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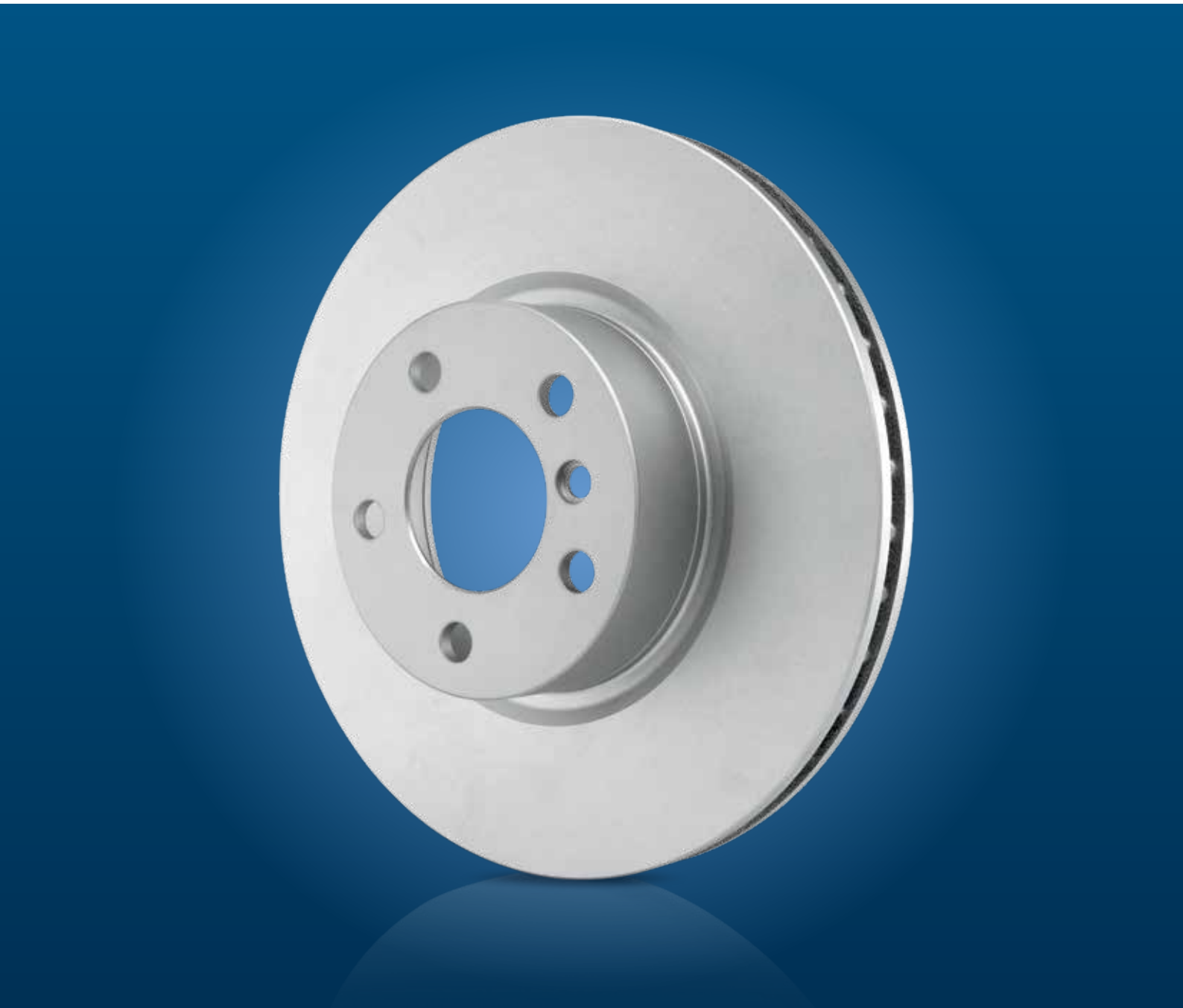
Braking System: Brake Pads and Disc Troubleshooting Guide

Tips, Tests, and Repair Information



Disc brake – Identifying and solving the most common problems

	Cause	Effect	Recommendation
Scoring or grooves on the friction surface 	Dirt particles on the brake disc and pad	Brake noise Rubbing effect during braking Reduced braking performance	When changing the brake discs, always change the brake pads as well
Uneven wear 	Uneven function of the brake caliper Run-out of the brake disc	Poor and/or irregular braking performance Vibration on the steering wheel Pulsing effect on the brake pedal	Check the brake caliper and wheel hub when installing new brake discs
Blue surface discoloration 	Overheating due to jammed or seized brake pads The vehicle is driven with an activated or seized par king brake The brake caliper piston is sticking	Rubbing effect during braking Overheating	Check the entire brake system Ensure that the brake caliper is functioning properly
Indentations on the contact surface 	Improper cleaning of the contact surfaces Damage to the contact surfaces through contami nation Distortion of the wheel hub	Increased lateral run- out of the brake discs Chattering and rubbing effects	Clean the contact surface of the brake disc and the wheel hub before mounting new brake discs Do not use paste lubricants (copper paste, etc.)
Corroded friction area 	Impact of corrosive substances (e.g. road salt, cleaning agents) Damage through water or lack of use – low demand on the brakes	Noise during braking Irregular braking performance	Replace brake discs and pads Instruct the customer to occasionally stress the brakes by applying pressure appropriately (bed in the brakes)

Brake pad – Identifying and solving the most common problems

	Cause	Effect	Recommendation
Wear on one side only 	Brake caliper and/or brake caliper piston is blocked	Vehicle pulls to one side during braking Faster and/or uneven brake pad wear	Check the brake caliper and replace it if necessary Replace the brake pads
Conical wear – vertical or horizontal 	Worn brake caliper seals and/or spring Excessive operating clearance of the caliper	Premature brake pad wear-Braking noise	Check the brake caliper and replace it if necessary Replace the brake pads
Grooves and scoring in the friction material 	Dust or metal particles on the contact Scratches on the surface of the brake disc	Braking noise Vibration during braking Affected braking efficiency	Check the brake disc and replace if necessary Replace the brake pads
Cracks or broken edges in the friction material 	Extreme heat buildup due to constant contact between the brake pad and brake disc Bending of the brake pad backing plate Brake caliper or brake caliper piston is blocked	Braking noise Vehicle pulls to one side during braking Overheating on one wheel Uneven brake pad wear	Check the brake caliper and replace if necessary Replace the brake pads

Brake noise – how to distinguish and fix them

Brake noise is one of the main reasons why customers take their cars to the workshop. They are usually due to vibrations in some part of the brake system or its connection to the chassis. The following practical tips help to diagnose and eliminate these noises.

Low-frequency vibrations – rubbing

Noise type	Diagnosis	Recommendations
Low-pitched noises at fre quencies below 300 Hz The smallest vibrations of a braking system component (macro vibrations)	Installed materials have poor tolerances The brake disc is damaged, has an irregular thickness or sits poorly on the wheel hub	Replace the brake disc. Clean the wheel hub Clean all lubricated surfaces and re-lubricate if necessary

Mid-frequency vibrations – squeaking

Noise type	Diagnosis	Recommendations
Squeaking noises at a frequency between 300 and 5000 Hz Minor vibration in the caliper pistons or surrounding components (micro-vibrations)	Caliper pistons or sliding parts sticking Brake disc thickness less than the required minimum Uneven brake disc or damaged brake pads Incorrectly placed, e.g. reversed, linings Incorrectly installed shims	Clean and if necessary lubricate sticking parts of caliper pistons Replace brake disc Make sure that the smooth surface of the brake disc is level after installation, with a maximum tolerance of 0.1 mm Correctly install brake discs Correctly install accessories

Note: The use of anti-vibration plates (shims) can help to reduce the intensity of vibrations and noise.

High-frequency vibrations - screeching

Noise type	Diagnosis	Recommendations
Screeching noises with a frequency above 5 kHz	Molecular vibrations when the surface material of brake pads rubs on the disc Other causes are possible but improbable	Replace all brake pads Check if the right accessories have been used and properly installed

Note: The use of Bosch QuietCast Ceramic Brake Pads can further improve the braking experience.

Notes:

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