

GENERIC · POWERTRAIN

P07EF

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P07EF

Transmission Range Multi-Function Select Circuit Low

P07EF indicates that the transmission control module (TCM) has detected an abnormally low voltage on the multi-function select circuit, which is the wiring path that carries the driver's gear selector position to the computer. The TCM compares the expected signal voltage for the selected range against what it actually receives, and when the circuit stays below the low threshold, it logs this code and may default to a limp-home mode.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Transmission

Symptoms you may notice

- The check engine light or transmission warning light illuminates on the dashboard.
- The gear indicator on the instrument cluster may be blank, flashing, or show the wrong range.
- The transmission may stay in a single gear or refuse to shift out of park.
- The engine may crank but not start because the TCM does not recognize park or neutral.
- Often no symptoms besides the warning light, especially if the fault is intermittent.
- The vehicle may enter limp-home mode with reduced power and limited gear selection.

Common causes, most likely first

- 1 A faulty transmission range sensor, also called the multi-function switch or neutral safety switch, with worn or contaminated internal contacts.
- 2 Corroded, loose, or damaged electrical connector pins at the transmission range sensor or TCM.
- 3 A chafed, broken, or shorted wire in the multi-function select circuit, often near the transmission or under the dash.
- 4 Water intrusion into the range sensor connector or TCM connector causing low-voltage leakage.
- 5 A failed or failing TCM that misreads the range sensor signal.
- 6 Poor ground connection for the range sensor or TCM, raising the reference voltage above normal.
- 7 Aftermarket alarm or remote start wiring improperly spliced into the range circuit.



How to diagnose and fix it

- 1 Scan all modules for stored and pending codes, then record freeze-frame data to see the conditions when P07EF set.
- 2 Visually inspect the transmission range sensor and its connector for corrosion, water intrusion, or loose pins, and clean or repair as needed.
- 3 Backprobe the multi-function select circuit at the sensor and at the TCM to measure voltage with the key on, comparing against the manufacturer's specification.
- 4 Perform a wiggle test on the harness while watching live data for the range sensor input to expose an intermittent wire fault.
- 5 Check the sensor ground circuit for excessive resistance using a voltage drop test rather than a simple continuity check.
- 6 If the circuit and connectors pass, test the range sensor with a multimeter or scan tool bidirectional control, and replace it if it does not switch states correctly.
- 7 After any repair, clear the code and drive the vehicle through all gear ranges to confirm the code does not return.

What the range sensor circuit hides

- A low-voltage code on this circuit is more often a wiring or connector problem than a failed range sensor, so inspect the harness before condemning the switch.
- The range sensor shares its ground with other transmission components on many vehicles, so a bad ground elsewhere can set P07EF without any fault in the sensor itself.
- Aftermarket remote start or alarm installers sometimes tap the range circuit for a park/neutral signal, and a poor splice there can cause a low-voltage code that looks like a sensor failure.
- The TCM may substitute a default range value when the signal is low, allowing the engine to start and the vehicle to move, which can mask the fault until the driver notices harsh shifting or a no-start in park.
- A weak or failing battery can cause the TCM to log this code during cranking if system voltage drops below the module's operating threshold, so check battery health before deeper diagnostics.

Can I keep driving with P07EF?

You can usually drive the vehicle to a repair shop if it starts and moves, but avoid relying on it for long trips because the transmission may default to a single gear or refuse to start in park. If the vehicle will not start or will not shift out of park, do not force it and arrange a tow instead.



Tools that help

- OBD-II scan tool with live data and bidirectional control capability
- Digital multimeter with backprobe pins
- Wire terminal pick and connector release tools
- Electrical contact cleaner and dielectric grease
- Vehicle-specific wiring diagram for the transmission range sensor circuit

Reading P07EF

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

Often seen with

P0705 Transmission Range Sensor Circuit Malfunction · **P0706** Transmission Range Sensor Circuit Range/Performance · **P0707** Transmission Range Sensor Circuit Low · **P0708** Transmission Range Sensor Circuit High · **P0850** Park/Neutral Switch Input Circuit

See it working

Watch the animated explainer [How an Automatic Transmission Works, Gear by Gear](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p07ef/>

