DTC P0300 Engine Misfire Detected

Circuit Description

The Crankshaft Position sensor is mounted through the side of the engine block at the rear of Bank 2 behind the starter assembly. The Crankshaft Position sensor works in conjunction with a 24X reluctor wheel on the crankshaft. The reluctor wheel is inside the engine immediately in front of the rear main bearing. The PCM provides a 12 volt power supply to the CKP sensor as well as a ground and a signal circuit.

A misfire causes a change in crankshaft speed. The PCM times the interval between each pulse and compares each new time interval with the previous one in order to determine when an excessive change in crankshaft speed has occurred. You can expect a certain amount of acceleration/deceleration between each firing stroke, but if the crankshaft speed changes are greater than an expected amount, the PCM interprets this as a misfire.

The PCM uses the Crankshaft Position sensor for both spark and fueling. As the crankshaft rotates, the reluctor wheel teeth interrupt a magnetic field produced by a magnet within the sensor. The sensors internal circuitry detects this and produces a signal which the PCM reads. The PCM uses this 24X signal in combination with the Camshaft Position sensor 1X signal in order to accurately determine crankshaft position. The PCM also calculates a 4X signal from this information. The PCM uses the 4X signal for internal calculations. The 4X signal also provides a tach signal for any device which requires one.

Observe that as long as the PCM receives the Crankshaft Position sensor 24X signal, the engine will start. The PCM can determine top dead center for all cylinders by using the Crankshaft Position sensor 24X signal alone. The Camshaft Position sensor 1X signal is used by the PCM to determine if the cylinder at top dead center is on the firing stroke, or the exhaust stroke. The system attempts synchronization and looks for an increase in engine speed indicating the engine started. If the PCM does not detect an increase in engine speed, the PCM assumes it incorrectly synchronized to the exhaust stroke and re-syncs to the opposite cam position. A slightly longer cranking time may be a symptom of this condition.

Conditions for Running the DTC

- DTCs P0101, P0102, P0103, P0117, P0118, P0121, P0122, P0123, P0125, P0335, P0336, P0341, P0342, P0343, P0500, P0502, P0503, P1258 not set.
- The engine speed is between 450 RPM and 3,001 RPM.
- The ignition voltage is between 10.0 volts and 18.0 volts.
- The engine coolant temperature is between –7°C (19°F) and 130°C (266°F).
- Fuel level is more than 10 percent.
- The TP sensor angle is steady within 1 percent.
- The ABS and Traction Control systems are not active.
- The transmission is not changing gears.
- The AIR diagnostic test is not in progress.
- The A/C clutch is not changing states.
- The PCM is not in fuel shut-off or decel fuel cut-off mode.
- The ABS signals not exceeding rough road thresholds.

Conditions for Setting the DTC

- The PCM determines that an emission type Misfire is present.
- The PCM determines that a catalyst damaging Misfire is present.

Action Taken When the DTC Sets

The PCM illuminates the Malfunction Indicator Lamp (MIL) under the following conditions:

- The PCM illuminates the Malfunction Indicator Lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails, if the diagnostic fails under the same conditions (load, RPM, temperature, etc.) as the previous ignition cycle that the test ran and failed.
- The first time the diagnostic fails, the PCM records the operating conditions in Failure Records.
- The PCM determines the percent of misfire over a 1,000 revolution period is high enough to cause excessive tail pipe emissions. The PCM illuminates the Malfunction Indicator lamp the next consecutive ignition cycle that the diagnostic runs and fails, if the diagnostic fails under the same conditions (load, RPM, temperature, etc.) as the previous ignition cycle that the test ran and failed.

  Or

- The PCM flashes the Malfunction Indicator Lamp (MIL) when the diagnostic runs and fails a catalyst damaging misfire.

Conditions for Clearing the MIL/DTC

Important: If the last failure was during a non-typical driving condition, the MIL may remain ON longer than the three ignition cycles. Review the Freeze Frame/Failure Records for the last failure conditions.

- The PCM turns the MIL OFF after three consecutive ignition cycles that the diagnostic runs and does not fail within the same conditions that the DTC last failed.
- A History DTC clears after forty consecutive warm-up cycles, if this or any other emission related diagnostic does not report any failures.
- A last test failed (Current DTC) clears when the diagnostic runs and does not fail.
- Use a scan tool in order to clear the MIL/DTC.

Diagnostic Aids

Important:

- Remove any debris from the PCM connector surfaces before servicing the PCM. Inspect the PCM connector gaskets when diagnosing/replacing the PCM. Ensure that the gaskets are installed correctly. The gaskets prevent contaminant intrusion into the PCM.
- For any test that requires probing the PCM or component harness connectors, use the *J 35616-A* connector test adapter kit. Using this kit prevents any damage to the harness connector terminals. Refer to *Using Connector Test Adapters* in Wiring Systems.

The following may cause a misfire:

- Running the vehicle out of fuel causes sufficient misfire to set DTC P0300. A vehicle that is out of fuel may have DTC P0461 also set.
- A restricted fuel filter can cause sufficient misfire to set DTC P0300. Refer to *Fuel System Diagnosis*.
- A misfire may not be apparent at idle. The misfire may only occur above idle under a load. Road test the vehicle and monitor the misfire current counters.
- Observe, if more than one cylinder is mis-firing, the scan tool may only display one cylinder mis-firing. This will not be apparent until the repair is completed. Also, if an ignition coil/module ground circuit is open for one side of the engine, the scan tool may only display 2 or 3 cylinders mis-firing. Inspect the ground circuit for the ignition coil/modules on the cylinder bank of the engine that has more then one cylinder mis-firing.
- Excessive vibration from sources other than the engine could cause a misfire DTC. The following are possible sources of vibration:
  - Variable thickness brake rotor
  - Drive shaft not balanced
  - Certain rough road conditions

For an intermittent condition, refer to *Symptoms*.

Test Description

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

2. A misfire may not be apparent at idle. The misfire may only occur above idle or under a load. Road test the vehicle and monitor the Misfire Current Counters.

   The Misfire Current Counters will not increment if certain DTCs set at the same time or after DTC P0300 sets. Refer to conditions for running DTC P0300 for applicable DTC list.

   If more than one cylinder is misfiring, the Misfire Current Counters may increment for only one cylinder. Example: Cylinders 1 and 8 are both misfiring, yet only cylinder 8 increments on the Misfire Current Counter.

   If one injector fuse open, only two or three Misfire Current Counters may increment for the corresponding side of the engine.

   Wetting down the secondary ignition system with water from a spray bottle may help locate damaged or deteriorated components. Look/listen for arcing or misfiring as you apply the water.

   If the Misfire Current Counters are incrementing and there is no apparent misfire, an erratic CKP sensor signal could be the cause. Perform the diagnostic table for DTC P0335 first if this condition is suspected.

   If a misfire is present and you suspect a fuel control condition, force the fuel system into Open Loop using the scan tool and allow the engine to run for a few minutes. If this eliminates the misfire, refer to any fuel control related DTCs which are set. If no other DTCs are set, refer to the Engine Scan Tool Data List.

4. The cylinder with the more significant misfire may cause another cylinders counter to increment only by a small amount.

10. If the engine misfire moves with the spark plug, this is good indication that you should replace the spark plug.

12. If you cannot locate a fuel system condition, refer to Engine Mechanical–5.7L. An engine mechanical condition can cause a spark plug to gas foul. Inspect for loose rockers, collapsed lifters or worn camshaft lobes.

17. If the customers concern is the MIL is flashing, this indicates that a Catalyst Misfire has occurred. Drive the vehicle in the conditions to run the catalyst diagnostic.

DTC P0300 Engine Misfire Detected

Step	Action	Value(s)	Yes	No
1	Did you perform the Powertrain On-Board Diagnostic (OBD) System Check?	—	*Go to Step 2*	Go to *A Powertrain On Board Diagnostic (OBD) System Check*
2	**Important:** • You must perform the CKP System Variation Learn Procedure before proceeding with this diagnostic table. Refer to *CKP System Variation Learn Procedure.* • Ensure that the ABS and Traction Control systems are functioning properly before proceeding with this diagnostic. • If any DTCs are set, refer to those DTCs before proceeding with this diagnostic. Monitor all the Misfire Current Counters on the misfire data list (There are a total of 8 counters, one counter per cylinder) using the scan tool. Are any of the Misfire Current Counters incrementing?	—	*Go to Step 4*	*Go to Step 3*
3	1. Turn ON the ignition leaving the engine OFF. 2. Review the Freeze Frame and/or Failure Records data for this DTC and observe the parameters. 3. Turn OFF the ignition for 15 seconds. 4. Start the engine. 5. Operate the vehicle within the conditions required for this diagnostic to run, and as close to the conditions recorded in Freeze Frame/Failure Records as possible. Special operating conditions that you need to meet before the PCM will run this diagnostic, where applicable, are listed in Conditions for Running the DTC. 6. Select the Diagnostic Trouble Code (DTC) option. Does the scan tool indicate that this diagnostic failed this ignition?	—	*Go to Step 4*	Go to Diagnostic Aids
4	Is only one Misfire Counter incrementing?	—	*Go to Step 6*	*Go to Step 5*

DTC P0300 Engine Misfire Detected (cont'd)

Step	Action	Value(s)	Yes	No
5	1. Visually/physically inspect the following items: • Accessory drive belt and pulleys for damage or misalignment. Refer to *Symptoms - Drive Belt* in Engine Mechanical 5.7L. • Vacuum hoses for splits, kinks and proper connections. Refer to *Emission Hose Routing Diagram*. • Throttle body and intake manifold for vacuum leaks • Crankcase ventilation valve and/or system for vacuum leaks. Refer to *Crankcase Ventilation System Description*. • PCM grounds for being clean and secure. Refer to *Ground Distribution Schematics* in Wiring Systems. • Verify that all injector harness connectors are connected to the proper injector/cylinder. • Inspect the injector and Ignition Control fuses for being open. If you find an open fuse, locate and repair the shorted circuit. Refer to *Wiring Repairs* in Wiring Systems. • Test for low fuel pressure or restricted fuel flow. Refer to *Fuel System Diagnosis*. • Inspect for a restricted exhaust. Refer to *Restricted Exhaust* in Engine Exhaust. • Fuel contamination. Refer to *Alcohol/Contaminants-in-Fuel Diagnosis*. 2. If you find a condition, repair as necessary. Did any of the above tests isolate a condition requiring a repair?	—	*Go to Step 17*	*Go to Step 6*
6	1. Turn OFF the ignition. 2. Disconnect the injector that corresponds to the Misfire Current Counter(s) that was incrementing. 3. Connect the *J 34730-2C* injector test lamp to the injector electrical connector. 4. Idle the engine. Is the injector test lamp flashing?	—	*Go to Step 7*	Go to *DTC P0200 Injector Control Circuit*
7	1. Turn OFF the ignition. 2. Reconnect the injector harness electrical connector. 3. Disconnect the ignition wire(s) from the spark plug that corresponds to the Misfire Current Counter(s) that was incrementing. 4. Install *J 26792* spark tester to ground. 5. Start the engine. Does the spark jump the tester gap and is the spark consistent?	—	*Go to Step 9*	*Go to Step 8*
8	1. Remove the ignition wire for the cylinder that is misfiring. 2. Measure the resistance of the ignition wire using the DMM. Is the ignition wire resistance less than the specified resistance?	700Ω	Go to *Electronic Ignition (EI) System Diagnosis*	*Go to Step 16*
9	1. Remove the spark plug(s) from the cylinder that indicated a misfire. Refer to *Spark Plug Replacement* in Engine Electrical. 2. Visually inspect the spark plug(s). Refer to *Spark Plug Visual Diagnosis* in Engine Electrical. Does the spark plug appear to be OK?	—	*Go to Step 10*	*Go to Step 11*

DTC P0300 Engine Misfire Detected (cont'd)

Step	Action	Value(s)	Yes	No
10	**Important:** If the Injector Coil Test Procedure does not isolate the condition, refer to *Base Engine Misfire Diagnosis* in Engine Mechanical–5.7L. 1. Swap the suspected spark plug with another cylinder that is operating properly. 2. Operate the vehicle under the same conditions that the misfire occurred. Did the misfire move with the spark plug?	—	*Go to Step 15*	Go to *Fuel Inj Coil Test - ECT Between 10-35 Degrees C (50-95 Degrees F)*
11	Are the spark plugs oil or coolant fouled.	—	Go to *Base Engine Misfire Diagnosis* in Engine Mechanical–5.7L	*Go to Step 12*
12	**Important:** If the Fuel System is OK, refer to *Base Engine Misfire Diagnosis* in Engine Mechanical–5.7L. Are the spark plugs gas fouled?	—	Go to *Fuel System Diagnosis*	*Go to Step 13*
13	**Important:** If the Injector Coil Test Procedure does not isolate the condition, refer to *Base Engine Misfire Diagnosis* in Engine Mechanical–5.7L. Do the spark plugs show any signs of being cracked, worn, or improperly gapped?	—	*Go to Step 14*	Go to *Fuel Inj Coil Test - ECT Between 10-35 Degrees C (50-95 Degrees F)*
14	1. Replace or re-gap spark plugs. 2. If improper gap is found, be sure to re-gap spark plugs using a wire type gauge. Is the action complete?	—	*Go to Step 17*	—
15	Replace the faulty spark plug(s). Refer to *Spark Plug Replacement* in Engine Electrical. Is the action complete?	—	*Go to Step 17*	—
16	Replace the faulty ignition wire(s). Refer to *Spark Plug Wire Harness Replacement (5.7 L)* in Engine Electrical. Is the action complete?	—	*Go to Step 17*	—
17	Was the customers concern that the MIL was flashing?	—	Go to *DTC P0420 Catalyst System Low Efficiency Bank 1* or *DTC P0430 Catalyst System Low Efficiency Bank 2*	*Go to Step 18*
18	1. Select the Diagnostic Trouble Code (DTC) option and the Clear DTC Information option using the scan tool. 2. Idle the engine at the normal operating temperature. 3. Select the Diagnostic Trouble Code (DTC) option. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text, if applicable. Does the scan tool indicate that this test ran and passed?	—	*Go to Step 19*	*Go to Step 2*
19	Select the Capture Info option and the Review Info option using the scan tool. Does the scan tool display any DTCs that you have not diagnosed?	—	Go to the applicable DTC table	System OK