



FITTING INSTRUCTIONS FOR THE INSTALLATION AND REMOVAL OF DISC BRAKE PADS FOR PASSENGER AND LIGHT COMMERCIAL MOTOR VEHICLES

In case of queries, please contact the supplier of the brake linings and not the FEMFM.

This fitting instruction is addressed exclusively to trained qualified staff! Assembly and disassembly work may only be carried out if the following instructions have been read and understood. No liability is accepted for damage caused by ignoring this fitting instruction.

1. Important general statements:

Brake pads are part of the brake system and as such are safety critical parts. All work must therefore be executed with the utmost care. **Brake pads must only be replaced by persons possessing the necessary expertise.** Incorrect work may lead to total failure of the brake system.

These fitting instructions are a guideline for standard repair work and do not take into consideration any special features which might apply to the different brake systems. **The special instructions issued by the vehicle and brake manufacturers must therefore always be followed with priority over the instructions given in these fitting instructions. No liability is accepted for damage caused by ignoring the specific instructions of the vehicle and brake manufacturers.** Brake pads must be replaced in axle sets. Do not use brake pads other than those specified for the particular vehicle type.

WARNING



- To minimise exposure, **avoid inhaling non-exhaust emissions and fine brake dust.**
 - Perform brake maintenance in a well-ventilated area.
 - When performing repair work, **do not clean brake parts with compressed air.**
 - **Wearing personal protective equipment, especially safety shoes, gloves, safety goggles, and respirators, is strictly required.**

WARNING



- **Do not bring the friction material of the brake pads, discs, callipers, brake hoses etc. into contact with greases, oils, other lubricants or mineral oil-based cleaning agents as this could lead to brake failure. If necessary, replace any parts, which became contaminated.**
- **Do not use any sharp tools, as inappropriate use of these might cause damage. Use special tools only (torque spanner, expanding tool, pull-out hooks, etc.).**
- **Should damage be observed on any part of the brake system while working on it, it must be remedied appropriately before the vehicle is put back into service.**
- **For brakes with electric parking brake function (electric parking brake), the special instructions issued by the vehicle and brake manufacturer regarding the basic adjustment after changing the brake pads must be followed. An incorrect basic setting can lead to dangerous malfunctions of the brake system!**

2. Dismantling

Before starting to work on the brake system attach a warning notice to the steering wheel that the vehicle is under repair, chock the wheels not being worked on, jack up the vehicle and ensure its stability. Begin with working on one brake of the axle at a time. The second brake may serve as a guide for the correct positioning of the individual parts during reassembly. All working steps must be identical for both brakes on the same axle.

CAUTION

- **Springs/clips holding down the pads may be under spring tension; relieve in a controlled fashion and keep in place by covering the calliper housing.**
- **Do not actuate the brake after pads have been removed.**

a) Pads Replacement without dismantling the calliper:

→ **Fixed Calliper Brake, see Fig. 1.**

→ **Sliding Calliper Brake, if pad can be removed from the top, see Fig. 2**

- Remove cover plates if provided.
- Dismantle safety devices like retainer pins, clamping sleeves, springs or screws used to fasten the brake pads.
- If a wear indicator is provided, disconnect plug.

CAUTION Avoid possible spillage of the brake fluid contained in the fluid reservoir, if necessary, by draining some of the fluid into a suitable container. If inappropriately handled, brake fluid may cause serious injury or damage. Observe the brake fluid manufacturer's instructions.

- Use an expansion tool to push the pads backward, if necessary.
- With fixed calliper brakes, pull the pads out of the calliper housing.
- With sliding callipers, start with removing the brake pad on the piston side, then shift the sliding calliper until the brake pad toward the calliper side can be removed from the pivot.
- Remove any shims and replace by new ones if damaged. Do not dismantle any plates or caps firmly inserted into the brake piston. If there are signs of fluid leakage or other damage to the calliper, these are to be repaired professionally by an authorized Workshop only.

b) Pad Replacement with partial dismantling of the Calliper

→ **Fist Calliper Brake, if pad removal from top is not possible, see Fig. 3**

- If a wear indicator is provided, disconnect plug.
- Depending on calliper configuration, dismantle locking springs, fastening screws, guiding pieces or bolts.

CAUTION Avoid possible spillage of the brake fluid contained in the fluid reservoir, if necessary, by draining some of the fluid into a suitable container. If inappropriately handled, brake fluid may cause serious injury or damage. Observe the brake fluid manufacturer's instructions.

- Push the piston back and pivot out or remove the housing. Do not detach the brake hose.
- Support or suspend the removed housing in such a way that the brake hose is not stretched or damaged.
- Remove brake pads from housing.

3. Subsequent steps:

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- To make the new, naturally thicker, brake pads fit into the calliper, push pistons back.
- With 4-piston fixed callipers or 2-piston fist callipers, insert shims between the pushed back pistons or between piston and fist in order to prevent these pistons from coming back out while the other pistons are pushed back.
- With brakes, which combine a mechanical parking brake and adjustment feature, the pistons must be brought back to their original position by turning or by means of adjustment screws, depending on their type.
- Clean pad shafts, housings and guides with non-mineral-oil based cleaning agents. Replace damaged or brittle dust caps.

WARNING



- Do not clean brakes with compressed air, a stiff brush or something similar.
- Do not whirl up fine dust which, if inhaled, can be harmful to health. Wear a respirator, if working in a poorly ventilated area.
- Do not degrease guiding bolts and calliper spring assemblies, as they require special grease.
- When calliper is tight slightly grease the calliper guides with special grease following the instructions of the vehicle or brake manufacturer.
- The friction materials of the brake pads and the discs must not come into contact with the greases used, as this could lead to brake failure otherwise, degrease the discs and use new brake pads.
- Replace corroded guide bolts.

- With stepped pistons, check correct position by means of piston gauge and readjust, if necessary.
- Check brake disc thickness and replace all discs on an axle if the wear limit is exceeded or if heavy surface crazing or cracks are found.
- Remove any corroded areas on the outer and inner parts of the disc working surface.

4. Montage

NOTE

Disc brake pads must have been stored in accordance with the storage conditions specified in the **FEMFM Catalogue of Characteristic Features** (<https://www.femfm.com/publications/catalogue>). The maximum storage period specified by the manufacturer applies from the date of manufacture and should not be exceeded. After the expiry of this storage period, the manufacturer can no longer guarantee the serviceability of the product.

- The new brake pads must move freely in their guides.
- The contact surface of the pad backing plate/calliper guides as well as of the pad backing plate/brake pistons are to be slightly greased with a special grease following the instructions of the vehicle

manufacturer.

- Shims which are not corroded, bent or embedded may be reinstalled. Otherwise replace by new ones.
- If wear indicators are provided, clip non-damaged or new wear sensors into the new brake pads.
- Insert new brake pads in the reverse order as described under "Dismantling" with the friction surface pointing toward the brake disc. With asymmetrical backing plates/brake pads, the arrow must point in the direction of rotation of the disc (when driving forward).
- Insert locating pins, springs and clamps in the same position as before dismantling.
- If brake pads are equipped with wear indicators, re-connect plugs and sockets.
- Retighten the detached fastening bolts of the brake calliper or guiding bolts. Replace self-locking screws by new ones of the same type.

CAUTION Observe tightening torque of the calliper body fixing bolts prescribed by the vehicle manufacturer. An incorrect torque may induce brake failure.

- Brakes combined with a mechanical parking brake adjustment feature must have free travel after repeated brake actuations, which must be set according to the instructions of the vehicle manufacturer.
- Replace the pads on the other end of an axle in the same fashion.

5. Functional test:

After having re-fitted the wheels and lowered the vehicle, be sure to observe the following points:

- Check the brake fluid level in the brake fluid reservoir and replenish to maximum filling line, if necessary. Use only new brake fluid of the grade specified for the particular vehicle type.

CAUTION If inappropriately handled, brake fluid may cause serious injury or damage. Observe the brake fluid manufacturer's instructions.

NOTE

- To re-position the brake pads correctly, repeatedly actuate the brake once the vehicle is back on the ground.
- Repeat this process until the brake pedal travel has stabilized at approx. one-third of its total travel. At a constant maximum pedal force, the pedal travel must not change even over a prolonged period of application.

WARNING If the pressure point and consistency cannot be achieved, recheck the entire brake system, as otherwise, the risk of a brake failure cannot be ruled out.



- Recheck the brake system for leaks.
- Recheck the brake fluid level and replenish up to the maximum filling line, if necessary. Use only new brake fluid of the grade specified for the particular vehicle type.

CAUTION If inappropriately handled, brake fluid may cause serious injury or damage. Observe the brake fluid manufacturer's instructions.

- Perform trial brake applications at low speeds keeping in mind that brake effectiveness may be somewhat reduced during the first brake applications. Do not apply excessive force or perform continuous brake applications in order to achieve faster bedding-in.
- Always observe the bedding instructions of the vehicle manufacturer.
- Observe traffic regulations when performing brake tests.
- Carry out a functional test on a rolling road to ascertain that the system meets any legal requirements, which may exist; on trailers, check automatic reverse gear, if necessary.
- Check the tightening torque of the wheel nuts/bolts again after approx. 30 miles.

6. General:

- Used brake pads must be disposed according the legal requirement applicable under national and/or local regulations.
- Brake pads are wearing parts und must therefore be checked at regular intervals.
- If the thickness of friction material remaining on a pad is less than 2 mm or the wear indicator releases, all brake pads have to be replaced axle wise by original spare parts or by ECE R90 type approved parts.

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