Driveline and Chassis Technology

Maintenance Bus Brakes

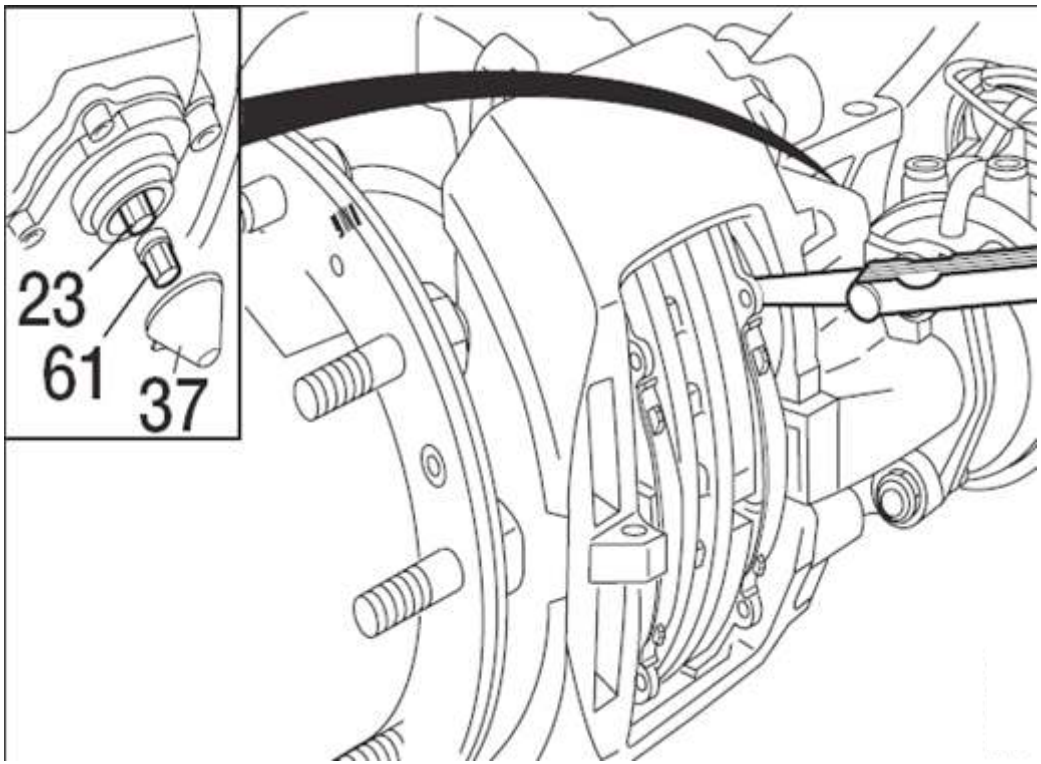
ZF Passau GmbH



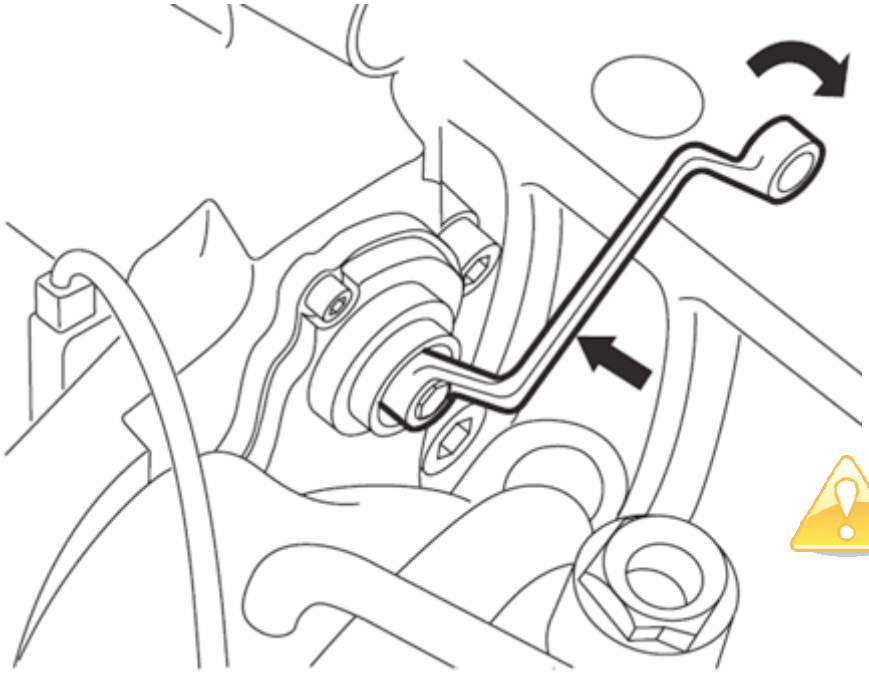

Knorr brake
Brake clearance and adjuster check

- Remove wheel
- The caliper assembly should be pushed inboard on its guide bushes. Using a suitable tool, press the inboard pad away from the Tappets and check the gap between Tappet and inboard pad backplate – it must be between 0,6 – 0,11 mm.

If the clearance is too wide, there is a danger of brake failure. If the clearance is too small, there is a danger of overheating, that may lead to consequential damage



Knorr brake
Brake clearance and adjuster check



If the running clearance is too small or too large, the adjuster may not be functioning correctly and should be checked as follows

Pull off the adjuster cap (37) using the tag, taking care not to lose the shear adapter (61).

The adjuster (23) must be turned with the shear adapter (61) anti-clockwise for 2 or 3 clicks (increasing running clearance).

Never turn adjuster (23) without shear adapter (61) being fitted. If the shear torque of the shear adapter is exceeded, then it is designed to fail. Try again with a new (unused) shear adapter. With a second failure of the shear adapter the caliper must be exchanged since internal damage is present.

Do not use an open-ended spanner as this may damage the adapter

Make sure that the ring spanner or socket can turn freely clockwise during the following procedure.

By applying the brake (about 2 bar) 5 to 10 times the spanner or socket should turn clockwise in small increments if the adapter is functioning correctly.

Knorr brake
Wear check of disc and pad

Measure thickness at thinnest point. Avoid measuring near the edge of the disc as a burr may be present.

A = Disc thickness (new condition) 45mm

B = Disc thickness (worn) 37 mm, disc must be replaced

C = Overall thickness of Pad (new condition) 30mm

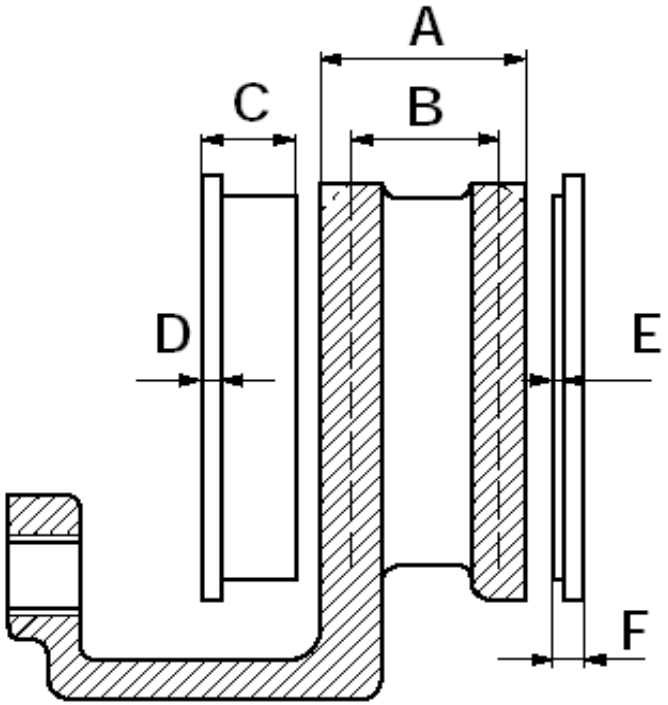
D = Back-plate 9mm

E = Minimum thickness of friction material 2mm

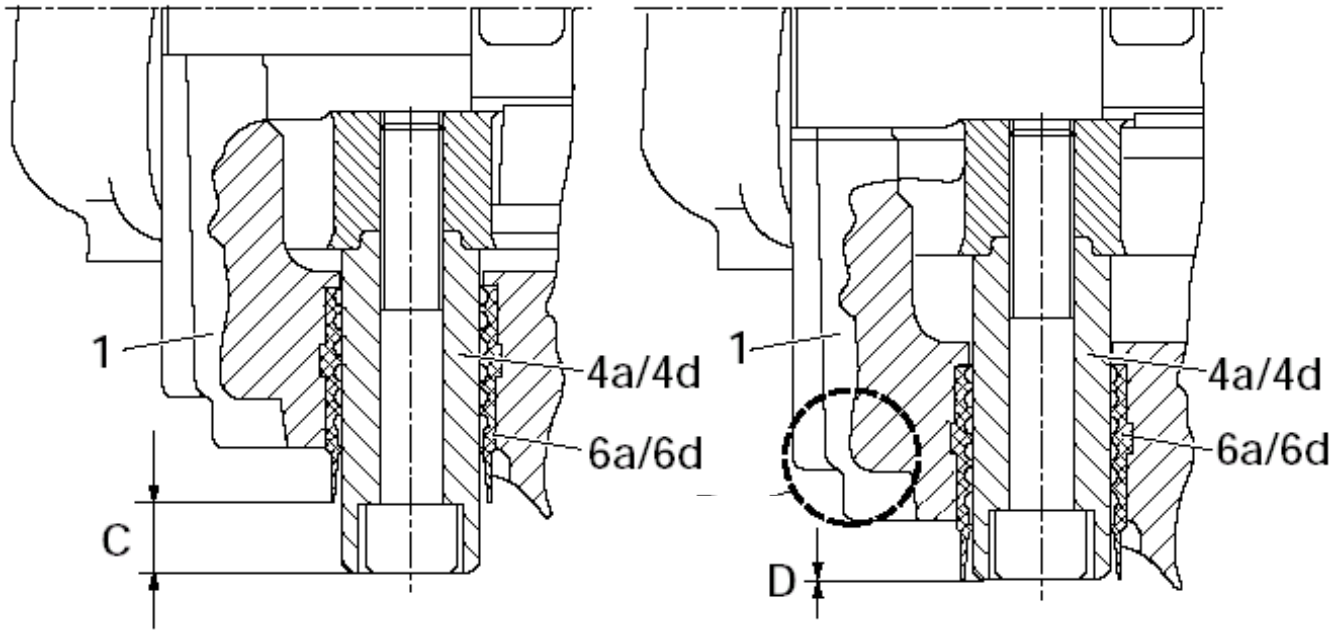
F = Minimum allowed thickness in worn condition for back-plate and friction material 11mm (replacement of Pads necessary).

If the wear dimension B ≤ 39 mm, the Disc should be renewed together with the Pads.

If the disc thickness is less than 37 mm, the disc must be replaced.

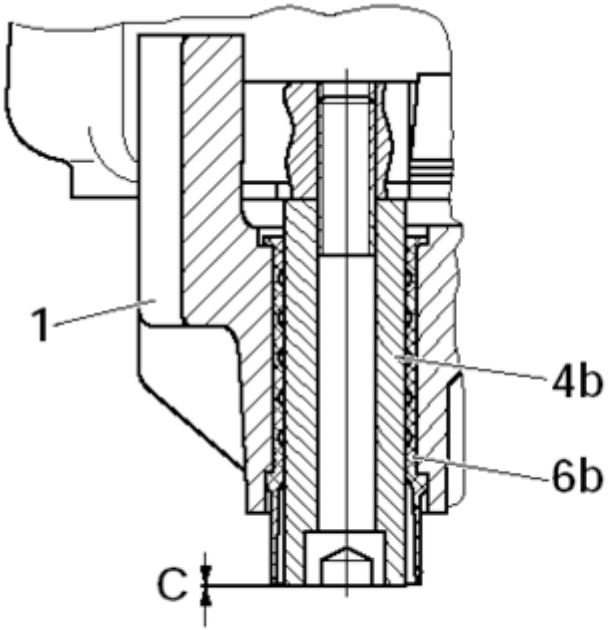


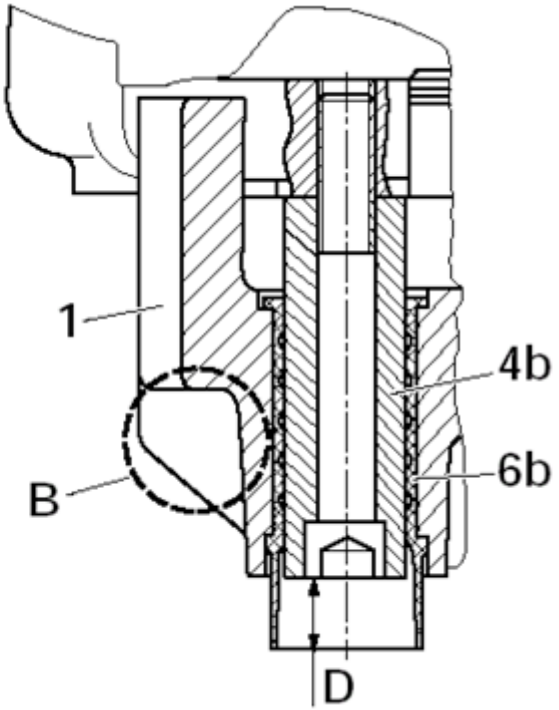
Knorr brake
Visual pad wear-out check



The condition of the Pads can be visually determined without removing the road wheel by viewing the position of the Guide Pin (4a or 4d) in the Caliper (1).
If dimension ‘C’ is less than 1mm, a more accurate check of the Pads and Disc must be made.

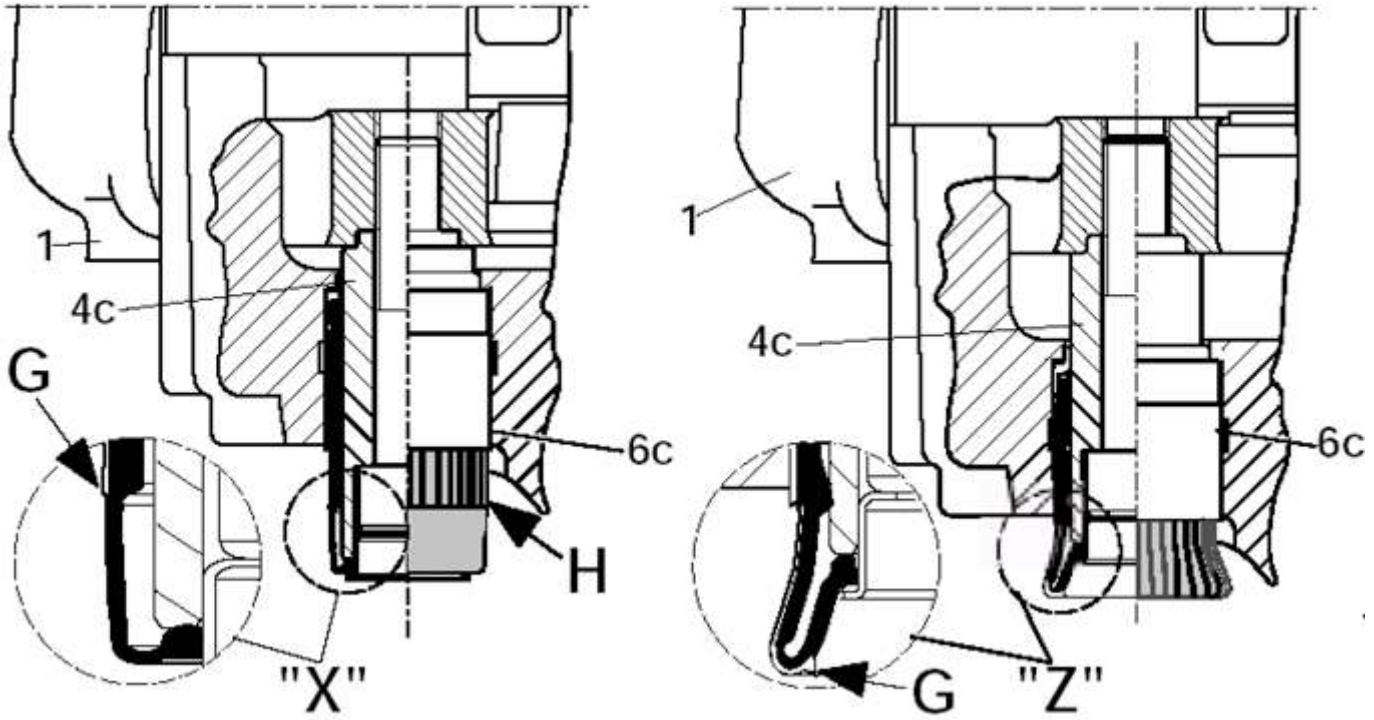
Knorr brake
Visual pad wear-out check





The condition of the Pads can be visually determined without removing the wheel by viewing the position of the Guide Pin (4b) in the Caliper (1).
If the head of the Guide Pin (4b) is inside the Rubber Bush (6b) by a dimension D greater than 18mm, then a more accurate check of the Pads and Disc must be made.

Knorr brake
Visual pad wear-out check



When the Rubber Bush (6c) is retracted to the level “G” of the Wear Indicator as shown, the wheel must be removed so that the wear of the Pads and Disc can be checked.

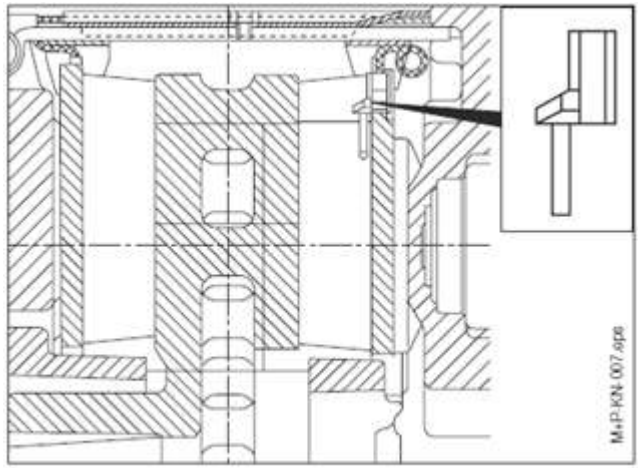
Knorr brake
different pad wear indicators

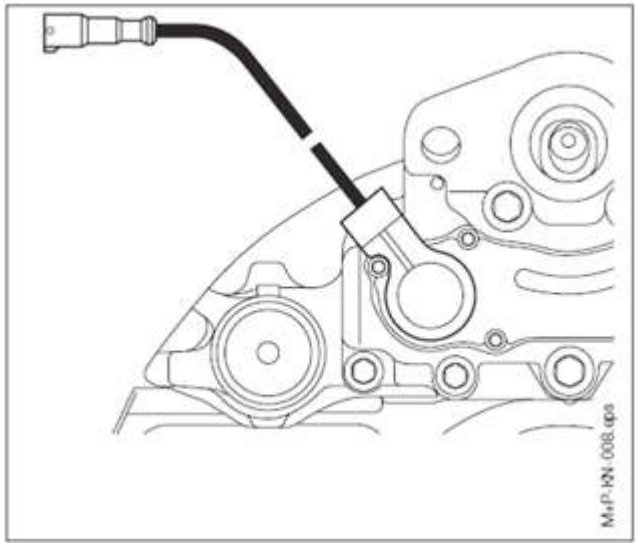
Due to different Vehicle Manufacturer and vehicle types there are several types of Pad Wear Indicator used.

a) In-pad Normally Closed Indicator - Circuit is broken when Pad Wear reaches limit.

b) In-pad Normally Open Indicator - Circuit is made when Pad Wear reaches limit.

c) Wear Indicator using built-in Potentiometer. This is available either as an on/off version or as a continuous signal version which can be linked to the vehicle's electronic monitoring systems.



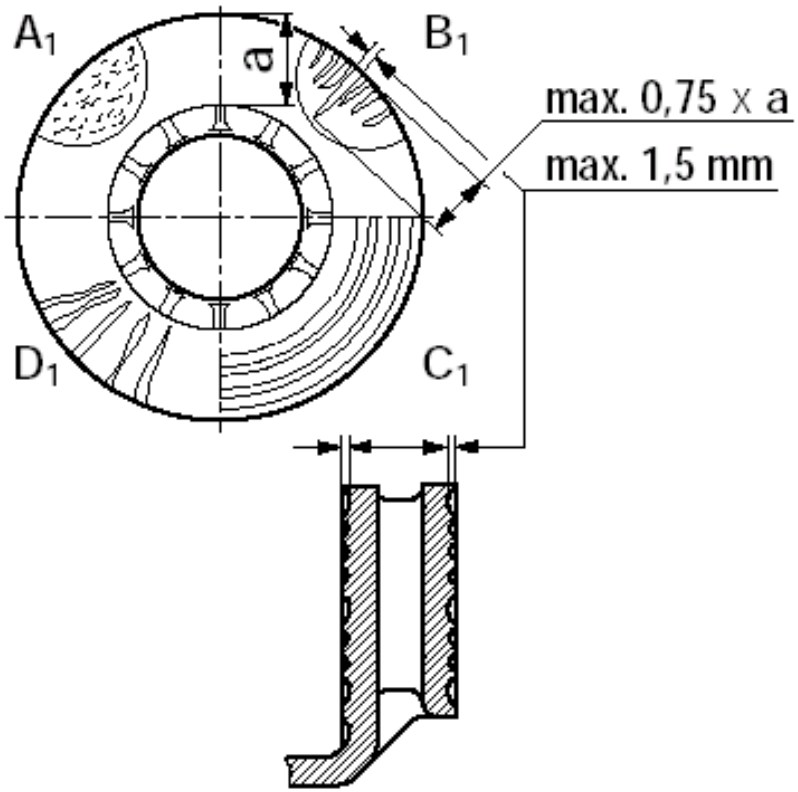


Knorr brake
Wear check of discs

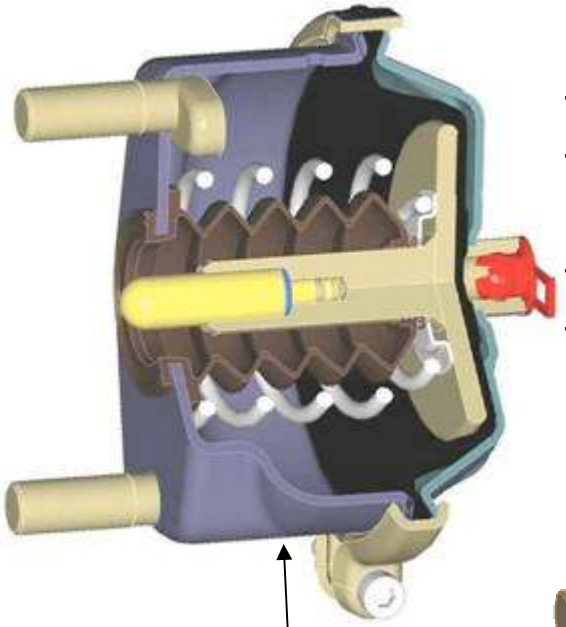
Disc check at each change of pads for grooves and cracks.
The diagram shows possible surface conditions.

A1 = Small cracks spread over the surface are permitted
B1 = Cracks less than 1.5mm deep or wide, running in a radial direction are permitted
C1 = Grooves (circumferential) less than 1.5mm deep are permitted
D1 = Cracks in the vanes are <u>not</u> permitted, the disc must be replaced

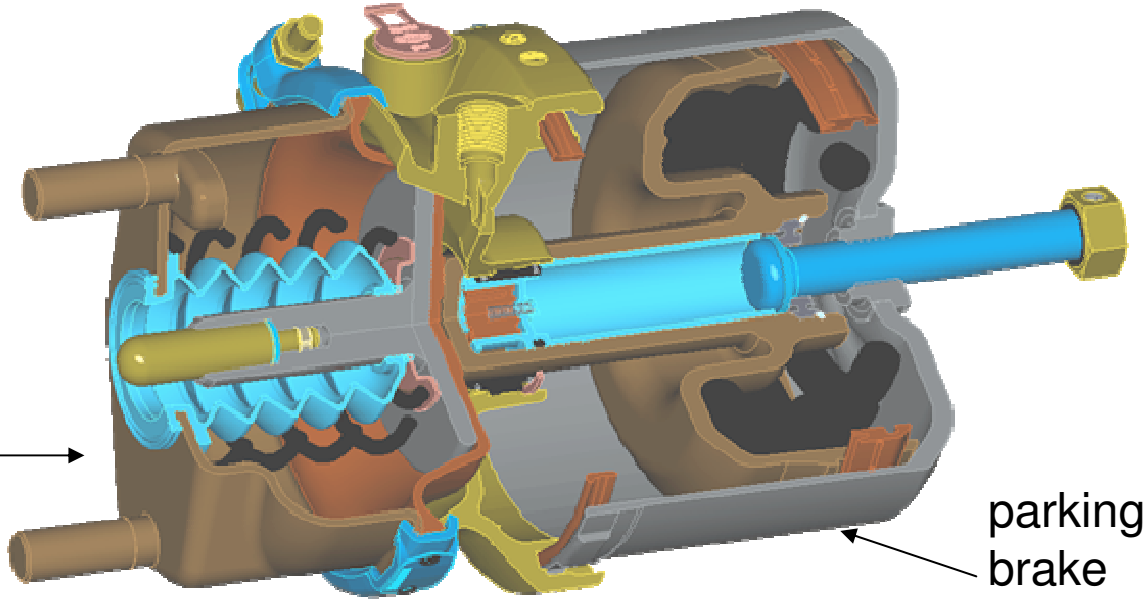
a: pad contact area



Knorr brake
Disc brake actuators



- Lowest drain plugs have to be opened
- If the cylinder is attached to the caliper the nuts have to be screwed simultaneously
- The nuts have to be tightened with 180 Nm
- The nuts can only be used one time, only self locking nuts are allowed



Thank you very much for your attention!