P06A9: SENSOR REFERENCE VOLTAGE D CIRCUIT RANGE/PERFORMANCE

OVERVIEW

Severity	:	Medium
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$100-$300**
Can I Still Drive?	:	No

What Does The P06A9 Code Mean?

If your OBD-II vehicle has a stored P06A9 code, it means that the powertrain control module (PCM) has detected an out of range reference voltage signal, or performance problem with a particular sensor that has been given the designation “D”. The sensor in question is usually associated with the automatic transmission, transfer case, or one of the differentials.

A more specific sensor code will almost always accompany this code. The P06A9 adds that sensor reference circuit voltage is out of range or expected performance. To determine the “D” sensor’s location and function for the vehicle in question, consult a reliable vehicle information source (e.g. AllDataDIY).

Suspect that a PCM programming error has occurred if the P06A9 is stored alone. You will need to diagnose and repair any other sensor codes prior to diagnosing and repairing the P06A9 – but keep the range/performance reference voltage condition in mind.

The sensor in question is supplied with reference voltage (typically 5 volts) via a switched (energized with the key on) circuit. There will be a ground signal as well. The sensor is going to be of either the variable resistance or electromagnetic variety and it will complete the circuit. Sensor resistance should decrease as pressure, temperature, or speed is increased and vice versa. As the sensor resistance changes (with varying conditions) it provides the PCM with an input voltage signal.

If the input voltage signal, received by the PCM, is outside expected parameters, a P06A9 will be stored. A malfunction indicator lamp (MIL) may be also illuminated. Some vehicles will require multiple drive cycles (with a failure) for the MIL to be illuminated. Allow the PCM to enter readiness mode before considering any repair successful. Just clear the code, after repairs are performed, and drive the vehicle normally. If the PCM enters readiness mode, the repair was successful. If the code is reset, the PCM will not enter readiness mode and you know that a malfunction still exists.

What Are The Symptoms Of The P06A9 Code?

Symptoms of a P06A9 code may include:

- Failure of the transmission to shift between sport and economy modes
- Transmission shifting malfunctions
- Delayed (or no) transmission engagement
- Failure of the transmission to switch between all-wheel and two-wheel drive modes
- Failure of the transfer case to shift from low to high gear
- Lack of front differential engagement
- Lack of front hub engagement
- Erratic or inoperative speedometer/odometer

What Are The Potential Causes Of The P06A9 Code?

Possible causes for this engine code include:

- Bad sensor
- Defective or blown fuses and/or fusible links
- Faulty system power relay
- Open circuits and/or connectors

How Can You Fix The P06A9 Code?

A diagnostic scanner, a digital volt/ohmmeter (DVOM), and a trustworthy vehicle information source (like All Data DIY) will be needed to diagnose a stored code P06A9. A portable oscilloscope may also prove helpful in your diagnosis.

Step 1

First, consult your vehicle information source to determine the location and function of the sensor in question, as it relates to your particular vehicle. Perform a visual inspection of sensor system related wiring harnesses and connectors. Repair or replace damaged or burned wiring, connectors, and components as required.

Step 2

Second, connect the scanner to the vehicle diagnostic port and retrieve all stored trouble codes and freeze frame data. Write the codes down, along with the order in which they were stored, and any related freeze frame data, as this information may prove helpful if the code turns out to be intermittent. Now you may go ahead and clear the code; then test drive the vehicle to see if it is immediately reset.

Step 3

If the code is immediately reset, use the DVOM to test reference voltage and ground signals at the sensor in question. You would normally expect to find 5 volts and a ground at the sensor connector.

Step 4

Continue by testing sensor resistance and continuity levels, if the voltage and ground signals are present at the sensor connector. Obtain testing specs from your vehicle information source and compare your actual findings to them. Sensors that don't comply with these specs should be replaced.

Step 5

Disconnect all related controllers from system circuits prior to testing resistance with the DVOM. Failure to do so could result in PCM damage. If reference voltage is low (at the sensor), use the DVOM to check circuit resistance and continuity between the sensor and the PCM. Replace open or shorted circuits as necessary. If the sensor in question is electromagnetic with a reciprocating signal, use the oscilloscope to monitor live data. Focus on glitches and completely open circuits.

Additional diagnostic notes:

- This type of code is generally provided as support for a more specific code
- A stored code P06A9 is normally associated with the drivetrain

Severity Description

The severity of this DTC depends upon which sensor circuit is experiencing the abnormal voltage situation. Other stored codes must be considered before a determination of severity can be made.

Reference Sources

P06A9 Sensor Reference Voltage D Circuit Range/Performance, OBD-Codes.