

GM · POWERTRAIN

P1845

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1845 · GM

Transmission Gear Ratio Output Circuit

P1845 on a GM vehicle means the transmission control module (TCM) has detected an implausible signal from the output shaft speed sensor circuit, which it uses to calculate gear ratio. The TCM compares the output shaft speed to the input shaft speed and expected ratio for the commanded gear, and when the calculated ratio does not match the expected value within a calibrated window, it sets this code.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	GM specific	Medium	Intermediate	Transmission

Symptoms you may notice

- Illumination of the check engine light or transmission warning light, often with no other noticeable symptoms
- Harsh or delayed shifts, especially when the transmission attempts to engage a new gear
- The transmission may enter limp mode, sticking in a single gear or refusing to downshift
- Erratic speedometer operation if the output shaft speed signal is shared with the instrument cluster
- A noticeable slip or flare during acceleration as the TCM struggles to confirm the correct gear ratio
- Reduced fuel economy due to the transmission holding lower gears longer than normal

Common causes, most likely first

- 1 Faulty output shaft speed sensor (OSS) or a damaged sensor reluctor wheel
- 2 Wiring damage such as chafed, corroded, or open circuits between the OSS and the TCM
- 3 Poor electrical connection at the OSS connector or TCM harness, often due to moisture or vibration
- 4 Internal transmission mechanical wear causing an actual gear ratio mismatch, such as a slipping clutch pack
- 5 Valve body issues or low fluid pressure leading to incorrect gear engagement and ratio errors
- 6 A failing TCM that misinterprets a valid OSS signal or has internal circuit faults
- 7 Contaminated transmission fluid or low fluid level affecting hydraulic control and ratio stability



How to diagnose and fix it

- 1 Check transmission fluid level and condition; top off or service fluid if it is low or burnt
- 2 Inspect the OSS and its reluctor wheel for physical damage, metal debris, or loose mounting
- 3 Disconnect and inspect the OSS connector and TCM harness for corrosion, pushed pins, or chafed wires
- 4 Measure the OSS resistance and compare to the manufacturer's specification; replace the sensor if out of range
- 5 Backprobe the OSS signal circuit at the TCM and verify a clean AC voltage waveform while rotating the output shaft
- 6 Perform a bidirectional scan tool test to command gears and compare commanded versus actual ratio data
- 7 If electrical and sensor checks pass, perform a transmission pressure test and inspect the valve body for wear or sticking valves

What the ratio code really tells you

- A P1845 is often set by a dirty or failing output shaft speed sensor rather than a major internal transmission failure, so always verify the sensor signal before condemning the gearbox.
- The TCM may set this code intermittently if the OSS signal drops out only at certain speeds or temperatures, which can be missed during a quick test drive.
- Metal debris on the OSS magnet is a common finding that points to internal wear, but cleaning the sensor may restore operation temporarily and confirm the circuit is otherwise intact.
- A weak battery or charging system fault can cause the TCM to log false ratio codes because low voltage disrupts sensor signal processing.
- After any sensor or wiring repair, the TCM may need a relearn or adaptive reset procedure to clear the ratio error and restore normal shift feel.

Can I keep driving with P1845?

You can usually drive the vehicle to a shop if the transmission still shifts and the light is steady, but avoid heavy acceleration or towing. If the transmission is in limp mode or slipping severely, stop driving to prevent further internal damage.

Tools that help

- OBD-II scan tool with live data and bidirectional controls
- Digital multimeter for resistance and voltage checks
- Oscilloscope for waveform analysis of the speed sensor signal
- Transmission fluid level dipstick or scan tool fluid level procedure
- Basic hand tools for sensor and connector access



Reading P1845

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (GM): its meaning depends on the make.
- 8** Transmission.
- 45** The exact fault within that area.

Often seen with

P0715 Input/Turbine Speed Sensor Circuit Malfunction · **P0720** Output Speed Sensor Circuit Malfunction · **P0721** Output Speed Sensor Range/Performance · **P0722** Output Speed Sensor Circuit No Signal · **P0730** Incorrect Gear Ratio

See it working

Watch the animated explainer [How an Automatic Transmission Works, Gear by Gear](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/gm-p1845/>

