Installation and Operating Instructions for Brake Caliper DH 010 PFK

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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.

Contents

1. General information

These installation and operating instructions apply to:

- the DH 010 PFK, brake caliper mounted at a right angle to the brake disc, see Fig. 3.1 in Section 3.
- or installation on a brake disc with a thickness of 12.5 mm.
- for the remarks with spezial brake pad materials.
- for the remarks with spezial levers with sensor damping (see Fig. 3.2 and 3.3)

An identification plate with a 16-digit part number is affixed to the caliper. The precise design of the brake caliper is defined by this part number only.

Please consult the drawings in each section when using this instructions.

2. Configuration and function

The brake caliper is used as a stopping and parking brake.

Braking force is generated by compressed air. The brake is opened by spring force.

Rotating parts must be secured by the user against inadvertent contact (e.g. brake disc).

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.

3. Drawing and parts list

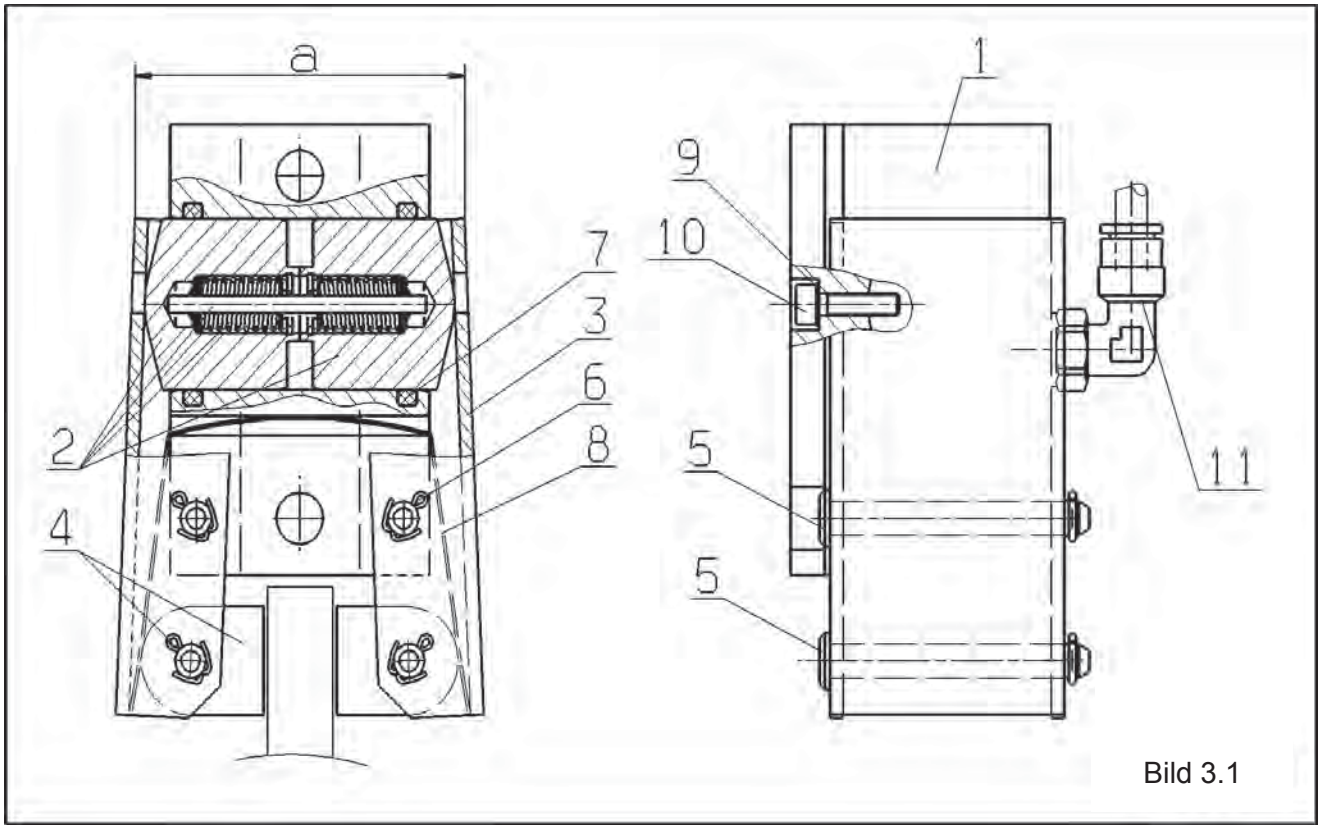
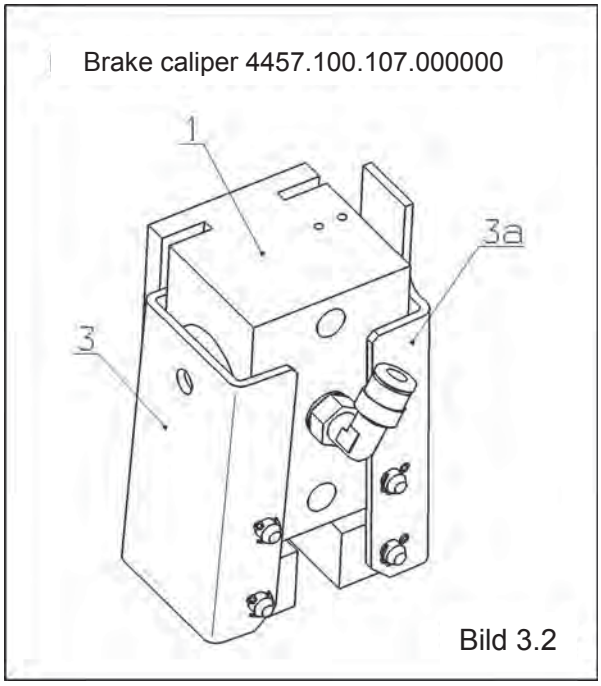


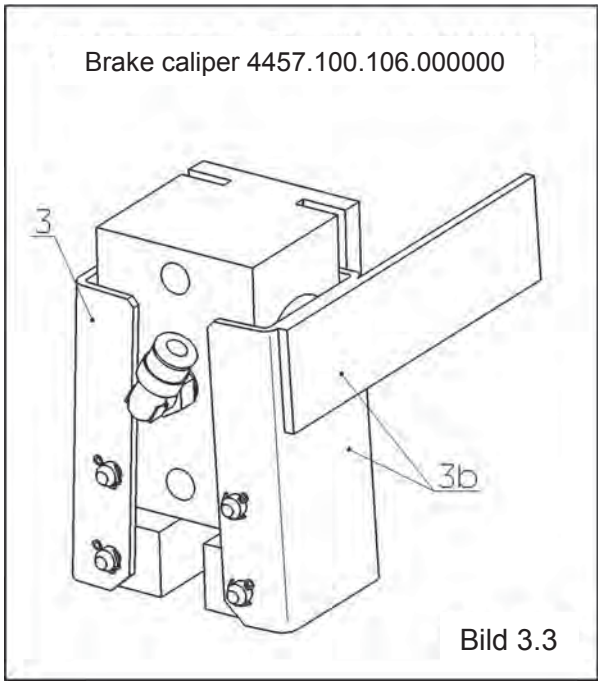
Bild 3.1

Ersatzteilliste:

Part	Nomenclature	Quantity	Part number
1	Cylinder block to DH 010 PFK	1	2768.079.001.000000
2	Piston assembly group completely to DH 010 PFK	1	3771.030.601.000000
3	Lever to DH 010 PFK	2	2789.087.002.000000
4	Standard brake pad with split pin for brake calipers: 4457.901.101.000000 4457.100.106.000000 4457.100.107.000000	2	3457.901.101.000000
	Brake pad from BK 6905 for brake caliper: 4457.100.109.000000	2	3457.901.104.000000
	Brake pad from PTFE for brake caliper: 4457.100.108.000000	2	3457.901.106.000000
5	Pin with head a hole for split pin 6h11x50	4	5213.010.150.000000
6	Split pin 1,6x12	2	5202.016.106.000000
7	O-ring 30,2x3	2	5116.030.002.000000

Part	Nomenclature	Quantity	Part number
8	Return spring	1	2449.146.001.000000
9	Seal 7,5x4,5x0,5	1	2517.000.017.000000
10	Hexagonal socket cap screw M4x16 DIN EN ISO 4762	1	5001.004.012.000000
11	L-shaped hose connector, swivelling G 1/8	1	5161.106.101.000000





Part	**Nomenclature for Fig. 3.2**	Quantity	Part number
1	Cylinder block to DH 010 PFK for mounting of sensor	1	2768.079.003.000000
3	Lever to DH 010 PFK	1	2789.087.002.000000
3a	Lever to DH 010 PFK for sensor damping	1	2789.087.005.000000

Part	**Nomenclature for Fig. 3.3**	Quantity	Part number
3	Lever to DH 010 PFK	1	2789.087.002.000000
3b	Lever to DH 010 PFK for sensor damping	1	2789.087.004.000000

4. Condition on delivery

The brake caliper is delivered with a clamping gap of approx. 14.0 mm between brake pads.

5. Installing the brake caliper

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.

Caution!

A compressed air admission is to be made only after the mounting of the brake caliper.

Caution!

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

5.1 Installation

The brake caliper should be mounted to stabile, vibration-free machine components in order to ensure noise-free, non-screech.
During installation, it is essential to ensure that brake pads are centred and in full contact with the brake disc (the midlines of the brake arm must point to the midpoint of the brake disc). Maximum permissible lateral brake disc wobble is 0.2 mm. Greater wobble may cause rattling and shaking of the brake unit.

The brake caliper is mounted to the machine component with using 2 M8 bolts the strength class 8.8.

5.2 Compressed air connection

The connecting thread at the cylinder block is G 1/8, the max. screw depth amounts to 4,0 mm. The brake caliper are delivered with a 360° swivelling L-shaped hose connector.

The compressed air connected to the L-shaped hose connector by way of a plastic hose, outside diameter 6 mm, the type PUN or PAN (e.g. plastic hose type PUN-6x1-BL, part-number: 159664, color blue, delivered from the company FESTO Pneumatik, D-73726 Esslingen, Germany).

A compressed air admission is to be made only after the mounting of the brake caliper to the brake disk.

Operating pressure may range between 1 to 6 bar, depending on braking force. Maximum pressure is 8 bar.

The brake caliper has been lubricated prior to delivery and thus can be operated with compressed air with or without oil.

Compressed air must be filtered, dried and drained (solid material class 5 – impurities larger than 40µm must be removed with suitable filters – pressure dew-point +2°C). If oiled compressed air is

used, is essential to ensure that it contains no ozone, as ozone causes premature ageing of the diaphragm. If the brake caliper has been operated once with compressed air containing oil, it must always be operated with oiled air from that point on, as the additional oil may wash out the initial grease lubrication.

If the brake is operated with oiled air, the following oils are recommended for a maintenance unit:

Suitable types of oil	Viscosity at 20° C (mm²/s)
Avia Avilub RSL 3	34
BP Energol HLP 40	27
ESSO Spinesso 34	23
Shell Tellus Öl C 10	22
Mobil VAC HLP 9	25,2

Maximum air consumption per braking operations is approx.10 cm³ .

5.3 Running-in procedure

Optimum braking effect is achieved only when both brake pads (5) are in full contact with the brake disc and the brake pads have attained a temperature of approx. 200°C. This requires multiple, brief braking with small compressed air admission (1 to 2 bar) while the brake disc is rotating (run-in).

Caution!

If run-in is not performed, the braking forces cited in our publication no. 46 cannot be achieved. Reductions of up to 50% are possible.

6. Maintenance

6.1 General maintenance

- Check both brake caliper lever arms for ease from movement.
- Clean all bearings and glide points
- Lubricate all bearing and glide points.
- Check to ensure that the brake pads do not rub against the brake disc when the brake caliper is open, i.e. hat the gap is uniform on both sides.
- Check the screw connection brake caliper to machine part onto fixed gland:

Caution!

Brake pads must not be come in contact with lubricants.

6.2 Checking brake pad wear

Maximum permissible brake pad wear is determined by the maximum possible piston (2) stroke. The value is 3.0 mm for each pad.

Inspecting for brake pad wear:

When brake pads are worn, the levers (3) are spread at a wider angle when the brake is engaged (i.e. when the brake caliper is subjected to pressure). (see Fig. 3.1, dimension a). Therefore, it is necessary to inspect the brake at regular intervals to determine how far the levers (3) are spread when the brake is engaged. Both brake pads must be replaced when the length of spread reaches a value of a = 79.0 mm – at the very latest.

7. Replacement of worn parts

Consumable parts include brake pads and possibly the piston seals in the cylinder block (after extended operation). Brake pads (4) must always be replaced in pairs.

7.1 Replacing brake pads

Caution!

Before replacing brake pads, ensure that the mass held in place by the brake is secured against shifting, as the brake must be disengaged (opened) to replace the brake pads.

Remove the split pin (6), pull the bolt (5) out of the brake pad and caliper and remove the worn brake pad (4). Press the rounded side of the new brake pad against the return spring (8) and secure the bolt with the split pin. Repeat this procedure on the opposite side.

Danger to life and limb!

Brake pads may only be replacing when the plant or the working machine is at complete standstill!

7.2 Exchange of the piston seals

If leaks occur and the brake caliper blows off air, the brake caliper should be inspected and repaired. If this is not possible, please proceed as follows:

- Remove the brake caliper from the machine component.
- Disassemble the two brake levers (3) through removing the splint pins (6) and the pins (5) pull out.
- Remove the hexagon socket cap screw (10) and the seal (9).
- Push the piston assembly group (2) out of the cylinder block.
- Remove the O-rings (7).

- Clean individual parts thoroughly, especially the O-ring grooves and the cylinder bore for the piston assembly group (2).
- Install the new O-rings and apply a thin coat of ALVANIA G2 grease (company SHELL) to the rings before reassembling the unit. Also clean the cylinder bore for the piston assembly group (2).
- Push the piston assembly group (2) to the middle position into the cylinder bore of the cylinder block (1). Install the seal (9) and tighten the hexagon socket cap screw(10) to a torque of 3.3 Nm.
- Reinstall both brake levers (3), after applying a thin coat of ALVANIA G2 grease to the two pins (5). Do not forget to secure the pins with the split pins (6)!