

GENERIC · POWERTRAIN

P2D3F

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2D3F

Hybrid/EV Battery Cooling System B Performance

P2D3F indicates that the hybrid or electric vehicle battery cooling system is not performing as expected, specifically on the 'B' circuit or subsystem. The battery energy control module monitors coolant flow, pump operation, and temperature sensors, and it has detected that the cooling system's performance has degraded beyond acceptable limits, which can lead to reduced battery life or power output.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light or a dedicated hybrid system warning light.
- Often no symptoms besides the warning light, especially in early stages.
- Reduced electric-only range or power output due to battery derating.
- The vehicle may enter a limp mode or limit acceleration to protect the battery.
- Overheating warnings or messages on the dashboard in more severe cases.
- Audible coolant pump noise or lack of pump operation when the vehicle is on.

Common causes, most likely first

- 1 Low coolant level or air trapped in the cooling system due to a leak or improper bleeding.
- 2 Faulty coolant pump (electric water pump) that is weak, seized, or has an electrical fault.
- 3 Blocked or restricted coolant passages in the battery pack, radiator, or hoses.
- 4 Defective coolant temperature sensor or flow sensor providing inaccurate data.
- 5 Wiring or connector issues (corrosion, loose pins, damaged harness) to the pump or sensors.
- 6 Failed thermostat or control valve that prevents proper coolant circulation.
- 7 Internal battery pack issue causing excessive heat generation, overwhelming the cooling system.



How to diagnose and fix it

- 1 Check coolant level and condition; top off or replace coolant as needed and bleed the system.
- 2 Scan all modules for related codes and view live data for coolant temperature and pump operation.
- 3 Perform a visual inspection of the cooling system for leaks, kinks, or blockages.
- 4 Test the coolant pump with a commanded activation using a scan tool and verify it runs and flows.
- 5 Check electrical connections and wiring to the pump and sensors for continuity and corrosion.
- 6 Perform a coolant flow test or pressure test to confirm circulation through the battery pack.
- 7 If all else checks out, follow the manufacturer's diagnostic flow chart for the 'B' performance code, which may involve replacing the pump or sensor.

Don't overlook the simple coolant bleed

- A common mistake is replacing the coolant pump without first checking for air pockets in the system, which can mimic a failed pump and set this code.
- The 'B' circuit designation often refers to a secondary cooling loop or a specific sensor circuit, so consult the service manual for the exact location on your vehicle.
- This code can be set by a weak pump that still runs but does not produce enough flow, so a simple 'on/off' test may not be sufficient.
- In some hybrids, the battery cooling system shares components with the cabin HVAC, so issues like a failing blower motor or blend door can indirectly affect battery cooling.
- Always verify that the coolant is the correct type and mixture; using the wrong coolant can cause sensor malfunctions or pump damage over time.

Can I keep driving with P2D3F?

You can drive the vehicle for short distances to a repair shop, but avoid heavy acceleration, high speeds, and long trips because the battery may overheat and cause permanent damage. If the vehicle enters limp mode or shows overheating warnings, stop driving and seek professional assistance.

Tools that help

- OBD-II scan tool with hybrid/EV capability
- Digital multimeter
- Coolant refractometer or hydrometer
- Hand tools (wrenches, screwdrivers, pliers)
- Vacuum coolant refill kit or bleed tool



Reading P2D3F

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- D** Hybrid propulsion.
- 3F** The exact fault within that area.

Often seen with

P0A0D High Voltage System Interlock Circuit A High · **P0A93** Inverter A Cooling System Performance · **P0C73** Hybrid Battery Pack Cooling Pump Performance · **P2D3E** Cold Start Hybrid/EV Battery Performance · **P2D40** Hybrid/EV Battery Cooling System C Performance

See it working

Watch the animated explainer [How Regenerative Braking Works in Electric Cars](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2d3f/>

