

GM · POWERTRAIN

P1638

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1638 · GM

Alternator Field F Terminal Circuit

P1638 on GM vehicles indicates that the engine control module (ECM) has detected an abnormal condition on the alternator field F terminal circuit, which is the control wire the ECM uses to regulate charging output. The ECM monitors this circuit for expected voltage behavior and sets the code when the signal is out of range, often due to an open, short, or faulty alternator.

SYSTEM

Powertrain

CODE TYPE

GM specific

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Computer and output circuits

Symptoms you may notice

- Battery warning light illuminated on the dashboard
- Charging system voltage gauge reads low or fluctuates
- Dimming headlights or interior lights, especially at idle
- Battery repeatedly goes dead or requires frequent jump starts
- Electrical accessories such as radio or climate control behave erratically
- Often no symptoms besides the warning light, with the vehicle running normally

Common causes, most likely first

- 1 Broken, corroded, or disconnected wire in the alternator field F terminal circuit
- 2 Failed alternator voltage regulator or internal field circuit
- 3 Poor ground connection at the alternator or engine block
- 4 Faulty engine control module (ECM) driver for the field circuit
- 5 Damaged or loose alternator connector at the field terminal
- 6 Blown fuse or fusible link protecting the field circuit

How to diagnose and fix it

- 1 Inspect the alternator field F terminal connector and wiring for damage, corrosion, or looseness
- 2 Check the charging system voltage at the battery with the engine running to confirm undercharging
- 3 Test the field circuit for continuity and shorts between the ECM and alternator using a wiring diagram
- 4 Verify the alternator ground strap and engine ground connections are clean and tight
- 5 Check the fuse or fusible link that supplies power to the field circuit
- 6 If the circuit tests good, command the field circuit with a scan tool to see if the ECM driver responds
- 7 Replace the alternator if the field circuit is intact but the alternator does not respond to commands



Don't replace the alternator before checking this

- A loose or corroded field terminal connector often mimics a failed alternator, so always inspect the plug before condemning the unit.
- The ECM may set P1638 even when the alternator still charges, because the code can be triggered by a brief glitch in the field circuit.
- A weak or failing battery can cause erratic field circuit behavior and set this code, so load-test the battery before chasing wiring.
- On some GM vehicles, a faulty ignition switch or voltage drop in the charging system can indirectly affect the field circuit and set P1638.
- After repairs, the code may need to be cleared with a scan tool and the charging system monitored to confirm the fix.

Can I keep driving with P1638?

You can drive short distances to a repair shop, but avoid long trips and heavy electrical loads because the battery may drain and leave you stranded. If the battery warning light is on and voltage is dropping, stop driving and seek service immediately.

Tools that help

- Digital multimeter
- Scan tool with bidirectional control
- Wiring diagram for the specific GM vehicle
- Test light
- Battery load tester

Reading P1638

P	Powertrain: engine, transmission and emissions.
1	Manufacturer-specific code (GM): its meaning depends on the make.
6	Computer and output circuits.
38	The exact fault within that area.

Often seen with

P1637 Data Bus Powertrain Missing Message From Central Electronic · **P1637** CAN Link ECM ABS Control Module Circuit Network · **P1637** Alternator Warning Lamp Control Signal · **P1637** Throttle Valve Position Control Deviation · **P0562** System Voltage Low · **P0563** System Voltage High · **P0620** Generator Control Circuit Malfunction · **P0625** Generator Field/F Terminal Circuit Low



See it working

Watch the animated explainer **V6 Engine Explained: 60° Bank and Firing Order** on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/gm-p1638/>

