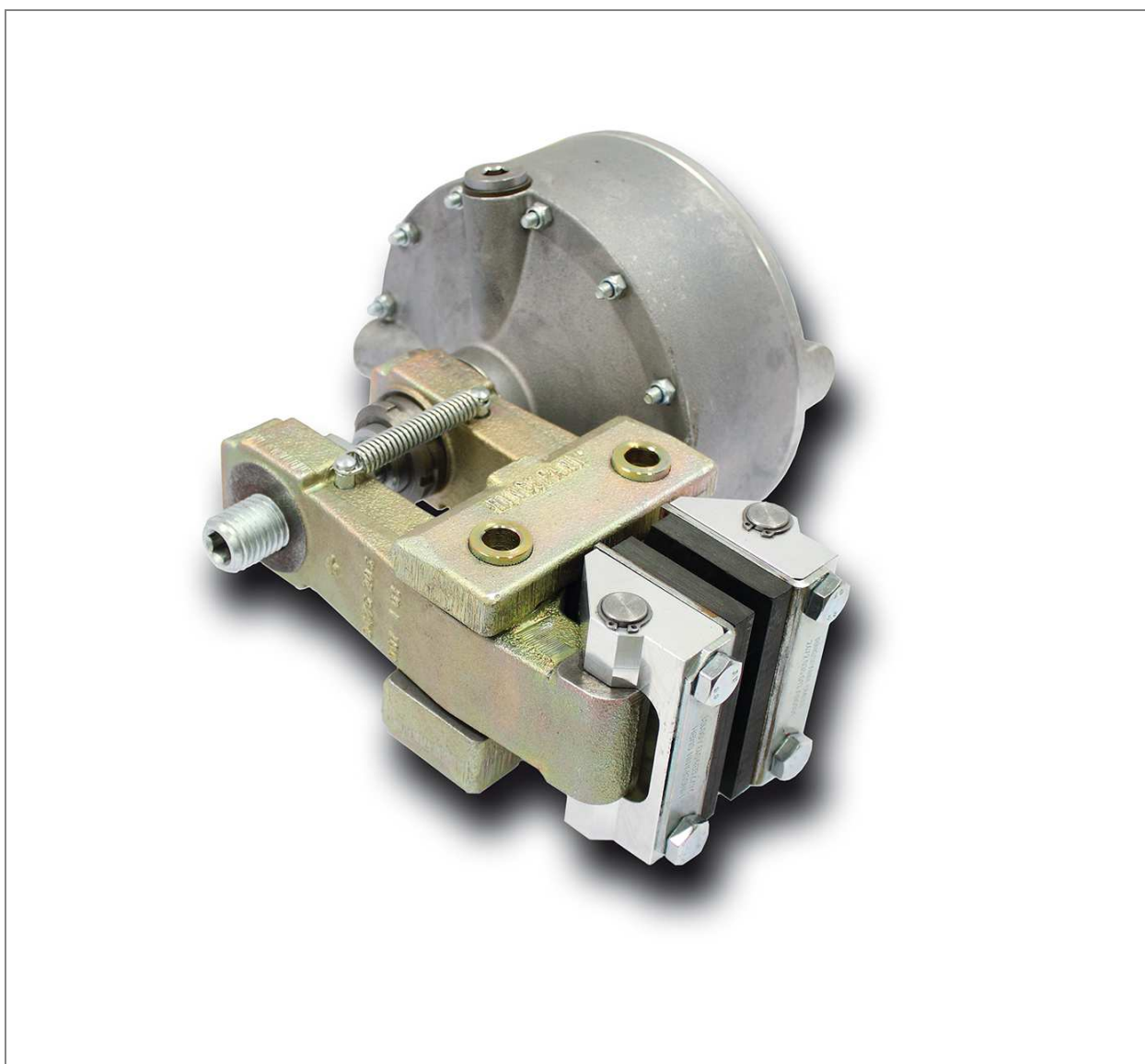


## Installation and Operating Instruction for Brake Caliper DV / DH 035 FPM

E 09.737e



Any questions? Please contact us.

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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 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.

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## 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.

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## 1. General information

These installation and operating instruction apply to the Brake Caliper DV 035 FPM and DH 035 FPM:

- with right-mounted brake chamber.
- with left-mounted brake chamber.
- with signal generator
- for the installation on 12,5; 25; 30 and 40 mm thick brake discs.
- various types of brake-pads, e.g. with wear alarm cable, increased glide speed, double friction surface or other special brake pad materials.

An identification plate with a 16-digit part number is affixed to the calliper. 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 springs in the brake chamber (1). It is released (opened) pneumatically with compressed air. Brake pad (2) wear decreases holding/braking force, as spring pressure is reduced.

When brake pad wear occurs in the course of normal operation, brake pads must be inspected and adjusted as described in Section 6.2 and 6.3.

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

### 2.1 Safety instruction

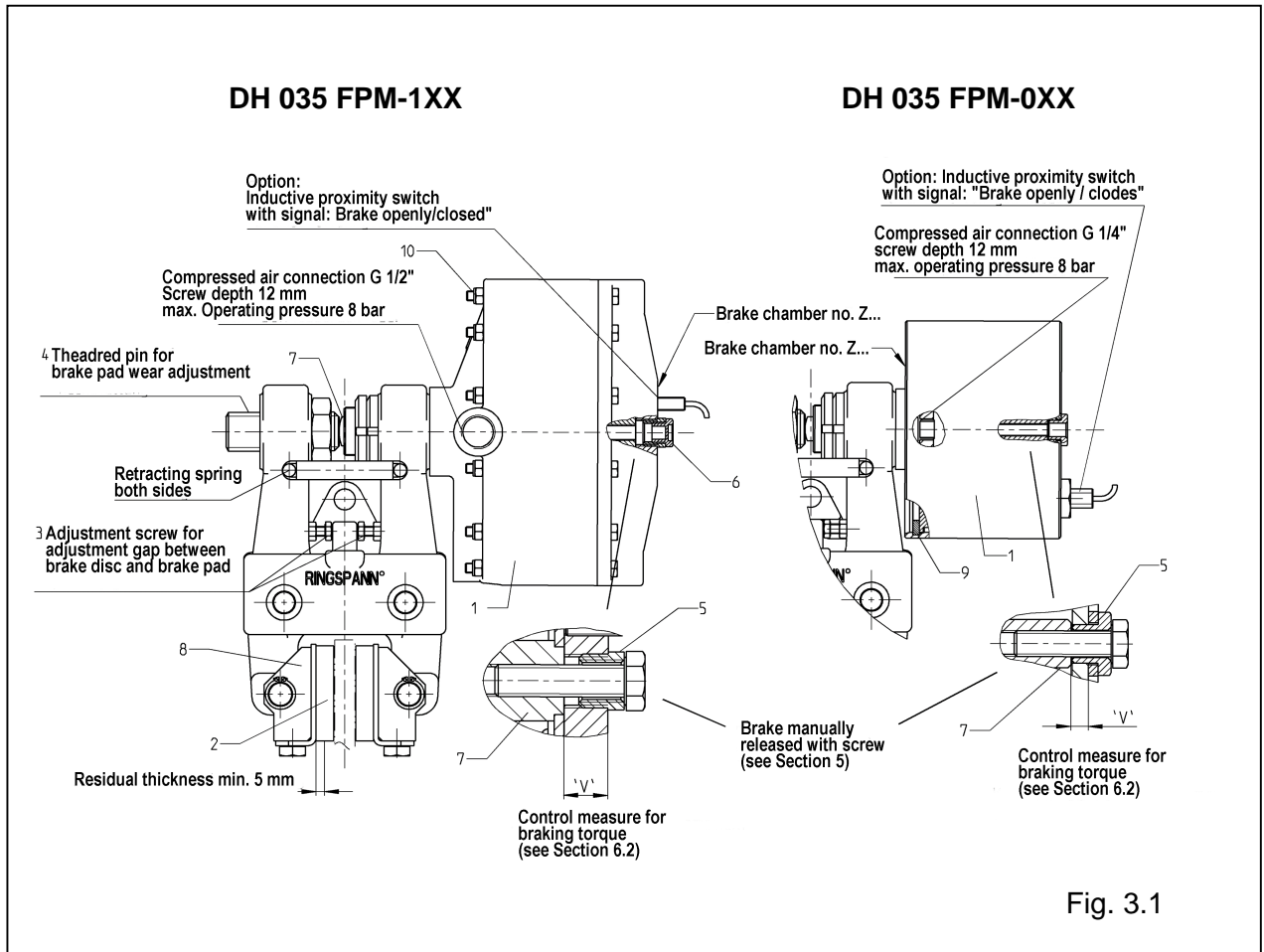
The brake chamber (1, see parts list) may be dismantled by the manufacturer only.



#### **Caution! Danger of injury!**

Brake chambers are equipped with high-pressure pre-tensed springs. When the safety ring (9) / the screws (10) is loosened or removed, spring pressure is released abruptly.

### 3. Drawing and parts list



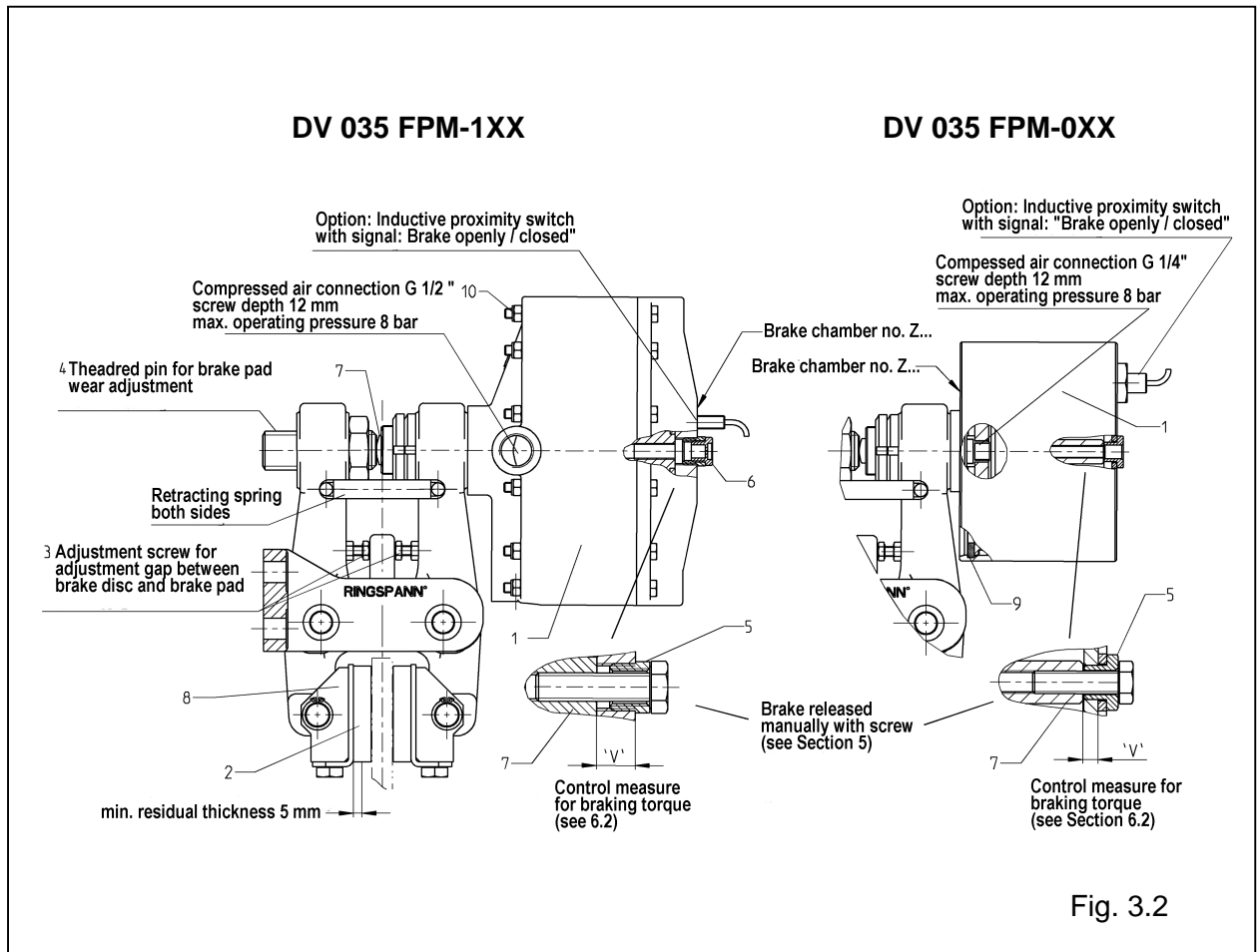


Fig. 3.2

Parts list:

Part	Nomenclature	Quantity	Part number
1	Brake chamber Z065	1	3514.100.146.000000
	Brake chamber Z100	1	3514.190.103.000000
	Brake chamber Z110	1	3514.190.102.000000
	Brake chamber Z120	1	3514.190.100.000000
	Brake chamber Z121	1	3514.190.101.000000
optional	Inductive proximity switch	1	3504.000.085.A00003
2	Standard brake pad	2	2472.035.013.A00101*
	Brake pad for parking application	2	2472.035.013.A00102*
	Brake pad set with signal cable	1	2472.035.013.A00104

\* Part number for 1 pad.

For the unique assignment of identical Pos.-No. the part number of the brake is necessary

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#### 4. Condition on delivery

The brake calliper are adjusted to the ordered brake disc thickness and an air gap of 0,5mm reciprocal between brake pad and brake disc. In the delivery condition the distance between the two brake pads is smaller, since the spring pressure in the brake chamber reduces the distance between brake pads.

For the option “proximity switch as signal generators for signal brake openly/closed”, the proximity switches separately packs to the brake calliper, so that by transport these proximity switches are not damaged.

#### 5. Installing the RINGSPANN 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!

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

Prior to installation to a brake disc, the brake calliper must be released (opened). This is possible:

- once the compressed air supply has been connected (see Section 5.2).

Or by manual released with a screw:

- M10x40 at brake chamber 100,110,120,121
- for brake chamber 095: M8x30



#### Caution! Danger of injury!

When the air escapes during the assembly, the brake can close abruptly.



#### Caution!

If the brake calliper released manually with a screw must be removed for a functional brake the screw again!



### 5.1 Installation

The brake calliper 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 calliper is using:        4 bolts M12 (DV 035) or.  
    3 bolts M12 (DH 035)  
    the strength class 8.8. attached in the machine part.

### 5.2 Compressed air connection

To open the brake calliper, compressed air is needed. The necessary pressure, please refer to the following table:

Brake chamber no.	Release pressure
Z100	3.0 to 8.0 bar
Z110	5.0 to 8.0 bar
Z065	5.0 to 8.0 bar
Z120	6.5 to 8.0 bar
Z121	6.5 to 8.0 bar

A flexible hose connection is required. Please use hoses with a diameter of 6 mm.  
Hose pressure must be at least 8 bar (preferably 12 bar) with a temperature range of approx. - 20°C to + 80°C.

Air hoses are connected to the brake chamber Z0XX with a G ¼" fitting and/or a G ½" fitting to the brake chamber Z1XX (Whitworth threaded pipe DIN ISO 228-1).

Compressed air must be filtered to remove all dirt, pipe chips, rust and condensation. Purified air must then be enriched with a fine oil mist injected by a standard, commercially available conditioning unit. The quantity of oil added depends on the nominal air flow rate in l/min and is specified by the manufacturer of the conditioning unit.

Depending on the brake chamber is the max. air consumption per braking operation is 250cm<sup>3</sup> (Z1XX) and/or 135 cm<sup>3</sup> (Z0XX).

### 5.3 Brake caliper adjustment



#### **Caution!**

Holding/braking force must be adjusted prior to commissioning.

- Subjecting you the brake chamber with the appropriate release pressure (see Section 5.2).

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- Note:  
Actual operating pressure must be equal to or greater than this pressure setting, as otherwise the brake calliper will not open completely during normal operation and brake pads may rub against the brake disc.
- Turn both M6x25 DIN ISO 4017 screws (3) in the calliper arms counter-clockwise, approx. 2 full turns.
- Turn abuts the treaded pin (4) clockwise with an SW 12 Allan spanner to this on plunger (7) of the brake chamber. Then set a small gap (0.2 – 0.4 mm) between the two brake pads and the brake disc by turning the plunger unit further, ensuring that the brake pads do not rub against the disc. This is best done by pressing one brake pad against the brake disc and setting the total gap on the other side with the aid of a feeler gauge.

Note:

The minimum adjustable gap depends on existing disc wobble. The smaller the gap, the larger the wear reserve, i.e. the distance to the point at which the brake pads must be readjusted.

- Depending upon the positions of the brake caliper and the brake disc axle, the laterally mounted spring pressure cylinder may cause tipping resulting in an unequal gap between the brake pads and the brake disc. In extreme cases, one brake pad may come to rest against the brake disc, while the total gap shifts to the other side of the disc, which in turn would result in constant rubbing of this brake pad against the disc during operation. The gap can be adjusted (distributed equally) with the aid of the screw (3). Determine where the gap between the brake pad (calliper arm) and the disc is largest. Then turn the screw (3) on that side clockwise until the gap is equal on both sides.



**Caution!**

It is important to ensure that the brake pads (3) do not rub against the brake disc when the brake is released (open).

- When pressure is released from the brake chamber, the full braking/holding force is applied.

5.4 Running-in procedure

Optimum braking effect is achieved only when both brake pads (2) 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 while the brake disc is rotating (run-in).



**Caution!**

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

Note:

If is not possible to break in the unit while the brake calliper is fully engaged (exposed to full spring pressure), braking force can be reduced by decreasing air pressure.

5.5 Option – Inductive proximity switch „Brake openly / closed“

Installation of the included proximity switch:

Open the brake with the prescribed release pressure (see Section 5.2). Turn the proximity switch by hand in the brake chamber until it abuts with the piston. From this position, turn the proximity switch carefully counter-clockwise, approximately ½ complete turn. Fix the switch in this position.

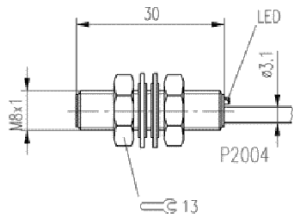


Bild 5.1

Switching function : PNP (closer)  
 Operating voltage : 10....30 V DC  
 Voltage drop : < 2,5 V  
 Temp. range : -25 to +70°C  
 Connection : 3m PVC-cable

Circuit diagram

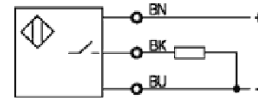


Bild 5.2

Switching distance : 1,5 mm, flush  
 max. op. current : 200 mA  
 Polarity reversal-resistant : yes  
 Safety class : IP 68  
 Housing : M8x1 Steel, stainless

Test for proper operation by repeatedly activate the brake caliper.

5.6 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.

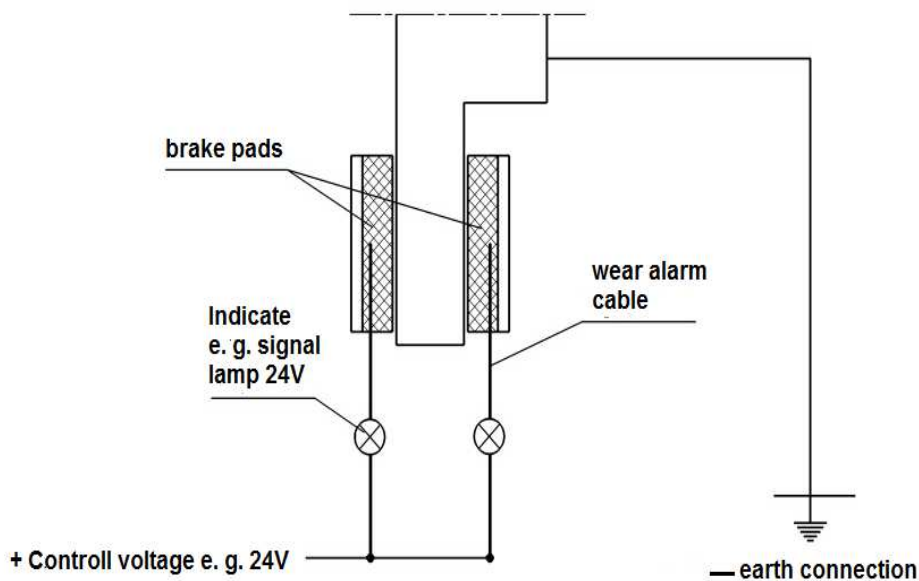


Bild 5.3

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## 6. Maintenance

Maintenance should be performed on the brake calliper at intervals of 4 to 12 weeks, depending upon the frequency and duration of operation.

### 6.1 General maintenance

- Check both brake levers for ease of 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. Adjust the brake gap is required (see Section 5.3).



#### Caution!

Brake pads must not be come in contact with lubricants!

#### Check for tight bolt / screw connections:

- brake caliper to machine component
- brake chamber to brake caliper arm
- brake pads to brake calliper arm

#### Check the following for proper seal / leaks:

- brake chamber
- hose connection  
(leaks can be detected quickly and easily using e.g. "Güpoflex LECKSUCHER", manufactured by: GÜPO GmbH, 77694 Kehl, Germany, telephone 07851/4044-45).

### 6.2 Checking / adjusting braking force

Please refer to the drawings in Section 3.

Check the braking force and spring tension. Remove the filter screw (6) and reducer (5). When the brake caliper is closed, measure the gap "V" between the piston (7) and the housing of the brake chamber (1).



#### Caution!

If brake pads worn, brake calliper spring relaxation increases when the brake is closing and the distance "V" between the piston and the housing of the brake chamber increases. This reduces the braking force.

Adjustment of the braking torque as described in Section 5.3 is necessary if:

V = 20 mm, for brake chamber size 100,110,120,121 or

V = 13 mm, for brake chamber size 065

This position corresponds to a braking torque loss of about 10%.

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### 6.3 Checking brake pad wear

Brake pad material must have a thickness of at least 5 mm (from the top surface of the brake pad to the top surface of the steel mounting plate). Brake pads or brake linings (Pos. 2) must always be replaced in pairs.

## **7. Replacing wearing parts**

### 7.1 Brake pads

Ensure that the mass held by the brake is secured against shifting or movement, as the brake must be released (opened) in order to replace the brake pads.

Pressurize the brake chamber; the brake opens. Remove the old brake pads. Turn counter-clockwise the threaded pin (4, SW 12) until replaced the new brake pads between the swivel mount (8) and the brake disc.

Open-ended or closed SW 17 spanners are used to loosen and tighten bolts/screws. Make sure that no air gap between the brake pad and swivel mount remains.

Note: Tighten the screws at first only slightly and activate the brake. From the clamping force of the brake calliper, the brake pads are pressed to the swivel mount. Tighten the screws now on with the full tightening torque of 30 Nm (M10-8.8;  $\mu=0.12$ ) an.

Following replacement of the brake pads, the braking force and brake gap must be readjusted as described in Section 5.3.

### 7.2 Brake chamber

The brake chamber is defective when the plunger (7) does not move when pressure is applied and released or when air escapes from the brake chamber. Inspection and repair of the brake chamber must be performed by the manufacturer.



#### **Caution! Danger of injury!**

Brake chambers are equipped with high-pressure pre-tensed springs. When the safety ring (9) / the screws (10) is loosened or removed, spring pressure is released abruptly.