

FORD · POWERTRAIN

P1877

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1877 · Ford

Transmission Transfer Case 2-Wheel Drive Solenoid Circuit Short To Battery

P1877 on Ford vehicles means the transmission control module (TCM) has detected a short to battery voltage on the electrical circuit that controls the transfer case 2-wheel drive (2WD) solenoid. The TCM commands the solenoid to engage or disengage four-wheel drive, and when the circuit voltage stays high when it should be low, the TCM sets this code and may default to a fail-safe mode.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Ford specific	Medium	Professional	Transmission

Symptoms you may notice

- The four-wheel drive (4WD) or 2WD indicator light may flash or stay illuminated on the dashboard.
- The transfer case may fail to shift between 2WD and 4WD, leaving the vehicle stuck in one mode.
- A noticeable clunk or hesitation may occur when the transfer case attempts to engage or disengage.
- The transmission may enter limp mode, holding a single gear or refusing to shift normally.
- Often no symptoms besides the warning light, especially if the short is intermittent.

Common causes, most likely first

- 1 Chafed or damaged wiring in the transfer case solenoid circuit shorting to a battery-positive wire.
- 2 A failed transfer case 2WD solenoid with an internal short to its power feed.
- 3 Corroded, loose, or water-intruded connector pins at the solenoid or TCM.
- 4 A shorted wire harness inside the transmission or transfer case assembly.
- 5 A faulty TCM driver circuit that keeps the solenoid control wire at battery voltage.
- 6 Aftermarket accessories or poor previous repairs that tapped into the circuit.



How to diagnose and fix it

- 1 Scan all modules for stored and pending codes, then record freeze-frame data for P1877 to see when the short was detected.
- 2 Visually inspect the transfer case solenoid connector and the TCM connector for corrosion, bent pins, or water intrusion.
- 3 Disconnect the solenoid and measure resistance across its terminals; compare to Ford specifications to rule out an internal short.
- 4 With the solenoid disconnected, check for battery voltage on the control wire with the key on; voltage present indicates a short to battery in the harness.
- 5 Wiggle-test the harness while watching live solenoid command data to catch intermittent shorts caused by chafing.
- 6 Repair or replace the damaged section of wiring, then clear the code and verify the solenoid commands correctly in both 2WD and 4WD.
- 7 If the harness and solenoid test good, perform a TCM output test or substitute a known-good TCM to confirm the driver circuit.

What Ford Techs Check Before Replacing the Solenoid

- A short to battery in this circuit often comes from a harness rubbed through near the transfer case motor or exhaust heat shield, not from the solenoid itself.
- The TCM may set P1877 only when the vehicle is moving above a certain speed, so a stationary key-on test can miss an intermittent short.
- Water intrusion into the transfer case connector is a common Ford-specific issue that mimics a failed solenoid and is fixed by cleaning and resealing the connector.
- This code does not always mean the transfer case is mechanically damaged; the TCM can default to 2WD for protection even when the only fault is a wiring short.
- Aftermarket remote start or alarm wiring tapped into the 4WD circuit can back-feed battery voltage and set P1877 without any factory component failure.

Can I keep driving with P1877?

You can usually drive the vehicle in 2WD, but avoid relying on four-wheel drive and do not tow or drive on slippery surfaces where 4WD engagement is expected. If the transmission is in limp mode or the vehicle will not move, stop and have it towed.



Tools that help

- OBD-II scan tool with Ford-specific software for live transfer case solenoid data
- Digital multimeter with back-probe pins
- Wiring diagram for the transfer case solenoid circuit
- Test light or load-probe for circuit testing
- Socket set and trim removal tools for harness access

Reading P1877

P Powertrain: engine, transmission and emissions.

1 Manufacturer-specific code (Ford): its meaning depends on the make.

8 Transmission.

77 The exact fault within that area.

Often seen with

P1866 Data Bus Powertrain Missing Messages · **P1875** 4WD Low Switch Circuit Malfunction · **P1875** 4WD Low Switch Circuit · **P1866** Transmission Transfer Case System Concern Servicing Required · **P1867** Transmission Transfer Case Contact Plate General Circuit Fai · **P1876** Transmission Transfer Case 2-Wheel Drive Solenoid Circuit Fa

See it working

Watch the animated explainer [How an Automatic Transmission Works, Gear by Gear](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/ford-p1877/>

