DTC P1258 Engine Coolant Overtemperature - Protection Mode Active

Circuit Description

In order to reduce the engine temperature the PCM has the ability to disable a number of fuel injectors during an engine over temperature condition. The PCM considers the engine over temperature whenever the ECT reaches a predetermined temperature. This DTC sets in order to show that the PCM detected an over temperature condition and that the system engaged the protection mode.

Conditions for Running the DTC

- DTCs P0117, P0118, P0125 are not set.
- The engine is running.

Conditions for Setting the DTC

- The engine coolant temperature is more than 132°C (270°F).
- The above conditions present for more than 10 seconds.

Action Taken When the DTC Sets

- The PCM illuminates the Malfunction Indicator Lamp (MIL) when the diagnostic runs and fails.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM stores this information in the Freeze Frame and/or the Failure Records.
- The PCM alternately disables four fuel injectors.

Conditions for Clearing the MIL/DTC

- The PCM turns the malfunction indicator lamp (MIL) OFF after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A last test failed (current DTC) clears when the diagnostic runs and does not fail.
- A History DTC clears after 40 consecutive warm-up cycles, if this or any other emission related diagnostic does not report any failures.
- 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 contaminate intrusion into the PCM.
- For any test that requires probing the PCM or a component harness connector, use the *J 35616-A* connector test adapter kit. Using this kit prevents damage to the harness/component terminals. Refer to *Using Connector Test Adapters* in Wiring Systems.

The PCM enables the Engine Coolant Over temperature mode when coolant temperature exceeds 132°C (270°F). Engine damage still could occur if the customer operates the vehicle too long in an overheat condition. Ensure no engine mechanical conditions exists after the overheat condition is repaired.

If an overheating condition exists, repair the overheat condition and change the engine oil and filter. Refer to *Engine Overheating* in Engine Cooling, and *Engine Oil and Oil Filter Change* in Engine Mechanical 5.7L.

For an intermittent condition, refer to *Symptoms*.

Test Description

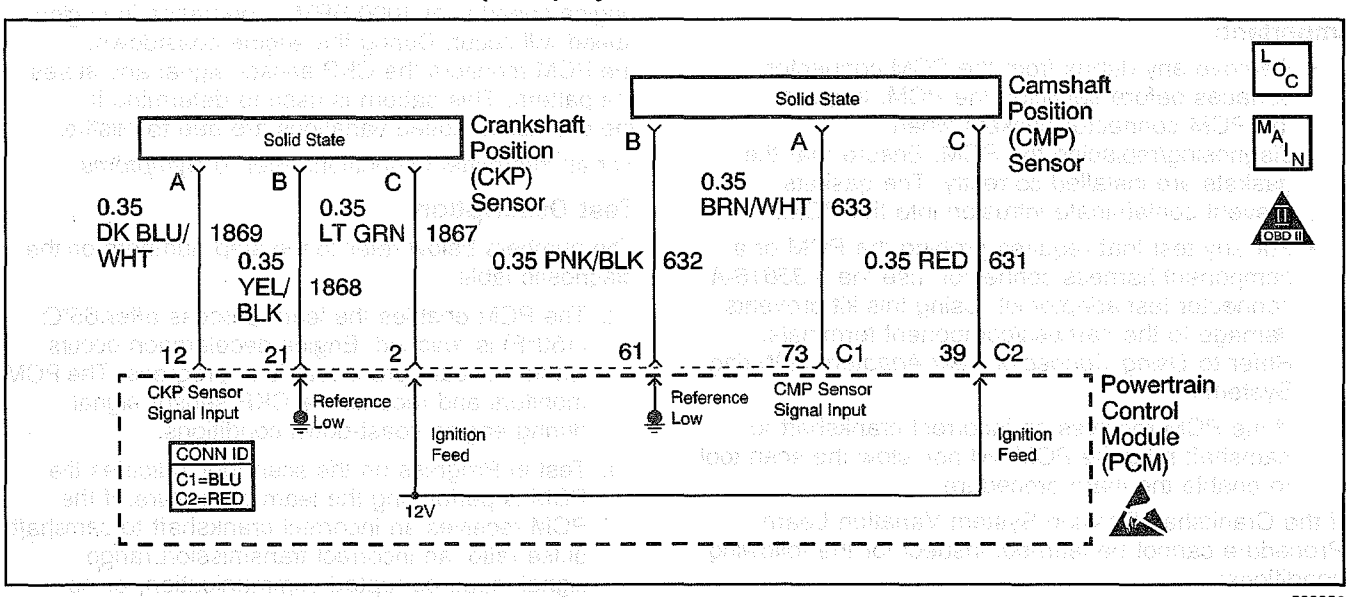
The numbers below refer to the step numbers on the diagnostic table.

1. A cooling system over heating condition will enable the engine protection mode.

DTC P1258 Engine Coolant Overtemperature - Protection Mode Active

Step	Action	Value(s)	Yes	No
1	Did you perform the Powertrain On-Board Diagnostic (OBD) System Check?	—	Go to *Engine Overheating* in Engine Cooling	Go to *A Powertrain On Board Diagnostic (OBD) System Check*

DTC P1336 Crankshaft Position (CKP) System Variation Not Learned



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Circuit Description

The Crankshaft Position (CKP) sensor sends pulses to the PCM as the reluctor wheel teeth rotate past the CKP sensor. The PCM uses the CKP pulses to synchronize the ignition and fuel injector operation, and to time the interval between each CKP pulse. The PCM determines when an excessive change in crankshaft speed occurs by comparing each new time interval with the previous interval. A misfire causes an unexpected change in the crankshaft speed. A certain amount of acceleration/deceleration is expected between each firing stroke, but if the crankshaft speed changes more than an expected amount, the PCM interprets this as a misfire. The interval between CKP sensor pulses is extremely small. At high engine speeds, slight variations in the following components make misfire detection difficult:

- Crankshaft
- Reluctor wheel
- CKP sensor

The PCM learns variations during the Crankshaft Position System Variation Learning Procedure. The PCM compensates for these variations when performing detect misfire calculations. Only a scan tool can command the PCM to perform the Crankshaft Position System Variation Learning Procedure again.

Perform the learning procedure after the following actions:

- A PCM replacement
- Any operation or repair involving the crankshaft, the CKP sensor, or the CKP sensor to reluctor wheel gap relationship.
- An engine replacement.
- The ignition switch is in the ON position until the battery is drained.

Important: A PCM power disconnect with the ignition ON may erase the stored pulse value and set the DTC P1336.

Disconnecting the PCM will not erase the learned Crankshaft Position System Variation as long as the ignition switch is in the OFF position.

Important: Reprogramming the PCM does not require running the Crankshaft Position System Variation Learn Procedure unless the PCM is new or from another vehicle.

A DTC P1336 sets if the Crankshaft Position System Variation is not within an acceptable range, or can not be learned.

Conditions for Running the DTC

There are no crankshaft position (CKP) or camshaft position (CMP) sensor DTCs.

Conditions for Setting the DTC

The PCM has not learned the Crankshaft Position System Variation.

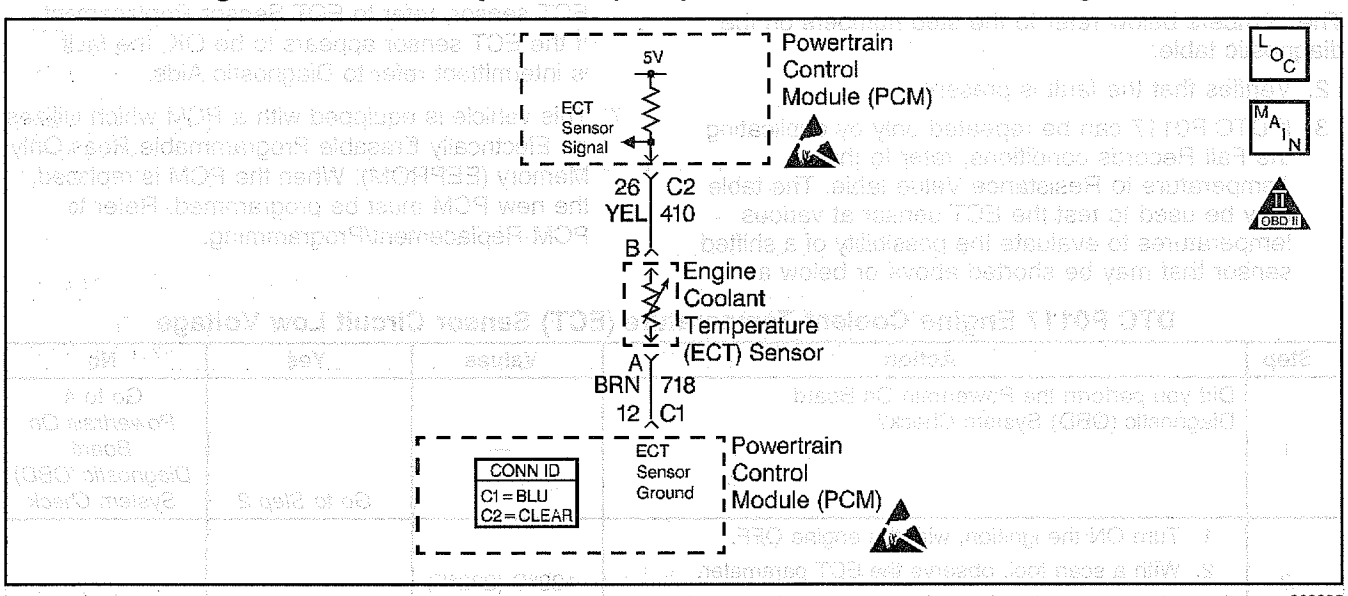
Action Taken When the DTC Sets

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

Conditions for Clearing the MIL/DTC

- The PCM turns the malfunction indicator lamp (MIL) OFF after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A last test failed (current DTC) clears when the diagnostic runs and does not fail.
- A History DTC clears after 40 consecutive warm-up cycles, if this or any other emission related diagnostic does not report any failures.
- Use a scan tool in order to clear the MIL/DTC.

DTC P0117 Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage



Circuit Description

The engine coolant temperature (ECT) sensor is a thermistor mounted in the engine coolant stream. The PCM applies a voltage (about 5.0V) through a pull up resistor to the ECT signal circuit. When the engine coolant is cold, the sensor (thermistor) resistance is high, therefore the PCM will measure a high signal voltage. As the engine coolant warms, the sensor resistance becomes less, and the ECT signal voltage measured at the PCM drops. With a fully warmed up engine, the ECT signal voltage should measure about 1.5 to 2.0V.

Conditions for Running the DTC

The engine is running.

Conditions for Setting the DTC

The ECT indicates an engine coolant temperature more than 140°C (284°F).

Action Taken When the DTC Sets

- The PCM will illuminate the malfunction indicator lamp (MIL) during the second consecutive trip in which the diagnostic test has been run and failed.
- The PCM will store conditions which were present when the DTC set as Freeze Frame/Failure Records data.

Conditions for Clearing the MIL/DTC

- The PCM will turn the MIL OFF during the third consecutive trip in which the diagnostic has been run and passed.
- The History DTC will clear after 40 consecutive warm-up cycles have occurred without a malfunction.
- The DTC can be cleared by using a scan tool.

Diagnostic Aids

Inspect for the following:

Important: Remove any debris from the connector surfaces before servicing a component. Inspect the connector gaskets when diagnosing or replacing a component. Ensure that the gaskets are installed correctly. The gaskets prevent contaminate intrusion.

- Poor terminal connection.

  Inspect the harness connectors for backed out terminals, improper mating, broken locks, improperly formed or damaged terminals, and faulty terminal to wire connection. Use a corresponding mating terminal to test for proper tension. Refer to *Testing for Intermittent and Poor Connections* and *Connector Repairs* in Wiring Systems.
- Damaged harness.

  Inspect the wiring harness for damage. If the harness appears to be OK, observe the display on the scan tool while moving connectors and wiring harnesses related to the sensor. A change in the display may indicate the location of the fault. Refer to *Wiring Repairs* in Wiring Systems.
- Inspect the PCM and the engine grounds for clean and secure connections.

If the DTC is determined to be intermittent, reviewing the Failure Records can be useful in determining when the DTC was last set.

Test Description

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

2. Verifies that the fault is present.
3. If DTC P0117 can be repeated only by duplicating the Fail Records conditions, refer to the Temperature to Resistance Value table. The table may be used to test the ECT sensor at various temperatures to evaluate the possibility of a shifted sensor that may be shorted above or below a certain temperature. If this is the case, replace the ECT sensor, refer to ECT Sensor Replacement. If the ECT sensor appears to be OK, the fault is intermittent refer to Diagnostic Aids.
7. This vehicle is equipped with a PCM which utilizes an Electrically Erasable Programmable Read Only Memory (EEPROM). When the PCM is replaced, the new PCM must be programmed. Refer to PCM Replacement/Programming.

DTC P0117 Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage

Step	Action	Values	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	1. Turn ON the ignition, with the engine OFF. 2. With a scan tool, observe the ECT parameter. Does the scan tool indicate the parameter is more than the specified value?	139°C (282°F)	*Go to Step 4*	*Go to Step 3*
3	Operate vehicle within Fail Records conditions. Does scan tool indicate DTC P0117 failed this ignition?	—	*Go to Step 4*	Go to Diagnostic Aids
4	1. Turn OFF the ignition. 2. Disconnect the ECT sensor. 3. Turn ON the ignition, with the engine OFF. 4. With a scan tool, observe the ECT parameter. Does the scan tool indicate the parameter is less than the specified value?	–38°C (–36°F)	*Go to Step 6*	*Go to Step 5*
5	Test the ECT sensor signal circuit for a short to ground or a short to the sensor ground circuit. Refer to *Circuit Testing* and *Wiring Repairs* in Wiring Systems. Did you find and correct the condition?	—	*Go to Step 8*	*Go to Step 7*
6	Replace the ECT sensor. Refer to *ECT Sensor Replacement.* Did you complete the replacement?	—	*Go to Step 8*	—
7	**Important:** The replacement PCM must be programmed. Replace the PCM. Refer to *PCM Replacement/Programming.* Did you complete the replacement?	—	*Go to Step 8*	—
8	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Fail Record conditions. Does the DTC reset?	—	*Go to Step 2*	System OK