P0060: HO2S HEATER RESISTANCE (BANK 2 SENSOR 2)

OVERVIEW

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

What Does The P0060 Code Mean?

If your OBD-II equipped vehicle has stored a code P0060, it 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 indicates the malfunction involves the bank of the engine that doesn't contains cylinder #1. Sensor 2 means that the problem is related to the downstream sensor.

A zirconium dioxide sensing element protected by a vented steel housing makes up the business end of your O2 sensor. Platinum electrodes are used to connect the sensing element to wire leads in the O2 sensor wiring harness.

The controller area network (CAN) allows the PCM to receive data from the O2 sensor. Data regarding the percentage of oxygen particles in the engine exhaust, as compared to the oxygen content of ambient air, is provided to the PCM by the O2 sensor. The PCM uses this data to calculate fuel delivery and ignition timing.

The heated O2 sensor uses battery voltage as a means to preheat during cold start conditions. In the heated O2 sensor, O2 sensor signal circuits are accompanied by a circuit dedicated to heating the sensor. The heater circuit usually carries battery voltage (12.6-volts minimum) and may be equipped with an in-line fuse.

During low engine coolant temperature conditions, the PCM takes measures so that battery voltage

is applied to the O2 sensor heater. This should occur until the engine reaches normal operating temperature and the PCM enters closed loop operation.

Voltage is usually routed through the PCM, sometimes with help from a relay and/or fuses, and is initiated when the ignition switch is turned on during cold start conditions. The PCM is programmed to discontinue battery voltage to the O2 heater circuit once the engine reaches normal operating temperature, and it should take measures to do so.

Should the PCM detect a level of resistance from the O2 sensor heater circuit that is greater than programmed limitations allow, a code P0060 will be stored and a malfunction indicator lamp (MIL) may be illuminated.

Certain models will require multiple ignition cycles (with a failure) for the MIL to be illuminated. Because of this, you will need to use the OBD-II readiness mode in order to make sure that your repairs are successful. Once you have performed repairs, drive the vehicle until the PCM enters readiness mode or the code is reset.

What Are The Symptoms Of The P0060 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 P0060 Code?

Potential causes of a P0060 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 P0060 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 diagnosing a code P0060, I would need a diagnostic scanner, a digital volt ohmmeter (DVOM), and a reliable vehicle information source, such as All Data DIY.

I like to start with a visual inspection of system wiring harnesses and connectors; focusing on 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.

I would proceed using the DVOM to test all system fuses and fusible links. I would test these components when they are under load because fuses that aren't loaded may seem operational; then fail when loaded. Activating the O2 sensor heaters will effectively load this circuit.

Retrieving all stored trouble codes and freeze frame data would be my next step. I would accomplish this by connecting the scanner to the vehicle diagnostic port. I like to write this information down as it could be helpful if the P0060 proves to be intermittent. I'd clear the codes and test drive the vehicle to see if the P0060 is immediately reset.

Make sure that the engine is cold enough to allow the O2 sensor heater to be activated, if the code is reset. Observe O2 sensor heater input data using the scanner data stream and narrow the data stream display to include only pertinent data. This will yield a faster data response. With the engine within the correct temperature range, O2 sensor heater voltage should be the virtually the same as battery voltage. If O2 sensor heater voltage varies from that of the battery, due to a resistance issue, A P0060 will be stored.

To monitor live data from the O2 sensor heater circuit, connect the DVOM test leads to the sensor ground and battery voltage signal wires. Resistance of the O2 sensor in question may also be checked use the DVOM. All related controllers should be disconnected prior to testing system circuit resistance with the DVOM.

Additional diagnostic tips & notes:

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

Severity Description

A code P0060 should be considered severe as it means that the upstream O2 sensor heater is inoperable.

Reference Sources

Diagnostic Trouble Code (DTC) Charts and Descriptions for P0060 - Page 14.