

GENERIC · POWERTRAIN

P05F1

OBD-II TROUBLE CODE

P05F1

Reductant Pump Supply Voltage Circuit Stuck On

P05F1 indicates that the reductant pump supply voltage circuit is stuck on, meaning the engine control module has detected voltage on the pump supply circuit when it should be off. This fault typically occurs in diesel vehicles equipped with selective catalytic reduction (SCR) systems, where the reductant pump delivers diesel exhaust fluid (DEF) to the exhaust stream.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Vehicle speed, idle control and auxiliary inputs

Symptoms you may notice

- Illumination of the malfunction indicator lamp (MIL) on the dashboard.
- Often no symptoms besides the warning light, especially if the pump is not commanded on.
- Possible reduction in engine power or limp mode if the system enters a fail-safe strategy.
- Increased diesel exhaust fluid (DEF) consumption if the pump runs continuously.
- Difficulty starting the engine or rough running if the pump remains energized and floods the exhaust.
- A noticeable ammonia smell from the exhaust if DEF is over-injected.

Common causes, most likely first

- 1 Short to voltage in the reductant pump supply circuit, such as a chafed wire contacting a power source.
- 2 Faulty reductant pump relay or solid-state relay that remains closed, supplying constant power.
- 3 Defective reductant pump control module with an internal short keeping the output energized.
- 4 Corroded or damaged connector pins at the pump or control module causing a short.
- 5 Engine control module (ECM) internal fault holding the supply voltage on.
- 6 Aftermarket accessories or improper wiring repairs that backfeed the circuit.



How to diagnose and fix it

- 1 Verify the code with a scan tool and check for any related codes in the reductant system.
- 2 Inspect the reductant pump supply circuit wiring for damage, chafing, or signs of shorting to voltage.
- 3 Disconnect the reductant pump and measure voltage on the supply circuit with the key on and off to confirm the stuck-on condition.
- 4 Test the reductant pump relay or control module output for proper switching and replace if stuck closed.
- 5 Check the ECM output signal and wiring to the relay or control module for a short to voltage.
- 6 Repair or replace any damaged wiring, connectors, or components as needed.
- 7 Clear the code and perform a road test to verify the repair and ensure the pump operates only when commanded.

When the pump runs with key off

- A stuck-on reductant pump can drain the battery overnight if the pump continues to run after the engine is shut off.
Technicians often overlook a faulty reductant pump relay that welds its contacts closed, causing constant power to the pump.
 - The code can be set by a short to voltage in the wiring harness where it rubs against a hot exhaust component, melting insulation.
 - Some vehicles use a solid-state relay integrated into the reductant control module, so the entire module may need replacement if the output is stuck on.
- A stuck-on pump may not trigger drivability symptoms immediately, but it can lead to DEF over-injection and eventual SCR catalyst damage if left unchecked.

Can I keep driving with P05F1?

It is generally safe to drive with this code as long as the engine is running normally and the warning light is the only symptom, but avoid long trips because continuous pump operation can drain the battery or damage the SCR system. Have the fault diagnosed promptly to prevent secondary issues.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the reductant pump circuit
- Test light
- Basic hand tools for connector and relay access



Reading P05F1

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 5** Vehicle speed, idle control and auxiliary inputs.
- F1** The exact fault within that area.

Often seen with

P05F0 Reductant Pump Supply Voltage Circuit High · **P05F2** Reductant Pump Supply Voltage Circuit Stuck Off
 · **P05F3** Exhaust Aftertreatment Power Relay Control Circuit/Open · **P208E** Reductant Injection Valve Stuck Closed (Bank 1 Unit 1) · **P20E8** Reductant Pressure Too Low

See it working

Watch the animated explainer [Disc Brake Trainer: How Car Brakes Stop a Wheel](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p05f1/>

