

GENERIC · CHASSIS

C0509

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

C0509

Right Front Wheel Speed Sensor A Circuit High

C0509 indicates that the anti-lock brake system (ABS) module has detected an abnormally high voltage on the right front wheel speed sensor circuit, which typically means the signal wire is shorted to power or the sensor's internal resistance is out of range. The computer sets this code when the sensor output exceeds the expected upper threshold during a self-test or while the vehicle is moving.

SYSTEM

Chassis

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Brakes, steering and suspension

Symptoms you may notice

- ABS warning light illuminated on the dashboard
- Traction control or stability control warning light may also be on
- Often no symptoms besides the warning light, with normal braking performance
- ABS may deactivate, leading to wheel lockup during hard braking
- Intermittent or erratic speedometer readings if the sensor signal is used for vehicle speed
- Cruise control may become inoperative on some vehicles

Common causes, most likely first

- 1 Damaged or chafed sensor wiring shorted to a power source
- 2 Failed right front wheel speed sensor (internal short or excessive resistance)
- 3 Corroded or loose electrical connector at the sensor or ABS module
- 4 Metallic debris or improper air gap between the sensor and tone ring
- 5 Faulty ABS control module (less common)
- 6 Aftermarket or incorrect sensor installed previously

How to diagnose and fix it

- 1 Inspect the right front sensor wiring and connector for damage, corrosion, or contact with power wires
- 2 Measure sensor resistance with a multimeter and compare to manufacturer specification
- 3 Check for AC voltage output while spinning the wheel by hand (if applicable)
- 4 Inspect the tone ring for cracks, missing teeth, or debris buildup
- 5 Verify reference voltage and ground at the sensor connector with the key on
- 6 Replace the right front wheel speed sensor if tests indicate an internal fault
- 7 Clear the code and perform a road test to confirm the repair



What Most Techs Miss on C0509

- A shorted sensor can still produce a plausible signal at low speeds, so a simple resistance check may pass while the code returns only during high-speed driving.
- Wiring harness damage near the strut tower or wheel well often mimics a sensor failure, so always flex-test the harness while watching live data.
- Debris on the tone ring can create an erratic signal that the module interprets as a high-voltage event, so clean the ring before condemning the sensor.
- The ABS module may set this code due to a low battery or charging system issue that causes voltage spikes, so check system voltage first.
- On some vehicles, a failing wheel bearing can alter the air gap and trigger C0509 without any play being felt by hand.

Can I keep driving with C0509?

The vehicle remains safe to drive under normal conditions because base braking is unaffected, but avoid hard braking or slippery surfaces where ABS would normally engage. Have the fault diagnosed promptly to restore full ABS and stability control function.

Tools that help

- OBD-II scan tool with ABS capability
- Digital multimeter
- Jack and jack stands
- Wheel chocks
- Basic hand tools (sockets, ratchet, screwdrivers)

Reading C0509

- C** Chassis: brakes, steering and suspension.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 5** Brakes, steering and suspension.
- 09** The exact fault within that area.

Often seen with

C0035 Left Front Wheel Speed Sensor Circuit Range/Performance · **C0040** Left Rear Wheel Speed Sensor Circuit · **C0050** Right Rear Wheel Speed Sensor Circuit Malfunction · **C0508** Right Front Wheel Speed Sensor A Circuit Low · **C0510** Hill Hold Function Disabled



See it working

Watch the animated explainer [How ABS Works: Anti-Lock Brakes in X-Ray](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/c0509/>

