DIAGNOSTIC TROUBLE CODE (DTC) P1171

FUEL SUPPLY SYSTEM LEAN DURING POWER ENRICH

System Description

The internal circuitry of the powertrain control module (PCM)/engine control module (ECM) can identify if the vehicle fuel system is capable of supplying adequate amounts of fuel during heavy acceleration (power enrichment). When a power enrichment mode of operation is requested during Closed Loop operation (by heavy acceleration), the PCM/ECM will provide more fuel to the engine. Under these conditions the PCM/ECM should detect a rich condition. If this rich exhaust is not detected at this time, a DTC P1171 will set. A plugged fuel filter or restricted fuel line can prevent adequate amounts of fuel from being supplied during power enrichment mode.

Conditions for Setting the DTC

- DTC(s), P0131, P0132, P0133, P0134, not set.
- Engine is operating in Closed Loop.
- Oxygen Sensor (O2S 1) voltage is less than 300 mv for 5 seconds.
- Engine is in power enrichment mode.

Action Taken When the DTC Sets

- The PCM/ECM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame and Failure Records buffers.
- A history DTC is stored.
- Coolant fan turns on.

Conditions for Clearing the MIL/DTC

- A history DTC will clear after 40 consecutive warm–up cycles without a fault.
- DTC(s) can be cleared by using the scan tool.

Diagnostic Aids

A restricted fuel filter can supply adequate amounts of fuel at idle, but may not be able to supply enough fuel during heavy acceleration.

Water or alcohol in fuel may cause low O2S 1 voltage during acceleration.

Check for adequate amount of fuel in the Tank.

When the engine is idling or at steady cruise, the O2S 1 voltage should vary from between approximately 100 mv to 900 mv. During power enrichment mode, more fuel is needed and O2S 1 should rise above 447 mv.

Check for faulty or plugged injector(s).

Test Description

Number(s) below refer to the step number(s) on the Diagnostic Table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.
4. This step checks to see if the O2S 1 is operating properly.
6. If no faults have been found at this point and no additional DTCs were set, refer to ”Diagnostic Aids” in this section for additional checks and information.

DTC P1171 Fuel Supply System Lean During Power Enrich

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Turn the ignition ON. 2. Install the scan tool. Are any component related Diagnostic Trouble Codes (DTCs) set?		Go to applicable DTC table	Go to *Step 3*
3	1. Check the vehicle for an adequate amount of fuel. 2. Add fuel to the vehicles fuel tank if the tank is almost empty. Did the fuel tank require fuel?		Go to *Step 5*	Go to *Step 4*
4	1. Using the scan tool, observe the Oxygen Sensor O2S 1) voltage while running the engine at the specified temperature and rpm. 2. The O2S 1 voltage should vary from the specified voltage and occasionally toggle above the specified voltage. Does the O2S 1 toggle?	75˚C–95˚C (167˚F–203˚F) 1200 rpm 100–900 mV 447 mv	Go to ”Fuel System Diagnosis”	Go to ”DTC P0134 O2 Bank 1 Sensor 1 No Activity”
5	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic has run and passed?		Go to *Step 6*	Go to *Step 2*
6	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to ”Applicable DTC table”	System OK

DIAGNOSTIC TROUBLE CODE (DTC) P1336

58X CRANK POSITION TOOTH ERROR NOT LEARNED

Circuit Description

In order to detect engine misfire at higher engine speeds, the powertrain control module (PCM)/engine control module (ECM) must know of any variation between the crankshaft sensor pulses. Most variations are due to the machining of the crankshaft reluctor wheel. However, other sources of variation are also possible. A crankshaft position (CKP) system variation learning procedure must be performed ant time a change is made to the crankshaft sensor to crankshaft relationship of if the PCM/ECM is replaced or reprogrammed. The PCM/ECM measures the variations and then calculates compensation factors needed to enable the PCM/ECM to accurately detect engine misfire at all speeds and loads. A scan tool must be used to command the PCM/ECM to learn these variations. If for any reason the PCM/ECM is unable to learn these variations or they are out of an acceptable range, the PCM/ECM will set a DTC P1336. A PCM/ECM that has not had the CKP system variation learning procedure performed due to replacement or reprogramming will also set a DTC P1336.

Conditions for Setting the DTC

- No crank or cam sensor DTCs.
- The PCM/ECM has not successfully learned CKP system variation.

Action Taken When the DTC Sets

- The Malfunction Indicator Lamp (MIL) will illuminate.
- The PCM/ECM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame and Failure Records buffer.
- A history DTC is stored.

Conditions for Clearing the MIL/DTC

- The MIL will turn OFF after three consecutive ignition cycles in which the diagnostic runs without a fault.
- A history DTC will clear after 40 consecutive warm up cycles without a fault.
- DTCs can be cleared by using the scan tool.

Diagnostic Aids

CAUTION : To avoid personal injury when performing the crankshaft position system variation learning procedure always set the vehicle parking brake and block the drive wheels. Release the throttle immedi – ately when the engine starts to decelerate. Once the learn procedure is completed, engine control will be returned to the operator and the engine will respond to throttle position.

DTC P1336 will only set if the PCM/ECM has not learned the CKP system variation. The PCM/ECM only needs to learn this variation once per life cycle of the vehicle unless the crank sensor to crankshaft relationship is disturbed. Removing a part is considered a disturbance. A fully warmed up engine is critical to learning the variation correctly. If a valid learn occurs, no other learns can be completed that ignition cycle.

If the engine cuts out before the specified learn procedure engine speed or at normal fuel cutoff rpm, the PCM/ECM is not in the learn procedure mode.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the fault occurred. The information is then stored on the scan tool for later reference.
2. Engine temperature is critical to properly learn the CKP system variation. Failure to properly warm the engine before performing this procedure will result in an inaccurate measurement of the CKP system variation. The PCM/ECM learns this variation as the engine is decelerating and then allows engine control to be returned to the operator. All accessories must be OFF when learning the CKP system angle variation. If the A/C is not disabled when the learn procedure is enabled, the PCM/ECM will disable the A/C.
3. If after the specified number attempts the PCM/ECM cannot learn the CKP system variation, then the variation is too large and no further attempts should be made until the variation problem is corrected.
4. Being unable to learn the procedure indicates that the variation is out of range.

DTC P1336 – 58X Crank Position Tooth Error Not Learned

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Install the scan tool. 2. Put the vehicle in PARK or NEUTRAL. 3. Run the engine until it is above the specified temperature. 4. Set the vehicle parking brake and block the wheels. 5. Turn all accessories OFF. 6. Enable the CRANKSHAFT POSITION SYSTEM VARIATION LEARNING PROCEDURE with the scan tool. 7. Raise the engine rpm to the specified value, then release the throttle as soon as the engine cuts out. Does the scan tool indicate that the crankshaft position (CKP) system variation has been learned?	70˚C (158˚F) 3920 rpm	Go to *Step 5*	Go to *Step 3*
3	Attempt the CKP system variation procedure as many times as the specified value. Does the scan tool indicate that the CKP system variation has been learned?	10	Go to *Step 5*	Go to *Step 4*
4	Check for a problem with the crankshaft sensor to crankshaft relationship. Is a repair necessary?		Go to *Step 5*	
5	1. Using the scan tool, clear the Diagnostic Trouble Codes (DTCs). 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 6*	Go to *Step 2*
6	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK

DIAGNOSTIC TROUBLE CODE (DTC) P1380
ABS ROUGH ROAD ROUGH ROAD DATA INVALID

Circuit Description

The powertrain control module (PCM)/engine control module (ECM) identifies engine misfire by detecting variations in crankshaft speed. Crankshaft speed variations can also occur when a vehicle is operated over a rough road. The Anti–Lock Brake System (ABS) can detect if the vehicle is on a rough surface based on wheel acceleration/deceleration data supplied by each wheel speed sensor. This information is sent to the PCM/ECM by the Electronic Brake Control Module (EBCM) through the instrument panel cluster (IPC) over the Universal Asynchronous Receiver Transmitter (UART) serial data line. The PCM/ECM then uses this information to determine if the crankshaft variations are being caused by an actual engine misfire or from being driven on a rough surface.

If the ABS is found to be malfunctioning, the PCM/ECM will still continue to detect for misfire. However, if a misfire Diagnostic Trouble Code (DTC) is set, this additional DTC will also be set, indicating that rough surface data was not usable during the misfire detection due to the ABS malfunction.

Conditions for Setting the DTC

- ABS system has detected a wheel speed sensor fault.
- The vehicle speed is greater than or equal to 10 mph 16 km/h).
- The engine speed is less than or equal to 6000 rpm.
- The engine load is less than or equal to 100%.

Conditions for Clearing the MIL/DTC

- A history DTC will clear after 40 consecutive warm–up cycles without a fault.
- DTCs can be cleared by using a scan tool.

Diagnostic Aids

The setting of this DTC indicates that a misfire was detected and that the PCM/ECM could not determine if the detected misfire was true or due to operating the vehicle on a rough surface. A misfire can be a true misfire with or without setting this DTC. Check the IPC and the EBCM for poor connections at the UART serial data terminals. Be sure no true misfire exists after repairing the cause of this DTC. A DTC P1618 also indicates that a fault may lie within the IPC serial data line, its connections, or within the IPC.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.
4. Be careful to clear only DTCs and not the captured information stored on the scan tool. The scan tool will issue a warning if this is about to happen.
5. A DTC P1380 being reset indicates that the PCM/ECM is not receiving the correct information from the EBCM due to an ABS DTC.
6. When DTC P1380 is set, an ABS DTC should also be set.
7. Repair any condition that remains and is causing a misfire by following the table for any DTC that has set.
8. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P1380 ABS Rough Road Rough Road Data Invalid

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Turn the ignition ON with engine OFF. 2. Install the scan tool. 3. Check for any ABS Diagnostic Trouble Codes (DTCs). Are any ABS DTCs set?		Go to applicable DTC table	Go to *Step 3*
3	1. Review the Freeze Frame data and note the parameters. 2. Operate the vehicle within the Freeze Frame conditions and Conditions for Setting the DTC as noted when driving on a rough surface. Does the misfire set?		Go to *Step 4*	Go to *Step 8*
4	Check the scan tool. Does DTC P1380 set?		Go to *Step 5*	Go to *Step 6*
5	Check the scan tool Does an ABS DTC set?		Go to applicable DTC table	Go to *Step 7*
6	Repair the condition causing the misfire. Is the repair complete?		Go to *Step 8*	
7	Replace the powertrain control module (PCM)/engine control module (ECM). Is the repair complete?		Go to *Step 8*	
8	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 9*	Go to *Step 2*
9	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK

DIAGNOSTIC TROUBLE CODE (DTC) P1381
ABS ROUGH ROAD SERIAL DATA FAULT

Circuit Description

The powertrain control module (PCM)/engine control module (ECM) identifies engine misfire by detecting variations in crankshaft speed. Crankshaft speed variations can also occur when a vehicle is operated over a rough road. The Anti–Lock Brake System (ABS) can detect if the vehicle is on a rough surface based on wheel acceleration/deceleration data supplied by each wheel speed sensor. This information is sent to the PCM/ECM by the Electronic Brake Control Module EBCM through the instrument panel cluster (IPC) over the Universal Asynchronous Receiver Transmitter (UART) serial data line. The PCM/ECM then uses this information to determine if the crankshaft variations are being caused by an actual engine misfire or from being driven on a rough surface.

If the ABS is found to be malfunctioning, the PCM/ECM will still continue to detect for misfire. However, if a misfire Diagnostic Trouble Code (DTC) is set, this additional DTC will also be set, indicating that rough surface data was not usable during the misfire detection due to the ABS malfunction.

Conditions for Setting the DTC

- ABS communication is present.
- The vehicle speed is greater than or equal to 5 mph (8 km/h).
- The engine speed is less than or equal to 5500 rpm.
- The engine load is less than or equal to 90%.

Conditions for Clearing the MIL/DTC

- A history DTC will clear after 40 consecutive warm–up cycles without a fault.
- DTCs can be cleared by using a scan tool.

Diagnostic Aids

The setting of this DTC indicates that a misfire was detected and that the PCM/ECM could not determine if the detected misfire was true or due to operating the vehicle on a rough surface. A misfire can be a true misfire with or without setting this DTC. Check the IPC and the EBCM for poor connections at the UART serial data terminals. Be sure no true misfire exists after repairing the cause of this DTC. A DTC P1618 also indicates that a fault may lie within the IPC serial data line, its connections, or within the IPC.

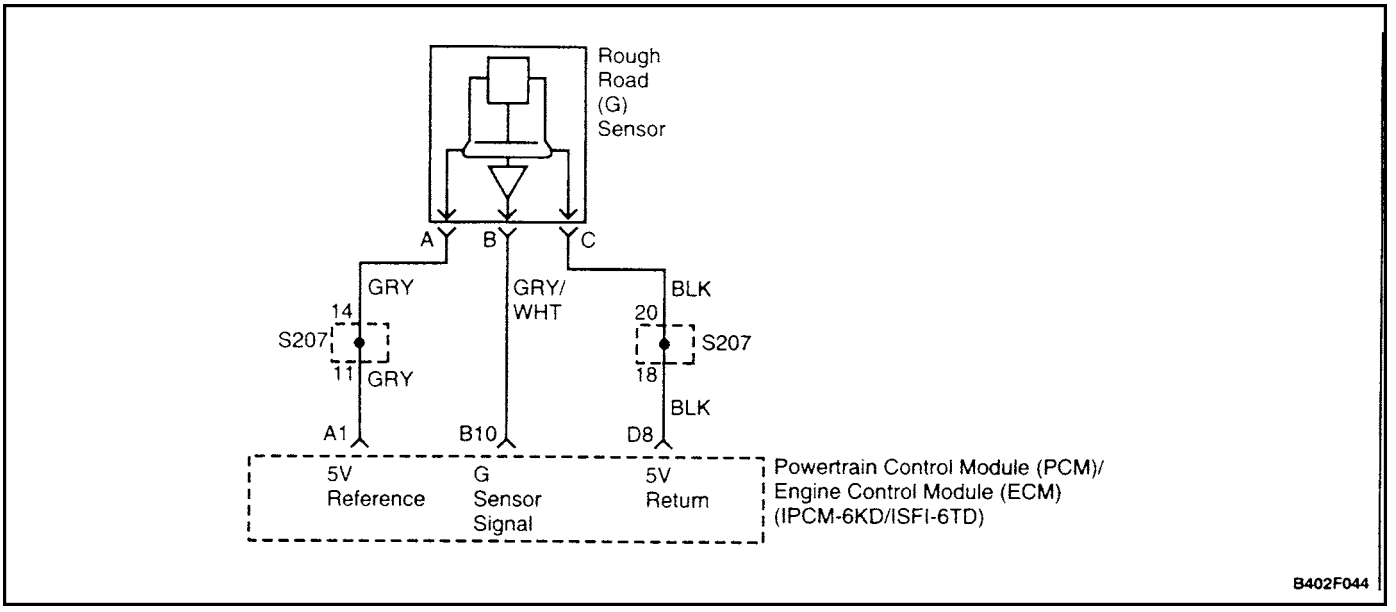
Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.
2. Be careful to clear only DTCs and not the captured information stored on the scan tool. The scan tool will issue a warning if this is about to happen.
4. A DTC P1381 being reset indicates that the PCM/ECM is not receiving the correct information from the EBCM due to an ABS DTC.
5. When DTC P1381 is set, an ABS DTC should also be set.
6. Repair any condition that remains and is causing a misfire by following the table for any DTC that has set.
7. The replacement PCM/ECM must be reprogrammed. Refer to the latest Techline procedure for PCM/ECM reprogramming.

DTC P1381 ABS Rough Road Serial Data Fault

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Turn the ignition ON with engine OFF. 2. Install the scan tool. 3. Check for any ABS Diagnostic Trouble Codes (DTCs). Are any ABS DTCs set?		Go to applicable DTC table	Go to *Step 3*
3	1. Review the Freeze Frame data and note the parameters. 2. Operate the vehicle within the Freeze Frame conditions and Conditions for Setting the DTC as noted when driving on a rough surface. Does the misfire set?		Go to *Step 4*	Go to *Step 8*
4	Check the scan tool. Does DTC P1381 set?		Go to *Step 5*	Go tp *Step 6*
5	Check the scan tool Does an ABS DTC set?		Go to applicable DTC table	Go to *Step 7*
6	Repair the condition causing the misfire. Is the repair complete?		Go to *Step 8*	
7	Replace the powertrain control module (PCM)/engine control module (ECM). Is the repair complete?		Go to *Step 8*	
8	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 9*	Go to *Step 2*
9	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK



DIAGNOSTIC TROUBLE CODE (DTC) P1391

G SENSOR ROUGH ROAD RATIONALITY

Circuit Description

The G sensor is a vertical low g–acceleration sensor. By sensing vertical acceleration caused by bumps or pot-holes in the road, the powertrain control module (PCM)/engine control module (ECM) can determine if the changes in crankshaft speed are due to engine misfire or are driveline induced. If the G sensor detects a rough road condition, the PCM/ECM misfire detection diagnostic will be de–activated. The G sensor at rest output should be between 2.35–2.65 volts (+1G). During a rough road condition, the voltage output can vary between 0.5 (–1G) and 4.5 volts (+3G).

Conditions for Setting the DTC

- Engine is running.
- No vehicle speed.
- G sensor output indicates greater than 2.5 volts (+1G) or less than 1.5 volts (0G).

OR

- Vehicle speed is between 30 mph (50 km/h) and 70 mph (112 km/h).
- G sensor signal changes more than 0.002 volts each tenth of a second (changing faster than physically possible).

Action Taken When DTC Sets

- The Malfunction Indicator Lamp (MIL) will illuminate.
- The PCM/ECM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame and Failure Records buffers.

Conditions for Clearing the MIL/DTC

- The MIL will turn off after three consecutive ignition cycles in which the diagnostic runs without a fault.
- A history Diagnostic Trouble Code (DTC) will clear after 40 consecutive warm–up cycles without a fault.
- DTC(s) can be cleared by using the scan tool.

Diagnostic Aids

Check for the following conditions:

- Poor connection at the PCM/ECM – Inspect the harness connections for backed–out terminals, improper mating, broken locks, improperly formed or damaged terminals, and poor terminal–to–wire connection.
- Damaged harness – Inspect the wiring harness for damage. If the harness appears to be OK, observe the G sensor display on the scan tool while moving connectors and wiring harnesses related to the sensor. A change in the display will indicate the location of the fault.

Since the G sensor shares the PCM/ECM 5 v reference and ground terminals with the Throttle Position (TP) sensor, a damaged TP harness or sensor could cause a G sensor DTC to set. Refer to ”Multiple PCM/ECM Information Sensor DTCs Set”in this section.

The G sensor will give correct voltages only if it is level and mounted securely to its bracket.

Reviewing the Failure Records vehicle mileage since the diagnostic test last failed may help determine how often the condition that caused the DTC to be set occurs. This may assist in diagnosing the condition.

Test Description

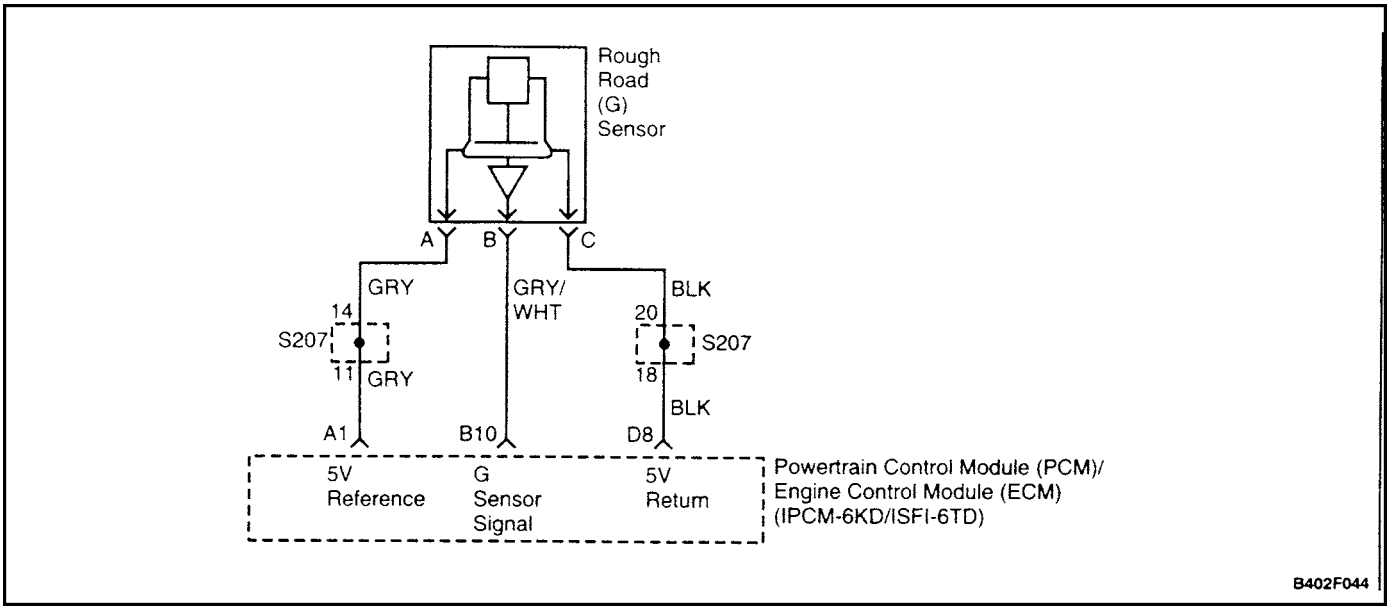
The number(s) below refer to step(s) on the diagnostic table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.

DTC P1391 G Sensor Rough Road Rationality

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Turn the ignition ON engine OFF. 2. Review and record the scan tool Failure Records data. 3. Operate the vehicle within Failure Records conditions as noted. 4. Using the scan tool, monitor specific Diagnostic Trouble Code (DTC) info for DTC P1391. Does the scan tool indicate that DTC P1391 failed?		Go to *Step 4*	Go to *Step 3*
3	1. Check for the following conditions: • G sensor seal missing or damaged. • G sensor mounting flanges cracked, missing, or incorrectly installed. 2. If a problem is found, repair as necessary. Is a problem found?		Go to *Step 14*	Go to ”Diagnostic Aids”
4	1. Disconnect the G sensor electrical connector. 2. Observe the G sensor value displayed on the scan tool. Is the G sensor value near the specified value?	0.0 v	Go to *Step 5*	Go to *Step 12*
5	1. Jumper the 5 volt reference circuit, at terminal B and the G sensor signal circuit, at terminal C together at the G sensor harness connector. 2. Observe the G sensor value displayed on the scan tool. Is the G sensor value near the specified value?	4.95 v	Go to *Step 6*	Go to *Step 7*
6	1. Turn the ignition OFF. 2. Disconnect the powertrain control module PCM)/engine control module (ECM) and check the sensor ground circuit terminal D8 for high resistance, an open between the PCM/ECM and the G sensor, or for a poor connection at the PCM/ECM. 3. If the problem is found, repair as necessary. Is a problem found?		Go to *Step 14*	Go to *Step 10*
7	1. Check the 5 volt reference circuit, terminal A1 for high resistance, an open between the PCM/ECM and the G sensor, or a poor connection at the PCM/ECM. 2. If a problem is found, repair as necessary. Is a problem found?		Go to *Step 14*	Go to *Step 8*

Step	Action	Value(s)	Yes	No
8	1. Turn the ignition OFF. 2. Disconnect the PCM/ECM and check the G sensor signal circuit for high resistance, an open, a short to ground, or a short to the sensor ground circuit. 3. If a problem is found, repair as necessary. Is a problem found?		Go to *Step 14*	Go to *Step 9*
9	1. Check the G sensor signal circuit for a poor connection at the PCM/ECM. 2. If a problem is found, repair as necessary. Is a problem found.		Go to *Step 14*	Go to *Step 13*
10	1. Check for a poor connection at the G sensor. 2. If a problem is found, repair as necessary. Is a problem found?		Go to *Step 14*	Go to *Step 11*
11	Replace the G sensor. Is the repair complete?		Go to *Step 14*	
12	1. Turn the ignition OFF. 2. Disconnect the PCM/ECM. 3. Turn the ignition ON. 4. Check the G sensor signal circuit for a short to voltage or a short to the 5 volt reference circuit. 5. If a problem is found, repair as necessary. Is a problem found?		Go to *Step 14*	Go to *Step 13*
13	Replace the PCM/ECM Is the repair complete?		Go to *Step 14*	
14	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 15*	Go to *Step 2*
15	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK



DIAGNOSTIC TROUBLE CODE (DTC) P1392

G SENSOR ROUGH ROAD LOW VOLTAGE

Circuit Description

The G sensor is a vertical low g–acceleration sensor. By sensing vertical acceleration caused by bumps or potholes in the road, the powertrain control module (PCM)/engine control module (ECM) can determine if the changes in crankshaft speed are due to engine misfire or are driveline induced. If the G sensor detects a rough road condition, the PCM/ECM misfire detection diagnostic will be de–activated. The G sensor at rest output should be between 2.35–2.65 volts (+1G). During a rough road condition, the voltage output can vary between 0.5 (–1G) and 4.5 volts (+3G).

Conditions for Setting the DTC

- The G sensor signal is less than 0.4 volt for a total of 12.5 seconds over a 25 second period of time.

Action Taken When DTC Sets

- The Malfunction Indicator Lamp (MIL) will not illuminate.
- The PCM/ECM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame and Failure Records buffers.

Conditions for Clearing the MIL/DTC

- A history Diagnostic Trouble Code (DTC) will clear after 40 consecutive warm–up cycles without a fault.
- DTC(s) can be cleared by using the scan tool.

Diagnostic Aids

Check for the following conditions:

- Poor connection at the PCM/ECM – Inspect the harness connections for backed–out terminals, improper mating, broken locks, improperly formed or damaged terminals, and poor terminal–to–wire connection.
- Damaged harness – Inspect the wiring harness for damage. If the harness appears to be OK, observe the G sensor display on the scan tool while moving connectors and wiring harnesses related to the sensor. A change in the display will indicate the location of the fault.

Since the G sensor shares the PCM/ECM 5 volt reference and ground terminals with the Throttle Position (TP) sensor, a damaged TP harness or sensor could cause a G sensor DTC to set. Refer to ”Multiple ECM Information Sensor DTCs Set” in this section.

The G sensor will give correct voltages only if it is level and mounted securely to its bracket.

Reviewing the Failure Records vehicle mileage since the diagnostic test last failed may help determine how often the condition that caused the DTC to be set occurs. This may assist in diagnosing the condition.

Test Description

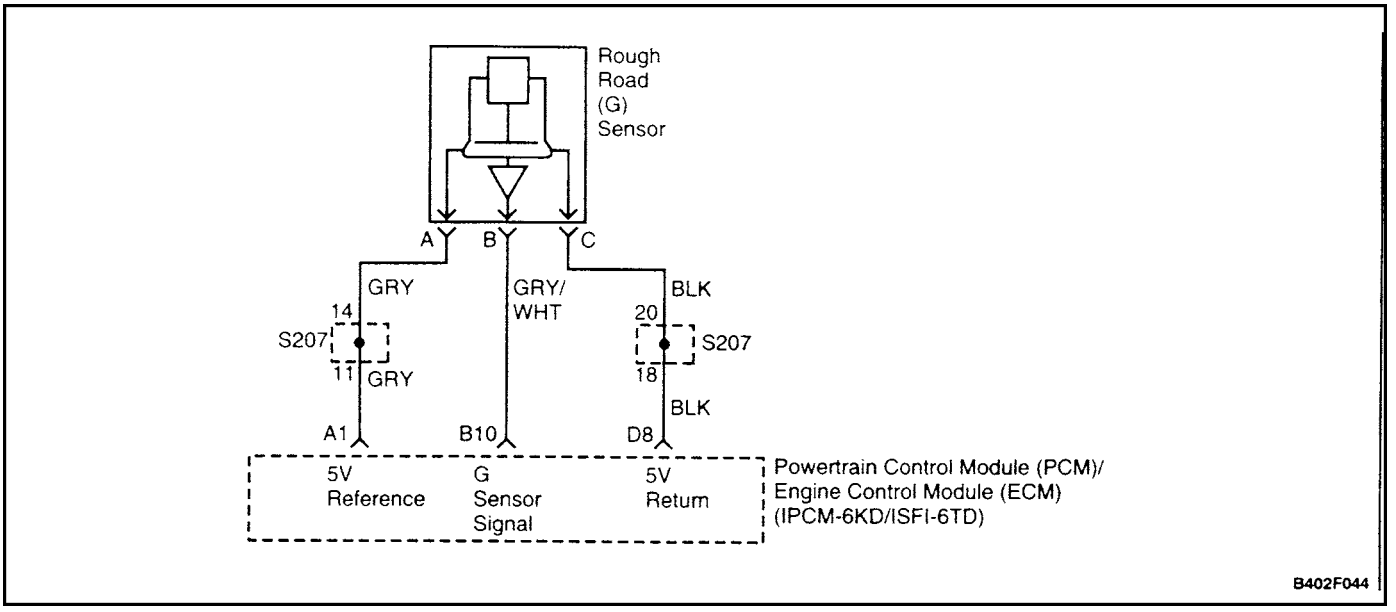
The number(s) below refer to step(s) on the diagnostic table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.

DTC P1392 G Sensor Rough Road Low Voltage

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Turn the ignition ON, engine OFF. 2. Disconnect the G sensor electrical connector 3. Observe the ROUGH ROAD value displayed on the scan tool. Is the ROUGH ROAD value near the specified value?	0.0 v	Go to *Step 4*	Go to *Step 3*
3	1. Turn the ignition ON, engine OFF. 2. Review and record the scan tool Failure Records data. 3. Operate the vehicle within Failure Records conditions as noted. 4. Using the scan tool, monitor specific Diagnostic Trouble Code (DTC) info for DTC P1392. Does the scan tool indicate that DTC P1392 failed?		Go to *Step 4*	Go to ”Diagnostic Aids”
4	1. Disconnect the G sensor electrical connector. 2. Jumper the 5 volt reference circuit, terminal B and the G sensor signal circuit, terminal C together at the G sensor harness connector. 3. Observe the G sensor value displayed on the scan tool. Is the G sensor value near the specified value?	4.95 v	Go to *Step 9*	Go to *Step 5*
5	1. Turn the ignition OFF. 2. Disconnect the powertrain control module PCM)/engine control module (ECM) and check the 5 volt reference circuit for an open or short to ground. 3. If the problem is found, repair as necessary. Is a problem found?		Go to *Step 11*	Go to *Step 6*
6	Check the 5 volt reference circuit for a poor connection at the PCM/ECM and replace the terminal if necessary. Does the terminal require replacement?		Go to *Step 11*	Go to *Step 7*
7	1. Turn the ignition OFF. 2. Disconnect the PCM/ECM and check the sensor signal circuit for an open, short to ground, or short to the sensor ground circuit. 3. If the problem is found, repair as necessary. Is a problem found?		Go to *Step 11*	Go to *Step 8*
8	Check the G sensor signal circuit for a poor connection at the PCM/ECM and replace the terminal if necessary. Did the terminal require replacement?		Go to *Step 11*	Go to *Step 9*
9	Replace the G sensor. Is the repair complete?		Go to *Step 11*	
10	Replace the PCM/ECM Is the repair complete?		Go to *Step 11*	

Step	Action	Value(s)	Yes	No
11	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 15*	Go to *Step 2*
12	Check if any additional DTCs are set. Are any DTCs displayed that have not been diagnosed?		Go to applicable DTC table	System OK



DIAGNOSTIC TROUBLE CODE (DTC) P1393

G SENSOR ROUGH ROAD HIGH VOLTAGE

Circuit Description

The G sensor is a vertical low g–acceleration sensor. By sensing vertical acceleration caused by bumps or potholes in the road, the powertrain control module (PCM)/engine control module (ECM) can determine if the changes in crankshaft speed are due to engine misfire or are driveline induced. If the G sensor detects a rough road condition, the PCM/ECM misfire detection diagnostic will be de–activated. The G sensor at rest output should be between 2.35–2.65 volts (+1G). During a rough road condition, the voltage output can vary between 0.5 (–1G) and 4.5 volts (+3G).

Conditions for Setting the DTC

- The G sensor signal is greater than 4.8 volts for a total of 12.5 seconds over a 25 second period of time.

Action Taken When DTC Sets

- The Malfunction Indicator Lamp (MIL) will not illuminate.
- The PCM/ECM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame and Failure Records buffers.

Conditions for Clearing the MIL/DTC

- A history DTC will clear after 40 consecutive warm–up cycles without a fault.
- DTC(s) can be cleared by using the scan tool.

Diagnostic Aids

Check for the following conditions:

- Poor connection at the PCM/ECM – Inspect the harness connections for backed–out terminals, improper mating, broken locks, improperly formed or damaged terminals, and poor terminal–to–wire connection.
- Damaged harness – Inspect the wiring harness for damage. If the harness appears to be OK, observe the G sensor display on the scan tool while moving connectors and wiring harnesses related to the sensor. A change in the display will indicate the location of the fault.

Since the G sensor shares the PCM/ECM 5 v reference and ground terminals with Throttle Position (TP) sensor, a damaged TP harness or sensor could cause a G sensor DTC to set. Refer to ”Multiple PCM/ECM Information Sensor DTCs Set”in this section.

The G sensor will give correct voltages only if it is level and mounted securely to its bracket.

Reviewing the Failure Records vehicle mileage since the diagnostic test last failed may help determine how often the condition that caused the DTC to be set occurs. This may assist in diagnosing the condition.

Test Description

The number(s) below refer to step(s) on the diagnostic table.

1. The On–Board Diagnostic (OBD II) System Check prompts the technician to complete some basic checks and store the freeze frame and failure records data on the scan tool if applicable. This creates an electronic copy of the data taken when the malfunction occurred. The information is then stored on the scan tool for later reference.

DTC P1393 G Sensor Rough High Voltage

Step	Action	Value(s)	Yes	No
1	Perform an On–Board Diagnostic (OBD II) System Check. Is the system check complete?		Go to *Step 2*	Go to ”On–Board Diagnostic System Check”
2	1. Idle the engine. 2. Observe the ROUGH ROAD value displayed on the scan tool. Is the ROUGH ROAD value near the specified value?	4.5 v	Go to *Step 4*	Go to *Step 3*
3	1. Turn the ignition ON, engine OFF. 2. Review and record the scan tool Failure Records data. 3. Operate the vehicle within Failure Records conditions as noted. 4. Using the scan tool, monitor specific Diagnostic Trouble Code (DTC) info for DTC P1393. Does the scan tool indicate that DTC P1393 failed?		Go to *Step 4*	Go to ”Diagnostic Aids”
4	1. Disconnect the G sensor electrical connector. 2. Note the G sensor voltage displayed on the scan tool. Is the G sensor voltage near the specified value?	0.0 v	Go to *Step 5*	Go to *Step 6*
5	Probe the sensor ground circuit terminal A with a test light to B+. Is the test light ON?		Go to *Step 7*	Go to *Step 9*
6	1. Check the G sensor signal circuit for a short to voltage or a short to the 5 volt reference circuit. 2. If the G sensor signal circuit is shorted, repair the circuit as necessary. Is the G sensor signal circuit shorted?		Go to *Step 12*	Go to *Step 11*
7	1. Check for a poor sensor ground terminal connection at the G sensor electrical connector. 2. If a problem is found replace the faulty terminal. Did the terminal require replacement?		Go to *Step 12*	Go to *Step 8*
8	Check for a poor sensor ground terminal connection at the powertrain control module (PCM)/engine control module (ECM) and replace the terminal if necessary. Does the terminal require replacement?		Go to *Step 12*	Go to *Step 9*
9	1. Check the continuity of the G sensor ground circuit. 2. If the G sensor ground circuit measures over the specified value, repair the open or poor connection. Is a condition found and corrected?		Go to *Step 12*	Go to *Step 10*
10	Replace the PCM/ECM. Is the repair complete?		Go to *Step 12*	
11	Replace the G sensor. Is the repair complete?		Go to *Step 12*	

Step	Action	Value(s)	Yes	No
12	1. Using the scan tool, clear the DTCs. 2. Start the engine and idle at normal operating temperature. 3. Operate the vehicle within the conditions for setting this DTC as specified in the supporting text. Does the scan tool indicate that this diagnostic ran and passed?		Go to *Step 13*	Go to *Step 2*
13	Check if any additional DTCs are set. Are any DTC displayed that have not been diagnosed?		Go to applicable DTC table	System OK