

Installation and operating instructions for Brake DV/DH 030/035 FHM

E 09.759e



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EDMAYR ANTRIEBSTECHNIK	Installation and operating instructions for Brake DV/DH 030/035 FHM spring activated - hydraulically released			E 09.759e	
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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; 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.

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 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. 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 springed thruster may only be disassembled by the factory. When loosening the screws or the circlip, the springs' pre-load is suddenly released.

2. Design and function / parts list

2.1 Function

The brake 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 produced by springs, and the brake is opened by means of oil pressure. If there is pad wear on the friction blocks, the holding or braking torque will decrease since the pre-load of the springs in the springed thruster will have gone down. Brake torque readjustment is necessary in the event of pad wear.

2.2 Identification

These operating instructions apply for:

- The execution V, parallel attachment to the machine.
- The execution H, right-angled attachment to the machine.
- For brake disc thickness $W = 12.5, 25, 30, 40$ and for special widths.
- With thruster mounted right.
- With thruster mounted left.
- With signal transmitter installation.
- With different friction block variants (e.g. with cable for wear monitoring, higher sliding speed, double friction surface or special friction materials.)
- With manual spring force setting and special frame.

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 and the drawings in the individual sections.

2.3 Drawing and parts list

Illustration of brake DV, for execution DH see catalogue data

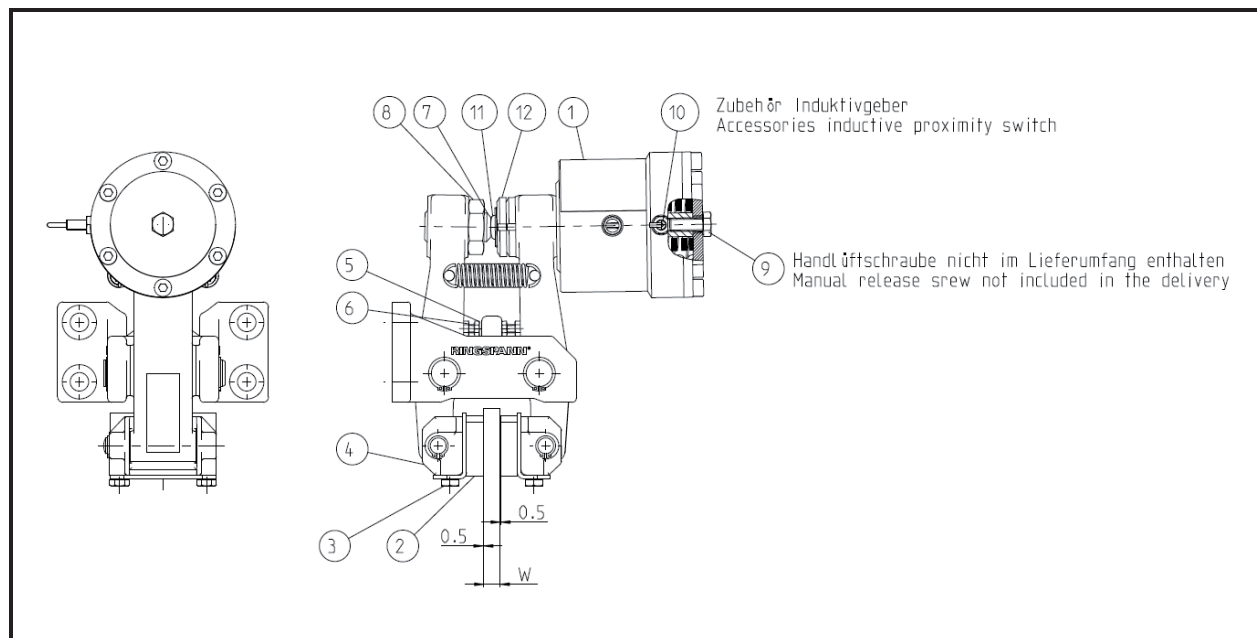


Fig. 2.1

Part	Designation	Quantity
1	Thruster	1
2	Friction block	2
3	Screw for friction block	4
4	Swivel piece	2
5	Adjusting screw	2
6	Nut	2
7	Set screw	1
8	Nut	1
9	Manual release screw not included in the scope of supply	-
10	Sensor (kit) accessories	-
11	Tappet	1
12	Grooved nut KM 6	2

3. Intended use

The brake has been designed for use as a holding, control and stopping brake. Use for any other purpose will be deemed improper.

4. Impermissible use

It is not permissible to operate the brake with a higher pressure than prescribed in the technical catalogue data or with other media. The application of oil pressure must be carried out using a filter. Unauthorised constructional changes to the brake are also not allowed.

5. Condition as delivered

The brake is tested prior to delivery. The brake is delivered ready to install. The brake is delivered depressurised. Sensors are delivered separately.

When delivered, the brake has a clamping gap between the friction blocks that is smaller than the brake disc thickness. When the brake is applied, the brake opens to the pre-set distance (brake disc thickness and an air gap on either side of 0.5mm each).

6. Handling and storage

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The technical data of the brake such as oil pressure, clamping force, oil volume, dimensions and weight are shown on the catalogue pages for the brake.

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.

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 brake

8.1 General instructions regarding assembly and installation

Before installing the brake, 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

Hydraulic hoses should be used for the pressure connections.

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

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 should be used for the pressure line and leakage oil line connection so as to not inhibit the movements of the brake.



Important!

The brake caliper has two oil connections of size G 1/8 (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 120 bar.

Oil volume: As per catalogue data sheet

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.

Before mounting onto the brake disc, the brake caliper must be released (opened). This can be done by:

- Connecting the hydraulic pressure (for the necessary pressure, please see the catalogue pages for the brake). The hydraulic hose connection must be flexible.

Or by manually releasing using a manual release screw for the following thruster:

- M10x25 for thruster 250, 270

The standard brake callipers are fastened to the machine part with screws of strength class 8.8 or higher. (The screws are not included in the scope of supply. Please see the catalogue pages for quantities, sizes and lengths).



Caution - danger of injury!

If hydraulic pressure escapes during assembly, the brake can suddenly close!

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.

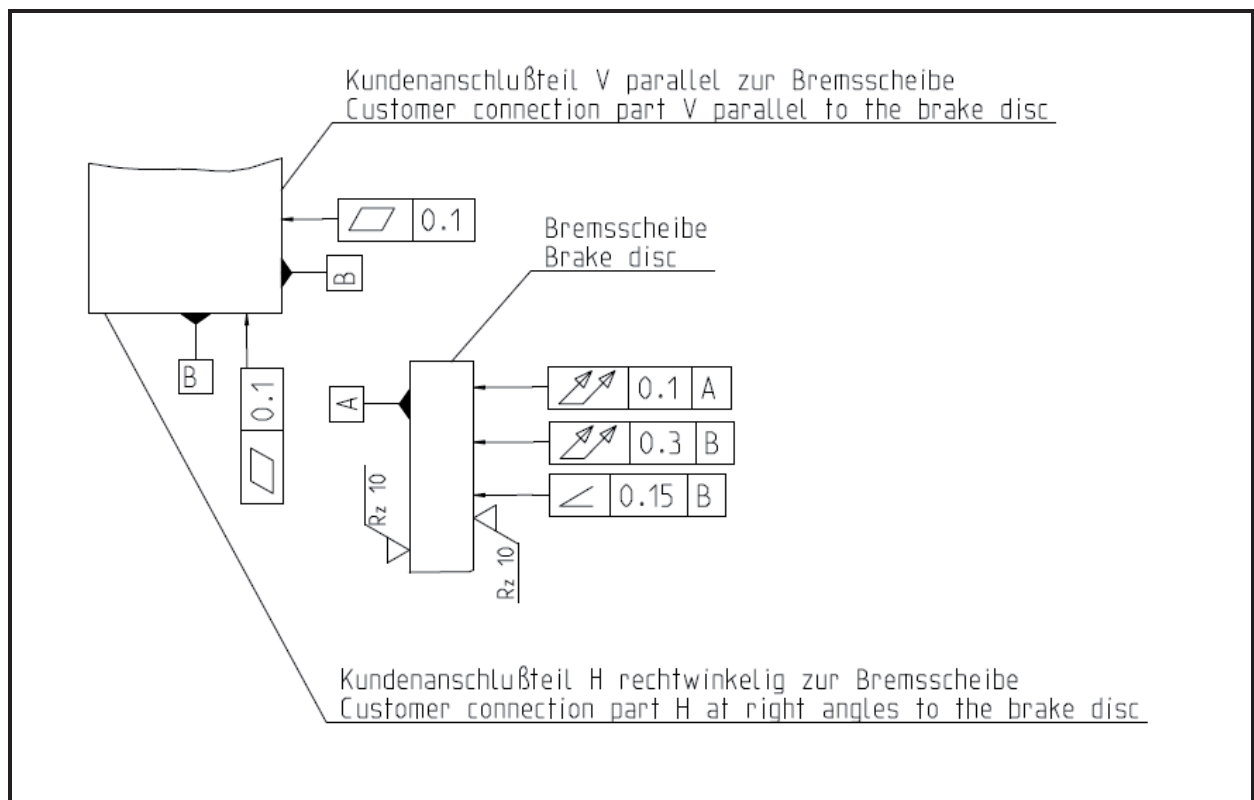


Fig. 8.1

The connecting plate for the brake as well as the brake disc must be checked for dimensional accuracy. For this purpose, the connection dimensions shown on the catalogue data sheet or installation drawing are to be checked.



Important!

Check whether the brake disc can be freely rotated.



Important!

If the brake calliper is manually released using a manual release screw, this manual release screw (item 9) must be removed again to ensure a functional brake!

8.3 Setting/adjusting of the friction block distance

The friction block distance is set after the brake calliper has been assembled and after friction block wear through adjusting/readjusting. See also Fig. 2.1.

- Apply the appropriate oil pressure to the thruster as given in the catalogue data.
- For the purpose of adjusting, loosen the nut (item 6) and turn the adjusting screw (item 5) into the lever by approx. 2 revolutions.
- Loosen the nut (item 8) at the set screw (item 7)
- With the set screw (item 7), set a total clearance between the brake pad and brake discs of 0.5 on either side or of 1 mm on one side.
- Secure the position of the set screw (item 7) using the nut (item 8).
- With the adjusting screws (item 5), the total clearance of 1 mm on one side is evenly spread to 0.5 mm on either side. Once the adjustment has been carried out, secure the position of the adjusting screws (item 5) using the nuts (item 6).
- If there is wear to the friction blocks, a braking force setting must be performed as well as an adjustment/readjustment of the friction blocks in order to preserve the full braking torque.
- The spring pre-load can also be checked if you are measuring the travel of the tappet (item 11) on applying the brake. A travel of 3 to 4 mm is normal. If the distance travelled becomes greater, adjusting/readjusting may be necessary in order to achieve the maximum braking torque again.



Important!

Before start-up, the air gap must be adjusted to 0.5 mm on either side!



Important!

If the friction blocks are worn, a braking force setting must be performed through readjusting the friction blocks. Wear to the friction blocks will cause the springs in the thruster to be relaxed in closed position and reduce the transferable torque. The transferable torque is reduced by approx. 7% per mm of friction block wear.



Important!

It must be ensured that the friction blocks (item 2) do not grind on the brake disc while the brake is released!



Important!

If the brake is released by screwing on the manual release screw (item 9), this screw must be removed once the brake has been installed to ensure a functional brake!

8.4 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.

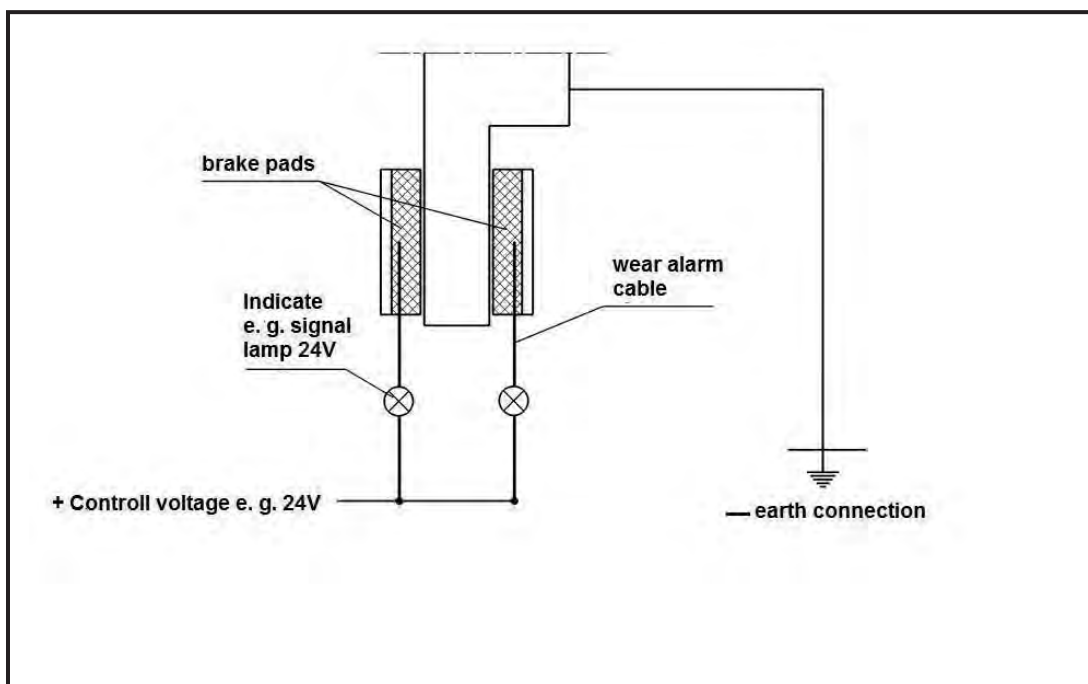


Fig. 8.2

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 when the brake disc is rotating.



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.

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.

Apply the appropriate oil pressure to the thruster as given in the catalogue data. Where possible, secure this state using the manual release screw. Remove the screws that serve for fastening the brake to the machine frame. The brake calliper can now be removed from the mounting surface.

11. Maintenance

11.1 General maintenance

Depending on how much the brake is used in operation, maintenance is to be carried out on it at intervals of 4 to 12 weeks.

The following is to be carried out when performing maintenance:

- Check the friction blocks for wear.
- Check that, when the brake calliper is released, the friction blocks do not grind on the brake disc and that there is an even air gap on both sides.
- Check the screw connection of the brake calliper and the screw connection of the friction blocks for firmness.
- Check both brake calliper levers for ease of movement.
- Clean the bearing and sliding points.
- Oil or grease the bearing and sliding points.
- Check the thruster and hydraulic hose connection for tightness.



Important!

The friction linings must not come into contact with the lubricant!

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11.2 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!



Important!

The friction lining has a thickness of 12.5 mm when new. After 7.5 mm of abrasion or a residual lining thickness of 5 mm, the friction blocks are to always be exchanged in pairs.

Only original friction blocks may be used.

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

Open the brake with the prescribed oil pressure.

Loosen the nuts at the screws (item 6 and 8). Turn the adjusting screw (item 5) and set screw (item 7) back until the friction blocks (item 2) can be exchanged without any problems. Re-secure the adjusting screw and the set screw with the nuts (item 6 and 8).

After exchanging the friction blocks, tighten the screws (item 3) at the friction pads (item 2) slightly at first.

Apply the brake. The clamping force of the brake will cause the friction blocks (item 2) to be pushed flat onto the swivel pieces (item 4), eliminating any air gap.

You can now tighten the screws (item 3) with a tightening torque of 30 Nm.

After exchanging friction blocks, you must reset the brake torque and clearance as described in point 8.3.



Important!

If the brake is opened by screwing on a manual release screw, this manual release screw (item 9) must be removed again once the brake has been installed to ensure a functional brake!



Important!

After exchanging friction blocks, a running-in process should be performed in order to reach the maximum brake torque.

12. Accessories: Sensor for operating state monitoring

12.1 Mounting and connection of inductive transmitter for position monitoring

Installation of the inductive proximity switch provided



Life-threatening danger!

The inductive transmitter may only be assembled and changed when the system or the work machine is stationary!

The inductive proximity switches are enclosed loose with the delivery.

Inductive proximity switch of thrusters 250 and 270:

Switching function	: PNP (normally open contact)	Switching distance	: 1.5 mm, flush-mountable
Operating voltage	: 10...30 V DC	Max. switching current	: 200 mA
Voltage drop	: < 2.5 V	Inverse-polarity protection	: Yes
Temp. range	: -25 to +70°C	Protection class	: IP 68
Connection type	: 3m PVC cable	Housing	: M8x1 steel, non-rusting

Connection diagram of the inductive transmitter:

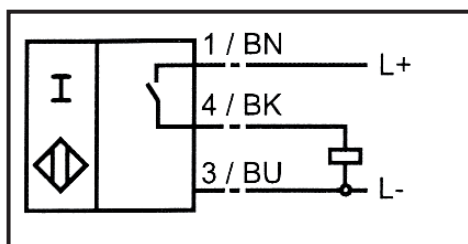


Fig. 12.1

Attachment of inductive proximity switch to the thruster

There is an M8x1 thread at the thruster for the connection of an inductive proximity switch.

Open the brake with the prescribed oil pressure. Remove the plug M8x1 and turn the inductive proximity switch (item 10) into the springed thruster by hand until it abuts at the piston. Now turn the inductive proximity switch back approx. ½ a revolution and secure the position using a nut (item 10) enclosed with the inductive proximity switch.

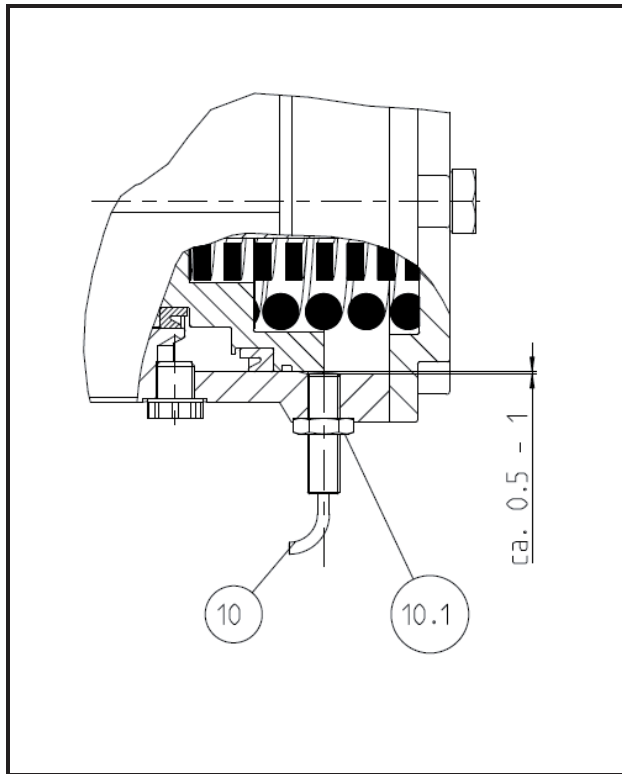


Fig. 12.2

Test for proper functioning by repeatedly activating the brake. If the brake is open, the LED of the inductive proximity switch must shine.