

P0503: VEHICLE SPEED SENSOR A INTERMITTENT

OVERVIEW

Severity	:	<div><div>High</div></div>
DIY Difficulty Level	:	<div><div>Intermediate</div></div>
Repair Cost	:	\$100-\$350
Can I Still Drive?	:	No

What Does The P0503 Code Mean?

When a stored code P0503 is exhibited, it means that the powertrain control module (PCM) has detected a voltage input signal, from vehicle speed sensor (VSS) A, that is intermittent, erratic, or excessive. The designation A usually refers to the primary VSS in a system which utilizes multiple vehicle speed sensors.

OBD II vehicle speed sensors are typically electromagnetic sensors which utilize some type of toothed reluctor ring wheel or gear that is mechanically affixed to an axle, transmission/transfer case output shaft, differential gear, or driveshaft.

As the shaft spins, so spins the metal reluctor ring. The reluctor ring completes a circuit with the stationary electromagnetic sensor as the reluctor passes in very close proximity to electromagnetic tip of the sensor. The notches between the teeth of the reluctor ring create interruptions in the sensor circuit. The combination of circuit completions and interruptions are recognized by the PCM (and possibly other controllers) as voltage wave form patterns.

Vehicle speed is monitored by the PCM using input data from one or more vehicle speed sensors. The PCM compares inputs from the VSS with antilock brake control module (ABCM) or electronic brake control module (EBCM) inputs. The primary VSS input (A) will likely be initiated by the VSS in the transmission but secondary VSS input/s may be monitored using one or more wheel speed sensors.

If the PCM detects an intermittent, erratic, or high input voltage signal from the primary VSS, a code P0503 will be stored and a malfunction indicator lamp may be illuminated. An intermittent, erratic, or high voltage input condition may be the result of an electrical or mechanical problem.

Related vehicle speed sensor trouble codes:

- [P0500 Vehicle Speed Sensor "A" Malfunction](#)
- [P0501 Vehicle Speed Sensor "A" Range/Performance](#)
- [P0502 Vehicle Speed Sensor "A" Low Input](#)

What Are The Symptoms Of The P0503 Code?

Symptoms of a P0503 code may include:

- Erratic speedometer/odometer operation
- Irregular transmission shift patterns
- Other transmission and ABS codes may be stored
- Illumination of the service engine soon lamp, traction control lamp, or antilock brake lamp
- Unexpected activation/deactivation of the traction control system (if equipped)
- The ABS system may be rendered inoperable in some cases

What Are The Potential Causes Of The P0503 Code?

Possible causes for this code include:

- Excessive metal debris buildup on speed sensor/s
- A defective wheel speed or vehicle speed sensor
- Cut or otherwise damaged wiring harnesses or connectors (especially near speed sensors)
- Damaged or worn teeth on a reluctor ring
- A faulty PCM, ABCM, or EBCM

How Can You Fix The P0503 Code?

I would require a diagnostic scanner, a digital volt/ohmmeter (DVOM), possibly an oscilloscope, and a reliable vehicle information source to diagnose a code P0503. A scanner with an integrated DVOM and oscilloscope would be ideal for this diagnosis.

I like to start my diagnosis with a visual inspection of system wiring, speed sensors, and connectors. I would repair open or shorted circuits as required and clean excessive metallic debris from effected sensors. If sensor removal is feasible, I would also check the integrity of the entire reluctor ring at this time.

Next, I would connect the scanner to the vehicle diagnostic port and retrieve all stored trouble codes and freeze-frame data. Write this information down as it may prove helpful as your diagnosis

progresses. Now, clear the codes and test drive the vehicle to see if the symptoms persist and/or if code is reset.

A trick that many professional technicians use is to search the vehicle information source for applicable technical service bulletins (TSB). If you find a TSB that matches the symptoms and stored codes of the vehicle in question, the diagnostic information contained therein will likely aid in correctly diagnosing the P0503.

Observe wheel speed and/or vehicle speed (using the scanner data stream) while test driving the vehicle. By narrowing the data stream to display only pertinent fields, you can increase the speed and accuracy at which the desired data is delivered. Inconsistent, erratic, or high readings from VSS or wheel speed sensors may lead you to wiring, electrical connector, or sensor problems by narrowing the general area of the system malfunction.

Use the DVOM to perform a resistance test on the sensor in question, after you have pinpointed the problematic area. Consult your vehicle information source for the manufacturer's recommendation for testing the VSS and replace sensors that do not coincide with specifications.

The oscilloscope can be used to retrieve live data from each individual VSS by probing the sensor signal wire and the sensor ground wire. The driveline will need to be running, so securely jacking or hoisting the vehicle will be necessary to safely perform this type of testing.

Vehicle speed sensors are frequently damaged as a result of regular transmission maintenance and wheel speed sensors (and sensor wiring harnesses) are often broken when brake repairs are performed. If a code P0503 is exhibited (immediately following a repair) suspect a damaged sensor harness or sensor.

Additional diagnostic notes:

- When performing circuit resistance and continuity testing with a DVOM, always disconnect electrical connectors from related controllers – failure to do so could result in a damaged controller
- Use caution when removing sensors from transmission cases (for testing) as hot transmission fluid may be harmful

Severity Description

Since conditions which may result in a stored code P0503 could create drivability and ABS issues, it should be classified as severe and addressed with some degree of urgency.

Reference Sources

[Diagnostic Trouble Code \(DTC\) Charts and Descriptions for P0503](#) - Page 79.