COVERING SYSTEM FOR TIPPER TRUCKS

Installation Manual

- Translation of the original instructions in Italian language -
Covering with lowered cables

Dear Customer, all the Coverings model Sigillo® 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, which in the standard case is approx. 11 mm over the body upper edge, in this case is lowered by approx. 22 mm under 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 purchased the covering with lowered cables, please follow the advices on the following drawings while fitting the mechanical part on the front side and the tensioning plates or idler pulleys on the rear part.

Sigillo® covering fitting with lowered cables:
# SUMMARY

**Summary** ........................................................................................................................................................................ 4

**Chapter 1**  
**Introduction** .......................................................................................................................................................... 6

1.1 Introduction ......................................................................................................................................................... 6
1.2 Important information if purchasing the “lowered cable system” ................................................................. 6
1.3 Commitments of the machinery deliverer to the end-user ................................................................................. 6
1.3.1 The teaching and training course for the end-user must include the following items: ............................ 6

**Chapter 2**  
**The Sigillo® Covering System** .......................................................................................................................... 8

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

**Chapter 3**  
**Sigillo® Covering System installation** ........................................................................................................... 11

3.1 Fitting the rear tensioning plate ......................................................................................................................... 11
3.1.1 General informations ................................................................................................................................. 11
3.1.2 Fitting the rear tensioning plate in case of “STANDARD CABLE SYSTEM” ............................................. 11
3.1.3 Fitting of the rear tensioning plate in case of “LOWERED CABLE SYSTEM” ............................................ 12
3.2 Driving system installation ................................................................................................................................ 12
3.2.1 Versatility of the covering system ........................................................................................................... 12
3.2.2 Working and preparation of the cab guard with “STANDARD CABLE SYSTEM” ................................... 13
3.2.3 Working and preparation of the cab guard with “LOWERED CABLE SYSTEM” ................................. 14
3.2.4 Fitting the gear housings ....................................................................................................................... 15
3.3 Installation of the steel cables .......................................................................................................................... 16
3.3.1 Run of the left steel cable ......................................................................................................................... 17
3.3.2 Cable fastening .......................................................................................................................................... 19
3.3.3 Running the right steel cable ................................................................................................................... 20
3.3.4 Steel cables tightening up ....................................................................................................................... 22
3.4 Fastening the operating rod (manually-operated covering system) ............................................................. 23
3.5 Tarpaulin fastening .......................................................................................................................................... 24
3.6 Lateral hooking systems for the covering ....................................................................................................... 25
3.6.1 Standard closure with automatic “L” hooking system ........................................................................... 25
3.6.2 Hermetic closure with elastic strings ...................................................................................................... 27
3.6.3 Positioning of the fastening brackets for hermetic tarp .......................................................................... 28
3.7 Electrical wiring for Sigillo® electric Covering System ................................................................................ 29
3.7.1 Motor Control Unit models’ description ............................................................................................... 30
3.7.2 Installation of the electrical components ............................................................................................... 31
3.8 Switch panel of the machine ........................................................................................................................... 33
3.8.1 Description of the Motor Control Unit (MCU) ....................................................................................... 33
3.8.2 Emergency pushbutton key, safety shutdown ...................................................................................... 33
3.8.3 Control switches of the Motor Control Unit for operators .................................................................... 33
3.8.4 Description of the radio control system ............................................................................................... 34
3.8.5 Unfold the Sigillo® covering for covering the tipper body ................................................................. 34
3.8.6 Interruption of machine operations ...................................................................................................... 34
3.8.7 How do you stop the machine in case of emergency? .......................................................................... 35
3.8.8 Restoring of standard operative conditions ........................................................................................ 35
3.8.9 Machine stop in safety conditions ........................................................................................................ 35
3.8.10 Folding of the Sigillo® tarpaulin to uncover the tipper body ............................................................ 35
3.8.11 How do I interrupt the machine operations? ...................................................................................... 36
3.8.12 How do I stop the machine in case of emergency? ............................................................................ 36
3.8.13 Machine stop in safety conditions ...................................................................................................... 36
3.8.14 In case of empty tipper body ............................................................................................................. 36
3.9 What is to be done, when the electric-operated system does not work? ..................................................... 37
3.9.1 Replacement of the internal fuse in emergency situation .................................................................... 37
3.9.2 Motor unlocking in emergency situation ........................................................................................... 38

**Chapter 4**  
**Accessory equipment installation** .................................................................................................................... 39

4.1 Automatic rear closing system ......................................................................................................................... 39
4.1.1 Installation of reinforcing brackets for automatic rear closing in case of lowered cables ....................... 40
4.2 Cable quick release system ............................................................................................................................. 41
4.2.1 Installation of the rear guide pulley ...................................................................................................................... 41
4.2.2 Tightening up system ........................................................................................................................................... 42
4.3 Automatic “Roller-Hooking System” .......................................................................................................................... 43
4.4 Windsafe hooking system ........................................................................................................................................... 45
  4.4.1 Installing the rear tensioning plate with pulley Ø70 in case of “STANDARD CABLE SYSTEM” ........................................ 45
  4.4.2 Installing the rear tensioning plate with pulley Ø70 in case of “LOWERED CABLE SYSTEM” ................................................ 46
  4.4.3 Installing the Windsafe hooks and the lateral Z-Section ........................................................................................ 47

Chapter 5  Maintenance work of the Sigillo® Covering System ................................................................. 49
  5.1 Bow replacement .......................................................................................................................................... 49
  5.2 Tarpaulin replacement .................................................................................................................................. 50
  5.3 Steel cables replacement ................................................................................................................................... 50
  5.4 Extraordinary maintenance work - Operations to be carried out on the customer’s covering system ........ 51
    5.4.1 General tightening up of the screw connections .......................................................................................... 51
    5.4.2 Checking of the conservation status of metal structure and bows ............................................................... 51
    5.4.3 Checking of the tarpaulin conservation status ............................................................................................. 51
    5.4.4 Checking of the elastic strings or the automatic safety hooks (only if installed) ................................................. 51
    5.4.5 Checking of the contact plates (only if installed) ........................................................................................... 51
    5.4.6 Checking of the sliding conditions of the covering system ............................................................................ 51
    5.4.7 Thoroughly checking of the pulleys ................................................................................................................. 51
    5.4.8 Replacement of broken or damaged fastening hooks on the outer board wall (only if installed) ..................... 52
    5.4.9 Lubricate and grease thoroughly the covering system ...................................................................................... 52
    5.4.10 Filling in the machine control register ........................................................................................................ 52
  5.5 Troubleshooting table for electrically operated covering system ................................................................. 53

Chapter 6  Enclosures .............................................................................................................................................. 54
  6.1 Reference diagram for electrical connections ....................................................................................................... 54
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 and patented the Sigillo® Covering System, 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 Sigillo® Covering System through the planned periodic maintenance.

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

1.2 Important information if purchasing the “lowered cable system”

The Sigillo® Covering is also available 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, which in the standard case is approx. 11 mm over the body upper edge, in this case is lowered by approx. 22 mm under 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 purchased the covering system with lowered cables, while fitting the mechanical part on the front side and the tensioning plates or idler pulleys on the rear part, **the height indications** mentioned in this installation manual **have to be increased by 33 mm**.

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 the user. For this reason, it is relevant that the selling operation is carried out with mutual 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 your own discretion) to pass by the machine operator.
  - 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 EC Declaration of Conformity.
- Handing over the own EC Declaration of Conformity 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 user manual 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 working 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 authorised 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:
  o carry out a teaching course to the new machine owner;
  o 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 SIGILLO® COVERING SYSTEM

2.1 Covering system components

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 of the covering system.

1. Front covering driving system (hand or electric operated).
2. Rear cable tensioning system.
3. Tarpaulin of variable size according to tipper body length;
4. Covering fastening system (depending on the model, it could be supplied with a hermetic closure with elastic strings with hooks).
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 provided for by law in force.

Whoever modifies the machine assumes the obligation to issue:

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

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 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:

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 edges 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.

Another solution is fastening the front gear housings at the level of the side edge and, to prevent the front steel cables from hitting the cylinder or the spare tyre bracket, creating deflections with pulleys (pic. C), so that the steel cable passes very close to the frontal sideboard.
Chapter 3  SIGILLO® COVERING SYSTEM INSTALLATION

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

3.1 Fitting the rear tensioning plate

3.1.1 General informations

The following description of the rear tensioning plate installation concerns the standard covering systems; in case of:

- covering systems with cable’s quick-release system for three-sided tipper
- covering systems with windsafe hooking system

please follow the described installation process for the specific case (paragraph 4.2 and paragraph 4.4).

3.1.2 Fitting 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 create 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.

![Diagram of rear tensioning plate installation](image)

**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.

1. For a proper working of the covering system, the axis of the lower fastening holes of the plate has to be positioned at a distance of 70 mm from the upper edge of the tipper body.
2. Drill two M10 threaded holes on the lateral board wall, aligning them with the plate holes.
3. Fasten the plate with the countersunk head screws M10x40 supplied with the system, paying attention that the tensioning 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 elements.
3.1.3 Fitting of the rear tensioning plate in case of “LOWERED CABLE SYSTEM”

For installing the LOWERED CABLE covering system, the height indication of 70 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 mm.

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 manually-operated or electric-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 manually-operated covering system.

In this manual, reference will be made to standard assembly of the covering system.

For installing on the opposite side, carry out the mirror-imaged activities on the opposite side.
3.2.2 Working and preparation of the cab guard with “STANDARD CABLE SYSTEM”

The type of work which has to be done on the cab guard is the same for both versions available for the covering system (manual or electric version).

Firstly, check the taper of the body:

1. Measure the centre distance of the pulleys located on the rear tensioning plates (L).
2. Set the gear housings (RH and LH) in place on the cab guard, taking care to create parallelism with the rear pulleys.

After having defined the position of the gear housings, it is possible to work on the cab guard to install the covering system.

3. On the left side (in relation to the direction of travel), cut all along at the height of the cab guard for placing the gear housing with the driving system.

4. Drill (Ø 11) the seats for fastening, according to the following diagram dimensions.

COMMAND LEFT GEAR HOUSING
*Left Side (in relation to the direction of travel)*

RIGHT GEAR HOUSING
*Right Side (in relation to the direction of travel)*

**CAUTION!**
FOR THE MANUALLY-OPERATED VERSION, DRILL ONLY 4 HOLES Ø11!
5. On the right side (in relation to the direction of travel), drill (Ø 11) the seats for fastening, according to the given dimensions.

At this point the cab guard is ready to house the various parts, according to that given below.

### 3.2.3 Working and preparation of the cab guard with “LOWERED CABLE SYSTEM”

Add 33 mm only to the positioning height, from 40 mm to 73 mm.

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**COMMAND LEFT GEAR HOUSING**
*Left Side (in relation to the direction of travel)*

**RIGHT GEAR HOUSING**
*Right Side (in relation to the direction of travel)*

---
3.2.4 Fitting the gear housings

The first element to be set on the front cab guard is the LH driving gear housing, which has to be installed on the left (with respect to the direction of travel):

1. Fit the gear housing according to the holes previously made.

2. Make sure there is a 25mm space from the upper edge of cab guard to the upper edge of the gear housing, and that this space is aligned or shifted, according to the needs, with respect to the side edge.

**Electric version:** position the gear housing so that the motor is housed under the cab guard of the vehicle.

**Manually-operated version:** place the gear housing with the inspection window towards the vehicle cab.

3. Fasten the element to the cab guard with the two self-locking screws (M10x40) and nuts.

At this point the left gear housing is fastened and now the right gear housing can be fastened.

4. Point the gear housing with the pulleys placed towards the outside of the tipper body.

5. Make sure there is a 25mm space between the upper edge of cab guard and the upper edge of the gear housing.

6. Fasten the element to the cab guard with the two self-locking screws (M10x40) and nuts.
3.3 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, it is only necessary to pull out one by one the iron rods that keeps together the bows and to pull the steel cable through the holes of the bow supports.

The main component that 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 bushing through which the steel cable runs.

**WARNING!**
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 manually-operated version, and the lesser the motor effort in case of electrical-operated version.

Loosing the rear tensioning plates:

1. Loose the central screw that fasten the pulley (1).
2. Unscrew the screw that adjust the run of the pulley slide part (2).
3. Shift the pulley towards the front part.
4. Remove the cover from the front driving left gear housing.
Proceed with the positioning of the covering:

5. Remove any packing.

6. Ensure the correct orientation of the tarpaulin (front – rear).

7. 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.

### 3.3.1 Run of the left steel cable

The explanation begins with instructions for positioning the steel cable placed on the left (with respect to the direction of travel), in correspondence to the left driving gear housing.

**Note:** The position of the cable is the same for manual and electric versions. If the covering is provided with the cable quick release device, follow the procedure described in paragraph 4.2.

Follow scrupulously the instructions below for positioning the steel cable.

**Note:** In the absence of our directive specifications, the cable must be passed through the outermost hole.

For convenience, insert the whole length of the cable in the various elements, operating as follows:

Positioning the lower steel cable end:

1. Put the head of the metallic cable onto the back of the tipper body.

2. Wrap the cable on the groove of the rear pulley.

3. Come back with the end of the steel cable towards the front of the tipper body.

4. Insert the head of the cable coming from the back on the main pulley (1) in correspondence with the outermost groove.
5. Pass the cable on the lower pulley (3), make it turn on the main pulley (1) and pass the cable through the upper pulley (2).

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

1) BOW
2) BOW SUPPORT WITH SLIDING PART

Using the head of the upper cable, proceed as follows:

6. Insert the steel cable onto all the bows through the hole on the bow support;
7. Last of all, insert the head of the cable into the hole of the first pulling bow;
8. Make sure that there is at least 100-150 mm left of the back end of the cable for further fastening and possible corrections.

**Note:** Pay attention that the bow remains the most perpendicular as possible to the edges of the tipper body, in order to avoid any further corrections.
3.3.2 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 supplied 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) and (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 cable ends (1-7).

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.
It is mandatory to fasten the cables using n. 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 fastening 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 fastened the steel cable, cut the excess length off but leaving about 100-150 mm, that can be used for any further adjustments.

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

3.3.3 Running the right steel cable

Even in this case, it is important to begin by the frontal part of the body, passing the cable through the driving system:

1. Insert the two ends of the cable from the external part towards the inside of the gear housing; while inserting the steel cable, make sure that the lower end of the cable (which will become the upper end after crossing), is sufficiently long to reach the pulling bow.

2. Wrap the steel cable around the main pulley (1) making its two ends pass over and under, in correspondence with the innermost groove.

3. Insert the two ends of the steel cable into the gear housing.

4. Insert the lower end into the outer upper pulley (2).

5. Insert the upper end onto the outer lower pulley (3).
6. When carrying out this operation, make sure that the cable forms a cross (4) necessary for the cover to work properly.

Using the end of the upper cable, proceed as shown:

7. Insert the steel cable through all the bows by inserting it in the holes of the bows supports.

8. Last of all, insert the end of the cable into the bow support of the pulling bow.

Now proceed with positioning the lower end of the steel cable:

9. Pull the lower end onto the rear part of the body.

10. Wrap the steel cable on the rear pulley.

11. Bring the end of the cable back to the pulling bow support.

12. Proceed with fastening the steel cable to the pulling bow support as previously explained.
3.3.4 Steel cables tightening up

After positioning the steel cables, tighten them up in order to make possible the proper sliding of the covering. To make this operation, it is necessary to work on the rear tensioning plates/pulleys, which have been projected and manufactured with the purpose of adjusting and regulating the steel cable tension.

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

1. Use a 14 N m torque wrench to tighten the screw placed on the front side (2) of the rear pulley.

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

2. When the required tension is achieved, block the rear pulley tightening the central screw (1).

3. Repeat the operation on the opposite rear pulley.

---

**WARNING!**

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

**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.

4. Reposition the metal cover on the left driving gear housing.

5. Position the connecting cover plate of the left and right gear housings.
3.4 Fastening the operating rod (manually-operated covering system)

When installing the manually-operated covering system, after having installed the driving system, it is necessary to assemble and mount the operating rod.

For fastening the operating rod use the following items:

1. Insert the operating rod (1) into the extension piece (2) and drill 2 holes for fastening it at the desired height.

2. Fasten 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 thread locker Loctite® liquid.

3. Place and fasten the operating rod on the pivot (5) situated on the left driving gear housing, with the supplied screws (3) and self-locking nuts (4).

Fasten the holder for the rod:

4. Find a suitable location for the rod in order that it does not become an obstacle.

5. Drill the tipper body to fit the holder’s holes.

6. Fasten the holder (7) with proper supplied rivets (9).

7. Fasten the safety chain (11) of the forelock (8) with proper supplied rivet (10).
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, to 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.

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

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

2. Tighten and fasten the PE flat strip (2) on the lateral fastening screws (1) of the front pulleys Ø 60.

3. Tighten up the front part of the tarpaulin.

4. Fasten the tarpaulin on the top of the gear housing, using the specific clamping plate (3) and rivets (4).

5. Cut off the excess part of the tarpaulin.
3.6 Lateral hooking systems 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 system

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 is automatically blocked and the vehicle is ready for moving on the road.

For installing, proceed as follows:

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

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.

3. Lean the safety hook against the lateral side of the bow support (1).
4. 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:

5. Place the U-bolt centrally to the safety hook;

6. 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.
7. Proceed installing the remaining safety hooks as shown in the figure below:

**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.

![Diagram of safety hooks installation](image)

8. In the absence of any obstacles while moving the tarpaulin, fasten the U-clamp of the respective hook.

9. Proceed with fastening the subsequent hooks.

**WARNING!**

We recommend taking care of each U-clamp terminal positioning 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:

1. Move out the tarpaulin and cover entirely the tipper body.

2. Fasten the specific hooks using the supplied rivets on the hooking points in the bottom part of the tipper body.

3. Make sure that the fastening 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.
3.6.3 Positioning of the fastening brackets for hermetic tarp

With this lateral closure system, the tarpaulin comes down a few centimetres from the upper edge of the tipper body.

To install the front mounting brackets for the tarpaulin hermetic closure system, proceed as follows:

1. Insert the brackets into the right and left gear housing, positioning a washer under the bracket (3).

2. Fasten the brackets with the upper self-locking nut (1) and the washer (2).

After having fastened all the covering components, fasten the tarp and the head:

3. Remove the self-locking nut (1) and the washer (2) on the upper part of the bracket.

4. Make a 10÷10,5 diam. hole and insert the tarp with PE flat strip (4).

5. Insert the washer (2) and the self-locking nut (1) removed before and tighten them up.

6. Finally fasten the tarpaulin on the side with the supplied wide-head rivet (5).

Final output of the operation ➔
3.7 Electrical wiring for Sigillo® electric Covering System

The application of the electric-operated 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, following material:

1. Motor Control Unit (X) → see paragraph 3.7.1
2. Radio remote control
3. Set of electrical contacts
4. Electrical wiring

_identification plaque: right side, downward →_

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

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

<table>
<thead>
<tr>
<th>Length</th>
<th>Cable End 1</th>
<th>Reference on diagram (paragraph 6.1)</th>
<th>Cable End 2</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.50 m</td>
<td>Open ended for cutting to length to connect to battery</td>
<td>A</td>
<td>80 A female plug</td>
<td>Connection from the tractor battery to the tipper trailer connection zone</td>
</tr>
<tr>
<td>2.50 m</td>
<td>80 A male plug</td>
<td>B</td>
<td>Open ended for cutting to length to connect to Motor Control Unit (1 – 2)</td>
<td>Connection from the tipper trailer connection zone to the Motor Control Unit power supply</td>
</tr>
<tr>
<td>2.50 m</td>
<td>Connection to Motor Control Unit terminals (3 – 4)</td>
<td>C</td>
<td>Open ended for cutting to length to connect to contact plate</td>
<td>Connection from Motor Control Unit (motor output) to contact plate</td>
</tr>
<tr>
<td>4.50 m</td>
<td>Connection to contact plate terminals</td>
<td>D</td>
<td>Open ended for cutting to length, for connection to the motor</td>
<td>Connection from contact plate to motor</td>
</tr>
</tbody>
</table>

**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 the use of different cables than those supplied should be necessary, consult previously the manufacturer.
### 3.7.1 Motor Control Unit models' description

The following table summarizes the various types of the Motor Control Unit (X), with (X) = 1, or 2, or 3, depending on model.

<table>
<thead>
<tr>
<th>FAMILY PRODUCT</th>
<th>DESCRIPTION</th>
<th>DIFFERENCES FROM STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTOR CONTROL UNIT 1</td>
<td>STANDARD model, in this version the mode of functioning provides a control dial with spring-return switch for withdrawing (&quot;UNCOVERED&quot; switch) and deploying (&quot;COVERED&quot; switch) the tarpaulin. An emergency stop pushbutton with safety lock is also installed. A timing circuit for tarp moving backwards is also installed, provided for tail lift tipper bodies.</td>
<td>(none)</td>
</tr>
<tr>
<td>MOTOR CONTROL UNIT 2</td>
<td>This model provides all the functionalities of the standard model, with the exception of the tarp partially moving backwards function provided for hydraulic tailgate tipper bodies.</td>
<td>In this version, the 4P3.00605 TIMING CIRCUIT FOR TARP MOVING BACKWARDS has been removed. The removal of this component does not change the functional structure of the motor control unit and the electromagnetic compatibility then.</td>
</tr>
<tr>
<td>MOTOR CONTROL UNIT 3</td>
<td>The difference between this motor control unit and the standard model is that the remote control has 4 channels instead of the standard two. The first two channels are devoted to the motor command (as the standard one), while the following 2 are used as auxiliary controls on the truck (with the verification of the electromagnetic compatibility carried out by the car manufacturer).</td>
<td>In this version, the 4P3.00101 (2 CHANNEL MINI TRANSMITTER) has been changed in the 4P3.00393 (4 CHANNEL MINI TRANSMITTER).</td>
</tr>
</tbody>
</table>
3.7.2 Installation of the electrical components

Hereafter the required operations for installing the electrical components:

1. Using proper hooking elements, fasten the Motor Control Unit on the chassis of the tipper body.
2. Fasten one of the two contact plates on the front part of the tipper body.
3. Fasten the other contact plate on the chassis.

**IMPORTANT!**

The fastening of the contact plates has to be done 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 Motor Control Unit can be positioned anywhere on the tipper-trailer chassis, provided that it is fastened vertically (as shown in the following drawing).

**IMPORTANT!**

The Motor Control Unit 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.

⚠️ 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.

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Current supply + 24 V</strong></td>
</tr>
<tr>
<td>2</td>
<td><strong>Current supply − 24 V</strong></td>
</tr>
<tr>
<td>3-4</td>
<td><strong>Motor connection</strong>&lt;br&gt;N.B. check the rotation direction of the engine with the control dial in pos. 9. If by turning the control dial to &quot;UNCOVERED&quot;, the tarpaulin covers the truck instead of discovering it, reverse the polarity on the contacts</td>
</tr>
<tr>
<td>5</td>
<td><strong>INPUT</strong>&lt;br&gt;−&lt;br&gt;moving back card control</td>
</tr>
<tr>
<td>6</td>
<td><strong>OUTPUT</strong>&lt;br&gt;−&lt;br&gt;moto-vibrator control&lt;br&gt;(MAX 5 A)</td>
</tr>
<tr>
<td>7</td>
<td><strong>Trimmer for current threshold intervention regulation</strong>&lt;br&gt;(engine)</td>
</tr>
<tr>
<td>8</td>
<td><strong>Radio control programming button</strong></td>
</tr>
<tr>
<td>9</td>
<td><strong>Control dial with spring-return switch</strong>&lt;br&gt;(UNCOVERED / COVERED)</td>
</tr>
</tbody>
</table>

1. By use of the supplied cables, connect the battery to the power supplying terminals of the Motor Control Unit.
2. Connect a system safety fuse (70 A) (not supplied) to the positive pole of the power supply cable.
3. Then connect the Motor Control Unit output (3-4 terminals) to the stationary contact plate;
4. Connect the motor to the movable contact plate.

**Note:** For a better understanding, consult the wiring diagram shown in paragraph 6.1.

**WARNING!**

During connection, do not invert power supply polarities!

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

**IMPORTANT!**

The connection of the motor polarities determines the correspondence between the switching command and the related function.

Check the rotation direction of the motor with the control dial. If by turning the control dial to "UNCOVERED", the tarpaulin covers the truck instead of discovering it, reverse the polarity on the contacts.
3.8 Switch panel of the machine

3.8.1 Description of the Motor Control Unit (MCU)

The Motor Control Unit consists of:

1. Control unit 24V power supply terminals and Motor terminals
2. Fuses cover
3. Control dial with spring-return switch (UNCOVERED / COVERED)
4. Emergency mushroom pushbutton with safety lock
5. Remote control with 2 or 4 channels (according to the model of the Motor Control Unit)
6. Identification plaque

WARNING!
It is absolutely forbidden to use the Motor Control Unit 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 unauthorised persons 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 Motor Control Unit for operators

3. Control dial UNCOVERED / COVERED
4. Emergency mushroom pushbutton with safety lock
3.8.4 Description of the radio control system

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

Below the available switches:
1. UNCOVERED switch.
2. COVERED switch.

ORDINANCE!
The remote control **MUST BE KEPT AND USED EXCLUSIVELY by the operator.**

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

Before using the pocket remote control, the operator must verify the absence of any unauthorised personnel close to the Motor Control Unit.

WARNING!
It is absolutely forbidden to use the remote control when the vehicle is moving. The constructor declines any responsibility.

3.8.5 Unfold the Sigillo® 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:

1. Check that the upper edges of the tipper body are free from any obstacle.
2. Remove all elastic strings (if provided for the version installed on your vehicle) from the front hooks so that the covering can move freely.
3. Insert the key in the emergency pushbutton.
4. Turn the key in CLOCKWISE direction to unlock the emergency pushbutton for giving the consent to start the machine:
   - **When the Motor Control Unit is activated, it gives off an acoustic signal.**
   - **On remote control:** PRESS THE PUSHBUTTON no. 2 (COVERED)
   - **On Motor Control Unit:** ROTATE THE CONTROL DIAL no. 3 TOWARDS RIGHT (COVERED)
5. Unfold the tarpaulin completely and release the control dial. The Motor Control Unit is equipped with an automatic motor shut-down system when covering reaches the end stop.
6. Close the covering on the rear side (in case of automatic rear closing system this operation takes place automatically).
7. 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).
8. Press the emergency mushroom pushbutton and remove the key.
9. 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.

3.8.6 Interruption of machine operations

For stopping the covering moving, release simply the control pushbutton on the Motor Control Unit or on the remote control.
3.8.7 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. 4 on the Motor Control Unit.

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

3.8.8 Restoring of standard operative conditions

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

For restoring the machine after an emergency situation and after having pressed on the red mushroom pushbutton no. 4, proceed as follows:

1. Insert the unlocking key in the emergency pushbutton of the Motor Control Unit
2. Turn the key in clockwise direction and pull out the pushbutton.

3.8.9 Machine stop in safety conditions

1. Release the control pushbutton on the Motor Control Unit or on the remote control.
2. Set the machine in EMERGENCY STOP by pressing the mushroom pushbutton stated as no.4 on the Motor Control Unit.
3. For setting the machine in SAFETY SHUTDOWN (if it is necessary to leave the vehicle unattended), remove the key from the emergency pushbutton (no. 4).

3.8.10 Folding of the Sigillo® 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:

1. 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.
2. Insert the key in the emergency pushbutton.
3. Turn the key in CLOCKWISE direction to unlock the emergency pushbutton for giving the consent to restart the machine:

   By starting the Motor Control Unit gives out an acoustic signal.
   On remote control: PRESS THE PUSHBUTTON no. 1 (UNCOVERED)
   On Motor Control Unit: ROTATE THE CONTROL DIAL no. 3 TOWARDS LEFT (UNCOVERED)
4. Fold the tarpaulin completely and release the control dial. The Motor Control Unit is equipped with an automatic motor shut-down when covering reaches the end stop.
5. Carry out a quick but attentive control to verify that everything is in good order before starting the tilting movement of the tipper body.
3.8.11 How do I interrupt the machine operations?
Follow the process described in paragraph 3.8.6.

3.8.12 How do I stop the machine in case of emergency?
Follow the process described in paragraph 3.8.7.

3.8.13 Machine stop in safety conditions
Follow the process described in paragraph 3.8.9.

3.8.14 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 unfolds 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 travelling on the road.

1. Push the emergency pushbutton to set the machine in SAFETY SHUTDOWN and remove the key.
2. 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 system does not work?

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. If this is the case, that one is the fuse that 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 the local installer, if the emergency situation allows it, for getting detailed information about the procedure to apply.

CAUTION!

Prior to open the Motor Control Unit, disconnect the battery from power supply.

WARNING!

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

1. By using a suitable screwdriver, loosen the screws at the corners of the Motor Control Unit cover.
2. Remove the cover taking care not to damage the existing seal.
3. Replace the blown fuse (F).
4. Close again the Motor Control Unit with its cover, taking care not to damage the existing seal.
3.9.2 Motor unlocking in emergency situation

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

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

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

1. Using a 6 mm Allen key, loosen the 4 screws of the protection cover.
2. Remove the cover.
3. Using the same Allen key, loosen the 2 screws of the shaft reinforcement bracket.
4. Rotate the bracket as in the picture.
5. Extract the bracket from the bearing.
6. Tighten up the emergency crank handle at the centre of the shaft, paying attention to introduce the round pin into the proper seat.
7. Tighten up the crank handle screw until the end, eventually using a wrench for hexagonal screws.
8. Now the shaft and reduction unit are released from the pulley and we can go on with the covering manual handling.

**WARNING!**
After solving the problem owing to which the emergency procedure has been done, repeat the operations inversed to come back to the initial position.

On re-assembling, pay attention to the re-insertion of the shaft reinforcement bracket into its proper seat.

By moving the covering with the motor without previously re-assembling the bracket, damages to the reduction unit and to the shaft may occur.
4.1 Automatic rear closing system

**Note:** The automatic rear closing system can be installed 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:

1. 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.

2. Tighten now the front part of the tarpaulin.

3. Fasten the lateral PE flat strip (3) to the fastening screws of the front driving pulleys Ø 60.

4. Fasten the tarpaulin to the top of the front gear cases, by employing the aluminium flat plate (2) and rivets (1).

5. 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 closing 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 WITH STATIONARY VEHICLE AND DISCONNECTED EQUIPMENTS**

**DO NOT WALK ON THE COVERING!**

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

6. Unfold the tarpaulin (manually or electrically depending on the version) and cover the tipper body (pic. 1).
7. Go into the internal space of the tipper body for setting up the chains (two n. 10 open-ended wrench are required);

8. Push down manually the rear closing system and readjust the chain in order that it is perfectly tightened once the rear closing has come down (pic. 2).

![Pic 2](image)

### 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:

![Diagram](image)

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 Cable quick release system

This system allows to remove the lateral steel cable by setting the upper edge free and making possible to tip sidewards 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 installing the accessory equipment which makes the quick release of the steel cables possible

4.2.1 Installation of the rear guide pulley

In the cable quick release system, the plate with the rear pulley is the component which differs from the standard system.

For carrying out the installation proceed as follows:

**Note:** 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 edge, but at a sufficient distance for avoiding to be an obstacle for hinges.

**WARNING!**

A wrong positioning of the tension plate could cause 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, place the plate the highest possible (accordingly to the board wall type).

1. Drill the four holes Ø 8, thread and screw the plate with the supplied screws.
2. Apply Loctite® screwlock liquid.
3. If the thickness of the side wall of the tipper body is 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 guide 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 3.3 applying the necessary adjustments:

1. Open the release system.
2. Fasten the steel cable as described in the paragraph 3.3.2 and verify that the cable is so tightened that, with open tightening, the cable can be removed from the rear plate and, with closed tightening, the proper handling of the tarpaulin can be performed.

**Note:** Make sure that the bows keep being perpendicular to the side walls of the tipper body 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:

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

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

---

**CAUTION!**

A wrong repositioning of the cables could cause 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 “Roller-Hooking System”

With this lateral hooking system, the roller-hooks automatically fit 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:

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

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

The number of roller 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 roller hooks is essential for the proper working of the hooking system.

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

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

After having defined the roller-hook height, the lower countersupport can be fastened on the tipper body as follows:

6. Place the lower support (3) ca. 6 mm up from the roller hook.
7. Drill the side wall of the tipper body and fasten the support with the supplied rivets (8).

Now the positioning of the remaining roller-hooks can be done.

**WARNING!**

From now on, the even arrangement of the roller-hooks and respective supports is the decisive factor for a proper working of the covering system.
8. Proceed installing the remaining roller-hooks as shown in the figure below.

Note: If obstacles interfere with the lower supports, shift the roller-hook upwards on the upper hole and repeat the above described fastening operations.

9. In the absence of any obstacles while moving the tarpaulin, fasten the lower countersupport of the respective roller-hook.

10. Proceed with fastening the subsequent roller-hooks.

WARNING!

We recommend paying care attention of each roller-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 hooks number may change according to the tipper body length or the customer’s requirements

---

**IMPORTANT!**

When using a covering with Windsafe Hooking system, the rear tensioning plate with pulley Ø70 is the component which differs from the standard system. As a consequence, the positioning of the rear tensioning plate has to be changed.

For the installation, follow the instructions of the following paragraphs accordingly to the type of the covering system installed (with "standard cable system" or "lowered cable system").

**4.4.1 Installing the rear tensioning plate with pulley Ø70 in case of “STANDARD CABLE 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 any hinges.

1. For a proper functioning of the covering, place the axis of the lower fastening hole of the plate at a distance of 54,5 mm from the upper edge of the tipper body.

2. Proceed with 2 threaded M10 holes on the side wall, at the level of the holes of the plate.

3. Fasten the plate with the supplied countersunk head screws M10x40, paying attention that the tensioning screw is pointed towards the front part of the vehicle.

---

**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.

4. Repeat the plate fastening operations on the opposite side wall.
4.4.2 Installing the rear tensioning plate with pulley Ø70 in case of “LOWERED CABLE 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 any hinges.

1. For a proper functioning of the covering, place the axis of the lower fastening hole of the plate at a distance of 90 mm from the upper edge of the tipper body.

2. Proceed with four threaded M10 holes on the side wall, at the level of the holes of the plate.

3. Fasten the plate with the supplied countersunk head screws M10x40, paying attention that the tensioning screw is pointed towards the front part of the vehicle.

---

**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.

4. Repeat the plate fastening operations on the opposite side wall.

**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.
4.4.3 Installing the Windsafe hooks and the lateral Z-Section

For the installation, proceed as follows:

1. Unfold the covering and cover the tipper body entirely.
2. Define the fastening position of the hooks.
3. Lean the hooking support (2) against the lateral part of the bow support (1).
4. Fasten the hook on the bow’s support with the supplied round-head screws (3).

Nota: Apply medium threadlocker Loxeal 54.03 on the supplied round-head screws (3).

5. Fasten the hook on the bow support by the means of the hexagonal-head screw (4) and the self-locking nut (5).

IMPORTANT!
Leave at least a space of 1 mm between the nut and the lateral blade of the hook.

After having defined the hook’s height, it is possible to fasten the lateral Z-Section on both sides of the tipper body.

IMPORTANT!
The lateral Z-Section has the following dimensions: 30x30x3 mm. Other dimensions could compromise the correct functioning of the hooking system and damage the covering tarpaulin.

6. Place the Z-Section (7) 6÷8 mm from the upper part of the knob of the hook, as shown in the drawing

Note: The Z-Section position is the same both for standard cable system and lowered cable system.
7. Drill the side wall of the tipper body and fasten the Z-Section with the supplied self-drilling screws (8).

**IMPORTANT!**
Using a torque wrench, tighten the supplied self-tapping screws to a torque values not greater than the following values:
- **6 N m** for aluminium tipper bodies
- **9 N m** for steel tipper bodies

It is now possible to place the remaining hooks.

**WARNING!**
From now on, the correct placing with a uniform pitch of the windsafe hooks is fundamental for the correct functioning of the covering.

8. Proceed with the installation of the following hooks as shown in the figure below:

**Note:** In presence of obstacles for the covering sliding movement, verify the height of the Z-Section.

**ATTENTION!**
It is important to pay special attention while placing every windsafe hook, in order to avoid malfunctions during the covering movement.

**Note:** The diameter of the rear pulley, the dimension of the Z-Section, the positioning of the hooks are basic elements for the proper functioning of the hooking system. A Z-Section with dimensions out of standard, or a wrong position of the rear pulley could compromise the correct functioning of the hooking system.
Chapter 5 MAINTENANCE WORK OF THE SIGILLO® COVERING SYSTEM

The covering system is subject to stress and wear, 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.

5.1 Bow replacement

For replacing a bow proceed as follows:

**WARNING!**
In case of electric-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.

1. Find out the bow that needs to be replaced.
2. Remove the rivets positioned on the tarpaulin upper side which fasten 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.

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

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

7. 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.
8. Fix the supports using the suitable self-tapping screws.
9. Inside the tipper body fasten the tarpaulin to the bow by using common cable ties (in case of fire-resisting PVC-tarpaulin or polyurethane, apply fire-resisting cable ties).

**CAUTION!**
For fire-resisting PVC or Polyurethane 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.
10. Reposition the rivets for fastening the tarpaulin and the PE flat strip to the support.

11. 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

1. Remove the rivets positioned on the outside of the tarpaulin which fasten 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 TARPALIN!** The manufacturer denies any liability.

2. On the frontside of the tipper body remove the aluminium flat bar which fastens the tarpaulin.

3. Inside the tipper body remove the cable ties which fasten the tarpaulin to the bows.

4. Remove the damaged tarpaulin.

5. Proceed to position the new tarpaulin.

6. 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 or Polyurethane 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.

7. Reinsert the PE flat strip inside the lateral sleeves of the tarpaulin.

8. Reposition the rivets which hold the tarpaulin in place.

9. Tighten up the front part of the tarpaulin.

10. Fasten the tarpaulin on the top of the gear housing employing the specific aluminium flat bat and rivets.

11. Cut the excess tarpaulin part off.

### 5.3 Steel cables replacement

For the steel cables replacement, see paragraph 3.3.
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!**

Tighten up all screw connections!

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)

Check the conservation status of the contact plates (if installed, only for electric operated covering system), and if necessary provide for their cleaning.

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 are straight-line (absence of breaches on the locating surface) so that the covering does not 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 fastening hooks on the outer board wall (only if installed)

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

5.4.9 Lubricate and grease thoroughly the covering system

GREASE TIE ROD JOINT
(manually-operated version)

Make use of lithium-based grease.

GREASE THE INTERNAL COUPLING BETWEEN PINION AND GEAR
(manually-operated version)

Make use of lithium-based grease.

IMPORTANT!

CLEAN AND LUBRICATE THE VARIOUS PULEYS LOCATED ON THE MACHINE, ALSO CABLES, GROOVES AND SLOTS OF THE PULEYS, 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.

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Possible cause</th>
<th>Problem solving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressing any pushbutton of the remote control the motor does not start running.</td>
<td>Emergency stop activated.</td>
<td>Check the emergency pushbutton.</td>
</tr>
<tr>
<td></td>
<td>Wrong electrical connections.</td>
<td>Check the electrical connections (positive – negative battery pole).</td>
</tr>
<tr>
<td></td>
<td>The safety fuse has tripped.</td>
<td>Check fuses integrity, one fuse on the power supply line, the second one inside the Motor Control Unit.</td>
</tr>
<tr>
<td></td>
<td>Contact plate is defective.</td>
<td>Check that the existing contact plates are properly coupled.</td>
</tr>
<tr>
<td></td>
<td>Malfunctions inside the Motor Control Unit.</td>
<td>Contact the manufacturer or authorised qualified personnel for intervention.</td>
</tr>
<tr>
<td>Pressing the remote control pushbutton, the red indicator light does not light up.</td>
<td>Remote control batteries are discharged.</td>
<td>Replacement of remote control batteries.</td>
</tr>
<tr>
<td>The motor runs always in the same direction.</td>
<td>Coding defects of the switch plate.</td>
<td>Call customer service for remote control reprogramming.</td>
</tr>
<tr>
<td>The Motor Control Unit works only by rotating its control dial and not by using the remote control.</td>
<td>Power supply voltage reversal.</td>
<td>Check that the positive pole (+) of the battery is connected to the 1 terminal of the Motor Control Unit, and, that the negative pole (-) is connected to the 2 terminal of the Motor Control Unit.</td>
</tr>
<tr>
<td>The Motor Control Unit seems to be functioning (the internal relay can be heard) but the motor does not run.</td>
<td>Possible oxidation of the electrical contacts.</td>
<td>CHECK! Prior to proceed with cleaning disconnect the power supply (press the emergency pushbutton or unplug the dumper). Check that the electrical contacts existing between tipper body and chassis frame are clean and free from oxidation. If required proceed with cleaning by using a dry cleaning cloth. Any stubborn stains due to oxidation can be removed by fine-grained sandpaper (400 grade or higher).</td>
</tr>
<tr>
<td></td>
<td>Possible breaking of a ring terminal.</td>
<td>Check that the ring terminals of the motor and contact plate connection cables are not damaged or broken. If required, let them replace by an authorised customer service or by a car electrical repair shop.</td>
</tr>
<tr>
<td>Turning the control dial on &quot;UNCOVERED&quot;, the covering covers the tipper body instead of folding.</td>
<td>Motor voltage reversal.</td>
<td>Invert the two cables on the 3-4 contacts of the Motor Control Unit.</td>
</tr>
</tbody>
</table>

**ATTENTION!**

Prior to proceed with cleaning disconnect the power supply (press the emergency pushbutton or unplug the dumper). Check that the electrical contacts existing between tipper body and chassis frame are clean and free from oxidation. If required proceed with cleaning by using a dry cleaning cloth. Any stubborn stains due to oxidation can be removed by fine-grained sandpaper (400 grade or higher).
Chapter 6  ENCLOSURES

6.1 Reference diagram for electrical connections