

Installation and operating instructions for Brake HS 165 FHM

E 09.778e



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RINGSPANN	Installation and operating instructions for Brake HS 165 FHM spring activated – hydraulically released	E 09.778e			
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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 these installation and operating instructions invalidates any product liability or guarantee 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 Principle

The HS 165 FHM calipers are hydraulic fail-safe calipers; the braking force is applied by spring washers and hydraulic pressure is necessary to hold the brake released. The stack of spring washers is adjusted in factory. This adjustment, combined with adjustment of the pads gap, determines the braking torque value.

There is a type plate on the brake with a 16-digit article number. The exact design of the brake is defined by this article number only.

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.

The Caliper is describe as “manually readjusted”. This means that the pad wear must be compensated for by manual adjustment of the pad gap to avoid any loss of braking force.

The brakes have a manual release device mechanically holding the caliper open, without any need for a hydraulic pressure. This release is useful for installation and maintenance work when there is no hydraulic pressure available.

1.2 Delivery condition

The caliper is delivered in the following conditions:

- In manual release position, i.e. manually locked in open position,
- With pads installed,
- Adjusted with the nominal lining gap,
- The holding force adjusted according to customer’s specifications,
- Mechanical contacts adjusted,
- With bleed screw in correct position.
- As well as these instructions, please also consider the catalogue data for the brake at www.RINGSPANN.de and the drawings in the individual sections.

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Life-threatening danger!

Disc must be absolutely degreased before all contact with the brakes linings.

In case of lining pollution with grease, the nominal brake force is not guaranteed.

**Calipers are fail safe components.
All setting and repairs must be performed by skilled operators.**

**BE CAREFUL: The caliper is delivered in " manual release" position and the holding force is adjusted in the factory.
Instructions in this manual must be followed up to chapter 2.4 inclusive (INITIAL START-UP) to ensure that the brake is operational.**

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 springed thrusters of the brake. The spring thruster may only be disassembled by the factory.

2 Installation

2.1 Preparing the positioning area

Ensure that the positioning surface is clean and dry.
Make sure that there is sufficient space around the brake.
Check that the mounting holes are in conformity (center distances, sizes and numbers).

Brake HS 165 FHM-420 L-H (Thrustor mounted left shown)

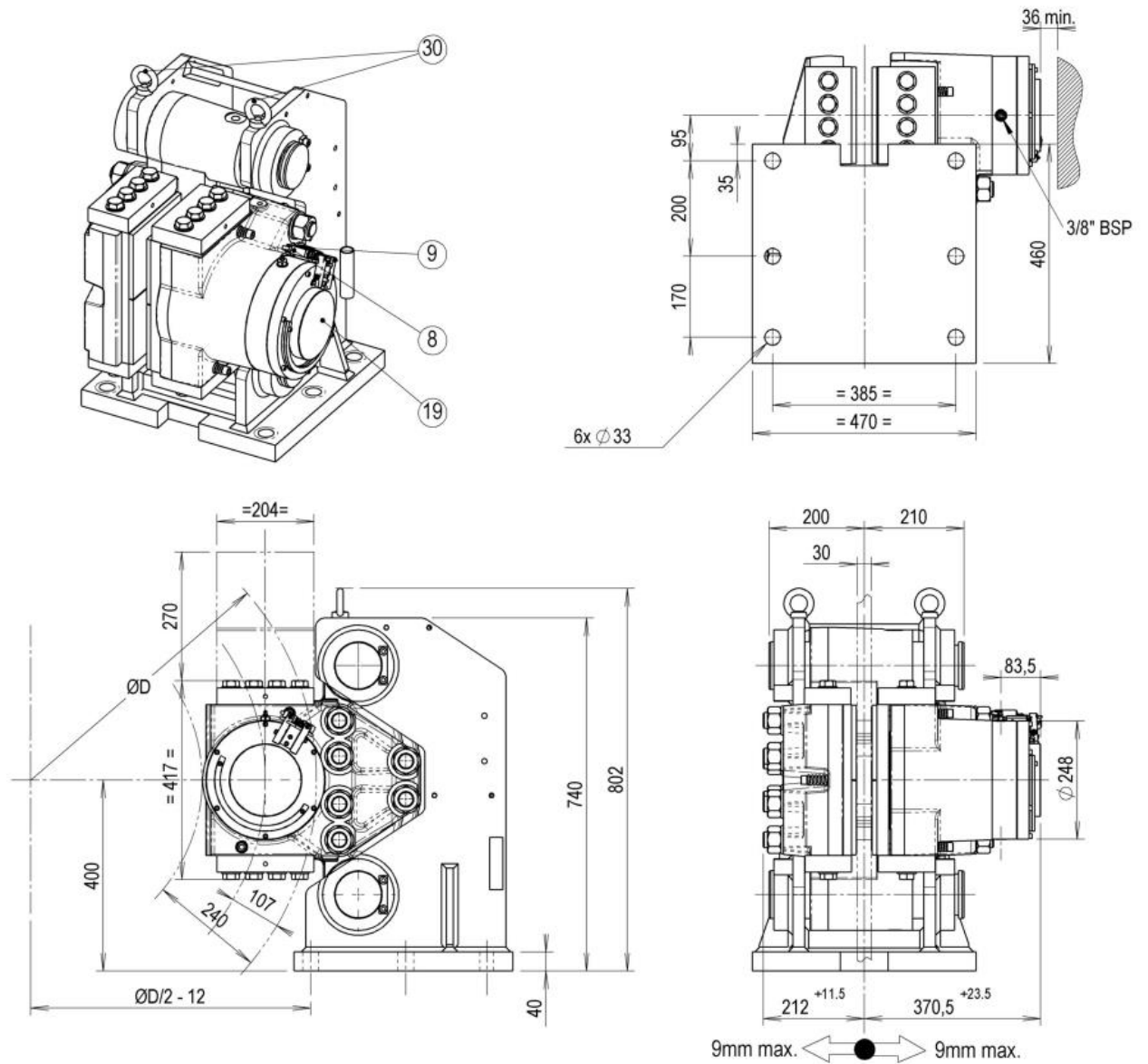


Fig. 2.1

Brake HS 165 FHM-420 R-V

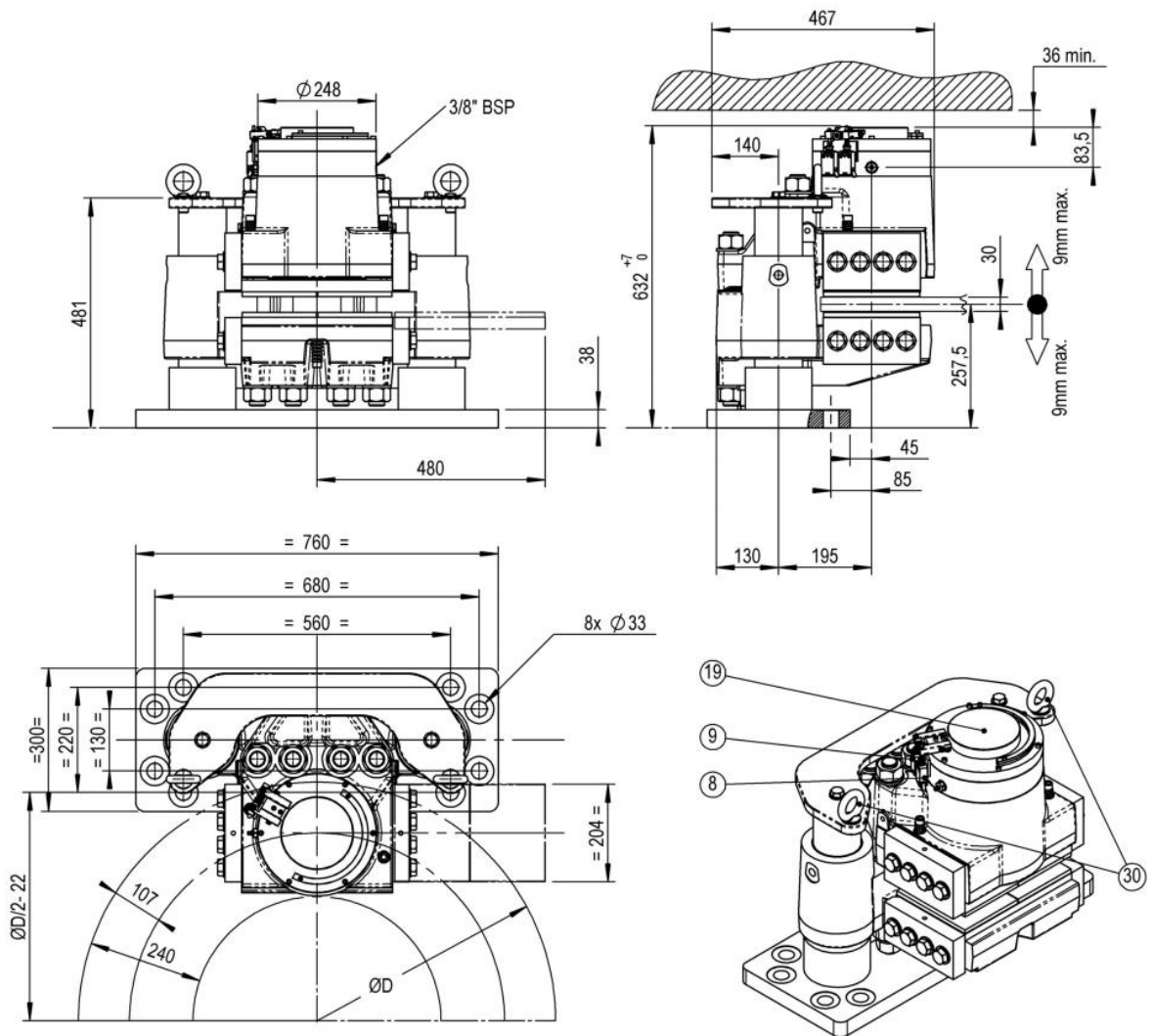


Fig. 2.2

- 8 Brake off monitoring switch
- 9 Pad gap monitoring switch
- 19 Manual release and adjustment screw
- 30 Lifting eyes

2.2 Installing the disc

Make sure that the disc is accurately positioned and attach it to its hub.
 Check that the disc is not buckled more than 0.3mm.
 Check that the disc is 30mm thick standard arrangement.

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Important!

If these conditions are not complied with, the caliper cannot be assembled or will not operate to standard. Contact RINGSPANN for more details.

First clean the disc tracks with the degreasing agent:

- Quick drying degreaser (CRC / KF)



Important!

BE CAREFUL: The disc must be degreased and free of any deposits so as not to decrease the friction coefficient.

2.3 Installing the caliper

2.3.1 List of tools

1. 1200Nm torque wrench, socket measuring 46mm across flats for brake attachment.
2. AF spanner, Flexible pipe inside Ø6mm (Bleed).

2.3.2 Brake handling

Put the assembly in position on the disc, raising it with lifting eyes Fig. 2.1 and Fig. 2.2.
Weight for one caliper: HS 165 FHM-___ H = 625kg HS 165 FHM-___ R-V = 528kg

2.3.3 Alignment procedure

1. Brake HS 165 FHM-420 R-V Check the disc position 257,5 +/-9 mm Fig. 2.2 use the balancing screw (16mm on flats) and that the disc is parallel // 0,3 to the brake pad. Check that the support balance in relation to the disc is less than 0,2mm. Check that the disc is fully between the pads.
2. Brake HS 165 FHM-420 H check the disc position 8mm mini fixed pad side 2a; 18mm mini from the other side 2b Fig. 2.3.

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A crowbar can be used in the area shown by the arrow **2a** and **2b** to slide the caliper from one side to the other.

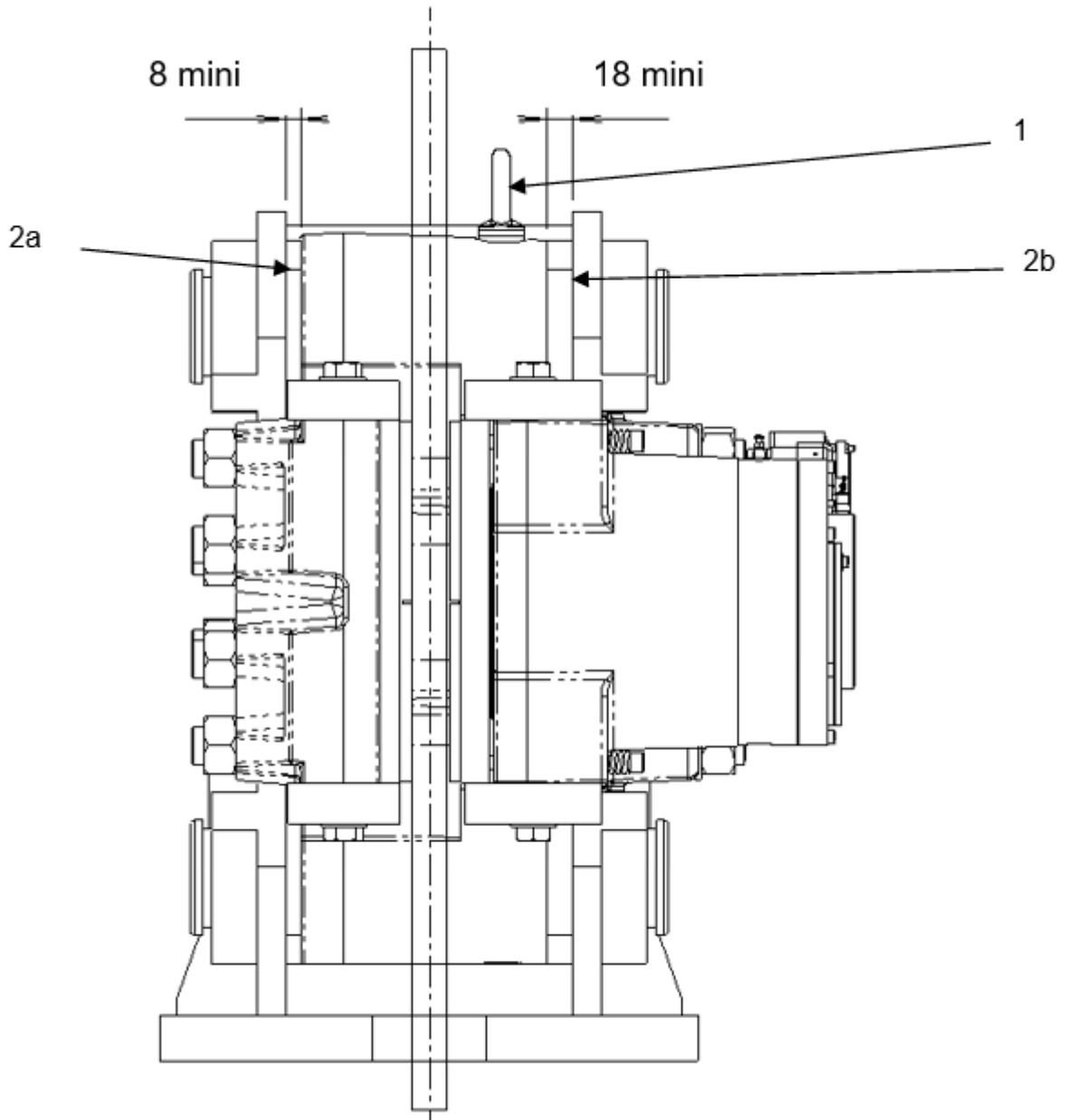


Fig. 2.3

Check that disc deflection in relation to the support does not exceed 0.3mm.
Check parallelism of the fixed pad **3** Fig. 2.4 in relation to the disc using a set of laminated shims, in compliance with the following spacing:

Transversal spacing: 0.2mm maxi. over pad width.

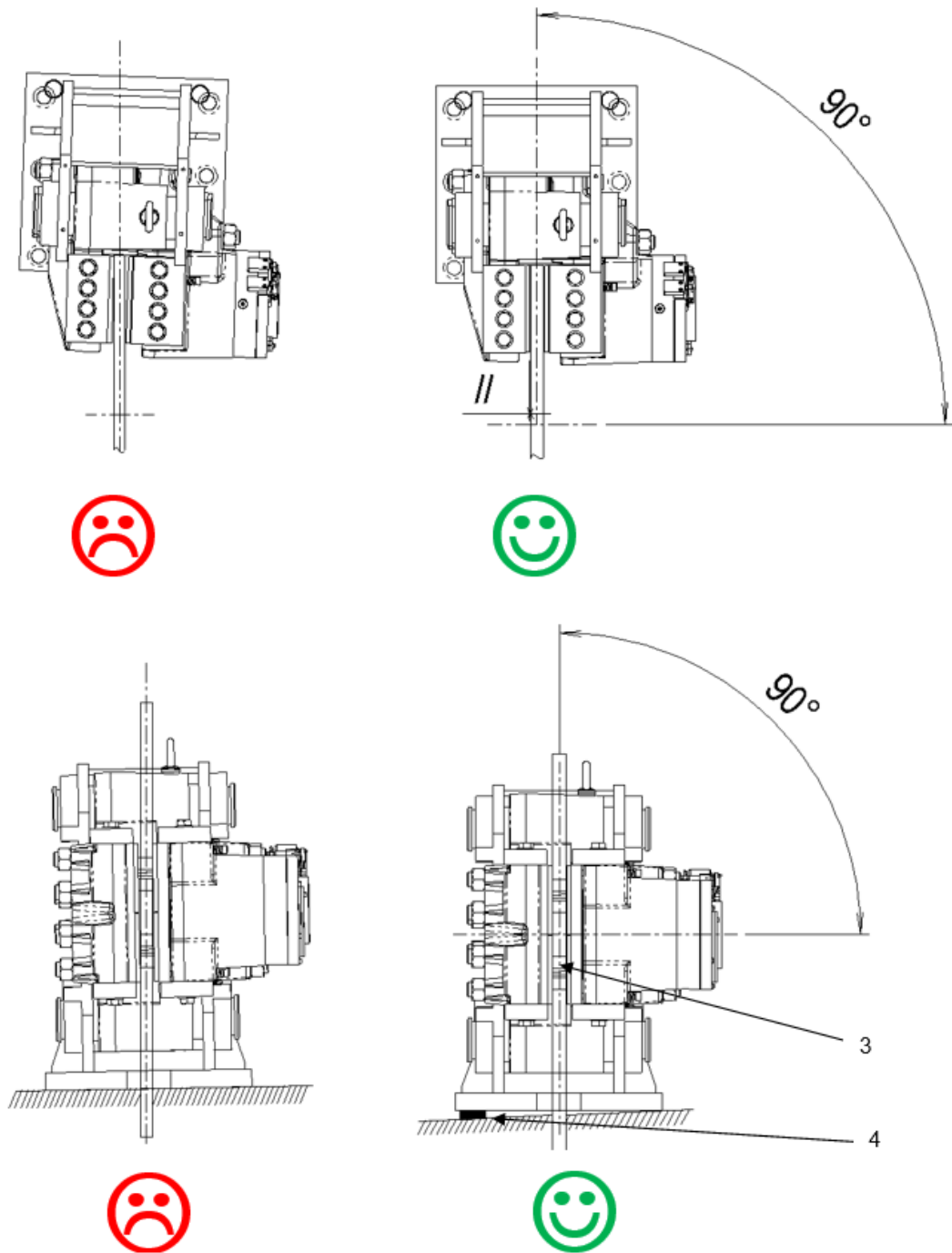


Fig. 2.4

Longitudinal spacing: 0.3mm max. over pad length. If necessary, set the support using foil 4 located close to the attachment screws Fig. 2.4.

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3. Position the screws M30 class 8.8 for caliper to the basement connection.

The tightening torque (Cs) which has to be applied on the screws M30 class 8.8 rows for each nut is: **Cs = 1200Nm ±10%** with greased screws.

Brake HS 165 FHM-420 R-V 8 screws M30 class 8.8

Brake HS 165 FHM-420 L(R)-H 6 screws M30 class 8.8



Important!

Check the tightening torque

4. Check, after having tightened to torque, that the whole part has not moved.

2.3.4 Orientation of the piston heads

If the caliper stands on a horizontal support, the orientation of the piston heads is not important.

For other positions, the piston heads must be oriented: Bleed screw 11271-17 on top Fig. 2.5 and connecting plug on bottom, in a vertical plan $\pm 30^\circ$. For more information, please contact RINGSPANN.

2.3.5 Hydraulic connection



Important!

**Opening pressure: 230bar
MAX PRESSURE: 250bar**

For an ambient temperature range from 0 through 60°C, recommended oil is ISO HM32. By instance, RINGSPANN uses FUCHS RENOLIN EXTRA 32S.

Use a mineral oil with a viscosity range between 10 and 380mm²/s (optimal range between 12 and 100mm²/s) while allowing for the ambient temperature conditions



Important!

***This oil must be clean
(maximum permitted level of pollution as per NAS 1638: 10µm).
Use only new fluid and never mix several types all brands of fluid.***

The caliper must be connected to its source at a hydraulic pressure 250bar max, by threaded plug G 3/8". Fig. 2.5.
Do not use hemp, mastic, Teflon (etc.) and use flexible hoses exclusively.
It is preferable to use liquid joints.
Clean the pipes and couplings while ensuring that they are perfectly clean (soiling, scale, swarf, etc.).

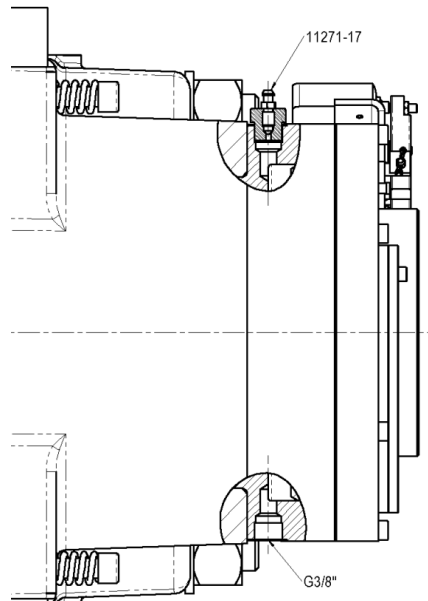


Fig. 2.5

2.3.6 Electrical connection

Opening and wear contact:

Bipolar switch

Mechanical contact output by
cable 5 wire x 0.75mm²
Standard length of the cable: 2m.

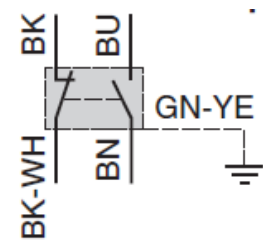
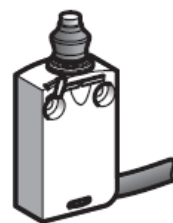


Fig. 2.6

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2.4 Initial start-up

2.4.1 Hydraulic circuit bleed

Tools: AF spanner, 6mm ID flexible hose.



Important!

Take the necessary precautions to avoid the oil being sprayed onto the disc.

1. Connect the bleed screw 11271-17 to a 6mm ID flexible hose and put the end of the hose into a container Fig. 2.7.
2. Feed oil to the caliper from the power pack, then from the hand pump.
3. Loosen slightly the bleed screw 11271-17.
4. When the oil pours out continuously and there are no more air bubbles at the end of the hose, tighten the bleed screw 11271-17.
5. Disconnect the flexible hose (beware of any oil remaining in the hose)



Important!

**This file must be clean
(maximum permitted level of pollution as per NAS 1638: 10µm).
Use only new fluid and never mix several types all brands of fluid.**

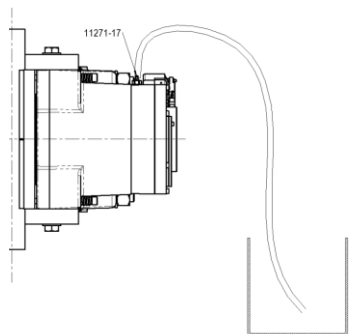


Fig. 2.7

2.4.2 Deactivate the manual release

The principle is to position the stopping rings in the piston groove once the pressure is applied. They are fixed in position by 2 screws Fig. 2.8.

When the caliper is in operating mode, the rings are screwed to the cover in holding position.

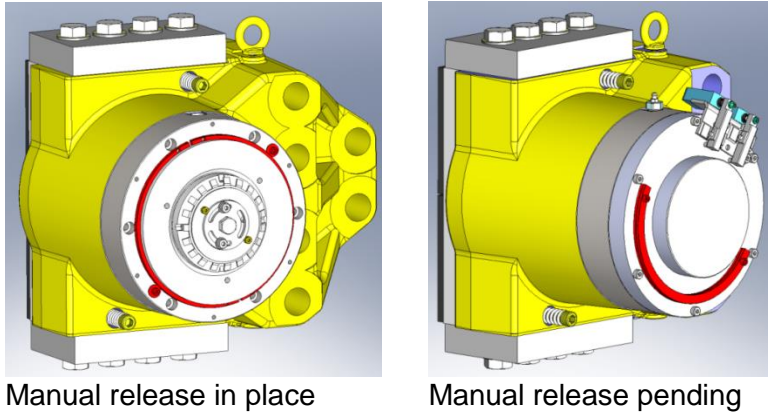




Fig. 2.8

Refer to chapter 5.2 for more information about the manual release mode

	<p>Important!</p> <p>The manual release must be deactivated to ensure a well running of the brake.</p>
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2.4.3 Adjustments of pad gap

	<p>Important!</p> <p>Contact are factory set and do not need any adjustment. If necessary, follow the procedure chapter 5.3</p>
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First check the thickness of the disc. Use a set of laminated shims to verify that total gap between the pads and the disc is corresponds to the "PG= Pad Gap on the type plate.

The pad gap must be equal both side $PG = (a+b)$

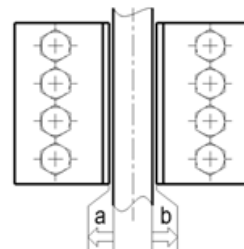


Fig.2.9

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2.4.4 Control of the general running



Important!

Be Careful: The disc must be degreased and free from any deposits so as not to decrease the friction coefficient.

Check the well running of the electric contacts.

Run the brake under no-load with the disc turning, 20 or so times, to bed in the pads.



Information!

THE SYSTEM IS NOW OPERATIONAL

3 Operational RUNNING

3.1 Caliper tightening

The lack of hydraulic pressure allows the pads to be tightened on the disc.
The opening contact is not activated.

3.2 Caliper untightening

Apply opening pressure to open the brake.
The opening contact is activated.

3.3 Caliper manual release

Manual release keeps the caliper open without hydraulic pressure.
Refer to chapter 5.1 and chapter 5.2.

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4 PERIODIC MAINTENANCE

Every two months, check:

- As a general rule, inspect the entire system for correct operation
- Check that there is not any leakage
- Also, check the brake pad gap see chapter 5.3.



Attention!

When the remaining lining thickness reaches 3mm, proceed to pad exchange as per chapter 5.4. If this rule is not observed, a loss of breaking force may occur.

Every two years, replace:

- Oil in the *power pack* (refer to the power pack instructions)

Every five years:

- Plan complete overhaul of the entire unit (replace worn parts, seals, spring washers, flexible hoses...)

5 Maintenance

5.1 Manual release: activation

1. Supply the caliper with a opening pressure and maintain the pressure until point 6.
2. Remove the 2 retaining segments **14** by their 2 screws **V03** on the cover **21**.
3. Remove the cover **21** via its 6 Allen screws **V09**.
4. For an easier handling, it is possible the remove the connector of indicator switches
Fig.5.1. Unlock the connector by insert the screwdriver behind the connector and turn it a 1/4 of a turn counter-clockwise and then insert the screwdriver into the slot at the side to release the connector.

In 'ATEX' execution, it is not possible to remove the connector

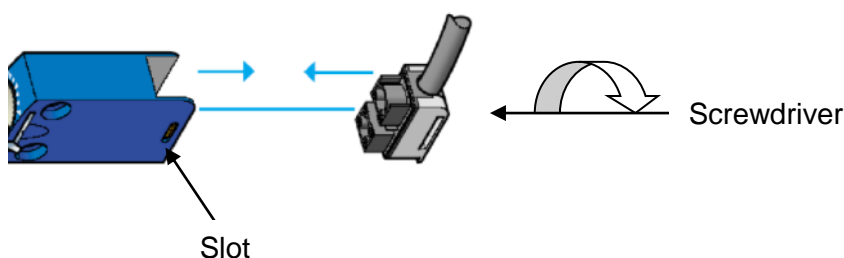


Fig. 5.1

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5. Put the 2 retaining segments **14** in the piston groove **04** Fig. 5.2.
6. Screw the 2 screws **V03** into the unlock position to securely hold the retaining segments.
7. Cut off the pressure.
8. Remove the 2 screws **V03** to put them on the cover **21**
9. Replace the cover **21** and tighten the 6 screws **V09**.
10. Re-engage the connectors in the switches and lock with the flat screwdriver by a 1/4 of a turn clockwise.



Attention!

MOVEMENT IS STILL POSSIBLE AFTER CUTTING OFF THE PRESSURE.

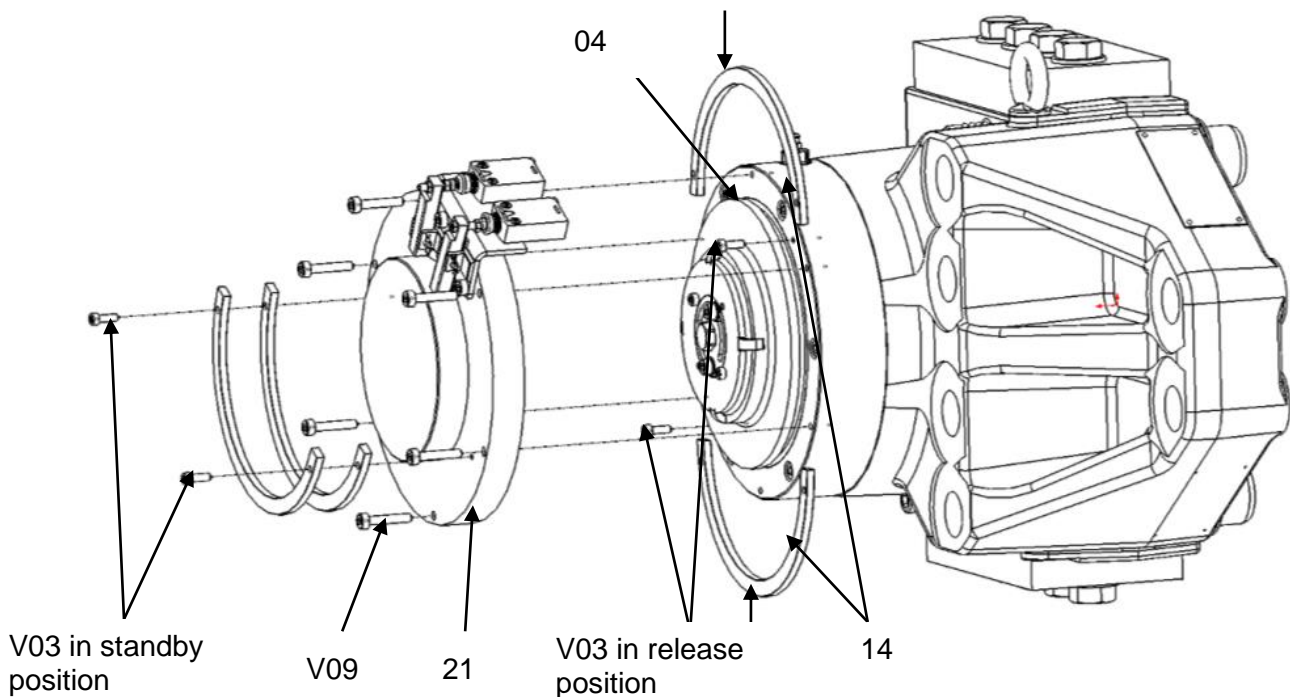


Fig. 5.2

5.2 Manual release: deactivation

1. With the pressure cut off, remove the cover **21** with its 6 Allen screws **V09**.

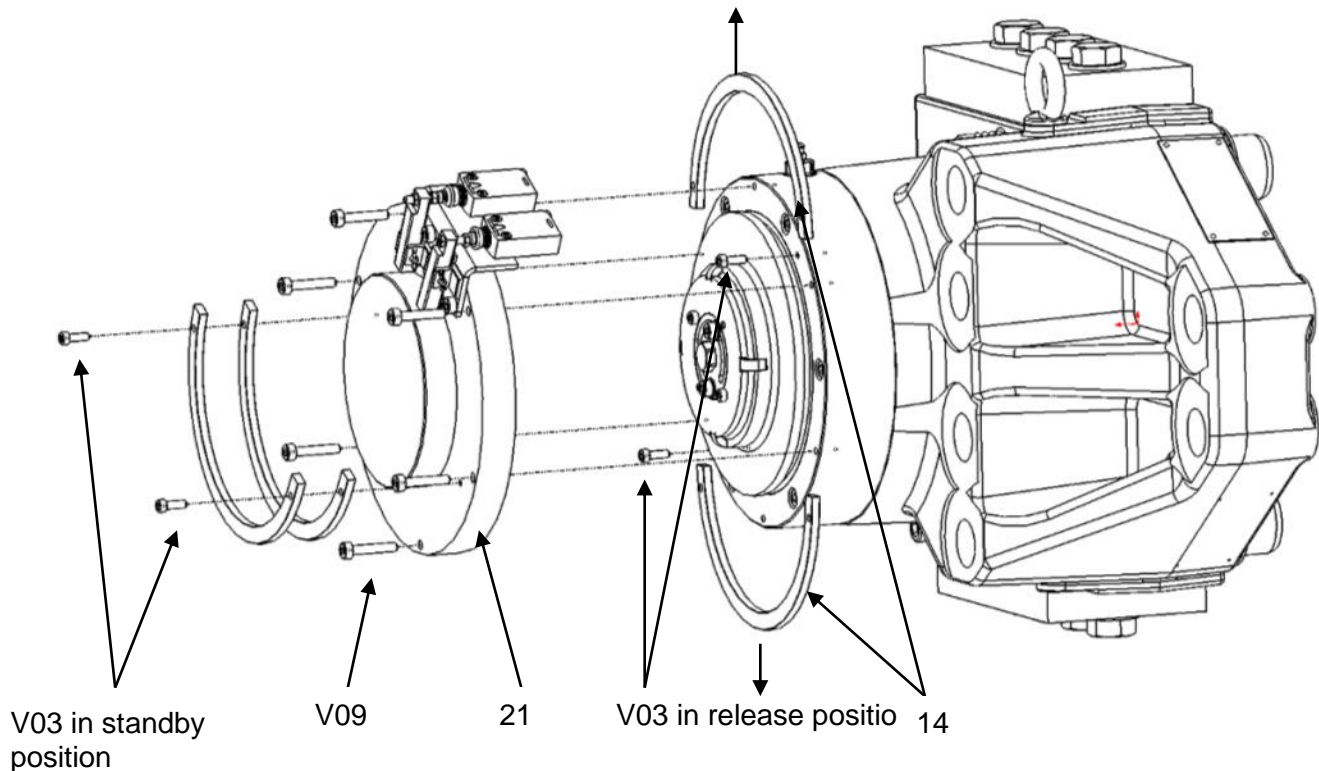


Fig. 5.3

2. For an easier handling, it is possible to remove the connector of indicator switches Fig. 5.1. Unlock the connector by inserting the screwdriver behind the connector and turning it a 1/4 of a turn counter-clockwise and then inserting the screwdriver into the slot at the side to release the connector. In 'ATEX' execution, it is not possible to remove the connector see Fig. 5.1.
3. Supply the caliper with opening pressure and maintain it throughout the operation.



Attention!

Retaining segments 14 can be fall. Do not cutting off the pressure without removed these retaining segment.

4. Remove the 2 retaining segments **14** Fig. 5.2 and install them in the standby position on the cover **21**, one on the other, using the 2 screws **V03**. See Fig.5.3.
5. Reinstall cover **21** and retighten 6 screws **V09** Fig.5.2 chapter 5.1.
6. Reengage connectors in the switches and lock it using screwdriver turn it to 1/4 turn clockwise.

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5.3 Adjustment of brake pad clearance, pad wear take up



Danger!

**Frequently check the total gap between pads and the disc.
(a 1mm increase to this gap corresponds to 9% loss of torque).
Refer to the RINGSPANN Datasheet for the nominal clearance.**



Attention!

**When the remaining lining thickness reaches 3mm, proceed to pad
exchange as per chapter 5.4. If this rule is not observed, a loss of
breaking force may occur.**

Only original RINGSPANN brake pads may be used.

Tools: AF spanner, Allen wrench, screwdriver

Procedure:

1. Apply opening pressure to the caliper and maintain the pressure throughout the entire procedure.



Attention!

DO NOT USE THE MANUAL RELEASE DEVICE

2. Remove the cover **21** by its 6 screws **V09** Fig.5.2.
3. Remove the 2 connectors of opening and wear contacts Fig.5.1.
4. Unscrew and remove the 2 screws **V04** and 2 washers **V14** Fig.5.4.
5. Remove the locking washer **15** to free the wear take up screw **06** Fig.5.4.
6. Screw or unscrew using a flat spanner Fig.5.5 or socket, to adjust the screw **06** until the gap between the pad and the disc reaches the required value see type plate brake "PG" Pad Gap. The Pad Gap is to check on both side and if the version R-V additional readjust with the screw M16 readjust.

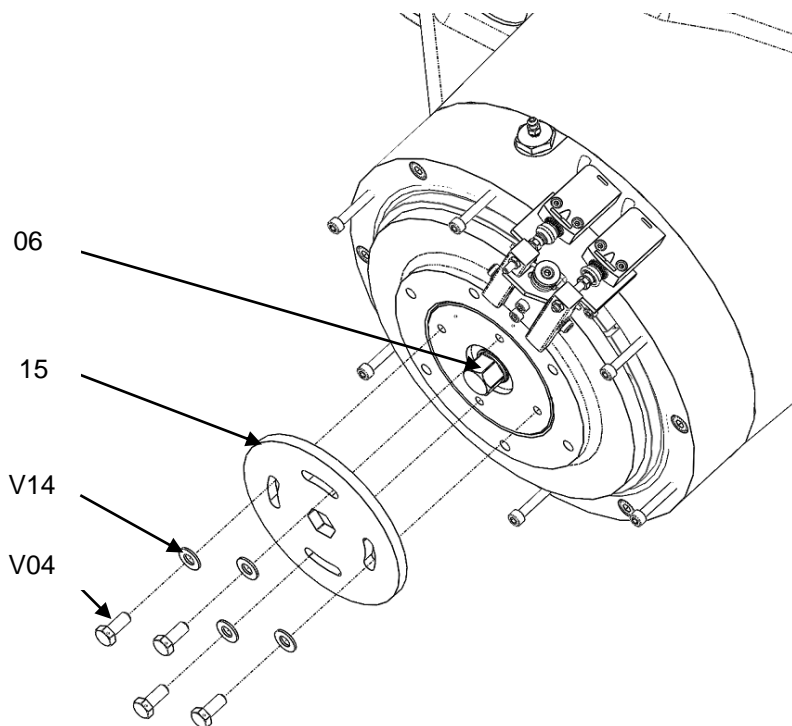


Fig. 5.4

7. Reposition the lock washer **15** each side and secure with screws **V04** and washers **V14**.
8. Replace the cover **21** with the 6 screws **V09** and the connectors of switches.
9. Be careful not to reverse the assignment of the connectors on the two switches.



Attention!

Be careful not to reverse the assignment of the connectors on the two switches.

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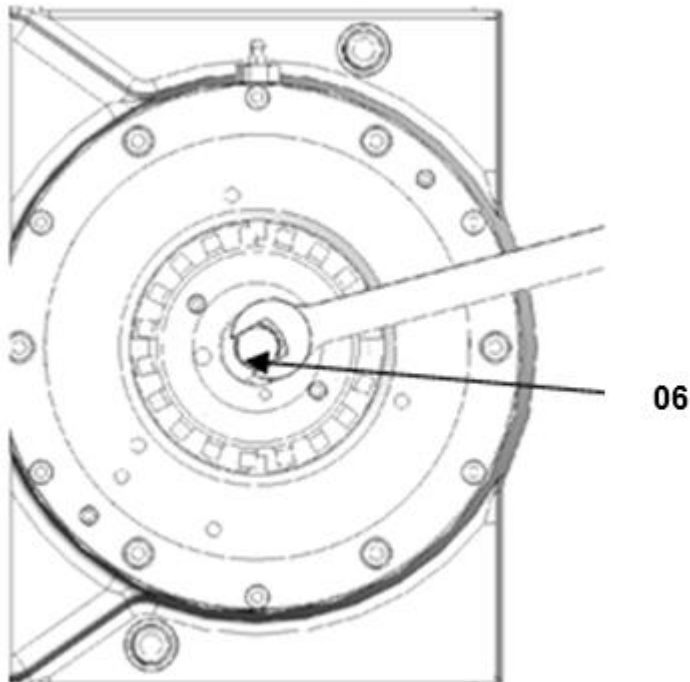


Fig. 5.5

5.4 Replacement of worn brake pads

Tools: AF spanner, Allen wrench

Procedure: For thruster pad side

1. Put the caliper into manual release position, see chapter 5.1 and switch off the pressure.
2. Cover being removed, unscrew and remove the allen screws **V04** and washers **V14** Fig. 5.4 see chapter 5.3
3. Remove the locking washer **15** to free the wear take up screw **06** Fig. 5.4 see chapter 5.3.
4. Screw or unscrew using a 19mm wrench or socket the wear take up screw **06** until the gap between the pad and the disc enables to put the new pad in position Fig.5.5 see chapter 5.3.
5. Screw a **M10x40** min. screw in the retaining plate **09** on the pad extraction side to handle it.
6. Remove retaining plate **09** + 4 screws **V08** + 4 washers **V17** on the side where the pad is to be removed.
7. Loosen 2 screws **V07** pad holding.

8. Fit a screw M10 **V30** into the end of the pad **11** to facilitate gripping. (recommended length: 60 mm).
9. Remove pad **11** from its pad holder **01** by pulling screw M10
10. Fit the new pad **11** in its housing. If necessary, use the screw M10 to helps.
11. Loosen the screw M10 **V30**
12. Reinstall retaining plate **09** onto **01** with 4 screw **V08** and washer **V17**.
13. Loosen the screw M10 into the retaining plate **09**

Tightening torque: Cs = 470Nm ±10%+ Loctite 243.

Note: Check that the 4 screws **V18** located on the opposite side are correctly torqued to 470Nm.

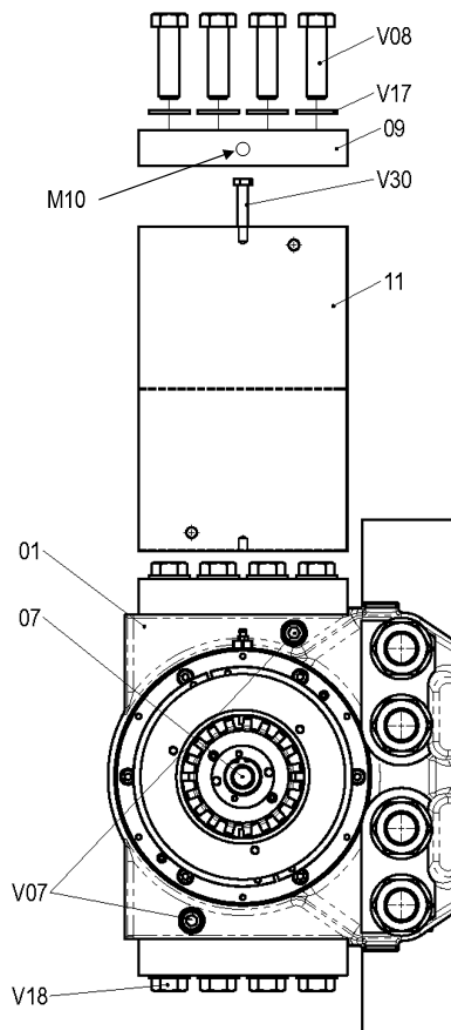


Fig. 5.6

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Procedure: For the other side

1. Fit a screw M10 into the stop plate **10** to facilitate gripping.
2. Remove 1 retaining plate **10** + 4 screws **V08** + 4 washers **V17** on the side where the pad is to be removed.
3. Fit a screw M10 **V30** into the end of the pad **11** to facilitate gripping (recommended length: 60mm).
4. Remove screw **V10** including the pad pull-back spring.
5. Remove pad **11** from its pad holder **02** by pulling screw M10.
6. Fit the new pad **11** in its housing. If necessary, use the screw M10.
7. Loosen the screw M10 **V30**.
8. Put back in place the screw **V10** including its spring and tighten it up fully on the pad.
9. Reinstall retaining plate **10** onto **02** with 4 screws **V08** and Washer **V17**.
10. Loosen the screw M10 into the stop plate **10**.
11. After the pads replacement, remove the manual release chapter 5.2 und proceed with the adjustment of the pad gap chapter 5.3 Version R-V readjust the Pad Gap with the screw M12 friction pad fixed side.

Tightening torque: Cs = 470Nm ±10%+ Loctite 243.

Note: Check that the 4 screws **V18** located on the opposite side are correctly torqued to 470Nm.

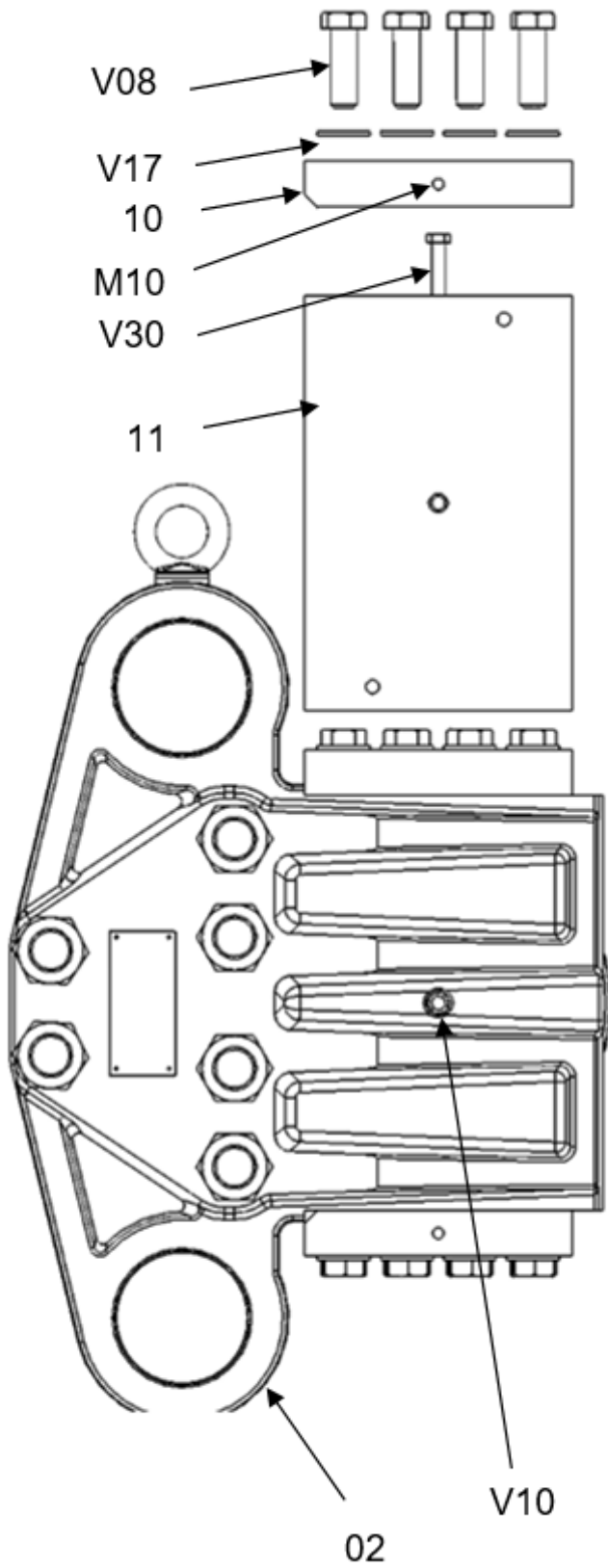


Fig. 5.7

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5.5 Opening and wear contacts (mechanicals) adjustment



Information!

**Contacts are factory set and do not need any adjustment.
If necessary, follow this procedure.**

Verify the gap for the pad at each side, otherwise perform all the operations in chapter 5.3. Refer to the identification plate for the nominal clearance "PG" Pad Gap.

Tools: Allen wrench, AF spanner.

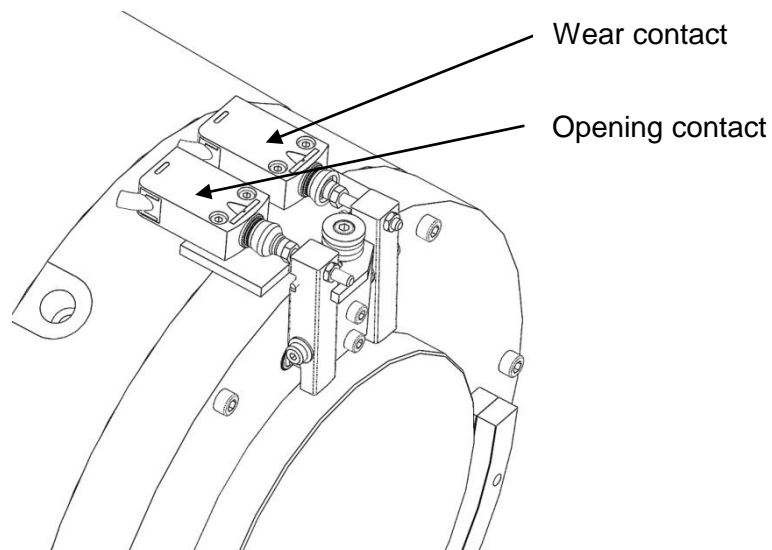


Fig. 5.7

5.5.1 Adjustment of 'brake released' switch

This switch monitors the status of the brake (closed or released) It closes when the brake is released (set under pressure).

- Power the brake opening pressure.
- Unscrew nut **V11 AF spanner**.
- Check that the axle **22** is in contact onto lever **41**.
- Adjust the screw **V02** until the activation of contact. Check that state contact is "Open".
- Release pressure. When the brake is close, check the contact state (Position "closed"). If this information is not obtained, unscrew the screw **V02** until change of state.

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- Power the brake with opening pressure.
- Check that state contact is "Open". Execute this operation till correct monitoring of the " open & closed" status.
- After an adjustment is finished, do not forget to retighten nut **V11** to the screw **V02**.

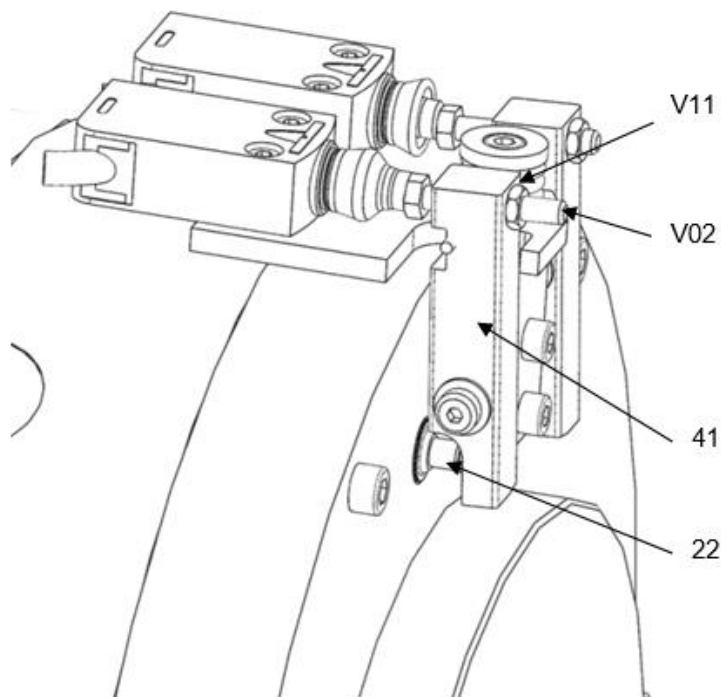


Fig. 5.8

RINGSPANN	Installation and operating instructions for Brake HS 165 FHM spring activated – hydraulically released			E 09.778e	
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5.5.2 Adjustment of 'pad wear' switch

This switch is permanently closed and opens when the pad wear reaches 1mm.

- Power the brake with opening pressure.
- Check that the pads clearance is correctly adjusted, otherwise proceed to adjustment.
- Brake being open, check that the connection pin **22** is in contact onto lever **42**.
- Cut off pressure to close the brake.
- Unscrew nut **V11** then adjust screw HC **V02** to free it from the switch end adjust the screw skimming the lever.
- Adjust the screw **V02** until the switch triggers (status « worn pads »). When the pads will reach a 1mm wear.
- After an adjustment is finished, do not forget to retighten nut **V11** on the screw **V02**.

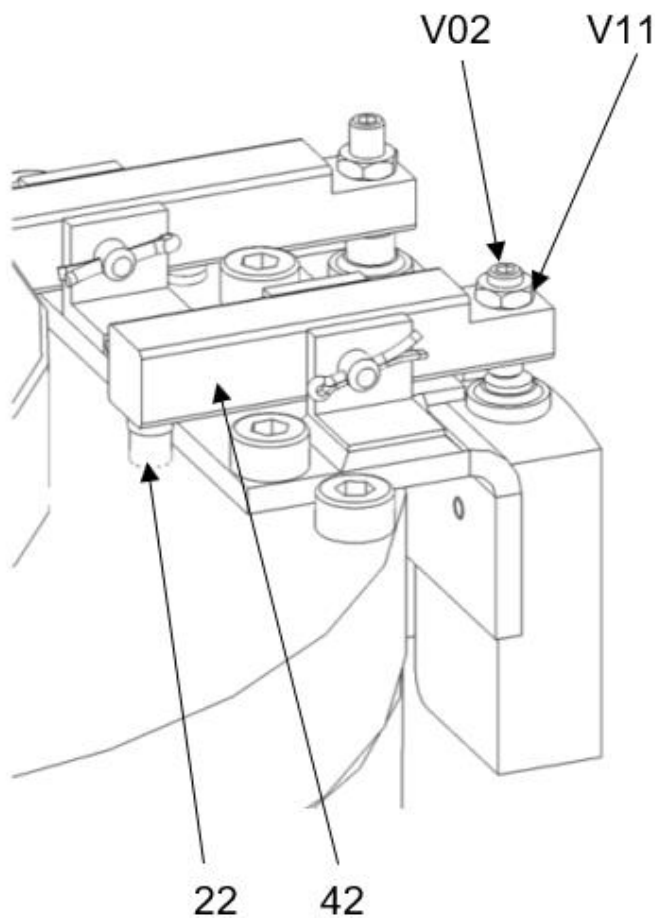


Fig. 5.9

RINGSPANN	Installation and operating instructions for Brake HS 165 FHM spring activated – hydraulically released			E 09.778e	
Issue: 27.05.2021	Version: 3	Drawn: BAHS	Checked: EISF	Pages: 28	Page: 28

6 Spare parts

Monitoring switches (Opening/wearing) Ref.: CONOUVREG-PIN-HW

- Set of pads:

2 pads 11 „Dynamic“, Ref: JG ST5 RINGSPANN 132

- Hydraulic control parts comprising (Refer to assembly drawing):

- ▶ 1 Piston 12660-026
- ▶ 1 Piston rod JOITIG-090 105 Z
- ▶ 1 Piston seal JOIPIS-200 184 E
- ▶ 1 Static piston seal JOISTA-95.6-90-1
- ▶ 1 Cylinder 12660-005
- ▶ 1 Bleed screw 11271-17

In case of order, please specify:

Type, Nr. of the caliper and item Nr. of the part.

There is a type plate on the brake with a 16-digit article number. The exact design of the brake is defined by this article number only.

7 Troubleshooting

NATURE	VERIFICATION	SOLUTION
Decrease in braking force	- Check the pad gap	- Proceed with pad gap adjustment chapter 5.3
	- Check the condition of the pads and the disc (wear or grease particles).	- Replace the pads and clean the disc.
	- Check the pressure is zero	- No more pressure
Abnormal overheating of the disc during start-up.	- Insufficient gap between the pads and the disc in released position. - Check that pressure is at 230bar	- Re-adjust the pads. chapter5.3 - Re-adjust pressure at 230bar
The caliper releases and closes slowly	- Air may be in the circuit	- Bleed according to chapter2.4