



Product information

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Progressive safety gear SG braking downwards

Safety gear
SG1D-1



Authorised
Distributor
for UK



SLS Sassi Lift Systems
5 Blackwell Drive, Springwood Industrial Estate,
Braintree, Essex CM7 20J

Phone: 01376 5500666
Telefax: 01376 341219

Email: sales@sls-ltd.co.uk
Home: www.sls-ltd.co.uk

Published by SLC Sautter Lift Components GmbH & Co. KG
Borsigstraße 26
70469 Stuttgart I Germany

Phone: +49 (0) 711.860 62 - 0
Telefax: +49 (0) 711.860 62 - 501
Service: +49 (0) 173.679 18 42

Email: info@slc-liftco.com
Home: www.slc-liftco.com

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1. Safety instructions

This product information refers to the progressive safety gear type SG braking downwards and contains important information on correct and safe installation, putting into service, use and maintenance of the safety gear. Observing these instructions helps to avoid danger, to reduce repair costs and downtimes and to increase the reliability and life of the safety gear.

The product information has to be supplemented by instructions based on national rules and regulations concerning accident prevention.

The product information must always be available wherever the safety gear is in use. The manual must be read and applied by any person in charge of carrying out work with and on the safety gear.

In addition to the product information and to the mandatory rules and regulations for accident prevention in the country and place of use of the safety gear the generally recognized technical rules for safe and proper working must also be observed.

1.1 Designations and signs

The following designations and signs are used in this product information to designate instructions of particular importance:



DANGER

in this manual refers to the risk of death, heavy injuries and extensive damage if the required prevention measures are not taken.



WARNING

in this manual refers to light injuries or damage if the required prevention measures are not taken.



IMPORTANT

in this manual refers to important information about the product or is meant to attract the readers attention to important parts of the product information.

1.2 Principle / intended use of the safety gear

The safety gear has been built in accordance with current standards and the recognized safety rules. Nevertheless, its use may constitute a risk to life and limb of the user or cause damage to the safety gear and to other material property.

The safety gear must be operated in technically perfect condition only, in accordance with its intended use and with the instructions set out in this product information.

Any functional disorders, especially those affecting the safety of the safety gear should therefore be rectified immediately.

The safety gear SG braking downwards is designed exclusively for preventing the fall of the lift car. Using the safety gear for purposes other than those mentioned above is considered contrary to its designated use. The manufacturer cannot be held liable for any damage resulting from such use. The risk of any misuse lies entirely with the user.

Operating the safety gear within the limits of its designated use also involves observing the instructions set out in this manual and complying with the inspection and maintenance directives.

Never make any modifications, additions or conversions that might affect safety without the supplier's approval!

Spare parts must comply with the technical requirements specified by the manufacturer. Spare parts from original equipment manufacturers can be relied to do so.

Adhere to prescribed intervals for routine checks and inspections!

For the execution of maintenance work tools and workshop equipment adapted to the task on hand are absolutely indispensable.

1.3 Selection and qualification of personnel / basic responsibilities

Any work on and with the safety gear must be executed by reliable personnel only. Statutory minimum age limits must be observed!

Employ only trained and instructed staff and set out clearly the individual responsibilities of the personnel for operation, set-up, maintenance and repair!

Make sure that only authorized personnel works on or with the safety gear!

1.4 Safety instructions governing assembly and specific operational phases

Assembly	Always wear personal protective equipment during assembly work.
Standard operation	Avoid any operational mode that might be prejudicial to safety! Take the necessary precautions to ensure that the safety gear is used only when in a safe and reliable state!
Main-tenance	Ensure that the maintenance area is adequately secured! For carrying out overhead assembly work always use specially designed or otherwise safety-oriented ladders and working platforms. Wear a safety harness when carrying out maintenance work at greater heights! Before cleaning with water or detergents cover or tape up all openings which - for safety and functional reasons - must be protected against water or detergent penetration. After cleaning remove all covers and tapes applied for that purpose! Always tighten any screwed connections that have been loosened during maintenance and repair! Ensure that all consumables and replaced parts are disposed safely and with minimum environmental impact!
Gas dust steam smoke	Carry out welding or grinding work on the safety gear only if this has been expressly authorized, as there may be a risk of explosion and fire! Before carrying out welding or grinding operation, clean the safety gear and its surroundings from dust and other inflammable substances and make sure that the premises are adequately ventilated (risk of explosion)! When there is little space for working observe the national rules and regulations!
Oil grease etc.	When handling oil, grease and other chemical substances, observe the product-related safety regulations! Be careful when handling hot consumables (risk of burning or scalding)!

2. General notes

The safety gear of type SG is a single-sided acting safety device for passenger and goods lifts as well as for counterweights.

The single-sided acting safety gear prevents the car from falling downwards.

All safety gears are type-examined.

2.1 Designation

SG.. - .	Safety Gear
1D	braking in 1 Direction ↓
2D	braking in 2 Directions ↑↓
- 1	Type 1
- 2	Type 2

Example SG1D-1 = Safety gear SG braking downwards, type 1

2.2 Advantage-Gain-Argument

Feature	Advantage	Gain
Safety gear	<ul style="list-style-type: none"> ❖ Prevents inadmissible excess of car speed in the event of intact suspension means and unfavourable loading ❖ Prevents free fall of the car in the event of broken suspension means 	<ul style="list-style-type: none"> ❖ Reduces the residual risk
Default setting at works	<ul style="list-style-type: none"> ❖ Exact setting ❖ Reduced assembly time 	<ul style="list-style-type: none"> ❖ Cost saving
Braking in down direction	<ul style="list-style-type: none"> ❖ compact, minimized dimensions 	<ul style="list-style-type: none"> ❖ High degree of freedom for mounting at the car
Mounting of safety gear	<ul style="list-style-type: none"> ❖ Flexible mounting with excentric pivot ❖ Application for external and internal guide rails („Rucksack-lift“) 	<ul style="list-style-type: none"> ❖ Flexibility
Component for braking	Combination safety gear roller – brake shoe <ul style="list-style-type: none"> ❖ Easy release of the safety gear ❖ Low maximum deceleration 	<ul style="list-style-type: none"> ❖ Service-friendly

2.3 Criteria for the selection of safety gears

Rail head width			
Load of safety operation P+Q			
Counterweight mass			
Car speed			
Guide rail	→	machined	→ dry oiled
	→	drawn	→ dry oiled

2.4 EC type-examination certificate

Certification no. of the EC type-examination certificate:

Type	Certification no.
SG1D-1	AFV 802/2

2.5 Manufacturer of the safety gear

Manufacturer of the safety gear and holder of the type-examination certificate:

SLC Sautter Lift Components GmbH & Co. KG

Borsigstraße 26

70469 Stuttgart | Germany



IMPORTANT

EC type-examination certificates plus certificates of conformity are added to the delivery separately.

In addition the EC type-examination certificates can be downloaded on the homepage of SLC:
www.slc-liftco.com

3. Technical Data

3.1 Roundary conditions

- ❖ The device is a progressive safety gear.
- ❖ Braking is caused by frictional force.
- ❖ The device is installed on the lift car.
- ❖ Connection to the car with screws M12.

3.2 Dimensions

Type	Installation dimensions			
	Weight (Pair)	Height	Width	Depth
SG1D-1	18 kg	144 mm	417 mm	55 mm

Drawings see chapter 4

3.3 Range of application

	Machined rails		Drawn rails	
	dry	oiled ¹	dry	oiled ¹
SG1D-1				
Min. width of running surface	19 mm			
Rail head width	5 – 16 mm			
Max. rated speed [m/s]	3,23		3,23	
Total mass min.-max. [kg]	543 - 3.095	523 - 2.935	305 - 2.605	299 - 2.547

Maximum tripping speed of the overspeed governor and range of maximum rated speed:

Max. tripping speed [m/s]	3,23
Max. rated speed [m/s]	2,50 – 2,80

¹ the indications for oiled guide rail refer to use of mineral oils without additive (for example lubricant C according to DIN 51517, Part 1).

3.4 Tripping

Below the minimum tripping force required to trip the safety gear

Type	Braking downwards
SG1D-1	120 N

The maximum admissible tripping force required at the safety gear shall not exceed 1600N.

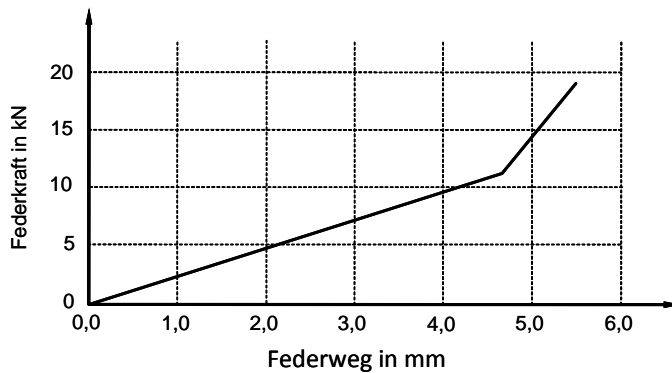
The individually needed tripping force has to be ascertained at the lift, considering all components.

Standard EN 81 rules that for the tripping of safety gears twice the required tripping force has to be available.

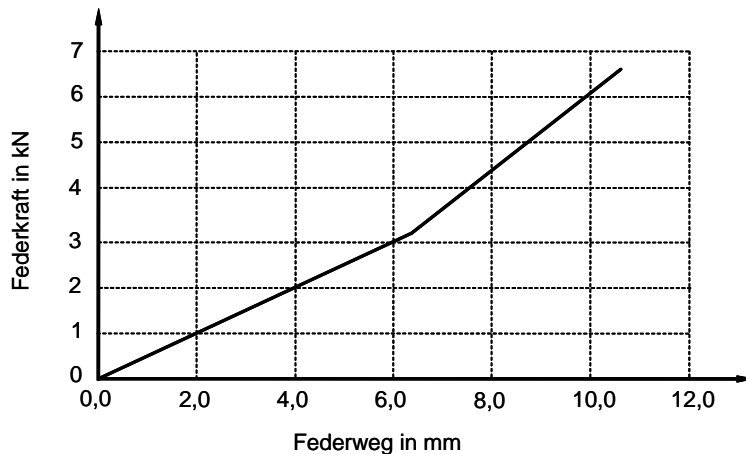
3.5 Compression stress of springs

The following diagrams show the compression stress of the disk springs depending on the length of the spring assembly.

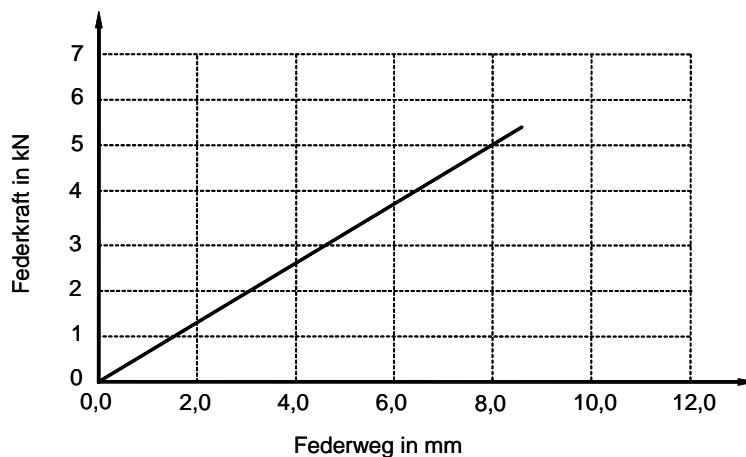
**Spring characteristic for combination
3x 2TF + 2x 3TF**



**Spring characteristic for combination
5x 2TF + 3x 1TF**



**Spring characteristic for combination
10x 1TF**



3.6 State of delivery

The safety gear is adjusted in the factory to the following lift specific characteristics:

- ❖ Mass of lift car (P)
- ❖ Mass of payload (Q)
- ❖ Mass of compensation ropes
- ❖ Rated speed of the lift car
- ❖ Rail head width (5 – 16 mm)
- ❖ Manufacturing mode of rails (machined, drawn)
- ❖ Surface condition of rails (dry, oiled)

The setting is secured against alterations by the manufacturer by means of a seal.



DANGER

Wrong setting of the safety gear can result in falling-down of the lift.

The safety gear is adjusted by the manufacturer. As the deceleration depends on different, partially lift-specific factors (material of guide rail, surface hardness of the rail, ...) a precise pre-adjustment can not be guaranteed.

If a setting correction is exceptionally required, the setting has to be carried out only by specially trained personnel after consultation with the manufacturer. The new setting has to be secured against unauthorized alterations by means of a seal.



WARNING

The manufacturer cannot be held liable for damages caused by unauthorized setting alterations.



WARNING

Before installing the safety gear on the lift car its type plate characteristics have to be compared with the lift characteristics. The type plate is mounted on the safety gear.

The safety gear must only be applied within the permission scope of application: see EC type-examination certificate "Scope of application", certificate no. see chapter 2.4.



IMPORTANT

The safety gear is set at work according to values specified in the order form for safety gears to obtain the required braking force.

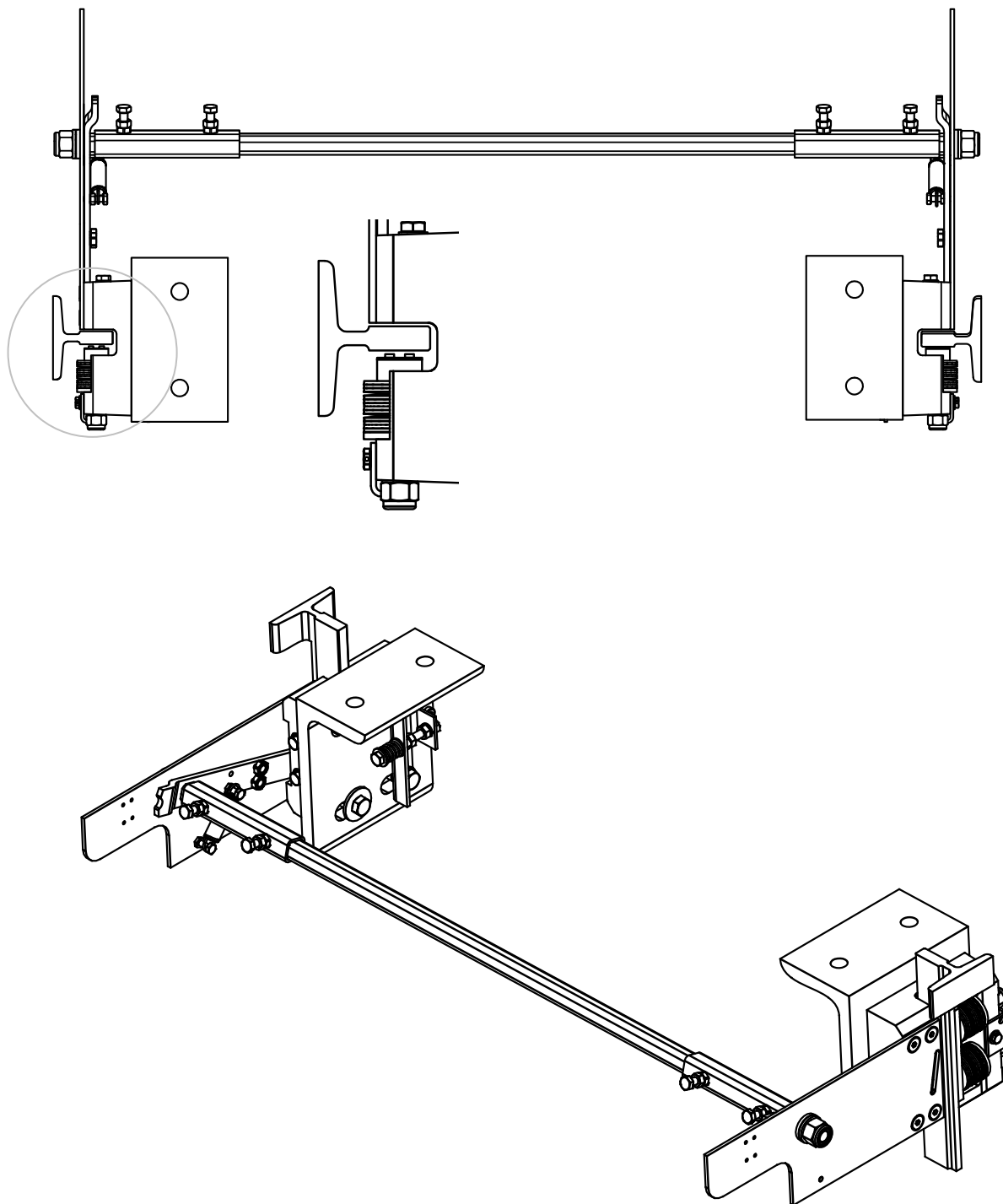
The order form is included in the annexe of this product information.

In addition the order form can be downloaded on the homepage of SLC: www.slc-liftco.com

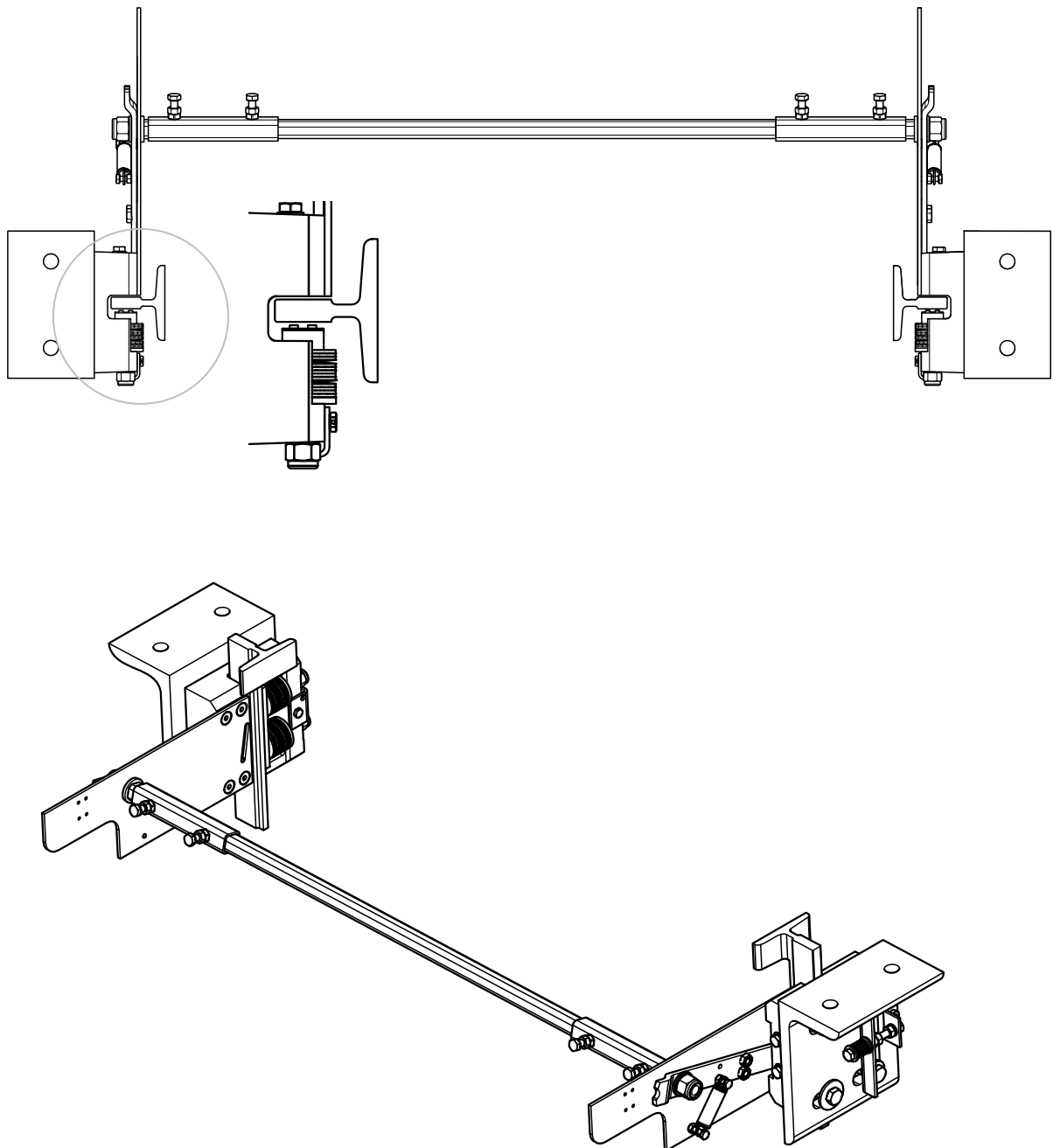
4. Mounting and dimensions

4.1 Mounting the safety gear

SG1D-1, external rail

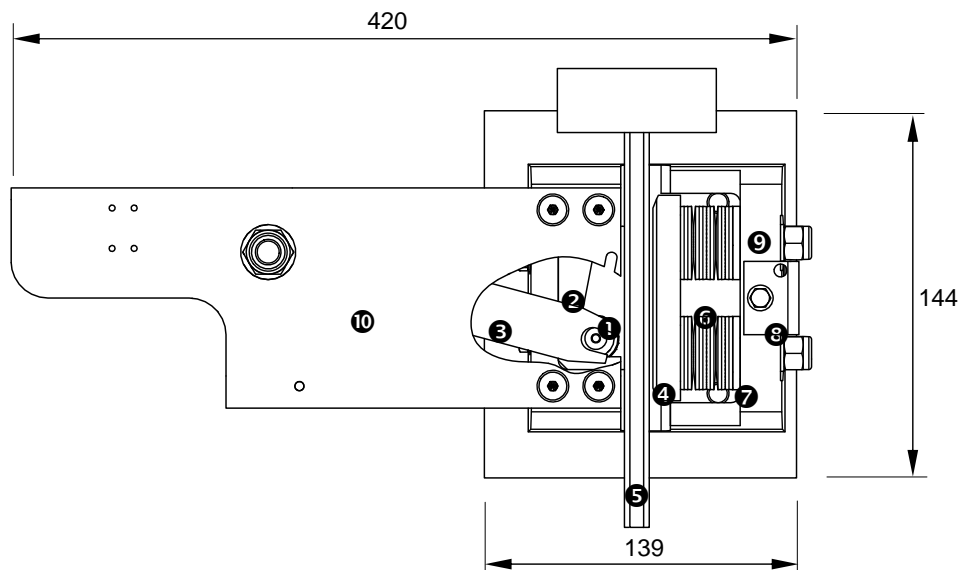


SG1D-1, internal rail



5. Description and function

5.1 Description of safety gear



- | | |
|----------------------|--------------------|
| ① safety gear roller | ⑥ disk spring |
| ② roller guide | ⑦ distance plates |
| ③ lever | ⑧ safety plate |
| ④ brake shoe | ⑨ internal housing |
| ⑤ rail | ⑩ fishplate |

5.2 Function of safety gear

Upon tripping the overspeed governor both levers ③ synchronised by the actuating shaft are turned by 15°.

In doing so the safety gear roller ① moved by the lever makes contact with the rail surface. The safety gear roller is pressed into the wedge-shaped gap between rail and roller guide ②. Owing to the wedge effect of the roller guide the full floating beared safety gear is moved until the brake shoe ④ rests against the rail ⑤.

The disc spring transmits the braking force to the internal housing. To adapt to different widths of guide blades distance plates of various thickness ⑦ are placed under the disc.

The spring pressure is preset and secured by a safety plate ⑧ and a led-sealing to prevent unauthorized adjustment.

In the braking process the brake shoe fixed on the bracket cuts into the rail surface. The braking effect is caused by metal cutting in the rail surface, friction and spring tension action.

Moving the lift car upwards releases the brakes and lever and the safety gear rollers return to neutral position.

The safety gear is ready for action again.



IMPORTANT

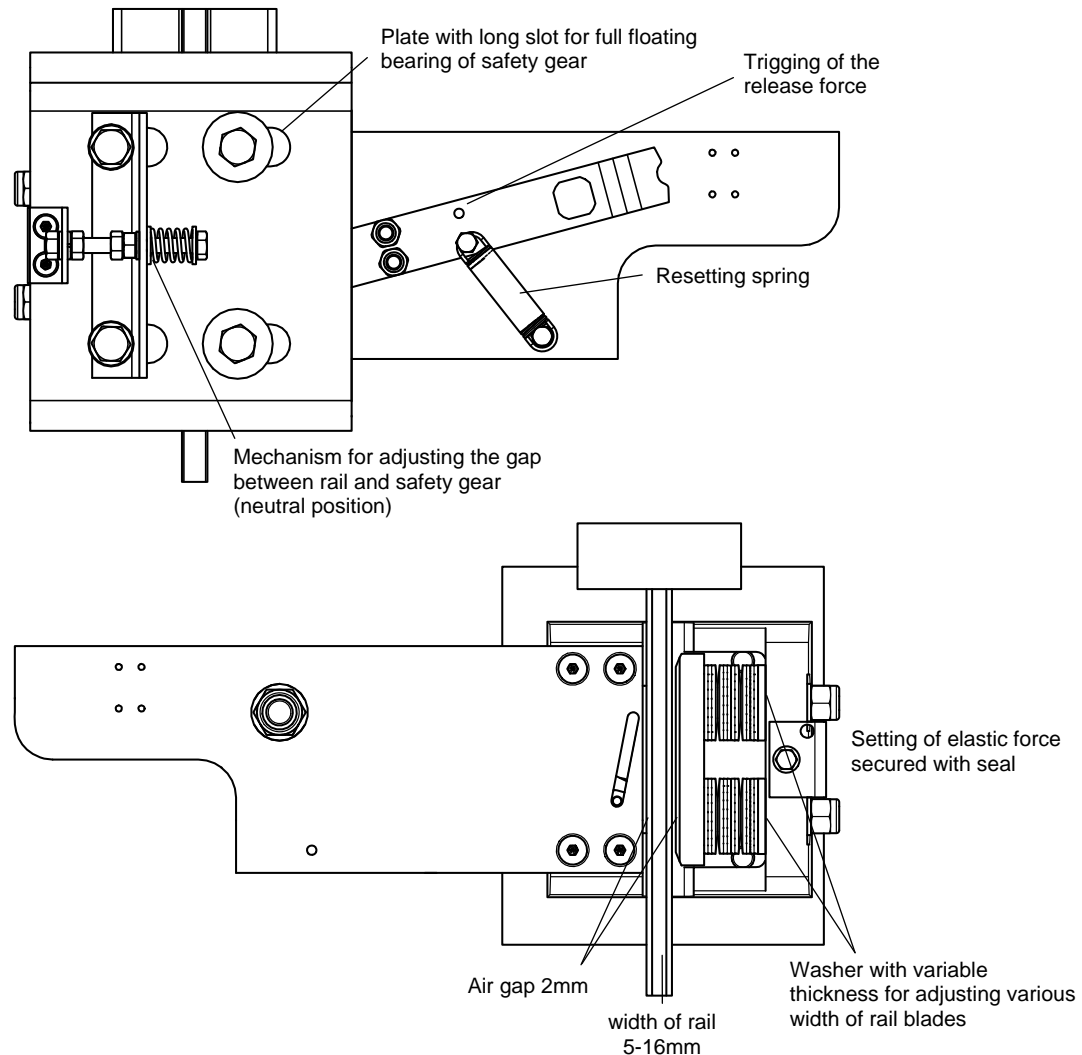
The safety gear transmits the braking force to the car. This braking force must be taken into account in the construction of the interface between safety gear and car.

6. Assembly

6.1 Assembly the safety gear on the lift car

The safety gear is fixed to the lift car with four screws of type M12 as well as bushes.

Pay attention to the full floating bearing the safety gear as this is key to the safety gear sliding into braking position after being tripped by the overspeed governor.



WARNING

When the safety gear is in neutral position it can be adjusted using the adjustment mechanism.

The following points must be observed:

The rail running guide must cover the brake shoes completely. The air gap between the rail running surface and the brake shoe must be adjusted to 2 mm.

The safety gear must be installed so that the spring mounted brake shoe is parallel to the rail and in direction of travel.



WARNING

Ensure that the mounting screws in the long slots of the external housing have enough play in both directions in neutral positions.

Correct position of the safety gear

During assembly the safety gear on the car take care for the correct position of the safety gear.

Firstly there is an advice on the type plate of the safety gear, secondly the following behaviour of the safety gear roller is only given if the safety gear is mounted correctly:

By pulling the lever upwards the gap between safety gear roller and rail gets smaller until the safety gear roller rests against the rail.



WARNING

Incorrect installation of the braking device causes a functional disorder of the safety gear.

Linkage of the braking units

Both safety gear units are linked with an actuating shaft.

The actuating shaft is fixed to the lever of the safety gear with attachment screws or spring type straight pins. The actuating shaft is connected by mean of two square-type tubes □ 20x20 mm.

❖ Connection to pull rod

The lever is connectet with a pull rod to the rope of the overspeed governor. The pull rod is fixed to the lever by a screw type M8. The tightening torque for this screw is 20 Nm.

When the overspeed governor is blocked, the rod transfers the tractive forces from the governor rope to the lever. The pivoting of the lever pulls the safety gear out of neutral position so the safety gear makes contact to the rail.

Inertia of the governor rope and of the components between safety gear and rope appearing during acceleration has to be compensated by a spring.

On dimensioning the pull rod the tractive force has to be considered.

7. Commissioning

7.1 Functional check



WARNING

Before commissioning the safety gear

- ❖ make sure that the overspeed governor works correctly, that the safety gear is attached to the overspeed governor and that the produced tractive force is two times the force required for engaging the safety gear.
- ❖ the guide rail must be cleaned of dirt. Most suitable for cleaning is cold solvent.

Before commissioning the lift car

- ❖ the lift car must be braked statically:
by turning the actuating shaft until both safety gear rollers contact the guide rail as well as letting the car down slowly. It has to be checked if both safety gear rollers move to their working position.
- ❖ the lift car must be braked with low speed.
It has to be checked if both safety gear rollers move to their working position.

For checking the braking force it is possible to trip the safety gear with rated speed or overspeed. By pulling out from braking position the lever of the safety gear roller turns back into neutral position.



WARNING

The safety gear may be operated only in combination with an overspeed governor.

7.2 Commissioning at the lift

Braking the car in down direction with 125% of payload decelerations of the car must be between 0,2g and 1g (9,81m/s²).

7.3 Acceptance test or commissioning of the lift



IMPORTANT

Engagement test downwards

Tests before commissioning the lift according to EN 81-1, annexe D resp. periodic tests according to EN 81-1, annexe E.

7.4 Check after braking

After every braking the safety gear has to be rechecked by a qualified person.

There is to be checked visually whether any changes or dirtying at the braking elements has occurred.

The following points are to be rechecked:

- ❖ excessive wear of the brake shoes
- ❖ deformations
- ❖ smooth running

The rubbed-off particles have to be removed and the braking marks grinded down.

Braking again on a re-grinded braking track is not causing an essential change of the braking force.



DANGER

For guide rail lubrication only oil products approved in the type examination certificate shall be used.

Use machine oil of viscosity class ISO 68-150 without extreme pressure additive. See mineral oils without additive (for example lubricant C according to DIN 51517, Part 1.)

Oils for hydraulic aggregates, gears and motors are not suitable for this use.

8. Maintenance

Upon maintenance the safety gear shall be checked for:

- ❖ smooth operation
- ❖ synchronous operation of the two units
- ❖ wear
- ❖ rust
- ❖ dirt
- ❖ sealing

If, after a couple of braking tests, the braking rollers or the safety gear base show signs of wear they are to be replaced by qualified persons.

Material no.:

Brake shoe	106.930.288
Safety gear roller	106.920.120
Roller guide	106.700.191

9. Transport

Any work upon transport, storage, installation and commissioning as well as (if any) demounting and disposal of a safety gear is to be carried out by qualified persons only.

They shall be responsible for proper assembly, transport and installation, and for putting the safety gear into operational condition. If this is not ensured, the manufacturer shall not be held liable for any damages that might occur.

Upon transport the safety gear must be protected against:

- ❖ humidity
- ❖ shock
- ❖ dirt
- ❖ falling-down, etc.

10. Annexe

- ❖ Order form for safety gear type SG