

GENERIC · POWERTRAIN

P0946

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0946

Hydraulic Pump Relay Circuit Range/Performance

P0946 indicates that the powertrain control module (PCM) has detected an out-of-range or performance fault in the hydraulic pump relay circuit, which typically controls a pump used for hydraulic pressure in systems such as active suspension or transmission fluid circulation. The computer monitors the relay's control circuit and expects a certain voltage or current response when the relay is commanded on or off; when the feedback does not match the expected range, the code is stored.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Transmission

Symptoms you may notice

- Illumination of the check engine light or service vehicle soon message on the dashboard.
- Often no symptoms besides the warning light, especially if the hydraulic system is not currently needed.
- Reduced or disabled operation of the hydraulic pump, leading to a stiffer ride or impaired suspension function in vehicles with active suspension.
- Delayed or harsh transmission shifts if the hydraulic pump supports transmission fluid pressure.
- Audible relay clicking or absence of pump operation when the ignition is turned on.
- In rare cases, the vehicle may enter a limp mode or limit certain functions to protect the hydraulic system.

Common causes, most likely first

- 1 Faulty hydraulic pump relay, such as worn contacts or a stuck coil.
- 2 Damaged or corroded wiring or connectors in the relay control circuit.
- 3 Blown fuse or fusible link supplying power to the relay or pump.
- 4 Failed hydraulic pump motor drawing excessive current or not operating at all.
- 5 Poor ground connection for the relay or pump circuit.
- 6 Faulty powertrain control module (PCM) driver circuit, though this is less common.



How to diagnose and fix it

- 1 Verify the code with a scan tool and check for any related codes in other modules.
- 2 Inspect the hydraulic pump relay and its socket for corrosion, loose pins, or burn marks; swap with a known-good relay of the same part number if possible.
- 3 Check all fuses and fusible links that supply power to the relay and pump circuit.
- 4 Test the relay control circuit with a multimeter to confirm power and ground signals from the PCM when the relay is commanded on.
- 5 Measure resistance and voltage drop across the pump motor and its ground circuit to rule out a faulty pump or bad ground.
- 6 If the relay and wiring are good, test the PCM output driver with a noid light or oscilloscope to confirm proper control signal.
- 7 Repair or replace any faulty components, clear the code, and verify the repair by cycling the ignition and test-driving the vehicle.

Relay Circuit Checks Before Replacing the Pump

- A common mistake is replacing the hydraulic pump when the actual fault is a \$10 relay or a corroded connector; always test the relay control signal first.
- The code can set intermittently due to a loose relay terminal that only loses contact when the vehicle vibrates, so wiggle-test the relay and harness while monitoring live data.
- Some vehicles use the hydraulic pump relay for multiple functions, such as suspension and power steering, so a failure may affect more than one system and set additional codes.
- A weak battery or charging system fault can cause the PCM to misreport relay performance, so check battery voltage and ground integrity before condemning the relay.
- The PCM may set P0946 if the relay coil resistance is out of specification even though the relay still clicks, so an ohmmeter test of the coil is more reliable than listening for a click.

Can I keep driving with P0946?

You can usually drive the vehicle with P0946 set, but avoid aggressive driving or heavy loads if the hydraulic system supports suspension or transmission functions. If you notice a significant loss of ride comfort, steering assist, or transmission performance, have the vehicle inspected promptly to prevent further damage.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Test light or noid light
- Relay puller and terminal pick tools
- Vehicle-specific wiring diagram



Reading P0946

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 9** Transmission.
- 46** The exact fault within that area.

Often seen with

P0945 Hydraulic Pump Relay Circuit/Open · **P0947** Hydraulic Pump Relay Circuit Low · **P0948** Hydraulic Pump Relay Circuit High · **P0949** Auto Shift Manual Adaptive Learning Not Complete · **P0950** Auto Shift Manual Control Circuit

See it working

Watch the animated explainer [Car Relay Test Bench: Test 4-Pin and 5-Pin Relays](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0946/>

