

Installation and Operating Instructions for Brake Caliper HS 075 HFK

E 09.743e



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RINGSPANN	Installation and Operating Instructions for Brake Caliper HS 075 HFK hydraulically operated, spring released	E 09.743			
Issue: 19.05.2020	Version : 4	Drawn.: BAHS	Checked: EISF	Pages: 26	Page: 2

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. General notes

1.1 General safety instructions

Read these installation/operating instructions carefully before putting the brake caliper into operation. Consider these instructions as well as the drawings in the individual sections.

All work with and on the brake is to be carried out taking into account that "safety is top priority".

Switch the drive unit off before carrying out work on the brake.

Rotating parts (e.g. brake disc) must be secured by the operator against unintentional touching.

1.2 Special safety instructions



Life-threatening danger!

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

2. Design and function

2.1 Function

The brake caliper HS 075 HFK is a machine element with which accelerated masses can be safely slowed down. In combination with a brake disc, you have a complete brake for the effective safeguarding of machines and systems. Thanks to its universal design, it fulfils the following functions:

- As a holding brake, it prevents a stationary shaft from starting unintentionally.
- As a stopping brake, it brings a rotating shaft to a halt.
- As a control brake, it maintains a particular tensile force within the material.

The braking force is generated by hydraulic pressure, the brake caliper is opened by spring force.

The braking force is generated with pressure oil. The friction blocks release up to a residual pressure in the hydraulic system of < 0.3 bar.

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2.2 Identification

These operating instructions apply for

- The design HS 075 HFK
- The mounting onto vertical brake discs (in case of horizontal shaft) as well as horizontal brake discs.
- The design with and without an inductive transmitter.
- Different friction materials as well as for friction blocks with signal cable.
- The mounting of various basic holders / special base plates according to the customer's drawing.

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.

2.3 Drawing and parts list

Brake caliper HS 075 HFK

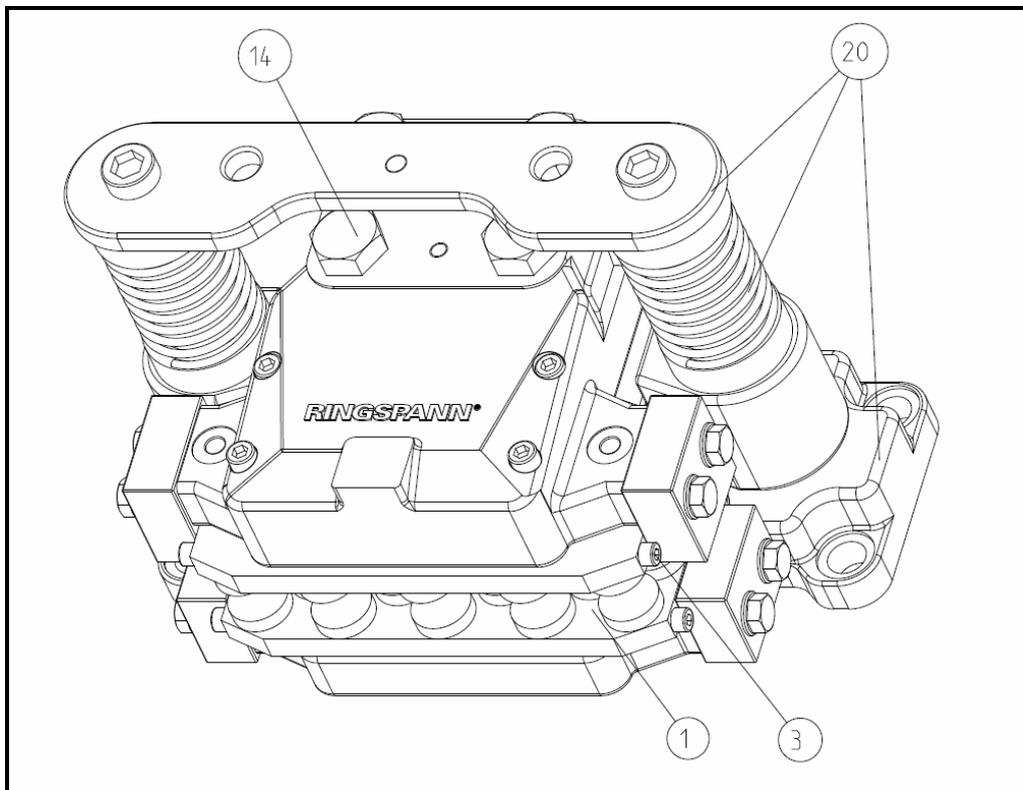


Fig. 2.1

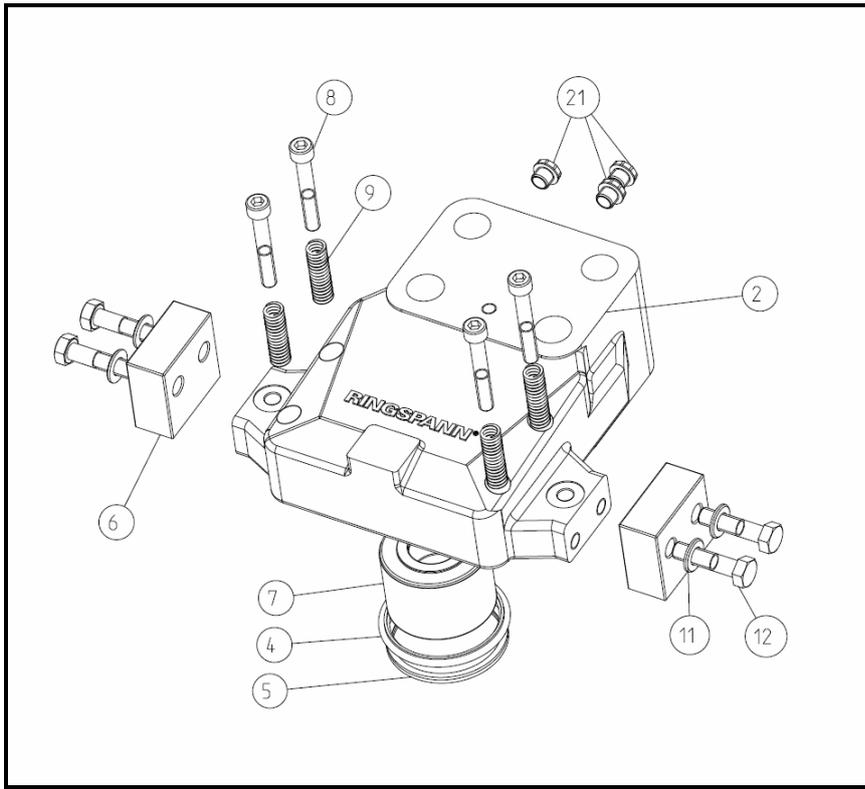


Fig. 2.2

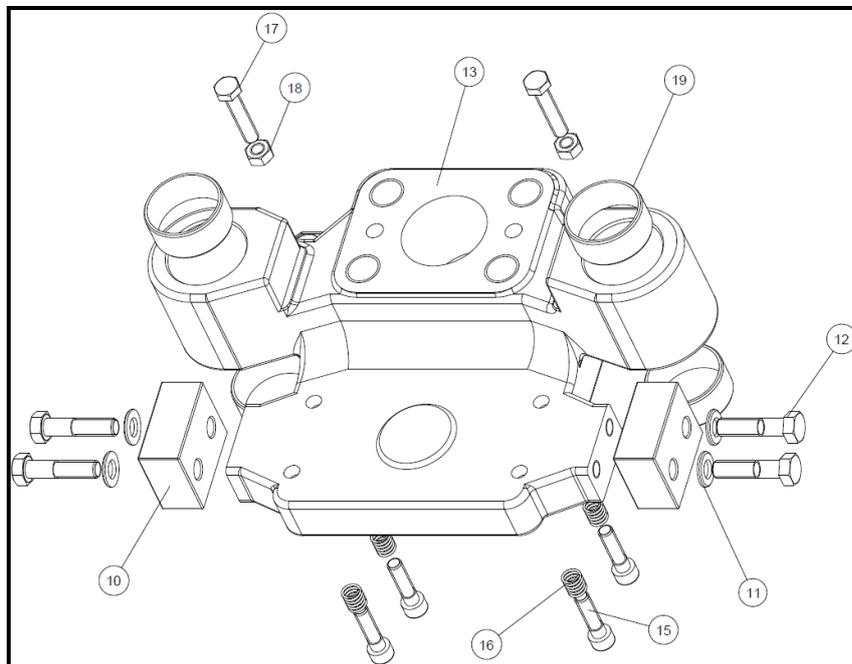


Fig. 2.3

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Part	Designation	Quantity
1	Friction pad set HW(S) 075	1
2	Brake housing H 075 HFK	1
3	Cylinder screw M8x12 DIN 912-10.9	8
4	Turcon-Stepseal 2K RSK300750 - T46N	1
5	Turcon-Excluder 2 WE3200750 - T46V	1
6	Holding plate	2
7	Piston for HW 075 HFK	1
8	Cylinder screw M10x70 DIN 912-8.8	4
9	Pressure spring RDF-2199	4
10	Holding plate	2
11	Disc B13 DIN 125-ST galvanised	8
12	Hexagon screw M12x50 DIN 931-10.9	8
13	Base body HS75	1
14	Hexagon screw M24x140 DIN 933-8.8	4
15	Cylinder screw M10x40 DIN 912-10.9	4
16	Pressure spring RDF-2055	4
17	Hexagon screw M 10x50 ISO 4017-10.9	4
18	Hexagon nut M10 DIN 934-8	4
19	Slide bush 50x55x24,5 DIN 6313	4
20	Base holder for HS 075	1
21	Stopper plug R 1/4" KAPSTO GPN 700	3

* For the clear assignment of identical item no., the material number of the brake is required

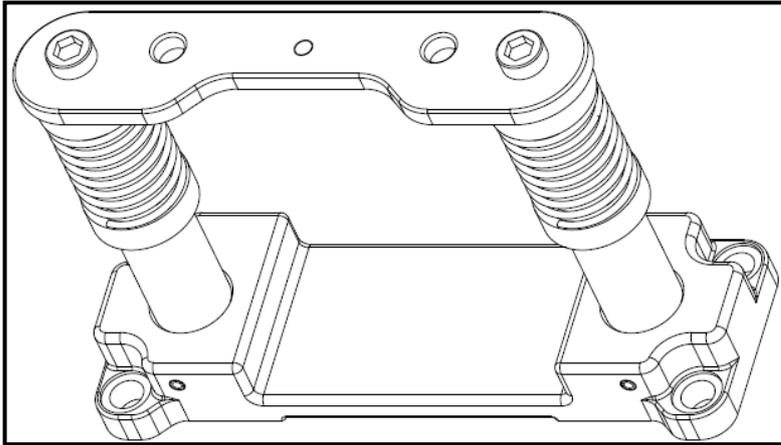


Fig. 2.4

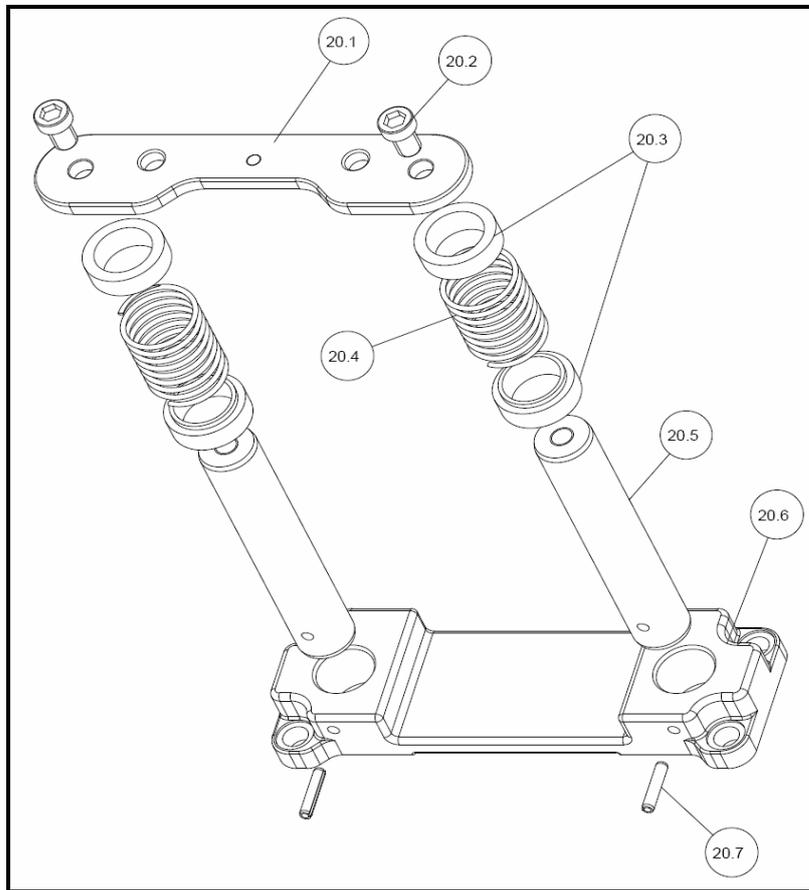


Fig. 2.5

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Part	Designation	Quantity
20.1	End plate	1
20.2	Cylinder screw M20x30 DIN 6912-8.8	2
20.3	Guide ring	4
20.4	Pressure spring RDF-2714	2
20.5	Holding bolt	2
20.6	Base plate for HS 75	1
20.7	Clamping sleeve 10x50	2

3. Intended use

The brake caliper may only be used with a maximum hydraulic pressure of 125 bar and in accordance with the technical data.

The brake caliper has been designed for use as a holding, control and stopping brake. Use for any other purpose will be deemed improper. RINGSPANN shall not be liable for any damage caused by improper use; the risk shall be borne by the user alone.

4. Impermissible use

It is not permissible to operate the brake caliper with a higher pressure than given in the technical data or with other media. Unauthorised constructional changes to the brake caliper are also not allowed. RINGSPANN shall not be liable for any damage caused by improper use; the risk shall be borne by the user alone.

5. Condition as delivered

The brake caliper is supplied tested. The test pressure is 160 bar
The brake caliper is delivered ready to install.

6. Handling and storage

Depending on the design, the weight of the brake caliper is between 80 kg and 120 kg. Two bore holes are provided at the end plate (item 20.1) for the transport and handling.

The brake is delivered in preserved condition and can be stored for 12 months in an enclosed and dry place. It is to be made sure that no condensation develops. Damp storage rooms are not suitable. If storing the brake for a period longer than 12 months, as well as after any transport, the brake must be activated once in order to prevent the seals from getting stuck down.

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7. Technical prerequisite for reliable operation

Fastening the brake to stable and low-vibration machine parts will ensure quiet braking without creaking.

8. Installing the RINGSPANN brake caliper

8.1 General instructions regarding assembly and installation

Before installing the brake caliper, the brake disc must be cleaned with alcohol (e.g. spirit (ethanol) or isopropyl alcohol) or with water-based tenside solutions (soapy water or the like).

If cleaning the brake disc with a diluent, acetone or brake cleaning agent, it must be ensured that these agents and no residues of these agents come into direct contact with the friction blocks. This must be ensured for pure holding brakes in particular, since no dynamic braking takes place that would remove any diluent residues from the brake disc.



Important!

Residues from oil and anti-rust agent considerably reduce the coefficient of friction and thus also the braking and holding torque!

8.2 Assembly description



Important!

Hydraulic pressure must not be applied to the brake caliper during assembly.

Before assembly it is to be checked that the customer connection part is even and that the axial run-out between the brake disc and the mounting surface of the brake is within a tolerance of 0.3 mm.

Examine the axial movement of the brake disc. The axial movement must not be greater than ± 0.3 mm.

The maximum permissible lateral run-out of the brake disc is 0.1 mm. A greater lateral run-out can cause the brake unit to rattle and shake.

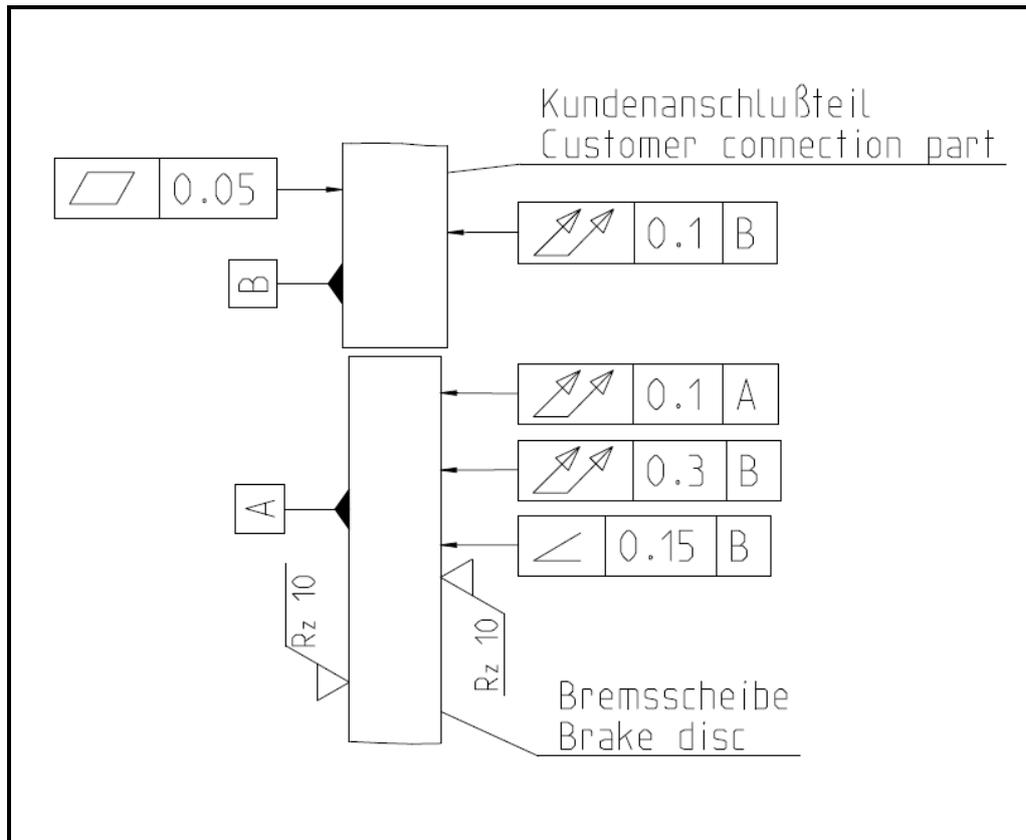


Fig. 8.1

	<p>Important!</p> <p>Check whether the brake disc can be freely rotated.</p>
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The brake caliper is lubricated with 4 screws standard brake caliper M20–12.9 tightening torque 880Nm, fixed with Molykote MoS₂. (The screws are not included in the scope of delivery).

	<p>Information!</p> <p>To make assembly easier, you can fix the position of the brake with just one screw to start with, before then slewing the brake far enough for the second screw to be mounted also.</p>
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8.3 Adjusting / readjusting the brake pad distance

The adjustment of the friction block distance is carried out after the brake caliper has been assembled. It is done by setting/adjusting using the setting/adjusting screw (see Fig. 8.2).

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The distance from both sides of the friction blocks to the brake disc should be approx. 1 mm when new. At the time of wear adjustment, one side is adjusted.

During installation, make sure that the brake pads are aligned centrally and fully engage the brake disc.



Attention!

The friction block distance adjustment procedure must be repeated after initial installation or after replacing brake pads or individual parts.

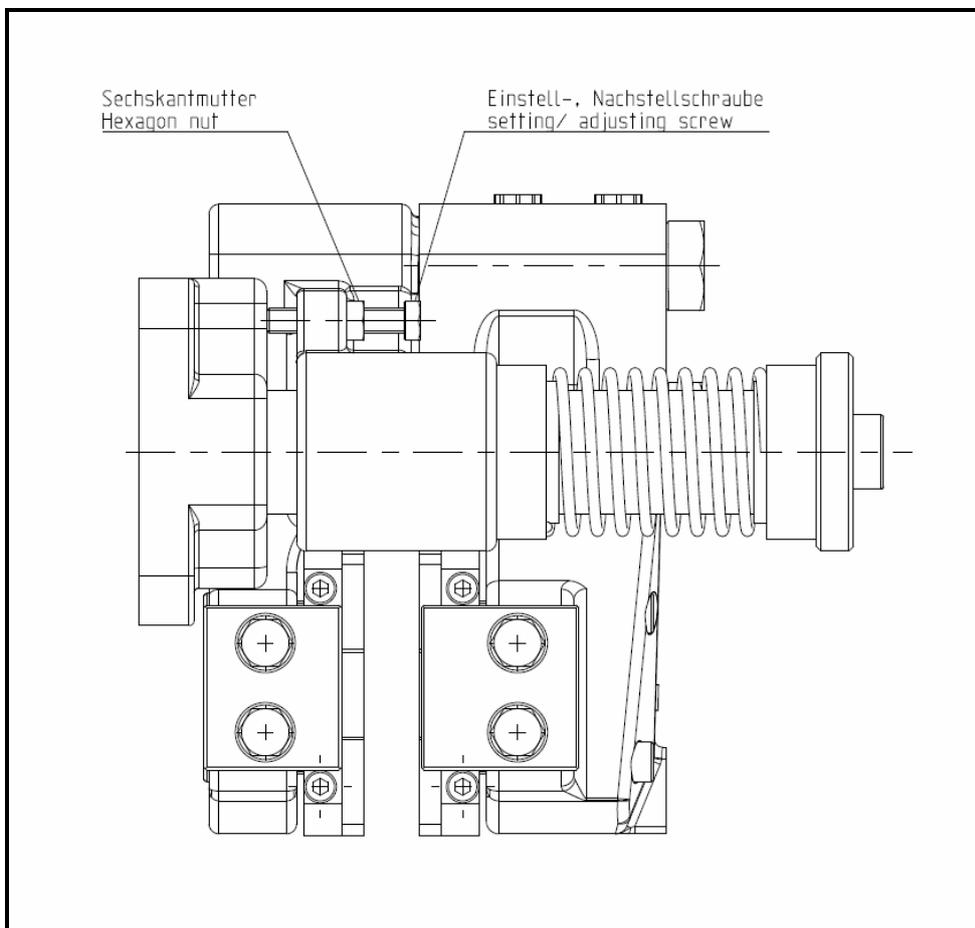


Fig. 8.2

After the setting/adjustment procedure, lock the hexagon nuts (see Fig. 8.1)



Important!

During assembly it is to be ensured that the brake blocks are centrally aligned and make full-face contact with the brake disc.
The distance from both sides of the brake linings to the brake disc should be approx. 1 mm when new. The maximum permissible wear must be observed.

So that there is enough space for changing a friction block, there should be at least 260 mm of free space on one side of the brake, in order for the friction block to be easily disassembled and assembled.

8.4 Assembly of the screw connection and bleeding of the brake

Hydraulic hoses should be used to connect pressure and leakage oil connections.

The connection is made at one of the two pressure oil connections; the second borehole serves as a bleeder hole.

Attach the leakage oil line (if available) or use a collection container for each brake caliper in order to be able to locate an oil leakage easily.

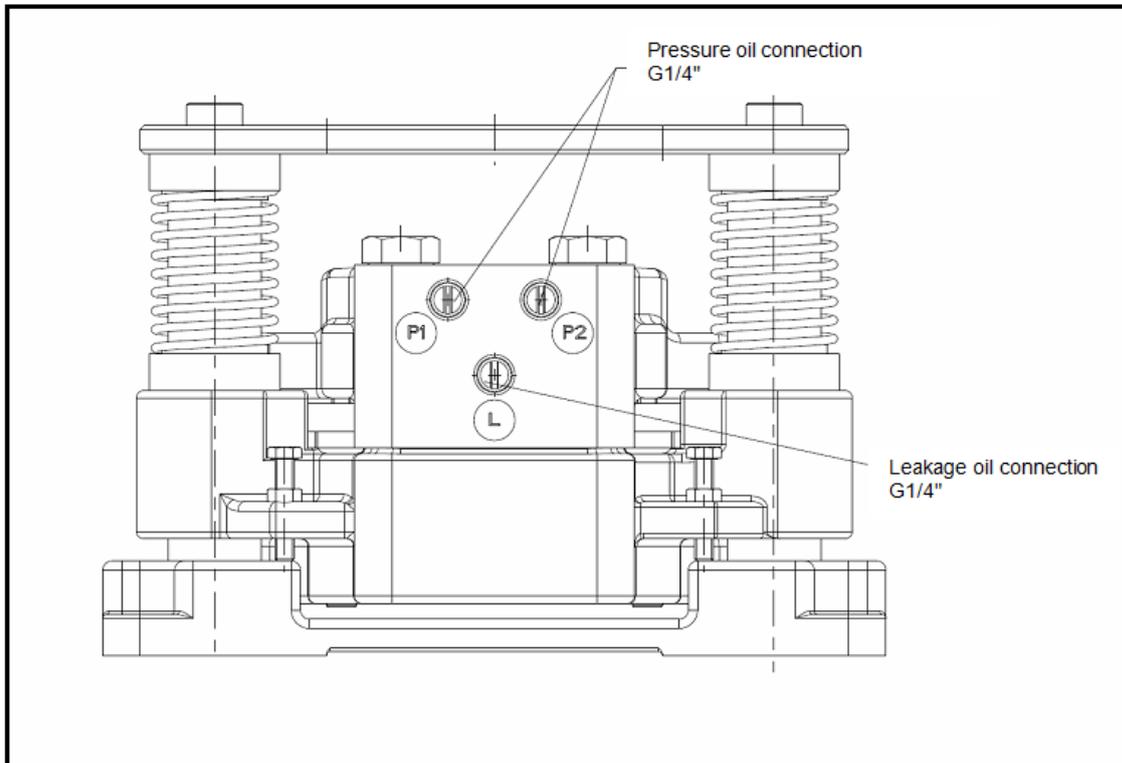


Fig. 8.3

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Assemble a mini measuring connection or an automatic bleeding system at the bleeder hole. The screwed sealing plug is to be removed beforehand for this purpose.

If carrying out initial assembly, exchanging the seals or performing other work on the hydraulics, the hydraulic system must be bled.

If the system is designed for hydraulic oil circulation, the hydraulic system can alternatively be bled through circulating hydraulic oil.



Important!

Flexible hydraulic hoses are to be used for the pressure connection and leakage oil connection so as to not inhibit the movements of the brake.



Important!

Any oil that has escaped must be completely removed. Leakages are to be eliminated immediately.

The following are to be checked to ensure firm screwing and connection:

- Brake caliper at the machine part

The following are to be inspected for tightness:

- Screwings and connections



Important!

The brake caliper has two pressure oil connections marked with P1 and P2 size G ¼ (Whitworth pipe thread DIN ISO 228-1) and a leakage oil connection marked with L size G ¼ (Whitworth pipe thread DIN ISO 228-1). The hydraulic system must never be operated with a higher pressure than permitted. The maximum operating pressure is 125 bar.

Oil volume: Per 1 mm of piston stroke = 5 cm³
Max. oil volume (at max. friction lining wear) = 53 cm³.

Alloyed mineral oil of HLP group in accordance with DIN 51525 or in accordance with API classification SC, SD, SE can be used as hydraulic fluid.



Information!

The service life of the brake system will extend depending on how high the purity of the oil is.



Important!

It must be ensured that the friction blocks do not grind on the brake disc while the brake caliper is released.

8.5.5 Connecting the signal cable (optional)

Attach the signal cable (e.g. via a signal lamp) to a 24V control voltage. If the maximum friction lining abrasion limit is reached, contact with the neutral conductor will be made and the signal lamp will light up.

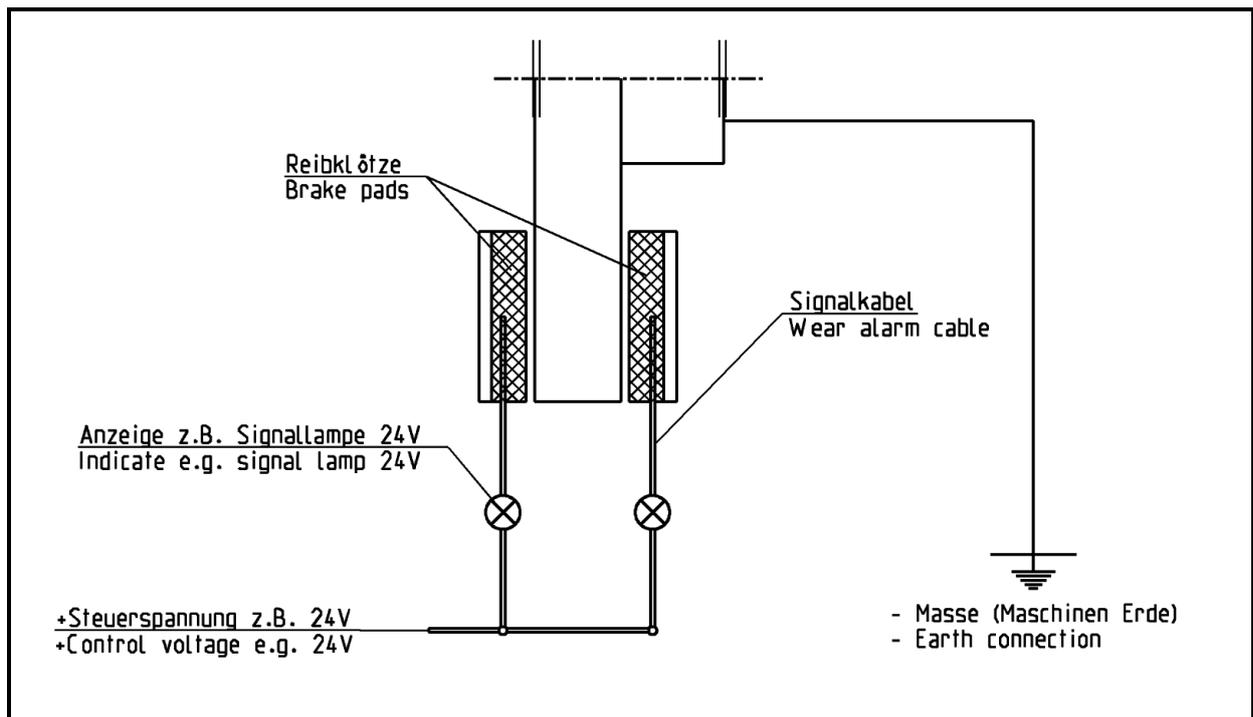


Fig. 8.4

9. Start-up

Only full-face contact of the two friction blocks (item 1) on the brake disc as well as a rapid heating of the friction linings to approx. 200°C will ensure an optimal braking effect. It is therefore necessary to brake several times and for a short duration with low oil pressure when the brake disc is rotating.

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Important!

If the brakes are used as holding brakes, then the braking torques indicated in the catalogue will not be reached. Reductions of up to 50% of the braking torque are possible.



Important!

If breaking-in is not possible, the braking torques specified in our leaflet (46) will not be reached. Reductions of up to 50% are possible.

10. Disassembling the brake



Life-threatening danger!

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

Release the oil pressure from the hydraulic system.



Attention!

Make sure that there is no oil pressure at the brake caliper.

Drain the hydraulic oil completely.



Important!

Secure the brake for disassembly.

Separate the hydraulic lines from the brake caliper. Secure the brake for disassembly. Remove the M20 screws that serve for fastening the brake. The brake can now be removed from the mounting surfaces.

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11. Lubrication

Oil or grease the bearing and sliding points.



Important!

The friction blocks must not come into contact with the lubricant.

12. Maintenance

12.1 General maintenance

Depending on how much the brake caliper is used in operation, maintenance is to be carried out on it at intervals of 4 weeks to once a year.

The following is to be carried out when performing maintenance:

- Check the friction blocks for wear.
- Check the screw connection of the brake caliper to the machine part and also check the firmness of the screw connection of the holding plates.
- Check the hydraulic lines and connections for tightness.
- Check the sealing system of the brake pistons for tightness by inspecting the leakage oil lines. If there is oil in the leakage oil line, the seals are to be exchanged.
- Respect the oil changing interval! Renew the mineral oil after 8000 hours of operation or once a year.



Important!

The friction blocks must not come into contact with the hydraulic oil.

12.2 Permissible friction lining wear and exchanging of the friction blocks



Life-threatening danger!

Friction blocks may only be changed when the system or the work machine is stationary!

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Attention!

The friction lining may only be worn down to a residual thickness of 16 mm (thickness of holding plate plus residual lining). Friction blocks must always be replaced in pairs.

Before exchanging the friction blocks (item 1), ensure that the mass held by the brake is secured against moving, since parts of the brake need to be loosened for this purpose.



Important!

Ensure that there is no oil pressure at the brake caliper before exchanging the friction blocks.

Make sure that there is no oil pressure on the brake caliper before exchanging the friction blocks and disassemble one of the two holding plates in each case (item 6 and 10) on one side.

Remove the 4 cylinder screws M10x70 (item 8) and cylinder screws M10x40 (item 15). Make sure that the cylinder screws are slightly pretensioned by the pressure springs (item 9) and (item 16). Pull out the old friction blocks laterally. Change the cylinder screw (item 3) M8x12 DIN 912-10.9 to the new friction blocks. Insert the new friction blocks. Secure the friction blocks again with 4 cylinder screws M10x70 (item 8) and the 4 pressure springs (item 9) and on the other side M10x40 (item 15) and the 4 pressure springs (item 16). The screws (item 8 and item 15) are to be secured with Loctite 243 and tightened with a tightening torque of 10 Nm.

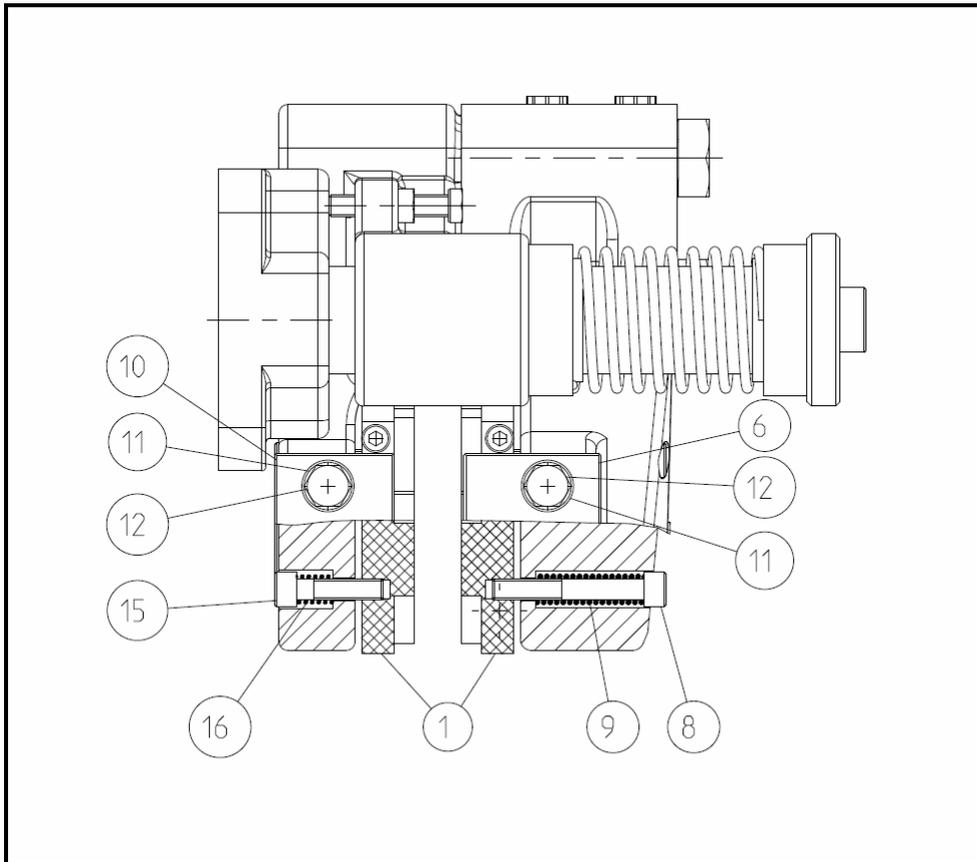


Fig. 12.1



Important!

The thread in the friction block is a blind hole thread of approx. 10 mm in depth. A tightening torque higher than 10 Nm can destroy the thread! The screws are to be secured with Loctite 243.

Refasten the holding plates (item 6 and 10) to the brake housing. The fastening torque for the screws M12x50 (item 12) is 125 Nm.

After the friction blocks have been changed, point 8.3 (setting/adjusting friction blocks) must be repeated.

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Information!

For brakes with special base plates it is necessary to loosen the mounting screws and remove all but one of them. The brake can then be unscrewed from the brake disc. In this position the holding plates (item 6 and item 10) do not have to be removed. To change the friction blocks, it is sufficient to loosen the screws M10x70 (item 8) and M10x70 (item 15).

12.3 Exchanging seals, wipers and piston seals



Life-threatening danger!

The seals may only be changed when the system (or the work machine) is stationary!



Important!

Ensure that there is no oil pressure at the brake caliper.
Note the manufacturer's instructions for handling solvents.

The greatest possible cleanliness is to be ensured when working on the hydraulic system. Each part must be cleaned in solvent, dried and stored in a dust-proof place. Dirt shortens the service life of the seals considerably. Check the surfaces of the brake housings and brake pistons. Damages on the surface can destroy the seal immediately.

Disassemble the upper half of the brake caliper by loosening the 4 screws M24x140 (item 14).

- Remove the brake caliper halves. Remove the 4 cylinder screws (item 8), making sure that the cylinder screws are slightly pretensioned by the pressure springs (item 9). Close on pressure oil connection on each brake caliper half and connect a hydraulic hand pump to the second pressure oil connection. Hold or clamp the brake housing (item 2). Press out the brake pistons (item 7) using the hand pump. Ensure that the brake pistons are pressed evenly out of the brake housing (item 2).
- HW-075-HFK (brake piston diameter 75 mm):
Remove the Turcon Excluder 2 (item 5), then the Turcon Stepseal 2K (item 4) from the brake housing (item 2). Insert the new seal into the brake housing. In doing so, ensure the correct fitting position of the seal (see Fig. 12.3). This should only be carried out by hand, so that the sealing edge is not damaged. To make fitting easier, the seal can be bent into a kidney shape and placed into the groove. Slightly oil the seal. Push the piston in with a press or, using a plastic hammer, hit it centrally into the cylinder borehole until it comes to a stop.

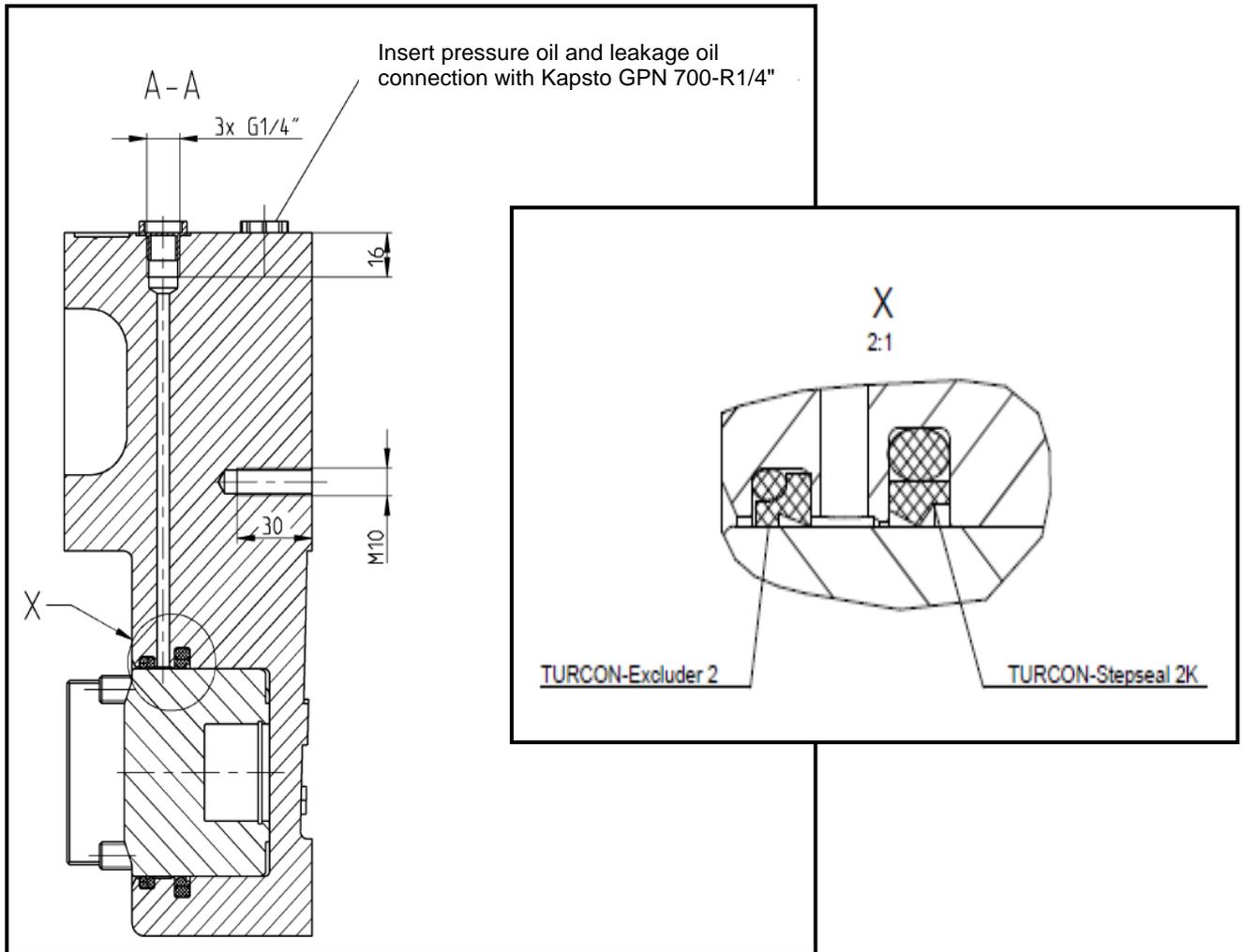


Fig. 12.2



Life-threatening danger!

The seals may only be changed when the system (or the work machine) is stationary!



Important!

Ensure that there is no oil pressure at the brake caliper.
Note the manufacturer's instructions for handling solvents.

Then assemble the friction block (item 1), taking point 8.3 into account. After this has been done, refasten the upper half of the brake caliper onto the brake caliper with the 4 screws.

13. Accessories: Sensor for operating state monitoring

13.1 Mounting and connection of inductive transmitter for position monitoring

	<p>Life-threatening danger!</p> <p>The inductive transmitter may only be assembled and changed when the system or the work machine is stationary!</p>
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The inductive transmitter 3502.112.004.B024VG M12x1 65 mm with a high-grade steel housing, is enclosed loosely with the supply.

Two M12x1 threaded holes are provided on the brake housing for mounting the inductive transmitters.

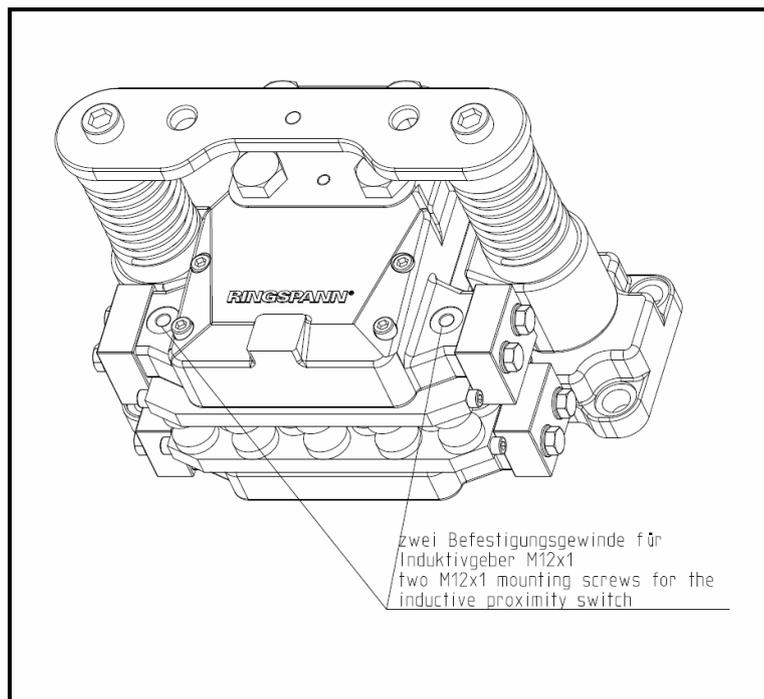


Fig. 13.1

Switching function:	PNP (normally open contact)	Switching distance:	2 mm flush
Operating voltage:	10....30 V DC	Operating current:	0...200 mA
Idle current:	< or = 17 mA	Residual current:	< or = 0.5 mA
Voltage drop :	< or = 3 V	Short-circuit protection:	Synchronising
Reverse polarity protection:	Yes	Switching display:	Multi-hole LED
Temp. range:	-25 to +70°C	Type of protection:	IP 67
Connection type:	V1 appliance plug	Housing:	High-grade steel

Connection diagram of
the inductive transmitter

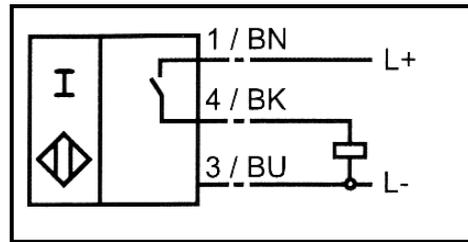


Fig. 13.2



Information!

The inductive transmitter is to be arranged in such a way that it is activated in depressurised state (the LED at the inductive transmitter shine). When the brake is actuated, the brake engages and the inductive transmitter moves out of the field of the switch and is no longer damped. The LED at the inductive transmitter goes out.

Sequence of operations for mounting or if the proximity switch needs to be replaced:

(The following instructions apply to the above proximity switch with 2 mm switching distance.)

- Mount the inductive transmitter in the depressurised state of the brake.
- Screw the inductive transmitter into the brake housing until there is a distance of approx. 1 mm between the inductive transmitter and the back of the friction block.
- Secure this position with the counter nut.
- Attach the proximity switch. The LED of the inductive transmitter should shine.
- Test for proper functioning by repeatedly activating the brake caliper.



Important!

Follow the exact work steps described, since otherwise the proximity switch could get damaged:

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13.2 Mounting and connection of inductive transmitter for friction block wear



Life-threatening danger!

The inductive transmitter may only be assembled and changed when the system or the work machine is stationary! The inductive transmitter will be damaged if the brake is activated without friction blocks.

The inductive transmitter 3502.112.004.B024VG M12x1 65mm with stainless steel housing and the hexagon screw M10x35 DIN 933 with hexagon nut M10 DIN 934 is enclosed loose with the delivery. To fix the inductive transmitter, there is a threaded hole M12x1 on the end plate (item 20.1) and a thread M10 in the brake housing to fix the hexagon screw M10 M10x35 DIN 933.

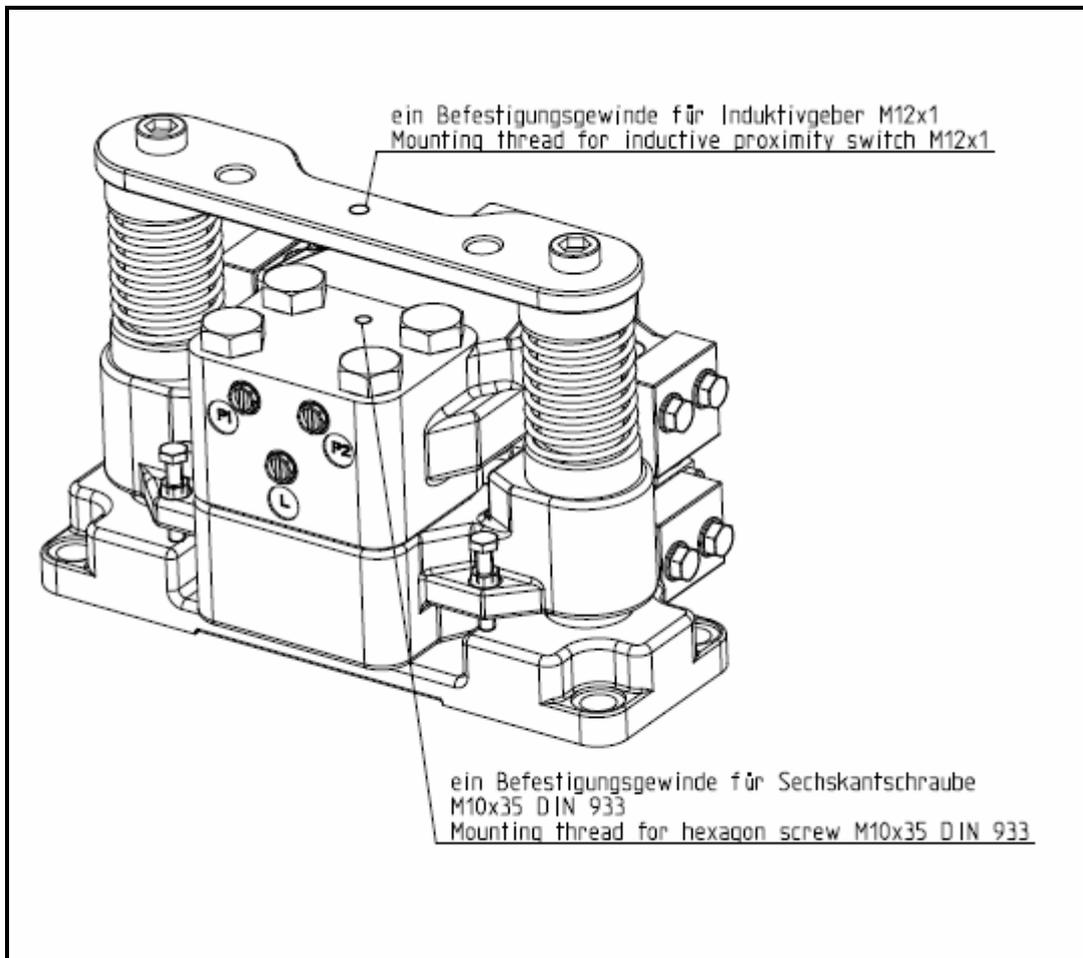


Fig. 13.3

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Switching function:	PNP (normally open contact)	Switching distance:	2 mm flush
Operating voltage:	10...30 V DC	Operating current:	0...200 mA
Idle current:	< or = 17 mA	Residual current:	< or = 0.5 mA
Voltage drop:	< or = 3 V	Short-circuit protection:	Synchronising
Reverse polarity protection:	Yes	Switching display:	Multi-hole LED
Temp. range:	-25 to +70°C	Type of protection:	IP 67
Connection type:	V1 appliance plug	Housing:	High-grade steel

Connection diagram of the inductive transmitter

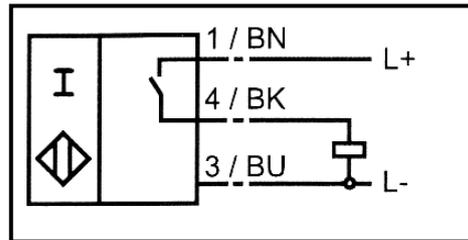


Fig. 13.4



Information!

- The inductive transmitter is to be arranged according to Fig. 13.3. When the brake is actuated, the brake engages and the distance between the release screw and the inductive transmitter becomes smaller. As soon as the limit value is reached, the inductive transmitter is damped in the pressurised state. The LED of the inductive transmitter will shine.

Work sequence for mounting or in the case that exchanging the proximity switch is necessary:

(The following instructions apply to the above proximity switch with 2 mm switching distance.)

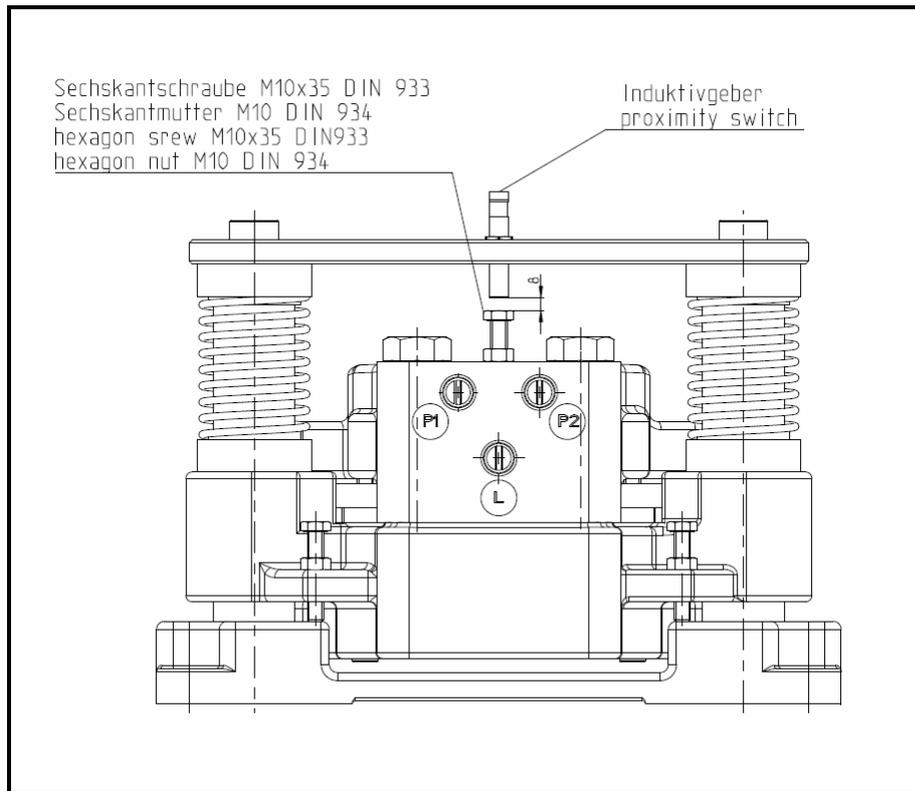


Fig. 13.5

- Mount the inductive transmitter in the pressurised state of the brake.
- Screw the hexagon screw M10x35 DIN 933 into the brake housing as shown in figure 13.5 with hexagon nut M10 DIN 934.
- Screw the inductive transmitter into the brake housing until there is a gap of approx. 8 mm between the inductive transmitter and the hexagon screw M10x35 DIN 933.
- Secure the position of the inductive transmitter and the screw with the hexagon nuts.
- Connect the proximity switch.
- Test the correct function of the proximity switch by holding a metal object about 2mm in front of the proximity switch. The LED of the proximity switch must light up.

**Important!**

Follow the exact work steps described, since otherwise the proximity switch could get damaged: