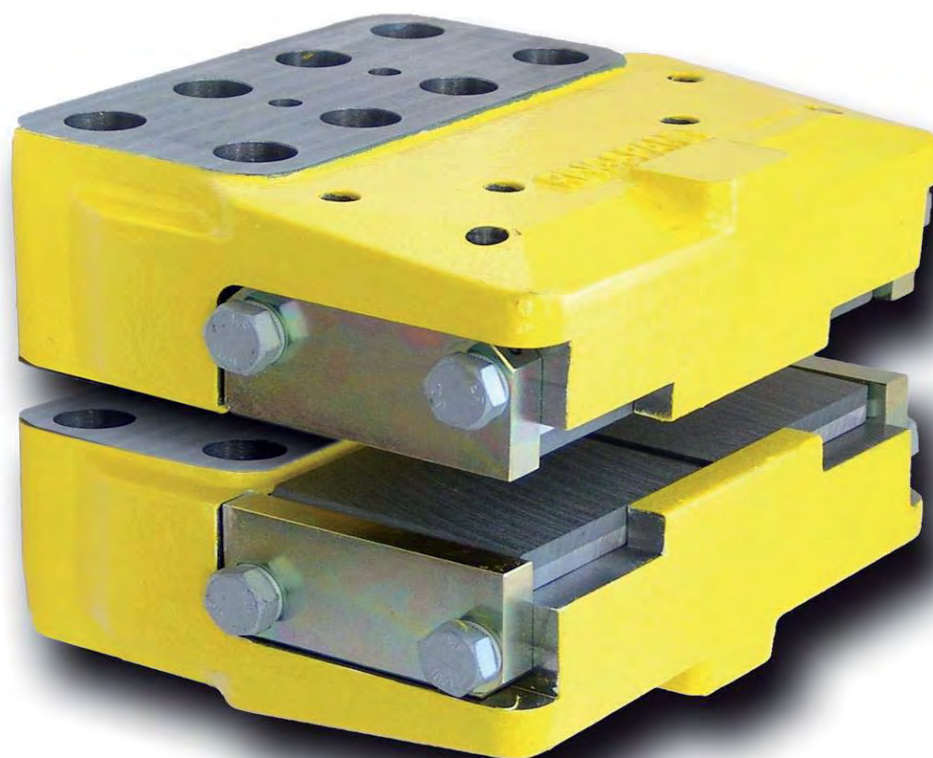


Installation and Operating Instruction for Brake Caliper HW 150 HFA and HW 180 HFA

E 09.736e



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EDMAYR ANTRIEBSTECHNIK	Installation and Operating Instructions for Brake Caliper HW 150 HFA und HW 180 HFA hydraulically activated with Brake Pad Retraction			E 09.736 e	
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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 warranty; 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 agents.
- If a malfunction is indicated, the product or the machine into which it is installed, should be stopped immediately and either we or an accredited 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.

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1. General remarks

These installation and operating instructions apply to

- model HW 150 HFA and HW 180 HFA .
- the various brake pad materials as well as brake pads with wear alarm cables.
- Installation on vertical brake discs (on horizontal shafts) and on horizontal brake discs.
- special brakes HW 150 and HW 180

Please refer to the drawings in the individual sections.

1.1 General safety instructions

Please read these installation and operating instructions carefully before installing and operating the brake caliper. Please refer also to the drawings in the various sections.

Safety must be given the highest priority during all work performed on the brake.

Switch off the drive unit before performing work on the brake.

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

1.2 Special safety instructions



Danger to life and limb!

It is essential to secure the entire drive train against inadvertent starts during brake installation and maintenance. Rotating components can cause severe injuries.

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

2. Configuration and function / Parts list

2.1 Function

The brake caliper is used as a parking (holding) brake and a stopping brake.

The braking force is generated with pressure oil. The friction blocks are lifted down to a residual pressure in the hydraulic system of < 0,3 bar. An automatic wear adjustment ensures constant braking stroke.

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

2.2 Drawing and Parts List

Brake caliper HW 150 HFA and 180 HFA Standard

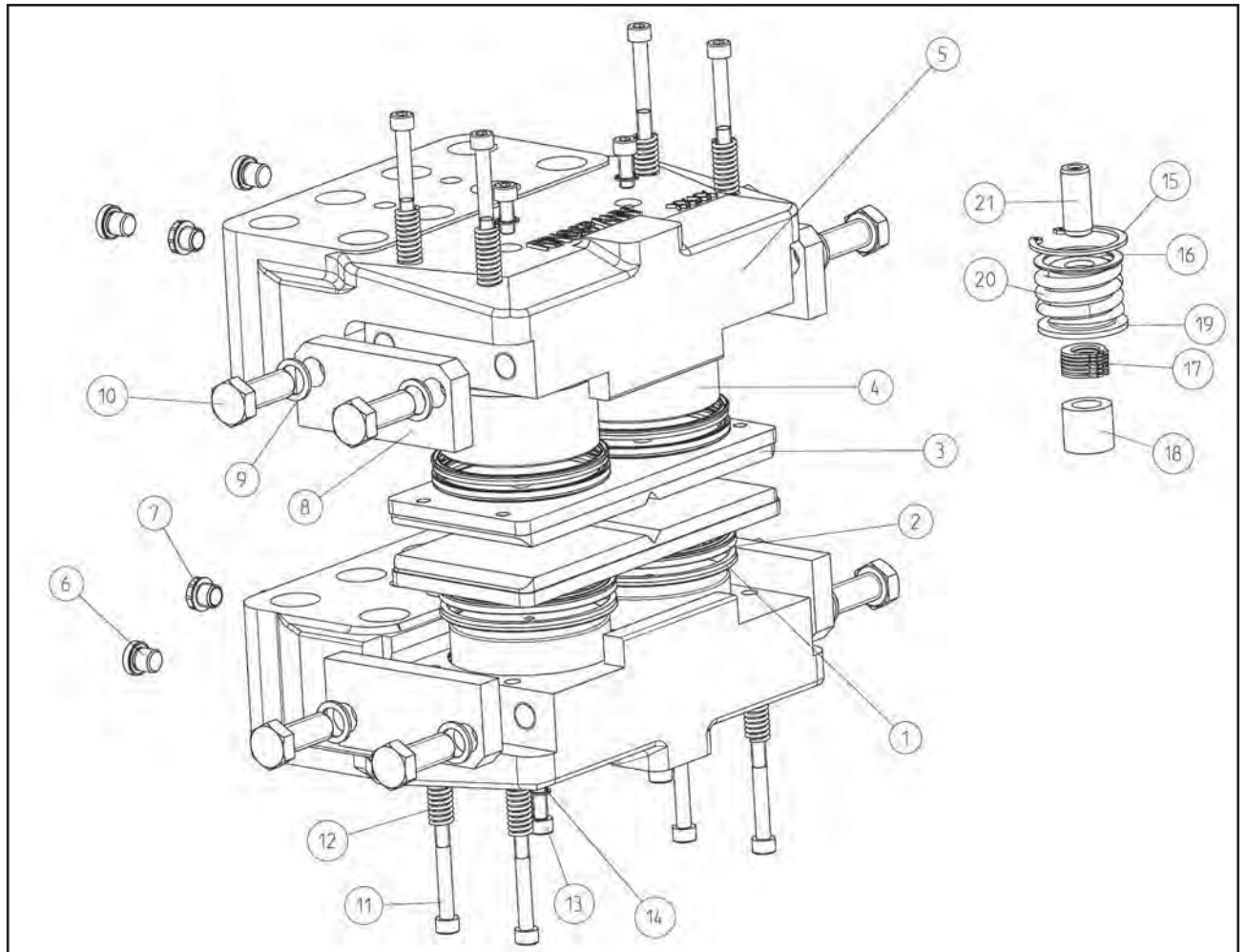


Fig. 2.1

Part	Nomenclature	Quantity
1	Rod seal	4
2	Double wiper	4
3	Brake pad 1 set = 2 pieces	2
4	Brake piston	4
5	Brake caliper housing	2
6	Screw plug G-A 1/4" DIN908	4
7	Stopper plug R 1/4"	2
8	Brake pad holder	4
9	Hexagon head screw M16x40-10.9 ISO 7014	8
10	Toothed lock washer M16 galvanized	8
11	Cylinder screw M8x70-8.8 ISO 4762	8
12	Pressure spring	8
13	Cylinder screw M8x20-10.9 ISO 4762	4
14	Usit-ring U 9,3x13,3x1	4
15	Circlip 52x2 DIN 472	4
16	Adjusting washer 40x50x1 DIN 988	4
17	Gripping ring G 16x1,5	24
18	Bushing	4
19	Receiver bushing	4
20	Pressure spring	4
21	Parallel pin with internal thread D 16x40-ST DIN 7979	4

3. Condition on delivery

The brake caliper is delivered as two brake saddle halves with 1 set of brake pads.

4. Installing the brake saddle

4.1 Handling

Each brake caliper-half weighs approximately 35 kg. A threaded transport bore is provided for lifting (see Annex A).

4.2 Cleaning the brake disc

Before installing the brake, the brake disc must be cleaned with alcohol, e.g. ethyl or isopropyl alcohol, or a water-based surfactant solution (soapy water, etc.) and then rubbed dry with a clean cloth.

When cleaning the brake disc with a thinner, acetone or a brake cleaning agent, it is important to ensure that neither these cleaners nor any cleaner residues come in contact with the brake pads. This is especially important in the case of brakes used only as parking brakes, as no dynamic braking operations take place during which thinner residues would be rubbed off the brake disc.

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Caution!

Oil and rust-proofing-agent residues reduced friction coefficient and thus diminish transmissible braking torque substantially!

4.3 Cleaning the mounting surfaces

The mounting surfaces on the brake caliper-halves and the mounting flange (supplied by the customer) are to be cleaned in the same manner as the brake disc.

4.4 Mounting the brake pads

The brake pads (3) are delivered in separate packaging. In order to prevent brake pads soiling, the brake pads should not be removed from the packaging until immediately before they are to be mounted. Brake pads that come in contact with grease or oil are no longer suitable for use and must be replaced immediately. Brake pads made of sintered metal are less sensitive and can be reused after cleaning with a solvent.

Remove one brake pad holder (8) and slide the brake pad sideways into the brake. Is the lateral insertion not for reasons of space by the mounted brake possible, the brake pads are incorporate before the assembly in the brake. Insert the pressure springs (12) in the stepped hole and fasten the brake pads with the screws (11) on the brake. Use Loctite 243 to secure the screws; the tightening torque of screws is 5 Nm.



Caution!

The two halves of the brake caliper must not be exposed to hydraulic pressure during assembly/installation.

4.5 Mounting the brake

To ensure low-noise braking, the brake saddle should be mounted on stable, low-vibration machine components. .

The thickness of the mounting plate between the two caliper-halves should be exactly disc thickness. This results in a gap between the brake disc and brake pad of 1.5 mm on each side.

- Before installing the brake caliper, check to ensure that the mounting surface is even and concentric run between the brake disc and the mounting surface is within the prescribed tolerance range (see Annex B, "Installation, at interior assembly" or Annex C "Installation, at exterior assembly").
- Position the brake caliper-half with the inserted brake pads and tighten the mounting bolts/screws with little pretension.
- Check to ensure that the brake disc can be turned without resistance. The distance between the brake disc and the brake caliper should be approx. $0.001 \times d$ (d = brake disc diameter), so that the brake disc can rotate freely even at increased temperatures.
- Tighten the mounting bolts/screws with the specified tightening torque (see Annex A).

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- Mount the oil pressure- and oil leak connections (see Annex A).



Caution!

Check to ensure that the brake disc rotates freely.



Please note!

For easier installation, you can fix the position of the brake at first with only one screw before you swing the brake to the point where the rest of the screws can be mounted.

Maximum operating pressure is 160 bar. The two piston bores are connected in the pressure area. There are always two oil pressure ports located on each caliper-half. Alloyed mineral oil, Group HLP as defined in DIN 51525 or API to classification SC, SD or SE, can be used as pressure fluid.

HW 150 HFA : Oil volume per 1 mm of piston stroke = 17 cm³ per brake caliper
(1 caliper = 2 halves)
max. oil volume per braking = 51 cm³ per brake caliper
max. oil volume (at max. brake pad wear) = 128 cm³ per brake caliper

HW 180 HFA : Oil volume per 1 mm of piston stroke = 26 cm³ per brake caliper
(1 caliper = 2 halves)
max. oil volume per braking = 104 cm³ per brake caliper
max. oil volume (at max. brake pad wear) = 195 cm³ per brake caliper



Caution!

For the connection of the pressure and drain connections should be flexible hydraulic hoses are used to restrict the movement of the brake not.



Caution!

Oil expelled from the system must be removed completely. Leaks must be repaired immediately.



Please note!

The purer the hydraulic fluid, the longer service life of the brake system.

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Caution!

It is essential to ensure that the brake pads do not rub against the brake disc when the brake is released.

4.6 Control of mounting position

- Check to ensure that the permissible angular offset between the brake disc and the mounting surface is not exceeded (see Annex B, "Installation, at interior assembly" or Annex C, "Installation, at exterior assembly").
- Check the axial movement of the brake disc. Axial movement must not exceed ± 0.3 mm.



Caution!

During installation, ensure that the brake pads are centred and in full contact with the surface of the brake disc.
The gap between the brake pads and the brake disc should always be approx. 1 mm on each side. Please observe maximum the wear limit.

4.7 Bleeding the brake

For initial installation, gasket replacement or other work performed on the hydraulic system the hydraulic system must be bled.

If the system is designed for circulation from hydraulic oil, the hydraulic system can be bled by circulating the hydraulic oil.

4.8 Running-in procedure of the brake pads

Full-surface contact between the two brake pads (3) and the brake disc as well as brief heating of the brake pads to approx. 200°C are required to ensure optimum braking. Therefore, multiple brief braking operations (running in) must be performed while the brake disc is rotating.



Caution!

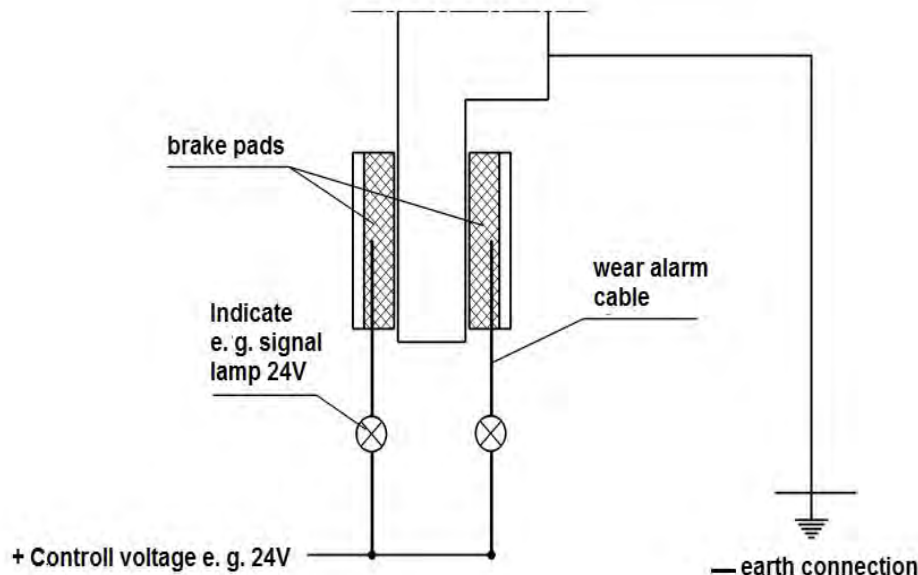
If the brake pads cannot be run in, the torques listed in our Publication 46 cannot be achieved. Reductions of up to 50% are possible.

**Caution!**

If the brake are used as parking (holding) brake, the specified torques cannot be achieved. Reductions of up to 50% are possible.

4.9 Connecting of the wear alarm cable (optional)

Connect the wear alarm cable to a 24V control voltage source, e.g. via a signal light. When the maximum permissible brake pad wear thickness is reached, a contact comes established with the neutral conductor and the signal lamp lights up.

**4.10 Dismantling the brake**

Make sure that no pressure is exerted on the brake saddle and disconnect the hydraulic lines from the brake saddle halves.

Remove the mounting bolts/screws. The brake caliper can then be removed from the mounting surfaces.

**Danger to life and limb!**

When disassembling the brake it is essential to ensure that the entire drive train is secured against inadvertent activation. Rotating components can cause severe injuries. Therefore, rotating components (e.g. brake discs) must be secured against accidental contact. To prevent injuries to personnel, secure the brake with the aid of an assembly locking device.



Caution!

Ensure that no hydraulic pressure is applied to the brake caliper.



Caution!

Secure the brake for disassembly.



Caution!

Brake pads must not come in contact with lubricants.

5. Maintenance

Maintenance must be performed on the brake caliper at intervals of between 4 and 12 weeks, depending upon the frequency and duration of operation.

5.1 General maintenance

- Check the bolt connection between the brake caliper and the machine component and the bolt connection of the brake pad holder (8) for solid compound.
- Check the hydraulic lines and -connections for leaks.
- Check the brake piston gasket system for proper seal by inspecting the oil leak lines. If there is oil in the oil leak lines, the gasket must be replaced (see Section 6.2).



Caution!

Brake pads must not come in contact with hydraulic oil.

5.2 Brake pad wear control

Brake pad material must not be worn to less than 2 mm from the steel base plate. The brake pads (3) must always be replaced in pairs.

6. Replacing consumable parts

6.1 Brake pads

Before replacing the brake pads (3), make sure that the mass held by the brake is secured in a fixed position, since the brake will be released in order to replace the brake pads.

- Make sure that no oil pressure acts to the brake caliper; solve one of the brake pad holder (8) at each the caliper-halves.

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- Remove the 4 cylinder screws (11). Note that the cylinder screws are slightly pre-tensed by the compression springs (12). Pull the old brake pads out from the side and push the brake piston (4) back into the brake caliper housing (5). Insert the new brakes pads. Attach the brake pads with the 4 cylinder screws. Use Loctite 243 to secure the threads for the screws; tightening torque of the screws is 5 Nm.



Caution!

The threaded bore in the brake pad is a tapped blind bore with a depth of approx. 5 mm. A tightening torque in excess of 5 Nm may damage or destroy the threading!
Use Loctite 243 to secure the threads for screws.

- Attach the brake pad holder (8) with the specified tightening torque (see Annex A).
- The brake is now ready for the running-in procedure of the brake pads (see Section 4.8).



Caution!

The brake pad spacing adjustment must be repeated after initial installation or after replacement of brake pads.



Danger to life and limb!

Brake pads may be replaced only when the equipment system and/or the working machine is at a complete standstill!



Caution!

Ensure before replacement the brake pads that no hydraulic pressure is applied to the brake caliper.

6.2 Piston gaskets

Before replacing the piston gaskets, make sure that the mass held by the brake is secured in a fixed position, since the brake will be released in order to replace the piston gaskets. Maximum possible cleanliness is essential when working on the hydraulic system. Each part must be cleaned in solvent, dried and stored protected in a dust-free place. Dirt reduces the service life of the gaskets substantially. Check the surfaces of the brake pistons for damage. Surface damage can destroy a gasket immediately.

- Make sure that no oil pressure is applied to the brake caliper and solve the hydraulic fittings at the caliper-halves.

- Remove the brake caliper-halves. Remove the 4 cylinder screws (11). Note that the cylinder screws are slightly pre-tensed by the compression springs (12). Connect a hydraulic fluid line to each of the brake caliper-halves and connect a hydraulic hand pump to the second hydraulic fluid connection. Hold or clamp the brake housing (5) firmly in place. Push the brake piston (4) out with the aid of the hand pump. Make sure that the brake pistons is pressed evenly out of the brake caliper housing (5).
- Remove the old seal (1) and the old double wiper (2) and install the new seal and the new double wiper in the brake caliper housing (5). Observe the correct installation position for the seal as shown in Fig.6.1. The incorporation should be occur by hand to ensure that the sealing edge is not damaged. The seal and the doble wiper can be inserted more easily be bending it into a kidney shape and laying it into the groove. Oiling the seal with a light coat of Molycotec prior to assembly. Centering befor installing the piston (4) the gripping rings in the piston to bore or outside diameter of the piston with a conically turned pin (see Fig 6.2). Push the piston centric with a press or beat with a plastic hammer into the cylinder bore to the stop point.

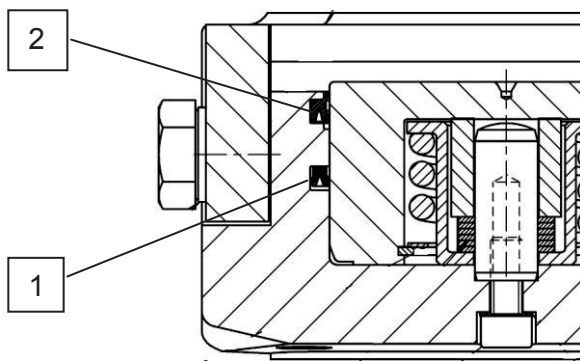


Fig. 6.1

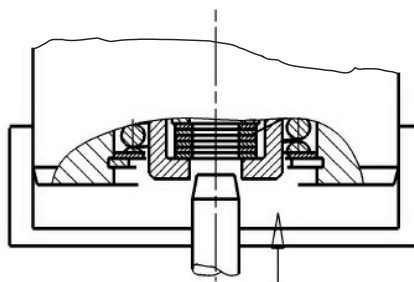


Fig. 6.2

**Danger to life and limb!**

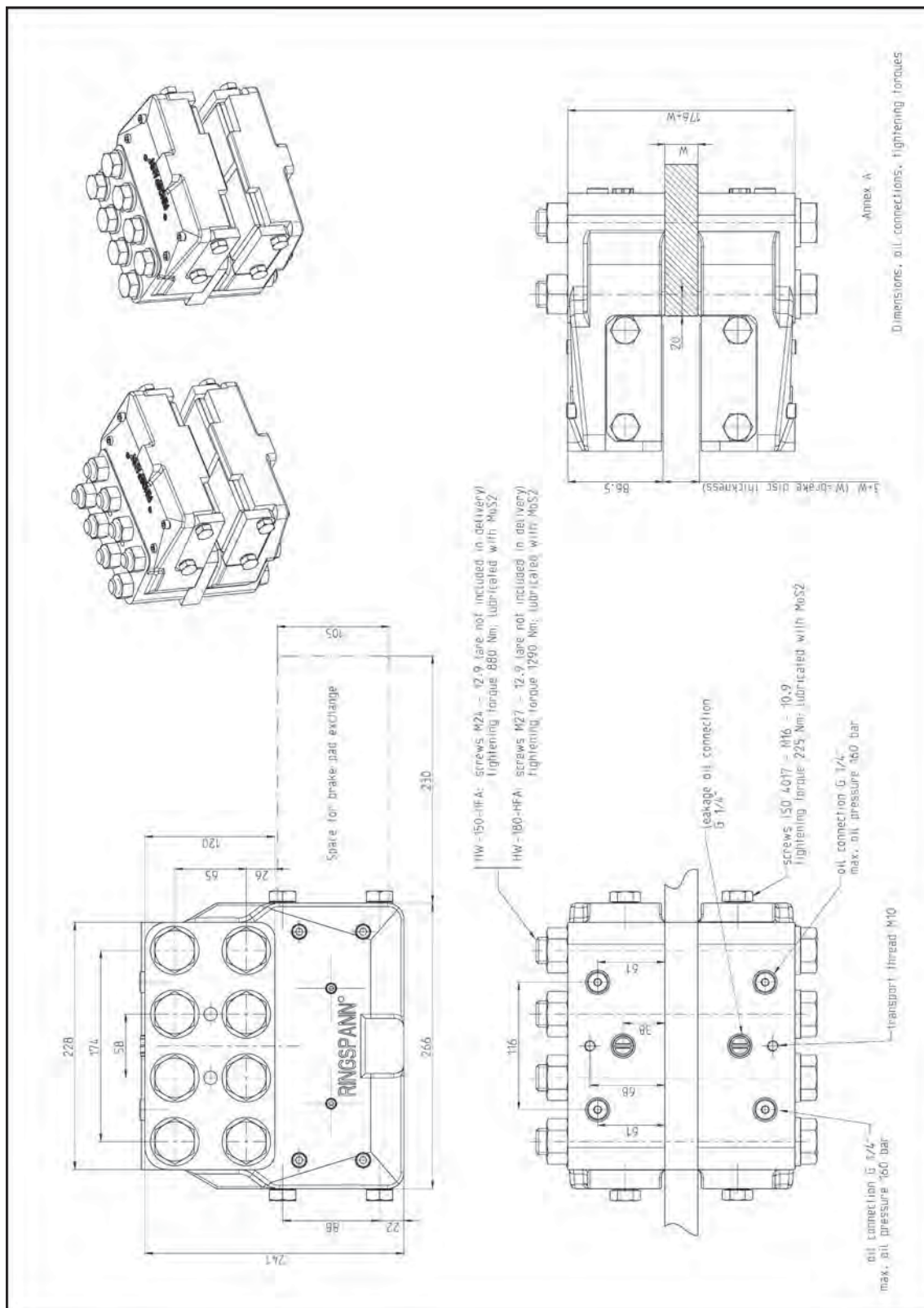
Seals/gaskets may be replaced only with the equipment system and/or working machine is at a complete standstill!

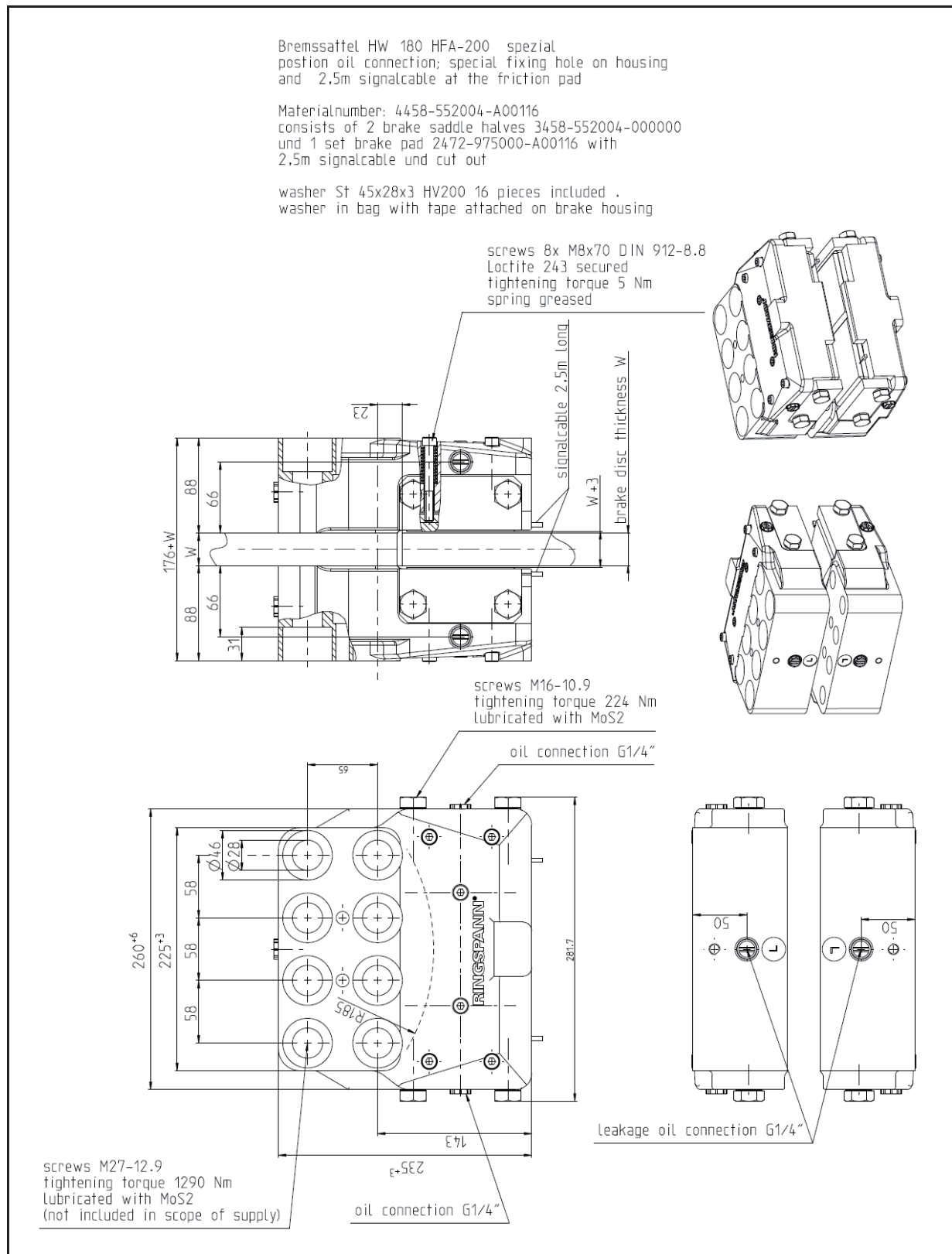
**Caution!**

Ensure that no hydraulic pressure is applied to the brake caliper.
Observe the manufacturer's instructions when handling solvents.

**Caution!**

Document the configuration and number of disc springs and support disc for easy installation.





figures in (i) as an example of a brake disc diameter of $d=2500\text{mm}$

