

GENERIC · POWERTRAIN

P02F1

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P02F1

Cylinder 4 Injector Circuit Range/Performance

P02F1 indicates that the powertrain control module (PCM) has detected an abnormal condition in the electrical circuit for the fuel injector serving cylinder 4, specifically a range or performance fault rather than a simple open or short. The PCM monitors injector current and response time, and when the signal falls outside the expected window for a calibrated period, it stores this code and may disable the injector to protect the engine.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Fuel and air metering (injector circuits)

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or misfire felt as a shake or stumble, especially when cold
- Noticeable loss of power and reduced fuel economy
- Engine may enter limp mode or flash the check engine light under load
- Increased hydrocarbon emissions and a raw fuel smell from the exhaust
- In some cases, the engine may stall or hesitate during acceleration

Common causes, most likely first

- 1 Faulty fuel injector for cylinder 4 (internal coil or mechanical issue)
- 2 Damaged or corroded electrical connector at the injector
- 3 Chafed, broken, or shorted wiring in the injector harness
- 4 PCM driver circuit fault for that injector channel
- 5 Low fuel pressure or contaminated fuel affecting injector performance
- 6 Loose or poor engine ground affecting injector operation



How to diagnose and fix it

- 1 Perform a visual inspection of the cylinder 4 injector connector and wiring for damage or corrosion
- 2 Use a noid light or oscilloscope to check for a proper injector pulse signal at the connector
- 3 Measure injector resistance with a multimeter and compare to manufacturer specifications
- 4 Check fuel pressure and inspect fuel for contamination or restricted flow
- 5 Swap the cylinder 4 injector with a known-good injector from another cylinder to see if the code moves
- 6 Inspect and test the injector driver circuit from the PCM to the injector for continuity and shorts
- 7 If all electrical and fuel checks pass, replace the cylinder 4 fuel injector and clear the code

Before you replace the cylinder 4 injector

- A loose or corroded connector pin at the injector is a frequent cause that mimics a failed injector and costs nothing to fix.
- The code can be set by a mechanical injector problem such as a clogged nozzle or internal leak, not just an electrical fault.
- Swapping the injector to another cylinder is the quickest way to confirm whether the fault follows the injector or stays with the circuit.
- A weak battery or poor engine ground can cause injector performance codes on multiple cylinders, so check charging system health first.
- Some vehicles require a relearn or adaptation reset after injector replacement to avoid a repeat code.

Can I keep driving with P02F1?

It is generally safe to drive short distances to a repair shop, but avoid heavy acceleration or towing because a misfiring cylinder can overheat the catalytic converter. If the check engine light flashes or the engine runs very rough, stop driving and arrange a tow.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Noid light or oscilloscope
- Fuel pressure gauge
- Basic hand tools for connector and injector access



Reading P02F1

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 2** Fuel and air metering (injector circuits).
- F1** The exact fault within that area.

Often seen with

P0204 Injector Circuit Malfunction - Cylinder 4 · **P0264** Cylinder 2 Injector Circuit Low · **P0304** Cylinder 4 Misfire Detected · **P2146** Fuel Injector Group 'A' Supply Voltage Circuit/Open · **P2149** Fuel Injector Group 'B' Supply Voltage Circuit/Open

See it working

Watch the animated explainer [Four-Stroke Engine Cutaway: Intake to Exhaust](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p02f1/>

