

SUBARU · POWERTRAIN

P1090

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1090 · Subaru

Tumble Generator Valve #1 RH Malfunction Stuck Open

P1090 on a Subaru means the engine control module has detected that the right-hand tumble generator valve is stuck open, based on the valve position sensor signal not matching the commanded position during the self-test. The tumble generator valve is a butterfly flap in the intake port that stays closed at low engine speeds to create turbulence for better combustion and opens at higher speeds for airflow.

SYSTEM

Powertrain

CODE TYPE

Subaru specific

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other symptoms besides the warning light
- Rough or unstable idle, especially when the engine is cold
- Hesitation or a flat spot during light acceleration from a stop
- Slightly reduced fuel economy or increased emissions
- In some cases, a noticeable loss of low-end torque

Common causes, most likely first

- 1 Carbon buildup on the tumble generator valve flap or bore, preventing it from closing fully
- 2 Faulty tumble generator valve position sensor or damaged wiring to the sensor
- 3 Sticking or failed tumble generator valve actuator motor
- 4 Vacuum leak or disconnected vacuum hose to the tumble generator valve actuator
- 5 Damaged or corroded electrical connector at the tumble generator valve
- 6 Mechanical binding in the valve linkage or shaft
- 7 Rarely, a failed engine control module driver for the valve



How to diagnose and fix it

- 1 Connect a scan tool and verify P1090 is current, then command the tumble generator valve through its full range while watching the position sensor data to confirm the stuck-open condition
- 2 Inspect the valve linkage and flap for carbon buildup or mechanical binding, and clean the intake port and valve with approved carbon cleaner if necessary
- 3 Check the vacuum supply and actuator operation by applying vacuum and observing valve movement, repairing any leaking or disconnected hoses
- 4 Test the position sensor and actuator motor with a multimeter for resistance and signal voltage, comparing to factory specifications
- 5 Inspect the electrical connector and wiring harness for corrosion, chafing, or loose pins, and repair as needed
- 6 If the valve assembly is mechanically sound but the actuator or sensor is faulty, replace the tumble generator valve assembly
- 7 Clear the code and perform a road test to confirm the repair, then verify no pending codes return

Carbon buildup often mimics a failed valve

- A stuck-open tumble generator valve is frequently caused by carbon deposits on the flap and bore rather than an electrical failure, so cleaning the valve should be the first repair attempt before replacing parts.
- The engine control module runs a self-test of the tumble generator valve after the engine is shut off, so a code can set even if the valve works perfectly during normal driving.
- A vacuum leak at the tumble generator valve actuator can cause the valve to stay open and set P1090, but the leak may also cause lean fuel trim codes that lead technicians away from the real problem.
- On some Subaru engines, the tumble generator valve position sensor is not available separately from the valve assembly, so a faulty sensor requires replacing the entire valve unit.
- The right-hand and left-hand tumble generator valves are controlled separately, and a failure on one side does not always set a code for the other, so always check both valves when diagnosing P1090.

Can I keep driving with P1090?

You can usually continue driving with P1090, but avoid aggressive acceleration and prolonged idling until the fault is repaired, as the stuck-open valve can cause rough running and increased emissions. Have the vehicle diagnosed soon to prevent carbon buildup from worsening and to maintain fuel economy.

Tools that help

- OBD-II scan tool with bidirectional control
- Digital multimeter
- Hand vacuum pump
- Socket and wrench set
- Carbon cleaner spray
- Inspection mirror and flashlight



Reading P1090

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (Subaru): its meaning depends on the make.
- 0** Fuel and air metering and auxiliary emission controls.
- 90** The exact fault within that area.

Often seen with

P1091 Tumble Generator Valve #1 RH Malfunction Stuck Close · **P1092** Tumble Generator Valve #2 LH Malfunction Stuck Open · **P1093** Tumble Generator Valve #2 LH Malfunction Stuck Close · **P1094** Tumble Generator Valve Circuit #1 Open Circuit · **P1091** Pre-Catalyst Fuel Trim Too Rich Bank 1 · **P1092** Pre-Catalyst Fuel Trim Too Lean Bank 2 · **P1093** Pre-Catalyst Fuel Trim Too Rich Bank 2 · **P1094** O2 Sensor Circuit Slow Response in Rich Control Range Bank 2 · **P0171** System Too Lean (Bank 1)

See it working

Watch the animated explainer [Four-Stroke Engine Cutaway: Intake to Exhaust](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/subaru-p1090/>

