

GM · POWERTRAIN

P1820

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1820 · GM

Internal Mode Switch Circuit A Low

P1820 on a GM vehicle means the transmission control module (TCM) has detected an abnormally low voltage on the internal mode switch (IMS) circuit A, which is the signal line that tells the TCM the physical position of the manual shift lever. The TCM compares the expected voltage pattern for the selected gear against what it actually sees on circuit A, and when that voltage stays below the acceptable threshold, it logs this code and may default to a limp-home shift strategy.

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

Symptoms you may notice

- The check engine light or transmission warning light illuminates on the instrument cluster.
- The gear position indicator on the dash may show the wrong range or flash erratically.
- The transmission may shift harshly, stay in a single gear, or refuse to engage certain ranges.
- The engine may crank but not start if the TCM cannot confirm park or neutral.
- The vehicle may enter limp-home mode with reduced power and limited gear selection.
- Often no symptoms besides the warning light, especially in the early stages of the fault.

Common causes, most likely first

- 1 A faulty internal mode switch (IMS) assembly inside the transmission, worn or contaminated with debris.
- 2 A chafed, pinched, or corroded wire in the circuit A harness between the IMS and the TCM.
- 3 A loose or corroded connector terminal at the IMS, the transmission pass-through connector, or the TCM.
- 4 Transmission fluid contamination or metallic debris bridging the IMS contacts and pulling the signal low.
- 5 A poor ground connection for the IMS or TCM causing a reference voltage drop on circuit A.
- 6 A failing TCM that misreads a correct IMS signal, though this is less common than wiring and switch faults.
- 7 Internal transmission mechanical wear that misaligns the manual valve and the IMS detent, altering the signal pattern.



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data for P1820, then verify the gear selector position reading in live data against the actual lever position.
- 2 Inspect the IMS connector and the transmission pass-through connector for corrosion, loose pins, or fluid intrusion, and clean or repair as needed.
- 3 Backprobe circuit A at the IMS and at the TCM and compare voltages through the full range of lever positions to isolate a harness fault.
- 4 Check the IMS ground circuit and the TCM ground for excessive resistance using a voltage drop test under load.
- 5 Remove and inspect the internal mode switch for wear, contamination, or a bent detent plate, and replace the switch if the signal is inconsistent at the switch itself.
- 6 If the switch and wiring test good, perform a continuity and resistance check on circuit A end to end and repair any chafed or open sections of the harness.
- 7 After repair, clear the code, perform a transmission adaptive relearn if required, and road test through all gear ranges to confirm the code does not return.

What the IMS circuit A test really shows

- A low voltage on circuit A does not automatically mean the switch is bad; a short to ground anywhere along the harness will produce the same reading at the TCM.
- Technicians often replace the internal mode switch only to find the real fault is a corroded pass-through connector at the transmission case, which is exposed to road splash and heat.
- The IMS is a set of sliding contacts, so metallic clutch debris in the fluid can bridge the segments and pull circuit A low without any mechanical failure of the switch.
- A weak or missing ground at the TCM can bias the entire IMS signal low, so always voltage-drop the grounds before condemning the switch.
- This code can set intermittently from a harness that rubs only during certain engine torque loads, so a wiggle test of the harness while watching live data is a key step.

Can I keep driving with P1820?

You can usually drive the vehicle to a shop if it still moves and shifts, but avoid highway speeds and heavy loads because the transmission may drop into limp-home mode without warning. If the engine will not crank or the transmission will not engage a forward gear, stop driving and arrange a tow to prevent a no-start or rollaway situation.



Tools that help

- Scan tool with GM transmission live-data and bidirectional control capability
- Digital multimeter with backprobe pins and a voltage drop function
- Transmission fluid pressure gauge and a clean drain pan
- Factory service information for IMS pinout and resistance specifications
- Wire terminal pick and connector release tools
- Flashlight and inspection mirror for harness routing checks

Reading P1820

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

Often seen with

P1815 Pressure Control Solenoid 1 Short To B+ · **P1810** ATF Pressure Manual Valve Position Switch Malfunction · **P1811** Long Shift / Maximum Adaptation Limit Reached · **P1815** Transmission Range Switch Start In Wrong Range · **P1810** TFP Valve Position Switch Circuit Transmission 4-Wheel Drive · **P1815** Transmission 4-Wheel Drive Mode Select Short Circuit To Grou · **P0705** Transmission Range Sensor Circuit Malfunction

See it working

Watch the animated explainer [Fuel Trims Explained: Short-Term and Long-Term](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/gm-p1820/>

