P0168: FUEL TEMPERATURE TOO HIGH

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Advanced
Repair Cost	:	**$80-$1000**
Can I Still Drive?	:	**Yes** (Short-term only)

What Does The P0168 Code Mean?

I have discovered that when an OBD II vehicle has stored a code P0168, it means that the powertrain control module (PCM) has detected a voltage signal from the fuel temperature sensor/fuel composition sensor or circuit that indicates fuel temperature is too high.

The fuel temperature sensor is usually integrated into the fuel composition sensor. It is a small computerized device (that resembles a fuel filter) designed to provide the PCM with an accurate fuel composition and fuel temperature analysis.

Fuel which passes through the inline sensor is electronically analyzed to determine the degree of ethanol, water, and unknown contaminants (non-fuel) found therein. The fuel composition sensor not only analyzes fuel composition but also measures fuel temperature and inputs an electrical signal to the PCM that reflects not only what contaminants are present (and to what degree the fuel has been contaminated) but also the temperature of the fuel.

The degree of fuel contamination is analyzed, according to the percentage of contaminants to fuel; generating a voltage signature in the fuel composition/temperature sensor.

The voltage signature is input to the PCM as square waveforms of voltage. Waveform patterns vary in frequency depending upon the degree of contamination present in the fuel. The closer the waveform frequency, the higher the degree of fuel contamination; this composes the vertical portion of the waveform.

The fuel composition sensor analyzes the amount of ethanol present in fuel separately from other contaminants. Pulse width, or the horizontal portion of the waveform, is indicative of the voltage signature created by fuel temperature. The higher the temperature of the fuel passing through the fuel temperature sensor; the more rapid the pulse width. Typical pulse width modulation varies between one and five-milliseconds or hundredths-of-a-second.

If the PCM detects an input signal from the fuel temperature/composition sensor that indicates that fuel temperature is too high, a P0168 code will be stored and a malfunction indicator lamp (MIL) may be illuminated. Multiple ignition cycles (with a failure) may be required for MIL illumination on certain models.

What Are The Symptoms Of The P0168 Code?

Symptoms of this code may include:

- Usually no symptoms accompany a code P0168
- Other fuel composition codes may be present
- MIL illumination will eventually occur

What Are The Potential Causes Of The P0168 Code?

Potential causes for this code to set are:

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

How Can You Fix The P0168 Code?

Preparation

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.

You will need a diagnostic scanner, a digital volt/ohmmeter (DVOM), an oscilloscope, an infrared thermometer, and a vehicle information source (such as All Data DIY) to diagnose a code P0168. A diagnostic scanner with an integrated DVOM and a portable oscilloscope would serve you well in this situation.

To increase your chances of a successful diagnosis, start with a visual inspection of all related wiring

harnesses and connectors. You will need to repair or replace damaged or burnt components as required and retest the system.

Step 1

Most fuel temperature sensors are supplied with a five-volt reference signal and a ground. As a variable resistance sensor, the fuel temperature sensor completes the circuit and provides the PCM with the appropriate waveform signal as fuel flows through. Using the DVOM, test reference voltage and ground at the fuel temp sensor connector.

If there is no reference voltage, use the DVOM to test the corresponding circuits at the PCM connector. If a reference voltage signal is detected at the PCM connector, repair open circuits as required. Caution: Disconnect all related controllers prior to testing circuit resistance with the DVOM.

Step 2

Suspect a faulty PCM (or a programming error) if no reference voltage is present at the PCM connector. If there is no fuel temp sensor ground, use your vehicle information source and locate the appropriate ground to make sure that it is secure.

Step 3

Use the oscilloscope to observe live data in the form of waveform patterns if the reference and ground are present at the fuel temperature sensor connector. Connect the test leads of to the appropriate circuits and observe the display screen. Measure actual fuel temperature, using the infrared thermometer and compare the results with the temperature reflected by the waveform patterns on the oscilloscope. If the fuel temperature reflected on the oscilloscope fails to coincide with that of the infrared 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
- If actual fuel temperature is higher than acceptable, check for shorted wiring or improperly routed exhaust near the fuel tank or supply lines

Severity Description

A stored code P0168 should be treated as severe because fuel temperature is used by the PCM to calculate fuel delivery strategy in flex fuel vehicles.

Reference Sources

P0168: Fuel Temperature Too High, OBD-Codes.