

P008F: ENGINE COOLANT TEMPERATURE/FUEL TEMPERATURE CORRELATION

OVERVIEW

Severity	:	Medium
DIY Difficulty Level	:	Intermediate
Repair Cost	:	\$150 - 600
Can I Still Drive?	:	Yes (Short-term only)

What Does The P008F Code Mean?

When your OBD-II equipped vehicle exhibits a service engine soon lamp and a code P008F is stored, it means that the powertrain control module (PCM) has detected a discrepancy in the correlating signals between perceived engine coolant temperature (ECT) and fuel temperature.

Engine coolant temperature and fuel temperature are typically monitored in comparison only when the engine is at ambient temperature.

ECT sensors are composed of a thermal resistor that is dipped in a hard resin and sealed in a metal or plastic housing. Brass is the most common metal used as ECT sensor housing material. The ECT housing is designed so that it may be threaded into a coolant passage in the engine intake manifold, cylinder head, or block.

As warm coolant passes through the passages and across the ECT sensor, the level of thermal resistance in the ECT decreases. When engine coolants decreases in temperature, resistance increases and ECT sensor circuit voltage is reduced as a result. These fluctuations in resistance (which result in voltage variations) are interpreted by the PCM as changes in engine coolant temperature. ECT sensor input data is critical in calculating fuel delivery and ignition timing strategy.

The fuel temperature sensor also uses a thermal resistor but it is of the low voltage variety. It is

most often integrated into the fuel level sending unit and provides the PCM with a voltage signal that reflects fuel temperature whenever the ignition is in the ON position. Fuel temperature can be especially crucial to drivability in vehicle applications which utilize a diesel engine. Fuel temperature is also more of a concern in extremely cold climates.

A code P008F will be stored and a malfunction indicator lamp (MIL) may be illuminated if the PCM detects a discrepancy (between the ECT sensor and the fuel temperature sensor) which varies by more than the maximum allowable parameters over a set period of time and under a certain set of circumstances.

What Are The Symptoms Of The P008F Code?

Symptoms of a P008F engine code may include:

- Reduced engine performance
- Diminished fuel efficiency
- Excessively rich exhaust

What Are The Potential Causes Of The P008F Code?

Causes for this engine code may include:

- Faulty ECT sensor
- Bad fuel temperature sensor
- Open or shorted wiring or connector
- PCM or PCM programming error

How Can You Fix The P008F Code?

Any stored ECT sensor related codes, would prompt me to make sure that the engine is not overheating. It should be full of coolant and operating within the acceptable temperature guidelines. If the engine is not overheating, a visual inspection of ECT sensor and fuel temperature sensor system wiring and connectors should be your next step.

A diagnostic scanner, a digital volt/ohmmeter (DVOM), an infrared thermometer with a laser pointer, and a source of reliable vehicle information will be required before attempting to diagnose a code P008F.

Step 1

Now, connect the scanner to the vehicle diagnostic port and retrieve all stored codes and freeze frame data. Write this information down as it may be helpful as you continue to go deeper into the diagnostic process. Next, you will want to clear the codes and test-drive the vehicle to see if the

code is reset.

Step 2

Use your vehicle information source to obtain wiring diagrams, connector pin out charts, component testing specifications, and connector views. This information will aid you in testing individual circuits and sensors. To prevent controller damage, test individual system circuits using the DVOM only after the PCM (and all related controllers) have been disconnected. Connector pin-out charts and wiring diagrams will help you to effectively test individual circuit resistance and/or continuity.

Step 3

You may use the DVOM (and your source of reliable vehicle information) to test the ECT and fuel temperature sensors. Follow component testing specifications, disconnect the sensor to be tested, and place the DVOM on the ohms setting. Sensors which fail to comply with manufacturer's specifications are no good.

Should the P008F be immediately reset, probe the reference circuit pin of each (ECT and fuel temperature) individual sensor connector using the positive test lead of the DVOM. Use the negative test lead to probe the ground pin.

Step 4

Test for reference voltage (typically 5-volts) and a ground at the individual sensor connectors with the key on and the engine off (KOEO).

If reference voltage and ground are present on the respective connector pins, reconnect the sensor. Now, probe the signal circuit of each sensor with the positive test lead of the DVOM (negative probe connected to known good engine ground). Use the infrared thermometer to check actual coolant and fuel temperature.

Step 5

Check out the temperature to voltage chart (found within the vehicle information source). With it you may determine if each sensor is functioning properly by comparing actual voltage with desired voltage. If either of the sensors in question fail to reflect the correct amount of voltage (according to actual coolant temperature and fuel temperature) suspect that it is faulty.

If the individual sensor signal circuits reflect the correct degree of voltage, use the DVOM to test the signal circuit (for the sensor in question) at the PCM connector. If there is not a sensor signal at the PCM connector but it is detected at the sensor connector, an open circuit exists between the two components.

Step 6

Suspect PCM failure or a PCM programing error only if all ECT and fuel temperature sensors and circuits are within specifications.

You may find help with your diagnosis by matching the vehicle, symptoms, and codes stored to applicable technical service bulletins (TSB)

Severity Description

Since ECT and fuel temperature are so important to fuel delivery and ignition timing strategy, a stored code P008F should be addressed with some degree of urgency.

Reference Sources

[P008F: Engine Coolant Temperature/Fuel Temperature Correlation](#), OBD-Codes.