

SUBARU · POWERTRAIN

P1091

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1091 · Subaru

Tumble Generator Valve #1 RH Malfunction Stuck Close

P1091 is a Subaru-specific code indicating that the engine control module (ECM) has detected a malfunction in the tumble generator valve (TGV) on the right-hand (RH) side of the engine, specifically that the valve is stuck in the closed position. The TGV system uses butterfly valves in the intake ports to create turbulence at low engine speeds for better combustion; when the ECM commands the valve to open and the expected change in airflow or sensor feedback does not occur, it sets this code.

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 noticeable symptoms.
- Rough or unstable idle, especially when the engine is cold.
- Hesitation or stumble during light acceleration from a stop.
- Reduced engine performance and poor fuel economy in some cases.
- In cold weather, the engine may be harder to start or run poorly until warmed up.
- A noticeable lack of power at low RPM if the valve remains stuck closed.

Common causes, most likely first

- 1 Carbon buildup or sludge on the TGV flap or bore, causing it to stick closed.
- 2 Failed TGV actuator motor or solenoid that cannot move the valve.
- 3 Wiring damage (open, short, or corrosion) to the TGV motor or position sensor circuit.
- 4 Faulty TGV position sensor providing incorrect feedback to the ECM.
- 5 Mechanical binding in the TGV linkage or shaft due to wear or debris.
- 6 ECM software issue or internal fault (less common).



How to diagnose and fix it

- 1 Use a scan tool to verify the code and check TGV live data for commanded vs. actual position.
- 2 Inspect the TGV actuator and linkage for free movement and obvious damage.
- 3 Perform a visual inspection of the wiring harness and connectors at the TGV for corrosion or chafing.
- 4 Measure resistance and voltage on the TGV motor and sensor circuits according to Subaru service information.
- 5 Remove the intake manifold and clean the TGV valve and bore to remove carbon deposits.
- 6 If cleaning does not resolve the issue, replace the TGV assembly or actuator as needed.
- 7 Clear the code and perform a relearn or drive cycle to confirm the repair.

Carbon Buildup and Wiring Traps

- Carbon accumulation on the TGV flap is the most common cause of a stuck-closed condition, especially on higher-mileage engines with direct injection.
- A stuck-closed TGV may not produce obvious driveability symptoms in warm weather, so the code can be overlooked until winter cold starts.
- The TGV position sensor can fail independently of the motor, causing the ECM to misinterpret the valve position and set P1091 even if the valve moves freely.
- Wiring harness damage near the TGV connector is often missed because the insulation may look intact while the conductor is broken internally.
- Replacing the TGV without cleaning the intake ports can lead to repeat sticking if carbon is not removed from the bore.

Can I keep driving with P1091?

You can generally continue driving with P1091, but expect reduced low-speed performance and possible rough running; avoid heavy acceleration and have the fault diagnosed soon to prevent worsening driveability or potential catalytic converter damage from rich running.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Basic hand tools (sockets, wrenches, screwdrivers)
- Intake manifold gasket and cleaning supplies (carb cleaner, brushes)
- Subaru service information or wiring diagrams



Reading P1091

- 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.
- 91** The exact fault within that area.

Often seen with

P1090 Tumble Generator Valve #1 RH Malfunction Stuck Open · **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 · **P1090** Pre-Catalyst Fuel Trim Too Lean 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 · **P2004** Intake Manifold Runner Control Stuck Open (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-p1091/>

