GENERIC · POWERTRAIN

P054E

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P054E
Idle Control System Fuel Quantity Lower Than Expected

P054E indicates that the engine control module has detected that the fuel quantity delivered during idle is lower than the expected value for the current operating conditions. The computer compares actual idle fuel delivery against a modeled target and sets this code when the measured quantity falls below the calibrated threshold.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Vehicle speed, idle control and auxiliary inputs

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough or unstable idle, sometimes feeling like the engine is struggling to maintain speed
- Occasional stalling when coming to a stop or while idling in gear
- Slight hesitation or stumble when accelerating from idle
- Reduced fuel economy or a rich-running condition if the engine compensates
- Audible changes in idle sound, such as loping or surging

Common causes, most likely first

1. Clogged or restricted fuel injectors causing uneven or insufficient fuel delivery at idle
2. Weak or failing fuel pump unable to maintain pressure at low demand
3. Contaminated or restricted fuel filter limiting flow
4. Faulty fuel pressure regulator or pressure sensor providing incorrect feedback
5. Vacuum leaks or unmetered air entering the intake, throwing off fuel quantity calculations
6. Carbon buildup on intake valves or throttle body affecting airflow at idle
7. Software calibration issues or faulty engine control module (rare)

How to diagnose and fix it

1. Connect a scan tool and check for any related diagnostic trouble codes (DTCs) and freeze-frame data to confirm the fault conditions
2. Inspect the air intake system for vacuum leaks and verify that the throttle body and idle air control passages are clean
3. Measure fuel pressure with a gauge and compare it to the manufacturer's specification at idle and under load
4. Perform a fuel injector balance test or inspect injector spray patterns for clogging or dripping
5. Check the fuel filter for restriction and replace it if service life is exceeded or flow is poor
6. Test the fuel pressure regulator and sensor operation with a multimeter or scan tool live data
7. If all mechanical checks pass, verify the engine control module software is up to date and consider reprogramming or replacement as a last resort

Idle fuel quantity faults often misdiagnosed

- A dirty mass airflow sensor can skew the calculated fuel quantity without setting a mass airflow sensor code, leading directly to P054E.
- Leaking or partially stuck-open injectors can cause an overfueling condition that the computer interprets as a lower-than-expected quantity due to adaptive corrections.
- The code can be set by a failing fuel pump that still provides adequate pressure at higher engine speeds but cannot maintain it at idle.
- Technicians sometimes replace the engine control module prematurely when the real problem is a simple vacuum leak or a clogged fuel filter.
- P054E is often accompanied by misfire codes or lean condition codes that can distract from the true root cause of the idle fuel quantity discrepancy.

Can I keep driving with P054E?

The vehicle can usually be driven with caution, but avoid prolonged idling and heavy load conditions until the fault is diagnosed. If the engine stalls frequently or runs very rough, limit driving to a short distance to a repair shop.

Tools that help

- OBD-II scan tool with live data capability
- Fuel pressure gauge
- Vacuum gauge
- Multimeter
- Injector balance tester or stethoscope
- Basic hand tools for intake and fuel system inspection

Reading P054E

P	Powertrain: engine, transmission and emissions.
0	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
5	Vehicle speed, idle control and auxiliary inputs.
4E	The exact fault within that area.

Often seen with

P0087 Fuel Rail/System Pressure - Too Low · **P0171** System Too Lean (Bank 1) · **P0174** System Too Lean (Bank 2) · **P0300** Random/Multiple Cylinder Misfire Detected · **P0505** Idle Control System Malfunction

See it working

Watch the animated explainer **How a Boxer Engine Works: Flat Engine Cutaway** on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: https://www.autoveteran.tech/dtc-codes/p054e/