



P1221 · GM

Throttle Position (TP) Sensor 1 2 Correlation

P1221 on a GM vehicle means the engine control module (ECM) has detected a disagreement between the two throttle position (TP) sensor signals inside the electronic throttle body. The ECM compares sensor 1 and sensor 2 voltages, which should track each other in opposite directions, and sets this code when their correlation falls outside the calibrated window for a set time.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	GM specific	Medium	Intermediate	Fuel and air metering (injector circuits)

Symptoms you may notice

- Reduced engine power message or limp-home mode with limited throttle response
- Rough or erratic idle, sometimes surging or hanging at a high idle
- Hesitation or stumble when accelerating from a stop
- Transmission shifts harshly or refuses to downshift because it relies on throttle angle
- Cruise control may be disabled or drop out unexpectedly
- Often no symptoms besides the warning light if the correlation error is intermittent

Common causes, most likely first

- 1 Carbon buildup or mechanical wear inside the electronic throttle body causing the two position sensors to disagree
- 2 Faulty throttle body assembly with a failing sensor 1 or sensor 2 track
- 3 Damaged or chafed wiring in the throttle body harness, especially at the connector
- 4 Corroded or loose terminals at the throttle body or ECM connector
- 5 Poor electrical ground between the engine and chassis affecting sensor reference voltage
- 6 ECM software calibration issue or internal driver fault (less common)
- 7 Aftermarket throttle body or intake work that disturbed the sensor correlation



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data for P1221, then clear the code and verify whether it returns immediately or only after a drive cycle
- 2 Inspect the throttle body connector and harness for corrosion, pushed pins, or chafed insulation, and repair as needed
- 3 Measure sensor 1 and sensor 2 voltages at the throttle body with a scan tool or voltmeter while slowly opening the throttle by hand, confirming they move in opposite directions without dropouts
- 4 Remove the throttle body and clean the bore and plate with throttle-body cleaner, then perform a throttle relearn with the scan tool
- 5 Check engine ground straps and battery connections for voltage drop that could skew sensor reference
- 6 If sensor correlation is still out of range after cleaning and wiring repair, replace the electronic throttle body and perform the idle relearn procedure
- 7 As a last step, verify ECM calibration is current and inspect ECM connectors before condemning the module

Why cleaning the throttle body often fixes P1221

- The two throttle position sensors are redundant tracks inside the same throttle body, so a mechanical stick or carbon ridge on the plate can make them disagree even when the electrical circuits test fine.
- A dirty throttle body that has been cleaned without a relearn will often set P1221 again because the ECM's learned closed-throttle and wide-open-throttle voltages no longer match the new mechanical resting position.
- Intermittent P1221 that appears only in cold weather or after a bump often traces to a chafed wire in the throttle body harness rather than the throttle body itself, so wiggle-test the harness while watching live sensor data.
- A weak or corroded engine ground can pull the sensor reference voltage down under load and create a correlation error that looks exactly like a failing throttle body.
- This code does not always mean the throttle body is bad; a low battery or a recent battery replacement that erased learned throttle values can set a correlation code until a relearn is completed.

Can I keep driving with P1221?

You can usually drive the vehicle to a shop, but expect reduced power and possible limp-home mode, so avoid highway merging, towing, or any situation that demands full throttle until the fault is repaired.

Tools that help

- OBD-II scan tool with live data and throttle relearn capability
- Digital multimeter
- Throttle body cleaner and shop rags
- Basic hand tools (socket set, screwdrivers)
- Wiring diagram for the throttle body circuit



Reading P1221

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (GM): its meaning depends on the make.
- 2** Fuel and air metering (injector circuits).
- 21** The exact fault within that area.

Often seen with

P0121 Throttle Position Sensor A Circuit Range/Performance · **P0122** Throttle Position Sensor A Circuit Low Input · **P0123** Throttle Position Sensor A Circuit High Input · **P0221** Throttle Position Sensor B Circuit Range/Performance · **P2135** Throttle/Pedal Position Sensor A/B Voltage Correlation

See it working

Watch the animated explainer [How a Refrigerator Works: The Cooling Cycle](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/gm-p1221/>

