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INSTRUCTIONS**1.- GENERAL****1.1 NORMAL USE**

The SLC LM12CD overspeed governor is a safety component in compliance with annex III of the directive 2014/33/UE and it is certified according to the said directive. It is activated by means of a toothed belt, a system which is not listed in section 5.6.2.2.1.3 of standard EN-81-20. Therefore, an exhaustive analysis of risks has been performed in order for it to be certified.

The overspeed governor is aimed to be used solely as a safety component, in compliance with the directive 2014/33/UE. Any other use has not been assessed and is therefore not foreseen.

1.2 GUARANTEE

LUEZAR-ECO, S.L. guarantees, for the period established by the current legislation, the functioning of its product against any fault in the materials and assembly during its manufacturing.

This guarantee will not be valid in the following cases:

- Inappropriate use of the overspeed governor.*
- Faulty installation of the overspeed governor and its accessories.*
- Superficial impacts.*
- Faulty electrical connections.*
- Inappropriate maintenance.*

And, in general, non-compliance with the instructions described in this handbook.

The features of the overspeed governor are regulated and sealed in factory. The original features of the overspeed governors cannot be manipulated or modified under any circumstances. Any action on them must be carried out by LUEZAR-ECO S.L.

LUEZAR-ECO S.L. reserves all rights to modify the content of this document without prior notice, thus cancelling the validity of previous revisions.

1.3 TRANSPORT AND STORAGE

The overspeed governor will be transported from the factory to its assembly in appropriate packaging, so that it is protected from bumps, humidity, dirtiness and poor weather conditions at all times.

At the reception of the overspeed governor and before assembling it, it must be checked that the packaging has not been damaged and that the features of the product received coincide with the order and with the characteristics of the installation.

Overspeed governors do not have a limited shelf life, but they will be returned to the factory in order to be checked by LUEZAR-ECO, S.L., after agreement, if any superficial damaged caused by bumps or any beginning of rusting is detected when the product is unpackaged.

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1.4 FUNCTIONING PRINCIPLE

The SLC LM 12 CD overspeed governor detects when the lift surpasses its nominal speed by a certain value and brings it to a standstill, either by directly triggering the safety gear or by stopping the machine via an electrical switch.

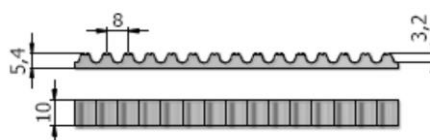
The SLC LM12CD overspeed governor has a toothed pulley which engages with the fixed toothed belt, laid along the whole shaft and fixed at its edges by a tensioner.

The toothed pulley is fixed by a friction clutch to the centrifugal forces of the governor. Tripping of the overspeed governor occurs due to the blocking of the centrifugal masses and the actuating disk, which activates the linkage of the safety gear. The clutch allows for the toothed pulley to turn freely and limits the effort on the toothed belt and the linkage during the breaking movement of the car.

1.5 GENERAL FEATURES

The general features of the SLC LM12CD overspeed governor are as follows:

- Permissible tripping speed: 0,27 - 1,5 m/s
- Permissible nominal speed: ≤ 1.0 m/s
- Drive: Toothed belt
- Type: ISO 13050 R8M
- Tensile strength: ≥ 5415 N
- Maximum permissible length: 131,1 m
- Diameter tooth wheel: 70mm / 120 mm
- Maximum tensioning force of toothed belt: 100 N
- Tripping force at the toothed belt: 450 - 500 N
- Arrangement: Car
- Permissible application: Progressive safety gear
Instantaneous safety gear
- Tripping direction: Upwards-downwards
Only downwards



TOOTHED BELT ISO 13050 R8M

1.6 MARKING

In compliance with section 5.6.2.2.1.8 of standard EN81-20, the overspeed governor has an identifying label with the manufacturing number (F.Nr.), the date of manufacturing (F-Date), the nominal speed (rated) and the tripping speed of the overspeed governor (tripping), as well as the name of the manufacturer, exam of type certificate number and type of device.

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The tripping direction of the governor, bi-directional, to the left or to the right, is marked on a label on the blocking disk, with the following symbols:



It is very important to check that the data reflected on the identifying label are in accordance with the characteristics of the installation and that once assembled, the tripping direction of the governor is correct.

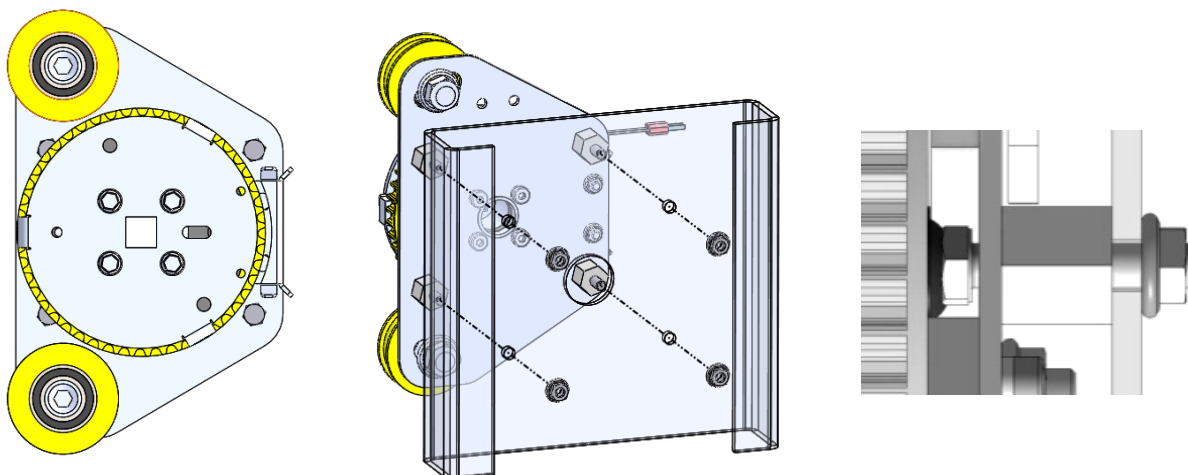
2.- ASSEMBLY

The instructions described below are for general assembly guidance. There are also specific assembly instructions based on the different devices of each customer.

2.1 OVERSPEED GOVERNOR

Depending on the type of safety gear, the type of installation and its tripping speed, the overspeed governor can be assembled in different configurations. For tripping speeds lower than 0.5m/s, the governor will have a toothed pulley of $\varnothing 70$ and a $\varnothing 120$ pulley for higher speeds.

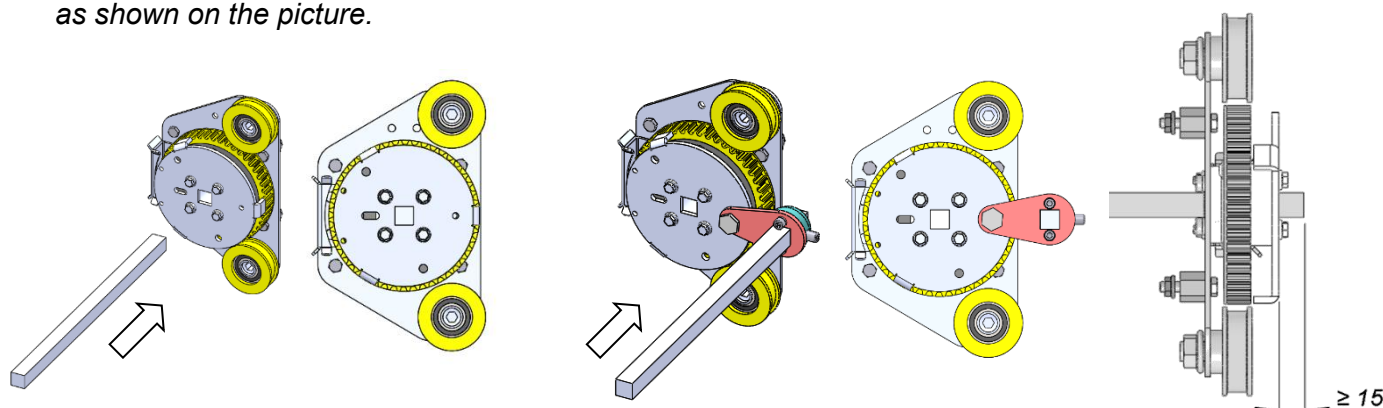
In all cases, it will be fixed directly to the chassis or the linkage via the M6 spacers, as shown on the figure.



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It is very important for the overspeed governor to be soundly fixed and level. This will prevent the toothed belt from diverting in its normal functioning.

Then, the transmission bar of the linkage is assembled ($\square 15$), either on the axis of the overspeed governor or outside, by means of an arm joint to the trip wheel. We must make sure that one position reverses the direction of the rotation of the transmission bar with regards to the other one. There must be at least 15 mm between the transmission bar and the governor wheel, as shown on the picture.



TRANSMISSION IN THE AXIS

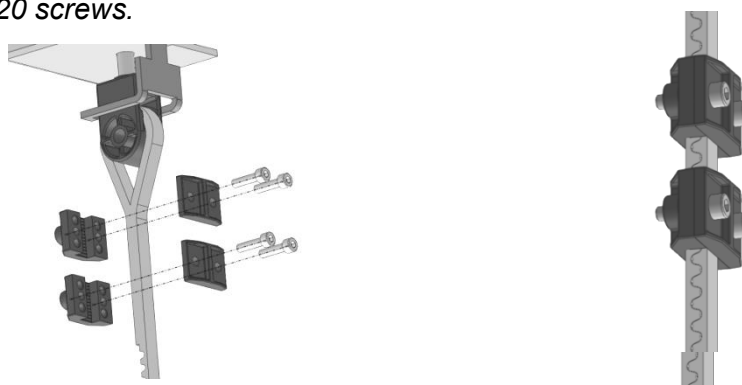
TRANSMISSION OUTSIDE THE AXIS

2.2 TENSIONERS AND TOOTHED BELT

To begin with, the tensioner of the shaft ceiling is assembled. There are different models which can be directly fixed to the ceiling with M10 screws, to walls or supports with M6 screws and even to the rail with M12 clamps.



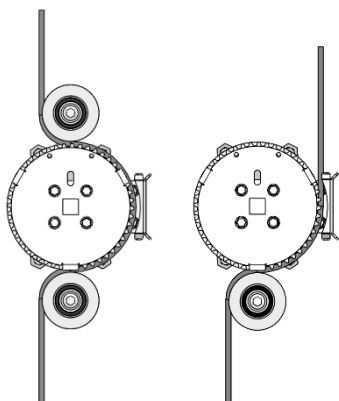
The toothed belt goes through the fork of the support, so that the teeth face each other and the belt is fixed by means of the belt fixings, made of 2 pieces which already have the nuts and 4 DIN912 M5x20 screws.



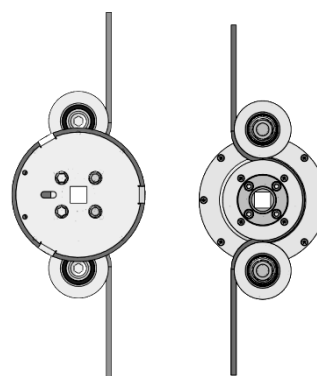
INSTRUCTIONS

The belt is left hanging from the installation and it is engaged in the toothed pulley of the governor, taking into account the desired position of the upper and lower tensioner, as well as the direction of the rotation of the governor. The position in front of or behind the belt reverses the rotation and therefore the tripping direction of the overspeed governor.

Wheels of $\varnothing 50$ will be used for the belt detours and anti-sliding ferrules to prevent it from diverting, as shown on the figure. In all layouts, the minimum number of teeth engaged between the toothed belt and the toothed pulley of the governor must be 10.



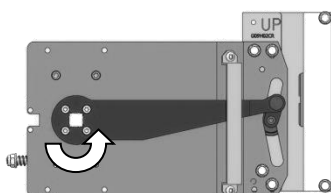
Ø120 TOOTHED PULLEY



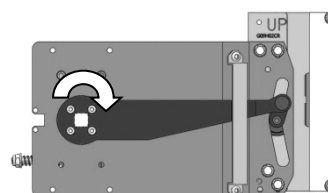
Ø70 TOOTHED PULLEY

The same procedure applies for the lower tensioner. The belt is stretched manually, with a force lower than 100 N, before assembling the belt fixings.

Once the tension belt is fixed, it is very important to check the correct functioning of the safety gear-overspeed governor unit. If the safety gear is bi-directional, then it will be checked that when the overspeed governor is tripped in downward direction then the lever of the safety gear turns in upward direction and vice-versa. If the safety gear is triggered only downwards, then it will be checked first that in descent the governor turns in the direction of the arrow and then, that when the overspeed governor trips, the lever of the safety gear turns in upward direction. If it does not work properly, then the toothed belt must be engaged at the opposite side and the same verifications must be carried out.



DOWNWARD DIRECTION TRIPPING

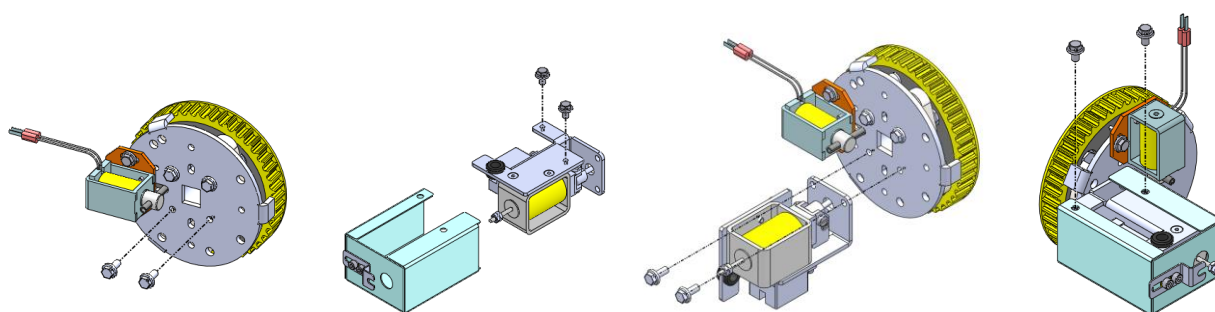


UPWARD DIRECTION TRIPPING

INSTRUCTIONS**2.3 AD12 ANTI-SLIDING PROTECTION**

If the overspeed governor is equipped with AD12 anti-sliding protection, which due to packaging reasons is supplied disassembled, then the procedure is as follows:

- 1º) Remove two out of the four M5x12 sealed screws of the tripping wheel of the governor DIN6921 as shown on the figure.
- 2º) Remove the cover of the AD12 system, by removing the M5x8 DIN6921 screws.
- 3º) With the same M5x12 screws, assemble the AD12 system, by placing its pivot in the slanted hole of the tripping wheel of the governor.
- 4º) Re-assemble the cover of the AD12 system.

**3.- CONNECTION**

The overspeed governor and the linkage driving bar are joint in such a way that after disengaging the safety gear, the overspeed governor always remains in its on position. This is why the electrical safety device described in section 5.6.2.2.1.6 b) of standard EN81-20 is not necessary.

3.1 REMOTE TRIPPING

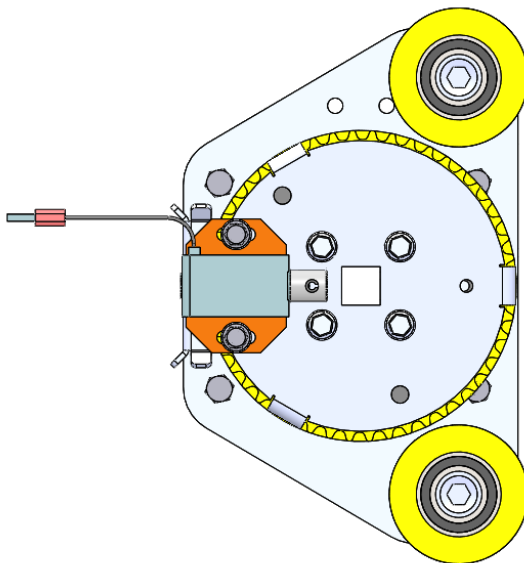
In compliance with section 5.6.2.2.1.4 c) 1) of section EN81-20, the governor has a remote tripping system, composed of an electromagnet that acts directly on the centrifugal masses and triggers the governor tripping.

The model of electromagnet used is Nafsa ER30/C. It must be assembled as shown on the figure and its characteristics are as follows:

Duty-cycle	ED25%
Consumption	30W
Max. excitation time	30 s
Standardised tensions:	24Vdc; 48Vdc; 110Vdc; 190Vdc; 230Vac
Nominal intensities:	1.2A; 0.5A; 0.27A; 0.16A; 0.28A

Connect the electromagnet to the electrical installation, taking into account the values of voltage and intensity. The electromagnet is only supplied when manually activating the device that performs the tripping test and for a lapse of time no longer than the maximum excitation time.

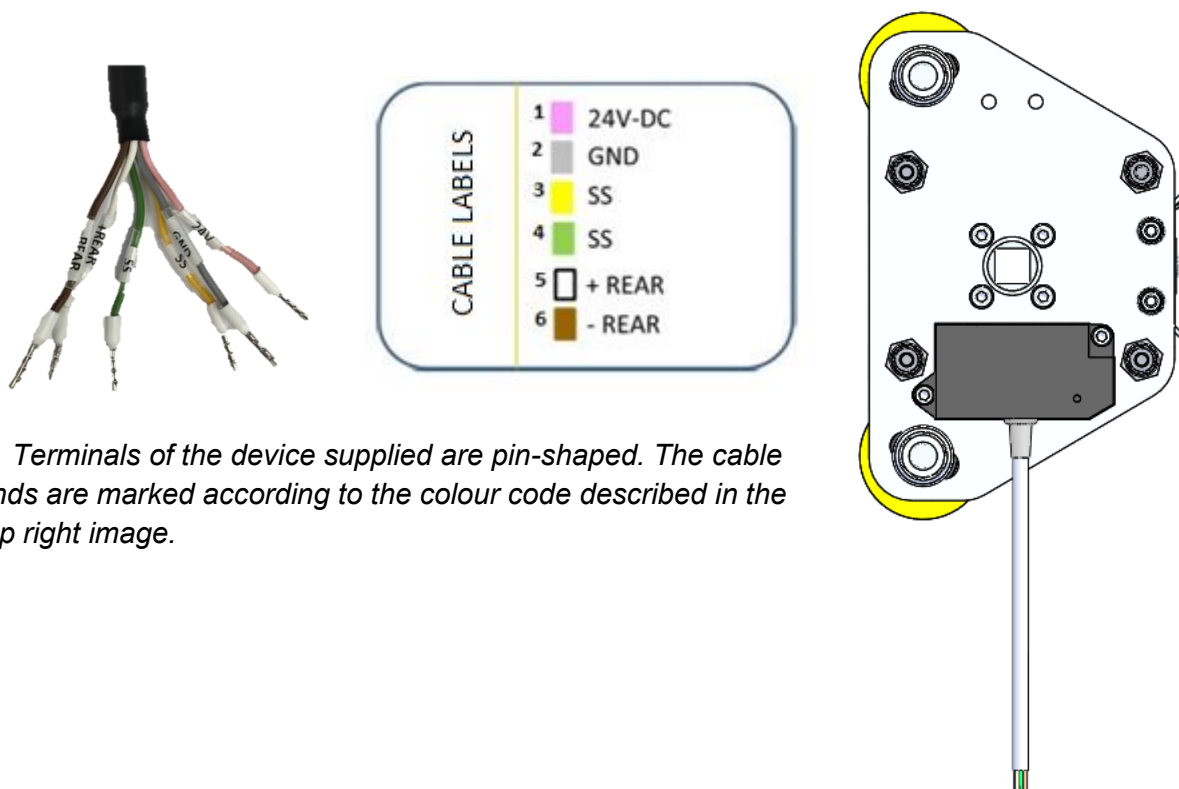
INSTRUCTIONS



3.2 SEL-20 OVERSPEED SWITCH

In compliance with section 5.6.2.2.1.6 a) of standard EN81-20, the governor has an electrical safety switch that commands the stop of the machine before reaching the tripping speed. If the nominal speed of the lift is not higher than 1m/s, then this device is not necessary, since the safety switch of the safety gear linkage can carry out this function when reaching the tripping speed of the governor.

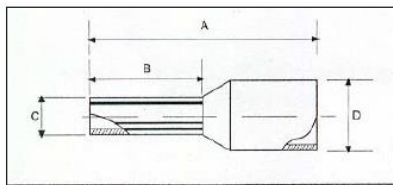
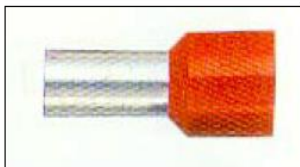
SEL-20 device is fitted with 6 terminals and is supplied as shown in the following picture



Terminals of the device supplied are pin-shaped. The cable ends are marked according to the colour code described in the top right image.

INSTRUCTIONS

Pin connectors dimensions are as follows:



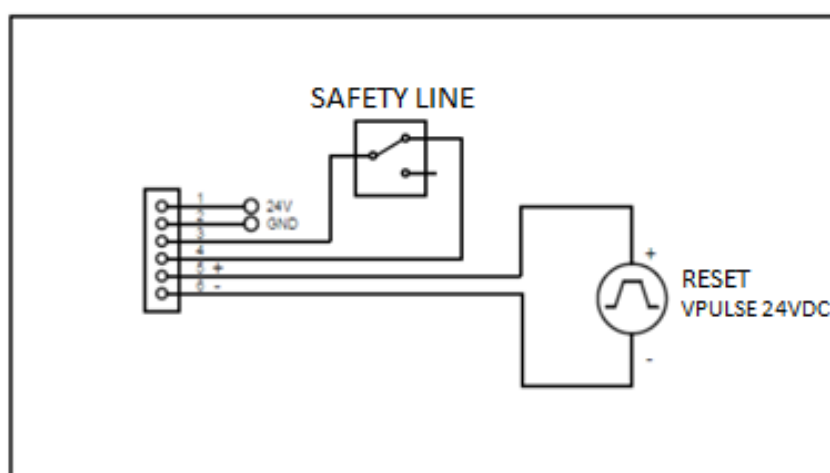
DIN 46228/4

INSULATED PIN CONNECTORS	SECTION mm ²	A	B	C	D	COLOUR System "T"
TE-0,50	0,50	14,0	8,0	1,0	2,6	White

The device can be supplied with connectors upon prior agreement with the client.

The following table contains electrical data on the connections of the device.

Colour	Terminal	Description
Pink	1	Device power supply 24 Vdc (+)
Grey	2	Device power supply 0 Vdc (-)
Yellow	3	Safety circuit contact
Green	4	Safety circuit contact
White	5	Device reset power supply 24Vdc (+)
Brown	6	Device reset power supply 0 Vdc (-)

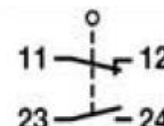


INSTRUCTIONS**3.3 ANTI-SLIDING PROTECTION**

Optionally and in compliance with section 5.6.7 of standard EN81-20, the overspeed governor can include the AD 12 device. This component may be an integral part of the means to protect the uncontrolled movement of the car.

The system is composed of:

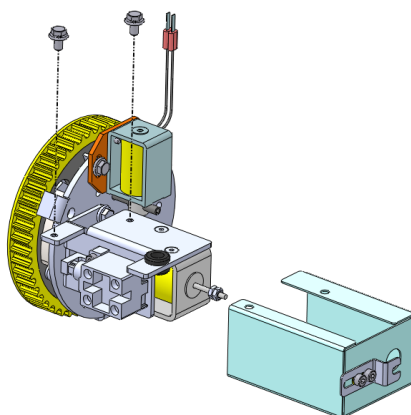
- Mechanical blocking system
- PIZZATO VF B602 (1NC, 1NO) safety electrical switch.
 - AC-15 6A/250Vac
 - IP20
- NAFSA ERC45-50/XX/C Electromagnet
 - Duty-cycle ED100%
 - Consumption 12W
 - Max. excitation time: α
 - Standardised tensions: 24Vdc; 48Vdc; 190Vdc; 230Vac
 - Nominal intensities 0.47A; 0.24A; 0.06A; 0.10A



Connect the electromagnet to the electrical installation, taking into account the values of voltage and intensity, so that the electromagnet is permanently supplied during the normal movement of the lift.

Connect the series of safeties to the safety electrical switch in the position of normally closed when the electromagnet is supplied, so that in the absence of the electrical supply or when the electromagnet stops being supplied, the mechanical system triggers and the safety electrical switch is open. When the coil is supplied again, the system returns to its original position.

From the moment the electromagnet stops being supplied until the governor trips, the lift can travel between 21mm and 102mm. The minimum travel avoids undesired tripping in load and unload operations.



INSTRUCTIONS

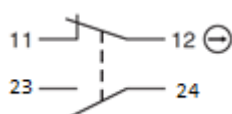
3.4 TOOTHED BELT LOOSENING CONTACT

As an equivalent measure to section 5.6.2.2.1.6 c) of standard EN81-20, the tensioners of the toothed belt have a safety electrical switch which brings the machine to a standstill if it is broken or too stretched.

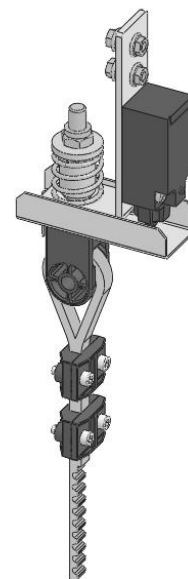
The model of safety electrical switch is PIZZATO FR 515-S18 (1NC, 1NO) or similar and it will connect to the series of safeties in the position of normally closed.

Its features are as follows:

AC-15 6A/240Vac
 DC-13 0,4A/250Vdc
 IP67

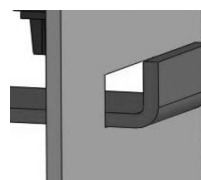
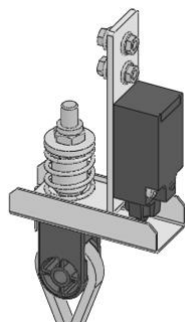


By acting manually on the safety electrical switches of the upper and lower tensioners, check that the lift cannot move.



4.- ADJUSTEMENT

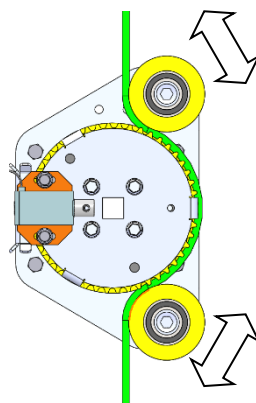
Start the adjustment of the installation in the upper tensioner, by turning the tensioner nut and compressing the spring until the actuator rocker of the switch reaches its limit. If necessary, also correct slightly the physical position of the tensioner, so as to obtain a higher precision in the verticality of the toothed belt.



MAX



Then, adjust the governor, by checking first its verticality and, if necessary, also adjust the position of the diverting wheels and the anti-sliding devices, in order to guarantee that the toothed belt is plumbed in all directions.



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Finally, adjust the lower tensioner in the same way as the upper one. The final tension of the belt must be approx. 100N.

In order to check the adjustment, travel the lift several times, paying special attention to the correct entry and exit of the toothed belt in the governor and the deviating wheels all along the travel path, as well as to possible noises and vibrations produced by them. In most cases, failures in the final functioning are produced by an incorrect plumbing of the toothed belt, the overspeed governor or both.

Finally, when carrying out the tests described in section 6.3 "Inspections and tests before implementation" and specifically section 6.3.4 "Shaft safety gear" of standard EN81-20, act from the control panel on the remote control device and check the correct functioning of the clutch of the overspeed governor and the functioning of the unit overspeed governor-safety gear.

5.- MAINTENANCE

In order to guarantee the correct functioning of the overspeed governor all along its useful life, the following maintenance tasks must be performed with the suggested frequency.

In addition, visual inspections shall be performed annually so as to detect possible superficial damage of components and specifically of the toothed belt.

5.1 OVERSPEED GOVERNOR'S TRIPPING

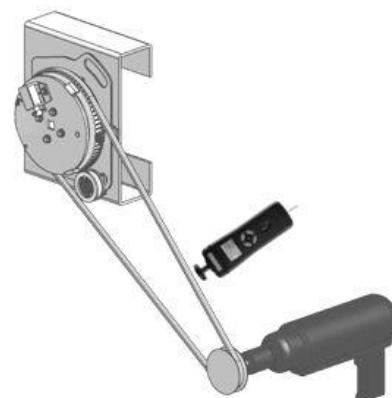
This maintenance task is aimed at checking that the governor works properly at the tripping speed that appears on the plate of characteristics. The task shall be performed once every five years.

Use the following tools:

- A closed toothed belt.
- A drill/motor with a toothed pulley.
- A tachometer

The procedure is as follows:

- 1) Remove the toothed belt from the installation of the governor.
- 2) Engage the closed toothed belt in the governor.
- 3) Fit a toothed pulley to the drill. It must be suitable for the pass and profile of our toothed belt. Engage the closed toothed belt in the toothed pulley of the drill.
- 4) Turn slowly the drill and progressively increase the spins.
- 5) Place the wheel of the tachometer on the toothed belt and write down the speed at which the governor trips.
- 6) Check that the tripping speed does not differ more than 5% with regards to the one displayed on the plate of characteristics.



INSTRUCTIONS**5.2 CLUTCH FORCE**

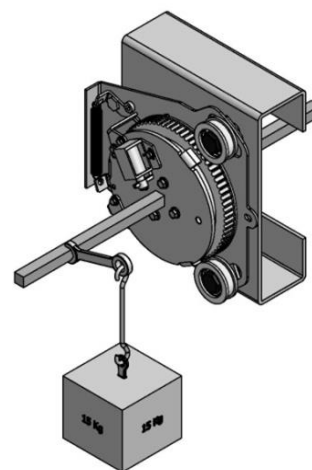
This maintenance task is aimed at checking that the clutch of the governor is able to transfer (300N) the double of the effort required to activate the safety gear. It is 150N for the SLC2500 model. The test only needs to be done in one direction. The task shall be performed once every five years.

The following tools will be used:

- A key/lever
- A weight

The procedure is as follows:

- 1) *Place a key on the driving bar and hang a weight on it, so that a par of 13.5Nm is produced (for instance 15Kg at 90mm; 15x90/100 Nm). Make sure that the weight is placed on the right side, that is to say, the weight must increase resistance to the action of the safety gear in the direction that is going to be tested.*
- 2) *From the control panel, activate the remote control system and move the lift slowly in the desired direction. The test will be considered satisfactory when the safety contact of the linkage is activated and the machine is brought to a standstill. The governor will be blocked and the clutch will have transferred the linkage tripping force plus the one of the weight that has been placed.*



Please note: If necessary, place a stop to prevent the safety gear from staying blocked when hanging the weight.

5.3 SAFETY SWITCHES AND COIL

We shall check every year that the safety switches of the tensioners, SEL20 overspeed switch and the remote tripping coil work correctly.

5.4 USEFUL LIFE

The useful life of the overspeed governor cannot be defined with regards to a specific period of time; the overspeed governor can work provided the results of the maintenance tests above are satisfactory.

Otherwise, only LUEZAR-ECO,S.L can repair the said overspeed governor or supply a new one, based on the manufacturing number (F.Nr.) displayed on the characteristics plate.

The useful life of the coil is 3,000,000 manoeuvres.

The number of hours of minimum functioning (system in motion) of the toothed belt is 25,000h.