P0119: ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT INTERMITTENT

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$50-$200**
Can I Still Drive?	:	**Yes** (Short-term only)

What Does The P0119 Code Mean?

When I connect my code reader to a vehicle and find a stored P0119, I know that the powertrain control module (PCM) has detected an intermittent signal from the engine coolant temperature (ECT) sensor.

The PCM monitors ECT using a reference circuit (typically five-volts) that is completed by the ECT sensor. If separate ECT sensors are used (one for the PCM and another for the temperature gauge), the sensor itself is usually of a two-wire design. The first wire carries the five-volt reference and the second wire is the ground wire.

The ECT sensor is usually a negative coefficient sensor, which means that as sensor temperature is increased, resistance decreases. The variation in sensor resistance translates into fluctuations in circuit voltage that are recognized by the PCM as changes in ECT. If the PCM and the temperature gauge use the same ECT sensor, then the sensor will be of a three-wire design.

It reacts to temperature the same way as the two-wire sensor but one wire feeds an input signal to the gauge and one wire feeds an input signal to the PCM. Simple, huh?

Although ECT location will differ between manufacturers, it will always be threaded directly into an engine coolant passage. Many automakers place the ECT sensor in the cylinder block or cylinder head, others thread it into one of the intake manifold coolant passages, and some locate it in the

thermostat housing.

With the ECT sensor threaded into the engine, the tip of the sensor, which contains the thermistor, protrudes into the coolant passage. With the engine running, coolant should constantly flow across the tip. As engine coolant increases in temperature, so does the thermistor inside of the ECT sensor.

The PCM uses engine temperature to help calculate fuel delivery, idle speed, and ignition timing. The ECT sensor input is critical because the engine control system must function differently as engine temperature changes from ambient temperature to more than 220-degrees Fahrenheit. The PCM also uses the ECT sensor input to initiate electric cooling fan operation.

If the PCM receives input signals from the ECT sensor that are erratic or intermittent, during a set period of time and under certain circumstances, a code P0119 will be stored and a malfunction indicator lamp (MIL) may be illuminated.

What Are The Symptoms Of The P0119 Code?

Symptoms of a P0119 code may include:

- Rough engine idle on cold start
- Hesitation or stumble on acceleration
- Rich exhaust smell, especially on cold start
- Possible engine overheating
- Electric cooling fan running constantly or not running at all

What Are The Potential Causes Of The P0119 Code?

Possible causes for this engine code include:

- Low engine coolant level
- Faulty thermostat
- Bad ECT sensor
- Open or shorted wiring and/or connectors in ECT sensor circuit

How Can You Fix The P0119 Code?

A good starting point is always to check for technical service bulletins (TSB) for your particular vehicle. Your issue may be a known issue with a known fix put out by the manufacturer and can save you time and money during diagnosis.

When faced with diagnosing a code P0119, I like to have a suitable diagnostic scanner, a digital volt/ohmmeter (DVOM), an infrared thermometer, and a reliable vehicle information source (such as All Data DIY) on hand.

I like to connect the scanner to the vehicle diagnostic connector, retrieve stored trouble codes and freeze frame data, and write this information down, to begin my diagnosis. Now, clear the codes.

Next, I would perform a visual inspection of ECT sensor wiring and connectors. Repair or replace burnt or damaged wiring and/or connectors as required and retest the system. If the P0119 is not immediately reset, it may be intermittent. Operate the vehicle normally until the PCM enters OBD-II readiness mode or the code is reset. If the P0119 is now reset, continue with your diagnosis.

Reconnect the scanner and bring up the appropriate data stream. Narrow the data stream so that only pertinent data is shown and data response will be much faster. Observe the ECT sensor temperature and voltage while looking for glitches or inconsistencies. These will be seen by the PCM as intermittent ECT sensor circuit signals.

If there are inconsistencies, inspect the ECT sensor connector for signs of corrosion. Check wiring that is routed near hot exhaust manifolds/headers (intermittent short to ground) and loose or broken connector pins at the ECT sensor. Repair or replace defective components as required.

Low engine coolant may also contribute to a code P0119 being stored. With the engine cool, remove the high pressure cap and make sure that the engine is full of the recommended coolant. If the engine coolant level is down by more than several quarts, inspect the engine for a coolant leak. A cooling system pressure tester may be helpful for this. Repair leaks as necessary, refill the system with suitable coolant, and retest the system.

If the ECT sensor is observed (in the scanner data stream display) as being extremely low or high, suspect that it is defective. Using the DVOM, test ECT sensor resistance and compare your findings with manufacturer's recommendations. Replace the sensor if it fails to comply.

If the ECT sensor seems slightly low or high, use the infrared thermometer to obtain actual ECT. Compare the ECT sensor signal reflected in the data stream with actual ECT and discard the sensor if the two do not coincide.

Additional diagnostic notes:

- Make sure that the engine is full of coolant, and the thermostat is operating properly, before attempting to diagnose a P0119
- Other ECT sensor codes, as well as engine over temp codes, may accompany this type of code
- Diagnose and repair other ECT related codes prior to diagnosing the P0119

Other ECT sensor diagnostic codes include P0115, P0116, P0117, and P0118.

Severity Description

Because the ECT sensor plays such an important role in engine drivability, the code P0119 should

be addressed urgently.

Reference Sources

Diagnostic Trouble Code (DTC) Charts and Descriptions for P0119 - Page 25.