

GENERIC · POWERTRAIN

P2510

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2510

ECM/PCM Power Relay Sense Circuit Range/Performance

P2510 means the engine control module (ECM) or powertrain control module (PCM) has detected an abnormal voltage on the sense circuit that monitors the main power relay, which supplies battery power to the computer and its outputs. The computer expects a specific voltage range on that sense wire when the relay is commanded on or off, and the reading fell outside that range for a calibrated period.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Vehicle speed, idle control and auxiliary inputs

Symptoms you may notice

- The check engine light or service engine soon light is illuminated, often with no other noticeable symptoms.
- The engine may crank but not start, or may stall intermittently if the relay is failing to supply stable power.
- Electrical accessories or dashboard warning lights may flicker or behave erratically when the relay contacts chatter.
- The engine may run rough or cut out under load if the ECM/PCM loses its main power feed momentarily.
- In some vehicles, the engine may fail to start at all because the ECM/PCM never receives power through the relay.
- A no-start condition that temporarily resolves after cycling the key or tapping the relay.

Common causes, most likely first

- 1 A failing ECM/PCM power relay with worn or pitted internal contacts that no longer close cleanly.
- 2 Corroded, loose, or damaged terminals at the relay socket or in the underhood fuse box.
- 3 A damaged or chafed wire in the relay sense circuit, often near the fuse box or where the harness bends.
- 4 Poor ground connections for the relay coil or for the ECM/PCM itself, causing a voltage offset on the sense line.
- 5 A failing ECM/PCM with an internal fault in its power supply monitoring circuit.
- 6 A blown or partially blown fuse in the relay power feed circuit that causes intermittent voltage drops.
- 7 Water intrusion into the underhood fuse box or relay panel causing corrosion and voltage irregularities.



How to diagnose and fix it

- 1 Verify battery voltage and condition first, since a weak battery can cause misleading relay sense readings.
- 2 Inspect the ECM/PCM power relay and its socket for corrosion, loose pins, or heat damage, and swap the relay with an identical known-good one to test.
- 3 Check all fuses that feed the relay coil and relay contacts, and confirm they are seated and not corroded.
- 4 Back-probe the relay sense circuit at the ECM/PCM connector and compare the voltage with the relay commanded on and off against the manufacturer's specification.
- 5 Perform a voltage drop test on the relay power feed and ground circuits while the circuit is loaded to find resistance that a simple voltage check misses.
- 6 Inspect the harness for chafing, pinched wires, or water intrusion along the route from the fuse box to the ECM/PCM.
- 7 If all wiring and the relay test good, follow the manufacturer's diagnostic flow for the ECM/PCM internal power supply before condemning the computer.

Relay sense faults that fool good technicians

- A relay that clicks and passes a simple continuity test can still have pitted contacts that drop voltage under load, so the sense circuit may only misbehave when the engine is running or hot.
- The sense circuit is a low-current monitoring wire, and a small amount of corrosion at a terminal can shift the voltage enough to set P2510 without causing any drivability symptom.
- Technicians often replace the ECM/PCM when the real fault is a poor ground for the relay coil or a corroded fuse box terminal that changes resistance with temperature.
- P2510 can be set by a momentary voltage dip during cranking, so a battery that is marginal or a starter drawing excessive current can trigger it even though the relay itself is fine.
- On some vehicles the same sense circuit feeds other modules, so a fault there can set companion codes in transmission or body control modules that distract from the real cause.

Can I keep driving with P2510?

If the engine starts and runs normally, you can drive to a repair shop, but avoid long trips and heavy electrical loads because the relay may fail completely without warning. If the engine cranks but does not start or stalls repeatedly, stop driving and have the vehicle towed, since a failed power relay can leave you stranded.

Tools that help

- Digital multimeter with back-probe pins
- Test light or load tester
- Relay puller or small pick
- Wiring diagram for the ECM/PCM power relay circuit
- Scan tool capable of reading live data and clearing codes



Reading P2510

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 5** Vehicle speed, idle control and auxiliary inputs.
- 10** The exact fault within that area.

Often seen with

P0562 System Voltage Low · **P0600** Serial Communication Link Malfunction · **P0685** ECM/PCM Power Relay Control Circuit Open · **P0686** ECM/PCM Power Relay Control Circuit Low · **P2511** ECM/PCM Power Relay Sense Circuit Intermittent

See it working

Watch the animated explainer [Car Relay Test Bench: Test 4-Pin and 5-Pin Relays](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2510/>

