P219A: BANK 1 AIR/FUEL RATIO IMBALANCE

OVERVIEW

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

What Does The P219A Code Mean?

When a code P219A is stored, it means that the powertrain control module (PCM) has detected an air to fuel ratio imbalance for the bank of the engine which contains the number one cylinder.

In order to monitor the air to fuel ratio for each engine bank, the PCM uses data input from heated exhaust oxygen sensors (sometimes called air fuel sensors).

Each oxygen sensor is constructed using a zirconium dioxide sensing element situated in the center of a vented steel housing. Tiny electrodes (usually of platinum) attach the sensing element to wire leads in the oxygen sensor harness connector and the connector plugs into the controller area network (CAN) which connects the oxygen sensor wiring harness to the PCM connector.

Each oxygen sensor is threaded (or studded) into an exhaust pipe. It is situated so the the sensing element is near the center of the pipe. As spent exhaust gases exit the combustion chamber (via the exhaust manifold) and continue through the exhaust system (including catalytic converters), they flow over the oxygen sensors.

Exhaust gases enter the oxygen sensor through specially designed vent holes in the steel housing and swirl around the sensing element. Swirling ambient air is drawn through wire lead cavities in the sensor housing in order to fill a tiny chamber in the middle of the sensor. The air (in the tiny chamber) is then heated. This forces the oxygen ions to produce energy that is recognized by the PCM as voltage.

Variations between the number of oxygen ions in ambient air (drawn into the O2 sensor), and the number of oxygen molecules in the exhaust, cause the oxygen ions inside the O2 sensor to bounce from one platinum layer to the other, very swiftly and repetitively. As the surging oxygen ions shift between platinum layers, variations in oxygen sensor output voltage occur.

The PCM sees these variations in oxygen sensor output voltage as changes in exhaust oxygen concentration. Voltage signal outputs from the oxygen sensors are lower when more oxygen is present in the exhaust (lean condition) and higher when less oxygen is present in the exhaust (rich condition).

If the PCM detects an imbalance in the air to fuel ratio for a particular bank of the engine, a code P219A will be stored and a malfunction indicator lamp (MIL) may be illuminated. Most vehicles will require multiple ignition cycles (with a failure) for MIL illumination.

What Are The Symptoms Of The P219A Code?

Symptoms of a P219A trouble code may include:

- Diminished fuel efficiency
- A lack of general engine performance
- Stored misfire codes or lean/rich exhaust codes
- Service engine soon lamp illumination

What Are The Potential Causes Of The P219A Code?

Causes for this code may include:

- Engine vacuum leak (large)
- Defective oxygen sensor/s
- Burnt, chafed, broken, or disconnected wiring and/or connectors
- Engine exhaust leaks
- A faulty mass air flow or manifold air pressure sensor
- Bad fuel pump or clogged fuel filter

How Can You Fix The P219A Code?

All misfire codes, throttle position sensor codes, manifold air pressure codes, and mass air flow sensor codes should be addressed before attempting to diagnose a code P219A. The engine should also be running smoothly and efficiently. If it is determined that either a rich or lean condition exists (with the engine), this must be repaired as it may be the cause of the P219A being stored.

You will need a diagnostic scanner, a digital volt/ohmmeter (DVOM), and a source of reliable vehicle information in order to accurately diagnose a code P219A.

You may save yourself time by searching for technical service bulletins (TSB) that replicate the code stored, vehicle (year, make, model, and engine), and symptoms exhibited. This information may be found in your vehicle information source. If you find the right TSB, it could yield a speedy solution to your diagnosis.

Step 1

After you connect the scanner to the vehicle diagnostic port and retrieve all stored codes and pertinent freeze frame data, write the information down (in case the code proves to be an intermittent one). After that, clear the codes and test drive the vehicle until one of two things happens; the code is restored or the PCM enters readiness mode.

The code may actually be more difficult to diagnose if the PCM enters readiness mode at this point, because the code is intermittent. The condition which caused the P219A to be stored may need to worsen before an accurate diagnosis can be made. If the code is restored, continue with the diagnosis.

You may obtain connector face views, connector pinout charts, component locator charts, wiring diagrams, and diagnostic flow charts (pertaining to the code and vehicle in question) using your source of vehicle information.

Step 2

Perform a visual inspection of related wiring and connectors. Repair or replace wiring that has been cut, burned, or damaged.

If the engine is running smoothly and the code P219A/P219B continues to be reset, start the engine and allow it to reach normal operating temperature. Allow the engine to idle (with the transmission in neutral or park).

Step 3

With the scanner connected to the vehicle diagnostic port, observe oxygen sensor input data on the data stream. Narrow the scope of the data stream to include only pertinent data and you will get a faster response.

If the oxygen sensors are functioning normally, voltage on pre-cat oxygen sensors will cycle continuously between 1 and 900-millivolts once the PCM enters closed loop operation. Post-cat sensors will cycle between 1 and 900-millivolts as well but they will settle at a certain point and remain relatively stable) compared to the pre-cat sensors). Oxygen sensors which fail to cycle adequately should be considered defective if the engine is in good working order.

Note: In most cases, you will rectify this code by correcting a rich or lean running engine

Severity Description

An incorrect air to fuel ratio may be the result of insufficient fuel or excessive air (vacuum). A code P219A should be categorized as severe and rectified as quickly as possible.

Reference Sources

Diagnostic Trouble Code (DTC) Charts and Descriptions for P219A - Page 142.