaks before or near the HO2S  
• Damaged HO2S |
| Diagnostic Aids | Check for leaks in the exhaust system. |

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>
### P013C - O2 Sensor Slow Response - Rich to Lean (Bank 2, Sensor 2)

**Description:** See the description for DTC P013A.

**Possible Causes:** See the possible causes for DTC P013A.

**Diagnostic Aids:** See the diagnostic aids for DTC P013A.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

**Description:** During a deceleration fuel shut-off (DFSO) event, the powertrain control module (PCM) monitors the rear heated oxygen sensor (HO2S) signal to determine if the signal is stuck in range. The PCM expects the signal to exceed a calibrated rich or lean value within a calibrated amount of time. If the signal voltage remains less than the rich value after a number of occurrences, the PCM intrusively controls the fuel system rich over increasing time periods in an attempt to force the signal to greater than the calibrated rich value. The test fails when, after three consecutive intrusive attempts, the signal cannot be forced greater than the calibrated rich value. Also, if the signal voltage remains greater than the lean value after a calibrated amount of time with the fuel injectors off, a counter is incremented. The test fails when after three consecutive occurrences the signal is not less than the calibrated lean value.

**Possible Causes:**
- Exhaust leaks before or near the HO2S
- Aftermarket exhaust accessories or performance modifications
- Ethanol content in the fuel
- Circuit intermittent
- Damaged HO2S

**Diagnostic Aids:** Check for leaks in the exhaust system. Check for an intermittent HO2S signal.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

**Description:** The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for a lack of movement concern. If the sensor signal value is not changing from the default value, the PCM commands an oscillating air/fuel ratio attempting to detect some movement in the signal value. The test fails when the PCM is unable to detect movement in the sensor signal while the air/fuel ratio is oscillating.

**Possible Causes:**
- HO2S circuit open
- Damaged HO2S sensor

**Diagnostic Aids:** An HO2S PID switching across 0.45 volt from 0.2 to 0.9 volts indicates a normal switching HO2S.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

**Description:** See the description for DTC P0135.

**Possible Causes:** See the possible causes for DTC P0135.

**Diagnostic Aids:** Check the HO2S electrical connector for damage, corrosion, and water intrusion. Damaged HO2S heater.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>
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 air flow (MAF) sensor

Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HC.</td>
</tr>
</tbody>
</table>

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

Description: See the description for DTC P013E.
Possible Causes: See the possible causes for DTC P013E.
Diagnostic Aids: See the diagnostic aids for DTC P013E.

Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

P0150 - O2 Circuit (Bank 2, Sensor 1)

Description: See the description for DTC P0130.
Possible Causes: See the possible causes for DTC P0130.

Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>

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

Description: See the description for DTC P0131.
Possible Causes: See the possible causes for DTC P0131.

Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>

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

For Vehicles With Universal HO2S
Description: See the description for DTC P0132.
Possible Causes: See the possible causes for DTC P0132.
Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

For Vehicles With HO2S (4-pin)
Description: See the description for DTC P0132.
Possible Causes: See the possible causes for DTC P0132.
Diagnostic Aids: See the diagnostic aids for DTC P0132.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

(Continued)
## Diagnostic Trouble Code (DTC) Charts and Descriptions

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</td>
<td>GO to Pinpoint Test DZ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

- **Description:** See the description for DTC P0133.
- **Possible Causes:** See the possible causes for DTC P0133.
- **Diagnostic Aids:** See the diagnostic aids for DTC P0133.
# Diagnostic Trouble Code (DTC) Charts and Descriptions

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

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>

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

| Description: | See the description for DTC P0135. |
| Possible Causes: | See the possible causes for DTC P0135. |
| Diagnostic Aids: | See the diagnostic aids for DTC P0135. |

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus</td>
<td></td>
<td>GO to Pinpoint Test DZ.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

| Description: | See the description for DTC P0137. |
| Possible Causes: | See the possible causes for DTC P0137. |
| Diagnostic Aids: | |

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

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

| Description: | See the description for DTC P0132. |
| Possible Causes: | See the possible causes for DTC P0132. |
| Diagnostic Aids: | See the diagnostic aids for DTC P0132. |

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>
# Diagnostic Trouble Code (DTC) Charts and Descriptions

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DW.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** See the description for DTC P0139.

**Possible Causes:** See the possible causes for DTC P0139.

**Diagnostic Aids:** See the diagnostic aids for DTC P0139.

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DW.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** See the description for DTC P0135.

**Possible Causes:** See the possible causes for DTC P0135.

**Diagnostic Aids:**
- Check the HO2S electrical connector for damage, corrosion, and water intrusion.
- Damaged HO2S heater

## P016A - O2 Sensor Not Ready (Bank 1, Sensor 1)

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DW.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** The heated oxygen sensor (HO2S) monitor tracks the rate of voltage change during the rise and fall of the HO2S signal. When the rate of voltage change is less than a calibrated value, the powertrain control module (PCM) begins to modify the fuel trim attempting to increase the HO2S voltage switch rate. The DTC sets when the PCM is at the allowable limit or has exceeded an allowable length of time for fuel trim modification, without detecting an acceptable rate of voltage change.

**Possible Causes:**
- Exhaust leaks
- Aftermarket accessories
- Performance modifications
- Contaminated or damaged HO2S
- Deteriorating HO2S

**Diagnostic Aids:** Access the HO2S test results from the scan tool to verify the DTC.
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0171 - System Too Lean (Bank 1)

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

**Possible Causes:**
- Fuel System:
  - Ethanol content in the fuel
  - Fuel filter plugged 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
  - Evaporative emission (EVAP) canister purge valve is leaking when the canister is clean
  - Fuel supply line restricted
  - Fuel rail pressure (FRP) sensor bias
- Exhaust System:
  - Exhaust leaks in the exhaust manifold gasket or mating gaskets before or near the heated oxygen sensor (HO2S)
- EGR System:
  - Vacuum hose disconnected on exhaust gas recirculation (EGR) system module (ESM) applications
  - EGR valve tube or gasket leak
  - EGR vacuum regulator solenoid leak
- Intake Air System:
  - Air leaks after the mass air flow (MAF) sensor
  - Vacuum leaks
  - Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open
  - Incorrectly seated engine oil dipstick
  - Intake air turbulence due to incorrect air filter
  - Damaged or contaminated MAF sensor

**Diagnostic Aids:** View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques, for more information and the appropriate pinpoint test for specific concern identification.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>

P0172 - System Too Rich (Bank 1)

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

**Possible Causes:**
- Fuel System:
  - Leaking fuel injectors
  - Fuel return line restricted
  - Fuel rail pressure (FRP) sensor bias
  - EVAP canister purge valve is leaking when the canister is full
- Base Engine:
  - Engine oil contamination
- Intake Air System:
  - Damaged or contaminated mass air flow (MAF) sensor

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0172 - System Too Rich (Bank 1)

Diagnostic Aids: View the freeze frame data to determine the operating conditions when the DTC was set. Observe the LONGFT1 and LONGFT2 PIDs. Refer to Section 2, Adaptive Fuel Diagnostic Trouble Code (DTC) Diagnostic Techniques for more information and the appropriate pinpoint test for specific concern identification.

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

P0174 - System Too Lean (Bank 2)

Description: See the description for DTC P0171.
Possible Causes: See the possible causes for DTC P0171.
Diagnostic Aids: See the diagnostic aids for DTC P0171.

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

P0175 - System Too Rich (Bank 2)

Description: See the description for DTC P0172.
Possible Causes: See the possible causes for DTC P0172.
Diagnostic Aids: See the diagnostic aids for DTC P0172.

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

P0180 - Fuel Temperature Sensor A Circuit

Description: The comprehensive component monitor (CCM) monitors the fuel temperature sensor circuit to the powertrain control module (PCM) for low and high voltage. The test fails if the voltage falls below or exceeds a calibrated limit and amount of time during testing.

Possible Causes: • Open or short in the harness • Low ambient temperature operation • Incorrect harness connection • Damaged fuel temperature sensor
Diagnostic Aids: Verify the FRT parameter identification (PID) value to determine an open or short.

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

P0181 - Fuel Temperature Sensor A Circuit Range/Performance

Description: The comprehensive component monitor (CCM) monitors the fuel temperature sensor for acceptable operating temperature. The test fails if the voltage falls below or exceeds a calibrated limit, for a calibrated amount of time during testing.

Possible Causes: • Open or short in the harness • Low ambient temperature operation • Incorrect harness connection • Damaged fuel temperature sensor • Damaged powertrain control module (PCM)
Diagnostic Aids: Verify the FRT parameter identification (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.
P0182 - Fuel Temperature Sensor A Circuit Low

Description: The comprehensive component monitor (CCM) monitors the fuel temperature sensor circuit to the powertrain control module (PCM) for low voltage. The test fails if the voltage falls below a calibrated limit for a calibrated amount of time during testing.

Possible Causes:
- Short in the harness
- VREF open or short
- Low ambient temperature operation
- Incorrect harness connection
- Damaged fuel temperature sensor

Diagnostic Aids: Verify the FRT parameter identification (PID) and VREF values to determine an open or short.

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

P0183 - Fuel Temperature Sensor A Circuit High

Description: The comprehensive component monitor (CCM) monitors the fuel temperature sensor circuit to the powertrain control module (PCM) for high voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time during testing.

Possible Causes:
- Open circuit
- Open or short to voltage in the harness
- Incorrect harness connection
- Damaged fuel temperature sensor

Diagnostic Aids: Verify the FRT parameter identification (PID) value to determine an open or short.

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

P0190 - Fuel Rail Pressure Sensor A Circuit

Description: The comprehensive component monitor (CCM) monitors the fuel rail pressure (FRP) sensor to the powertrain control module (PCM) for VREF voltage. The test fails when the VREF voltage from the PCM drops to a voltage less than a minimum calibrated value.

Possible Causes:
- VREF open in harness
- VREF open in sensor
- Vacuum leaks

Diagnostic Aids: VREF voltage should be between 4.0 and 6.0 volts.

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

P0191 - Fuel Rail Pressure Sensor A Circuit Range/Performance

Description: The comprehensive component monitor (CCM) checks the fuel rail pressure (FRP) sensor for an acceptable fuel pressure. The test fails when the difference between the FRP requested by the PCM and the FRP delivered exceeds 138 kPa (20 psi) for more than 8 seconds.

Possible Causes:
- High fuel pressure
- Low fuel pressure
- Damaged FRP sensor
- Excessive resistance in the circuit
- Vacuum leaks
- Low or no fuel

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

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0191 - Fuel Rail Pressure Sensor A Circuit Range/Performance

Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DD.</td>
</tr>
</tbody>
</table>

P0192 - Fuel Rail Pressure Sensor A Circuit Low

Description: The comprehensive component monitor (CCM) monitors the fuel rail pressure (FRP) sensor circuit to the powertrain control module (PCM) for low voltage. The test fails if the voltage falls below a calibrated limit for a calibrated amount of time during testing.

Possible Causes:
- FRP signal short to SIG RTN or PWR GND
- Damaged FRP sensor

Diagnostic Aids: A FRP parameter identification (PID) value during ignition ON, engine OFF or ignition ON, engine running less than 0.3 volt indicates a concern is present.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DD.</td>
</tr>
</tbody>
</table>

P0193 - Fuel Rail Pressure Sensor A Circuit High

Description: The comprehensive component monitor (CCM) monitors the fuel rail pressure (FRP) sensor circuit to the powertrain control module (PCM) for high voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time during testing.

Possible Causes:
- FRP signal short to VREF or VPWR
- FRP signal open
- Damaged FRP sensor

Diagnostic Aids: An FRP signal high condition can be caused by any number of conditions, including a short on FRP signal to VREF, 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DD.</td>
</tr>
</tbody>
</table>

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

Description: Indicates the value from the EOT sensor is not within the powertrain control module (PCM) predicted engine oil temperature range, based on other PCM inputs.

Possible Causes:
- Engine not at operating temperature
- Cooling system problem or stuck thermostat
- Open or short in the EOT circuit

Diagnostic Aids: The EOT rationality test looks for the EOT sensor value to be within a calibrated delta of the PCM predicted engine oil temperature. Make sure the EOT sensor reading is similar to the engine temperature. If the EOT reading greatly differs from engine temperature, check the EOT circuitry for correct operation.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DY.</td>
</tr>
</tbody>
</table>

P0197 - Engine Oil Temperature (EOT) Sensor Circuit Low

Description: Indicates EOT signal voltage is low (high temperature).

Possible Causes:
- Damaged harness
- Damaged harness connector
- Damaged EOT sensor

(Continued)
P0197 - Engine Oil Temperature (EOT) Sensor Circuit Low

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DY.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P0198 - Engine Oil Temperature (EOT) Sensor Circuit High

Description: Indicates EOT signal voltage is high (low temperature).

Possible Causes: 
- Damaged harness
- Damaged harness connector
- Damaged EOT sensor

Diagnostic Aids: An EOT PID reading greater than 4.5 volts with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test DY.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P020x - Injector Circuit/Open - Cylinder X

For Vehicles With Direct Fuel Injection

Description: Note: x represents injector numbers 1 through 9. The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the powertrain control module (PCM). The test fails when the fuel injector circuitry is inoperative.

Possible Causes: 
- INJ circuit open, short to ground, or short to voltage
- INJRTN circuit open, short to ground, or short to voltage
- Damaged fuel injector
- Damaged PCM

Diagnostic Aids: PID Data Monitor INJx_F flags a concern.
This DTC sets when a concern is detected between the PCM and either fuel injector circuit.

For All Others

Description: Note: x represents injector numbers 1 through 9. The comprehensive component monitor (CCM) monitors the operation of the fuel injector drivers in the powertrain control module (PCM). The test fails when the fuel injector circuitry is inoperative.

Possible Causes: 
- VPWR circuit open
- INJ circuit open
- Damaged fuel injector
- Damaged PCM

Diagnostic Aids: PID Data Monitor INJx_F fault flags equals YES.
This DTC sets when a concern is detected between the PCM and the fuel injector.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flex 3.5L GTDI, MKS 3.5L, MKT 3.5L, Taurus 3.5L GTDI</td>
<td>GO to Pinpoint Test DI.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test KG.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P0210 - Injector Circuit/Open - Cylinder 10
**Description:** See the description for DTC P020x.
**Possible Causes:** See the possible causes for DTC P020x.
**Diagnostic Aids:** See the diagnostic aids for DTC P020x.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KG.</td>
</tr>
</tbody>
</table>

### P0217 - Engine Coolant Over-Temperature Condition

**For Vehicles With 3.5L GTDI Engine**

**Description:** Indicates an engine overheat condition was detected by the engine temperature sensor (CHT or ECT depending how the vehicle is equipped).

**Possible Causes:**
- Engine cooling system concerns
- Low engine coolant level
- Base engine concerns
- 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

**Diagnostic Aids:**
This DTC may be accompanied by other DTCs. If DTCs P1285 or P1299 are present, disregard DTC P0217 at this time. Diagnose DTCs P1285 or P1299 first.
Monitor the engine temperature PID (CHT or ECT) for an overheat condition. Typical engine temperature should be close to cooling system thermostat specification.
If excessive engine RPM is suspected, refer to Section 1, Powertrain Control Software, Engine Fluid Temperature Management, for additional information.

**For All Others**

**Description:** Indicates an engine overheat condition was detected by the engine temperature sensor (CHT or ECT depending how the vehicle is equipped).

**Possible Causes:**
- Engine cooling system concerns
- Low engine coolant level
- Base engine concerns

**Diagnostic Aids:**
This DTC may be accompanied by other DTCs. If DTCs P1285 or P1299 are present, disregard DTC P0217 at this time. Diagnose DTCs P1285 or P1299 first.
Monitor the engine temperature PID (CHT or ECT) for an overheat condition. Typical engine temperature should be close to cooling system thermostat specification.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DX.</td>
</tr>
</tbody>
</table>

### P0218 - Transmission Fluid Temperature Over-Temperature Condition

**Description:** Indicates a transmission overheat condition was sensed by the transmission fluid temperature (TFT) sensor.

**Possible Causes:**
- Low transmission fluid level
- Transmission cooling system concerns

**Diagnostic Aids:**
Monitor the transmission temperature PID TFT for an overheat condition.
Refer to the Workshop Manual Section 307-02, Transaxle/Transmission Cooling, Transmission Overheating to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>
### P0219 - Engine Over Speed Condition

**For Vehicles With 3.5L GTDI Engine**

**Description:** Indicates the vehicle has been operated in a manner which caused the engine speed to exceed a calibrated limit. The engine RPM is continuously monitored and evaluated by the powertrain control module (PCM). The DTC sets when the RPM exceeds the calibrated limit set within the PCM. For additional information on the engine RPM limiter, refer to Section 1, Powertrain Control Software.

**Possible Causes:**
- 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

**Diagnostic Aids:**
This DTC may be accompanied by other DTCs. If DTCs P1285 or P1299 are present, disregard DTC P0219 at this time. Diagnose DTCs P1285 or P1299 first.

The DTC indicates the vehicle has been operated in a manner which caused the engine speed to exceed a calibrated limit.

If excessive engine RPM is suspected, refer to Section 1, Powertrain Control Software, Engine Fluid Temperature Management, for additional information.

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test ND.</td>
</tr>
</tbody>
</table>

### For All Others

**Description:** Indicates the vehicle has been operated in a manner which caused the engine speed to exceed a calibrated limit. The engine RPM is continuously monitored and evaluated by the powertrain control module (PCM). The DTC sets when the RPM exceeds the calibrated limit set within the PCM. For additional information on the engine RPM limiter, refer to Section 1, Powertrain Control Software.

**Possible Causes:**
- Wheel slippage (water, ice, mud, and snow)
- Excessive engine RPM in NEUTRAL or operated in the incorrect transmission gear

**Diagnostic Aids:**
This DTC may be accompanied by other DTCs. If DTCs P1285 or P1299 are present, disregard DTC P0219 at this time. Diagnose DTCs P1285 or P1299 first.

The DTC indicates the vehicle has been operated in a manner which caused the engine speed to exceed a calibrated limit.

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test ND.</td>
</tr>
</tbody>
</table>

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

**Description:** The electronic throttle control (ETC) throttle position (TP) sensor 2 circuit was flagged as a concern by the powertrain control module (PCM) indicating an out of range in either the closed or wide open throttle (WOT) modes.

**Possible Causes:**
- Obstruction in the throttle plate movement
- Damaged throttle body
- TP circuit open to PCM
- Damaged TP sensor
- Self-test operator error (foot resting on the accelerator pedal during test)

**Diagnostic Aids:** This concern exhibits a symptom of limited power.

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test DV.</td>
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</tbody>
</table>
### Diagnostic Trouble Code (DTC) Charts and Descriptions

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

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

**Possible Causes:**
- Open ETC TP sensor harness
- Short to ground in the ETC TP sensor harness
- Damaged TP sensor

**Diagnostic Aids:** This concern exhibits a symptom of limited power. A TP2 PID reading less than 0.25 volt in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.

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<th>Application</th>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
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</table>

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

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

**Possible Causes:**
- TP sensor harness short to voltage
- TP sensor harness short to VREF
- TP2 circuit open
- ETCRTN circuit open
- Damaged TP sensor

**Diagnostic Aids:** This concern exhibits a symptom of limited power. A TP2 PID reading greater than 4.75 volts in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.

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<th>Application</th>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
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</table>

#### P0230 - Fuel Pump Primary Circuit

**Description:** The powertrain control module (PCM) monitors the fuel pump (FP) circuit output from the PCM. The test fails when the FP output is commanded ON (grounded) and excessive current draw is detected on the FP circuit. The test also fails when the FP output is commanded OFF and voltage is not detected on the FP circuit. The PCM expects to detect VPWR voltage coming through the fuel pump relay coil to the FP circuit.

**Possible Causes:**
- Open or short (FP) circuit
- Open VPWR circuit to the fuel pump relay
- Damaged fuel pump relay
- Damaged PCM

**Diagnostic Aids:** A concern is present when the FP_F PID reads YES. An open circuit or short to ground can only be detected with the fuel pump commanded OFF. A short to voltage can only be detected with the fuel pump commanded ON. During the key ON engine OFF (KOEO) and key ON engine running (KOER) self-test, the fuel pump output command is cycled on and off.

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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>All</td>
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<td>GO to Pinpoint Test KA.</td>
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</table>

#### P0231 - Fuel Pump Secondary Circuit Low

**Description:** The powertrain control module (PCM) monitors the fuel pump monitor (FPM) circuit. The test fails if the PCM commands the fuel pump ON and B+ voltage is not detected on the FPM circuit.

**Possible Causes:**
- Open B+ circuit to the fuel pump relay
- Open FP PWR circuit between the fuel pump relay and its connection to the FPM circuit
- Damaged fuel pump relay

(Continued)
P0231 - Fuel Pump Secondary Circuit Low

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

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

P0232 - Fuel Pump Secondary Circuit High

Description: The powertrain control module (PCM) monitors the fuel pump monitor (FPM) circuit. This test fails when the PCM detects voltage on the FPM circuit while the fuel pump is commanded OFF. The FPM circuit is wired to a pull-up voltage inside the PCM. The FPM circuit goes high if, with the ignition ON, engine OFF and the fuel pump commanded OFF, the FPM/FPW circuit loses its path to ground through the fuel pump. The FPM circuit also goes high if the FPM/FPW circuit is short to voltage.

Possible Causes:
- Inertia fuel shutoff (IFS) switch not reset or electrically open
- Open circuit between the fuel pump and the FPM connection to the FP WPR circuit
- Intermittent fuel pump ground
- Fuel pump electrically open
- Fuel pump secondary circuits short to voltage
- Fuel pump relay contacts always closed
- Open FPM circuit between the PCM and the connection to the FP WPR circuit

Diagnostic Aids: Continuous memory P0232 can be set if the IFS switch is tripped then reset, or if the fuel pump circuit is activated when the PCM expected the circuit to be off. This DTC may set during a fuel system test or prime procedure.

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

P0234 - Turbocharger/Supercharger A Overboost Condition

Description: The powertrain control module (PCM) continuously monitors the turbocharger system for an overboost condition. The PCM checks for a maximum throttle intake pressure (TIP) parameter identification (PID) reading during engine operation, which indicates an overboost condition. The DTC sets when the PCM detects that the actual throttle intake pressure is greater than the desired throttle intake pressure by 27.6 kPa (4 psi) or more for 5 seconds.

Possible Causes:
- Damaged turbocharger (TC) wastegate regulating valve solenoid
- Damaged wastegate adjusting rod
- TC wastegate regulating solenoid valve stuck
- Wastegate stuck closed
- Wastegate control hose open or plugged
- Incorrect wastegate adjustment

Diagnostic Aids: Check tubing for obstructions, 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.
### P0236 - Turbocharger/Supercharger Boost Sensor A Circuit Range/Performance

**Description:** The powertrain control module (PCM) continuously monitors this sensor for concerns. This DTC sets when either of the following conditions are present. When the throttle intake pressure (TIP,PRS,BOOST) parameter identification (PID) does not correlate with the barometric pressure (BARO) or the manifold absolute pressure (MAP) PIDs at ignition ON. When the turbocharger boost pressure (TCBP) sensor does not correlate with the BARO sensor at idle and the TCBP sensor and MAP sensor fail to correlate while driving.

**Possible Causes:**
- Damaged turbocharger boost pressure (TCBP)/charge air cooler temperature (CACT) sensor
- Contaminated or blocked TCBP/CACT sensor
- Slow responding TCBP/CACT sensor

**Diagnostic Aids:** Check the intake air system for leaks and restrictions. The TCBP/CACT sensor is a dual function pressure and temperature sensor located on the intake air tube between the CAC and the throttle body.

<table>
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<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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</table>

### P0237 - Turbocharger/Supercharger Boost Sensor A Circuit Low

**Description:** The powertrain control module (PCM) continuously monitors the TCBP circuit for concerns. This DTC sets when the PCM detects a short to ground in the circuit.

**Possible Causes:**
- Damaged turbocharger boost pressure (TCBP)/charge air cooler temperature (CACT) sensor
- TCBP 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. The TCBP/CACT sensor is a dual function pressure and temperature sensor located on the intake air tube between the CAC and the throttle body.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
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</table>

### P0238 - Turbocharger/Supercharger Boost Sensor A Circuit High

**Description:** The powertrain control module (PCM) continuously monitors the TCBP circuit for concerns. This DTC sets when the PCM detects an open circuit or high voltage in the circuit.

**Possible Causes:**
- Damaged turbocharger boost pressure (TCBP)/charge air cooler temperature (CACT) sensor
- TCBP circuit open or short to voltage

**Diagnostic Aids:** Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components. The TCBP/CACT sensor is a dual function pressure and temperature sensor located on the intake air tube between the CAC and the throttle body.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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</table>
### P0245 - Turbocharger/Supercharger Wastegate Solenoid A Low

**Description:** The powertrain control module (PCM) continuously monitors the TCWRVS circuit for concerns. This DTC sets when the PCM detects a short to ground in the circuit.

**Possible Causes:**
- Damaged turbocharger (TC) wastegate regulating valve solenoid
- TCWRVS 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 solenoid valve is energized.

<table>
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<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test HN.</td>
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</table>

### P0246 - Turbocharger/Supercharger Wastegate Solenoid A High

**Description:** The powertrain control module (PCM) continuously monitors the TCWRVS circuit for concerns. This DTC sets when the PCM detects an open circuit or high voltage in the circuit.

**Possible Causes:**
- Damaged turbocharger (TC) wastegate regulating valve solenoid
- TCWRVS circuit open or 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 solenoid is not energized.

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<th>Continuous Memory</th>
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<td>GO to Pinpoint Test HN.</td>
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</table>

### P025A - Fuel Pump Module A Control Circuit/Open

**Description:** The powertrain control module (PCM) monitors the fuel pump command (FPC) circuit for a concern. When the PCM commands the fuel pump (FP) ON, the PCM is able to detect a short to voltage on the FPC circuit. When the PCM commands the FP OFF, the PCM is able to detect an open circuit or a short to ground on the FPC circuit. The test fails if the voltage is less than or greater than a calibrated limit, for a calibrated amount of time.

**Possible Causes:**
- FPC circuit open or short to ground
- FPC circuit short to voltage
- Damaged fuel pump control module

**Diagnostic Aids:** Check for any harness concerns.

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<th>Application</th>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test KC.</td>
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</table>
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 powertrain control module (PCM). The fuel pump control module determines if the signal from the PCM on the fuel pump command (FPC) circuit is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module sends a 20% duty cycle signal on the fuel pump monitor (FPM) circuit to report the concern to the PCM. The test fails when the fuel pump control module is still reporting that it is receiving an invalid duty cycle or frequency from the PCM after a calibrated amount of time.

**Possible Causes:**
- FPC circuit open or short to ground
- FPC circuit short to voltage
- Radio frequency interference/electromagnetic interference (RFI/EMI)
- Damaged fuel pump control module
- Damaged PCM

**Diagnostic Aids:** Check the harness for routing, alterations, incorrect shielding, or electrical interference from other systems.

**Application Key On Engine Off Key On Engine Running Continuous Memory**

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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test KC.</td>
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P025C - Fuel Pump Module A Control Circuit Low

**Description:** The powertrain control module (PCM) monitors the fuel pump command (FPC) circuit for a concern. When the PCM commands the fuel pump (FP) ON, the PCM is able to detect a short to voltage on the FPC circuit. When the PCM commands the FP OFF, the PCM is able to detect an open circuit or a short to ground on the FPC circuit. The test fails if the voltage is less than or greater than a calibrated limit, for a calibrated amount of time.

**Possible Causes:**
- 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**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test KC.</td>
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</table>

P025D - Fuel Pump Module A Control Circuit High

**Description:** The powertrain control module (PCM) monitors the fuel pump command (FPC) circuit for a concern. When the PCM commands the fuel pump (FP) ON, the PCM is able to detect a short to voltage on the FPC circuit. When the PCM commands the FP OFF, the PCM is able to detect an open circuit or a short to ground on the FPC circuit. The test fails if the voltage is less than or greater than a calibrated limit, for a calibrated amount of time.

**Possible Causes:**
- 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**

<table>
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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test KC.</td>
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P025E - Turbocharger/Supercharger Boost Sensor A Intermittent/Erratic

**Description:** The powertrain control module (PCM) continuously monitors the TCBP circuit for concerns. The test fails when the PCM detects ten intermittent events during a single drive cycle.

**Possible Causes:**
- Damaged turbocharger boost pressure (TCBP)/charge air cooler temperature (CACT) sensor
- Damaged harness connector
- Damaged harness
### Diagnostic Trouble Code (DTC) Charts and Descriptions

#### P025E - Turbocharger/Supercharger Boost Sensor A Intermittent/Erratic

**Diagnostic Aids:** Check the harness for intermittent concerns, incorrect connections, routing, alterations and damage due to contact with other components.

The TCBP/CACT sensor is a dual function pressure and temperature sensor located on the intake air tube between the CAC and the throttle body.

<table>
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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
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#### P0261 - Cylinder 1 Injector Circuit Low

**Description:** The powertrain control module (PCM) monitors the output of the fuel injector circuits and sets a DTC when it detects the output is not within a calibrated limit.

**Possible Causes:**
- VPWR circuit open
- INJ circuit open or short to ground
- Damaged fuel injector
- Damaged PCM

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

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<th>Application</th>
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#### P0262 - Cylinder 1 Injector Circuit High

**Description:** The powertrain control module (PCM) monitors the output of the fuel injector circuits and sets a DTC when it detects the output is not within a calibrated limit.

**Possible Causes:**
- INJ circuit short to voltage
- Damaged fuel injector
- Damaged PCM

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

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#### P0264 - Cylinder 2 Injector Circuit Low

**Description:** See the description for DTC P0261.

**Possible Causes:** See the possible causes for DTC P0261.

**Diagnostic Aids:** See the diagnostic aids for DTC P0261.

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<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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#### P0265 - Cylinder 2 Injector Circuit High

**Description:** See the description for DTC P0262.

**Possible Causes:** See the possible causes for DTC P0262.

**Diagnostic Aids:** See the diagnostic aids for DTC P0262.

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<th>Continuous Memory</th>
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</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

**P0267 - Cylinder 3 Injector Circuit Low**

Description: See the description for DTC P0261.
Possible Causes: See the possible causes for DTC P0261.
Diagnostic Aids: See the diagnostic aids for DTC P0261.

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<th>Application</th>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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**P0268 - Cylinder 3 Injector Circuit High**

Description: See the description for DTC P0262.
Possible Causes: See the possible causes for DTC P0262.
Diagnostic Aids: See the diagnostic aids for DTC P0262.

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**P0270 - Cylinder 4 Injector Circuit Low**

Description: See the description for DTC P0261.
Possible Causes: See the possible causes for DTC P0261.
Diagnostic Aids: See the diagnostic aids for DTC P0261.

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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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**P0271 - Cylinder 4 Injector Circuit High**

Description: See the description for DTC P0262.
Possible Causes: See the possible causes for DTC P0262.
Diagnostic Aids: See the diagnostic aids for DTC P0262.

<table>
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**P027A - Fuel Pump Module B Control Circuit/Open**

Description: The powertrain control module (PCM) monitors the fuel pump command (FPC) circuit for a concern. When the PCM commands the fuel pump (FP) ON, the PCM is able to detect a short to voltage on the FPC circuit. When the PCM commands the FP OFF, the PCM is able to detect an open circuit or a short to ground on the FPC circuit. The test fails if the voltage is less than or greater than a calibrated limit, for a calibrated amount of time.
Possible Causes: • FPC circuit open or short to ground • FPC circuit short to voltage • Damaged fuel pump control module 2
Diagnostic Aids: Check for any harness concerns.

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<thead>
<tr>
<th>Application</th>
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<tr>
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<td>GO to Pinpoint Test KC.</td>
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</table>
# Diagnostic Trouble Code (DTC) Charts and Descriptions

## P027B - Fuel Pump Module Control Circuit Range/Performance

**Description:** The fuel pump control module 2 monitors the duty cycle and frequency of the signal it receives from the powertrain control module (PCM). The fuel pump control module 2 determines if the signal from the PCM on the fuel pump command (FPC) circuit is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module 2 sends a 20% duty cycle signal on the fuel pump monitor 2 (FPM2) circuit to report the concern to the PCM. The test fails 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.

<table>
<thead>
<tr>
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<th>Continuous Memory</th>
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<tr>
<td>All</td>
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<td>GO to Pinpoint Test KC.</td>
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</table>

## P0297 - Vehicle Over Speed Condition

**Description:** Indicates the vehicle has been operated in a manner which caused the vehicle speed to exceed a calibration limit. The vehicle speed is continuously monitored and evaluated by the powertrain control module (PCM). The DTC is set when the vehicle speed exceeds the calibrated limit set within the PCM. For additional information on the vehicle speed limiter, refer to Section 1, Powertrain Control Software.

**Possible Causes:**
- Vehicle driven at a high rate of speed

**Diagnostic Aids:** The DTC indicates the vehicle has been operated in a manner which caused the engine speed to exceed a calibrated limit.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
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## P0298 - Engine Oil Over Temperature Condition

**Description:** Indicates the engine oil temperature protection strategy in the powertrain control module (PCM) has been activated. This temporarily prohibits high engine speed operation by disabling injectors, to reduce the risk of engine damage from high engine oil temperature. On engines equipped with an oil temperature sensor, the PCM reads oil temperature to determine if it is excessive. When an oil temperature sensor is not present, the PCM uses an oil algorithm to determine actual temperature. Engine shutdown strategy function is the same on vehicles with and without oil temperature sensors.

**Possible Causes:**
- Very high engine RPM for an extended period of time
- Overheating condition
- Damaged engine oil temperature (EOT) sensor or circuit (vehicles with an EOT sensor)
- Base engine concerns

**Diagnostic Aids:** The engine is operating in high RPM range due to incorrect gear selection. This may cause a lack/loss of power or surge.

<table>
<thead>
<tr>
<th>Application</th>
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<td>GO to Pinpoint Test DY.</td>
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</table>
### P0299 - Turbocharger/Supercharger A Underboost Condition

**Description:** The powertrain control module (PCM) continuously monitors the turbocharger system for an underboost condition. The PCM checks for a minimum throttle intake pressure (TIP) parameter identification (PID) reading during engine operation, which indicates an underboost condition. The DTC sets when the PCM detects that the actual throttle intake pressure is less than the desired throttle intake pressure by 27.6 kPa (4 psi) or more for 5 seconds.

**Possible Causes:**
- Damaged turbocharger (TC) wastegate regulating valve solenoid
- TC wastegate regulating solenoid valve stuck
- Wastegate stuck open
- Wastegate control hose open or plugged
- Air leak between turbocharger and throttle

**Diagnostic Aids:** Check tubing for obstructions, cracks and incorrect fitting connections. Check the turbocharger wastegate regulating valve solenoid for correct operation.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test HN.</td>
<td></td>
</tr>
</tbody>
</table>

### P0300 - Random Misfire Detected

**Description:** The random misfire DTC indicates multiple cylinders are misfiring or the powertrain control module (PCM) cannot identify which cylinder is misfiring.

**Possible Causes:**
- Camshaft position (CMP) sensor
- Low fuel (less than 1/8 tank)
- Stuck open exhaust gas recirculation (EGR) valve
- Blocked 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 blocked or partially blocked.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test HD.</td>
<td></td>
</tr>
</tbody>
</table>

### P030x - Cylinder x Misfire Detected

**Description:**

NOTE: x represents cylinder numbers 1 through 9.

The misfire detection monitor is designed to monitor engine misfire and identify the specific cylinder in which the misfire has occurred. Misfire is defined as lack of combustion in a cylinder due to absence of spark, incorrect fuel metering, low compression, or any other cause.

**Possible Causes:**
- Ignition system
- Fuel injectors
- Running out of fuel
- Evaporative emission (EVAP) canister purge valve
- Fuel pressure
- Evaporative emission system
- Exhaust gas recirculation (EGR) system
- Base engine
- Misfire monitor neutral profile correction has not been relearned since the last mechanical repair

**Diagnostic Aids:** The malfunction indicator lamp (MIL) blinks once per second when a misfire severe enough to cause catalyst damage is detected. If the MIL is on steady state due to a misfire, this indicates the threshold for emissions was exceeded and caused the vehicle to fail an inspection and maintenance tailpipe test.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test HD.</td>
<td></td>
</tr>
</tbody>
</table>
P0310 - Cylinder 10 Misfire Detected

Description: See the description for DTC P030x.
Possible Causes: See the possible causes for DTC P030x.
Diagnostic Aids: See the diagnostic aids for DTC P030x.

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

P0313 - Misfire Detected with Low Fuel

Description: The powertrain control module (PCM) continuously monitors the ignition system for concerns. This DTC sets if the PCM detects that the actual fuel volume is less than the requested fuel volume that results in a misfire condition.
Possible Causes:
- Customer driving habits
- Low fuel or no fuel in tank (less than 1/8 tank)
- High ethanol content in the fuel tank
- Fuel pressure
- Restricted fuel filter
- Restricted fuel supply line
- Fuel Injectors
- Damaged or worn fuel pump
- Misfire monitor neutral profile correction has not been relearned since the last mechanical repair

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

P0315 - Crankshaft Position System Variation Not Learned.

For Profile Correction Learning During Drive Cycle

Description: The powertrain control module (PCM) is unable to learn and correct for mechanical inaccuracies in crankshaft pulse wheel tooth spacing. This DTC disables the misfire monitor.
Possible Causes:
- Damaged crankshaft pulse wheel teeth
- Damaged crankshaft position (CKP) sensor

Diagnostic Aids: Requires visual inspection of the CKP sensor and the crankshaft pulse wheel teeth for damage.

For Neutral Profile Correction Using Scan Tool

Description: The powertrain control module (PCM) has not learned the crankshaft pulse wheel tooth spacing. This DTC disables the misfire monitor.
Possible Causes:
- PCM replacement
- Internal PCM non-volatile random access memory (NVRAM) error

Diagnostic Aids: Complete the Misfire Monitor Neutral Profile Correction procedure using the scan tool.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
Crown Victoria, Fiesta, Focus, Grand Marquis, Ranger, Town Car, Transit Connect | GO to Pinpoint Test HD.
All others | Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
# Diagnostic Trouble Code (DTC) Charts and Descriptions

## P0316 - Misfire Detected On Startup (First 1000 Revolutions)

### Description:
DTC P0316 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
- Ignition system
- Fuel injectors
- Running out of fuel
- Fuel quality
- Base engine
- Damaged powertrain control module (PCM)

### Diagnostic Aids:
Freeze frame data and the DTC P03xx are also stored, indicating which cylinder the misfire occurred.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HD.</td>
</tr>
</tbody>
</table>

## P0320 - Ignition/Distributor Engine Speed Input Circuit

### Description:
The ignition engine speed sensor input signal to powertrain control module (PCM) is continuously monitored. The test fails when the signal indicates two successive erratic profile ignition pickup (PIP) pulses occurred.

### Possible Causes:
- Incorrect connections
- Arcing secondary ignition components (coil, wires and plugs)
- On-board transmitter (2-way radio)

### Diagnostic Aids:
The DTC indicates two successive erratic PIP pulses occurred.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test A.</td>
</tr>
</tbody>
</table>

## P0325 - Knock Sensor 1 Circuit (Bank 1)

### Description:
The knock sensor (KS) detects vibrations upon increase and decrease in engine RPM. The KS generates a voltage based on this vibration. A DTC is set if the voltage goes outside a calibrated level.

### Possible Causes:
- KS circuit short to ground
- KS circuit short to voltage
- KS circuit open
- Damaged KS

### Diagnostic Aids:
A knock sensor voltage greater than 0.5 volt with the ignition ON engine OFF indicates a concern is present.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DG.</td>
</tr>
</tbody>
</table>

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

### Description:
See the description for DTC P0325.

### Possible Causes:
See the possible causes for DTC P0325.

### Diagnostic Aids:
See the diagnostic aids for DTC P0325.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DG.</td>
</tr>
</tbody>
</table>
### P0330 - Knock Sensor 2 Circuit (Bank 2)

**Description:** See the description for DTC P0325.

**Possible Causes:** See the possible causes for DTC P0325.

**Diagnostic Aids:** See the diagnostic aids for DTC P0325.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DG.</td>
</tr>
</tbody>
</table>

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

**Description:** See the description for DTC P0325.

**Possible Causes:** See the possible causes for DTC P0325.

**Diagnostic Aids:** See the diagnostic aids for DTC P0325.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DG.</td>
</tr>
</tbody>
</table>

### P0335 - Crankshaft Position Sensor A Circuit

**Description:** The powertrain control module (PCM) continuously monitors this sensor for concerns. This DTC sets when the PCM detects that the crankshaft position (CKP) sensor signal is missing for greater than a calibrated number of camshaft revolutions.

**Possible Causes:**
- CKP circuit open or short to voltage
- CKP circuit short to ground
- VREF or SIGRTN circuit open
- Damaged CKP sensor

**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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test JD.</td>
</tr>
</tbody>
</table>

### P0336 - Crankshaft Position Sensor A Circuit Range/Performance

**Description:** This DTC sets when the input signal to the powertrain control module (PCM) from the crankshaft position (CKP) sensor is erratic.

**Possible Causes:**
- CKP circuit noise
- Damaged CKP sensor connection
- Damaged CKP sensor
- Damaged crankshaft pulse wheel 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test JD.</td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

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

**Description:** This DTC sets when the powertrain control module (PCM) can no longer detect the signal from the camshaft position (CMP) sensor on bank 1 (vehicles with a single CMP sensor per bank) or bank 1, sensor 1 (vehicles with dual CMP sensors per bank).

**Possible Causes:**
- CMP circuit open
- CMP circuit short to ground
- CMP circuit short to voltage
- SIGRTN circuit open
- VRSRTN circuit open
- CMP circuit shorted to other CMP circuits (2 or more CMP sensor systems)
- Damaged CMP sensor shielding
- CMP sensor incorrectly installed
- Damaged CMP sensor

**Diagnostic Aids:** Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

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

**Description:** The powertrain control module (PCM) monitors the camshaft position (CMP) sensor for a noisy signal.

**Possible Causes:**
- Radio frequency interference or electromagnetic interference
- Damaged camshaft phaser and sprocket
- Damaged CMP sensor shielding

**Diagnostic Aids:** Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

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

**Description:** The test fails when the powertrain control module (PCM) detects an intermittent signal from the camshaft position (CMP) sensor.

**Possible Causes:**
- Intermittent open circuit
- Intermittent short circuit
- Damaged CMP sensor shielding
- Incorrect harness connections
- Corrosion
- Damaged CMP sensor

**Diagnostic Aids:** Harness routing, harness alterations, incorrect shielding, or electrical interference from other systems may have an intermittent impact on the CMP signal.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

### P0345 - Camshaft Position Sensor A Circuit (Bank 2)

**Description:** This DTC sets when the powertrain control module (PCM) can no longer detect the signal from the camshaft position (CMP) sensor on bank 2 (vehicles with a single CMP sensor per bank) or bank 2, sensor 1 (vehicles with dual CMP sensors per bank).

**Possible Causes:** See the possible causes for DTC P0340.

(Continued)
P0345 - Camshaft Position Sensor A Circuit (Bank 2)

Diagnostic Aids: See the diagnostic aids for DTC P0340.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

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

Description: See the description for DTC P0341.

Possible Causes: See the possible causes for DTC P0341.

Diagnostic Aids: See the diagnostic aids for DTC P0341.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

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

Description: See the description for DTC P0344.

Possible Causes: See the possible causes for DTC P0344.

Diagnostic Aids: See the diagnostic aids for DTC P0344.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

P0351 - Ignition Coil A Primary/Secondary Circuit

Description: Each ignition primary circuit is continuously monitored. The test fails when the powertrain control module (PCM) does not receive a valid ignition diagnostic monitor (IDM) pulse signal from the ignition module (integrated in the PCM).

Possible Causes:
- Open or short in the ignition START/RUN circuit
- Open coil driver circuit in the harness
- Coil driver circuit short to ground
- Damaged coil
- Coil driver circuit short to voltage

Diagnostic Aids: DTC P035x only sets for a coil primary circuit failure. A secondary ignition coil or spark plug failure does not set DTC P035x. DTC P030x does not set for a coil primary circuit malfunction. DTC P035x may set with or without DTC P030x; however DTC P035x 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 START/RUN voltage at the ignition coil harness connector. Check the coil driver circuit for open, short to voltage, or short to ground.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coil-on-plug (COP) ignition testing</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test JF.</td>
</tr>
<tr>
<td>Coil pack ignition testing</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test JE.</td>
</tr>
</tbody>
</table>
### Diagnostic Trouble Code (DTC) Charts and Descriptions

#### P0352 - Ignition Coil B Primary/Secondary Circuit

**Description:**
See the description for DTC P0351.

**Possible Causes:**
See the possible causes for DTC P0351.

**Diagnostic Aids:**
See the diagnostic aids for DTC P0351.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coil-on-plug (COP) ignition testing</td>
<td></td>
<td>GO to Pinpoint Test JF.</td>
<td></td>
</tr>
<tr>
<td>Coil pack ignition testing</td>
<td></td>
<td>GO to Pinpoint Test JE.</td>
<td></td>
</tr>
</tbody>
</table>

#### P0353 - Ignition Coil C Primary/Secondary Circuit

**Description:**
See the description for DTC P0351.

**Possible Causes:**
See the possible causes for DTC P0351.

**Diagnostic Aids:**
See the diagnostic aids for DTC P0351.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coil-on-plug (COP) ignition testing</td>
<td></td>
<td>GO to Pinpoint Test JF.</td>
<td></td>
</tr>
<tr>
<td>Coil pack ignition testing</td>
<td></td>
<td>GO to Pinpoint Test JE.</td>
<td></td>
</tr>
</tbody>
</table>

#### P0354 - Ignition Coil D Primary/Secondary Circuit

**Description:**
See the description for DTC P0351.

**Possible Causes:**
See the possible causes for DTC P0351.

**Diagnostic Aids:**
See the diagnostic aids for DTC P0351.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test JF.</td>
<td></td>
</tr>
</tbody>
</table>

#### P0355 - Ignition Coil E Primary/Secondary Circuit

**Description:**
See the description for DTC P0351.

**Possible Causes:**
See the possible causes for DTC P0351.

**Diagnostic Aids:**
See the diagnostic aids for DTC P0351.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test JF.</td>
<td></td>
</tr>
</tbody>
</table>

#### P0356 - Ignition Coil F Primary/Secondary Circuit

**Description:**
See the description for DTC P0351.

**Possible Causes:**
See the possible causes for DTC P0351.

**Diagnostic Aids:**
See the diagnostic aids for DTC P0351.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test JF.</td>
<td></td>
</tr>
</tbody>
</table>
### P0357 - Ignition Coil G Primary/Secondary Circuit

<table>
<thead>
<tr>
<th>Application</th>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
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</tr>
</tbody>
</table>

### P0358 - Ignition Coil H Primary/Secondary Circuit

<table>
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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
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<td>GO to Pinpoint Test JF.</td>
</tr>
</tbody>
</table>

### P0359 - Ignition Coil I Primary/Secondary Circuit

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
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<td>GO to Pinpoint Test JF.</td>
</tr>
</tbody>
</table>

### P0360 - Ignition Coil J Primary/Secondary Circuit

<table>
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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test JF.</td>
</tr>
</tbody>
</table>

### P0365 - Camshaft Position Sensor B Circuit (Bank 1)

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
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<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>
### Diagnostic Trouble Code (DTC) Charts and Descriptions

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

<table>
<thead>
<tr>
<th>Description:</th>
<th>See the description for DTC P0344.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td>See the possible causes for DTC P0344.</td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>See the diagnostic aids for DTC P0344.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

#### P0390 - Camshaft Position Sensor B Circuit (Bank 2)

<table>
<thead>
<tr>
<th>Description:</th>
<th>This DTC sets when the powertrain control module (PCM) can no longer detect the signal from the camshaft position (CMP) sensor (bank 2, sensor 2).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td>See the possible causes for DTC P0340.</td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>See the diagnostic aids for DTC P0340.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description:</th>
<th>See the description for DTC P0341.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td>See the possible causes for DTC P0341.</td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>See the diagnostic aids for DTC P0341.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description:</th>
<th>See the description for DTC P0344.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td>See the possible causes for DTC P0344.</td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>See the diagnostic aids for DTC P0344.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DR.</td>
</tr>
</tbody>
</table>

#### P0400 - Exhaust Gas Recirculation (EGR) Flow

<table>
<thead>
<tr>
<th>Description:</th>
<th>The electric EGR (EEGR) system is monitored once per drive cycle at high and low load conditions. The test fails when a concern is detected by powertrain control module (PCM) calculations indicating the EGR flow is less or greater than expected.</th>
</tr>
</thead>
</table>
| Possible Causes: | • EEGR valve stuck open or closed  
• EEGR connector not seated correctly  
• EEGR motor windings short or open  
• No voltage to the EEGR  
• Harness open or short to voltage or ground  
• Vacuum signal to manifold absolute pressure (MAP) sensor restricted or leaking  
• Mass air flow (MAF) sensor signal erroneous  
• Carbon build up in the EEGR valve seat area  
• One or more sensors is not responding or is out of range |

(Continued)
## P0400 - Exhaust Gas Recirculation (EGR) Flow

**Diagnostic Aids:** The following sensors input data to the PCM for correct operation of the EEGR system: engine coolant temperature (ECT), crankshaft position (CKP), intake air temperature (IAT), MAF, throttle position (TP), MAP and vehicle speed sensor (VSS). Any DTC relating to these sensors must be diagnosed prior to addressing this DTC.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test KD.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## P0401 - Exhaust Gas Recirculation (EGR) Flow Insufficient Detected

**Description:** The EGR system is monitored during steady state driving conditions while the EGR is commanded on. The test fails when the signal from the differential pressure feedback EGR sensor indicates that EGR flow is less than the desired minimum.

**Possible Causes:**
- Vacuum supply
- EGR valve stuck closed
- EGR valve leaks vacuum
- EGR flow path restricted
- EVR circuit short to voltage
- VREF open to differential pressure feedback EGR sensor
- Differential pressure feedback EGR sensor downstream hose is off or plugged
- EVR circuit open
- VPWR open to EGR vacuum regulator solenoid
- Differential pressure feedback EGR sensor hoses are both off
- Differential pressure feedback EGR sensor hoses are reversed
- Damaged EGR orifice tube
- Damaged EGR vacuum regulator solenoid

**Diagnostic Aids:** Carry out the key ON engine running (KOER) self-test and look for DTC P1408 as an indication of a hard fault. If DTC P1408 is not present, look for contamination, restrictions, leaks, and intermittent concerns.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown Victoria, E-Series, F-150 4.6L 2V, F-Series Super Duty 6.8L, Grand Marquis, Mustang 5.4L, Town Car</td>
<td></td>
<td>GO to Pinpoint Test HH.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test HE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Diagnostic Trouble Code (DTC) Charts and Descriptions

## P0402 - Exhaust Gas Recirculation (EGR) Flow Excessive Detected

**Description:** The EGR system is monitored for undesired EGR flow during idle. The EGR monitor looks at the differential pressure feedback EGR (DPFE) signal at idle and compares it to the stored signal measured during ignition ON engine OFF. The test does not pass when the signal at idle is greater than at ignition ON engine OFF by a calibrated amount.

**Possible Causes:**
- EGR valve stuck open
- Plugged EGR vacuum regulator solenoid vent
- Plugged EGR tube
- Slow responding differential pressure feedback EGR sensor
- Damaged differential pressure feedback EGR sensor
- Incorrect vacuum hose connection
- Plugged vacuum hoses
- EVR circuit short to ground
- Damaged EGR vacuum regulator solenoid

**Diagnostic Aids:** A DPFEGR PID reading that is greater at idle than during KOEO by 0.5 volt or a rough engine idle may indicate a hard fault.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown Victoria, E-Series, F-150 4.6L 2V,</td>
<td>GO to Pinpoint Test HH.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Series Super Duty 6.8L, Grand Marquis, Mustang 5.4L, Town Car</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test HE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## P0403 - Exhaust Gas Recirculation (EGR) Control Circuit

### For Vehicles With an Electric EGR (EEGR)

**Description:** The electric EGR (EEGR) system is continuously monitored to check the four EEGR motor coils, circuits, and the powertrain control module (PCM) for opens, shorts to voltage and ground. If a concern is detected, the EEGR system is disabled and additional monitoring is suspended for the remainder of the drive until the next drive cycle.

**Possible Causes:**
- EEGR motor windings open
- EEGR connector not seated correctly
- Open circuit in the harness from the PCM to the EEGR
- Short circuit in the EEGR motor
- Short circuit in the harness from the PCM to the EEGR
- PCM

**Diagnostic Aids:**

### For All Others

**Description:** This test checks the electrical function of the EGR vacuum regulator solenoid. The test fails when the EVR circuit voltage is either too high or too low when compared to the expected voltage range. The EGR system must be enabled for the test to be completed.

**Possible Causes:**
- EVR circuit open
- EVR circuit short to voltage or ground
- VPWR open to EGR vacuum regulator solenoid
- EGR vacuum regulator solenoid
- PCM

**Diagnostic Aids:** The EGR vacuum regulator solenoid resistance is between 26 and 40 ohms.
### P0403 - Exhaust Gas Recirculation (EGR) Control Circuit

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown Victoria,</td>
<td>GO to Pinpoint Test HH.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Series,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-150 4.6L 2V,</td>
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<td></td>
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<tr>
<td>F-Series Super Duty 6.8L,</td>
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<tr>
<td>Grand Marquis,</td>
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<tr>
<td>Mustang 5.4L,</td>
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<td></td>
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<tr>
<td>Town Car</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Escape / Mariner,</td>
<td>GO to Pinpoint Test KD.</td>
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<tr>
<td>Focus,</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fusion 2.5L,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fusion 3.0L,</td>
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<tr>
<td>Milan,</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ranger 2.3L,</td>
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</tr>
<tr>
<td>Transit Connect</td>
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<tr>
<td>All others</td>
<td>GO to Pinpoint Test HE.</td>
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<td></td>
</tr>
</tbody>
</table>

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

**Description:** The EGR monitor checks the differential pressure feedback EGR sensor signal to the powertrain control module (PCM) for low voltage. The test fails when the average voltage to the PCM drops to a voltage less than the minimum calibrated value.

**Possible Causes:**
- Differential pressure feedback EGR circuit short to ground
- Damaged differential pressure feedback EGR sensor
- VREF circuit short to ground

**Diagnostic Aids:** A DPFEGRA PID reading less than 0.05 volt with the ignition ON, engine OFF or running indicates a hard fault.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown Victoria,</td>
<td>GO to Pinpoint Test HH.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Series,</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>F-150 4.6L 2V,</td>
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</tr>
<tr>
<td>F-Series Super Duty 6.8L,</td>
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<tr>
<td>Grand Marquis,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mustang 5.4L,</td>
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<td></td>
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<tr>
<td>Town Car</td>
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</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test HE.</td>
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</tr>
</tbody>
</table>

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

**Description:** The EGR monitor checks the EGR sensor signal to the powertrain control module (PCM) for high voltage. The test fails when the average voltage to the PCM exceeds the maximum calibrated value.

**Possible Causes:**
- Differential pressure feedback EGR circuit open
- VREF circuit short to voltage
- Damaged differential pressure feedback EGR sensor
- Differential pressure feedback EGR circuit short to voltage
- SIG RTN circuit open

**Diagnostic Aids:** A DPFEGRA PID reading greater than 4.5 volts with the ignition ON, engine OFF or running indicates a hard fault.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Continued)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

| Crown Victoria, E-Series, F-150 4.6L 2V, F-Series Super Duty 6.8L, Grand Marquis, Mustang 5.4L, Town Car | GO to Pinpoint Test HH. |
| All others | GO to Pinpoint Test HE. |

**P0420 - Catalyst System Efficiency Below Threshold (Bank 1)**

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

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

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

**Application Key**
- On Engine Off
- On Engine Running
- Continuous Memory

**Application**
- All

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>GO to Pinpoint Test HF.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**P0430 - Catalyst System Efficiency Below Threshold (Bank 2)**

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

**Possible Causes:** See the possible causes for DTC P0420.

**Diagnostic Aids:** See the diagnostic aids for DTC P0420.

**Application Key**
- On Engine Off
- On Engine Running
- Continuous Memory

**Application**
- All

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>GO to Pinpoint Test HF.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### P0442 - Evaporative Emission System Leak Detected (Small Leak)

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

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

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HX.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### P0443 - Evaporative Emission System Purge Control Valve Circuit

**Description:** The powertrain control module (PCM) monitors the state of the evaporative emission (EVAP) canister purge valve circuit output driver. The test fails when the signal moves outside the minimum or maximum limit for the commanded state.

**Possible Causes:**
- VPWR circuit open
- EVAP canister purge valve circuit short to ground
- Damaged EVAP canister purge valve
- EVAP canister purge valve circuit open
- EVAP canister purge valve circuit short to voltage
- Damaged PCM

**Diagnostic Aids:**
To verify normal function, monitor the EVAP canister purge valve signal PID EVMV or EVAPCP and the signal voltage (PCM control side). With the valve closed, the EVMV indicates 0 mA (0% duty cycle for EVAPCP) and voltage approximately equal to battery voltage. When the valve is commanded fully open, EVMV indicates 1,000 mA (100% duty cycle for EVAPCP) and a voltage drop of 3 volts minimum is normal.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HX.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### P0444 - Evaporative Emission System Purge Control Valve A Circuit Open

**Description:** The powertrain control module (PCM) monitors the state of the evaporative emission (EVAP) canister purge valve circuit output driver. The test fails when the signal moves outside the minimum or maximum limit for the commanded state.

**Possible Causes:**
- VPWR circuit open
- Damaged EVAP canister purge valve
- EVAP canister purge valve circuit open
- Damaged PCM

**Diagnostic Aids:**
To verify normal function, monitor the EVAP canister purge valve signal PID EVAPCP. With the valve closed, the EVAPCP indicates 0% duty cycle. When the valve is commanded fully open, the EVAPCP indicates 100% duty cycle.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HZ.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P0446 - Evaporative Emission System Vent Control Circuit

**Description:** Monitors the canister vent (CV) solenoid circuit for an electrical failure. The test fails when the signal moves outside the minimum or maximum allowable calibrated parameters for a specified canister vent duty cycle by powertrain control module (PCM) command.

**Possible Causes:**
- VPWR circuit open
- KAPWR circuit open
- CV solenoid circuit short to ground
- Damaged CV solenoid
- CV solenoid circuit open
- CV solenoid circuit short to voltage
- CV solenoid circuit short to KAPWR
- Damaged PCM

**Diagnostic Aids:** To verify normal functioning, monitor the EVAP canister vent solenoid signal PID EVAPCV and the signal voltage (PCM control side). With the valve open, EVAPCV indicates 0% duty cycle and a voltage approximately equal to battery voltage. When the valve is commanded fully closed, EVAPCV indicates 100% duty cycle, and a minimum voltage drop of 4 volts is normal.

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HX.</td>
<td></td>
</tr>
</tbody>
</table>

### P0450 - Evaporative Emission System Pressure Sensor/Switch

**Description:** The powertrain control module (PCM) monitors the evaporative emission (EVAP) system natural vacuum leak detection (NVLD) module vacuum switch input signal to the PCM. The test fails when the signal input is not responding as expected.

**Possible Causes:**
- Damaged NVLD module
- Damaged PCM

**Diagnostic Aids:** Monitor the EVAP_SWITCH PID for a change in state to verify NVLD module operation.

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HZ.</td>
<td></td>
</tr>
</tbody>
</table>

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

#### For Vehicles With NVLD Module

**Description:** This DTC sets if the natural vacuum leak detection (NVLD) module pressure switch does not respond to pressure changes in the EVAP system.

**Possible Causes:**
- NVLD module pressure switch stuck open or closed

**Diagnostic Aids:**

#### For All Others

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

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

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

**Application**

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiesta</td>
<td>GO to Pinpoint Test HZ.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test HX.</td>
<td></td>
</tr>
</tbody>
</table>
P0452 - Evaporative Emission System Pressure Sensor/Switch Low
For Vehicles With NVLD Module

Description: The natural vacuum leak detection NVLD module monitors the position of the NVLD module pressure switch. This DTC sets if the NVLD module pressure switch voltage is out of range low.

Possible Causes:
- NVLD module VBATT circuit open
- Damaged NVLD module

Diagnostic Aids:

For All Others

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

Possible Causes:
- Contamination internal to the FTP sensor connector
- FTP circuit short to ground or SIGRTN
- Damaged FTP sensor

Diagnostic Aids: An FTP voltage PID reading less than 0.22 volt in key ON, engine OFF or key ON, engine running indicates a concern is present.

Application |
--- |
Key On Engine Off | Key On Engine Running | Continuous Memory
--- |
Fiesta | GO to Pinpoint Test HZ. |
All others | GO to Pinpoint Test HX. |

P0453 - Evaporative Emission System Pressure Sensor/Switch High
For Vehicles With NVLD Module

Description: The natural vacuum leak detection NVLD module monitors the position of the NVLD module pressure switch. This DTC sets if the NVLD module pressure switch voltage is out of range high.

Possible Causes:
- NVLD module GND circuit open
- Damaged NVLD module

Diagnostic Aids:

For All Others

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

Possible Causes:
- FTP circuit open
- VREF circuit short to voltage
- FTP circuit short to voltage
- SIGRTN circuit open
- Damaged FTP sensor

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

Application |
--- |
Key On Engine Off | Key On Engine Running | Continuous Memory
--- |
Fiesta | GO to Pinpoint Test HZ. |
All others | GO to Pinpoint Test HX. |
Diagnostic Trouble Code (DTC) Charts and Descriptions

**P0454 - Evaporative Emission System Pressure Sensor/Switch Intermittent**

**Description:** The fuel tank pressure changes greater than 14 inches of water in 0.10 seconds.

**Possible Causes:**
- Intermittent open or short in the fuel tank pressure (FTP) sensor or the FTP sensor signal
- Contaminated or damaged sensor

**Diagnostic Aids:** Monitor the FTP PID and note if it changes from above 15 inches of water to below minus (-) 15 inches of water often in 1 minute.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test Z.</td>
</tr>
</tbody>
</table>

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

**Description:** The powertrain control module (PCM) monitors the complete evaporative emission (EVAP) control system for no purge flow, the presence of a large fuel vapor leak, or multiple small fuel vapor leaks. System failure occurs when no purge flow, which is attributed to fuel vapor blockages or restrictions, a large fuel vapor leak, or multiple fuel vapor leaks are detected by the EVAP running loss monitor test with the engine running, but not at idle.

**Possible Causes:**
- Aftermarket EVAP hardware that does not conform to the required specifications
- Disconnected or cracked fuel EVAP canister tube, EVAP canister purge outlet tube, or EVAP return tube
- EVAP canister purge valve stuck closed
- Damaged EVAP canister
- Damaged, missing or loosely installed fuel filler cap
- Capless fuel tank filler pipe damaged or not sealed correctly (if equipped)
- Loose fuel vapor hose/tube connections to the EVAP system components
- Blockages or restrictions in the fuel vapor hoses/tubes
- Fuel vapor control valve tube assembly or fuel vapor vent valve assembly blocked
- Canister vent (CV) solenoid stuck open (if equipped)
- Mechanically inoperative fuel tank pressure (FTP) sensor (if equipped)

**Diagnostic Aids:** Check for audible vacuum noise or significant fuel odor in the engine compartment or near the EVAP canister and fuel tank.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiesta</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HZ.</td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HX.</td>
</tr>
</tbody>
</table>

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

**Description:** The powertrain control module (PCM) monitors the complete evaporative emission (EVAP) control system for the presence of a very small fuel vapor leak. The system failure occurs when a fuel vapor leak from an opening as small as 0.508 mm (0.020 inch) is detected by the EVAP running loss monitor test.

**Possible Causes:**
- Very small holes or cuts in the fuel vapor hoses/tubes
- Loose fuel vapor hose/tube connections to the EVAP system components
- EVAP system component seals leaking.

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiesta</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HZ.</td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HX.</td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

Description: The powertrain control module (PCM) continuously monitors the fuel level and retains the last updated value prior to the ignition switch being placed in the OFF position. After the ignition switch is placed in the ON position a new fuel level is taken and compared to the level recorded at ignition OFF. If the fuel level has increased, a flag is set in the PCM indicating the vehicle was refueled. If the evaporative emission (EVAP) monitor detects a gross leak while the refueling flag is set, a loose fuel filler cap or an incorrectly sealed fuel tank filler pipe (if equipped) is suspected and the DTC is set. On most vehicles when the DTC sets, either the check fuel cap indicator illuminates or a message on the instrument cluster displays to instruct the driver to check the fuel cap or capless fuel tank filler pipe (if equipped).

Possible Causes:
- Damaged, missing, or loosely installed fuel filler cap
- Capless fuel tank filler pipe damaged or not sealed correctly (if equipped)

Diagnostic Aids: Check for a missing fuel filler cap or the integrity of the cap. Verify the capless fuel tank filler pipe is sealed correctly (if equipped). If OK, clear the continuous memory DTCs and test the system for correct operation.

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

P0458 - Evaporative Emission System Purge Control Valve Circuit Low

Description: The powertrain control module (PCM) monitors the state of the evaporative emission (EVAP) canister purge valve circuit output driver. The test fails when the signal moves outside the minimum or maximum limit for the commanded state.

Possible Causes:
- VPWR circuit open
- EVAP canister purge valve circuit short to ground
- Damaged EVAP canister purge valve
- EVAP canister purge valve circuit open
- Damaged PCM

Diagnostic Aids: To verify normal function, monitor the EVAP canister purge valve signal PID EVAPCP. With the valve closed, the EVAPCP indicates 0% duty cycle. When the valve is commanded fully open, the EVAPCP indicates 100% duty cycle.

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

P0459 - Evaporative Emission System Purge Control Valve Circuit High

Description: The powertrain control module (PCM) monitors the state of the evaporative emission (EVAP) canister purge valve circuit output driver. The test fails when the signal moves outside the minimum or maximum limit for the commanded state.

Possible Causes:
- Damaged EVAP canister purge valve
- EVAP canister purge valve circuit short to voltage
- Damaged PCM

Diagnostic Aids: To verify normal function, monitor the EVAP canister purge valve signal PID EVAPCP. With the valve closed, the EVAPCP indicates 0% duty cycle. When the valve is commanded fully open, the EVAPCP indicates 100% duty cycle.

Application Key On Engine Off Key On Engine Running Continuous Memory
All GO to Pinpoint Test HZ.
P0460 - Fuel Level Sensor A Circuit

Description: The powertrain control module (PCM) monitors the fuel level input (FLI) communications network message for a concern. The test fails when the PCM determines that the value of the FLI signal is stuck. The PCM calculates the amount of fuel used during operation. If the FLI signal does not change or does not correspond with the calculated fuel usage, the DTC is set.

Possible Causes:
- 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)
- Damaged instrument cluster (IC)

Diagnostic Aids: Check with the customer for driving and fueling habits that would keep the fuel level at approximately the same value. Monitor the FLI PIDs while attempting to move the fuel level float by adding or removing fuel as necessary.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
Fiesta | GO to Pinpoint Test HZ. | | 
All others | | GO to Pinpoint Test HX. | |

P0461 - Fuel Level Sensor A Circuit Range/Performance

Description: The powertrain control module (PCM) monitors the fuel level input (FLI) communications network message for a concern. The test fails when the FLI signal repeatedly moves in and out of range, exceeding the minimum or maximum allowable calibrated parameters for a specified fuel fill percentage in the fuel tank.

Possible Causes:
- Excessive electrical noise
- Intermittent open circuit

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
--- | --- | --- | ---
Fiesta | GO to Pinpoint Test HZ. | | 
All others | | GO to Pinpoint Test HX. | |

P0462 - Fuel Level Sensor A Circuit Low

Description: The powertrain control module (PCM) monitors the fuel level input (FLI) communications network message for a concern. The test fails when the FLI signal is less than the minimum allowable calibrated parameter for a specified fuel fill percentage in the fuel tank.

Possible Causes:
- Empty fuel tank
- Fuel pump (FP) module concern
- Incorrectly installed fuel gauge
- Damaged instrument panel cluster (IPC)
- Damaged instrument cluster (IC)
- Damaged fuel gauge
- FLI circuit short to ground

Diagnostic Aids: Monitor the FLI PIDs in ignition ON, engine running. A concern is present if the FLI percentage PID is at 25% fill and the FLI voltage PID is less than 0.90 volt with a non-matching fuel gauge or the FLI percentage PID is at 75% fill and the FLI voltage PID is greater than 2.45 volts with a non-matching fuel gauge.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0462 - Fuel Level Sensor A Circuit Low

<table>
<thead>
<tr>
<th>Fiesta</th>
<th>GO to Pinpoint Test HZ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test HX.</td>
</tr>
</tbody>
</table>

P0463 - Fuel Level Sensor A Circuit High

**Description:** The powertrain control module (PCM) monitors the fuel level input (FLI) communications network message for a concern. The test fails when the FLI signal is greater than the maximum allowable calibrated parameter for a specified fuel fill percentage in the fuel tank.

**Possible Causes:**
- Fuel pump (FP) module concern
- Incorrectly installed fuel gauge
- Damaged instrument panel cluster (IPC)
- Damaged instrument cluster (IC)
- FLI circuit open
- FLI circuit short to voltage
- Overfilled fuel tank
- Damaged fuel gauge

**Diagnostic Aids:** See the diagnostic aids for DTC P0462.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiesta</td>
<td></td>
<td>GO to Pinpoint Test HZ.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td>GO to Pinpoint Test HX.</td>
<td></td>
</tr>
</tbody>
</table>

P0480 - Fan 1 Control Circuit

**For Relay Controlled Electric Cooling Fan**

**Description:** Monitors the low fan control (LFC) primary circuit output from the powertrain control module (PCM). The test fails when the PCM grounds the LFC circuit and excessive current draw is detected on the LFC circuit; or with the LFC circuit not grounded by the PCM the voltage is not detected on the LFC circuit (the PCM expects to detect VPWR voltage coming through the low speed fan control relay coil to the LFC circuit).

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

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

**For Variable Speed Electric Cooling Fan**

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

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

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

**For Cooling Fan Clutch**

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

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0480 - Fan 1 Control Circuit

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

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escape / Mariner, Fiesta, Focus, F-150, Mustang, Ranger 2.3L, Transit Connect</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KF.</td>
</tr>
<tr>
<td>Crown Victoria, Edge, Flex, Fusion, Milan, MKS, MKX, MKZ, Taurus, Town Car</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KN.</td>
</tr>
<tr>
<td>Expedition, Navigator, F-Series Super Duty</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HV.</td>
</tr>
</tbody>
</table>

P0481 - Fan 2 Control Circuit

**Description:**
Monitors the high fan control (HFC) primary circuit output from the powertrain control module (PCM). The test fails when the HFC output is commanded on (grounded) and excessive current draw is detected on the HFC circuit; or when the HFC circuit is commanded off and voltage is not detected on the HFC circuit (the PCM expects to detect VPWR voltage through the high speed FC relay coil to the HFC circuit).

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

**Diagnostic Aids:**
When the high fan control fault (HFCF) PID reads YES, a concern is currently present. An open circuit or short to ground can only be detected when the PCM is not grounding the HFC circuit. A short to voltage can only be detected when the PCM is grounding the HFC circuit. During the key ON engine OFF (KOEO) and key ON engine running (KOER) self-test, the HFC circuit is cycled ON and OFF.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KF.</td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P0496 - Evaporative Emission System High Purge Flow

**Description:** The powertrain control module (PCM) monitors the complete evaporative emission (EVAP) control system for high purge flow.

**Possible Causes:**
- Aftermarket EVAP hardware that does not conform to the required specifications
- Small holes or cuts in the fuel vapor hoses/tubes
- Capless fuel tank filler pipe damaged or not sealed correctly
- Loose fuel vapor hose or tube connections to the EVAP system components
- EVAP system component seals leaking at or near the EVAP canister purge valve

**Diagnostic Aids:**
- Verify the capless fuel tank filler pipe is sealed correctly.
- Application Key On Engine Off Key On Engine Running Continuous Memory
- All GO to Pinpoint Test HZ.

### P0497 - Evaporative Emission System Low Purge Flow

**Description:** The powertrain control module (PCM) monitors the complete evaporative emission (EVAP) control system for low purge flow.

**Possible Causes:**
- Aftermarket EVAP hardware that does not conform to the required specifications
- Holes or cuts in the fuel vapor hoses/tubes
- Capless fuel tank filler pipe damaged or not sealed correctly
- Loose fuel vapor hose or tube connections to the EVAP system components
- EVAP system component seals leaking at or near the EVAP canister purge valve

**Diagnostic Aids:**
- Verify the capless fuel tank filler pipe is sealed correctly.
- Check for loose or damaged vapor hoses. Visually inspect the EVAP canister inlet port.
- Application Key On Engine Off Key On Engine Running Continuous Memory
- All GO to Pinpoint Test HZ.

### P0500 - Vehicle Speed Sensor (VSS) A

**Description:** Indicates the powertrain control module (PCM) detected an error in the vehicle speed information. Vehicle speed data is received from either the VSS, the transfer case speed sensor (TCSS) or the anti-lock brake system (ABS) control module. If the engine RPM is above the torque converter stall speed (automatic transmission) and the engine load is high, it can be inferred that the vehicle must be moving. If there is insufficient vehicle speed data input, a concern is indicated and this DTC sets. On most vehicle applications the malfunction indicator lamp (MIL) illuminates when this DTC sets.

**Possible Causes:**
- Open in the VSS+/VSS- harness circuit
- Open in the TCSS signal or the TCSS signal return harness circuit
- Short to ground in the VSS harness circuit
- Short to ground in the TCSS harness circuit
- Short to voltage in the VSS harness circuit
- Short to voltage in the TCSS harness circuit
- Damaged drive mechanism for VSS or TCSS
- Damaged VSS or TCSS
- Damaged wheel speed sensors
- Damaged wheel speed sensor harness circuits

**Diagnostic Aids:**
- Monitor the VSS PID while driving the vehicle. This DTC sets when the PCM detects a sudden loss of vehicle speed signal over a period of time. If vehicle speed data is lost, check the source of the vehicle speed input: VSS, TCSS or ABS. On some manual shift-on-the-fly (MSOF) applications, VSS and TCSS PID can be monitored. However if no TCSS PID is available and VSS PID is zero, TCSS circuitry frequency must be checked for loss of sensor.
- Application Key On Engine Off Key On Engine Running Continuous Memory
- F-Series Super Duty GO to Pinpoint Test DF.
### P0500 - Vehicle Speed Sensor (VSS) A

<table>
<thead>
<tr>
<th>Manual Transmission</th>
<th>All others</th>
</tr>
</thead>
<tbody>
<tr>
<td>GO to Pinpoint Test DP.</td>
<td>The powertrain control module (PCM) uses information from the ABS module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.</td>
</tr>
</tbody>
</table>

### P0501 - Vehicle Speed Sensor A Range/Performance

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 307-01, Automatic Transmission, Diagnostic Trouble Code (DTC) Index to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Description:** Indicates incorrect or noisy VSS performance. Vehicle speed data is received from either the VSS, the transfer case speed sensor (TCSS), or the anti-lock brake system (ABS) control module.

**Possible Causes:**

- Noisy VSS or TCSS 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 TCSS
- Damaged wiring harness or connectors
- Concern in the modules or circuits connected to the VSS or TCSS circuit
- Aftermarket add-on

**Diagnostic Aids:** Monitor the VSS PID while driving the vehicle, and check for intermittent vehicle speed indication. Verify the ignition and charging systems are functioning correctly.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Series Super Duty</td>
<td>GO to Pinpoint Test DF.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual Transmission</td>
<td>GO to Pinpoint Test DP.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>The powertrain control module (PCM) uses information from the ABS control module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### P0504 - Brake Switch Correlation

**Description:** The PCM does a comparison test between the brake pedal switch (BPS) and the brake pedal position (BPP) switch.

**Possible Causes:**

- Damaged brake switch
- Open or short in the BPS circuit
- Open or short in the BPP circuit

**Diagnostic Aids:** Check the state of the BPS and BPP PIDs. The BPS PID is normally closed and BPP PID is normally open.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test FD.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### P0505 - Idle Air Control (IAC) System

**For Vehicles With An Idle Air Control (IAC) Valve**

**Description:** The powertrain control module (PCM) attempts to control engine speed during the key ON engine running (KOER) self-test. The test fails when the desired RPM could not be reached or controlled during the self-test.

**Possible Causes:**
- IAC circuit open
- VPWR to IAC solenoid open
- B+ or VPWR to IAC solenoid open
- Air inlet is plugged
- IAC circuit short to voltage
- Damaged IAC valve

**Diagnostic Aids:**

For All Others

**Description:** The powertrain control module (PCM) attempts to control engine speed during the key ON engine running (KOER) self-test. The test fails when the desired RPM could not be reached or controlled during the self-test.

**Possible Causes:**
- Failure mode effects management (FMEM) condition is present
- Intake air restriction
- Exhaust restriction
- Sludged throttle body
- Vacuum leaks
- Damaged electronic throttle body (ETB)
- Damaged PCM

**Diagnostic Aids:** This DTC may be accompanied by other DTCs. Diagnose other DTCs first. If 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranger</td>
<td></td>
<td>GO to Pinpoint Test KE.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td>GO to Pinpoint Test HU.</td>
<td></td>
</tr>
</tbody>
</table>

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

**For Vehicles With An Idle Air Control (IAC) Valve**

**Description:** This DTC sets when the powertrain control module (PCM) detects an engine idle speed that is less than the desired RPM.

**Possible Causes:**
- IAC circuit open
- Air inlet is plugged
- B+ or VPWR to IAC solenoid open
- Damaged or incorrect IAC valve
- IAC valve stuck closed
- VPWR to IAC solenoid open
- IAC circuit short to voltage

**Diagnostic Aids:** Disconnect the IAC valve and look for little or no change in engine RPM as an indication of a stuck or damaged valve.

**For All Others**

**Description:** This DTC sets when the powertrain control module (PCM) detects an engine idle speed that is less than the desired RPM.

(Continued)
# Diagnostic Trouble Code (DTC) Charts and Descriptions

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

**Possible Causes:**
- Intake air restriction
- Vacuum leaks
- Exhaust restriction
- Engine mechanical concern
- Sludged throttle body
- Damaged electronic throttle body (ETB)
- Damaged PCM

**Diagnostic Aids:**
This DTC may be accompanied by other DTCs. Diagnose other DTCs first. If 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranger</td>
<td></td>
<td>GO to Pinpoint Test KE.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td>GO to Pinpoint Test HU.</td>
<td></td>
</tr>
</tbody>
</table>

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

For Vehicles With An Idle Air Control (IAC) Valve

**Description:**
This DTC sets when the powertrain control module (PCM) detects an engine idle speed that is greater than the desired RPM.

**Possible Causes:**
- IAC circuit short to ground
- Damaged or incorrect IAC valve
- IAC valve stuck open
- Intake air leak after throttle body
- Vacuum leaks
- Damaged evaporative emissions (EVAP) system
- Exhaust gas recirculation (EGR) valve leaks vacuum

**Diagnostic Aids:**
Disconnect the IAC valve and look for little or no change in engine RPM as an indication of a stuck or damaged valve.

**For All Others**

**Description:**
This DTC sets when the powertrain control module (PCM) detects an engine idle speed that is greater than the desired RPM.

**Possible Causes:**
- Intake air leak after throttle body
- Vacuum leaks
- Damaged evaporative emissions (EVAP) system
- Exhaust gas recirculation (EGR) valve leaks vacuum
- Damaged electronic throttle body (ETB)
- Damaged PCM

**Diagnostic Aids:**
This DTC is informational only and it may be accompanied by other DTCs. Diagnose other DTCs first. If 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranger</td>
<td></td>
<td>GO to Pinpoint Test KE.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
</tr>
</tbody>
</table>
P050A - Cold Start Idle Air Control Performance

For Vehicles With An Idle Air Control (IAC) Valve

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

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

**Diagnostic Aids:**
This DTC is an informational DTC and may be accompanied by other DTCs. Diagnose other DTCs first. If no other DTCs are present, inspect the intake air system for air restrictions and damage. If no concerns are present, clear the DTCs and repeat the self-test.

The cold start emission reduction monitor runs during a cold start. Before repeating the self-test, a 2 to 3 hour soak period is required for the cold start emission reduction monitor to run at start up.

---

For All Others

**Description:** The monitor compares the actual measured engine speed to the engine speed requested by the powertrain control module (PCM). When the difference between desired and actual engine speed exceeds the calibrated threshold, the DTC sets.

**Possible Causes:**
- Intake air restriction
- Exhaust restriction
- Engine mechanical concern
- Damaged or sludged electronic throttle body (ETB)
- Vacuum leaks
- Damaged PCM

**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 (ECT) is below 37.8°C (100°F). Allow the vehicle to soak for 2-3 hours if necessary for the ECT 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranger</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

P050B - Cold Start Ignition Timing Performance

**Description:** The monitor compares commanded spark timing to the spark timing desired by the powertrain control module (PCM). When the difference between desired and commanded spark timing exceeds the calibrated threshold, the DTC sets.

**Possible Causes:**
- Intake air restriction
- Exhaust restriction
- Engine mechanical concern
- Damaged or sludged electronic throttle body (ETB)
- Vacuum leaks
- Damaged PCM

**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 (ECT) is below 37.8°C (100°F). Allow the vehicle to soak for 2-3 hours if necessary for the ECT 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.

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</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P050E - Cold Start Engine Exhaust Temperature Out of Range

**For Vehicles With An Idle Air Control (IAC) Valve**

**Description:** The powertrain control module (PCM) attempts to control engine speed during the key ON engine running (KOER) self-test. The test fails when the desired RPM could not be reached or controlled during the self-test.

**Possible Causes:**
- IAC circuit open
- VPWR to IAC solenoid open
- B+ or VPWR to IAC solenoid open
- Air inlet is plugged
- IAC circuit short to voltage
- Damaged IAC valve

**Diagnostic Aids:**

**For All Others**

**Description:** The powertrain control module (PCM) calculates the actual catalyst warm up temperature during a cold start. The PCM then compares the actual catalyst temperature to the expected catalyst temperature model. The difference between the actual and expected temperatures is a ratio. When this ratio exceeds the calibrated value this DTC sets 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
- Damaged PCM

(Continued)
P050E - Cold Start Engine Exhaust Temperature Out of Range

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 (ECT) is below 37.8°C (100°F). Allow the vehicle to soak for 2-3 hours if necessary for the ECT 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.

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</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P0511 - Idle Air Control (IAC) Circuit

Description: This DTC sets when the powertrain control module (PCM) detects an electrical load failure on the IAC output circuit.

Possible Causes: • IAC circuit open  • VPWR to IAC solenoid open  • B+ or VPWR to IAC solenoid open  • IAC circuit short to voltage  • Damaged IAC valve  • IAC circuit short to ground

Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test KE.</td>
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</tbody>
</table>

P0512 - Starter Request Circuit

Description: Possible Causes: Diagnostic Aids: Refer to the Workshop Manual Section 303-06 Starting System, PCM DTC Chart, to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
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<td></td>
</tr>
</tbody>
</table>

P0528 - Fan Speed Sensor Circuit No Signal

Description: The powertrain control module (PCM) uses the fan speed sensor (FSS) input to monitor the cooling fan clutch speed. If the indicated fan speed is lower than the calibrated value during the key ON engine running (KOER) self-test, the DTC is set.

Possible Causes: • FSS VPWR circuit open in the harness  • FSS PWRGND circuit open in the harness  • FSS circuit open in the harness  • FSS circuit short to voltage or ground in the harness  • Damaged FSS sensor  • Damaged PCM

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HV.</td>
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</tr>
</tbody>
</table>
### P052A - Cold Start Intake (A) Camshaft Position Timing Over-Advanced (Bank 1)

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

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

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

<table>
<thead>
<tr>
<th>Application</th>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HK.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

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

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<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HK.</td>
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</table>

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

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

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

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

<table>
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<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HK.</td>
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</tbody>
</table>
P052D - Cold Start Intake (A) Camshaft Position Timing Over-Retarded (Bank 2)

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

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

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

<table>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HK.</td>
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</table>

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

**Description:** This DTC sets when the powertrain control module (PCM) detects that the actual PCVHC circuit voltage is less than the desired voltage.

**Possible Causes:**
- PCVHC circuit open or short to ground
- IGN START/RUN circuit open or short to ground
- Damaged PCV heater assembly

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HG.</td>
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</tbody>
</table>

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

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

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

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

<table>
<thead>
<tr>
<th>Application</th>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HK.</td>
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</tr>
</tbody>
</table>

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

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

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

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

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.

P054C - Cold Start Exhaust (B) Camshaft Position Timing Over-Advanced (Bank 2)

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

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

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

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

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

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

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

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

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

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

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

Possible Causes: • Damaged PSP sensor
• VREF circuit open, or short to ground
• PSP circuit open or short to ground

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

Application Key On Engine Off Key On Engine Running Continuous Memory
All GO to Pinpoint Test DT.
P0553 - Power Steering Pressure (PSP) Sensor Circuit High Input

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

Possible Causes:
- Damaged PSP sensor
- VREF circuit short to voltage
- SIGRTN circuit open
- PSP sensor signal circuit open
- PSP sensor signal circuit short to voltage

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

Application

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
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</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test DT.</td>
</tr>
</tbody>
</table>

P0562 - System Voltage Low

Description:

Possible Causes:

Diagnostic Aids: Refer to the Workshop Manual Section 414-00, Battery and Charging System.

Application

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
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</thead>
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<td></td>
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</tbody>
</table>

P0563 - System Voltage High

Description:

Possible Causes:

Diagnostic Aids: Refer to the Workshop Manual Section 414-00, Battery and Charging System.

Application

<table>
<thead>
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<th>Key On Engine Off</th>
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</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

P0571 - Brake Switch A Circuit

Description: The purpose of this DTC is to check whether the brake switch has toggled or not during the key ON engine running (KOER) test.

Possible Causes:
- Open or short in the brake pedal position (BPP) circuit
- Open or short in the stoplamp circuits
- Concern in module(s) connected to the BPP circuit
- Damaged brake switch
- Incorrectly adjusted brake switch

Diagnostic Aids: Using the scan tool, check the BPP/BOO PID. The BPP/BOO PID should toggle on and off with brake pedal activation.

Application

<table>
<thead>
<tr>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td>GO to Pinpoint Test FD.</td>
</tr>
</tbody>
</table>

P0572 - Brake Switch A Circuit Low

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

Possible Causes:
- Open or short in the brake pedal position (BPP) circuit
- Open or short in the stoplamp circuits
- Damaged brake switch
- Incorrectly adjusted brake switch

(Continued)
### P0572 - Brake Switch A Circuit Low

**Diagnostic Aids:** Using the scan tool, check the BPP/BOO PID. The BPP/BOO PID should toggle on and off with brake pedal activation.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Go to Pinpoint Test FD.</td>
</tr>
</tbody>
</table>

### P0573 - Brake Switch A Circuit High

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

**Possible Causes:**
- Open or short in the brake pedal position (BPP) circuit
- Open or short in the stoplamp circuits
- Damaged brake switch
- Incorrectly adjusted brake switch

**Diagnostic Aids:** Using the scan tool, check the BPP/BOO PID. The BPP/BOO PID should toggle on and off with brake pedal activation.

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td>Go to Pinpoint Test FD.</td>
</tr>
</tbody>
</table>

### P0579 - Cruise Control Multifunction Input A Circuit Range / Performance

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 419-03, Cruise Control to continue diagnosis of the cruise control system.

<table>
<thead>
<tr>
<th>Application</th>
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<th>Key On Engine Running</th>
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</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P0581 - Cruise Control Multifunction Input A Circuit High

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 419-03, Cruise Control to continue diagnosis of the cruise control system.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
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</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P0600 - Serial Communication Link

**Description:** Indicates an error occurred in the powertrain control module (PCM). This DTC may set alone or in combination with P2105.

**Possible Causes:**
- Software incompatibility issue
- Damaged PCM

**Diagnostic Aids:**

<table>
<thead>
<tr>
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<th>Continuous Memory</th>
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</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Go to Pinpoint Test QE.</td>
</tr>
</tbody>
</table>

### P0602 - Powertrain Control Module (PCM) Programming Error

**Description:** This DTC indicates a programming error within the vehicle identification (VID) block.

**Possible Causes:**
- VID data corrupted by the scan tool during VID reprogramming

(Continued)
## P0602 - Powertrain Control Module (PCM) Programming Error

**Diagnostic Aids:** The VID block must be programmed. Refer to Section 2, *Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Making Changes to the VID Block*. If the PCM does not allow reprogramming of the VID block, reflashing of the PCM is required.

<table>
<thead>
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<tbody>
<tr>
<td>All</td>
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</table>

**Explanation:** Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

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

**Description:** Indicates the powertrain control module (PCM) has experienced an internal memory concern. However, there are external items that can cause this DTC.

**Possible Causes:**
- 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.

<table>
<thead>
<tr>
<th>Application</th>
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<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test QB.</td>
</tr>
</tbody>
</table>

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

**Description:** Indicates the powertrain control module (PCM) RAM has been corrupted.

**Possible Causes:**
- Module reprogramming
- Aftermarket performance products
- PCM

**Diagnostic Aids:** Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new PCM. If it is necessary to install a new PCM, refer to Section 2, *Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the VID Block for a Replacement PCM*.

<table>
<thead>
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<tbody>
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</tbody>
</table>

**Explanation:** Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

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

**Description:** The powertrain control module (PCM) ROM has been corrupted.

**Possible Causes:**
- An attempt was made to change the calibration
- Module programming error
- Aftermarket performance products
- PCM

**Diagnostic Aids:** Reprogram the vehicle identification (VID) block (use as built data). Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new powertrain control module (PCM). If it is necessary to install a new PCM, refer to Section 2, *Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the (VID) Block for a Replacement PCM*.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Explanation:** Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
Diagnostic Trouble Code (DTC) Charts and Descriptions

P0606 - Control Module Processor

Description: This DTC indicates an internal powertrain control module (PCM) communication error.
Possibale Causes:
• Module programming error
• Aftermarket performance products
• PCM

Diagnostic Aids: Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the VID Block for a Replacement PCM.

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

P0607 - Control Module Performance

Description: Indicates that the powertrain control module (PCM) internal central processing unit (CPU) has encountered an error. The PCM monitors itself and carries out internal checks of its own CPU. If any of these checks returns an incorrect value, the DTC is set.

Possible Causes:
• Module programming error
• Aftermarket performance products
• PCM

Diagnostic Aids: Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the VID Block for a Replacement PCM.

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

P060A - Internal Control Module Monitoring Processor Performance

Description: Indicates an error occurred in the powertrain control module (PCM). This DTC may set in combination with P2105.

Possible Causes:
• Software incompatibility issue
• Damaged PCM

Diagnostic Aids: Verify the PCM is at the latest calibration level.

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

P060B - Internal Control Module A/D Processing Performance

Description: Indicates an error occurred in the powertrain control module (PCM). This DTC may set in combination with P2104 or P2110.

Possible Causes:
• Damaged PCM

Diagnostic Aids: Inspect the harness for damage. Verify correct operation of the sensors using VREF and related circuits.

Application Key On Engine Off Key On Engine Running Continuous Memory
All GO to Pinpoint Test QE.
### Diagnostic Trouble Code (DTC) Charts and Descriptions

<table>
<thead>
<tr>
<th>DTC Code</th>
<th>Description</th>
<th>Possible Causes</th>
<th>Diagnostic Aids</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>P060C</td>
<td>Internal Control Module Main Processor Performance</td>
<td>Indicates an error occurred in the powertrain control module (PCM).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Software incompatibility issue</td>
<td>Verify the PCM is at the latest calibration level.</td>
<td>Key On Engine Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damaged PCM</td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>P060D</td>
<td>Internal Control Module Accelerator Pedal Position Performance</td>
<td>Indicates an error occurred in the powertrain control module (PCM).</td>
<td>If the PCM detects a concern identifying an issue with an accelerator pedal position (APP) sensor signal or with processing the brake pedal sensor input, the DTC is set.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damaged PCM</td>
<td>Verify the PCM is at the latest calibration level.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>P0610</td>
<td>Control Module Vehicle Options Error</td>
<td>Indicates a powertrain control module (PCM) vehicle options error.</td>
<td>Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new PCM. If it is necessary to install a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the VID Block for a replacement PCM.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Module reprogramming</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aftermarket performance products</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PCM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>P0616</td>
<td>Starter Relay Circuit Low</td>
<td>Possible Causes:</td>
<td>Refer to the Workshop Manual Section 303-06 Starting System, PCM DTC Chart, to continue diagnosis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>P0617</td>
<td>Starter Relay Circuit High</td>
<td>Possible Causes:</td>
<td>Refer to the Workshop Manual Section 303-06 Starting System, PCM DTC Chart, to continue diagnosis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All</td>
</tr>
</tbody>
</table>
### P061A - Internal Control Module Torque Performance

**Description:** Indicates an error occurred in the powertrain control module (PCM).

**Possible Causes:**
- Software incompatibility issue
- Damaged PCM

**Diagnostic Aids:** Verify the PCM is at the latest calibration level.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test QE.</td>
</tr>
</tbody>
</table>

### P061B - Internal Control Module Torque Calculation Performance

**Description:** Indicates a calculation error occurred in the powertrain control module (PCM).

**Possible Causes:**
- Crankshaft position (CKP) sensor circuit is open or short
- CKP sensor circuit intermittent
- Damaged CKP sensor
- Camshaft position (CMP) sensor circuit is open or short
- CMP sensor circuit intermittent
- Damaged CMP sensor
- Damaged PCM

**Diagnostic Aids:** Check for sensor and circuit related DTCs. Do not install a new electronic throttle body (ETB) for this DTC.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test QE.</td>
</tr>
</tbody>
</table>

### P061C - Internal Control Module Engine RPM Performance

**Description:** Indicates a calculation error occurred in the powertrain control module (PCM).

**Possible Causes:**
- Crankshaft position (CKP) sensor circuit is open or short
- CKP sensor circuit intermittent
- Damaged CKP sensor
- Camshaft position (CMP) sensor circuit is open or short
- CMP sensor circuit intermittent
- Damaged CMP sensor
- Damaged PCM

**Diagnostic Aids:** Verify correct operation of the CKP and CMP sensors and related circuits.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test QE.</td>
</tr>
</tbody>
</table>

### P061D - Internal Control Module Engine Air Mass Performance

**Description:** Indicates an error occurred in the powertrain control module (PCM).

**Possible Causes:**
- Software incompatibility issue
- Damaged PCM

**Diagnostic Aids:** Verify the PCM is at the latest calibration level.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test QE.</td>
</tr>
</tbody>
</table>

### P061F - Internal Control Module Throttle Actuator Controller Performance

**Description:** Indicates an error occurred in the powertrain control module (PCM).

**Possible Causes:**
- Software incompatibility issue
- Damaged PCM

**Diagnostic Aids:** Verify correct operation of the electronic throttle control (ETC) components and related circuits.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test QE.</td>
</tr>
</tbody>
</table>
P0620 - Generator Control Circuit

Description: Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

Possible Causes:

Diagnostic Aids: Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

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

P0622 - Generator Field Terminal Circuit

Description: Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

Possible Causes:

Diagnostic Aids: Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

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

P0625 - Generator Field Terminal Circuit Low

Description: Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

Possible Causes:

Diagnostic Aids: Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

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

P0626 - Generator Field Terminal Circuit High

Description: Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

Possible Causes:

Diagnostic Aids: Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

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

P0627 - Fuel Pump A Control Circuit/Open

Description: The fuel pump control module monitors the fuel pump module and secondary circuits for a concern. If the fuel pump control module detects a concern with the fuel pump module or secondary circuits, the fuel pump control module sends an 80% duty cycle signal on the fuel pump monitor (FPM) circuit to report the concern to the powertrain control module (PCM). The test fails when the fuel pump control module is still reporting a concern with the fuel pump module or secondary circuits after a calibrated amount of time.

Possible Causes:

- FPPWR circuit open or short to ground
- FPRTN circuit open
- FPPWR circuit short to voltage
- FPRTN circuit short to voltage
- Damaged fuel pump module
- Damaged fuel pump control module

Diagnostic Aids: Check for any harness concerns. The fuel pump control module controls the speed of the fuel pump module by supplying a variable voltage to the fuel pump module on the FPPWR circuit.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
---|---|---|---
All | GO to Pinpoint Test KC.
P062C - Internal Control Module Vehicle Speed Performance

- **Description:** Indicates an error occurred in the powertrain control module (PCM).
- **Possible Causes:**
  - Module communications network concerns
  - Output shaft speed (OSS) sensor concern
  - Turbine shaft speed (TSS) sensor concern
  - Anti-lock brake system (ABS) concern
- **Diagnostic Aids:** Repair any ABS DTCs, ABS-related DTCs in other modules, or vehicle communication concerns.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test QE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P062F (PCM) - Internal Control Module EEPROM Error

- **Description:** The powertrain control module (PCM) 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:** Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new PCM. If it is necessary to install a new PCM, refer to Section 2, *Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the VID Block for a Replacement PCM.*

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P062F (TCM) - Internal Control Module EEPROM Error

- **Description:**
- **Possible Causes:**
- **Diagnostic Aids:** Refer to the Workshop Manual Section 419-10, Multifunction Electronic Modules, Diagnostic Trouble Code (DTC) Chart to diagnose the DTC.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P0630 - VIN Not Programmed or Incompatible - ECM/PCM

- **Description:**
- **Possible Causes:**
- **Diagnostic Aids:** Refer to the Workshop Manual Section 418-00 Module Communications Network, Communication Network Diagnostic Trouble Codes (DTC) Index to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P0642 - Sensor Reference Voltage A Circuit Low

**Description:** Indicates the reference voltage (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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test C.</td>
</tr>
</tbody>
</table>

### P0643 - Sensor Reference Voltage A Circuit High

**Description:** Indicates the reference voltage (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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test C.</td>
</tr>
</tbody>
</table>

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

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

**Possible Causes:**
- Damaged PCM

**Diagnostic Aids:**
- Internal PCM concern.
- Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM), Programming the VID Block for a Replacement PCM.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

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

**Description:** See the description for DTC P064D.

**Possible Causes:** See the possible causes for DTC P064D.

**Diagnostic Aids:** See the diagnostic aids for DTC P064D.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P0652 - Sensor Reference Voltage B Circuit Low

**Description:** Indicates the electronic throttle control reference voltage (ETCREF) circuit is less than reference voltage (VREF) minimum.

**Possible Causes:**
- ETCREF circuit short to ground
- Damaged sensor
- Incorrect harness connection

(Continued)
### P0652 - Sensor Reference Voltage B Circuit Low

**Diagnostic Aids:** This DTC sets due to an under voltage condition on the ETCREF circuit.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test C.</td>
</tr>
</tbody>
</table>

**Description:** Indicates the electronic throttle control reference voltage (ETCREF) circuit is greater than reference voltage (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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test C.</td>
</tr>
</tbody>
</table>

### P0653 - Sensor Reference Voltage B Circuit High

**Description:** Indicates the electronic throttle control reference voltage (ETCREF) circuit is greater than reference voltage (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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test C.</td>
</tr>
</tbody>
</table>

### P0657 - Actuator Supply Voltage A Circuit/Open

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 307-01, Automatic Transmission, Diagnostic Trouble Code (DTC) Index to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P065B - Generator Control Circuit Range/Performance

**Description:** Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P065C - Generator Mechanical Performance

**Description:** Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

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

**Description:** The IMTV system is monitored for failure during continuous, key ON engine OFF (KOEO) or key ON engine running (KOER) self-tests. The test fails when the signal is more or less than an expected calibrated range.

**Possible Causes:**
- IMTV signal circuit open, short to PWR GND or SIG RTN
- Damaged IMTV actuator

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

Diagnostic Aids: An IMTVM PID reading may indicate a fault.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
</table>
| All                  |                   |                       | GO to Pinpoint Test HU.

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

Description: The IMTV system is monitored for failure during continuous, key ON engine OFF (KOEO) or key ON engine running (KOER) self-tests. The test fails when the signal is more or less than an expected calibrated range.

Possible Causes: • IMTV signal circuit open, short to PWR GND or SIG RTN
                • Damaged IMTV actuator

Diagnostic Aids: An IMTVM PID reading may indicate a fault.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
</table>
| All                  |                   |                       | GO to Pinpoint Test HU.

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

Description: This DTC sets when the ignition switch position run (ISP-R) circuit indicates the ignition is in the OFF, ACC, or LOCK position, and the amount of time the PCM remains powered through the PCM power relay exceeds a predetermined amount of time.

Possible Causes: • PCM relay control (PCMRC) circuit short to ground in the harness
                 • Damaged PCM power relay

Diagnostic Aids: Ability to communicate with the PCM when the ignition is in the OFF, ACC, or LOCK position indicates a hard fault.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
</table>
| All                  |                   |                       | GO to Pinpoint Test B.

P0686 - Electronic Control Module (ECM)/Powertrain Control Module (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: • PCM relay control (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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
</table>
| All                  |                   |                       | GO to Pinpoint Test B.

P0687 - Electronic Control Module (ECM)/Powertrain Control Module (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: • PCM relay control (PCMRC) circuit short to voltage
                 • Damaged PCM

(Continued)
### P0687 - Electronic Control Module (ECM)/Powertrain Control Module (PCM) Power Relay Control Circuit High

**Diagnostic Aids:** Ability to communicate with the PCM when the ignition is in the OFF, ACC, or LOCK position indicates a hard fault.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test B.</td>
</tr>
</tbody>
</table>

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

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

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

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test B.</td>
</tr>
</tbody>
</table>

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

**Description:** This DTC sets when the voltage on the ISP-R and the INJPWRM circuit voltages do not correspond for a calibrated period of time. 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:**
- ISP-R circuit short to voltage in the harness
- Fuel injector voltage power (VPWR) circuit open
- Fuel injector power monitor (INJPWR) circuit open
- Damaged ignition switch
- Damaged fuel pump relay
- Damaged PCM power relay

**Diagnostic Aids:** The INJPWRM PID voltage should be greater than 10.5 volts when the ignition is in the ON position.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test B.</td>
</tr>
</tbody>
</table>

### P0691 - Fan 1 Control Circuit Low

**Description:** This DTC sets when the powertrain control module (PCM) detects that the fan control (FC) circuit voltage is less than the desired voltage.

**Possible Causes:**
- FC circuit open or short to ground
- Damaged FC relay

**Diagnostic Aids:** Check the wiring, connectors and FC relay for damage.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KF.</td>
</tr>
</tbody>
</table>
### P0692 - Fan 1 Control Circuit High

**Description:** This DTC sets when the powertrain control module (PCM) detects that the fan control (FC) circuit voltage is greater than the desired voltage.

**Possible Causes:**
- FC circuit short to voltage
- Damaged FC relay

**Diagnostic Aids:** Check the wiring, connectors and FC relay for damage.

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

### P06B6 - Internal Control Module Knock Sensor Processor 1 Performance

**Description:** The powertrain control module (PCM) has detected an error condition with the knock sensor (KS) processor integrated circuit.

**Possible Causes:**
- Damaged PCM

**Diagnostic Aids:** Reprogram or update the calibration. Check for other DTCs or drive symptoms for further action. Make sure to check for aftermarket performance products before installing a new powertrain control module (PCM). If it is necessary to install a new PCM, refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM).

**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 indicates a concern with the ability of the powertrain control module (PCM) to correctly store permanent DTCs.

**Possible Causes:**
Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products.
- If an updated calibration is available, update the calibration to the latest level. Clear the DTCs and drive the vehicle.
- If an updated calibration is not available, 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.

### P0703 - Brake Switch B Input Circuit

**Description:** Indicates the powertrain control module (PCM) did not receive a brake pedal position (BPP) input.

**Possible Causes:**
- Open or short in the BPP circuit
- Open or short in the stoplamp circuits
- Damage in module(s) connected to the BPP circuit.
- Damaged brake switch
- Incorrectly adjusted brake switch

**Diagnostic Aids:** Check for correct function of the stoplamps. Using a scan tool, check the brake pedal position PID. The stoplamps and PID should turn ON and OFF with brake pedal activation.

**Application** | Key On Engine Off | Key On Engine Running | Continuous Memory
---|---|---|---
Town Car | Verify the brake pedal was applied and released during the key ON engine running KOER self-test. For additional concerns, refer to the Workshop Manual Section 417-01, Exterior Lighting, to diagnose all the stoplamps are inoperative.
**P0703 - Brake Switch B Input Circuit**

<table>
<thead>
<tr>
<th>Expedition, Navigator</th>
<th>Verify the brake pedal was applied and released during the key ON engine running KOER self-test. For additional concerns, refer to the Workshop Manual Section 206-09, Vehicle Dynamic Systems.</th>
</tr>
</thead>
<tbody>
<tr>
<td>All others</td>
<td>GO to Pinpoint Test FD.</td>
</tr>
</tbody>
</table>

**P0704 - Clutch Switch Input Circuit**

**Description:** When the clutch pedal is applied the voltage goes to low. If the powertrain control module (PCM) does not see this change from high to low the DTC is set.

**Possible Causes:**
- Clutch pedal position (CPP) circuit short to voltage
- Damaged CPP switch
- CPP circuit open in the SIGRTN

**Diagnostic Aids:** When the clutch pedal is applied and then released, the switch voltage should cycle.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Go to Pinpoint Test TA.</td>
</tr>
</tbody>
</table>

**P0705 - Transmission Range Sensor A Circuit (PRNDL) Input**

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

**P0706 - Transmission Range Sensor A Circuit Range/Performance**

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

**P0707 - Transmission Range Sensor A Circuit Low**

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

**P0708 - Transmission Range Sensor A Circuit High**

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P071x - Transmission Code

<table>
<thead>
<tr>
<th>Description:</th>
<th>Possible Causes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Transmission</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DP.</td>
</tr>
</tbody>
</table>

### P0720 - Output Shaft Speed (OSS) Sensor Circuit

| Description: | The OSS sensor inputs a signal to the powertrain control module (PCM) based on the speed of the output shaft of the transmission. |
| Possible Causes: | • 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. |

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Transmission</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DP.</td>
</tr>
</tbody>
</table>

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

| Description: | The OSS sensor signal is very sensitive to noise. This noise distorts the input to the powertrain control module (PCM). |
| Possible Causes: | • Wiring misrouted  
• Aftermarket add-on  
• Wiring damaged  
• Wiring insulation wear |
| Diagnostic Aids: | Check the routing of the harness.  
Check the wiring and the connector for damage. |

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Transmission</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DP.</td>
</tr>
</tbody>
</table>

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

| Description: | The OSS sensor failed to provide a signal to the powertrain control module (PCM) upon initial movement of vehicle. |
| Possible Causes: | • Damaged OSS connector  
• Damaged OSS sensor, or not installed correctly  
• Harness intermittently short or open |
| Diagnostic Aids: | Check the wiring, connector, and sensor for damage. |

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Transmission</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DP.</td>
</tr>
</tbody>
</table>
# Diagnostic Trouble Code (DTC) Charts and Descriptions

## P0723 - Output Shaft Speed (OSS) Sensor Circuit Intermittent

<table>
<thead>
<tr>
<th>Description:</th>
<th>The OSS sensor signal to the powertrain control module (PCM) is irregular or interrupted.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td>• Harness connector not correctly seated</td>
</tr>
<tr>
<td></td>
<td>• Harness intermittently short or open</td>
</tr>
<tr>
<td></td>
<td>• Harness connector damaged</td>
</tr>
<tr>
<td></td>
<td>• OSS sensor damaged, or not installed correctly</td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Verify harness and connector integrity, Verify correct installation of the OSS sensor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Transmission</td>
<td></td>
<td></td>
<td>Refer to Pinpoint Test DP.</td>
</tr>
</tbody>
</table>

## P073x - Transmission Code

<table>
<thead>
<tr>
<th>Description:</th>
<th>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## P074x - Transmission Code

<table>
<thead>
<tr>
<th>Description:</th>
<th>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## P075x - Transmission Code

<table>
<thead>
<tr>
<th>Description:</th>
<th>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## P076x - Transmission Code

<table>
<thead>
<tr>
<th>Description:</th>
<th>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

P077x - Transmission Code

<table>
<thead>
<tr>
<th>Description:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
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</table>

P078x - Transmission Code

<table>
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<td>Possible Causes:</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
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<td></td>
</tr>
</tbody>
</table>

P079x - Transmission Code

<table>
<thead>
<tr>
<th>Description:</th>
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<td>Possible Causes:</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P0815 - Upshift Switch Circuit

<table>
<thead>
<tr>
<th>Description:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Causes:</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Aids:</td>
<td>Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P0830 - Clutch Pedal Switch A Circuit

| Description: | The powertrain control module (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 |
| · Open PWRGND circuit to the CPP-BT switch |
| · Vehicle push-started with the clutch engaged (clutch pedal released) |
| · Aftermarket remote starting device |
| Diagnostic Aids: | Verify 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. |

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
P0833 - Clutch Pedal Switch B Circuit

**Description:** The powertrain control module (PCM) monitors the clutch pedal position (CPP) 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
- Open PWRGND circuit to the CPP-TT switch
- Vehicle push-started with the clutch engaged (clutch pedal released)
- Aftermarket remote starting device

**Diagnostic Aids:** Verify 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 419-03, Cruise Control, the speed control does not disengage when the clutch pedal is applied.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

P0840 - Transmission Fluid Pressure Sensor/Switch A Circuit

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 307-01, Automatic Transaxle/Transmission.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
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</tbody>
</table>

Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

P09xx - Transmission Code

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 307-01, Automatic Transaxle/Transmission.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

P0A3B - Generator Over Temperature

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
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</tr>
</tbody>
</table>

Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
P1000 - On-Board Diagnostic (OBD) Systems Readiness Test Not Complete

**Description:** The OBD monitors are carried out during the OBD drive cycle. This DTC is stored in continuous memory if any of the OBD monitors do not carry out their full diagnostic check. This DTC is not supported on all vehicles. Refer to Section 2, On Board Diagnostic (OBD) Drive Cycle for additional information.

**Possible Causes:**
- The vehicle is new from the factory
- Battery or powertrain control module (PCM) had recently been disconnected
- An OBD monitor concern occurred before completion of an OBD drive cycle
- PCM DTCs have recently been cleared with a scan tool
- Power take-off (PTO) circuit concern or PTO is on during testing

**Diagnostic Aids:** This DTC, inspection/maintenance (I/M) readiness function is part of the PCM strategy. A battery disconnection or clearing codes using a scan tool results in the various I/M readiness bits being set to a not-ready condition. As each non-continuous OBD monitor completes a full diagnostic check, the I/M readiness bit associated with that monitor is set to a ready condition. This may take one or two drive cycles based on whether concerns are detected or not. The readiness bits for comprehensive component monitoring (CCM), misfire and fuel system monitoring are considered complete once all the non-continuous monitors have been evaluated. Because the EVAP system monitor requires certain ambient conditions to run, special logic can bypass the monitor for the purpose of clearing the EVAP and I/M readiness bit, due to continued presence of these extreme conditions. DTC P1000 does not need to be cleared from the PCM except to pass an I/M test. The malfunction indicator lamp (MIL) flashes after a period of time with the ignition in the ON position (engine not running) if DTC P1000 is set.

### Application

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>See Note 1</td>
<td>See Note 1</td>
<td>GO to Pinpoint Test QC.</td>
</tr>
</tbody>
</table>

P1001 - Key On Engine Running (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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test QC.</td>
</tr>
</tbody>
</table>

P1100 - Mass Air Flow (MAF) Sensor Circuit Intermittent

**Description:** The MAF sensor circuit is monitored by the powertrain control module (PCM) for sudden voltage (or air flow) input change through the comprehensive component monitor (CCM). If during the last 40 warm-up cycles in ignition ON, engine running the PCM detects a voltage (or air flow) change beyond the minimum or maximum calibrated limit, a continuous memory DTC is stored.

**Possible Causes:**
- Incorrect continuity through the MAF sensor harness or connector
- Intermittent open or short inside the MAF sensor

**Diagnostic Aids:** While accessing the MAF PID on the scan tool, lightly tap on the MAF sensor or wiggle the MAF sensor connector and harness. If the MAF PID suddenly changes below 0.23 volt or above 4.60 volts, an intermittent fault is indicated.

### Application

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DC.</td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

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

**Description:** The MAF sensor circuit is monitored by the powertrain control module (PCM) for an out of range condition. The DTC sets if during ignition ON engine OFF, the output signal is greater than a calibrated limit or during ignition ON engine running, the output signal is not within the calibrated range.

**Possible Causes:**
- Low battery charge
- MAF sensor partially connected
- MAF sensor contamination
- PWR GND open to the MAF sensor
- MAF RTN circuit open to PCM
- Damaged MAF sensor
- Intake air leaks

**Diagnostic Aids:** Diagnose circuit faults prior to range or performance faults.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key Off</th>
<th>Running</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Key On Engine Off</td>
<td>Key On Engine Running</td>
<td>Continuous Memory</td>
</tr>
<tr>
<td></td>
<td>GO to Pinpoint Test DC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### P1112 - Intake Air Temperature (IAT) Circuit Intermittent

**Description:** Indicates the IAT sensor signal was intermittent.

**Possible Causes:**
- Damaged harness
- Damaged IAT sensor
- Damaged harness connector

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key Off</th>
<th>Running</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Key On Engine Off</td>
<td>Key On Engine Running</td>
<td>Continuous Memory</td>
</tr>
<tr>
<td></td>
<td>GO to Pinpoint Test DA.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Description:** Indicates the sensor signal is less than the self-test minimum. The IAT2 sensor minimum is 0.2 volt.

**Possible Causes:**
- IAT2 circuit short to ground
- Incorrect harness connection
- Damaged IAT sensor

**Diagnostic Aids:** Monitor the IAT2 PID value. A typical IAT2 temperature should be greater than the IAT1 temperature.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key Off</th>
<th>Running</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Key On Engine Off</td>
<td>Key On Engine Running</td>
<td>Continuous Memory</td>
</tr>
<tr>
<td></td>
<td>GO to Pinpoint Test DU.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Description:** Indicates the sensor signal is greater than the self-test maximum. The IAT2 sensor maximum is 4.6 volts.

**Possible Causes:**
- IAT2 circuit open or short to voltage
- Incorrect harness connection
- Damaged IAT sensor

**Diagnostic Aids:** Monitor the IAT2 PID value. A typical IAT2 temperature should be greater than the IAT1 temperature.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key Off</th>
<th>Running</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Key On Engine Off</td>
<td>Key On Engine Running</td>
<td>Continuous Memory</td>
</tr>
<tr>
<td></td>
<td>GO to Pinpoint Test DU.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Diagnostic Trouble Code (DTC) Charts and Descriptions

<table>
<thead>
<tr>
<th>DTC</th>
<th>Description</th>
<th>Possible Causes</th>
<th>Diagnostic Aids</th>
<th>Application</th>
</tr>
</thead>
</table>
| P1116 - Engine Coolant Temperature (ECT) Sensor Out of Self-Test Range | Indicates the ECT sensor is out of self-test range. The correct range is 0.3 to 3.7 volts. | • Overheating condition  
• Damaged thermostat  
• Damaged ECT sensor  
• Low engine coolant  
• Damaged harness connector | 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. | Key On Engine Off | Key On Engine Running | Continuous Memory |
| All | GO to Pinpoint Test DX. |

| P1117 - Engine Coolant Temperature (ECT) Sensor Circuit Intermittent | Indicates the ECT circuit became intermittently open or short while the engine was running. | • Damaged harness  
• Damaged EOT sensor  
• Damaged harness connector  
• Open or short in the ECT circuit  
• Low engine coolant | Monitor the ECT on a scan tool. Look for sudden changes in the reading when the harness is wiggled or the sensor is tapped. | Key On Engine Off | Key On Engine Running | Continuous Memory |
| All | GO to Pinpoint Test DX. |

| P1120 - Throttle Position Sensor A Out Of Range Low (Ratch Too Low) | The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for a low TP rotation angle or voltage input below the closed throttle position through the comprehensive component monitor (CCM). The test fails if the TP rotation angle or voltage remains within the calibrated self-test range, but falls between 3.42-9.85% (0.17-0.49 volt). | • TP circuit with frayed wires  
• Corrosion  
• Incorrect connections  
• VREF open to TP sensor  
• VREF short to SIG RTN | A TP PID between 3.42-9.85% (0.17-0.49 volt) in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present. | Key On Engine Off | Key On Engine Running | Continuous Memory |
| All | GO to Pinpoint Test DH. |

| P1124 - Throttle Position Sensor A Out Of Self-Test Range | The throttle position (TP) sensor circuit is monitored by the powertrain control module (PCM) for an out of range TP rotation angle or voltage input. The test fails if the TP rotation angle or voltage reading is less than 13.27% (0.66 volt) or greater than 23.52% (1.17 volts). | | | | |

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

Possible Causes:
- Binding or bent throttle linkage
- TP sensor not seated correctly
- Throttle plate below closed throttle position
- Throttle plate/screw incorrectly adjusted
- Damaged TP sensor

Diagnostic Aids: The TP PID reading not between 13.27-23.52% (0.66-1.17 volts) in ignition ON, engine OFF or ignition ON, engine running indicates a concern is present.

For All Others

Description: During key ON engine OFF (KOEO) and key ON, engine running (KOER) self-tests, the powertrain control module (PCM) monitors the electronic throttle control (ETC) throttle position (TP) sensor inputs to determine if the TP1 and TP2 signals are less than an expected value. If either TP1 or TP2 is greater than the expected value, the DTC is set.

Possible Causes:
- Accelerator pedal applied during KOEO or KOER self-test

Diagnostic Aids: Repeat the self-test without applying the accelerator pedal. Make sure the floor mat is not interfering with the accelerator pedal. Diagnose any TP circuit DTCs first.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
Ranger | GO to Pinpoint Test DH. | |  
All others | GO to Pinpoint Test DV. | |  

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

Description: The heated oxygen sensor (HO2S) monitor uses an exhaust temperature model to determine when the HO2S heaters are cycled ON. The test fails when the inferred exhaust temperature is below a minimum calibrated value.

Possible Causes:
- Engine not operating long enough prior to carrying out the key ON, engine running (KOER) self-test
- Exhaust system too cool

Diagnostic Aids: Monitor the HO2S heater PIDs to determine their ON/OFF state. DTC P1127 is present if the exhaust is not hot.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
Edge, Escape / Mariner 2.5L Automatic Transmission, Escape / Mariner 3.0L, E-Series 4.6L, E-Series 5.4L, Expedition, F-150, Flex, F-Series Super Duty, Fusion 2.5L, Fusion 3.0L, Milan, MKS, MKT, MKX, Mustang, Navigator, Taurus | GO to Pinpoint Test DZ. | |  
All others | | | GO to Pinpoint Test DW.  

## Diagnostic Trouble Code (DTC) Charts and Descriptions

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

**Description:** During idle, the powertrain control module (PCM) monitors the throttle angle and air flow. If the air flow is determined to be less than expected, the PCM adjusts the throttle angle to compensate. The air flow reduction is typically the result of engine deposit buildup around the throttle plate. This DTC indicates the PCM has reached the maximum allowed compensation and is no longer able to compensate for the buildup.

**Possible Causes:**
- 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
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</tr>
</tbody>
</table>

Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

### P117A - Engine Oil Over Temperature — Forced Limited Power

**Description:** Indicates the engine oil protection strategy is enabled when the engine oil temperature (EOT) reaches a predetermined level in the powertrain control module (PCM). The PCM then limits the engine RPMs until the EOT returns to normal.

**Possible Causes:**
- Engine overheating
- Low engine coolant
- Loaded weight is greater than the maximum vehicle weight rating. Refer to Owner’s Literature for vehicle weight ratings.

**Diagnostic Aids:** This DTC is an informational DTC and may be set by an engine overheating concern. If the engine overheats, check the cooling system. Refer to the Workshop Manual Section 303-03, Engine Cooling, the engine overheats symptom to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
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</tbody>
</table>

Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

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

**Description:** Indicates the EOT sensor signal was out of self-test range.

**Possible Causes:**
- Damaged harness
- Damaged sensor
- Damaged harness connector

**Diagnostic Aids:** The engine should be at operating temperature before carrying out the self-test.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
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</tbody>
</table>

GO to Pinpoint Test DY.

### P1227 - Wastegate Failed Closed (Over Pressure)

**Description:** Indicates that boost pressure is continuously higher than desired.

**Possible Causes:**
- Exhaust gas recirculation (EGR) valve
- Mass air flow (MAF) sensor
- Manifold absolute pressure (MAP) sensor
- Supercharger bypass actuator stuck closed
- Supercharger

**Diagnostic Aids:** This DTC is informational only and it may be accompanied by other DTCs. Diagnose other DTCs first.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
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</tbody>
</table>

GO to Pinpoint Test KJ.
Diagnosis Trouble Code (DTC) Charts and Descriptions

P1228 - Wastegate Failed Open (Under Pressure)

Description: Indicates that boost pressure is continuously lower than desired.
Possible Causes: • Exhaust gas recirculation (EGR) valve
• Mass air flow (MAF) sensor
• Manifold absolute pressure (MAP) sensor
• Supercharger bypass actuator stuck open
• Supercharger

Diagnostic Aids: This DTC is informational only and may be accompanied by other DTCs. Diagnose other DTCs first.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | | | GO to Pinpoint Test KJ.

P1229 - Charge Air Cooler (CAC) Pump Driver

Description: This DTC sets when the powertrain control module (PCM) commands the supercharger CAC pump to operate but no current is detected.
Possible Causes: • CAC pump motor open circuit
• CAC pump relay coil open
• Open circuit between the relay and pump
• CAC pump motor short
• Open circuit between the PCM and the relay
• Incorrect CAC pump ground connection

Diagnostic Aids: Check for voltage at the relay. Check the fuse in the voltage circuit. Check the ground connection of the CAC pump motor.

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

P1233 - Fuel Pump Driver Module Disabled or Off Line

Description: The powertrain control module (PCM) monitors the fuel pump monitor (FPM) circuit from the fuel pump driver module (FPDM). With the ignition ON, engine OFF or ignition ON, engine running the FPDM continuously sends a duty cycle signal to the PCM through the FPM circuit. The test fails if the PCM stops receiving the duty cycle signal.
Possible Causes: • Inertia fuel shutoff (IFS) switch needs to be reset
• Open FPDM ground circuit
• Open circuit to FPDM PWR RLY
• Open FPDM PWR circuit
• Open or short FPM circuit (engine should start)
• Damaged IFS switch
• Damaged FPDM PWR RLY
• Damaged FPDM

Diagnostic Aids: The PCM expects to see one of the following duty cycle signals from the FPDM on the FPM circuit: 1) 50% (500 ms on, 500 ms off), all OK. 2) 25% (250 ms on, 750 ms off), FPDM did not receive a fuel pump (FP) duty cycle command from the PCM, or the duty cycle that was received was invalid. 3) 75% (750 ms on, 250 off), the FPDM detected a concern in the circuits between the FPDM and the fuel pump.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | | | GO to Pinpoint Test KB.
P1235 - Fuel Pump Control Out Of Range

**Description:** This DTC indicates the fuel pump driver module (FPDM) detected an invalid or missing fuel pump (FP) duty cycle signal on the fuel pump control (FPC) circuit from the powertrain control module (PCM). The FPDM sends a message to the PCM through the fuel pump monitor (FPM) circuit, indicating this concern was detected. The PCM sets the DTC when the message is received.

**Possible Causes:**
- FPC circuit open or short
- Electronic throttle control (ETC) system concern. Check for ETC DTCs
- Damaged FPDM
- Damaged PCM

**Diagnostic Aids:**
The FPDM sends a 25% duty cycle (250 ms on, 750 ms off) through the FPM circuit to the PCM while the concern is being detected by the FPDM. If the concern is no longer detected, the FPDM returns to sending an all OK (50% duty cycle) message to the PCM. For ETC applications, check if ETC DTC P2105 is present. An ETC system concern could cause DTC P1235, and should be diagnosed first.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KB.</td>
</tr>
</tbody>
</table>

P1237 - Fuel Pump Secondary Circuit

**Description:** This DTC indicates the fuel pump driver module (FPDM) detected a fuel pump secondary circuit concern. The FPDM sends a message to the powertrain control module (PCM) through the fuel pump monitor (FPM) circuit indicating this concern was detected. The PCM sets the DTC when the message is received.

**Possible Causes:**
- Open or short FP PWR circuit
- Open FP RTN circuit to FPDM
- Open or short circuit in the fuel pump
- Locked fuel pump rotor
- Damaged FPDM

**Diagnostic Aids:**
The FPDM sends a 75% duty cycle (750 ms on, 250 ms off) through the FPM circuit to the PCM while the concern is being detected by the FPDM. If the concern is no longer detected, the PCM returns to sending an all OK (50% duty cycle) message to the PCM. The FPDM controls pump speed by supplying a variable ground on the FP RTN circuit.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KB.</td>
</tr>
</tbody>
</table>

P1244 - Alternator Load High Input

**Description:**

<table>
<thead>
<tr>
<th>Possible Causes:</th>
</tr>
</thead>
</table>

**Diagnostic Aids:** Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

P1245 - Alternator Load Low Input

**Description:**

<table>
<thead>
<tr>
<th>Possible Causes:</th>
</tr>
</thead>
</table>

**Diagnostic Aids:** Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>
### P1246 - Alternator Load Input

**Description:**
Possible Causes: [Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.]

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

### P1260 - Theft Detected, Vehicle Immobilized

**Description:**
This DTC can be set if the passive anti-theft system (PATS) has determined a theft condition existed and the engine is disabled or an engine start was attempted using a non-PATS key. This DTC is a good indicator to check the PATS for DTCs. This DTC can also be set when a new instrument cluster (IC), instrument panel cluster (IPC) or powertrain control module (PCM) is installed without correctly programming either module even if the vehicle is not equipped with PATS.

**Possible Causes:**
- Incorrectly programmed PCM
- Incorrectly programmed IC or IPC
- Previous theft condition
- Anti-theft system concern

**Diagnostic Aids:**
Theft indicator flashing rapidly or on solid when the ignition is in the ON position. Check the anti-theft system for DTCs. Refer to the Workshop Manual Section 419-01 Anti-Theft, Diagnostic Trouble Code (DTC) Charts to continue diagnosis.

If a new IC, IPC or PCM is installed without correctly programming either module, the parameters must be reset in both modules. Refer to the Workshop Manual Section 419-01 Anti-Theft, Passive Anti-Theft System (PATS) Parameter Reset, to continue diagnosis.

**Application**
Key On Engine Off  |  Key On Engine Running  |  Continuous Memory
--- | --- | ---
All | GO to Pinpoint Test QD.

### P1270 - Engine RPM or Vehicle Speed Limiter Reached

**Description:**
Indicates the vehicle has been operated in a manner which caused the engine or vehicle to exceed a calibration limit. The engine RPM and vehicle speed are continuously monitored and evaluated by the powertrain control module (PCM). The DTC 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:**
The DTC indicates the vehicle was operated in a manner which caused the engine RPM or vehicle speed to exceed a calibrated limit.

**Application**
Key On Engine Off  |  Key On Engine Running  |  Continuous Memory
--- | --- | ---
All | GO to Pinpoint Test ND.

### P1285 - Cylinder Head Over Temperature Condition

**Description:**
Indicates an engine overheat condition was sensed by the cylinder head temperature (CHT) sensor.

**Possible Causes:**
- Low engine coolant level
- Base engine concerns
- Engine cooling system concerns
- CHT sensor concern

(Continued)
### P1285 - Cylinder Head Over Temperature Condition

**Diagnostic Aids:** On some applications when this fault occurs the engine temperature warning indicator illuminates or forces the temperature gauge to the full H (hot) zone. The warning indicator can be triggered by either grounding the engine temperature warning circuit when wired to the powertrain control module (PCM), or by sending a PCM network message to the instrument cluster (IC) or instrument panel cluster (IPC).

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DL.</td>
</tr>
</tbody>
</table>

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

**Description:** Indicates the CHT sensor is out of self-test range. The engine is not at a normal operating temperature.

**Possible Causes:**
- Cold engine
- Engine overheating
- Damaged harness connector
- Low engine coolant level
- Damaged CHT sensor

**Diagnostic Aids:** Bring the engine to operating temperature. If cold, repeat the self-test. If the engine overheats, check the cooling system. 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DL.</td>
</tr>
</tbody>
</table>

### P1289 - Cylinder Head Temperature (CHT) Sensor Circuit High

**Description:** Indicates a CHT sensor circuit open.

**Possible Causes:**
- Open CHT sensor circuit
- CHT sensor circuit short to voltage
- Damaged CHT sensor
- Incorrect harness connection

**Diagnostic Aids:** A CHT V PID reading of greater than 4.6 volts with ignition ON engine OFF, or during any engine operating mode, indicates a concern is present. DTC P0118 may also be reported when this DTC sets. Either of these DTCs activate the malfunction indicator lamp (MIL).

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DL.</td>
</tr>
</tbody>
</table>

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

**Description:** Indicates the CHT circuit became intermittently open or short while the engine was running.

**Possible Causes:**
- Damaged harness or connector
- Damaged sensor
- Open or short in the CHT circuit

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DL.</td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

<table>
<thead>
<tr>
<th>DTC</th>
<th>Description</th>
<th>Possible Causes</th>
<th>Diagnostic Aids</th>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
</table>
| P1290 - Cylinder Head Temperature (CHT) Sensor Circuit Low | Indicates a CHT sensor circuit short to ground. | • Grounded circuit in CHT harness  
• Damaged CHT sensor  
• Incorrect harness connection | A CHT V PID value reading of less than 0.2 volt with the ignition ON engine OFF, or during any engine operating mode, indicates a concern is present. The DTC P0117 may also be reported when this DTC sets. Either of these DTCs activates the malfunction indicator lamp (MIL). | All | GO to Pinpoint Test DL. |
| P1299 - Cylinder Head Over Temperature Protection Active | Indicates an engine overheat condition was detected by the cylinder head temperature (CHT) sensor. A failure mode effects management (FMEM) strategy called fail-safe cooling was activated to cool the engine. | • Engine cooling system concerns  
• Low engine coolant level  
• Base engine concerns | Refer to Section 1, Powertrain Control Software, for more information on the fail-safe cooling strategy and CHT sensor. | All | GO to Pinpoint Test DL. |
| P1336 - Crankshaft/Camshaft Sensor Range/Performance | The input signal to the powertrain control module (PCM) from the crankshaft position (CKP) sensor or the camshaft position (CMP) sensor is erratic. | • Damaged CKP sensor  
• Damaged CMP sensor  
• Base engine concerns  
• Harness concerns | Check the harness for routing, alterations, incorrect shielding, or electrical interference from other systems. | All | GO to Pinpoint Test JD. |
| P1397 - System Voltage Out Of Self -Test Range | This DTC indicates 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. | • Battery or charging system concern | 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 414-00, Charging System to diagnose the battery is discharged or battery voltage is low symptom or the charging system overcharges (battery voltage is greater than 15.5 volts) symptom. | All | Refer to the Description, Possible Causes and Diagnostic Aids for the DTC. |
Diagnostic Trouble Code (DTC) Charts and Descriptions

P1405 - Differential Pressure Feedback Sensor Upstream Hose Off or Plugged

| Description: | While driving, the exhaust gas recirculation (EGR) monitor commands the EGR valve closed and checks the differential pressure across the EGR orifice. The test fails when the signal from the differential pressure feedback EGR sensor indicates EGR flow is in the negative direction. |
| Possible Causes: | • The upstream hose is disconnected  
• The upstream hose is plugged (ice)  
• Plugged or damaged EGR tube |
| Diagnostic Aids: | Look for signs of water or icing in the hose. Verify the hose connection and routing (no excessive dips). Check the differential pressure feedback EGR sensor for correct mounting and function. View the DPFEGR PID while applying and releasing vacuum directly to the sensor with a hand pump. |

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

P1406 - Differential Pressure Feedback Sensor Downstream Hose Off or Plugged

| Description: | While driving, the exhaust gas recirculation (EGR) monitor commands the EGR valve closed and checks the differential pressure across the EGR orifice. The test fails when the signal from the differential pressure feedback EGR sensor continues to indicate EGR flow even after the EGR valve is commanded closed. |
| Possible Causes: | • Downstream hose is disconnected  
• Downstream hose is plugged (ice)  
• Plugged or damaged EGR tube |
| Diagnostic Aids: | Look for signs of water or icing in the hose. Verify the hose connection and routing (no excessive dips). Check the differential pressure feedback EGR sensor for correct mounting and function. View the DPFEGR PID while applying and releasing vacuum directly to the sensor with a hand pump. |

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

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

| Description: | This test is carried out during the key ON engine running (KOER) on demand self-test only. The EGR system is commanded on at a fixed engine speed. The test does not pass and the DTC is set when the measured EGR flow falls above or below the required calibration. |
| Possible Causes: | • For electric EGR (EEGR) system, see possible causes for DTC P0400.  
• For vacuum activated systems, see the possible causes for DTC P0401. |
| Diagnostic Aids: | For EEGR, use the output state control function of the scan tool and monitor the manifold absolute pressure (MAP) PID and the EEGR PID (EGRMDSD) while commanding the EEGR on. If EGR is introduced into the engine at idle, the RPM drops or stalls out. For vacuum systems see diagnostic aids for DTC P0401. |

| Application | Key On Engine Off | Key On Engine Running | Continuous Memory |
| Escape / Mariner, Focus, Fusion 2.5L, Fusion 3.0L, Milan, Ranger 2.3L, Transit Connect | | | GO to Pinpoint Test KD. |

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown Victoria, E-Series, F-150 4.6L 2V, F-Series Super Duty 6.8L, Grand Marquis, Mustang 5.4L, Town Car</td>
<td></td>
<td>GO to Pinpoint Test HH.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HE.</td>
</tr>
</tbody>
</table>

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

Description: This test checks the electrical function of the EGR vacuum regulator solenoid. The test fails when the EVR circuit voltage is either too high or too low when compared to the expected voltage range. The EGR system must be enabled for the test to be completed.

Possible Causes:
- EVR circuit open
- EVR circuit short to voltage or ground
- VPWR open to EGR vacuum regulator solenoid
- Damaged EGR vacuum regulator solenoid

Diagnostic Aids: The EGR vacuum regulator solenoid resistance is between 26 and 40 ohms.

Application Key On Engine Off Key On Engine Running Continuous Memory
<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown Victoria, E-Series, F-150 4.6L 2V, F-Series Super Duty 6.8L, Grand Marquis, Mustang 5.4L, Town Car</td>
<td></td>
<td>GO to Pinpoint Test HH.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HE.</td>
</tr>
</tbody>
</table>

P144A - Evaporative Emission System Purge Vapor Line Restricted/Blocked

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

Possible Causes: Blocked fuel vapor tube between the FTP sensor and the fuel tank

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

Application Key On Engine Off Key On Engine Running Continuous Memory
<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HX.</td>
</tr>
</tbody>
</table>
P144C - Evaporative Emission System Purge Check Valve Performance

Description: The powertrain control module (PCM) tests the EVAP canister purge check valve for a stuck open condition. The EVAP canister purge check valve test is performed during minimal boost conditions, once per drive cycle, when entry conditions are met. The DTC is set if the fuel tank pressure exceeds a calibrated amount within a specified amount of time during the test.

Possible Causes: • Stuck open EVAP canister purge check valve (part of EVAP canister purge valve) • Damaged EVAP canister purge check valve


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

P1450 - Unable to Bleed Up Fuel Tank Vacuum

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

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

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

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

P1451 - Evaporative Emission System Vent Control Circuit

Description: Monitors the canister vent (CV) solenoid circuit for an electrical failure. The test fails when the signal moves outside the minimum or maximum allowable calibrated parameters for a specified canister vent duty cycle by powertrain control module (PCM) command.

Possible Causes: • VPWR circuit open • CV solenoid circuit short to PWR GND or CHASSIS GND • Damaged CV solenoid • CV solenoid circuit open • CV solenoid circuit short to voltage

Diagnostic Aids: To verify normal functioning, monitor the EVAP canister vent solenoid signal PID EVAPCV and the signal voltage (PCM control side). With the valve open, EVAPCV indicates 0% duty cycle and a voltage approximately equal to battery voltage. When the valve is commanded fully closed, EVAPCV indicates 100% duty cycle, and a minimum voltage drop of 4 volts is normal.

Application Key On Engine Off Key On Engine Running Continuous Memory
All GO to Pinpoint Test HX.
P145E - PCV Heater Control B Circuit

**Description:** This DTC sets when the powertrain control module (PCM) detects the actual PCVHF circuit voltage is less than or greater than the desired voltage.

**Possible Causes:**
- PCVHF circuit open, short to ground or voltage circuit open, short to ground or voltage
- IGN START/RUN circuit open or short to ground
- Damaged PCVHF heater assembly

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HG.</td>
<td>—</td>
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</tr>
</tbody>
</table>

P1474 - Fan Control Primary Circuit

**Description:** Monitors the low fan control (LFC) primary circuit output from the powertrain control module (PCM). The test fails if the PCM grounds the LFC circuit, excessive current draw is detected on the LFC circuit, or with the LFC circuit not grounded by the PCM, voltage is not detected on the LFC circuit (the PCM expects to detect VPWR voltage coming through the low speed FC relay coil to the LFC circuit).

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

**Diagnostic Aids:** When the LFCF PID reads YES, a concern is currently present. An open circuit or short to ground can only be detected when the PCM is not grounding the LFC circuit. A short to voltage can only be detected when the PCM is grounding the LFC circuit. During the key ON engine OFF (KOEO) and key ON engine running (KOER) self-test, the LFC circuit is cycled ON and OFF.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test KF.</td>
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</tr>
</tbody>
</table>

P1479 - High Fan Control Primary Circuit

**Description:** Monitors the high fan control (HFC) primary circuit output from the powertrain control module (PCM). The test fails if the HFC output commanded on (grounded), excessive current draw is detected on the HFC circuit or, with the HFC circuit commanded off, voltage is not detected on the HFC circuit (the PCM expects to detect VPWR voltage through the high speed FC relay coil to the HFC circuit).

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

**Diagnostic Aids:** When the HFCF PID reads YES, a concern is currently present. An open circuit or short to ground can only be detected when the PCM is not grounding the HFC circuit. A short to voltage can only be detected when the PCM is grounding the HFC circuit. During the key ON engine OFF (KOEO) and key ON engine running (KOER) self-test, the HFC circuit is cycled ON and OFF.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test KF.</td>
<td>—</td>
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</tr>
</tbody>
</table>
### P1489 - PCV Heater Control Circuit

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>This DTC sets when the powertrain control module (PCM) detects the actual PCVHC circuit voltage is less than or greater than the desired voltage.</td>
</tr>
</tbody>
</table>

#### Possible Causes:
- PCVHC circuit open, short to ground or voltage
- IGN START/ RUN circuit open or short to ground
- Damaged PCV heater assembly

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test HG.</td>
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</tr>
</tbody>
</table>

### P1500 - Vehicle Speed Sensor (VSS)

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicates the VSS input signal was intermittent. This DTC is set when a VSS concern interferes with other on-board diagnostics (OBD) tests, such as the catalyst efficiency monitor, the EVAP monitor or the HO2S monitor.</td>
</tr>
</tbody>
</table>

#### Possible Causes:
- Intermittent VSS connections
- Intermittent short in VSS harness circuit(s)
- Intermittent open in the VSS harness circuit(s)
- Damaged VSS

#### Diagnostic Aids:
Check the wiring, connector, and sensor for damage.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Series Super Duty</td>
<td>GO to Pinpoint Test DF.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual Transmission</td>
<td>GO to Pinpoint Test DP.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>The powertrain control module (PCM) uses information from the anti-lock brake system (ABS) module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicates the VSS input signal is out of self-test range. If the powertrain control module (PCM) detects a VSS input signal any time during the self-test, DTC P1501 is set and the test aborts.</td>
</tr>
</tbody>
</table>

#### Possible Causes:
- Noise on the VSS input signal from the 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Series Super Duty</td>
<td>GO to Pinpoint Test DF.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual Transmission</td>
<td>GO to Pinpoint Test DP.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td>The powertrain control module (PCM) uses information from the anti-lock brake system (ABS) module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P1502 - Vehicle Speed Sensor (VSS) Intermittent

**Description:** Indicates the powertrain control module (PCM) detected an error in the vehicle speed information. Vehicle speed data is received from either the VSS, transfer case speed sensor (TCSS) or anti-lock brake system (ABS) control module. This DTC 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:** See the possible causes for DTC P0500.

**Diagnostic Aids:** See the diagnostic aids for DTC P0500.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Series Super Duty</td>
<td></td>
<td>GO to Pinpoint Test DF.</td>
<td></td>
</tr>
<tr>
<td>Manual Transmission</td>
<td></td>
<td>GO to Pinpoint Test DP.</td>
<td></td>
</tr>
<tr>
<td>All others</td>
<td></td>
<td></td>
<td>The powertrain control module (PCM) uses information from the ABS control module and the transmission control module (TCM) to calculate vehicle speed. Check these modules for DTCs.</td>
</tr>
</tbody>
</table>

### P1504 - Idle Air Control (IAC) Circuit

**Description:** This DTC sets when the powertrain control module (PCM) detects an electrical load failure on the IAC output circuit.

**Possible Causes:**
- IAC circuit open
- VPWR to IAC solenoid open
- IAC circuit short to voltage
- IAC circuit short to ground
- Damaged IAC valve

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KE.</td>
</tr>
</tbody>
</table>

### P1506 - Idle Air Control (IAC) Overspeed Error

**Description:** This DTC sets when the powertrain control module (PCM) detects an engine idle speed that is greater than the desired RPM.

**Possible Causes:**
- IAC circuit short to ground
- Damaged IAC valve
- IAC valve stuck open
- Intake air leak after throttle body
- Vacuum leaks
- Damaged EVAP system

**Diagnostic Aids:** Disconnect the IAC valve and look for little or no change in engine RPM as an indication of a stuck or damaged valve.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KE.</td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

P1507 - Idle Air Control (IAC) Underspeed Error

**Description:** This DTC sets when the powertrain control module (PCM) detects an engine idle speed that is less than the desired RPM.

**Possible Causes:**
- IAC circuit open
- Air inlet is plugged
- Damaged or incorrect IAC valve
- IAC valve stuck closed
- VPWR to IAC solenoid open
- IAC circuit short to voltage

**Diagnostic Aids:** Disconnect the IAC valve and look for little or no change in engine RPM as an indication of a stuck or damaged valve.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test KE.</td>
</tr>
</tbody>
</table>

P1548 - Engine Air Filter Restriction

**Description:** The powertrain control module (PCM) monitors the manifold absolute pressure at various engine speeds during wide open throttle (WOT) operation, and compares the information to a calibrated value. This DTC sets if the air flow is out of range.

**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 obstructions are found. Refer to the Workshop Manual Section 303-12, Intake Air Distribution and Filtering for air filter replacement.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

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

**Description:** The PSP sensor input signal to the powertrain control module (PCM) is continuously monitored. The test fails when the signal falls out of a maximum or minimum calibrated range.

**Possible Causes:**
- Steering wheel not turned during self-test.
- Damaged PSP sensor
- PSP circuit open, short to ground or voltage
- Power steering concern

**Diagnostic Aids:** The DTC indicates the PSP sensor is out of self-test range.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DT.</td>
</tr>
</tbody>
</table>

P1561 - Brake Line Pressure Sensor Circuit

**Description:**

**Possible Causes:**

**Diagnostic Aids:** Refer to the Workshop Manual Section 206-10, Auxiliary Brake System, Powertrain Control Module (PCM) DTC Chart to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>
### P1572 - Brake Pedal Switch Circuit

**Description:** Indicates the brake input rationality test for brake pedal position (BPP) and brake pressure switch (BPS) has detected a concern. One or both inputs to the powertrain control module (PCM) did not change state when expected. On some vehicles with stability assist, the BPP switch is connected to the anti-lock brake system (ABS) control module and the ABS generates a driver brake application signal, which is then sent to the PCM.

**Possible Causes:**
- Incorrectly adjusted brake switches, BPP or BPS
- Blown fuse
- Damaged BPP switch
- Damaged BPS switch
- Open or short in the BPP circuit
- Open or short in the BPS circuit

**Diagnostic Aids:** DTC P1572 sets when the PCM does not sense the correct sequence of the brake pedal input signal from both the BPP switch and the BPS when the brake pedal is pressed and released.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test FD.</td>
</tr>
</tbody>
</table>

### P1575 - Pedal Position Out Of Self Test Range

**Description:** During key ON engine OFF (KOEO) self-test, the powertrain control module (PCM) monitors the accelerator pedal position (APP) sensor inputs to determine if the APP1 and APP2 signals are less than an expected value. If either APP1 or APP2 is greater than the expected value, the DTC is set.

**Possible Causes:**
- 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DK.</td>
</tr>
</tbody>
</table>

### P1588 - Throttle Control Detected Loss Of Return Spring

**Description:** The powertrain control module (PCM) tests the electronic throttle for the ability of the throttle plate to return to the default (limp home) position from both the open and closed positions. This DTC sets if the throttle does not return to the default (limp home) position.

**Possible Causes:**
- Obstruction in the throttle plate movement
- Damaged ETB

**Diagnostic Aids:** Visually inspect the throttle plate for an obstruction.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DV.</td>
</tr>
</tbody>
</table>

### P161A - Incorrect Response from Immobilizer Control Module

**Description:**

<table>
<thead>
<tr>
<th>Possible Causes:</th>
</tr>
</thead>
</table>

**Diagnostic Aids:** Refer to the Workshop Manual Section 419-01 Anti-Theft - Passive Anti-Theft System PATS.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>
# Diagnostic Trouble Code (DTC) Charts and Descriptions

## P1633 - Keep Alive Power (KAPWR) Voltage Too Low

**Description:** Indicates the KAPWR circuit has experienced a voltage interrupt.

**Possible Causes:**
- Open KAPWR circuit
- Intermittent KAPWR

**Diagnostic Aids:** Loss of KAPWR to the powertrain control module (PCM) results in immediate malfunction indicator lamp (MIL) illumination and DTC P1633.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test QB.</td>
</tr>
</tbody>
</table>

## P1635 - Tire/Axle Ratio Out of Acceptable Range

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

**Possible Causes:**
- Incorrect tire size
- Incorrect axle ratio
- Incorrect VID configuration parameters

**Diagnostic Aids:** Using the scan tool, view the tire and axle parameters within the VID. They must match the vehicle hardware.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

## P1636 - Inductive Signature Chip Communication Error

**Description:** Indicates the powertrain control module (PCM) has lost communication with the inductive signature chip.

**Possible Causes:**
- Damaged PCM

**Diagnostic Aids:** DTC P1636 indicates the PCM has lost communication with the inductive signature chip. Install a new PCM. Refer to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM).

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

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

**Description:** This DTC indicates the VID block is not programmed or the information within is corrupt.

**Possible Causes:**
- New powertrain control module (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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

## P1640 - Powertrain DTCs Available in Another Module

**Description:** Vehicles using a secondary engine control module can request that the powertrain control module (PCM) illuminate the malfunction indicator lamp (MIL) when a failure occurs which affects emissions.

<table>
<thead>
<tr>
<th>Possible Causes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Continued)</td>
</tr>
</tbody>
</table>
### P1640 - Powertrain DTCs Available in Another Module

**Diagnostic Aids:** DTCs stored in a secondary module, which requested the MIL to be turned on.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P1646 - Linear O2 Sensor Control Chip (Bank 1)

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

**Possible Causes:**
- Damaged PCM

**Diagnostic Aids:** Internal PCM concern. Reprogram or update the calibration. Check for other DTCs and diagnose those first. Make sure to check for aftermarket performance products before installing a new PCM. Clear the DTCs, repeat the self-test. If the DTC is retrieved again, install a new PCM. Refer to Section 2, *Flash Electrically Erasable Programmable Read Only Memory (EEPROM)*.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P1647 - Linear O2 Sensor Control Chip (Bank 2)

**Description:** See the description for DTC P1646.

**Possible Causes:** See the possible causes for DTC P1646.

**Diagnostic Aids:** See the diagnostic aids for DTC P1646.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
</tr>
</tbody>
</table>

### P164A - O2 Sensor Positive Current Trim Circuit Performance (Bank 1 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. The test fails if the PCM receives an inconsistent or erratic measurement of the resistor.

**Possible Causes:**
- Corrosion
- Incorrect connections
- Damaged universal HO2S

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>

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

**Description:** See the description for DTC P164A.

**Possible Causes:** See the description for DTC P164A.

**Diagnostic Aids:** See the description for DTC P164A.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>
P1650 - Power Steering Pressure (PSP) Switch Out of Self-Test Range

Description: In the key ON engine OFF (KOEO) self-test, this DTC indicates the PSP input to the powertrain control module (PCM) is high. In the key ON engine running (KOER) self-test, this DTC indicates the PSP input did not change state.

Possible Causes:
- The steering wheel must be turned during KOER self-test
- PSP switch/shorting bar damaged
- SIG RTN circuit open
- PSP signal or ground circuit open
- PSP signal circuit short to ground

Diagnostic Aids: Check if the vehicle was towed or a power steering repair was carried out. Observe the PSP PID while checking the wires for intermittent concerns.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | GO to Pinpoint Test FF.

P1674 - Control Module Software Corrupted

Description: Indicates an error occurred in the powertrain control module (PCM). This DTC sets in combination with P2105.

Possible Causes:
- Software incompatibility issue
- Damaged PCM

Diagnostic Aids: Verify the PCM is at the latest calibration level.

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

P1703 - Brake Switch Out of Self-Test Range

Description: Indicates that during the key ON engine OFF (KOEO) self-test, the brake pedal position (BPP) signal was high, or during the key ON engine running (KOER) self-test, the BPP signal did not cycle high and low.

Possible Causes:
- Open or short in the BPP circuit
- Open or short in the stoplamp circuits
- Concern in module(s) connected to the BPP circuit
- Damaged brake switch
- Incorrectly adjusted brake switch

Diagnostic Aids: Check for correct function of the stoplamps. Using a scan tool, check the brake pedal position PID. The stoplamps and PID should turn ON and OFF with brake pedal activation.

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | GO to Pinpoint Test FD.

P1705 - Transmission Range Sensor Out of Self-Test Range

Description:
Possible Causes:
Diagnostic Aids:

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
### P1709 - Park/Neutral Position (PNP) Switch Out of Self-Test Range

**Description:** This DTC indicates that the voltage is high when it should be low. Refer to the Workshop Manual Section 307-01, Automatic Transmission/Transaxle.

**Possible Causes:**
- Damaged PNP or clutch pedal position (CPP) switch
- PNP/CPP circuit short to voltage
- PNP/CPP circuit open in the SIGRTN

**Diagnostic Aids:** When activating either the PNP or CPP switch, the voltage should cycle from 5 volts to low.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

### P1729 - 4x4L Switch

**Description:**

**Possible Causes:**

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to the Workshop Manual Section 308-07A, Four-Wheel Drive Systems.

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

**Description:** During key ON engine running (KOER) self-test the TCS must be cycled, or a DTC is set.

**Possible Causes:**
- TCS not cycled during the self-test
- TCS circuit short or open
- Damaged TCS switch

**Diagnostic Aids:** Verify the TCS switch cycles ON and OFF.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

GO to Pinpoint Test TB.

### P1781 - 4x4L Switch Out of Self-Test Range

**Description:**

**Possible Causes:**

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to the Workshop Manual Section 308-07A, Four-Wheel Drive Systems.

### P1793 - Ignition Supply Malfunction

**Description:** The powertrain control module (PCM) monitors the ignition switch position run (ISP-R) circuit. This DTC sets if the voltage drops below 7 volts or rises above 16 volts.

**Possible Causes:**
- ISP-R circuit short to ground
- ISP-R circuit short to voltage
- Battery or charging system concern

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
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</tr>
</tbody>
</table>

GO to Pinpoint Test B.
Diagnostic Trouble Code (DTC) Charts and Descriptions

P17xx -
Description:
Possible Causes:
Diagnostic Aids:
Application | Key On Engine Off | Key On Engine Running | Continuous Memory
All | | | Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.

P18xx -
Description:
Possible Causes:
Diagnostic Aids:
Application | Key On Engine Off | Key On Engine Running | Continuous Memory
All | | | Refer to the Workshop Manual Section 308-07A, Four-Wheel Drive Systems.

P1900 - Output Shaft Speed (OSS) Sensor Circuit Intermittent
Description: The OSS sensor signal to the powertrain control module (PCM) is irregular or interrupted.
Possible Causes: • Harness connector not correctly seated • Harness intermittently short or open • Harness connector damaged • OSS sensor damaged, or not installed correctly
Diagnostic Aids: Verify harness and connector integrity. Verify correct installation of the OSS sensor.
Application | Key On Engine Off | Key On Engine Running | Continuous Memory
Manual Transmission | | | GO to Pinpoint Test DP.

P1901 - Turbine Shaft Speed (TSS) Sensor Circuit Intermittent
Description: The TSS sensor signal to the powertrain control module (PCM) is irregular or interrupted.
Possible Causes: • Harness connector not correctly seated • Harness intermittently short or open • Harness connector damaged • TSS sensor damaged or not installed correctly
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 (IMRC) Stuck Open (Bank 1)
Description: This DTC sets when the IMRC is commanded closed, but the IMRC monitor indicates open.
Possible Causes: • IMRC monitor signal circuit short to PWR GND or SIG RTN • Damaged IMRC actuator or solenoid • Blocked vacuum hoses

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

Diagnostic Aids: Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HU.</td>
</tr>
</tbody>
</table>

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

Description: This DTC sets when the IMRC is commanded closed, but the IMRC monitor indicates open.

Possible Causes:
- IMRC monitor signal circuit short to PWR GND or SIG RTN
- Damaged IMRC actuator or solenoid
- Damaged PCM
- Blocked vacuum hoses

Diagnostic Aids: An IMRCM PID reading near approximately 1 volt at closed throttle may indicate a fault.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HU.</td>
</tr>
</tbody>
</table>

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

Description: This DTC sets when the IMRC is commanded open, but the IMRC monitor indicates closed.

Possible Causes:
- IMRC monitor circuit open
- IMRC control circuit open
- IMRC monitor circuit short to voltage
- Damaged IMRC actuator or solenoid

Diagnostic Aids: Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HU.</td>
</tr>
</tbody>
</table>

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

Description: This DTC sets when the IMRC is commanded open, but the IMRC monitor indicates closed.

Possible Causes:
- IMRC monitor circuit open
- IMRC control circuit open
- IMRC monitor circuit short to voltage
- Damaged IMRC actuator or solenoid

Diagnostic Aids: Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HU.</td>
</tr>
</tbody>
</table>

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

Description: This DTC indicates a failure in the IMRC primary control circuit.

Possible Causes: IMRC control circuit open

Diagnostic Aids: Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test HU.</td>
</tr>
</tbody>
</table>
P2014 - Intake Manifold Runner Position Sensor/Switch Circuit (Bank 1)

Description: The intake manifold runner control (IMRC) system is monitored for failure during continuous or key ON engine OFF (KOEO) self-test. Each DTC distinguishes the corresponding bank for IMRC actuator assemblies with dual monitor switches. The test fails when the signal on the monitor pin is outside an expected calibrated range.

Possible Causes:
- IMRC monitor circuit open
- Mechanical concern - bind, seize, damage or obstruction of IMRC hardware

Diagnostic Aids: Monitor the IMRC and IMRCM PIDs. The IMRCM state should change when the IMRC is commanded open or closed.

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

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

Description: The intake manifold runner control (IMRC) system is monitored for failures. Each DTC distinguishes the corresponding bank. The test fails when the system detects the presence of a broken or persistently out of range linkage.

Possible Causes:
- Mechanical concern - bind, seize, damage, or obstruction of IMRC hardware

Diagnostic Aids:

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

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

Description: See the description for DTC P2015.

Possible Causes: See the possible causes for DTC P2015.

Diagnostic Aids:

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

P2025 - Evaporative Emissions Fuel Vapor Temperature Sensor Circuit Performance

Description: The powertrain control module (PCM) monitors the natural vacuum leak detection (NVLD) module input for expected NVLD ambient temperature sensor values. This DTC sets when the input is outside a calibrated set of limits.

Possible Causes:
- NVLD circuit open
- NVLD circuit shorted to voltage or ground
- Damaged NVLD module
- Damaged PCM

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

Application | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | | | GO to Pinpoint Test HZ.
P2026 - Evaporative Emissions Fuel Vapor Temperature Sensor Circuit Low Voltage

Description: The powertrain control module (PCM) monitors the natural vacuum leak detection (NVLD) module input for expected NVLD ambient temperature sensor values. This DTC sets when the input is outside a calibrated set of limits.

Possible Causes: • NVLD circuit open
• NVLD circuit shorted to voltage or ground
• Damaged NVLD module
• Damaged PCM

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

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

P2027 - Evaporative Emissions Fuel Vapor Temperature Sensor Circuit High Voltage

Description: The powertrain control module (PCM) monitors the natural vacuum leak detection (NVLD) module input for expected NVLD ambient temperature sensor values. This DTC sets when the input is outside a calibrated set of limits.

Possible Causes: • NVLD circuit open
• NVLD circuit shorted to voltage or ground
• Damaged NVLD module
• Damaged PCM

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

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

P2065 - Fuel Level Sensor B Circuit

Description: Fuel level information is sent to the powertrain control module (PCM) on the communication link.

Possible Causes: • Communication link concern
• Damaged instrument panel cluster (IPC)
• Damaged instrument cluster (IC)
• Damaged PCM

Diagnostic Aids: REFER to the Workshop Manual Section 413-01, Instrumentation, Message Center, and Warning Chimes, Symptom Charts, to diagnose the incorrect fuel gauge indication 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.

P2066 - Fuel Level Sensor B Circuit Range/Performance

Description: See the description for DTC P2065.

Possible Causes: See the possible causes for DTC P2065.

Diagnostic Aids: See the diagnostic aids for DTC P2065.

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

P2067 - Fuel Level Sensor B Circuit Low

Description: See the description for DTC P2065.

Possible Causes: See the possible causes for DTC P2065.

(Continued)
# Diagnostic Trouble Code (DTC) Charts and Descriptions

## P2067 - Fuel Level Sensor B Circuit Low

| Diagnostic Aids: | See the diagnostic aids for DTC P2065. |
| Application | All  |
| Key On Engine Off | Key On Engine Running | Continuous Memory |
| All | Refer to the Description, Possible Causes and Diagnostic Aids for the DTC. |

## P2068 - Fuel Level Sensor B Circuit High

| Diagnostic Aids: | See the diagnostic aids for DTC P2065. |
| Application | All  |
| Key On Engine Off | Key On Engine Running | Continuous Memory |
| All | Refer to the Description, Possible Causes and Diagnostic Aids for the DTC. |

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

| Description: | The IMTV system is monitored for failure during continuous, key ON engine OFF (KOEO), or key ON engine running (KOER) self-tests. The test fails when the signal is more or less than an expected calibrated range. |
| Possible Causes: | IMTV signal circuit short to PWR GND or SIG RTN  
| Diagnostic Aids: | An IMTVM PID reading may indicate a fault. |
| Application | All  |
| Key On Engine Off | Key On Engine Running | Continuous Memory |
| All | GO to Pinpoint Test HU. |

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

| Description: | The IMTV system is monitored for failure during continuous, key ON engine OFF (KOEO), or key ON engine running (KOER) self-tests. The test fails when the signal is more or less than an expected calibrated range. |
| Possible Causes: | IMTV signal circuit short to PWR GND or SIG RTN  
| Diagnostic Aids: | An IMTVM PID reading may indicate a fault. |
| Application | All  |
| Key On Engine Off | Key On Engine Running | Continuous Memory |
| All | GO to Pinpoint Test HU. |

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

| Description: | This DTC only identifies that the strategy has carried out several open and close cycles to remove potential ice build up. This DTC does not imply any system concerns, only that the mode has occurred, and that mode may be causing a long start time. |
| Possible Causes: | Ice or oil in the intake air system could be the result of a positive crankcase ventilation (PCV) system concern |

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

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

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

P2088 - A Camshaft Position Actuator Control Circuit Low Bank 1

Description: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) circuit for high and low voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time.

Possible Causes: • Open or short in the VCT circuit
• Open VPWR circuit
• Open or short in the VCT solenoid valve

Diagnostic Aids: All | 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: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) circuit for high and low voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time.

Possible Causes: • Open or short in the VCT circuit
• Open VPWR circuit
• Open or short in the VCT solenoid valve

Diagnostic Aids: All | 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: The powertrain control module (PCM) monitors the variable camshaft timing (VCT) circuit for high and low voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time.

Possible Causes: • Open or short in the VCT circuit
• Open VPWR circuit
• Open or short in the VCT solenoid valve

Diagnostic Aids: All | Key On Engine Off | Key On Engine Running | Continuous Memory
--- | --- | --- | ---
All | GO to Pinpoint Test HK.
### P2091 - B Camshaft Position Actuator Control Circuit High Bank 1

**Description:** The powertrain control module (PCM) monitors the variable camshaft timing (VCT) circuit for high and low voltage. The test fails if the voltage exceeds a calibrated limit for a calibrated amount of time.

**Possible Causes:**
- Open or short in the VCT circuit
- Open VPWR circuit
- Open or short in the VCT solenoid valve

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test HK.</td>
</tr>
</tbody>
</table>

### P2096 - Post Catalyst Fuel Trim System Too Lean Bank 1

**Description:** The powertrain control module (PCM) monitors the correction value from downstream heated oxygen sensor (HO2S) as part of the fore-aft oxygen sensor control routine. The test fails when the correction value is greater than a calibrated limit.

**Possible Causes:**
- Corrosion
- Incorrect connections
- Exhaust leaks
- Contaminated HO2S

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test DZ.</td>
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</tbody>
</table>

### P2097 - Post Catalyst Fuel Trim System Too Rich Bank 1

**Description:** See the description for DTC P2096.

**Possible Causes:** See the possible causes for DTC P2096.

**Diagnostic Aids:** See the diagnostic aids for DTC P2096.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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</thead>
<tbody>
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<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>

### P2098 - Post Catalyst Fuel Trim System Too Lean Bank 2

**Description:** See the description for DTC P2096.

**Possible Causes:** See the possible causes for DTC P2096.

**Diagnostic Aids:** See the diagnostic aids for DTC P2096.

<table>
<thead>
<tr>
<th>Application</th>
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<tbody>
<tr>
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<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>

### P2099 - Post Catalyst Fuel Trim System Too Rich Bank 2

**Description:** See the description for DTC P2096.

**Possible Causes:** See the possible causes for DTC P2096.

**Diagnostic Aids:** See the diagnostic aids for DTC P2096.

<table>
<thead>
<tr>
<th>Application</th>
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<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

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

Description: A powertrain control module (PCM) fault flag is set indicating the motor circuit is open. May require cycling the ignition.

Possible Causes: • TAC motor has an open winding • TAC motor is damaged • TAC motor harness is open • TAC motor harness short to voltage • TAC motor harness circuits are short together • TAC motor harness connector is unplugged

Diagnostic Aids: A TAC motor circuit PID reading may indicate a concern, if available.

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

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

Description: A powertrain control module (PCM) fault flag is set indicating the motor circuit is open, and may require cycling the ignition.

Possible Causes: • TAC motor circuits are cross-wired

Diagnostic Aids: A TAC motor circuit PID reading may indicate a concern, if available.

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

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

Description: The TAC system is in the failure mode effects management (FMEM) mode of forced idle.

Possible Causes:

Diagnostic Aids: This DTC is an informational DTC and may set in combination with a number of other DTCs which are causing the FMEM. Diagnose other DTCs first.

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

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

Description: The TAC system is in the failure mode effects management (FMEM) mode of forced engine shutdown.

Possible Causes:

Diagnostic Aids: This DTC is an informational DTC and may set in combination with a number of other DTCs which are causing the FMEM. Diagnose other DTCs first.

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

P2107 - Throttle Actuator Control (TAC) Module Processor

Description: The electronic throttle control (ETC) area of the powertrain control module (PCM) failed the self-test. The concern could be the result of an incorrect throttle position (TP) command, or TAC motor wires shorted together.

Possible Causes: • TAC motor harness circuit short to ground • TAC motor harness circuit short to voltage • Damaged electronic throttle body (ETB) • Damaged PCM

(Continued)
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### P2107 - Throttle Actuator Control (TAC) Module Processor

**Diagnostic Aids:** This DTC may be accompanied by other DTCs. If DTC P2110 is present along with other DTCs, disregard DTCs P2107 and P2110 at this time. Diagnose other DTCs first. A TAC motor circuit PID reading may indicate a concern, if available.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
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<td>All</td>
<td>GO to Pinpoint Test DV.</td>
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</table>

### P2109 - Throttle/Pedal Position Sensor A Minimum Stop Performance

**Description:** The powertrain control module (PCM) monitors the electronic throttle for the ability of the throttle plate to reach the lower mechanical stop position within a calibrated amount of time at ignition ON. This DTC sets if 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 ETB

**Diagnostic Aids:** Visually inspect the throttle plate for an obstruction.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
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<td>All</td>
<td>GO to Pinpoint Test DV.</td>
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</table>

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

**Description:** The TAC system is in the failure mode effects management (FMEM) mode of forced limited RPM.

**Possible Causes:**
- This DTC is an informational DTC and may set in combination with a number of other DTCs which are causing the FMEM. Diagnose other DTCs first.

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>All</td>
<td>GO to Pinpoint Test QE.</td>
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</table>

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

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

**Possible Causes:**
- Binding throttle body, stuck open
- TAC motor circuit open
- TAC motor circuits are cross-wired
- TAC motor harness circuits are shorted together
- Damaged PCM

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>All</td>
<td>GO to Pinpoint Test DV.</td>
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</table>

### P2112 - Throttle Actuator Control (TAC) System - Stuck Closed

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

**Possible Causes:**
- Binding throttle body, stuck closed
- TAC motor circuit open
- TAC motor circuits are cross-wired
- TAC motor harness circuits are shorted together
- Damaged PCM

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

P2112 - Throttle Actuator Control (TAC) System - Stuck Closed

Diagnostic Aids:

<table>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test DV.</td>
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</table>

P2118 - Throttle Actuator A Control Motor Current Range/Performance

Description: The powertrain control module (PCM) monitors the electronic throttle control (ETC) operation for a high current condition. This DTC sets if the current necessary to operate the TAC motor is higher than a calibrated limit.

Possible Causes:
- TAC motor is damaged
- TAC motor harness circuits are short together
- Obstruction in the throttle plate movement

Diagnostic Aids:

<table>
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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test DV.</td>
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</table>

P2119 - Throttle Actuator A Control Throttle Body Range/Performance

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

Possible Causes:
- Binding throttle body, stuck open
- TAC motor circuit open
- TAC motor circuits are cross-wired
- TAC motor harness circuits are shorted together
- Damaged PCM

Diagnostic Aids:

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test DV.</td>
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</table>

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

Description: The accelerator pedal position (APP) sensor fault flag is set for sensor 1 by the powertrain control module (PCM), indicating the signal is out of the normal self-test operating range.

Possible Causes:
- APP sensor 1 is open, or short to ground or voltage
- APP sensor signal circuits are short together
- Damaged APP sensor
- Damaged PCM

Diagnostic Aids: An APP1 or APP_D sensor PID reading may indicate a concern.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
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<td>GO to Pinpoint Test DK.</td>
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</tbody>
</table>

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

Description: The accelerator pedal position (APP) sensor 1 is out of self-test range low.

Possible Causes:
- APP sensor harness open (ETC system with a 2-track APP sensor)
- APP sensor harness short to ground
- Damaged APP sensor

Diagnostic Aids: An APP1 or APP_D sensor PID reading may indicate a concern.

<table>
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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
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<td>GO to Pinpoint Test DK.</td>
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</tbody>
</table>
P2123 - Throttle/Pedal Position Sensor/Switch D Circuit High

Description: The accelerator pedal position (APP) sensor 1 is out of self-test range high.

Possible Causes: • APP sensor harness open (ETC system with a 3-track APP sensor)
• APP sensor harness short to voltage
• Damaged APP sensor

Diagnostic Aids: An APP1 or APP_D sensor PID reading may indicate a concern.

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

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

Description: The accelerator pedal position (APP) sensor fault flag is set for sensor 2 by the powertrain control module (PCM), indicating the signal is out of the normal self-test operating range.

Possible Causes: • APP sensor assembly is binding
• Damaged APP sensor
• Damaged PCM
• Damaged IPC (some vehicles)

Diagnostic Aids: An APP2 or APP_E sensor PID reading may indicate a concern.

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

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

Description: The accelerator pedal position (APP) sensor 2 is out of self-test range low.

Possible Causes: • APP sensor circuit is short to ground
• APP sensor circuit is open
• Damaged APP sensor

Diagnostic Aids: An APP2 or APP_E sensor PID reading may indicate a concern.

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

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

Description: The accelerator pedal position (APP) sensor 2 is out of self-test range high.

Possible Causes: • APP sensor assembly is binding
• APP sensor harness short to voltage
• Damaged APP sensor

Diagnostic Aids: An APP2 or APP_E sensor PID reading may indicate a concern.

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

P2131 - Throttle/Pedal Position Sensor/Switch F Circuit Range/Performance

Description: The accelerator pedal position (APP) sensor fault flag is set for sensor 3 by the powertrain control module (PCM), indicating the signal is out of the normal self-test operating range.

Possible Causes: • APP sensor assembly is binding
• Damaged APP sensor
• Damaged PCM

(Continued)
### P2131 - Throttle/Pedal Position Sensor/Switch F Circuit Range/Performance

**Diagnostic Aids:** An APP3 sensor PID reading may indicate a concern.

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<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test DK.</td>
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</table>

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

**Description:**
The accelerator pedal position (APP) sensor 3 is out of self-test range low.

**Possible Causes:**
- APP sensor assembly is binding
- APP sensor circuit is open
- APP sensor harness short to ground
- Damaged APP sensor

**Diagnostic Aids:** An APP3 sensor PID reading may indicate a concern.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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</table>

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

**Description:**
The accelerator pedal position (APP) sensor 3 is out of self-test range high.

**Possible Causes:**
- APP sensor assembly is binding
- APP sensor harness short to voltage
- Damaged APP sensor

**Diagnostic Aids:** An APP3 sensor PID reading may indicate a concern.

<table>
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<th>Application</th>
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<th>Continuous Memory</th>
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</table>

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

**Description:**
The powertrain control module (PCM) flagged a concern indicating that throttle position voltage PIDs TP1 and TP2 disagree by more than a calibrated limit.

**Possible Causes:**
- Corrosion or incorrect connection at the ETC TP sensor terminals and wiring
- Damaged TP sensor

**Diagnostic Aids:** Compare the TP1 and TP2 PID values for a full sweep and correlation. Refer to the chart in pinpoint test DV.

<table>
<thead>
<tr>
<th>Application</th>
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</table>

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

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

**Possible Causes:**
- APP sensor circuit concerns
- Damaged APP sensor

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<td>GO to Pinpoint Test DK.</td>
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</table>
### P2163 - Throttle/Pedal Position Sensor A Maximum Stop Performance

**Description:** The powertrain control module (PCM) monitors the electronic throttle for the ability of the throttle plate to reach the upper mechanical stop position within a calibrated amount of time at ignition ON. This DTC sets if 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 ETB

**Diagnostic Aids:** Visually inspect the throttle plate for an obstruction.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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</table>

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

**Description:** The electronic throttle control (ETC) system of the powertrain control module (PCM) detected a concern. This DTC sets if the PCM is unable to learn the calibrated throttle positions.

**Possible Causes:**
- Obstruction in the throttle plate movement
- TAC motor is damaged

**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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Key On Engine Off</td>
<td>Key On Engine Running</td>
<td>Continuous Memory</td>
</tr>
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<td>GO to Pinpoint Test DV.</td>
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<td></td>
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</tbody>
</table>
## Diagnostic Trouble Code (DTC) Charts and Descriptions

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

**Description:** A heated oxygen sensor (HO2S) indicating lean at the end of a test is trying to correct for an over-rich condition. The test fails when the fuel control system no longer detects switching for a calibrated amount of time.

**Possible Causes:**
- **Electrical:**
  - Short to voltage in the harness or HO2S
  - Water in the harness connector
  - Open HO2S circuit
  - Open UO2SPC circuit
  - Corrosion
  - Incorrect harness connections
  - Damaged HO2S
  - Damaged powertrain control module (PCM)
- **Fuel System:**
  - Excessive fuel pressure
  - Leaking or contaminated fuel injectors
  - Leaking fuel pressure regulator
  - Low fuel pressure or running out of fuel
  - Vapor recovery system
- **Intake Air System:**
  - Air leaks after the mass air flow (MAF) sensor
  - Vacuum leaks
  - Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open
  - Incorrectly seated engine oil dipstick
- **Exhaust Gas Recirculation (EGR) System:**
  - Leaking gasket
  - Stuck EGR valve
  - Leaking diaphragm or EGR vacuum regulator
- **Base Engine:**
  - Oil overfill
  - Camshaft timing
  - Cylinder compression
  - Exhaust leaks before or near the HO2S

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>

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

**Description:** A heated oxygen sensor (HO2S) indicating rich at the end of a test is trying to correct for an over-lean condition. The test fails when the fuel control system no longer detects switching for a calibrated amount of time.

**Possible Causes:** See the possible causes for DTC P2195.

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
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</tr>
</tbody>
</table>

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

**Description:** See the description for DTC P2195.

**Possible Causes:** See the possible causes for DTC P2195.

**Diagnostic Aids:**

<table>
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<tr>
<th>Application</th>
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<th>Continuous Memory</th>
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<td>GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>
Powertrain DTC Charts and Descriptions

Diagnostic Trouble Code (DTC) Charts and Descriptions

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

Description: See the description for DTC P2196.
Possible Causes: See the possible causes for DTC P2195.
Diagnostic Aids:

<table>
<thead>
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<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
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<tbody>
<tr>
<td>All</td>
<td></td>
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<td>GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>

P219A - Bank 1 Air/Fuel Ratio Imbalance

Description: The air fuel imbalance monitor is designed to detect differences in the air fuel ratio between cylinders per engine bank. The test fails if the air 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 evaporative emission (EVAP) canister purge valve
- Exhaust or intake air system leaks
- Exhaust gas recirculation (EGR) system
- Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open
- Ignition system
- Incorrectly seated engine oil dipstick, tube or oil fill cap
- Base engine concerns
Diagnostic Aids: One or more EGR passages may be blocked or partially blocked.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
<td>All</td>
<td></td>
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<td>GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>

P219B - Bank 2 Air/Fuel Ratio Imbalance

Description: The air fuel imbalance monitor is designed to detect differences in the air fuel ratio between cylinders per engine bank. The test fails if the air 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 evaporative emission (EVAP) canister purge valve
- Exhaust or intake air system leaks
- Exhaust gas recirculation (EGR) system
- Positive crankcase ventilation (PCV) system is leaking or the valve is stuck open
- Ignition system
- Incorrectly seated engine oil dipstick, tube or oil fill cap
- Base engine concerns
Diagnostic Aids: One or more EGR passages may be blocked or partially blocked.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td></td>
<td></td>
<td>GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>

P2227 - Barometric Pressure Sensor A Circuit Range/Performance

For Fiesta
Description: The powertrain control module (PCM) continuously monitors this sensor for concerns. This DTC sets when the PCM detects an out of range condition in the control circuit.
Possible Causes:
- Damaged BARO sensor
- Damaged PCM

(Continued)
Diagnostic Trouble Code (DTC) Charts and Descriptions

P2227 - Barometric Pressure Sensor A Circuit Range/Performance

Diagnostic Aids: The BARO sensor is integral to the PCM. A BARO reading less than 50 kPa (7.25 psi) indicates a concern. 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).

For All Others
Description: The powertrain control module (PCM) continuously monitors this sensor for concerns. The test fails when the barometric pressure (BARO) parameter identification (PID) does not correlate with the throttle intake pressure (TIP) or the manifold absolute pressure (MAP) PIDs at ignition ON. This DTC sets when the PCM detects an out of range condition in the control circuit.

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 out side the operational range.

Application Key On Engine Off Key On Engine Running Continuous Memory
Fiesta Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
All others GO to Pinpoint Test DO.

P2228 - Barometric Pressure Sensor A Circuit Low

For Fiesta
Description: The powertrain control module (PCM) continuously monitors this sensor for concerns. Checks whether the signal from the barometric pressure (BARO) sensor is below the minimum threshold.

Possible Causes: • Damaged BARO sensor  • Damaged PCM

Diagnostic Aids: The BARO sensor is integral to the PCM. When the BARO signal is less than the calibrated threshold, a concern is indicated. 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).

For All Others
Description: Checks whether the 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 more 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 out side the operational range.

Application Key On Engine Off Key On Engine Running Continuous Memory
Fiesta Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
All others GO to Pinpoint Test DO.

P2229 - Barometric Pressure Sensor A Circuit High

For Fiesta
Description: The powertrain control module (PCM) continuously monitors this sensor for concerns. Checks whether the signal from the barometric pressure (BARO) sensor is above the maximum threshold.

(Continued)
P2229 - Barometric Pressure Sensor A Circuit High

Possible Causes:
- Damaged BARO sensor
- Damaged PCM

Diagnostic Aids:
The BARO sensor is integral to the PCM. When the BARO signal is greater than a calibrated threshold, a concern is indicated. 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).

For All Others

Description: Checks whether the BARO reading is abnormally high indicating an extreme low altitude.
Possible Causes:
- BARO circuit short to voltage
- Damaged BARO sensor

Diagnostic Aids:
When the BARO signal is greater than a calibrated threshold for more 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 out side the operational range.

Application Key On Engine Off Key On Engine Running Continuous Memory
Fiesta Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.
All others GO to Pinpoint Test DO.

P2237 - O2 Sensor Positive Current Control Circuit Open - Bank 1, Sensor 1

Description: The powertrain control module (PCM) monitors the universal heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with the circuit used to determine the oxygen content in the exhaust gas.
Possible Causes:
- Open UO2SPC circuit
- Damaged universal HO2S sensor

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: See the description for DTC P2237.
Possible Causes: See the possible causes for DTC P2237.

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: The powertrain control module (PCM) monitors the universal heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with the circuit used to determine the oxygen content in the exhaust gas.
Possible Causes:
- Open UO2S circuit
- Damaged universal HO2S sensor

Diagnostic Aids:

Application Key On Engine Off Key On Engine Running Continuous Memory
All GO to Pinpoint Test DZ.
### Diagnostic Trouble Code (DTC) Charts and Descriptions

<table>
<thead>
<tr>
<th>DTC</th>
<th>Description</th>
<th>Possible Causes</th>
<th>Diagnostic Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2247</td>
<td>O2 Sensor Reference Voltage Circuit Open - Bank 2, Sensor 1</td>
<td>See the description for DTC P2243.</td>
<td>Application Key On Engine Off Key On Engine Running Continuous Memory All GO to Pinpoint Test DZ.</td>
</tr>
<tr>
<td>P2251</td>
<td>O2 Sensor Negative Current Control Circuit Open - Bank 1, Sensor 1</td>
<td>The powertrain control module (PCM) monitors the universal heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with the circuit used to determine the oxygen content in the exhaust gas.</td>
<td>Application Key On Engine Off Key On Engine Running Continuous Memory All GO to Pinpoint Test DZ.</td>
</tr>
<tr>
<td>P2254</td>
<td>O2 Sensor Negative Current Control Circuit Open - Bank 2, Sensor 1</td>
<td>See the description for DTC P2251.</td>
<td>Application Key On Engine Off Key On Engine Running Continuous Memory All GO to Pinpoint Test DZ.</td>
</tr>
<tr>
<td>P2270</td>
<td>O2 Sensor Signal Stuck Lean - Bank 1, Sensor 2</td>
<td>The downstream heated oxygen sensor (HO2S) is forced rich and lean and monitored by the powertrain control module (PCM). The test fails if the PCM does not detect the output of the HO2S in a calibrated amount of time.</td>
<td>Application Key On Engine Off Key On Engine Running Continuous Memory All GO to Pinpoint Test H.</td>
</tr>
<tr>
<td>P2271</td>
<td>O2 Sensor Signal Stuck Rich - Bank 1, Sensor 2</td>
<td>See the description for DTC P2270.</td>
<td>Application Key On Engine Off Key On Engine Running Continuous Memory All GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>
### P2272 - O2 Sensor Signal Stuck Lean - Bank 2, Sensor 2

**Description:** See the description for DTC P2270.

**Possible Causes:** See the possible causes for DTC P2270.

**Diagnostic Aids:**

<table>
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<th>Continuous Memory</th>
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<tbody>
<tr>
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<td></td>
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<td>GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>

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

**Description:** See the description for DTC P2270.

**Possible Causes:** See the possible causes for DTC P2270.

**Diagnostic Aids:**

<table>
<thead>
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<tbody>
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<td>GO to Pinpoint Test H.</td>
</tr>
</tbody>
</table>

### P2282 - Air Leak Between Throttle Body and Intake Valve

**Description:** This DTC sets when the powertrain control module (PCM) detects an air leak that exceeds a predetermined limit for greater than 5 seconds. If the air flow entering the engine exceeds the air flow 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 or the valve is stuck open

**Diagnostic Aids:** Verify the integrity of the PCV system. Refer to Section 1, Positive Crankcase Ventilation (PCV) System for system information.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
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<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test HG.</td>
</tr>
</tbody>
</table>

### P2297 - O2 Sensor Out of Range During Deceleration (Bank 1, Sensor 1)

**Description:** During a deceleration fuel shut-off (DFSO) event, the powertrain control module (PCM) monitors how quickly the rear heated oxygen sensor (HO2S) switches from rich to lean. The measured rate of the rich to lean switch is compared to a calibrated threshold value. The threshold value takes into account the level of oxygen in the catalyst, which has an impact on how quickly the rich to lean switch occurs. The test fails when the measured value is slower than the threshold value.

**Possible Causes:**
- Exhaust leaks before or near the HO2S
- Damaged HO2S

**Diagnostic Aids:** Check for leaks in the exhaust system.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
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<tbody>
<tr>
<td>All</td>
<td></td>
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<td>GO to Pinpoint Test DW.</td>
</tr>
</tbody>
</table>

### P2300 - Ignition Coil A Primary Control Circuit Low

**Description:** The powertrain control module (PCM) continuously monitors the ignition system for concerns. This DTC sets when the PCM detects a short to ground in the circuit.

**Possible Causes:**
- CD A circuit short to ground
- Damaged ignition coil pack
- Damaged ignition coil pack wiring harness
P2300 - Ignition Coil A Primary Control Circuit Low

Description: The powertrain control module (PCM) continuously monitors the ignition system for concerns. This DTC sets when the PCM detects a short to voltage in the circuit.

Possible Causes:
- CD A circuit short to voltage
- Damaged ignition coil pack
- Damaged ignition coil pack wiring harness

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

P2301 - Ignition Coil A Primary Control Circuit High

Description: The powertrain control module (PCM) continuously monitors the ignition system for concerns. This DTC sets when the PCM detects a short to voltage in the circuit.

Possible Causes:
- CD A circuit short to voltage
- Damaged ignition coil pack
- Damaged ignition coil pack wiring harness

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

P2303 - Ignition Coil B Primary Control Circuit Low

Description: The powertrain control module (PCM) continuously monitors the ignition system for concerns. This DTC sets when the PCM detects a short to ground in the circuit.

Possible Causes:
- CD B circuit short to ground
- Damaged ignition coil pack
- Damaged ignition coil pack wiring harness

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

P2304 - Ignition Coil B Primary Control Circuit High

Description: The powertrain control module (PCM) continuously monitors the ignition system for concerns. This DTC sets when the PCM detects a short to voltage in the circuit.

Possible Causes:
- CD B circuit short to voltage
- Damaged ignition coil pack
- Damaged ignition coil pack wiring harness

Diagnostic Aids:
Application | Key On Engine Off | Key On Engine Running | Continuous Memory
All | GO to Pinpoint Test JE.
P2510 - ECM / PCM Power Relay Sense Circuit Range/Performance

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

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

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

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

P260F - Evaporative System Monitoring Processor Performance

Description: This DTC sets when a concern is detected internal to the powertrain control module (PCM). The microprocessor that controls the engine off natural vacuum (EONV) leak check monitor is separate from the main processor within the PCM.

Possible Causes:
- Module communications network concerns
- PCM calibration level
- Damaged PCM

Diagnostic Aids: Verify the PCM is at the latest calibration level. Reprogram if necessary.

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

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

Description: Indicates an error in the internal PCM engine off timer processor.

Possible Causes:
- Incorrect or intermittent battery cable connections
- Keep alive power (KAPWR) circuit to PCM concern
- Engine coolant temperature (ECT) sensor
- Engine cooling system concerns
- Electrical interference around vehicle or PCM

Diagnostic Aids: Verify the PCM is at the latest calibration level.

Application Key On Engine Off Key On Engine Running Continuous Memory
All GO to Pinpoint Test QB.
## P2626 - O2 Sensor Positive Current Trim Circuit/Open (Bank 1 Sensor 1)

**Description:** During deceleration fuel shut-off (DFSO) the powertrain control module (PCM) monitors the integrity of the universal heated oxygen sensor (HO2S) UO2SPCT circuit by comparing the actual oxygen sensor voltage signal to an expected oxygen sensor voltage signal. The test fails when the actual oxygen sensor voltage exceeds the maximum expected voltage threshold for a specified amount of time.

**Possible Causes:**
- Corrosion
- Incorrect harness connections
- UO2SPCT circuit open

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

## P2627 - O2 Sensor Pumping 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 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. The test fails if the PCM determines the resistance value is too high.

**Possible Causes:**
- UO2SPCT circuit open
- UO2SPCT circuit short to ground
- Contaminated or damaged HO2S

**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:** The powertrain control module (PCM) monitors the universal heated oxygen sensor (HO2S) for a circuit concern. This DTC sets when the PCM detects a concern with the circuit used to determine the oxygen content in the exhaust gas.

**Possible Causes:**
- UO2SPCT circuit short to voltage
- Damaged universal HO2S sensor

**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:** See the description for DTC P2626.

**Possible Causes:** See the description for DTC P2626.

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

## P2630 - O2 Sensor Pumping Current Trim Circuit Low Bank 2, Sensor 1

**Description:** See the description for DTC P2627.

**Possible Causes:** See the description for DTC P2627.

(Continued)
### P2630 - O2 Sensor Pumping Current Trim Circuit Low Bank 2, Sensor 1

**Diagnostic Aids:**

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<th>Application</th>
<th>Key On Engine Off</th>
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<th>Continuous Memory</th>
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<tbody>
<tr>
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<td></td>
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</tr>
</tbody>
</table>

### P2631 - O2 Sensor Positive Current Trim Circuit High (Bank 2 Sensor 1)

**Description:** See the description for DTC P2628.

**Possible Causes:** See the possible causes for DTC P2628.

**Diagnostic Aids:**

<table>
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<th>Application</th>
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<th>Key On Engine Running</th>
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<tbody>
<tr>
<td>All</td>
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<td></td>
<td>GO to Pinpoint Test DZ.</td>
</tr>
</tbody>
</table>

### 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 powertrain control module (PCM). The test fails 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 module by supplying a variable voltage to the fuel pump module on the FPPWR circuit.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
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<tbody>
<tr>
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</table>

### P2A01 - O2 Circuit Range / Performance Bank 1, Sensor 2

**Description:** The powertrain control module (PCM) monitors the heated oxygen sensor (HO2S) for an out of range low voltage concern. This DTC sets if the HO2S voltage is out of range low for a calibrated period of time.

**Possible Causes:**
- Crossed HO2S and SIGRTN circuits
- Contaminated or damaged HO2S
- Deteriorating HO2S
- Corrosion
- Incorrect harness connections

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
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</table>

### P2A04 - O2 Circuit Range / Performance Bank 2, Sensor 2

**Description:** See the description for DTC P2A01.

**Possible Causes:** See the possible causes for DTC P2A01.

(Continued)
P2A04 - O2 Circuit Range / Performance Bank 2, Sensor 2

Diagnostic Aids: See the diagnostic aids for DTC P2A01.

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<th>Application</th>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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<tbody>
<tr>
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<td>GO to Pinpoint Test DW.</td>
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</tr>
</tbody>
</table>

Pxxxx -

Description: For Pxxxx DTCs not listed in this chart, refer to the customer’s symptom to determine the applicable Workshop Manual section for diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
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<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
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</tr>
</tbody>
</table>

U0101 - Lost Communication With Transaxle Control Module (TCM)

Description: The powertrain control module (PCM) continuously monitors the controller area network (CAN) for messages from the TCM. This DTC sets when the PCM does not receive the TCM message within the defined amount of time.

Possible Causes: • Communication error

Diagnostic Aids: Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test QA.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

U0109 - Lost Communication With Fuel Pump Control Module A

Description: The powertrain control module (PCM) monitors the fuel pump monitor (FPM) circuit for the presence of a duty cycled signal. If the FPM circuit is fixed at a low or high voltage, the PCM begins to increment a counter. The test fails when the PCM is still not detecting a duty cycled signal on the FPM circuit after a calibrated amount of time.

Possible Causes: • FPM circuit open or short to ground
• FPM circuit short to voltage
• VPWR fuel circuit open
• PWRGND circuit open
• Damaged inertia fuel shutoff (IFS) switch (if equipped)
• Damaged fuel pump control module relay

Diagnostic Aids: Check if the inertia fuel shutoff (IFS) switch is tripped.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test KC.</td>
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<td></td>
</tr>
</tbody>
</table>

U0120 - Lost Communication With Starter/Generator Control Module

Description: Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

Diagnostic Aids: Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Diagnostic Trouble Code (DTC) Charts and Descriptions**

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

**Description:** The powertrain control module (PCM) continuously monitors the controller area network (CAN) for messages from the ABS. This DTC sets when the PCM fails to receive the ABS message within the defined amount of time.

**Possible Causes:** • Communication error

**Diagnostic Aids:** Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test QA.</td>
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<td></td>
</tr>
</tbody>
</table>

**U0140 - Lost Communication With Body Control Module**

**Description:** The powertrain control module (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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test QA.</td>
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</tr>
</tbody>
</table>

**U0155 - Lost Communication With Instrument Panel Cluster Control Module**

**Description:** The powertrain control module (PCM) continuously monitors the controller area network (CAN) for messages from the instrument panel cluster. This DTC sets when the PCM does not receive the instrument panel cluster 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.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test QA.</td>
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<td></td>
</tr>
</tbody>
</table>

**U016C - Lost Communication With Fuel Pump Control Module B**

**Description:** The powertrain control module (PCM) monitors the fuel pump monitor 2 (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. The test fails 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  
• PWRGND circuit open  
• Damaged fuel pump control module relay

**Diagnostic Aids:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GO to Pinpoint Test KC.</td>
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</tbody>
</table>
Diagnostic Trouble Code (DTC) Charts and Descriptions

U029F - Lost Communication with Evaporative Emission System Leak Detection 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 HZ. |

U0300 - Internal Control Module Software Incompatibility

| Description: | This DTC indicates there are incompatible software levels within the powertrain control module (PCM) that control the electronic throttle control (ETC) system. The ETC system uses multiple microprocessors within the PCM, each having its own software level and function. The microprocessors must have the correct level of software in order to communicate and function together. |
| Possible Causes: | | |
| Diagnostic Aids: | Verify the PCM is at the latest calibration level. |

Application | Key On Engine Off | Key On Engine Running | Continuous Memory |
---|---|---|---|
All | | | Go to Pinpoint Test QE. |

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 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 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. |
### Diagnostic Trouble Code (DTC) Charts and Descriptions

#### U0423 - Invalid Data Received From IPC

<table>
<thead>
<tr>
<th>Description:</th>
<th>Network DTC concerns occur during module-to-module communication.</th>
</tr>
</thead>
</table>
| 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. |

#### U0469 - Invalid Data Received From Starter / Generator Control Module

| Description: | See Workshop Manual Section 414-00 Charging System to continue diagnosis. |
| Possible Causes: | Refer to the Workshop Manual Section 414-00 Charging System to continue diagnosis. |
| Diagnostic Aids: | Refer to the Description, Possible Causes and Diagnostic Aids for the DTC. |
| Application | Key On Engine Off | Key On Engine Running | Continuous Memory |
| All | | | Refer to the Description, Possible Causes and Diagnostic Aids for the DTC. |

#### U05A0 - Invalid Data Received from Evaporative Emission System Leak Detection 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 HZ. |

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

| Description: | Network DTC(s) occur during module-to-module communication concerns. Two types of network concerns can be categorized:  
• 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. |
| Possible Causes: | Check for other PCM DTCs or PCM related symptoms. Diagnose all other PCM DTCs or PCM related symptoms first. |
| 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. |
## Diagnostic Trouble Code (DTC) Charts and Descriptions

### 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 event notification signal (ENS) circuit from the RCM is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module sends a 40% duty cycle signal on the fuel pump monitor (FPM) circuit to report the concern to the powertrain control module (PCM). The test fails when the fuel pump control module is still reporting that it is receiving an invalid duty cycle or frequency from the RCM after a calibrated amount of time.

**Possible Causes:**
- 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. This signal is used instead of an inertia fuel shutoff (IFS) switch. The fuel pump control module monitors the ENS signal by sending a 12V low current signal on the ENS circuit to the RCM.

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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</thead>
<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test KC.</td>
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</tbody>
</table>

### U210C - Lost Communication Between Fuel Pump Control Module B and Restraints Control Module

**Description:**
The fuel pump control module 2 monitors the duty cycle and frequency of the signal it receives from the restraints control module (RCM). The fuel pump control module 2 determines if the signal on the event notification signal (ENS) circuit from the RCM is a valid duty cycle and frequency. If the duty cycle or frequency is invalid, the fuel pump control module 2 sends a 40% duty cycle signal on the fuel pump monitor 2 (FPM2) circuit to report the concern to the PCM. The test fails when the fuel pump control module 2 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 2
- 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 2 of an event requiring the fuel pump to be disabled. This signal is used instead of an inertia fuel shutoff (IFS) switch. The fuel pump control module 2 monitors the ENS signal by sending a 12V low current signal on the ENS circuit to the RCM.

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test KC.</td>
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</tbody>
</table>

### U300C - Ignition Input Off/On/Start

**Description:**
The powertrain control module (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:**

<table>
<thead>
<tr>
<th>Application</th>
<th>Key On Engine Off</th>
<th>Key On Engine Running</th>
<th>Continuous Memory</th>
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</thead>
<tbody>
<tr>
<td>All</td>
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<td>GO to Pinpoint Test B.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
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<th>Key On Engine Running</th>
<th>Continuous Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Refer to the Description, Possible Causes and Diagnostic Aids for the DTC.</td>
<td></td>
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</tbody>
</table>

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