

What Is Brake Judder?

Brake judder can be categorised into one of two types:

Hot brake judder

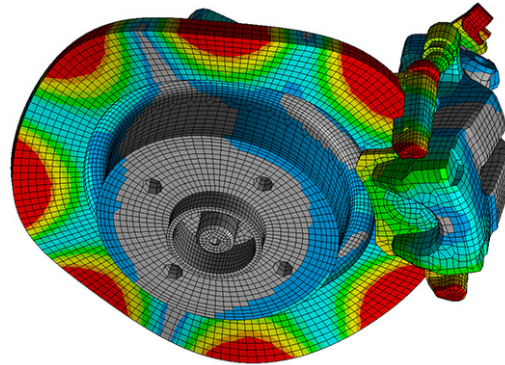
Cold brake judder

Hot Brake Judder

When two surfaces are brought into contact with each other, particularly if at least one of those surfaces are moving at high speed, it results in friction. This friction creates heat which is transmitted to other parts of a vehicle's braking system.

Brake discs are often made from cast iron. When cast iron becomes hot, it naturally expands and distorts, returning to its original shape once cool. Brake discs are designed to withstand this and can operate at temperatures of up to 500°C.

If brake discs exceed these typical operating temperatures, hot brake judder can occur.



What causes excessive heat?

Despite the fact that brake discs are designed to withstand high temperatures and cool down rapidly, repeated heavy use of a vehicle's brakes in quick succession can cause 'brake fade'. This is where a vehicle's brakes become too hot to work effectively.

Repeated heavy use of front brakes can also cause the discs to turn blue. If this occurs, this indicates that the disc has been permanently damaged and must be replaced.

A malfunctioning brake caliper can also generate excessive heat if the brake pad is in constant contact with the disc, even when not under braking. In this instance, heat will steadily increase and may eventually lead to a cracked disc if cooled rapidly.



Fig. 1 shows a brake disc which displays a number of indicators of excessive heat and thermal distortion, including:

- Oxidation (the orange colouring)
- Blue tint on the braking surface
- Dark (high) spots on the braking surface
- Large radial crack

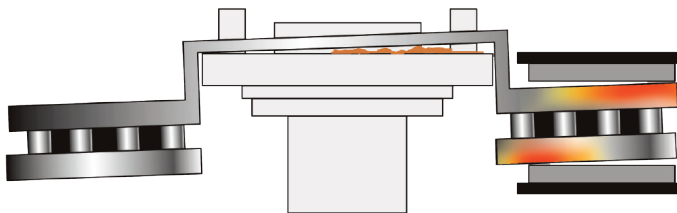


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Cold Brake Judder

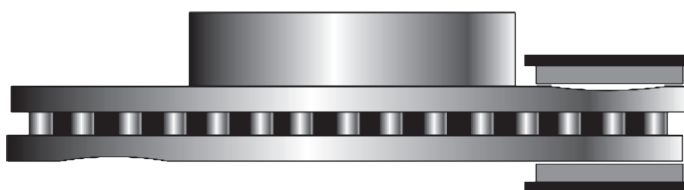
Cold brake judder is almost always a result of a fitting issue between the brake disc and hub.

Brake discs and hubs are manufactured to strict tolerances, therefore it is essential that any rust or other debris is removed from the hub prior to installing the replacement discs as this can lead to fitting issues.



If the disc is fitted with a high level of radial run-out, the consequence is very light continuous contact between the disc and pad at diametrically opposite points on the disc face even when the vehicle is not under braking conditions.

Over time, this can result in a progressively larger localised variation in the thickness of the disc, otherwise known as **Disc Thickness Variation (DTV)**, causing a pulsation to be felt through the brake pedal and steering wheel when the brakes are applied.



To help prevent this from occurring:

- Ensure the hub is free of rust or debris
- Check the hub for run-out using a dial gauge
- Install the new disc, mount the dial gauge close to the outer radius of the disc and ensure that the radial run-out does not exceed 70 microns

Poor quality brake discs can also lead to brake judder, which would be detected immediately after installation.

Juratek brake discs are designed and manufactured to exacting standards and are tested to UNECE R90:02 regulations, offering reassurance on their quality.

- ✓ Designed to OE specifications
- ✓ Tested to UNECE R90:02 regulations
- ✓ Anti-corrosion coated
- ✓ Optimised vent design
- ✓ Vent protection



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