

GENERIC · POWERTRAIN

P2E46

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2E46

Hybrid/EV Electronics Coolant Pump B Overspeed - Dry Run

P2E46 indicates that the vehicle's control module has detected the hybrid or electric electronics coolant pump B running at an excessive speed, which typically means the pump is spinning without moving coolant, a condition known as a dry run. The computer sets this code when the pump's feedback signal exceeds the expected speed for the commanded output, often because the pump has lost its liquid prime or the coolant level is too low.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

High

FIX DIFFICULTY

Professional

AREA

Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light or a dedicated hybrid system warning light, often with no other noticeable symptoms.
- Reduced power or a forced limp mode as the vehicle protects the hybrid electronics from overheating.
- A whining or grinding noise from the coolant pump area, especially during the first few minutes after a cold start.
- Overheating of the hybrid battery pack or power electronics, which may trigger additional codes or a shutdown.
- In some cases, the vehicle may fail to start or enter a ready-to-drive state if the coolant pump cannot establish flow.

Common causes, most likely first

- 1 Low coolant level in the hybrid electronics cooling circuit, often due to a slow leak or improper bleeding after service.
- 2 Air trapped in the coolant pump causing it to lose prime and spin dry, frequently after a coolant flush or component replacement.
- 3 A failing coolant pump B that has worn internal components, allowing it to overspeed when not under load.
- 4 A restricted or kinked coolant hose on the pump B circuit, preventing proper fluid flow and causing the pump to run dry.
- 5 A faulty pump speed sensor or wiring issue that sends an erroneous overspeed signal to the control module.
- 6 A control module software glitch or calibration issue that misinterprets normal pump operation as an overspeed condition.
- 7 Debris or contamination in the cooling system that blocks the pump inlet or damages the pump impeller.



How to diagnose and fix it

- 1 Check the coolant level in the hybrid electronics reservoir and top off with the specified coolant if it is low.
- 2 Inspect the coolant pump B circuit for leaks, kinks, or loose connections, and pressure test the system if a leak is suspected.
- 3 Perform the manufacturer's coolant bleeding procedure to remove trapped air from the pump and cooling circuit.
- 4 Use a scan tool to command the coolant pump on and observe live data for pump speed and coolant temperature to verify the overspeed condition.
- 5 Check the pump's electrical connector and wiring for corrosion or damage, and measure resistance or voltage according to the service information.
- 6 If the pump is confirmed faulty, replace it and refill/bleed the cooling system with the correct coolant.
- 7 After repairs, clear the code and perform a road test to ensure the pump operates within normal parameters and the code does not return.

Dry Run Codes Often Misdiagnosed

- A dry run code frequently appears after a coolant service because air was not properly bled from the hybrid electronics cooling loop, so always verify the bleed procedure before condemning the pump.
- Some vehicles use the same pump for both battery and power electronics cooling, and a partial blockage in one branch can cause the pump to overspeed without a complete loss of cooling.
- The pump may pass a static resistance test but still fail under load, so live data monitoring during a commanded activation is more reliable than a simple ohmmeter check.
- A failing coolant pump can set this code without illuminating the check engine light on some models, instead triggering a hybrid system warning that owners may overlook.
- Aftermarket pumps with incorrect impeller designs can cause overspeed codes even when new, so always verify part compatibility with the vehicle's specific cooling system requirements.

Can I keep driving with P2E46?

Do not continue driving with this code set, as the hybrid electronics or battery pack can overheat rapidly and suffer permanent damage. Have the vehicle towed to a qualified repair facility or limit driving to a very short distance to a safe location, and avoid any heavy acceleration or high-speed operation.

Tools that help

- OBD-II scan tool with live data and bidirectional control capabilities
- Coolant refractometer or hydrometer to check coolant concentration
- Pressure tester for the cooling system
- Digital multimeter for electrical checks
- Hose clamp pliers and basic hand tools
- Manufacturer-specific service information for bleeding procedures



Reading P2E46

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- E** Hybrid propulsion.
- 46** 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 · **P2E45** Hybrid/EV Electronics Coolant Pump B Enable Circuit · **P2E47** Hybrid/EV Electronics Coolant Pump B Underspeed

See it working

Watch the animated explainer [Engine Cooling System Trainer: How Engines Stay Cool](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2e46/>

