TRISCAN
smartparts

Product information

Damage symptoms - brake discs

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Purpose

In this product information, we have gathered several examples of the most common problems as well as a brief description of what may be the cause of the problem that maybe experienced. We hope that this guide will be able to help our customers to perform an initial assessment of what might be the reason to why a brake disc causes problems, e.g. noise or vibration. With this guide we also hope to reduce the number of cases where the customer has a bad brake experience that could have been avoided.

Mounting of the brake discs and work on the vehicles' braking system

Brake discs should be replaced every second time when changing the brake pads.
Always replace brake pads when mounting new brake discs.
Do not exceed the specifications of the minimum thickness of the disc (min. TH). The minimum thickness is specified on each disc.

Running-in of new brake discs

After working on the car's braking system, it is important to ensure that the car's braking system is working properly.
If the brake discs and/or brake pads have been replaced, you must be aware of the fact that they have a short running-in phase/ period.

So keep in mind:
The first 300 - 500 kilometers of braking should be done with short, smooth movements. Try to avoid heavy braking and emergency braking. Both rigid and long braking may result in overheating of the surface of the brake disc and brake pads resulting in skewed/ lopsided brake discs or impaired braking effect.

When the discs and pads have adapted to each other, the two friction surfaces do receive and distribute large amounts of heat much better, and therefore they do sustain and dissipate higher temperatures.

Causes of complaints

The most frequent causes of complaints in relation to the brake discs, which the customer driver experiences, are:
- Vibration in the steering, felt through the steering wheel
- Pulsating brake pedal
- Murmurs from the brake system
- Reduced braking effect

The customer/driver is generally not interested in why there is a problem, but only that there is NOTHING wrong. The brakes must function without problems.There may be several reasons as to why the brake disc is not working properly. These can be divided into three categories:

1.0 Mounting errors
2.0 Driving conditions
3.0 Other parts of the brake system

On the following pages you will see examples illustrated with photos and an explanation of cause and effect.

1.0 Mounting mistakes

1.1 Dirty contact surfaces

> **Visually** — The contact surface on the brake discs have been smeared with grease/paste when fitting or a lack of cleaning of the hub's contact surface. Resulting in dirt or rust on the contact surface against the hub.

> **Symptom:** — Shaking from the steering after approx. 1500-5000 kilometers.

> **Cause:** — Grease / paste bind foreign particles which compile between the brake disc and the hub. Parallel mounting is made difficult or simply not possible. After a short-term use, pulsation and vibration will be experienced from the brake pedal.

> **NB.:** — The contact surfaces are cleaned very carefully. Check the brake discs for any submission after the mounting. The total disc run-out must not exceed 0.10 mm. When mounting, brake discs must be clean, dry and shiny.
Grease / paste must NOT be used.

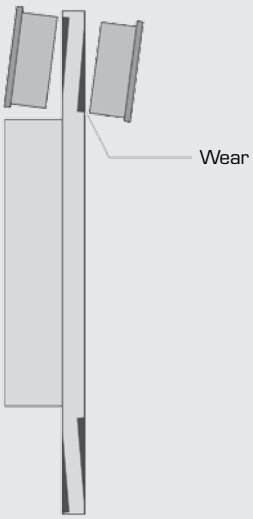
1.2 Tightening error

> **Visually:** — Contact surface cracked by mounting hole.

> **Symptom:** — Strong vibrations arise shortly after mounting.

> **Cause:** — The surface of the mounting surface is destroyed when the axle / wheel nut is fitted with improper torque or sequence when tightening has not been done correctly.

> **NB.:** — Use the manufacturer's instructions for tightening and make sure that the tightened is carried out in the correct order and to the correct torque (as noted in the vehicle manufacturer's specifications).



1.3 Position of the brake caliper/disc

> **Visually:** — Asymmetric wear of the sides of the braking surface. Attrition will be opposite from the side facing the car and the side facing out.

> **Symptom:** — Pulsating brake pedal, shaking, turns in the steering, reduced braking power, noise.

> **Cause:** — Brake disc and brake caliper are not mounted in parallel.

> **NB.:** — Before the new brake discs are mounted, the mounting of the caliper must be checked.

Also see section 3.3
Assembly and form errors brake pads/brake caliper.

1.4 Run-out hub

> **Visually:** Stains are signs of local overheating of the braking surface.

> **Symptom:** Vibrations occur shortly after mounting and increase gradually. Noise from the brake system.

> **Cause:** Great unbalance on the hub results in uneven wear of the brake pads, as they are not parallel with the surface of the brake disk. This results in asymmetric contact between the brake discs and brake pads.

2.0 Driving conditions

2.1 Running-in period forced

> **Visually:** Brake discs have colors of varying intensity and form: blue, purple straw and golden. The discoloration may occur on the whole brake disc,or on the edge of the disc and groove toward the hub.

> **Symptom:** At first,light vibration which over time increases.

> **Cause:** Errors of this type occur in the running-in period and is due to overheating of the discs. Overheating change the properties of cast iron and structure. This change is permanent.

> **NB.:** Always be sure to inform the customer that there is a running-in period when there has been mounted new brake discs or brake pads on the car. The running-in period is 300-500 kilometers. During this period, the brakes must be applied with short, soft movements, so that the brake pads can adjust properly to the surface of the brake disc. A sharp braking cannot just overheat the surface of the brake pad, but also the surface of the brake disc. This will cause a loss in brake efficiency. Do not try to activate the car's ABS system. Brake discs / brake pads which have been overheated, must be replaced.

2.2 Intensive use

> **Visually:** Cracks on the brake surface.

> **Symptom:** Vibration when decelerating, pulsating brake pedal.

> **Cause:** Thermal and / or overheating of the brake discs. High operating temperatures can lead to the formation of cracks/ fissures. This can be caused by an emergency maneuver in the implementation phase, the implementation phase is forced.

> **NB.:** Immediate replacement of brake discs and pads is required.

2.3 Minimum thickness

> **Visually:** The thickness of the brake discs is significantly less than prescribed minimum thickness.

> **Symptom:** Vibration in the steering, long pedal travel, reduced braking power.

> **Cause:** Exceeding the minimum thickness.

> **NB.:** Check the wear on the brake discs regularly.
Brake discs and brake pads should be replaced

2.4 Thermal overheating – ”Hot spots”

> **Visually:** Discoloration on the braking surface.

> **Symptom:** Pulsating brake pedal, reduced braking power, noise and vibration from the steering system.

> **Cause:** Brake discs have been overheated. Material properties and molecular structure are permanently altered.

> **NB.:** Brake discs and brake pads should be replaced.

2.5 Long-term parking/storage “Garage car”

> **Visually:** Clear markings of brake pads on the brake surface.

> **Symptom:** Pulsating brake pedal vibration of the steering wheel and steering system, reduced braking power, noise.

> **Cause:** For some time, the car has not been in operation – long-term parking/storage “garage-car”.
The coating of the brake pads imprints the surface of the brake discs.

> **NB.:** It is recommended that cars that have been stationary for a long period, have their brake discs and brake pads replaced. If the car has been parked for a shorter period of time, it is recommended that you make a few stops to remove the im prints of the brake disc surface. If vibrations and shaking continues, replace the brake discs and brake pads.

3.0 Other parts in the brake system

3.1 Remains of the friction material from the brake pads

> **Visually:** Mostly worn and “glazed” braking surface. The brake discs are only worn on one part of the braking surface.

> **Symptom:** Gradual reduction of braking efficiency, vibration, brake pedal can be “hard”.

> **Cause:** Incorrect mounting of the caliper. The brake pads do not have full contact with the brake discs and overheat as a result of this. Incorrect brake pads have been mounted.

> **NB.:** Replace brake discs and brake pads.
Check the mounting of the caliper and if it functions properly.

3.2 Plated / “Glazed” brake discs

> **Visually:** The braking surface is coated with material from the brake pads. The brake discs’ surface may appear shiny and with burnt particles from the brake pads.

> **Symptom:** Poor braking power, long braking distance, pedal seems very firm, vibrations from the steering wheel and steering system.

> **Cause:** Quick cooling of very hot brake discs, brake pads of poor quality, this occurs most frequently in connection with brake discs that are not run / bedded in.

> **NB.:** Replace brake discs and brake pads.

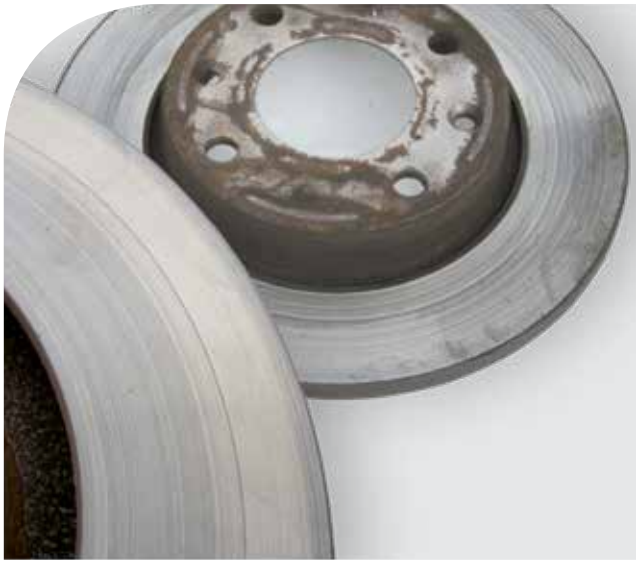
3.3 Assembly and form-errors brake pads/brake calipers

> **Visually:** Discoloration in some areas on the surface of the brake disc. Uneven wear on the brake discs and brake pads.

> **Symptom:** Vibrations, shaking in the steering, pulsating brake pedal.

> **Cause:** Brake pads have had contact with the entire surface of the brake disc. The brake disc and brake caliper is not mounted parallel. The brake caliper is shifted relative to the brake disc / hub or mounted crookedly. Brake discs overheat because of the small contact area of the brake pads. Heat is distributed in a small area and cause overheating.

> **NB.:** Change brake discs and brake pads. Check the settings of the brake caliper. It is important that you ensure that the friction surfaces fit together prior to the mounting. Also check whether the caliper and brake discs are mounted parallelly.



3.4 Uneven brake surface

> **Visually:**	There may be bumps or grooves on the brake disc's surface.
> **Symptom:**	Murmurs. Reduced braking efficiency due to reduced contact between the brake discs and brake pads.
> **Cause:**	Foreign particles that has captured / trapped between brake pads and brake discs. This could be the particles from the brake pads or external dirt and grime.
> **NB.:**	Replace brake discs and brake pads.

Other conditions (storage)

Brake discs must be stored in such a way that they are protected against corrosion and external factors that may affect the brake discs.

When filing a complaint, the submitted brake discs must be in such a condition that a verification/assessment in relation to the cause of complaint is possible.

Error and solution matrix

Error							
Inappropriate wear on the brake pads	The brakes are stuck	The vehicle pulls to one side when braking	Noise from brakes	The brake pedal travel is too long	Tremors in the steering wheel	Pulsating brake pedal	Remedy
●	●	●	●				Replace brake pads - use brake pads in OE quality
●	●	●	●		●	●	Check to see if the caliper is working properly
●	●		●		●		Check the disc thickness, throws and general condition
		●		●			Check the hydraulic system for leaking fluids
		●					Check that the coating is not damaged by brake fluid or copper grease
			●				Check the springs, clips and pegs in brake pads and caliper
				●			Bleed the brake system
					●	●	Make sure that the wheel bearings are set in relation to the manufacturer's specification
					●	●	Check steering components, suspension and wheel hubs
					●		Check to see if the tyres and rims are damaged

Mounting instruction

For safety reasons it is important to follow these guidelines for replacement of brake discs :

Brake discs should be replaced with every second change of brake pads or when the brake discs have uneven wear. Do not exceed the specifications of the minimum thickness of the discs (my TH). The minimum thickness is specified on each brake disc.

1.
Make sure that the anti-corrosion protection on the brake discs is completely removed. Brake cleaner or benzene can be used. Any traces of corrosion on the brake disc could cause overheating and a consequent degradation and deformation of the brake discs and brake pads.

2.
It is important that the contact surface and the wheel hub is completely cleaned before the brake discs are mounted.

Do not use copper grease or paste between the disc and the hub.

Discs fixing studs or bolts must be tightened hexagonally with a torque wrench.

3.
Brake disc run out must, after final assembly, not exceed 0.10 mm. If the tolerance fails, it is necessary to remove the discs and mount them on a different position on the hub.

Note : Always replace brake pads in pairs. Hard braking should be avoided when possible for the first 300-500 km as the discs and pads have a run-in period.

Coated discs

Triscan's program of brake discs also includes coated brake discs. The program is constantly expanding.

If you are looking for a brake disc for e.g. a BMW 5 Series (E60) 520d, in Triweb or Tecdoc, you will see two Triscan references: 812011158 and 812011158C. The first reference is a standard disc and the second reference is a coated brake disc, which is indicated by the addition of a "C" to the standard reference number.

The coated discs are as always in Triscan's OE quality.

BENEFITS

- The coating protects the disc from corrosion, especially on non-braking surfaces and internal vented areas.
- No need to degrease before mounting.
- Ideal for open rims where the brake disc is very visible.

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