P0061: HO2S HEATER RESISTANCE (BANK 2 SENSOR 3)

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$100-$200**
Can I Still Drive?	:	**Yes** (Short-term only)

What Does The P0061 Code Mean?

In my personal experience, a stored code P0061 means that the powertrain control module (PCM) has detected a malfunction in the heater circuit of the downstream (or pre catalytic converter) oxygen (O2) sensor for engine bank one. Bank 2 specifies that the malfunction concerns the bank of the engine that does not contain the number one cylinder. Sensor 3 indicates that the problem is associated with the downstream sensor.

A zirconium dioxide sensing element, protected by a vented steel housing, lies at the heart of your typical O2 sensor. The sensing element is connected to wire leads in the O2 sensor wiring harness with platinum electrodes. Data from the O2 sensor is transmitted to the PCM via the controller area network (CAN).

The data consists of information regarding the percentage of oxygen particles in the engine exhaust as compared to the oxygen content of ambient air. The data is used by the PCM to calculate fuel delivery and ignition timing.

Battery voltage is used by the PCM as a means to preheat the O2 sensor during cold start conditions. The O2 sensor signal circuits are complemented by a circuit dedicated to preheating the sensor. The heater circuit usually consists of a battery voltage wire (12.6-volts minimum) and a system ground wire.

The PCM takes measures to apply battery voltage to the O2 sensor heater during low engine

coolant temperature conditions. This usually occurs until the PCM enters closed loop operation. Voltage is routed through the PCM, sometimes with the help of a relay and/or fuses. The circuit is energized when the ignition switch is turned on during cold start conditions.

The PCM is programmed to de-energize the O2 heater circuit once the engine reaches normal operating temperature.

When the PCM detects a level of resistance, from the O2 sensor heater circuit, that is greater than programmed limitations; a code P0061 will be stored and a malfunction indicator lamp (MIL) may be illuminated. Certain vehicles could require multiple ignition cycles (with a failure) for the MIL to be illuminated.

If this applies to your vehicle, you will need to use the OBD-II readiness mode in order to make sure that your repairs are successful. Once repairs are performed, drive the vehicle until the PCM either enters readiness mode or the code is reset.

What Are The Symptoms Of The P0061 Code?

Symptoms of a this engine code may include:

- Delayed start up due to a lean cold start condition
- Diminished fuel efficiency
- Black smoke from exhaust due to a rich cold start condition
- Other related diagnostic trouble codes may also be stored

What Are The Potential Causes Of The P0061 Code?

Potential causes of a P0061 trouble code may include:

- Burnt, broken, or disconnected wiring and/or connectors
- A faulty O2 sensor
- Blown fuse or burnt fusible link
- Defective engine control relay

How Can You Fix The P0061 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.

When attempting to diagnose a code P0061, I would gain access to a diagnostic scanner, a digital volt ohmmeter (DVOM), and a reliable vehicle information source, such as All Data DIY.

I would likely begin with a visual inspection of system wiring harnesses and connectors. I would pay

particular attention to harnesses that are routed near hot exhaust pipes and manifolds and those that are routed near sharp edges like the ones found on exhaust shields.

Next, I might proceed by using the DVOM to test all system fuses and fusible links. Skilled technicians would test these components when they are under load because fuses that aren't loaded may seem operational; then fail when loaded. You may effectively load this circuit by activating the O2 sensor heater/s.

My next step would be retrieving all stored trouble codes and freeze frame data. This can be done by connecting the scanner to the vehicle diagnostic port. I write this information down as it could be helpful if the P0061 proves to be intermittent. Now, I'd clear the codes and test drive the vehicle to see if the P0061 is immediately reset.

When the engine is cool enough to allow the O2 sensor heater to be activated, and the code is reset, observe O2 sensor heater input data using the scanner data stream. You may want to narrow the data stream display to include only pertinent data as this will yield a faster data response. If the engine is within the correct temperature range, O2 sensor heater voltage should be the about the same as battery voltage. If a resistance issue causes O2 sensor heater voltage to vary from that of the battery, a P0061 will be stored.

You may connect the DVOM test leads to the sensor ground and battery voltage signal wires in order to monitor live data from the O2 sensor heater circuit. Test O2 sensor resistance using the DVOM. Keep in mind that all related controllers should be disconnected prior to testing system circuit resistance with the DVOM.

Additional diagnostic tips & notes:

- The O2 sensor heater circuit should be energized when the engine is below normal operating temperature
- If blown fuses are found, suspect that the O2 heater circuit in question has shorted to ground

Severity Description

When a code P0061 is stored, it should be considered severe because it means that the upstream O2 sensor heater is inoperable.

Reference Sources

P0061: HO2S Heater Resistance Bank 2 Sensor 3, OBD-Codes.