P0157: O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 2 SENSOR 2)

OVERVIEW

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

What Does The P0157 Code Mean?

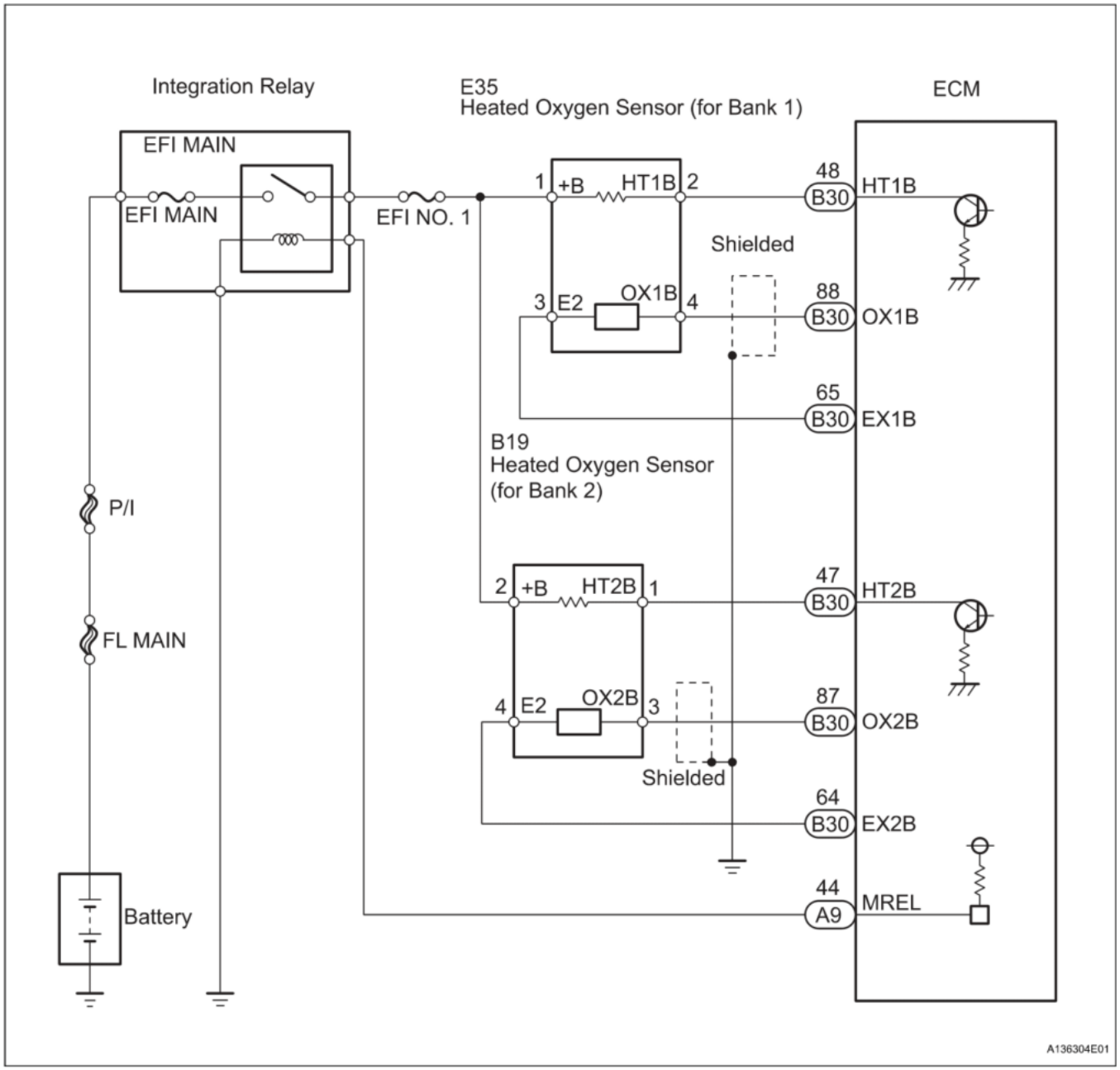
This code refers to a fault in the post-catalyst o2 sensor on Bank 2. First, a basic run-down of the catalyst: The Catalytic Converter is used to help control tailpipe emissions, to “clean up” the exhaust, if you will. The PCM (Powertrain Control Module) uses the signal from the heated oxygen sensor to the rear of the catalyst to monitor the catalyst’s efficiency by comparing it to the o2 sensors in front of the catalyst.

If the PCM sees little or no difference between the exhaust quality in post- and pre- catalyst sensors then it knows that the catalyst is not working properly. To over simplify: a post-cat sensor’s main job is to monitor catalyst efficiency, not control fuel management (although they can have a measure of influence over the front o2 sensor’s operation, we’ll just stick to basics for the sake of simplicity).

If you have a P0157, that doesn’t mean your catalyst is bad (in fact, it usually never does). This code basically means that the Bank 2, Sensor 2 (or second o2 sensor back on bank 2) signal voltage is below what is considered normal for that sensor.

It’s a four wire sensor being supplied a 0.5 volt reference voltage (usually on the signal wire) and a ground, as well as a power and ground circuit for the o2 sensor heater element. Changes in oxygen content cause resistance changes in the sensor’s signal circuit.This changing resistance affects the 0.5 volts on the signal/reference circuit.

A heated o2 sensor is capable of switching between 0.1 volts and 0.9 volts. However, a properly working post-catalyst sensor will exhibit small changes at a slower rate than front (pre-catalyst) o2 sensors. It may switch slightly above and below 0.45 volts at the rate of about 1 switch per second or less(depends on the vehicle). The PCM monitors this changing signal to determine if the catalyst is working properly. If the PCM determines that the post-cat o2 sensor signal voltage is below a certain threshold for too long, P0157 will set.



P0157 wiring diagram

What Are The Symptoms Of The P0157 Code?

Usually rear o2 sensor problems won't cause drivability issues since they are an input that measures catalyst efficiency (unlike front o2 sensors). However if you have other codes present, like lean codes or pre-o2 sensor codes, then they may cause drivability problems as well as P0143. The following symptoms may be present:

- MIL (Malfunction Indicator Lamp) illumination
- Engine performance issues
- Engine running rough
- Engine running rich (only if PCM is trying to add fuel to compensate for low o2 sensor voltage reading)
- Engine running lean (only if vacuum leak is large enough that PCM can't compensate by adding fuel)
- Poor idle

What Are The Potential Causes Of The P0157 Code?

If you have reason to believe that your engine is running lean, fix that problem first, then clear codes and see if the P0157 code resets. An engine that is running lean could set this code, but usually there will be lean codes (P0171, P0174) present. The following could be causes:

- Air leaks in exhaust in front of o2 sensor giving false reading
- Engine running excessively lean
- O2 sensor connector damaged/corroded
- O2 sensor signal circuit is shorted to ground
- O2 sensor ground circuit is open
- O2 sensor has failed (it may be contaminated with fuel or coolant)
- PCM has failed

How Can You Fix The P0157 Code?

Preparation

It's always good to start with checking for air leaks in the exhaust manifold and in the exhaust pipes. Fix these first.

Step 1

With KOER (Key on engine running) use a scan tool or a voltmeter check the o2 sensor signal voltage with engine warm. You may have to increase the RPM to a fast idle to check the voltage of the bank 2,2 sensor. If it's voltage is stuck low (less than 0.5 volts may not be enough to set the code, but it depends on the vehicle) and you don't have any other o2 sensor codes present in the

PCM, then it's a good bet that the sensor is bad. If the voltage isn't stuck low and the o2 sensor seems to be operating fine, it's likely sticking low intermittently.

This often turns out to be the sensor. In either case, replacing the sensor can be an effective way to diagnose the problem. But it can also be an expensive diagnostic tool, especially if it turns out to be a wiring issue, instead of a sensor.

Step 2

So, if you're interested in knowing for sure what the problem is before spending unnecessarily, then perform the following: 1. Turn off the engine and unplug the 2,2 o2 sensor connector. Inspect for corrosion, etc. Repair as necessary. Make sure that there is battery voltage present and ground present for the o2 sensor heater. If there isn't, then diagnose that first then retest.

The o2 sensor depends on the heater to warm it up so it can start working quicker. If the heater element is bad or there isn't the proper voltage supplying it, the sensor may set this code. Usually heater problems have codes associated with them, too. If you find there is no battery voltage feeding the o2 sensor use the associated code to diagnose that. If you find the heater element bad, replace the sensor.

Step 3

If the heater element checks out then, using a jumper wire, supply a chassis ground to the o2 sensor connector(PCM side) ground circuit. Now observe the scan tool bank 2,2 o2 sensor reading. If it is now at about a half a volt then replace the o2 sensor.

If, after supplying a ground to the unplugged PCM side of the o2 sensor connector, the voltage reading doesn't change then check the harness for short to ground. Check for harness making contact with exhaust components. Check pins for damage, and for moisture. Repair as necessary. If you can find no harness problems, then the PCM may be at fault.

Reference Sources

ENGINE CONTROL SYSTEM [GASOLINE ENGINE (V-6)] SERVICE MANUAL for P0157 - Pages 433-438.