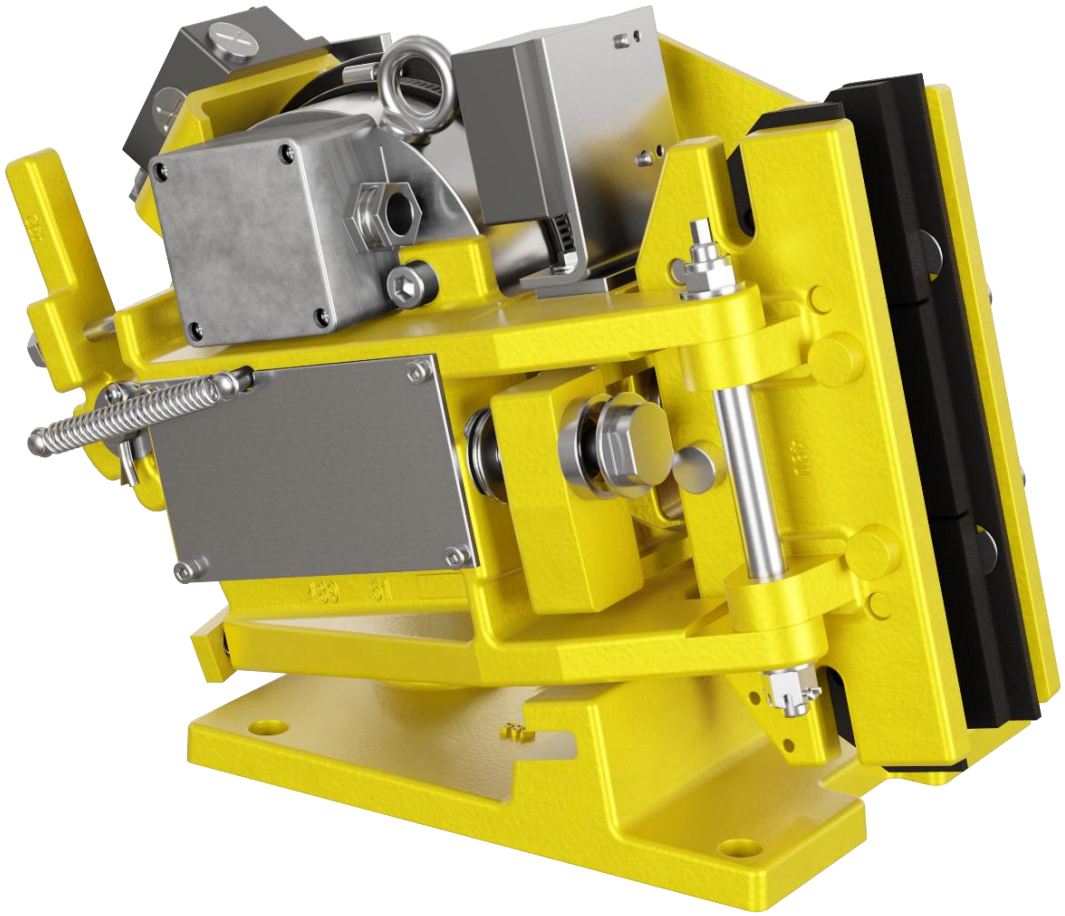
RINGSPANN®
Power Transmission

Installation and Operating Instructions for Brake DA 505/450/445, 405, 305 FEM/FEA

E09.810e



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IMPORTANT

Please read these instructions carefully before installing and operating the product. Your particular attention is drawn to the notes on safety.

These installation and operating instructions are valid on condition that the product meets the selection criteria for its proper use. Selection and design of the product is not the subject of these installation and operating instructions.

Disregarding or misinterpreting this installation and operating instructions invalidates any product liability or warranty by RINGSPANN; the same applies if the product is taken apart or changed.

These installation and operating instructions should be kept in a safe place and should accompany the product if it is passed on to others – either on its own or as part of a machine – to make it accessible to the user.

Safety Notice

- Installation and operation of this product should only be carried out by skilled personnel.
- Repairs may only be carried out by the manufacturer or accredited RINGSPANN agents.
- If a malfunction is indicated, the product or the machine into which it is installed, should be stopped immediately and either RINGSPANN or an accredited RINGSPANN agent should be informed.
- Switch off the power supply before commencing work on electrical components.
- Rotating machine elements must be protected by the purchaser to prevent accidental contact.
- Supplies abroad are subject to the safety laws prevailing in those countries.

This is a translation of the German original version!

In case of inconsistencies between the German and English version of this installation and operating instruction, the German version shall prevail.

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1. Description of the caliper

1.1 Operating principle

These installation and operating instructions apply to the following brake calipers:

- DA 505 FEM / FEA and identical frame sizes DA 450, DA 445 FEM / FEA
- DA 405 FEM / FEA
- DA 305 FEM / FEA

with and without additional options.

The braking force is generated by spring washers. Electrical power is required to power the magnet that compresses these spring washers and keeps the brake caliper in the released condition.
The arrangement and stacking of the spring washers are preset at the factory. This setting, in combination with the brake pad clearance adjustment, determines the resulting clamping force.

The “FE**A**” version described in this manual features **a**utomatic wear adjustment.
On these versions with automatic adjustment, the lining wear is automatically compensated to maintain the nominal lining clearance and prevent any loss of braking force.

The “FE**M**” version described in this manual features **m**anual wear adjustment.
On these versions with manual adjustment, the lining wear must be compensated by a manual adjustment of the gap between pads and the brake disc to prevent a loss of braking force.

The brake calipers are equipped with a manual release mechanism that mechanically maintains the brake caliper in the released position without the need for an electrical power supply.
This function is intended for installation and maintenance work when the power supply is not available.
The manual release must be disengaged for normal brake operation.

An identification plate (Figure 1.1) with a 16-digit part number is mounted to each brake caliper.
The exact design and configuration of the brake caliper are defined exclusively by this part number.
Please read these installation and operating instructions carefully before installing or operating the brake. Always observe the drawings referenced in the individual sections.

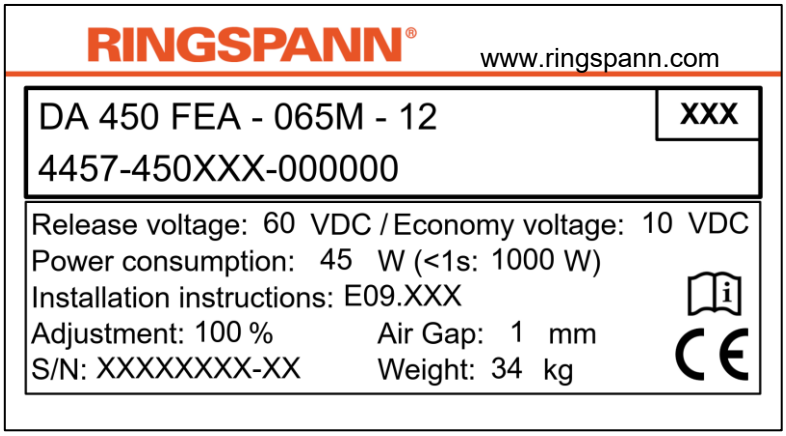


Figure 1.1

Safety must be given the highest priority during all work performed on the brake. Before performing any work on the brake, switch off the drive unit.

Rotating components (e.g. the brake disc) must be secured by the operator to prevent accidental contact.

1.2 Delivery condition

The brake caliper is supplied in the following condition:

- In manual release position, i.e. mechanically locked in released position.
- With brake pads installed.
- Adjusted to the nominal brake pad clearance
- Braking force set to the nominal value or according to customer specifications.
- Optional mechanical switches or sensors adjusted.
- As well as these instructions, please also consider the catalogue data for the brake at www.RINGSPANN.com and the drawings in the individual sections.

Life-threatening danger!

The brake disc must be completely degreased before coming into contact with the brake linings. If the brake linings are contaminated with grease or oil, the nominal braking force is not guaranteed.

The brake caliper can be a safety-relevant machine component. All adjustments, settings, and repair work may only be carried out by qualified personnel.

The brake caliper is supplied in the manual release position (manually locked in the released state). The brake force is preset. To ensure correct brake function, the instructions in this manual must be strictly followed before commissioning.

When assembling, operating and maintaining the brake it is to be ensured that the entire drive train is secured against being switched on unintentionally. Moving parts can cause severe injury. Rotating parts (e.g. brake disc) must be secured by the operator against unintentional touching.

Strongly pre-loaded pressure springs are installed in the thrusters of the brake. The spring thruster may only be disassembled by the factory.

2. Installation

2.1 Installing the disc

Make sure that the disc is perfectly positioned and attached to its hub or shaft. Check that the disc warp does not exceed 0.2 mm per side.

Check that the disc thickness is as ordered and according to the designation printed on the brake:

Example: DA 450 FEA – 065M – **12** **12** = 12,7 mm (see data sheet)

Attention!

If these conditions are not met, the brake caliper cannot be installed or cannot operate properly.

Prior to installing the brake, the brake disc must be cleaned using alcohol - e.g. methylated spirits (ethyl alcohol) or isopropyl alcohol—or alternatively with water-based surfactant solutions (such as soapy water or similar).

If the brake disc is cleaned using thinners, acetone, or brake cleaner, it must be ensured that these substances, as well as any residues thereof, do not come into direct contact with the friction pads. Particular care must be taken in the case of holding brakes, as no dynamic braking occurs that could otherwise remove any remaining residues of the solvents from the brake disc.

Attention!

The disc must be degreased and free of deposits to prevent any reduction in the coefficient of friction. Residues of oil and corrosion protection agents significantly reduce the coefficient of friction and, consequently, the braking and holding torque.

As well as these instructions, please also consider the drawing data sheet for the brake at www.RINGSPANN.com and the drawings in the individual sections.

2.2 Installing the brake caliper

Make sure that the support surface is clean and dry. The brake caliper should be mounted to stabile, vibration-free machine components to ensure noise-free, non-screech. Tighten the screws with a torque wrench.

During installation, it is essential to ensure that brake pads are centered and in full contact with the brake disc (the midlines of the brake arms must point to the midpoint of the brake disc). Maximum permissible lateral brake disc warp is 0,2 mm. Greater lateral movements may cause rattling and shaking of the brake unit.

Tooling:

- Feeler gauges, metal ruler + dimensional control devices (calipers, depth gauges)
- Brake caliper DA 505/450/445: Torque wrench (200 Nm), socket 21 mm on flats, Ø15 pin
- Brake caliper DA 405 & 305: Torque wrench (200 Nm), socket 30 mm on flats, Ø20 pin

Installation procedure:

1. Position the brake onto the brake disc so that the disc is located between the two brake pads. Use the lifting eye AL (Figure 2.1) to lift the brake.
   If necessary, deactivate the manual release to close the brake and ensure proper alignment with the disc.

2. Centre the caliper transversally in relation to the disc at ± 2.5 mm.

Information!

The hinged pad holders as well as the levers connected to the rear pivot of the caliper enable them to correct centering faults.

3. Thread in 2 attachment screws, without tightening them, at the spots a and b (Figure 2.1) and insert two pins in the two opposite holes.

4. Verify the parallelism of the base plate with respect to one side of the disc by pushing a ruler against the 2 pins and check that the parallelism flaw does not exceed ± 0,05 by taking 2 measurements as far apart as possible between the ruler and the machined track of the disc. Check the perpendicularity of the pads to the disc using a set of feeler gauges: 0.2 mm max over the width of the pad.

5. Fit the other 2 attachment screws of the base plate and tighten the 4 screws to the torque indicated in the table below:

	ATTACHMENT HOLES ON THE BASE PLATE	SCREW
DA 505 FEM/FEA DA 450 FEM/FEA DA 445 FEM/FEA	4 x Ø15	4 x M14, minimum class 8.8 Cs: 121 Nm +/-10% μ=0.15
DA 405 FEM/FEA DA 305 FEM/FEA	4 x Ø22	4 x M20, minimum class 8.8 Cs: 370 Nm +/- 10% μ=0.15

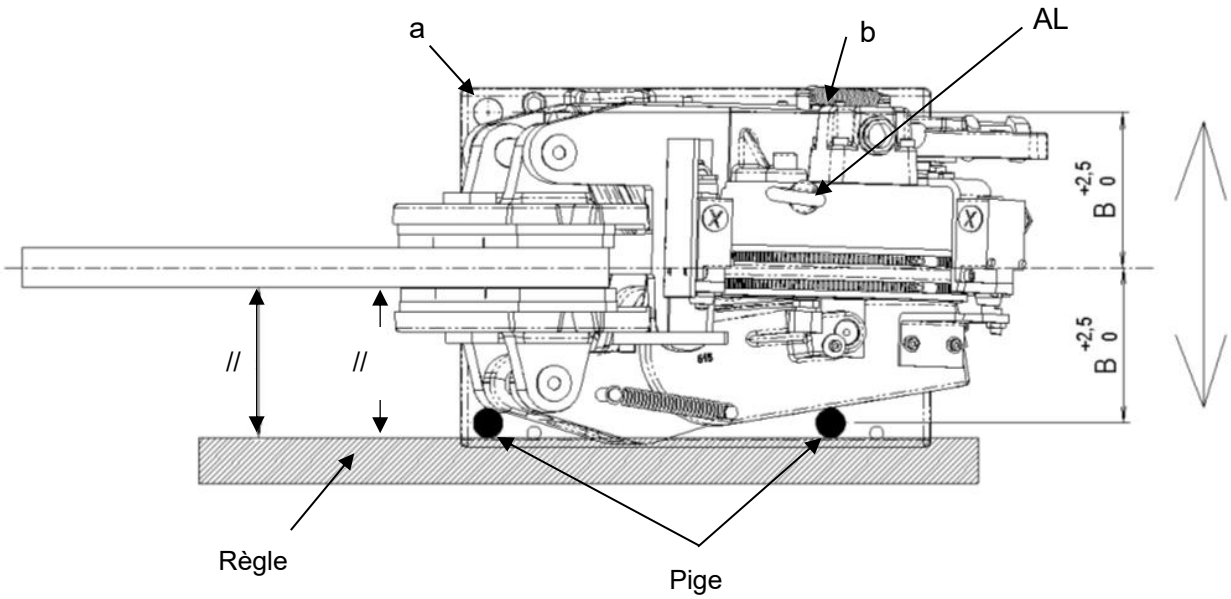


Figure 2.1

If not valid, disable manual release to close the brake so that it aligns with the disc.

If necessary, wedge the base plate with foil **(2)** located close to the attachment screws.

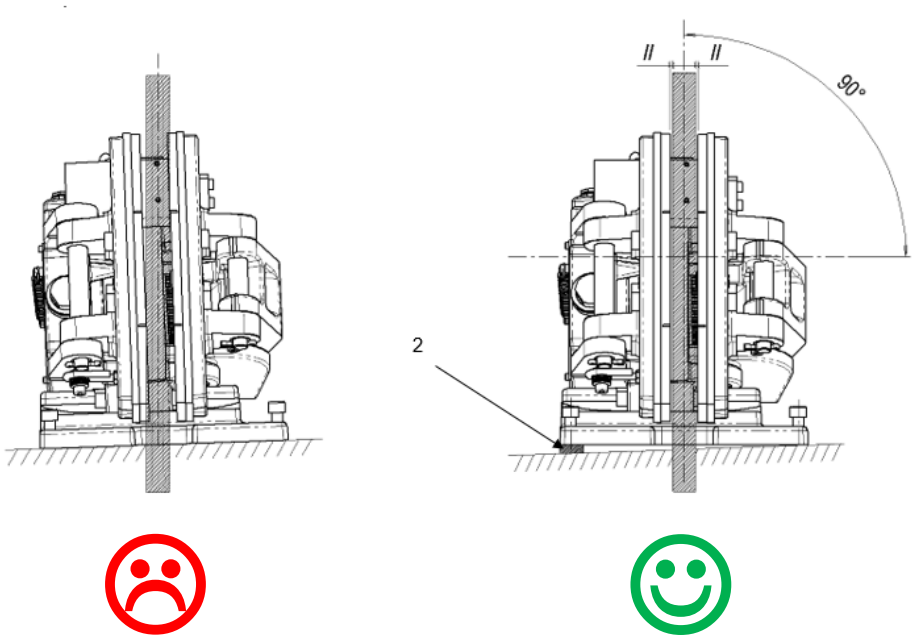


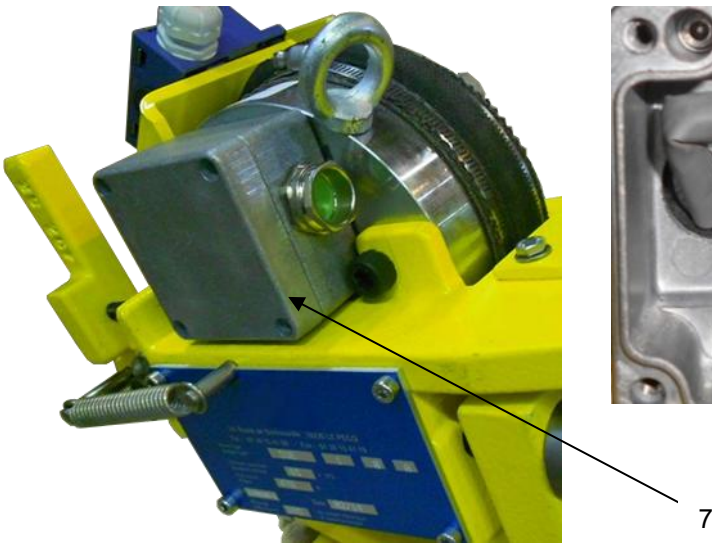
Figure 2.2

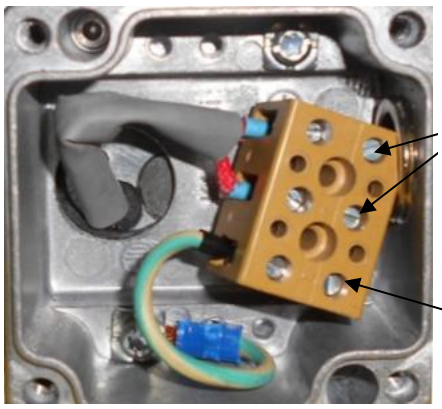
Note

Report to chapter 7.2 for adjusting the caliper on vertical position.

2.3 Connection

The caliper has a terminal box **7**, which must be connected to an electronics controller ESE or ESP type automatic power pack (Tightening capacity of stuffing box Ø 10.5 -15 mm):





The caliper terminals must be connected to the + and - terminals of the power pack, without respecting polarities.

Attention!

Refer to the power pack manual:

Make sure that the fuse rating is correct depending on the caliper.
For the minimum theoretical cross-section and the max resistance of connecting cables.

The opening switch, pad wear switch and other switches must be connected when they are supplied. See chapter 7.3, 7.4, 7.5 and 7.6 for more details.

2.4 Deactivating the manual release

Attention!

Manual release must be deactivated for the caliper to operate correctly.

The manual release of the caliper is deactivated by fully loosening the screw **4**, and by tightening the locknut on the lever **11**.
As a result, the lever moves to an approximately vertical position. Lever **11** is then free around its axis and the washers are no longer free (J1 clearance is null).

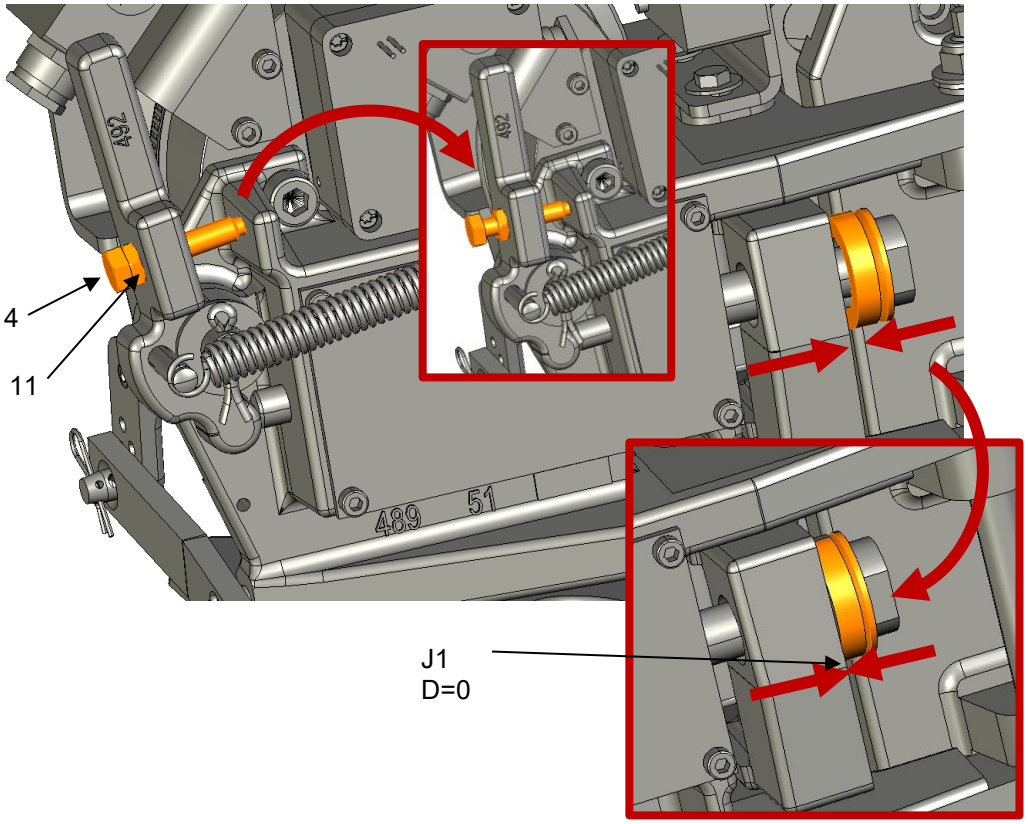


Figure 2.3

For more details about the manual release, chapter 4.1 and 7.1 need to be considered.

2.5 Checking the pad clearance

Attention!

The pad gap is set at the factory on a disc of the thickness specified at the type plate. It must always be between 0,7 and 1 mm.
If this is not the case, the brake will not be able to create its full force and the air gap must be set again.

Release and pivot the caliper to obtain maximum space between the pad and the disc (the other pad is in contact with the disc).

Use laminated shims to check that the **X** total clearance between the pads and the disc. It must always be set between 0.7 and 1 mm (see Figure 2.4).

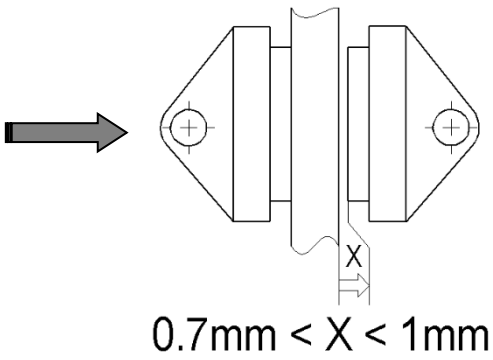


Figure 2.4

Information

For brake calipers with automatic wear adjustment, the air gap at commissioning may exceed 1 mm. In such cases, several switching operations are required until the correct air gap (a + b) is automatically established.

2.6 General operational check

Check that the electrical contacts are operating properly.

Attention!

The disc must be degreased and free from any deposit so as not to reduce the friction coefficient.

Information!

For initial start-up with new pads, operate the caliper, under no-load conditions, with disc rotating about twenty times to bed in the pads.

For brakes with automatic wear adjustment, certain switching operations are required to ensure that the correct air gap (a + b) is established.

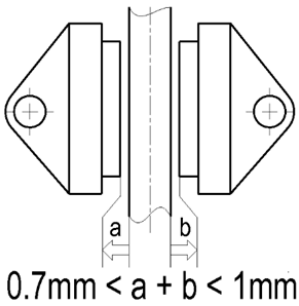


Figure 2.5

Pad Gap **PG** total clearance will be equalize symmetrically due to caliper repositioning:

PG = 0,7 < (a + b) < 1 (see Figure 2.5).

Information!

THE SYSTEM IS NOW OPERATIONAL.

3. Periodic maintenance

Attention!

Regularly check the gap between the pads and the disc. Especially after an emergency stop. The nominal pad gap is 0.7 mm to 1 mm.
If this value is exceeded, braking torque will be reduced!

The pad gap is set at the factory on a disc that has the thickness specified.
If this is not the case, follow the corresponding adjustment procedure.

When the remaining thickness per lining reaches 2 mm, proceed as in chapter 4.4 - Replacement of the caliper pads. Failure to do so will result in a loss of braking.

To ensure the correct operation of calipers, it is necessary to check the following points **each time the pads are adjusted or** at least **once per year**:

- The caliper must be movable on the base plate in axial direction to the disc (± 2.5 mm).
  If necessary, clean the shafts of the base plate and then grease them moderately along with the rear swivel pin (the caliper assembly must move freely when one of the levers is pushed). We recommend MOLYSLIP copper grease.

- Check that the pads are not worn at an angle or asymmetrically, in which case:

  - Manually release the brake (see chapter 4.1).

  - Manually open the brake completely by unscrewing the adjustment screw to free the space on either side of the disc (see chapter 4.2) and remove the pads.

  - Check that both pad holders can be moved on their axles. Pivoting must be resistant but possible by hand.

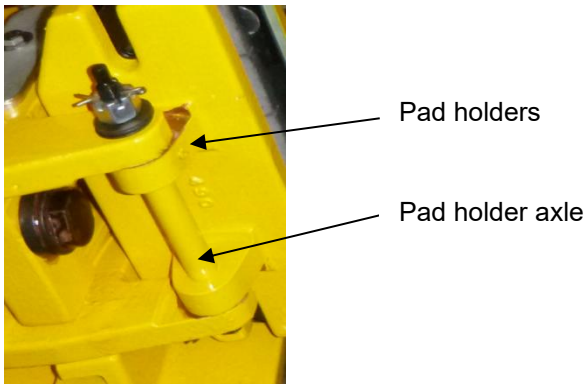


Figure 3.1

- Check the condition of the dust seal of the air gap and the cleanliness of the exhaust filter 19.

Every five years of operation **or 2 million cycles**:

Plan a thorough overhaul of the clamp exclusively in RINGSPANN's workshop, which will include at least the replacement of:

- Spring washers.
- Pads *.
- Other parts as per expertise.

*Note: The conditions for exchanging the pads are defined in the instructions supplied with the spare pads.

Attention

Perform maintenance at regular intervals, at the latest in accordance with the specified maintenance intervals, to ensure the long-term proper functioning of the brake.

4. General maintenance

4.1 Standard manual release

Activation:

The caliper is manually released using the lever **11** and screw **4**:

- Either by gradually placing an extension tube (see table) on the end of the lever
- or permanently, by tightening the screw **4** (see table).

Unscrew the locknut of the screw **4** (see table) on the lever **11**. The caliper is fully released when the release lever is down, the gap J1 between the control lever **20** and the drive rod **10** can be seen. (See below).

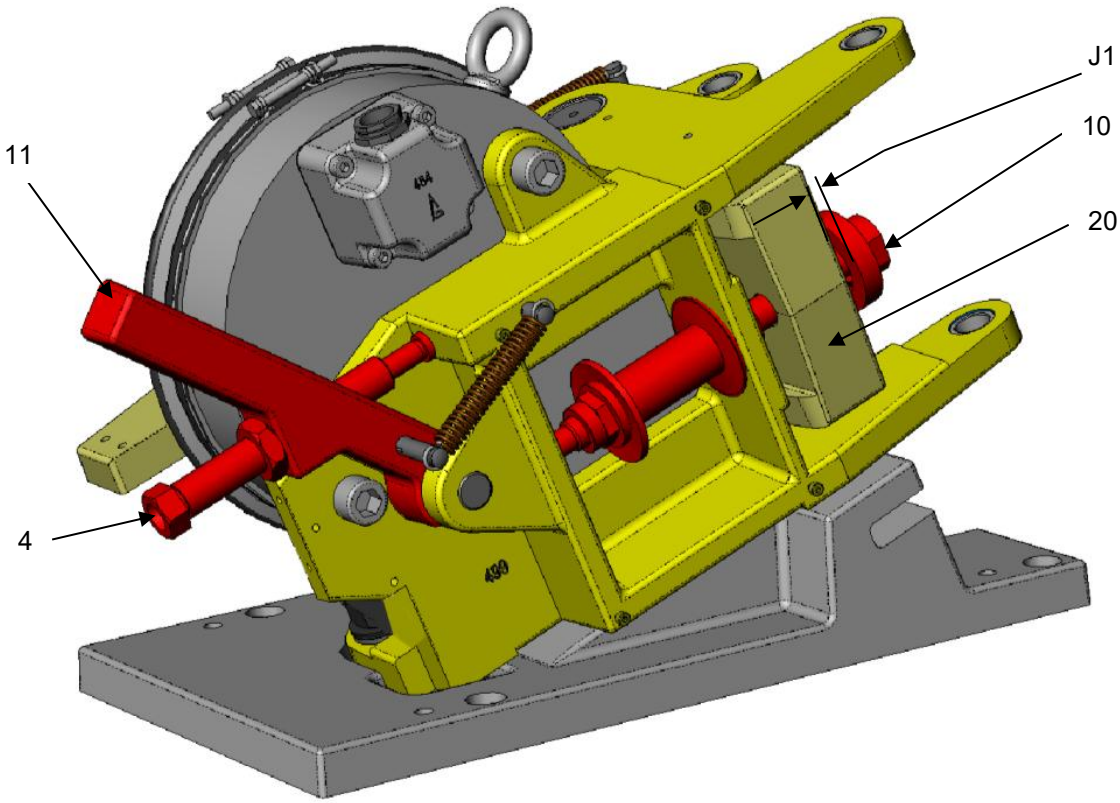


Figure 4.1

	BY SCREW Item 4	EXTENSION TUBE
DA 505 FEM/FEA DA 450 FEM/FEA DA 445 FEM/FEA	Screw HM 16x45 - 24 mm A/F + Locknut HM M16 - 24 mm A/F	Outside dia. 27 - thickness 2.6 - length 500 mm
DA 405 FEM/FEA	Screw HM 20x130 - 30 mm A/F + Locknut Hm M20 - 30 mm A/F	Outside dia. 38 - thickness 4 - length 1450 mm
DA 305 FEM/FEA		Outside dia. 54 - thickness 5 - length 1500 mm

4.2 Manual adjustment of the clearance between the linings

4.2.1 Brakes with automatic wear compensation (FEA):

Follow the instructions of this chapter to increase the distance between pads. See also Figure 4.2.

1. Verify that the manual release is activated (see chapter 4.1).
2. Remove Beta pin **21**.
3. Separate the link **22** from the pin.
4. Fit an Allen key for socket head 5 (or a screwdriver for Allen socket head nut 5) into the hole of the adjustment lever **23**. (After removing screw HC, which serves as a plug).´
5. Turn this key counterclockwise in order to move back the push rod **3** (the lever **23** turns at the same time).

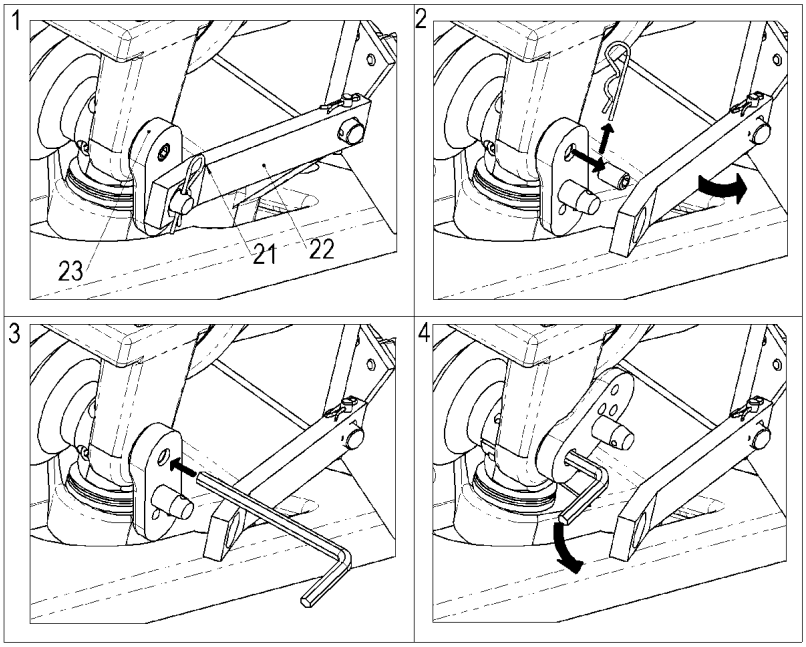


Figure 4.2

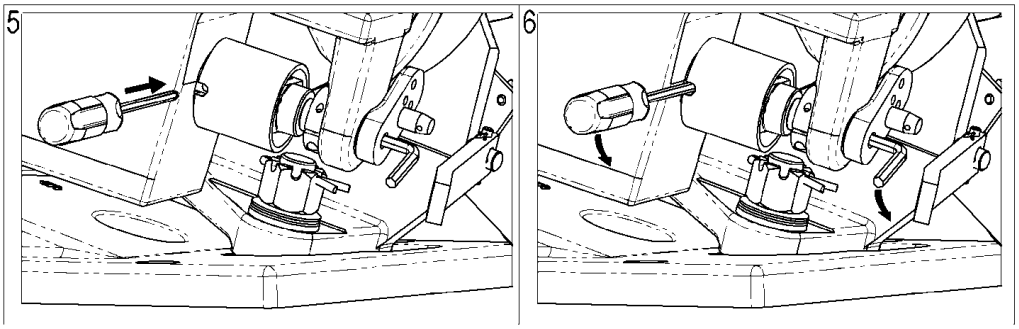
Attention!

If not, DO NOT FORCE which could damage adjustment ratchet.

If this is the case, then check first of all that blocking screw **4** is totally tightened. This increases the gap between the pads **6**.

If the spanner still remains difficult to rotate:

- Use a rod of ∅ 4.8 mm.
- Push the dust seal away (not shown in the sketch) in order to access one of the 6 drive shaft holes.
- Insert the rod through this slot in the ratchet cover into one of the 6 holes and apply leverage in the counterclockwise direction, to push back the push rod 3.



Continue this operation until the space between the pads exceeds the thickness of the disc - **Do not force into extreme position**

Note: Calipers are equipped with a device to harden the pad-holders on their axle; make sure that the pads are parallel to the disc.

Important!

When the remaining thickness per lining reaches 2 mm, proceed as in chapter 4.4 - Replacement of the caliper pads. Failure to do so will result in a loss of braking.

Important!

The manual release must be deactivated for the brake to operate correctly.

Information!

If new pads are fitted:
Operate the caliper, under no-load conditions with disc rotating, about twenty times to clean the pads.

4.2.2 Brakes with manual wear compensation (FEM):

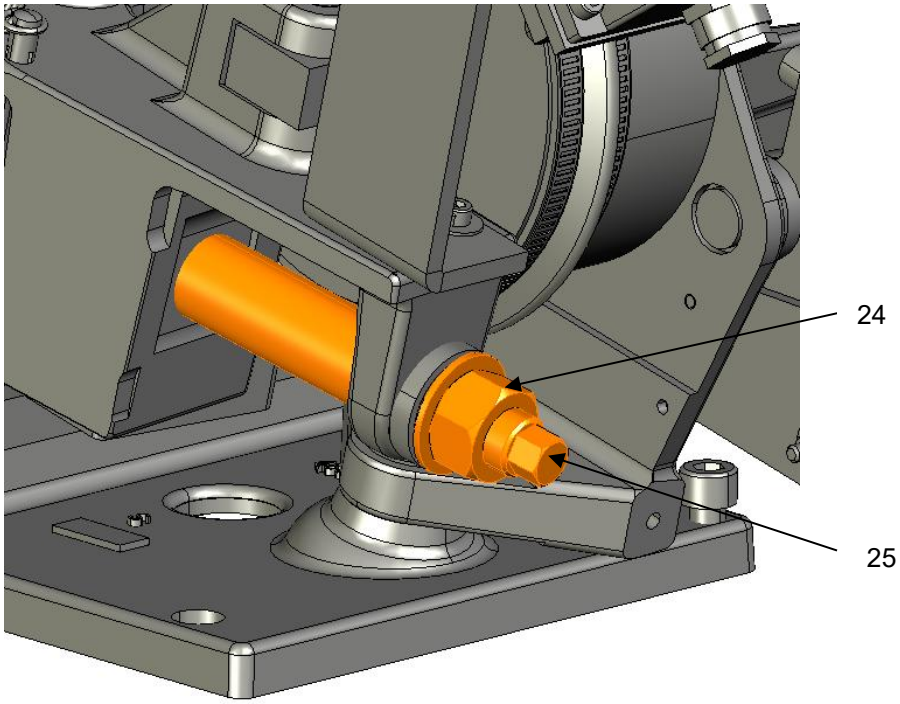


Figure 4.3

For brakes with manual wear adjustment (FEM) position 21, 22, 23 (Figure 4.2) are replaced by a hex nut **24** and adjustment rod **25** (Figure 4.3). To adjust the air gap setting on the brake pads, follow the according steps:

- Loosen the nut **24** by holding the adjustment rod **25.**
- Screw the adjustment rod and watch the movement of the brake pads in relation to the brake disk surface.
- Ensure that the air gap is set correctly on both brake pads.
- Tighten nut **24** by holding the adjustment rod **25** to save the position.

Important!

This operation causes the factory-set clearance to be adjusted.

4.3 Setting the gap between the brake pads and the brake disc

The gap must be set: - during initial installation.
- when brake pads are worn
- after every brake pad replacement

To be carried out after chapter 4.1 and 4.2.

1. As the manual release is activated according to chapter 4.1, this operation does not necessarily cause the electromagnet moveable armature to come close to the coil. Make sure the air gap is zero by checking dimension X.

	Dimension X in mm ± 0.5 mm
DA 505 FEM/FEA DA 450 FEM/FEA DA 445 FEM/FEA	67
DA 405 FEM/FEA	87
DA 305 FEM/FEA	90

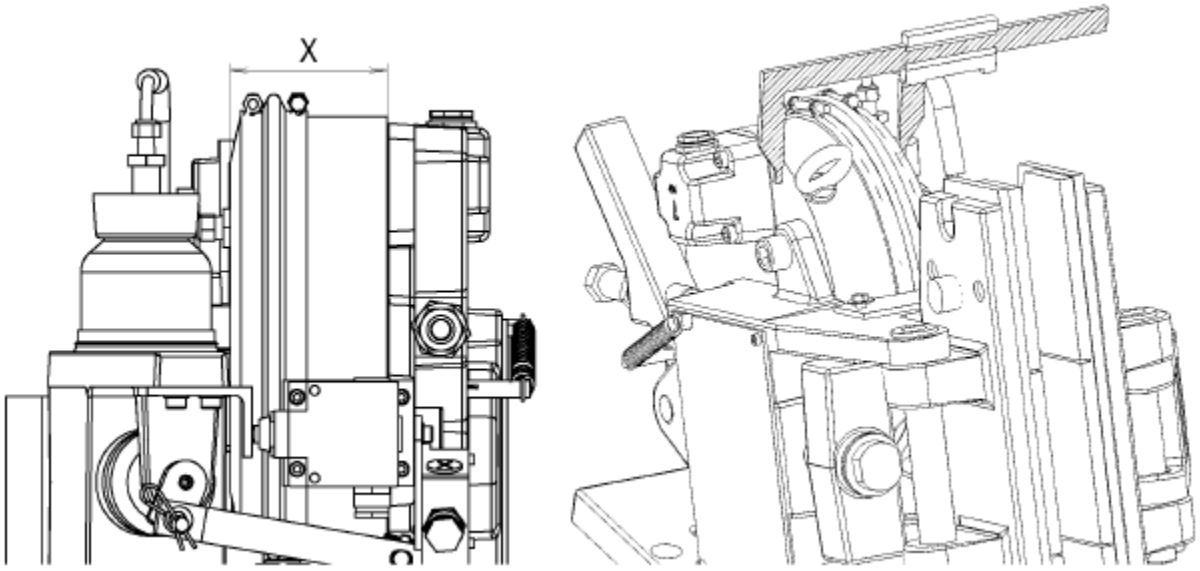


Figure 4.4

2. Replace the link **22** on its axle. To achieve this, turn lever **23** counterclockwise by hand.
3. Reinstall Beta pin **21**.
4. Turn an Allen key for socket head 5 (or a screwdriver for Allen socket head nut 5) clockwise in order to get a total gap (both sides) of about 0.7 - 1 mm between the pads and the disc.
5. If the rotation of the spanner remains difficult, **DO NOT FORCE** and see chapter 4.2.
6. Replace the screw HC, which serves as a plug.

Important!

The manual release must be deactivated for the brake to operate correctly.

Information

FEA - Brakes: It is possible to make an approximate adjustment (e.g. 2 mm) and then apply the brake about ten times so that the adjustment system adjusts the brake automatically.

4.4 Replacement of the caliper pads

Important!

When the remaining thickness per lining reaches 2 mm, proceed as per chapter 4.4 - Replacement of the caliper pads.Failure to do so will result in loss of braking.

Important!

Brake pads must always be replaced in pairs.

Important!

Record the date of manufacture printed on the metal sheet in the form WW/YY (Week/Year). The conditions for exchanging the pads are defined in the instructions supplied with the spare pads.

1. Follow the steps from chapter 4.2. Open the brake completely.
2. As the caliper is equipped with a device for maintaining the pad-holders, pivot the pad-holder, which is linked to the lever **17** so it remains parallel to the disc (this avoids moving back the push rod **3** too much).
3. Pivot the caliper to obtain maximum space between the pad and the disc (the other pad is in contact with the disc).
4. Separate the pad from its pad holder, so as to release the magnetic suckers and disengage it from its locking devices then pull out the disk in line.
5. Put the new pad inside making sure that it is well held in its locks.
6. Pivot the caliper on the other side. Check that the new pad is effectively flat against the disk. Proceed with the replacement of the other pad.
7. Replace the link **22** on its shaft. For this, turn lever **23** counterclockwise by hand.
8. Put the Beta pin **21** back in place.

Important!

Then adjust the air gap.

4.5 Clamping force adjustment

Information!

The clamping force is set in factory and checked using a test bench.

5. Spare parts

Refer to reference drawing chapter 9.

Rep.	Description	Frame size	Item code	Qty
Pads (excluding special versions SID or sintered)				
6	Set of pads (constituted of 2 pads rep 6)	DA 505/450/445 FEM/FEA	***JG005ATV 132***	1
6	Set of pads (constituted of 2 pads rep 6)	DA 405 FEM/FEA	***JG004ATV 132***	1
6	Set of pads (constituted of 2 pads rep 6)	DA 305 FEM/FEA	***JG003ATV 132***	1
Electrical switches (excluding special versions)				
12,14	Brake release, brake applied, pad wear monitoring switch	DA 505/450; 405; 305 FEM/FEA	***CON XCK M110***	1
16	Manual release monitoring switch	DA 505/450; 405; 305 FEM/FEA	***CON XCK M102***	1
27,29,31	Brake release, brake applied, pad wear monitoring switch	DA 445 FEM/FEA	***CON XCK D2111P16***	1
30	Manual release monitoring switch	DA 445 FEM/FEA	***CON XCK D2102P16***	1
Calipers supplies				
19	Exhaust filter	All sizes	***FOUPAST100***	1
Complete coil (excluding special voltages)				
Complete with armature, guide, axle, mounted seal, terminal box (sensor support plate for DA 445 FEM/FEA)				
		DA 505 FEM/FEA	***BOBCOM-5SE-65***	1
		DA 450 FEM/FEA	***BOBCOM-450SE-65***	1
		DA 445 FEM/FEA	***BOBCOM-45SE-65***	1
		DA 405 FEM/FEA	***BOBCOM-4SE-65***	1
		DA 305 FEM/FEA	***BOBCOM-3SE-65***	1

When ordering, specify the type and S/N of the brake and the part number required.

6. Specific tooling

Rep.	Description	Rail type	Item code	Qty
None				

7. APPENDICES

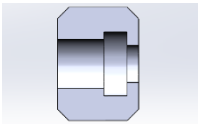
This chapter describes the various options available on the caliper:

- Lateral manual release (with nuts)
- Vertical mounting
- Brake release monitoring switch
- Wear or adjustment monitoring switch
- Manual release monitoring switch
- Brake applied monitoring switch

7.1 Lateral manual release (with nut)

- Presentation

Two different nuts are used depending on how the brake is used:



- **Operation nut,** special M10 nut with integrated stop**:**

- **Manual release nut,** standard M10 H nut painted red**:**

Figure 7.1 shows brake in operation (not released).

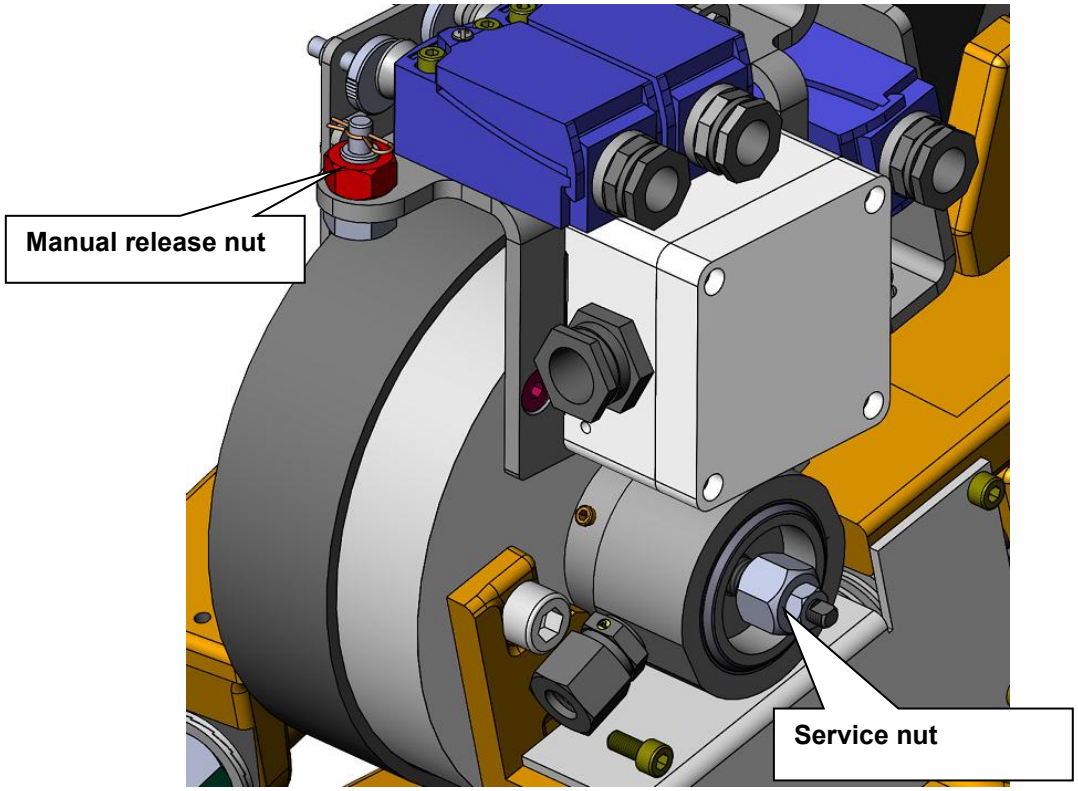


Figure 7.1

7.1.1 Deactivating of the lateral manual release

Tooling:

- Hexagon socket 17 mm on flats
- Flat wrench 10 mm on flats

Procedure:

1. Energize brake to maintain opening.

2. Remove M6 locknut H at shaft end. Slowly unscrew the manual release nut (red).

3. Insert the manual release nut on the parking screw in place of the operation nut, and fit the safety beta pin:

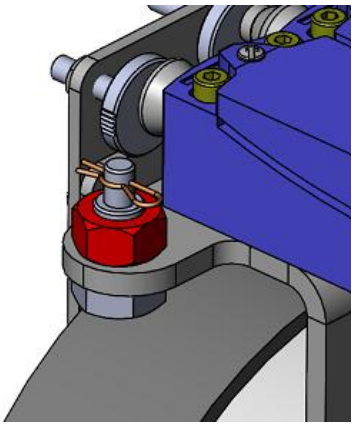


Figure 7.2

4. Place the operation nut on the coil axle and screw it on by hand until it stops on the axle shoulder. Do not force.

5. Screw the M6 H locknut back onto the operation nut.

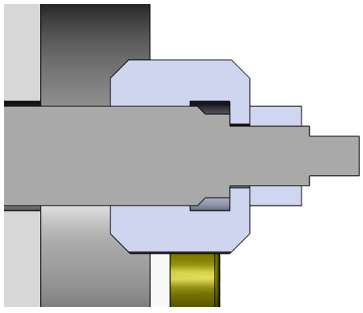


Figure 7.3

The brake is now ready for normal operation.

7.1.2 Activating the lateral manual release (with nut):

Tooling:

- Hexagon socket 17 mm on flats
- Flat wrench 10 mm on flats

Procedure:

1. Energize the brake to open it.

2. Unscrew M6 locknut H.

3. Unscrew service nut.

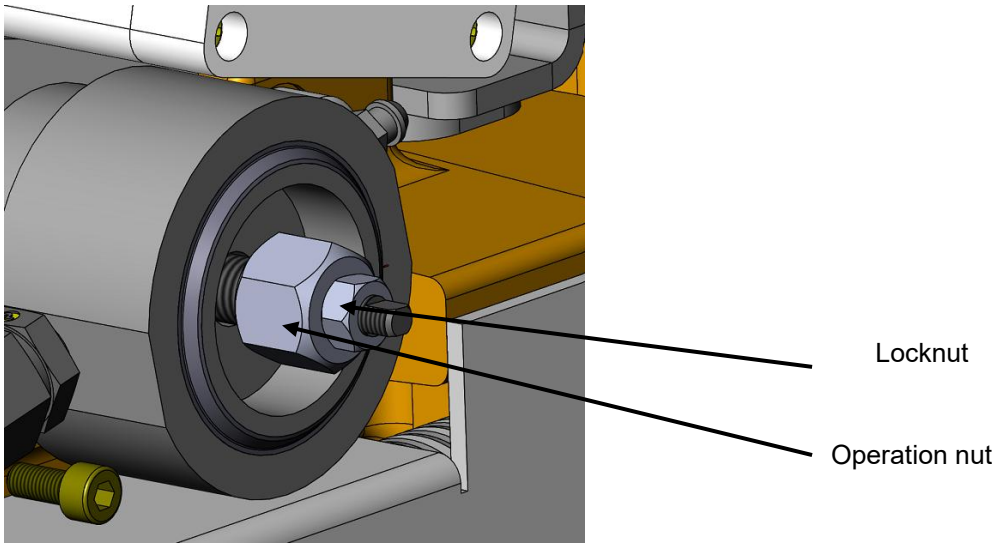


Figure 7.4

4. Insert the service nut on the parking screw in place of the manual release nut, and fit the safety beta pin (Figure 7.5):

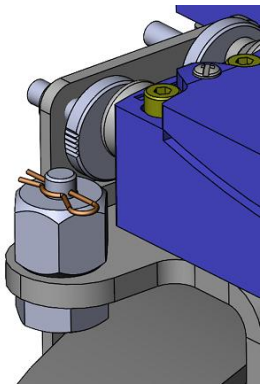


Figure 7.5

5. Place the manual release nut on the coil pin and screw on using a sleeve until it stops on the piston. Do not force.

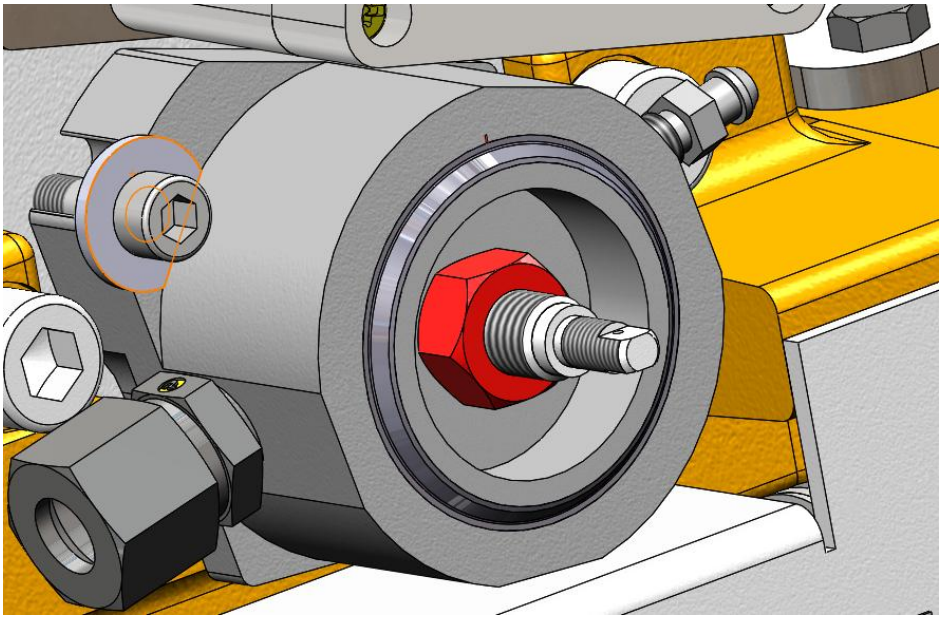


Figure 7.6

6. Replace locknut H M6.

7. Switch off brake supply.

The brake is now manually released.

	MANUAL RELEASE	
	Torque nut (Nm)	**Max. Torque nut (Nm)**
DA 445 FEM/FEA	9	12
DA 405 FEM/FEA	18	22
DA 305 FEM/FEA	21	25

Important!

The manual release must be deactivated for the brake to operate correctly.

7.2 Option: Vertical mounting

Information!

The calipers for vertical mounting with the ratchet below are fitted with an additional compression spring and an adjustment screw.

Tooling:

2 x 10mm wrenches on flats.

After following the clamp installation instructions in chapter 0, follow the procedure below:

1. Screw in or out the M6 H screw, loosening the locknut beforehand, so that the clearance between the disc and gaskets is evenly distributed (the top gasket must not touch the disc).

2. Re-tighten locknut and visually check packing clearance. If necessary, refer to chapter 4.3 to adjust pad clearance.

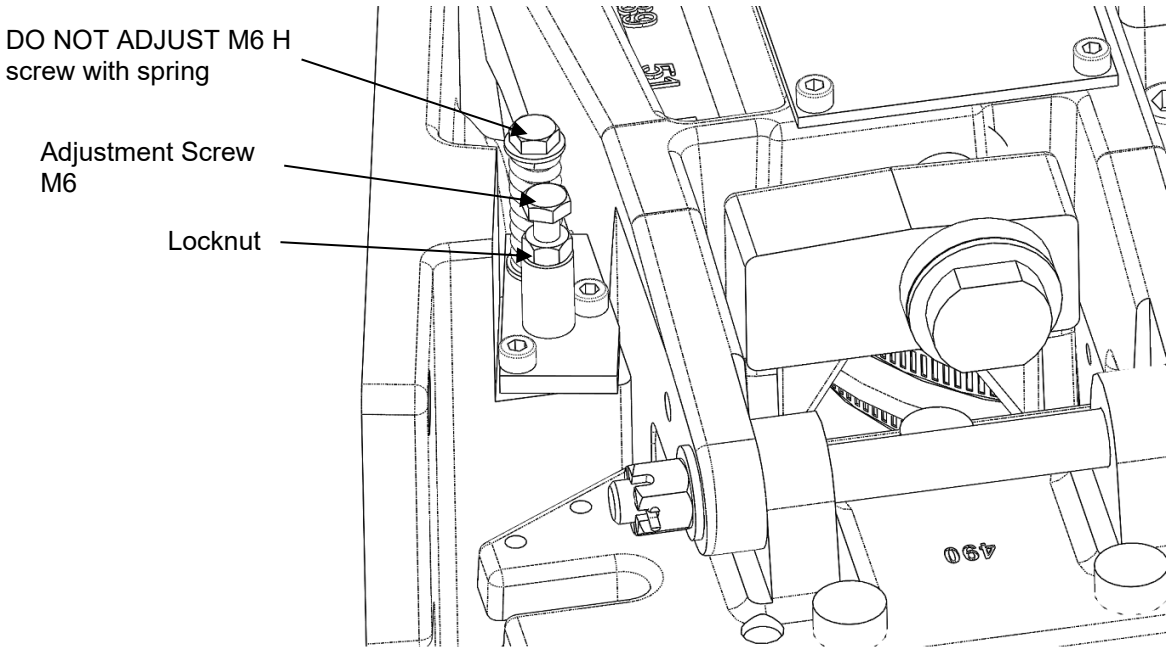
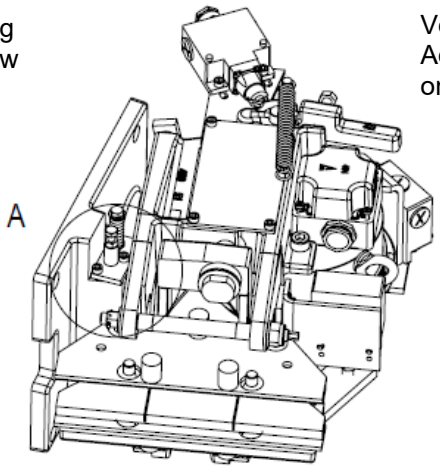


Figure 7.7

Information!

The procedure is valid, both mounting ways: ratchet in top position, as well as in bottom position.

Vertical mounting
Adjustment screw
below



Vertical mounting
Adjustment screw
on top

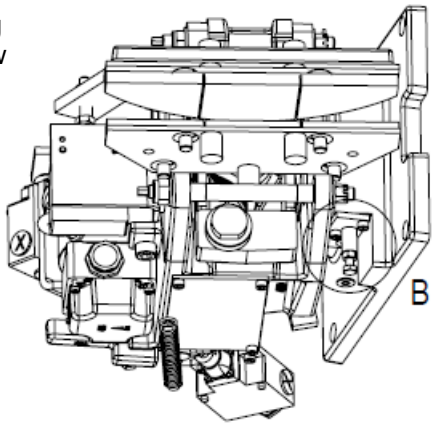


Figure 7.8

7.3 Adjusting the brake off monitoring switch

7.3.1 Switch

Information!

The switch is factory set and does not need any adjustments.

The switch **12** indicates the position of the caliper, **closed** or **released**.
It is triggered by the stop plate **13** connected to the displacement of the actuator.

The switch must be activated when the caliper is released (brake off).

“R + C” snap-action two-pole switch

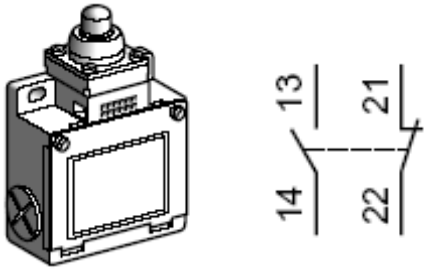


Figure 7.9

Connection:

Stuffing box with tightening capacity 6 to 11 mm
Connect to terminals 13 – 14 inside the switch.

If this switch needs to be adjusted:

7.3.2 For caliper DA 305

Tooling: *Male wrench 4 mm A/F.*

Procedure:

1. Energize the caliper.

2. Using the adjustment slots on the stop plate **13**, press switch **12** until it is activated, then push forward about 1 to 2 mm.

3. Tighten the attachment screws with a 4 mm Allen wrench.

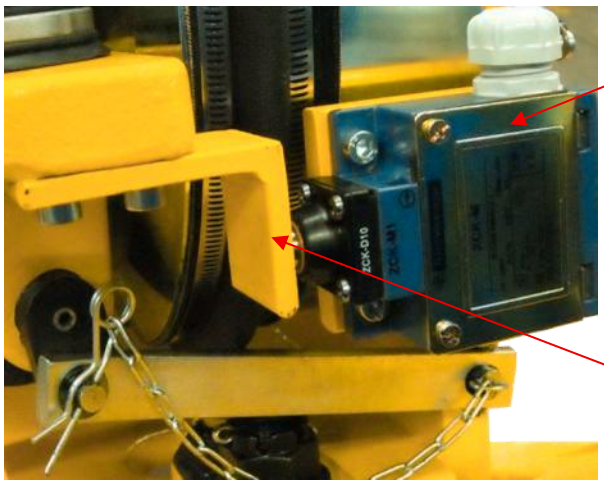


Figure 7.10

Important

The attachment screws of the switches, stop plates and switch brackets must all be locked with adhesive (LOCTITE Normal thread lock 243).

7.3.3 For caliper DA 405

Tooling: *Male wrench 6 mm A/F - open-end wrench 13 mm.*

Procedure:

1. Energize the caliper.

2. Using the adjustment screw (6 mm hexagon socket screw) on the stop plate **13**, press the switch **12** until it is activated, then push forward about 1 to 2 mm.

3. Tighten the locknut with a 13 mm open-end wrench.

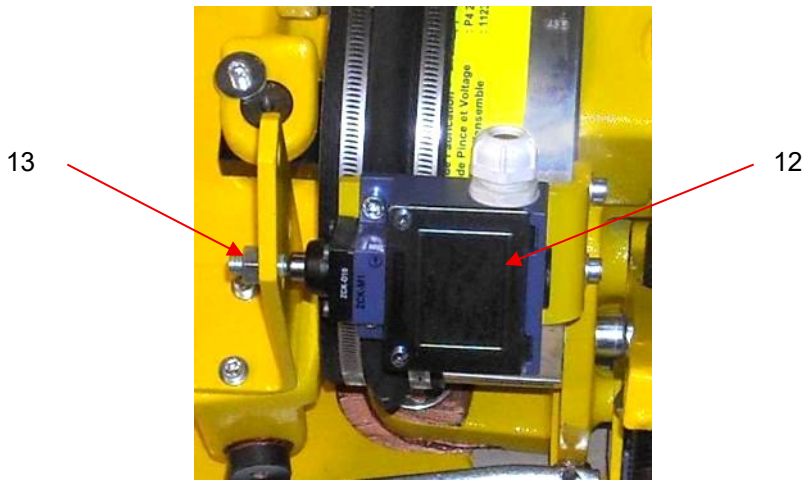


Figure 7.11

7.3.4 For caliper DA 505 / 450

Tooling: *Male wrench 4 mm A/F*

Procedure:

1. Energize the caliper.

2. Using the adjustment slots on the stop plate **13**, press switch **12** until it is activated, then push forward about 1 to 2 mm.

3. Tighten the attachment screws with a 4 mm Allen wrench.

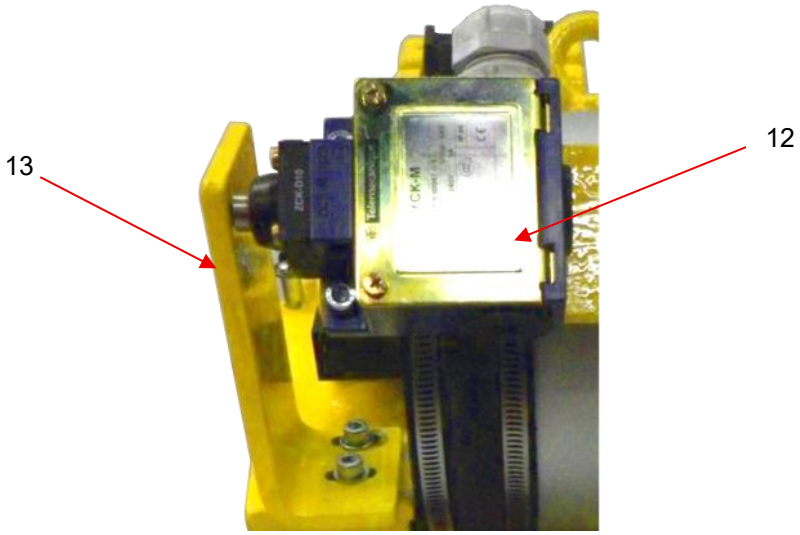


Figure 7.12

Important

The attachment screws of the switches, stop plates and switch brackets must all be locked with adhesive (LOCTITE Normal thread lock 243).

7.3.5 For caliper DA 445

“R + C” snap-action two-pole switch

Contact mécanique compact à une entrée de câble ISO M16 x 1.5

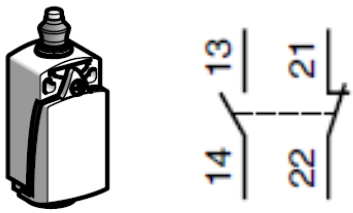


Figure 7.13

Tooling: 8mm wrenches on flats.

Procedure:

1. Energize the caliper.

2. Using the adjustment slots on the stop plate **13** (knurled screw), press the switch **27** until it is activated.

3. Check contact status (“Closed” position). If this information is not obtained, unscrew the knurled screw until the status changes.

4. Slightly retighten knurled screw locknut (8 mm on flats)

5. Open and close the caliper. Check that contact status changes for both positions: “Open” / “Closed”.

6. Tighten locknut (8 mm on flats) on knurled screw.

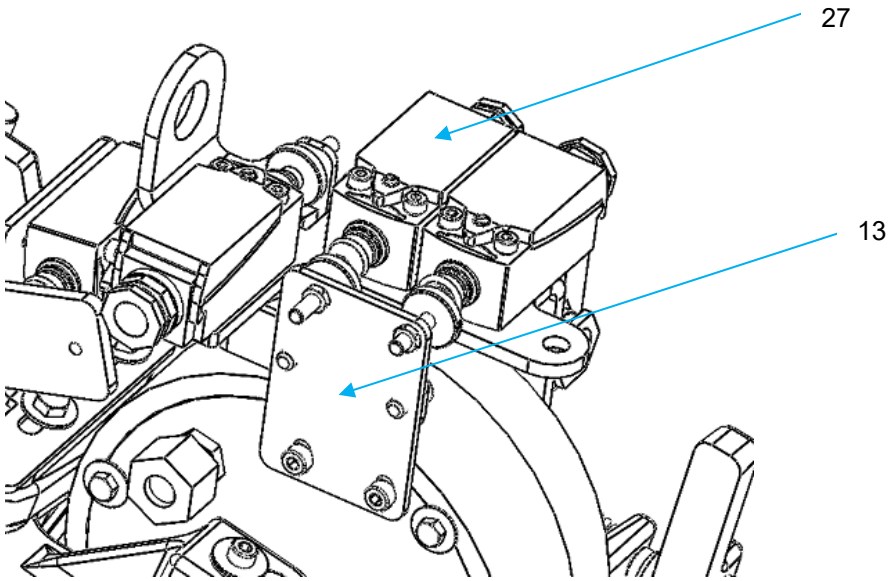


Figure 7.14

7.4 Adjusting the release switch (without lateral cylinder)

Information!

The switch is factory set and does not need any adjustments.

The switch **16** indicates if the caliper is manually released (by the manual locking screw **4**).
The switch is activated when the caliper is released manually.

"R + C" snap-action two-pole switch

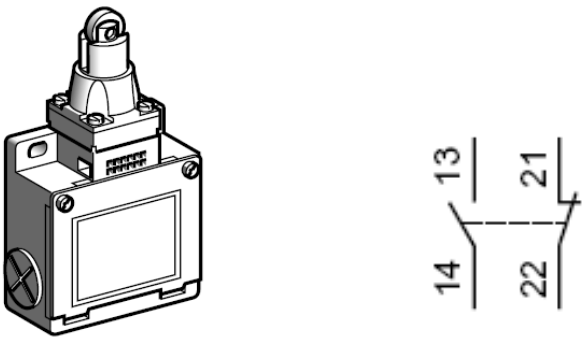


Figure 7.15

Stuffing box with tightening capacity 6 to 11 mm
Connect to terminals 13 – 14 inside the switch.

If this switch needs to be adjusted:

Tooling: Male wrench 4 mm A/F.

Procedure:

1. The lever **11** being in manual release position (see §5.1), using the adjustment slots, place the switch in such a way that its push rod is pressed.

2. After the switch screws are tightened, verify that the switch changes position when the screw **4** is fully unscrewed.

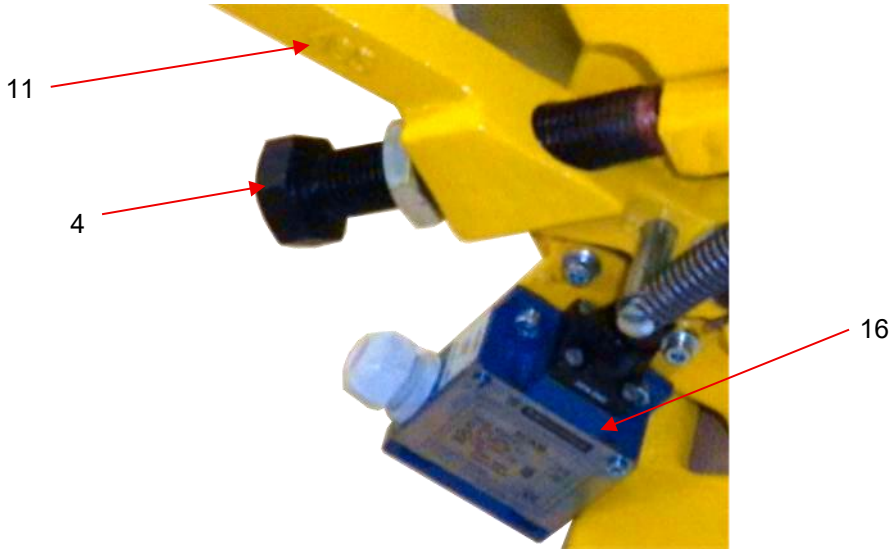


Figure 7.16

Important

The attachment screws of the switches, stop plates and switch brackets must all be locked with adhesive (LOCTITE Normal thread lock 243).

7.5 Adjusting the pad wear switch

Information!

The switch is factory set and does not need any adjustments.

The switch **14**, depending on the pad wear compensation the brake has:

FEA: Signal, if the brake pads need to be replaced
FEM: Signal, if the air gap between brake pads and brake disc needs to be adjusted.

“R + C” snap-action two-pole switch

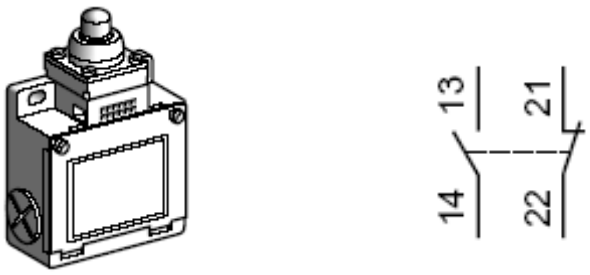


Figure 7.17

Stuffing box with tightening capacity 6 to 11 mm
Connect to terminals 13 – 14 inside the switch.

To adjust the pad wear switch:

Tooling: *Open-end wrench 10 mm A/F - 14 mm shim*

Procedure:

The caliper being equipped with new pads and tightened on the disc:

1. Loosen the 2 attachment H screws (10 mm A/F) on the switch bracket **21.**

2. Put a 14 mm shim between the stop plate **15** and the switch head **14**.

3. Adjust the switch until it is activated.

4. Tighten the 2 attachment H screws (10 mm A/F) on the switch bracket **21** and then remove the shim.

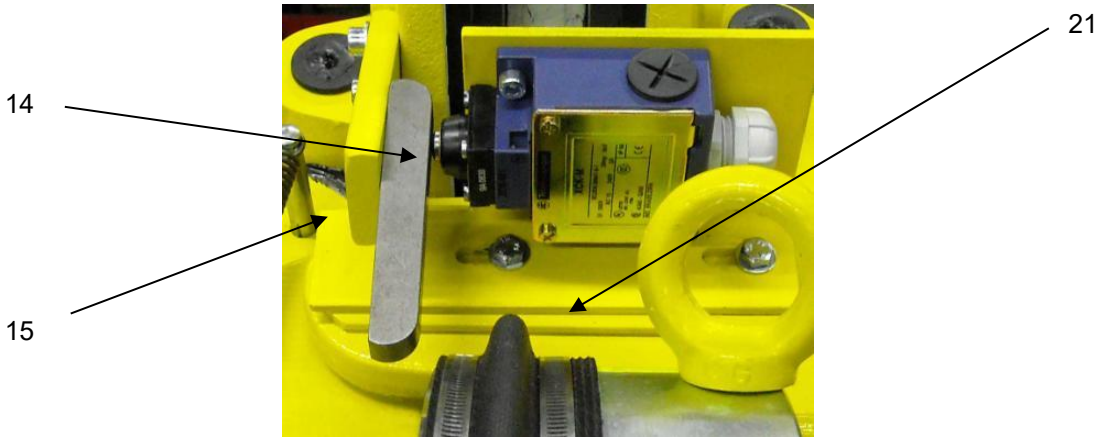


Figure 7.18

Important

The attachment screws of the switches, stop plates and switch brackets must all be locked with adhesive (LOCTITE Normal thread lock 243).

7.6 Adjusting of Brake applied monitoring switch (caliper DA 450 FEM and DA 305 FEM)

Contact 29 is designed to signal brake applied.

The Brake applied monitoring switch must be activated when the brake is closed.

“R + C” snap-action two-pole switch

Compact mechanical contact with one ISO M16 x 1.5 cable entry

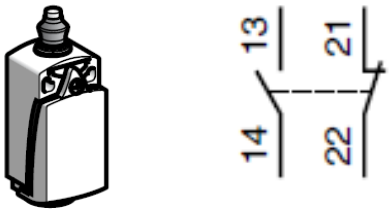


Figure 7.19

To adjust the brake applied switch:

Tooling: 8mm wrench on flats.

Procedure:

1. Apply power to the clamp and check that the pad clearance is correct. If not, refer to chapter 4.3.
2. Switch off brake power supply.
3. Unscrew the lock nut (8 mm on flats) then tighten the knurled screw to push the contact head all the way in.
4. Using a multimeter, gently loosen until the state changes.
5. Once the position has been confirmed, loosen the knurled screw again by 1/4 turn.
6. Open and close the brake to check that the contact changes state correctly.
7. Once adjustment is complete, retighten the knurled screw locknut.

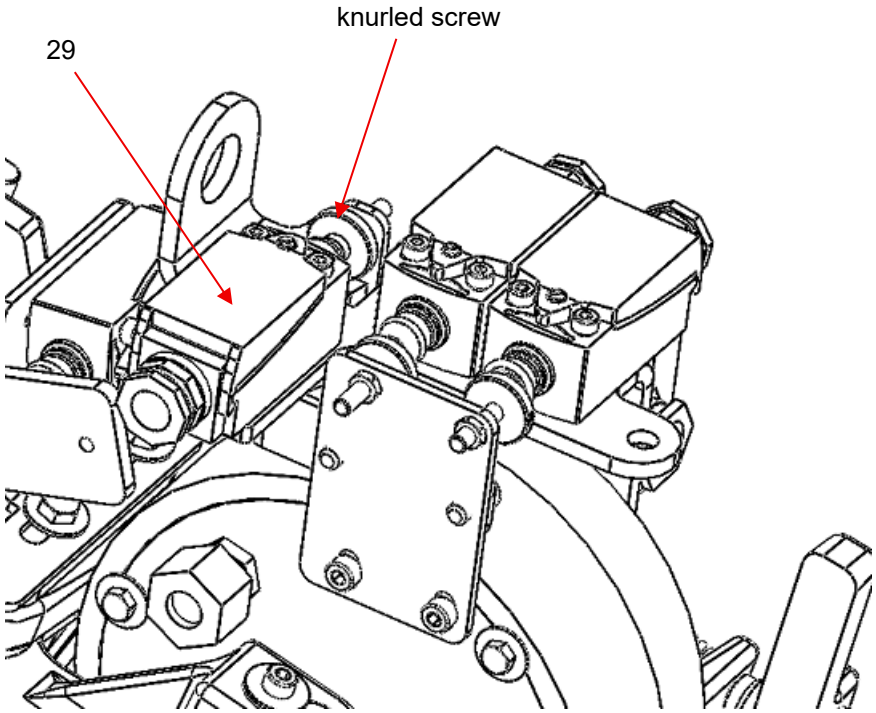


Figure 7.20

8. Operating Faults Only

KIND OF DEFECT	CHECK	REMEDY
The caliper does not release.	- Voltage present at power supply input. Nominal voltage: - 10% Max.	➢ Supply the power
	- Position of fuse.	➢ Put the fuse in the correct position.
	- Drain voltage (between 40 and 60 V) for ≈ 1 s.	➢ Replace the control card
	- Check the pad clearance.	➢ Readjust the pads between **0.7 mm** and **1 mm**.
The caliper does not stay released.	- Hold voltage present ≈ 10 V	➢ Replace the control card
	- Gap is clogged, the armature does not make contact.	➢ Clean the gap. Ensure cleanliness of the seal and filter **19**.
Braking power decreases	- Check the pad clearance.	➢ Adjust the pad clearance.
	- Check the condition of the pads and the disc (wear or splashing of fats).	➢ Replace the pads and clean the disc
Dissymmetrical worn pads	- Perpendicularity of the bracket to the disc	➢ Reset the caliper
Abnormal heating of the disc when running starts.	- Space between pads and disc is too small, when caliper is released.	➢ Readjust the pads between **0.7 mm** and **1 mm**.
	- Correct mounting of the caliper.	➢ Reset the caliper

9. Reference drawing

Brake DA 505/450; 405; 305 FEM/FEA

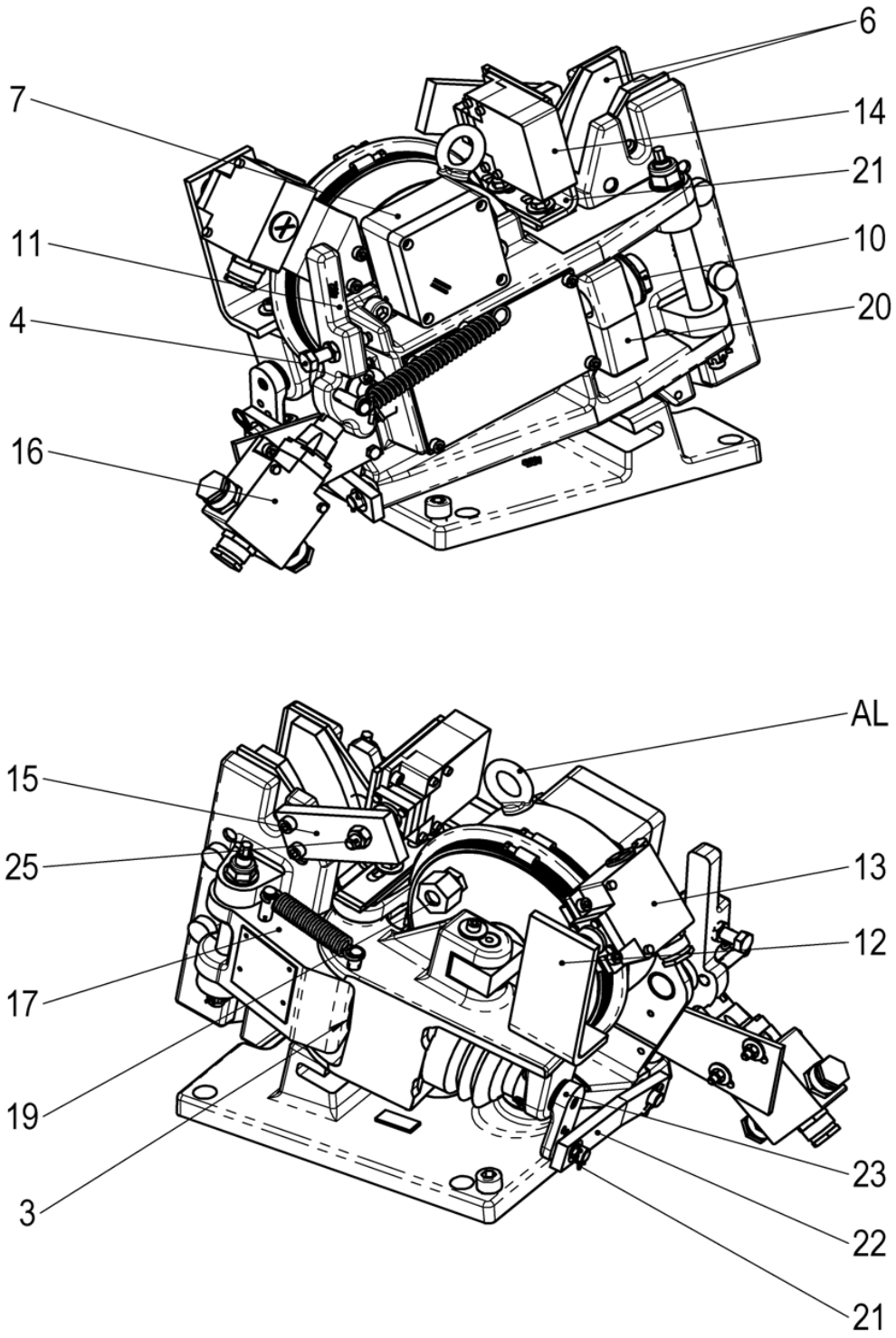


Figure 9.1

Brake DA 445 FEM/FEA identical except:

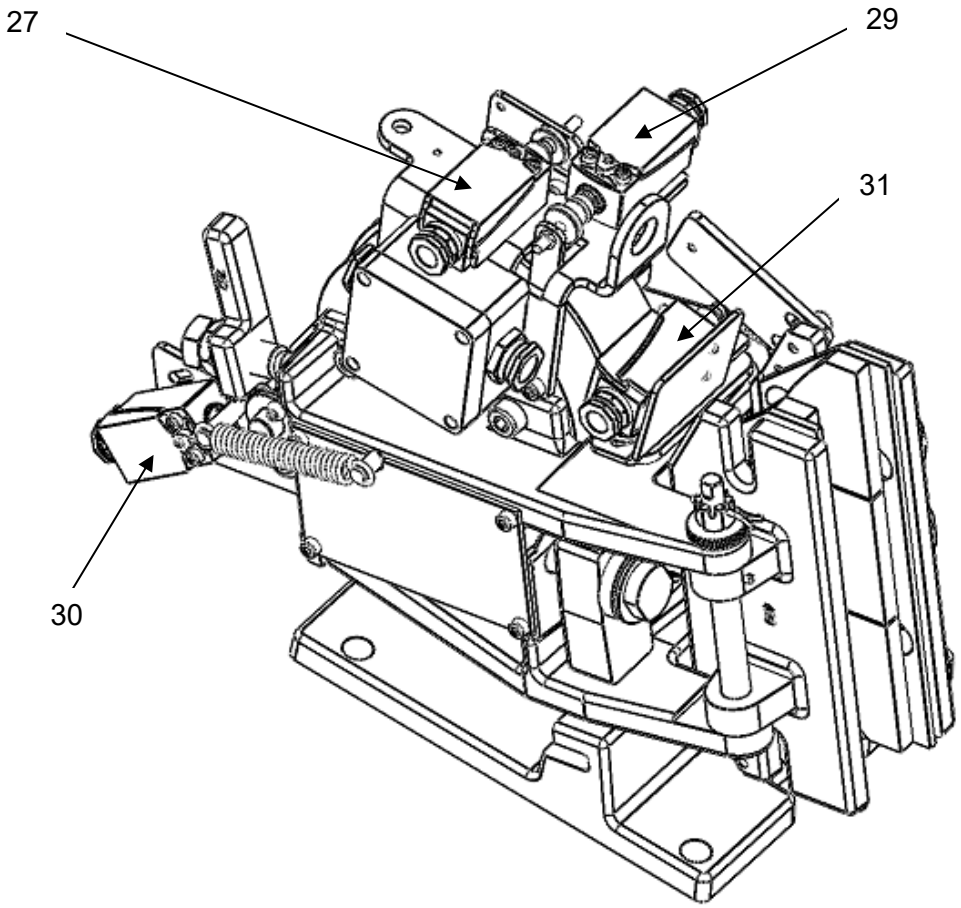


Figure 9.2