DTC P0341

Circuit Description

The camshaft position (CMP) sensor is a sensor designed to detect changes in a magnetic field. The control module supplies the CMP sensor with the following circuits:

- A 12-volt reference circuit
- A low reference circuit
- A signal circuit

The CMP sensor produces a magnetic field whenever the ignition is ON. The CMP sensor is mounted near a reluctor wheel that is attached to the distributor shaft. When the distributor shaft rotates, or when the engine is cranking or running, the reluctor wheel changes the magnetic field. The CMP sensor converts each change in the magnetic field into a PULSE. The number of teeth on the reluctor wheel determines how many pulses the CMP sensor detects per camshaft rotation. The control module uses the CMP sensor signal in order to calculate the correct timing for sequential fuel injection. If the powertrain control module (PCM) does not detect the CMP signal while the engine is running, this diagnostic trouble code (DTC) will set.

Conditions for Running the DTC

The engine is running.

Conditions for Setting the DTC

The CMP sensor reference pulse is not detected once every 2 crankshaft revolutions.

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.

Diagnostic Aids

- If the condition is intermittent, refer to Intermittent Conditions .
- Electromagnetic interference (EMI) from the ignition coil or from the spark plug wires could cause a faulty signal condition in the CMP signal circuit to the PCM. Ensure that the routing of the CMP circuitry is correct.

Test Description

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

8. The CAM signal on the scan tool should change each time the signal circuit is touched.

9. If the fuse opens in the jumper wire, there is a short to ground on the signal circuit.

Step	Action	Value(s)	Yes	No
Schematic Reference: Engine Controls Schematics				
1	Did you perform the Diagnostic System Check-Engine Controls?	--	Go to Step 2	Go to Diagnostic System Check - Engine Controls
2	1. Install a scan tool. 2. Start the engine. 3. Monitor the CAM signal input high to low and low to high transition parameter using the scan tool. Does the scan tool parameter increment?	--	Go to Step 3	Go to Step 4
3	1. Observe the Freeze Frame/Failure Records data 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 as specified in the supporting text or as close to the Freeze Frame/Failure Records data that you observed. Does the DTC fail this ignition?	--	Go to Step 4	Go to Diagnostic Aids
4	1. Turn OFF the ignition. 2. Disconnect the CMP sensor connector. 3. Turn ON the ignition, with the engine OFF. 4. Connect a DMM between the 12-volt reference circuit of the CMP sensor and a good ground. Does the voltage measure near the specified value?	B+	Go to Step 6	Go to Step 5
5	1. Turn OFF the ignition. 2. Disconnect the PCM. 3. Test the 12-volt reference circuit of the CMP	--	Go to Step 16	Go to Step 12

	sensor for an open. Refer to Wiring Repairs in Wiring Systems. Did you find and correct the condition?			
6	1. Connect a test lamp to battery positive voltage. 2. Touch the CMP sensor low reference circuit. Does the test lamp illuminate?	--	Go to Step 8	Go to Step 7
7	1. Turn OFF the ignition. 2. Disconnect the PCM. 3. Test the low reference circuit of the CMP sensor for an open or high resistance. Refer to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	--	Go to Step 16	Go to Step 12
8	1. Start the engine. 2. Monitor the CAM signal high to low and low to high parameter on the scan tool. 3. Connect a 5-amp fused jumper wire to battery positive voltage and monetarily touch the signal circuit 5 times for a duration of 1 second each. Does the cam signal high to low and low to high parameter change each time the signal circuit is touched?	--	Go to Step 14	Go to Step 9
9	Did the fuse in the jumper wire open?	--	Go to Step 11	Go to Step 10
10	Test the signal circuit of the CMP sensor for a short to voltage or an open or high resistance. Refer to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	--	Go to Step 16	Go to Step 12
11	Test the signal circuit of the CMP sensor for a short to ground. Refer to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	--	Go to Step 16	Go to Step 12
12	Inspect for poor connections at the PCM. Refer to Testing for Intermittent and Poor Connections in Wiring Systems. Did you find and correct the condition?	--	Go to Step 16	Go to Step 13
13	Replace the PCM. Refer to Powertrain Control Module (PCM) Replacement . Did you complete the replacement?	--	Go to Step 16	--
14	Inspect for poor connections at the CMP sensor. Refer to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	--	Go to Step 16	Go to Step 15

15	Replace the CMP sensor. Refer to Camshaft Position (CMP) Sensor Replacement . Did you complete the replacement?	--	Go to Step 16	--
16	1. Use the scan tool in order to clear the DTCs. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC run and pass?	--	Go to Step 17	Go to Step 2
17	With a scan tool, observe the stored information, Capture Info. Does the scan tool display any DTCs that you have not diagnosed?	--	Go to Diagnostic Trouble Code (DTC) List	System OK