



P1120 · Mazda

Throttle Position Sensor Out Of Range Low

P1120 on a Mazda means the powertrain control module (PCM) has detected a throttle position sensor (TPS) signal voltage that is lower than the expected range for the current operating conditions. The PCM compares the TPS voltage against its calibrated map and sets this code when the signal stays below the minimum threshold for a set period, indicating a short to ground, an open circuit, or a failed sensor.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Mazda specific	Medium	Intermediate	Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Hesitation or stumble when accelerating from a stop
- Reduced engine power or limp-home mode in some models
- Poor fuel economy or erratic idle quality
- Automatic transmission may shift harshly or late due to incorrect throttle input

Common causes, most likely first

- 1 Throttle position sensor internal failure causing a low voltage output
- 2 Wiring harness damage between the TPS and PCM, such as a rubbed-through wire or corroded connector
- 3 Poor electrical connection at the TPS or PCM connector, including loose pins or water intrusion
- 4 Short to ground on the TPS signal circuit
- 5 Contaminated or sticking throttle body preventing the sensor from sweeping its full range
- 6 PCM internal fault, though this is rare and should be diagnosed last

How to diagnose and fix it

- 1 Connect a scan tool and read live TPS voltage data while slowly opening the throttle to confirm the low signal and check for dead spots
- 2 Visually inspect the TPS connector and wiring for corrosion, chafing, or loose pins, and repair as needed
- 3 Measure reference voltage (usually 5 volts) and ground continuity at the TPS connector with a digital multimeter
- 4 Backprobe the TPS signal wire and check for a short to ground with the key on and engine off
- 5 Remove the throttle body and clean any carbon buildup that could restrict throttle plate movement
- 6 Replace the throttle position sensor if voltage remains out of range after electrical checks
- 7 Clear the code and perform a throttle relearn or idle relearn procedure if required for the Mazda model



What Mazda Techs Check Before Replacing the TPS

- A common oversight is a worn throttle body that holds the throttle plate slightly open, causing the TPS to report a low voltage at closed throttle and setting P1120 even when the sensor itself is good.
- Corrosion inside the TPS connector from a leaking throttle body coolant line or a missing connector seal can create a low-voltage signal that mimics a failed sensor.
- On some Mazda models, a failing accelerator pedal position sensor can cause the PCM to set P1120 because the two signals are compared, so always check pedal sensor data before condemning the TPS.
- After replacing the TPS, many Mazdas require a throttle position relearn procedure; skipping it can cause the code to return immediately even with a new sensor.
- A shorted signal wire may only show up when the engine is running and vibration is present, so wiggle-test the harness while watching live TPS voltage.

Can I keep driving with P1120?

You can usually drive the vehicle to a repair shop, but avoid aggressive acceleration or heavy loads because the PCM may limit power or shift the transmission erratically. If the engine enters limp mode or stalls, stop driving and have the vehicle towed.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wire probing kit or backprobe pins
- Throttle body cleaner and shop rags
- Basic hand tools (screwdrivers, socket set)

Reading P1120

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

Often seen with

P0120 Throttle Position Sensor A Circuit Malfunction · **P0121** Throttle Position Sensor A Circuit Range/Performance · **P0122** Throttle Position Sensor A Circuit Low Input · **P0123** Throttle Position Sensor A Circuit High Input · **P2135** Throttle/Pedal Position Sensor A/B Voltage Correlation



See it working

Watch the animated explainer [How a Manual Transmission Works: Four-Speed Cutaway](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/mazda-p1120/>

