

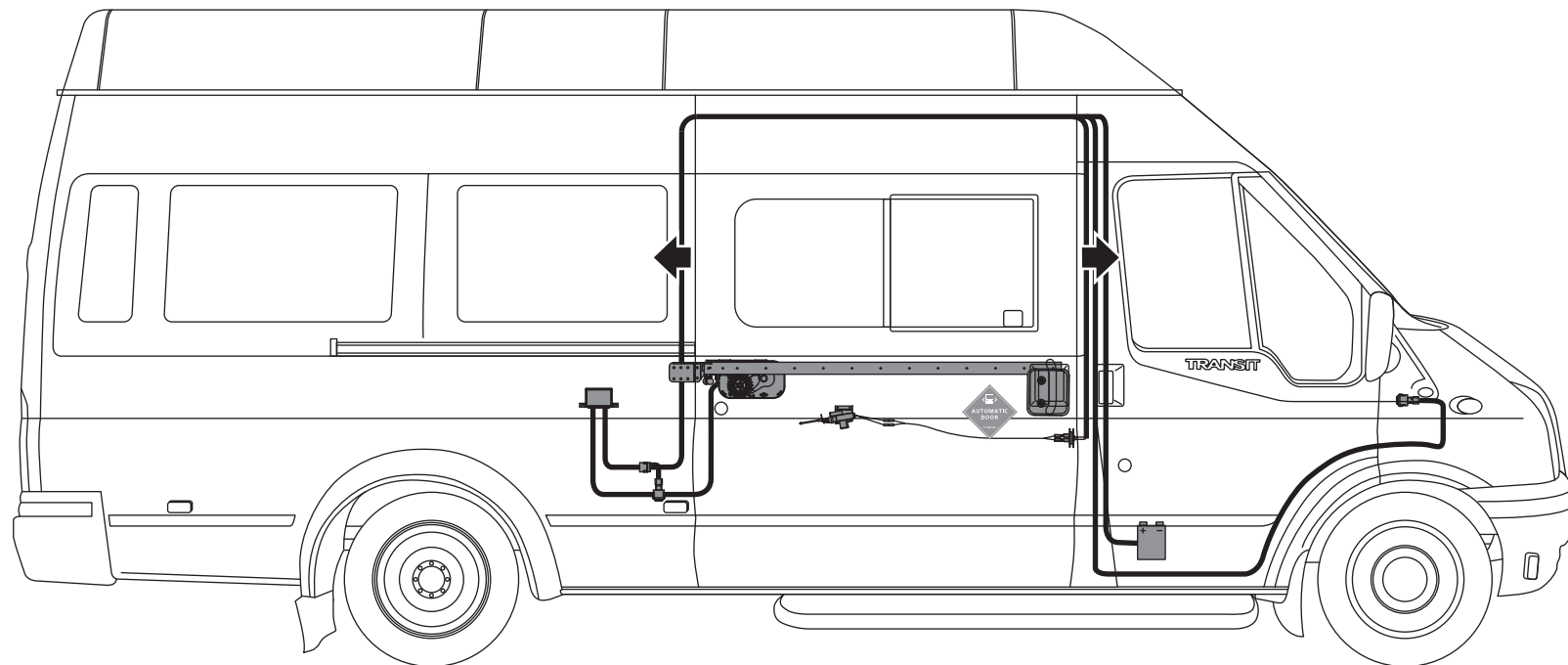


automatic  
doors

# RACK AND PINION DRIVE ADOR CROCO INSTALLATION MANUAL

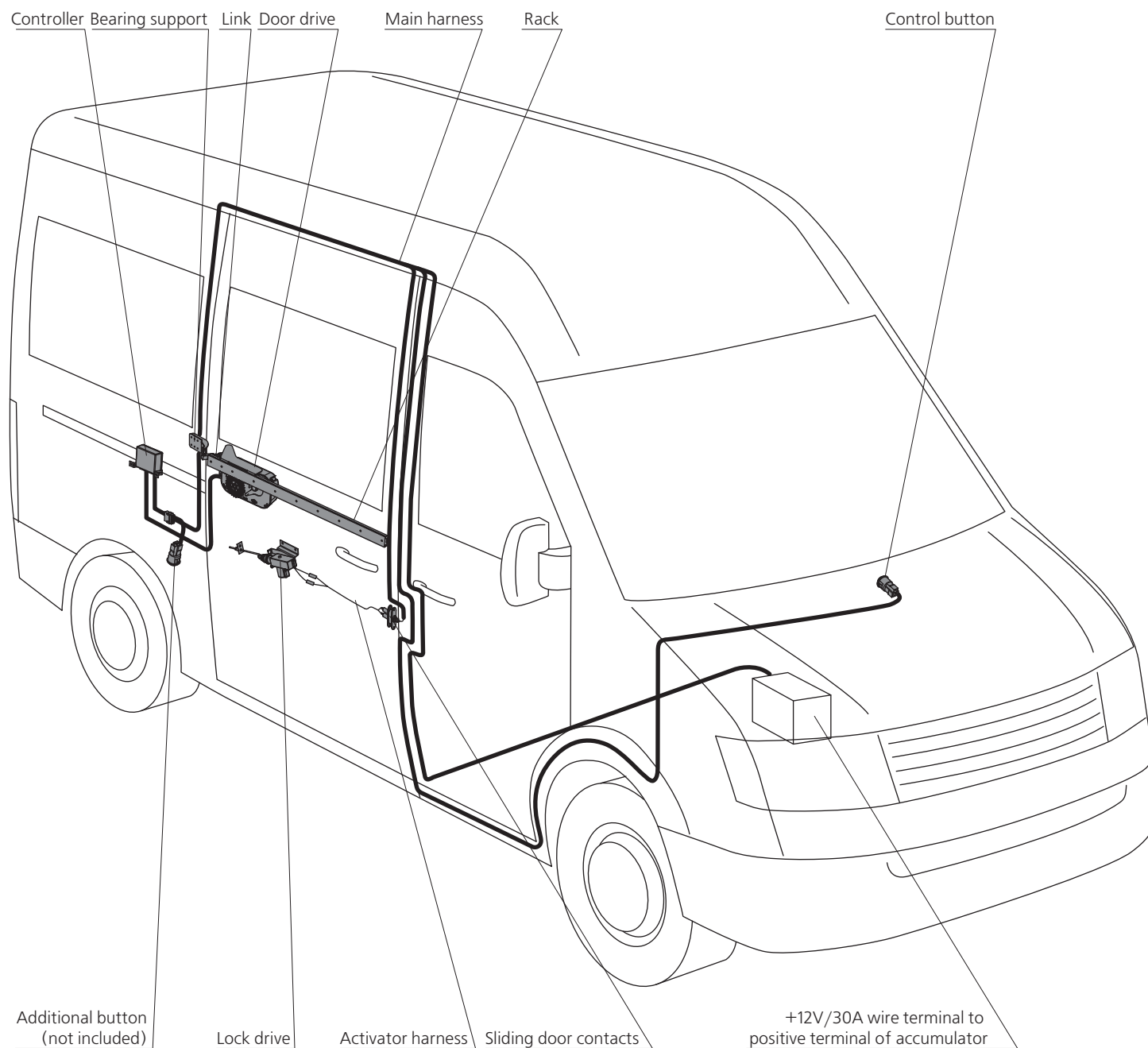
19.06.2013

FORD TRANSIT





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This model is suitable for opening and closing sliding doors in minibus FORD TRANSIT.

Disposition of assemblies and parts of the drive is shown on the model of a standard minibus.



#### NOTE



This manual describes installation of the drive with maximum specifications. If you install a door drive without any additional options, just omit unnecessary paragraphs of the manual.

#### BASIC TECHNICAL CHARACTERISTICS

CROCO drive is designed for opening and closing doors in minibuses working as taxi buses. The models of the buses are listed on the manual cover.

Power consumption (nominal)	70 W
Power consumption (maximum)	250 W
Time of door opening (depends on the width settings)	2 sec.
Time of door closing (depends on the width settings)	2 sec.
External temperatures	-25 - +40
Maximum allowed angle of bus ascent when the door will close	10°
Resource	Not less than 150 000 opening/closing cycles

**NOTE**

Long-lasting and trouble-free operation of ADOR drive depends on the quality of installation. That is why installation is carried out in specialized workshops of ADOR's representatives.

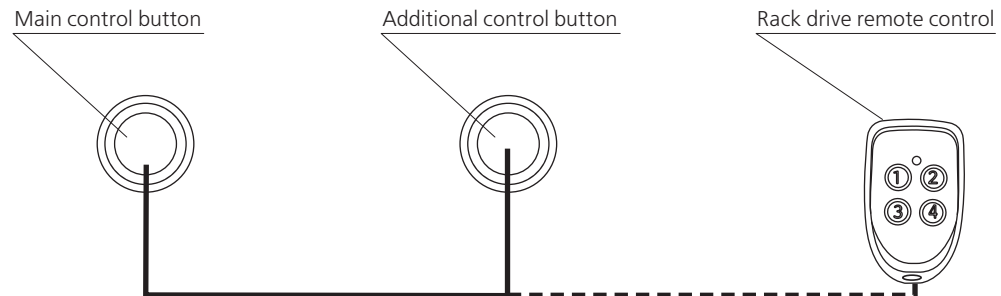
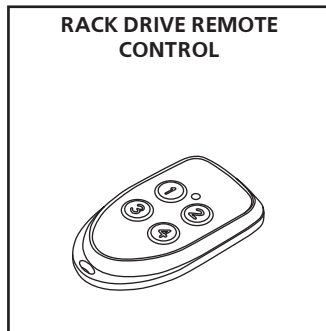
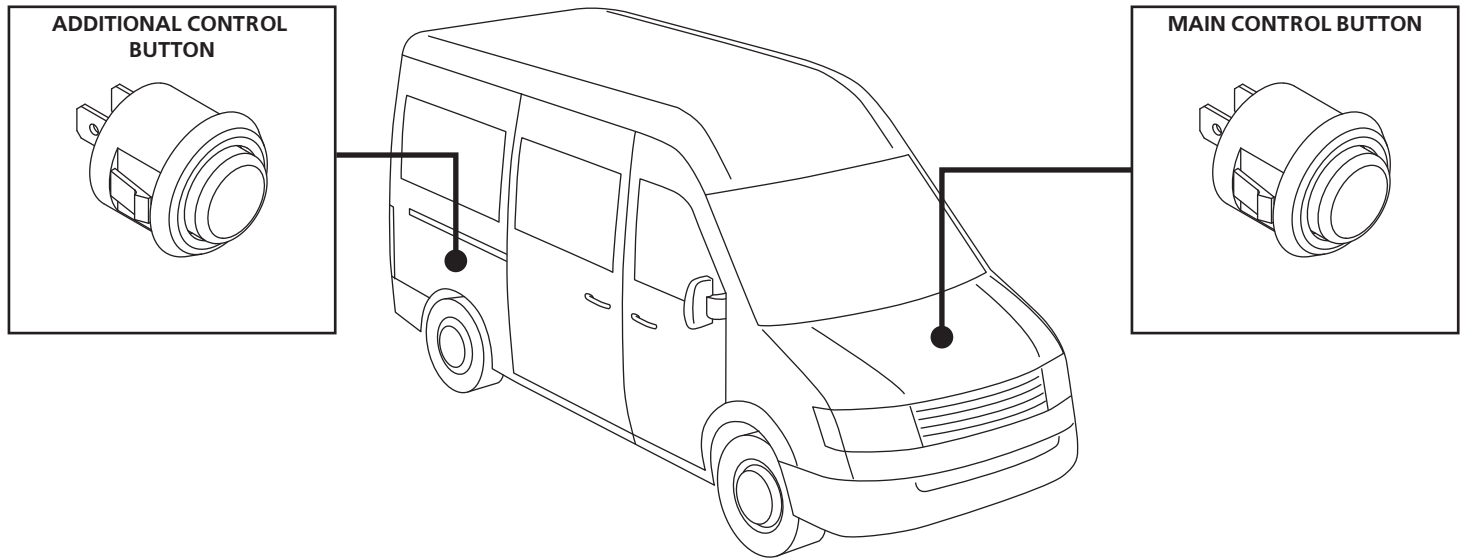
**OPERATING CONTROL**

ADOR drive is an electromechanical device which operates being connected to the in-vehicle network. The drive consists of two main parts: lock drive and door drive. The lock drive opens the lock and the door drive opens and closes the door. Drive control can be carried out by means of

- **Main control button** which controls the door functions and the system settings
- **Rack drive remote control** which controls the door functions.

**MOTOR DRIVE FUNCTIONS:**

- **Opening and closing the door**
- **Automatic roll-back of the door**
- **Door stopping**
- **Sound signal**
- **Operating mode with and without fixing the sliding door**
- **Adjustment of the opening width**



## PRECAUTIONS

Drive installation involves refining of existing body parts of a minibus. All body parts of a minibus are made of sheet metal, so there is a high probability of being cut by sharp edges appearing after refinement or by sharp parts of mechanical hand tools. During drive installation follow safety procedures while working with mechanical hand tools, blunt sharp edges of drilled holes. Use only tools in good working condition. During installation keep your working place clean, especially in the bus saloon. Before starting installation prepare all the necessary tools and parts, take away unnecessary things.

Trouble-free operation, reliability and operating life of the drive depend on precise accomplishments of the instructions given. It also depends on the precision of relative disposition of drive parts and assemblies. Before drilling fixation holes put the marks for drilling thoroughly, check correct disposition of a concrete part or assembly and only after that drill the holes.

This drive is an electromechanical device, so alongside metalwork there is also wire installation and connection to power supply. That is why electrical safety procedures must be followed. While connecting contacts, keep your hands and working place clean. This will provide reliable contacts connection and trouble-free operation of the drive as a whole.

## TOOL LIST

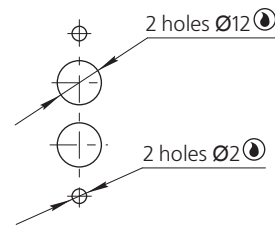
Clip withdrawal tool .....	1
Headstock 10-17mm .....	1set
Riveter .....	1
Riveter for pull-out nuts GESIPA GBM10 .....	1
Centre punch .....	1
Set of combination wrenches .....	1set
Metal ruler .....	1
Hammer .....	1
Set of hexagon wrench tools .....	1
Set of star wrench tools Torx .....	1
Knife .....	1
Flat tip screwdriver .....	1
Cross tip screwdriver .....	1set
Pliers .....	1set
Wire for tightening .....	3m.

Drill bits 2,5; 3,2; 5; 6,5; 9; .....	1
Step-shaped drill 4-24 mm .....	1
Slack adjuster .....	1
Electrical extension cord .....	1
Lamp .....	1
Sliding calipers .....	1
Electric drill .....	1
Hack saw .....	1
Multimeter .....	1
Sid cutter .....	1
Rivet nut .....	15
Rubber solvent petrol .....	1 bottle.

After drilling holes burrs are left on hole edges and paint coating of the body is inevitably damaged. In some places which require additional processing the following symbols will be used:

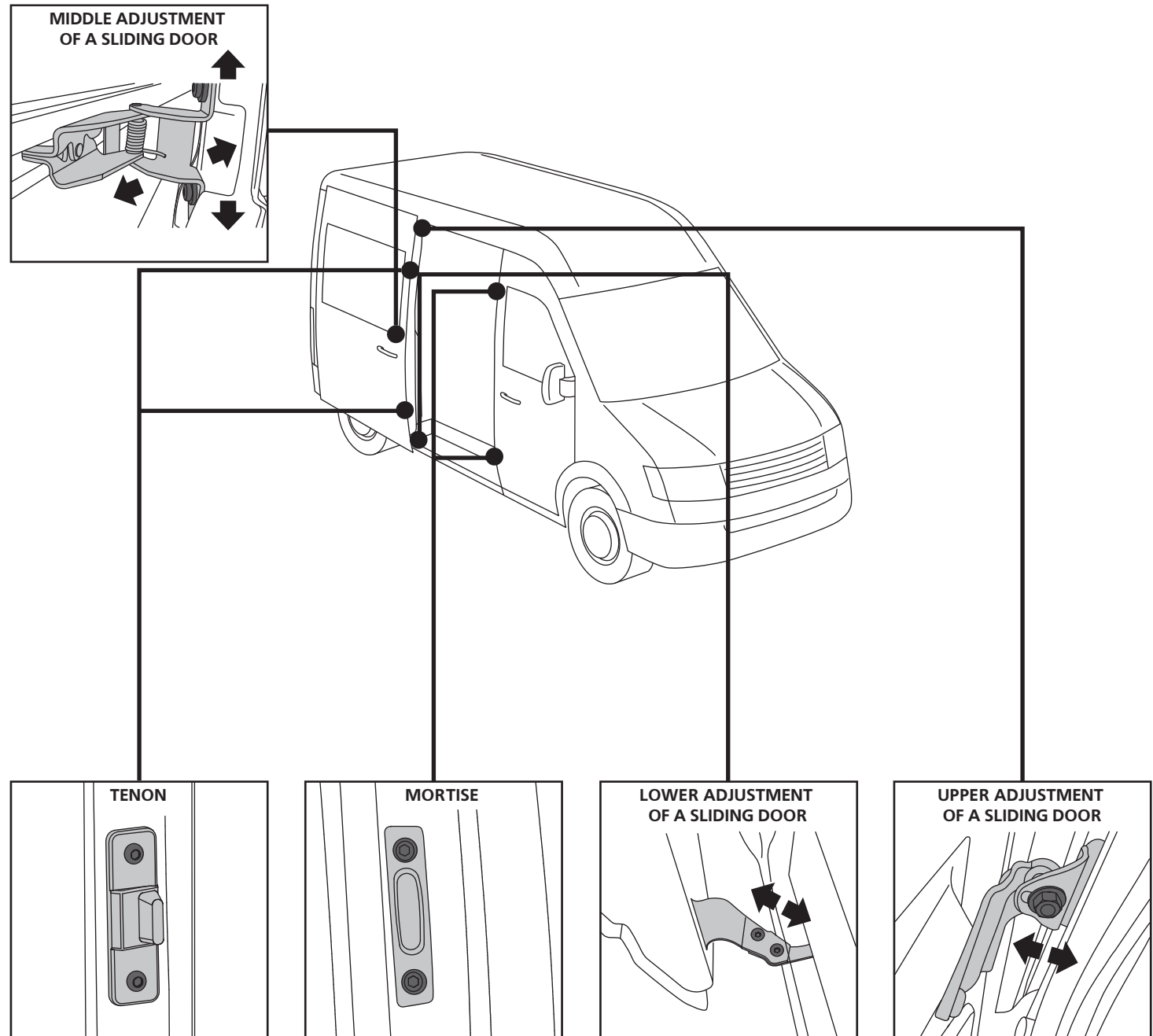
- ☹ – Remove burrs off the edges
- ☹ – Blunt sharp edges
- ☹ – Coat the edge with rust-proof liquid

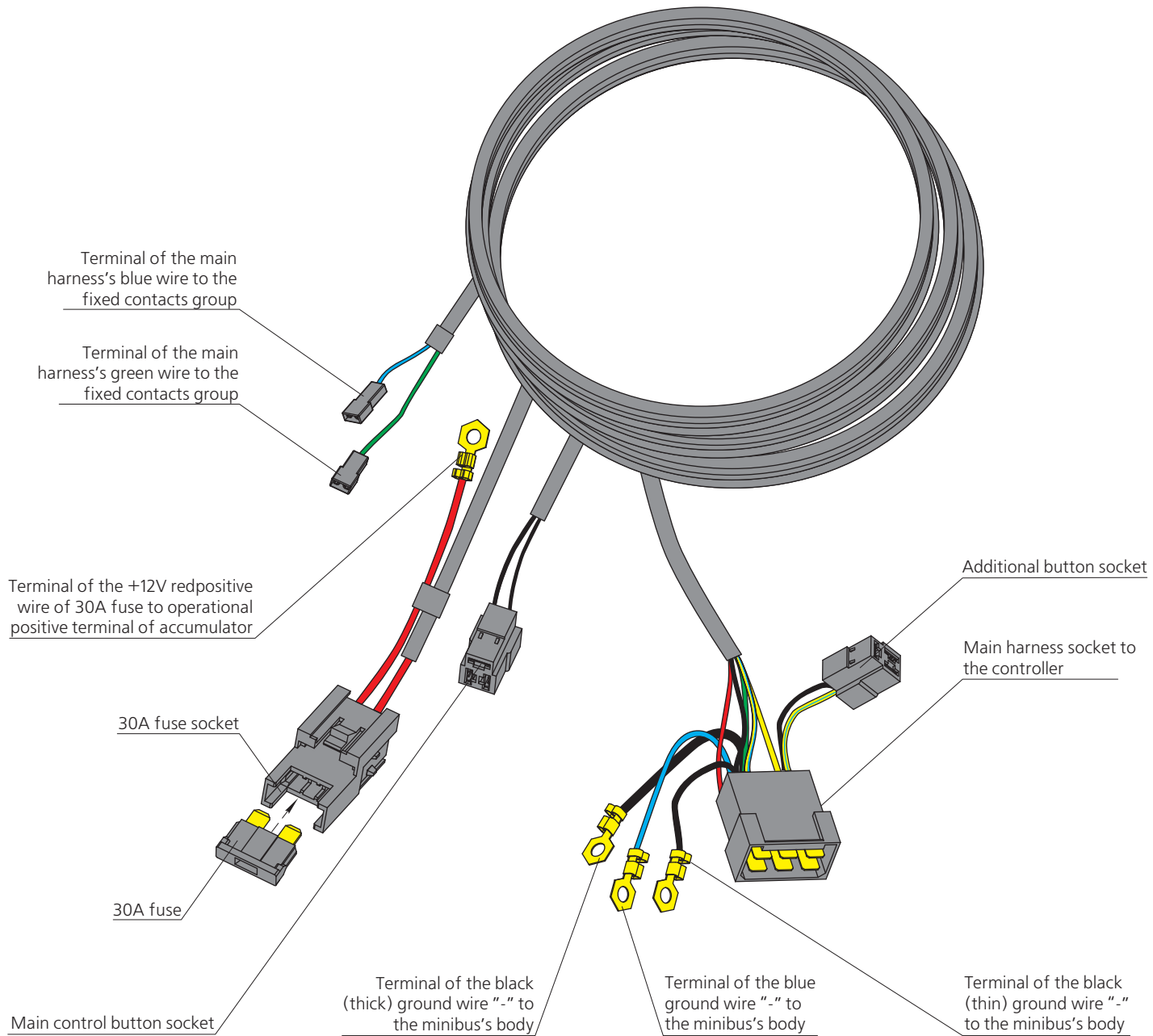
Example: cover the edges of the holes with rust-proof liquid



## 2.1 DOOR ADJUSTMENT

Before installing the drive, adjust the minibus's door because its adjustment influences the drive operation.

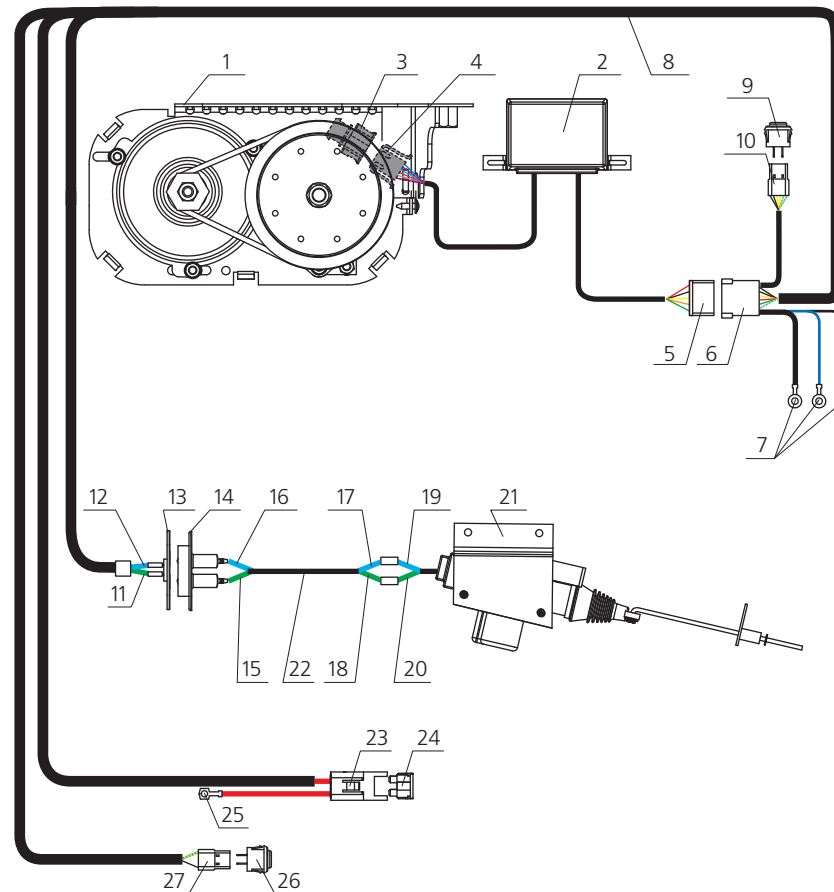


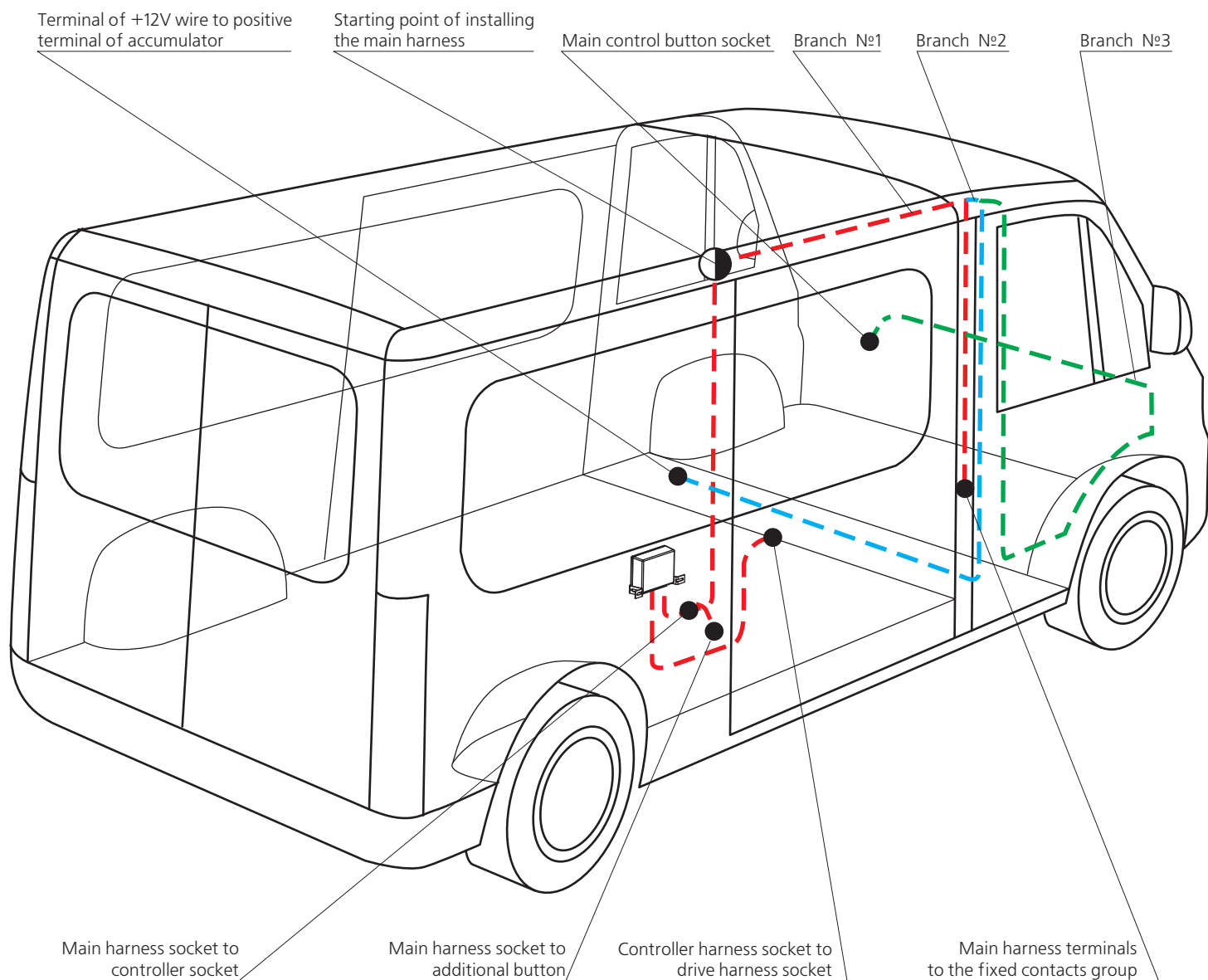




## 2.3 CONNECTION DIAGRAM OF RACK AND PINION DRIVE

1. Rack drive
2. Controller
3. Drive harness socket (black, red, grey and black, blue and black, grey and white, red and white)
4. Controller harness socket (black, red, grey and black, blue and black, grey and white, red and white)
5. Controller harness socket (red, black, green, blue and yellow, yellow)
6. Main harness socket (green, red, blue, black (thick), black (thin), blue and yellow)
7. Terminals of the ground wires "-" (black (thick), black (thin), blue) to the minibus's body
8. Main harness
9. Additional button
10. Additional button socket (black, blue and yellow)
11. Terminal of the main harness's green wire to the fixed contacts group
12. Terminal of the main harness's blue wire to the fixed contacts group
13. Fixed contacts group
14. Movable contacts group
15. Terminal of the activator harness's green wire to the movable contacts group
16. Terminal of the activator harness's blue wire to the movable contacts group
17. Terminal of the activator harness's blue wire
18. Terminal of the activator harness's green wire
19. Terminal of the activator's blue wire
20. Terminal of the activator's green wire
21. Lock drive
22. Activator harness
23. Terminal of 30A fuse red wire
24. 30A fuse
25. Terminal of +12V red positive wire of 30A fuse to operational positive terminal of accumulator
26. Main control button
27. Main control button socket (black, blue and yellow)





When installing the main harness use steel wire to conceal the harness in the hidden places. Disposition of the main harness is shown in the picture. Be careful while installing the harness: insulating material must not be damaged.

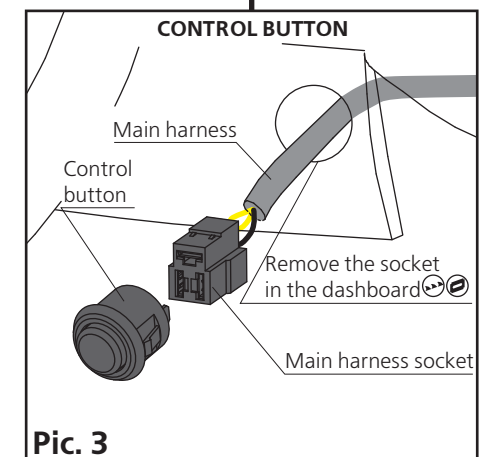
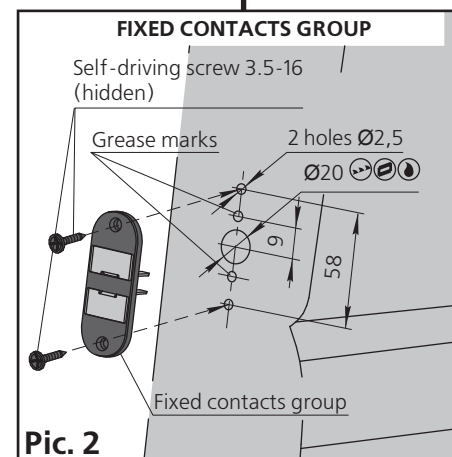
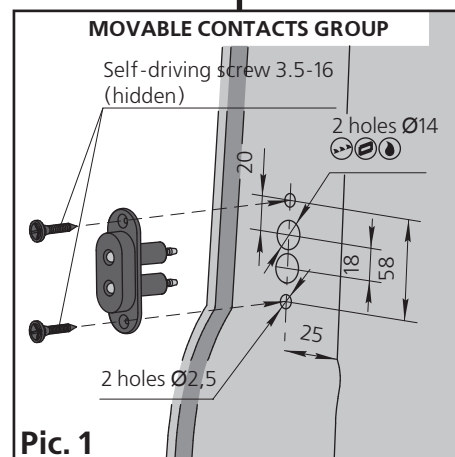
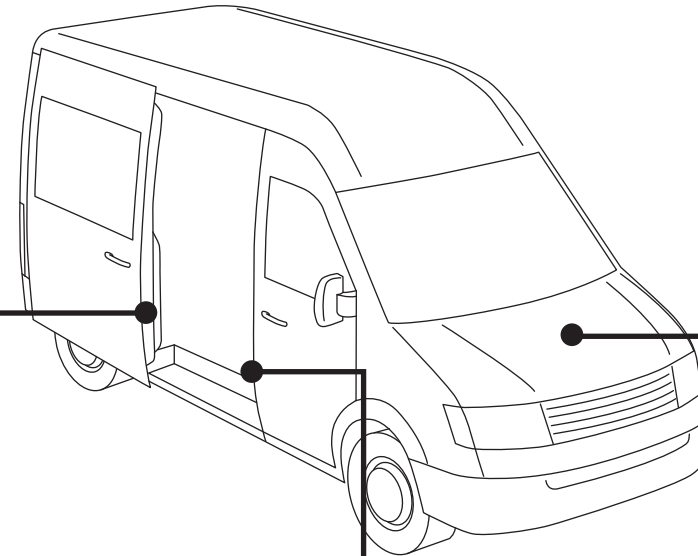
Begin installing the main harness at the starting point as shown in the picture in the following order:

- Extend branch № 1
- Extend branch № 2
- Extend branch № 3

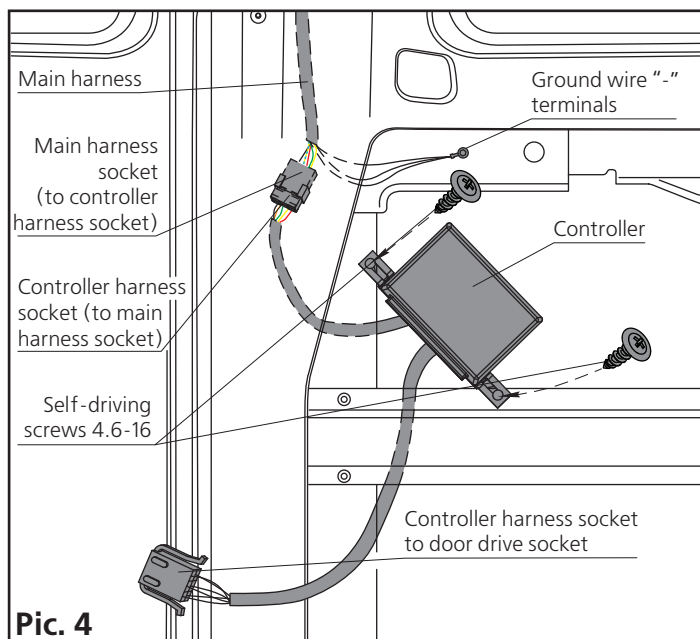
To place the control button drill a hole  $\varnothing 23$  mm on the dashboard where you will find it convenient to use. Remove burrs from the edges and blunt sharp edges. First connect the control button to the main harness socket (pic. 3) and then put it into the hole.

Mark the holes as shown in picture 1. Drill 2 holes  $\varnothing 14$  mm. Connect activator harness's blue wire to the upper contact of the movable contacts group and the green wire to the lower contact as shown in the picture on page 13. Fix the movable contacts group with self-driving screws 3.5-16 from the metalware set.

Open and close the door several times. Using the marks left by the contacts on the pillar, mark and drill a hole  $\varnothing 20$  mm (pic. 2). Connect the blue wire of the main harness to the upper terminal of the fixed contacts group and the green wire to the lower terminal. Fix the fixed contacts group with self-driving screws 3.5-16 from the metalware set.

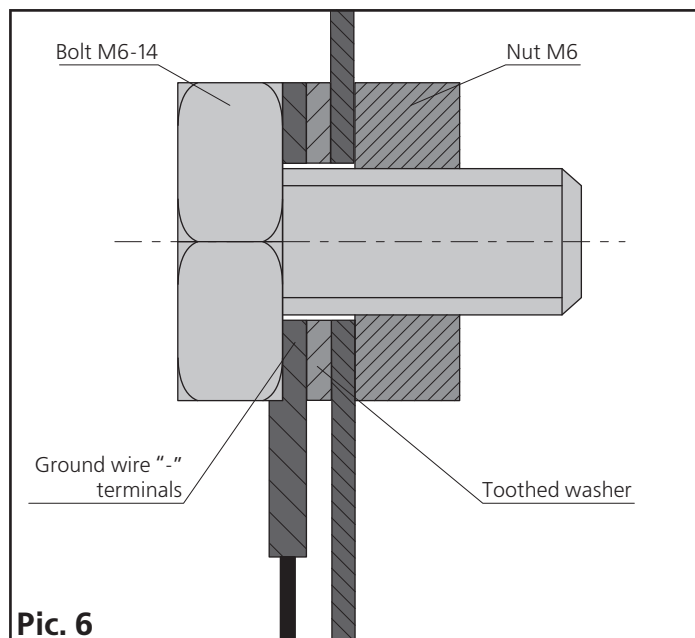
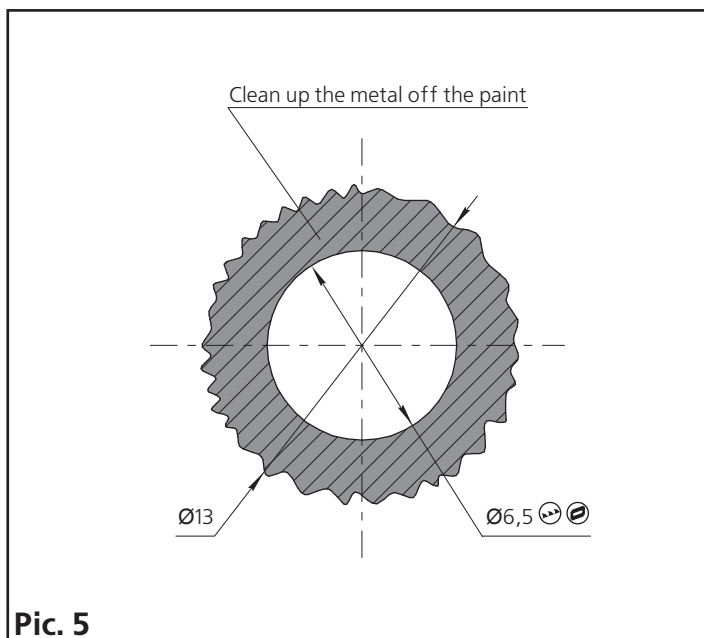


## 12 2.6 CONTROLLER INSTALLATION AND CONNECTION OF GROUND WIRE "-" TERMINAL



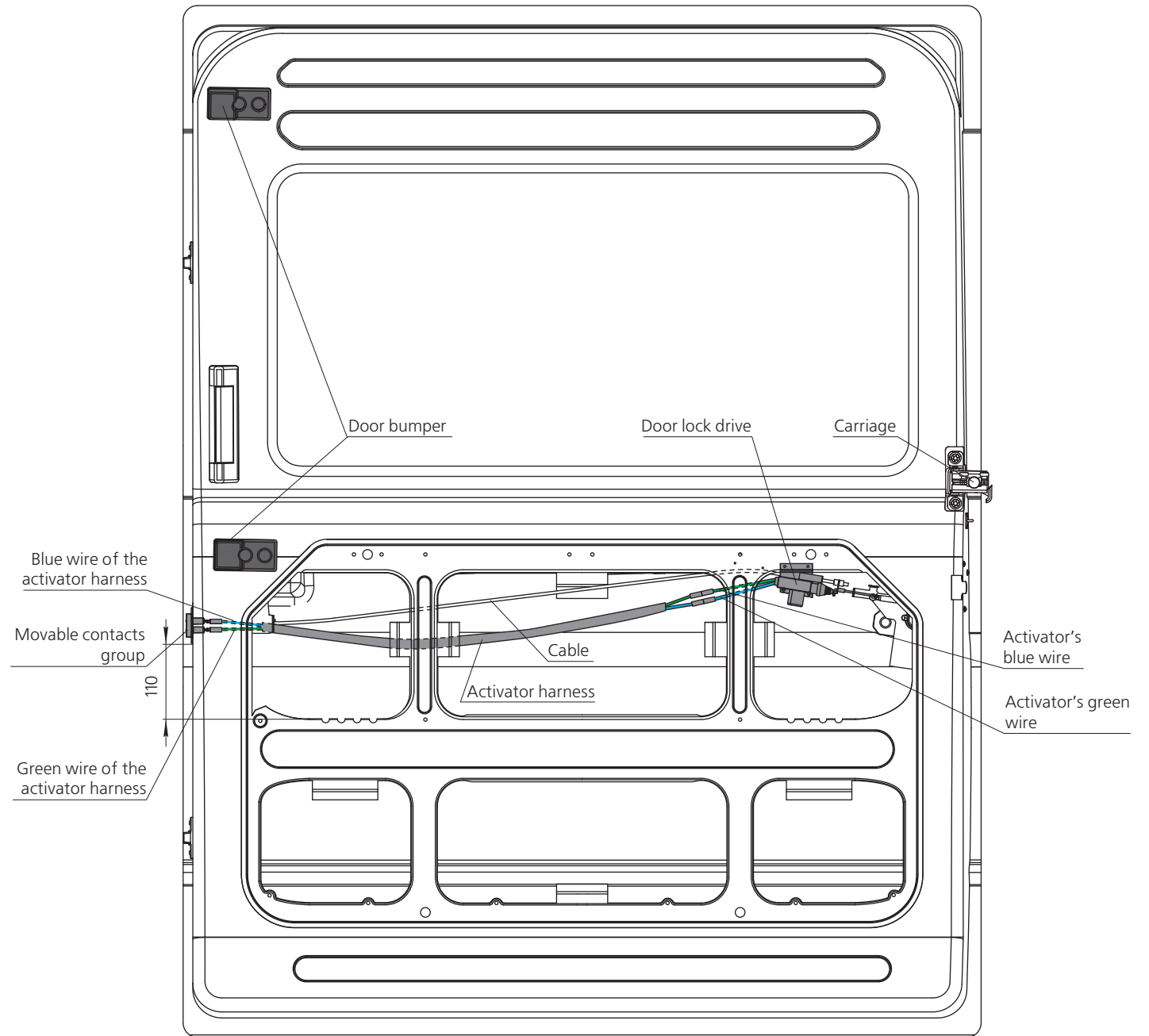
Place the controller in the pocket of the side frame and fix it with 2 self-driving screws 4.6-16 from the metalware set as shown in picture 4.

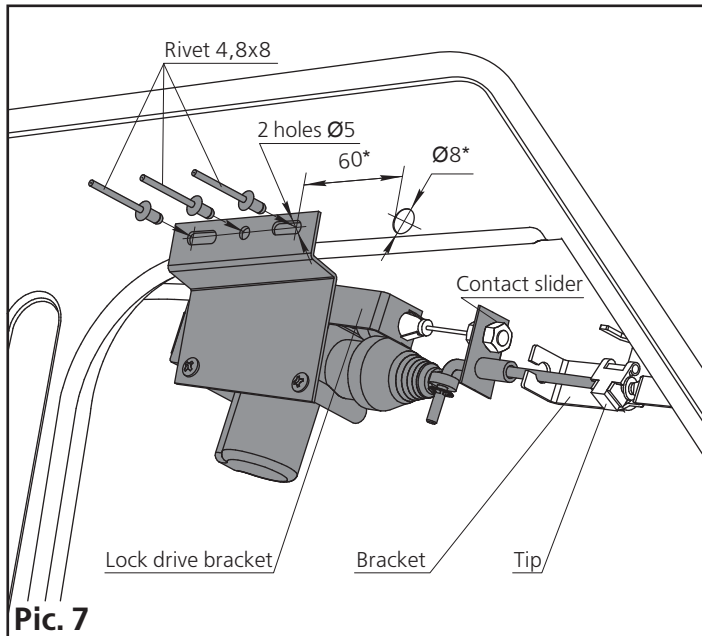
To fix the ground wire "-" terminals of the main harness drill a hole  $\varnothing 6.5$  mm in any place of the internal wall of the body, next to the controller as shown in picture 4. Remove the paint off the metal around the hole to ensure good contact as shown in picture 5. Fix the ground wire "-" terminals using bolt M6-14, toothed washer and nut M6 as shown in picture 6. After having tightened bolt M6 coat the surface with damaged painting with rust-proof liquid.



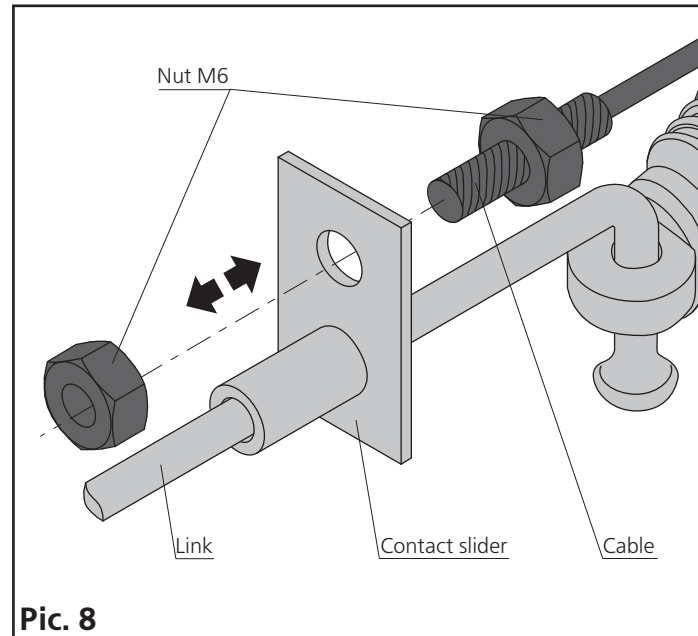
**⚠ NOTE ⚠**

If you have not installed the lock drive, do not remove counterparts of locking mechanisms from the back pillar (to avoid door sagging and excessive loading on the drive frame). The locking mechanism of the door lock must be fixed in open position.





Pic. 7



Pic. 8

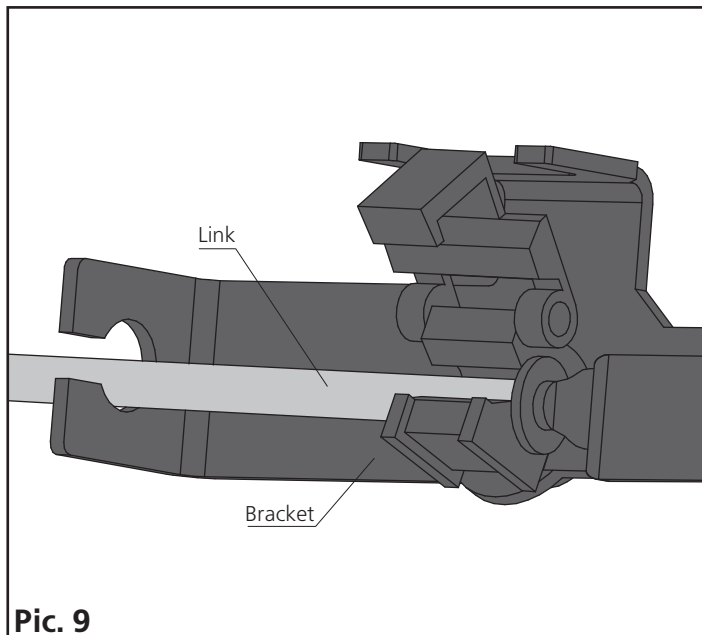
Close the door.

Disconnect the door opening cable from the lock tip and the lock bracket. Fix the cable jacket on the lock drive bracket and the thread part of the cable on the contact slider with nuts M6 (picture 7, 8). Fix the lock drive link in the lock tip (picture 9, 10).

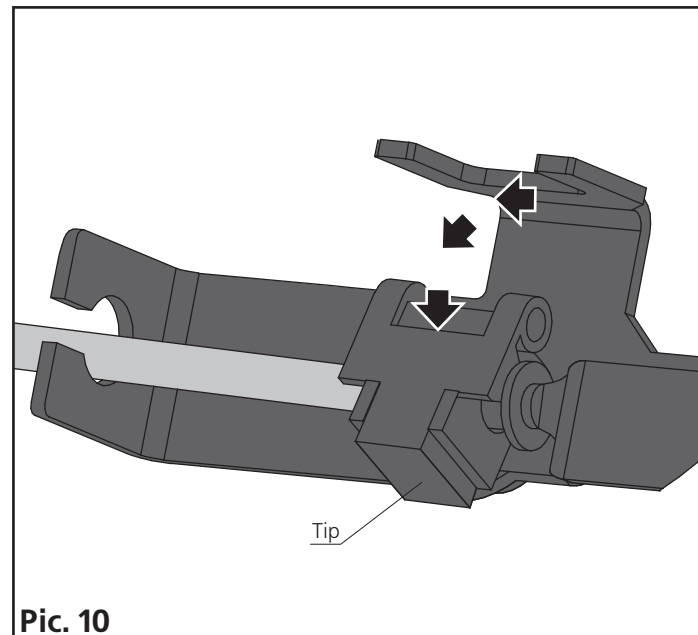
Insert the lock drive into the door pocket and fix it with 2 rivets through the oval holes (picture 7).

Check the ability of the lock drive to operate correctly. Adjust the tightening of the drive link moving the drive to the left and to the right (if necessary). Then fix the lock drive completely with a rivet through the central hole of the bracket.

Connect the terminal of the lock drive's green wire to the terminal of activator harness's green wire and the terminal of the lock drive's blue wire to the terminal of activator harness's blue wire as shown in pictures 9 and 13.



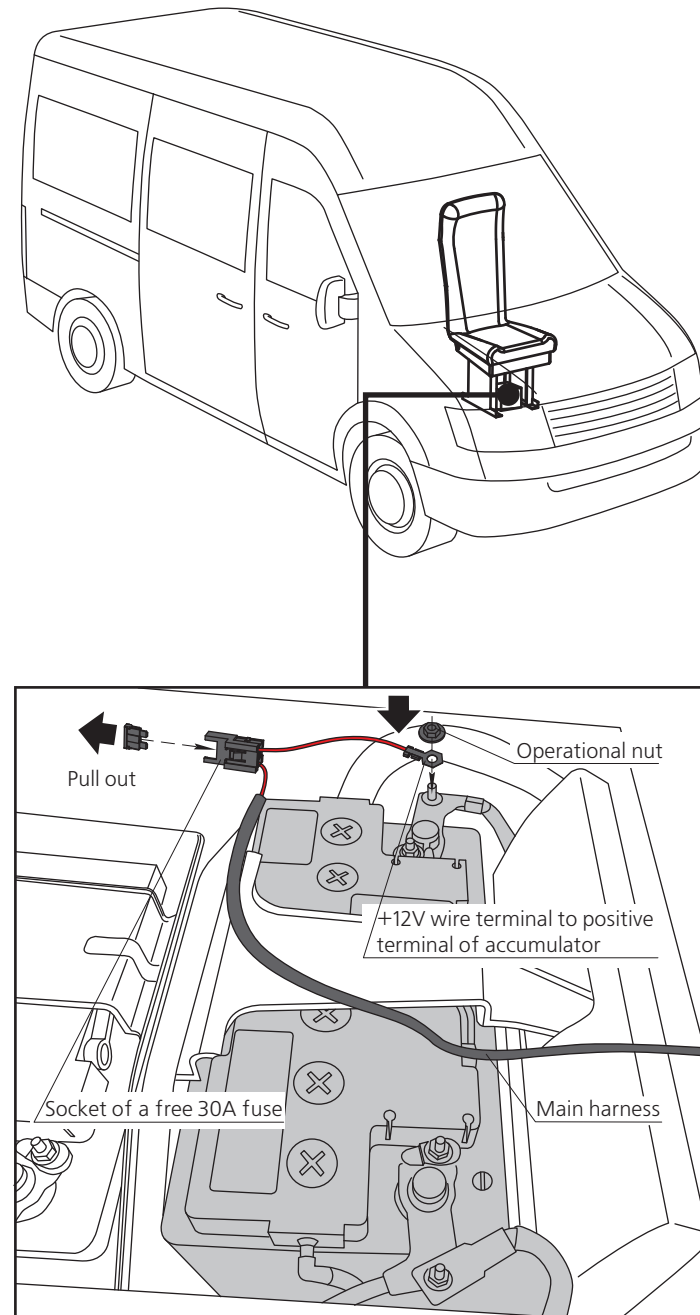
Pic. 9

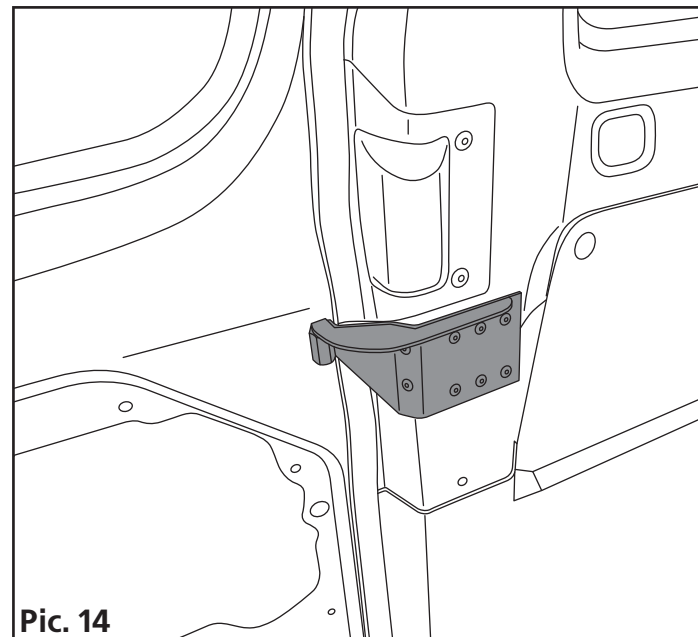
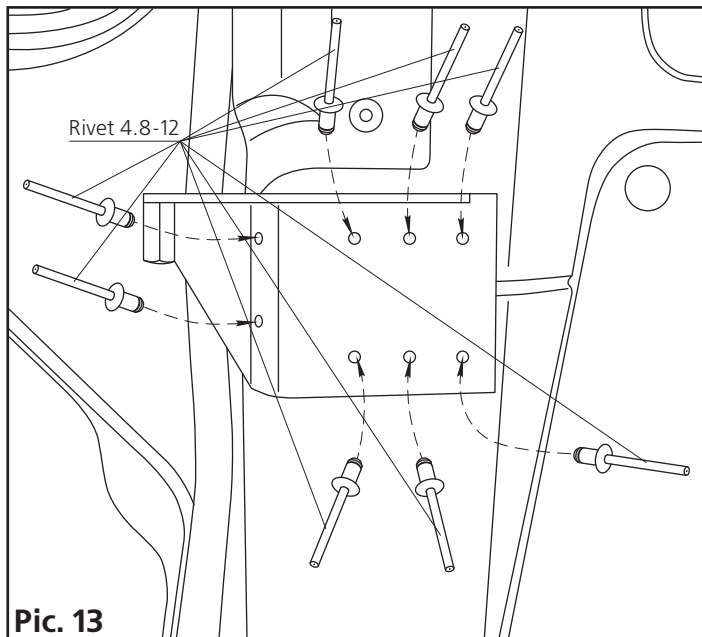
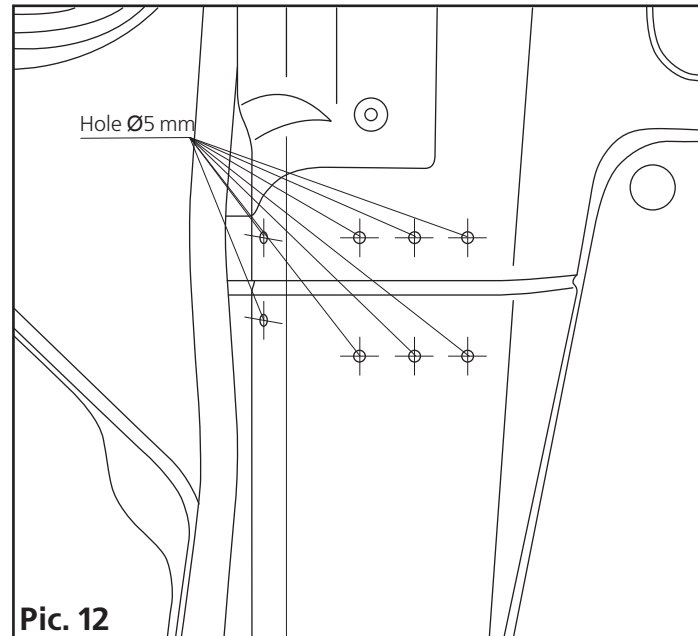
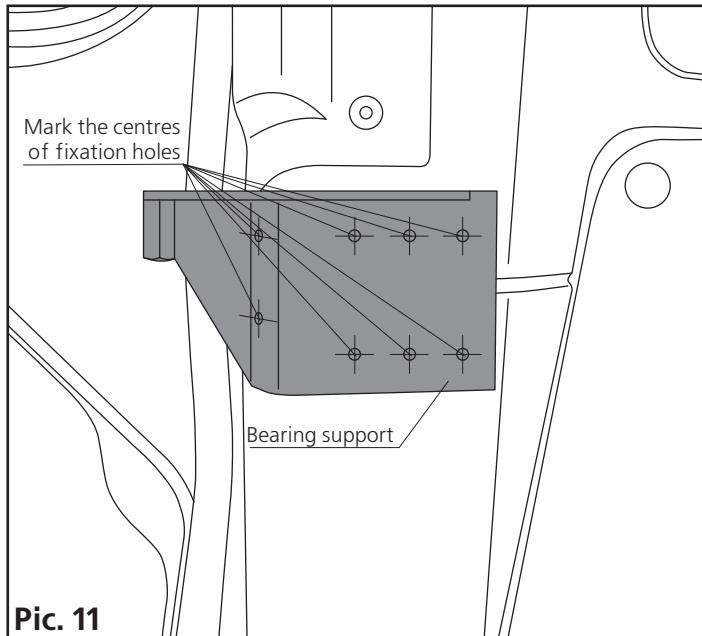


Pic. 10

## 2.8 CONNECTION OF POSITIVE WIRE TO POSITIVE TERMINAL OF ACCUMULATOR 15

Connect the terminal of +12V/30A wire of the main harness to a free positive terminal of the accumulator which is situated under the driver's seat. Fix the terminal of +12V harness wire with an accumulator's operational nut. Pull out 30A fuse from the fuse socket before connecting.





If you install the drive in Ford Transit, first install the bearing support and then the rack with the padding.

Put the bearing support tightly to the body pillar (picture 11). Mark the centres of fixation holes on the bearing support with a marker.

Using the marks, drill 8 holes  $\varnothing$ 5 mm for rivets 4.8-12 from the metalware set (picture 12).

Fix the bearing support with rivets 4.8-12 from the metalware set (picture 13, 14).



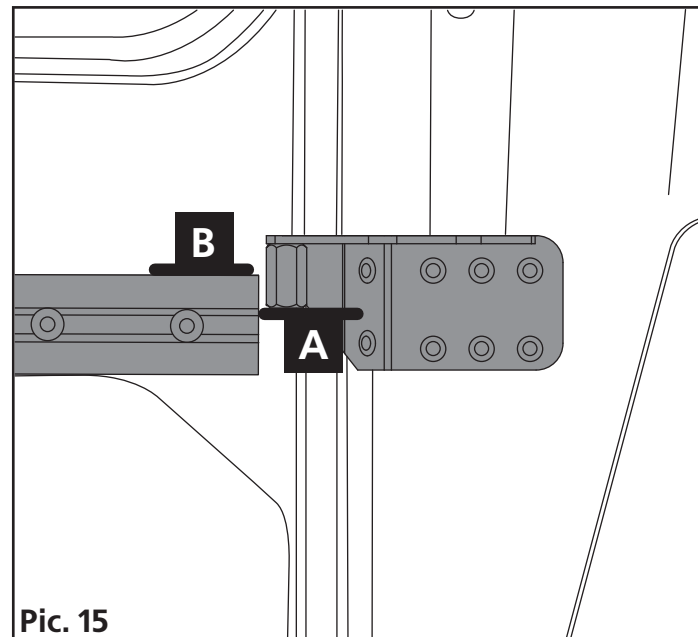
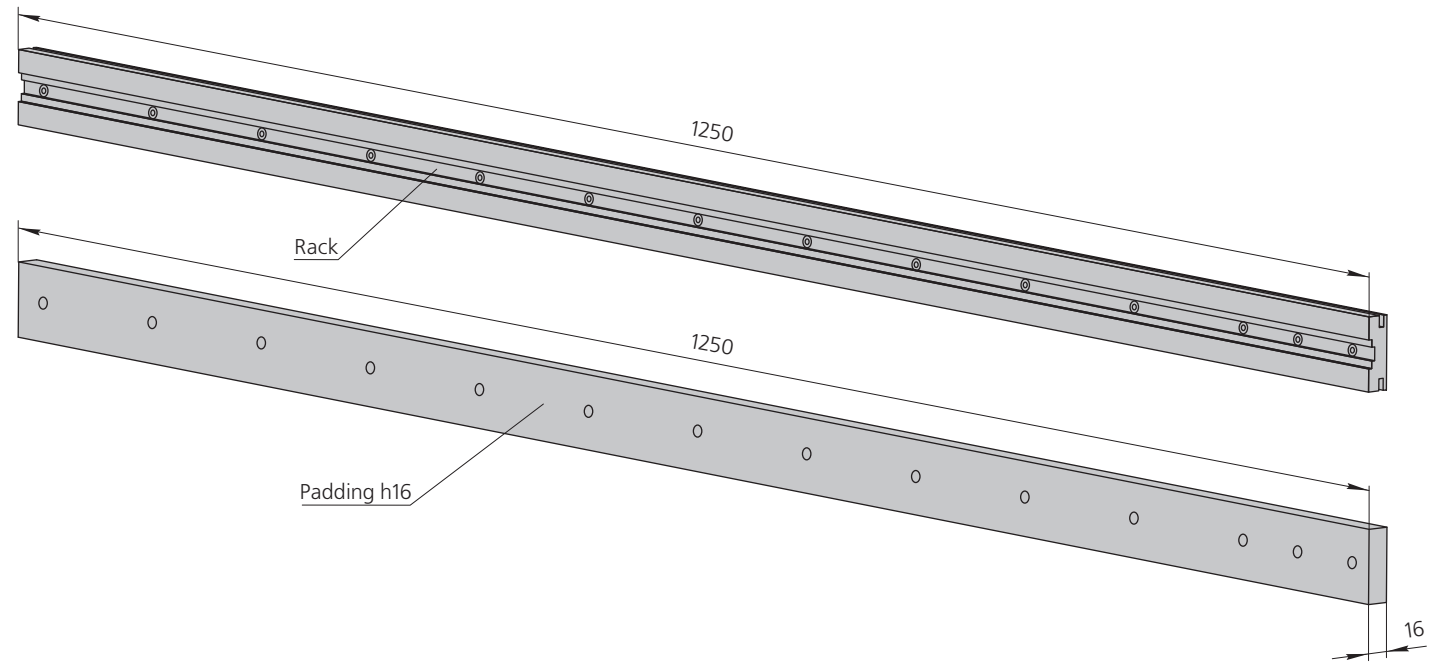
Do not remove the door seal of the sliding door during installation.



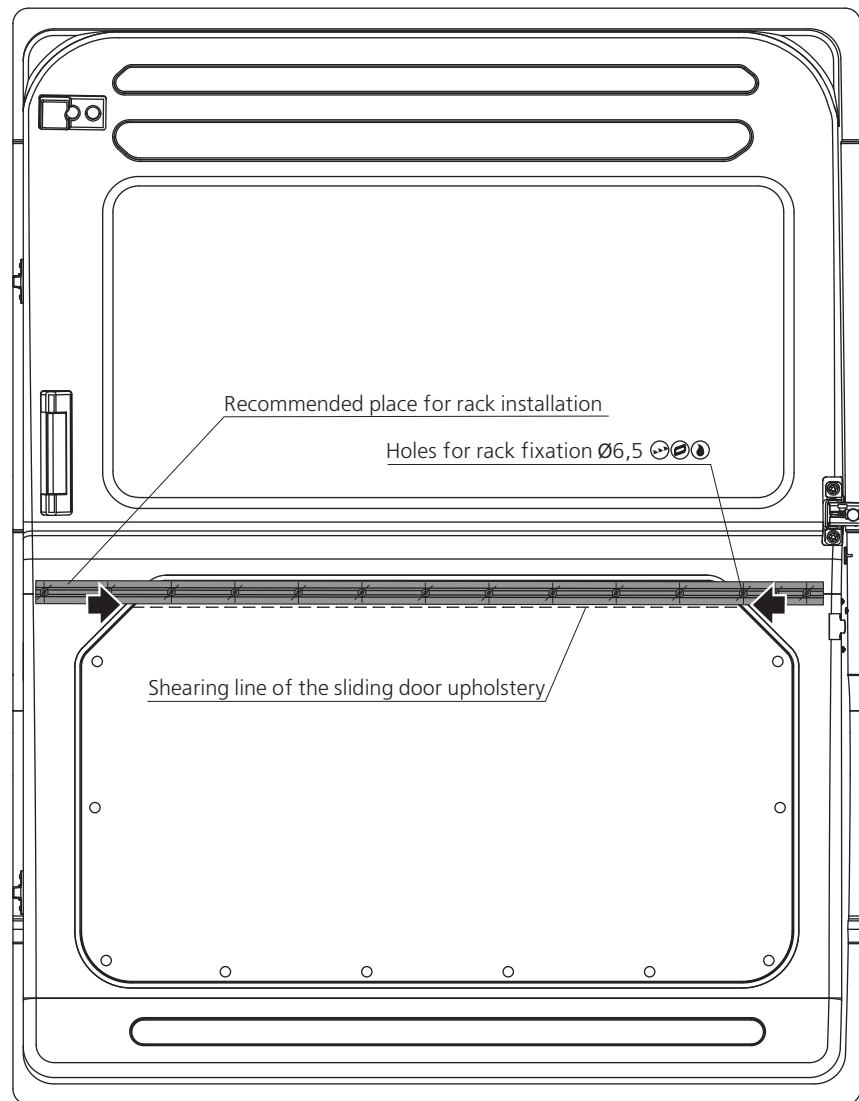
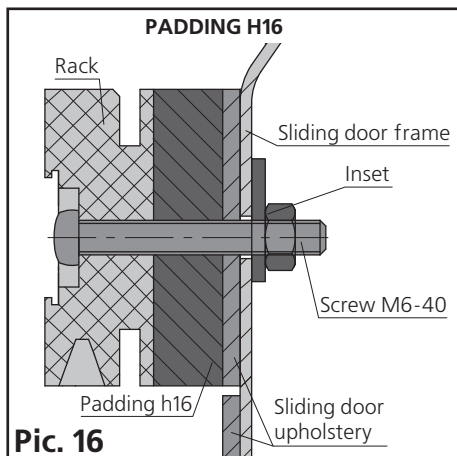
## 3.2 INSTALLATION OF THE RACK AND PADDING ON THE DOOR

Install the padding 1-h16 between the rack and upholstery of the sliding door (picture 15).

Plane A of the bearing support must be positioned 8-10 mm below plane B of the upper end face of the rack as shown in the picture.



Pic. 15



On this page you will find a recommended place for rack installation on the door where the upper edge of the sliding door upholstery is sawn off and touches the lower edge of the rack.

Close the door and install the sliding door upholstery.

Put the rack to the recommended place as shown in the picture. Using the rack, mark the centres of fixation holes and the shearing line of the door upholstery as shown in the picture.



**NOTE**



The rack must necessarily be fixed through 4 back holes and 1 front hole. The middle part of the rack can be fixed through 1 hole.

Drill holes Ø6.5 mm using the marks. The holes must be positioned in one line.

Saw off the upper edge of the upholstery using the marked shearing line.

Install the rack, padding h16 and sawn-off upper edge of the door upholstery using the metalware set (picture 16):

- Screws M6-40
- Insets (10 pieces)

Put the lower part of the door upholstery back to its place under the lower edge of the rack.

## 3.4 INSTALLATION OF THE RACK ON THE DOOR (VARIANT N°2)

On this page you will find a recommended place for rack installation on the door where it is installed on the sliding door panel.

Close the door without removing the door upholstery.

Put the rack to the recommended place as shown in the picture. Using the rack, mark the centres of fixation holes.

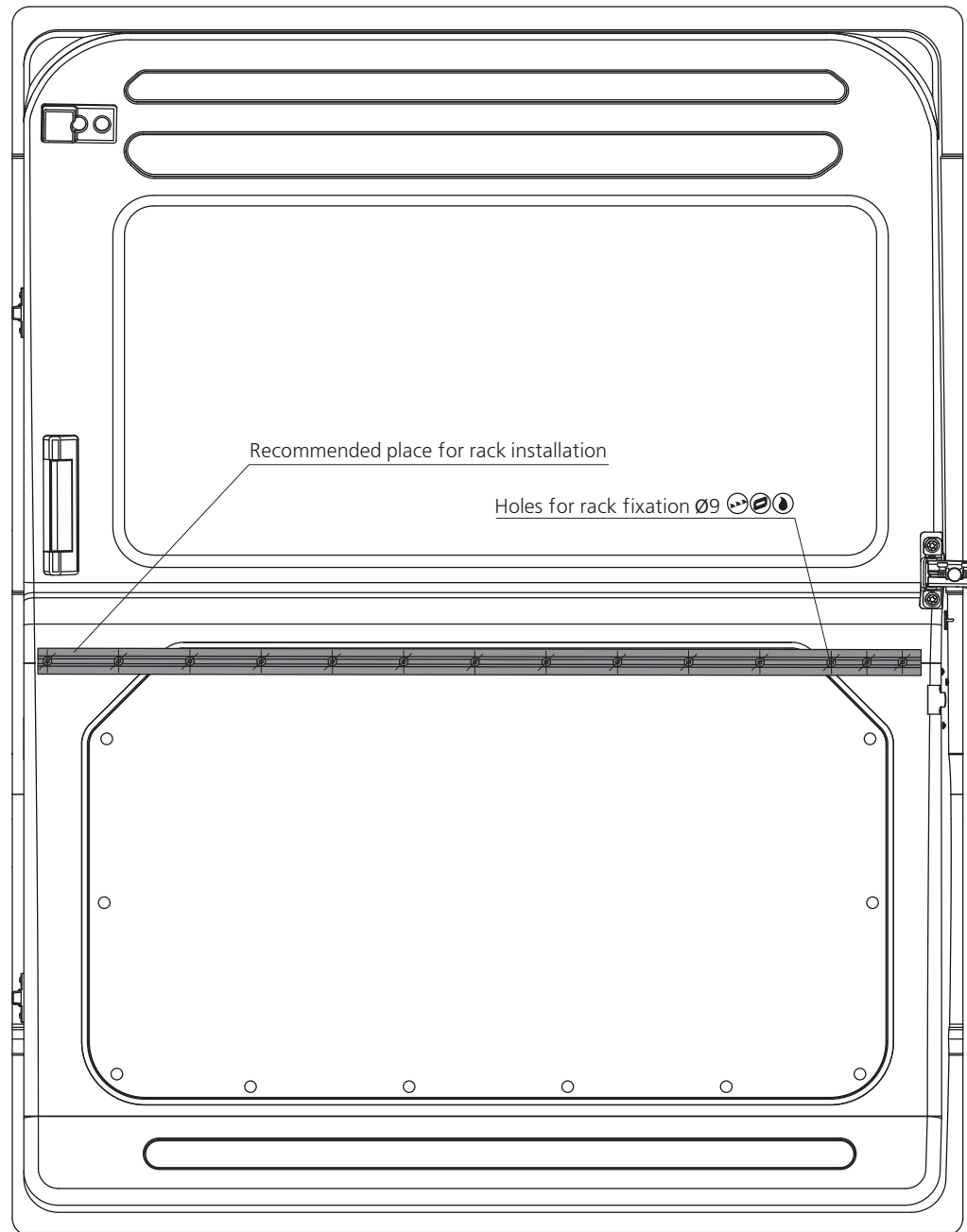


### NOTE

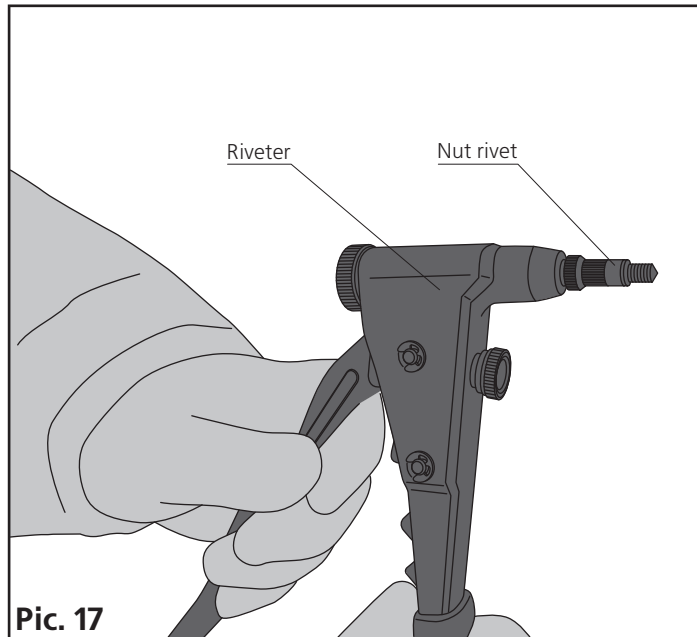


The rack must necessarily be fixed through 4 back holes and 1 front hole. The middle part of the rack can be fixed through 1 hole.

Drill holes  $\varnothing 9$  mm using the marks. The holes must be positioned in one line.  
Remove the rack and door upholstery.



### 3.4 INSTALLATION OF THE RACK ON THE DOOR (VARIANT N°2)



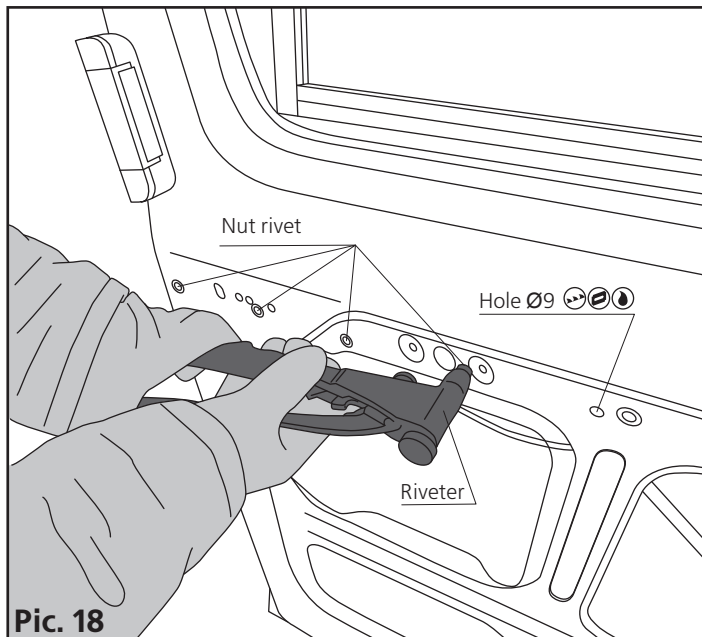
Pic. 17

Rivet all holes on the sliding door frame with a riveter using nut rivets (not included in the metalware set) as shown in picture 18.

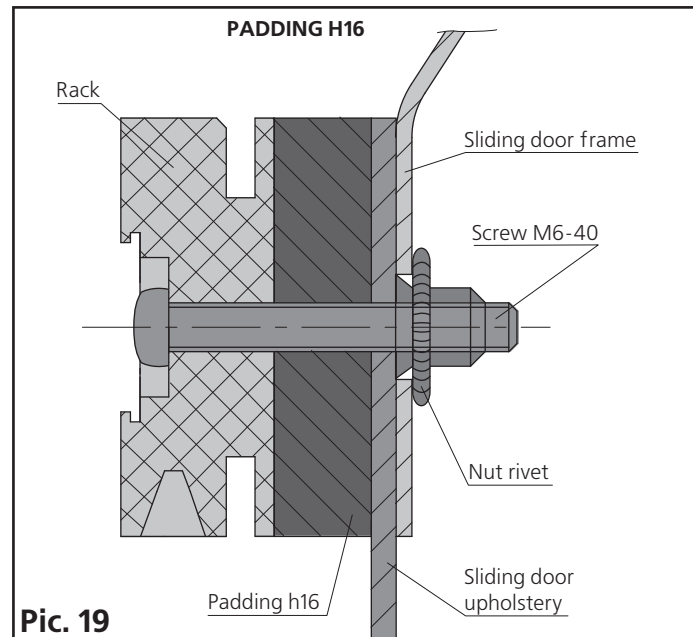
Put back the door upholstery onto the sliding door.

Install the rack and padding h16 on the sliding door panel using the metalware set:

- Screws M6-40 (picture 19).



Pic. 18



Pic. 19

### 3.5 PREPARING TO DOOR DRIVE INSTALLATION

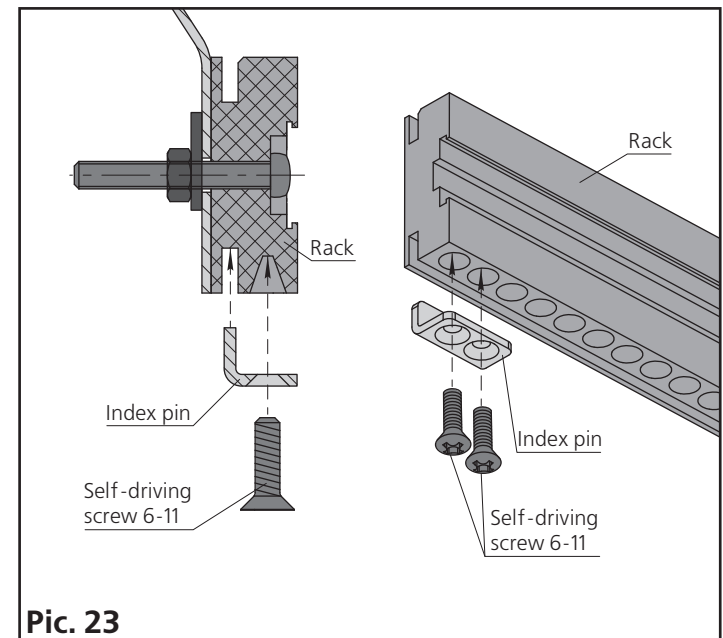
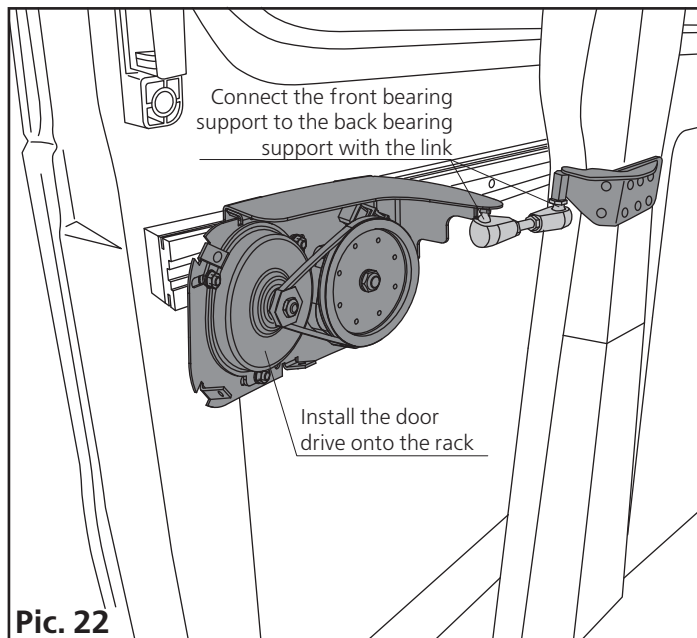
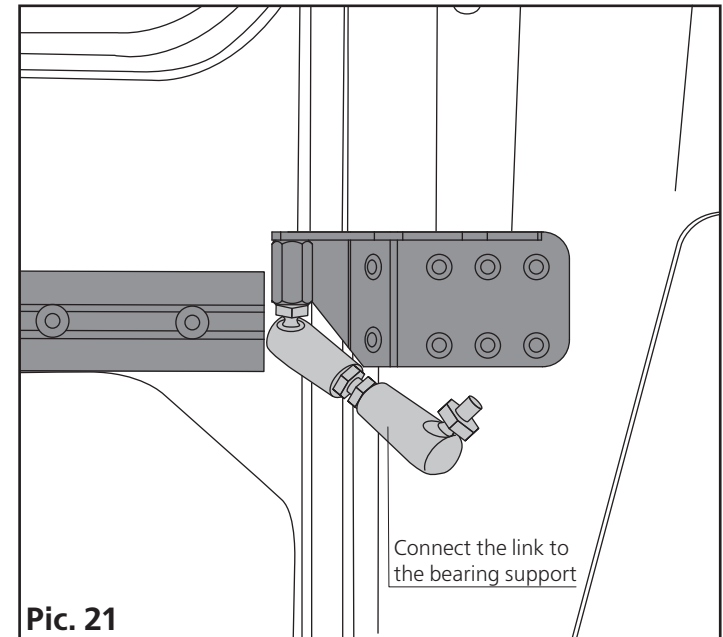
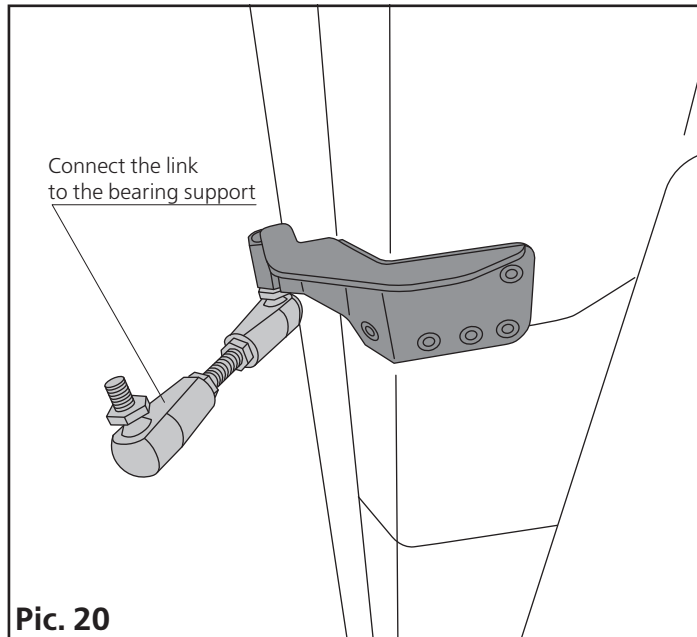
Connect the link to the bearing support (picture 20, 21).

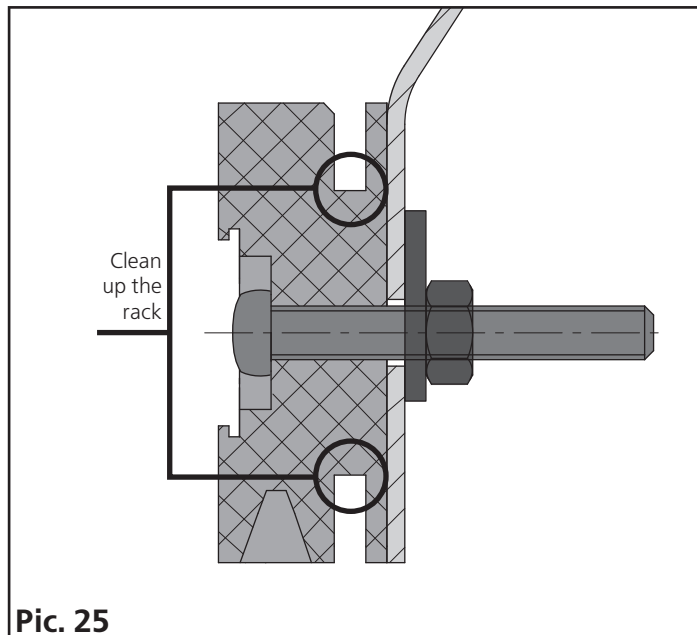
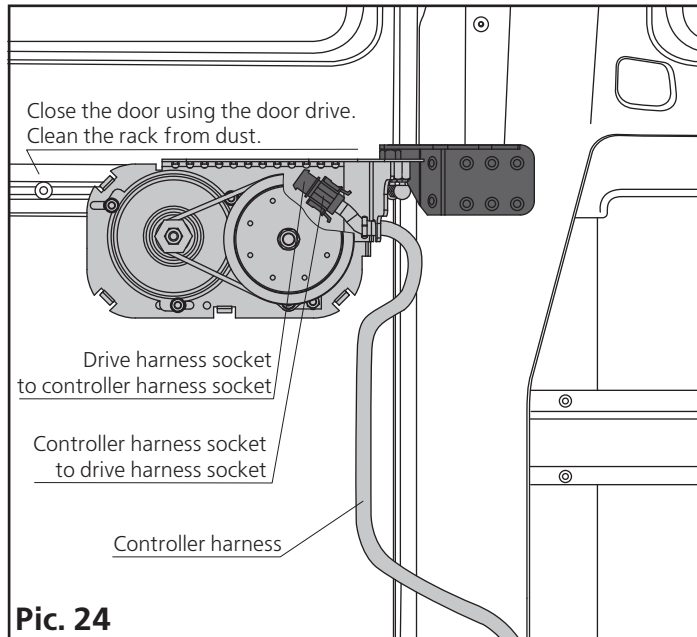
Close the door.

Make sure that the parts of the bearing support and the link do not hinder to close the door easily.

Install the door drive onto the rack (picture 22). Connect the front bearing support and the back bearing support with the link.

Install the index pin to its end position on the rack (picture 23).





Clear up the grooves of the rack from dust and cuttings (picture 24, 25).

Connect the drive to the controller.

Insert 30A fuse into the main harness.

Start up the engine of the minibus.

Press the control button. The drive will close the door and the controller will be making sound signals for 1-2 sec. Then start opening cycle. The drive will open the door and slowly roll up to the index pin. After that the drive will be working in regular operation mode.



**NOTE**



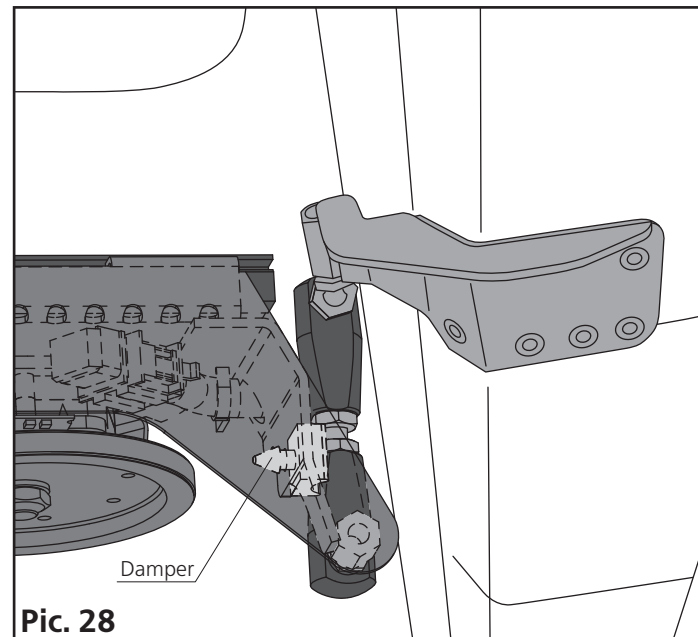
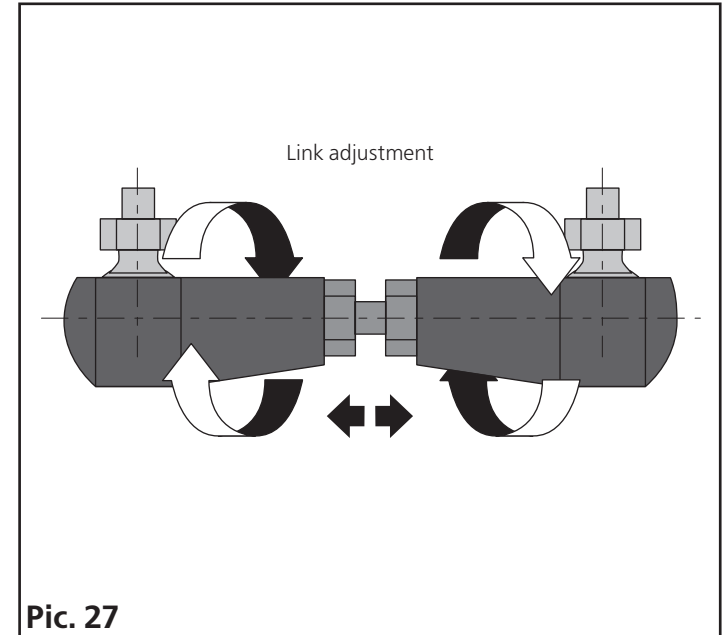
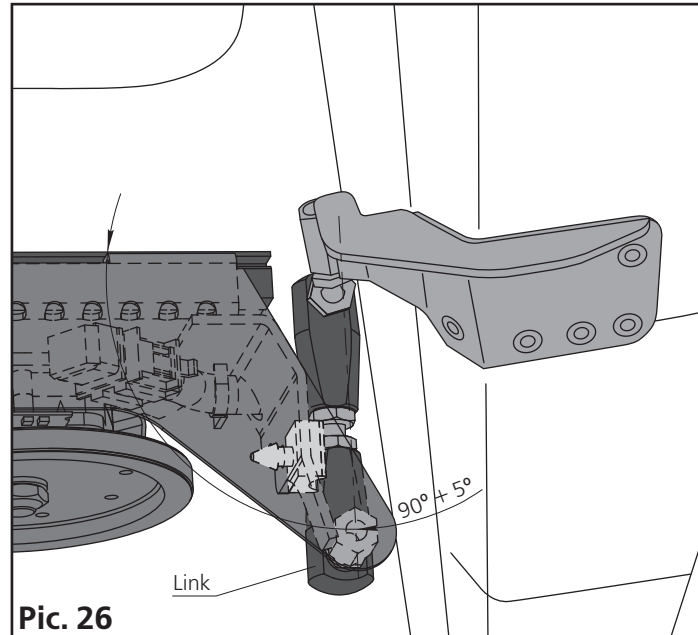
Before removing the drive (if necessary) or switching off the controller, first remove 30A fuse. Thus you will stop the drive's power supply.

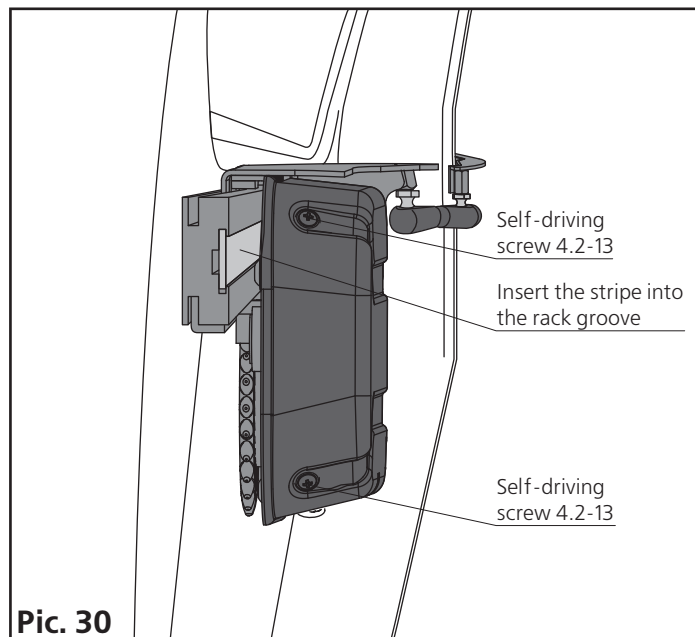
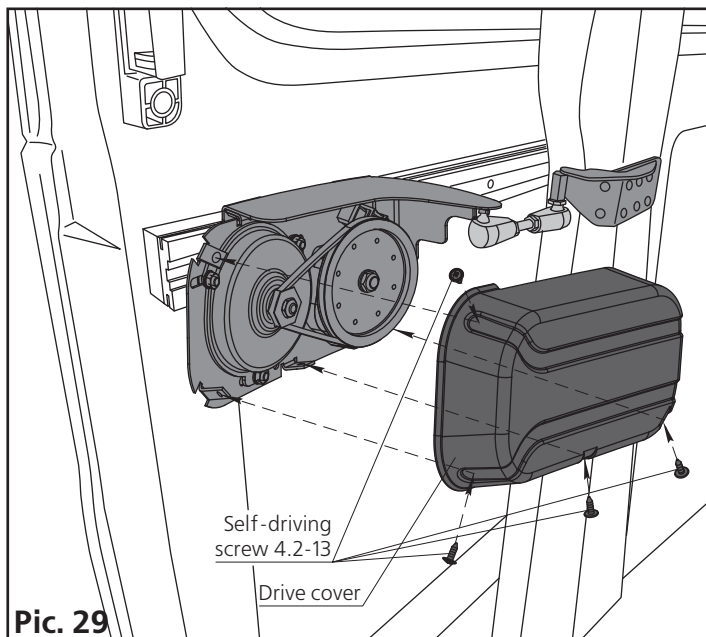
### LINK ADJUSTMENT

The position of the link in normal closed position of the door is shown in picture 26.

Extend the length of the link so that the door would close tightly (picture 27).

If the link is installed correctly it must come up against the damper on the carriage (picture 28).

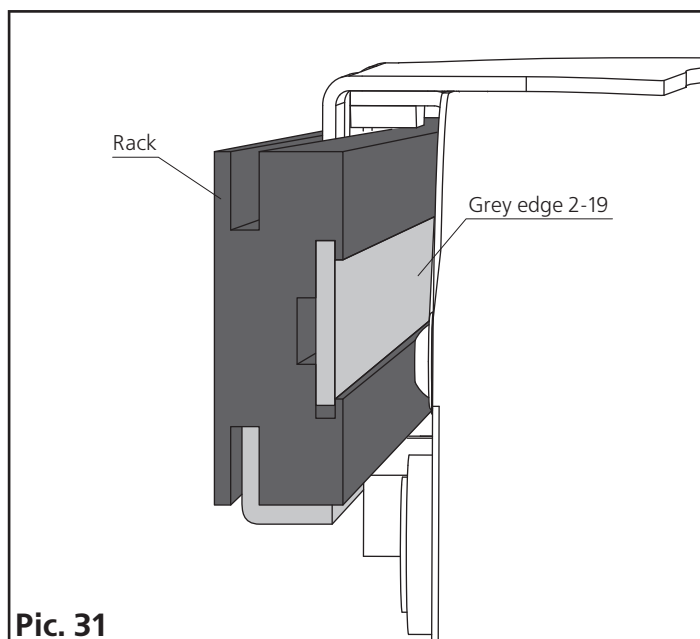




Fix the cover of the drive with 4 self-driving screws 4.2-13 from the metalware set (picture 29).

Cut the protective edge to fit the rack (picture 30, 31).

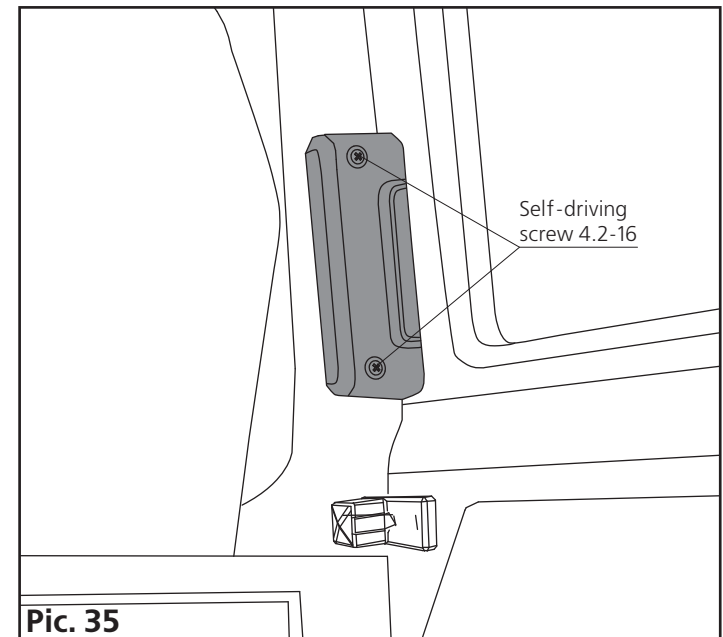
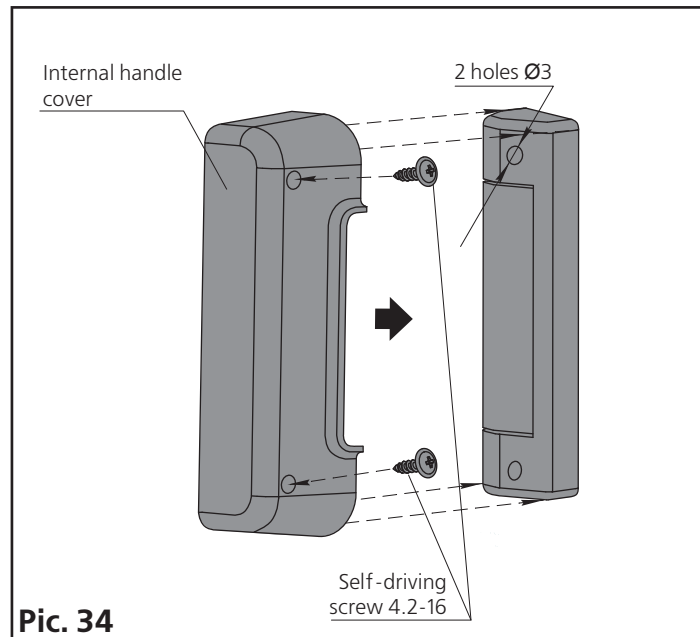
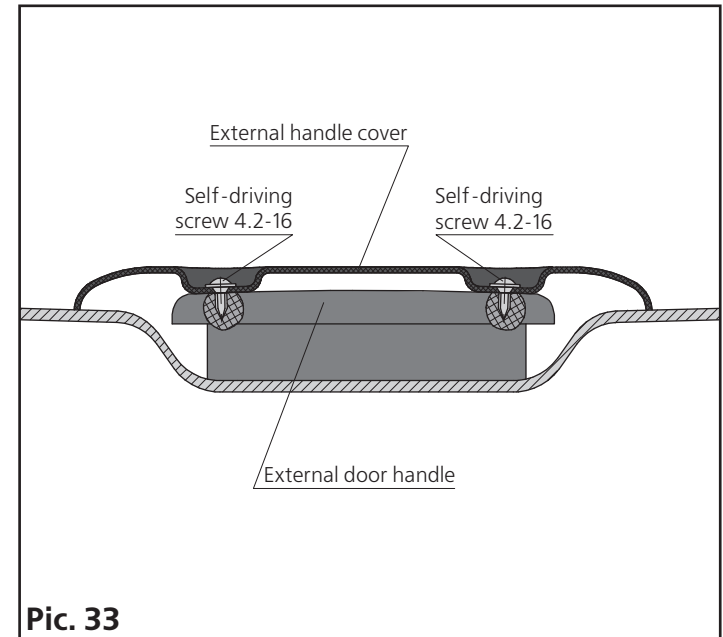
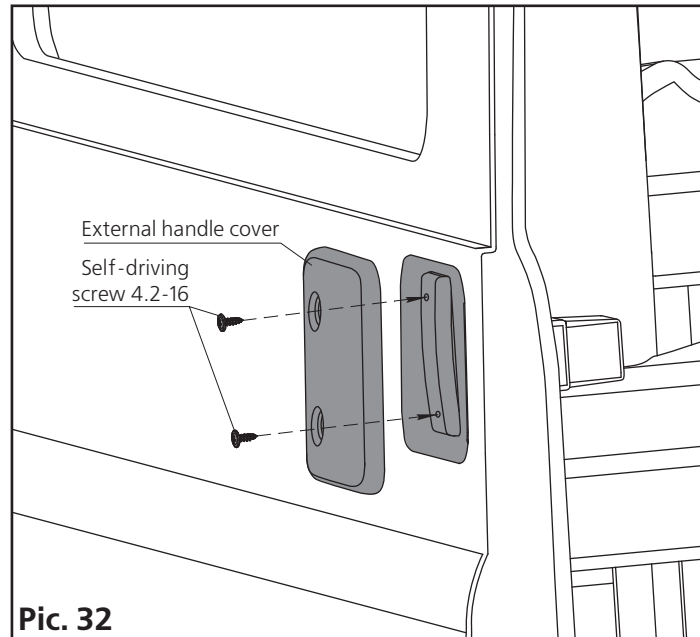
Carefully insert the stripe into the rack groove as shown in pictures 30 and 31.

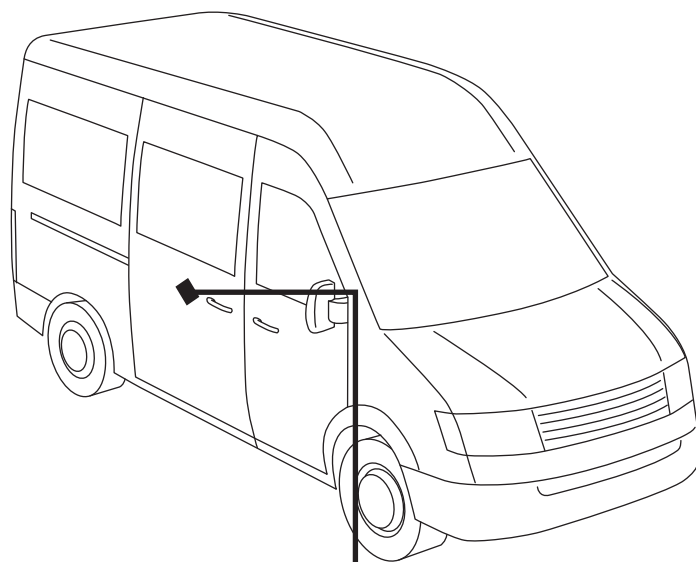




Put the cover of the external handle to the opening/closing door handle. Mark and drill 2 holes  $\varnothing 3$  mm. Fix the cover of the external handle on the opening/closing door handle with 2 self-driving screws 4.2-16 from the metalware set as shown in pictures 32, 33.

Put the cover of the internal handle to the place shown in picture 35. Fix it with 2 self-driving screws 4.2-16 from the metalware set as shown in pictures 34, 35.





Place the information sticker on the outside panel of the sliding door next to the external handle so that it could be easily noticed.

### OPENING AND CLOSING THE DOOR

Press the control button for 0.5 sec. The door will start moving after you release the button.

### STOPPING THE DOOR

Press the control button to stop the door while it is moving.

### AUTOMATIC ROLL-BACK

If the door pushes against an obstacle while it is closing, it will stop automatically and roll back.

### ADJUSTMENT OF THE WIDTH OF DOOR OPENING

Open the door. Adjust the needed width by hand. Press the control button for 10 sec. until you hear 2-times sound signal. Release the button. Now the drive will automatically remember the adjusted width of the opening.

### OPERATING MODE OF SLIDING DOOR FIXING

The drive can operate in 2 modes:

1. With fixing (factory settings) picture 31).
2. Without fixing (picture 32).

To change the mode to operating without fixing press the control button for 15 sec. until you hear 3 long sound signals. Release the button.

### RETURN TO FACTORY SETTINGS

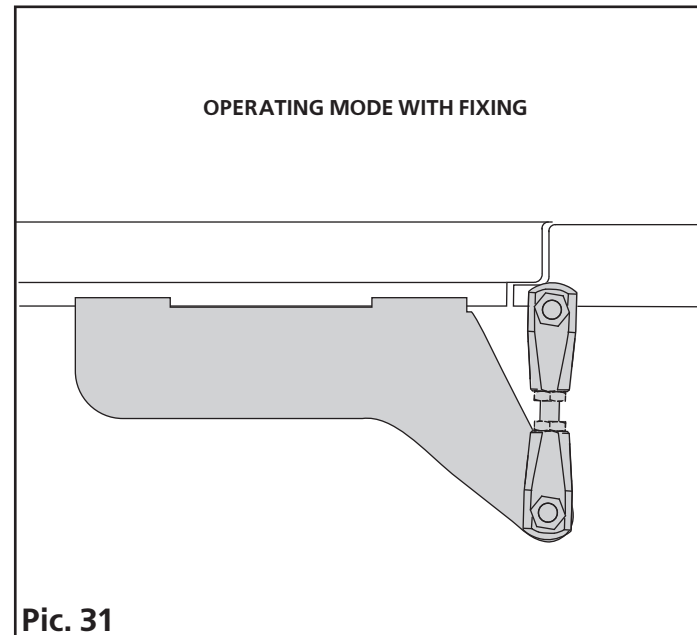
Press the control button for 20 sec. until you hear 4-times sound signal. Release the button. All drive settings will return to factory settings.



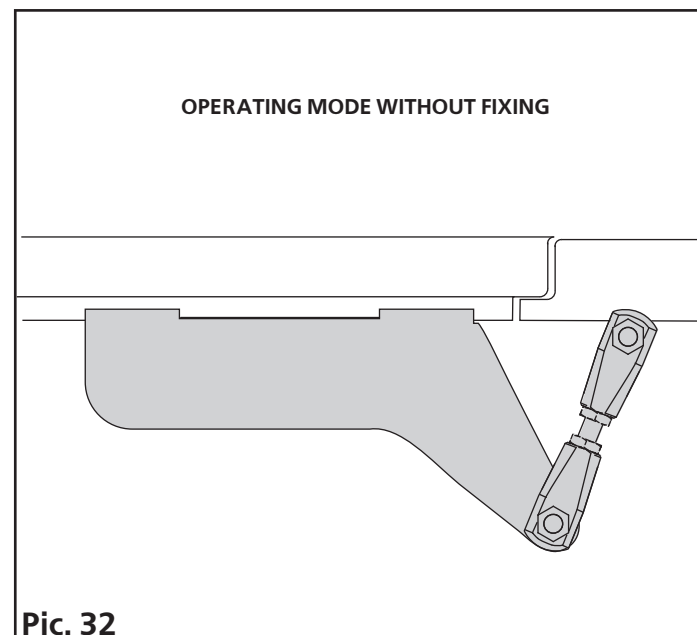
#### NOTE



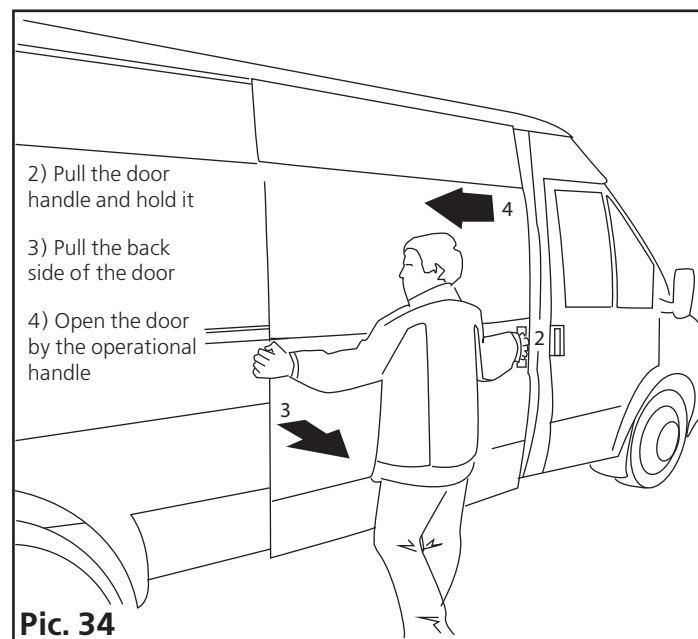
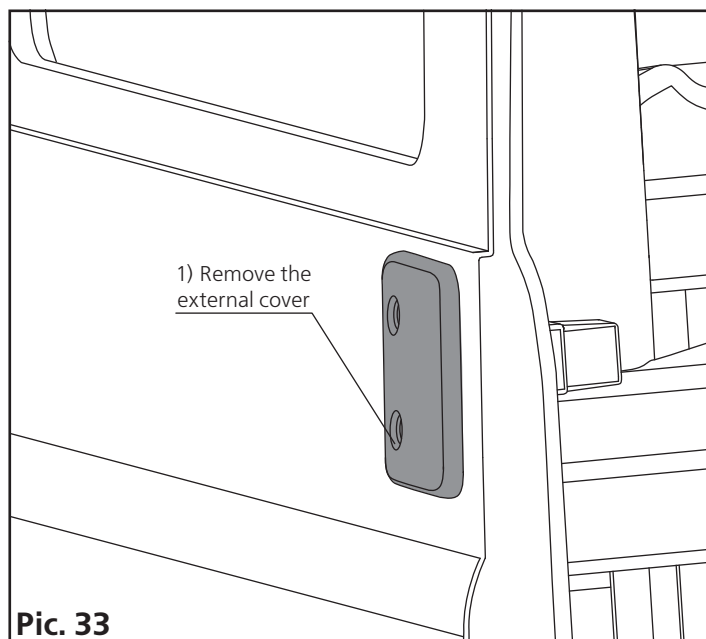
The drive settings will automatically return to factory settings in case of power outage.



Pic. 31



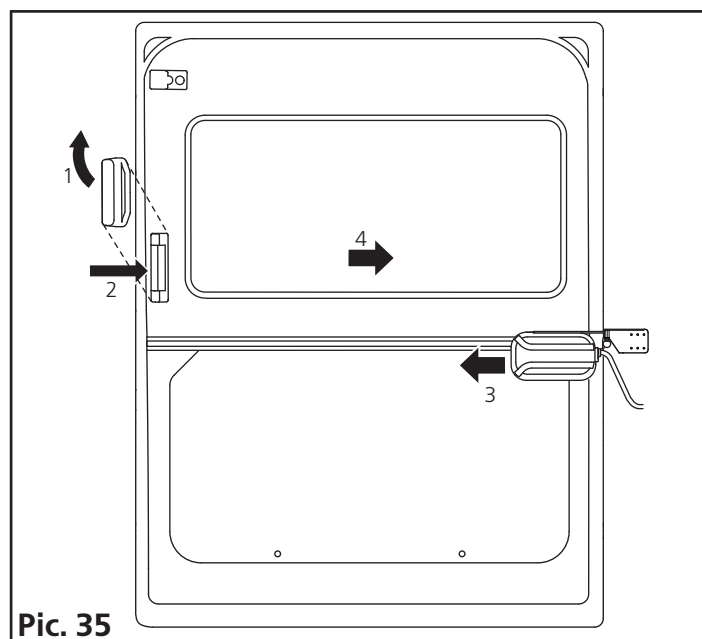
Pic. 32

**EMERGENCY DOOR OPENING****FROM THE OUTSIDE (ONLY IN THE OPERATING MODE WITHOUT FIXING)**

1. Remove the external cover (picture 33).
2. Pull the door handle and hold it (picture 34).
3. Pull the back side of the door (picture 34).
4. Open the door by the operational handle (picture 34).

**FROM THE INSIDE**

1. Remove the handle cover (picture 35).
2. Pull the door handle and hold it (picture 35).
3. Move the drive to the left against the stop (picture 35).
4. Open the door by hand (picture 35).



### CHANGING TO MANUAL OPERATING MODE

1. Unscrew the covers of the external and internal handles and open the door by hand (picture 36).
2. Remove the index pin (picture 37).
3. Remove the drive cover (picture 37).
4. Disconnect the drive harness socket (picture 37).
5. Unscrew the link (picture 38).
6. Remove the drive off the rack (picture 38).

