



P2CE1

Intake Air Heater C Circuit/Open

P2CE1 indicates that the engine control module has detected an open circuit or excessive resistance in the intake air heater circuit C, which is typically the control circuit for one of the heater elements. The computer expects a certain voltage or current on the circuit when the heater is commanded on, and it does not see that expected signal.

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, often with no other noticeable symptoms.
- Extended crank time or rough idle when starting a cold engine, especially in low ambient temperatures.
- White smoke or excessive exhaust smoke after a cold start due to incomplete combustion.
- Poor fuel economy during warm-up because the intake air is not being heated as designed.
- Possible derate or reduced engine power if the ECM limits operation to protect the heater circuit.

Common causes, most likely first

- 1 Open or damaged wiring in the intake air heater circuit C, such as a broken wire or corroded connector.
- 2 Failed intake air heater element or heater grid associated with circuit C.
- 3 Blown fuse or faulty relay that supplies power to the intake air heater circuit C.
- 4 Poor ground connection for the heater circuit, causing excessive resistance.
- 5 Faulty engine control module driver for the heater circuit, though this is less common.
- 6 Aftermarket accessories or modifications that tapped into the heater circuit and caused an open.

How to diagnose and fix it

- 1 Verify the code with a scan tool and check for any related pending or history codes in the intake air heater system.
- 2 Inspect the wiring harness and connectors for the intake air heater circuit C for signs of damage, corrosion, or loose pins.
- 3 Check the fuse and relay that supply power to the intake air heater circuit and replace if faulty.
- 4 Measure resistance of the heater element or grid for circuit C and compare to the manufacturer's specification.
- 5 Perform a voltage drop test on the power and ground sides of the circuit while the heater is commanded on.
- 6 If the circuit tests good, check the ECM driver output with a lab scope or bidirectional scan tool to confirm the ECM is commanding the heater on.
- 7 Repair or replace the faulty component, clear the code, and verify the repair with a test drive that includes a cold start.



Intake heater circuit checks before replacement

- A common oversight is assuming the heater element itself has failed when the real problem is a corroded connector or chafed wire that only shows up under vibration or temperature changes.
- The intake air heater circuit often shares a fuse or relay with other components, so a blown fuse may be caused by a short elsewhere in the shared circuit rather than the heater itself.
- Some vehicles use a heater grid with multiple circuits, and circuit C may be one of several; a failure in one circuit can sometimes be masked by the others still functioning.
- The ECM may set this code only after a cold start sequence, so the fault may not be present during a warm shop visit and a cold soak test may be required.
- Aftermarket electrical accessories wired into the heater circuit can introduce an open or excessive resistance that mimics a failed heater element.

Can I keep driving with P2CE1?

You can generally drive the vehicle with this code, but cold-start performance and emissions may be affected, and prolonged driving in very cold weather could lead to rough running or increased exhaust smoke. Avoid heavy loads or extended idling until the circuit is repaired, and address the issue before winter if possible.

Tools that help

- OBD-II scan tool with bidirectional control capability
- Digital multimeter
- Test light
- Wiring diagram for the intake air heater circuit
- Socket and ratchet set
- Heat gun or cold spray for temperature-related fault isolation

Reading P2CE1

P Powertrain: engine, transmission and emissions.

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

C Hybrid propulsion.

E1 The exact fault within that area.

Often seen with

P0544 Exhaust Gas Temperature Sensor Circuit (Bank 1 Sensor 1) · **P0545** Exhaust Gas Temperature Sensor Circuit Low (Bank 1 Sensor 1) · **P2CE0** Cold Start Cylinder 6 Deactivation/Intake Valve Control Perf · **P2CE2** Intake Air Heater C Circuit Range/Performance · **P2CE3** Intake Air Heater C Circuit Low



See it working

Watch the animated explainer [How an Oxygen Sensor Works: Live 3D Cutaway](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2ce1/>

