P0166: O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 3)

OVERVIEW

Severity	:	Medium
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$100-$300**
Can I Still Drive?	:	**Yes** (Short-term only)

What Does The P0166 Code Mean?

The catalytic converter is used to control emissions. The O2 (oxygen) sensor on bank 2, position 3 is aft of the converter and monitors the catalyst efficiency. The PCM (Powertrain Control Module) does this by comparing the post-cat o2 sensor to the pre-cat o2 sensors.

The o2 sensor is a four wire sensor. The PCM supplies a reference to the sensor of about half a volt and also supplies a sensor ground and 12 volts for the heater element. The fourth wire is a ground for the heater element (the heater in the sensor helps the sensor to warm up faster which allows the engine to reach closed loop sooner).

The sensor varies the supplied reference voltage based on oxygen content of the exhaust. Oxygen sensors are capable of varying between 0.1 volts to 0.9 volts. Lean exhaust produces low voltage and causes the supplied 0.45 volts to drop. Rich exhaust produces high voltage and causes the supplied 0.45 voltage to increase. Pre-catalyst o2 sensors switch between low and high voltage rapidly.

However a post-cat o2 sensor may switch much slower & not vary as much (this is normal). If the sensor doesn't respond as it should or there are too few switches in a given time period, P0166 may set. Bank 2 is the side of the engine that does not contain cylinder #1.

What Are The Symptoms Of The P0166 Code?

Symptoms of a P0166 DTC may include:

- MIL (Malfunction Indicator Lamp) on
- May idle or drive poorly
- Fuel economy may decrease

What Are The Potential Causes Of The P0166 Code?

Potential causes of an P0166 code include:

- Bad Bank 2, position 3, o2 sensor
- Wiring problem, melted harness, broken connectors, etc.
- Bad PCM

How Can You Fix The P0166 Code?

Start the engine and allow it to reach operating temperature. Using a scan tool, observe the Bank 2 position 3 o2 sensor. If it isn't moving between 0.1 and 0.9 volts, increase the engine RPM to a fast idle and then recheck the sensor voltage reading. If it starts switching now, the sensor may be sluggish and/or intermittently going "dormant".

Replacing the sensor at this point would be a good idea.

Visually check the o2 sensor for contaminates, etc. If you suspect it's contaminated with coolant or oil, replace it.

a. But, if it still isn't responding after increasing engine RPM, turn off the engine and unplug the 1/3 o2 sensor. With KOEO (key on engine off) check that there is battery voltage and ground to the o2 sensor heater element. If the heater element has no battery voltage it can cause the o2 sensor to go "dormant" and not switch properly which can cause a P0166. So, diagnose that problem first(there will usually be other codes present).

b. If there is power and ground to the heater element check that the sensor ground is present. If it is, connect a jumper wire between the sensor ground and signal wire. Now the 1/3 o2 sensor reading should be low. If so, replace the Bank 2 position 3 o2 sensor.

c. If, after connecting the jumper wire, the o2 sensor reading still remains "stuck", check for wiring problems, harness contacting exhaust components, or broken connectors. Repair as necessary. Then recheck.

d. If you can find no wiring problems and the o2 sensor reading on the scan tool doesn't change after installing the jumper wire, recheck at the PCM connector. If it still shows no change, the PCM

may be at fault.

Reference Sources

P0166: O2 Sensor Circuit No Activity B1S3, OBD-Codes.