

GENERIC · CHASSIS

C051B

OBD-II TROUBLE CODE

C051B

Right Rear Wheel Speed Sensor - Mechanical

C051B indicates that the anti-lock brake system (ABS) control module has detected a mechanical fault with the right rear wheel speed sensor circuit, meaning the signal is present but physically implausible or inconsistent with vehicle speed. The module compares the right rear sensor's signal to the other three wheel speed sensors and flags this code when the right rear signal drops out, becomes erratic, or shows a mechanical discrepancy such as an air gap or tone ring issue.

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, often accompanied by the traction control and stability control lights
- No noticeable change in braking performance during normal driving, as the base hydraulic brakes remain fully functional
- ABS may activate unnecessarily or feel like a pulsation at the brake pedal during low-speed stops
- Traction control or stability control may intervene unexpectedly or become disabled entirely
- Speedometer may fluctuate or read incorrectly if the right rear sensor also feeds the vehicle speed signal
- Cruise control may fail to engage or disengage on its own if it relies on wheel speed data

Common causes, most likely first

- 1 Excessive air gap between the right rear wheel speed sensor and the tone ring due to a worn or incorrectly seated sensor
- 2 Debris, metal shavings, or corrosion buildup on the tone ring or sensor tip interfering with the magnetic signal
- 3 Damaged or cracked tone ring on the right rear hub or axle, causing an irregular pulse pattern
- 4 Loose or damaged sensor mounting bracket allowing the sensor to vibrate or shift out of position
- 5 Worn wheel bearing or hub assembly creating excessive play that changes the sensor-to-ring gap dynamically
- 6 Aftermarket or incorrect sensor installed with a different physical length or magnetic strength than the original
- 7 Corroded or partially broken sensor wiring harness connector that passes a static test but fails under vibration



How to diagnose and fix it

- 1 Inspect the right rear wheel speed sensor and tone ring for visible damage, debris, or corrosion, and clean any metallic buildup from the sensor tip and ring surface
- 2 Measure the air gap between the sensor face and tone ring with a feeler gauge, comparing it to the manufacturer's specification for the vehicle
- 3 Check the sensor mounting bracket and bolt for tightness and proper seating, and verify the sensor is fully inserted into its bore
- 4 Remove the right rear wheel and inspect the tone ring for cracks, missing teeth, or runout by rotating the hub and watching for wobble
- 5 Test the wheel bearing and hub assembly for excessive play by rocking the wheel at the 12 and 6 o'clock positions and listening for growling during rotation
- 6 Back-probe the sensor connector and observe the AC voltage signal on a scope while spinning the wheel by hand, looking for a smooth sine wave that increases with speed
- 7 If the signal is erratic or absent after mechanical checks pass, replace the right rear wheel speed sensor and clear the code to verify the repair

Mechanical faults that mimic a bad sensor

- A tone ring packed with metallic debris from a worn brake pad or road grit can produce a perfect-looking sensor signal at low speed but drop out at higher speeds, setting C051B without any visible sensor damage.
- Technicians often replace the right rear sensor first only to find the tone ring is cracked or the hub bearing is loose, so always inspect the ring and check bearing play before condemning the sensor.
- The right rear sensor shares its signal with the ABS module and often the body control module for speedometer and cruise control functions, so a mechanical fault here can cause symptoms that seem unrelated to braking.
- A sensor that tests good with a multimeter resistance check can still fail under vibration or heat, so a scope test while spinning the wheel is far more reliable than a static ohm reading.
- Aftermarket brake work or hub replacement can leave a tone ring installed backwards or with the wrong tooth count, which sets a mechanical code even though every component is new.

Can I keep driving with C051B?

You can usually drive the vehicle short distances at moderate speeds because the base brakes still work, but avoid hard braking, towing, or driving in wet or slippery conditions where ABS and traction control are needed. Have the fault diagnosed promptly, as an erratic wheel speed signal can cause unexpected ABS activation and extend stopping distances.



Tools that help

- OBD-II scan tool with live wheel speed data capability
- Digital multimeter
- Oscilloscope for viewing the AC voltage waveform
- Feeler gauge set for measuring air gap
- Floor jack and jack stands
- Basic hand tools including socket set and Torx bits

Reading C051B

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.
1B	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 · **C051A** Left Rear Wheel Speed Sensor - Mechanical · **C051C** Multi-axis Acceleration Sensor Module A Range/Performance · **P0500** Vehicle Speed Sensor Malfunction

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/c051b/>

