WITTUR

Guide Rail Brake WGRB04

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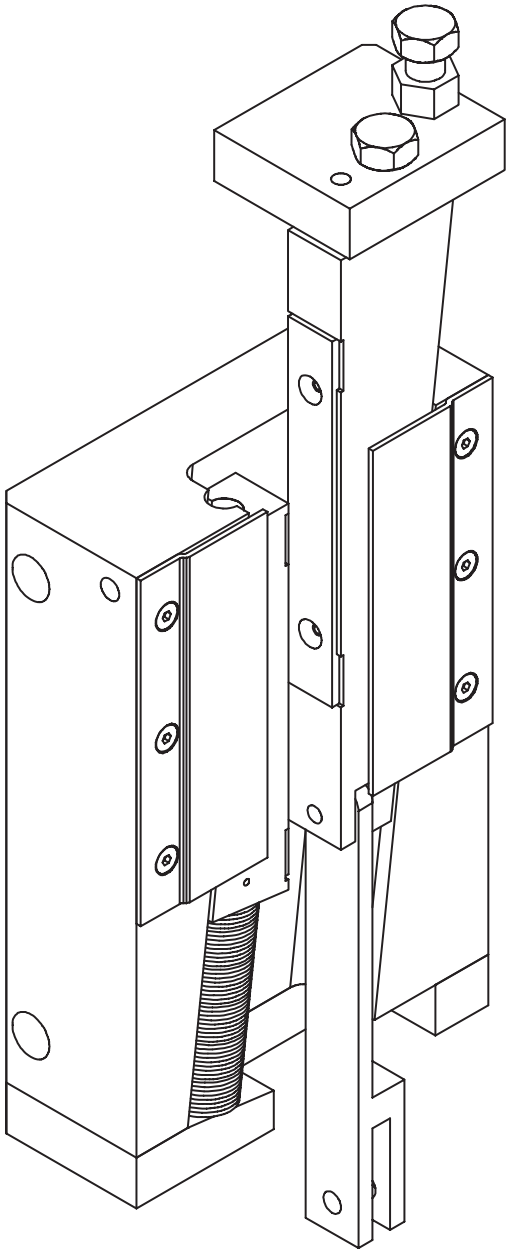
Stand/*version* C-05.04.2016
Geprüft/*approved* WAT/MZE

Operating instructions

D727MGB$111

Guide Rail Brake WGRB04



D727MGB 12.2005

Original Instruction

www.wittur.com

Product manufacturer reference can be found on the product type label.
For any support or further questions please contact your trading office.

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Guide Rail Brake WGRB04

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Operating instructions

1 General information prior to installation

1.1 Description and functions

The WGRB04 is a guide rail braking system against upwards overspeed of the car. It acts onto the guide rail and reduces the car speed.

The braking force is limited by a disc spring loaded counterwedge. If the breaking force turns to high, the disc springs will be compressed and therefore the braking force is limited.

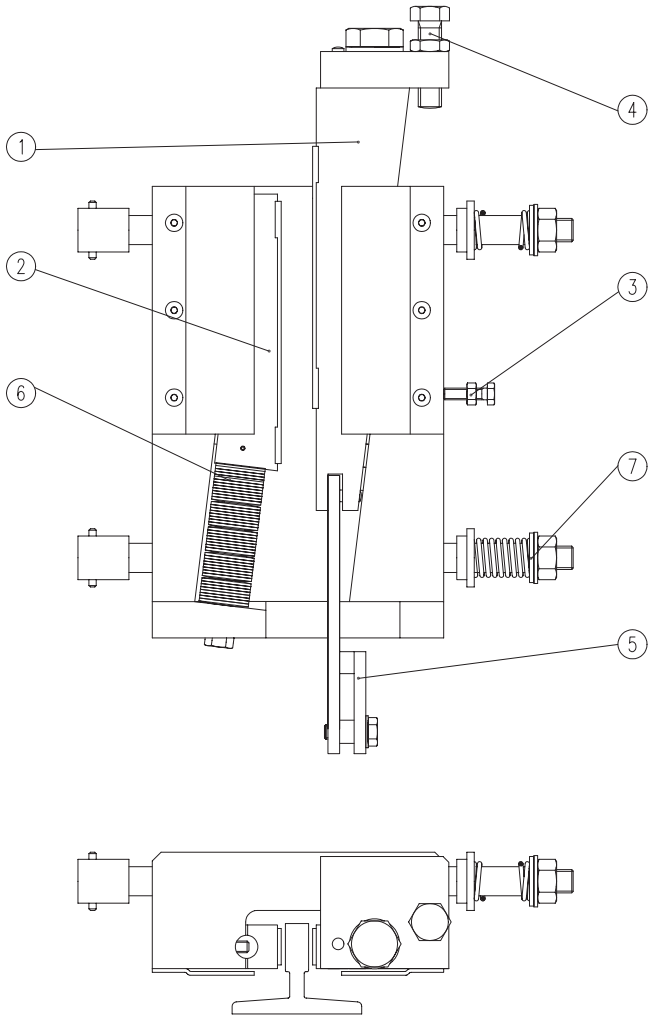
The brakes are activated by a movable gripping wedge. The braking force depends on the pull-in distance of the wedge, which is limited by an adjustment screw.

If the lift car exceeds its activating speed (acc. to EN81-9.10) a tripping device (e.g. overspeed governor) engages the guide rail brakes which reduce the car speed until the car is stopped or the counterweight has gently reached its bottom position.

The setting is done in the factory (according to the load and rail conditions) and sealed. Later adjustments will not be necessary and are prohibited in any case for safety reasons.

The operating range is defined as follows:

- Elevator speed 2,0 - 6,0 m/s
- width of guide rail head 16 / 19 mm
- max. brake force
  F_{Brake}=78500 N
- tripping force of the governor
  max. 2100 ± 250 N



1. Gripping wedge
2. Counter wedge
3. Set screw (alignment of brake with reference to guide rail)
4. Adjustment screw (brake force)
5. Lifting lever
6. Spring pack
7. Shaft with resetting spring

1.2 Liability and guarantee

This instructions handbook is written for people who are familiar with lift servicing and installation. Sufficient knowledge of lifts is essential.

WITTUR accept no responsibility for damage caused by improper handling, or for damage caused as a result of actions other than those stated in these operating instructions.

The WITTUR guarantee may be voided if any other parts than those described in these instructions are installed.

Due to technical safety reasons it is **not permissible** as followed (unless stated otherwise):

- The use of other components than those installed
- Carrying out brakes-modifications of any kind
- Installing two brakes in common with different index numbers
- Destruction of the lead seal
- Combining different component types
- Installing guide rail brakes intended for other use than stipulated
- Carrying out faulty or improper maintenance or inspection checks
- Using unsuitable accessories, spare parts or operating material which has neither been released by the WITTUR Company nor consists of original WITTUR spare parts

1.3 Safety precautions

WITTUR machine installation or repair engineers are chiefly responsible for the safe operation of machinery.

It is essential to comply with and keep abreast of all safety rules and legal obligations in order to avoid personal / product damage during installation, maintenance and repair work.

Important safety advice and danger warnings are emphasized with the following symbols:


General danger warning


High danger risk warning (i.e. crushing edge, cutting edge etc.).


Risk of damage to machinery parts (i.e. due to incorrect installation, or such like).


Important information sign

These operating instructions belong to the whole installation and must be kept in a safe place at all times (i.e. machine room).

The proper assembly and installation of WITTUR components requires correspondingly well trained fitting engineers. The company appointed to carry out the work is responsible for this training.

Before starting installation work:

Only properly trained personnel may carry out work, or be allowed to access the installation site.

- Attach safety devices to a guard to prevent falling (platform or harnesses)
- Cover any floor openings
- Secure installation tools or objects against accidental falling
- Lift shaft openings should be cordoned off and suitable warning signs must be erected when working in shaft openings
- Work involving electrical equipment has to be carried out by an electrical engineer or qualified personnel, only.

1.4 Preparation

Before beginning installation work read the operating instructions attentively. It is in your own interest to ascertain the constructional and spatial conditions. Check, where and when installation operations can or must be carried out (workshop or on site). It is recommended therefore, to take into account all the given circumstances, to plan the various operational sequences in advance, rather than carrying them out prematurely and in unconsidered manner.
On receipt of the delivery, the goods or components should be checked for correctness and completeness based on the order sheet.

Following should be checked also:

- that factory and order number correspond
- that details on the name plate correspond to those on the order
- elevator speed
- width and type of guide rail used
- brake force

1.5 Advice on working with safety components

Safety gears and guide rail brakes are classified as safety components. It is highly important that the standards and guidelines described in this section to be ruled as well as those given in the rest of this operating manual.

These instructions, and especially the section on safety precautions, must be read and fully understood before work begins.

Safety devices require special attention. It is compulsory that they function perfectly to ensure danger-free installation operation.

Safety devices that can only be adjusted after installation should be adjusted immediately after installation.

Operation of safety devices installed ex-works must be tested immediately.

If it is necessary to disassemble a safety device during servicing or repair, they have to be reassembled and comply with the required tests, as soon as the work has been carried out.

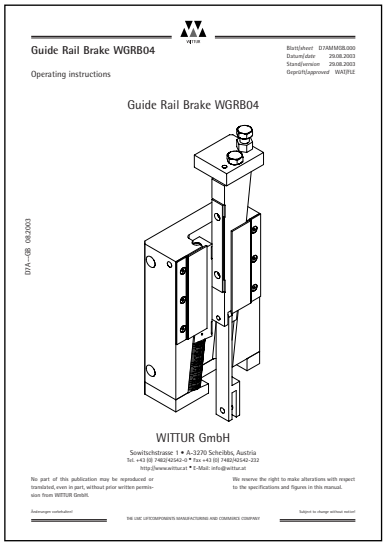
1.6 Contend of supply

After delivery, check the guide rail brake for damage and for full delivery of parts. The content of supply covers:

- Operating instructions manual

- One left handed and one right handed guide rail brake with lifting lever (parts 1, 2, 4, 5 and 6 - adjusted and sealed at the factory)

- Additional package including spring bolts (shaft), bushing, adjustment screw for housing and screw joint for lifting lever, optionally (parts 3 and 7)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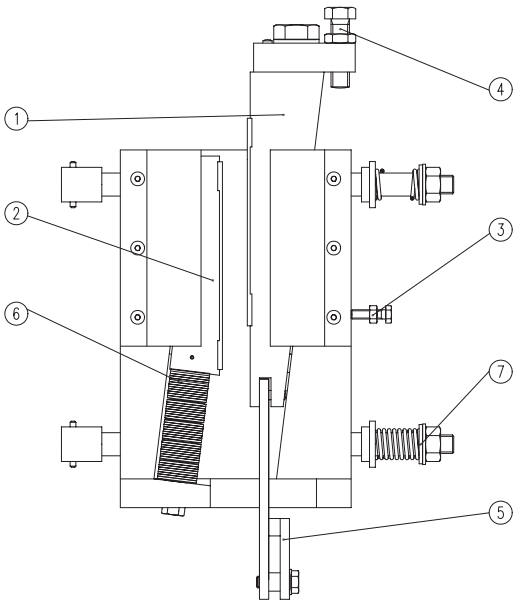
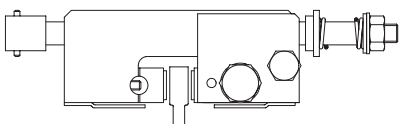
WITTUR GmbH





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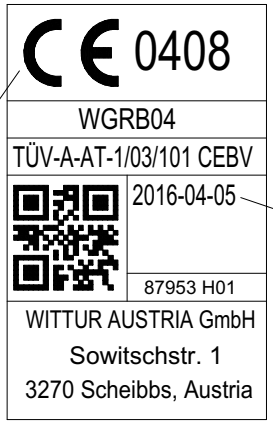
2 Name plate, designation, identification

The identification indicators have to be located near the guide rail brakes (e.g. housing).

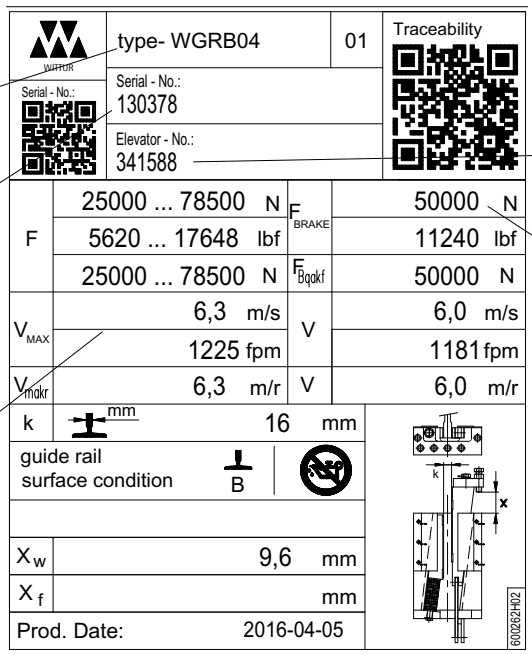
These consist of a type label and a identification sticker which give following data:

- Type term of safety gear
- Serial number
- Elevator number
- Tripping speed
- Required brake force



Type label acc. to EN81 with type test designation and CE-label

Date of manufacture



Type term

Order number (refer to delivery or order sheet)

Serial number

Required brake force F_{BRAKE} (N, lbf)

Tripping speed v_{max} (m/s, fpm)

3 Installation and adjustment

3.1 Important Note

☞ Check the distance between guide rails.

☞ Cleaning of the guide rails must be done before installation of the guide rail brake. If cleaning afterwards the brake-linings get dirty and the friction-factor is reduced dramatically!

☞ For proper function of the safety gear the guide rails have to be clean! It is highly recommended to use brake-disc cleaner! Any other cleansing agent might left dirt on the guide rail. Do not use nitro!

☞ Check with spirit level that the safety gear is mounted vertically.

☞ Check the running clearance!

☞ Lift the synchronization-lever horizontal and measure the distance between safety gear-adjustment screw and safety gear-block. This must be the same value on the left and right safety gear to prevent unsymmetrical gripping. For readjustment turn the synchronization nut until the distance is the same left and right.

☞ Watch for smooth function of the safety gear by lifting the lever by hand. The lever has to return to its previous position itself.

3.2 Alignment of guide rail brake blocks in relation to guide rail

After installation of the car frame and the guides, the correct centering and adjustment of the block has to be done with regard to the rails.

Before installing the brake, grease from guide rails has to be removed because otherwise brake linings will get dirty during every contact with guide rails.

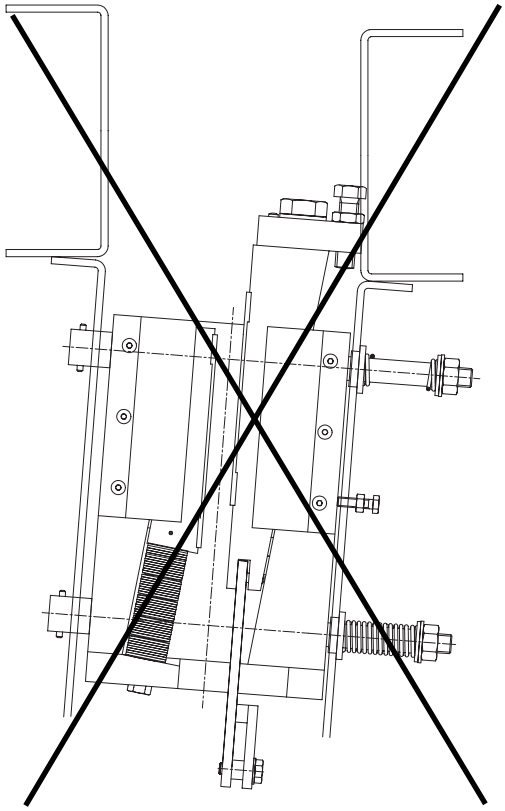
When mounting in the brake, observe the position of the overspeed governor rope. The position of the lifting lever of the rope at the safety gear cannot be changed if the brake is built-in.

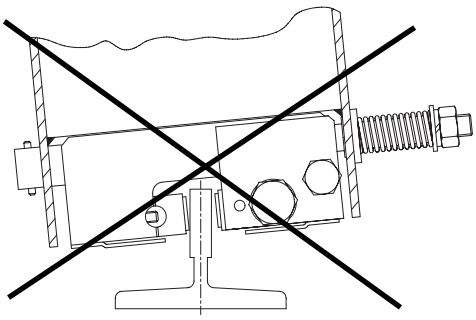
Check with a spirit level if the guide rail brake is installed parallel to the vertical guide rail. If the brake blocks are not parallel to the guide rail please use shim plates to compensate the inclination.

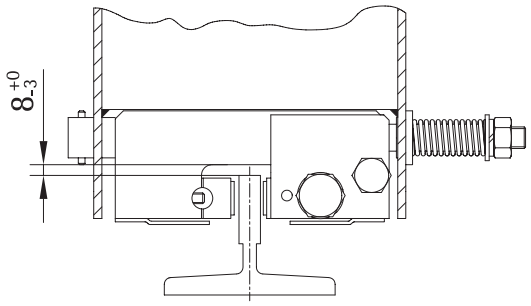
If brakes are not exactly parallel to the guide rail, the brake linings touch the guide rail in an illegal way.

- the brake does not reach the required brake force
- insufficient deceleration

The distance between housing and guide rail has to be equal on both sides.
Check the gap between guide rail head and brake body.







3.3 Gripping wedge synchronization and adjustment

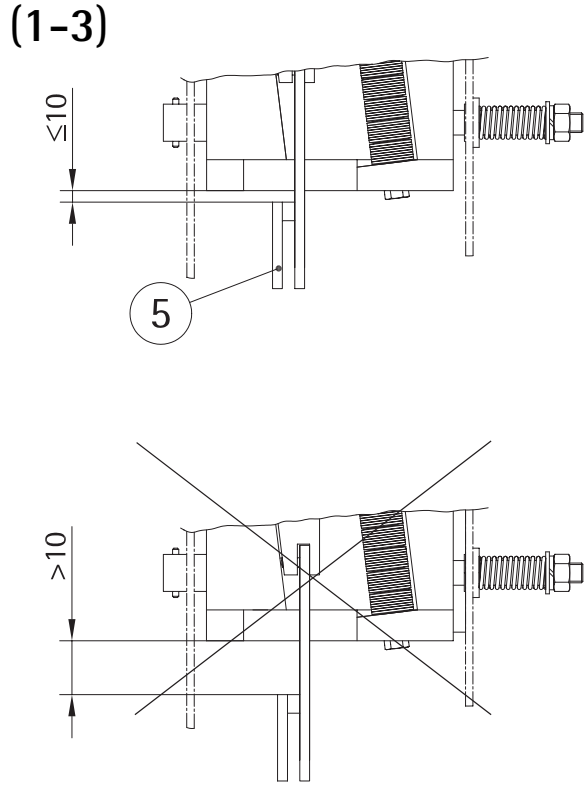
(1) Check that the fixing links (5) of the gripping wedges are in topmost position.

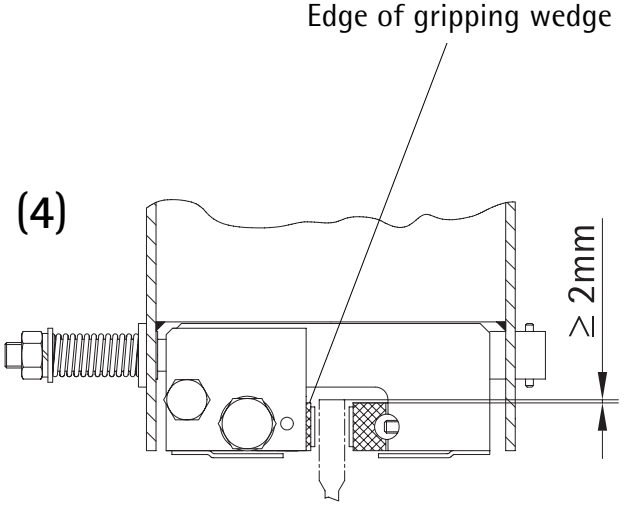
☞ Adjust the synchronization in accordance with the instructions for the car frame.

(2) Activate the synchronization by hand and check that both brake blocks are activated at the same time.

(3) Check the horizontal movement of the brake blocks to be sure that the counter wedge is able to access the guide rail when the brake is activated.

(4) Check the horizontal adjustment of the gripping wedge.



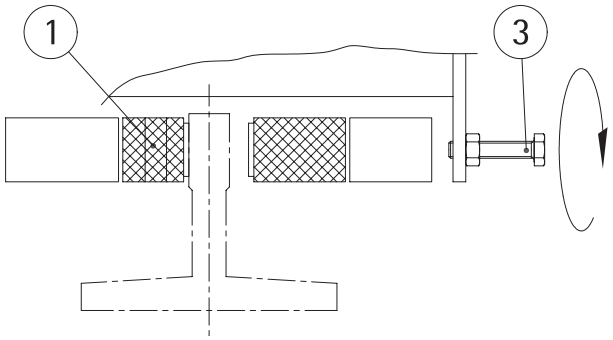


3.4 Adjustment of running clearance between guide rails and brake linings

Adjust the correct running clearance between guide rail brake and housing according to the instructions below (this is also valid for adequate housing types).

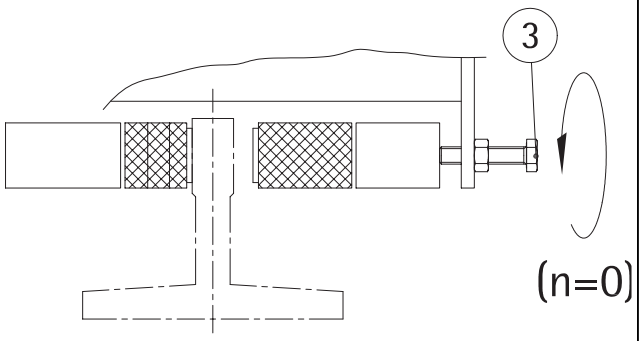
This kind of instruction is valid for following WITTUR car frames:
WCF series (WCF10, WCF16, WCF25,WCF35)

(1)



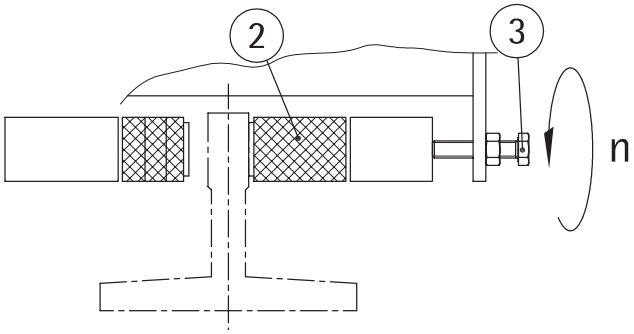
Slacken the adjustment screw (3) so that the gripping wedge (1) bears against the guide rail. The screw is not to be in contact with the brake block.

(2)



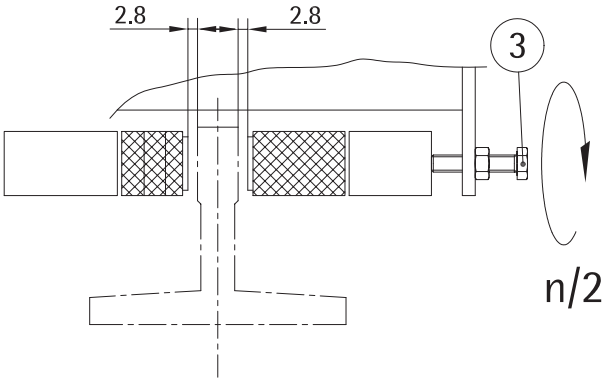
Screw in the adjustment screw (3) by hand, until it contacts the brake block.

(3)



Screw in the adjustment screw (3) until the counter wedge (2) bears against the guide rail (count the number of turns **n**).

(4)



Slacken the adjustment screw (3) half the number of turns **n**. Tighten the lock nut.

4 Function testing

Operational reliability of the installation is assured. The quality and function of individual components are subject to thorough inspection and is checked before dispatch from our works. The brake system should undergo an operational test before commissioning or before possible inspection from a technical institute.

First test run after installation

Before the first test run:
The protective coating of grease is to be removed carefully from the guide rails! Clean the guide rails!

The cleaning of the guide rail must be done with a disc brake cleaner or a similar fluid. It is not allowed to do mechanical cleaning like filing, grinding. If the surface cannot be cleaned properly contact the manufacturer.

Clear all people and objects from the lift shaft before commencing the test run! **Risk of crushing injuries!**

The entire lift travel path should be slowly travelled (in inspection mode) before the function tests. Pay attention to the clearance of all fastened parts, especially with regards to potential interferences in the area guide brackets/guide rail brake. Find and remove any protruding bolts or other dangerous restrictions well in advance.

Preparations before tests:

The guide rail may not be lubricated at all.

- Check the activating force of the brake synchronization (it should be 400 ... 500 N). This value can be higher if the travel is over 75 m. Calculate the minimum required force F_1 as follows:

F_1 = mass of overspeed governor rope x downwards acceleration x safety factor (2)

e.g.: F_{1min} = 200 kg x 1,5 m/s 2 x 2 = 600 N

This is the minimum force which should be measured on the car frame brake synchronization to prevent unintended gripping. If force is less then retaining means (e.g. spring) of brake synchronization must be adjusted accordingly.

- Check the tripping force of the overspeed governor F_2:

  This force must be between 1200 N and 2000 N.

  F_2 must be twice as high as force measured on car frame brake synchronization (see EN81-1:1998 chapter 9.9.4).

The maximum permissible tripping force F_{2max} of the overspeed governor is 2000 $\pm$ 250 N.

4.1 Static functions test

The function of the guide rail brake is to be checked with empty car before the real braking test is performed.

- Move the empty car to ground floor.
- Switch off the power-supply of the elevator drive.
- Release the brake of the elevator drive manually. Then the counterweight tries to accelerate the car upwards.
- After the car has been starting to move activate the guide rail brake, immediately (e.g. remote-control on OSG).
- The car should move approximately 100 ... 250 mm upwards.

If the retardation is not correct the brake must be replaced (please contact WITTUR).

The real brake test can be performed when the above mentioned tests are ok.

4.2 Dynamic function test

Nobody should be inside the lift car or on the car roof while carrying out test runs or functions tests!

Test procedure according to EN81-1: 1998 appendix (D) point (n) page 73:

Move the car to ground floor. The test can be made while the empty car is ascending at not less than rated speed, using only WGRB04 for braking.

If tripping speed is reached the WGRB is activated by an activating-device (e.g. OSG) and brake of elevator drive is kept opened during braking.

Visual checks after a braking test

After each test or activation of the WGRB you have to check that there are no defects that can impair the normal run of the elevator.

Climb into the elevator shaft and check following items:

- existence of brake linings
- visual defects of parts of the brake system
- friction marks
- defects on the WGRB-housing

If there is any defect the brake must be replaced!

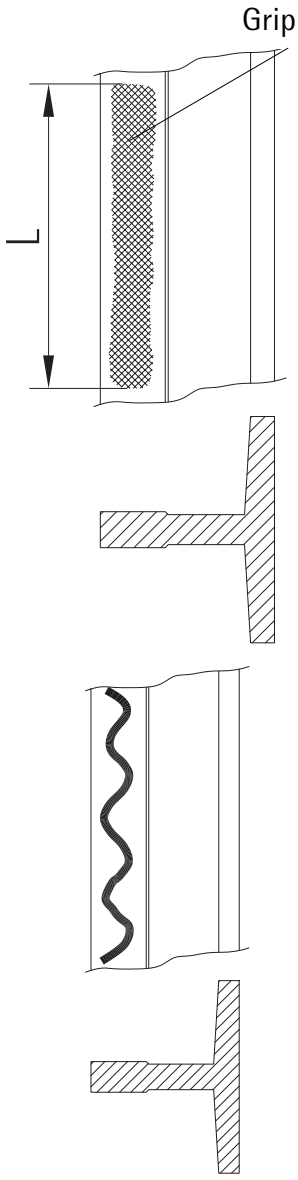
If the brake can't reduce the car speed significantly (the elevator is still accelerating), then activate brake of elevator drive immediately to slow down the car !

Continue with the checks described in the following chapters.

4.3 Braking distance

4.3.1 Measurement of braking distance "s"

Measure the braking distance "**s**" and compair with the value calculated according to the following instruction:



After braking the wedges leave a slight but definite polished marking with length **L** on the guide rail.

The actual braking distance s is calculated as follows:

s = L - 0.18 (m)

The value "0.18" refers the length of the brake lining.

Before attempting a braking test, it is recommended to mark the guide rail with a non-greasy pencil in the area where braking should happen. This makes measuring of braking distance more easy.

4.3.2 Permitted braking distance

Brake test with empty car and tripping speed of the activating device:

The braking distance s is to be within the maximum and minimum values which are based on the speed value where brake is released.

s	=	gripping distance	(m)
v_n	=	nominal speed	(m/s)
v_t	=	tripping speed (of the governor)	(m/s)
g	=	9.81 m/s^2	
a	=	(0.4 ... 1.0) g = 3.92 ... 9.81 m/s^2	

$$s_{min} = v_t^2 \ / \ (2 \times a_{max})$$

$$s_{max} = v_t^2 \ / \ (2 \times a_{min})$$

If brake test is carried out at nominal speed, "v_t" has to be replaced by "v_n" in formulas used for calculation of braking distance.

4.3.3 Check of braking distance "s" against the diagrams 1 and 2

Read from the diagram 1 or 2 (depending on v_t, v_n) within which area the braking distance "**s**" is plotted.

Note the tripping speed v_t stamped on the rating plate of the overspeed governor.

- If the braking distance "**s**" is within area 1 (shaded), the guide rail brake is set correctly!

- If the braking distance "**s**" is in one of the areas 2 or 3, the brake must be readjusted (please contact WITTUR)!

Example:

Tripping speed of the overspeed governor:
v_t = 4.2 m/s (select diagram 1)

The braking distance measured:
s = 1.45 m

The braking test has been done with nominal load and tripping speed of the Overspeed governor (v_t)

The diagram shows that the braking distance "s" is in area 1 - i.e. the gripping distance is OK (max. braking distance for v_t = 4.2 m/s approximately 2.25 m).

4.3.4 Visual check after a brake test

- Inclination of the car

During braking the car may not incline more than 5% towards the normal position.

- Guide rail brake:
  Drive to the lowest floor and check from the pit:
  - existence of brake linings
  - visual defects
  - friction marks
  - defects on the housing

If there are any defects the braking-device must be replaced!

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Diagram 1: v_t or v_n = 1.5 - 4.5 m/s

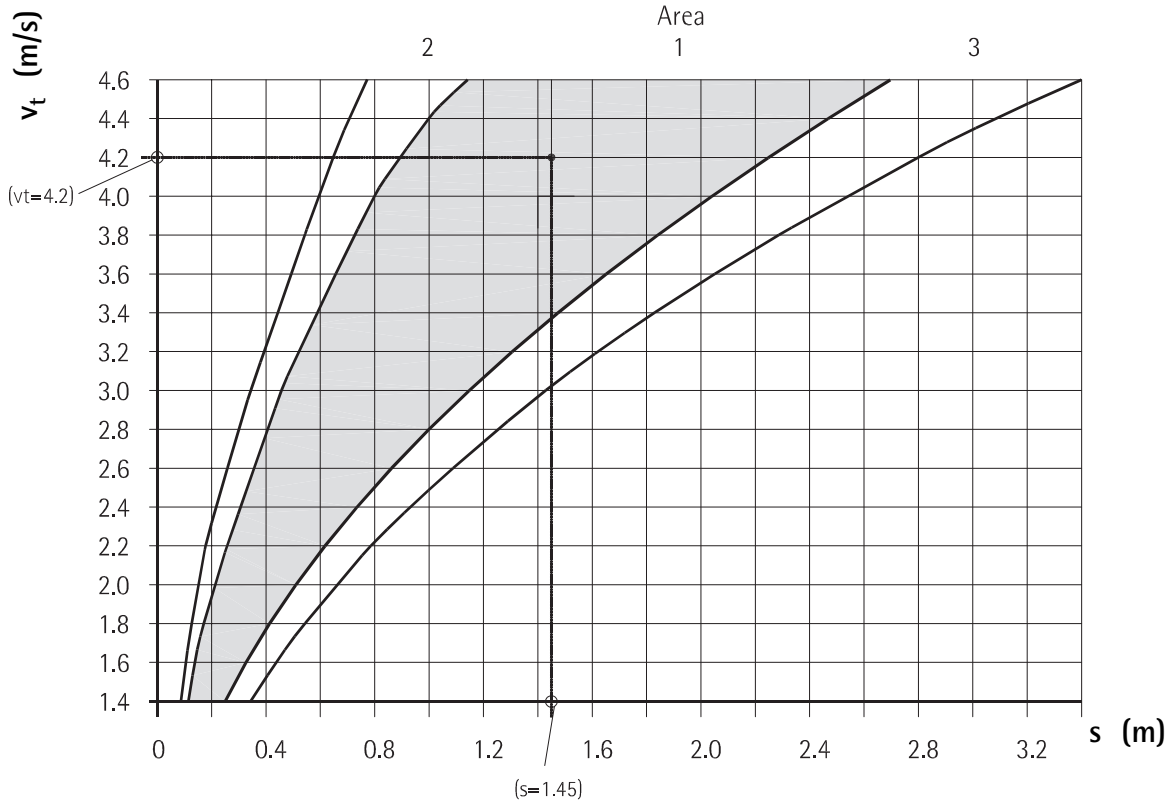
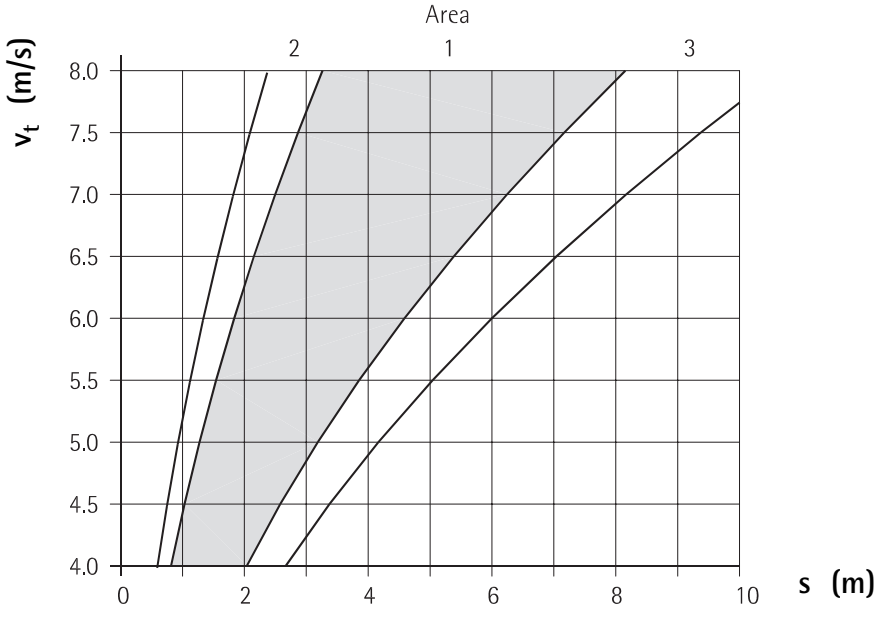


Diagram 2: v_t or v_n = 4.0 - 8.0 m/s



5 Maintenance, inspection and repair

5.1 Maintenance and inspection

The guide rail brake WGRB04 is basically maintenance free. The whole installation is designed in a way that no extensive maintenance operations have to be carried out during damage free operation of the installation.

Inspection checks must be carried out at regular intervals (minimum twice a year with each service) to guarantee safe operation. Alterations, damage or other irregularities should be reported and repaired if possible. Frequent service and control checks do not only make operation of the installation safer, but also ensure long and reliable service life.

It is recommended to perform control checks and servicing before legally prescribed functional tests (e.g. before TÜV tests).

The lift installation must be immediately taken out of use if any damage or irregularities arise which could possibly impair operational safety.

Please contact us at WITTUR if you have any problems or queries.

Maintenance work should be expertly carried out with utmost care in order to guarantee safe installation operation.

5.1.1 General

The guide rail may not be lubricated at all. They have to be dry!

5.1.2 Maintenance and inspection check list

- Check brake shoe/guide rail for free running, and adjust if necessary
- Check brake linings for damage or high degree of wear.
- Check condition of brake and neighboring components for damage, deformation or heavy oxidation (rust).
- Check that the gripping wedge can move freely.
- Check axial gap and turnability of lifting lever.
- Check lifting lever activation system
- Check even running of left and right guide rail brake block (synchronization).
- Check free movement of brake blocks in horizontal direction
- Check actuating mechanism and governor rope connection for free movement/proper functioning, following check synchronization.
- Clean system if dirt has built up.

5.1.3 Cleaning of guide rails

Any dust or dirt on the guide rails can have influence to the friction between the guide rail and the brake system. This means that the guide rails must be cleaned carefully whenever the dirt becomes visible on the guide rails or in minimum once a year.

A disc brake cleaner or a similar fluid should be used as cleaning fluid.

Mechanical cleaning like filing, grinding is not permitted.

5.2 Returning tests

The standard levels of returning tests should not be higher than the standards of the tests before installation.

These returning tests are not allowed to cause wear or stresses that impair the operation reliability of the elevator. Tests must be done with empty car and reduced speed.

The reset of the guide rail brake must be done by an expert person.

Each gripping test has to be documented and a copy of the test report should remain in the elevator book.

For detailed adjustment dimensions and testing procedures refer to chapter 4 Function testing.

5.3 Operational life time of the guide rail brake

After 10 times of braking change the complete guide rail brake!

5.4 Carrying out repairs

General rule: The guide rail brake should neither be dismantled or altered in any other way (sealants, sealing wax). This also applies to repairs.

It is forbidden to replace faulty or worn parts of the guide rail brake by yourself.

The reasons are:

- conditions of liability and technical safety
- only WITTUR spare parts may be installed (these are distributed by WITTUR only).
- parts are replaced only in pairs and checked before approval.

Operation of the system without the guide rail brake, even for short periods of time, is forbidden.

Permitted repair work:

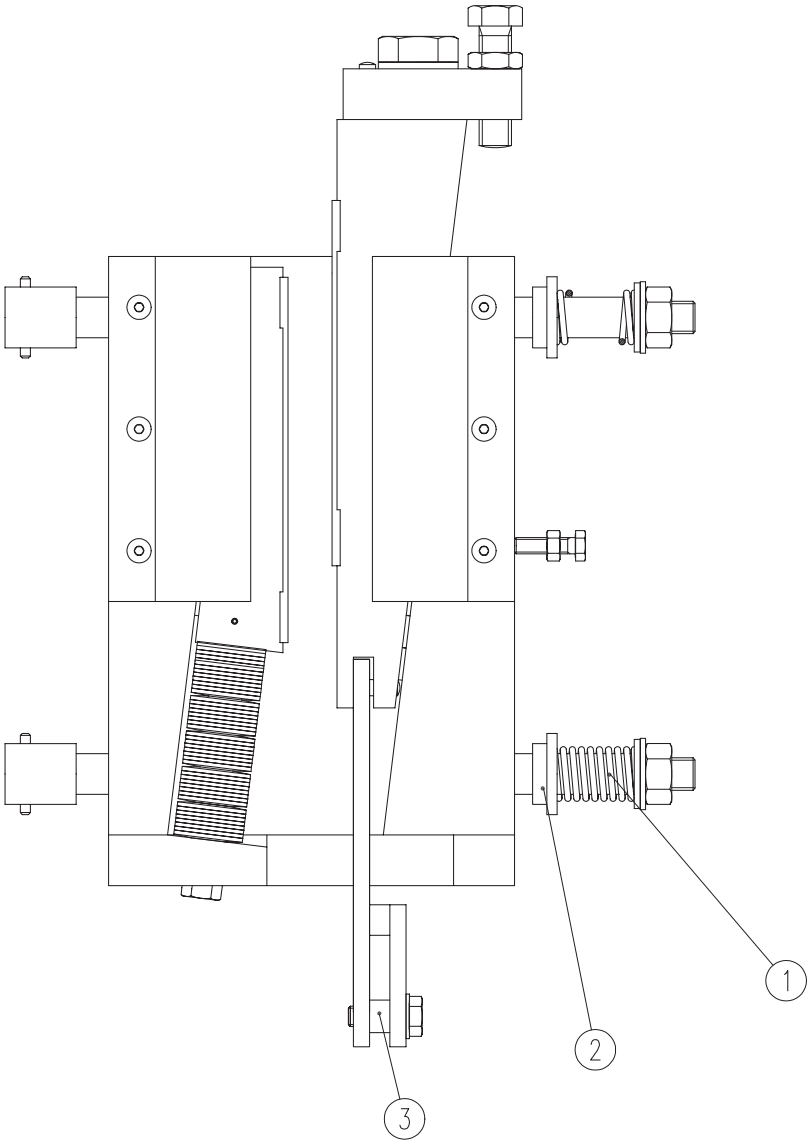
Repairs to the braking system which do not directly affect the guide rail brake (e.g. synchronization, switch in synchronization, etc.) may be carried out locally. In other words, all procedures involved in initial installation are also included in the repairs and maintenance schedule.

Such repair work in the safety system must, of course, be carried out correctly and with utmost care, in order to guarantee long-term safe operation of the system.

Please contact WITTUR if for any reason something is unclear, or you discover damage that cannot be repaired with the help of these instructions.

5.5 Spare parts list

Pos.	Component	Spare part	Pcs inclued	Art. No.
1	Spring bolt	Spring bolt incl. nut (two pcs. per brake block required)	1	86352 G01
2	Bushing	Bushing for spring bolt (hole diam. 31 mm in housing required)	1	86372 H01
3	Bushing	Bushing for screw joint at lifting lever (inside diameter 12 mm)	1	587967 H04



WITTUR manufacturing locations

Product manufacturer reference can be found on the product type label.

ARGENTINIA

WITTUR S.A.
Av. Belgrano 2445
Sarandi - Pcia. de Buenos Aires, Argentinia

AUSTRIA

WITTUR Austria GmbH
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3270 Scheibbs, Austria

BRAZIL

WITTUR LTDA
Rodovia Celso garcia Cid
1406 Cambé Parana, Brazil

CHINA

WITTUR Elevator Components (Suzhou) Co. Ltd.
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