

P0188: FUEL TEMPERATURE SENSOR B CIRCUIT HIGH INPUT

OVERVIEW

Severity	:	<div>High</div>
DIY Difficulty Level	:	<div>Intermediate</div>
Repair Cost	:	\$250-\$300
Can I Still Drive?	:	Yes (Short-term only)

What Does The P0188 Code Mean?

I have found that a stored code P0188 means that the powertrain control module (PCM) has detected a voltage signal from the fuel temperature sensor (or circuit) that is higher than expected. Fuel temperature sensors, in my experience, are typically integrated into the fuel composition sensor. "B" refers to an area of circuitry as opposed to a particular circuit or component.

The fuel composition sensor provides the PCM with an accurate fuel composition and fuel temperature analysis. The fuel composition sensor is computerized and is found in-line between the fuel tank and the fuel rail.

As fuel passes through the fuel composition sensor, the percentage of ethanol, water, and other contaminants are assessed. Square waveform voltage patterns are input to the PCM according to the level of contamination in the fuel. Shorter waveform frequencies indicate a high percentage of fuel contamination. Waveform frequency could also be illustrated as the vertical posting of the pattern. The amount of ethanol present in the fuel is typically categorized independently of other contaminants. Flex fuel vehicles function normally even if fuel composition levels are as high as eighty-five-percent ethanol.

Fuel temperature is recognized by the PCM as pulse width or the horizontal portion of the waveform. The thicker the pulse width signal, the higher the temperature of the fuel passing through the fuel composition sensor. One and five-milliseconds (hundredths-of-a-second) is the

usual pulse width variation used in most vehicles.

If fuel temperature appears much higher than ambient temperature, a P0188 code will be stored and a malfunction indicator lamp (MIL) may be illuminated. Most OBD II equipped vehicles will require multiple ignition cycles (with a failure) for MIL illumination.

What Are The Symptoms Of The P0188 Code?

Symptoms of a P0188 code may include:

- Possible MIL illumination
- There may be no obvious symptoms
- Other fuel composition codes may be present

What Are The Potential Causes Of The P0188 Code?

Potential causes for this code to set are:

- Faulty intake air temperature sensor
- A bad ambient temperature sensor
- Defective fuel temperature/composition sensor
- Open, shorted, or damaged wiring or connectors
- PCM or a PCM programming error

How Can You Fix The P0188 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.

Possibly the most complete tool for diagnosing a code P0188 is a diagnostic scanner with an integrated DVOM and oscilloscope. An infrared thermometer and a vehicle information source (like All Data DIY) can also be very helpful.

A visual inspection of all related wiring harnesses and connectors is an appropriate beginning to any diagnosis. Damaged, burnt, or corroded wiring and connectors will need to be repaired or replaced. Next, clear the codes and retest the system. Utilize the OBD II readiness mode when multiple failure cycles are required for MIL illumination. Simply complete your repairs and clear the codes, then drive the vehicle normally. If the PCM enters readiness mode, your repairs were effective. By the same token, the malfunction still exists if the code is reset.

Fuel composition sensor operation is normally accomplished with a five-volt reference signal and a ground. The variable resistance fuel composition sensor completes the circuit and provides the PCM with a fluctuating fuel temperature voltage signal. Continue by testing reference voltage and

ground at the fuel temp sensor connector using the DVOM. If reference voltage is not present at the fuel temperature sensor connector, use the DVOM to test parallel circuits at the PCM connector. If no reference voltage is discovered at the PCM connector, a faulty PCM or a PCM programming error may be the problem. Consider PCM failure only as a last resort.

By using the oscilloscope, you can observe live data in waveform patterns if the reference and ground are both present at the fuel temperature sensor connector. Connect the test leads to the ground and signal circuits and observe the waveform patterns on the display screen. Use the infrared thermometer to obtain actual fuel temperature and compare it with the temperature reflected by the waveform patterns on the oscilloscope. If the fuel temperature reflected by the waveform voltage patterns fails to coincide with that of the thermometer, suspect that the fuel temperature sensor is defective.

Additional diagnostic notes:

- Use the DVOM to test fuel temperature sensor resistance according to manufacturer's recommendations
- Disconnect all related controllers prior to testing circuit resistance with the DVOM

Severity Description

Due to the fact that fuel temperature is used to calculate fuel delivery strategy in flex fuel vehicles, this code should be treated as severe.

Reference Sources

[P0188: Fuel Temperature Sensor B Circuit High Input](#), OBD-Codes.