**Please note:**

The technical tips describe general procedures which may not apply to all vehicles or individual components. Therefore, we cannot guarantee that the information provided as part of the technical tips is universally correct. If you are in any doubt, TRW strongly recommends that maintenance and repair work is carried out by trained specialists as per the specific vehicle manufacturer's guidelines. Thank you for your understanding.

Brake discs - Checking and replacement

Because of their design, brake pads and brake discs wear each other down during braking. Because they can no longer achieve the required braking performance beyond a certain level of wear, regularly checking the brake system is absolutely essential for every motorcyclist and should be carried out much more often than just every two years by an official inspector.

In addition to replacing old brake fluid and worn pads, maintaining the brake system includes checking the brake discs. It is important to not only check the thickness of the brake disc but also to inspect it for deformation and any scoring.



Observe minimum thickness.

Every disc has a minimum thickness stipulated by the manufacturer, which must be ensured. This dimension is clearly visible on all TRW brake discs outside the friction ring (Min.Th.). When the minimum thickness is reached, the brake disc must be replaced. The best way to measure it is using a micrometer. The vernier/digital caliper frequently used are not so well suited as deposited material generally forms a small burr on the outermost edge of the brake disc's friction ring. This can falsify the measurement result when using a caliper.

Avoid deformation.

At very high loads, brake discs reach temperatures of up to 600°C around the friction ring. The mounting area remains significantly cooler. This results in uneven thermal expansion of the material, which is considered to be the most frequent cause of deformation of the disc. Rigid brake discs with a large diameter are particularly susceptible to deformation.

Extreme temperatures occur not only with sporty riding and on a race track, but also in everyday life. Driving down steep and winding roads, often with heavy luggage and a pillion rider, pushes up the temperatures as the brake is almost constantly applied.

Sticking brake caliper pistons are another cause of overheating brake systems. Continuous contact with the pad causes the discs to get extremely hot and to wear prematurely.

If a deformed brake disc has to be replaced, at least the following possible sources of faults should be checked, as they can be an indirect cause:

- Is the brake disc aligned parallel to the brake pistons in the brake caliper?
- Is the front fork correctly adjusted and fitted without deformation?
- Are the brake system components matched to one another (brake caliper original or matching the vehicle; properly aligned with brake disc during installation)?
- Are the brake discs positioned flush on the boss (an uneven contact surface can occur due to paint or bolt adhesive residue for example)?
- Is the wheel correctly mounted on the wheel axle and in the centre of the front fork?
- Is the tyre pressure correct; are the wheel bearings OK?

Check for scoring.

Deep scores on the surface of the brake band also lead to a deterioration in the braking effect - the only remedy for this is to replace the disc. Scoring on the discs leads to grooves also forming on the brake pads, which means that the pads can no longer be used on a new disc later.

Floating brake discs

Especially on larger and/or faster motorcycles, so called floating brake discs are fitted as standard on the front axle these days. They have an inner ring, which is

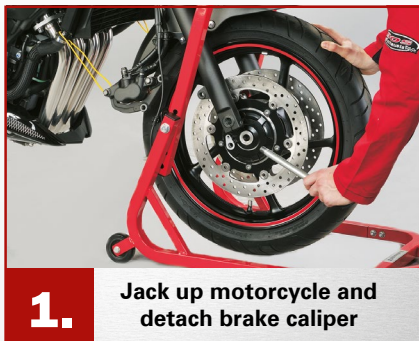
bolted onto the wheel hub. Pressed sleeves („floaters“) provide the connection to the outer ring or brake band, on which the brake pads are fitted.

Primarily due to the use of aluminium as the material for the inner ring, floating discs have the following advantages over a rigid design:

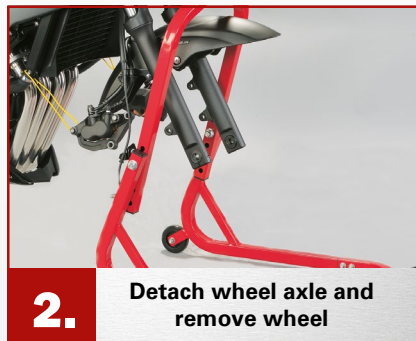
- Reduction in rotating mass
- Lower unsprung mass for better handling properties
- Better heat dissipation of the aluminium combined with the floating bearing ensures increased resistance to high temperatures and deformation
- The design means that stresses produced during operation can be offset more easily, guaranteeing a more spontaneous brake response

Worn out floaters

The connection points are subject to wear due to a reduction in the spring pre-tension, which may not exceed 1 mm axially (laterally to the direction of travel). The brake disc then clatters audibly and has to be replaced. Any radial clearance produces a kind of delay when braking, which is not permitted and is also rated as a defect in the MOT check.



1. Jack up motorcycle and detach brake caliper



2. Detach wheel axle and remove wheel



3. Loosen brake disc fastening screws

New discs, new pads.

To obtain an optimum braking effect from the new brake disc, it should always be fitted along with new brake pads. Even if the old pads were not yet completely worn, you cannot continue to use them. Their surface has adapted to the wear pattern of the old disc and would not press properly onto the new disc. This would result in a significantly weaker braking effect and increased wear on the new disc.

With two-rotor disc brakes, both brake discs should always be replaced.

Proceed as follows:

Please do not forget the following before starting work: Brakes are relevant to your safety. Work on the brake system only if you have experience in technical maintenance and repair work. Do not risk your safety. If in doubt, have the work on the brake system carried out by your workshop.

Use the enclosed approval certificate to check whether the disc you have purchased is approved for your vehicle. Only use suitable tools for the installation. A torque wrench should be available to ensure proper tightening of the bolts for the brake disc and brake caliper. Take the tightening torques and vehicle-specific data for your machine's brake system from a maintenance manual for your machine model.

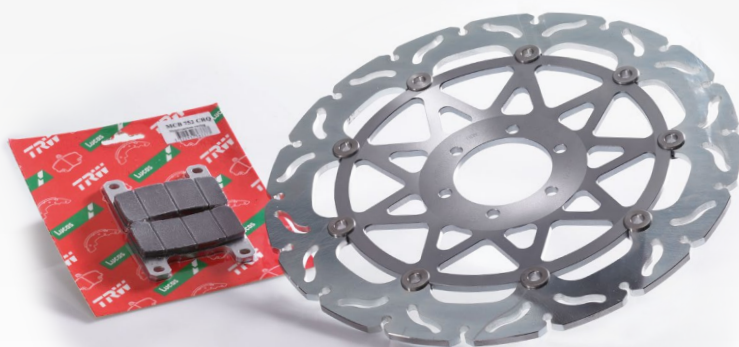
1. First jack up the motorcycle safely so that there is no load on the wheel you want to work on. If the machine does not have a main stand, an assembly lift must be used. First remove the brake caliper and replace the brake pads. Refer to the TRW technical test tip „Brake pads - checking and replacing“.

Then suspend the relevant brake caliper on the vehicle, e.g. with wire or cable ties, so that it is not in the way during the subsequent wheel removal. Do not allow the brake caliper to dangle on the brake hoses, in order to avoid damage to the hoses and connections.

2. Detach the wheel axle and remove the wheel from the front fork or the rear wheel swingarm.

3. Place the wheel on a suitable work surface and detach the fastening screws for the brake disc crosswise. Particularly for socket head screws, always use an appropriate and high-quality tool and make sure that it engages as deeply as possible in the socket. If the screw heads are deformed, removing the screws can become a problem. If the screws are fitted very securely, heat and a hammer blow on the tool can often help. If a socket in the screw head is rounded, one solution may be to hammer in a bit one size higher and use it to loosen the screw.

4. Detach the old brake disc(s) from the boss and clean the contact surface. Any unevenness (paint residue, bolt adhesive etc.) must be painstakingly removed. The rims and axles can be cleaned more easily at this point.



**Perfectly matched:
TRW brake discs and pads**



4. Detach old brake disc



5. Fit and secure new brake disc



6. Check brake and wheel

5. Now fit the new TRW-Lucas brake disc. Tighten the fastening screws crosswise to the tightening torque specified by the vehicle manufacturer. Heavily corroded or damaged fastening screws should be replaced with new ones.

Important: If the manufacturer recommends the use of bolt adhesive, apply it carefully and sparingly. You must not allow any of the adhesive to run below the contact surface of the brake disc, as otherwise the parallel running of the disc relative to the boss may be impaired. This would result in brake judder and increased wear. The wheel and brake caliper are fitted in the reverse order of removal. When fitting the wheel, make sure the running direction of the tyre is correct.

6. Before operating the hand brake cylinder, check that the fluid level in the brake fluid tank is correct. The new, thicker pads and discs press the brake fluid in the brake system into the fluid tank and it may need to be removed until the Max marking is reached. Operate the brake lever to press the disc brake pads onto

the brake disc. Check the pressure point of the brake. Release the brake and check that the wheel moves freely. If the brake slips, there may have been an error during fitting or a brake piston may be sticking in the brake caliper.

Important: When working, the surface of the brake disc may not come into contact with greases, pastes, brake fluid or any other chemicals. If necessary, the brake discs must be cleaned with brake cleaner. For the first 200 kilometres, the new brake discs and pads should be run in cautiously. If the riding situation allows, heavy and continuous braking and allowing the brake to slip should be avoided wherever possible. This also applies to organic brake pads, in order to prevent glazing of the pads.

The work steps in brief:



1. Jack up motorcycle and detach brake caliper.



2. Detach wheel axle and remove wheel.



3. Loosen brake disc fastening screws.



4. Detach old brake disc and clean contact surface.



5. Fit new brake disc and tighten fastening screws.



6. Check brake pressure point and free movement of wheel. Clean brake disc.