

GENERIC · POWERTRAIN

P2C54

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2C54

Cylinder 2 Fuel Injector B Offset Learning At Min Limit

P2C54 indicates that the engine control module (ECM) has learned a fuel injector offset correction for cylinder 2 that has reached its minimum allowable limit, meaning the ECM can no longer compensate for the injector's flow characteristics. The ECM detects this when the learned offset value for the 'B' injector on cylinder 2 stays at the bottom of its adaptive range during the fuel trim learning process.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Hybrid propulsion

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or misfire sensation, especially when the engine is cold
- Slight hesitation or stumble during acceleration
- Decreased fuel economy due to incorrect injector delivery
- Occasional hard start or extended cranking time
- Elevated hydrocarbon emissions detectable during an emissions test

Common causes, most likely first

- 1 Clogged or restricted fuel injector on cylinder 2 causing reduced flow
- 2 Internal injector wear or damage leading to abnormal spray pattern
- 3 Fuel contamination or deposits affecting injector performance
- 4 Wiring harness fault or poor electrical connection at the cylinder 2 injector
- 5 Low fuel pressure or volume from a weak pump or restricted filter
- 6 ECM software calibration issue or adaptive learning memory corruption
- 7 Mechanical engine problem such as low compression on cylinder 2 altering combustion



How to diagnose and fix it

- 1 Inspect the cylinder 2 injector electrical connector and harness for corrosion, chafing, or loose pins
- 2 Measure fuel pressure and volume to rule out a supply-side restriction
- 3 Perform a cylinder contribution test or injector balance test to compare cylinder 2 with others
- 4 Run a fuel injector cleaning service or use a concentrated injector cleaner additive
- 5 Swap the cylinder 2 injector with a known-good injector from another cylinder and recheck the learned offset
- 6 Check for ECM software updates and perform an adaptive learning reset if applicable
- 7 Replace the cylinder 2 fuel injector if cleaning and electrical checks do not resolve the offset limit

What the offset limit really tells you

- A min-limit offset often means the injector is flowing less than expected, but a faulty fuel pressure regulator or weak pump can produce the same code by starving all injectors.
- Many technicians replace the injector immediately, yet a dirty MAF sensor or vacuum leak can skew fuel trim learning and push the offset to its limit without any injector fault.
- The 'B' designation refers to a secondary injector offset table, so on some engines this code can set even when the primary injector circuit is healthy and the issue lies in the adaptive strategy.
- Always clear the adaptive memory after any repair; otherwise the ECM may retain the min-limit offset and keep the code active even with a new injector.
- This code can be stored alongside misfire codes for cylinder 2, but the absence of a misfire does not guarantee the injector is fine because the ECM may be compensating effectively.

Can I keep driving with P2C54?

You can usually continue driving short distances at moderate speeds, but avoid heavy acceleration or towing until the fault is diagnosed. Prolonged driving with a min-limit offset can lead to misfire, catalytic converter damage, and worsened fuel economy.

Tools that help

- OBD-II scan tool with live data and bidirectional control
- Fuel pressure gauge
- Digital multimeter
- Noid light or injector pulse tester
- Mechanic's stethoscope
- Factory service information for injector offset learning procedures



Reading P2C54

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- C** Hybrid propulsion.
- 54** The exact fault within that area.

Often seen with

P0171 System Too Lean (Bank 1) · **P0202** Injector Circuit Malfunction - Cylinder 2 · **P0302** Cylinder 2 Misfire Detected · **P2C53** Cylinder 1 Fuel Injector B Offset Learning At Max Limit · **P2C55** Cylinder 2 Fuel Injector B Offset Learning At Max Limit

See it working

Watch the animated explainer [Four-Stroke Engine Notebook: The Otto Cycle Explained](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2c54/>

