

P0177: FUEL COMPOSITION SENSOR CIRCUIT RANGE/PERFORMANCE

OVERVIEW

Severity	:	<div><div>Medium</div></div>
DIY Difficulty Level	:	<div><div>Intermediate</div></div>
Repair Cost	:	\$90-\$500
Can I Still Drive?	:	Yes (Short-term only)

What Does The P0177 Code Mean?

This trouble code that is specific to flex fuel vehicles. The fuel composition sensor is also known as a flex fuel sensor (FFS) and measures the percentage of ethanol present in the fuel being supplied to the engine.

The powertrain control module (PCM) uses FFS information to calculate the correct air/fuel mixture and ignition timing for the best possible performance and fuel economy under all operating conditions. The FFS produces a frequency (hz) signal that is a direct reflection of the percentage of methanol in the fuel.

The higher the percentage of methanol, the higher the frequency. If the PCM receives signals from the FFS that are not within a specific range it will illuminate the check engine light and set DTC P0177.

Related fuel composition sensor circuit trouble codes include:

- [P0176](#): Fuel Composition Sensor Circuit Malfunction
- [P0178](#): Fuel Composition Sensor Circuit Low Input
- [P0179](#): Fuel Composition Sensor Circuit High Input

What Are The Symptoms Of The P0177 Code?

Symptoms of a P0177 code may include:

- Check engine light on
- Lack of Power
- Poor fuel economy
- Possible stalling at stops

What Are The Potential Causes Of The P0177 Code?

The possible operating range of the FFS is 30hz to 145hz. The normal, or expected, operating range of the FFS is 40hz to 125hz. The FFS circuit is can be influenced by the electromagnetic interference caused by faulty secondary ignition components (i.e. spark plugs, spark plug wires, ignition coils) and aftermarket audio equipment causing a signal outside of the expected range, hence setting DTC P0177.

Potential causes for this code to set are:

- Aftermarket equipment
- Faulty secondary ignition components
- Faulty FFS
- Faulty PCM (rare)

How Can You Fix The P0177 Code?

I have only encountered this code one time in the field and it turned out to be a man-made problem. The customer had installed a 0 gauge audio amp power wire running directly in over the harness containing the FFS circuit. The magnetic field created by the amperage running through the power wire interfered with the frequency output of the FFS to the point that it sent a false signal of 145hz to the PCM.

Although I have never encountered a faulty FFS it is a definite possible cause for this code but not as probable as electrical interference caused by aftermarket add ons or faulty ignition components.

A PCM failure in the FFS circuit would be very rare.

Severity Description

If the conditions to set this code are present two key cycles in a row the PCM will limit the amount of timing advance and possibly lower the rev limiter RPM.

Due to the possibility of over working the catalytic converters, poor fuel mileage and lack of power I recommend getting this code repaired as soon as possible.

Reference Sources

[P0177: Fuel Composition Sensor Circuit Range/Performance](#), OBD-Codes.