

GENERIC · POWERTRAIN

P2D45

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2D45

Reductant Temperature Too Low

P2D45 indicates that the powertrain control module has detected the diesel exhaust fluid (DEF) temperature is lower than the expected range for reliable reductant delivery and dosing. The computer compares the reductant temperature sensor signal against a model-based threshold and sets this code when the fluid is too cold for the system to operate correctly.

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 specific reductant system warning lamp
- Often no symptoms besides the warning light, especially in cold ambient temperatures
- Reduced engine power or limp mode if the condition persists and the system cannot maintain proper dosing
- A driver information message indicating low DEF temperature or poor DEF quality
- Increased DEF consumption or failure to complete a regeneration cycle
- Rough running or hesitation if the cold reductant prevents proper selective catalytic reduction operation

Common causes, most likely first

- 1 Low ambient temperatures causing the DEF tank heater to be commanded on but failing to warm the fluid
- 2 Faulty reductant temperature sensor or its wiring connector, including corrosion or open circuits
- 3 Failed DEF tank heater element or heater control circuit, such as a blown fuse or open relay
- 4 Stale or diluted DEF with an incorrect urea concentration that alters its thermal properties
- 5 Restricted or blocked DEF line preventing warm fluid from circulating to the sensor area
- 6 Powertrain control module software calibration that is overly sensitive to cold-start temperature thresholds



How to diagnose and fix it

- 1 Verify the actual DEF temperature with a scan tool and compare it to ambient and engine coolant temperatures after a cold soak
- 2 Inspect the reductant temperature sensor connector and wiring for corrosion, chafing, or loose pins and repair as needed
- 3 Test the DEF tank heater circuit for power, ground, and resistance according to the manufacturer's specification
- 4 Check the DEF concentration with a refractometer and replace the fluid if it is outside the specified urea range
- 5 Inspect the DEF lines and tank for restrictions, ice formation, or contamination that could prevent proper heating
- 6 Reprogram the powertrain control module with the latest calibration if a known cold-temperature sensitivity bulletin applies
- 7 Replace the reductant temperature sensor or DEF tank heater assembly only after electrical and fluid checks confirm a failed component

Cold DEF faults that fool good technicians

- A weak battery or low charging voltage during cold cranking can cause the heater control module to log a temperature-too-low fault even when the heater element itself is healthy.
- Aftermarket DEF or diluted urea changes the fluid's freezing point and heat absorption, so the temperature sensor may report a plausible but out-of-range value that mimics a sensor failure.
- The code can set intermittently during short winter trips where the DEF tank heater never reaches operating temperature, and it may clear on a longer drive without any repair.
- A restricted DEF line or a failed heater relay often sets this code alongside a reductant heater performance code, so always check for companion codes before condemning the temperature sensor.
- Some vehicles use a virtual temperature model rather than a direct sensor, so a software calibration error or a missing ambient temperature signal can trigger P2D45 without any physical heater fault.

Can I keep driving with P2D45?

You can usually continue driving to a workshop, but avoid long periods of idling in freezing weather and do not ignore a simultaneous reduced-power message. If the engine enters limp mode or the warning lamp flashes, have the vehicle scanned promptly because continued operation may prevent the selective catalytic reduction system from dosing correctly.



Tools that help

- OBD-II scan tool with live data and bidirectional control capability
- Digital multimeter for circuit and heater resistance testing
- DEF refractometer for urea concentration testing
- Infrared thermometer for comparing tank and ambient temperatures
- Basic hand tools and wiring repair kit for connector and harness inspection

Reading P2D45

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

Often seen with

P205B Reductant Tank Temperature Sensor A Circuit Range/Performanc · **P20B9** Reductant Heater A Control Circuit/Open · **P20BA** Reductant Heater A Control Performance · **P2D44** A/C Compressor Motor Performance · **P2D46** Hybrid/EV Battery Pack B Over Temperature

See it working

Watch the animated explainer [How Airbags Work: A 50 km/h Crash in Slow Motion](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2d45/>

