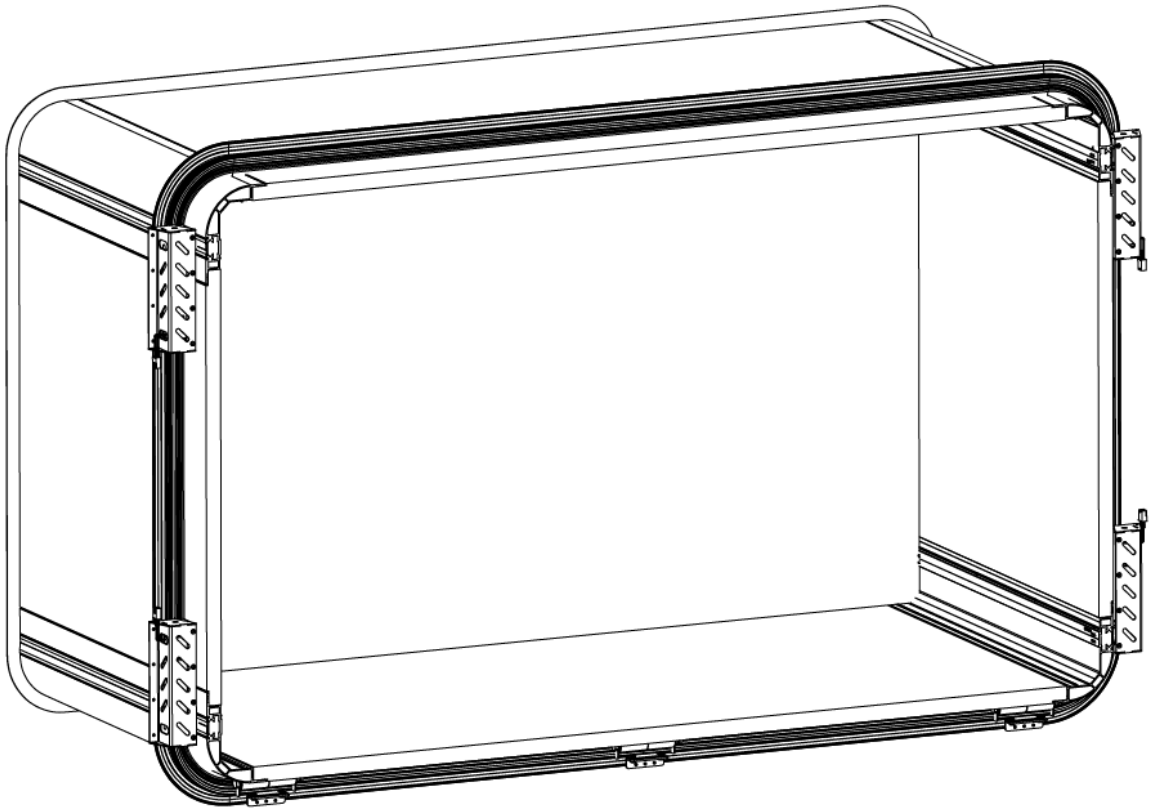
SMART ROOM
INSTALLATION MANUAL



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1. **Components**

A Smart room is composed by different items, designed and tested to ensure high performance. Some of these items could be customized for each room, so a detailed list is showed on each dedicated drawing, but generally each room is composed by two assembly kit as follows:

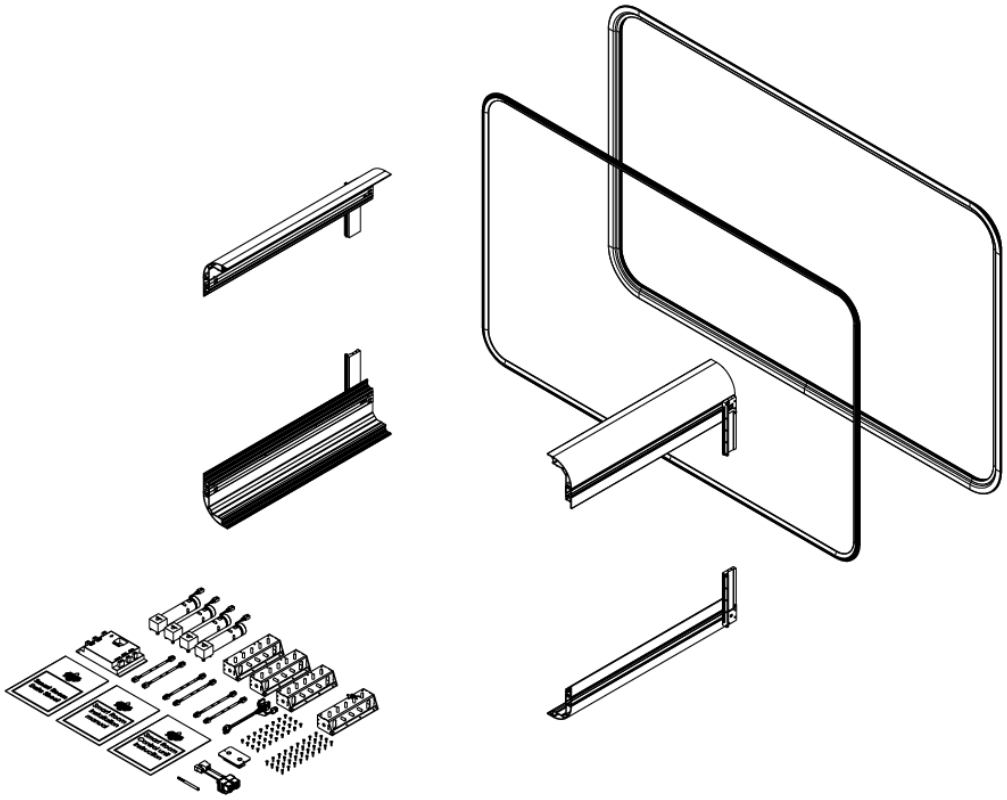
KIT CORNERS composed by:

- 4 x Corner composed by:
  - Aluminum profile;
  - Steel rack;
  - Seals;
  - Aluminum bracket;
  - Steel Shaft and bushings;
  - Steel pinion;
  - Plastic slider;

- 1 x Touchpad and harness;
- 1 x Control unit and accessories;
- 4 x Motors;
- 4 x Motor harnesses;
- 2 x Extended harnesses;
- 1 x Reed sensor and magnet, fixed on corner 3.

KIT FRAME composed by:

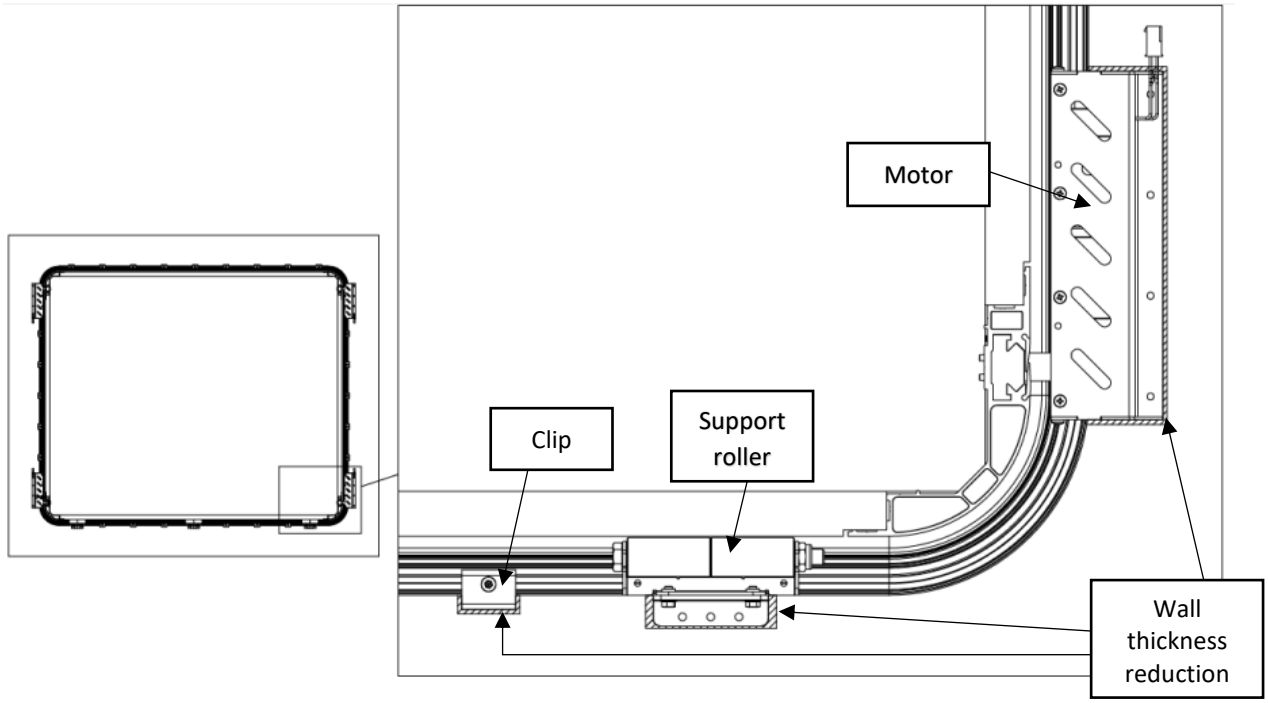
- 1 x Aluminum frame type A or type B;
- 1 x Perimetric V-Seal (Main seal) ;
- 1 x Perimetric bumper Seal (Scraper seal);
- 1 x Perimetric external Seal only for frame type B
- Clips;
- Rollers.



Picture 1 Example of the main components of each room.

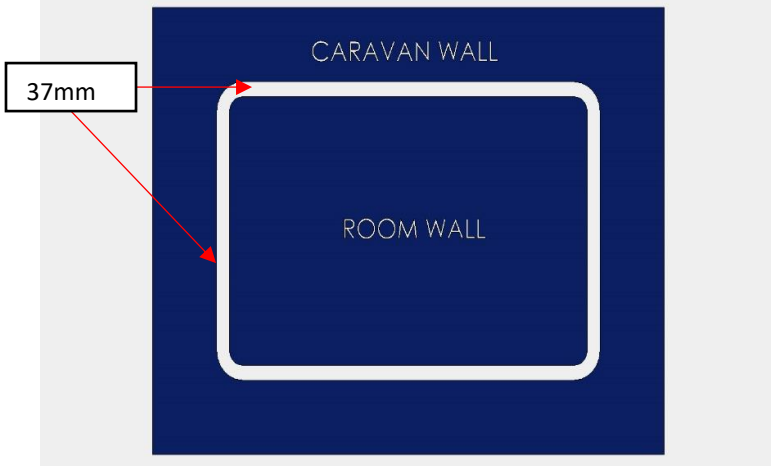
2. Description

The Smart Room must be installed on a structural wall with thickness of 30 mm. If you need to install the product on a thicker wall, it will be necessary to reduce the thickness up to 30 mm where there are the clips of the aluminum frame, the motors and the supporting rollers.



Picture 2 wall thickness reduction.

Installer must design the wall and fixing points according to the max allowable weight of the room and according to the effective weight of the room. Weight of the room must not exceed max design load of the Smart room (500kg). The nominal distance between the external side of the room and the internal side of the hole is 37mm (picture 3). Installer has to consider a tolerance on the Aluminum frame of ± 1mm. We suggest increasing the dimensions of the hole on the wall of 1mm, both on height and width, to ensure a correct installation.
Additional reinforcements on the walls must be defined by the installer/designer/supplier of the vehicle.

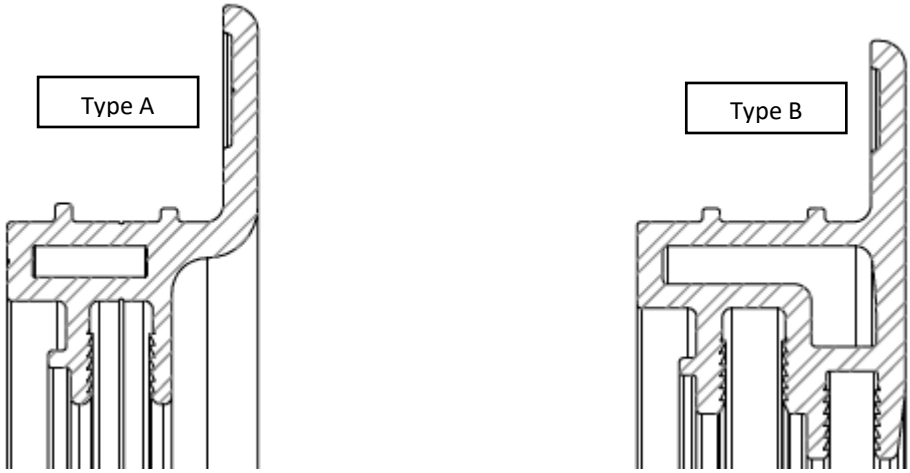


Picture 3 Nominal distance between external side of the room and internal side of the hole in the wall.

2.1 **Aluminum frame**

The aluminum profile can have two different shapes:

- Type A;
- Type B.

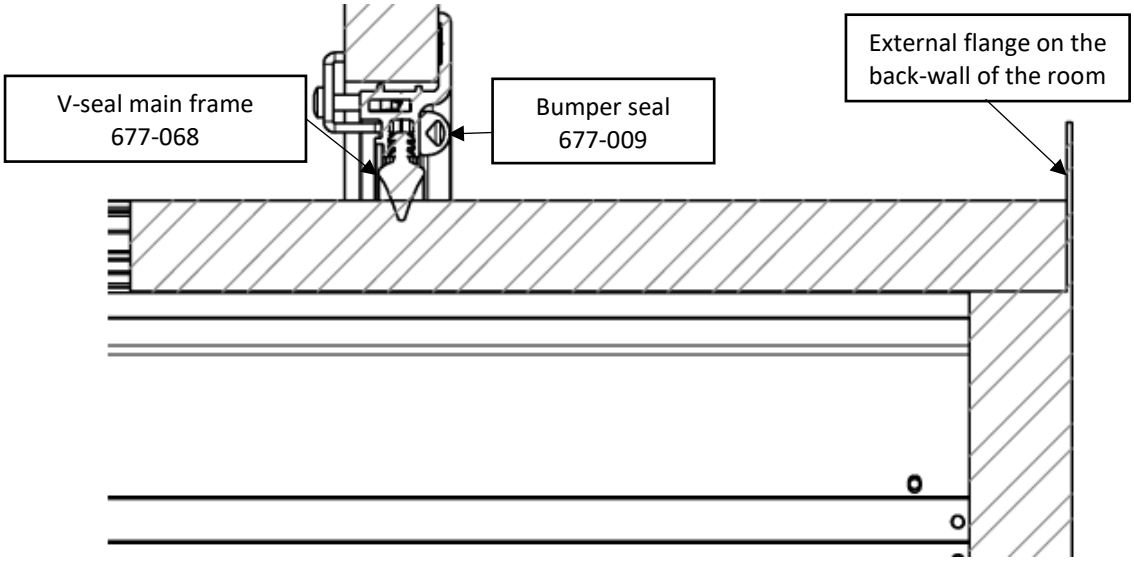


Picture 4 Section of different types of Aluminum frame.

Main differences between the two frames are the following:

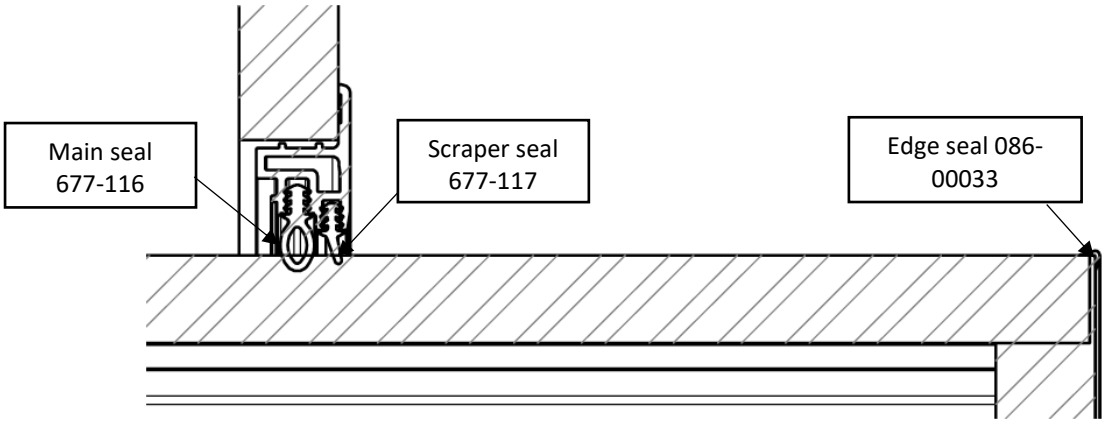
- Quantity of seals;
- Type of seals;
- Different external design of the room.

Here below (picture 5), the design of a room with the Aluminum frame type A. In this solution there are two types of seals and it's necessary to create a perimetric flange on the back-wall. In this way, when the room is closed, the flange presses on the bumper seal, sealing the room. Bumper seal 677-009 must be fastened using glue, already applied on the strip on the flat surface of the seal itself.



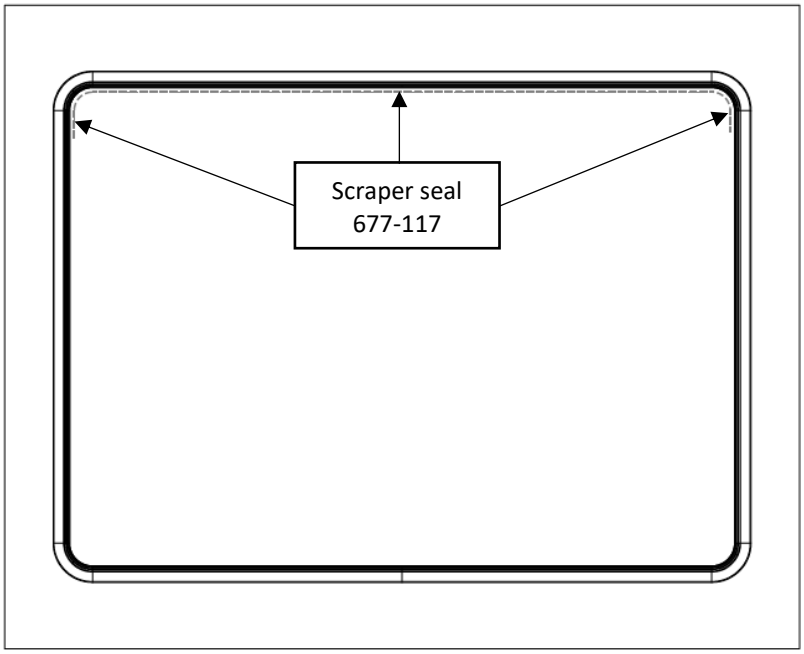
Picture 5 Section view of a Smartroom with Aluminum frame type A.

The solution with the Aluminum profile type B (picture 6 and 7) has three types of seals, but in this case it is not necessary to have the external flange.



Picture 6 Section view of a smartroom with Aluminum frame type B.

All the seals used are perimetrical except for the scraper seal 677-117 that has to be fastened only on the high part of the room (picture 7).



Picture 7 Fastened scraper seal 677-117

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3.1 Installation of the room and the frame

Assembly process can be divided in two steps:

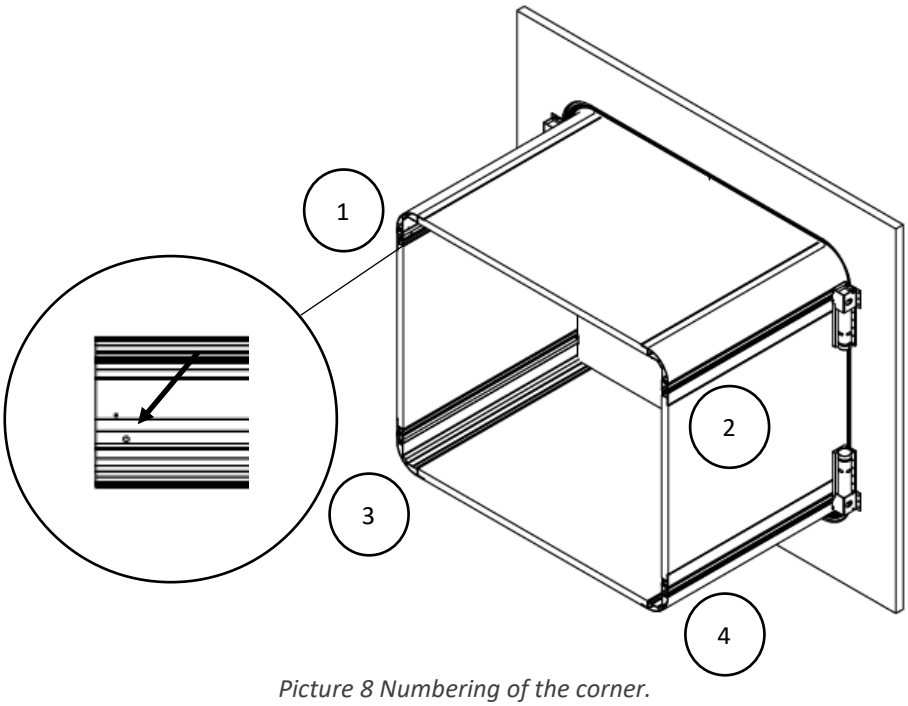
- Preliminary phase
- On-vehicle phase

3.1.1 Preliminary phase

The first step of the preliminary phase is the assembly of the room as explained below.

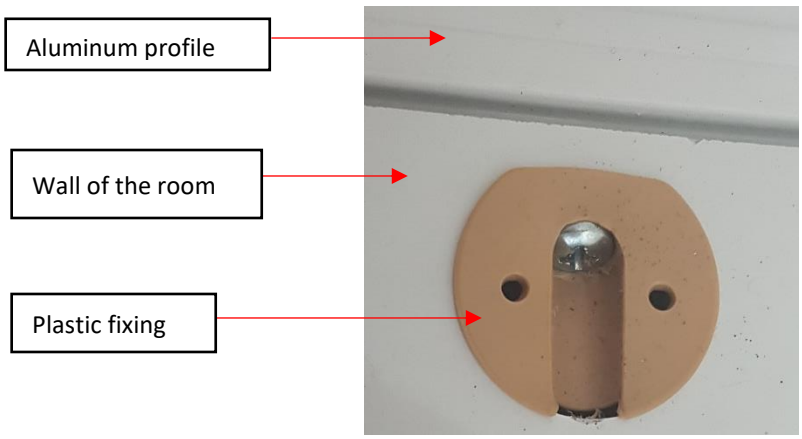
- Installation of the corners

Installation of the four corners on the walls of the room, checking the position of each corner.
Each corner has a number defined by a number of holes on the side of the Aluminum profile as per picture 8 (number one has one hole, number two has two holes, etc.). Please follow the dedicated drawings for additional details.



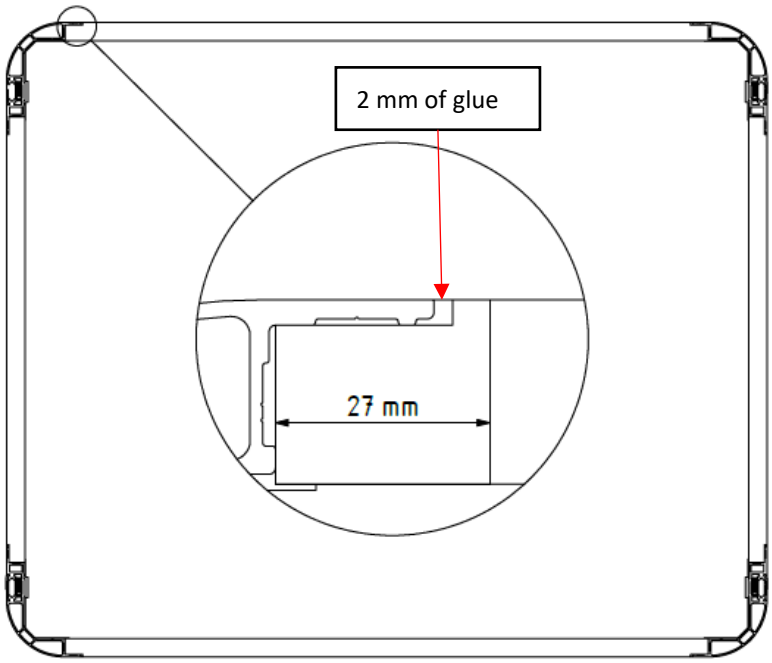
Picture 8 Numbering of the corner.

Fixing between corners and walls must be done using glue and plastic fixings with screws to connect walls with aluminum profiles.



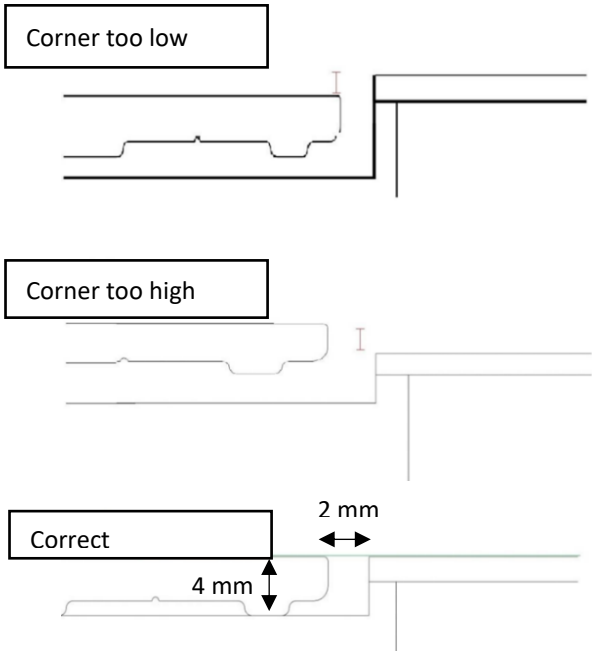
Picture 9 Example of plastic fixing with screw.

Check the distance between the edge of the corner and the end of the notch of the panel: it is important to keep 2 millimeters to allow presence of glue between the two edges (picture 10).



Picture 10 Check the notch on the wall to insert the corner.

The Aluminum wing of the corners and external surfaces of the wall must be on the same level. When the glue is applied, check if it is necessary to remove the excess of glue to make the junction aligned (picture 11).

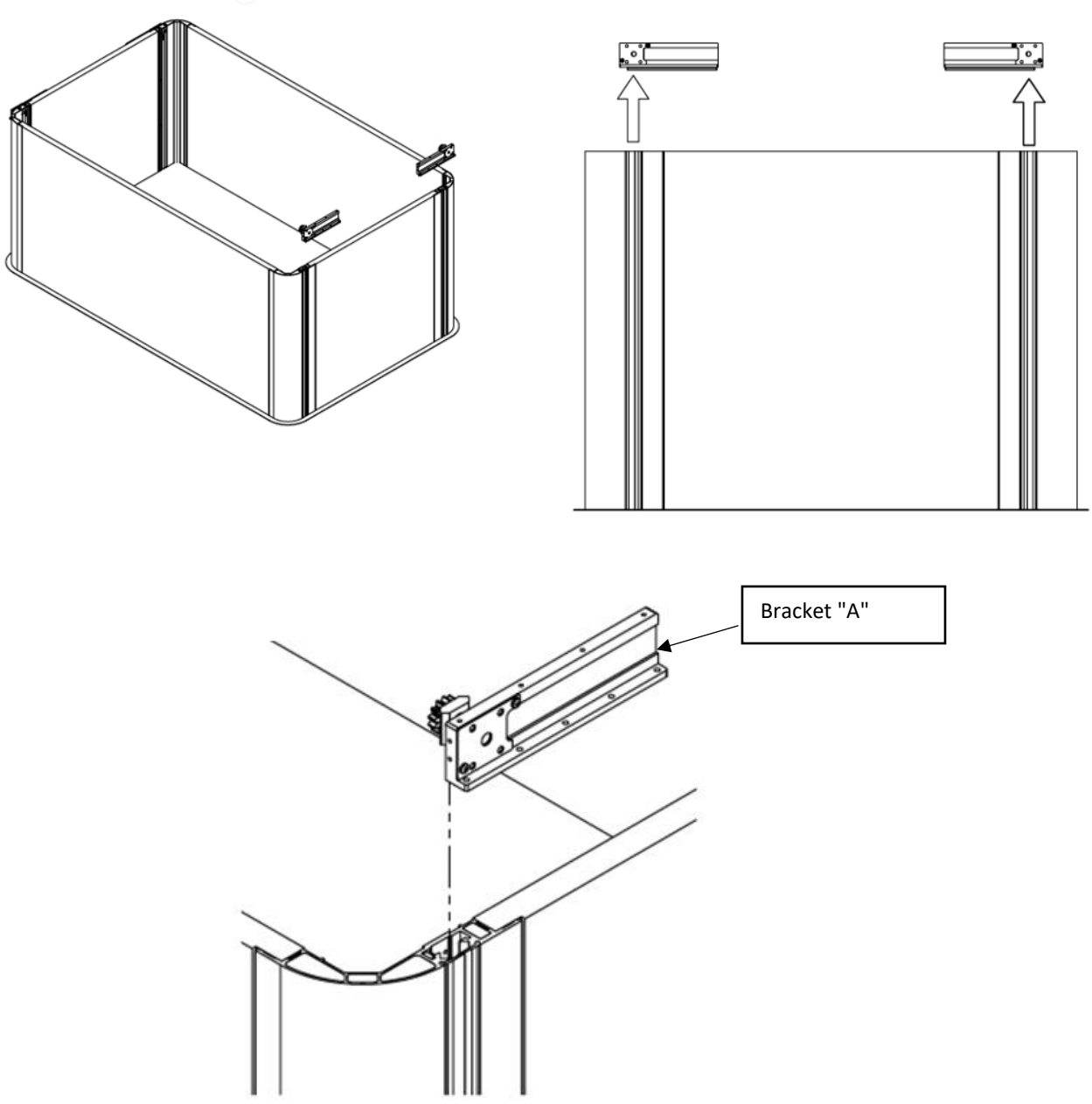


Picture 11 Correct alignment between corner and wall.

Use an internal jig for the room to keep the dimensions during the curing of the glue and keep it until the frame is fixed on the wall of the vehicle. After the curing of the glue, it is possible to proceed with next step if the dimensions of the room are correct (tolerance can be maximum ±1 mm) and the angles must be 90 degrees.

- Preparation for installation of the frame

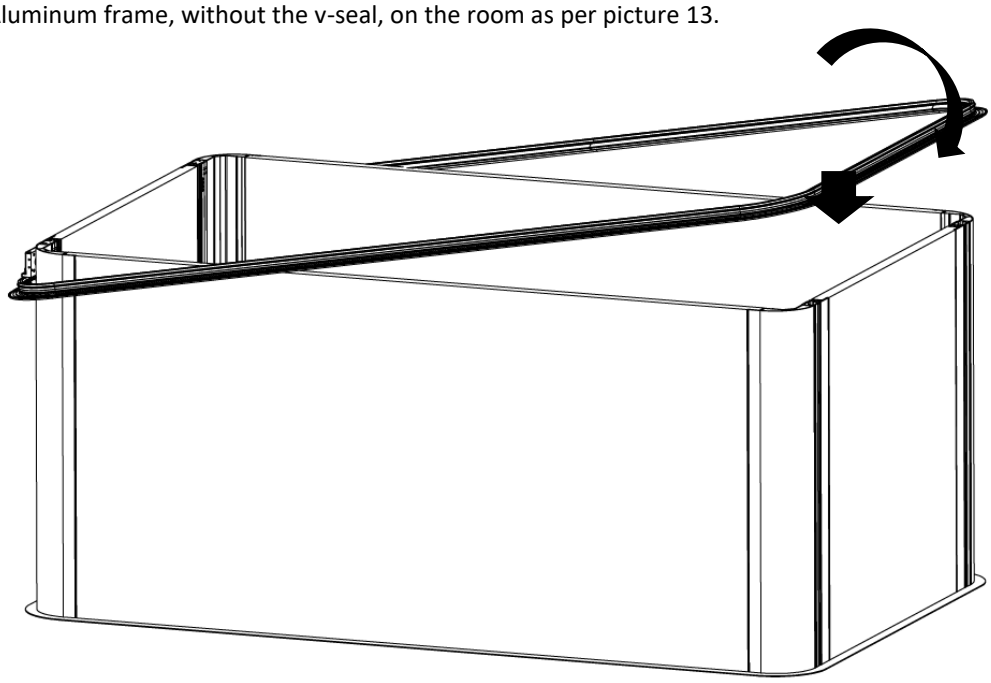
Disassemble bracket "A" at least on one side of the room.



Picture 12 Remove the bracket "A".

- Installation of Aluminum frame and seal

Install the Aluminum frame, without the v-seal, on the room as per picture 13.

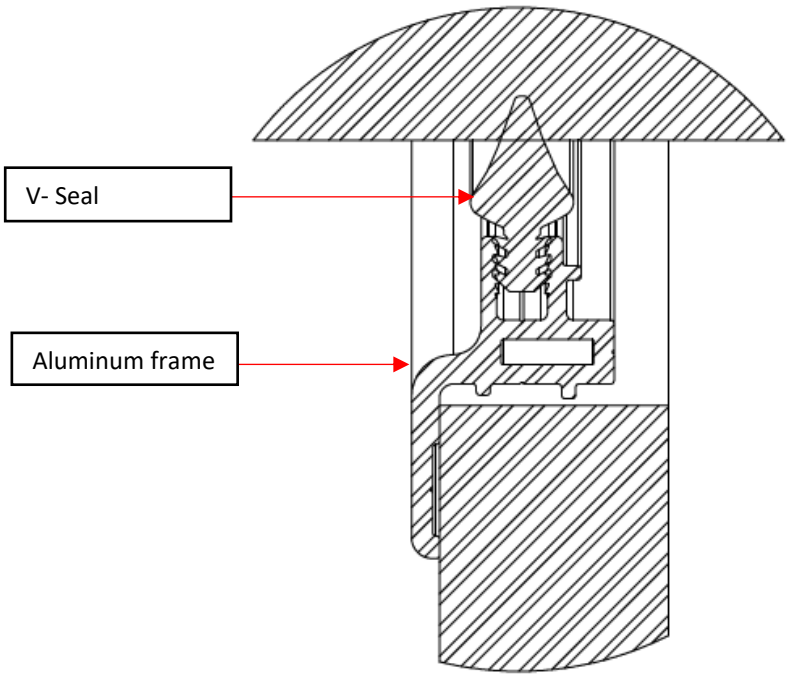


Picture 13 Movement to insert the frame.

As further check, frame must be slipped over the room without the seal and measured for proper clearance with 13 mm spacers (picture 14). Use at least two of these spacers on each side.

Picture 14 Check the clearance with 13mm spacers.

This distance is important to allow the perfect fit of the frame's seal on the surface of the room. Now remove the frame and install the V-Seal on it using a soft mallet and check the installation as per picture below. Seal must be inserted until they will be in contact with the Aluminum of the corner. A lubricant such as Tire – Lube will help in this installation. The seam should be located lower center and closed up with strong glue.

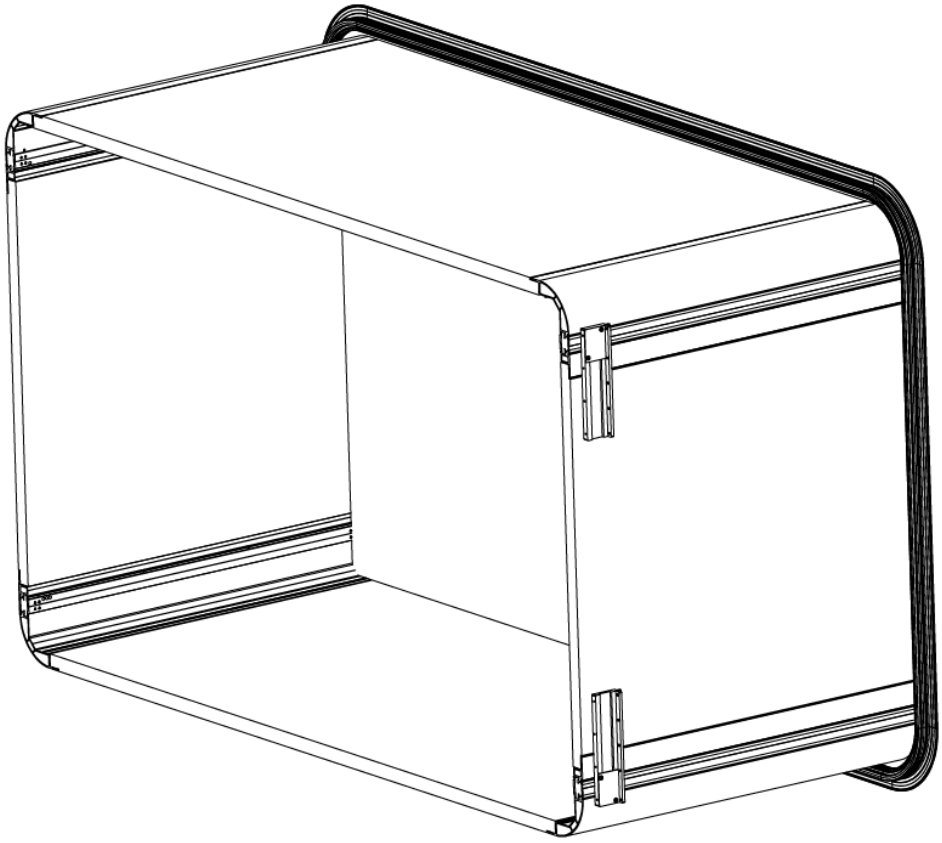


Picture 15 Check the installation of the seal.

Now reassemble the frame with the V-Seal on the room. Slip the frame over the room using a silicone spray (example Mitosil) or a sliding polymer (example Getren P3300).

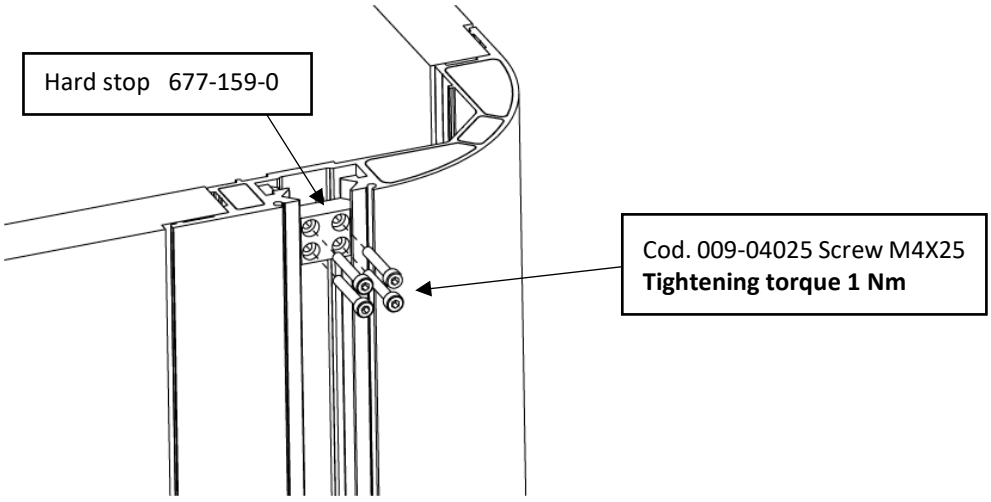
Picture 16 Application of the silicone spray.

Check if the frame's seal fits perfectly every side of the room (picture 17).

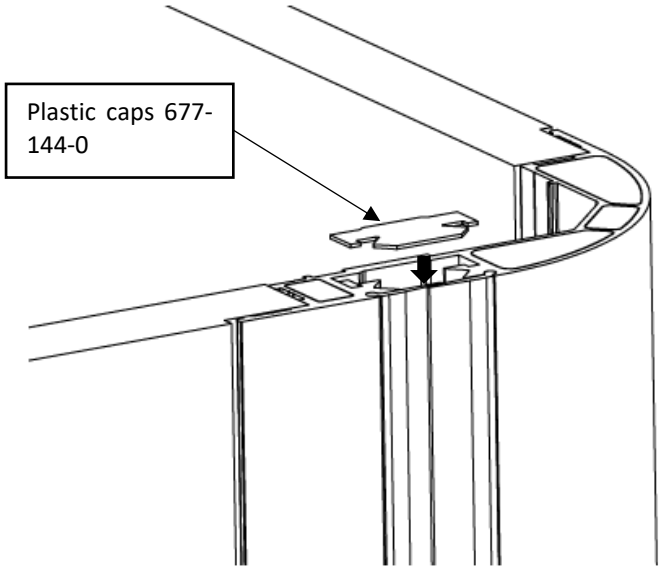


Picture 17 Check of the seal on the room.

If the frame and the V-Seal are assembled correctly, assemble again the brackets previously removed from the corners (Picture 8). Fasten the hard stops (one on each corner) and install the plastic caps (one on each corner) (Picture 18-19) using glue.

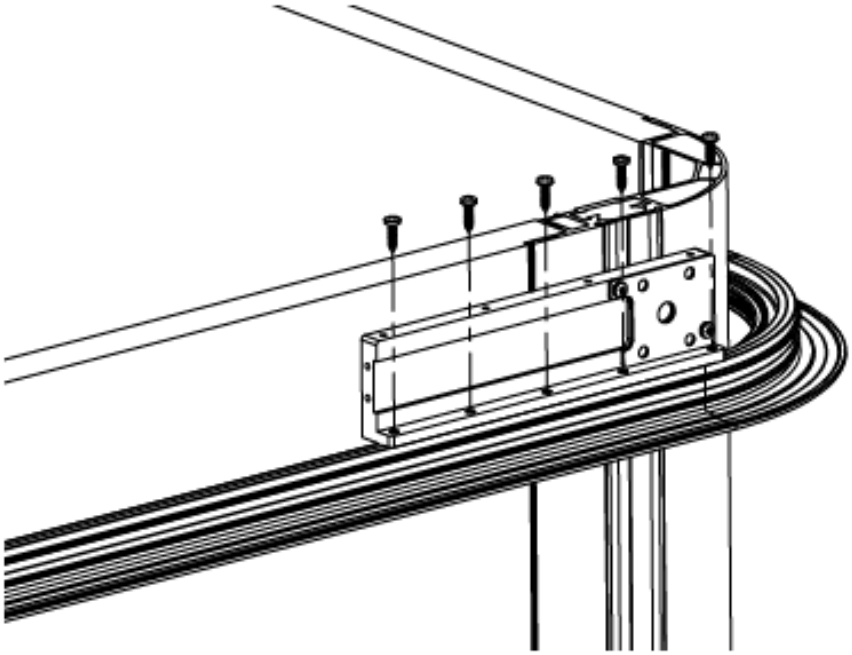


Picture 18 fasten the hard stop



Picture 19 Glue the plastic cap

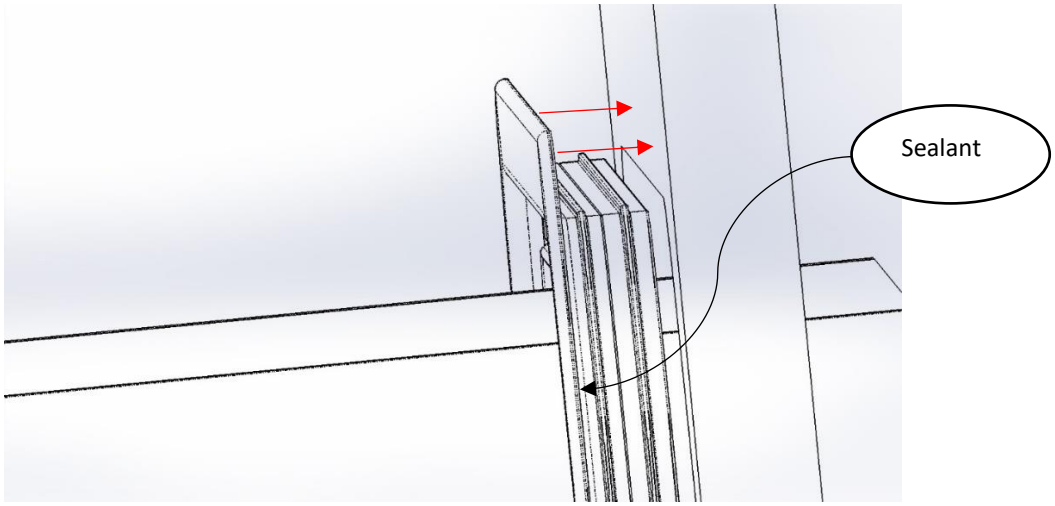
Fasten brackets "A" on the frame with the screws provided (selfdrilled screws 4,2x160).



Picture 20 Assembling of the motor support (Bracket "A") on the frame.

3.1.2 On-vehicle phase

Installation of the room in the hole on the vehicle wall must be executed from outside. Apply the sealant on the inner side of the frame to fix it to the wall. Push the frame on the external side of the vehicle wall and let the Aluminum frame adhere to the wall (picture 21).



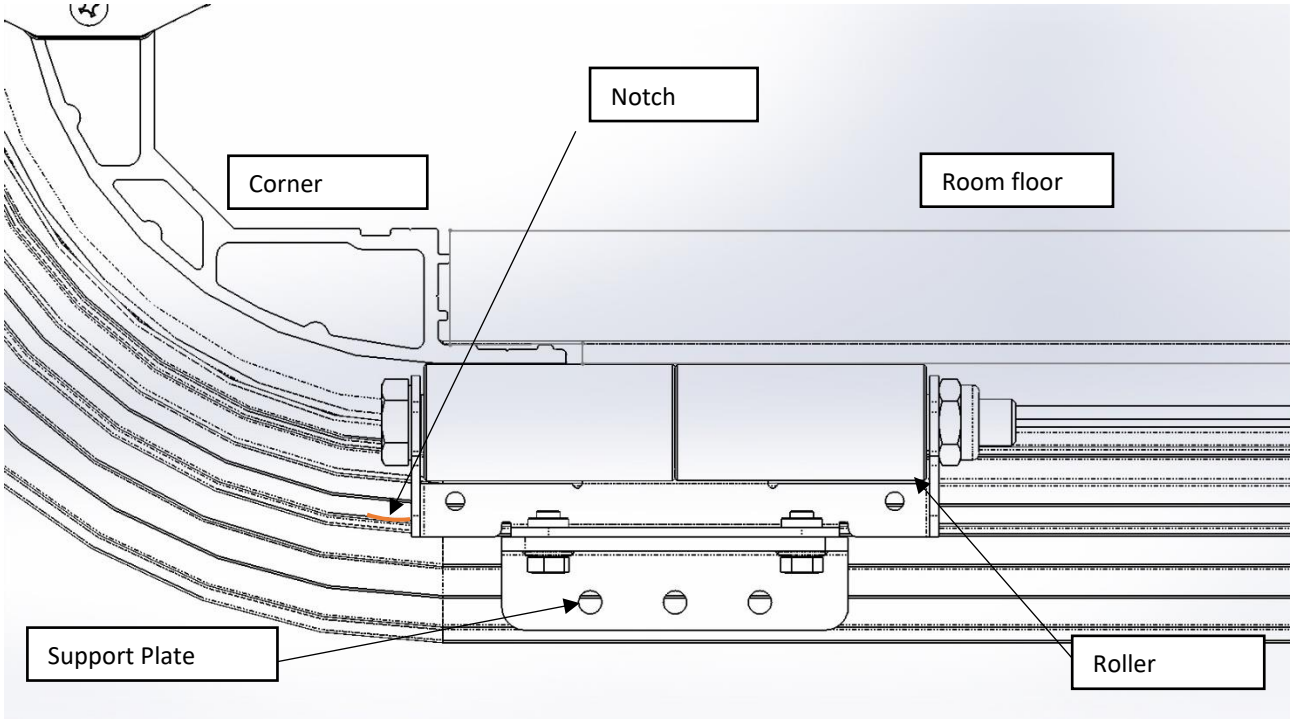
Picture 21 Fixing of the frame on the wall.

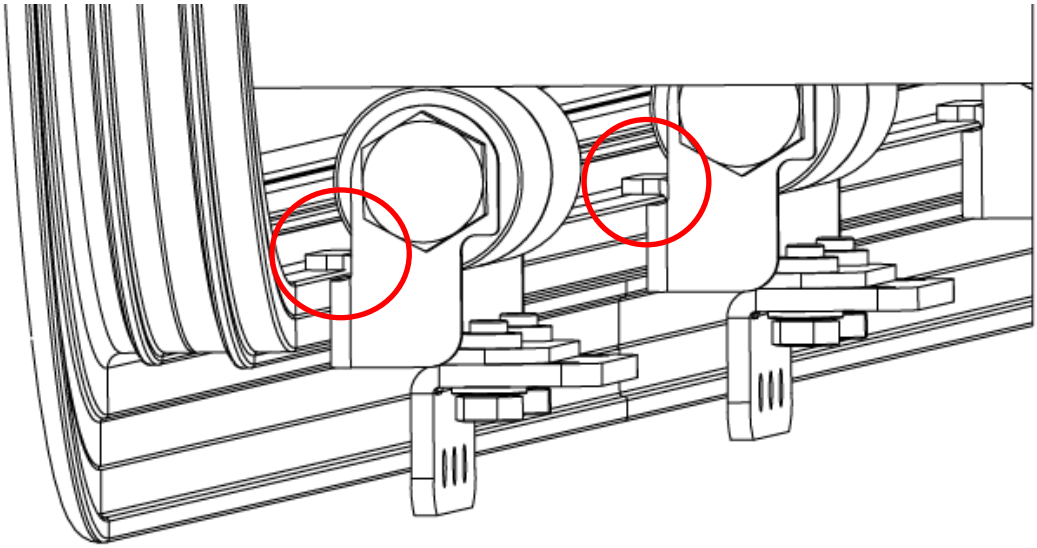
Fix the wall clips on the inner side of the vehicle wall to secure the frame. A groove on the frame helps to screw the fasteners in the right position. The distance between two wall clips must be around 200mm (picture 22).

Picture 22 Fixing of the clips on the wall.

Now the room is installed.
Next step is the fixing of the rollers at the bottom of the room on the inner side of the vehicle. Rollers are fixed by two brackets, one to fix the roller to the frame and one to fix the first bracket to the inner side of the wall (usable only when the thickness of the wall is less than 35mm). They bear the weight of the room, so it is important to check the position of the rollers and the maximum gap between them. A little wing on the steel bracket will help for the installation (highlighted on picture 23).

Install two rollers always close to the corner, supporting the Aluminum profiles for few millimeters (see picture below): an additional notch of 2mm is necessary on the wall to host the roller. Distance between two rollers cannot be more than 1 meter. If the number of rollers is odd, put one roller in the middle of the room.

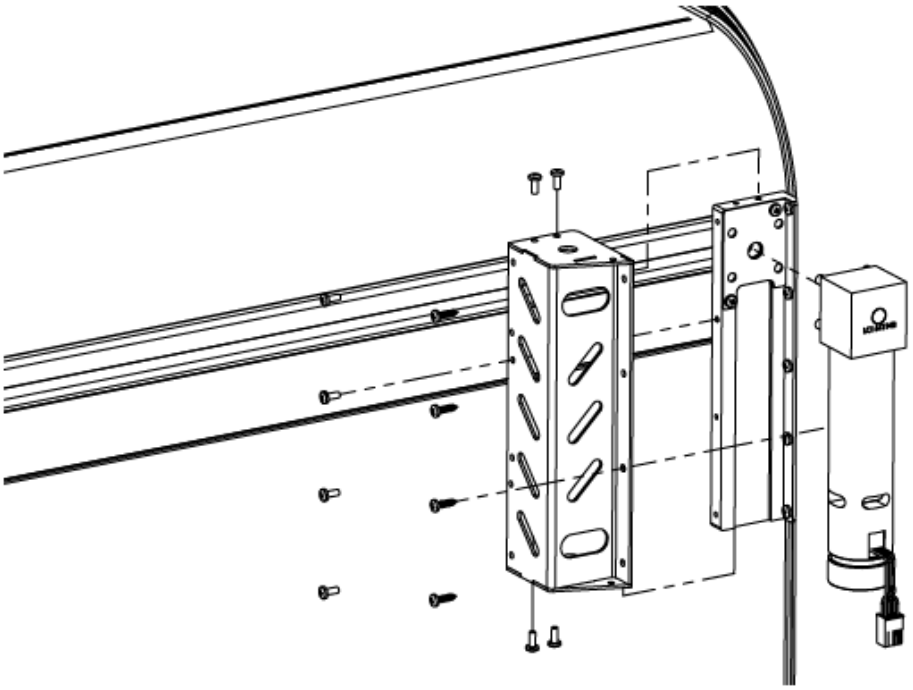




Picture 23 Check the correct position of the roller in the corner.
The wing on the steel (highlighted) will help for the installation.

Complete the assembly of the system by mounting the motors and their support S-Brackets. We suggest to rotate the motor using a battery, pressing it gently against the bracket “A” until the orientation of the motor and the shaft of the pinion is the same.

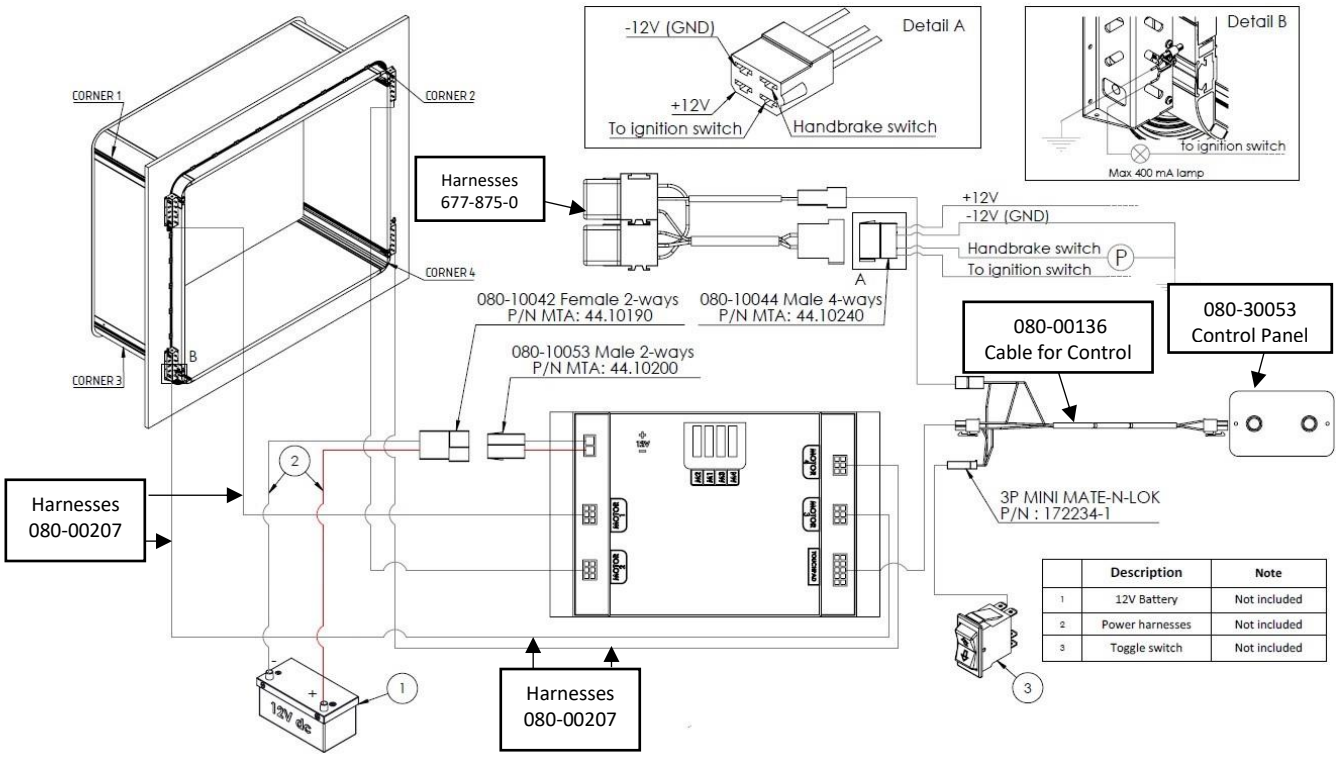
Fasten S-Brackets on the wall using the selfdrilled screws 4,2x160. Use screws 4x10 on the brackets"A" (picture 24).



Picture 24 Assembling the motors, and their “S” brackets, on the brackets“A”.

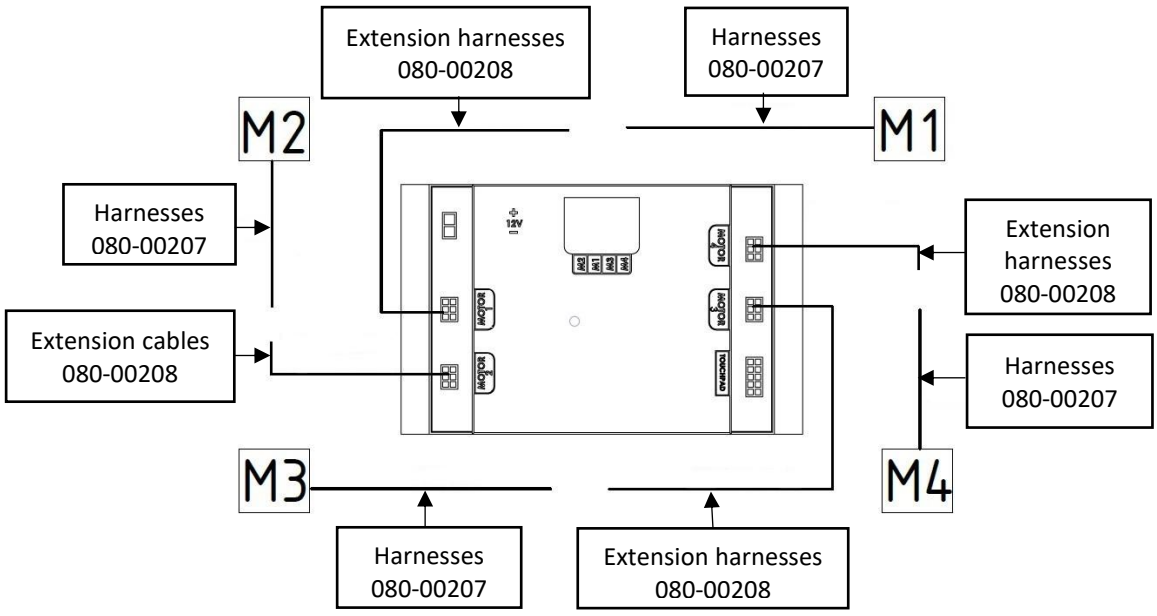
4. Electrical connections

Final step of the installation is the connection of the control unit and the harnesses. The setting of the control unit is described in a dedicated document. Here below the wiring scheme. For further details please check the dedicated drawings.



Picture 25 Electrical connections.

Connect the motors following the indication on the drawings using harnesses code 080-00207 and extension cables 080-00208 if they are necessary (picture 26).



Picture 26 Electrical connections between control unit and motors.

Connect the motor of each corner. Connect the touchpad with harnesses code 080-00136-0. The system can have a Reed sensor and a related magnet to determine if the room is open. This sensor is also very important because the system sends an alert to the driver to advise that the room is “out “and engine is on. When engine is on, room can move only if the handbrake is pulled. The sensor and the buzzers can be connected using the two relay boxes as per picture above and electric scheme. Buzzer should be max 400mA. When everything is connected, connect the control units to the battery and set it as per dedicated document. Use harnesses with section of the cables 6mm² if lengths are within 3 m, cables with section 10 mm² if lengths are between 3 and 8 m. Please avoid to have connections on the track.