

GENERIC · POWERTRAIN

P2CF1

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2CF1

Auxiliary Thermostat B Stuck Open

P2CF1 indicates that the engine control module has detected the auxiliary thermostat B is stuck open, meaning the coolant flows through the auxiliary cooling circuit even when it should be closed to help the engine reach operating temperature quickly. The computer typically compares actual coolant temperature rise against a modeled expectation and sets the code when the warm-up is too slow or the temperature stays lower than commanded.

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

Symptoms you may notice

- Often no symptoms besides the warning light, especially in warm weather.
- The engine takes noticeably longer to reach normal operating temperature.
- Heater output may be weak or slow to warm up in cold conditions.
- Fuel economy may drop slightly because the engine runs richer for longer.
- In very cold weather, the temperature gauge may stay low or fluctuate.
- A related code for coolant temperature rationality or thermostat performance may also be stored.

Common causes, most likely first

- Auxiliary thermostat B mechanically stuck open due to wear, debris, or a broken internal spring.
- Failed thermostat seal or O-ring allowing coolant to bypass the closed thermostat.
- Wiring damage or corrosion at the auxiliary thermostat connector causing incorrect control.
- Faulty auxiliary coolant temperature sensor providing inaccurate readings to the control module.
- Low coolant level or trapped air in the cooling system preventing proper thermostat operation.
- Engine control module software calibration issue or internal fault (less common).

How to diagnose and fix it

- Verify coolant level and inspect for leaks; top up and bleed the cooling system as needed.
- Use a scan tool to read live coolant temperature data and compare warm-up rate to specifications.
- Check the auxiliary thermostat connector and wiring for corrosion, damage, or loose pins.
- Test the auxiliary thermostat B for proper operation by monitoring its commanded state and temperature response.
- Replace the auxiliary thermostat B if it is confirmed stuck open or fails a functional test.
- Clear the diagnostic trouble code and perform a road test to confirm the repair and that the code does not return.

Auxiliary thermostat faults that fool technicians

- A stuck-open auxiliary thermostat often causes no drivability complaint, so the code is frequently ignored until fuel economy or heater performance suffers.
- Air pockets in the cooling system after a coolant service can mimic a stuck-open thermostat and set this code falsely.
- The auxiliary thermostat may be controlled by the engine control module via a vacuum or electrical actuator, so a wiring fault can produce the same symptoms as a mechanical failure.
- On some vehicles, the auxiliary thermostat shares a circuit with other components, and a short in a related system can trigger P2CF1 without any thermostat problem.
- Always verify the actual coolant temperature with an infrared thermometer or scan tool before condemning the thermostat, because a biased temperature sensor can cause a misdiagnosis.

Can I keep driving with P2CF1?

It is generally safe to continue driving with this code, but avoid extended idling in cold weather and monitor the temperature gauge; if the engine overheats or the heater stops working entirely, stop and have the cooling system inspected promptly.

Tools that help

- OBD-II scan tool with live data capability
- Infrared thermometer
- Coolant refractometer or hydrometer
- Basic hand tools (sockets, wrenches, screwdrivers)
- Multimeter for electrical testing
- Coolant drain pan and funnel

Reading P2CF1

P Powertrain: engine, transmission and emissions.

2 Generic (SAE) code: it means the same thing on every OBD-II vehicle.

C Hybrid propulsion.

F1 The exact fault within that area.

Often seen with

P0116 Engine Coolant Temperature Circuit Range/Performance · **P0128** Coolant Thermostat (Coolant Temperature Below Thermostat Reg · **P2181** Cooling System Performance · **P2CF0** Auxiliary Thermostat A Stuck Closed · **P2CF2** Auxiliary Thermostat B Stuck Closed



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/p2cf1/>

