

GENERIC · POWERTRAIN

P0654

OBD-II TROUBLE CODE

P0654

Engine RPM Output Circuit

P0654 indicates that the powertrain control module (PCM) has detected an abnormal condition on the engine RPM output circuit, which is the signal the PCM sends to other modules such as the instrument cluster tachometer. The PCM monitors the circuit for opens, shorts, or out-of-range voltage and sets this code when the signal does not behave as expected.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Low	Intermediate	Computer and output circuits

Symptoms you may notice

- Tachometer needle stays at zero or moves erratically while the engine runs
- Instrument cluster displays a dashes or error message instead of RPM
- Often no symptoms besides the warning light, especially if the fault is intermittent
- Other dashboard gauges or warning lights may behave strangely if they share the same data bus
- Engine may idle or run normally, but some vehicles limit power or disable certain features when the RPM signal is lost

Common causes, most likely first

- Damaged or corroded wiring between the PCM and the instrument cluster or other modules on the RPM output circuit
- Faulty instrument cluster or tachometer head that internally shorts or loads the RPM signal
- Poor connection at the PCM connector, cluster connector, or a splice in the harness
- Failed PCM driver circuit for the RPM output, often due to water intrusion or internal fault
- Aftermarket accessories tapped into the tachometer or data bus wiring, causing interference or a short
- Chafed harness rubbing against metal under the dash or in the engine bay



How to diagnose and fix it

- 1 Connect a scan tool and verify the code is current, then check live RPM data from the PCM to confirm the PCM is producing a valid signal internally
- 2 Inspect the wiring harness between the PCM and the instrument cluster for chafing, corrosion, or loose pins, especially at connectors
- 3 Disconnect the instrument cluster and check for battery voltage or a square-wave signal on the RPM output wire with a multimeter or oscilloscope
- 4 Perform a wiggle test on the harness and connectors while watching the tachometer or scan tool RPM reading to expose intermittent faults
- 5 If the signal is present at the cluster but the tachometer does not respond, test or replace the instrument cluster
- 6 If the signal is missing at the cluster but present at the PCM, repair the open or short in the harness
- 7 If the PCM output is absent with no wiring fault, diagnose the PCM driver circuit and replace or reprogram the PCM as needed

Before you replace the instrument cluster

- A common misdiagnosis is replacing the instrument cluster when the real fault is a corroded connector pin or a chafed wire under the dash that only acts up over bumps.
- The RPM output circuit often feeds more than just the tachometer; on many vehicles it also supplies the radio, climate control, or body control module, so a single short can affect several systems.
- Aftermarket remote starters, alarms, or stereo installers frequently tap into the tachometer wire, and a poor splice there can set P0654 without any factory component being defective.
- On some vehicles, a weak or failing battery or charging system can cause modules to drop the RPM signal intermittently, setting P0654 along with other communication codes.
- P0654 does not always mean the PCM is bad; the PCM driver is robust, and wiring or cluster faults account for the majority of cases.

Can I keep driving with P0654?

The vehicle is generally safe to drive because the engine and transmission continue to operate normally, but you should avoid relying on the tachometer and address the fault soon to prevent related electrical issues from worsening.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Oscilloscope (optional but helpful for signal analysis)
- Wiring diagram for the specific vehicle
- Trim removal tools for accessing the instrument cluster



Reading P0654

- 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.
- 54** The exact fault within that area.

Often seen with

P0650 Malfunction Indicator Lamp (MIL) Control Circuit Malfunction · **P0651** Sensor Reference Voltage 'B' Circuit/Open · **P0652** Sensor Reference Voltage 'B' Circuit Low · **P0653** Sensor Reference Voltage 'B' Circuit High · **U0100** Lost Communication With ECM/PCM A

See it working

Watch the animated explainer [Helicopter Flight Simulator: Learn the Three Controls](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0654/>

