

GENERIC · POWERTRAIN

P2047

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2047

Reductant Injector Circuit/Open (Bank 1 Unit 1)

P2047 indicates that the powertrain control module (PCM) has detected an open circuit or excessive resistance in the electrical path for the reductant injector on bank 1 unit 1. This injector is responsible for spraying diesel exhaust fluid (DEF) into the exhaust stream to reduce nitrogen oxide (NOx) emissions, and the code sets when the PCM commands the injector on but does not see the expected current flow or voltage drop.

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 may be activated as a protective measure
- A message on the dashboard indicating low DEF level or a fault in the emissions system
- Rough running or misfire if the injector is completely inoperative and DEF is not being dosed
- Increased exhaust smoke or odor due to improper NOx reduction
- Possible failure to pass an emissions inspection

Common causes, most likely first

- 1 Open or damaged wiring harness between the PCM and the reductant injector
- 2 Corroded or loose electrical connector at the reductant injector
- 3 Failed reductant injector solenoid (open coil)
- 4 Blown fuse or relay supplying power to the reductant injector circuit
- 5 PCM internal driver failure (rare but possible)
- 6 Aftermarket or damaged DEF system components causing circuit interruption



How to diagnose and fix it

- 1 Verify the code with a scan tool and check for any related pending or stored codes
- 2 Inspect the reductant injector connector and wiring for signs of corrosion, damage, or looseness
- 3 Measure the resistance of the reductant injector with a multimeter and compare to manufacturer specifications
- 4 Check the fuse and relay that supply power to the reductant injector circuit
- 5 Perform a voltage drop test on the ground and power circuits to the injector while commanding it on with a scan tool
- 6 If the circuit tests good, replace the reductant injector
- 7 Clear the code and perform a road test to verify the repair

What a P2047 Often Really Means

- A loose or corroded connector at the reductant injector is a frequent cause that is often overlooked during diagnosis.
- The code can be set by a failed injector coil even when the injector appears clean and the wiring looks perfect.
- Some vehicles require a relearn or adaptation procedure after injector replacement, so simply clearing the code may not be enough.
- A weak battery or charging system issue can cause voltage spikes that mimic an open circuit, so always check battery health first.
- The reductant injector circuit is often shared with other components, so a fault in a related module can set P2047 indirectly.

Can I keep driving with P2047?

You can usually continue driving to a repair shop, but avoid heavy loads and long distances because the engine may enter limp mode and emissions compliance is affected. Prolonged driving with an open reductant injector can lead to DEF crystallization and additional damage.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Test light
- Wire repair kit
- Factory service information for circuit testing



Reading P2047

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

Often seen with

P2048 Reductant Injector Circuit Low (Bank 1 Unit 1) · **P2049** Reductant Injector Circuit High (Bank 1 Unit 1) · **P2050** Reductant Injector Circuit/Open (Bank 2 Unit 1) · **P20B9** Reductant Heater A Control Circuit/Open · **P20BA** Reductant Heater A Control Performance

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/p2047/>

