

# ***MCA***

## **COVERING SYSTEM FOR TIPPER TRUCKS**

### ***Installation Manual***

 **English**

**- Translation of the original instructions in Italian language -**



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#### **Rev. 06**

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Marcolin Covering s.r.l. took great care in editing this manual, however, the company denies responsibility for errors and omissions, if present, and for personal and animal injuries as well as for material and environmental damages as a consequence of the application of the manual's instructions.

This manual has been edited in accordance with the Machinery Directive 2006/42/CE.

### Covering with lowered cables

Dear Customer, all the Coverings model Sigillo®, MCA and Ecotype manufactured by Marcolin Covering s.r.l. can be purchased with “lowered cables”.

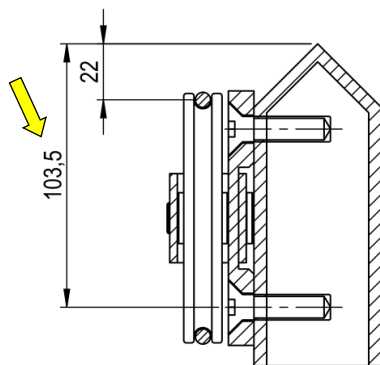
The system is intended for lowering the cable run of the upper steel cable which pulls the covering system. The cable run is lowered by approx. 22 mm under the body upper edge compared to the standard cable run which is approx. 11 mm over the body upper edge.

This option aims at fulfilling the requirements of our Customers and eliminating the breakage problems of the steel cable as a result of cable crushing during the normal loading operations.

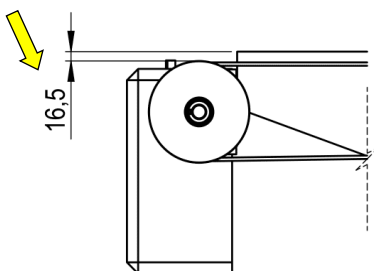
If you purchase the covering with lowered cables, please follow the advices on the drawings while fitting the mechanical part on the front side and the tensioning plates or idler pulleys on the rear part.

**COVERINGS mod. Eletta® are hereof excluded**, as they are designed for being fitted only with lowered cables. Therefore the dimensions in the installation manual already refer to the correct positioning.

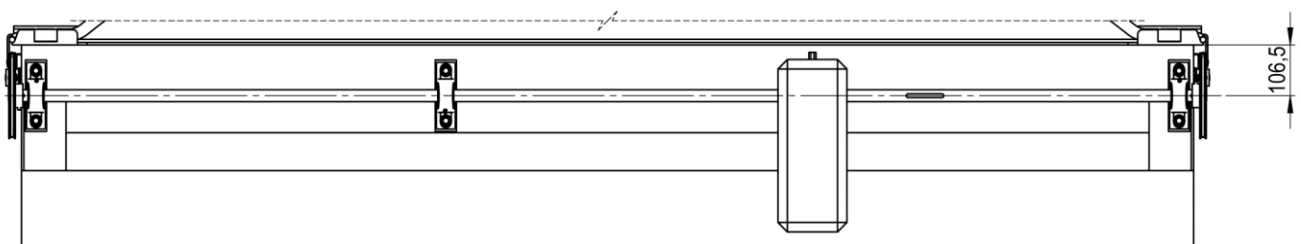
### MCA covering fitting with lowered cables:



Fitting dimension of the rear plates in case of lowered cables



Fitting dimension for the driving pulleys in case of lowered cables



front view

## SUMMARY

<b>Summary</b>	<b>4</b>
<b>Chapter 1 Introduction</b>	<b>6</b>
1.1 Introduction	6
1.2 Important information if purchasing the “lower cable system”	6
1.3 Commitments of the machinery deliverer to the end-user	6
1.3.1 <i>The teaching and training course for the end-user must include the following items:</i>	6
<b>Chapter 2 The MCA Covering System</b>	<b>8</b>
2.1 Covering system components	8
2.2 Interventions and machine modifications	9
2.3 Tipper body construction features for a good installation	9
2.4 Installation of the optional idler pulley system	9
<b>Chapter 3 MCA Covering System installation</b>	<b>11</b>
3.1 Fitting of the rear tensioning plate	11
3.1.1 <i>General information</i>	11
3.1.2 <i>Fitting of the rear tensioning plate in case of “STANDARD CABLE SYSTEM”</i>	11
3.1.3 <i>Fitting of the rear tensioning plate in case of “LOWER CABLE SYSTEM”</i>	12
3.2 Driving system installation	12
3.2.1 <i>Versatility of the covering system</i>	12
<i>For installing on the opposite side, carry out the mirror-imaged activities on the opposite side.</i>	12
3.2.2 <i>Installation of the driving system on the tipper front side</i>	12
3.2.3 <i>Installation on the tipper body front side in case of “LOWER CABLE SYSTEM”</i>	14
3.3 The hand-operated MCA covering system	15
3.3.1 <i>Installation on the tipper body front side in case of “LOWER CABLE SYSTEM”</i>	15
3.3.2 <i>Fastening of the operating rod (hand-operated covering system)</i>	16
3.4 Installation of the steel cables	17
3.4.1 <i>Cable fastening</i>	19
3.4.2 <i>Steel cables tightening up</i>	20
3.5 Tarpaulin fastening	21
3.6 Lateral hooking system for the covering	21
3.6.1 <i>Standard closure with automatic “L” hooking</i>	21
3.6.2 <i>Hermetic closure with elastic strings</i>	23
3.7 Electrical wiring for MCA Covering System	24
3.7.1 <i>Control Box models description</i>	25
3.7.2 <i>Installation of the electrical components</i>	26
3.8 Switch panel of the machine	28
3.8.1 <i>Description of the Control Box</i>	28
3.8.2 <i>Emergency pushbutton key, safety shutdown</i>	29
3.8.3 <i>Control switches of the Control Box for operators</i>	29
3.8.4 <i>Description of the remote control “TX MARCOLIN” system</i>	29
3.8.5 <i>Reprogramming the “TX MARCOLIN” radio remote control</i>	30
3.8.6 <i>Unfold the MCA covering for covering the tipper body</i>	30
3.8.7 <i>Interruption of machine operations</i>	30
3.8.8 <i>How do you stop the machine in case of emergency?</i>	30
3.8.9 <i>Restoring of standard operative conditions</i>	31
3.8.10 <i>Machine stop in safety conditions</i>	31
3.8.11 <i>Retraction of the MCA tarpaulin to uncover the tipper body</i>	31
3.8.12 <i>How do you interrupt the machine operations?</i>	31
3.8.13 <i>How do you stop the machine in case of emergency?</i>	31
3.8.14 <i>Machine stop in safety conditions</i>	31
3.8.15 <i>In case of empty tipper body</i>	31
3.9 What is to be done, when the electric operated driving system does not work?	33
3.9.1 <i>Replacement of the internal fuse in emergency situation</i>	33
3.9.2 <i>Motor unlocking in emergency case</i>	34
<b>Chapter 4 Accessory equipment installation</b>	<b>35</b>
4.1 Automatic rear closing system	35
4.1.1 <i>Installation of reinforcing brackets for automatic rear closing in case of lowered cables</i>	36
4.2 Quick cable release system	37

4.2.1 Installation of the rear drive pulley .....	37
4.2.2 Tightening up system .....	38
4.3 Automatic "Wheel-Hooking System" .....	39
4.4 Windsafe hooking system .....	40
4.4.1 Installing the rear tensioning plate with 70 mm pulley in case of "STANDARD CABLE SYSTEM" .....	41
4.4.2 Installation of the 70 mm rear plate with "LOWERED CABLE" .....	41
4.4.3 Installing hooks and side guides .....	42
<b>Chapter 5 Maintenance work of the MCA Covering System .....</b>	<b>45</b>
5.1 Bow replacement .....	45
5.2 Tarpaulin replacement .....	46
5.3 Steel cables replacement .....	46
5.4 Extraordinary maintenance work - Operations to be carried out on the customer's covering system .....	47
5.4.1 General tightening up of the screw connections .....	47
5.4.2 Checking of the conservation status of metal structure and bows .....	47
5.4.3 Checking of the tarpaulin conservation status .....	47
5.4.4 Checking of the elastic strings or the automatic safety hooks (only if installed) .....	47
5.4.5 Checking of the contact plates (only if installed) .....	47
5.4.6 Checking of the sliding conditions of the covering system .....	47
5.4.7 Thoroughly checking of the pulleys .....	47
5.4.8 Replacement of broken or damaged locking hooks on the outer board wall .....	47
5.4.9 Lubricate and grease thoroughly the covering system .....	48
5.4.10 Filling in the machine control register .....	48
5.5 Troubleshooting table for electrically operated covering system .....	49
<b>Chapter 6 Enclosures .....</b>	<b>51</b>
6.1 Reference diagram for electrical connections .....	51

# Chapter 1 INTRODUCTION

## 1.1 Introduction

Load securing, for example of aggregates, during the freight transport on road is required by law.

Marcolin Covering s.r.l. has developed the MCA Covering, which fulfils the legal obligation and satisfies practical and functional needs of its user.

This manual provides all the necessary instructions for a safe application and for keeping fully functional the MCA Covering System.

Thank you for having chosen the MCA Covering System of Marcolin Covering s.r.l. !

## 1.2 Important information if purchasing the “lower cable system”

The MCA Covering is also available as “lower cable system”.

The system is intended for lowering the cable run of the upper steel cable which pulls the covering system. The cable run is lowered by approx. 22 mm under the body upper edge compared to the standard cable run which is approx. 11 mm over the body upper edge.

With this change we wanted to meet the requirements of our clients as it represents a solution for avoiding the risk of steel cable rupture by getting squashed during common load operations.

In case of installation of the “lower cable” covering system **all the height indications** mentioned in this installation manual regarding the positioning of the machinery on the front side and the tension plates or guide pulleys on the rear side **have to be increased by 33 mm**.

**i** See details in paragraphs 3.1.3 and 3.2.3 .

## 1.3 Commitments of the machinery deliverer to the end-user

As dealer of Marcolin Covering s.r.l. your company finalizes the sale, the installation, the delivery of the covering system to the end-user and the customer service.

The handing over procedure of the machine to the end-user is an important happening both for the dealer and for the user. For this reason it is relevant that the selling operation is carried out with understanding and collaboration.

Following operations are mandatory for the machine deliverer:

- Carrying out the teaching and training course with final examination (in oral or written form at yours own discretion) to pass by the machine operator.
  - i** The teaching and training course can be considered as passed when the machine operator has successfully answered your questions and has personally performed several operating cycles on the machine.
- Issuing the own EU conformity declaration.
- Handing over the own EU conformity declaration to the end-user (not the one issued by Marcolin Covering s.r.l. because it doesn't cover any civil and criminal responsibility arising from the installation and the start-up work of the machine).
- Handing over the operator's guide and any other documentation received by Marcolin Covering s.r.l. together with the covering system to the end-user.

### 1.3.1 The teaching and training course for the end-user must include the following items:

**The end-user has to be informed about the great importance of the following operations:**

- recognizing its own machine;
- knowing well the piece parts the machine is made of and their specific function and application.

**The end-user has to receive an appropriate information about following items:**

- machine's risk and danger areas;
- actions which are absolutely forbidden;
- the permitted proper handling and the prohibited misuse of the machine;
- components regarding the operational security.

**The end-user has to receive proper instructions about the following activities:**

- turning on and off the control switches;
- the machine workings by processing some operating cycles;

- the processing of the maintenance actions permitted by the manufacturer in safety conditions (fuse replacing);
- the processing of the ordinary maintenance of the machine;
- that it is mandatory to process EVERY YEAR at least one extraordinary maintenance at the manufacturer's workshops or at workshops authorized by the manufacturer;
- that the end-user must keep the maintenance check register updated.

**It has to be repeated several times that:**

- all the instructions given during the training course can be looked up in the user manual that has to be entirely read and learnt by the end-user before using the machine for the first time.
- that in case of selling of the machine the end-user is obliged to:
  - **carry out a teaching course to the new machine owner;**
  - **hand over this installation manual and the EC Declaration of Conformity to the new machine owner.**

**It is mandatory to obtain from the receiver the signed declaration "ASSUMPTION OF RESPONSIBILITY BY ACCEPTANCE OF THE MACHINE"** to find under chapter 1.8.9 of the user manual, to make a copy of it and to send it to Marcolin Covering s.r.l. as acknowledgement of acceptance and beginning of the term of guarantee.

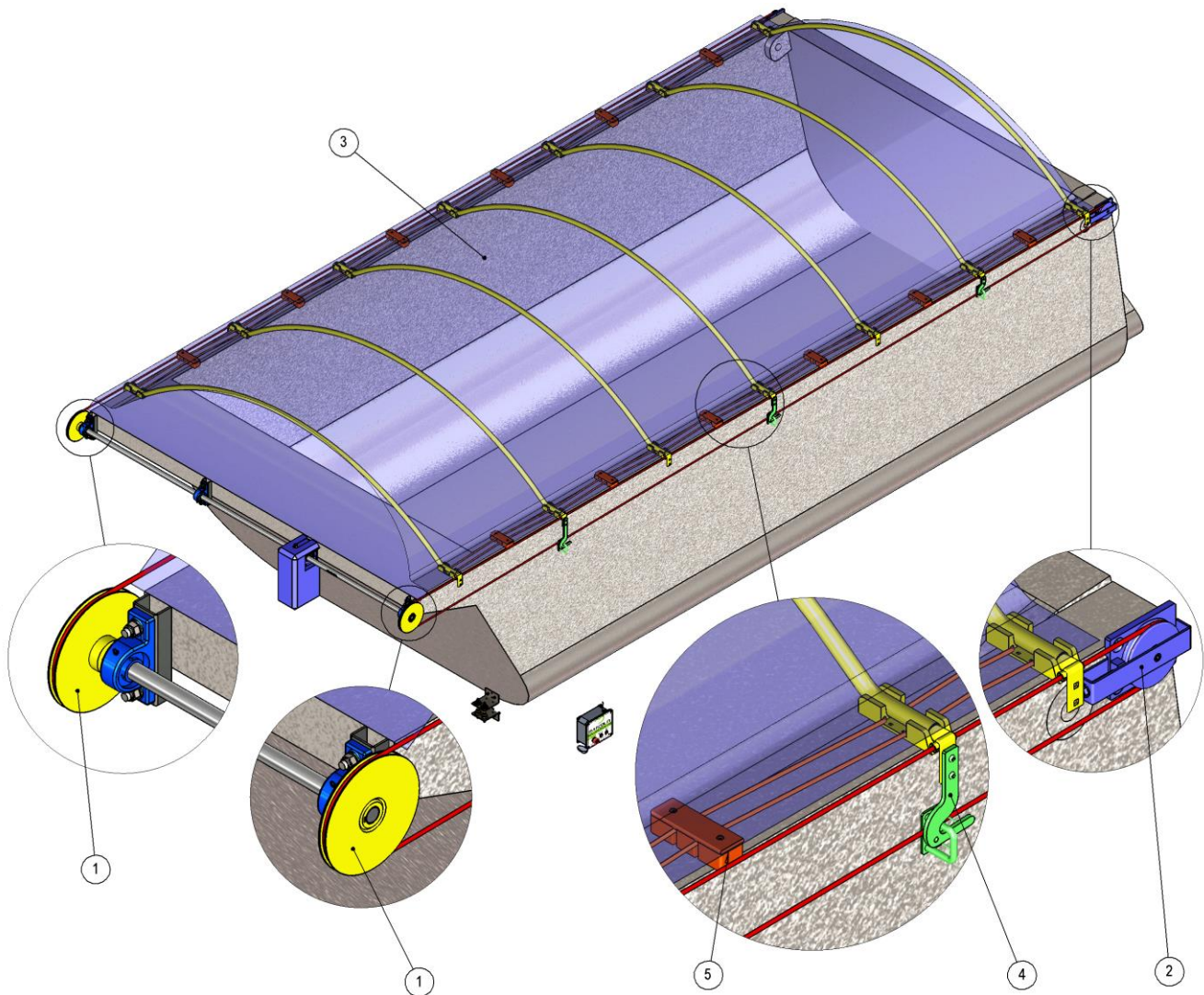
## Chapter 2 THE MCA COVERING SYSTEM

### 2.1 Covering system components

- ① THE INSTALLER IS OBLIGED TO KNOW THE CONTENT OF THE MANUAL HANDED OVER TO THE OPERATOR TOGETHER WITH EACH COVERING SYSTEM AND TO OBSERVE COMPLETELY PROHIBITIONS, REGULATIONS AND ADVICES.

Before installing the covering system, it is essential to know well its characteristics and the various elements the system is made of.

The figure below shows the main parts making up the system.



- 1 - Front covering driving system (hand or electrically operated);
- 2 - Rear cable tensioning system;
- 3 - Tarpaulin of variable size according to tipper body length;
- 4 - Covering fastening system (depending on the model).
- 5 - Folding and lifting system of the tarpaulin.



## 2.2 Interventions and machine modifications



### WARNING!

#### IT IS ABSOLUTELY FORBIDDEN TO MODIFY THE MACHINE!

Whoever modifies the machine becomes its manufacturer and assumes all civil and criminal liabilities foreseen in the legislation in force

Whoever modifies the machine assumes the obligation to issue:

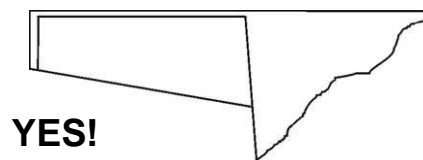
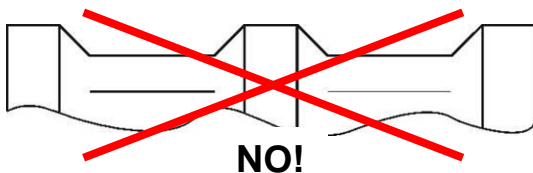
- a new CE marking,
- new installation, operating and service manuals for the end-user
- an own EC Declaration of Conformity.

**i** The replacement of whatever is usually called spare part is not regarded as a modification.

## 2.3 Tipper body construction features for a good installation

Before installing the covering system check the following items:

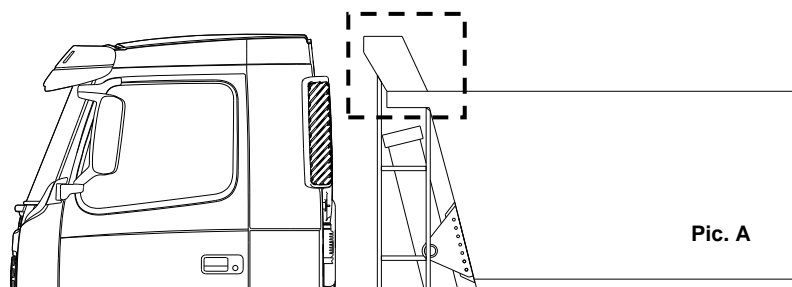
- The linearity of all the upper edge of the tipper body.
- The accuracy of flatness between the installation area of the covering (protrusion on the front side of the tipper body, usually called cab guard) and the remaining part of the tipper body along which the covering should slide.



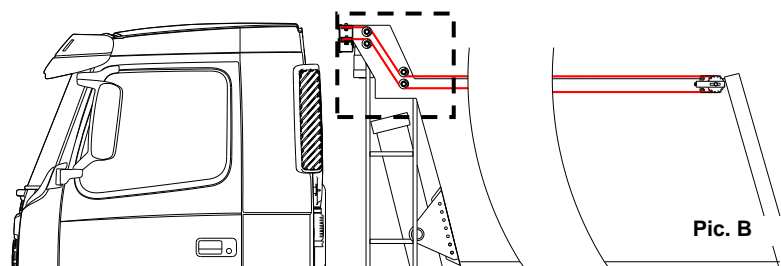
- The integrity of the upper edge of the tipper body.
- The absence of any projecting element all along the upper edge.
- The absence of any sharp edge.

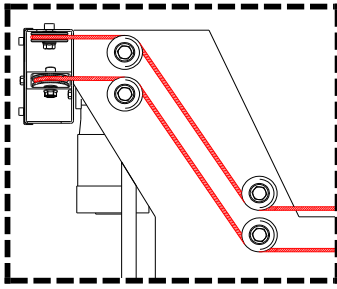
## 2.4 Installation of the optional idler pulley system

If linearity between the cabin guard and the top edge of the sides is not possible (**pic. A**) you can proceed as follows:



**i** Request to Marcolin Covering s.r.l. an optional idler pulley system (**pic. B**).

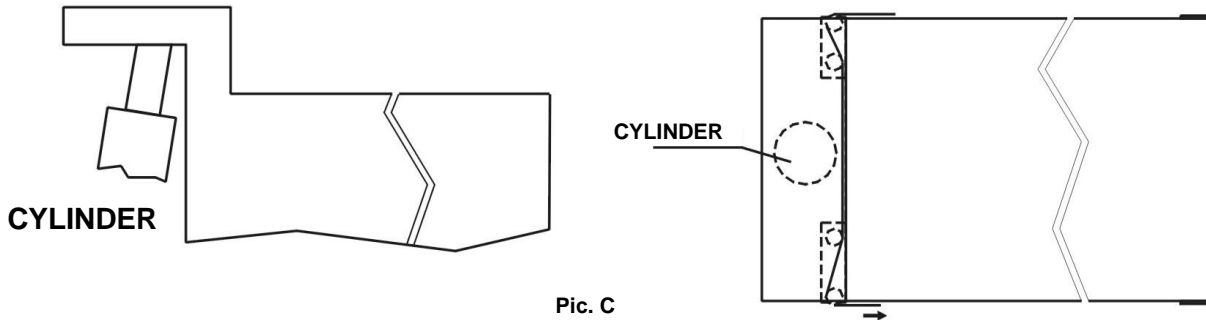




The optional idler system allows to deflect the steel cable from the top edge of the cab guard to the top edge level of the side walls in order to obtain a linear sliding movement of the covering.

Obviously, in this case, the covering occupies a part of the tipper body and the tarpaulin must be fastened over the cab guard.

- ① Another solution is fastening the front boxes at the level of the side edge and, to prevent the front steel cables from hitting the cylinder or spare tyre bracket, creating deflections with pulleys (**pic. C**), so that the steel cable passes very close to the frontal sideboard.



## Chapter 3 MCA COVERING SYSTEM INSTALLATION



### IMPORTANT!

Before starting with the installation process check the covering model at your disposal and examine carefully any particular case that can occur.

### 3.1 Fitting of the rear tensioning plate

#### 3.1.1 General information

The following description of the rear tension plate installation regards the standard covering systems; in case of:

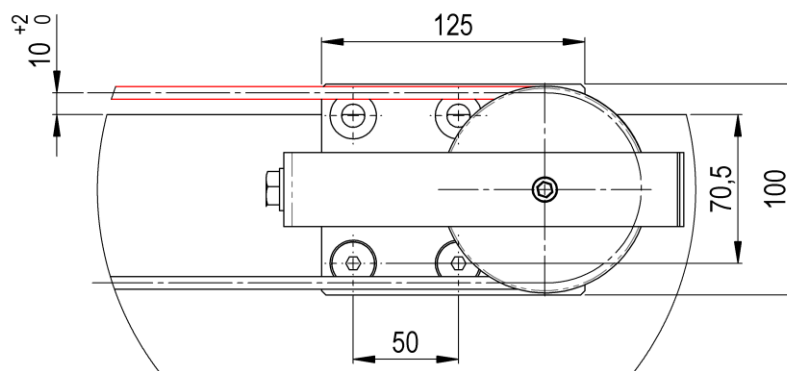
- Covering systems with **cablе's quick-release system** for three-sides tipper

please follow the described installation process for the specific case (paragraph 4.2).

#### 3.1.2 Fitting of the rear tensioning plate in case of "STANDARD CABLE SYSTEM"

The installation of the rear tensioning plate requires a special attention in order to avoid to form any obstacle for mobile elements (i.e. tailgate with lateral opening system).

The best installation position for the plate is the one as close as possible to the rear edge, but at a sufficient distance for avoiding to be an obstacle for hinges.

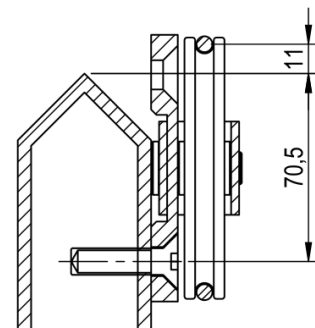


### WARNING!

A wrong positioning of the tensioning plate could cause damages for the covering or for the tipper body.

If in doubt, carry out mobility trials of the rear mobile elements to avoid unpleasant surprises.

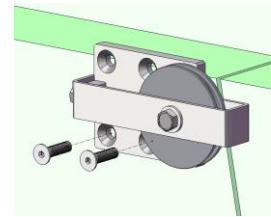
- For a proper working of the covering system, the axis of the lower fastening hole of the plate has to be positioned at a distance of 70,5 mm from the upper edge of the tipper body.
- Drill now two M10 threaded holes on the lateral board wall, aligning them with the plate holes.
- Fasten the plate with the countersunk head screws M10x35 supplied with the system, paying attention that the turnbuckle screw points to the front side of the vehicle.



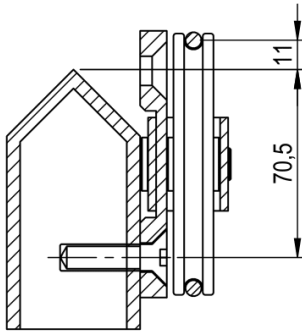
**Nota:** During its working life the structure is subject to vibrations and stress; therefore, it is recommended to apply a medium or strong threadlocker Loctite® liquid.

- Repeat now the plate fastening operation on the opposite board wall.

**Nota:** The proper fitting of the rear plates is of primary importance since it is binding for the positioning of all the subsequent element.

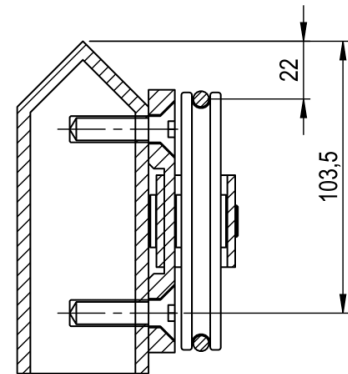


### 3.1.3 Fitting of the rear tensioning plate in case of “LOWER CABLE SYSTEM”



For installing the LOWERED CABLE covering system, the height indication of 70.5 mm given for installing the standard cable covering system has to be increased by 33 mm.

The installing height for lowered cable system becomes 103.5mm →



## 3.2 Driving system installation

The covering driving system must be placed on the front side of the tipper body next to the cab guard.

The driving system is available either hand-operated or motor-operated; in any case the installation process is similar.

### 3.2.1 Versatility of the covering system

In order to meet the various market requirements our covering system has been designed and manufactured for being installed with the driving unit either on the right or on the left side of the cab guard.

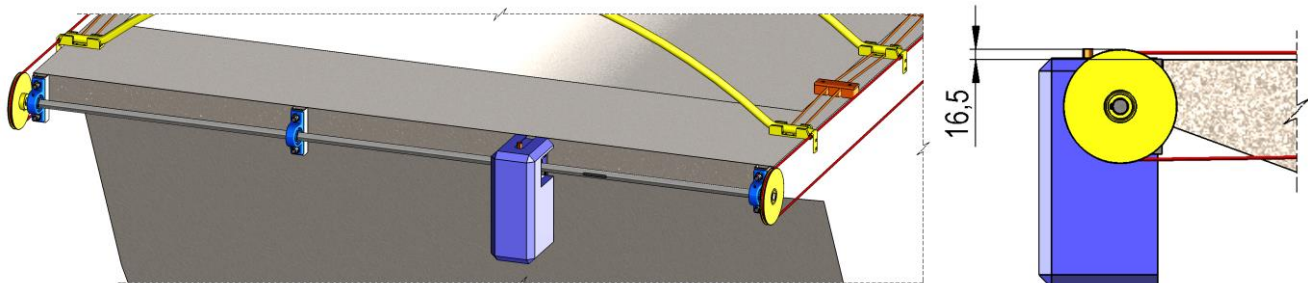
The procedure is the same for both assembly configurations, only the positioning of the driving system requires a special attention.

**Note:** Normally, installing the covering system, the positioning of the driving system should be on the left side (in relation to the driving direction) of the cab guard, as it is proved that in this position the driving unit is easy accessible for the driver when he gets out of the vehicle, and this especially in case of hand-operated covering system.

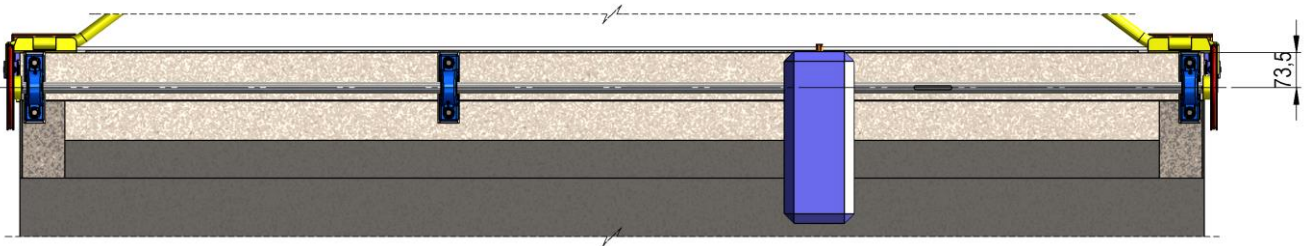
For installing on the opposite side, carry out the mirror-imaged activities on the opposite side.

### 3.2.2 Installation of the driving system on the tipper front side

- Position the MCA driving system on the front side of the tipper body.



- Check that the upper edge of the driving pulleys situated on the front side is 16,5 mm **higher** positioned than the upper edge of the tipper body.

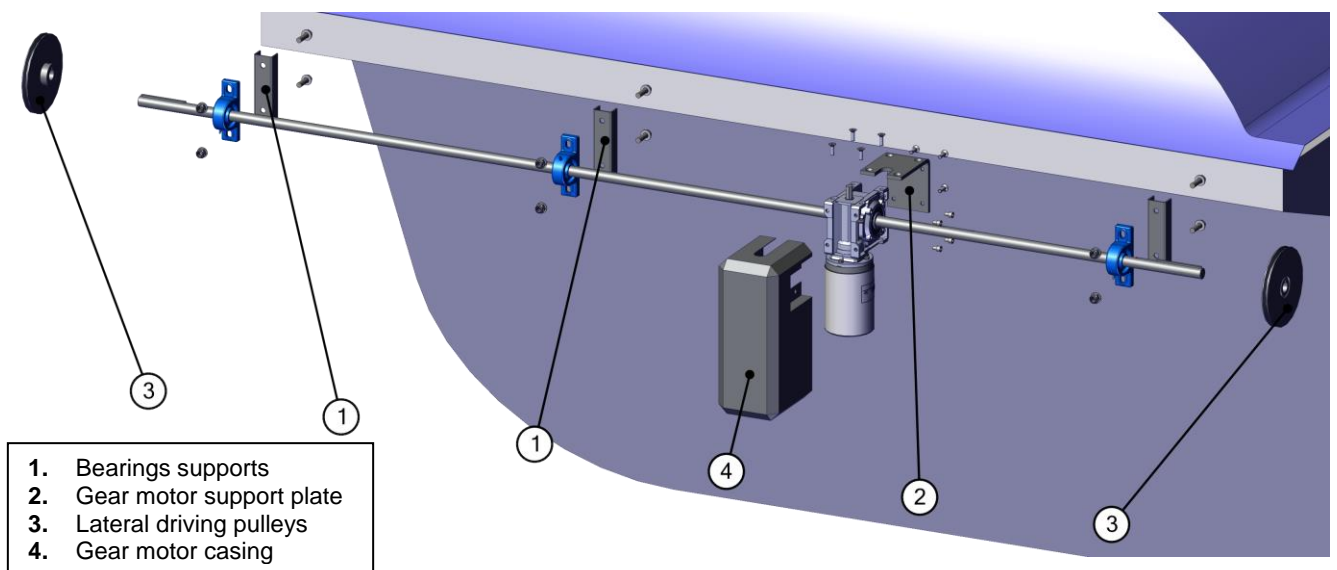


- Before fastening the mounting brackets for the MCA mechanical system check that all bearings of the shaft and the gear motor are aligned.



**WARNING!**

**MISALIGNMENT** prevents the smooth movement of the driving system and causes irreparable damages to the electric driving system.



- Fasten the mounting brackets (1) for the bearings of the MCA mechanical system with through bolts or by welding them on the tipper body.

**Nota:** The gear shaft is provided with proper slots for tightening with suitable feather keys included in the equipment. Therefore, it is essential that the several bearings fit in with the respective housings.

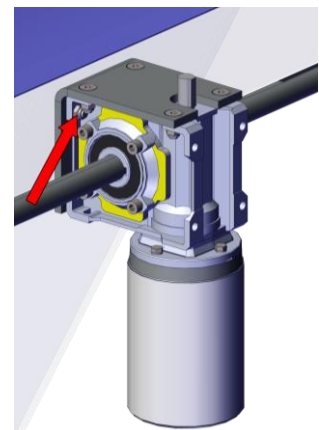
- Fasten the mounting bracket (2) for fastening the MCA geared motor (or MCA gearbox in case of hand-operated covering system) with through bolts or by welding it on the tipper body.

**Note:** The gear shaft is provided with a proper slot for tightening with a suitable feather key included in the equipment. Therefore, it is essential that the mounting plate of the MCA geared motor group fits in with the respective housing.

- Apply each bearing and the geared motor on the respective mounting bracket.

**Nota:** Insert the geared motor smoothly and without applying any force and pressure onto the geared motor.

- Insert the feather keys into the proper slots located on the shaft.
- Position the gear shaft.

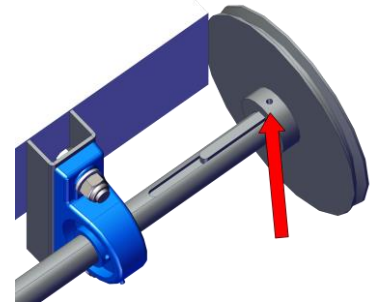


- After having fixed all mounting brackets and the shaft on the tipper body, tighten up the headless screws present in the centrally arranged mounting brackets and in the lateral driving pulleys (3).

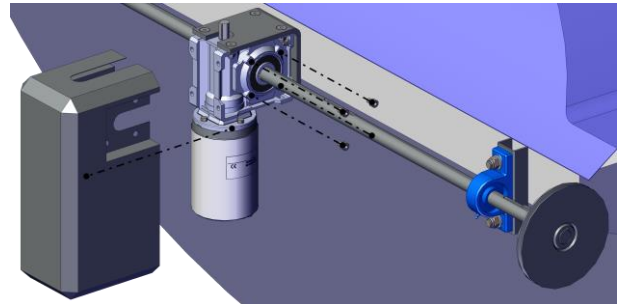


**WARNING!**

Check carefully that all above mentioned screws are properly tightened up.



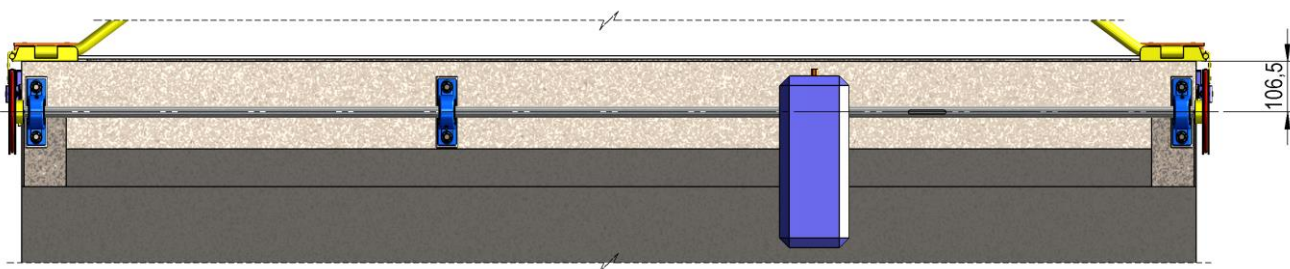
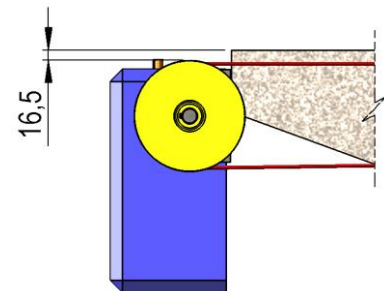
- Cut off the projecting end of the shaft  $\varnothing$  25 mm if it should jut out beyond the pulleys  $\varnothing$  180 mm.
- Insert the casing (optionally) and bolt it to the gear with the supplied screws.
- Proceed now installing the electric system.



**3.2.3 Installation on the tipper body front side in case of “LOWER CABLE SYSTEM”**

Lower 33 mm the positioning height of the driving pulleys.

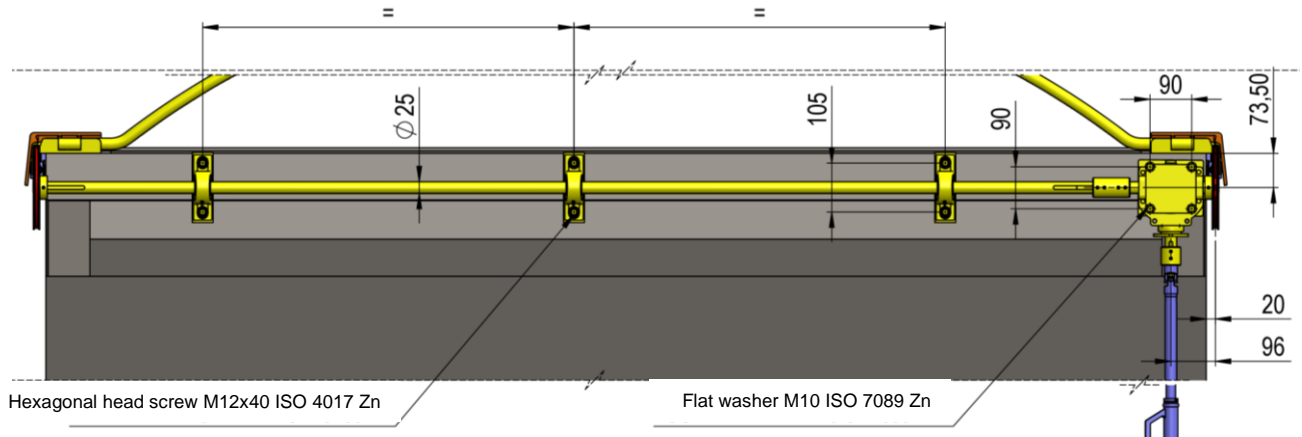
- Check that the upper edge of the driving pulleys situated on the front side is 16,5 mm **lower** positioned than the upper edge of the tipper body.



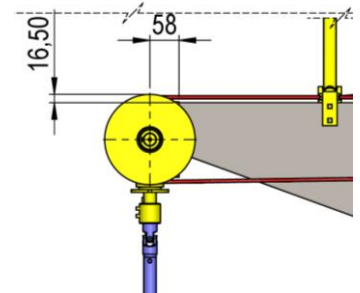
### 3.3 The hand-operated MCA covering system

The installing process of the hand-operated covering system on the front side of the tipper body differs from the electrically-operated one only by the gear and the fastening of the operating rod. However, the gearbox is fixed on the tipper body in the same way as the one of the electrically-operated covering system.

- Position the hand operated MCA driving system unit on the front side of the tipper body, as shown in the below figure:



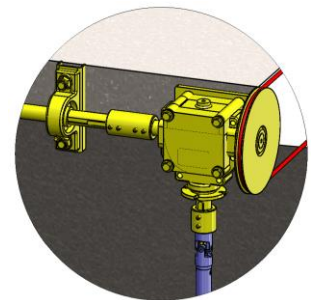
- Check that the upper edge of the driving pulleys situated on the front side is positioned 16,5 mm **higher** than the upper edge of the tipper body.
- Fix the mounting brackets for the bearings of the MCA mechanical system with through bolts or by welding them on the tipper body.



**Note:** Before fixing the mounting brackets for the MCA mechanical system check that all bearings of the shaft and the gearbox are aligned.

- Mount the gear using the suitable screws.

**Note:** Insert the gear box smoothly and without applying any force and pressure onto the geared motor.

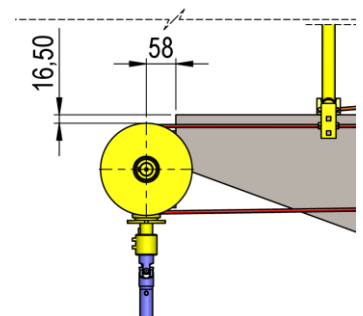


- Position the gear shaft.
- Insert the feather key matching with the gear.

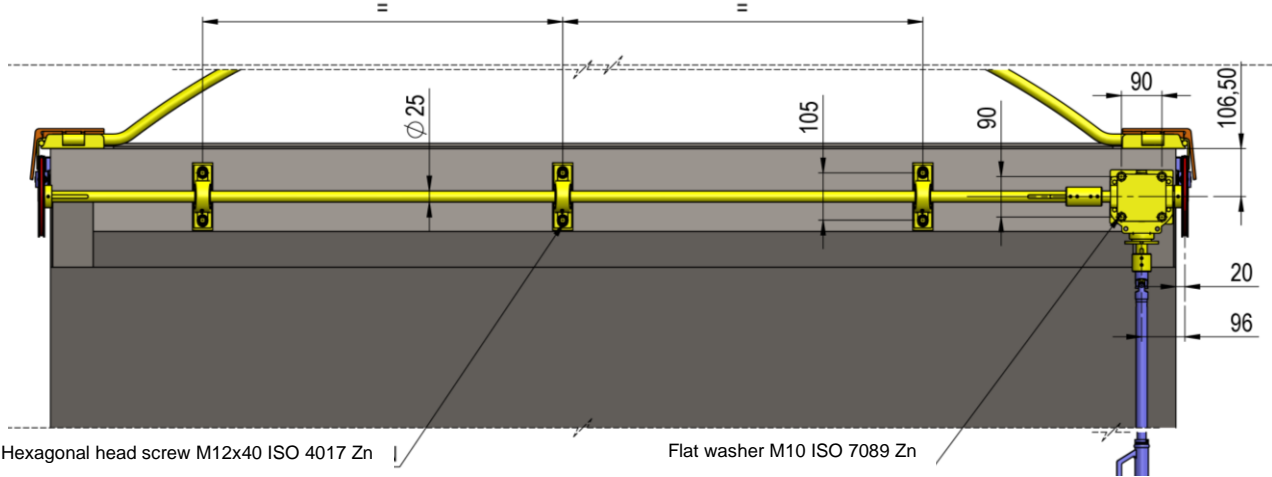
#### 3.3.1 Installation on the tipper body front side in case of “LOWER CABLE SYSTEM”

Lower 33 mm to the positioning height of the driving pulleys.

- Check that the upper edge of the driving pulleys situated on the front side is positioned 16,5 mm **lower** than the upper edge of the tipper body.



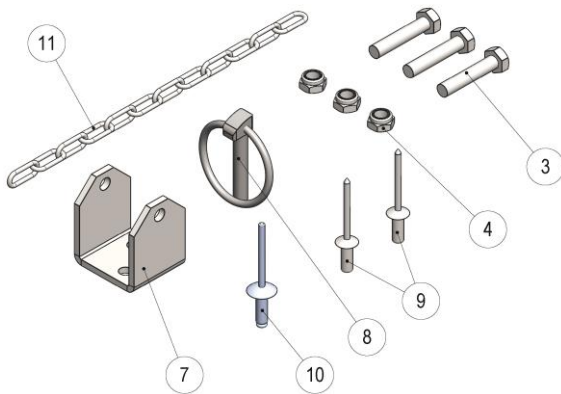
- Position the hand operated MCA driving system unit on the front side of the tipper body, as shown in the below figure:



### 3.3.2 Fastening of the operating rod (hand-operated covering system)

While installing the hand-operated covering system, after having mounted the driving system, it is necessary to assemble and mount the operating rod.

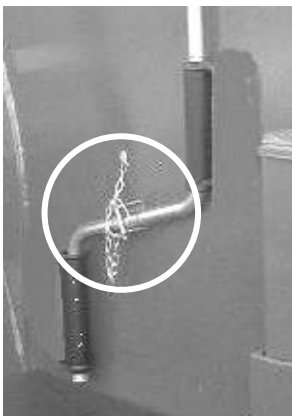
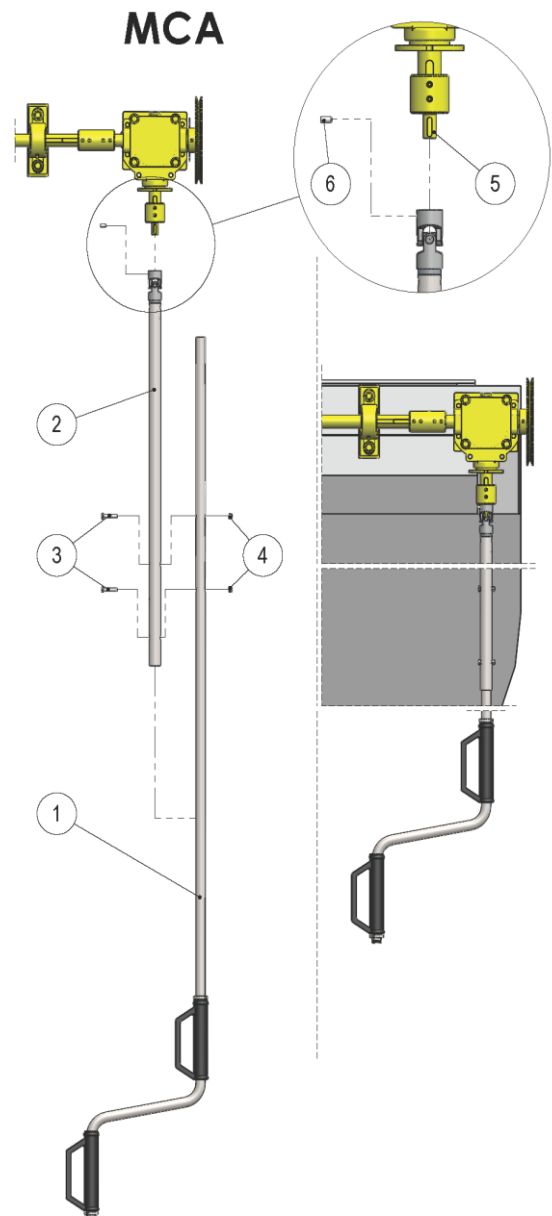
For fixing the operating rod use the following items:



- Insert the operating rod (1) into the extension piece (2) and drill 2 holes for fixing it at the desired height.
- Fix the operating rod (1) on the extension piece (2) with the supplied screws (3) and self-locking nuts (4).

**Note:** During its working life the structure is subject to vibrations and stress; therefore, it is recommended to apply a threadlocker Loctite® liquid.

- Insert the operating rod into the pivot (5) of the manual gearbox, ensuring that the feather key is inserted.
- Tighten the headless screw (6) situated on the joint.



Fix the holder for the rod:

- Find a suitable location for the rod in order that it does not become an obstacle;
- Drill the tipper body to fit the holder's holes;
- Fix the holder (7) with proper supplied rivets (9).
- Fix the safety chain (11) of the forelock (8) with proper supplied rivet (10).



### 3.4 Installation of the steel cables

The covering systems of Marcolin Covering s.r.l. are supplied already preassembled. Therefore, after having placed the covering on the tipper body, the installer needs only to remove the fastening which keeps together the bows during transport and to pull the steel cable through the holes of the bow supports.

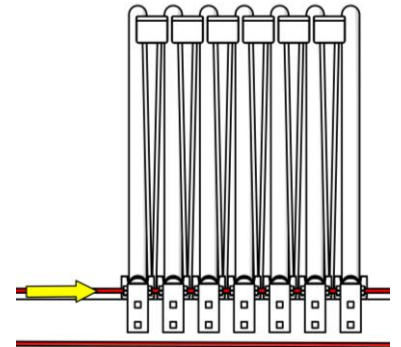
The main component which makes possible the proper covering functioning is the steel cable.



#### CAUTION!

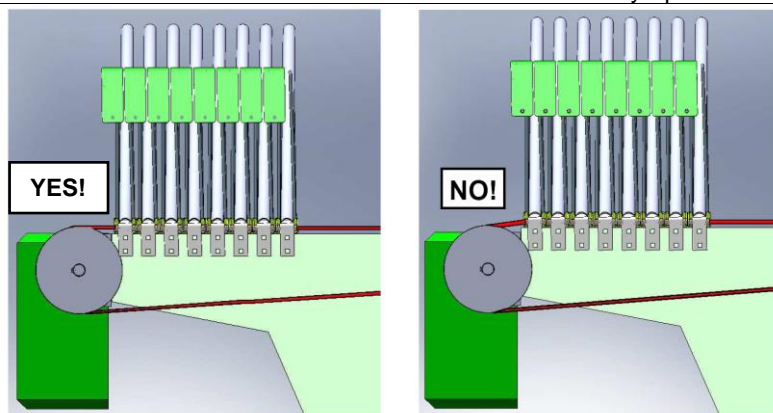
During the installing activities of the steel cable, the use of suitable protective gloves is mandatory in order to avoid any injury to hands due to a possible fraying of the steel cable mesh.

Before proceeding with the steel cable installation, it is necessary to verify the alignment between the upper driving pulley of the gear housing and the socket through which the steel cable runs.



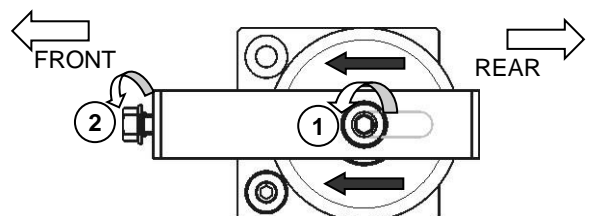
#### PAY ATTENTION!

This activity is one of the most important for the proper working of the tarpaulin. The better the alignment, the easier the handling of the tarpaulin, in case of hand-operated version, and the lesser the motor effort in case of electrically-operated version.



Loosing of the rear tensioning plates:

- Loose the centrally arranged screw that fasten the drive pulley (1);
- Undo the screw that adjust the running of the pulley slide part (2);
- Shift the pulley towards the front part.



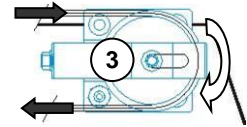
Proceed now with the positioning of the covering:

- Remove any packing;
- Ensure the correct orientation of the tarpaulin (front – rear);
- Position the first pulling bow exactly perpendicular to the edges of the tipper body.

**Note:** Pay close attention while fastening the pulling bow, because a misalignment could compromise the covering working.

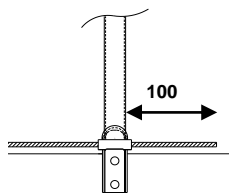
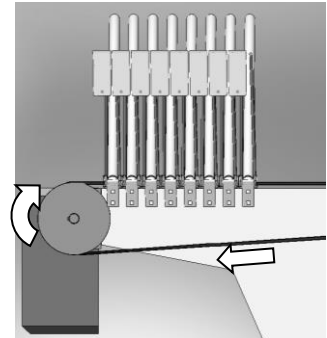
Positioning of the lower steel cable end:

- Take the end of the steel cable to the rear part of the tipper body;
- Wind the cable on the rear drive pulley (3);
- Take the end of the steel cable back towards the front part of the tipper body.



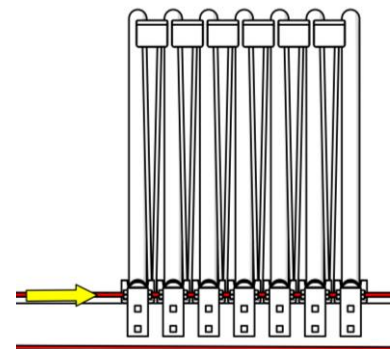
- Pass the steel cable from the bottom up to the front driving pulley and go on pulling the cable through the holes of the bow supports.

The bows holding up the tarpaulin have on their ends suitable supports for an easy sliding of the covering along the upper edge of the tipper body. These supports have at their outside a clearance hole through which the cable of the driving system runs.



Take the end of the upper cable and proceed as follows:

- Pull the cable through the hole present on every support of all bows;
- At last pull the end of the steel cable through the hole of the pulling bow support;
- Make sure that there is at least 100 mm left of the back end of the cable for further fastening and possible corrections.



**Note:**

Ensure that the bow keeps as perpendicular as possible to the board walls for avoiding any subsequent adjustment service.

### 3.4.1 Cable fastening

Now that the steel cable has been properly positioned on its path the cable fastening activities can be carried out.

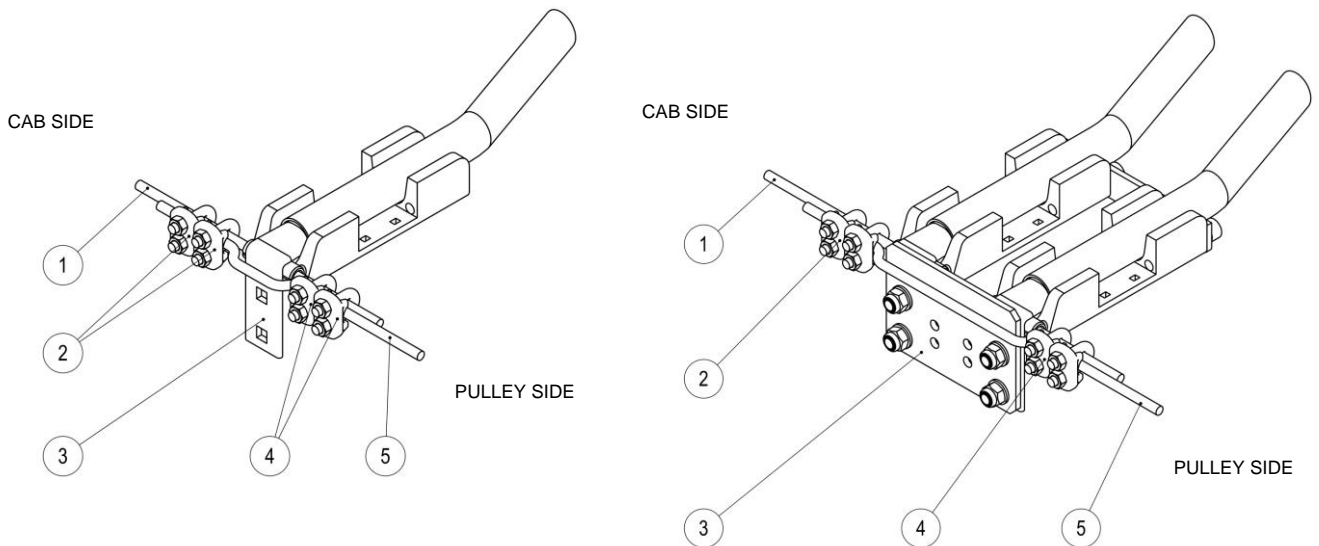


#### CAUTION!

During the installing activities of the steel cable the use of suitable protective gloves is mandatory in order to avoid any injury to hands due to a possible fraying of the steel cable mesh.

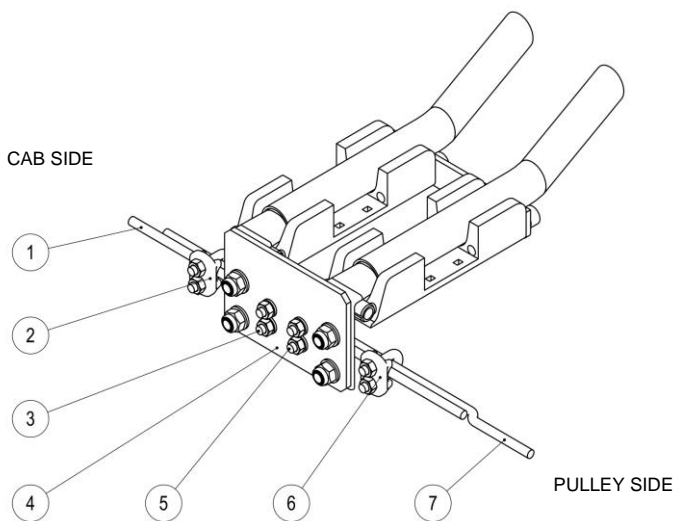
**Note:** Before fastening the cable, check carefully whether the covering is provided with a single or double pulling bow.

#### COVERING WITH SINGLE OR DOUBLE PULLING BOW (STANDARD CABLE)



1. Take the cable which comes back from the rear part (pulley side) **(5)** and pass it at the outside of the pulling bow support **(3)**.
2. Tighten the steel cable by pulling it manually.
3. Fasten both ends of the cable **(1)** & **(5)** pulling them through the specific supplied clamps **(2)** & **(4)**.

#### COVERING WITH DOUBLE PULLING BOW (LOWERED CABLE)



1. Insert a clamp **(3)** in the inner side of the double pulling bow support plate **(4)**.
2. Take the end of the cable **(1)** coming from the vehicle cab side and fasten it with the clamp **(3)**.
3. Take the end of the cable which comes from the vehicle back side (pulley side) **(7)**, overlap it to the first one **(1)**, passing it through the inner side of the support plate **(4)**.
4. Fasten both ends with a clamp **(5)** inserted in the inner side of the bow support **(4)**. Before tighten the clamp **(5)**, pull the cable manually for tensioning it.
5. Loose the first fastened clamp **(3)** and refasten it holding both cables.
6. For greater safety, it is mandatory to fasten one additional clamp on the left **(2)** and right **(6)** of the previously fastened ones.

**WARNING!**



**IT IS FORBIDDEN TO use different materials than those supplied with the covering system, in order to avoid invalidation of warranty.**

The cables must be secured by 4 galvanized steel clamps for Ø 6 cable, placed as shown in the figures above (i.e., 2 on each side).

**WARNING!**



An incorrect fastening of clamps, the lack of one or more clamps as well as a different fixing process from the described one can compromise the tarpaulin stability on the tipper body, causing its detachment with danger and damages to persons and objects.

**IT IS FORBIDDEN TO use different materials than those supplied with the covering system, in order to avoid invalidation of warranty.**

- After having fixed the steel cable cut the excess length off but leaving about 100-150 mm, that can be used for any necessary adjustments.

**Note:** Before cutting the cable, wrap the cut surface with insulating tape to prevent a possible fraying over time.

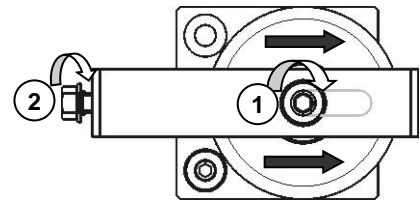
### 3.4.2 Steel cables tightening up

After positioning the steel cables, tighten them up by applying the process described for the rear drive pulleys in order to make possible the proper sliding of the covering. In fact, the rear drive pulleys have been developed and manufactured in order to allow the operator to adjust the steel cable tension.

Operating alternately on the two guide pulleys, proceed as follows:

- Use a 7 Nm torque wrench to tighten the screw placed on the front side (2) of the drive pulley.

As a consequence, the drive pulley and the slide move backwards, in this way tightening up the steel cable.



**WARNING!**



The left and right-hand cable must be given the same amount of tensioning. The drive pulley is designed with a V-shaped groove to prevent slipping and therefore does not require excessive tensioning.

- When the required tension is achieved block the guide pulley tightening the central screw (1);
- Repeat the operation on the opposite drive pulley.



**WARNING!**

During the installing activities of the steel cable the use of suitable protective gloves is mandatory in order to avoid any injury to hands due to a possible fraying of the steel cable mesh.



**IMPORTANT!**

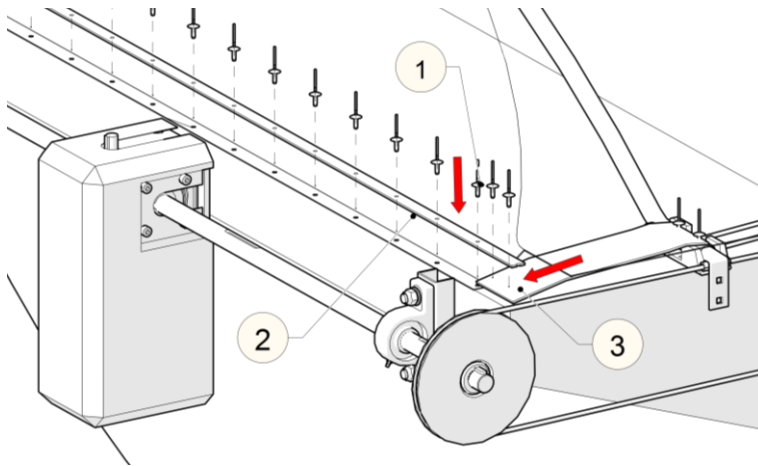
Once completed this operation, **make sure that the bow is perpendicular to the side boards of the body and at equal distance from the rear tailgate.** If not, operate consequently on the tensioning device of the steel cable or, if necessary, proceed to block it.

### 3.5 Tarpaulin fastening

On the front part, the tarpaulin is longer than the body for a better customization to the different types of tipper body and, especially, of the possible presence of the cab guard.

Before going on with the tarpaulin fastening, some operations have to be carried out in order to define the correct fastening measure of the tarpaulin.

**Note:** Pay special attention while fastening the tarpaulin in case of automatic rear closing. In such **circumstances refer to the process described in the specific paragraph 4.1.**



- Move the tarpaulin and cover the tipper body, stopping the pulling bow 70 mm before the rear pulley.

The tarpaulin has to be moved according to the installed driving system type (manually or electrically operated).

- Tighten up the PE flat strip (3) and the front part of the tarpaulin.
- Fasten the tarpaulin and the PE flat strip (3) on the top of the tipper body, using the specific clamping plate (2) and rivets (1).
- Cut off the excess tarpaulin part.

### 3.6 Lateral hooking system for the covering

The covering system has been designed to satisfy the various operative requirements. For this reason, two different types of lateral fastening of the tarpaulin have been developed:

- Standard closure with automatic “L” hooking.
- Hermetic closure with elastic strings.

#### 3.6.1 Standard closure with automatic “L” hooking

With this lateral closure system, the L-hooks automatically fit into the respective U-clamp terminals fastened on the side of the tipper body.

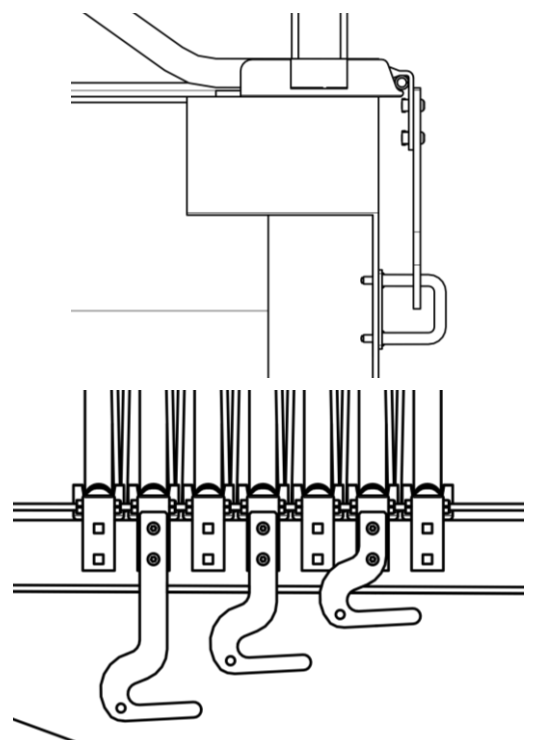
When the tipper body is covered the tarpaulin stops automatically and the vehicle is ready for moving on the road.

For installing proceed as follows:

- Move the covering and cover the tipper body entirely.
- Define the fastening positions of the safety hooks.

Generally, for fastening the covering, 2 or 3 safety hooks supplied in different heights are planned to be evenly distributed along the side of the tipper body.

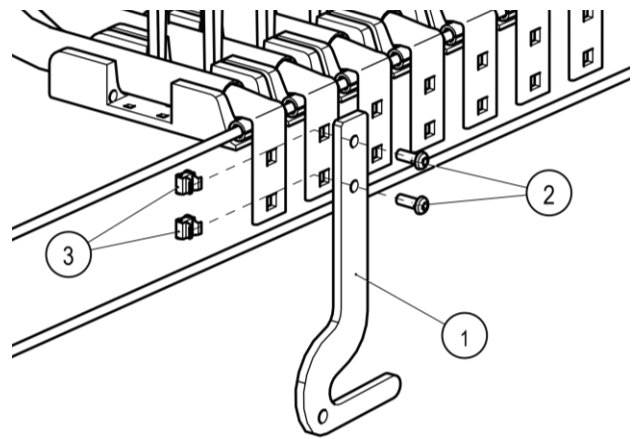
The number of safety hooks is in any case not binding as it can change according to the length of the tipper body or the customer’s requirements.



**Note:** The positioning of the safety hooks is essential for the proper working of the hooking system.

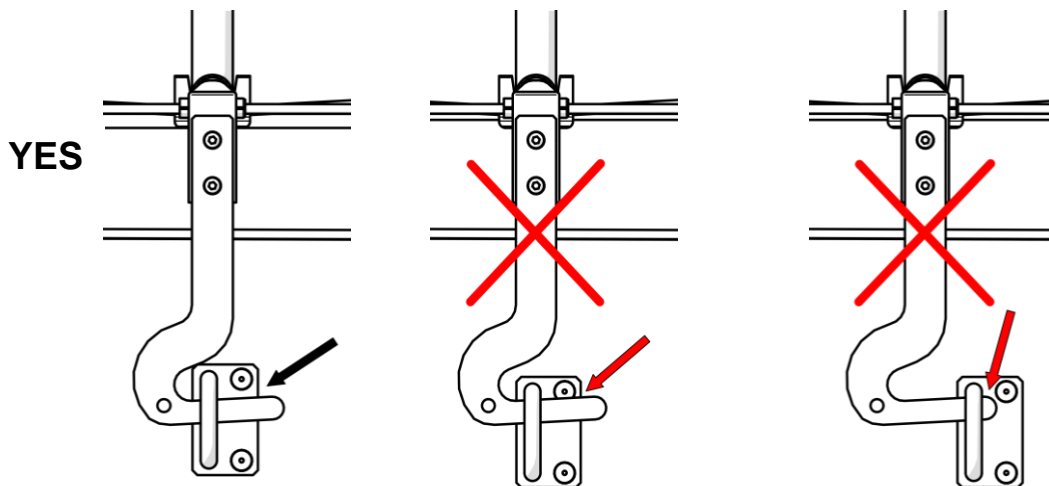
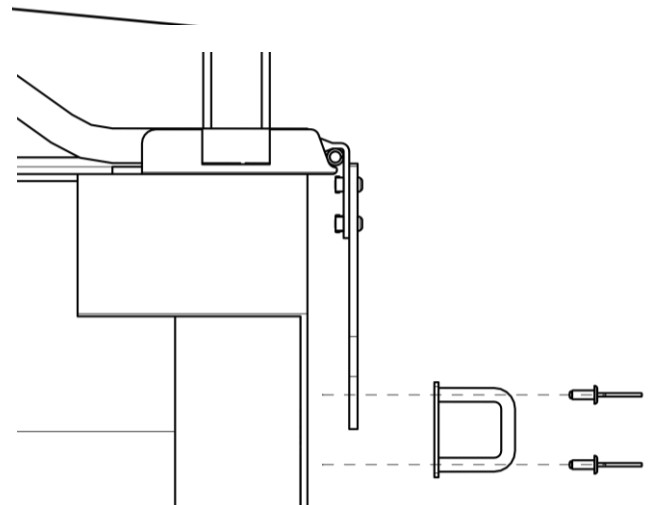
- Lean the safety hook against the lateral side of the bow support (1).
- Fasten the safety hook with the supplied round-head screws (2) and cage nuts (3).

**Note:** Apply medium threadlocker Loxeal 54.03 for the supplied screws.



After having defined the safety hook height, it is possible to fasten the U-bolt on the tipper body as follows:

- Place the U-bolt centrally to the safety hook.;
- Drill the board wall of the tipper body and fasten the hooking with suitable supplied rivets.



Now the positioning of the remaining safety hooks can be done.

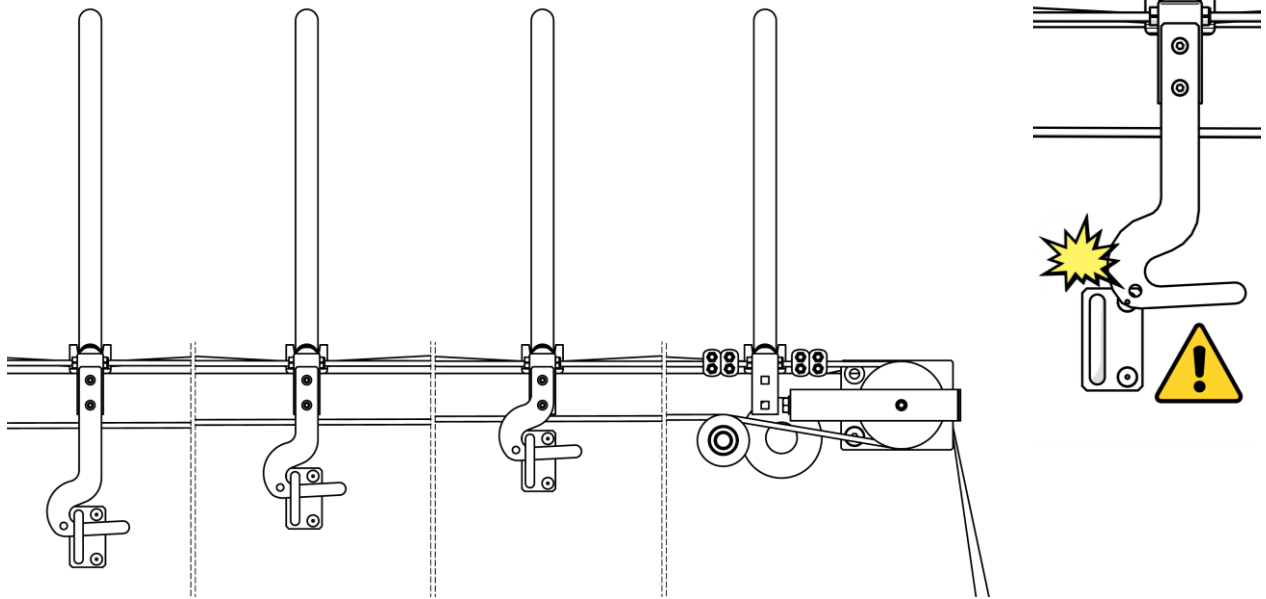


**WARNING!**

From now on the height positioning of the safety hook is the decisive factor for a proper working of the covering system.

- Proceed installing the remaining safety hooks as shown in the below figure

**Note:** Before fastening the respective hooking, verify that while folding the tarpaulin the safety hook is fastened on a different level than the foregoing one, in order not to interfere with the foregoing fastened hooking.



- If obstacles interfere with the hookings, shift the U-clamp terminal upwards on the upper hole and repeat the above described fixing operations.
- In the absence of any obstacles while moving the tarpaulin fix the hooking of the respective U-clamp terminal.
- Proceed fixing the subsequent U-clamps terminals.



**WARNING!**

We recommend taking care of each U-clamp position in order to avoid operating troubles while handling the covering system.

**3.6.2 Hermetic closure with elastic strings**

With this lateral closure system, the tarpaulin comes down a few centimetres from the upper edge of the tipper body and then it is tightened by appropriate elastic strings with hooks.

The tarpaulin borders are equipped with fastening ropes with elastic strings, with plastic or iron hooks.

For fastening the hooks proceed as follows:

- Move out the tarpaulin and cover the tipper body entirely.
- Fasten the specific hooks using the supplied rivets on the hooking points in the bottom part of the tipper body.



- Make sure that the fixing height of the hooks permits a proper tightening of the elastic strings.



**INSTRUCTION!**

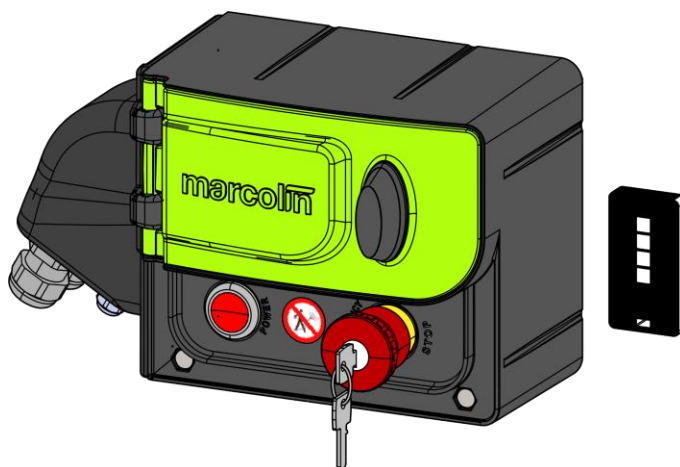
During the training course REPEAT often to the operator that HE HAS NOT TO MOVE THE VEHICLE while the elastic strings are still loose.

### 3.7 Electrical wiring for MCA Covering System

The application of the motorized covering system requires the installation of an elementary wiring, suitable for supplying electricity and the proper functioning of the covering.

The system equipment includes, apart from the above-described motor, the following material:

1. Control Box → see paragraph **Errore. L'origine riferimento non è stata trovata.**
2. Radio remote control "TX MARCOLIN"
3. Set of electrical contacts
4. Electrical wiring



identification plate: inside the door →

The electrical system also includes the connection cables for the various components.

Each supplied cable has been prepared and adapted for a specific application. Therefore each one is marked with a special initial.

The table below shows characteristics, application and identification marking of the several connection cables.

Length	Cable End 1	Reference Colour	Cable End 2	Application
4.50 m	Open ended for cutting to length to connect to battery	 <b>A</b>	80 A female plug	Connection from the tractor battery to the tipper trailer connection zone
2.50 m	80 A male plug	 <b>B</b>	Open ended for cutting to length to connect to Control Box (1 - 2)	Connection from the tipper trailer connection zone to the Control Box power supply
2.50 m	Connection to Control Box terminals (3 - 4)	 <b>C</b>	Open ended for cutting to length to connect to contact plate	Connection from Control Box (motor output) to contact plate
4.50 m	Connection to contact plate terminals	 <b>D</b>	Open ended for cutting to length, for connection to the motor	Connection from contact plate to motor



#### WARNING!

**Prior to establish the electrical connections "disconnect the battery".**

The wiring system must be made by qualified personnel in strict accordance with the instructions described in this manual and the wiring diagram shown in paragraph 6.1.

#### Note:

If use of different cables than those supplied should be necessary, consult previously the manufacturer.



### 3.7.1 Control Box models description

The following table summarizes the various types of Control Boxes (X), where (X) stands for R 24, RH 24, RHV 24, depending on the model.

PRODUCT FAMILY	DESCRIPTION	DIFFERENCES FROM THE STANDARD
<b>CONTROL BOX R 24 V</b>	Standard model. In this version the mode of operation includes a latching control selector and a radio remote control ("TX MARCOLIN"), to withdraw (" <b>UNCOVERED</b> ") and extend (" <b>COVERED</b> ") the covering tarpaulin. It also includes an emergency mushroom-head pushbutton with safety key reset and an LED-lit button showing the presence of power and allowing the programming of the "TX MARCOLIN" radio remote control.	(None)
<b>CONTROL BOX RH 24 V</b>	This model includes all the features of the standard model. It also provides an option for the timed partial retraction of the tarp for bodies fitted with hydraulically-operated sides.	This version includes the timed partial retraction of the tarp.
<b>CONTROL BOX RHV 24 V</b>	This model includes all the features of the RH 24 V model. It also includes an auxiliary output for the control of the vibrator. The first two channels of the "TX MARCOLIN" radio remote control are used to control the motor (as in the Control Box R 24V), while the other two channels are used for additional controls (verifying the electromagnetic compatibility remains the responsibility of the manufacturer of the vehicle).	This version includes the timed partial retraction of the tarp. It also includes an auxiliary output for the control of the vibrator.

### 3.7.2 Installation of the electrical components

Hereafter the required operations for installing the electrical components:

- Using proper hooking elements, fasten the Control Box on the chassis of the tipper body.
- Fasten one of the two contact plates on the front part of the tipper body.
- Fasten the other contact plate on the chassis.



#### IMPORTANT!

The fastening of the contact plates has to be performed making sure that, with the tipper body completely lowered, both contact plates meet properly.

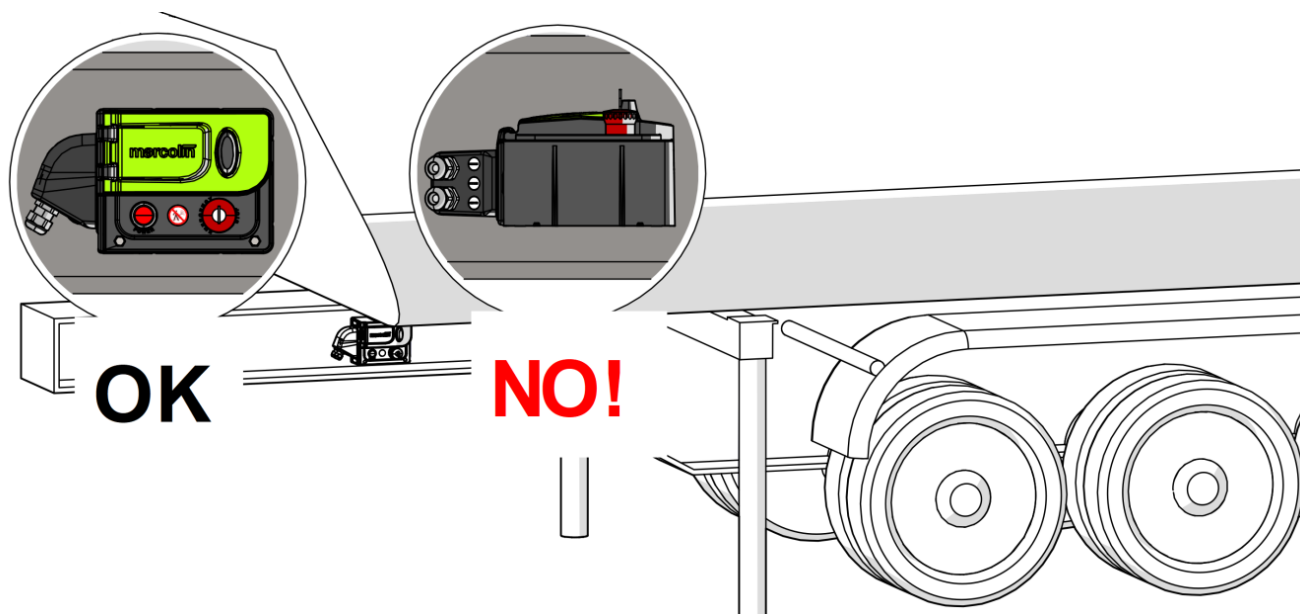


#### WARNING!

Make sure that the contacts connect properly to avoid any damage to the wiring system due to a possible short circuit

### EXAMPLE OF ASSEMBLY

The Control Box can be positioned anywhere on the semi-trailer chassis, provided that it is fastened vertically (as shown in above figure).



#### IMPORTANT!

The Control Box has to be fastened vertically on the tipper trailer chassis (see figure) by means of the supplied connection cables.

For battery connection insert a 70A fuse (not supplied) - see "wiring diagram" in paragraph 6.1.



#### WARNING!

**Do not power the Control Box with power supplies other than vehicle batteries** or with systems that have not been authorized by Marcolin Covering

**i** Call us in case of any doubts or problems during installation.

**Note:** Any installation made without authorization by Marcolin Covering s.r.l. can invalidate the warranty!

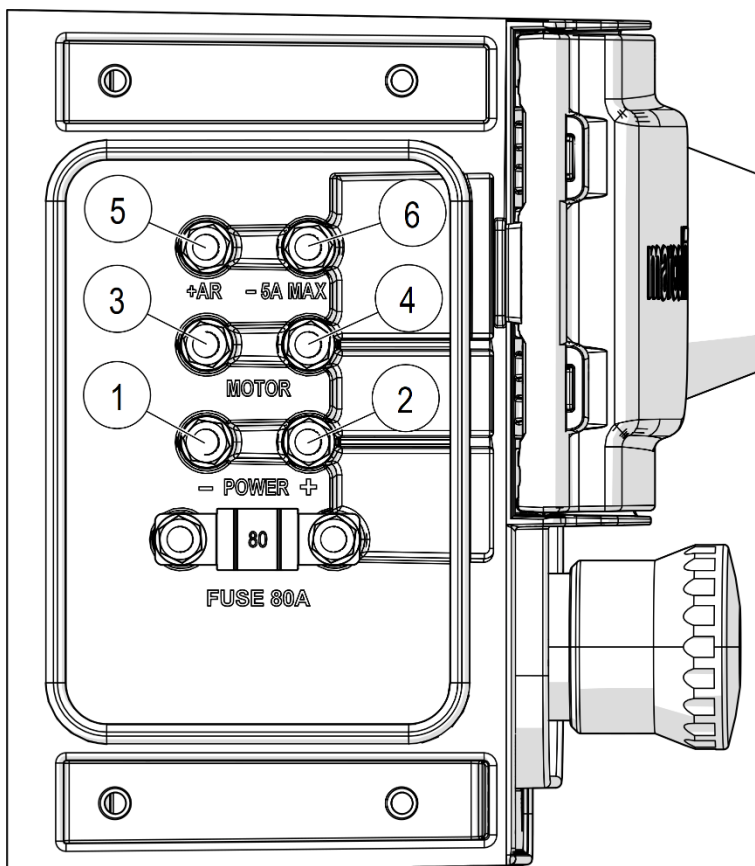
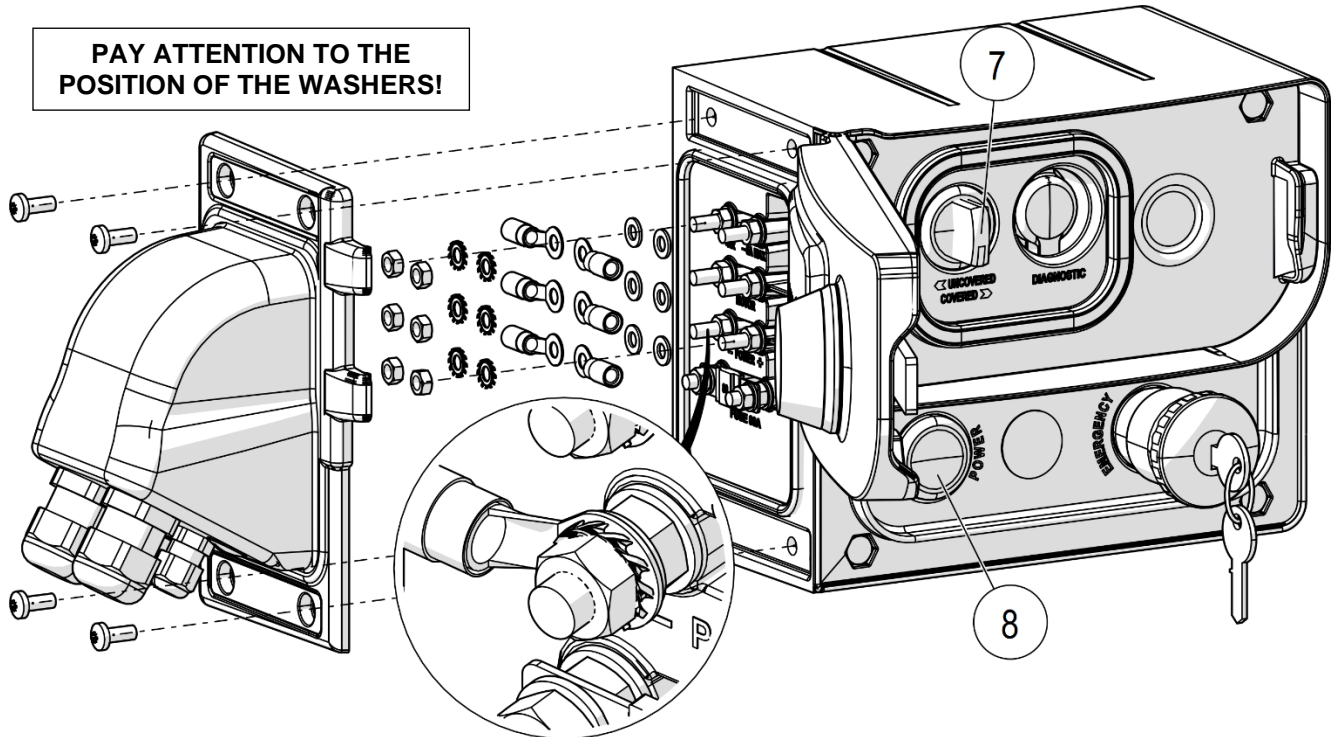
Once the main components are fastened, proceed with wiring the system.



**WARNING!**

**The electrical system must be installed by qualified personnel!**  
Disconnect the battery to remove voltage from the system before proceeding with the electrical connections.

**PAY ATTENTION TO THE POSITION OF THE WASHERS!**



Loc.	Description
1	<b>Power Supply – 24 V</b>
2	<b>Power Supply + 24 V</b>
3-4	<b>Connection to motor</b> Note: Verify the correct direction of rotation of the motor using the controls at loc. 7. If, when you turn the selector to "UNCOVERED", the tarp covers the body instead of uncovering it, reverse the polarity of the motor contacts.
5	<b>INPUT - Retraction board control</b>
6	<b>OUTPUT - Motorised vibrator control (MAX - 5 A)</b> <b>Warning: negative output!</b>
7	Latching control selector <b>(UNCOVERED / COVERED)</b>
8	"TX MARCOLIN" radio remote control programming button

1. Using the supplied cables, connect the battery to contacts **1-2** to power the Control Box.
2. Install a safety fuse (70 A -- not supplied) on the + pole of the power cable.
3. Then connect the control box output (contacts **3-4**) to the fixed contact plate.
4. Connect the motor on the movable contact plate.



**WARNING!**

**Pay special attention to ensure that the contacts of the motor are securely tightened.**  
Damages to the system may occur if the contacts were to come loose.

**Note:**

For a better understanding consult the wiring diagram shown in paragraph 6.1.



**WARNING!**

**When connecting do not reverse the polarity of the power supply!**

**Note:**

Make sure that cables are firmly fastened to the body in order that they would not form an obstacle or cause an entanglement risk.



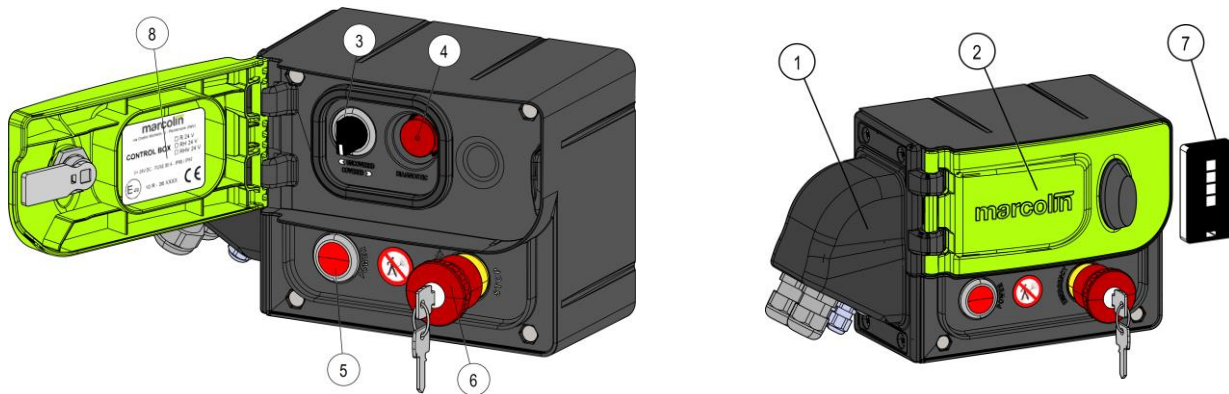
**IMPORTANT!**

It is important to connect the motor with the correct polarity to ensure that the controls operate correctly. Verify the correct direction of rotation of the motor using the control selector. If, when you turn the selector to "UNCOVERED", the tarp covers the body instead of uncovering it, reverse the polarity of the contacts.

## 3.8 Switch panel of the machine

### 3.8.1 Description of the Control Box

The Control Box consists of:



1. Cover for the contacts of the 24V power supply and motor connection cables.
2. Controls door
3. Latching control selector (**UNCOVERED / COVERED**)
4. Diagnostics socket
5. LED-lit button (power and "TX MARCOLIN" radio remote control programming)
6. Emergency button with safety key reset
7. 4-channel "TX MARCOLIN" radio remote control
8. Identification plate



**WARNING!**

It is absolutely forbidden to use the Control Box when the vehicle is moving.  
**The constructor declines any responsibility.**

**3.8.2 Emergency pushbutton key, safety shutdown**

The emergency pushbutton key is required for setting the machine in SAFETY SHUTDOWN to prevent that unauthorized people could power up the machine. The safety shutdown must be activated every time the covering system is not used (during day and overnight downtime, while executing maintenance or repair works, etc.) by pressing the emergency mushroom pushbutton and locking it with its key.



**CAUTION!**

It is strictly forbidden to leave the machine unattended while the system is active.  
**The manufacturer denies any responsibility.**

**3.8.3 Control switches of the Control Box for operators**

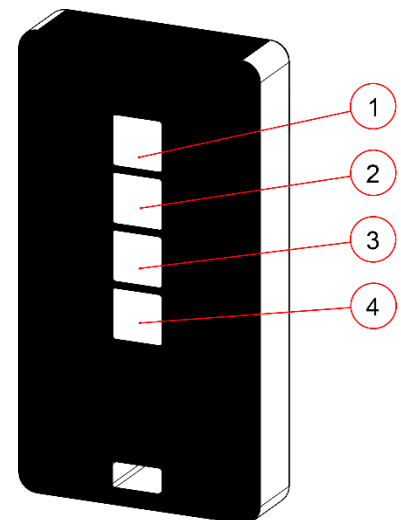
- **UNCOVERED / COVERED** switch;
- Emergency mushroom pushbutton with safety lock.
- LED-lit button (power and "TX MARCOLIN" radio remote control programming)
- "TX MARCOLIN" radio remote control

**3.8.4 Description of the remote control "TX MARCOLIN" system**

The radio remote control "TX MARCOLIN" consists of a pocket remote control to be used also as a key fob.

**Operation of the buttons:**

1. **UNCOVERED**
2. **COVERED**
3. Auxiliary control. If you have installed a Control Box model RHV 24 V, this button may be used to activate the vibrator)
4. Free auxiliary control



**ORDINANCE!**



The remote control "TX MARCOLIN" **MUST BE KEPT AND USED EXCLUSIVELY** by the operator.

After each use, the remote control "TX MARCOLIN" must be stored in a not accessible place.

**Before using the pocket remote control "TX MARCOLIN" the operator must verify the absence of any unauthorised personnel close to the Control Box.**



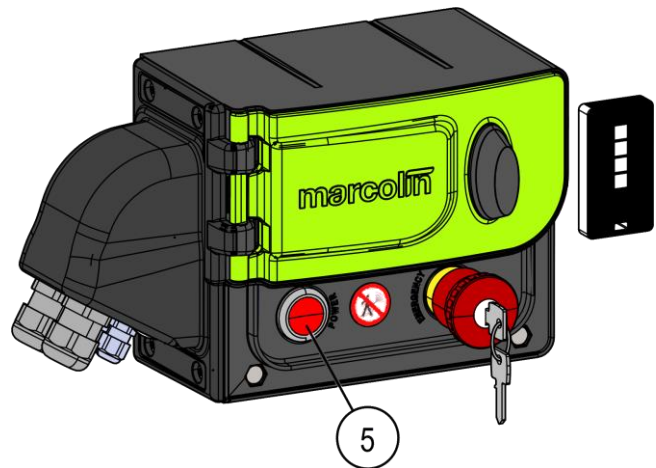
**WARNING!**

It is absolutely forbidden to use the remote control "TX MARCOLIN" when the vehicle is moving.  
**The constructor declines any responsibility.**

### 3.8.5 Reprogramming the "TX MARCOLIN" radio remote control

Should it become necessary to reprogram a "TX MARCOLIN" radio remote control, please follow the procedure below.

1. Enter programming mode by pressing **7 times** the Control Box LED button (no. 5 in the figure). After having pressed the button 7 times, the Control Box will beep intermittently and the LED button will flash.
2. Now press any button of the "TX MARCOLIN" radio remote control: The Control Box will beep again and the LED button will turn off for one second, then it will turn back on and remain lit. The "TX MARCOLIN" radio remote control is now programmed.
3. Check the correct operation of the "TX MARCOLIN" radio remote control by testing the operation of the motor in the two directions by opening and closing the covering.



In case of errors or incorrect operation, contact Marcolin Covering Support Service or an authorized workshop.

### 3.8.6 Unfold the MCA covering for covering the tipper body

In the starting position of the system the tarpaulin is folded on the front part of the tipper body. To unfold it, operate as follows:

- Check that the upper edges of the tipper body are free from any obstacle.
- Remove all elastic strings (if provided for the version installed on your vehicle) from the front hooks so that the covering can move freely.
- Insert the key in the emergency pushbutton.
- Turn the key in **CLOCKWISE** direction to unlock the emergency pushbutton for giving the consent to start the machine:

**i** When the Control Box is activated, it gives off an acoustic signal.

**On remote control "TX MARCOLIN":** PRESS THE PUSHBUTTON no. 2 (COVERED)

**On Control Box:** TURN THE CONTROL SWITCH towards the right side (COVERED)

- Unfold the tarpaulin completely and release the control SWITCH or the control pushbutton. The Control Box is equipped with an automatic motor shut-down when covering reaches the end stop.
- Close the covering on the rear side (in case of automatic rear closing system this operation takes place automatically).
- Hook the elastic strings into the lateral hooking points to fasten the tarpaulin for the transport way (if provided for the version installed on the vehicle).
- Press the emergency mushroom pushbutton.
- Remove the key.
- Carry out a quick but attentive control, especially of the automatic hooks, to verify that everything is in good order before moving the vehicle on the road.

### 3.8.7 Interruption of machine operations

For stopping the tarpaulin motion, release simply the control switch on the Control Box or the pushbutton on the remote control "TX MARCOLIN".

### 3.8.8 How do you stop the machine in case of emergency?

For setting the machine in **EMERGENCY STOP** press instinctively the mushroom pushbutton stated as no. 6 on the Control Box.



#### CAUTION!

It is strictly forbidden to leave the machine unattended while the system is active.  
**The manufacturer denies any responsibility.**

### 3.8.9 Restoring of standard operative conditions

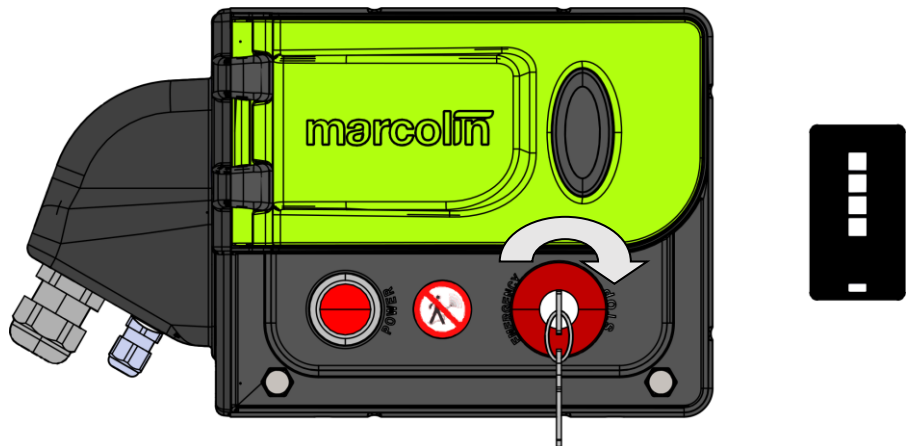


#### CAUTION!

Before restarting the machine, correct the situation causing the event.

For restoring the machine after an emergency situation with pressing on the red mushroom pushbutton no. 6, proceed as follows:

- Insert the unlocking key in the emergency pushbutton of the Control Box
- Turn the key in clockwise direction and pull out the pushbutton.



### 3.8.10 Machine stop in safety conditions

- Release the control pushbutton on the Control Box or on the remote control "TX MARCOLIN".
- Set the machine in EMERGENCY STOP by pressing the mushroom pushbutton stated as no.6 on the Control Box.
- For setting the machine in SAFETY SHUTDOWN (if it is necessary to leave the vehicle unattended), remove the key from the emergency pushbutton (no. 6).

### 3.8.11 Retraction of the MCA tarpaulin to uncover the tipper body

In the starting position of the system the tarpaulin is outstretched on the tipper body. To fold it operate as follows:

- Remove all elastic strings (if provided for the version installed on your vehicle) from the lateral hooking points so that the covering can move freely.
- Insert the key in the emergency pushbutton.
- Turn the key in CLOCKWISE direction to unlock the emergency pushbutton for giving the consent to restart the machine:

**i** When the Control Box is activated, it gives off an acoustic signal.

**On remote control "TX MARCOLIN":** PRESS THE PUSHBUTTON no. 1 (UNCOVERED)

**On Control Box:** TURN THE CONTROL SWITCH towards the left side (UNCOVERED)

- Fold the tarpaulin completely and release the control SWITCH or the control pushbutton. The Control Box is equipped with an automatic motor shut-down when covering reaches the end stop.
- Carry out a quick but attentive control to verify that everything is in good order before starting the tilting movement of the tipper body.

### 3.8.12 How do you interrupt the machine operations?

Follow the process described in paragraph 3.8.7 .

### 3.8.13 How do you stop the machine in case of emergency?

Follow the process described in paragraph 3.8.8 .

### 3.8.14 Machine stop in safety conditions

Follow the process described in paragraph 3.8.10 .

### 3.8.15 In case of empty tipper body

When the tipper body is totally empty, two different behaviours of the operator are required:

- If the tipper should be loaded again on the same place where the unloading happened, the operator is allowed to let the elastic strings removed (if these are part of the equipment). Then, after loading, the operator unfold again the tarpaulin and fastens the elastic strings properly.
- If the vehicle should move on the road with empty tipper body, it is mandatory to fasten the elastic strings to their frontal hooking points to prevent any risks of entanglement for persons or objects while moving on the road.
- Push the emergency pushbutton to set machine in SAFETY SHUTDOWN and remove the key.
- Carry out a quick but attentive control to verify that everything is in good order before moving the vehicle on the road.



### 3.9 What is to be done, when the electric operated driving system does not work?



#### WARNING!

It is forbidden to open the Control Box by removing the bottom cover.  
**Tampering will void the warranty.**

#### 3.9.1 Replacement of the internal fuse in emergency situation

Prior to replace the internal fuse, verify that the external one placed on the positive pole terminal of the battery hasn't blown. Otherwise that is the fuse which needs to be replaced.



#### IMPORTANT INFORMATION FOR USER SAFETY

The replacement of the internal fuse in emergency situation should be executed by the operator only as an exception, advising to contact as a matter of priority, if the emergency situation allows it, the local installer for getting detailed information about the procedure to apply.



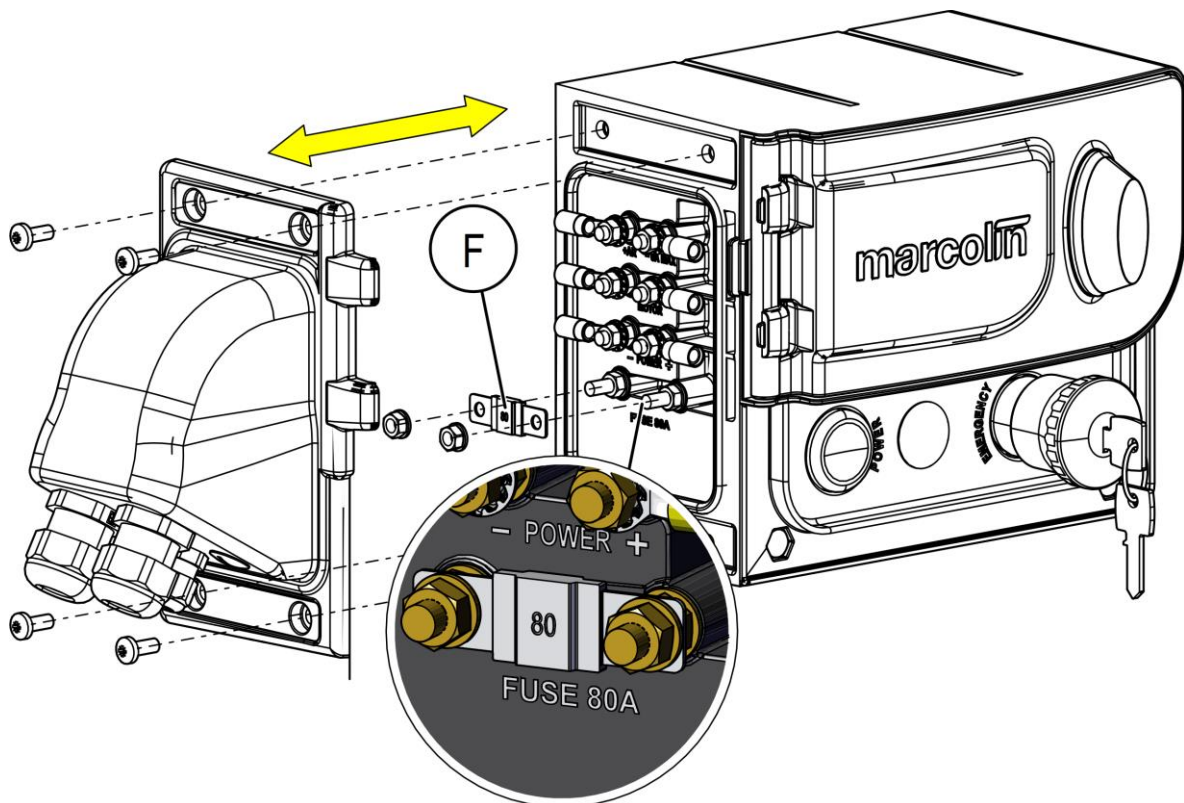
#### CAUTION!

Before opening the cover of the contacts of the Control Unit, disconnect the battery to isolate the unit.



#### WARNING!

This procedure must be absolutely carried out by qualified personnel in order to avoid invalidation of warranty!



1. Using a suitable screwdriver, loosen the screws on the sides of the cable cover on the left side of the Control Box.
2. Remove the cover while taking care not to damage its gasket.
3. Replace the blown fuse (F).
4. Wait at least 8 hours before reclosing the cover, as the gasket needs a sufficient time to recover its shape. When closing the cover, be careful not to damage the gasket.

### 3.9.2 Motor unlocking in emergency case



---

**WARNING!**

Prior to perform this operation push the emergency pushbutton on the Control Box **and remove the key!**

---

**Note:** The improper use can cause damages to the drive shaft, compromising the future efficiency.

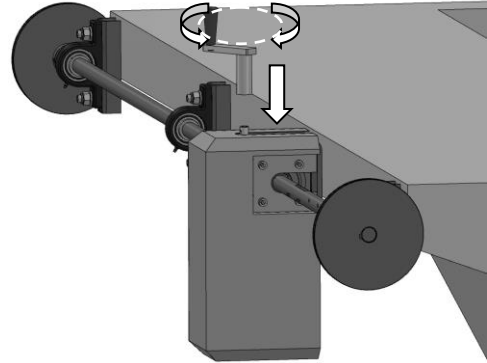
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**Note:** To realise the motor unlocking operation, use the supplied crank handle.

---

The manual emergency driving system is positioned on the top of the driving system motor. For carrying out the necessary operations proceed as follows:

- Take the supplied crank handle;
- Using an homologated and safety device to access the top of the covering, mount on the front side of the tipper body where the driving system motor is situated;
- Insert the crank handle in the shaft positioned on the top of the motor;
- Turn the crank handle in clockwise or in counter-clockwise direction, according to the covering motion that needs to be performed (covering or uncovering of the tipper body).

**WARNING!**

**IT IS FORBIDDEN** to power up the machine by means of the control switches of the Control Box or the radio remote control "TX MARCOLIN" while the crank handle is inserted.

---

## Chapter 4 ACCESSORY EQUIPMENT INSTALLATION

### 4.1 Automatic rear closing system

**Note:** The automatic rear closing system can be provided only together with the double pulling bow.

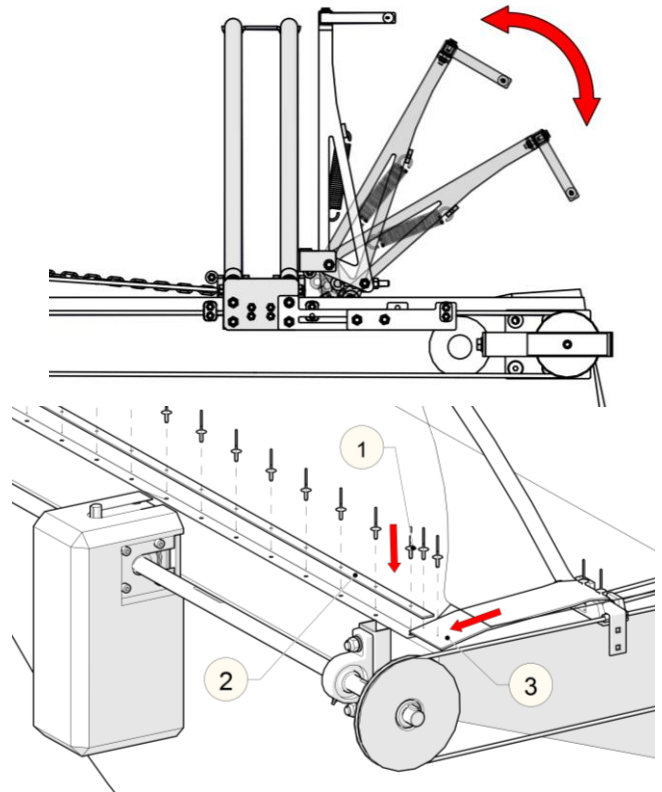
The covering system is available with an innovative rear closing system which avoids that the operator has to position by hand the end part of the tarpaulin when securing the tipper body.

This system requires a close attention during the fastening operation of the tarpaulin on the front side of the tipper body.

Here below the operations to perform:

- Unfold the covering (by hand or electrically, depending on the installed covering version) and cover the tipper body stopping the pulling bow at a distance from the tailgate that corresponds to the length of the closing system when completely closed.
- Tighten up the PE flat strip (3) and the front part of the tarpaulin.
- Fasten the tarpaulin and the PE flat strip (3) on the top of the tipper body, using the specific clamping plate (2) and rivets (1).
- Cut the excess tarpaulin part off.

Now it is possible to set up the automatic rear closing system in order that while closing the tarpaulin manually or electrically, arriving at the end stop, the rear closure comes down automatically.



#### WARNING!

For carrying out certain maintenance work the access to the internal space of the tipper body is required. Make sure that the internal space is empty and clean to avoid any sliding and falling.



Wear suitable protective clothing.

**ALL MAINTENANCE WORK MUST BE PERFORMED BY STATIONARY VEHICLE AND DISCONNECTED EQUIPMENT**

**DO NOT WALK ON THE TARPAULIN!**

Marcolin Covering s.r.l. denies any responsibility.

- Unfold the tarpaulin (manually or electrically depending on the version) and cover the tipper body (fig. 1).

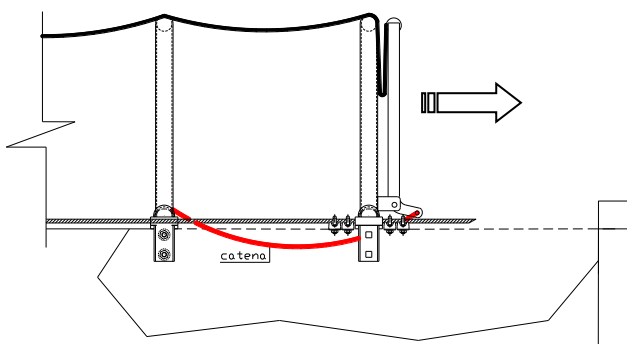


fig. 1

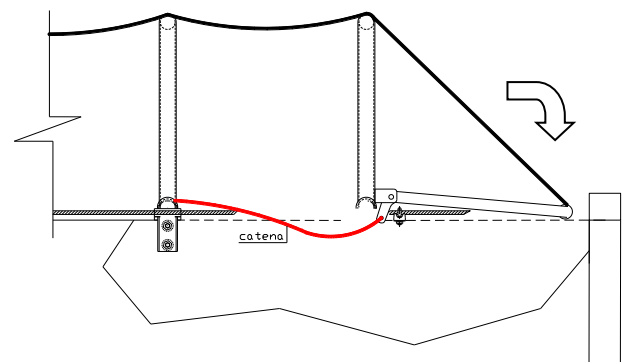


fig. 2

- Go into the internal space of the tipper body for setting up the chains (two n. 10 open-ended wrench are required);
- Push down manually the rear closing system (fig. 2);
- Readjust the chain in order that it is perfectly tightened once the rear closing has come down (fig. 3).

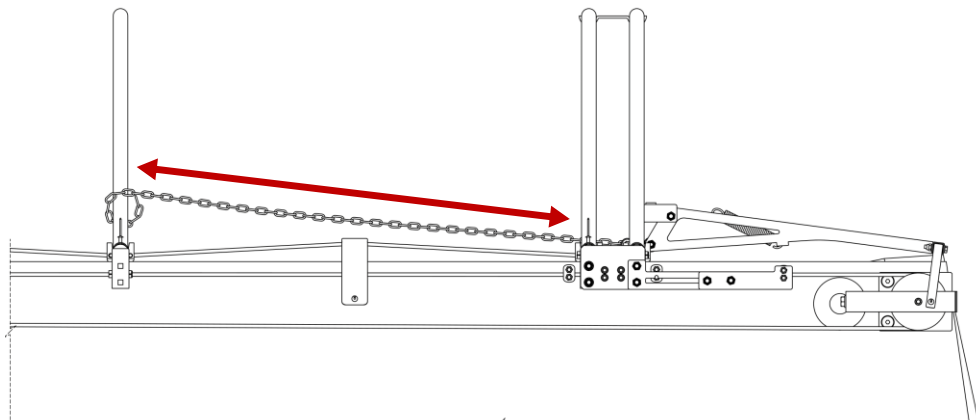


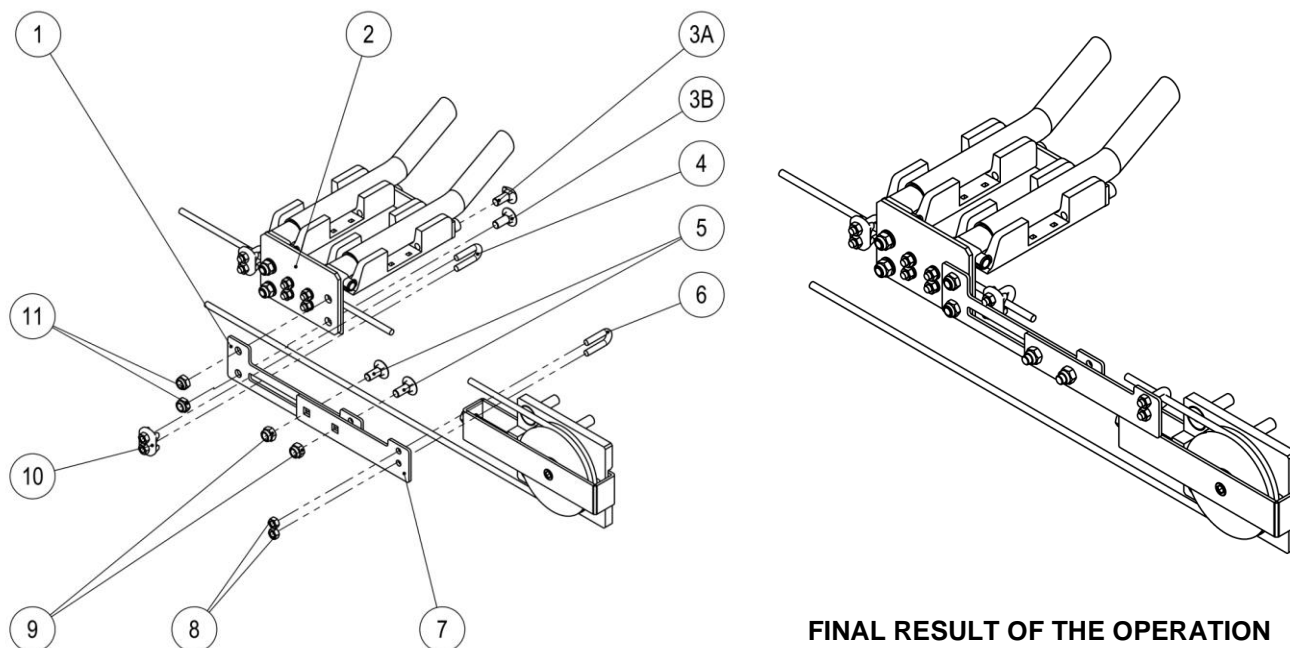
fig. 3

#### 4.1.1 Installation of reinforcing brackets for automatic rear closing in case of lowered cables

In case of installation of the "lower cable system", and **together**, of the automatic rear closing system, it is **absolutely mandatory** to assemble an additional reinforcing bracket kit on both sides of the covering. This system has to be positioned between the rear tensioner plate and the supports of the double pulling bow, and it is made up of:

- Reinforcing support plate and counterplate (with adjustable stroke) for the pulling double support;
- Clamp, screws and self-locking nuts for fastening the plates.

For installing, proceed as follows:



**FINAL RESULT OF THE OPERATION**

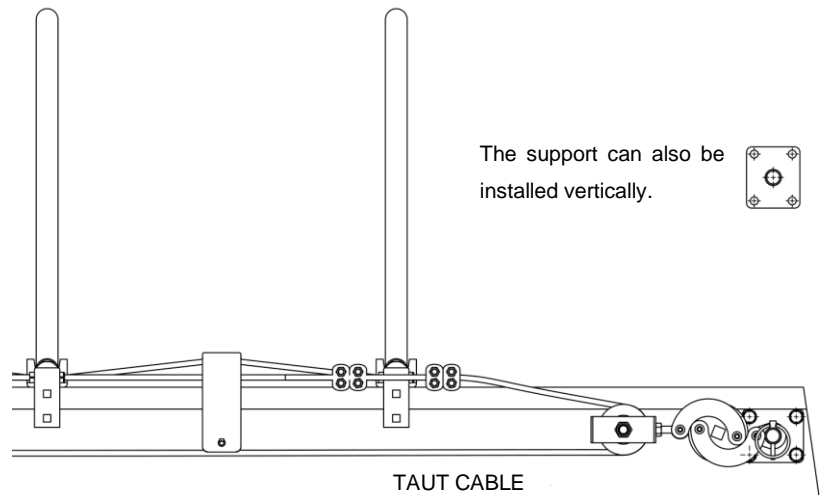
1. Remove the screws and the self-locking nuts from the external bow support of the double pulling bow (2).
2. Position and fasten the support plate (1) on the pulling bow support (2), with the supplied screws (3A and 3B) and self-locking nuts (11).
3. Put one supplied clamp (6) on the inner side of the support counterplate (7) and fasten it with the supplied self-locking nuts (8) to end of the cable which comes back from the rear side of the vehicle.
4. Adjust the desired stroke and fasten the counterplate (7) on the support plate (1) with the supplied screws (5) and self-locking nuts (9), or alternatively, use only the support plate (1).
5. Tighten properly the clamp (6).
6. For greater safety, it is mandatory to fasten one additional clamp (4) on the right of the pulling bow support, with the supplied nuts (10).

## 4.2 Quick cable release system

This system allows to remove the lateral steel cable by setting the upper edge free and making possible to tip sideward or to swing out the board walls. Of course, removing the steel cable following the standard procedure would be infeasible.

For this reason, we developed the cable quick release system. It differs from the standard system in the following items:

- the rear guide pulley;
- the tightening system of the steel cable.



Hereinafter the description of the operations for mounting the accessory equipment which makes the quick release of the steel cables possible

### 4.2.1 Installation of the rear drive pulley

In the quick cable release system the plate with the rear drive pulley is the component which differs from the standard system. For carrying out the installation proceed as follows:

- Pay close attention while choosing the installation position in order to avoid to form any obstacle for mobile elements as the tailgate. The best position for the plate is the one as close as possible to the rear board, but at a sufficient distance for avoiding to be an obstacle for hinges

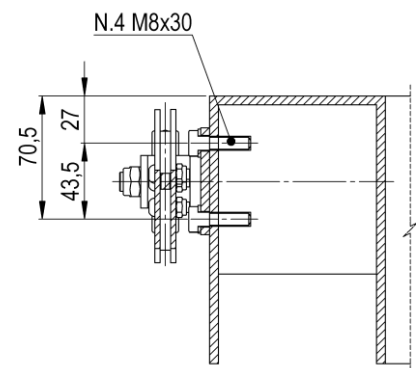
#### WARNING!



A wrong positioning of the tension plate could be cause of damages for the covering or for the tipper body.

In case of any doubt, we recommend to make some movement tests of the rear movable parts to avoid any bad surprise.

- For a proper working of the covering system position the plate the highest possible (accordingly to the board wall type).
- Drill the four holes  $\varnothing 8$ , thread and screw on the plate with the supplied screws.
- Apply Loctite® screwlock liquid.
- If the thickness of the board wall should be less than 6 mm, use through screw with washers and self-locking nuts (not included in the equipment).



**Note:** The proper positioning of the rear drive pulleys is binding for the positioning of the subsequent elements.

- Repeat now the plate fastening operation on the opposite board wall.

#### 4.2.2 Tightening up system

The automatic tightening up system is the main element that allows to release the steel cable.

Carry out the positioning activities of the steel cable described in the respective paragraph 3.4 applying the necessary adjustments:

- Open the release system.
- Fasten the steel cable as described in the paragraph 0and verify that the cable is so tightened that, with open tightener, the cable can be removed from the rear plate and, with closed tightener, the proper motion of the tarpaulin can be performed

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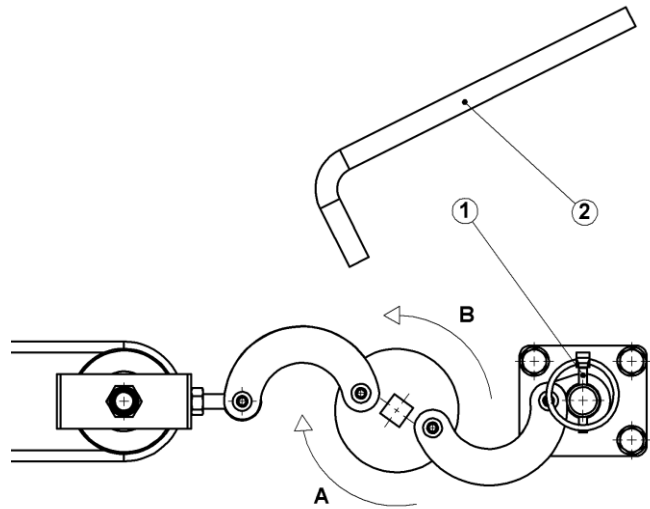
**Note:** Make sure that the bows keep being perpendicular to the board walls in order to avoid any later readjustments.

---

The quick cable release system is equipped with a lever for opening and closing the release system.

To release the cables, operate in this way:

- insert the lever (2) in the central hole of the release device;
- **open the release device** turning the lever in the direction shown in the figure (A);
- remove the locking pin (1) from the pivot of the plate;
- remove now the steel cables pulling out the release device from the plate.



For tightening up again the steel cables repeat the operations in reverse order.



#### CAUTION!

A wrong repositioning of the cables could be cause of damages to the covering or to the tipper body.

Check that the steel cables are still positioned on the grooves of the pulleys.

**VERIFY that the locking pin has been repositioned on the plate.**

---

### 4.3 Automatic “Wheel-Hooking System”

With this lateral closure system the covering hooks automatically into the respective lower supports fastened on the side of the tipper body, with a “ROLLING” coupling.

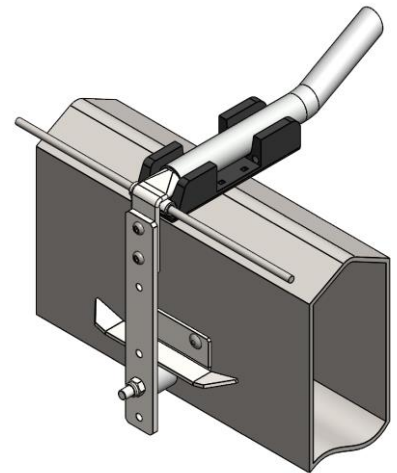
When the tipper body is covered the tarpaulin stops automatically and the vehicle is ready for moving on the road.

For installing it, proceed as follows:

- Move the covering and cover the tipper body entirely.
- Define the fastening points of the tarpaulin.

Generally, for fastening the covering, 2 or 3 wheel hooks, installed at the same heights, are planned to be evenly distributed along the side of the tipper body.

The number of wheel hooks is in any case not binding as it can change according to the length of the tipper body or the customer’s requirements.

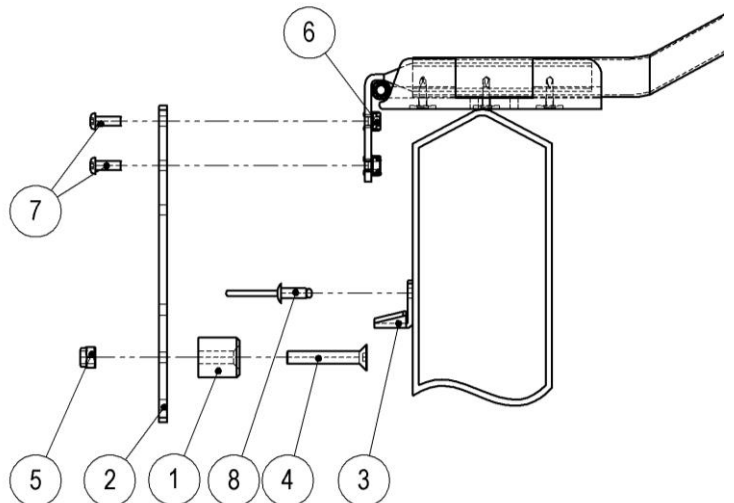



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**Note:** The positioning of the wheel hooks is essential for the proper working of the hooking system.

---

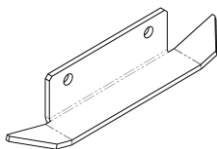
- Fasten the wheel (1) on its support (2) with the supplied screw (4) and self-locking nut (5).
- Lean the wheel hook support (2) against the lateral side of the bow support.
- Fasten the wheel hook support (2) with the supplied screws (7) and nuts (6).




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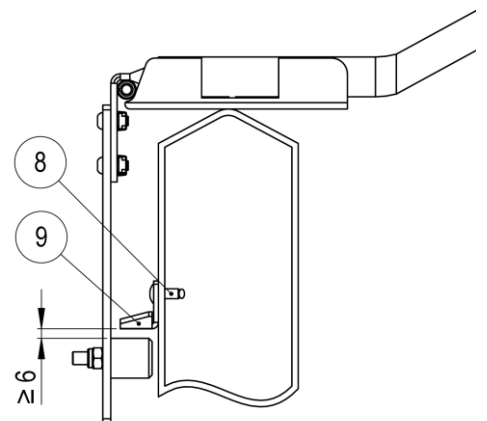
**Note:** Apply medium threadlocker Loxeal 54.03 for the supplied screws.

---



After having defined the wheel hook height, the lower support can be fastened on the tipper body as follows:

- place the support (3) 6 mm up from the wheel hook;
- drill the board wall of the tipper body and fasten the support with the supplied rivets (8).



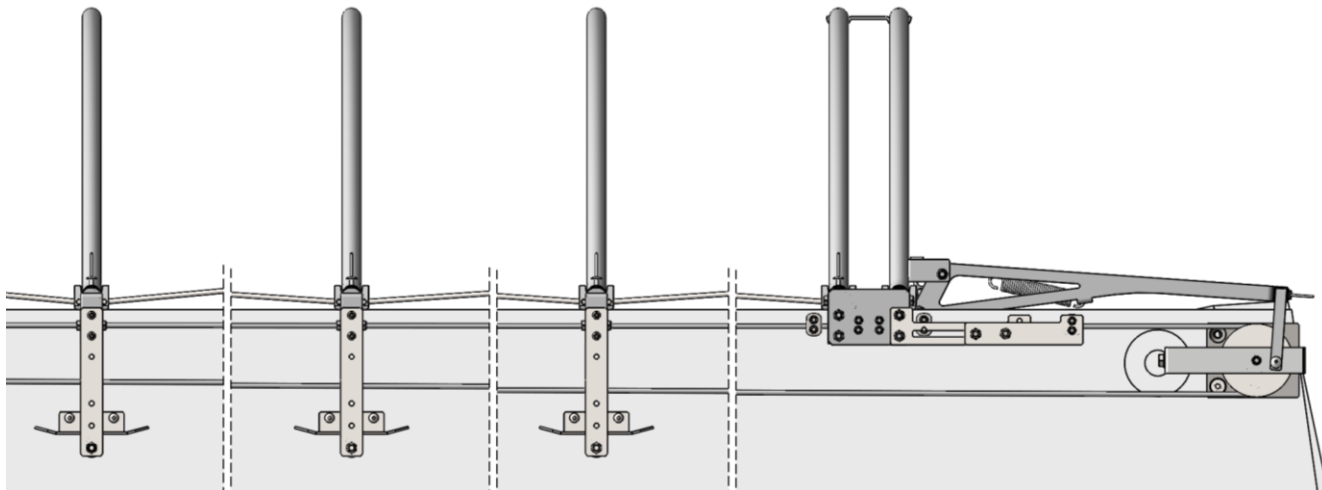
Now the positioning of the remaining wheel hooks can be done.



**WARNING!**

From now on, the even distribution of the wheel hooks and respective supports is the decisive factor for a proper working of the covering system.,

- Proceed installing the remaining wheel hooks as shown in the below figure



- If obstacles interfere with the lower supports, shift the wheel hook upwards on the upper hole and repeat the above described fastening operations.
- In the absence of any obstacles while moving the tarpaulin, fasten the lower support of the respective wheel hook.
- Proceed with fastening the subsequent wheel hooks.



**WARNING!**

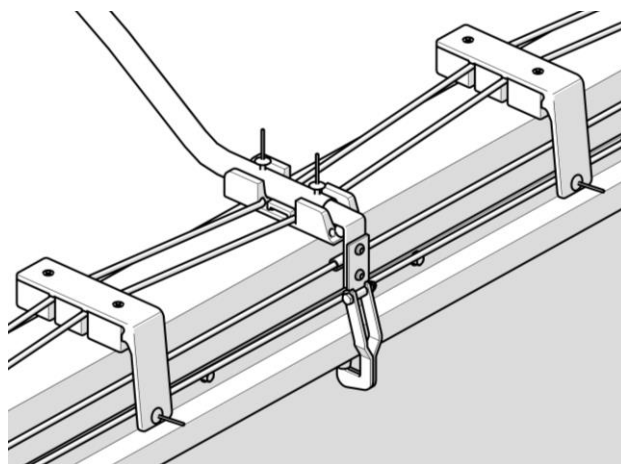
We recommend paying care attention of each wheel hook positioning in order to avoid operating troubles while handling the covering system.

**4.4 Windsafe hooking system**

With this type of lateral hooking system, the covering automatically fastens to the lateral Z-Section installed on the external side walls of the tipper body.

When the covering is completely unfolded, the tarp is locked automatically and the vehicle is ready to travel.

The number of hooks may vary based on the length of the body or the customer's requirements.



**IMPORTANT!**



Coverings fitted with Windsafe Hooking system use a different rear tensioning plate with a 70mm pulley compared with the standard system. As a consequence, the positioning of the rear tensioning plate has to be changed.

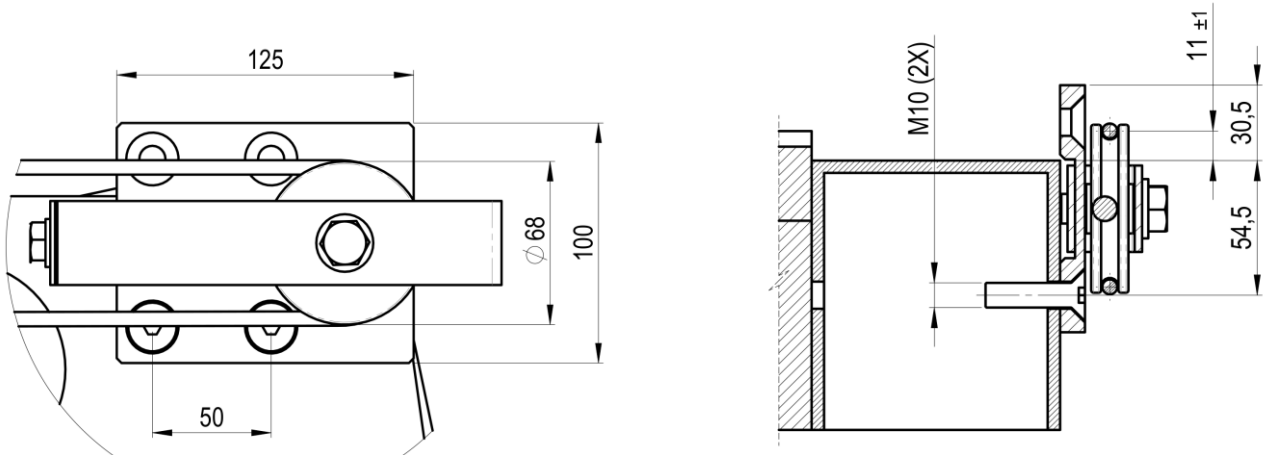
For installation, proceed as described below, depending on "standard" or "lowered" cable option used.



#### 4.4.1 Installing the rear tensioning plate with 70 mm pulley in case of "STANDARD CABLE SYSTEM"

The most appropriate location of the plate is as close as possible to the rear edge, but, at the same time, at such a distance as not to hinder the movement of hinges and similar.

1. For the correct operation of the covering, ensure that the axis of the lower plate fixing hole is located at a distance of 54.5 mm from the upper edge of the body.



2. Proceed with two M10 threaded holes on the side wall, in correspondence with the holes on the plate.
3. Secure the plate using the bevelled head screws M10x40 provided with the kit, ensuring that the tensioning screw is facing the front of the vehicle.



#### WARNING!

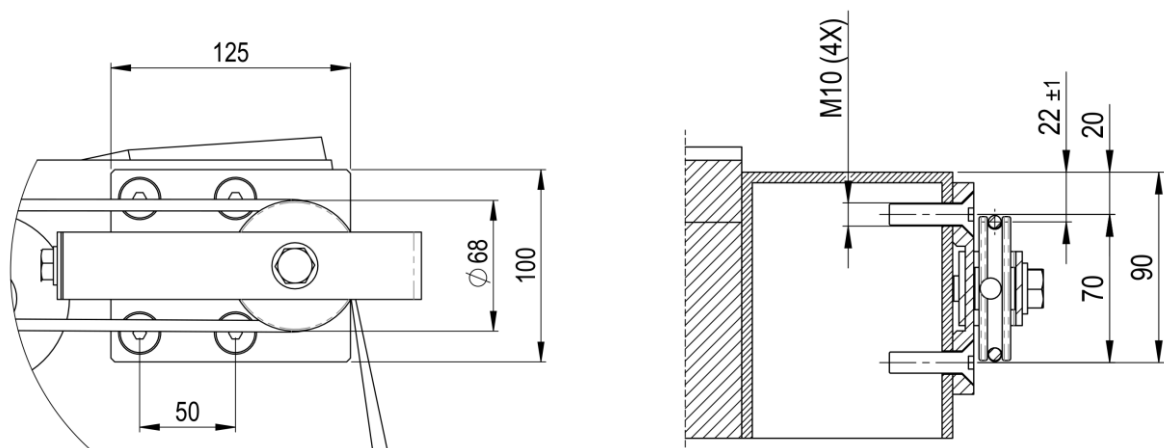
Incorrect placement could cause damage to the covering itself or to the body.  
If in doubt, it is advisable to try out the movement of the rear moving parts to avoid unpleasant surprises.

4. Mount the plate on the opposite side using the same procedure.

#### 4.4.2 Installation of the 70 mm rear plate with "LOWERED CABLE"

The most appropriate location of the plate is as close as possible to the rear edge, but, at the same time, at such a distance as not to hinder the movement of hinges and similar.

1. For the correct operation of the covering, ensure that the axis of the lower plate fixing hole is located at a distance of 90 mm from the upper edge of the body.



2. Proceed with four M10 threaded holes on the side wall, in correspondence with the holes on the plate.
3. Secure the plate using the bevelled head screws M10x40 provided with the kit, ensuring that the tensioning screw is facing the front of the vehicle.



**WARNING!**

Incorrect placement could cause damage to the covering itself or to the body.  
If in doubt, it is advisable to try out the movement of the rear moving parts to avoid unpleasant surprises.

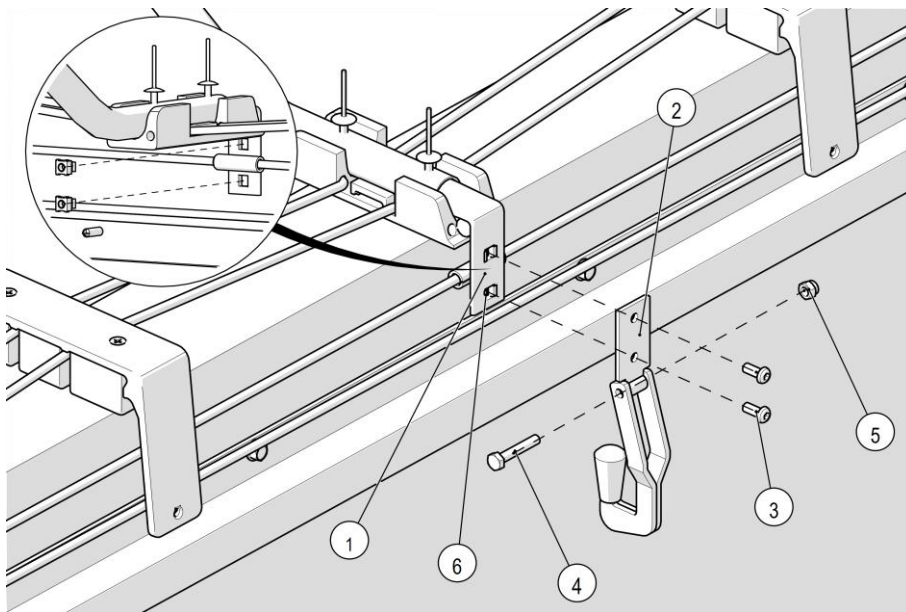
4. Mount the plate on the opposite side using the same procedure.

**Note:** During its lifetime, the structure will be subject to vibrations and stresses. It is therefore recommended to use a medium or high strength thread locking fluid.

**4.4.3 Installing hooks and side guides**

For installation, proceed as described below:

1. Unfold the covering to cover the body entirely.
2. Determine where to fix the hooks.



1. Place the hook support (2) on the side of the support foot bracket (1).
2. Secure the bracket to the support using the round head screws (3) provided.

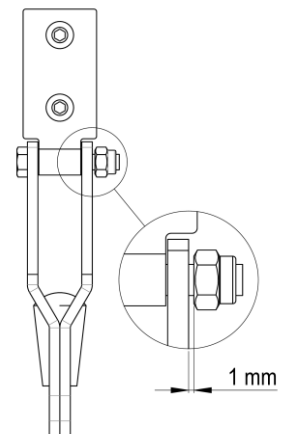
**Note:** Use medium-strength Loxeal 54.03 thread locking fluid on the round head screws (3) provided.

3. Secure the hook to the support using the hex bolt (4) and the self-locking nut (5) provided.



**IMPORTANT!**

Leave a minimum clearance of 1 mm between the nut and the side plate of the hook.



After determining the height of the hooks, you can install the Z-section guides on both sides of the body.

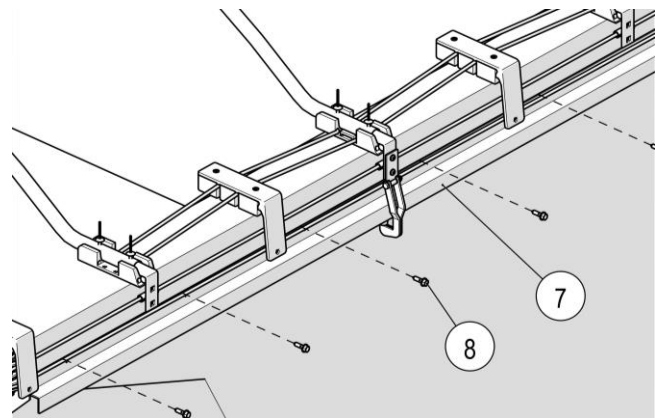
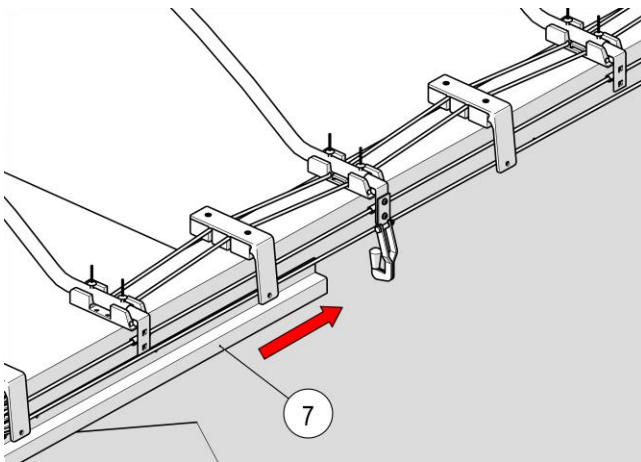
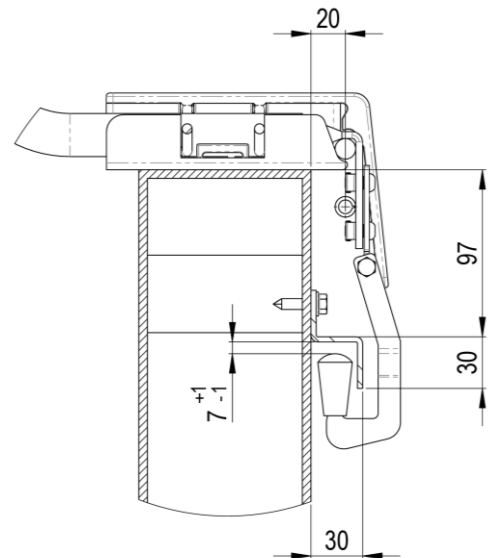


**IMPORTANT!**

The standard size of the Z-section guide is 30x30x3 mm. Different sizes could jeopardize the correct operation of the anchoring system and damage the covering tarpaulin.

- Place the Z-section guide (7) at approx. 6-8 mm from the top of the hook tip, as show in figure. →

**Note:** The installation position of the Z-section guide is the same with both normal and lowered cables.



- drill the side of the body and secure the Z-section guide using the self-tapping (8) screws provided.



**IMPORTANT!**

Screw in the self-tapping screws provided using a suitable torque wrench at torque values not exceeding:  
**6 N·m** for aluminium bodies  
**9 N·m** for steel bodies

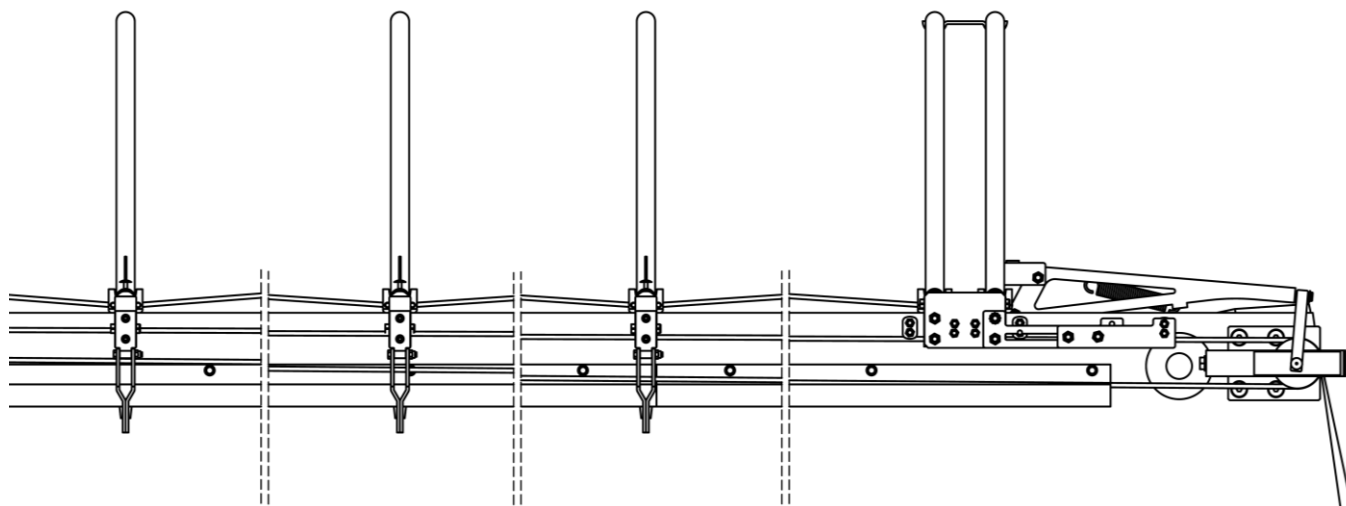
You can now proceed with positioning the other hooks.



**WARNING!**

To ensure the correct operation of the covering, it is important to position the windsafe hooks at regular intervals.

- Proceed with installing the other hooks following the example shown in the figure.



---

**Note:** If you find problems with the smooth sliding of the covering, check the height of the Z-section guide.

---



**WARNING!**

Please pay special attention to the correct positioning of each individual windsafe hooks to prevent later problems with the operation of the system.

---

**Note:** The correct diameter of the rear pulley, the size of the side guide and the location of the hooks are of fundamental importance for the correct operation of the anchoring system. A non-standard size side guide or a rear pulley positioned incorrectly may prevent the correct operation of the system.

---

## Chapter 5 MAINTENANCE WORK OF THE MCA COVERING SYSTEM

The covering system is subject to stress and wear and tear as well as it is exposed to weather agents. For these reasons, the system components can suffer wear and tear and their replacement can become necessary. Hereinafter the description of the operations for the necessary replacements of the main components of the covering system.

### 5.1 Bow replacement

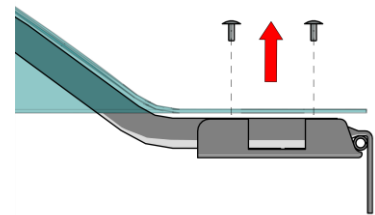
For replacing a bow proceed as follows:



#### WARNING!

In case of electrically operated covering system, before every maintenance work, take care to activate the safety shutdown with the key. As soon as the maintenance or repairing work has been performed remember to remove the key from the emergency mushroom pushbutton.

- Find out the bow that needs to be replaced;
- Remove the rivets positioned on the tarpaulin upper side which fix the same to the bow support;



#### WARNING!

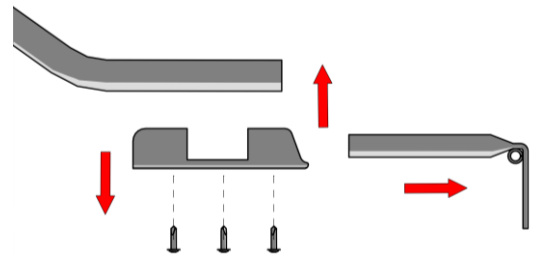
For carrying out certain maintenance work the access to the internal space of the tipper body is required. Make sure that the internal space is empty and clean to avoid any sliding and falling. Wear suitable protective clothing.



#### DO NOT WALK ON THE TARPAULIN!

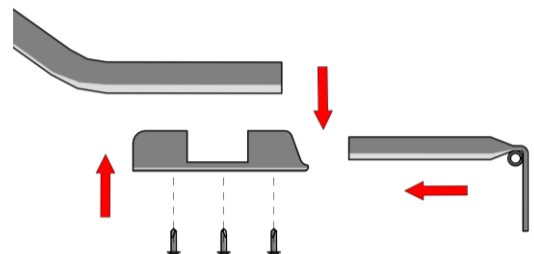
The manufacturer denies any liability.

- Inside the tipper body remove the cable ties which fasten the tarpaulin to the bow support.
- Undo the self-tapping screws which fix the bow to its support;
- Carry out the described operation on both sides;
- Pull out both supports and remove the bow.;



At this point the damaged bow has been removed and the new one can be assembled.

- Insert both supports in the respective end parts of the bow taking care that the passage axis of the cables is the same of the others;
- Fix the supports using the suitable self-tapping screws;
- Inside the tipper body fasten the tarpaulin to the bow by using common cable ties (in case of fire-resisting PVC-tarpaulin or neoprene apply fire-resisting cable ties);

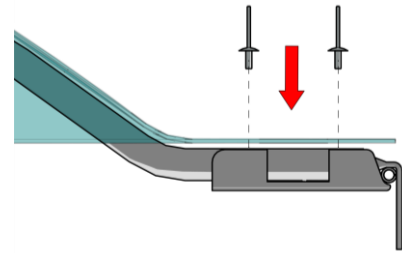


#### CAUTION!

For fire-resisting PVC tarpaulins the application of standard cable ties is not permitted. Demand the proper cable ties for fire-resisting tarpaulins of the manufacturer.

The manufacturer denies any liability.

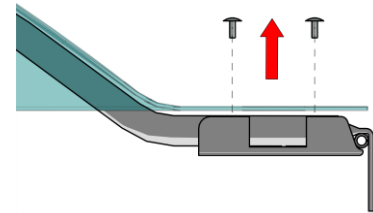
- Reposition the rivets for fixing the tarpaulin and the PE profile to the support.
- After the replacement of the bow the tarpaulin is again ready for use.



**Note:** In case of electrically operated handling system remember to restore the emergency case standby by unlocking using the relative key.

## 5.2 Tarpaulin replacement

- Remove the rivets positioned on the tarpaulin outside which fix the same to the supports of the various bows;



**WARNING!**  
For carrying out certain maintenance work the access to the internal space of the tipper body is required. Make sure that the internal space is empty and clean to avoid any sliding and falling. Wear suitable protective clothing.

**DO NOT WALK ON THE TARPAULIN!**

The manufacturer denies any liability.

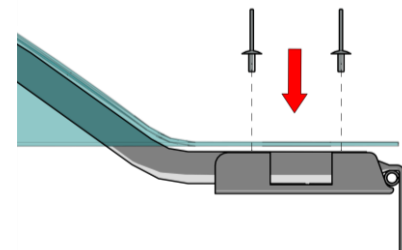
- On the frontside of the tipper body remove the profile which fixes the tarpaulin.
- Inside the tipper body remove the cable ties which fasten the tarpaulin to the bows
- Remove the damaged tarpaulin.
- Proceed to position the new tarpaulin.
- Inside the tipper body fasten the tarpaulin to the various bows by using common cable ties for standard PVC tarpaulins.



**CAUTION!**  
For fire-resisting PVC tarpaulins the application of standard cable ties is not permitted. Demand the proper cable ties for fire-resisting tarpaulins of the manufacturer.

The manufacturer denies any liability.

- Reposition the rivets which hold the tarpaulin in place.
- Tighten up the front part of the tarpaulin.
- Fix the tarpaulin on the top of the tubular frame employing the specific clamping plate and rivets.
- Cut the excess tarpaulin part off.



## 5.3 Steel cables replacement

For replacing the steel cables, see paragraph 3.4.

## 5.4 Extraordinary maintenance work - Operations to be carried out on the customer's covering system

### 5.4.1 General tightening up of the screw connections

After the first 20/30 operating hours and later on every three months, the screw connections have to be checked for excluding any loosening on the machine and for providing the tightening up where needed.



**WARNING!**

**Firmly tighten all bolts and screws of the covering!**

### 5.4.2 Checking of the conservation status of metal structure and bows



**WARNING!**

If damages are ascertained

**NOTIFY THE CUSTOMER THAT THE MACHINE REQUIRES PROBLEM-SOLVING INTERVENTION!**

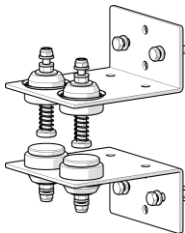
### 5.4.3 Checking of the tarpaulin conservation status

Verify especially the wear and tear status of the most stressed parts like the frontal fastening and the lateral fastening of the bows.

### 5.4.4 Checking of the elastic strings or the automatic safety hooks (only if installed)

Verify the conservation status of the hooking components, if necessary provide for their replacement.

### 5.4.5 Checking of the contact plates (only if installed)



- Verify the conservation status of the contact plates (if installed, only for motorized covering system), and if necessary provide for their cleaning.
- Protect the contacts using synthetic moisture-repellent grease.

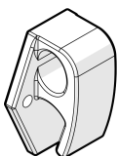
### 5.4.6 Checking of the sliding conditions of the covering system

Verify that the upper edges of the tipper body are free of damage and straight-line (absence of breaches on the locating surface) so that the covering doesn't hit upon any defects while sliding.

### 5.4.7 Thoroughly checking of the pulleys

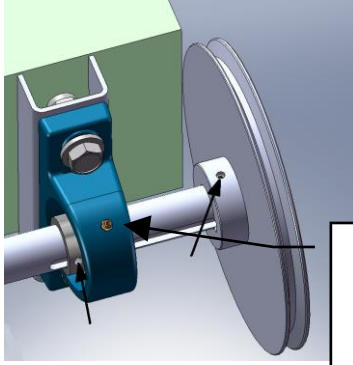
Verify that the various pulleys are free of damage so that the covering can slide properly and regularly without meeting any anomaly.

### 5.4.8 Replacement of broken or damaged locking hooks on the outer board wall

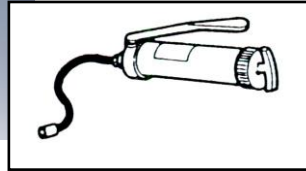


- Replace the hooks at the first sign of wear and tear.

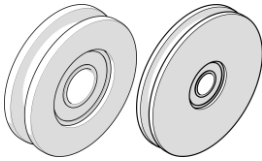
#### 5.4.9 Lubricate and grease thoroughly the covering system



GREASE THE BEARINGS LOCATED ON THE FRONTSIDE OF THE DRIVING SYSTEM



**i** Make use of lithium-based grease.



#### **IMPORTANT!**

WEEKLY CLEAN AND LUBRICATE THE VARIOUS PULLEYS LOCATED ON THE MACHINE, ALSO CABLES, GROOVES AND SLOTS OF THE PULLEYS, BY APPLYING SVITOL® or WD-40 LUBRICATING OIL OR A SIMILAR PRODUCT.

#### 5.4.10 Filling in the machine control register

The manual handed over to the customer includes a chapter referred to as “**Control register**”.

The Control register **MUST ALWAYS BE filled in**, completed with a report and duly signed by the firm that carried out the extraordinary maintenance work on the machine.



#### **WARNING!**

In the event of a legal dispute the lack of the necessary entries in the Control register of the customer's machine could also implicate for you an involvement in civil and criminal objective responsibility.



## 5.5 Troubleshooting table for electrically operated covering system

The following table lists some possible breakdowns or operating troubles.

Type of fault	Possible cause	Possible solution
The motor is not running after pressing a button of the "TX MARCOLIN" radio remote control or turning the control selector of the Control Box	Emergency engaged.	Check that the emergency button is reset.
	Incorrect electrical connections.	Check the electrical connections (positive - negative of the battery).
	The safety fuse has blown.	Check the fuses. One is located in line with the power supply, the other is inside the Control Box.
	The contacts of the motor have become disconnected.	Check that the contacts of the motor are firmly connected.
When you press a button on the "TX MARCOLIN" radio remote control, the red indicator light does not come on.	The battery of the "TX MARCOLIN" radio remote control is flat.	Replace the battery of the "TX MARCOLIN" radio remote control. If the case, reprogram the "TX MARCOLIN" radio remote control following the instructions described at para. 3.8.5
The Control Box operates only with the control selector and not with the "TX MARCOLIN" radio remote control.	The "TX MARCOLIN" radio remote control has lost the correct programming.	Reprogram the "TX MARCOLIN" radio remote control following the instructions described at para. 3.8.5 If, after reprogramming, the radio remote control continues not to work, check the Control Box for faults.
The Control Box appears to be working (you can hear its relay acting) but the motor is not running.	<p>The electrical contacts may be oxidised.</p> <p><b>WARNING!</b></p> <p>Isolate the power supply before cleaning.</p>	<p><b>WARNING!</b></p> <p>Isolate the power supply before cleaning (press the emergency button or disconnect the plug from the tractor).</p> <p>Check that the electrical contacts of the contact plate (between body and frame) are not dirty or oxidised.</p> <p>Check that the electrical contacts of motor and Control Box are not dirty or oxidised.</p> <p>If necessary, clean with a dry cloth and protect with synthetic moisture-repellent grease.</p> <p>Stubborn oxidation may be removed using very fine sandpaper (400 or finer)</p>
	Burnt motor	Replace the motor. To do so, contact Marcolin Technical Support or an authorised service centre.

Type of fault	Possible cause	Possible solution
	<p>A cable terminal or an eyelet of an electrical wire might have broken, or the electrical cables might be broken or damaged.</p>	<p>Check the cable terminals on the cables of the motor and the contact plate are not damaged or broken.</p> <p>Check that the wiring is free from faults.</p> <p>Restore the correct operation of the circuit by replacing any damaged parts at a service centre or an at electrical vehicle repair shop.</p>
<p>When you turn the control selector to "<b>UNCOVERED</b>", the covering covers the body instead of uncovering it.</p>	<p>The polarity of the motor is reversed</p>	<p>Reverse the two wires connecting the contacts <b>3</b> and <b>4</b> of the Control Box.</p> <p style="text-align: center;"><b>WARNING!</b></p> <p>Isolate the Control Box beforehand.</p>

# Chapter 6 ENCLOSURES

## 6.1 Reference diagram for electrical connections

