

GENERIC · POWERTRAIN

P2020

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2020

Intake Manifold Runner Position Sensor/Switch Circuit Range/Performance (Bank 2)

P2020 indicates that the powertrain control module (PCM) has detected an out-of-range or performance fault in the intake manifold runner position sensor or switch circuit for bank 2. The computer compares the expected runner position, derived from engine speed and load, against the actual signal from the sensor and flags the code when the two disagree beyond a calibrated threshold.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

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
- Slight hesitation or stumble during light-throttle acceleration
- Reduced engine power or sluggish response when merging or climbing hills
- Rough or unstable idle quality, particularly when the engine is cold
- Intermittent surging or uneven power delivery under steady cruise
- Poor fuel economy or increased emissions output noticed over time

Common causes, most likely first

- 1 Intake manifold runner position sensor or switch failure on bank 2
- 2 Wiring damage such as chafed insulation, corrosion, or a broken conductor in the sensor circuit
- 3 Loose, corroded, or backed-out electrical connector at the sensor or PCM
- 4 Sticking or binding intake manifold runner actuator linkage on bank 2
- 5 Carbon buildup or mechanical obstruction preventing the runner from reaching commanded positions
- 6 Failed intake manifold runner control solenoid or vacuum supply issue affecting runner movement
- 7 PCM software calibration error or internal driver fault, though this is less common



How to diagnose and fix it

- 1 Connect a scan tool and record freeze-frame data plus any stored or pending codes to confirm the fault conditions
- 2 Visually inspect the bank 2 runner position sensor, connector, and wiring harness for damage, corrosion, or looseness
- 3 Back-probe the sensor signal and reference voltage circuits and compare readings against the manufacturer's specification
- 4 Command the runner actuator through the scan tool and observe whether the sensor signal tracks smoothly through its full range
- 5 Check the intake manifold runner linkage and actuator for binding, carbon buildup, or mechanical wear on bank 2
- 6 Test the runner control solenoid and vacuum supply if the actuator does not respond to commands
- 7 Replace the faulty sensor, switch, or actuator assembly and clear codes, then verify the repair with a road test

What the runner sensor code hides

- A sticking runner linkage often mimics a failed sensor, so technicians who replace the sensor without checking for binding frequently see the code return within a few drive cycles.
- Carbon buildup on the intake manifold runner flaps can restrict travel just enough to set a performance code without ever producing a hard failure or a completely dead sensor signal.
- The bank 2 runner position sensor shares its reference voltage and ground with other sensors on many engines, so a fault in a shared circuit can set P2020 alongside unrelated sensor codes.
- Intermittent connector fretting at the sensor pigtail is a common cause that only appears when the engine bay is hot or vibrating, making a wiggle test essential during diagnosis.
- Some vehicles use a simple position switch rather than a continuous sensor, so a scan tool that shows only open or closed states does not indicate a faulty tool but rather the system design.

Can I keep driving with P2020?

The vehicle is generally safe to drive to a repair shop, but avoid aggressive acceleration and sustained high-load driving until the fault is repaired. Prolonged driving with a runner position fault can worsen emissions and fuel economy, and may lead to a more expensive mechanical failure if the runner linkage is binding.

Tools that help

- OBD-II scan tool with live data and bidirectional control capability
- Digital multimeter for voltage and resistance checks
- Back-probe kit or breakout leads for sensor circuit testing
- Hand tools for removing intake components and accessing the sensor
- Vacuum gauge and hand vacuum pump for testing the runner actuator



Reading P2020

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

Often seen with

P2004 Intake Manifold Runner Control Stuck Open (Bank 1) · **P2005** Intake Manifold Runner Control Stuck Open (Bank 2) · **P2019** Intake Manifold Runner Position Sensor/Switch Circuit (Bank · **P2021** Intake Manifold Runner Position Sensor/Switch Circuit Low (B · **P2022** Intake Manifold Runner Position Sensor/Switch Circuit High (

See it working

Watch the animated explainer [How a Manual Transmission Works: Four-Speed Cutaway](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2020/>

