Engine Controls Diagnosis (DTC P0507 (TAC) To DTC U0107) - 4.8L, 5.3L, and 6.0L - Hummer H2

ENGINE CONTROLS DIAGNOSIS (DTC P0507 (TAC) TO DTC U0107)

DTC P0507 (TAC)

Circuit Description

The electronic throttle control (ETC) system uses various inputs from the powertrain control module (PCM). This system uses these inputs to control the idle speed through serial data circuits to the throttle actuator control (TAC) module. The DC motor, which is located on the throttle body, activates the throttle plate. In order to decrease idle speed, the TAC module commands the throttle closed, reducing air flow into the engine, and the idle speed decreases. In order to increase the idle speed, the TAC module commands the throttle plate open, allowing more air in order to bypass the throttle plate. If the actual idle RPM does not match the desired idle RPM within a calibrated time, this DTC will set.

Conditions for Running the DTC

- DTCs P0101, P0102, P0103, P0107, P0108, P0112, P0113, P0117, P0118, P0125, P0171, P0172, P0174, P0175, P0200, P0300, P0440, P0442, P0443, P0500, P0502, P0503, P1120, P1220, P1221, P1441 are not set.
- The engine is running for greater than 60 seconds.
- The engine coolant temperature (ECT) is greater than 60°C (140°F).
- The intake air temperature (IAT) is greater than -10°C (+14°F).
- The barometric pressure (BARO) is greater than 65 kPa.
- The system voltage is between 9-18 volts.
- The vehicle speed is less than 1.7 km/h (1 mph).
- The accelerator pedal position (APP) sensor is at 0 percent.

Conditions for Setting the DTC

- The actual idle speed is 200 RPM greater than the desired idle speed.
- The above condition is present for 5 seconds.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze

Frame and updates the Failure Records.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: This test determines if the engine can achieve the commanded RPM.

DTC P0507 (TAC)

Step	Action	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference:Engine Controls Component Views** or **Powertrain Control Module (PCM) Connector End Views**			
1	Did you perform the Diagnostic System Check-Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Set the park brake and block the drive wheels. 2. Start the engine. 3. Turn OFF all accessories. 4. Command the engine RPM to 1,500 RPM, to 500 RPM, and back to 1,500 RPM with the RPM control function of the scan tool. 5. Exit the RPM control function. Did the engine speed stay within 200 RPM of the commanded RPM during the above test?	Go to **Step 3**	Go to **Step 4**
3	1. Observe the Freeze Frame/Failure Records for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Use the following information to operate the vehicle under the conditions which set the DTC: • The data in the Freeze Frame/Failure Records • The parameters listed in the Conditions for Running in the DTC		

	Does the DTC set?	Go to **Step 4**	Go to **Intermittent Conditions**
4	Inspect for the following conditions: • Deposits in the throttle body • A faulty positive crankcase ventilation (PCV) valve Did you find and correct the condition?	Go to **Step 5**	-
5	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 6**
6	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P0601-P0607, P1600, P1621, P1627, P1680, P1681, P1683, OR P2610

Description

This diagnostic applies to internal microprocessor integrity conditions within the powertrain control module (PCM). This diagnostic also addresses if the PCM is not programmed.

Test Description

The number below refers to the step number on the diagnostic table.

2: A DTC P0602 indicates the PCM is not programmed.

DTC P0601-P0607, P1600, P1621, P1627, P1680, P1681, P1683, or P2610

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Is DTC P0602 set?	Go to **Step 3**	Go to **Step 5**
3	Program the PCM. Refer to **Service Programming System (SPS)** in Programming. Does DTC P0602 reset?	Go to **Step 4**	Go to **Step 6**

4	1. Ensure that all tool connections are secure. 2. Ensure that the programming equipment is operating correctly. 3. Ensure that the correct software/calibration package is used. 4. Attempt to program the PCM. Refer to **Service Programming System (SPS)** in Programming. Does DTC P0602 reset?	Go to **Step 5**	Go to **Step 6**
5	Replace the PCM. Refer to **Powertrain Control Module (PCM) Replacement** . Did you complete the replacement?	Go to **Step 6**	-
6	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 7**
7	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P0641

Circuit Description

The powertrain control module (PCM) provides 5 volts to the following sensors:

- The engine oil pressure (EOP) sensor
- The manifold absolute pressure (MAP) sensor

These 5-volt reference circuits are independent of each other outside the PCM, but are bussed together inside the PCM. Therefore a circuit condition on one sensor 5-volt reference circuit may affect the other sensor 5-volt reference circuits. The PCM monitors the voltage on the 5-volt reference circuit. If the PCM detects that the voltage is out of tolerance, DTC P0641 sets.

Conditions for Running the DTC

The engine is running.

Conditions for Setting the DTC

- The PCM detects a voltage out of tolerance condition on the 5-volt reference circuit.
- The above condition is present for longer than 2 seconds.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Test Description

The number below refers to the step number on the diagnostic table.

9: A short to voltage on the signal circuit of the manifold absolute pressure (MAP) sensor will backfeed through the sensor into the 5-volt reference circuit and set this DTC.

DTC P0641

Step	Action	Values	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference: Engine Controls Connector End Views or Powertrain Control Module (PCM) Connector End Views**				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Observe the Freeze Frame/Failure Records for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records.	-		Go to **Intermittent**

	Does the DTC fail this ignition?		Go to **Step 3**	**Conditions**
3	1. Turn OFF the ignition. 2. Disconnect the engine oil pressure (EOP) sensor. 3. Turn ON the ignition, with the engine OFF. 4. Measure the voltage from the 5-volt reference circuit of the EOP sensor to a good ground with a DMM. Refer to **Circuit Testing** in Wiring Systems. Is the voltage within the specified range?	4.8-5.2 V	Go to **Step 4**	Go to **Step 5**
4	1. Connect the EOP sensor. 2. Disconnect the manifold absolute pressure (MAP) sensor. 3. Measure the voltage from the 5-volt reference circuit of the MAP sensor to a good ground with a DMM. Refer to **Circuit Testing** in Wiring Systems. Is the voltage within the specified range?	4.8-5.2 V	Go to **Intermittent Conditions**	Go to **Step 11**
5	Is the voltage measured in step 3 more than the specified value?	5.2 V	Go to **Step 8**	Go to **Step 6**
6	Monitor the DMM while disconnecting the MAP sensor. Does the voltage return to within the specified range when the MAP sensor is disconnected?	4.8-5.2 V	Go to **Step 10**	Go to **Step 7**
7	1. Turn OFF the ignition. 2. Disconnect the powertrain control module (PCM). 3. Test the 5-volt reference circuit for a short to ground or any sensor low reference circuit. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 12**
8	Test all 5-volt reference circuits for a short to voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 9**
9	Test the MAP sensor signal circuit for a short to voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 12**

10	Replace the MAP sensor. Refer to **Manifold Absolute Pressure (MAP) Sensor Replacement** . Did you complete the replacement?	-	Go to **Step 13**	-
11	Replace the EOP sensor. Refer to **Engine Oil Pressure Sensor and/or Switch Replacement** in Engine Mechanical. Did you complete the replacement?	-	Go to **Step 13**	-
12	Replace the PCM. Refer to **Powertrain Control Module (PCM) Replacement** . Did you complete the replacement?	-	Go to **Step 13**	-
13	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 14**
14	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P0650

Circuit Description

The malfunction indicator lamp (MIL) is located on the instrument panel cluster (IPC). The MIL informs the driver that an emission system fault has occurred and that the engine control system requires service. The control module monitors the MIL control circuit for conditions that are incorrect for the commanded state of the MIL. For example, a failure condition exists if the control module detects low voltage when the MIL is commanded OFF, or high voltage when the MIL is commanded ON. If the control module detects an improper voltage on the MIL control circuit, DTC P0650 will set.

Conditions for Running the DTC

- The engine speed is more than 400 RPM.
- The ignition voltage is between 6-18 volts.

Conditions for Setting the DTC

- The control module detects that the commanded state of the MIL driver and the actual state of the control circuit do not match.

- The conditions are present for a minimum of 5 seconds.

Action Taken When the DTC Sets

The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

Conditions for Clearing the MIL/DTC

- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

5: This step tests for a short to ground in the MIL control circuit. With the powertrain control module (PCM) disconnected and the ignition ON, the MIL should be OFF.

6: This step tests for a short to voltage on the MIL control circuit. With the fuse removed, there should be no voltage on the MIL control circuit.

DTC P0650

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics **Connector End View Reference: Engine Controls Component Views or Powertrain Control Module (PCM) Connector End Views**				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Verify whether the instrument cluster is operational. If the instrument panel (I/P) is completely inoperative, refer to **Diagnostic System Check - Instrument Cluster** in Instrument Panel, Gauges and Console. 2. Command the MIL ON and OFF with a scan tool. Does the MIL turn ON and OFF when commanded with a scan tool?	-	Go to **Step 3**	Go to **Step 4**

3	1. Observe the Freeze Frame/Failure Records for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Does the DTC fail this ignition?	-	Go to **Step 4**	Go to **Intermittent Conditions**
4	Inspect the fuse that supplies voltage to the MIL. Is the fuse open?	-	Go to **Step 12**	Go to **Step 5**
5	1. Turn OFF the ignition. 2. Disconnect the powertrain control module (PCM). 3. Turn ON the ignition. Is the MIL OFF?	-	Go to **Step 6**	Go to **Step 13**
6	1. Turn OFF the ignition. 2. Remove the fuse that supplies voltage to the MIL. 3. Turn ON the ignition, with the engine OFF. 4. Measure the voltage from the MIL control circuit in the PCM to a good ground. Is the voltage less than the specified value?	0.3 V	Go to **Step 7**	Go to **Step 14**
7	1. Turn OFF the ignition. 2. Install the fuse that supplies voltage to the MIL. 3. Turn ON the ignition, with the engine OFF. 4. Connect a 3-amp fused jumper wire between the MIL control circuit of the PCM and a good ground. Is the MIL illuminated?	-	Go to **Step 11**	Go to **Step 8**
	1. Turn OFF the ignition. 2. Remove the instrument panel cluster (IPC). Refer to **Instrument Panel Cluster (IPC) Replacement** in Instrument Panel, Gauges, and Console.			

8	3. Turn ON the ignition, with the engine OFF. 4. Probe the MIL voltage supply circuit of the IPC harness connector with a test lamp that is connected to a good ground. Does the test lamp illuminate?	-	Go to **Step 9**	Go to **Step 15**
9	Test the MIL control circuit for an open or high resistance. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct a condition?	-	Go to **Step 18**	Go to **Step 10**
10	Test for an intermittent and for a poor connection at the IPC. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 18**	Go to **Step 16**
11	Test for an intermittent and for a poor connection at the PCM. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 18**	Go to **Step 17**
12	Repair the short to ground in the voltage supply circuit. Refer to **Wiring Repairs** in Wiring Systems. Did you complete the repair?	-	Go to **Step 18**	-
13	Repair the short to ground in the MIL control circuit. Refer to **Wiring Repairs** in Wiring Systems. Did you complete the repair?	-	Go to **Step 18**	-
14	Repair the short to voltage in the MIL control circuit. Refer to **Wiring Repairs** in Wiring Systems. Did you complete the repair?	-	Go to **Step 18**	-
15	Repair the open in the MIL voltage supply circuit. Refer to **Wiring Repairs** in Wiring Systems. Did you complete the repair?	-	Go to **Step 18**	-
16	Replace the IPC. Refer to **Instrument Panel Cluster (IPC) Replacement** in Instrument Panel, Gauges, and Console. Did you complete the replacement?	-	Go to **Step 18**	-
17	Replace the PCM. Refer to **Powertrain Control Module (PCM) Replacement** . Did you complete the replacement?	-	Go to **Step 18**	-
18	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the	-		

	vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?		Go to **Step 2**	Go to **Step 19**
19	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P0651

Circuit Description

The powertrain control module (PCM) provides 5 volts to the following sensors:

- The air conditioning (A/C) pressure sensor.
- The fuel tank pressure (FTP) sensor

These 5-volt reference circuits are independent of each other outside the PCM, but are bussed together inside the PCM. Therefore a circuit condition on one sensor 5-volt reference circuit may affect the other sensor 5-volt reference circuits. The PCM monitors the voltage on the 5-volt reference circuit. If the PCM detects that the voltage is out of tolerance, DTC P0651 sets.

Conditions for Running the DTC

The engine is running.

Conditions for Setting the DTC

- The PCM detects a voltage out of tolerance condition on the 5-volt reference circuit.
- The above condition is present for longer than 10 seconds.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles

that the diagnostic runs and does not fail.

- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Test Description

The number below refers to the step number on the diagnostic table.

9: A short to voltage on the signal circuit of the fuel tank pressure (FTP) sensor will backfeed through the sensor into the 5-volt reference circuit and set this DTC.

DTC P0651

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Engine Controls Component Views or Powertrain Control Module (PCM) Connector End Views				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Observe the Freeze Frame/Failure Records for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Does the DTC fail this ignition?	-	Go to **Step 3**	Go to **Intermittent Conditions**
3	1. Turn OFF the ignition. 2. Disconnect the air conditioning (A/C) pressure sensor. 3. Turn ON the ignition, with the engine OFF. 4. Measure the voltage from the 5-volt reference circuit of the A/C pressure sensor to a good ground with a DMM. Refer to **Circuit Testing** in Wiring Systems. Is the voltage within the specified range?	4.8-5.2 V	Go to **Step 4**	Go to **Step 5**
	1. Connect the A/C pressure sensor.			

4	2. Disconnect the fuel tank pressure (FTP) sensor. 3. Measure the voltage from the 5-volt reference circuit of the FTP sensor to a good ground with a DMM. Refer to **Circuit Testing** in Wiring Systems. Is the voltage within the specified range?	4.8-5.2 V	Go to **Intermittent Conditions**	Go to **Step 11**
5	Is the voltage measured in step 3 more than the specified value?	5.2 V	Go to **Step 8**	Go to **Step 6**
6	Monitor the DMM while disconnecting the FTP sensor. Does the voltage return to within the specified range when the FTP is disconnected?	4.8-5.2 V	Go to **Step 10**	Go to **Step 7**
7	1. Turn OFF the ignition. 2. Disconnect the powertrain control module (PCM). 3. Test the 5-volt reference circuit for a short to ground or any sensor low reference circuit. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 12**
8	1. Turn OFF the ignition. 2. Disconnect the PCM. 3. Turn ON the ignition, with the engine OFF. 4. Test all 5-volt reference circuits for a short to voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 9**
9	Test the FTP sensor signal circuit for a short to voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 13**	Go to **Step 12**
10	Replace the FTP sensor. Refer to **Fuel Tank Pressure Sensor Replacement** . Did you complete the replacement?	-	Go to **Step 13**	-
11	Replace the A/C pressure sensor. Refer to **Air Conditioning (A/C) Refrigerant Pressure Sensor Replacement** in HVAC. Did you complete the replacement?	-	Go to **Step 13**	-
	Replace the PCM. Refer to **Powertrain Control**			

12	**Module (PCM) Replacement** . Did you complete the replacement?	-	Go to **Step 13**	-
13	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 14**
14	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1106

Circuit Description

The manifold absolute pressure (MAP) sensor responds to pressure changes in the intake manifold. The pressure changes occur based on the engine load. The MAP sensor has the following circuits:

- 5-volt reference circuit
- Low reference circuit
- MAP sensor signal circuit

The powertrain control module (PCM) supplies 5 volts to the MAP sensor on the 5-volt reference circuit. The PCM also provides a ground on the low reference circuit. The MAP sensor provides a signal to the PCM on the MAP sensor signal circuit which is relative to the pressure changes in the manifold. The PCM should detect a low signal voltage at a low MAP, such as during an idle or a deceleration. The PCM should detect a high signal voltage at a high MAP, such as the ignition is ON, with the engine OFF, or at a wide open throttle (WOT). The MAP sensor is also used in order to determine the barometric pressure (BARO). This occurs when the ignition switch is turned ON, with the engine OFF. The BARO reading may also be updated whenever the engine is operated at WOT. The PCM monitors the MAP sensor signal for voltage outside of the normal range.

If the PCM detects a MAP sensor signal voltage that is intermittently high, DTC P1106 sets.

Conditions for Running the DTC

- DTCs P0068, P0120, P0220, P1125, P1516, P2101, P2108, P2120, P2121, P2125, P2135 are not set.
- The engine is running.
- The throttle angle is less than 1 percent when the engine speed is less than 1,200 RPM.

OR

- The throttle angle is more than 20 percent when the engine speed is more than 1,200 RPM.

Conditions for Setting the DTC

The PCM detects that the MAP sensor voltage is intermittently more than 4.9 volts.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

3: This step attempts to pinpoint the location of the intermittent fault.

DTC P1106

Step	Action	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference:Engine Controls Connector End Views** or **Powertrain Control Module (PCM) Connector End Views**			
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Start the engine. 2. Monitor the diagnostic trouble code (DTC) information with the scan tool. Is DTC P0108 or P0641 also set?	Go to **Diagnostic Trouble Code (DTC) List**	Go to **Step 3**
	1. Observe the MAP sensor parameter with the scan tool. 2. Attempt to induce the fault that set the DTC by		

3	manipulating the following items: • The manifold absolute pressure (MAP) sensor wiring harness • The MAP sensor electrical connector • The powertrain control module (PCM) connector Refer to **Inducing Intermittent Fault Conditions** in Wiring Systems and **Intermittent Conditions** .Is the MAP sensor voltage affected during any part of the test?	Go to **Step 4**	Go to **Step 8**
4	Test the low reference circuit between the PCM and the MAP sensor for an intermittent open. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 8**	Go to **Step 5**
5	**IMPORTANT:** **Disconnecting the PCM may eliminate the short during testing.** Test the MAP sensor signal circuit between the PCM and the MAP sensor for an intermittent short to voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems.Did you find and correct the condition?	Go to **Step 8**	Go to **Step 6**
6	Test for an intermittent and for a poor connection at the MAP sensor. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 8**	Go to **Step 7**
7	Test for an intermittent and for a poor connection at the PCM. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you complete the action?	Go to **Step 8**	-
8	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 9**
9	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1107

Circuit Description

The manifold absolute pressure (MAP) sensor responds to pressure changes in the intake manifold. The pressure changes occur based on the engine load. The MAP sensor has the following circuits:

- 5-volt reference circuit
- Low reference circuit
- MAP sensor signal circuit

The powertrain control module (PCM) supplies 5 volts to the MAP sensor on the 5-volt reference circuit. The PCM also provides a ground on the low reference circuit. The MAP sensor provides a signal to the PCM on the MAP sensor signal circuit which is relative to the pressure changes in the manifold. The PCM should detect a low signal voltage at a low MAP, such as during an idle or a deceleration. The PCM should detect a high signal voltage at a high MAP, such as the ignition is ON, with the engine OFF, or at a wide open throttle (WOT). The MAP sensor is also used in order to determine the barometric pressure (BARO). This occurs when the ignition switch is turned ON, with the engine OFF. The BARO reading may also be updated whenever the engine is operated at WOT. The PCM monitors the MAP sensor signal for voltage outside of the normal range.

If the PCM detects a MAP sensor signal voltage that is intermittently low, DTC P1107 sets.

Conditions for Running the DTC

- The ignition is ON.
- DTCs P0068, P0120, P0220, P1125, P1516, P2101, P2108, P2120, P2121, P2125, P2135 are not set.
- The throttle angle is more than 0 percent when the engine speed is less than 800 RPM.

  OR

- The throttle angle is more than 12.5 percent when the engine speed is more than 800 RPM.

Conditions for Setting the DTC

The PCM detects that the MAP sensor voltage is intermittently less than 0.10 volt.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

3: This step attempts to pinpoint the location of the intermittent fault.

DTC P1107

Step	Action	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference:Engine Controls Connector End Views** or **Powertrain Control Module (PCM) Connector End Views**			
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Start the engine. 2. Monitor the diagnostic trouble code (DTC) information with the scan tool. Is DTC P0107 or P0641 also set?	Go to **Diagnostic Trouble Code (DTC) List**	Go to **Step 3**
3	1. Turn OFF the ignition. 2. Turn ON the ignition, with the engine OFF. 3. Observe the MAP sensor parameter with the scan tool. 4. Attempt to induce the fault that set the DTC by manipulating the following items: • The manifold absolute pressure (MAP) sensor wiring harness • The MAP sensor electrical connector • The powertrain control module (PCM) connector Refer to **Inducing Intermittent Fault Conditions** in Wiring Systems and **Intermittent Conditions** .Is the MAP sensor voltage affected during any part of the test?	Go to **Step 4**	Go to **Step 8**
4	Test the 5-volt reference circuit between the PCM and the MAP sensor for an open. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 8**	Go to **Step 5**

5	Test the MAP sensor signal circuit between the PCM and the MAP sensor for an intermittent short to ground or open. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 8**	Go to **Step 6**
6	Test for an intermittent and for a poor connection at the MAP sensor. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 8**	Go to **Step 7**
7	Test for an intermittent and for a poor connection at the PCM. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you complete the action?	Go to **Step 8**	-
8	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 9**
9	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1111

Circuit Description

The intake air temperature (IAT) sensor is a variable resistor. The IAT sensor has a signal circuit and a low reference circuit. The IAT sensor measures the temperature of the air entering the engine. The powertrain control module (PCM) supplies 5 volts to the IAT signal circuit and a ground for the IAT low reference circuit. When the IAT sensor is cold, the sensor resistance is high. When the air temperature increases, the sensor resistance decreases. With high sensor resistance, the PCM detects a high voltage on the IAT signal circuit. With lower sensor resistance, the PCM detects a lower voltage on the IAT signal circuit. If the PCM detects an intermittent high IAT signal voltage, indicating a low temperature, DTC P1111 sets.

Conditions for Running the DTC

- DTCs P0101, P0102, P0103, P0113 are not set.
- The engine run time is more than 120 seconds.
- The ECT sensor parameter is more than 60°C (140°F).

- The vehicle speed is less than 11 km/h (7 mph).
- The mass air flow is less than 15 g/s.

Conditions for Setting the DTC

The PCM detects that the IAT sensor parameter is less than -38°C (-36°F) intermittently for a calibrated amount of time.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Aids

- An IAT sensor or PCM which is intermittently shorted, open, or skewed is possible, yet very unlikely.
- A skewed sensor could result in poor driveability conditions.
- If an intermittent condition is suspected, refer to **Intermittent Conditions** .

DTC P1111

Step	Action	Value (s)	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Powertrain Control Module (PCM) Connector End Views or Engine Controls Connector End Views				
1	Did you perform the Diagnostic System Check-Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Observe the DTC Information with a scan tool. Is DTC P0113 set?	-	Go to **DTC P0113**	Go to **Step 3**
3	Test for an intermittent and for a poor connection at the IAT sensor. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems.	-		

	Did you find and correct the condition?		Go to **Step 8**	Go to **Step 4**
4	Test the IAT signal circuit between the IAT sensor and the PCM for an intermittent open. Refer to **Inducing Intermittent Fault Conditions** , **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 8**	Go to **Step 5**
5	Test the IAT signal circuit between the IAT sensor and the PCM for an intermittent short to voltage. Refer to **Inducing Intermittent Fault Conditions** , **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 8**	Go to **Step 6**
6	Test the low reference circuit for an intermittent open. Refer to **Inducing Intermittent Fault Conditions** , **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 8**	Go to **Step 7**
7	Test for an intermittent and for a poor connection at the PCM. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 8**	Go to Diagnostic Aids
8	1. Clear the DTCs with a scan tool. 2. Turn off the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 9**
9	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1112

Circuit Description

The intake air temperature (IAT) sensor is a variable resistor. The IAT sensor has a signal circuit and a low reference circuit. The IAT sensor measures the temperature of the air entering the engine. The powertrain control module (PCM) supplies 5 volts to the IAT signal circuit and a ground for the IAT low reference circuit. When the IAT sensor is cold, the sensor resistance is high. When the air temperature increases, the sensor resistance decreases. With high sensor resistance, the PCM detects a high voltage on the IAT signal circuit.

With lower sensor resistance, the PCM detects a lower voltage on the IAT signal circuit. If the PCM detects an intermittent low IAT signal voltage, indicating a high temperature, DTC P1112 sets.

Conditions for Running the DTC

- DTCs P0112, P0500, P0502, and P0503 are not set.
- The engine run time is more than 45 seconds.
- The vehicle speed is more than 40 km/h (25 mph).
- The ECT sensor parameter is less than 125°C (257°F).

Conditions for Setting the DTC

The PCM detects that the IAT sensor parameter is more than 128°C (262°F) intermittently for a calibrated amount of time.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Aids

- An IAT sensor or PCM which is intermittently shorted, open, or skewed is possible, yet very unlikely.
- A skewed sensor could result in poor driveability conditions.
- If an intermittent condition is suspected, refer to **Intermittent Conditions** .

DTC P1112

Step	Action	Value (s)	Yes	No
Schematic Reference: Engine Controls Schematics **Connector End View Reference: Powertrain Control Module (PCM) Connector End Views or Engine Controls Connector End Views**				
1	Did you perform the Diagnostic System Check-Engine Controls?	-		Go to **Diagnostic System Check -**

			Go to **Step 2**	**Engine Controls**
2	Observe the DTC information with a scan tool. Is DTC P0112 set?	-	Go to **DTC P0112**	Go to **Step 3**
3	Test for an intermittent and for a poor connection at the IAT sensor. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 5**	Go to **Step 4**
4	Test the IAT signal circuit between the IAT sensor and the PCM for an intermittent short to ground. Refer to **Inducing Intermittent Fault Conditions** , **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 5**	Go to Diagnostic Aids
5	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 6**
6	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1114

Circuit Description

The engine coolant temperature (ECT) sensor is a variable resistor, that measures the temperature of the engine coolant. The powertrain control module (PCM) supplies 5 volts to the ECT signal circuit and a ground for the ECT low reference circuit. When the ECT is cold, the sensor resistance is high. When the ECT increases, the sensor resistance decreases. With high sensor resistance, the PCM detects a high voltage on the ECT signal circuit. With lower sensor resistance, the PCM detects a lower voltage on the ECT signal circuit. If the PCM detects an excessively low ECT signal voltage, which is a high temperature indication, DTC P1114 sets.

Conditions for Running the DTC

The engine run time is more than 10 seconds.

Conditions for Setting the DTC

The PCM detects that the ECT sensor parameter is more than 138°C (280°F) intermittently for a calibrated

amount of time.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Aids

- An ECT sensor or PCM which is intermittently shorted, open, or skewed is possible, but very unlikely
- An intermittent short to ground in the ECT sensor signal circuit could result in a DTC P1114.
- Use the Temperature vs. Resistance Value scale to test the coolant sensor at various temperature levels to evaluate the possibility of a skewed sensor. A skewed sensor could result in poor driveability conditions. Refer to **Temperature vs Resistance** .
- For an intermittent condition, refer to **Intermittent Conditions** .

DTC P1114

Step	Action	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Powertrain Control Module (PCM) Connector End Views or Engine Controls Connector End Views			
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Observe the DTC information with a scan tool. Is DTC P0117 set?	Go to **DTC P0117**	Go to **Step 3**
3	Observe the engine coolant temperature (ECT) sensor parameter with a scan tool while moving the ECT sensor connector and the powertrain control module (PCM) connector. Refer to **Inducing Intermittent Fault Conditions** in Wiring Systems. Does the scan tool indicate an abrupt change in value?	Go to **Step 6**	Go to **Step 4**
4	Observe the ECT parameter with a scan tool while moving the wiring harness at the ECT sensor and the PCM. Refer to		

	Inducing Intermittent Fault Conditions in Wiring Systems. Does the scan tool indicate an abrupt change in value?	Go to **Step 7**	Go to **Step 5**
5	1. Observe the Freeze Frame/Failure Records for this DTC 2. Turn OFF the ignition for 30 seconds 3. Start the engine 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	System OK
6	Repair the ECT connector or the terminal as necessary. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 8**	-
7	Repair the ECT wiring or the wiring harness as necessary. Refer to **Wiring Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 8**	-
8	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 9**
9	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1115

Circuit Description

The engine coolant temperature (ECT) sensor is a variable resistor, that measures the temperature of the engine coolant. The powertrain control module (PCM) supplies 5 volts to the ECT signal circuit and a ground for the ECT low reference circuit. When the ECT is cold, the sensor resistance is high. When the ECT increases, the sensor resistance decreases. With high sensor resistance, the PCM detects a high voltage on the ECT signal circuit. With lower sensor resistance, the PCM detects a lower voltage on the ECT signal circuit. If the PCM detects an excessively high signal voltage, which is a low temperature indication, DTC P1115 sets.

Conditions for Running the DTC

The engine run time is more than 60 seconds.

Conditions for Setting the DTC

The PCM detects that the ECT sensor parameter is less than -38°C (-36°F) intermittently for a calibrated amount of time.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Aids

- An ECT sensor or PCM which is intermittently shorted, open, or skewed is possible, but very unlikely.
- An intermittent open or a short to voltage in the ECT sensor signal circuit could result in DTC P1115 setting. Refer to **Intermittent Conditions** .
- Use the Temperature vs. Resistance Value table to test the coolant sensor at various temperature levels to evaluate the possibility of a skewed sensor. A skewed sensor could result in poor driveability conditions. Refer to **Temperature vs Resistance** .

DTC P1115

Step	Action	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Powertrain Control Module (PCM) Connector End Views or Engine Controls Connector End Views			
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Observe the DTC information with a scan tool. Is DTC P0118 set?	Go to **DTC P0118**	Go to **Step 3**
	1. Turn OFF the engine. 2. Turn ON the ignition, with the engine OFF. 3. Observe the engine coolant temperature (ECT) sensor		

3	parameter with a scan tool while moving the ECT sensor connector and the powertrain control module (PCM) connector. Refer to **Inducing Intermittent Fault Conditions** in Wiring Systems. Does the scan tool indicate an abrupt change in value?	Go to **Step 6**	Go to **Step 4**
4	Observe the ECT parameter with a scan tool while moving the wiring harness at the ECT sensor and the PCM. Refer to **Inducing Intermittent Fault Conditions** in Wiring Systems. Does the scan tool indicate an abrupt change in value?	Go to **Step 7**	Go to **Step 5**
5	1. Observe the Freeze Frame/Failure Records for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	System OK
6	Repair the ECT connector or the terminal as necessary. Refer to **Connector Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 8**	-
7	Repair the wiring harness or the wiring as necessary. Refer to **Wiring Repairs** in Wiring Systems. Did you complete the repair?	Go to **Step 8**	-
8	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 9**
9	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1125

Circuit Description

The accelerator pedal position (APP) sensor 1 and the APP sensor 2 are potentiometer type sensors, each with the following circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The control module provides the APP sensors with a 5-volt reference circuit and a low reference circuit. The APP sensors then provide the control module signal voltages proportional to pedal movement. The APP sensor 1 signal voltage is low at rest and increases as the pedal is depressed. The APP sensor 2 signal voltage is low at rest and increases as the pedal is depressed. When the control module detects that the APP sensor 1 and the APP sensor 2 signal circuits are out of correlation with each other, DTC P1125 sets.

Conditions for Running the DTC

- DTC P1518, P2108 or U0107 is not set.
- The ignition is in the Crank or Run position.
- The ignition voltage is more than 5.23 volts.
- The communication between the throttle actuator control (TAC) module and the powertrain control module (PCM) must be valid.

Conditions for Setting the DTC

The PCM detects that the difference between APP sensor 1 and APP sensor 2 is more than the predicted value.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame and/or the Failure Records.
- The control module commands the TAC system to operate in the Reduced Engine Power mode.
- A message center or an indicator displays Reduced Engine Power.
- Under certain conditions the control module commands the engine OFF.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

DTC P1125

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics **Connector End View Reference: Engine Controls Connector End Views or Powertrain Control Module (PCM) Connector End Views**				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Record the throttle actuator control (TAC) module calibration with a scan tool. Does the TAC module calibration match the part number of the TAC module?	-	Go to **Step 3**	Go to **Step 11**
3	Observe the DTC Information with a scan tool. Is DTC P2120 or P2125 also set?	-	Go to **Diagnostic Trouble Code (DTC) List**	Go to **Step 4**
4	1. Turn OFF the ignition for 30 seconds. 2. Turn ON the ignition, with the engine OFF. 3. Observe the APP Sensors 1 and 2 parameter with a scan tool. Does the scan tool indicate that the APP sensors 1 and 2 parameters disagree?	-	Go to **Step 5**	Go to **Intermittent Conditions**
5	1. Turn OFF the ignition. 2. Disconnect the accelerator pedal position (APP) sensor. 3. Disconnect the TAC module. 4. Measure the resistance of the following circuits for each of the APP sensors with a DMM: • The low reference circuit • The signal circuit • The 5-volt reference circuit Is the resistance more than the specified value for any circuit?	5 ohm	Go to **Step 9**	Go to **Step 6**
6	Test the signal circuit of the APP sensor 1 for a short to the signal circuit of the APP sensor 2. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 12**	Go to **Step 7**
7	Test for an intermittent and for a poor connection at the TAC module. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems.	-		

	Did you find and correct the condition?		Go to **Step 12**	Go to **Step 8**
8	Test for an intermittent and for a poor connection at the APP sensor. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 12**	Go to **Step 10**
9	Repair the high resistance in the circuit that measured above the specified value. Refer to **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 12**	-
10	Replace the APP sensor. Refer to **Accelerator Pedal Position (APP) Sensor Replacement** . Did you complete the replacement?	-	Go to **Step 12**	-
11	Replace the TAC module. Refer to **Throttle Actuator Control (TAC) Module Replacement** . Did you complete the replacement?	-	Go to **Step 12**	-
12	1. Assemble the vehicle, as necessary. 2. Clear the DTCs with a scan tool. 3. Start the engine. 4. Operate the system in order to verify the repair. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 13**
13	**IMPORTANT:** **Be aware that repairing one individual condition may correct more than one DTC.** Observe the Capture Info with a scan tool.Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1133 OR P1153

Circuit Description

Heated oxygen sensors (HO2S) are used for fuel control and post catalyst monitoring. Each HO2S compares the oxygen content of the surrounding air with the oxygen content in the exhaust stream. The HO2S must reach operating temperature to provide an accurate voltage signal. Heating elements inside the HO2S minimize the time required for the sensors to reach operating temperature. The powertrain control module (PCM) supplies the HO2S with a reference, or bias, voltage of about 450 mV. When the engine is first started the PCM operates in open loop, ignoring the HO2S voltage signal. Once the HO2S reaches operating temperature and closed loop is achieved, the HO2S generates a voltage within a range of 0-1,000 mV that fluctuates above and below bias voltage. High HO2S voltage indicates a rich exhaust stream; low HO2S voltage indicates a lean exhaust stream. This diagnostic will only run once per ignition cycle. The PCM monitors the number of rich-to-lean and lean-to-rich transitions. If the PCM detects that the number of transitions were less than a specified value, DTC P1133 sets for HO2S bank 1 sensor 1, or DTC P1153 sets for HO2S bank 2 sensor 1.

Conditions for Running the DTC

- DTCs P0068, P0101, P0102, P0103, P0106, P0107, P0108, P0112, P0113, P0116, P0117, P0118, P0120, P0131, P0132, P0134, P0135, P0151, P0152, P0154, P0155, P0200, P0220, P0300, P0442, P0446, P0452, P0453, P0455, P0496, P1125, P1258, P1516, P2101, P2108, P2135, U0107 are not set.
- The ECT Sensor parameter is more than 60°C (140°F).
- The EVAP Purge Solenoid Command parameter is more than 1 percent.
- The MAF Sensor parameter is between 20-55 g/s.
- The Engine Speed parameter is between 1,200-3,000 RPM.
- The TP Indicated Angle parameter is 5 percent more than the value observed at idle.
- The Loop Status parameter is closed.
- The Ignition 1 Signal parameter is between 10-18 volts.
- The Fuel Tank Level Remaining parameter is more than 10 percent.
- The Engine Run Time parameter is more than 160 seconds.
- The above conditions are met for 100 seconds.

Conditions for Setting the DTC

The PCM detects that the affected HO2S lean-to-rich or rich-to-lean transitions are less than a calibrated value.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: If the voltage is varying above and below the specified value, the condition is not present.

DTC P1133 or P1153

Step	Action	Value (s)	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference:Engine Controls Connector End Views** or **Powertrain Control Module (PCM) Connector End Views**				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Start the engine. 2. Allow the engine to reach operating temperature. Refer to **Scan Tool Data List** . 3. Operate the engine at 1,500 RPM for 30 seconds. 4. Observe the affected heated oxygen sensor (HO2S) voltage parameter with a scan tool. Is the HO2S voltage parameter varying above and below the specified range?	250-625 mV	Go to **Step 3**	Go to **Step 4**
3	1. Observe the Freeze Frame/Failure Records for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 4**	Go to **Intermittent Conditions**
4	1. Turn OFF the ignition. 2. Disconnect the affected HO2S. 3. Turn ON the ignition, with the engine OFF. 4. Observe the HO2S voltage parameter with a scan tool. Is the HO2S voltage parameter less than the specified value?	100 mV	Go to **Step 6**	Go to **Step 5**
5	1. Connect a 3-amp fused jumper wire between the high signal circuit of the HO2S harness connector on the engine harness side and a good ground. 2. Observe the HO2S voltage parameter with a scan tool.	100 mV		

	Is the HO2S voltage parameter less than the specified value?		Go to **Step 8**	Go to **Step 7**
6	Test the HO2S high signal circuit for a short to the HO2S low signal circuit. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 14**	Go to **Step 11**
7	Test the HO2S high signal circuit for an open or high resistance. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 14**	Go to **Step 11**
8	1. Remove the jumper wire from the previous step. 2. Connect a 3-amp fused jumper wire between the high signal circuit of the HO2S harness connector on the engine harness side and the low signal circuit of the HO2S harness connector on the engine harness side. 3. Observe the HO2S voltage parameter with a scan tool. Is the HO2S voltage parameter less than the specified value?	100 mV	Go to **Step 10**	Go to **Step 9**
9	Test the HO2S low signal circuit for an open, or high resistance. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 14**	Go to **Step 11**
10	Test for shorted terminals and for poor connections at the HO2S. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 14**	Go to **Step 12**
11	Test for shorted terminals and for poor connections at the powertrain control module (PCM). Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 14**	Go to **Step 13**
	NOTE: **Refer to Silicon Contamination of Heated Oxygen Sensors Notice in Cautions and Notices.** **IMPORTANT:** **The HO2S may be damaged due to contamination. Prior to replacing the HO2S inspect for the following sources of contamination:** • A silicon contaminated HO2S			

12	• Fuel contamination - Refer to **Alcohol/Contaminants-in-Fuel Diagnosis (without Special Tool and E85)** or **Alcohol/Contaminants-in-Fuel Diagnosis (with Special Tool)** . • Engine oil consumption - Refer to **Oil Consumption Diagnosis** in Engine Mechanical. • Engine coolant consumption - Refer to **Loss of Coolant** in Engine Cooling. Replace the affected HO2S. Refer to **Heated Oxygen Sensor (HO2S) Replacement Bank 1 Sensor 1** or **Heated Oxygen Sensor (HO2S) Replacement Bank 2 Sensor 1** .Did you complete the replacement?	-	Go to **Step 14**	-
13	Replace the PCM. Refer to **Powertrain Control Module (PCM) Replacement** . Did you complete the replacement?	-	Go to **Step 14**	-
14	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 15**
15	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1134 OR P1154

Circuit Description

Heated oxygen sensors (HO2S) are used for fuel control and post catalyst monitoring. Each HO2S compares the oxygen content of the surrounding air with the oxygen content in the exhaust stream. The HO2S must reach operating temperature to provide an accurate voltage signal. Heating elements inside the HO2S minimize the time required for the sensors to reach operating temperature. The powertrain control module (PCM) supplies the HO2S with a reference, or bias, voltage of about 450 mV. When the engine is first started the PCM operates in open loop, ignoring the HO2S voltage signal. Once the HO2S reaches operating temperature and closed loop is achieved, the HO2S generates a voltage within a range of 0-1,000 mV that fluctuates above and below bias voltage. High HO2S voltage indicates a rich exhaust stream; low HO2S voltage indicates a lean exhaust stream. This diagnostic will only run once per ignition cycle. The PCM monitors the rich-to-lean and lean-to-rich transition time. A transition is defined as, the HO2S voltage changes from above 625 mV to below 250 mV or

from below 250 mV to above 625 mV. If the PCM detects that the difference between the rich-to-lean average transition time and lean-to-rich average transition time is more than a specified value, DTC P1134 sets for HO2S bank 1 sensor 1, or DTC P1154 sets for HO2S bank 2 sensor 1.

Conditions for Running the DTC

- DTCs P0068, P0101, P0102, P0103, P0106, P0107, P0108, P0112, P0113, P0116, P0117, P0118, P0120, P0131, P0132, P0134, P0135, P0151, P0152, P0154, P0155, P0200, P0220, P0300, P0442, P0446, P0452, P0453, P0455, P0496, P1125, P1258, P1516, P2101, P2108, P2135, U0107 are not set.
- The ECT Sensor parameter is more than 60°C (140°F).
- The EVAP Purge Solenoid Command parameter is more than 1 percent.
- The MAF Sensor parameter is between 20-55 g/s.
- The Engine Speed parameter is between 1,200-3,000 RPM.
- The TP Indicated Angle parameter is 5 percent more than the value observed at idle.
- The Loop Status parameter is closed.
- The Ignition 1 Signal parameter is between 10-18 volts.
- The Fuel Tank Level Remaining parameter is more than 10 percent.
- The Engine Run Time parameter is more than 160 seconds.
- The above conditions are met for 100 seconds.

Conditions for Setting the DTC

The PCM detects that the difference between the HO2S rich-to-lean average transition time and the lean-to-rich average transition time is more than a calibrated value.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: If the voltage is varying above and below the specified value, the condition is not present.

DTC P1134 or P1154

Step	Action	Value (s)	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference:Engine Controls Connector End Views** or **Powertrain Control Module (PCM) Connector End Views**				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Start the engine. 2. Allow the engine to reach operating temperature. Refer to **Scan Tool Data List** . 3. Operate the engine at 1,500 RPM for 30 seconds. 4. Observe the affected heated oxygen sensor (HO2S) voltage parameter with a scan tool. Is the HO2S voltage parameter varying above and below the specified range?	250-625 mV	Go to **Step 3**	Go to **Step 4**
3	1. Observe the Freeze Frame/Failure Records for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 4**	Go to **Intermittent Conditions**
4	1. Turn OFF the ignition. 2. Disconnect the affected HO2S. 3. Connect a 3-amp fused jumper wire between the high signal circuit of the HO2S harness connector on the engine harness side and a good ground. 4. Turn ON the ignition, with the engine OFF. 5. Observe the HO2S voltage parameter with a scan tool.	100 mV		

	Is the HO2S voltage parameter less than the specified value?		Go to **Step 6**	Go to **Step 5**
5	Test the HO2S high signal circuit for an open or high resistance. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 12**	Go to **Step 9**
6	1. Remove the jumper wire from the previous step. 2. Connect a 3-amp fused jumper wire between the high signal circuit of the HO2S harness connector on the engine harness side and the low signal circuit of the HO2S harness connector on the engine harness side. 3. Observe the HO2S voltage parameter with a scan tool. Is the HO2S voltage parameter less than the specified value?	100 mV	Go to **Step 8**	Go to **Step 7**
7	Test the HO2S low signal circuit for an open or high resistance. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 12**	Go to **Step 9**
8	Test for shorted terminals and for poor connections at the HO2S. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 12**	Go to **Step 10**
9	Test for shorted terminals and for poor connections at the powertrain control module (PCM). Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 12**	Go to **Step 11**
10	**NOTE:** **Refer to Silicon Contamination of Heated Oxygen Sensors Notice in Cautions and Notices.** **IMPORTANT:** **The HO2S may be damaged due to contamination. Prior to replacing the HO2S inspect for the following sources of contamination:** • A silicon contaminated HO2S • Fuel contamination - Refer to **Alcohol/Contaminants-in-Fuel Diagnosis (without Special Tool and E85)** or	-		

	Alcohol/Contaminants-in-Fuel Diagnosis (with Special Tool) . • Engine oil consumption - Refer to **Oil Consumption Diagnosis** in Engine Mechanical. • Engine coolant consumption - Refer to **Loss of Coolant** in Engine Cooling. Replace the affected HO2S. Refer to **Heated Oxygen Sensor (HO2S) Replacement Bank 1 Sensor 1** or **Heated Oxygen Sensor (HO2S) Replacement Bank 2 Sensor 1** .Did you complete the replacement?		Go to **Step 12**	-
11	Replace the PCM. Refer to **Powertrain Control Module (PCM) Replacement** . Did you complete the replacement?	-	Go to **Step 12**	-
12	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 13**
13	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P1380

System Description

The powertrain control module (PCM) detects engine misfire events by monitoring variations in the crankshaft rotation speed. Wheel speed changes caused by rough road conditions can cause changes in crankshaft speed. By monitoring the wheel speed sensors, the anti-lock brake system (ABS) can determine if the vehicle is operating on a rough road. If the ABS is detecting a rough road condition severe enough to effect misfire detection, a rough road signal is sent to the PCM on the serial data circuit. If DTC P0300 is set and the rough road information is not available due to an ABS malfunction, DTC P1380 will set.

Conditions for Running the DTC

- DTCs P0101, P0102, P0103, P0120, P0335, P0336, P0742 are not set.
- The vehicle speed is greater than 16 km/h (10 mph).
- The engine load is less than 60 percent.

- The engine misfire is detected-DTC P0300 set.
- The engine speed is less than 3,200 RPM.

Conditions for Setting the DTC

An ABS malfunction exists preventing the PCM from receiving rough road detection data.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

DTC P1380

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Diagnostic System Check - ABS** in Anti-lock Brake System	Go to **Diagnostic System Check - Engine Controls**

DTC P1381

System Description

The powertrain control module (PCM) detects engine misfire events by monitoring variations in the crankshaft rotation speed. Wheel speed changes caused by rough road conditions can cause changes in crankshaft speed. By monitoring the wheel speed sensors, the anti-lock brake system (ABS) can determine if the vehicle is operating on a rough road. If the ABS is detecting a rough road condition severe enough to effect misfire detection, a rough road signal is sent to the PCM on the serial data circuit. If DTC P0300 is set and the rough road information is not available due to an ABS malfunction, DTC P1381 will set.

Conditions for Running the DTC

- The vehicle speed is above 16 km/h (10 mph).
- The engine speed is below 3,200 RPM.
- The engine load is less than 60 percent.
- Engine misfire is detected-DTC P0300 set.

Conditions for Setting the DTC

- A serial data malfunction exists preventing the PCM from receiving rough road detection data.
- The above conditions met for 20 seconds.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Test Description

The number below refers to the step number on the diagnostic table.

1: This step will diagnose a malfunction in the serial data circuits.

DTC P1381

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Diagnostic System Check - ABS** in Anti-lock Brake System	Go to **Diagnostic System Check - Engine Controls**

DTC P1516

Circuit Description

The predicted throttle position (TP) is compared to the actual throttle position. The two values should be within a calibrated range of each other. Both the powertrain control module (PCM) and the throttle actuator control (TAC) module redundantly monitor the predicted and actual throttle position. This DTC sets if the PCM detects an out of range condition between the predicted and the actual throttle position.

Conditions for Running the DTC

- DTC U0107 is not set.
- The ignition switch is in the Crank or Run position.
- The ignition voltage is more than 5.23 volts.

- The TAC system is not in the battery saver mode.

Conditions for Setting the DTC

- The TAC module detects that the predicted and the actual throttle positions are not within a calibrated range of each other.
- The PCM and the TAC cannot determine the throttle position.
- Both of the TP sensors are invalid.
- All of the above conditions are met for more than 1 second.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame and/or the Failure Records.
- The control module commands the TAC system to operate in the Reduced Engine Power mode.
- A message center or an indicator displays Reduced Engine Power.
- Under certain conditions the control module commands the engine OFF.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Diagnostic Aids

- Inspect the TAC module connectors for signs of water intrusion. If water intrusion occurs, multiple DTCs may set without any circuit or component conditions found during diagnostic testing.
- Verify that the starting and charging systems are operating properly. Low system voltage can cause this DTC to set.
- When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing an individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.
- For an intermittent, refer to **Intermittent Conditions** .

Test Description

The numbers below refer to the step numbers on the diagnostic table.

7: If the TP indicated angle does not follow the movement of the throttle blade and no TP sensor DTCs are set, there is a mechanical condition with the throttle shaft or the TP sensor.

18: Locating and repairing an individual condition may correct more than one DTC.

DTC P1516

Step	Action	Yes	No
Schematic Reference: Engine Controls Schematics **Connector End View Reference: Engine Controls Connector End Views or Powertrain Control Module (PCM) Connector End Views**			
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Is DTC U0107 set?	Go to **DTC U0107**	Go to **Step 3**
3	Is DTC P2135 set?	Go to **DTC P2135**	Go to **Step 4**
4	**IMPORTANT:** **Low system voltage may cause this DTC to set. Clear DTCs if low system voltage has been experienced.** 1. Turn OFF the ignition for 15 seconds. 2. Turn ON the ignition, with the engine OFF. 3. Observe the throttle position (TP) sensor 1 and TP sensor 2 angle parameters with a scan tool. 4. Slowly depress the accelerator pedal to wide open throttle (WOT) and slowly return it to the released position. Does the scan tool indicate both angle parameters increasing as the pedal is depressed to WOT and decreasing as the pedal is released?	Go to Diagnostic Aids	Go to **Step 5**
5	1. Turn OFF the ignition. 2. Disconnect the throttle actuator motor harness connector. 3. Remove the air inlet duct from the throttle body. 4. Inspect the throttle body and throttle plate for the following conditions which may cause the throttle plate to bind: • Debris - If debris is found, clean the throttle body and repair the source of contamination. • Damage or evidence of tampering-If the throttle body and/or throttle plate is damaged, replace the throttle body. Refer to **Throttle Body**		

	Assembly Replacement . Did you find and correct the condition?	Go to **Step 17**	Go to **Step 6**
6	With your hand, slowly open the throttle plate to WOT and back to the closed position several times. Does the throttle plate move smoothly without binding in both directions?	Go to **Step 7**	Go to **Step 14**
7	1. Turn OFF the ignition. 2. Disconnect the throttle body harness connector. 3. Connect the jumper wires between the TP sensor terminals of the throttle body harness connector and the corresponding TP sensor terminals of the throttle body. 4. Turn ON the ignition, with the engine OFF. 5. Open the throttle blade to WOT, then to the closed position by hand. 6. Observe the TP sensor 1 and TP sensor 2 angle parameters with a scan tool. Does the scan tool indicate both angle parameters increasing as the throttle plate is moved to WOT, and decreasing as the plate is moved to the closed position?	Go to **Step 8**	Go to **Step 15**
8	1. Turn OFF the ignition. 2. Disconnect the throttle actuator control (TAC) module harness connector containing the throttle actuator control motor circuits. 3. Turn ON the ignition, with the engine OFF. 4. Test the TAC motor circuits for a short to voltage with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 17**	Go to **Step 9**
9	Test each TAC motor circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 17**	Go to **Step 10**
10	Test each TAC motor circuit for a short to ground with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 17**	Go to **Step 11**
	1. Disconnect the other TAC module harness connector. 2. Test for a short between each TAC motor circuit and all other TAC module circuits with a DMM. Refer to		

11	**Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 17**	Go to **Step 12**
12	1. Turn OFF the ignition. 2. Connect the TAC module. 3. Connect a test lamp between the 2 TAC motor circuits at the TAC motor harness connector. 4. Turn ON the ignition, with the engine OFF, and observe the test lamp. Did the test lamp illuminate briefly when the ignition was turned ON?	Go to **Step 13**	Go to **Step 15**
13	Inspect for poor connections at the TAC motor harness connector. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	Go to **Step 17**	Go to **Step 14**
14	Replace the throttle body assembly. Refer to **Throttle Body Assembly Replacement** . Did you complete the replacement?	Go to **Step 15**	-
15	Inspect for poor connections at the TAC module harness connectors. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	Go to **Step 17**	Go to **Step 16**
16	Replace the TAC module. Refer to **Throttle Actuator Control (TAC) Module Replacement** . Did you complete the replacement?	Go to **Step 17**	-
17	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 18**
18	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P2101

Circuit Description

The commanded throttle position (TP), based on accelerator pedal position (APP) and possibly other limiting factors, is compared to the actual TP. The two values should be within a calibrated range of each other. Both the powertrain control module (PCM) and the throttle actuator control (TAC) module redundantly monitor the commanded and actual TP. This DTC sets if the PCM detects an out-of-range condition between the commanded and the actual throttle position.

Conditions for Running the DTC

- DTCs P0601, P0602, P0604, P0606, P1516, P2108, U0107 are not set.
- DTCs P0120 and P0220 are not active at the same time.
- The ignition switch is in the Crank or Run position.
- The ignition voltage is more than 8.5 volts.
- The TAC system is not in the battery saver mode.

Conditions for Setting the DTC

- The PCM detects that the commanded and actual throttle positions are not within a calibrated range of each other.
- The above condition is met for less than 1 second.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame and/or the Failure Records.
- The control module commands the TAC system to operate in the Reduced Engine Power mode.
- A message center or an indicator displays Reduced Engine Power.
- Under certain conditions the control module commands the engine OFF.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Diagnostic Aids

- Inspect for mechanical concerns or binding that may be temperature related. Components may not move freely in extreme heat or cold due to the presence of contaminants or ice formation.

- Inspect the TAC module connectors for signs of water intrusion. If water intrusion occurs, multiple DTCs may set without any circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing an individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.
- For an intermittent, refer to **Intermittent Conditions** .

Test Description

The numbers below refer to the step numbers on the diagnostic table.

4: If the TP indicated angle does not follow the movement of the throttle blade and no TP sensor DTCs are set, there is a mechanical condition with the throttle shaft or the TP sensor.

15: Locating and repairing an individual condition may correct more than 1 DTC.

DTC P2101

Step	Action	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference:Engine Controls Connector End Views** or **Powertrain Control Module (PCM) Connector End Views**			
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Is DTC U0107 also set?	Go to **DTC U0107**	Go to **Step 2**
3	**IMPORTANT:** **The next test must be started within 15 seconds after the ignition is turned ON.** 1. Turn OFF the ignition for 15 seconds. 2. Turn ON the ignition, with the engine OFF. 3. Observe the throttle position (TP) sensor 1 and TP sensor 2 angle parameters with a scan tool. 4. Slowly depress the accelerator pedal to wide open throttle (WOT) and slowly return the pedal to the released position. Does the scan tool indicate both angle parameters increasing as the pedal is depressed to WOT and decreasing as the pedal is moved to the released position?	Go to Diagnostic Aids	Go to **Step 4**
	1. Turn OFF the ignition. 2. Remove the air inlet duct from the throttle body.		

4	3. Disconnect the throttle body harness connector. 4. Connect the jumper wires between the TP sensor terminals of the throttle body harness connector and the corresponding TP sensor terminals of the throttle body. 5. Turn ON the ignition with the engine OFF. 6. Open the throttle blade to WOT, then to the closed position by hand. 7. Observe the TP sensor 1 and the TP sensor 2 angle parameters with a scan tool. Does the scan tool indicate both angle parameters increasing as the throttle plate is moved to WOT, and decreasing as the throttle plate is moved to the closed position?	Go to **Step 5**	Go to **Step 12**
5	1. Turn OFF the ignition. 2. Disconnect the throttle actuator control (TAC) module harness connector containing the TAC motor circuits. 3. Turn ON the ignition, with the engine OFF. 4. Test the TAC motor circuits for a short to voltage with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 6**
6	Test each TAC motor circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 7**
7	Test each TAC motor circuit for a short to ground with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 8**
8	1. Disconnect the other TAC module harness connector. 2. Remove all jumper wires. 3. Test for a short between each TAC motor circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 9**
	1. Turn OFF the ignition.		

9	2. Connect the TAC module. 3. Connect a test lamp between the 2 TAC motor circuits at the TAC motor harness connector. 4. Turn ON the ignition, with the engine OFF, and observe the test lamp. Did the test lamp illuminate briefly when the ignition was turned ON?	Go to **Step 10**	Go to **Step 12**
10	Inspect for poor connections at the TAC motor harness connector. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 11**
11	Replace the throttle body assembly. Refer to **Throttle Body Assembly Replacement** . Did you complete the replacement?	Go to **Step 14**	-
12	Inspect for poor connections at the TAC module harness connectors. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 13**
13	Replace the TAC module. Refer to **Throttle Actuator Control (TAC) Module Replacement** . Did you complete the replacement?	Go to **Step 14**	-
14	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 15**
15	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P2108

Circuit Description

The throttle actuator control (TAC) module contains data which is essential for proper TAC system operation. The TAC module continuously tests the integrity of this data. When the TAC module is unable to write or read data to and from random access memory (RAM), or the TAC module is unable to correctly read data from the

flash memory or an internal TAC module processor fault is detected, this DTC sets.

Conditions for Running the DTC

- DTC U0107 is not set.
- The ignition switch is in the Crank or Run position.
- The ignition voltage is greater than 6 volts.

Conditions for Setting the DTC

- The TAC module determines that an internal data test did not pass.
- The above condition is met for more than 1 second.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame and/or the Failure Records.
- The control module commands the TAC system to operate in the Reduced Engine Power mode.
- A message center or an indicator displays Reduced Engine Power.
- Under certain conditions the control module commands the engine OFF.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Diagnostic Aids

- Verify that the starting and charging systems are operating properly. Low system voltage can cause this DTC to set.
- Inspect the TAC module connectors for signs of water intrusion. If water intrusion occurs, multiple DTCs may set without any circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing an individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.

Test Description

The number below refers to the step number on the diagnostic table.

4: Locating and repairing an individual condition may correct more than one DTC.

DTC P2108

Step	Action	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference:Engine Controls Connector End Views** or **Powertrain Control Module (PCM) Connector End Views**			
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Replace the throttle actuator control (TAC) module. Refer to **Throttle Actuator Control (TAC) Module Replacement** . Did you complete the replacement?	Go to **Step 3**	-
3	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 4**
4	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P2120

Circuit Description

The accelerator pedal position (APP) sensor 1 is a potentiometer type sensor with the following three circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The control module provides the APP sensor a 5-volt reference circuit and a low reference circuit. The APP sensor then provides the control module a signal voltage proportional to pedal movement. The APP sensor 1 signal voltage is low at rest and increases as the pedal is depressed. When the control module detects that the APP sensor 1 signal or APP sensor 5-volt reference voltage is outside the predetermined range, this DTC sets.

Conditions for Running the DTC

- DTCs P0601, P0602, P0606, P2108, U0107 are not set.
- The ignition switch is in the Crank or Run position.
- The ignition voltage is more than 5.23 volts.

Conditions for Setting the DTC

- The APP sensor 1 voltage is less than 0.24 volts or more than 4.49 volts.

  OR

- The 5-volt reference is less than 4.54 volts or more than 5.21 volts.
- One of the above conditions is present for more than 1 second.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- If one or more APP sensor DTCs are set, the following occurs:
  - The control module commands Reduced Engine Power mode.
  - The APP indicated angle is limited to a predetermined value to limit the amount of throttle control.

    OR

  - The APP indicated angle is limited to 0 percent. The control module only allows the engine to idle.
  - The message center displays Reduced Engine Power.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Aids

- Inspect the throttle actuator control (TAC) module connectors for signs of water intrusion. If water intrusion occurs, multiple DTCs may set without any circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and

repairing one individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.

- For an intermittent, refer to **Intermittent Conditions** .

Test Description

The numbers below refer to the step numbers on the diagnostic table.

12: This test isolates whether the short is to another TAC system circuit in the harness or within the TAC module.

26: When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.

DTC P2120

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Engine Controls Connector End Views or Powertrain Control Module (PCM) Connector End Views				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	**IMPORTANT:** **If DTCs P0120 or U0107 is also set, refer to the appropriate DTC for further diagnosis.** 1. Turn ON the ignition with the engine OFF, and with your foot OFF the accelerator pedal. 2. Observe the accelerator pedal position (APP) sensor 1 voltage with a scan tool. Does the scan tool indicate the APP sensor 1 voltage is within the specified values?	0.24-2.24 V	Go to **Step 3**	Go to **Step 6**
3	Depress the accelerator pedal to the wide open throttle (WOT) position. Does the scan tool indicate APP sensor 1 voltage within the specified values?	0.24-4.49 V	Go to **Step 4**	Go to **Step 6**
4	1. Turn OFF the ignition for 30 seconds. 2. Turn ON the ignition, with the engine OFF. 3. Select the DTC option using the scan tool. 4. Lightly touch and move the related engine wiring harnesses and connectors while	-		

	monitoring the DTC information. Did this DTC fail this ignition during the above test?		Go to **Step 24**	Go to **Step 5**
5	1. Continue to observe the DTC information. 2. Depress the accelerator pedal to WOT, then return the pedal to the rest position. Did this DTC fail this ignition during the above test?	-	Go to **Step 19**	Go to Diagnostic Aids
6	Disconnect the APP sensor harness connector. Does the scan tool indicate the APP sensor 1 voltage is at the specified value?	0 V	Go to **Step 7**	Go to **Step 11**
7	Connect a test lamp between the APP sensor 1 signal circuit and B+. Does the scan tool indicate the APP sensor 1 voltage is at the specified value?	5 V	Go to **Step 8**	Go to **Step 13**
8	Test the APP sensor 1 5-volt reference circuit for voltage with a DMM. Does the DMM indicate voltage within the specified values?	4.54-5.21 V	Go to **Step 10**	Go to **Step 9**
9	1. Turn OFF the ignition. 2. Disconnect the throttle actuator motor harness connector. 3. Remove the air inlet duct from the throttle body assembly. 4. Turn ON the ignition, with the engine OFF, 5. Rotate the throttle blade by hand to WOT and hold. 6. Test the APP sensor 1 5-volt reference circuit for voltage with a DMM. Does the DMM indicate voltage within the specified values?	4.54-5.21 V	Go to **Step 21**	Go to **Step 16**
10	1. Connect a fused jumper between the APP sensor 1 low-reference circuit and the APP sensor 1 5-volt reference circuit. 2. Observe the throttle position (TP) sensor 1 voltage parameter with a scan tool. Does the scan tool indicate TP sensor 1 voltage at the specified value?	0 V	Go to **Step 19**	Go to **Step 17**
	1. Turn OFF the ignition. 2. Disconnect the throttle actuator control (TAC)			

11	module harness connector containing the APP sensor circuits. 3. Turn ON the ignition, with the engine OFF. 4. Test the APP sensor 1 signal circuit for a short to voltage with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 12**
12	1. Turn OFF the ignition. 2. Disconnect the other TAC module harness connector. 3. Test for a short between the APP sensor 1 signal circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 22**
13	1. Turn OFF the ignition. 2. Disconnect the TAC module harness connector containing the APP sensor circuits. 3. Test the APP sensor 1 signal circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 14**
14	Test the APP sensor 1 signal circuit for a short to ground with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 15**
15	1. Turn OFF the ignition. 2. Disconnect the other TAC module harness connector. 3. Test for a short between the APP sensor 1 signal circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 22**
	1. Turn OFF the ignition. 2. Disconnect the TAC module connector containing the APP sensor circuits.			

16	3. Test the APP sensor 1 5-volt reference circuit for the following conditions with a DMM: • An open • A short to ground • High resistance Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 22**
17	1. Disconnect the TAC module connector containing the APP sensor circuits. 2. Test the APP sensor 1 low-reference circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 18**
18	Test the TAC module ground circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 22**
19	Inspect for poor connections at the harness connector of the APP sensor. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 20**
20	Replace the APP sensor assembly. Refer to **Accelerator Pedal Position (APP) Sensor Replacement** . Did you complete the replacement?	-	Go to **Step 25**	-
21	Did DTC P0120 set while performing Step 9?	-	Go to **DTC P0120**	Go to **Step 22**
22	Inspect for poor connections at the harness connector of the TAC module. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 23**
23	Replace the TAC module. Refer to **Throttle Actuator Control (TAC) Module Replacement** . Did you complete the replacement?	-	Go to **Step 25**	-
24	Repair the intermittent condition as necessary. Refer to **Connector Repairs** and **Wiring Repairs** in	-		

	Wiring Systems. Did you complete the repair?		Go to **Step 25**	-
25	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 26**
26	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P2121

Circuit Description

The accelerator pedal position (APP) sensor 1 and APP sensor 2 are potentiometer type sensors, each with the following circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The control module provides the APP sensors a 5-volt reference circuit and a low reference circuit. The APP sensors then provide the control module signal voltages proportional to pedal movement. The APP sensor 1 signal voltage is low at rest and increases as the pedal is depressed. The APP sensor 2 signal voltage is also low at rest and increases as the pedal is depressed. When the control module detects that the APP sensor 1 signal and the APP sensor 2 signal circuits are out of correlation, this DTC sets.

Conditions for Running the DTC

- DTCs P0606, P2108, or U0107 are not set.
- The ignition switch is in the Crank or Run position.
- The ignition voltage is more than 5.23 volts.

Conditions for Setting the DTC

- APP sensor 1 disagrees with APP sensor 2 by more than 10.5 percent.
- The above condition is present for more than 1 second.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- If one or more APP sensor DTCs are set for a single APP sensor, the following occurs:
  - The control module commands Reduced Engine Power mode.
  - The APP indicated angle is limited to a predetermined value to limit the amount of throttle control.
  - The APP indicated angle is limited to 0 percent. The control module only allows the engine to idle.
  - The message center displays Reduced Engine Power.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Aids

- Inspect the throttle actuator control (TAC) module connectors for signs of water intrusion. If water intrusion occurs, multiple DTCs may set without any circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.
- For an intermittent, refer to **Intermittent Conditions** .

Test Description

The numbers below refer to the steps numbers in the diagnostic table.

2: This step determines if a communication condition exists.

5: This step isolates an internal APP sensor failure. The condition may only occur at a certain accelerator pedal position. Monitoring the APP angles for sensor 2 and sensor 3 is an accurate way of verifying the actual position of the pedal. The APP angles for all 3 sensors should be within a few percent of each other. If the pedal is at rest, the APP angle for all 3 sensors should be 0 percent. If the pedal is fully depressed, all APP angles should be 100 percent.

6: The APP sensor 1 shares a common 5-volt reference circuit with the throttle position (TP) sensor 1. Monitoring the TP sensor 1 voltage aids in diagnosing the APP sensor 5-volt reference and low reference circuits.

9: With the TAC module still connected, this test will help determine a short to the signal circuit either

within the TAC module or the wiring.

10: This step determines whether the TAC module or a shorted circuit is causing the condition.

19: When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.

DTC P2121

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Engine Controls Connector End Views or Powertrain Control Module (PCM) Connector End Views				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Is DTCs U0107 also set?	-	Go to **DTC U0107**	Go to **Step 3**
3	**IMPORTANT:** **DO NOT depress the accelerator pedal.** 1. Start the engine. 2. Observe the DTC information with a scan tool. Did any other throttle actuator control (TAC) module or accelerator pedal position (APP) sensor DTC set except P1125?	-	Go to **Diagnostic Trouble Code (DTC) List**	Go to **Step 4**
4	Observe the APP sensor Agree/Disagree parameters with a scan tool. Does the scan tool indicate Disagree for any of the APP Agree/Disagree parameters?	-	Go to **Step 6**	Go to **Step 5**
5	1. Turn ON the ignition, with the engine OFF. 2. Observe the APP sensor angles for both APP sensors with a scan tool. 3. Slowly depress the accelerator pedal, stopping at 25, 50, 75, and 100 percent. 4. Slowly release the accelerator pedal, stopping at 75, 50, 25, and 0 percent. Does the scan tool indicate APP sensor 1 angle within 10.5 percent of the APP sensor 2 angle during the above test?	-	Go to Diagnostic Aids	Go to **Step 6**
	1. Turn OFF the ignition.			

6	2. Disconnect the APP sensor harness connector. 3. Connect a fused jumper between the APP sensor 1 5-volt reference circuit and ground. 4. Turn ON the ignition, with the engine OFF. 5. Observe the throttle position (TP) sensor 1 voltage parameter with a scan tool. Does the scan tool indicate TP sensor 1 voltage is at the specified value?	0.0 V	Go to **Step 7**	Go to **Step 11**
7	1. Connect a fused jumper between the APP sensor 1 5-volt reference circuit and the APP sensor 1 low reference circuit. 2. Observe the TP sensor 1 voltage parameter with a scan tool. Does the scan tool indicate TP sensor 1 voltage is at specified value?	0.0 V	Go to **Step 8**	Go to **Step 12**
8	1. Connect a fused jumper between the APP sensor 1 signal circuit and the APP sensor 1 5-volt reference circuit. 2. Observe the APP sensor 1 voltage parameter with a scan tool. Does the scan tool indicate APP sensor 1 voltage is near the specified value?	5 V	Go to **Step 14**	Go to **Step 9**
9	Test for a short between the APP sensor 1 signal circuit and all other APP circuits at the APP sensor harness connector with a DMM. Does the DMM indicate a short to another circuit?	-	Go to **Step 10**	Go to **Step 13**
10	1. Turn OFF the ignition. 2. Disconnect both of the TAC module harness connectors. 3. Test for a short between the APP sensor 1 signal circuit and all other APP circuits at the APP sensor harness connector with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 18**	Go to **Step 15**
	1. Turn OFF the ignition. 2. Disconnect the TAC module harness connector containing the APP circuits.			

11	3. Test the APP sensor 1 5-volt reference circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 18**	Go to **Step 15**
12	1. Turn OFF the ignition. 2. Disconnect the TAC module harness connector containing the APP circuits. 3. Test the APP sensor 1 low-reference circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 18**	Go to **Step 15**
13	1. Turn OFF the ignition. 2. Disconnect the TAC module harness connector containing the APP circuits. 3. Test the APP sensor 1 signal circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find an open or high resistance?	-	Go to **Step 18**	Go to **Step 15**
14	Inspect for poor connections at the harness connector of the APP sensor. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 18**	Go to **Step 16**
15	Inspect for poor connections at the harness connectors of the TAC module. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 18**	Go to **Step 17**
16	Replace the APP sensor assembly. Refer to **Accelerator Pedal Position (APP) Sensor Replacement** . Did you complete the replacement?	-	Go to **Step 18**	-
17	Replace the TAC module. Refer to **Throttle Actuator Control (TAC) Module Replacement** . Did you complete the replacement?	-	Go to **Step 18**	-
	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds.			

18	3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 19**
19	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P2125

Circuit Description

The accelerator pedal position (APP) sensor 2 is a potentiometer type sensor with the following circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The control module provides the APP sensor a 5-volt reference circuit and a low reference circuit. The APP sensor then provides the control module a signal voltage proportional to pedal movement. The APP sensor 1 signal voltage is low at rest and increases as the pedal is depressed. When the control module detects that the APP sensor 2 signal or the APP sensor 5-volt reference voltage is outside the predetermined range, this DTC sets.

Conditions for Running the DTC

- DTCs P0601, P0602, P0606, P2108, U0107 are not set.
- The ignition switch is in the Crank or Run position.
- The ignition voltage is more than 5.23 volts.

Conditions for Setting the DTC

- The APP sensor 2 voltage is less than 0.24 volt or more than 4.49 volts.

  OR

- The 5-volt reference is less than 4.54 volts or more than 5.21 volts.
- One of the above conditions is present for more than 1 second.

Action Taken When the DTC Sets

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- If one or more APP sensor DTCs are set, the following occurs:
    - The control module commands Reduced Engine Power mode.
    - The APP indicated angle is limited to a predetermined value to limit the amount of throttle control.

      OR

    - The APP indicated angle is limited to 0 percent. The control module only allows the engine to idle.
    - The message center displays Reduced Engine Power.

Conditions for Clearing the DTC

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Aids

- Inspect the throttle actuator control (TAC) module connectors for signs of water intrusion. If water intrusion occurs, multiple DTCs may set without any circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.
- For an intermittent, refer to **Intermittent Conditions** .

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: The throttle position (TP) sensor 2 and the APP sensor 2 share a common 5-volt reference source. Diagnose DTC P0220 first if that DTC is also set.

6: Measuring the specified voltage at the APP sensor harness connector verifies the integrity of the APP sensor 2 signal circuit from the TAC module.

18: This test determines whether or not the TAC module can recognize a change in signal voltage.

19: There are 2 separate 5-volt reference sources within the TAC module. The TP sensor 1 and the APP sensor 1 share one 5-volt reference source. The TP sensor 2 and the APP sensor 2 share another common 5-volt reference source. This test determines whether the signal circuit is shorted to any one of the 5-volt

reference circuits. If a short exists, the corresponding sensor voltage will be pulled low.

20: The previous step found the signal circuit and a 5-volt reference circuit shorted together. This test isolates whether the short is in the harness or within the TAC module.

26: When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.

DTC P2125

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Engine Controls Connector End Views or Powertrain Control Module (PCM) Connector End Views				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	**IMPORTANT:** **If DTCs P0220 or U0107 is also set, refer to Diagnostic Trouble Code (DTC) List and diagnose the applicable DTC first.** 1. Turn ON the ignition, with the engine OFF, and with your foot OFF of the accelerator pedal. 2. Observe the accelerator pedal position (APP) sensor 2 voltage parameter with a scan tool. Does the scan tool indicate the APP sensor 2 voltage is within the specified values?	0.24-2.24 V	Go to **Step 3**	Go to **Step 6**
3	Fully depress the accelerator pedal to the wide open throttle (WOT) position. Does the scan tool indicate the APP sensor 2 voltage is within the specified values?	0.24-4.49 V	Go to **Step 4**	Go to **Step 6**
4	1. Turn OFF the ignition for 15 seconds. 2. Turn ON the ignition, with the engine OFF. 3. Observe the DTC info with a scan tool. 4. Lightly touch and move the related engine wiring harnesses and connectors for the APP sensor while observing the DTC status. 5. If the scan tool indicates this DTC failed this ignition during the above test, repair the intermittent condition as necessary. Refer to **Wiring Repairs** and **Connector Repairs** in	-		

	Wiring Systems. Did you find and correct the condition?		Go to **Step 25**	Go to **Step 5**
5	Slowly depress the accelerator pedal to WOT, then slowly return the pedal to closed throttle while observing the DTC status. Did the scan tool indicate this DTC failed this ignition during the above test?	-	Go to **Step 21**	Go to Diagnostic Aids
6	1. Disconnect the APP sensor harness connector. 2. Test the APP sensor 2 signal circuit for voltage with a DMM. Does the DMM indicate the APP sensor 2 signal voltage is within the specified values?	3.94-6.06 V	Go to **Step 11**	Go to **Step 7**
7	1. Turn OFF the ignition. 2. Disconnect the throttle actuator control (TAC) module harness connector containing the APP sensor circuits. 3. Turn ON the ignition, with the engine OFF. 4. Test the APP sensor 2 signal circuit for a short to voltage with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 8**
8	Test the APP sensor 2 signal circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 9**
9	Test the APP sensor 2 signal circuit for a short to ground with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 10**
10	Test for a short between the APP sensor 2 signal circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 23**
11	Test the APP sensor 2 5-volt reference circuit for voltage with a DMM. Does the DMM indicate voltage within the specified values?	4.54-5.21 V	Go to **Step 16**	Go to **Step 12**
	1. Turn OFF the ignition. 2. Disconnect the TAC module harness			

12	connector containing the APP sensor circuits. 3. Turn ON the ignition, with the engine OFF. 4. Test the APP sensor 2 5-volt reference circuit for a short to voltage with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 13**
13	Test the APP sensor 2 5-volt reference circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 14**
14	Test the APP sensor 2 5-volt reference circuit for a short to ground with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 15**
15	Test for a short between the APP sensor 2 5-volt reference circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 23**
16	Measure resistance with a DMM connected between the APP sensor 2 low reference circuit and the APP sensor 1 low reference circuit. Does the DMM indicate resistance within the specified values?	0-5 ohm	Go to **Step 18**	Go to **Step 17**
17	1. Turn OFF the ignition. 2. Disconnect the TAC module harness connector containing the APP sensor circuits. 3. Test the APP sensor 2 low reference circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 23**
18	1. Connect a fused jumper between the APP sensor 2 signal circuit and the APP sensor 2 low reference circuit at the APP sensor harness connector. 2. Observe the APP sensor 2 voltage parameter with a scan tool. Does the scan tool indicate APP sensor 2 voltage is	0 V		

	at the specified value?		Go to **Step 19**	Go to **Step 23**
19	1. Observe the APP sensor 1, the APP sensor 3, and the TP sensor 2 voltage parameters with a scan tool. 2. Connect a fused jumper between the APP sensor 2 signal circuit and the APP sensor 2 low reference circuit at the APP sensor harness connector. Did the scan tool indicate a change in voltage in any of the parameters observed during the above test?	-	Go to **Step 20**	Go to **Step 21**
20	1. Turn OFF the ignition. 2. Disconnect the TAC module harness connectors. 3. Test for a short between the APP sensor 2 signal circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 23**
21	Inspect for poor connections at the harness connector of the APP sensor. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 22**
22	Replace the APP sensor assembly. Refer to **Accelerator Pedal Position (APP) Sensor Replacement** . Did you complete the replacement?	-	Go to **Step 25**	-
23	Inspect for poor connections at the harness connector of the TAC module. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 25**	Go to **Step 24**
24	Replace the TAC module. Refer to **Throttle Actuator Control (TAC) Module Replacement** . Did you complete the replacement?	-	Go to **Step 25**	-
	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine.			

25	4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 26**
26	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC P2135

Circuit Description

The throttle position (TP) sensors 1 and 2 are potentiometer type sensors, each with the following three circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The TP sensors are used to determine the throttle plate angle for various engine management systems. The control module provides each TP sensor a 5-volt reference circuit and a low reference circuit. The TP sensors then provide the control module with signal voltage proportional to throttle plate movement. Both TP sensor signal voltages are low at closed throttle and increase as the throttle opens. When the control module detects that TP sensor 1 signal and the TP sensor 2 signals disagree, or signal voltages are outside the predetermined range, this DTC sets.

Conditions for Running the DTC

- DTCs P2108 or U0107 are not set.
- The ignition switch is in the Crank or Run position.
- The ignition voltage is more than 5.23 volts.

Conditions for Setting the DTC

- The TP sensor 2 disagrees with the TP sensor 1 by more than 7.5 percent.
- The above condition is present for more than 1 second.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame and/or the Failure Records.

- The control module commands the TAC system to operate in the Reduced Engine Power mode.
- A message center or an indicator displays Reduced Engine Power.
- Under certain conditions the control module commands the engine OFF.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Diagnostic Aids

- Inspect the throttle actuator control (TAC) module connectors for signs of water intrusion. If water intrusion occurs, multiple DTCs may set without any circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.
- If this DTC is determined to be intermittent, refer to **Intermittent Conditions** .

Test Description

The number below refers to the step number on the diagnostic table.

21: When the TAC module detects a condition within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one DTC. Disconnecting components during testing may set additional DTCs. Remember this if you review the stored information in Capture Info.

DTC P2135

Step	Action	Yes	No
Schematic Reference:Engine Controls Schematics **Connector End View Reference:Engine Controls Connector End Views** or **Powertrain Control Module (PCM) Connector End Views**			
1	Did you perform the Diagnostic System Check - Engine Controls?	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	Is DTC U0107 set?	Go to **Diagnostic Trouble Code**	

		(DTC) List	Go to **Step 3**
3	1. Turn ON the ignition, with the engine OFF. 2. Observe the throttle position (TP) sensor 1 and 2 Agree/Disagree parameter with a scan tool. Does the scan tool TP sensor 1 and 2 Agree/Disagree parameter indicate Disagree?	Go to **Step 5**	Go to **Step 4**
4	1. Remove the air inlet duct from the throttle body. 2. Disconnect the throttle body harness connector. 3. Connect the jumper wires between the TP sensor terminals of the throttle body harness connector and the corresponding TP sensor terminals of the throttle body. 4. Observe the TP sensor 1 and 2 with a scan tool. 5. Slowly open the throttle blade to wide open throttle (WOT) and back to the closed throttle position several times by hand. Does the TP sensor Agree/Disagree parameter change from Agree to Disagree during the above test?	Go to **Step 18**	Go to Diagnostic Aids
5	1. Disconnect the TP sensor harness connector. 2. Disconnect the throttle actuator control (TAC) module harness connectors. 3. Test the TP sensor 1 5-volt reference circuit for resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 6**
6	Test for a short between the TP sensor 1 5-volt reference circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 7**
7	Test the TP sensor 1 signal circuit for resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 8**
8	Test for a short between the TP sensor 1 signal circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 9**
9	Test the TP sensor 1 low reference circuit for resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in		

	Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 10**
10	Test for a short between the TP sensor 1 low reference circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 11**
11	Test the TP sensor 2 5-volt reference circuit for resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 12**
12	Test for a short between the TP sensor 2 5-volt reference circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 13**
13	Test the TP sensor 2 signal circuit for resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 14**
14	Test for a short between the TP sensor 2 signal circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 15**
15	Test the TP sensor 2 low reference circuit for resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 16**
16	Test for a short between the TP sensor 2 low reference circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 17**
17	Inspect for an intermittent and for a poor connection at the harness connector of the TAC module. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 18**
18	Inspect for an intermittent and for a poor connection at the harness connector of the throttle body. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	Go to **Step 20**	Go to **Step 19**
19	Replace the throttle body assembly. Refer to **Throttle Body Assembly Replacement** . Did you complete the replacement?	Go to **Step 20**	-

20	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	Go to **Step 2**	Go to **Step 21**
21	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	Go to **Diagnostic Trouble Code (DTC) List**	System OK

DTC U0107

Circuit Description

The throttle actuator control (TAC) module and the powertrain control module (PCM) communicate via a dedicated serial data circuit. This serial data circuit is separate from any other serial data circuit on the vehicle. Accurate transmitting and receiving of serial data requires not only good circuit integrity, but also adequate system voltage. This diagnostic test monitors the accuracy of the serial data transmitted between the TAC module and the PCM. If the PCM detects a loss of data or invalid data, this DTC sets.

Conditions for Running the DTC

- The ignition switch is in the Crank or Run position.
- The ignition voltage is more than 5.23 volts.

Conditions for Setting the DTC

- Invalid or missing serial data messages are detected for a predetermined amount of time.
- The above condition is met for more than 1 second.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame and/or the Failure Records.
- The control module commands the TAC system to operate in the Reduced Engine Power mode.
- A message center or an indicator displays Reduced Engine Power.
- Under certain conditions the control module commands the engine OFF.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Diagnostic Aids

IMPORTANT: Reprogramming the PCM may cause a communication error between the PCM and the TAC. If the PCM detects a communication error, DTC U0107 sets. Clear any DTCs from the memory that may have been set by Reprogramming.

- DTC U0107 sets if the battery voltage is low. If the customer's concern is slow cranking or no crank because battery voltage is low, ignore DTC U0107. Clear any DTCs from memory that may have set from the low battery voltage condition.
- DTC U0107 sets when there is a short to B+ on the TAC module ground circuit. Inspect the fuses for the circuits that are in the TAC module harness-i.e. cruise, brake. An inspection of the fuses may lead you to the circuit that is shorted to the TAC module ground circuit.
- DTC U0107 sets if the TAC module ignition feed circuit is shorted to a B+ supply circuit. The TAC module stays powered-up when the ignition switch is turned OFF. When the ignition switch is turned ON, the TAC module is powered-up before the PCM. DTC U0107 sets because no communication is detected by the TAC module from the PCM. Inspect related circuits for being shorted to a B+ supply circuit.
- Inspect the TAC module power and ground circuits and the TAC module/PCM serial data circuits for intermittent connections.
- Inspect the TAC module connectors for signs of water intrusion. If water intrusion occurs, multiple DTCs may set without any circuit or component conditions found during diagnostic testing.
- When the TAC module detects a problem within the TAC system, more than one TAC system related DTC may set. This is due to the many redundant tests run continuously on this system. Locating and repairing an individual condition may correct more than one DTC. Remember this if you review the stored information in Capture Info.
- For an intermittent condition, refer to **Intermittent Conditions** .

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: This step determines if the ignition relay is supplying a voltage to the ETC fuse.

5: Increasing the engine speed to 3,000 RPM aids in locating a shorted throttle actuator motor control circuit. Depending on the polarity of the throttle actuator motor transistors, this DTC may not set with a fault in the control circuits. The throttle actuator motor is a bi-directional DC motor. Raising the engine speed changes the polarity of the transistors in the throttle actuator motor. This occurs because one set of the transistors is low, 0 volts, and the other set is high, B+. Therefore, if one set of transistors is at a low voltage and the corresponding circuit is shorted low, DTC P1518 will not set. When the polarity of the

transistors change, this DTC sets. If this DTC does not fail this ignition, continue to monitor this DTC status while moving related harnesses and connectors.

29: Locating and repairing an individual condition may correct more than one DTC.

DTC U0107

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics **Connector End View Reference: Engine Controls Connector End Views or Powertrain Control Module (PCM) Connector End Views**				
1	Did you perform the Diagnostic System Check - Engine Controls?	-	Go to **Step 2**	Go to **Diagnostic System Check - Engine Controls**
2	1. Turn ON the ignition, with the engine OFF. 2. Remove the cover from the underhood electrical center. 3. Test both sides of the ETC fuse with a test lamp connected to ground. Does the test lamp illuminate on at least one side of the fuse?	-	Go to **Step 3**	Go to **Ignition Relay Diagnosis**
3	1. Turn OFF the ignition 2. Test for voltage at the ETC fuse with a test lamp connected to ground. Does the test lamp illuminate?	-	Go to **Step 22**	Go to **Step 4**
4	Connect a scan tool. Is DTC P0604 also set?	-	Go to **DTC P0601-P0607, P1600, P1621, P1627, P1680, P1681, P1683, or P2610**	Go to **Step 5**
5	**IMPORTANT:** **If the Driver Information Center is displaying Reduced Engine Power, go to Step 6.** 1. Start the engine. 2. Increase the engine speed to 3,000 RPM, if possible. 3. Monitor the DTC Info option using the scan tool. Does the scan tool indicate this DTC failed this	-		Go to Diagnostic

	ignition?		Go to **Step 6**	Aids
6	1. Turn OFF the ignition. 2. Disconnect the throttle actuator motor harness connector. 3. Turn ON the ignition, with the engine OFF. 4. Test for voltage at both throttle actuator motor control circuits with a DMM. Does the DMM indicate voltage on both circuits above the specified value?	1 V	Go to **Step 12**	Go to **Step 7**
7	1. Turn OFF the ignition. 2. Disconnect the throttle actuator control (TAC) module connectors. 3. Test both throttle actuator motor control circuits for continuity to ground with a DMM. Does the DMM indicate continuity to ground?	-	Go to **Step 10**	Go to **Step 8**
8	1. Turn OFF the ignition. 2. Remove the ETC fuse. 3. Test the TAC side of the fuse terminal for continuity to ground with a DMM. Refer to Diagnostic Aids for terminal identification table. Does the DMM indicate continuity to ground?	-	Go to **Step 9**	Go to **Step 11**
9	1. Disconnect the TAC module 16-way harness connector. 2. Test the TAC side of the fuse terminal for a short to ground with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 24**
10	1. Disconnect the TAC module 16-way harness connector. 2. Test the throttle actuator motor control circuits for a short to ground at the TAC module 16-way harness connector with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems.	-		

	Did you find and correct the condition?		Go to **Step 28**	Go to **Step 24**
11	1. Turn OFF the ignition. 2. Disconnect the TAC module 16-way harness connector. 3. Test the TAC module ignition feed circuit for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 24**
12	1. Turn OFF the ignition. 2. Disconnect the TAC module 16-way connector. 3. Turn ON the ignition, with the engine OFF. 4. Test for a short to voltage at both throttle actuator motor control circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 13**
13	1. Turn OFF the ignition. 2. Disconnect the TAC module 10-way harness connector. 3. Test for a short between each throttle actuator motor control circuit and all other TAC module circuits with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 14**
14	Test for an open or high resistance in the TAC module ground circuit with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 15**
15	Test for voltage on the serial data circuits at the TAC module 16-way harness connector with a DMM. Does the DMM indicate voltage within the specified values for both circuits?	0-4.5 V	Go to **Step 16**	Go to **Step 18**
	1. Turn OFF the ignition. 2. Test both serial data circuits at the TAC module 16-way harness connector for			

16	continuity to ground with a DMM. Does the DMM indicate OL for both circuits?	-	Go to **Step 20**	Go to **Step 17**
17	1. Disconnect the powertrain control module (PCM) connector containing the TAC module serial data circuits. 2. Test both serial data circuits at the TAC module 16-way connector for a short to ground with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 18**
18	Test for a short between both serial data circuits and all other circuits at the PCM and TAC module harness connectors with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 19**
19	Test for a short to voltage on both serial data circuits at the TAC module 16-way connector with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 25**
20	1. Disconnect the PCM connector that contains the TAC module serial data circuits. 2. Test each serial data circuit between the TAC module 16-way harness connector and the PCM harness connector for an open or high resistance with a DMM. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 21**
21	1. Connect the PCM. 2. Turn ON the ignition. 3. Test for voltage on the serial data circuit at the TAC module 16-way harness connector with a DMM. Does the DMM indicate voltage at the specified value?	0 V	Go to **Step 25**	Go to **Step 24**
	1. Turn OFF the ignition. 2. Disconnect the 16-way TAC module harness			

	connector. 3. Test the TAC module ignition feed circuit for a short to battery voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 23**
23	1. Turn ON the ignition. 2. Test both TAC motor circuits for a short to voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 24**
24	Test for poor connections at the TAC module harness connector. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 26**
25	Test for poor connections at the PCM harness connector. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Repairing Connector Terminals** in Wiring Systems. Did you find and correct the condition?	-	Go to **Step 28**	Go to **Step 27**
26	Replace the TAC module. Refer to **Throttle Actuator Control (TAC) Module Replacement** . Did you complete the replacement?	-	Go to **Step 28**	-
27	Replace the PCM. Refer to **Powertrain Control Module (PCM) Replacement** . Did you complete the replacement?	-	Go to **Step 28**	-
28	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	-	Go to **Step 2**	Go to **Step 29**
29	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	-	Go to **Diagnostic Trouble Code (DTC) List**	System OK