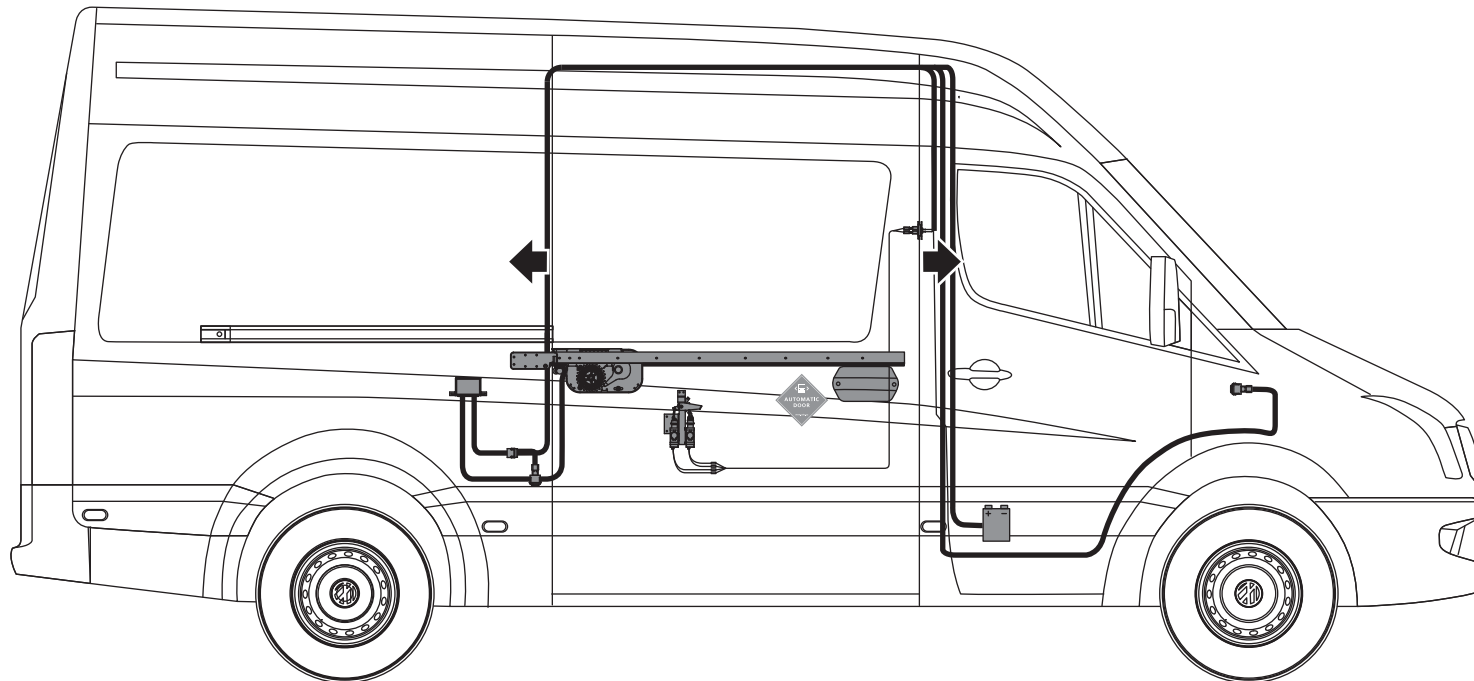




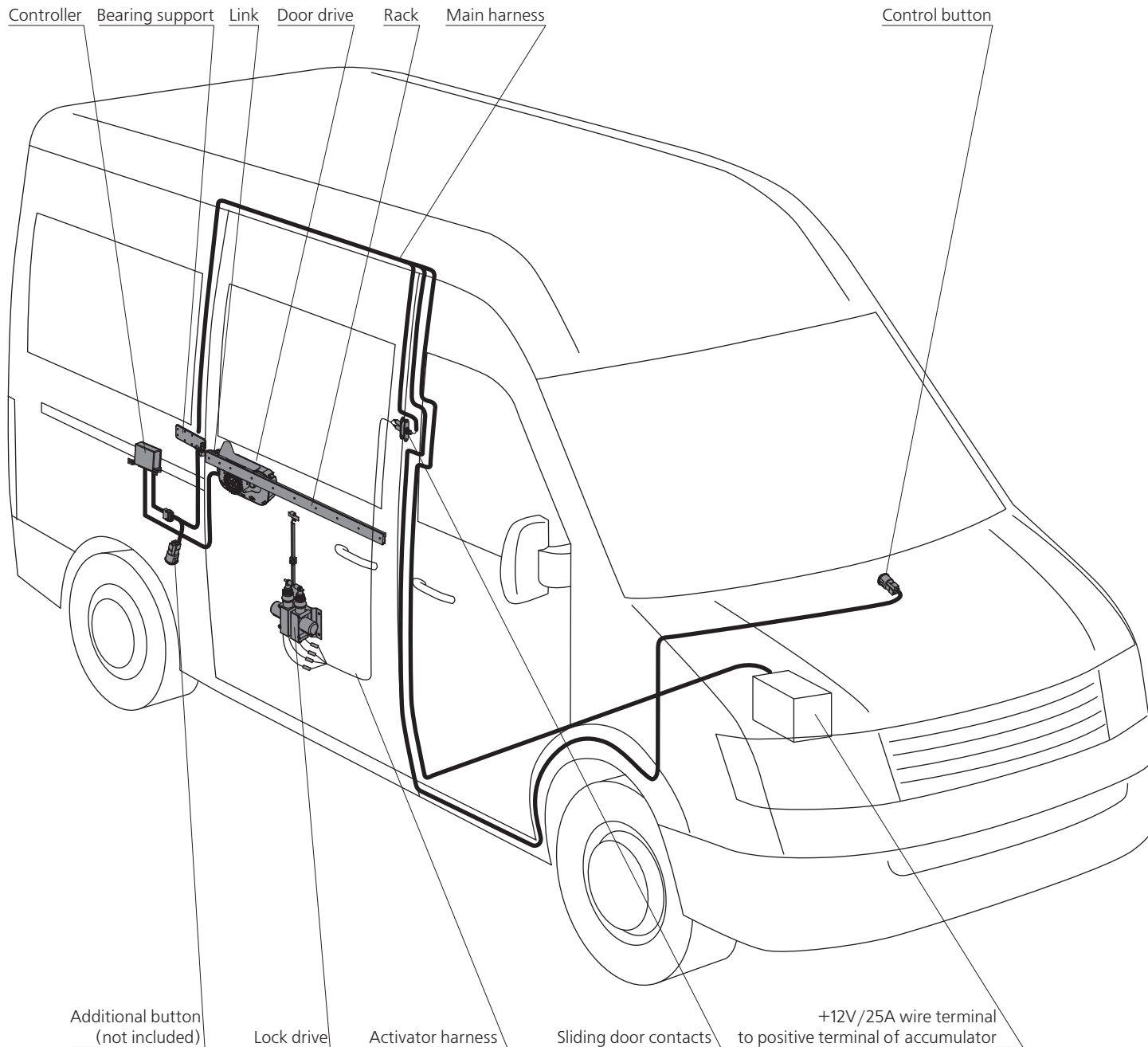
RACK AND PINION DRIVE ADOR CROCO INSTALLATION MANUAL

19.06.2013

MERCEDES SPRINTER (906) / VOLKSWAGEN CRAFTER



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This model is suitable for opening and closing sliding doors in minibus Volkswagen Crafter.

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.

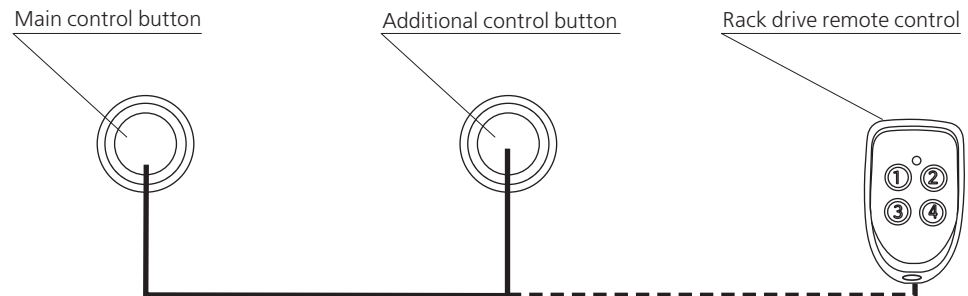
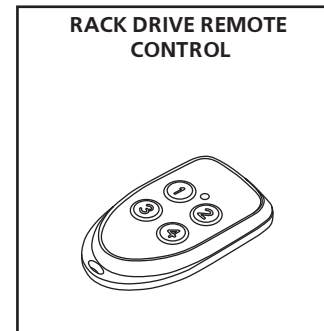
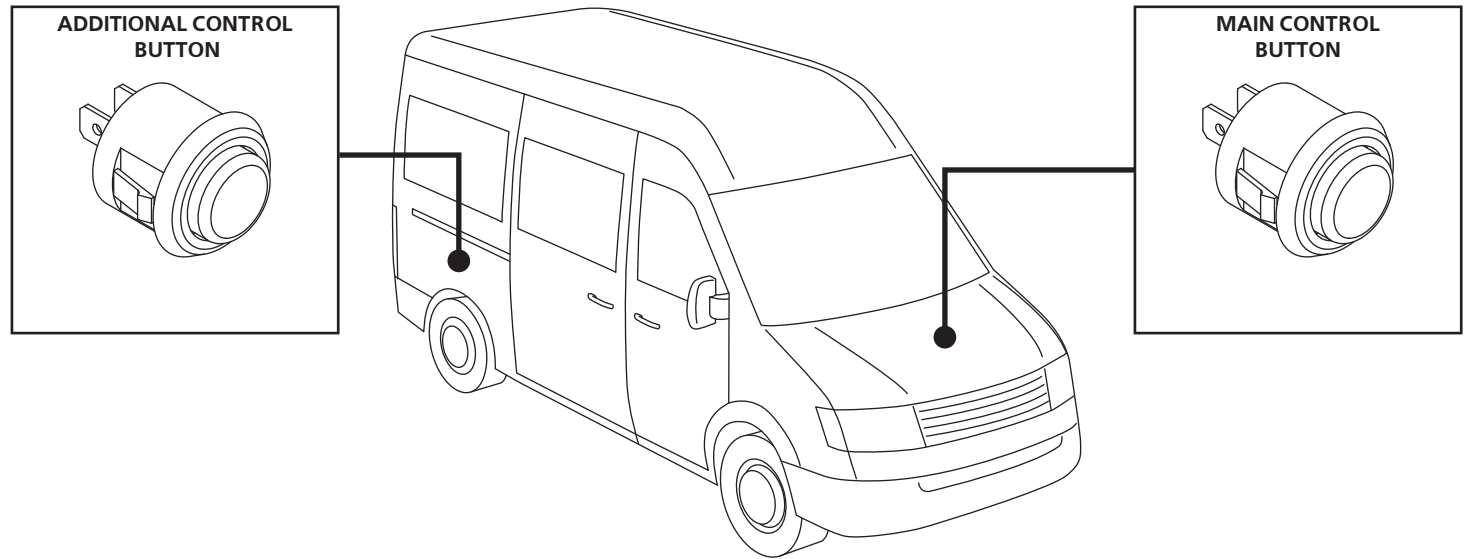
OPERATING CONTROL

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

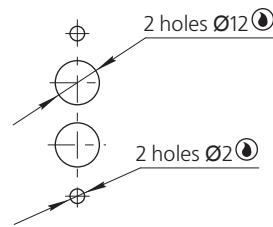
Clip withdrawal tool.....	1
Head stock 10-17 mm.....	1 set
Riveter.....	1
Riveter for pull-out nuts GESIPA GBM10	1
Centre punch	1
Combination wrenches	1 set
Metal ruler.....	1
Hammer.....	1
Hexagon wrench tools	1
Star wrench tools Torx	1
Knife.....	1
Flat tip screwdriver	1
Cross tip screwdriver	1 set
Pliers	1 set
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
Sidescutter	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

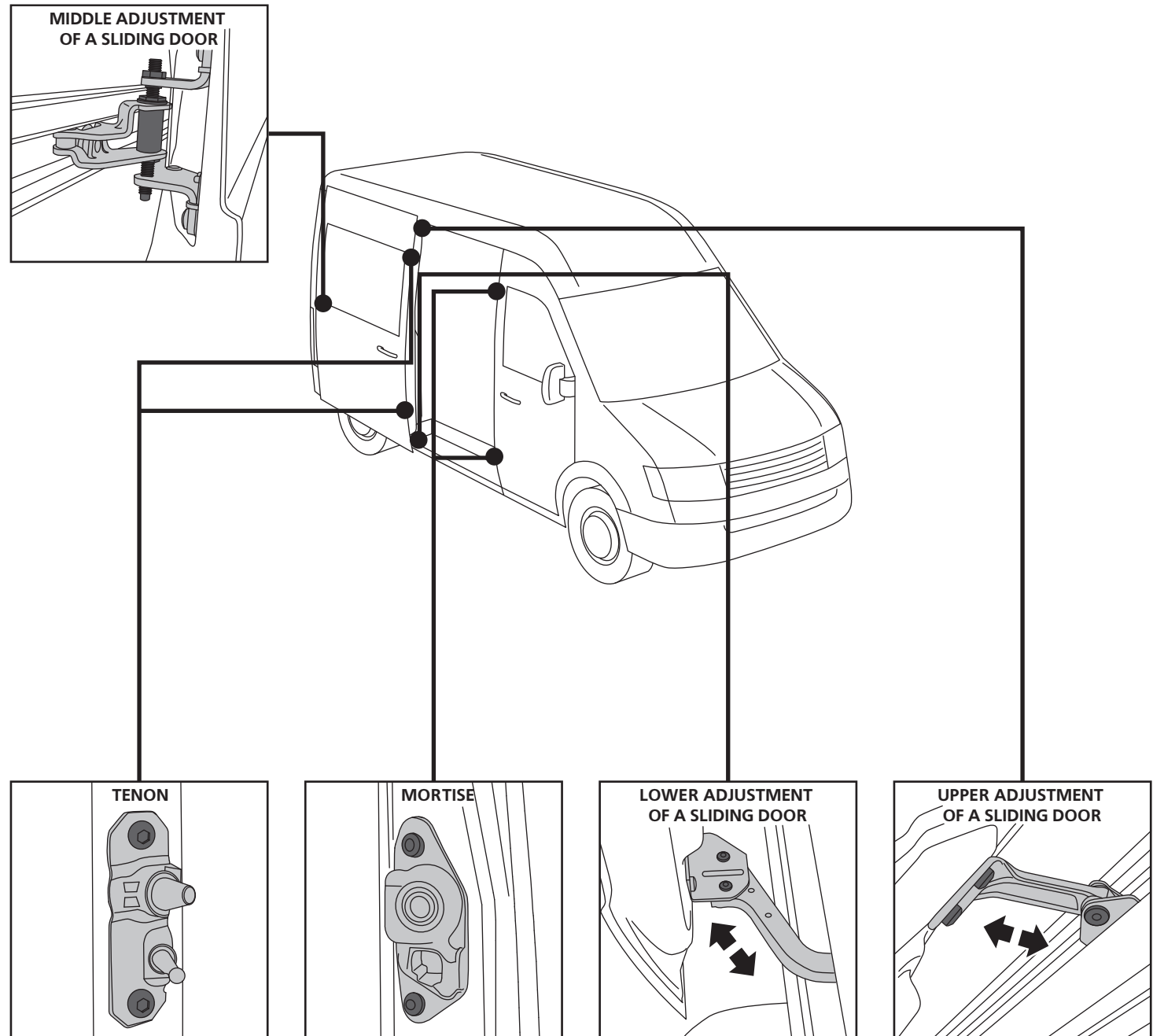
- ☉ – Remove burrs off the edges
- ☉ – Blunt sharp edges
- ☉ – Coat the edge with rust-proof liquid

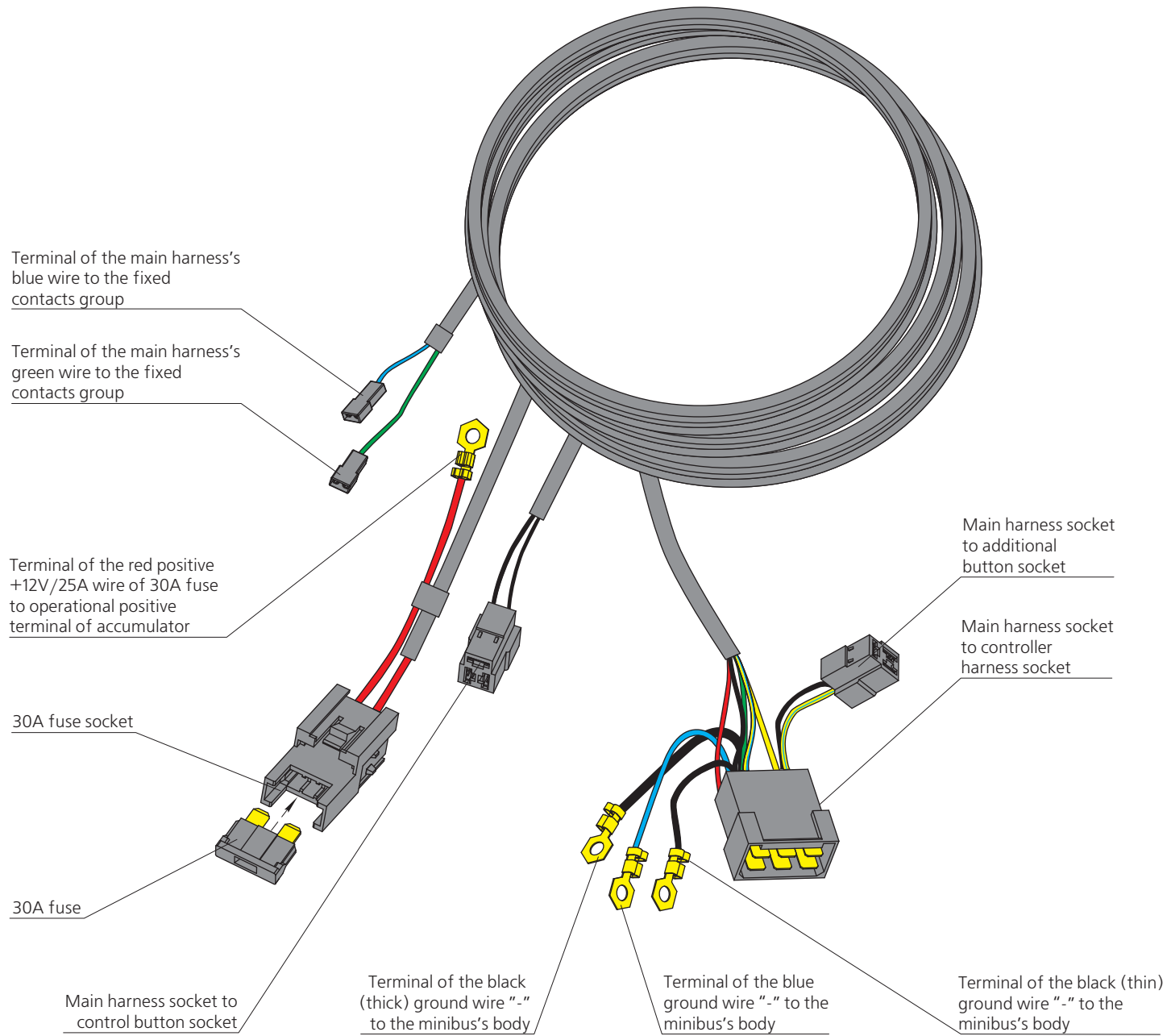
Example: coat the edges of the holes with rust-proof liquid



2.1 DOOR ADJUSTMENT

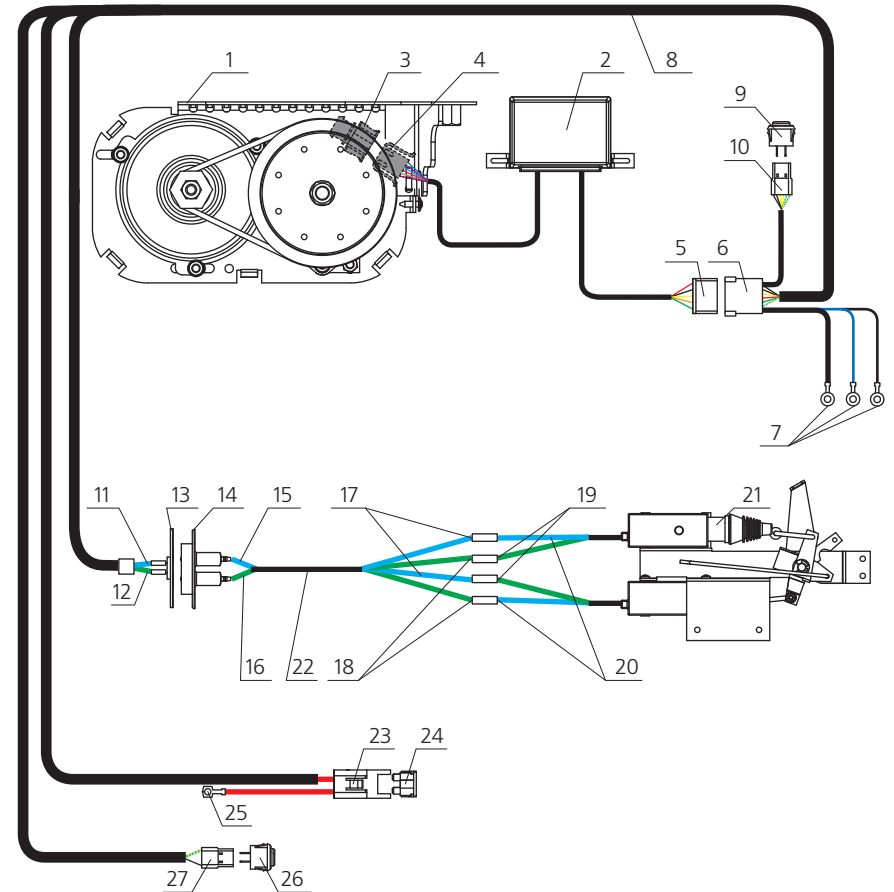
Before installing the drive, adjust the minibus's door because its adjustment influences the drive operation.

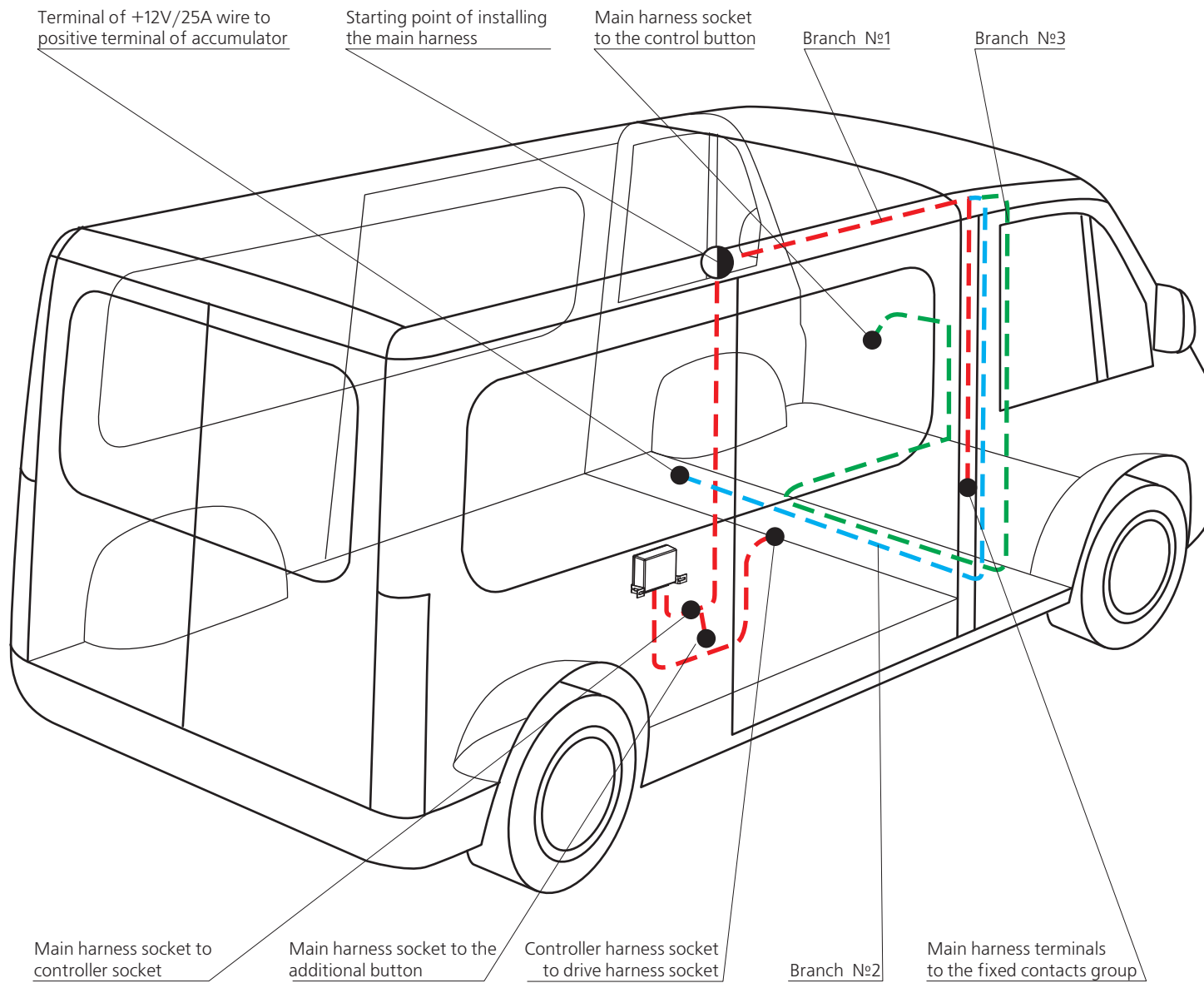




2.3 CONNECTION DIAGRAM OF RACK AND PINION DRIVE

1. Rack drive
2. Controller
3. Drive harness socket to controller 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 blue wire to the fixed contacts group
12. Terminal of the main harness's green wire to the fixed contacts group
13. Fixed contacts group
14. Movable contacts group
15. Terminal of the activator harness's blue wire to the movable contacts group
16. Terminal of the activator harness's green 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 green wire
20. Terminal of the activator's blue 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:

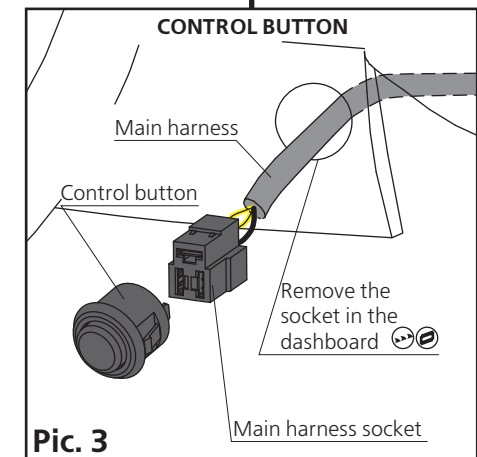
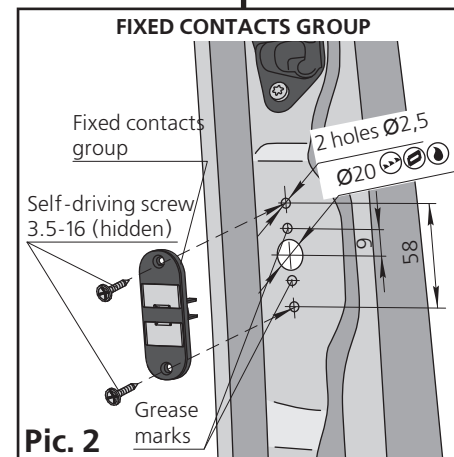
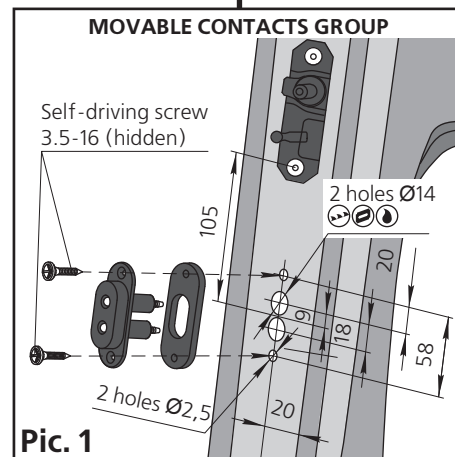
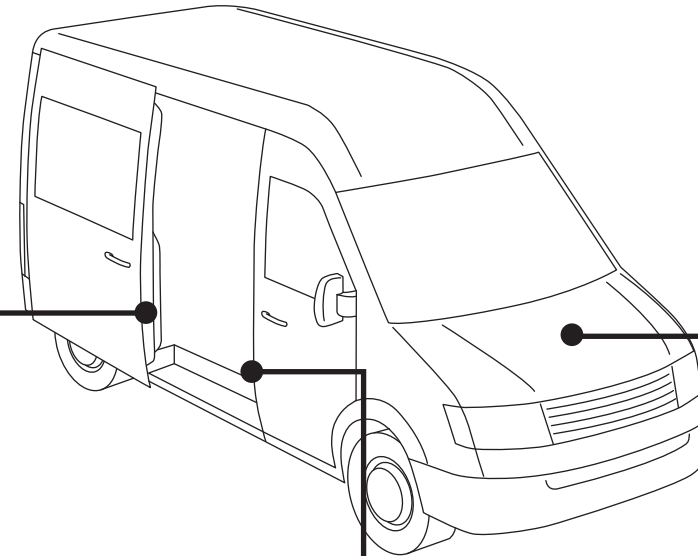
- Extend branch №1
- Extend branch №2
- Extend branch №3

To place the control button drill a hole $\varnothing 22$ 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.

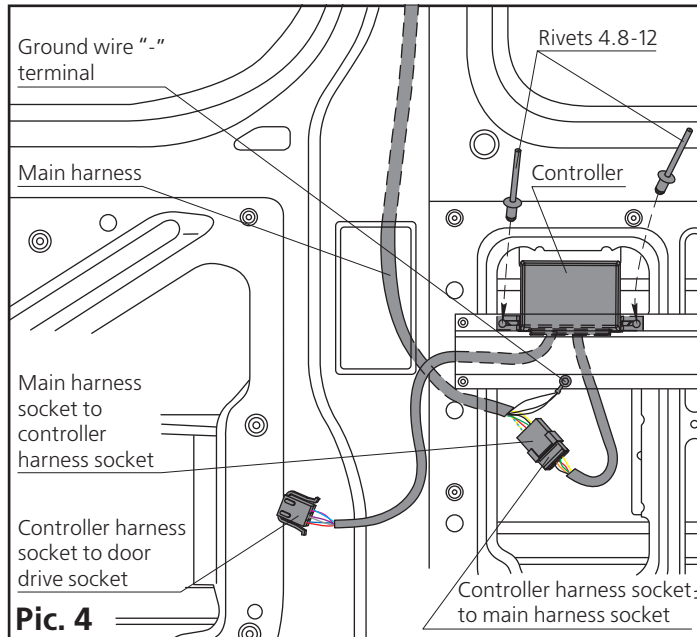
The fixed contacts group is fixed with 2 self-driving screws 3.5-16 (hidden) from the metal-ware set. Drill 2 holes $\varnothing 14$ mm. Remove burrs from the edges, blunt sharp edges and coat them with acid-free rust-proof liquid. Drill 2 holes $\varnothing 2.5$ mm (picture 1). Connect the activator to the fixed contacts group by the activator harness in the following order: connect the blue wire of the activator to the blue wire of the activator harness and the green wire of the activator to the green wire of the activator harness. Connect the green wire of the activator harness to the upper contact of the movable contacts group and the blue wire to the lower contact as shown in the pictures on pages 8, 12.

Apply lubrication grease on the collar edge of the movable contacts group. Open and close the door. Using the marks left by the grease on the pillar, mark and drill 2 holes $\varnothing 20$ mm. Remove burrs from the edges, blunt sharp edges and coat them with acid-free rust-proof liquid. Drill 2 holes $\varnothing 2.5$ mm. Fix the fixed contacts group with 2 self-driving screws 3.5-16 (hidden) from the metalware set (picture 2).

Connect the green wire terminal of the main harness to the fixed contacts group so that during the door closing it would contact the green wire terminal of the activator harness connected to the movable contacts group and the blue wire of the main harness would contact the blue wire of the activator harness as shown in the picture on page 8.

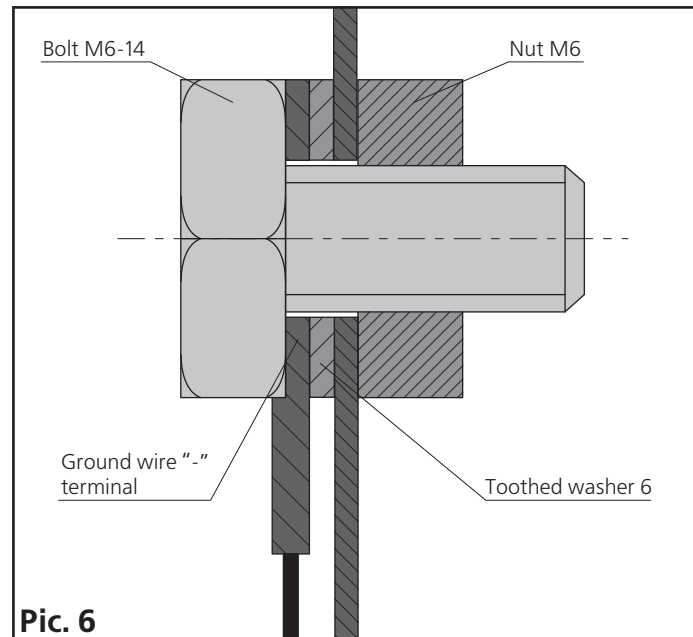
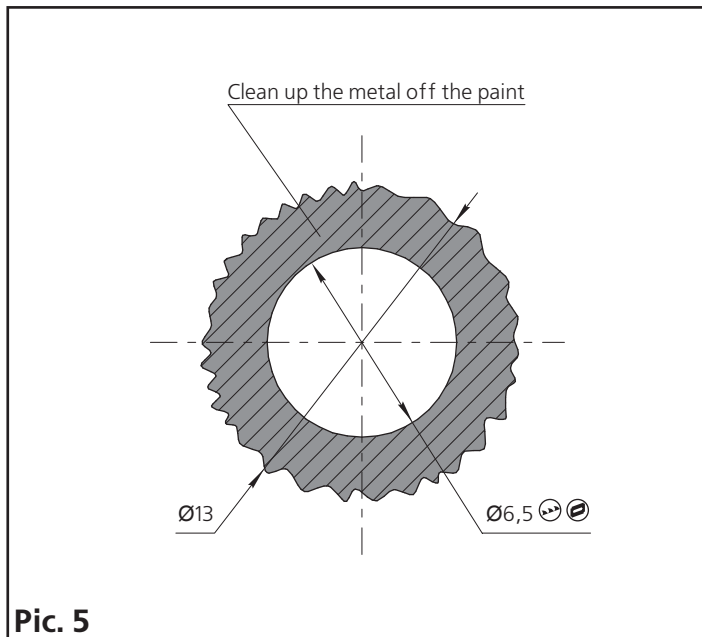


12 2.6 CONTROLLER INSTALLATION AND CONNECTION OF GROUND WIRE "-" TERMINAL



Place the controller and fix it with 2 rivets 4.8-12 from the metalware set under 2 drilled holes $\varnothing 6.5$ mm as shown in picture 4.

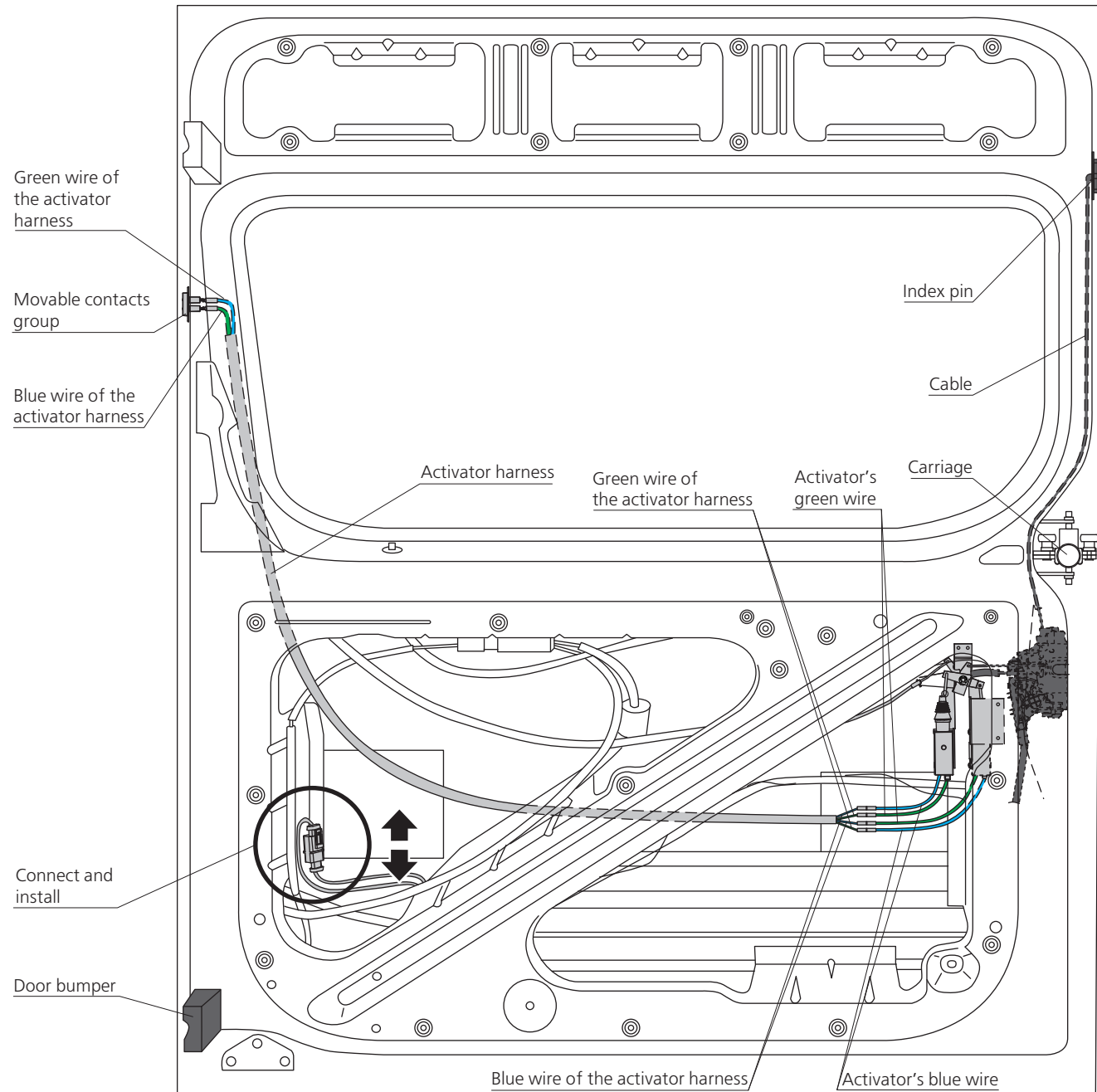
To fix the ground wire "-" terminal of the main harness drill a hole $\varnothing 6.5$ mm in any place of the internal wall of the body next to the drive as shown in picture 5. Remove the paint off the metal around the hole to ensure good contact as shown in picture 5. Fix the ground wire "-" terminal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



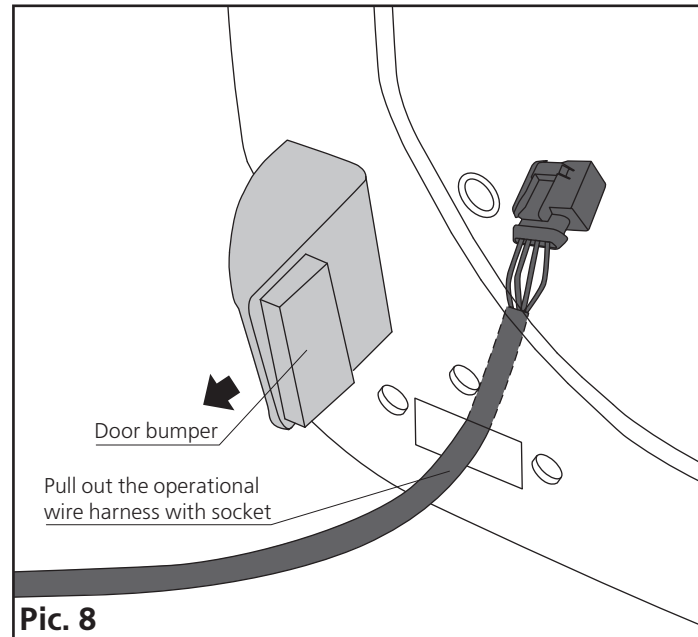
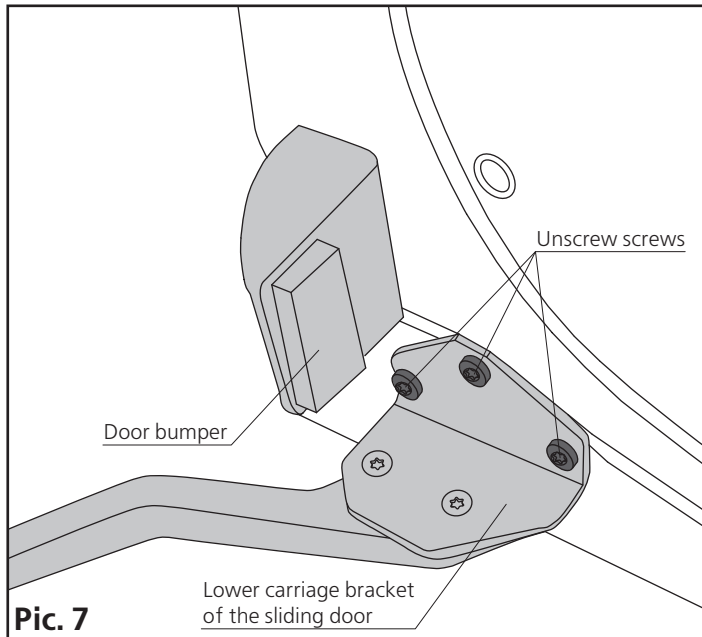
2.7 INSTALLATION OF UPPER AND LOWER DRIVES AND ACTIVATOR HARNESS 13

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.



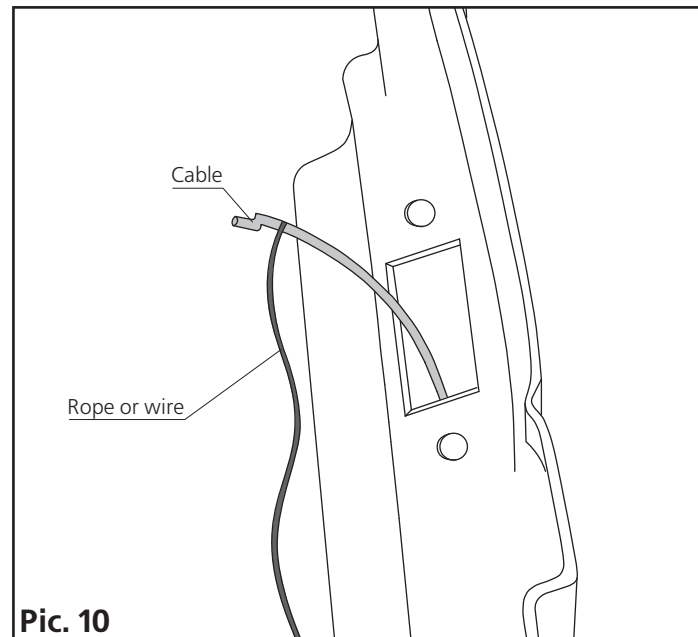
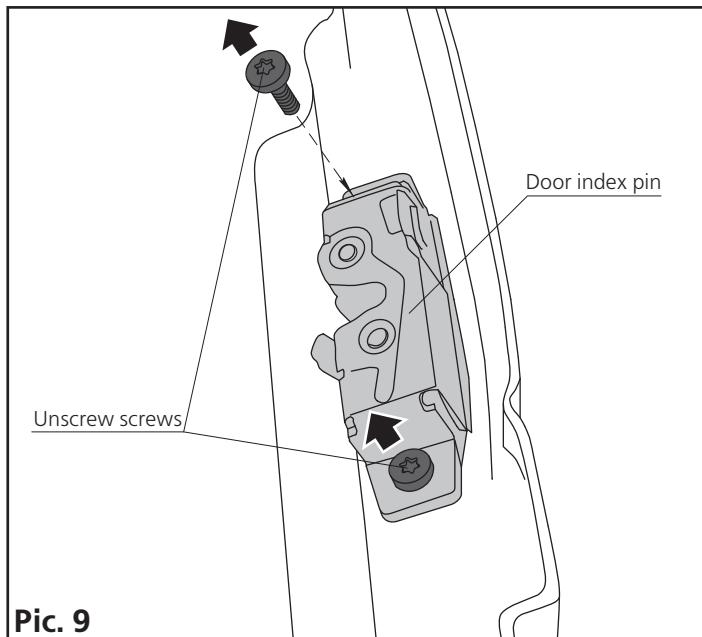
14 2.7 INSTALLATION OF UPPER AND LOWER DRIVES AND ACTIVATOR HARNESS



Disconnect the socket of the operational wire harness as shown in the picture on page 12 and remove the door.

Remove the door bumper. Unscrew 3 screws of the lower carriage bracket of the sliding door (picture 7). Pull out the disconnected wire harness through the appeared hole (picture 8).

Unscrew 2 screws of the door index pin and disconnect the cable from it (picture 9). Tie one-metre-long rope or wire to the cable (picture 10).



2.7 INSTALLATION OF UPPER AND LOWER DRIVES AND ACTIVATOR HARNESS 15

Unscrew 3 fixation screws of the door lock and dismantle it (picture 11).

Pull out the lock from the door pocket. Disconnect the cable from it (picture 12). Install the drive link instead (picture 13). Put the door lock back together with the door lock drive. Fix the door lock with 3 screws (picture 11).

Adjust the tightening of the drive link of the door lock moving the drive to the left and to the right. Mark 4 fixation holes $\varnothing 5$ mm for rivets 4.8-12 from the metalware set. Fix the door lock drive with 4 rivets 4.8-12 from the metalware set (picture 14).

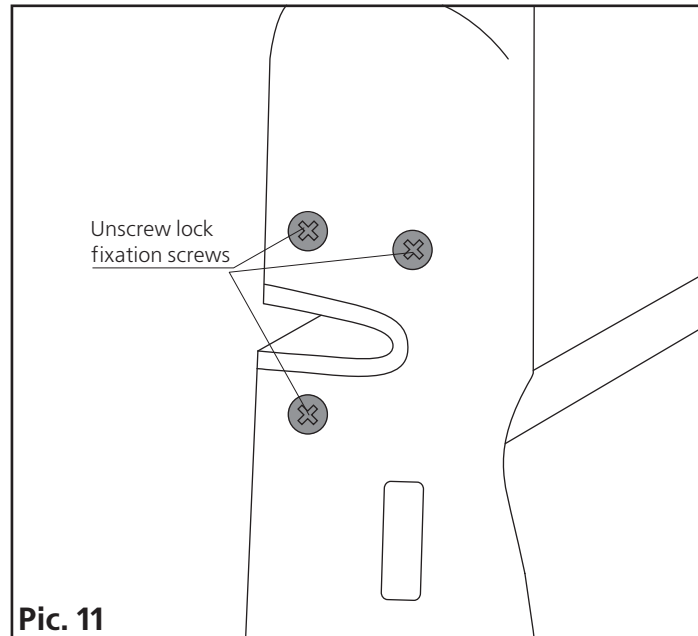
Connect 2 green terminals of the lock drive's green wires to the terminals of activator harness's green wires and 2 blue terminals of the lock drive's blue wires to the terminals of activator harness's blue wires as shown in the pictures on page 8 and 12.



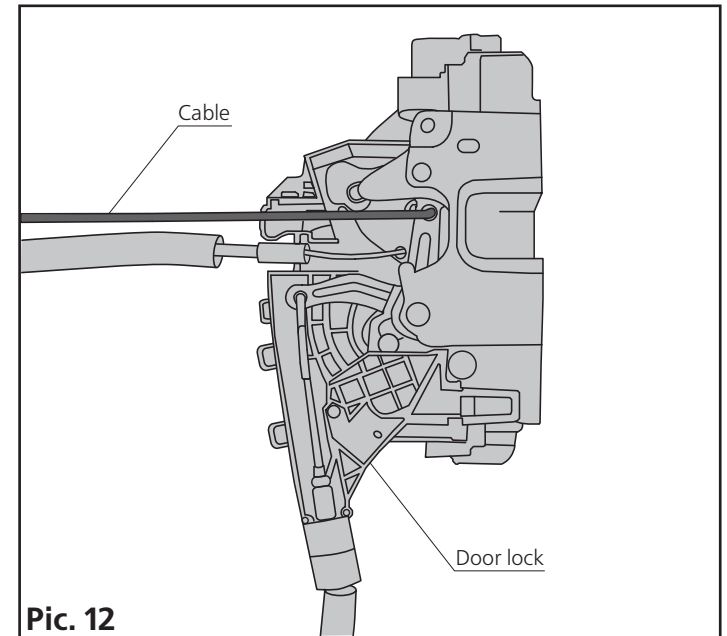
NOTE



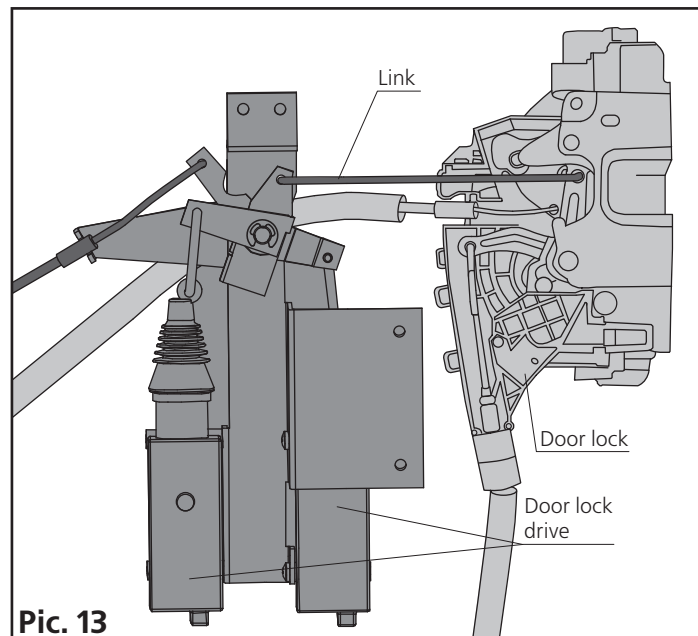
The lock cannot be removed until the door index pin is not removed and the cable is not disconnected from it.



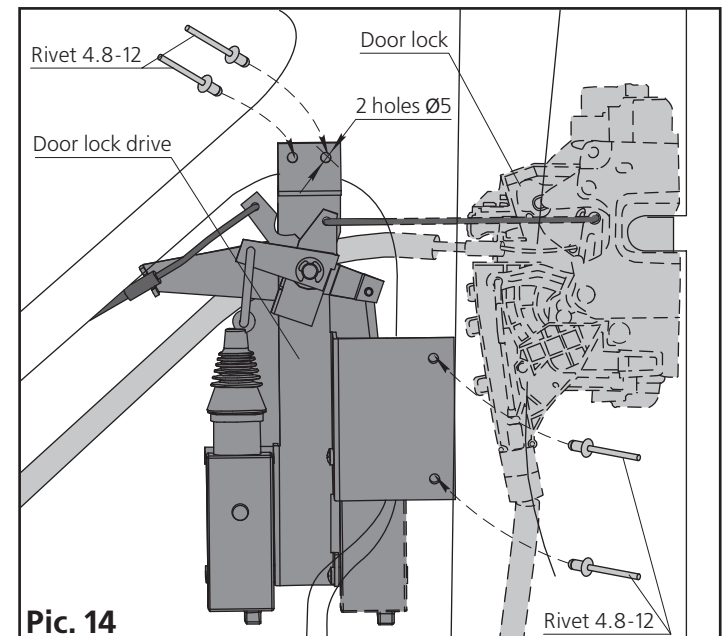
Pic. 11



Pic. 12

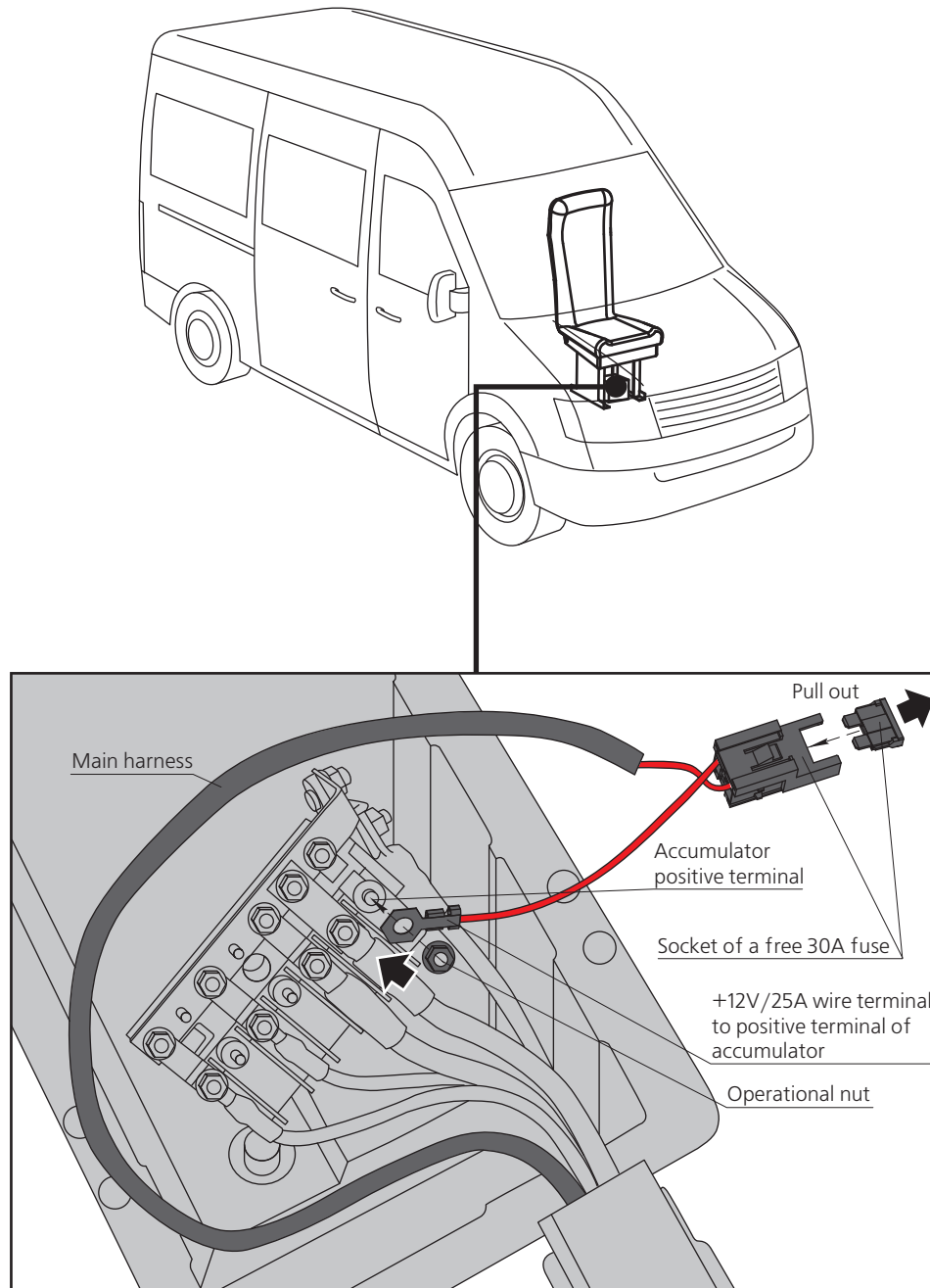


Pic. 13



Pic. 14

16 2.8 CONNECTION OF POSITIVE WIRE TO POSITIVE TERMINAL OF ACCUMULATOR



Connect the terminal of +12V/25A 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/25A main harness wire with an accumulator's operational nut. Pull out 30A fuse from the 30A fuse socket before connecting.



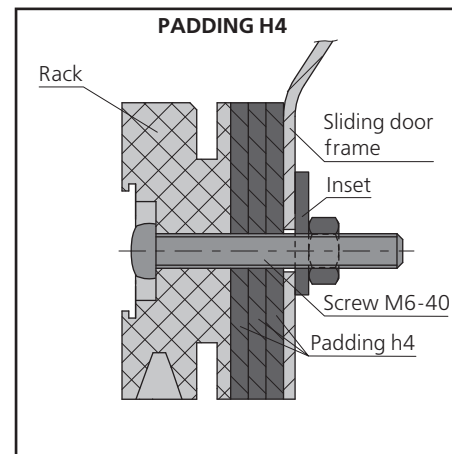
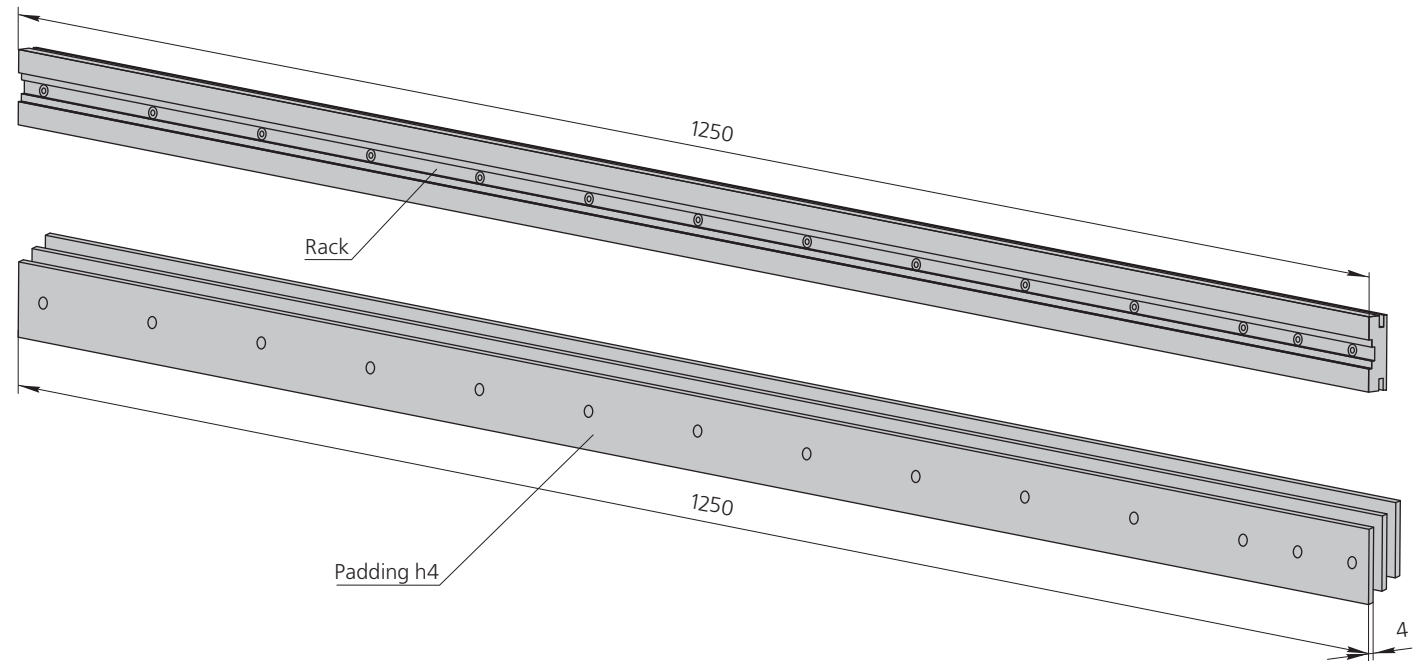
NOTE

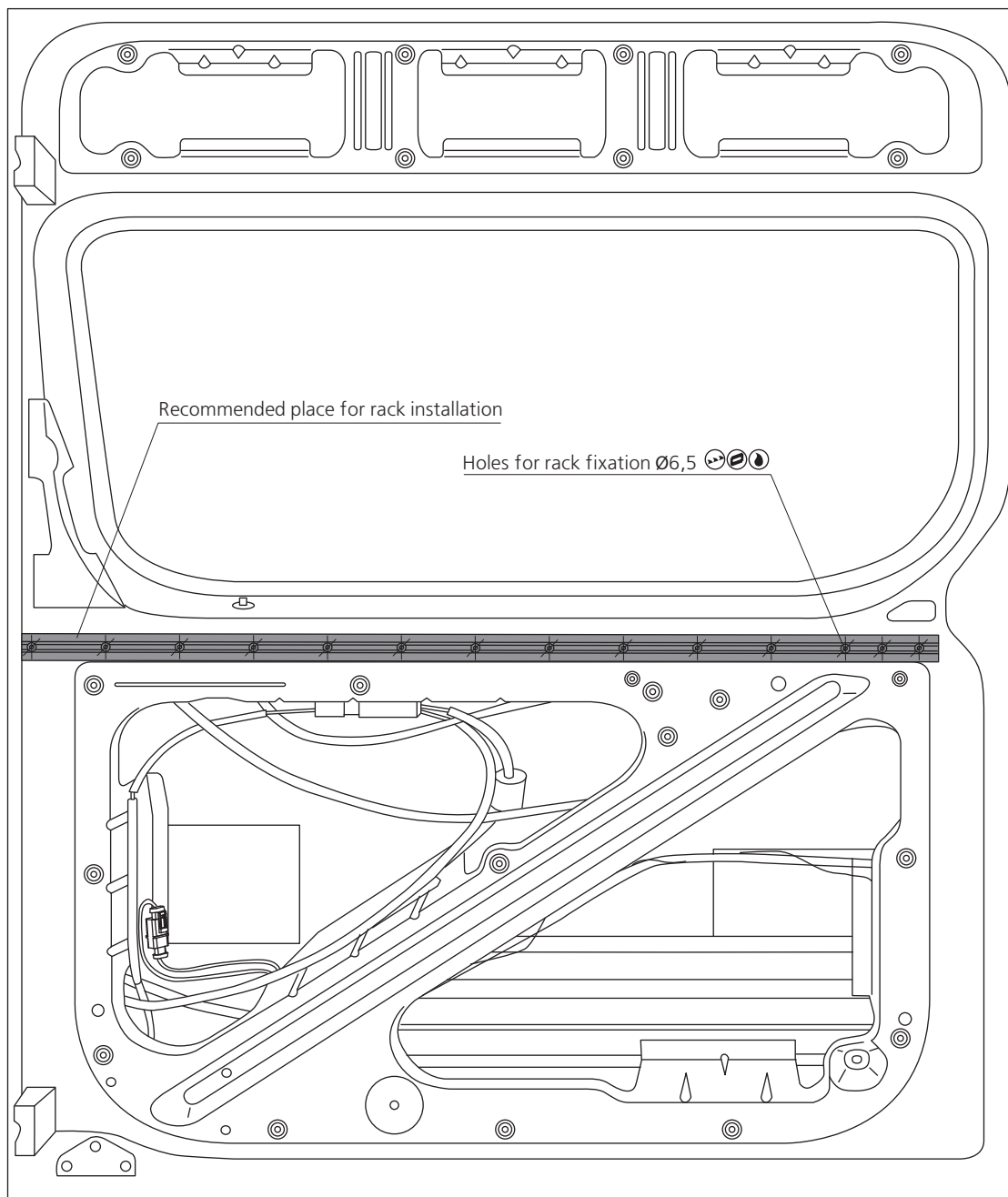


Connect the terminal of +12V/25A wire of the main harness only to a free positive terminal of the accumulator and not to the negative terminal of the accumulator. Otherwise the door drive can burn out.

3.1 INSTALLATION OF THE RACK AND PADDING ON THE DOOR

If there is not enough space for connecting the rack with the door drive, put a padding 3-h4 between the rack and the sliding door panel.





On this page you will find a recommended place for rack installation on the door.

Close the door and remove the door upholstery.

Put the rack to the recommended place as shown in the picture. The lower edge of the rack must be aligned with the upper edge of the upholstery. 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 $\text{Ø}6.5$ mm using the marks. The holes must be positioned in one line. Remove burrs from the edges, blunt sharp edges and apply acid-free rust-proof liquid.

Fix the rack using the metalware set:

- Screws M6-40
- Insets – 10 pieces

3.3 BEARING SUPPORT INSTALLATION

Remove door seal in the area of bearing support installation (picture 15).

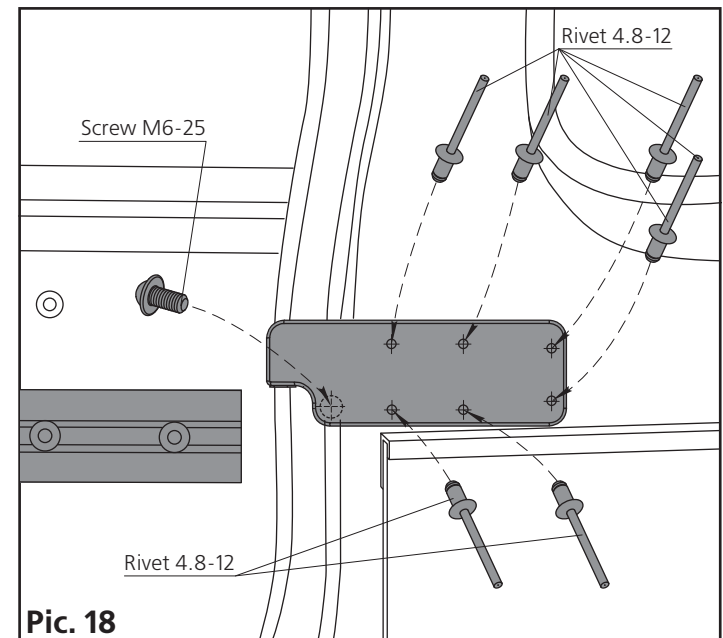
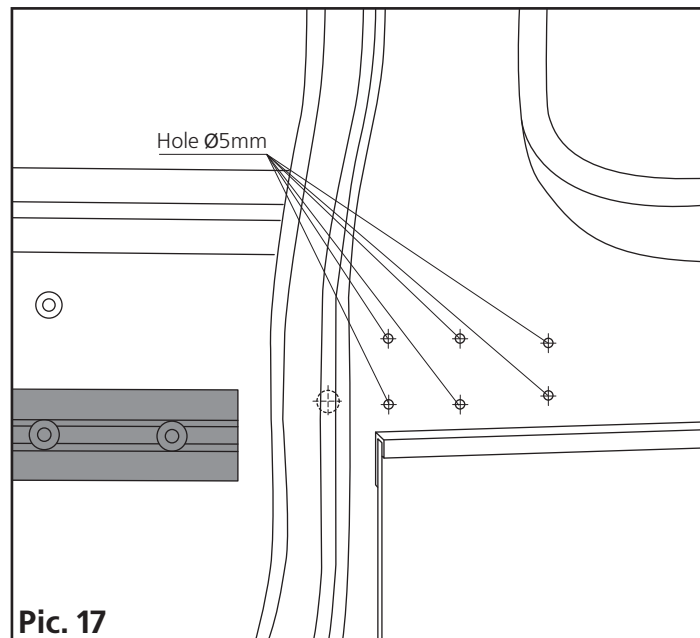
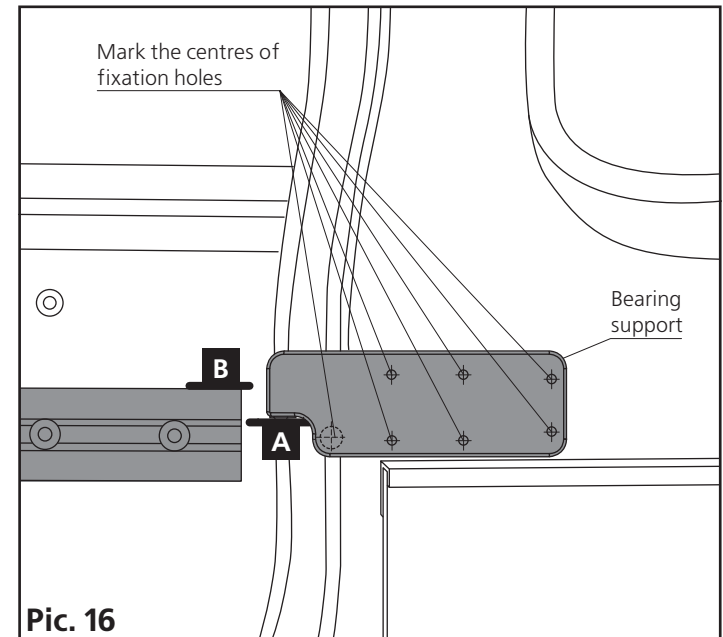
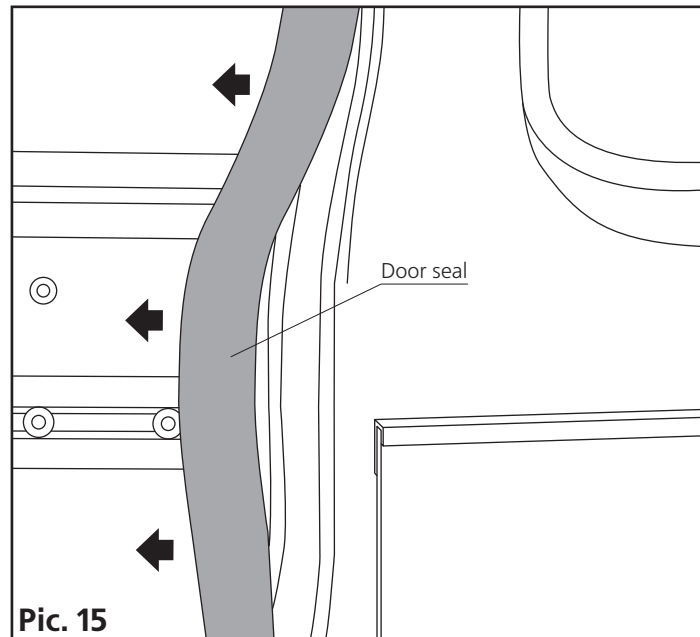
Put the bearing support to the body pillar (picture 16). Mark the centres of fixation holes on the bearing support with a marker.

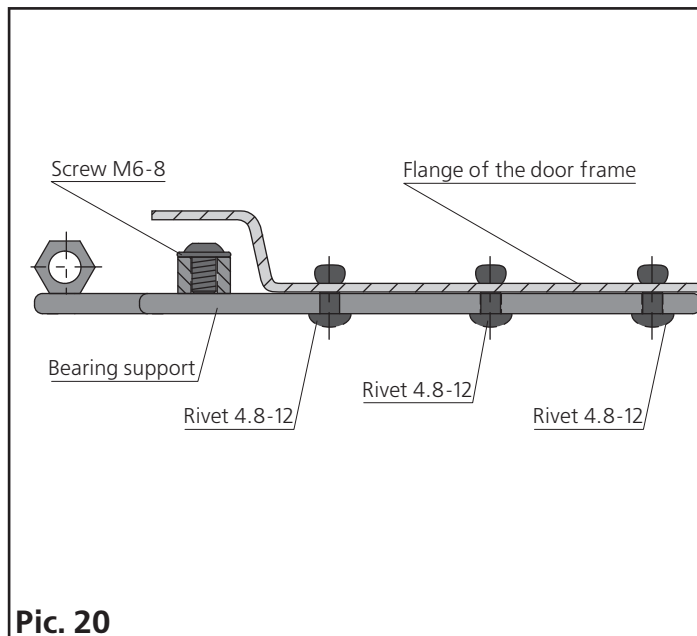
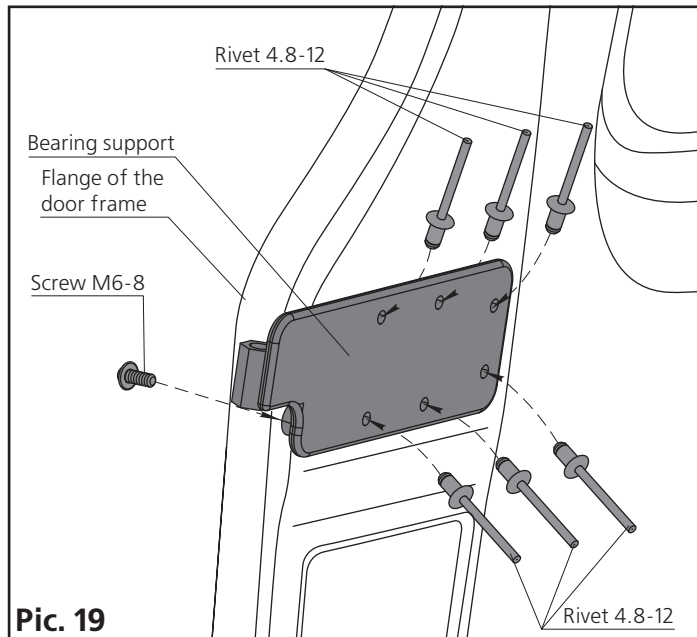
Plane A of the rack must be 8-10 mm below plane B of the rack's upper end face (picture 16).

Drill a hole $\varnothing 6.5$ mm for a screw M6-25 using the marks. Remove burrs from the edges, blunt sharp edges and apply acid-free rust-proof liquid. Drill holes $\varnothing 5$ mm for rivets 4.8-12 from the metalware set (picture 17).

Fix the bearing support with a screw M6-25 and washer 6-15 only (do not use rivets 4.8-12 (picture 18)).

Fix the bearing support with rivets 4.8-12 from the metalware set (picture 18).



**NOTE**

The head of the screw M6-25 and washer 6-15 of the metalware set must be positioned on the outer side of the pillar as shown in the pictures 19, 20.

3.4 PREPARING TO DOOR DRIVE INSTALLATION

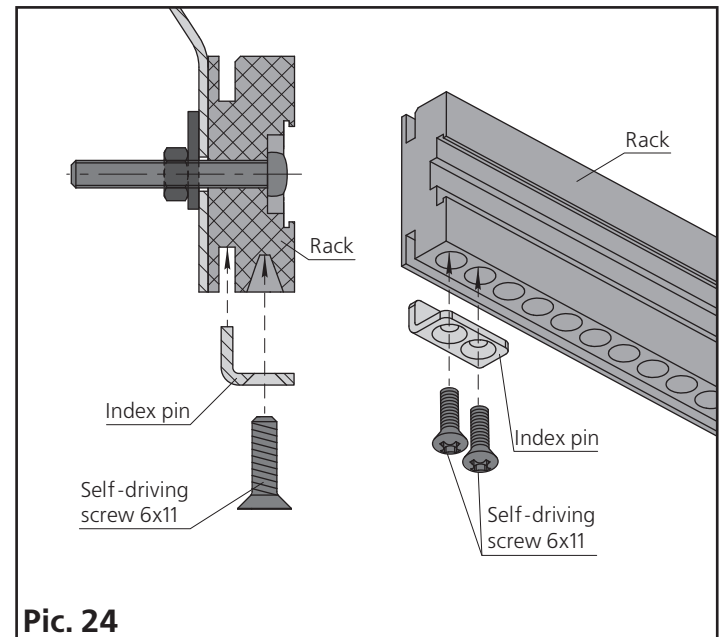
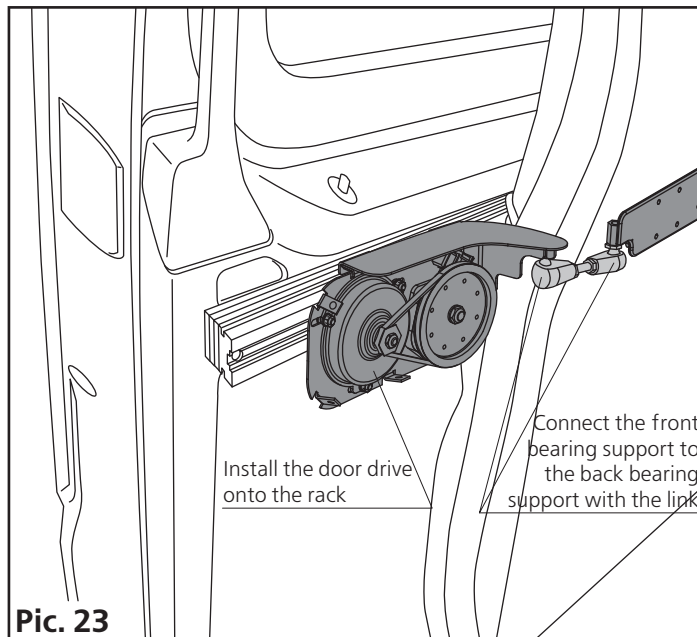
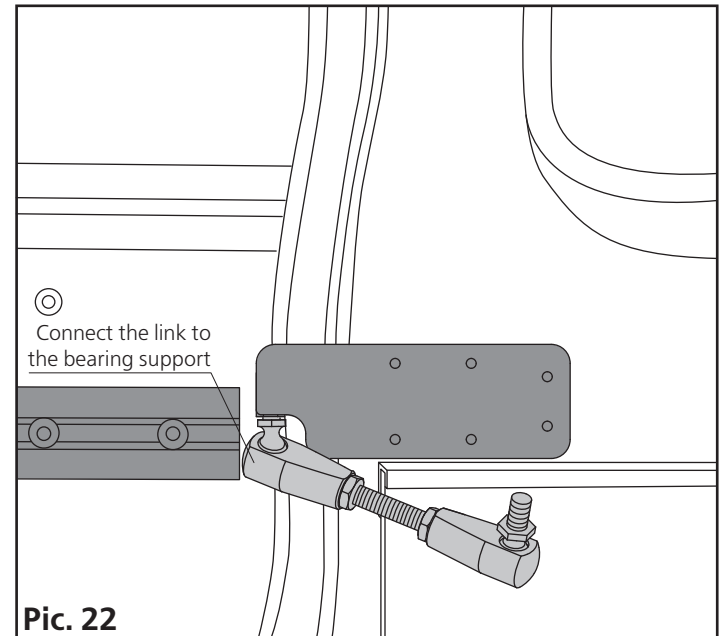
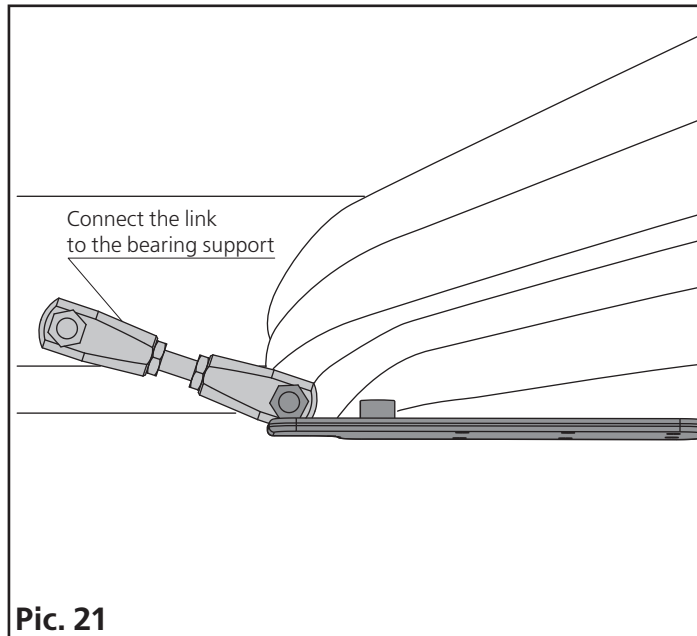
Connect the link to the bearing support (picture 21, 22).

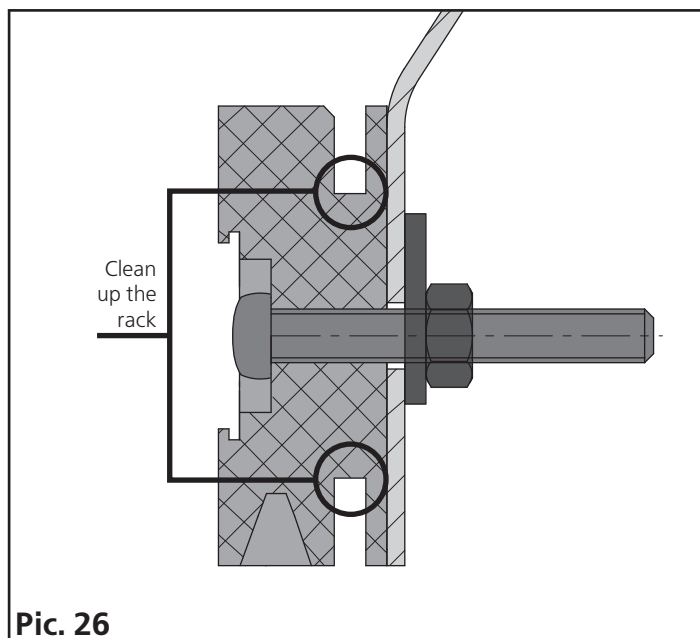
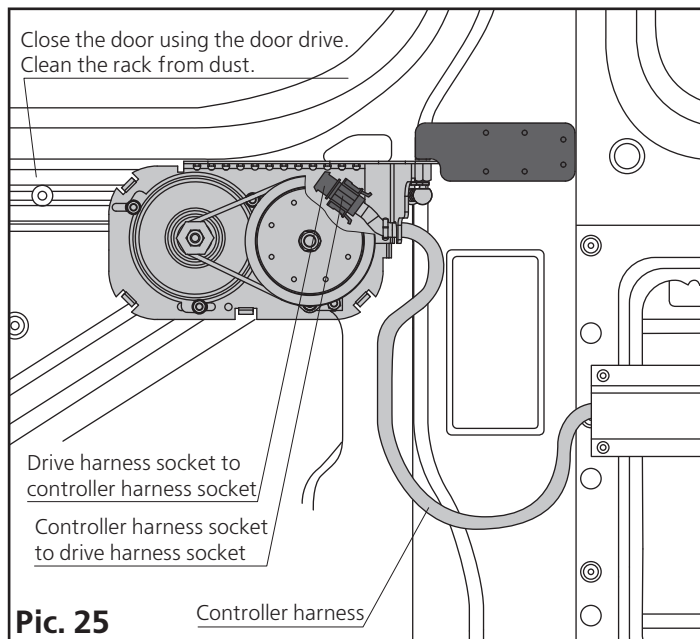
Close the door.

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 23).
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 24).





Clear up the grooves of the rack from dust and cuttings (picture 25, 26).

Connect the drive to the controller.

Insert 30A fuse into the main harness.

Close and open the door several times to make sure that the drive is operating correctly and nothing hinders its operation.



NOTE



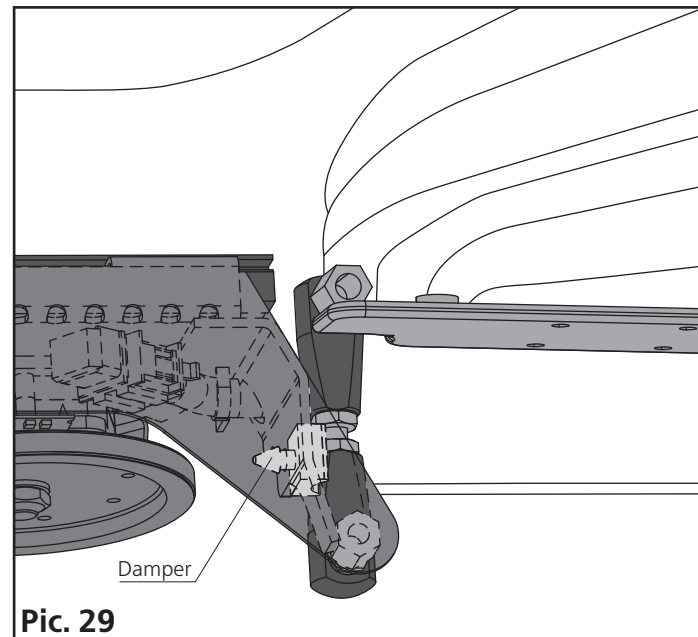
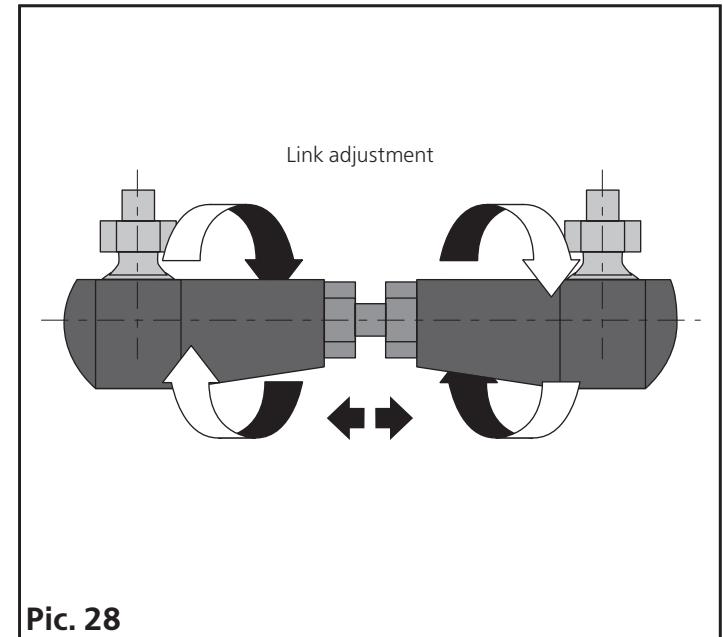
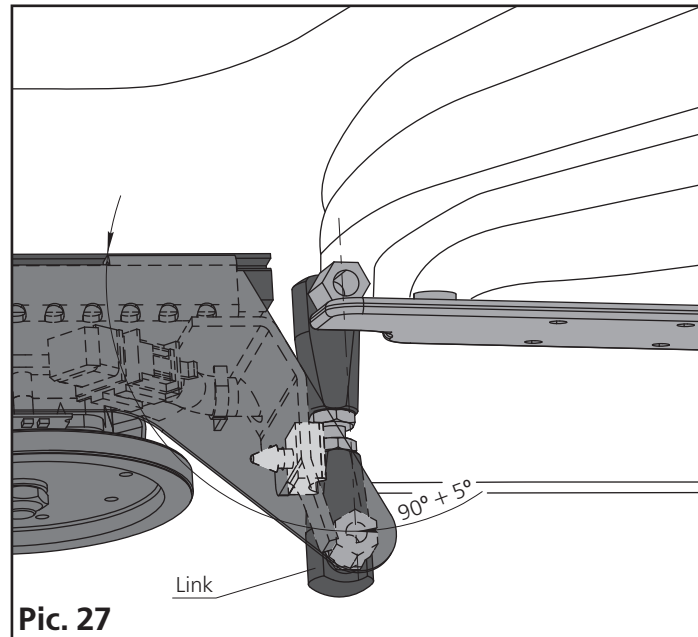
Before removing the drive (if necessary) or switching off the controller, first remove 30A fuse. Thus you will stop the drive's power supply.

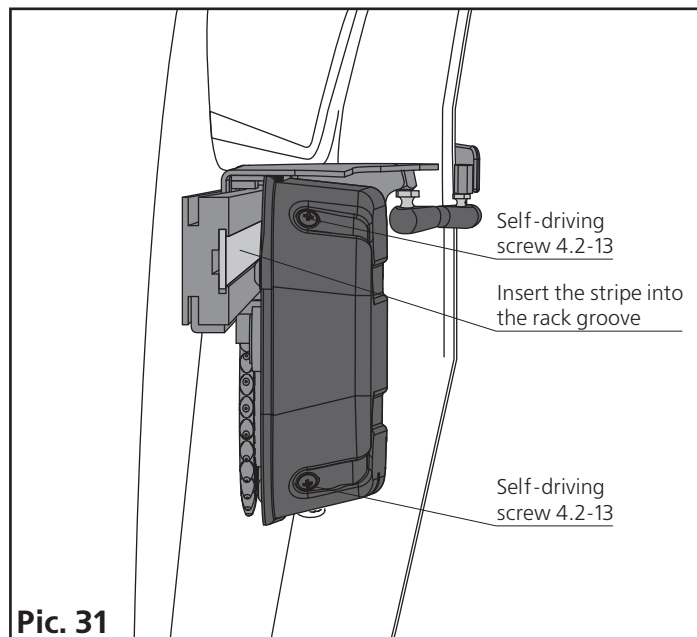
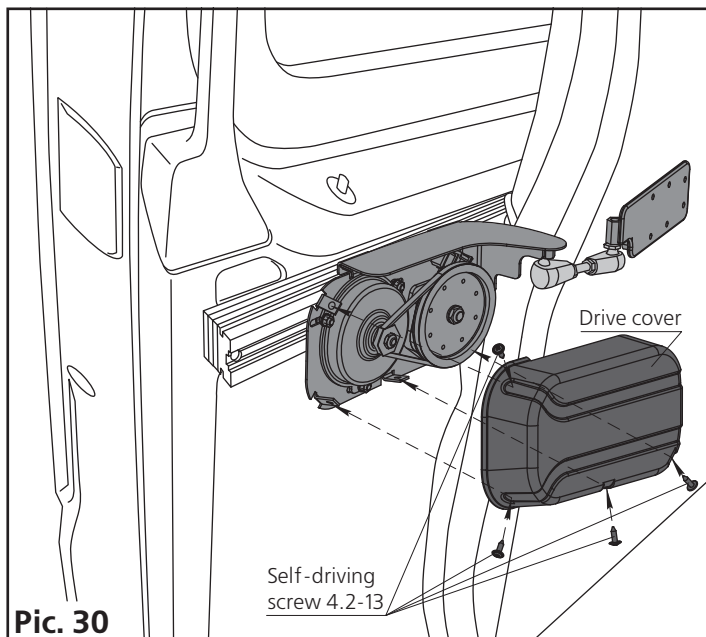
Link adjustment

The position of the link in normal closed position of the door is shown in picture 27.

Extend the length of the link so that the door would close tightly (picture 28).

If the link is installed correctly it must come up against the damper on the carriage (picture 29).

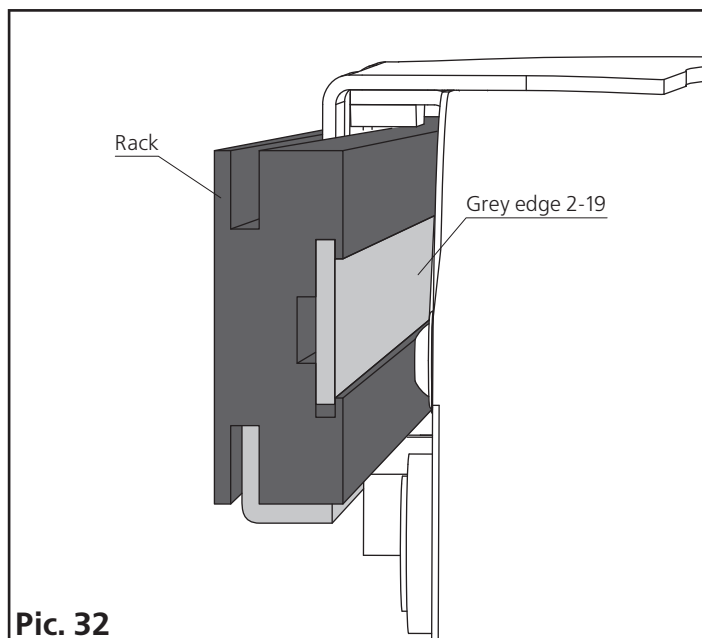




Fix the cover of the drive with 4 self-driving screws 4.2-13 from the metalware set (picture 30).

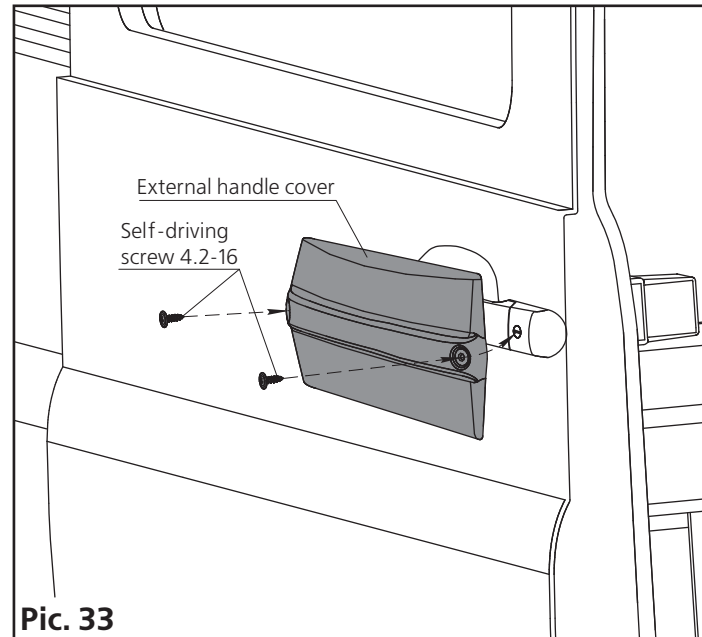
Cut the protective edge to fit the rack (picture 31, 32).

Carefully insert the stripe into the rack groove as shown in pictures 31 and 32.

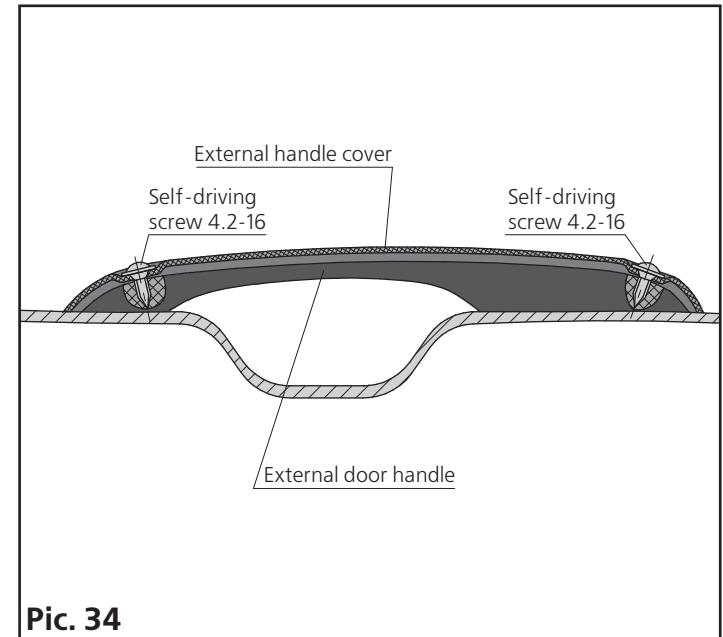


Put the cover of the external handle to the opening/closing door handle. Mark and drill 2 holes $\varnothing 3$ mm. Fix the cover of the external handle on the opening/closing door handle with 2 self-driving screws 4.2-16 from the metalware set as shown in pictures 33, 34.

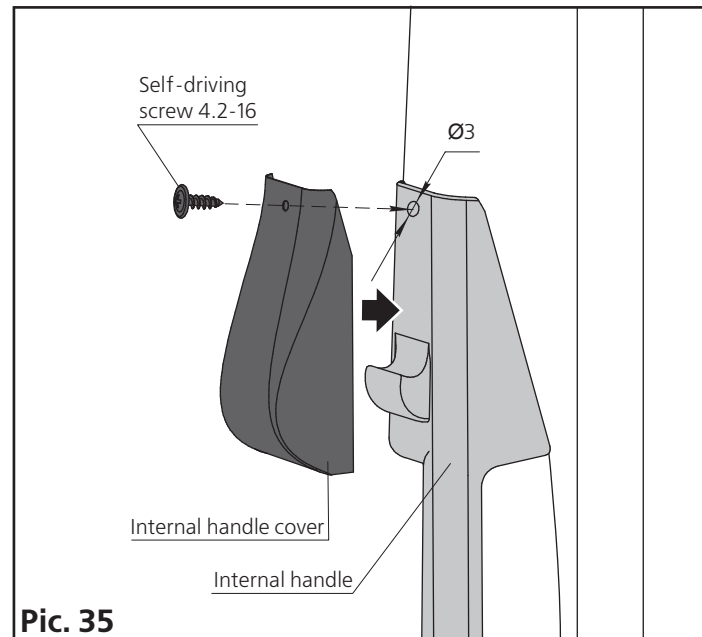
Put the cover of the internal handle to the place shown in picture 35. Fix it with 2 self-driving screws 4.2-16 from the metalware set as shown in pictures 35, 36.



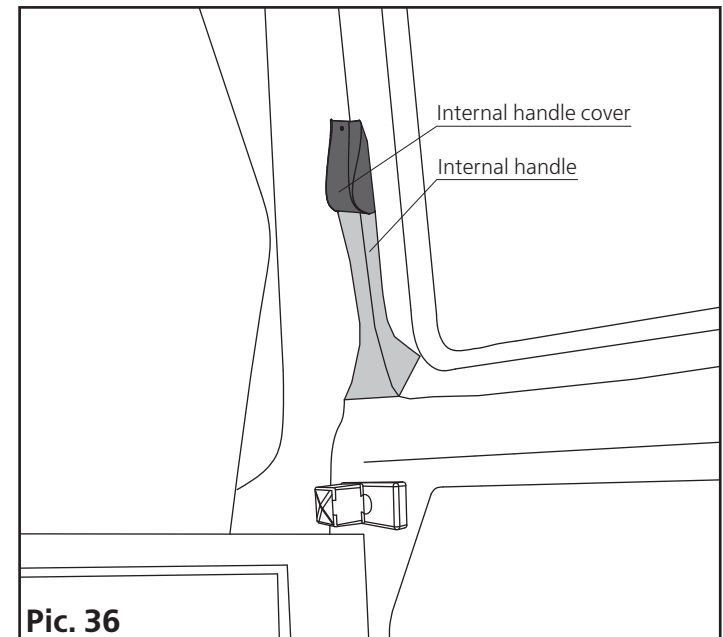
Pic. 33



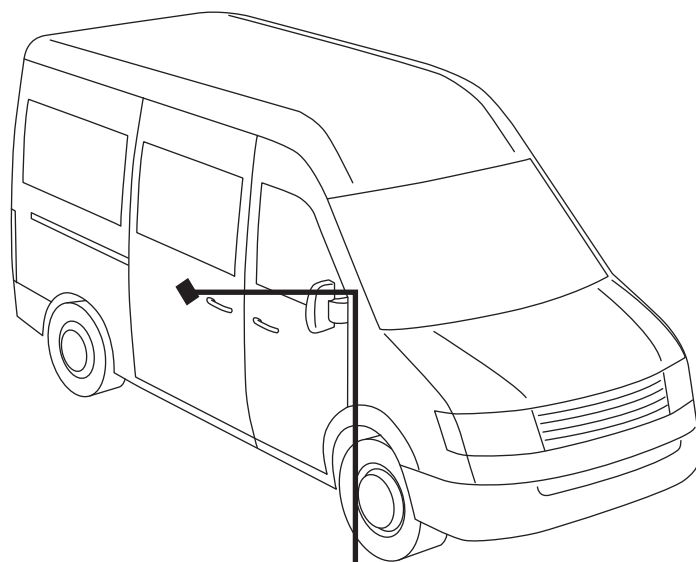
Pic. 34



Pic. 35



Pic. 36



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

