P0716: INPUT/TURBINE SPEED SENSOR A CIRCUIT RANGE/PERFORMANCE

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$200-$290**
Can I Still Drive?	:	No

What Does The P0716 Code Mean?

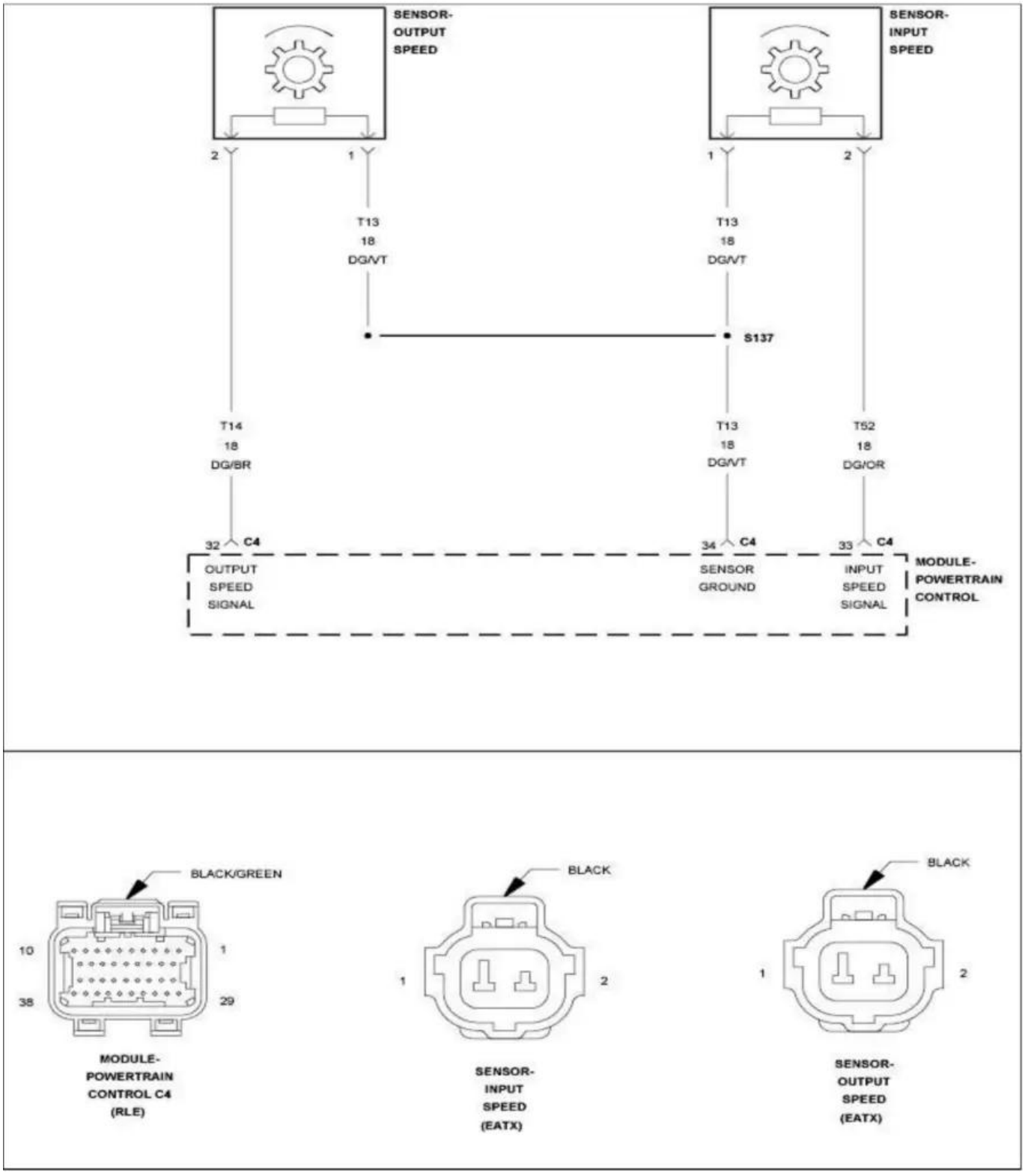
When a diagnostic trouble code P0716 is exhibited, it is due to the powertrain control module (PCM) detecting a malfunction in the circuit for the designated input (or turbine) speed sensor known as A. Although input and turbine speed sensors are virtually identical in design, some manufacturers choose to vary component terminology. The A designation is typically reserved for OBD-II equipped vehicles that use multiple input or turbine speed sensors.

The input/turbine speed sensor is usually an electromagnetic, 3-wire sensor used to monitor transmission input speed (recognized by the PCM as revolutions per minute or RPMs). The sensor is positioned near the rear of the torque converter (at the transmission input shaft) and is either mounted with a bolt/stud or threaded directly into the transmission case.

On the transmission main (or input) shaft, specially designed grooves (or a notched reluctor wheel) are present. The input shaft (or reluctor wheel) passes in close proximity to the end of the sensor; completing the electromagnetic circuit. As the grooves (or notches) pass by the sensor, the circuit is interrupted and an electronic pattern is formed. This pattern formation is received by the PCM as a waveform pattern that it further interprets as transmission input/turbine speed.

Transmission input/turbine speed is compared with engine RPM speed, percentage of engine load, and transmission output speed to determine the desired input speed RPM. If the actual input/turbine speed fails to coincide with the desired input/turbine speed, a code will be stored and

a malfunction lamp may be illuminated.



P0716 wiring diagram

What Are The Symptoms Of The P0716 Code?

Symptoms of a P0716 code may include:

- Speedometer and/or odometer fluctuation
- Harsh or erratic transmission shifting
- Failure of the transmission to shift at all
- Poor fuel efficiency
- Intermittent speedometer (odometer) operation
- The engine may stall when stopping the vehicle

What Are The Potential Causes Of The P0716 Code?

Potential causes for this code to set are:

- Damaged, loose, or burned wiring and/or connectors
- A faulty input speed sensor
- A defective output speed sensor
- Malfunctioning transmission torque converter
- PCM failure or a PCM programming error

How Can You Fix The P0716 Code?

A good starting point is always to check for technical service bulletins (TSB) for your particular vehicle. Your issue may be a known issue with a known fix put out by the manufacturer and can save you time and money during diagnosis.

An advanced diagnostic scanner, a digital volt/ohmmeter (DVOM), a manufacturer's service manual, and possibly an oscilloscope will be helpful in diagnosing the P0716 code.

I would likely begin my diagnosis with a visual inspection of system wiring and connectors. Disconnected, corroded, burnt, or shorted wiring and/or connectors must be repaired or replaced. Don't forget to test the battery and inspect battery cables and cable ends. Test alternator output as well.

I make it a habit to connect the scanner to the diagnostic port and retrieve all stored codes and write them down for future reference. I also like to make a note of the freeze frame data.

If input sensor and output sensor codes are present, use the scanner data stream to determine which circuit is at fault. For more accurate data, narrow the data stream to include only pertinent information.

Check for excessive metal debris on magnetic surfaces of input and/or output speed sensors. For best results, remove excessive debris before reinstallation. When sensors are removed, inspect

interruption grooves and/or reluctor wheel notches, as well.

Use the DVOM to test individual sensors, following manufacturer's specifications (found in the service manual or through All Data). Sensors that do not comply with manufacturer's specifications must be replaced. Some manufacturers recommend replacement of input and output speed sensors as a set. Before testing resistance and continuity with the DVOM, disconnect related controllers. Failure to do so could result in controller failure.

Suspect a faulty PCM or a PCM programming error if all system circuits and sensors are in proper working order and comply with manufacturer's specifications.

Additional diagnostic notes:

- Erratic input/output speed sensor readings are often contributed to excessive metallic debris (attracted to the electromagnetic sensor)
- If input and/or output speed sensors must be removed from the transmission case, use caution. Hot transmission fluid may escape from the opening
- Sensor to reluctor clearance is critical , so make sure that mounting surfaces/threaded holes are clear of obstructions

Severity Description

In some instances, the PCM will place the transmission in 'limp-in' mode when this code is stored. The transmission will shift harshly in this mode. If the transmission begins to shift irregularly when you are presented with a P0716, the problem should be addressed immediately.

Reference Sources

P0716 Input/Turbine Speed Sensor A Circuit Range/Performance, OBD-Codes.