P0642: Sensor Reference Voltage "A" Circuit Low

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

What Does The P0642 Code Mean?

If your OBD II equipped vehicle has a stored P0642, it means that the powertrain control module (PCM) has detected a low reference voltage signal for a particular sensor that has been given the designation “A”. The sensor in question is usually associated with the automatic transmission, transfer case, or one of the differentials.

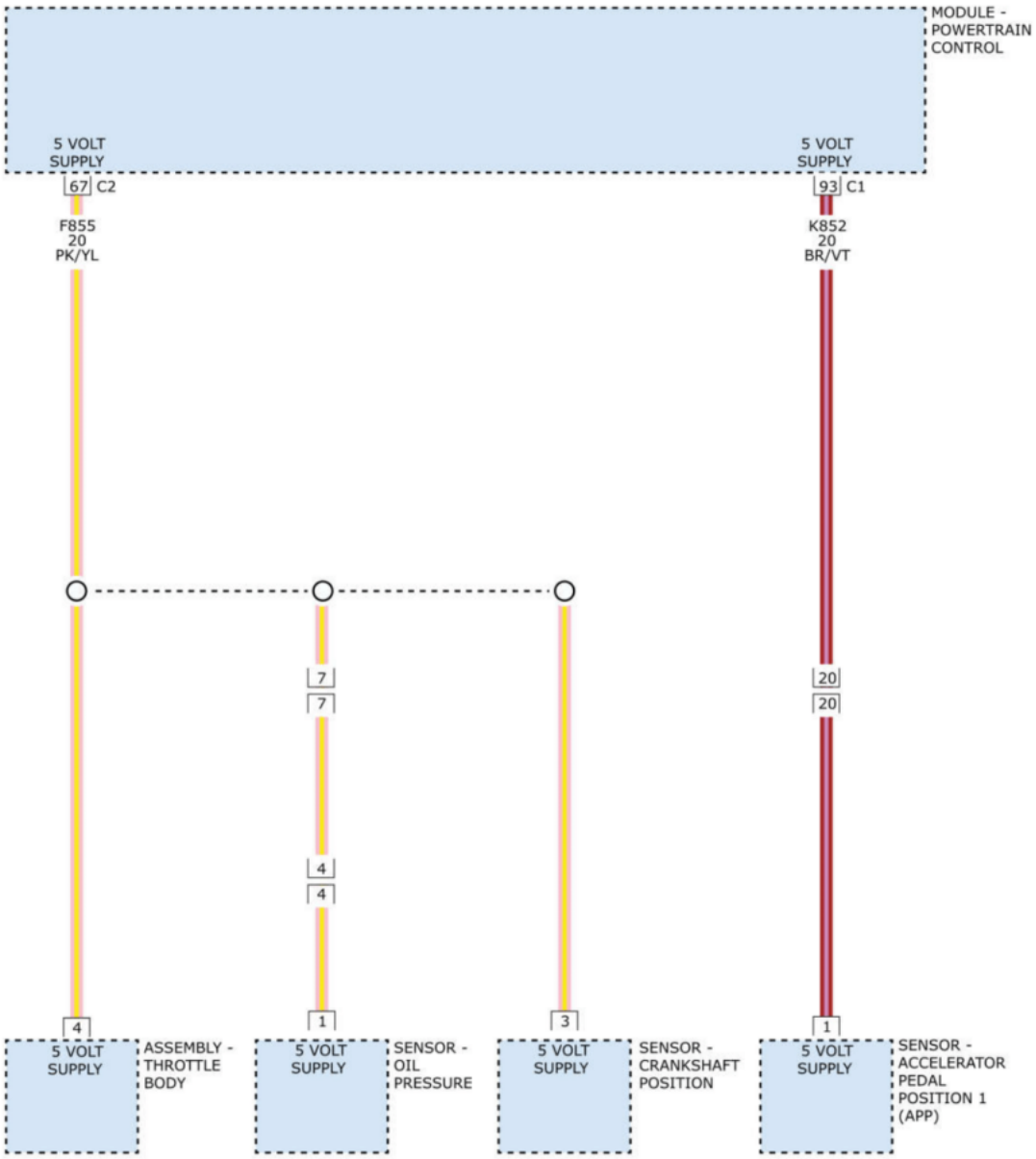
A more specific sensor code will almost always accompany this code. The P0642 adds that sensor reference circuit voltage is low. To determine the sensor location (and function), as it pertains to the vehicle in question, consult a reliable vehicle information source (All Data DIY is a great one).

Suspect that a PCM programming error has occurred if the P0642 is stored alone. You will need to diagnose and repair any other sensor codes prior to diagnosing and repairing the P0642 – but keep the low reference voltage condition in mind.

The sensor in question is supplied with reference voltage (typically five-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 lower than a programmed limit, a P0642 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.



P0642 wiring diagram

What Are The Symptoms Of The P0642 Code?

Symptoms of a P0642 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 P0642 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 P0642 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 P0642. A portable oscilloscope may also prove helpful in your diagnosis.

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.

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.

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 five-volts and a ground at the sensor connector.

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.

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 P0642 is normally associated with the drivetrain

Severity Description

The severity of a stored P0642 depends upon which sensor circuit is experiencing a low voltage condition. Other stored codes must be considered before a determination of severity can be made.

Reference Sources

Diagnostic Trouble Code (DTC) Charts and Descriptions for P0642 - Page 96.