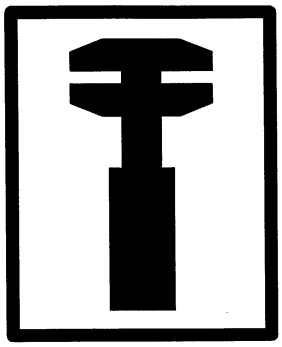


Order No.: 5871 212 122 E

SERVICE MANUAL

Pneumatic Disc Brake

SB 6... / SB 7... (Version : KNORR)

(Axial Disc Brake and Radial Disc Brake)

NOTE:

The present Assembly Manual concerns the nonmodified Reprint of the Original Assembly Manual of the Component Manufacturer.
The ZAHNRADFABRIK PASSAU GmbH is not liable in this connection for faulty Assembly Manuals, and is especially not responsible for the positive knowledge about a New Edition at the User of the Manual.

ZAHNRADFABRIK PASSAU GmbH
Donaustr. 25 - 71
D- 94 034 Passau

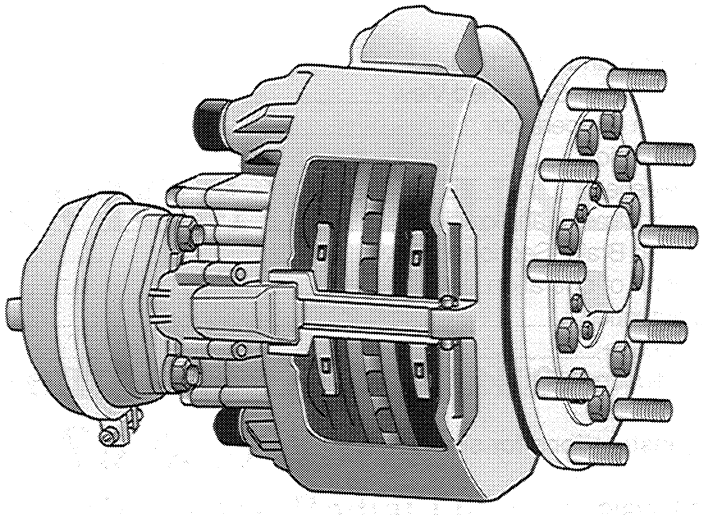
Edition: 08/1997

(kr) SB 7716-II34459 / SB 7706-II34459
0501 005 860/859
08/97

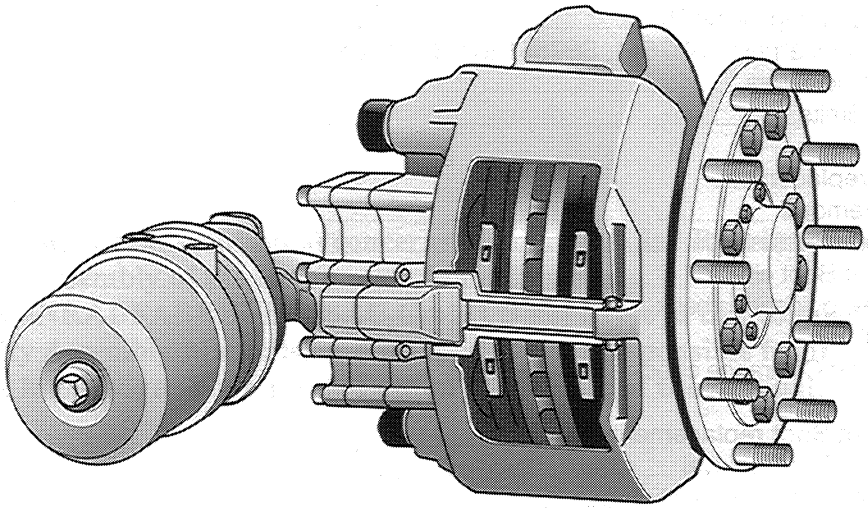
Service manual

RA-SB0002-EN

Pneumatic Disc Brake
SB 6... / SB 7...
(Axial Disc Brake and Radial Disc Brake)



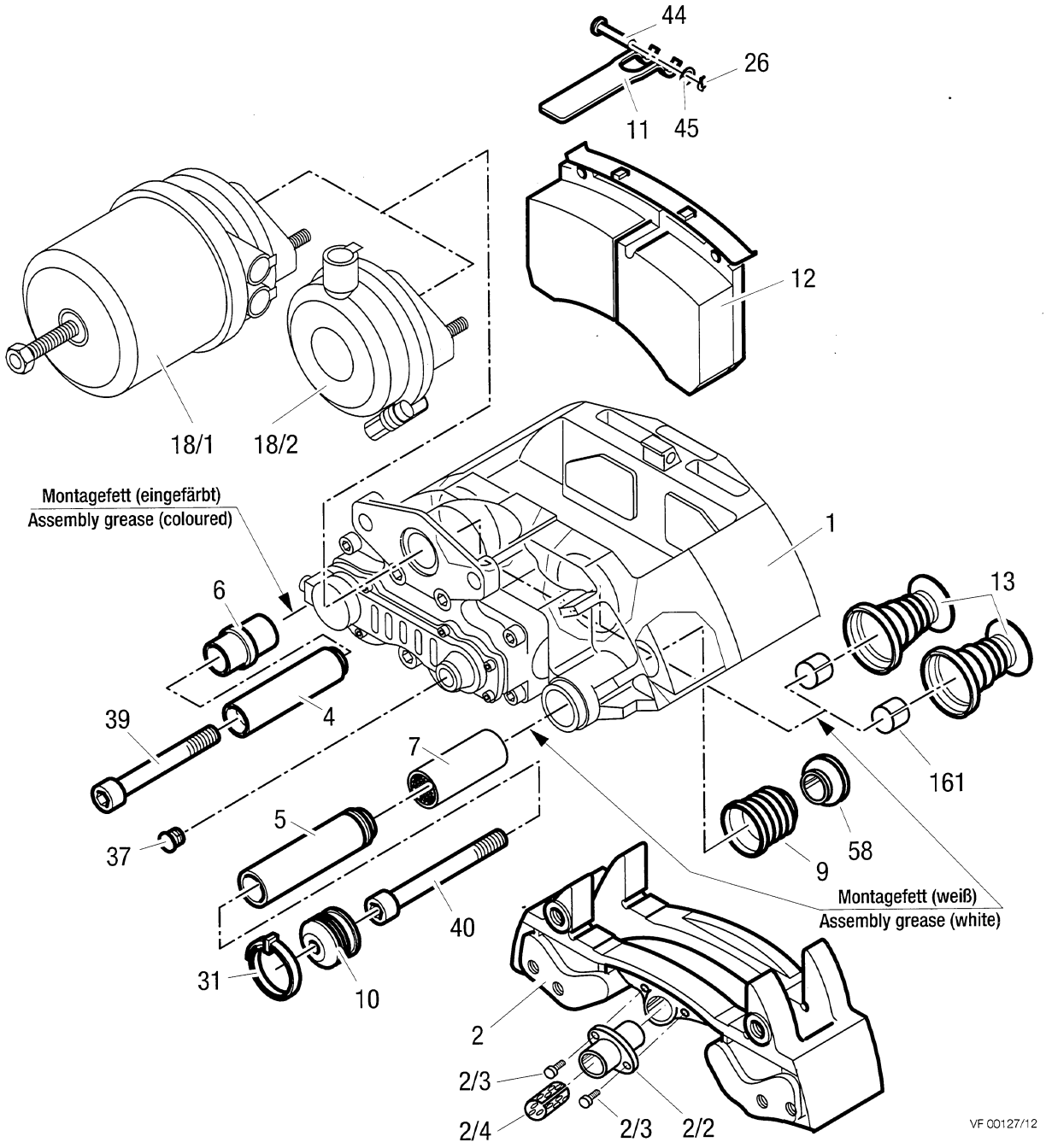
Axial Disc Brake



Radial Disc Brake

1 Overall view

1.1 Axial Disc Brake Components
(for Wear Indicator Kits see 1.2.1)



1	Caliper	13	Tappet with Boot
2	Carrier	18/1	Spring Brake
2/2	Sensor Bush Housing	18/2	Brake Chamber
2/3	Housing Bolt	26	Spring Clip
2/4	Sensor Bush	31	Outer Boot Clip
4	Sleeve	37	Adjuster Cap
5	Sleeve	39	Caliper Bolt
6	Rubber Bush	40	Caliper Bolt
7	Brass Bush	44	Pad Retainer Pin
9	Inner Boot	45	Washer
10	Outer Boot	58	Ring
11	Pas Retainer	161	Tappet Bush
12	Pad		

1.2 Axial Disc Brake Repair Kits

ATTENTION!

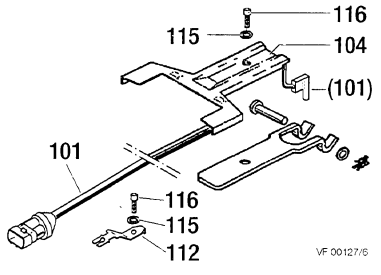
Use only KNORR-BREMSE parts

The following Repair Kits are available

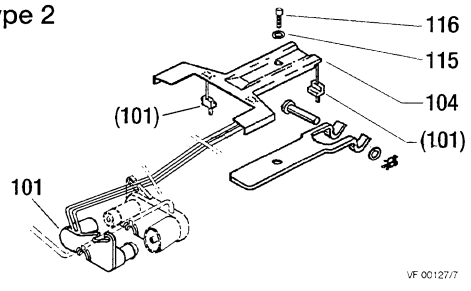
Description	Contents	Association of Repair Kits to the Disc Brakes and Repair Kit's Order no.
Carrier and Guide Kit	2, 4, 5, 39, 40	see R-Microfiche
Wear Indicator Kit (per axle)	for variants see 1.2.1	
Guide Pins Kit	4-7, 9, 10, 31, 39, 40, 58	
Seal Kit for Guide Pins	9, 10, 31, 37, 58	
Tappet and Boot Kit	13, 161	
Pad set (per axle)	12, 26, 37, 44, 45	
Adjuster Cap (4 pcs.)	37	
Pad Retainer Kit (per axle)	11, 26, 44, 45	
Sensor Bush Kit (10 pcs.)	2/4	
Outer Guide Seal Kit (10 pcs.)	10, 31	
Klemmhülse mit Buchse	2/2, 2/3, 2/4	
Exchange Caliper r.h.	only in assembled condition	see Type plate on the caliper
Exchange Caliper l.h.		

1.2.1 Axial Disc Brake Wear Indicator Kits (Typical kits are shown below)

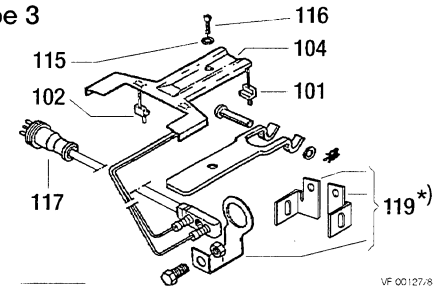
Type 1



Type 2

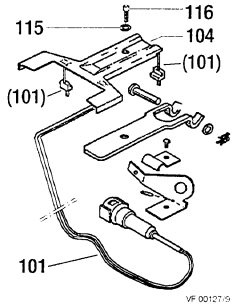


Type 3



*) Mounting Bracket 119 varies to suit specific applications

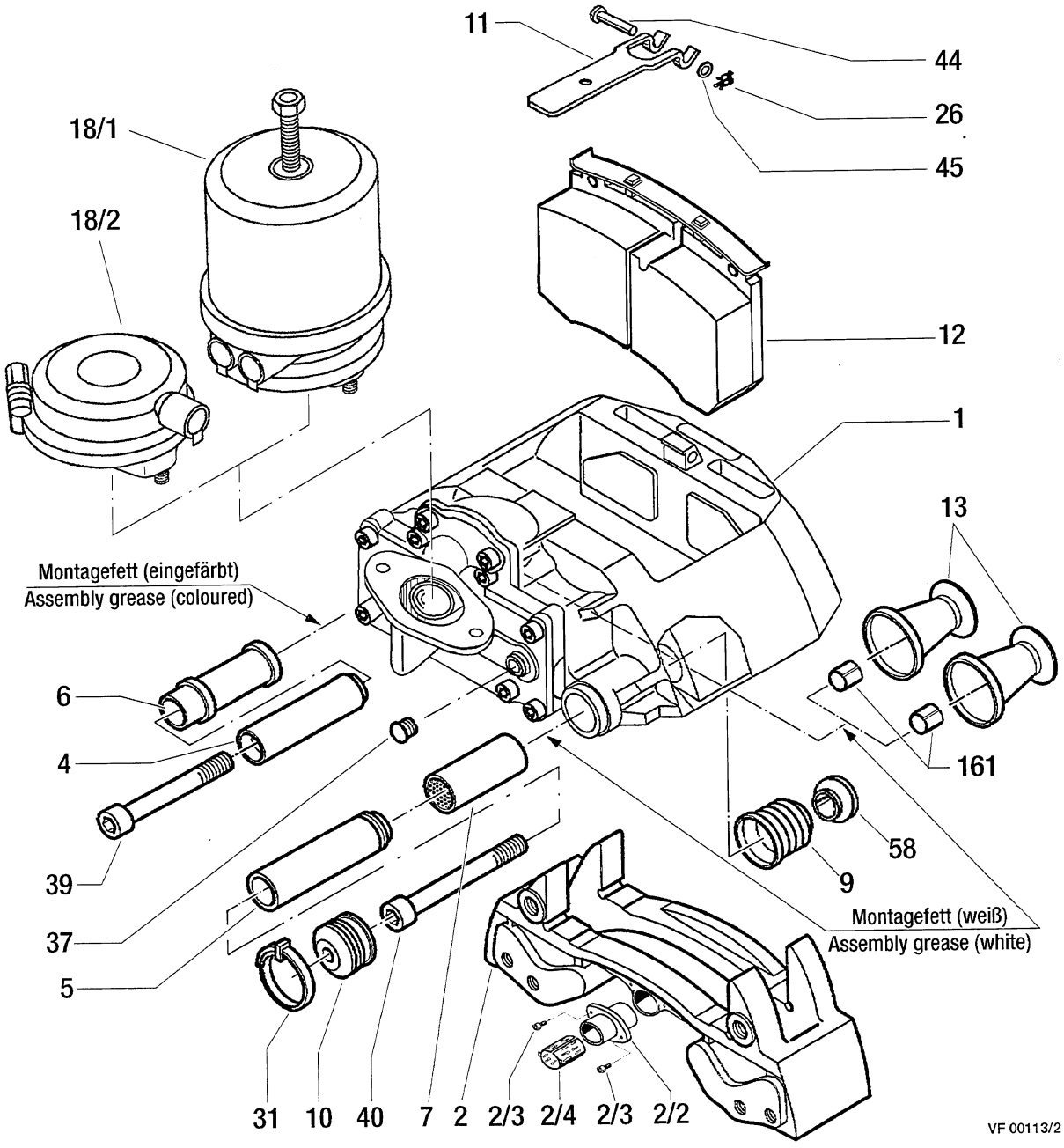
Type 4



101 Sensor
102 Sensor
104 Cable Protection Plate
111 Wear Indicator
112 Clip
115 Spring Washer
116 Screw
117 Wear Indicator Cable
119 Bracket

1.3 Radial Disc Brake Components

(for Wear Indicator Kits see 1.4.1)



1	Caliper		
2	Carrier	13	Tappet with Boot
2/2	Sensor Bush Housing	18/1	Spring Brake
2/3	Housing Bolt	18/2	Brake Chamber
2/4	Sensor Bush	26	Spring Clip
4	Sleeve	31	Outer Boot Clip
5	Sleeve	37	Adjuster Cap
6	Rubber Bush	39	Caliper Bolt
7	Brass Bush	40	Caliper Bolt
9	Inner Boot	44	Pad Retainer Pin
10	Outer Boot	45	Washer
11	Pas Retainer	58	Ring
12	Pad	161	Tappet Bush

1.4 Radial Disc Brake Repair Kits

ATTENTION!

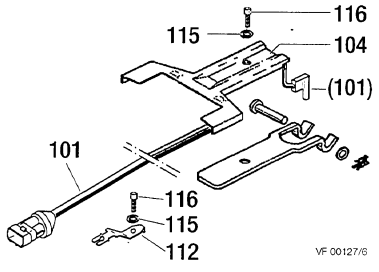
Use only KNORR-BREMSE parts

The following Repair Kits are available

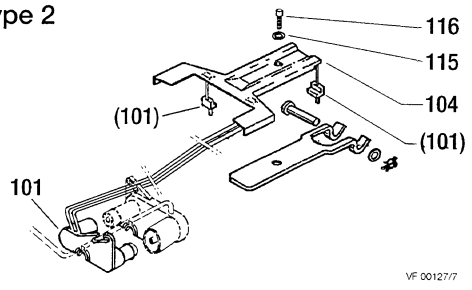
Description	Contents	Association of Repair Kits to the Disc Brakes and Repair Kit's Order no.
Carrier and Guide Kit	2, 4, 5, 39, 40	see R-Microfiche
Wear Indicator Kit (per axle)	for variants see 1.2.1	
Guide Pins Kit	4-7, 9, 10, 31, 39, 40, 58	
Seal Kit for Guide Pins	9, 10, 31, 37, 58	
Tappet and Boot Kit	13, 161	
Pad set (per axle)	12, 26, 37, 44, 45	
Adjuster Cap (4 pcs.)	37	
Pad Retainer Kit (per axle)	11, 26, 44, 45	
Sensor Bush Kit (10 pcs.)	2/4	
Outer Guide Seal Kit (10 pcs.)	10, 31	
Klemmhülse mit Buchse	2/2, 2/3, 2/4	
Exchange Caliper r.h.	only in assembled condition	see Type plate on the caliper
Exchange Caliper l.h.		

1.4.1 Radial Disc Brake Wear Indicator Kits (Typical kits are shown below)

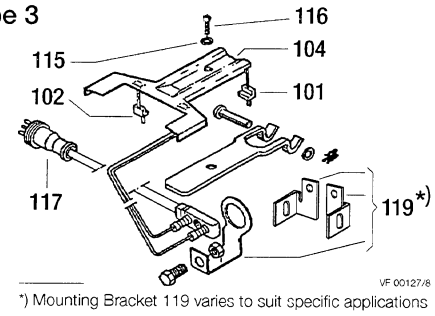
Type 1



Type 2

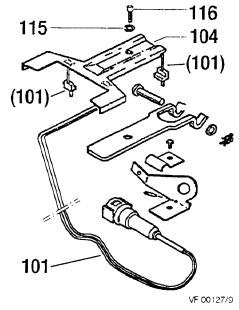


Type 3



*) Mounting Bracket 119 varies to suit specific applications

Type 4



101 Sensor
102 Sensor
104 Cable Protection Plate
111 Wear Indicator
112 Clip
115 Spring Washer
116 Screw
117 Wear Indicator Cable
119 Bracket

1.5 Brake Discs

(for "Axial- and Radial Disc Brake")

When replacing the Discs, please also refer to the instructions of the Vehicle Manufacturer.

This should also be done when fitting KNORR-Brake Discs.

When replacing Discs, please adhere to the recommended bolt tightening torques.

The use of non-approved Brake Discs will reduce levels of safety and invalidate warranty.

2 General Information (for "Axial- and Radial Disc Brake")

2.1 Service Tools

Part Number	Description
II 19252	Press-In Tool for Tappet and Boot (13)
II 19253	Pull-In Tool for Inner Boot (19)
II 19254	Pull-In/Out Tool for Brass Bush (7)
II 32202	Wedged Fork for removal of Tappet and Boot (13)
II 36797	Grooving Tool for Brass Bush (7)

2.2 Lubrication

Part Number	Description	Colour	Application
II 14525	Renolit HLT2	weiß	Brass Bush (7)
II 32793	Syntheso GL EP1	grün	(Rubber Bush (6)

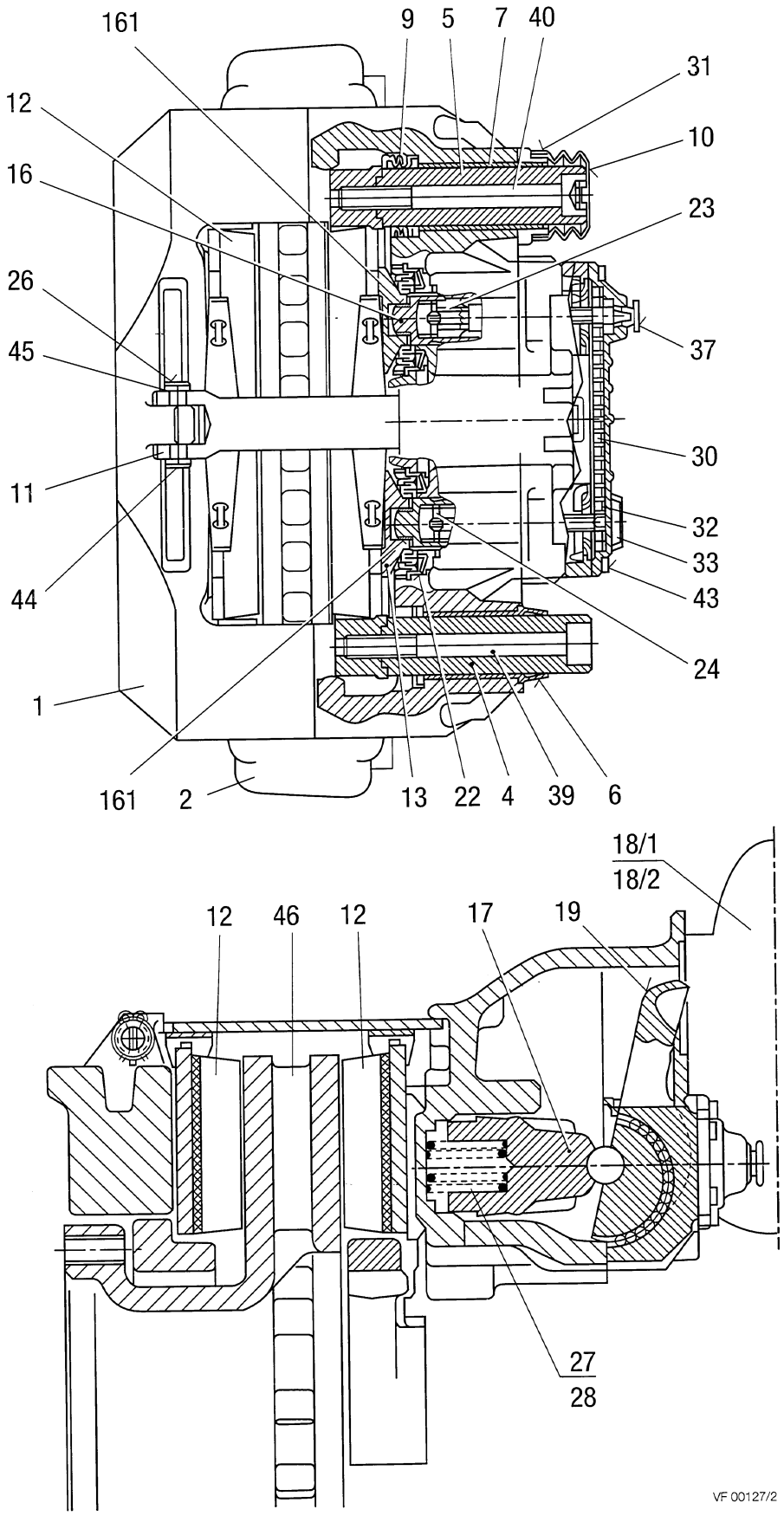
[1] **Important Note:** The correct Grease MUST be used for each Bush!

2.3 Torque requirements

Pos. Number		Torque [Nm]	spanner size [mm]
39 + 40	Caliper Bolts (39 + 34) M16x1,5 - 10.9	285^{+25}	14
	Actuator Mounting Nuts M16x1,5	$180^{\pm 20}$	24

3 Description and function

3.1 Axial Disc Brake Sectioned View



1 Caliper
2 Carrier
4 Sleeve
5 Sleeve
6 Rubber Bush
7 Brass Bush
9 Inner Boot
10 Outer Boot
11 Pad Retainer
12 Pad
13 Tappet with Boot
16 Threaded Tube
17 Bridge
18/1 Spring Brake
18/2 Brake Chamber
19 Lever
20 Eccentric Bearing
22 Inner Seal Cap
23 Adjuster Unit
24 Turning Device
26 Spring Clip
27 Spring
28 Spring
30 Chain
31 Outer Boot Clip
32 Chain Wheel
33 Wear Sensor
37 Adjuster Cap
39 Caliper Bolt
40 Caliper Bolt
44 Pad Retainer Pin
45 Washer
46 Disc
161 Tappet Bush

3.2 Description of operation
(Floating Caliper principle)

3.2.1 Brake actuation

During actuation, the Push Rod of the Actuator (18/1 or 18/2) moves the Lever (19). The input forces are transferred via the Eccentric Bearing (2) to the Bridge (17). The force is then distributed by the Bridge (17) and the two Threaded Tubes (16) to the Tappets (13) and finally to the inboard Pad (12).

After overcoming the running clearance between the Pads and the Disc, the reaction forces are transmitted to the outboard Pad (12). The clamping forces on the Pads (12) and the Disc (46) generate the braking force for the wheel.

3.2.2. Brake release

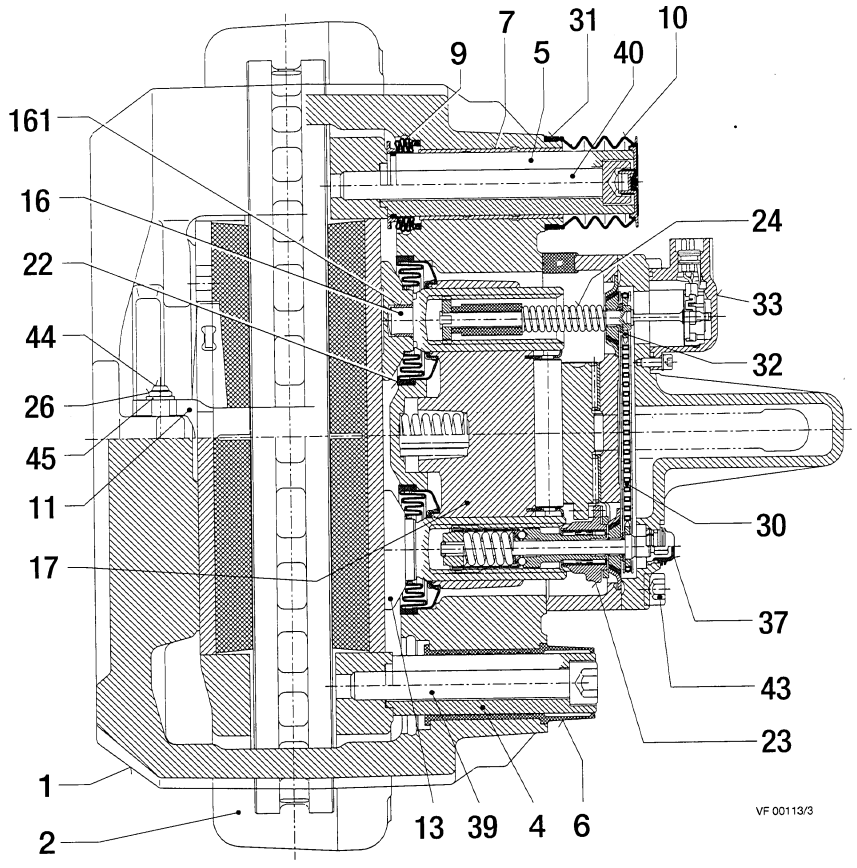
After releasing the air pressure, the two Return Springs (27/28) push the Bridge (17) and Lever (19) back to the start position; this ensures a running clearance between Pads and Disc is maintained.

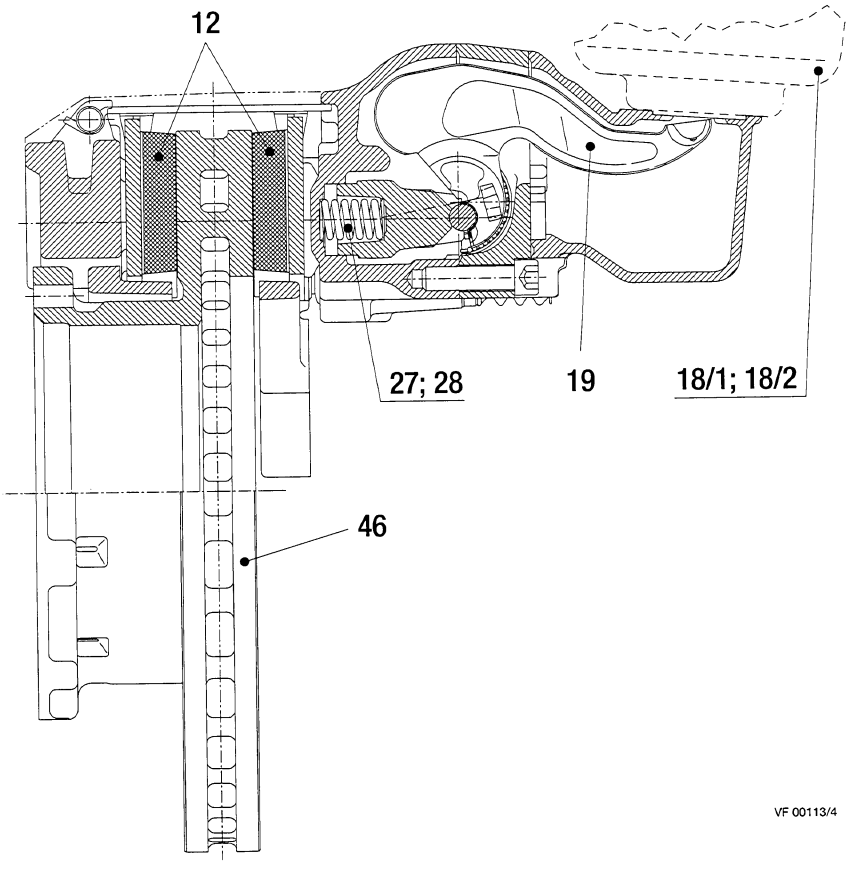
3.2.3 Brake adjustment (automatic)

To ensure a constant running clearance between Disc and Pads, the brake is equipped with a low wearing, automatic adjuster mechanism.

The Adjuster (23) operates with every cycle of actuation due to the mechanical connection with Lever (19). As the Pads and Disc wear, the running clearance increases. The Adjuster (23) and Turning Device (24) turn the Threaded Tubes (16) by an amount necessary to compensate for this wear. The total running clearance (sum of clearance both sides of Disc) should be between 0.6 and 0.9 mm.; smaller clearances may lead to overheating problems.

3.3 Radial Disc Brake Sectioned View





1	Caliper
2	Carrier
4	Sleeve
5	Sleeve
6	Rubber Bush
7	Brass Bush
9	Inner Boot
10	Outer Boot
11	Pad Retainer
12	Pad
13	Tappet with Boot
16	Threaded Tube
17	Bridge
18/1	Spring Brake
18/2	Brake Chamber
19	Lever
20	Eccentric Bearing
22	Inner Seal Cap
23	Adjuster Unit
24	Turning Device
26	Spring Clip
27	Spring
28	Spring
30	Chain
31	Outer Boot Clip
32	Chain Wheel
33	Wear Sensor
37	Adjuster Cap
39	Caliper Bolt
40	Caliper Bolt
44	Pad Retainer Pin
45	Washer
46	Disc
161	Tappet Bush

3.4 Description of operation
(Floating Caliper principle)

3.4.1. Brake Actuation

During actuation, the Push Rod of the Actuator (18/1 or 18/2) moves the Lever (19). The input forces are transferred via the Eccentric Bearing (20) to the Bridge (17). The force is then distributed by the Bridge (17) and the two Threaded Tubes (16) to the Tappets (13) and finally to the inboard Pad (12).

After overcoming the running clearance between the Pads and Disc, the reaction forces are transmitted to the outboard Pad (12). The clamping forces on the Pads (12) and the Disc (46) generate the braking force for the wheel.

3.4.2. Brake release

After releasing the air pressure, the two Return Springs (27/28) push the Bridge (17) and Lever (19) back to the start position; this ensures a running clearance between Pads and Disc is maintained.

3.4.3 Brake adjustment (automatic)

To ensure a constant running clearance between Disc and Pads, the brake is equipped with a low wearing, automatic adjuster mechanism. The Adjuster (23) operates with every cycle of actuation due to the mechanical connection with Lever (19). As the Pads and Disc wear, the running clearance increases. The Adjuster (23) and Turning Device (24) turn the Threaded Tubes (16) by an amount necessary to compensate for this wear. The total running clearance (sum of clearance both sides of Disc) should be between 0.6 and 0.9 mm.; smaller clearances may lead to overheating problems.

4 Safety Instructions for service work
(for "Axial- and Radial Disc Brake")

Please also refer to the relevant safety instructions for repair work on commercial vehicles, especially for jacking up and securing the vehicle.

Use only original KNORR-BREMSE parts.

Please follow repair manual instructions and adhere to the wear limits of the Pads and the Disc - see Section 5.3.

Use only recommended tools - see Section 2.1.

Tighten bolts and nuts to the recommended torque values - see Section 2.3.

WARNING!

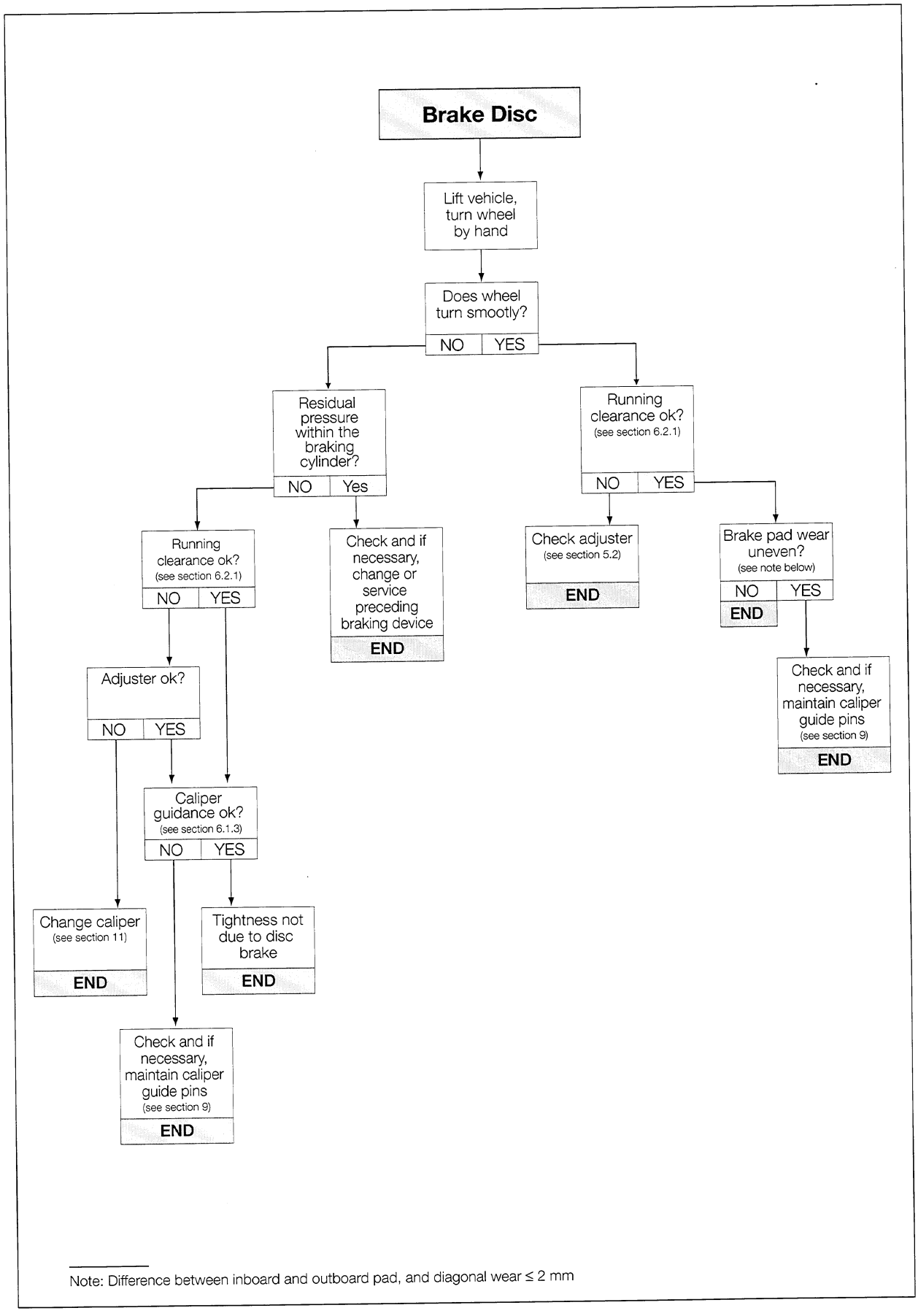
Pads must be changed as an axle set and NOT individually.
Use only Pads which are permitted by the vehicle manufacturer.
Failure to comply with this may invalidate the Vehicle Manufacturer's Warranty

After re-fitting the wheel according to the Vehicle Manufacturer's recommendations, please ensure that there is sufficient clearance between the Tyre Inflation Valve, the Caliper and the wheel rim, to avoid damage to the Valve.

After service work:
Check the brake performance and the system behaviour on a rolling road or by actual road test.

5 Brake Testing
(for Axial- and Radial Disc Brake)

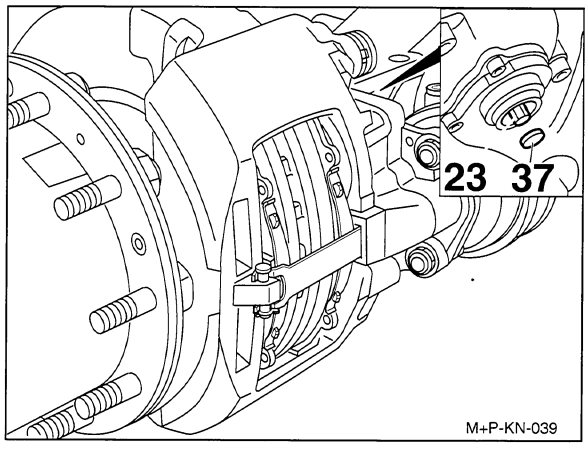
5.1 Fault finding procedure



Note: Difference between inboard and outboard pad, and diagonal wear ≤ 2 mm

5.2 Adjuster check

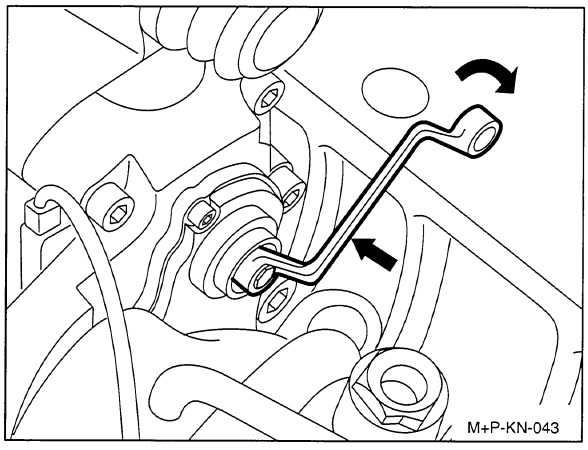
Remove cap (37).



WARNING!

Do not overload or damage the Adjuster (23). Use only 8 mm Ring Spanner or 1/4" drive Socket with a lever length no greater than 100mm. DO NOT use an Open Ended Spanner since this may damage the Adjuster shaft.

The Adjuster should be turned counter-clockwise for 2 or 3 clicks (increasing running clearance).



ATTENTION!

Make sure that the Ring Spanner or Socket can turn freely during adjustment.

By applying the brake 5 - 10 times (about 2 Bar) the Spanner or Socket should turn clockwise in small increments if the Adjuster is functioning correctly (see notes below).

The Cap (37) must then be replaced having lightly greased it with Renolit HLT2 (available as part number II14525).

NOTE:
As the number of applications increases, incremental adjustment will decrease.

NOTE:
If the Spanner or Socket does not turn, turns only with the first application or turns forward and backward with every application, the automatic Adjuster has failed and the Caliper must be replaced (see Section 11).

5.3 Brake Pad check

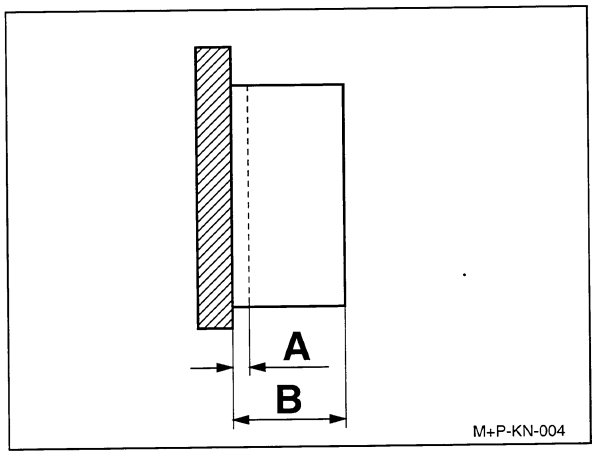
WARNING!

Watch the wear limits of the pads

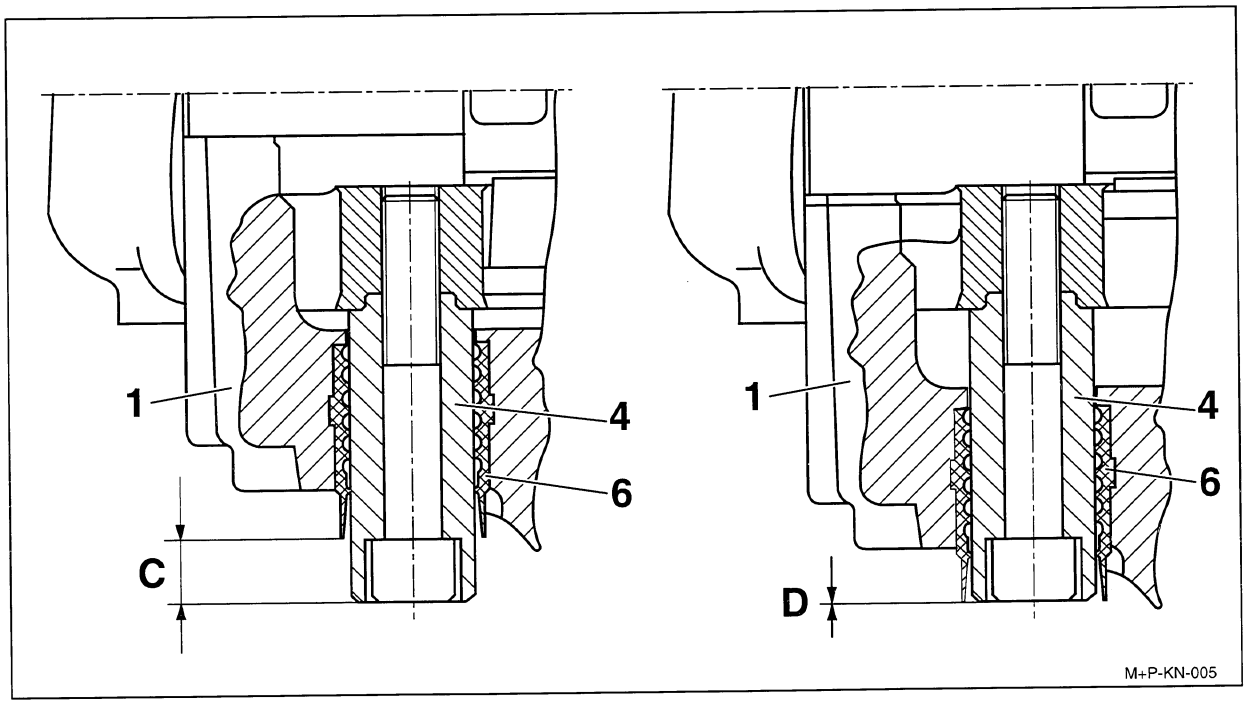
The thickness of the pad has to be checked regulary, dependent on the usage of the vehicle. The pads have to be checked corresponding to the lawfull regulations, at least however every three month.

A= minimum thickness of friction material 2mm
B= available thickness of friction material 21mm

If friction material is less than 2mm, the Pads must be replaced.



5.3.1 **Type A:** Short Guide Pin (Standard)



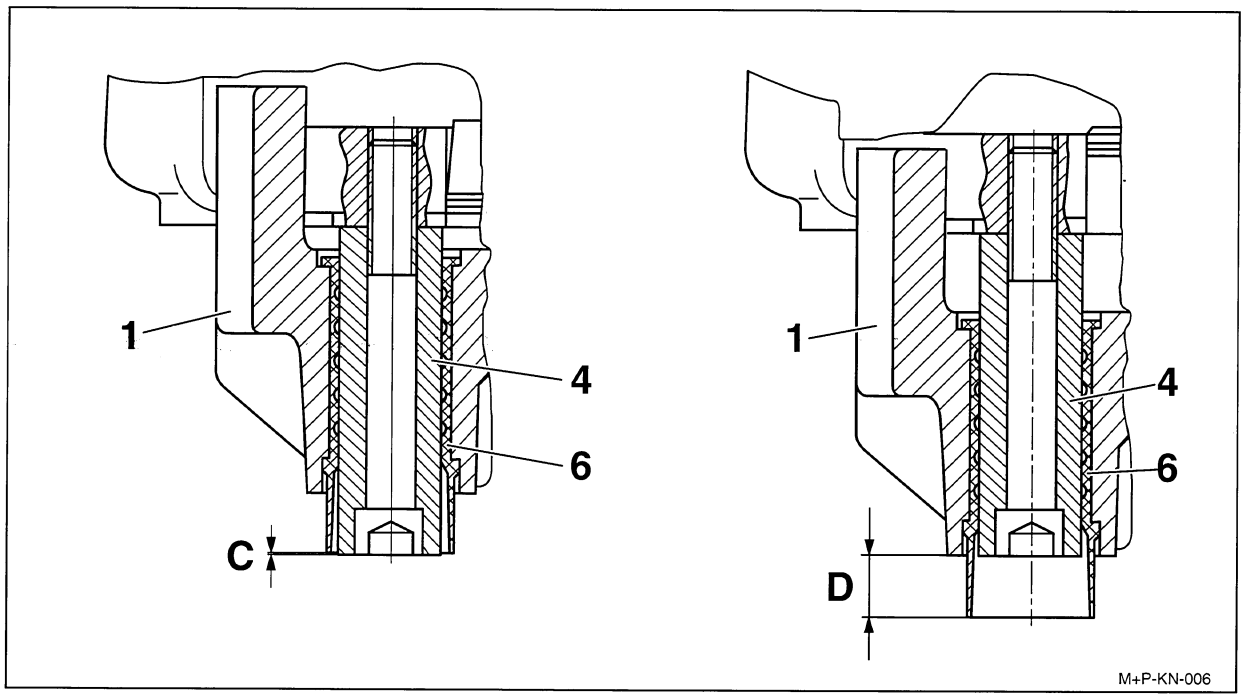
Due to the position of the Floating Caliper (1) to the Fixed Sleeve (4) the thickness of Pads can be determined without removing the road wheels.

If dimension 'C' is less than 1mm, a more accurate check of the Pads and Disc must be made.

If necessary change the Pads - see Section 6

C = pin protrusion - shown in new condition
D = pin protrusion - Pads and Disc must be checked with road wheel removed

5.3.2 **Type B:** Long Guide Pin (Only for Calipers **SB 7541**, **SB 7551** to **SB 7629**, **SB 7639** and **Radial Disc Brake**)



Due to the position of the Floating Caliper (1) to the Fixed Sleeve (4) the thickness of Pads can be determined without removing road wheels.

If the head of the Fixed Sleeve (4) is inside the Rubber Bush (6) by a dimension D greater than 18mm, then a more accurate check of the Pads and Disc must be made.

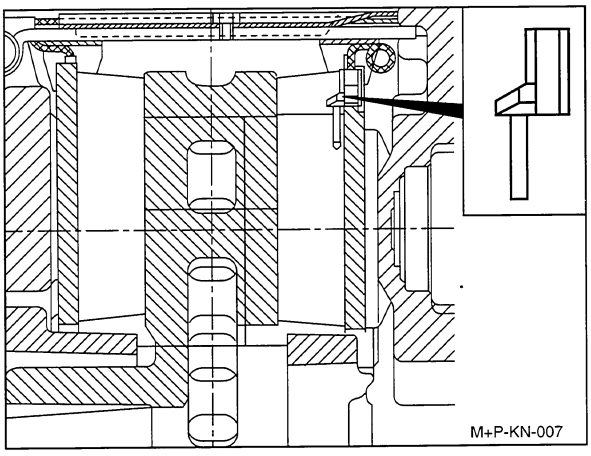
If necessary change the Pads - see Section 6.

C = new condition
D = 18 mm or more, Pads and Disc must be checked with road wheel removed

5.3.3 Wear indicators

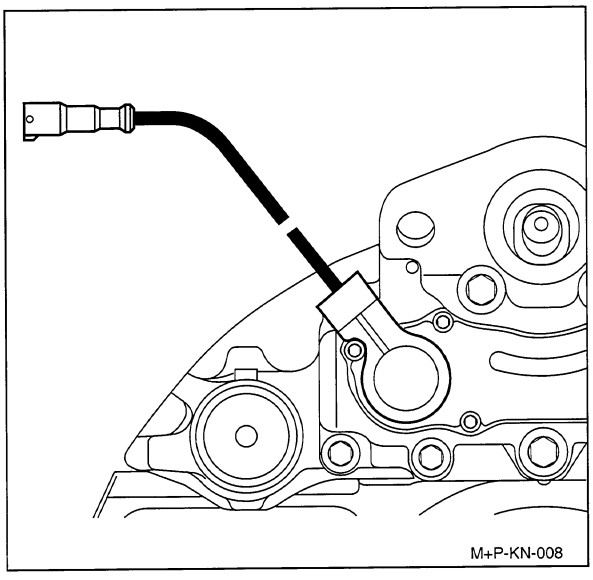
Due to different Vehicle Manufacturer and vehicle types there are several types of Pad Wear Indicator used.

a) Normally Closed Indicator - circuit is broken when Pad wear reaches set limit.



b) Normally Open Indicator - circuit is made when Pad wear reaches set 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.



An optical or acoustic device may be linked to any of the above.

Important
Please also refer to specifications provided by the Vehicle Manufacturer

WARNING!

To avoid damage to the Disc surfaces, the Pads must to be replaced when 2mm of friction material thickness is reached at any point.

5.4 Wear limits

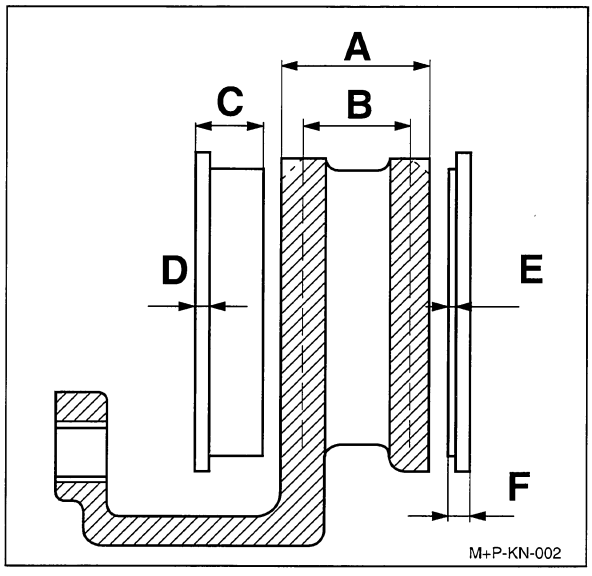
WARNING!

For optimum safety, stay within the Disc and Pad Wear limits

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 = Backplate 9mm
E = Minimum thickness of friction material 2mm
F = Maximum allowed thickness in worn condition for backplate and friction material 11mm (replacement of Pads necessary).

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



WARNING!

If these recommendations are ignored, there is a danger of brake failure. If the Pads are worn down to the backplate or if Disc wear is excessive, brake performance will be severely affected and may be lost completely.

Check Disc at each change of Pads for grooves and cracks. The diagram shows possible conditions of the surface.

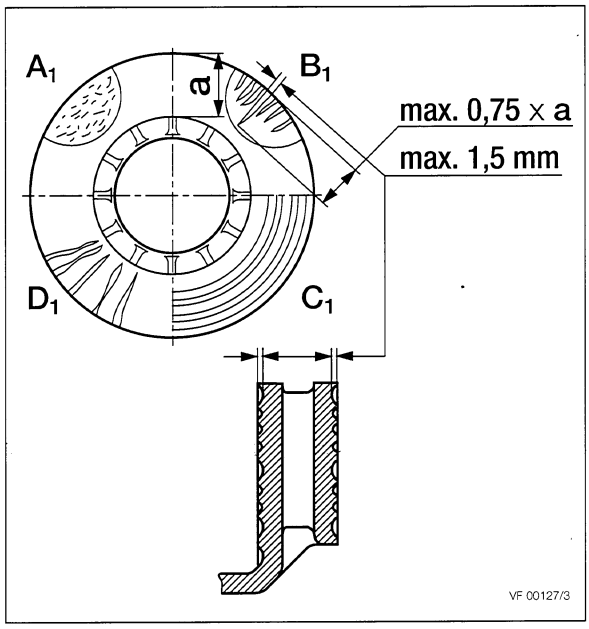
A_1 = Small cracks spread over the surface **are allowed**

B_1 = Cracks less than 1.5mm deep or wide, running in a Radial direction, **are allowed**

C_1 = Grooves (circumferencial) less than 1.5 m wide **are allowed**

D_1 = Cracks in the vanes **are not allowed** and the Disc **MUST BE REPLACED**.

a = Pad contact area



Note
In case of surface conditions A-C the Disc can continue to be used until the minimum thickness of 37mm is reached.

Knorr-Bremse Discs are normally service-free and grinding when changing Pads is not necessary. However, grinding could be useful, e.g. to increase the load-bearing surface of the Pads after severe grooving on the entire friction surface has occurred. To meet safety requirements, the minimum thickness after regrinding is 39-40 mm. In addition, the recommendation of the Vehicle Manufacturer MUST be followed.

WARNING!

If these recommendations are ignored, there is a danger of brake failure. If the Pads are worn down to the backplate or if Disc wear is excessive, brake performance will be severely affected and may be lost completely.

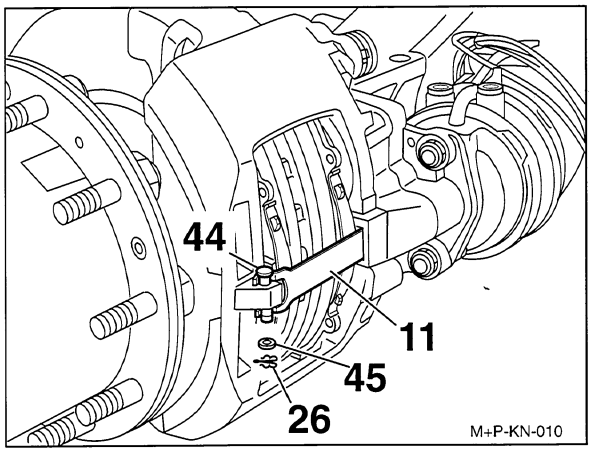
6 Pad replacement
(for "Axial- and Radial Disc Brake")

6.1 Pad removal

Take the wheel off (refer to Vehicle Manufacturer's recommendations).

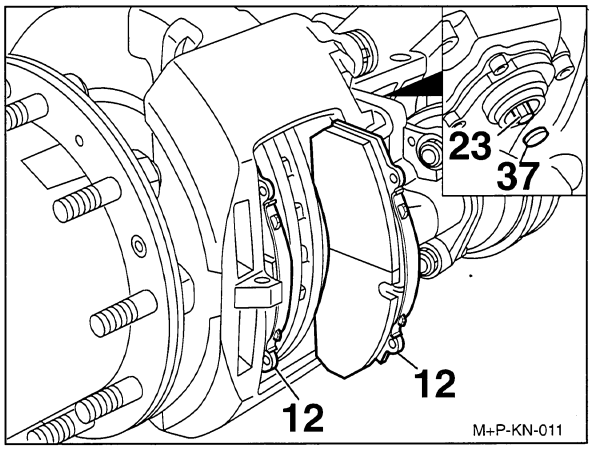
Remove Clip (26) and Washer (45), push down the Pad Retainer (11) and remove Bolt (44).

If the Pad Retainer (11) is corroded, it should be replaced.



6.1.1 Brake de-adjustment

Remove Cap (37).



WARNING!

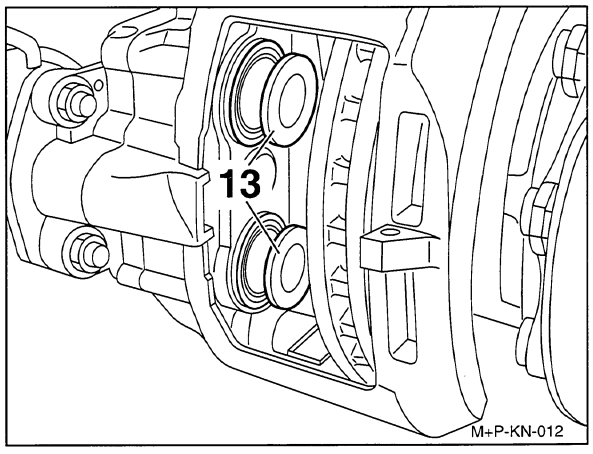
Do not overload or damage the Adjuster (23). Use only 8 mm Ring Spanner or 1/4" drive Socket with a lever length no greater than 100mm. DO NOT use an Open Ended Spanner since this may cause damage to the adjuster shaft.

Turn the Adjuster counter-clockwise until Pads can be removed, A clicking noise will be heard during this procedure.

Push inboard Pad (12) toward Actuator.

Pull out both Pads (12).

6.1.2 Tappet Boot check



The Tappet Boots should not show any damage. Check the attachment of the Boot into the Caliper housing.

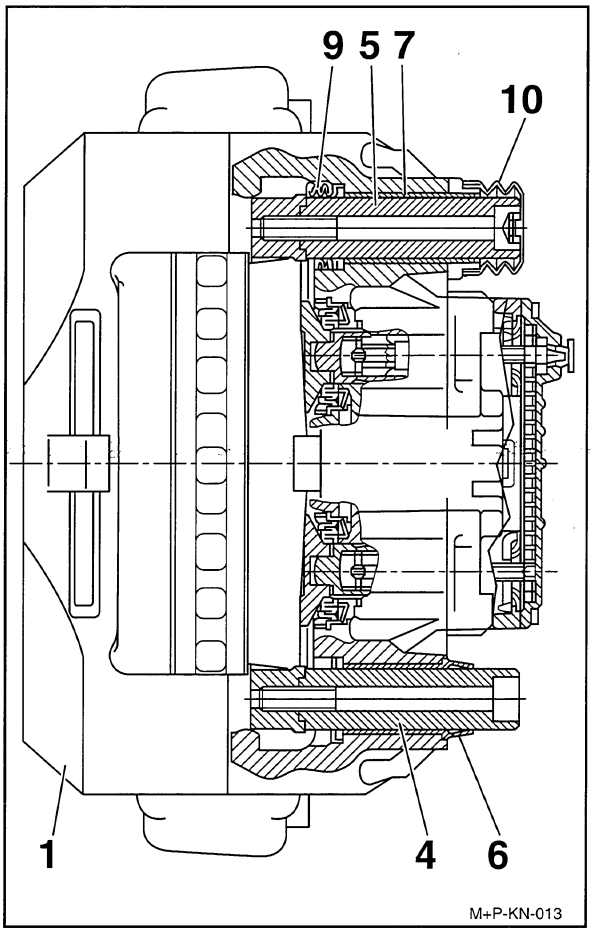
Important
Any ingress of water or dirt past the Tappet Boot will lead to corrosion and affect the function of the Actuation Mechanism and Adjuster Unit.

If damaged, the Boot and Tappet must be replaced (see Section 7).

6.1.3 Caliper guidance check

Using hand pressure only (no tools), the Caliper (1) must slide freely over the whole length of the Guide Pin arrangement >30mm.
During this operation the Sleeve (5) is sealed by the Boot (9) and Cap (10) and these must show no signs of damage. Check that these are correctly seated.

The Caliper may have to be re-sealed by using the Seal Kit for Guide Pins (see Section 8) or repaired by using the full Guide Pins Kit (see Section 9).



6.2 Pad fitting

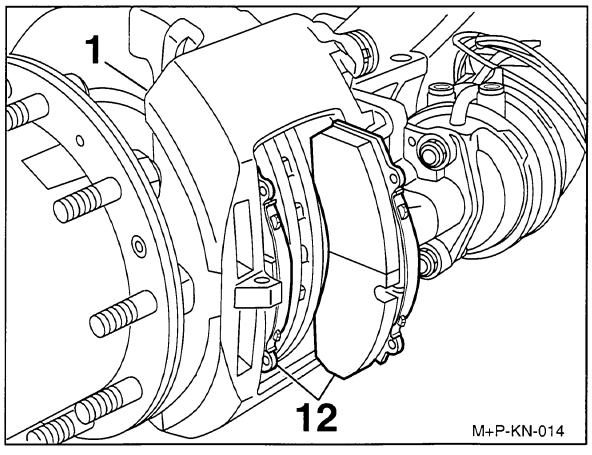
Note:
Before placing the Pads into the Carrier, the Adjuster must be de-adjusted (see Section 6.1.1).

Clean the Pad abutments.

Push Caliper (1) outboard and fit the outboard Pad (12).

For fitting the inboard Pad (12) push Caliper (1) in the opposite direction.

The Pad Wear Indicator Cables, if fitted, must be connected to the electrical system (see Section 5.3.3).



6.2.1 Running clearance check and adjustment

First use a suitable tool to press the inboard Pad (12) away from the Tappets.

Insert a feeler gauge (0.7mm) between Tappet and inboard Pad backplate. Turn Adjuster clockwise this clearance is achieved.

The cap (37) must then be replaced having lightly greased it with Renolit HLT2 (available as part number II14525).

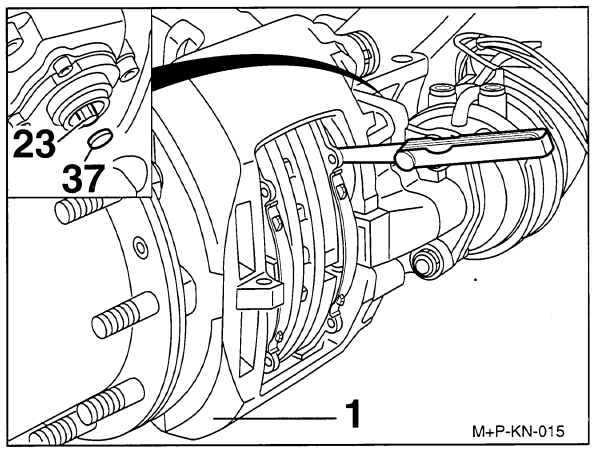
After setting the Pad Retainer (11) into the groove of the Caliper (1), it must be preloaded (with a screwdriver) to enable the positioning of Pad Retainer Pin (44).

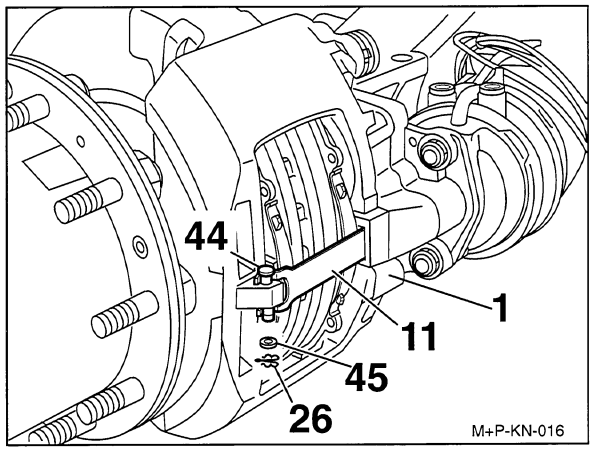
Fit washer (45) and Spring Clip (26) to the Pad Retainer Pin (44).

The hub should turn easily by hand after having applied and released the brake.

Clearance may have to be adjusted again.

Wheel mounting (refer to Vehicle Manufacturer's recommendations).





IMPORTANT!

New Pads need bedding in. Heavy or long duration or braking should initially be avoided.

7 Tappet Boot replacement
(for "Axial- and Radial Disc Brake")

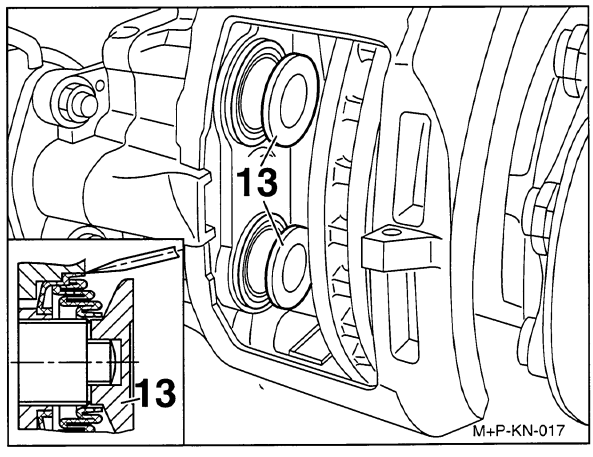
7.1 Tappet Boot removal

Note:
It may be easier to remove the Caliper from the axle to replace the Tappets of the Caliper (see Section 11.1).

The Tappets (13) must be screwed out, turn the Adjuster until the Boots can be reached.

The Tappet Boot can be deformed by pushing a screw driver between the caliper bore and the Boot location ring and it can then be removed.

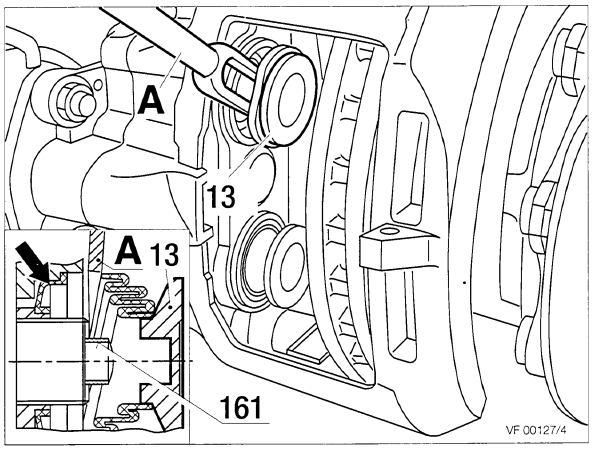
IMPORTANT NOTE:
Great care must be taken not to damage the Inner Seal since this is not a replacement item.



The Tappets (13) can be removed from the Threaded Tubes by using Wedge Fork A. (Order No. II32202).

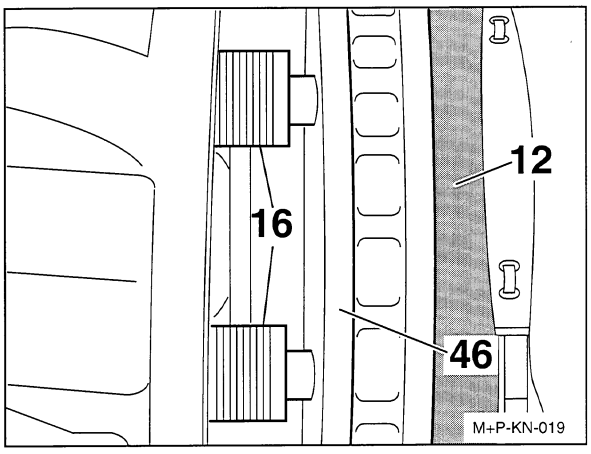
Old Tappet Bushes may need to be replaced.

Check Inner Seal (arrow) and if damaged, the Caliper must be replaced (see Section 11).



7.1.1 Adjuster thread inspection

Place an unworn Pad (12) into the outboard gap to avoid overrunning of the Threaded Tubes.

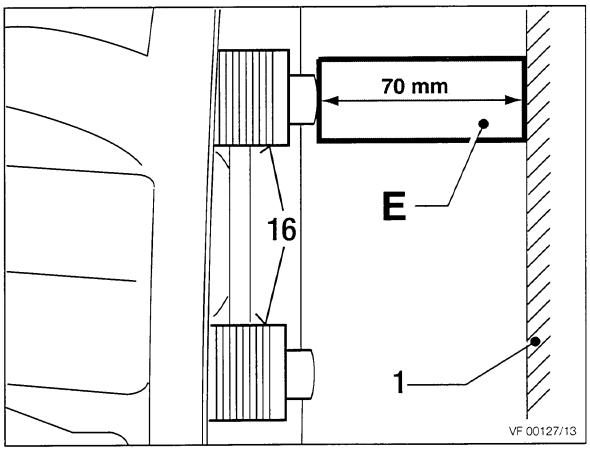


IMPORTANT!

Threaded Tubes should not overrun the inner thread of the Bridge. The Caliper must be changed if synchronisation is lost.

For the inspection of the threads, the tubes must be screwed out (max. 30mm) by turning the Adjuster clockwise.

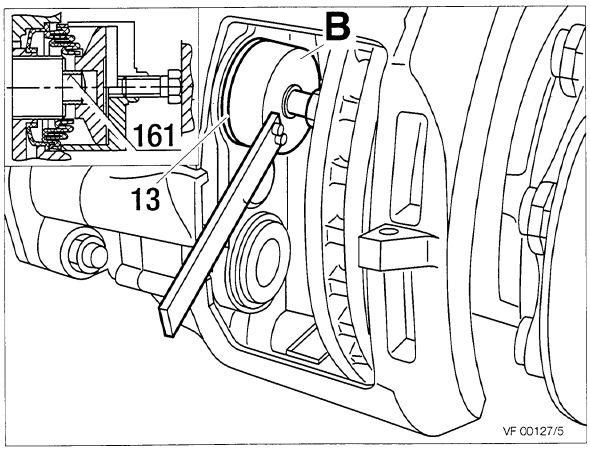
If Caliper is not installed on axle, put a spacer E (length = 70mm) into the Caliper (1) to avoid overrunning of the Threaded Tubes (16) when screwing them out (see illustration opposite). During screwing, the threads can be checked for corrision damage.
In case of water ingress or corrosion, the Caliper must be replaced (see Section 11).



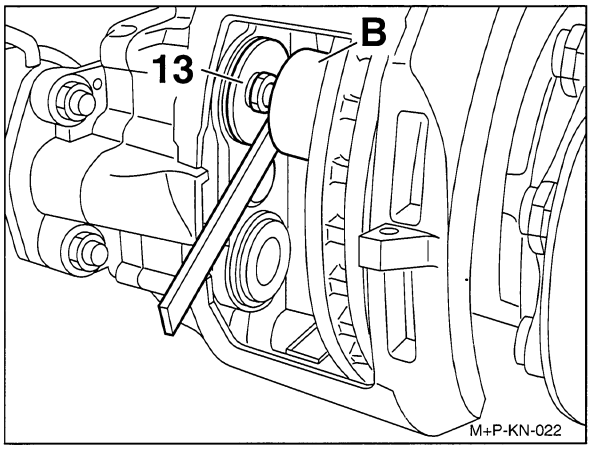
7.2 Tappet Boot fitting

With Caliper fixed to axle:
Grease threads with RENOLIT HLT2 (Order No. II14525).
Screw back Threaded Tubes (16), by turning the Adjuster counter-clockwise.
Place new Tappet Bush (161) onto the head of the Tube (16).
Place Tappet with Boot (13) onto the head of the Tube.

Use Push-In Tool with the long strut (B) (Order No II19252) for positioning and pressing-in the Boot (13).



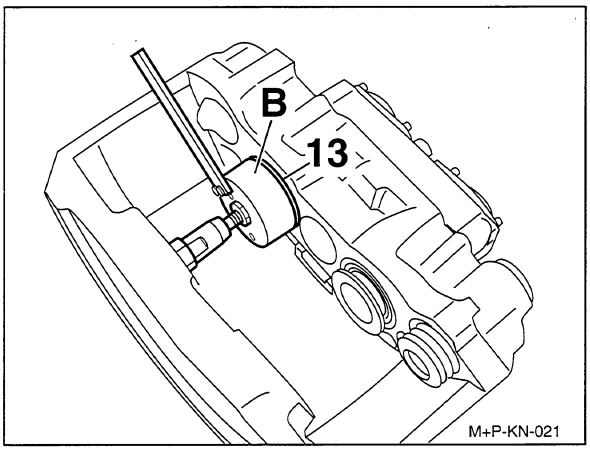
Using Tool B in reverse, the Tappet can be pressed on.

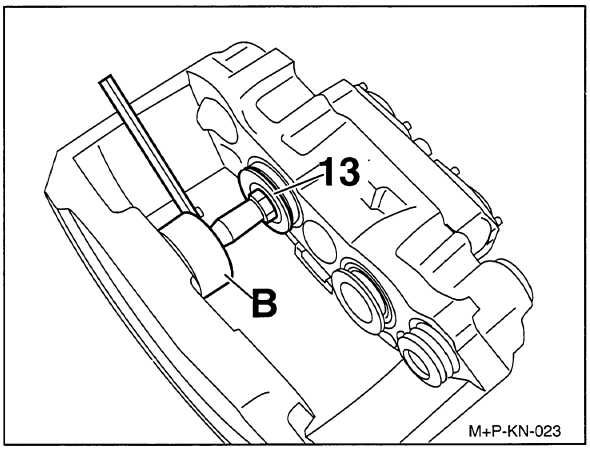


With Caliper not installed on axle
Grease threads with RENOLIT HLT2 (Order No. II14525).
Screw back Threaded Tubes (16), by turning the Adjuster counter-clockwise.
Place new Tappet Bush (161) onto the head of the Tube (16).
Place Tappet with Boot (13) onto the head of the Tube.

Use Push-In Tool with the long strut (B) (Order No II19252) for positioning and pressing-in the Boot (13).

Using the Tool (B) in reverse, the Tappet can be pressed on.





8 Guide Pin Seal replacement
(for "Axial- and Radial Disc Brake")

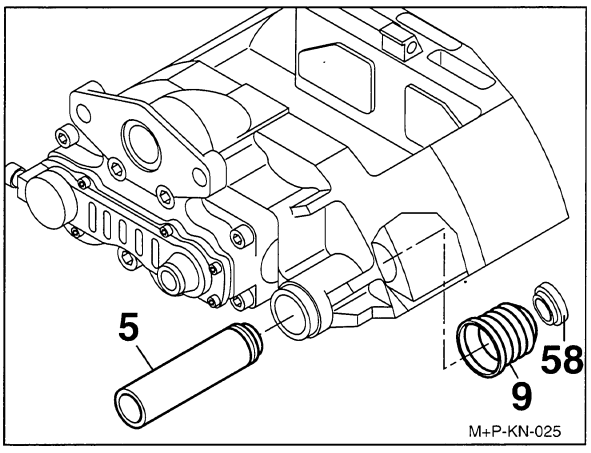
Remove Caliper (see Section 10.1)

Remove Ring (58)

Pull out Sleeve (5)

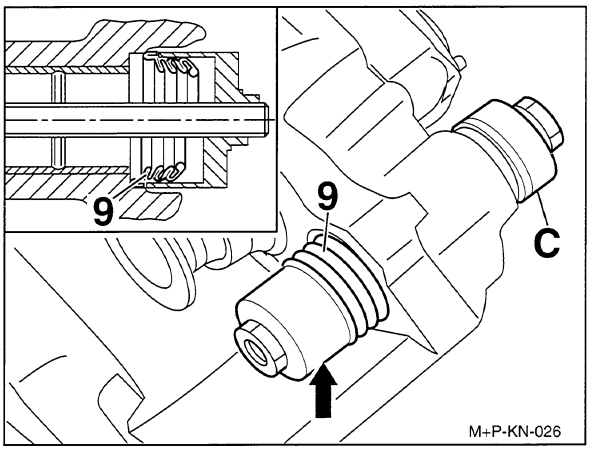
Push out Boot (9) with screw driver.

Inspect and clean contact area of Boot (9)



Put new Boot (9) into the Sleeve (arrow) of the Tool C (Order No Il19253).

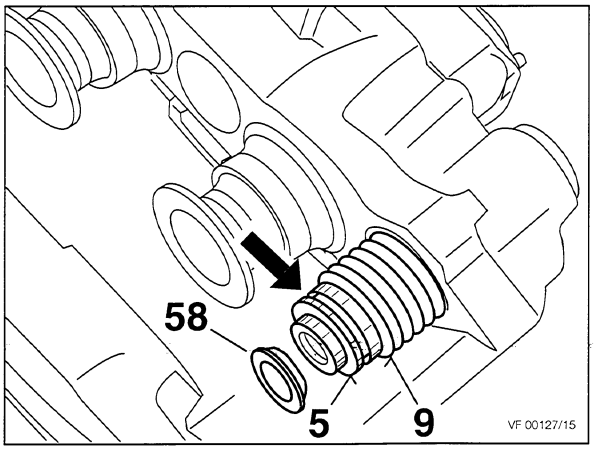
Position Sleeve with Boot (9) into the Caliper bore and pull in.



Fit the Sleeve (5)
The Boot end must engage in the groove of the Sleeve (5) (arrow). Lock with Ring (58) by pushing until it engages.

Important:
Before fitting the Caliper the unsealed Sleeve with the Rubber Bush should be checked for its ability to slide.

Fit Caliper (see Section 10.2).



9 Guide Pin Bush replacement
(for "Axial- and Radial Disc Brake")

Remove Caliper (see Section 10.1)

Remove Sleeve and Boot (see Section 7)

9.1 Brass Bush replacement

Pull out Bush (7) with Tool (D) (Order No. II19254).

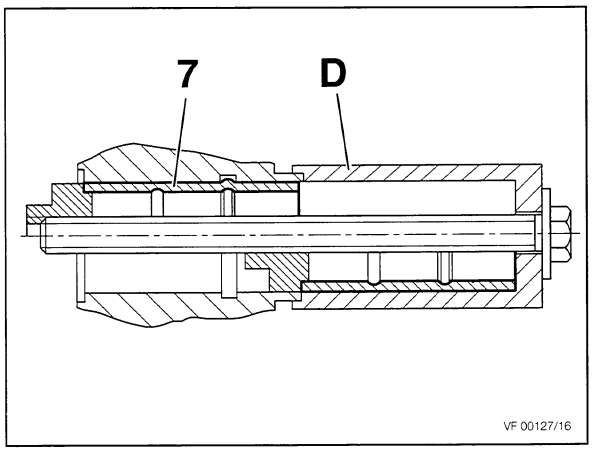
If Caliper has no groove (see arrow)
(Note: Groove is always located on the inboard side)

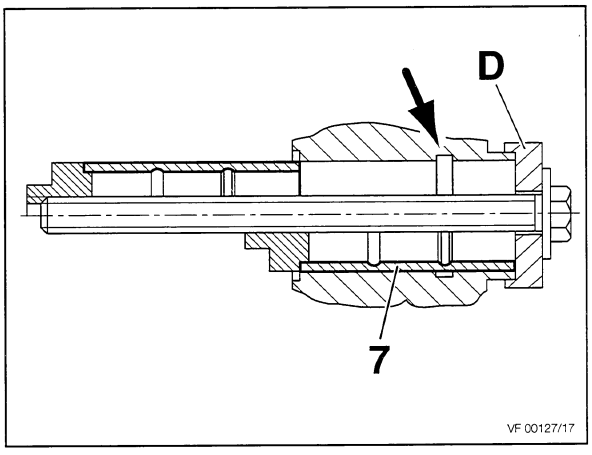
Pull in new Brass Bush (7) with Tool (D).

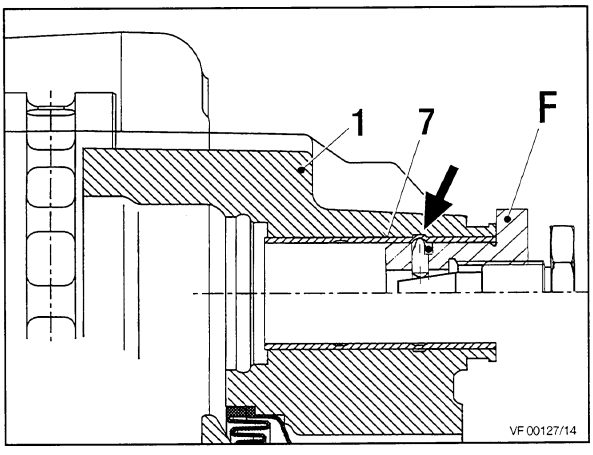
If Caliper has a groove:
Pull in new Brass Bush (7) with Tool (D). To prevent longitudinal displacement use Tool (F) (Order No II36797) to create new groove.

Check contact area of Brass Bush (7) for burrs. Remove burrs.
Grease Bush with white Grease RENOLIT HLT2 (Order No II14525).

Note:
The Guide Pins Kit contains a new Sleeve and a new Caliper Bolt.
Assemble Sleeve and Boot (see Section 8)





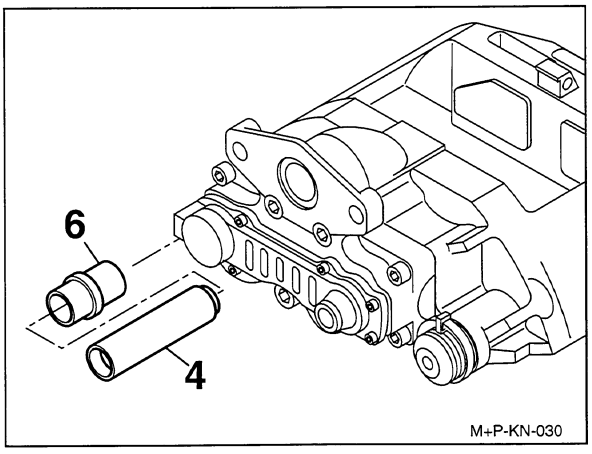


9.2 Rubber Bush replacement

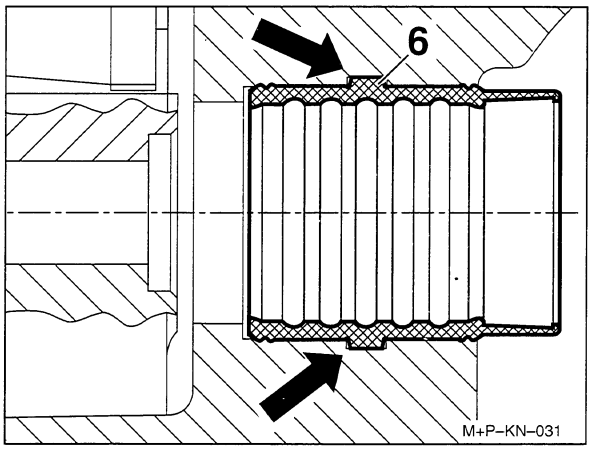
Remove Sleeve (4)

Pull Rubber Bush (6) out of bore.
Check bore for corrosion, clean if necessary.

Note:
There are two different types of Rubber Bush (6) (Short and long) Grease Rubber Bush (6) inside and outside with green Grease SYNTHESO GL EP 1 (Order No II32793).



Deform new Rubber Bush (6) and push from the inner side of the Caliper into the bore.
Push Rubber Bush (6) so that the outer positioning ring locates in the groove (see arrows).



IMPORTANT!

Under no circumstances must the white Grease(containing mineral oil) be used for lubricating the Bush or Sleeve. Use only synthetic based green Grease.

Use the green coloured synthetic Grease to lubricate the inner and outer faces of the Rubber Bush.

Note:
The Guide Pins Kit contains a new Sleeve and a new Caliper Bolt.

Assemble Sleeve (4)

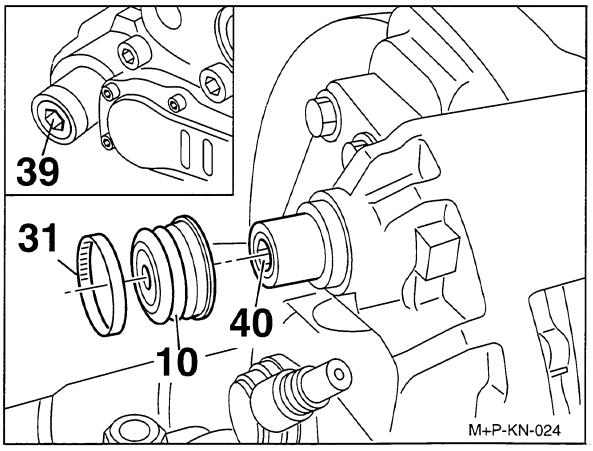
Assemble Caliper (see point 10.2)

Important:
Torque Caliper Bolts to 285^{+25} Nm and check that the Caliper slides easily.

10 Caliper replacement
(for "Axial and Radial Disc Brake")

IMPORTANT!

Do not repair Brake Actuator (because of "inner sealing"). Use only Knorr-Bremse Exchange Actuators.



10.1 Caliper removal

Remove Pads (see Section 6.1)

Remove Actuator (see Section 12.1 and 12.3).

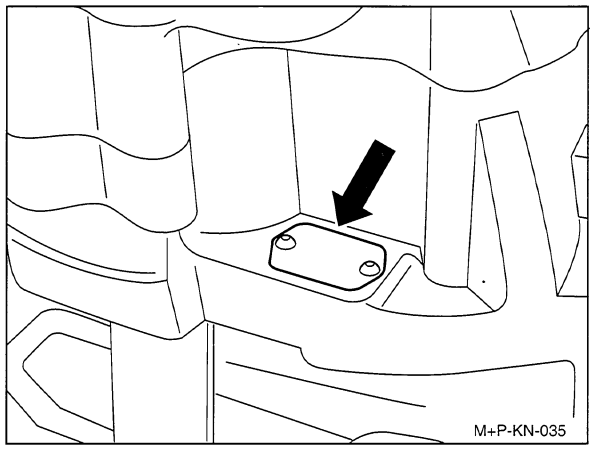
Remove Circlip (31) and take off Rubber Cap (10)

Remove Cylinder Bolts (39 and 40).schrauben.

WARNING!

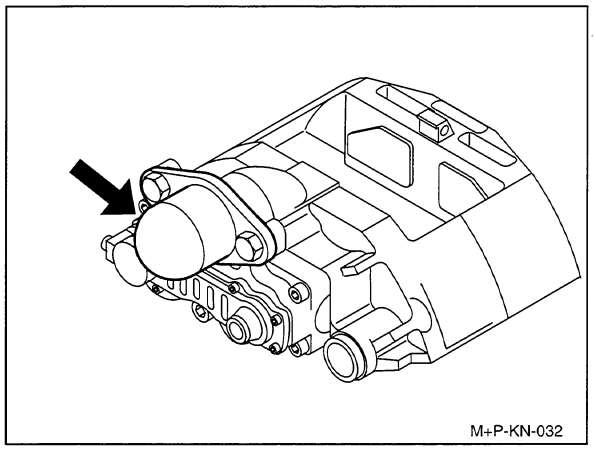
Hold Caliper only at its outer side. Never get your fingers between Caliper and Carrier!

Remove Caliper from Carrier.



IMPORTANT!

The opening or dismantling of the Caliper has not been authorized. Use only Genuine Knorr-Bremse Service Exchange Calipers.



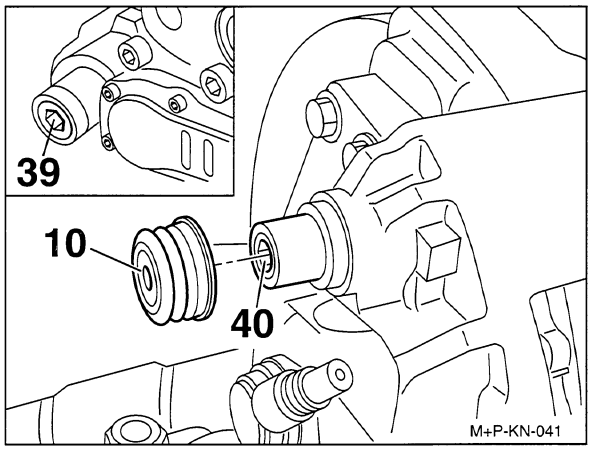
10.2 Caliper fitting

The correct choice of Caliper must be ensured by checking the Part No. on the label (arrow, picture above)

Note:
Service Exchange Calipers have a blue label.

The Service Exchange Caliper has a plastic cap in the area of the Actuator attachment. Remove the cap after installing the Caliper.

Note:
The service exchange Caliper includes sealing and guiding elements. The Pads are not included.



WARNING!

Hold Caliper only at its outer side. Never get your fingers between Caliper and Carrier!

Locate the Caliper to the Carrier.

Screw-in Caliper Bolts (39 and 40) and tighten to 285^{+25} Nm

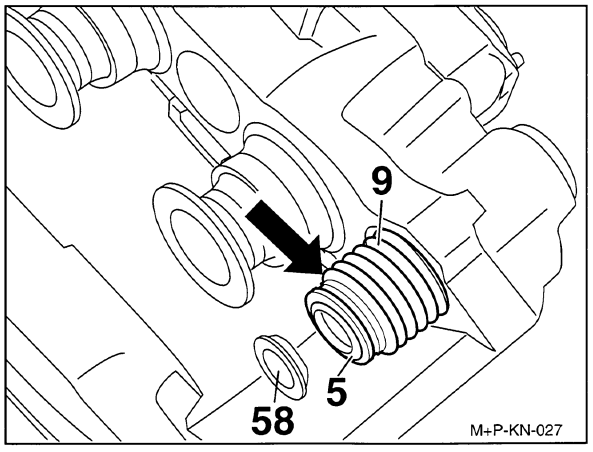
Check that the Caliper slides easily.

Check the position of the Inner Boot (9) on the Sleeve (5).

Check Adjuster function (see Section 5.2)

If necessary use new outer Boot (10).

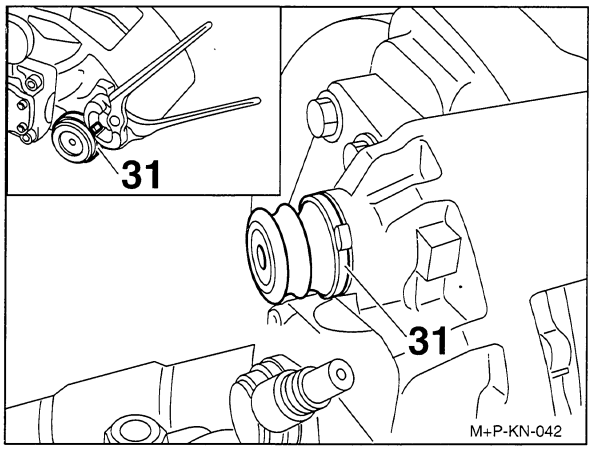
Check grease-free seating of the Cap (10) on the Caliper (1)



Tighten Circlip (31)

Fit the Pads (see Section 6.2)

Attach Brake Chamber or Spring Brake (see Section 12.2 or 12.4)



11 Carrier replacement
(for "Axial- and Radial Disc Brake")

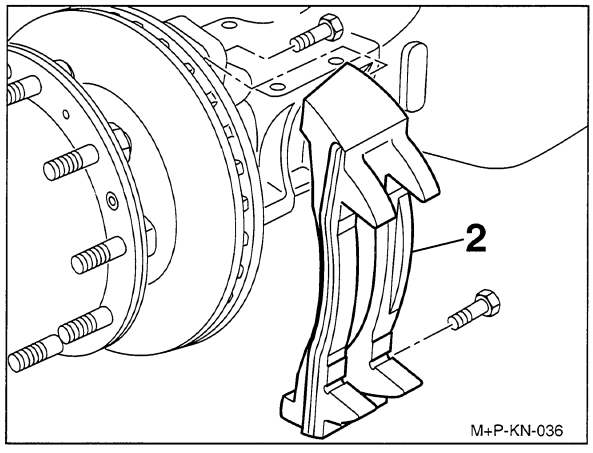
Remove Caliper (see point 10.1).

Remove Carrier (2) from axle.

Clean axle contact area.

Attach new Carrier with new bolts from the relevant truck manufacturer. Bolts are not supplied by Knorr-Bremse.

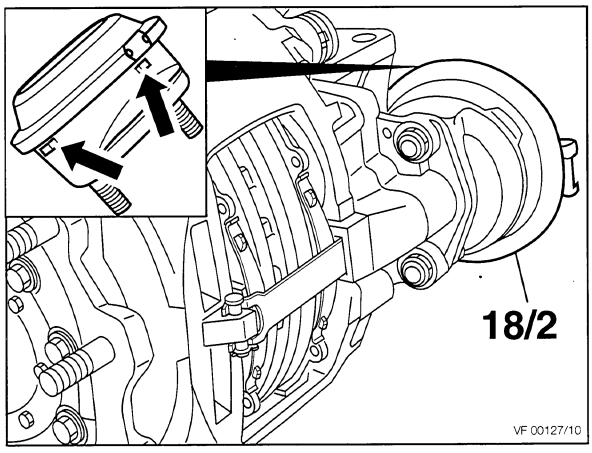
Attach Caliper (see Section 10.2)



12 Actuation cylinder replacement
(for "Axial- and Radial Disc Brake")

IMPORTANT!

Do not repair Brake Actuator (because of "inner sealing"). Use only Knorr-Bremse Exchange Actuators.



12.1 Brake Chamber removal

Disconnect air line from Brake Chamber (18/2)

Unscrew Brake Chamber Mounting Nuts

Remove Brake Chamber

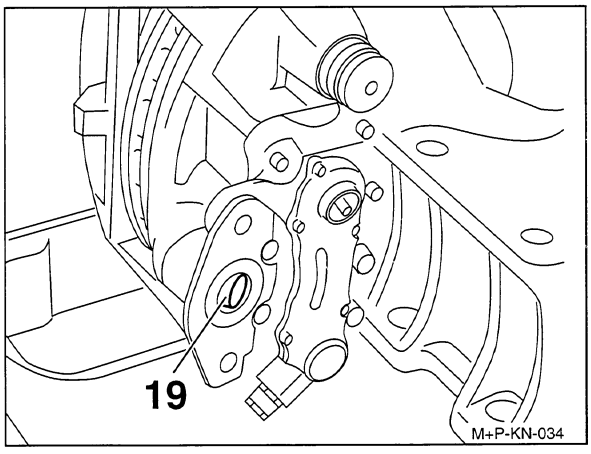
12.2 Brake Chamber fitting

IMPORTANT:
New Brake Chambers (18/2) have drain plugs installed. Remove bottom plug (see arrows). All other drain holes should be plugged.

Before fitting the new Brake Actuator, the sealing surfaces have to be cleaned, and the Spherical Cup (19) in the Lever must be greased with white Grease RENOLIT HLT2 (Order no II14525)

IMPORTANT!

Do not use Grease containing molybdenum disulphate. Use only Actuators which are recommended by the Vehicle Manufacturer.



Attach Actuator with new Nuts and torque tighten to 180 $^{\pm 20}$ Nm.

Connect air hose and check for leakage.

Make sure that hose is not twisted and that chafing is not possible.

IMPORTANT!

Check function and effectiveness of the brake.

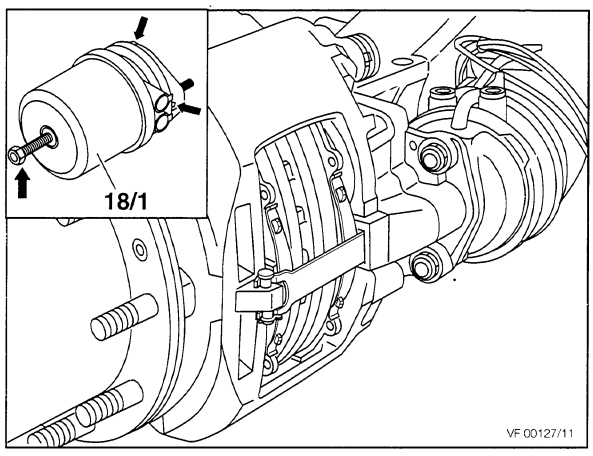
12.3 Spring Brake removal

IMPORTANT!

Do not repair Brake Actuator (because of "inner sealing"). Use only Knorr-Bremse Exchange Actuators.

CAUTION!

Chock wheels before releasing Spring Brake



Release parking brake, move Hand Control Valve to 'run' position.

Screw-out Release Bolt (arrow) with a maximum torque of 35Nm.

Release air from brake, move Hand Control Valve to 'park' position.

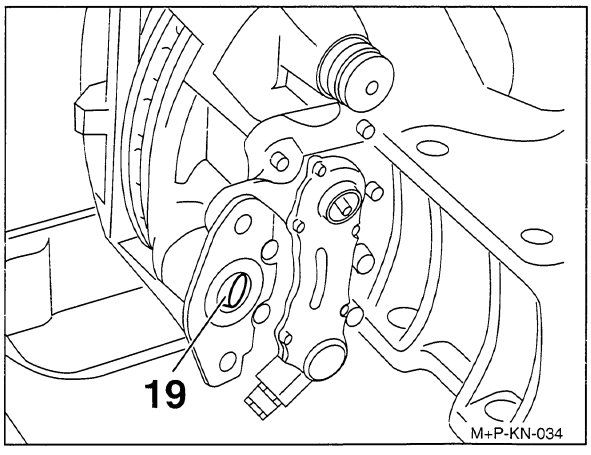
Disconnect air hoses from Spring Brake Actuator (18/1)

Unscrew Spring Brake Actuator Mounting Nuts.

Remove Spring Brake Actuator.

12.4 Spring Brake fitting

IMPORTANT!
New Spring Brake Actuators (18/1) have drain plugs installed. Remove bottom plug (see arrows).
All other drain holes should be plugged.



Before fitting the new Brake Actuator, the sealing surfaces have to be cleaned, and the Spherical Cup (19) in the Lever must be greased with white Grease RENOLIT HLT2 (Order no II14525)

IMPORTANT!

Do not use grease containing molybdenum disulphate. Use only Actuators which are recommended by the Vehicle Manufacturer.

Attach Actuator with new Nuts and torque tighten to 180 $^{\pm 20}$ Nm.

Connect air hose, ensuring that hoses are not mixed up.

Make sure that hoses are not twisted and that chafing is not possible.

Release parking brake, move Hand Control Valve to 'run' position, and check for leakage.

Torque Spring Brake Release bolt to maximum 70 Nm.

IMPORTANT!

Check function and effectiveness of the brake.