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Play It Safe When Replacing Brake Discs

- ZF Aftermarket increases safety on the road with OE quality
- TRW brake portfolio complies with ECE R90 regulations
- ZF Aftermarket experts provide tips on replacing brake discs on commercial vehicles

As a leading global automotive parts supplier, ZF features one of the most comprehensive safety technology portfolios on the market. This comprises: sensors, braking, steering & transmission systems, airbags and control units. ZF Aftermarket directly translates this OE power into the spare parts market to actively support increased road safety. As a member of the official working group, the aftersales specialist was centrally involved in the creation of the ECE R90 regulations. In line with this, the business welcomes the fact that in addition to brake pads and shoes, all brake discs and drums manufactured and sold across Europe for passenger cars and light commercial vehicles now have to meet the minimum standards outlined in the ECE R90 legislation. In order to meet these standards, the parts must pass a series of tests and perform to levels similar to the Original Equipment (OE) part. As owner of the TRW brand, ZF Aftermarket is proud to share that the specifications for its heavy and light commercial vehicle brake discs exceed the legal provisions of the ECE R90 standard. In the following, ZF Aftermarket provides valuable tips for the professional replacement of brake discs on commercial vehicles.

Brake discs are subject to very high mechanical and thermal loads. This is compounded by environmental factors such as splash water, dirt and grit from the roads; all of which further affects wear. Since brake discs are among the most safety-critical vehicle components, ZF Aftermarket experts recommend that they only be replaced by trained and authorized staff. It is also vital to refer precisely to the guidelines and repair instructions of the specific vehicle manufacturer (VM).



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Replacing the brake disc when wear limit is reached

When the brake disc has reached the wear limit, defined as the minimum thickness specified by the VM, it must be replaced (image 1). Before removing the brake disc, the new and the old brake disc must be compared. In addition to the right part number and design, it is important to ensure that you have to hand all accessories required to connect the wheel hub and brake disc: e.g. new bolts, wedges and lubricants, as well as the appropriate tools required for correct repair.

The vehicle must be lifted safely and the wheel removed. After disconnecting the cable connections of the Anti-lock Braking System (ABS) sensor, brake pad wear indicator and removing the brake cylinder, the brake caliper pistons have to be reset mechanically. To do this, remove the sealing cap and turn the adapter underneath it counterclockwise. The pistons then reveal the inner brake pad. The "breakaway torque" of the overload clutch in the adjuster produces a "click" sound.

Now you can remove the split pin, the safety bolt and the brake pad retainer together with the brake pads. Once the brake caliper carrier's fastening screws have been removed, the brake caliper can be removed completely.

Removing the wheel hub with the brake discs

Please note: The work processes may vary considerably depending on the brake system and VM.

To remove the wheel hub and the brake disc connected to it, first remove the axle nut cap and the axle nut itself. Then remove the wheel hub and the brake disc and place them on a stable work surface. Now, the ABS ring can be removed and all connecting bolts between wheel hub and brake disc can be loosened and removed. The brake disc can then be pressed away from the wheel hub on a hydraulic press.

Before the new brake disc is fitted, the contact surfaces on the wheel hub must be thoroughly cleaned. They should also be free of any



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corrosion. After **thorough cleaning**, the new brake disc is fitted onto the wheel hub. Use a new set of connecting bolts to secure the brake disc to the wheel hub (image 2).

Never rework the brake pads

In the next stage, a new ABS ring is fitted onto the wheel hub. Now the wheel hub can be remounted on the axle and secured with the axle nut. Tighten the axle nut to the specified torque and refit the axle nut cap. Before remounting the brake caliper, clean the brake disc with cleaner especially developed for this purpose by TRW. The next step is to insert the new TRW brake pads into the brake caliper and to fit the pad retaining springs provided.

Tighten the fastening screws to the torque specified by the VM. **Never rework** brake pads in this instance. Grinding or filing the reverse side of the pads may cause mechanical or thermal overload and thus result in increased wear. This can create unwanted noise or cause the brake caliper guides to stick; reducing the efficiency of the brake. So do not make any changes to the brake system under any circumstances!

Now you can mount the brake cylinder and connect the cables.

The final adjustment work is particularly important for ensuring long-lasting and reliable brake function. Carry out the adjustment process according to the VM's provisions (image 3):

- Turn the adjuster clockwise until the pads touch the brake disc. Do not turn the adjuster too far!
- Then turn the adjuster back by 3 to 4 clicks.

After having actuated and released the brake, it must be possible to turn the wheel hub by hand. Then mount the wheel, center it and secure it to the torque specified by the VM.

At the end of the brake disc replacement, testing the part on a brake test bench and undertaking a test drive are particularly important.



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OE quality parts for more safety

Using genuine parts developed and manufactured by experts is paramount for sustainable vehicle safety. ZF Aftermarket contributes to this with its broad OE quality TRW 'Corner Module' product portfolio of braking, steering & suspension parts and systems.

Captions:

1. If the brake disc falls below its defined minimum thickness, it must be replaced.
2. Before the brake disc is fitted, the wheel hub should be cleaned thoroughly.
3. Tighten the fastening screws to the torque specified by the vehicle manufacturer.

Images: ZF

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ZF Friedrichshafen AG

ZF is a global leader in driveline and chassis technology as well as active and passive safety technology. The company has a global workforce of 146,000 with approximately 230 locations in some 40 countries. In 2017, ZF achieved sales of €36.4 billion and as such, is one of the largest automotive suppliers worldwide.

ZF enables vehicles to see, think and act. The company invests more than six percent of its sales in research and development annually – in particular for the development of efficient and electric drivelines and also in striving for a world without accidents. With



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its broad portfolio, ZF is advancing mobility and services for passenger cars, commercial vehicles and industrial technology applications.

With integrated solutions and the entire ZF product portfolio, the ZF Aftermarket Division of ZF Friedrichshafen AG guarantees the performance and efficiency of vehicles throughout their life cycle. Its combination of established product brands, digital innovations, customized products and services, and a worldwide service network has made ZF a sought-after partner and number two in the global automotive aftermarket.

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