

FORD · POWERTRAIN

P1690

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1690 · Ford

Wastegate Solenoid Circuit Malfunction

P1690 on a Ford vehicle indicates that the powertrain control module (PCM) has detected an electrical fault in the wastegate solenoid control circuit, which regulates turbocharger boost pressure. The PCM monitors the circuit for expected voltage or current and sets this code when the signal is out of range, indicating an open, short, or component failure.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Ford specific	Medium	Intermediate	Computer and output circuits

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- Reduced engine power or limp mode due to overboost protection.
- Poor acceleration and sluggish turbo response.
- Audible hissing or whistling from the engine bay under boost.
- Decreased fuel economy and increased turbo lag.

Common causes, most likely first

- 1 Failed wastegate solenoid (sticking, open coil, or shorted internally).
- 2 Damaged or disconnected wiring harness to the solenoid (open, short to ground, or short to power).
- 3 Corroded or loose electrical connector at the solenoid.
- 4 Vacuum or pressure hose leaks or blockages between the solenoid and wastegate actuator.
- 5 Faulty PCM driver circuit (rare but possible).
- 6 Mechanical binding of the wastegate actuator or linkage.

How to diagnose and fix it

- 1 Perform a visual inspection of the wastegate solenoid, its connector, and vacuum hoses for damage or disconnection.
- 2 Use a scan tool to command the wastegate solenoid on and off while listening for a click; no click suggests a faulty solenoid or circuit.
- 3 Measure resistance across the solenoid terminals and compare to factory specification; an open or shorted coil requires replacement.
- 4 Check for battery voltage at the solenoid connector with the key on and engine off; repair wiring if voltage is missing.
- 5 Inspect vacuum hoses for cracks or leaks using a vacuum gauge or smoke machine; replace any faulty hoses.
- 6 Test the wastegate actuator for free movement and correct operation; repair or replace if binding.
- 7 If all electrical and mechanical checks pass, suspect the PCM and perform pinpoint tests before replacement.

Common misdiagnosis traps for P1690

- A stuck wastegate actuator can mimic a solenoid failure, so always verify actuator movement before replacing the solenoid.
- Vacuum leaks at the solenoid or actuator are a frequent cause of P1690 that many technicians overlook during electrical diagnosis.
- The wastegate solenoid is often confused with the bypass valve solenoid on Ford EcoBoost engines, leading to replacement of the wrong component.
- Intermittent wiring faults from chafed harnesses near the turbocharger can set P1690 without a hard failure, so wiggle-test the harness while monitoring live data.
- After repairs, the PCM may require a drive cycle or adaptive learning reset to clear the code and restore normal boost control.

Can I keep driving with P1690?

It is generally safe to drive with P1690, but avoid aggressive acceleration or heavy towing because the engine may enter limp mode or suffer overboost. Prolonged driving with a faulty wastegate solenoid can lead to turbocharger damage, so schedule repairs promptly.

Tools that help

- OBD-II scan tool with bidirectional control
- Digital multimeter
- Vacuum gauge or smoke machine
- Hand tools (screwdrivers, socket set)
- Factory service information for pinpoint tests

Reading P1690

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

Often seen with

P0234 Engine Overboost Condition · **P0235** Turbocharger Boost Sensor A Circuit Malfunction · **P0236** Turbocharger Boost Sensor A Circuit Range/Performance · **P0243** Turbocharger Wastegate Solenoid A Malfunction · **P0299** Turbo/Supercharger Underboost



See it working

Watch the animated explainer **Turbocharger Trainer: Boost, Wastegate and Intercooler** on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/ford-p1690/>

