

GENERIC · POWERTRAIN

P2048

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2048

Reductant Injector Circuit Low (Bank 1 Unit 1)

P2048 indicates that the powertrain control module (PCM) has detected an abnormally low voltage or current on the reductant injector circuit for bank 1 unit 1, which is part of the diesel exhaust fluid (DEF) injection system. The PCM monitors the injector command and feedback circuit and sets this code when the signal falls below the expected threshold, typically indicating a short to ground, an open circuit, or a failed injector.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- Reduced engine power or limp mode as the PCM limits torque to protect emissions components.
- A message on the dash indicating low DEF, incorrect DEF quality, or a service emissions system warning.
- Rough running or misfire if the reductant injector is stuck open and leaking DEF into the exhaust.
- White crystalline residue around the injector or exhaust tailpipe from dried DEF.
- Increased DEF consumption if the injector is leaking or the system attempts to compensate.

Common causes, most likely first

- 1 Faulty reductant injector with an internal short or open coil.
- 2 Damaged or corroded wiring harness to the reductant injector, including chafed wires or broken pins.
- 3 Poor electrical connection at the injector or PCM connector, often due to water intrusion or loose terminals.
- 4 Short to ground in the injector control circuit, which may be caused by insulation damage.
- 5 Failed PCM driver for the reductant injector circuit, though this is less common.
- 6 DEF contamination or crystallization causing injector blockage and abnormal current draw.
- 7 Aftermarket or incorrect injector installed previously, leading to mismatched electrical characteristics.



How to diagnose and fix it

- 1 Perform a visual inspection of the reductant injector, its connector, and the wiring harness for damage, corrosion, or DEF leakage.
- 2 Use a scan tool to command the reductant injector on and off and observe the circuit voltage or current to confirm the fault.
- 3 Measure resistance across the reductant injector terminals and compare to the manufacturer's specification to check for an open or shorted coil.
- 4 Check for continuity and short to ground on the injector control wire between the PCM and the injector, repairing any damaged wiring.
- 5 Inspect the PCM connector for corrosion or loose pins and verify the PCM driver output with a lab scope if possible.
- 6 If the circuit and injector test good, substitute a known-good injector to see if the code clears, then replace the injector if faulty.
- 7 Clear the code and perform a road test or forced regeneration to verify the repair and ensure the code does not return.

Reductant injector circuit low-voltage traps

- A common mistake is replacing the reductant injector without first checking the wiring harness for chafing where it routes near hot exhaust components or sharp edges.
- The code can be set by a poor ground connection at the chassis or engine block, which affects the injector circuit reference voltage and mimics a failed injector.
- DEF crystallization around the injector connector can create a conductive path that causes a short to ground, so cleaning the connector thoroughly is essential before testing.
- Some vehicles set P2048 when the DEF level is critically low or the fluid is diluted, as the system monitors injector current and may flag a low circuit condition indirectly.
- A failed PCM is rarely the root cause, but a shorted injector can damage the PCM driver, so always check the injector resistance before installing a new or remanufactured PCM.

Can I keep driving with P2048?

It is generally safe to drive the vehicle short distances to a repair shop, but avoid heavy loads or long trips because the PCM may enter limp mode and reduce power. Continuing to drive with an active fault can lead to increased emissions and potential damage to the exhaust aftertreatment system.



Tools that help

- OBD-II scan tool with bidirectional control and live data
- Digital multimeter with resistance and continuity functions
- Lab scope for waveform analysis
- Wiring diagram and service information for the specific vehicle
- Socket set and trim removal tools for accessing the injector

Reading P2048

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

Often seen with

P2047 Reductant Injector Circuit/Open (Bank 1 Unit 1) · **P2049** Reductant Injector Circuit High (Bank 1 Unit 1) · **P2050** Reductant Injector Circuit/Open (Bank 2 Unit 1) · **P208E** Reductant Injection Valve Stuck Closed (Bank 1 Unit 1) · **P20B9** Reductant Heater A Control Circuit/Open

See it working

Watch the animated explainer [How a Car Clutch Works: Diaphragm Clutch Cutaway](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2048/>

