

**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 pads – checks and replacements

The road to victory for motorcycle disc brakes began at the end of the 1960s. Along with its Asian Licensees, Lucas, a pioneer in this technology, was soon supplying the majority of European and Japanese manufacturers with disc brake systems. The way this brake type works is very simple, yet extremely effective: two brake pads positioned opposite each other are pressed against the brake disc between them using hydraulic pressure.

The advantage over drum brakes, which had been the standard until then, concerns the brake output; firstly by improved ventilation and cooling of the system and secondly, by the greater amount of pressure that can be applied to the pad material by effective, hydraulic transmission.

### Check regularly

The braking process determines that brake discs and pads will wear out over time. Rider behaviour will often influence how quickly this happens. It's therefore extremely important to check these parts regularly as once they have worn past a certain limit they will become unsafe.

TRW recommends the following visual inspections are carried out on a regular basis:

- Check brake pad thickness
- Check the pads from the side and from the bottom to determine if they have worn unevenly. Incorrectly positioned brake calipers may cause irregular (sloped) pad wear
- Replace brake pads if the friction compound is less than 2 mm thick.
- Even if the wear limit on the brake pad has not yet been reached, as a safety expert, TRW recommends replacement, e.g. before longer trips or expected higher than normal strains..
- Pay particular attention to parts fitted to older braking systems which may have been subjected to more heat, and also to organic friction materials which may be vitrified if overheated.



1.

Extract approx. 50%  
of the brake fluid



2a.

Remove brake caliper



2b.

Push back brake  
pistons with pads

## Proceed as follows:

Note the following before starting work: Brakes are safety critical automotive parts. Replace the pads only if you have experience in technical maintenance and repair work. If you do not have the necessary skills and experience we strongly recommend having your brakes serviced in a specialist workshop.

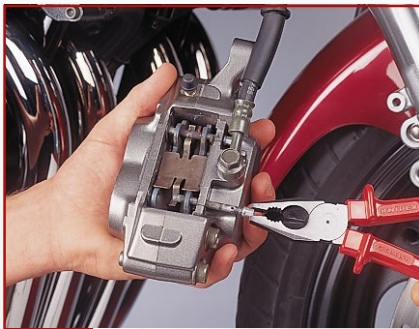
1. Position the motorcycle so the brake fluid tank is as horizontal as possible to prevent fluid escaping when you open the container. Brake fluid is poisonous and corrosive, and damages paintwork. In case of emergency, rinse with plenty of water. Do not just wipe off. Ensure that brake fluid does not come into contact with your skin, the brake discs or the pads. Cover any painted components in the vicinity of the brake fluid tank. Next, open the brake fluid tank lid using a lint-free cloth and extract about half the fluid from the tank. TRW recommends replacing the fluid if it is older than two years.

CAUTION! Despite all precautionary measures, fluid may escape later when you push back the brake pistons.

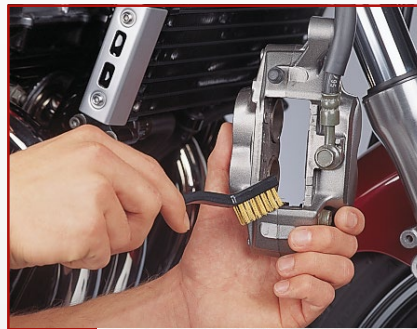
2. Undo the brake caliper screws at the fork and remove the caliper from the disc. You can now access the brake pads. Press back the pad(s) evenly using a brake piston return tool. You have now created the space for new pads with full pad thickness. It is important to only use the correct tools to reset brake pistons. Using a screwdriver for example carries a risk of wedging in the brake piston at an angle causing the brake to chafe. Also monitor the brake fluid level in the reservoir as it will increase when you push back the pistons.



Perfect Pair – TRW brake discs and brake pads perfectly complement each other!



**3.** Remove retaining pins



**4.** Clean and check brake caliper



**5.** Insert new pads into caliper

**3.** The actual process of removing the brake pads is relatively easy. In the example shown, the pads are guided by two retaining pins and held in position by a spring. To take them out, remove any retaining pin clips from retaining pins. Drive out any seized pins using suitable tools but be careful as these pins may have been screwed in so always attempt to unscrew them before trying any other method of removal.

**CAUTION!** The retaining spring is often subject to tension so be very careful when removing it and always take note of the installation position for subsequent re-installation – perhaps by simply taking a photograph on a mobile device. Once the pins have been removed, take out the pads. Please take note of any metal shims that may be fitted between pad and brake caliper piston. These are intended to thermally shield the pads from the remaining brake system and prevent or minimise brake noise. It is vital to reinstall them in the same position so they can correctly fulfil their function.

**4.** Thoroughly clean and check the brake caliper – as shown - using a soft brass or plastic brush and brake cleaner before you replace the brake pads. Check the dust caps on the calipers have been correctly fitted and check for dryness around the brake pistons as moisture indicates a worn seal. Dust caps must not be porous or have holes as moisture will escape onto the pistons and potentially cause corrosion. Replacing a dust cap is usually relatively easy and possible without having to remove other parts. Please refer to your vehicle's repair instructions for more detailed information on how to replace faulty seals. Do not brush the dust cap.

**5.** Carefully clean the retaining pins (replace if this is not possible) before installing new brake pads. Next, place both pads in the caliper with the insides facing each other. Correctly position any metal shim on the back plate of the pad. Insert one retaining pin and position the spring. Press the spring down and install the second retaining pin. Insert new retaining pin clips. It is paramount that the brake pad surfaces do not come into contact with grease, brake fluid or other foreign matter. Please take the time to once again check the work you have done before finally installing all components.

**ADDITIONAL TIP:** Although it is sometimes suggested that you apply copper paste to the back plate of the pad and chamfer the pad material to prevent brake noise, TRW strongly recommends that you do not do this. Tampering with the pad material will always render any manufacturer product liability void. Additionally, if metal particles have been exposed to the pad material it may cause premature wear and drag lines on the brake disc.

A mixture of copper paste and the unavoidable brake dust is often the reason for impaired brake caliper functionality.

If you are experiencing issues with brake noise, we recommend you use our dedicated, self-adhesive anti-squeak foil (TRW part no. MCB100) and apply it to the rear plate of the pad.



6.

### Remount brake caliper



**TRW Brake Cleaner thoroughly removes brake dust and grease deposits.**

**6.** Press the pads as far as possible towards the outside. This will create space for the brake disc to be able to install the brake caliper over the brake disc. Now position the caliper over the disc at the front fork. If a brake pad is blocking the installation space, it may mean that the caliper has shifted position. Correct this before you continue. To do this, use the brake piston return tool or two suitable wooden blocks to prevent damaging the brake pad. Once again, press evenly from both sides to make sure you do not wedge in components. Once the brake caliper is in position, install it using the brake caliper screws and tighten them to the specified torque.

**7.** If your motorcycle is equipped with a single-rotor disc brake, you may now refill brake fluid up to the „Max.“ mark and close the lid. Proceed as described above for the second brake caliper on models with two-rotor disc brakes.

**CAUTION!** Before you go for a test run, make sure the brake pistons are in their correct operating position by pulling the brake lever several times. This is VITAL as otherwise the brakes may not work when you first try them. Avoid heavy or continuous braking for the first 200 km to allow the pads to adapt and prevent vitrification of the material. Check whether your discs become hot, the brake pads chafe or there are any other defects that indicate a jammed brake piston. If any of this happens, press the piston completely back into the brake caliper without wedging it in. This will often solve the problem. Please contact your specialist workshop if this is not the case.

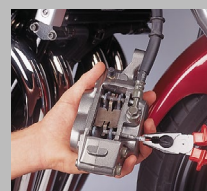
## The work steps in brief:



**1.** Extract approximately half of the brake fluid.



**2.** Unscrew the brake caliper. Push back the brake pistons and pads.



**3.** Remove the guide pins and remember the brake spring position.



**4.** Clean the brake caliper.



**5.** Insert the pads.



**6.** Remount the brake caliper using a torque wrench

