

BRAKE WEAR SENSOR

Replacing front and rear brake wear indicators on BMW F-series platforms

PLATFORM	2013 BMW F30 320i · N20 Engine
SENSOR TYPE	Front & Rear Resistive Wear Indicator
DIFFICULTY	Beginner · ~30-60 Minutes
SKILL	DIY - All work performed by owner

Disclaimer: Perform all work safely. Use jack stands. This guide describes one owner's experience - always verify specs for your application.

Companion video available at crenshawengineering.com/guides

// SECTION_01 - OVERVIEW & CONTEXT

The BMW F30 uses resistive brake wear sensors embedded in the brake pad friction material. When the pad wears to the minimum threshold, the sensor wire contacts the spinning rotor and is severed, triggering a warning on the iDrive display. The OBC message reads "Front brakes: wear" or "Rear brakes: wear." This is a maintenance alert – not an emergency – but the warning will not clear until a new sensor is installed, even after new pads are fitted.

This guide covers replacement of the front and rear brake wear sensors on a 2013 BMW F30 320i. Sensors are single-use components – they must be replaced any time brake pads are changed or a wear warning is triggered. Reusing a triggered sensor will result in a persistent warning even with new pads installed.

■ READ BEFORE STARTING

This job requires wheel removal. Use a floor jack, rated jack stands, and wheel chocks. Never work under a vehicle supported only by a floor jack. The brake system is safety-critical – confirm all connections are secure and test brakes at low speed before returning to normal use.

// SECTION_02 - PARTS & CONSUMABLES

COMPONENT	SPECIFICATION / PART #	QTY	SOURCE
Front Wear Sensor	BMW PN 34356792559 or equivalent	1	FCP Euro / ECS
Rear Wear Sensor	BMW PN 34356792560 or equivalent	1	FCP Euro / ECS
Brake Cleaner	Non-chlorinated, aerosol	1	Any auto parts
Dielectric Grease	Permatex 22058 or equivalent	1	Any auto parts
Blue Shop Towels	Lint-free for cleaning	1	Any auto parts

// SECTION_03 - TOOLS REQUIRED

TOOL	SPEC / MODEL	NOTES
Floor Jack	2-ton minimum capacity	Hydraulic preferred
Jack Stands	2-ton minimum, pair	Never skip – mandatory
Wheel Chocks	Any	Chock opposite axle
Torque Wrench	1/2" drive, 0-150 ft-lb	For lug bolt reinstall
17mm Socket	1/2" drive – OEM lug spec	Deep socket preferred
Flathead Screwdriver	Medium blade	Sensor clip release
Needle-Nose Pliers	Any length	Harness routing
Brake Cleaner	Non-chlorinated aerosol	Contact cleaning only

→ Companion video available at crenshawengineering.com/guides – watch before starting. Sensor routing and clip release are easier to follow visually.

// SECTION_04 – PRE-WORK & SAFETY

The brake wear sensor is located inside the wheel well, clipped to the caliper bracket or pad retaining plate. Access requires full wheel removal. Front and rear sensors are different part numbers – confirm you have the correct sensor before beginning disassembly.

01 Loosen lug bolts before lifting

With all four wheels on the ground, break the torque on each lug bolt 1/4 turn. Do not remove. This prevents hub rotation while loosening. BMW F30 spec: 120 Nm / 89 ft-lb.

02 Lift and support the vehicle

Jack at the designated BMW lifting point (reinforced pinch weld seam – use a rubber pad or BMW jack adapter to prevent flange damage). Position jack stands under the subframe or control arm mount. Lower the vehicle onto the stands. Confirm zero movement before proceeding.

03 Remove the wheel

Remove all five lug bolts and pull the wheel clear. If the wheel is seized to the hub face, reinstall two lug bolts finger-tight and strike the inner sidewall at 6 o'clock and 12 o'clock with a rubber mallet. Pull the wheel once free. Inspect the hub and brake components for any obvious damage before proceeding.

04 Locate the wear sensor connector

The sensor harness runs from the pad, through a clip on the caliper bracket, and connects to the vehicle body harness near the strut or control arm. The connector is a 2-pin plug with a locking tab. Identify the full harness path before attempting removal.

// SECTION_05 – FRONT SENSOR REPLACEMENT

The front sensor is mounted in the inboard brake pad and clips to the upper portion of the caliper bracket. The harness routes along the caliper to a connector near the upper control arm. Confirm the warning corresponds to the front axle before removing the sensor.

05 Disconnect the harness connector

Press the locking tab on the 2-pin connector and pull straight apart. Do not twist or pry with a screwdriver. If the connector is stiff from corrosion, work the tab with a flathead and pull with steady even force. Needle-nose pliers can help depress the tab fully on corroded connectors.

06 Release the harness from routing clips

The sensor harness passes through one or two plastic clips on the caliper bracket or dust shield. Use a flathead screwdriver to gently pry the harness from each clip. Do not cut or break the clips – the new sensor harness uses the same routing path and the clips must remain intact.

07 Remove the sensor from the pad

The sensor body presses into a receptacle in the brake pad backing plate. Grip the sensor body and pull straight out with firm, consistent force – do not twist. If the sensor has been triggered (severed by the rotor), only the wired portion may remain and the body may already be free of the pad.

08 Inspect the pad slot and clean contact area

Inspect the pad backing plate slot for debris, rust, or deformation. Spray brake cleaner into the slot and wipe clean with a shop towel. The new sensor must seat fully – any debris prevents proper installation. If the pad is not being replaced, confirm remaining friction material exceeds the minimum wear specification.

09 Install the new front sensor

Press the new sensor body firmly into the pad slot until fully seated – you should feel a positive stop. The sensor must not protrude or float in the slot. Route the harness through the original clips in the same path as the old sensor. Apply a small amount of dielectric grease to the connector mating faces. Connect the 2-pin plug until the locking tab clicks audibly.

■ CONNECTOR ORIENTATION

The 2-pin connector is keyed and inserts in one orientation only. If it does not click closed with normal hand pressure, verify alignment before forcing. Bent pins will prevent a reliable electrical connection and may generate a fault code that is difficult to trace.

// SECTION_06 – REAR SENSOR REPLACEMENT

The rear sensor procedure is identical to the front with minor harness routing differences. The rear sensor harness routes along the trailing arm toward the body connector near the wheel arch. Use steps 05 through 09, substituting the correct rear sensor part number (34356792560). The rear axle sensor is always in the inboard pad.

10 Access the rear caliper and pad

On the rear axle, the sensor harness clips to the trailing arm and rear knuckle area. The routing path is slightly longer than the front. Confirm you have identified all routing clips and the full harness path before beginning removal.

11 Disconnect and remove rear sensor

Follow the same procedure as the front: press the locking tab, pull the connector straight apart, unclip the harness from all routing clips, and pull the sensor body from the pad slot. Inspect the pad slot and clean with brake cleaner before installing the new sensor.

12 Install the new rear sensor

Press the new rear sensor firmly into the pad slot until seated. Route the harness along the original path through all clips. On the rear axle, confirm the harness has adequate slack to accommodate full suspension travel – a harness routed too tightly will stretch and break during full droop. Connect the 2-pin plug with dielectric grease until the locking tab clicks.

13 Reinstall wheel and torque to spec

Thread all five lug bolts in by hand until seated. Tighten in a star/cross pattern to approximately 30 ft-lb. Lower the vehicle until the wheel is fully loaded on the ground. Final-torque all five bolts to 120 Nm / 89 ft-lb in the same star pattern. Never torque lug bolts with the wheel in the air.

X Do Not Over-Route the Rear Harness

If the caliper was removed or the suspension was disturbed during this service, confirm the harness clears all moving components through the full range of suspension travel before lowering the vehicle. A pinched harness will cause an immediate false wear warning or an open-circuit fault that presents identically to a triggered sensor.

// SECTION_07 - CLEARING THE WARNING - INSTRUMENT CLUSTER RESET

After installing the new sensor, the brake wear warning must be cleared from the instrument cluster manually. On the BMW F30, this is performed via the BC stalk or the iDrive menu. The warning will not self-clear on the next key cycle - it requires a deliberate reset.

14 Reset via BC stalk (without iDrive)

With the ignition on (engine off or running), navigate to the brake warning message using the BC stalk (left stalk, end button). Hold the end button for 5 seconds while the message is displayed. The cluster will confirm the reset and the message will clear. On some F30 build variants, the reset is only accessible with the engine running.

15 Reset via iDrive (if equipped)

Navigate to: Vehicle → Vehicle status → Brake pads. The screen shows front and rear pad status and a reset prompt. Select the axle that was serviced and confirm the reset. If the sensor is correctly installed and connected, the status will update to "OK" on the next ignition cycle.

→ If the warning persists after reset, the most common cause is an incomplete connector lock, a mis-seated sensor body, or a new sensor installed on a pad already at minimum thickness. Diagnose with a multimeter: an intact sensor reads approximately 100-150 ohms across the two terminals. Open circuit = damaged or mis-connected sensor.

// SECTION_08 - VERIFICATION & FOLLOW-UP

Test at low speed before return to service

After reinstalling the wheel and resetting the warning, perform a slow-speed brake test in a safe area before returning to normal driving. Confirm brake feel is normal and no unusual noise is present. If pads were also replaced, perform 3-5 moderate stops from 30 mph to bed the new friction material before any hard use.

Re-torque at 50 miles

Wheel lug bolts should be re-checked at 50 miles after any wheel removal. Final spec is 120 Nm / 89 ft-lb. This is standard procedure after any wheel-off service.

Log the work

Record the corner serviced, current mileage, sensor part number, and pad brand/compound if replaced. If tracking this car over time, this is baseline data for future brake service intervals and wear rate analysis per corner.

// SECTION_09 - COMMON MISTAKES

X Reusing a triggered sensor

A sensor severed by rotor contact is destroyed and cannot be repaired. Installing a cut sensor causes an immediate persistent warning. Replace with a new sensor every time pads are changed, regardless of whether the warning was active.

X Installing the wrong sensor

Front and rear sensors are different part numbers on the F30. Installing the rear sensor on the front corner (or vice versa) may cause incorrect seating depth or harness length issues. Confirm part number before installation.

X Skipping dielectric grease on the connector

The sensor connector is exposed to road moisture, salt, and brake dust. Without dielectric grease, corrosion builds rapidly and can cause intermittent open-circuit faults that present identically to a worn sensor - difficult and time-consuming to diagnose.

X Forgetting the cluster reset

The instrument cluster warning does not self-clear after sensor replacement. The cluster must be manually reset via the BC stalk or iDrive. Skipping this step will leave an active warning on a car with a correctly installed sensor.

X Insufficient harness slack at the rear axle

On the rear axle, suspension travel creates significant harness movement. Routing without adequate slack (minimum 1" free loop before the first clip) will stretch and sever the harness during the first full droop cycle, requiring replacement of the new sensor.

// SECTION_10 - BUILD NOTES - FROM THE OWNER

The rear brake wear warning came on at approximately 47,000 miles. I had been tracking pad thickness since the last service - the rear wears faster than expected on this car, consistent with the factory rear-biased brake balance on the N20 F30 platform under any kind of spirited driving.

The sensor swap itself took about 15 minutes once the wheel was off. The only resistance was the harness clip on the rear caliper bracket - the plastic had become brittle and required careful flathead pressure to avoid snapping it. The connector clicked home cleanly with dielectric grease applied.

I replaced the rear pads at the same time. Rotors showed minor surface rust but were within spec. Cluster reset via the BC stalk cleared immediately on the first attempt - no fault codes in the system. Re-torque at 50 miles confirmed all bolts at spec.

Part cost: approximately \$12-18 per sensor sourced from FCP Euro or ECS Tuning on OEM supplier stock. BMW dealer pricing for the same component runs \$35-60. The job takes longer to jack the car and pull the wheel than it does to swap the sensor - 15 minutes of actual wrench time once access is achieved.

Dielectric grease on the connector and confirming harness slack at the rear trailing arm are the two steps most likely to be skipped and most likely to cause a return visit. Both take 30 seconds. Do them.

GUIDE_002 // CRENSHAWENGINEERING.COM // WATCH THE COMPANION VIDEO FOR THE FULL WALKTHROUGH