

GENERIC · POWERTRAIN

P0689

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0689

ECM/PCM Power Relay Sense Circuit Low

P0689 means the engine control module (ECM) or powertrain control module (PCM) has detected a low-voltage condition on the sense circuit that monitors power from the main ECM/PCM power relay. The computer is not seeing the expected voltage on its own power feed when the relay should be supplying it, so it flags the circuit as low.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Computer and output circuits

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Intermittent no-start or crank-no-start condition, especially after the vehicle sits
- Engine may stall randomly or shut off while driving if the relay drops out
- Multiple unrelated trouble codes stored in memory due to low module voltage
- Hesitation or poor running if the ECM/PCM is losing stable power during operation

Common causes, most likely first

- 1 Faulty ECM/PCM power relay (most common cause)
- 2 Blown or corroded fuse in the ECM/PCM power feed circuit
- 3 Loose, corroded, or damaged battery terminals and ground connections
- 4 Damaged wiring or connector at the relay, fuse box, or ECM/PCM harness
- 5 High resistance in the relay sense circuit due to chafed or broken wire
- 6 Weak or failing battery that drops voltage below the relay's pull-in threshold
- 7 Internal fault in the ECM/PCM sense circuit (rare but possible)

How to diagnose and fix it

- 1 Check battery state of charge and perform a load test; recharge or replace as needed
- 2 Inspect and clean battery terminals, grounds, and the ECM/PCM power relay fuse
- 3 Swap the ECM/PCM power relay with an identical known-good relay and clear the code
- 4 Back-probe the relay sense circuit at the ECM/PCM connector and compare voltage to battery voltage with the key on
- 5 Inspect relay socket, fuse box, and harness for corrosion, loose pins, or chafed wires
- 6 Perform a voltage drop test on the power and ground sides of the relay circuit under load
- 7 If all external circuits test good, follow the manufacturer's diagnostic flow for internal ECM/PCM testing before replacement



Why this code often misleads

- A weak battery or poor ground can set P0689 even when the relay itself is perfectly functional, so always load-test the battery and check grounds before condemning parts.
- The ECM/PCM power relay is often shared with other circuits, so a failure can cause multiple unrelated codes that disappear once the relay is replaced.
- Intermittent P0689 that only appears on cold mornings frequently traces to a relay coil that is failing thermally rather than a wiring fault.
- Some vehicles use a solid-state power module instead of a conventional relay, and the sense circuit behavior differs, so consult the specific wiring diagram before probing.
- Clearing the code without repairing the low-voltage cause can lead to adaptive memory loss and poor driveability if the ECM/PCM loses power repeatedly.

Can I keep driving with P0689?

If the engine starts and runs normally, short trips to a repair shop are acceptable, but avoid long drives or heavy electrical loads because a failing relay can cut power to the ECM/PCM and stall the engine without warning. If the vehicle is hard to start or stalls, park it and arrange diagnosis before driving further.

Tools that help

- Digital multimeter
- Test light
- Battery load tester
- Fuse puller
- Relay puller
- Wiring diagram for the specific vehicle

Reading P0689

P	Powertrain: engine, transmission and emissions.
0	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
6	Computer and output circuits.
89	The exact fault within that area.

Often seen with

P0562 System Voltage Low · **P0685** ECM/PCM Power Relay Control Circuit Open · **P0686** ECM/PCM Power Relay Control Circuit Low · **P0687** ECM/PCM Power Relay Control Circuit High · **P0688** ECM/PCM Power Relay Sense Circuit /Open



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/p0689/>

