

P0118 runs continuously once the above condition is met

Circuit Description

The engine coolant temperature (ECT) sensor is a variable resistor that measures the temperature of the engine coolant. The engine control module (ECM) supplies 5 volts to the ECT signal circuit and supplies a ground to the low reference circuit. If the ECM detects a high ECT signal voltage, which is a low temperature indication, this DTC sets. The following table illustrates the difference between temperature, resistance, and voltage:

		ECT Signal
ECT	ECT Resistance	Voltage
Cold	High	High
Warm	Low	Low

DTC Descriptor

This diagnostic procedure supports the following DTC. DTC P0118 Engine Coolant Temperature (ECT) Sensor Circuit High Voltage

Conditions for Running the DTC

- The ignition is ON or the engine is operating.
- DTC P0118 runs continuously once the above condition is met.

Conditions for Setting the DTC

The ECM detects that the engine coolant temperature is less than $\sim 42^{\circ}\text{C}$ ($\sim 43.6^{\circ}\text{F}$) for more than 3 seconds. The scan tool is limited to $\sim 40^{\circ}\text{C}$ ($\sim 40^{\circ}\text{F}$), so the diagnostic procedure uses $\sim 39^{\circ}\text{C}$ ($\sim 38^{\circ}\text{F}$) to determine if there is an ECT condition.

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 4 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

- Use the J 35616-C Connector Test Adapter Kit for any test that requires probing the ECM harness connector or a component harness connector.
- The lower connector of the ECM is connector C1 and the upper connector of the ECM is connector C2. Refer to Engine Controls Component Views.
- Use the Temperature vs Resistance table in order to test the ECT sensor at various temperature levels in order to evaluate the possibility of a skewed sensor. A skewed sensor could result in a driveability condition. If the engine has sat overnight, the engine coolant temperature and the intake air temperature values should display within a few degrees. If the temperatures are not within 3°C (5°F), refer to Temperature vs Resistance - Engine Coolant Temperature (ECT) Sensor
- After starting the engine, the ECT should rise steadily to about 90°C (194°F) then stabilize when the thermostat opens.
- For an intermittent condition, refer to Intermittent Conditions.

Test Description

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

6. This step is testing the low reference circuit for a short to voltage or for a low reference circuit that is open. If the low reference circuit within the ECM is open or if the low reference circuit is open between the ECM and the splice, a voltage of 3–5 volts will be measured on the DMM.
7. This step isolates if there is a circuit that is shorted to voltage or if the low reference circuit is open internally or externally of the ECM. If there is no voltage on the low reference circuit after disconnecting all the sensors, the low reference circuit is open.

DTC P0118

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Engine Control Module (ECM) 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	1. Turn ON the ignition, with the engine OFF. 2. Observe the ECT sensor parameter with a scan tool. Is the temperature less than the specified value?	-39°C (-38°F)	Go to Step 4	Go to Step 3
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 Diagnostic Aids

Step	Action	Values	Yes	No
4	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the engine coolant temperature (ECT) sensor. 3. Turn ON the ignition, with the engine OFF. 4. Measure the voltage from the signal circuit of the ECT sensor to the engine control module (ECM) housing with a DMM. <p>Is the voltage within the specified range?</p>	4.8–5.2 V	Go to Step 5	Go to Step 8
5	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Remove the ECM/TCM fuse from the underhood electrical center. <p>Notice: Do NOT use a test lamp to test the continuity of the circuit. Damage to the control module may occur due to excessive current draw.</p> <ol style="list-style-type: none"> 3. Measure the resistance between the low reference circuit of the ECT sensor and the ECM housing with a DMM. <p>Is the resistance less than the specified value?</p>	5 W	Go to Step 12	Go to Step 6
6	<ol style="list-style-type: none"> 1. Install the ECM/TCM fuse into the underhood electrical center. 2. Turn ON the ignition, with the engine OFF. 3. Measure the voltage between the low reference circuit of the ECT sensor and the ECM housing with a DMM. Refer to Circuit Testing in Wiring Systems. <p>Is the voltage more than the specified value?</p>	1.0 V	Go to Step 7	Go to Step 14

Step	Action	Values	Yes	No
7	<p>1. Turn OFF the ignition.</p> <p>2. Disconnect all components that share the low reference circuit.</p> <p>3. Turn ON the ignition, with the engine OFF.</p> <p>4. Measure the voltage between the low reference circuit of the ECT sensor and the ECM housing with a DMM. Refer to Circuit Testing on in Wiring Systems.</p> <p>Is the voltage more than the specified value?</p>	1.0 V	Go to Step 15	Go to Step 11
8	<p>Is the voltage more than the specified value?</p>	6 V	Go to Step 9	Go to Step 10
9	<p>Important: The ECT sensor may be damaged if the circuit is shorted to battery positive voltage. Test the signal circuit between the ECT sensor and the ECM for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?</p>	—	Go to Step 18	Go to Step 13
10	<p>Test the signal circuit between the ECT sensor and the ECM for an open or for high resistance. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?</p>	—	Go to Step 18	Go to Step 13
11	<p>Test the low reference circuit between the ECT sensor and the ECM for an open or for high resistance. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?</p>	—	Go to Step 18	Go to Step 13

Step	Action	Values	Yes	No
12	Test for an intermittent and for a poor connection at the ECT sensor. Refer to Testing for Intermittent and Poor Connections and Connector Repairs in Wiring Systems. Did you find and correct the condition?	—	Go to Step 18	Go to Step 16
13	Test for an intermittent and for a poor connection at the ECM. Refer to Testing for Intermittent and Poor Connections and Connector Repairs in Wiring Systems. Did you find and correct the condition?	—	Go to Step 18	Go to Step 17
14	Repair the open in the low reference circuit of the ECT sensor between the splice and the ECT sensor. Refer to Wiring Repairs in Wiring Systems. Did you complete the repair?	—	Go to Step 18	—
15	Important: The control module and/or the ECT sensor may be damaged if the circuit is shorted to battery positive voltage. Repair the short to voltage in the low reference circuit of the ECT sensor. Refer to Wiring Repairs in Wiring Systems. Did you complete the repair?	—	Go to Step 18	—
16	Replace the ECT sensor. Refer to Engine Coolant Temperature (ECT) Sensor Replacement. Did you complete the replacement?	—	Go to Step 18	—
17	Replace the ECM. Refer to Engine Control Module (ECM) Replacement on page 6-1648. Did you complete the replacement?	—	Go to Step 18	—

Step	Action	Values	Yes	No
18	<ol style="list-style-type: none">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

LAUNCH