



P2000

NOx Trap Efficiency Below Threshold (Bank 1)

P2000 indicates that the powertrain control module (PCM) has determined the nitrogen oxide (NOx) trap on bank 1 is not storing and converting NOx efficiently enough to meet the programmed threshold. The PCM monitors the trap's performance using upstream and downstream NOx sensors and sets this code when the calculated efficiency falls below the expected value during a designated test period.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Professional	Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Reduced fuel economy as the engine may run richer to compensate for poor NOx conversion
- Slight hesitation or reduced power during acceleration in some cases
- Increased tailpipe emissions, which may be detected during an emissions inspection
- In rare instances, a sulfur smell or exhaust odor from the tailpipe

Common causes, most likely first

- 1 Degraded or contaminated NOx trap (lean NOx catalyst) due to age or exposure to sulfur or other contaminants
- 2 Faulty downstream NOx sensor providing inaccurate readings to the PCM
- 3 Exhaust leaks upstream of the NOx trap, allowing oxygen to skew sensor readings
- 4 Engine running too rich or too lean, which can overload or damage the NOx trap
- 5 Malfunctioning exhaust gas recirculation (EGR) system affecting NOx formation
- 6 Software calibration issues in the PCM that misjudge trap efficiency
- 7 Physical damage to the NOx trap from impact or thermal stress



How to diagnose and fix it

- 1 Use a scan tool to verify the code and check for any related pending or stored codes in other systems
- 2 Inspect the exhaust system for leaks, loose clamps, or damaged components between the engine and the NOx trap
- 3 Monitor live data for upstream and downstream NOx sensor readings to confirm sensor operation and trap efficiency
- 4 Check for technical service bulletins (TSBs) or software updates from the manufacturer that address NOx trap monitoring
- 5 Perform a diagnostic test of the NOx sensors according to the manufacturer's procedure, replacing if faulty
- 6 If sensors and exhaust are intact, evaluate the NOx trap's storage capacity using a manufacturer-specific test and replace if below specification
- 7 After repairs, clear codes and complete a drive cycle to verify the fix and ensure the monitor runs to completion

Before you replace the NOx trap

- A common oversight is assuming the NOx trap itself is faulty when the downstream NOx sensor is skewed; always compare sensor readings with a known-good reference before condemning the trap.
- Exhaust leaks upstream of the trap can introduce oxygen that mimics a failed trap, so a thorough leak check is essential and often overlooked.
- The code can be set by a software calibration issue rather than a hardware failure, so checking for updated PCM software is a wise step before parts replacement.
- Driving habits such as frequent short trips can prevent the NOx trap from reaching its regeneration temperature, leading to false efficiency judgments by the PCM.
- Related codes like P20EE (SCR NOx efficiency) or P229F (NOx sensor circuit) may also be present and should be diagnosed together to avoid misdiagnosis.

Can I keep driving with P2000?

You can generally continue driving with this code, but avoid aggressive acceleration and heavy loads until it is diagnosed, as prolonged driving with a failed NOx trap can increase emissions and may lead to more expensive repairs. Have the vehicle inspected soon to prevent potential damage to other emissions components.

Tools that help

- OBD-II scan tool with live data and manufacturer-specific capabilities
- Digital multimeter for testing sensor circuits
- Exhaust leak detector or smoke machine
- Infrared thermometer for checking exhaust temperatures
- Hand tools for exhaust component inspection



Reading P2000

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 0** Fuel and air metering and auxiliary emission controls.
- 00** The exact fault within that area.

Often seen with

P207F Reductant Quality Performance · **P20B9** Reductant Heater A Control Circuit/Open · **P20EE** NOx Catalyst Efficiency Below Threshold (Bank 1) · **P229F** NOx Sensor Circuit Range/Performance Bank 1 Sensor 2 · **P249C** Excessive Time To Enter Closed Loop Reductant Injection Cont

See it working

Watch the animated explainer [How a Padlock Works: Pin Tumbler Lock in X-Ray](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2000/>

