

SECTIONAL GARAGE DOOR

AiKON
DISTRIBUTION


WIŚNIEWSKI

Installation Instructions



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[A000177] **Read this Installation Manual, as well as the UniPro Operating and Maintenance Manual, and observe all the instructions.**

1. OVERVIEW

[A000178] See: "UniPro Operating and Maintenance Manual".



- [A000132] **The product may be installed and adjusted by a PROFESSIONAL INSTALLER only.**
- [C000445] The electric drive unit or the controller can only be installed and adjusted by a **PROFESSIONAL INSTALLER** who is competent in automation and mechanical engineering equipment for residential use and must do the installation and adjustments in accordance with the current laws of the country of use.
- [A000097] **The manual covers the installation of the products with standard equipment and optional equipment components. The scope of standard and optional equipment is defined in the commercial offer.**
- [A000104] **Failure to observe the safety regulations, regulatory requirements, as well as instructions and recommendations provided in this Installation and Operating Manual voids all of the Manufacturer's obligations.**

[A000179] The overview drawings provided in the manual can differ in terms of manufacturing details. These details are shown in separate drawings where necessary. During installation, make sure to observe the OHS regulations regarding: installation work, locksmithing work done with power tools depending on the installation technology used, and follow all the applicable standards and regulations, as well as the reference construction documentation. During the installation/refurbishment work, protect all the elements from plaster, cement, and gypsum splashes. They might leave stains. After completing the installation and making sure the product operates properly, give the Operating and Maintenance Manual to the owner. The manual should be protected from damage and kept safe.

[B000002] The type and structure of the building material to which the products will be fastened determines the choice of the mounting elements. By default, wall plugs intended for installation in solid materials with dense structure (e.g. concrete, solid brick) are supplied together with the product. If the product is installed in other materials, the mounting elements should be substituted with ones appropriate for installing in the materials of which the walls and the ceiling are made. Wall plugs or anchors must be certified for use in construction and must be selected in accordance with the Manufacturer's instructions taking into account the required load-bearing capacity. The installer should follow the mounting element selection guidelines supplied by the manufacturer of the mounting elements. The selected mounting elements should not negatively impact the functioning of the product.

[A000115] Assemble and install the product in accordance with the requirements of EN 13241. Install the product using only original fastening elements (e.g. bolts, screws, nuts and washers) supplied with the product, compliant with the EN or ISO standards.



[A000152] **Making any modifications or changes to the product accessories is strictly prohibited.**

[A000122] The Manufacturer shall not be liable for any damage or operating malfunctions caused by use of the product with equipment from other suppliers.

[B000129] The product shipping packaging is intended to protect the product during transport only. Protect the products in the packaging against weather. Keep the packed product on a hard and dry surface (which must be flat, level and resist variations in indoor conditions) located in sheltered rooms that are dry and well-ventilated; the storage location must be free from all external conditions which may damage the product components and its packaging.



Do not store in wet rooms and/or rooms with vapours which may damage paint coats and/or galvanic coats.

[B000025] Airtight foil packaging must be unsealed when storing the doors to avoid adverse change of microclimate inside the packaging. Failure to do so may result in the damage of painted and zinc plated coating.

[A000157] Waste and packaging materials (plastic, cardboard, polystyrene, etc.) comply with the applicable European standards. Nylon and polystyrene packaging should be kept out of reach of children.

[A000153] Secure the product against toppling and protect it from any sort of damage during assembly and storage.

[C000075] The wiring system and the electric shock protection installations are defined by current norms and regulations. Only a qualified installer is allowed to perform electrical works.

- The drive feed circuit should be equipped with a cut-off protection, a residual current circuit-breaker, and an overcurrent protection.
- The gate power supply system should be executed as a separate electrical circuit.
- Grounding of the drive unit is obligatory and should be done in the first place.
- Disconnect power supply prior to any works on the electrical system. Disconnect any backup batteries, if used.
- If fuses trip, identify the cause and eliminate the fault before restoring normal operation.
- In case a problem persists and information from this instruction fails to help, contact the manufacturer technical department.
- Any rework or repairs on the system should be conducted only by a professional installer.
- Usage other than stated in this instruction is not allowed.
- Neither children nor adults should stay within the gate operating area.

2. TERMS AND DEFINITIONS ACC. TO STANDARD

See: "UniPro Operating and Maintenance Manual".

3. DESCRIPTION OF SYMBOLS

Ho	– opening height
So	– opening width
N	– minimum required lintel height
W1	– minimum required side clearance
W2	– minimum required side clearance
E	– minimum room depth with clearance under the ceiling
B _R	– right drum (black)
B _L	– left drum (red)
S _R	– right-wound spring (red)
S _L	– left-wound spring (blue)
L	– cable length
Lc	– cable active length



[C000493] this sign refers to a specific item in this Installation Manual.



symbol referring to a specified drawing



symbol referring to a specified page



correct position or action



incorrect position or action



option



manually operated product



power operated product



supervision



tighten



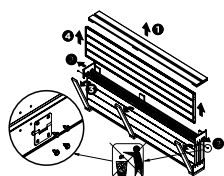
unscrew



use little force



use high force



[C000392] Removing the panels from the packaging. Do not discard the panel fixing screws, you can reuse them to install the hinges.



[C000393] Protect the products against weather.

4. SAFETY GUIDELINES

See: "UniPro Operating and Maintenance Manual".

5. REQUIRED INSTALLATION CONDITIONS

[B000027] The doors can be mounted to reinforced concrete walls, those made of bricks, or steel frameworks. A room intended to mount the doors should be finished completely (plastered walls, finished floor), walls must not have any faults in quality of work. The room should be dry and free of chemicals being harmful for coating paints. Both side walls, the frontal wall and door assembly opening lintel must be vertical and perpendicular to the floor, and must be finished.



It is prohibited to install the door in a room in which finishing works are still to be done (plastering, gypsum finishing, grinding, painting, etc.).

Floor in bottom sealing area must be levelled and constructed in such a way as to ensure free water drain. Appropriate ventilation (drying) of garage must be ensured.

[A000086] The clear installation area must be free of all pipes, lines, cables, etc.



[A000040] According to the current European regulations, a power-operated gate must be manufactured along with Directive 2006/42/EC. It must follow the following standards, as well: EN 13241, EN 12445, EN 12453, and EN 12635.

Before proceeding with the installation, a risk analysis must be performed, including all safety conditions, as provided by Appendix 1 Machine Directive, to indicate solutions to be used with the installation (planning permission).

[B000149] The installation should be performed at a temperature not lower than 5°C, the structure should be protected against the adverse effects of ambient conditions such as water, snow, construction site dust, all types of mortars.



- [C000081] **The product cannot be installed in an explosive atmosphere. Safety hazard.**
- [C000520] **The door drive unit should be protected from contact with water.**
- [C000184] **It is prohibited to open the door leaf if the guides are not mounted.**

5.1. RC2 ANTI-BURGLARY INSTALLATION

The walls surrounding the elements must be masonry in accordance with DIN 1053 (rated thickness ≥ 115 mm, stone compressive strength class ≥ 12 , mortar group II) or made of reinforced concrete in accordance with DIN 1045 (rated thickness ≥ 100 mm, B15 strength class).

[B000271] Place remote control transceivers or other door operation controls at least 0.8 m away from the nearest edge of the door.

6. INSTALLATION ERRORS

[B000048] There is a risk of errors occurring during installation. Errors are easy to avoid by making sure that:

- tracks are properly installed in accordance with the descriptions in this instruction manual,
- the leaf forms an even surface after it is closed, the segments/modules should not show any deformation; any displacement of segments/modules in relation to each other should be corrected,
- the product and its components are adjusted in accordance with the instruction manual,
- all the fastening elements are tightened with proper torque,
- accessories operate properly.



[A000151] Disregarding these basic recommendations may cause malfunctioning, damage.

7. ENVIRONMENTAL PROTECTION

See: "UniPro Operating and Maintenance Manual".

8. INSTALLATION INSTRUCTIONS

[A000041] Proper operation largely depends on correct installation of the product. The Manufacturer recommends its authorised installation companies. Safe and intended operation of the product can only be ensured by correct installation and maintenance carried out according to the Manual.

[A000164] Before you start the installation, check whether the product and all the components are fit for use. Make sure that all the materials and elements are in a perfect condition and are suitable for use.

[D000145] The garage ceiling must provide safe installation of the operator. If the construction of the ceiling is too light or the ceiling is too high, the operator must be installed on a support structure adapted for the conditions in the room. Mounting the door or the operator fixing elements in a way that allows their dislocation during operation is not allowed.

[D000146] Before drive installation, make sure that the door the drive is mounted on has been mounted and adjusted correctly and opens and closes easily. Also dismantle the fixing parts and the drive components which do not require power supply.



- **The drive must not be installed with a non-operational door.**
- **Disconnect the drive from a power source before proceeding with the installation works. Also a battery power supply should be disconnected if it has been delivered.**

[C0000451] Do not connect the drive unit to a power source before completing the installation process.

[B000096] When installing the drive unit, recommendations of the door manufacturer, manufacturer of the drive unit and the accessories should be observed. To connect the drive unit, only original subassemblies must be used.

[B000215] Fitting works should be carried out in accordance with the European directives and standards: 2014/30/UE; 2006/42/WE; 2014/35/UE; EN 13241 as amended. Install safety units (photocells, safety bars, etc.) according to applicable standards to protect persons, animals or objects that can appear near the gate from hitting, injury or damage.



- [A000165] **It is forbidden to use any additional end fittings or alter the existing ones without the Manufacturer's consent.**
- [A000129] **Install the operator using the holders and adapter brackets provided by the Manufacturer.**
- [A000026] **Keep the packaging (plastics, polystyrene, etc.) out of reach of children.**
- [A000151] **Disregarding these basic recommendations may cause malfunctioning, damage.**

8.1. INSTALLATION SEQUENCE FOR UNIPRO SJ, SP, ST, N, HL

Fig. 1 [D000800] Before starting installation, do the following:

- check whether the wall type enables the door to be installed properly,
- check the dimensions of the installation opening and the room where the product will be fitted.

Fig. 2 Frame installation method.

Fig. 3 Installation tools.

Fig. 4 Installation accessories.

Fig. 5 Install the gaskets.



Install only in temperatures over 5°C.

- Sj St N** Fig. 6.1 Screwing down the rear connecting section to the top roller bracket via the internal holes to obtain the "installation frame".
- Fig. 7 Fit the frame, adjust the plumb and level.
- Fig. 8 Check the spacing of the frames in the top, middle, and bottom sections.
- Fig. 9 Mark out the installation holes.
- Fig. 10 Drill the installation holes.
- Fig. 11 Place the opening frame anchors in the holes.
- Fig. 12 Use glue for the installation of thermal gaskets.
- Fig. 12.1 Screw down the frame to the wall.
- Sj Sp HL** Fig. 13 Install the fascia panel.
- Sj Sp** Fig. 14 Fasten the mounting plate in the middle of the installation opening. Fasten the mounting plate to the lintel with 4 anchors. When installing doors with a single long spring, it may be necessary to move the mounting plate relative to the centre of the opening while maintaining the required distance between the spring and the cable drum (fig. 17.1).
- Sj St N** Fig. 15 Unscrew the track fastener.
- Fig. 15 Install the horizontal track.
- Fig. 16 Ensure the horizontal track is level, make sure the lengths of the diagonals match (the difference between the diagonals cannot exceed ± 3 [mm]), mark out the holes for the suspension bars.
- Fig. 16.2 Drill the installation holes. Place anchors in the holes.
- Fig. 16.3 Suspend the door on the ceiling.
- O** Fig. 17 Cut the suspension bars, file the cut edges, apply corrosion protection to the edge.
- ↓
- Fig. 19 Install the drive unit. Follow the colour marking of the drums and the springs when installing them on the shaft.
- St** Fig. 17.3 The additional mounting bracket cannot be installed in the middle of the fastener, because space for the automatic operating unit has to be ensured.
- Fig. 23 Install the first door panel.
- Fig. 23.1 Pull for pulling the door should be fixed in a manner preventing any side movement.
- St Sj Sp** Fig. 24 When winding the cable on the drum, ensure at least two full winds of the cable on the drum with the door in the end closed position.
- Fig. 25 Hinge installation method.
- Fig. 26 Screw down the bottom elements of the hinges to the panel.
- Fig. 27 Install the subsequent panels. When installing the panels, maintain 1 to 2 [mm] gap between the panels. To ensure proper gap between the panels, use the provided cardboard pieces about 2 [mm] thick and place them between the panels near each hinge. Remove the cardboard after screwing down the hinges.
- Fig. 30 Install the top roller holder.
- HL** Fig. 31 Proper cable installation - HL type installation: With the cable properly wound, when the top panel moves from the vertical to the horizontal tracks, the cable moves from the conical to the cylindrical section of the cable drum (Fig. 31.1 - 31.2). MZL - point of cable attachment. Active length of the cable is calculated theoretically and may require adjustment during installation. Active length of the cable (Lc) is provided on the pack list. Cables can be cut only after the door is adjusted and after making sure that the door operates correctly.
- Sj Sp St HL** Fig. 33 Tension the springs in accordance with section 8.2.
- N** Fig. 34 Tension the springs in accordance with section 8.3.



Observe the OHS regulations when tensioning springs.

Fig. 35 Remove the interlock from the spring break safety device.

Fig. 36 Before commissioning the door, lubricate the hinge joints, the running rollers, and the springs with e.g. Würth HWS-100 semi-liquid grease.

Fig. 37 Before opening the door for the first time, perform the steps specified in section 11.

Fig. 50 Install the handle for lifting the door leaf.

O Fig. 48 Install the bolt.

Fig. 48.4 Add the deadbolt lock to the deadbolt assembly screwed down to the panel and mark out and drill holes in the frame.

O Fig. 48.5 The deadbolt tube on the lock side should be screwed down lightly, allowing free movement. Fasten rigidly on the deadbolt side. Glue tube bushes to the panel. Tube bushes can be screwed down if required.

Fig. 51 For manually-operated doors with $H_o \geq 2,200$ [mm], install a string facilitating closing of the door.

Fig. 53 When installing the drive unit, lock the door deadbolts in the open position.

O Fig. 55 Installing the wicket door.

O Fig. 57 In automatic doors, the drive unit connector can be shortened to obtain full clear passage.

8.2. TIGHTENING RULES FOR TORSION SPRINGS

The number of spring turns is stated on the manufacturer's plate of the door. To tighten the springs, steel rods are applied, which ends should conform to the holes in spring drums. The person who tightens the springs should be correspondingly trained, and no other people should stay in the vicinity. When tightening, the person who tightens should stand on scaffoldings next to the spring to ensure that the tightening rods and springs are

not located in front of him or her. Before starting the proper tightening, check if the springs are securely fixed on drums, and if springs do not have visible cracks and deformations. Then loosen the screws fastening spring drum with shaft. The tightening should be performed by ¼ turn till the required tension is achieved. During tightening, insert one rod into the spring drum hole, and turn it to such an angle as to enable the second rod to be inserted in the next spring drum hole. When the second rod is securely fixed in the drum hole, remove the first rod, but continue to hold firm the second rod. Repeat the procedure till the required tension is achieved. During tightening, the spring will stretch and decrease its diameter. When the desired tension is achieved, carefully tighten the screws fastening spring drum with shaft. Then, remove the tightening rods. Repeat the procedure to tighten the second spring. This instruction provides exemplary number of spring turns. The actual number of spring turns may differ slightly from the number of turns stated on the manufacturer's plate of the door. This is explained by specific conditions of the particular door installation.

When the door installation is completed, check whether the door operates according to the Assembly and Operating Instruction. If necessary, make corresponding adjustments.

Check the correct tension of springs, and, if necessary, adjust it. To do this:

- open the door by lifting its leaf to half-open position,
 - if the leaf is visibly falling, increase the spring tension by its regulation,
 - if the leaf is visibly lifting, decrease the spring tension by its regulation,



[B000094] **Failure to perform the above-mentioned work may cause the door leaf/curtain to suddenly drop and injure people or damage items near the door.**

8.3. TIGHTENING RULES FOR EXTENSION SPRINGS

To tighten the springs, spring tensioners on the horizontal guide ends are used. The person who tightens the springs should be correspondingly trained, equipped with relevant safety clothes, and no other people should be present in the vicinity. During tightening, the person who tightens the springs should stand on scaffoldings behind the springs. Before starting the proper tightening, ensure that the cables and mounting hooks are securely fixed. To tighten, pull the tensioner and hook its proper hole to a vertical protrusion of the corner bracket connecting the guide end with the cross-beam connecting both guides. On the other side of the door, hook the tensioner to the same hole.

When the door adjustment is completed, protect the tensioners with split pins.

When the door installation is completed, check whether the door operates according to the Assembly and Operating Instruction. If necessary, make corresponding adjustments.

Check the correct tension of springs, and, if necessary, adjust it. To do this:

- open the door by lifting its leaf to half-open position,
 - if the leaf is visibly falling, increase the spring tension by its regulation,
 - if the leaf is visibly lifting, decrease the spring tension by its regulation,



[B000094] **Failure to perform the above-mentioned work may cause the door leaf/curtain to suddenly drop and injure people or damage items near the door.**

8.4. DRIVE UNIT ADJUSTMENT

See: "UniPro Operating and Maintenance Manual".

8.5. OVERLOAD ADJUSTMENT

See: "UniPro Operating and Maintenance Manual".

8.6. MANUAL CONTROL BUTTONS

[C000008] Manual control buttons are installed:

- in a place where the operator will have an unobstructed view of the door and its surroundings,
- in a place where the device cannot be turned on unintentionally.
- away from moving parts,
- at a height of at least 1.5 m.

9. ANTI-DROP SAFETY DEVICE

See: "UniPro Operating and Maintenance Manual".



- [A000132] **The product may be installed and adjusted by a PROFESSIONAL INSTALLER only.**
- [D000646] **A safeguard should be installed on both cables, on which the door leaf is suspended.**

[D000095] Threats

The cables suspending the door leaf operate under high tension. All assembly and maintenance works may only be performed, when the spring tension is released. The spring tension should only be released when the door is in its closed position. It is critical to follow the safety rules provided in the door maintenance instruction.

[D000100] Assembly

1. The device should be assembled during the installation of the door first bottom panel. Installation of the device at the later stage of the assembly is much more complicated due to the hinges and panels.
2. During the assembly, the roller should be connected with the device casing.
3. The device should be installed in the guide when the spring on a lever is tightened (the lever fixing the cable should be turned downwards).

10. DOOR DISASSEMBLY

- [C000022] Close and lock the door.
- Release the tension of door springs.
- Perform the assembly procedure in the reverse order.

10.1. DISSASSEMBLY OF SN DOOR

- Open the door and secure the leaf against falling down.
- Release the tension of door springs.
- Carefully close the leaf.
- Perform the assembly procedure in the reverse order.

11. FINISHING TASKS

[B000164] On completing the installation, check if the product has a marking plate in accordance with the standard, contact an authorised service company if it is not present.



On completing the installation, remove the plastic sheet from the product. Failure to do so will cause very strong bonding of the plastic sheet to the structure caused by heat and sunlight. This will make it almost impossible to remove the plastic sheet and may cause severe damage to the paint finish of the product.

[C000481] Warning labels should be attached permanently in a visible location near the door or the central control unit.

[D000200] An installer is obliged to perform the risk analysis for the gate operation, and inform a user/ owner accordingly. An operating gate usually involves the following risks: hitting and crushing within the closing zone; hitting and crushing within the opening zone; injury from entrapment between the leaves; hazards of mechanical nature involved in the gate operation. Before operating the gate, ensure that the persons are at a safe distance. During gate operation, do not touch the gate moving parts. Keep a safe distance during gate opening: it is allowed to go through the gate clear opening only when it has fully opened and stopped.

[D000201] **Check the following before the final handover of the product to the owner:**

- proper functioning of all safety devices (photocells, etc.),
- manual start and stop,
- remote control start and stop,
- function logic,
- the safety devices operation in simulated emergency situations



- [C000457] **Verify proper performance of all safety equipment (overload switch, optical sensor strip, photocells, etc.).** The door must stop and reverse when the door leaf touches any object 80 [mm] in diameter at the height of 50 [mm] when standing on the ground.
- [B000209] **Verify proper adjustment of the product and its compliance with EN 13241, EN 12453 and EN 12445.** Do the checks explained in Section. 8.4, 8.5.
- [C000459] **Verify proper adjustment and performance of the manual drive unlocking.**
- [C000014] **Check visually the door and the whole system for maladjustment, mechanical damage, tear and wear evidence, cables or operator parts damage.**

- [B000007] **It is prohibited to keep using the door, if any faults in its operation, or damage of its components are found.** Do not operate; contact an authorised service centre or a Professional Installer.
- [B000216] **Check the emergency opening mechanism supplied with the operator.**
- [A000144] **The Professional Installer must explain proper operation of the product to its user, including the emergency procedures, and train the user in proper use.**
- [A000011] All the actions should be carried out as instructed in this Installation and Operating Manual. Please send any remarks and recommendations you might have to the owner in writing, e.g. note them in the Report Book or in the Warranty Sheet. After completing the inspection, confirm that the inspection was performed by adding an entry in the Report Book or in the Warranty Sheet.
- [A000180] **After making sure the product operates properly, give the Operating and Maintenance Manual to the owner.**
- [B000183] **Keep the door pack list for future reference.**
- [A000151] **Disregarding these basic recommendations may cause malfunctioning, damage or warranty loss of the door.**
- [B000094] **Failure to perform the above-mentioned work may cause the door leaf/curtain to suddenly drop and injure people or damage items near the door.**



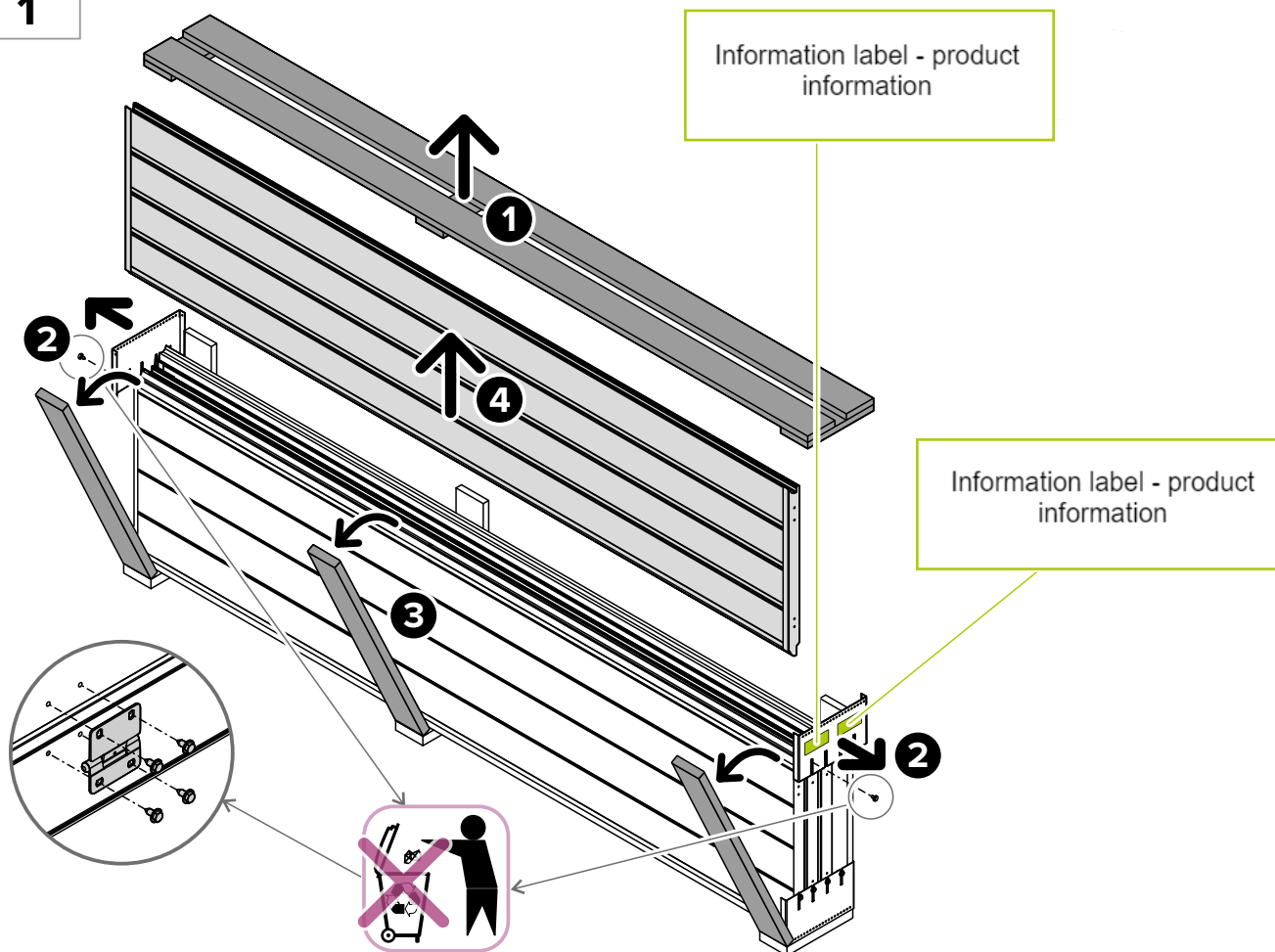
[A000011] **All the actions should be carried out as instructed in this Installation and Operating Manual. Please send any remarks and recommendations you might have to the owner in writing, e.g. note them in the Report Book or in the Warranty Sheet. After completing the inspection, confirm that the inspection was performed by adding an entry in the Report Book or in the Warranty Sheet.**

[A000079] **The manufacturer reserves the right to introduce design modifications due to technological progress that do not alter the product functionality, without prior notice.**

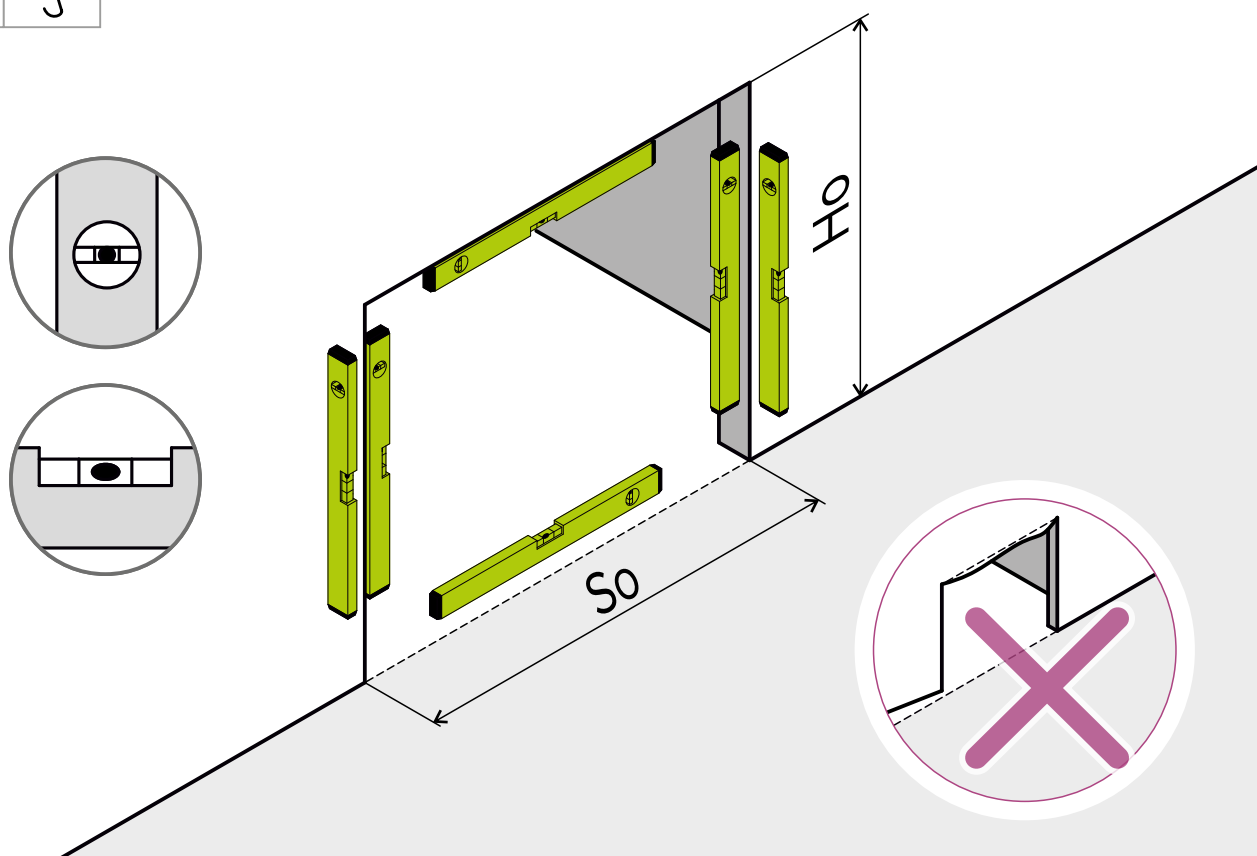
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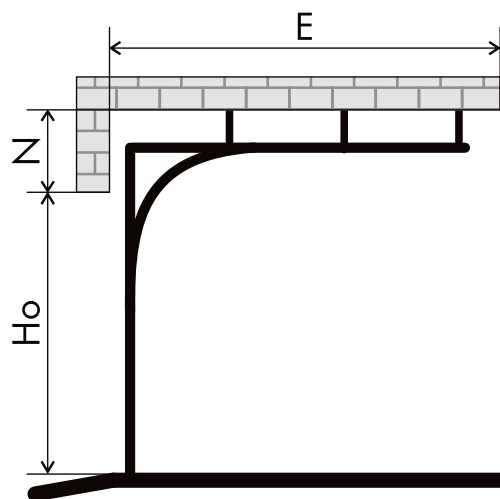
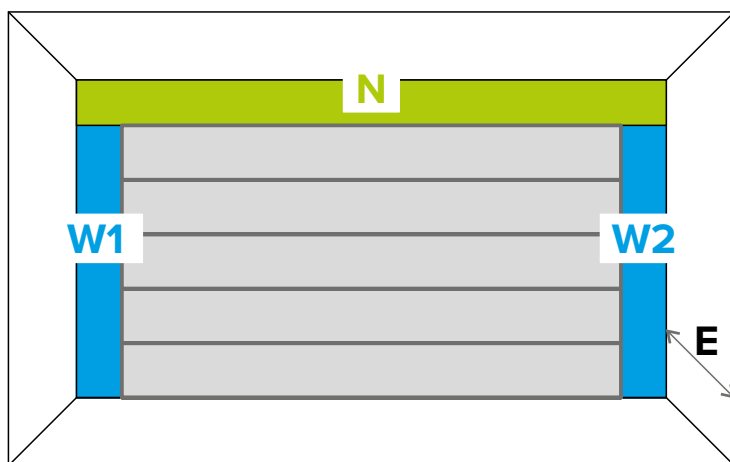
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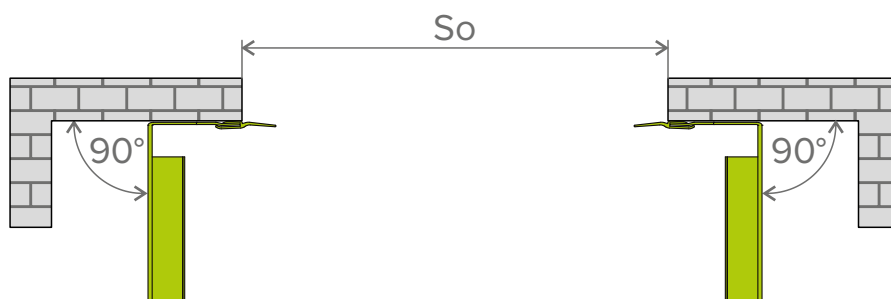
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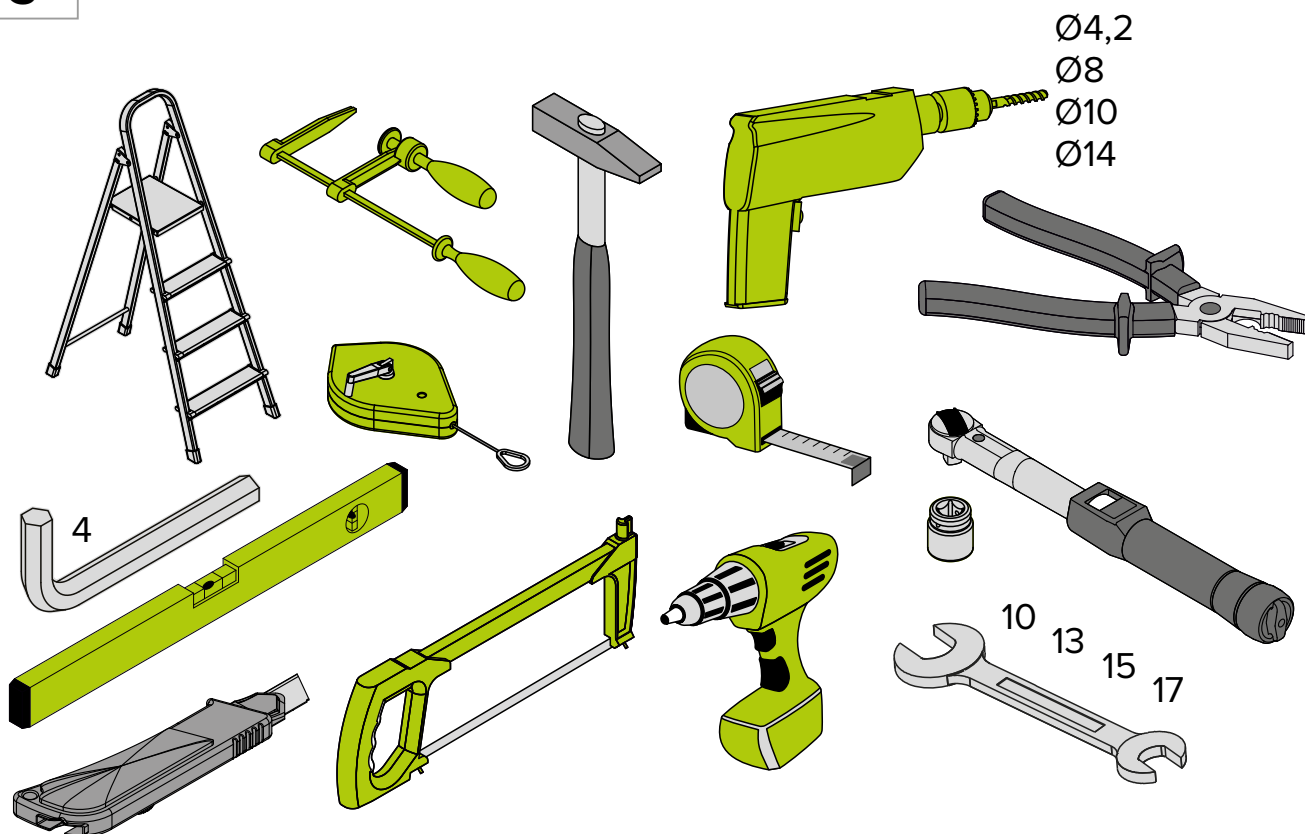
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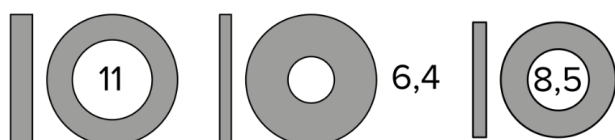
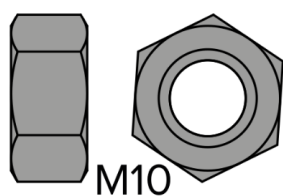
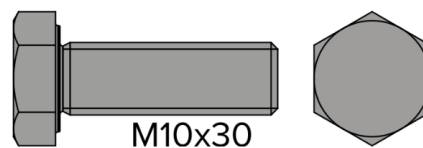
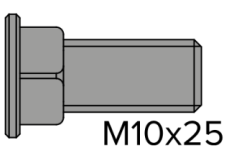
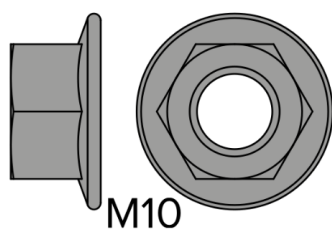
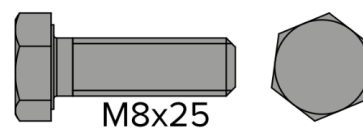
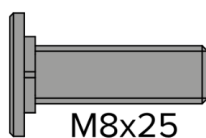
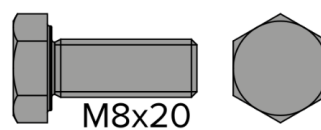
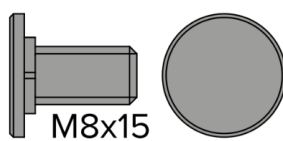
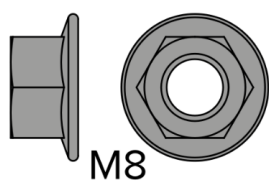
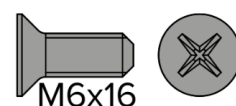
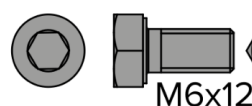
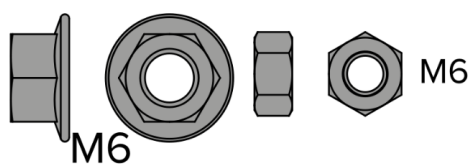
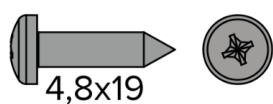
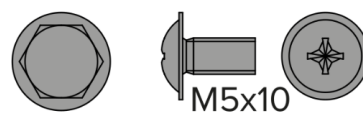
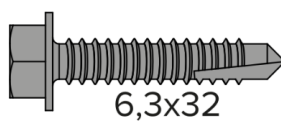
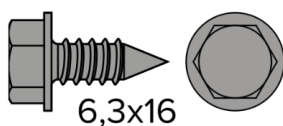
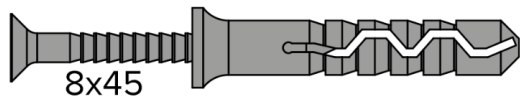
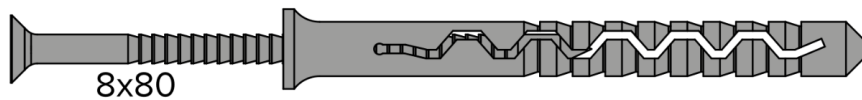
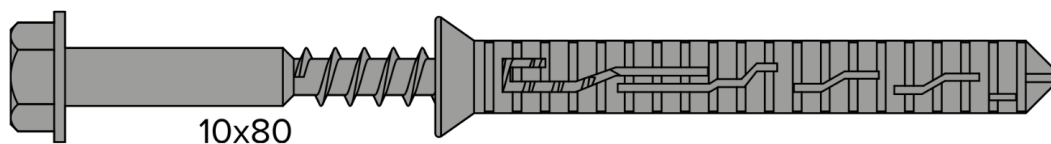


2

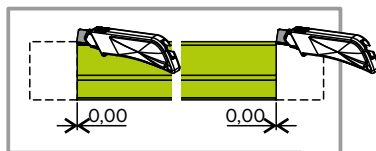
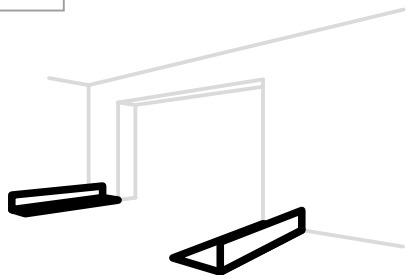


3

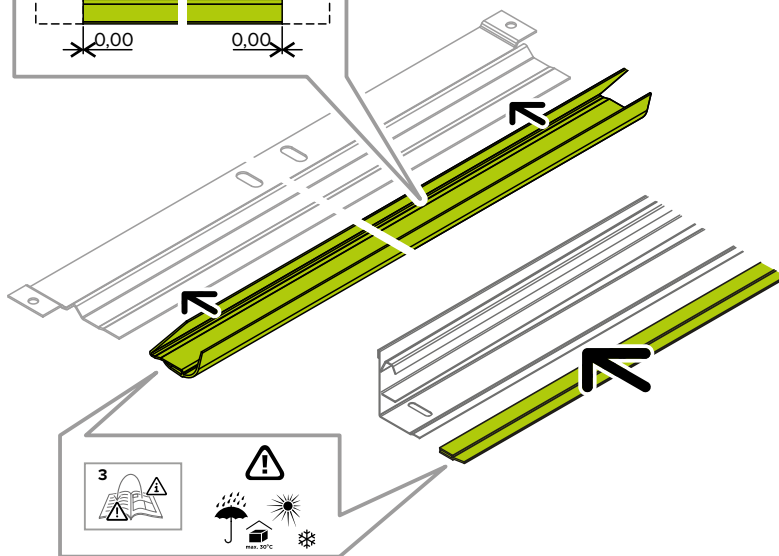
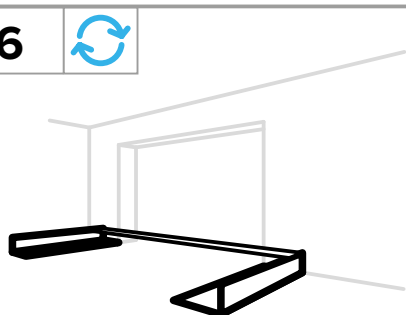




5



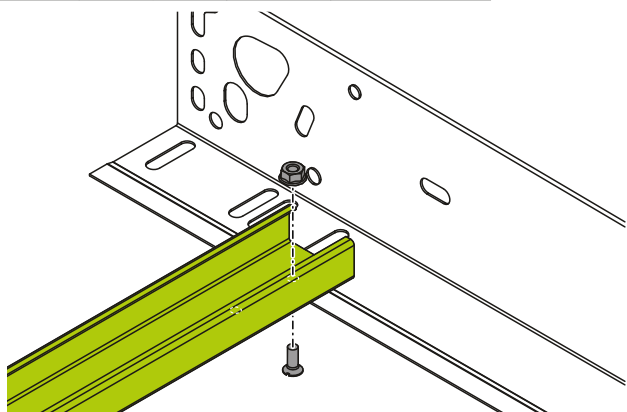
6



6.1

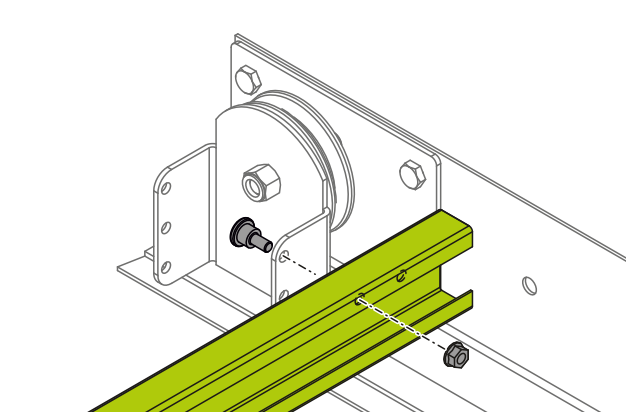
Sj

St



6.1

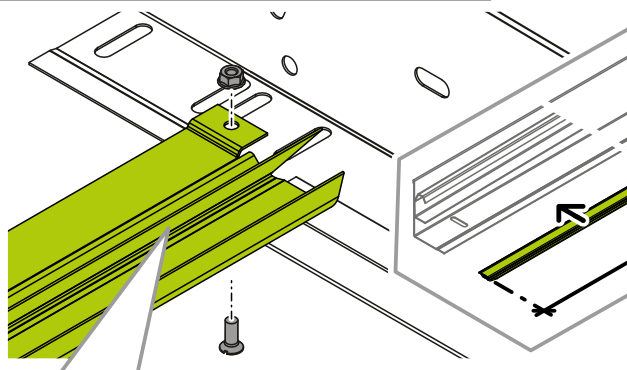
N



6.1

Sp

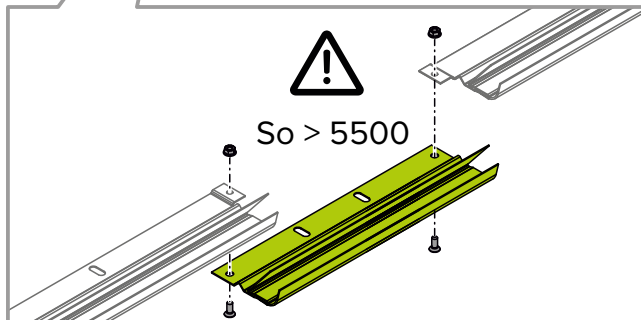
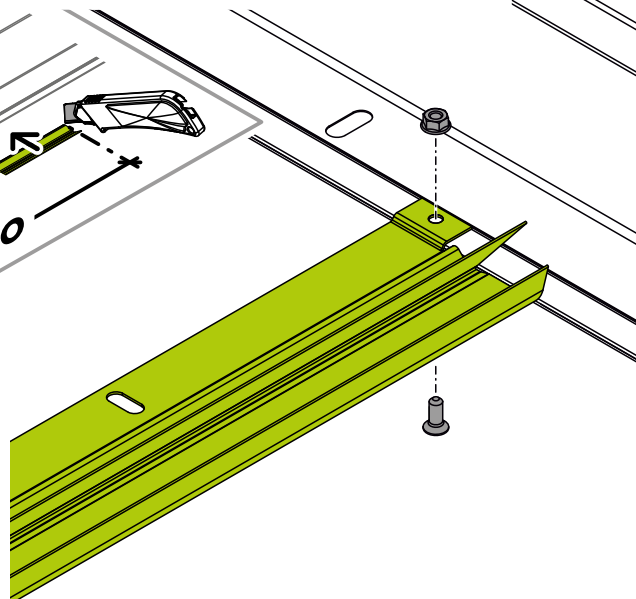
St



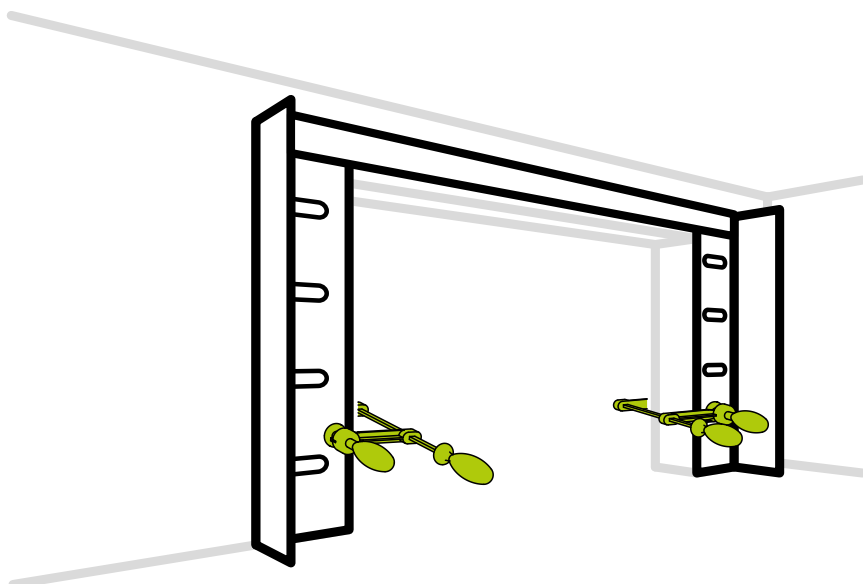
6.1

HL

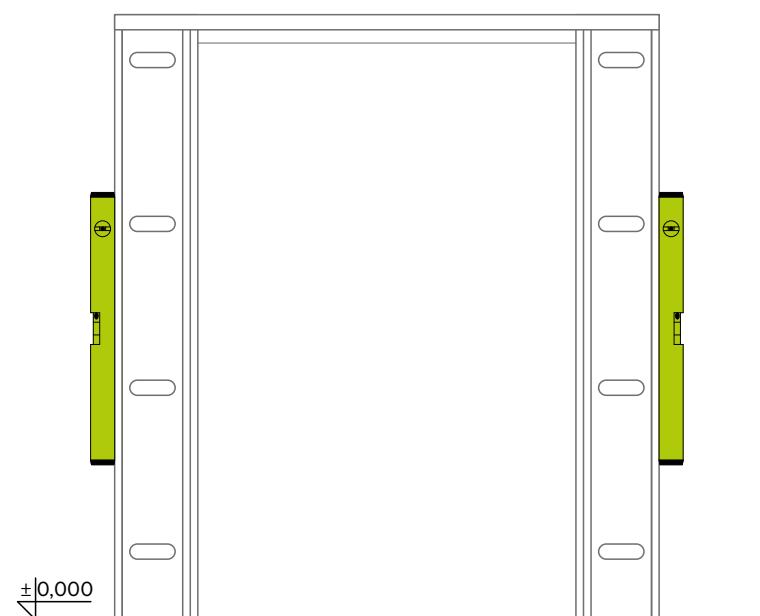
Sj



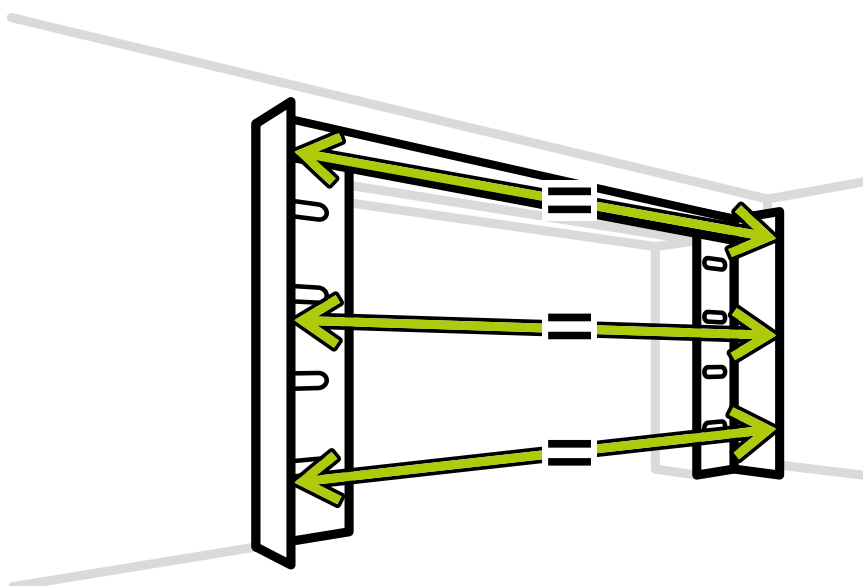
7



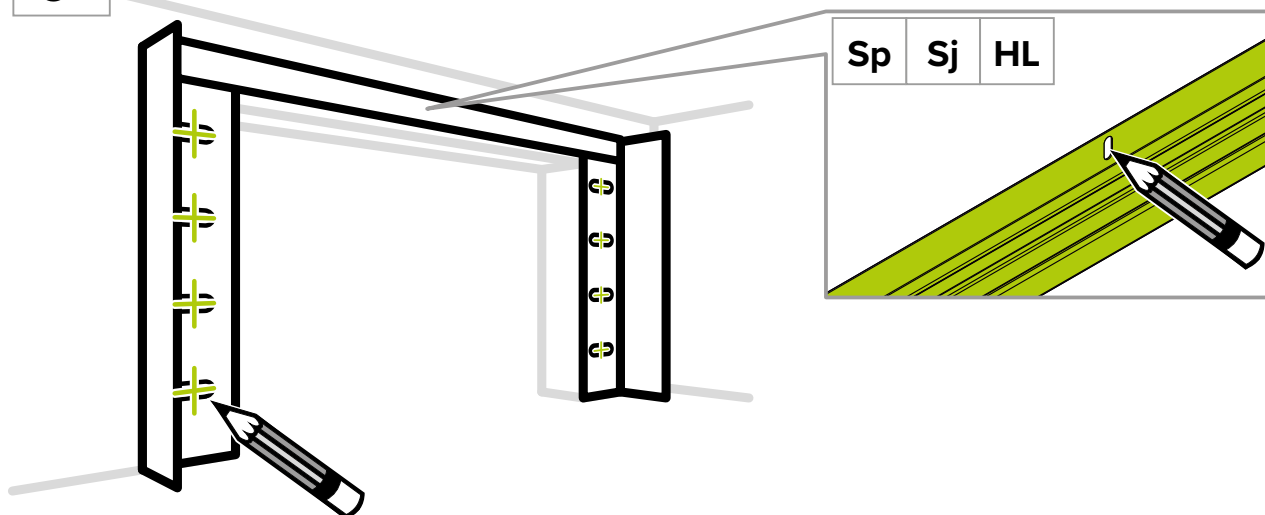
7.1



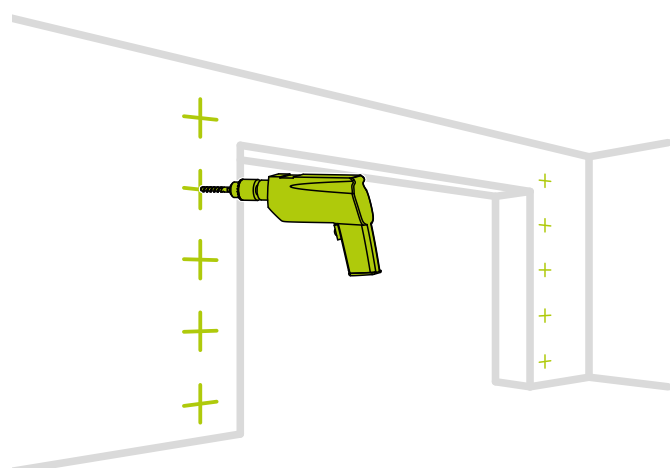
8



9



10

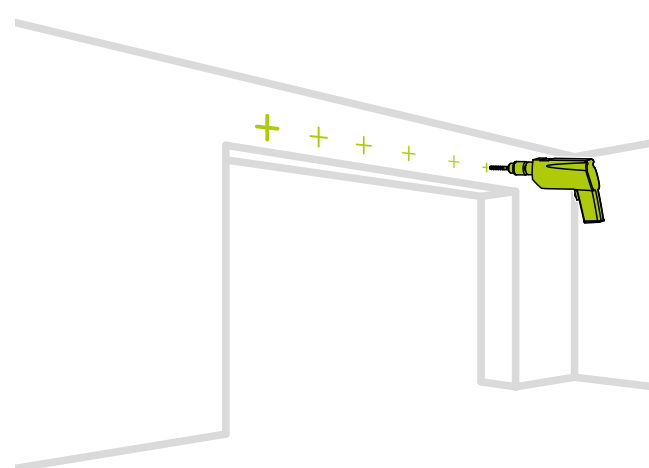


10.1

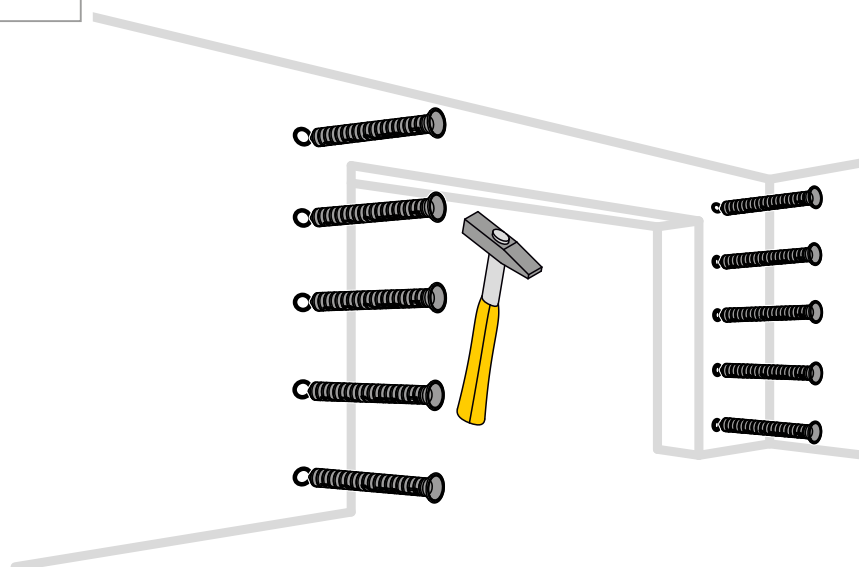
Sp

Sj

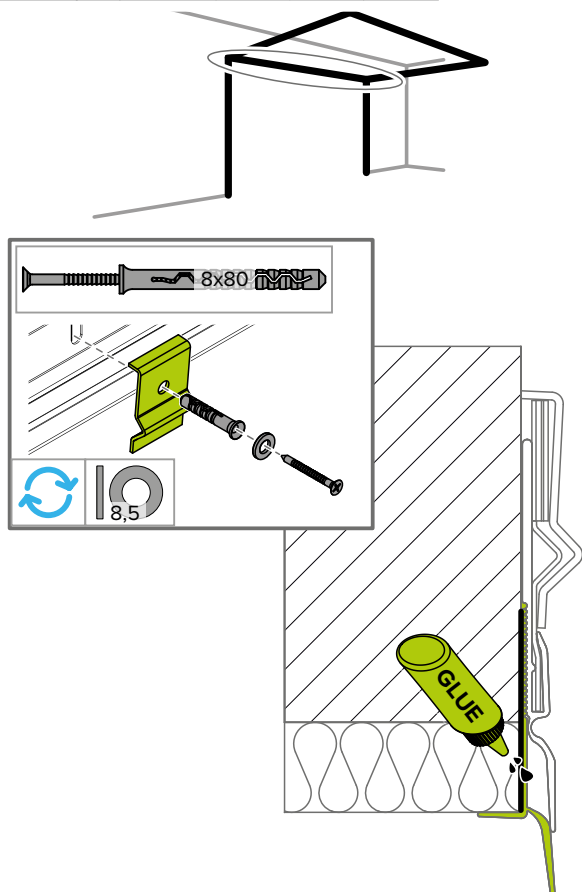
HL



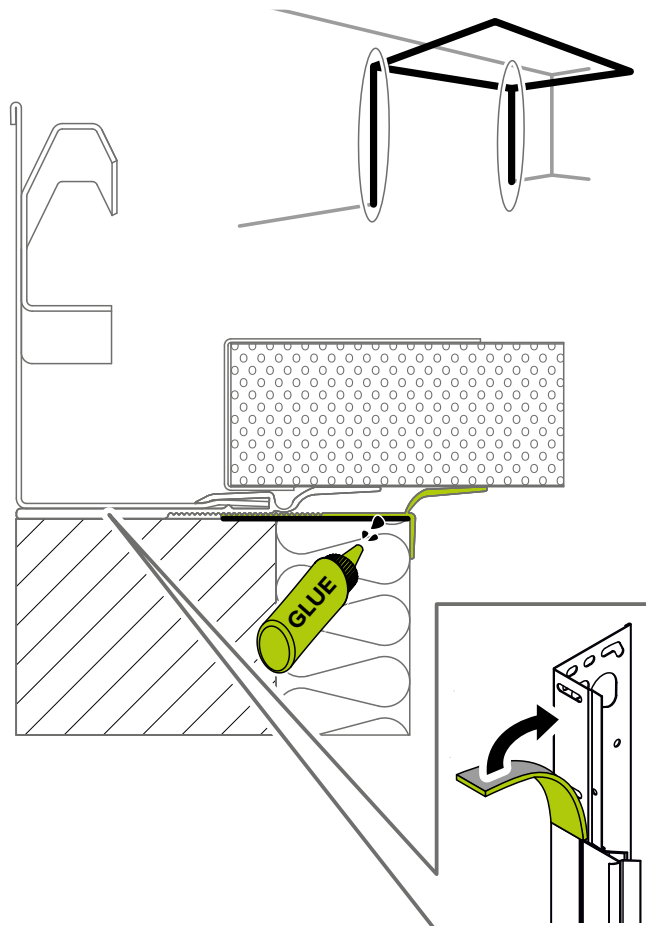
11





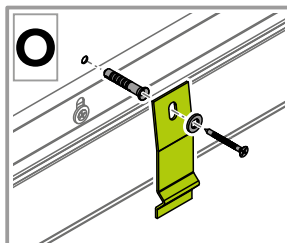
12  8.1  Sp Sj HL






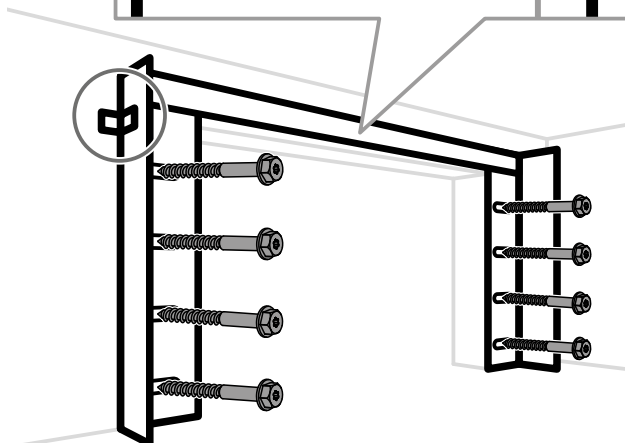
12.1  Sp HL Sj St N








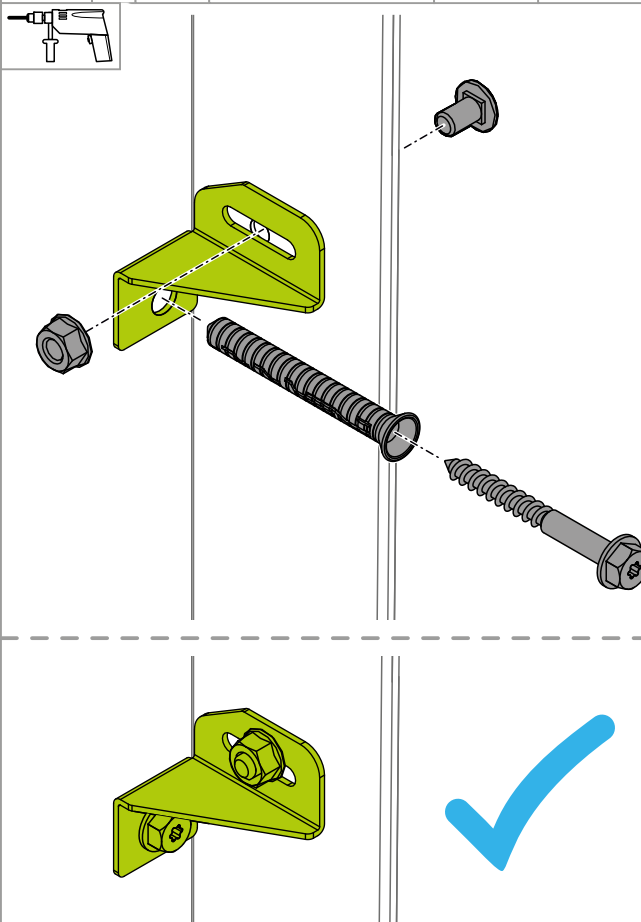
13  

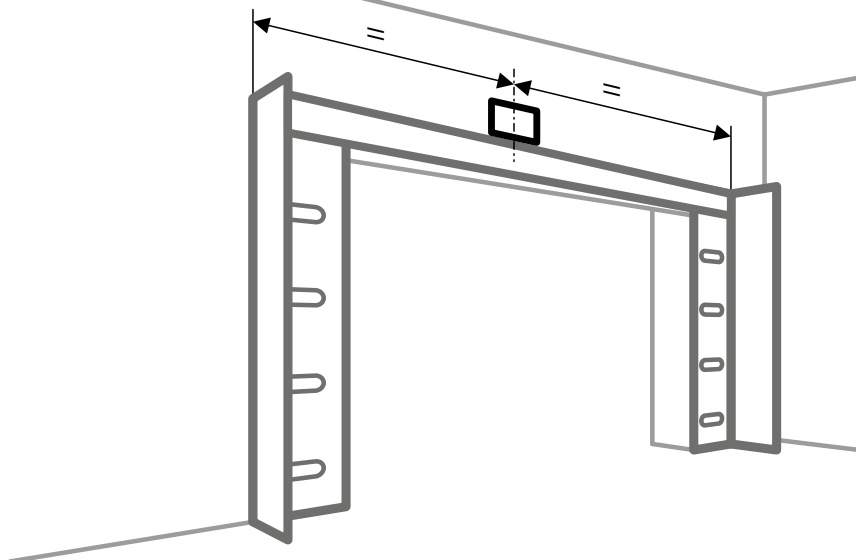
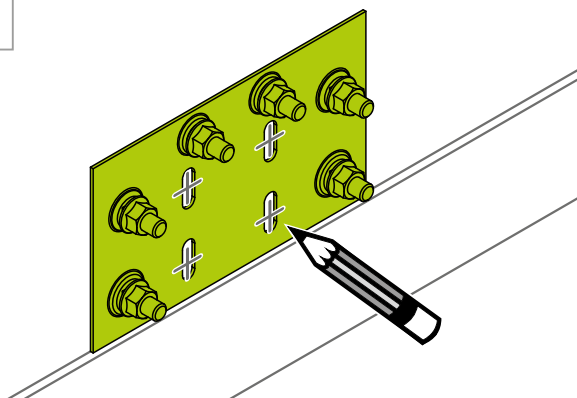
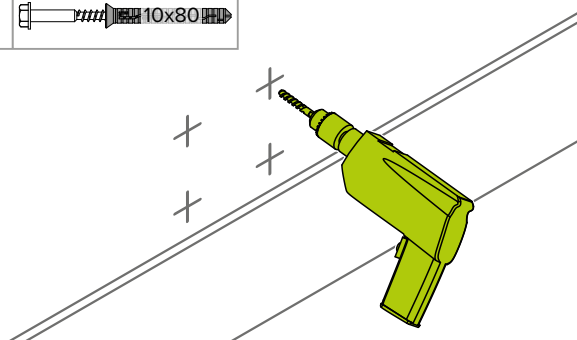
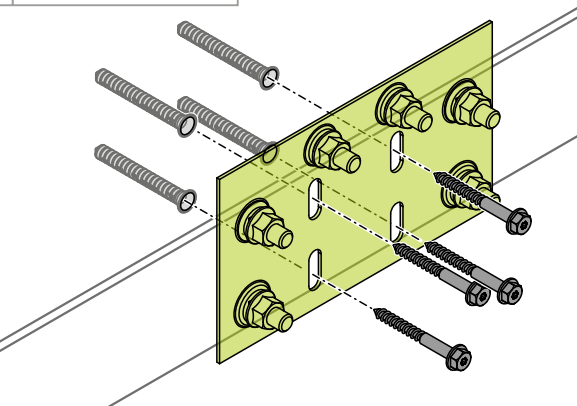
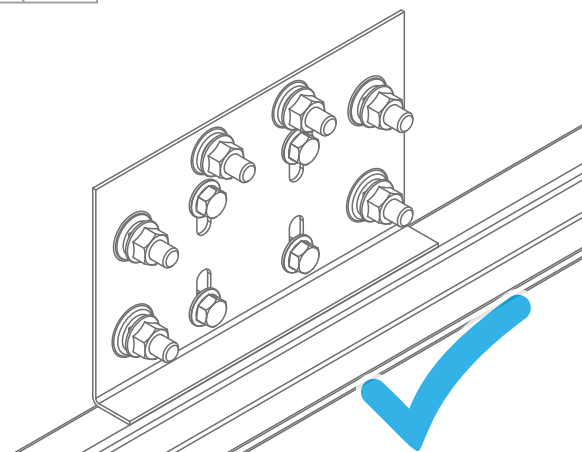
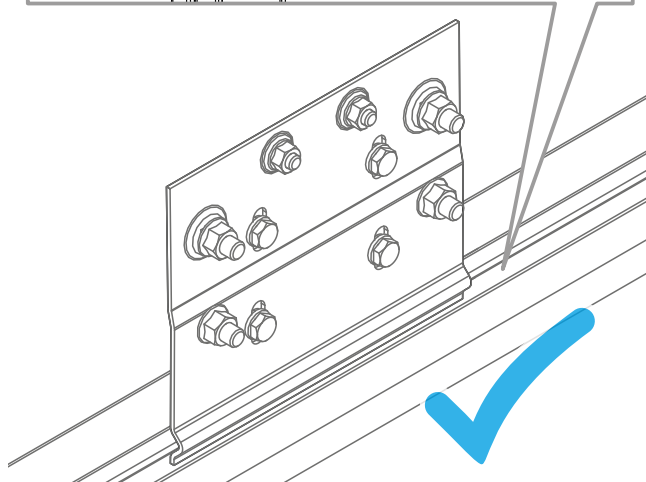
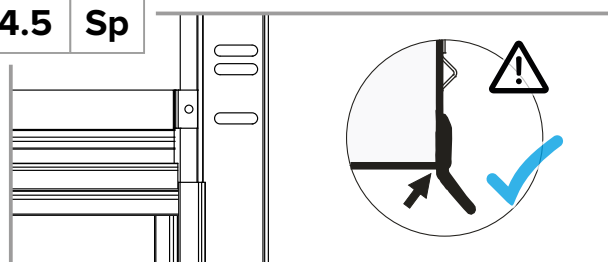


Sp HL   8x45
Sj  8.5



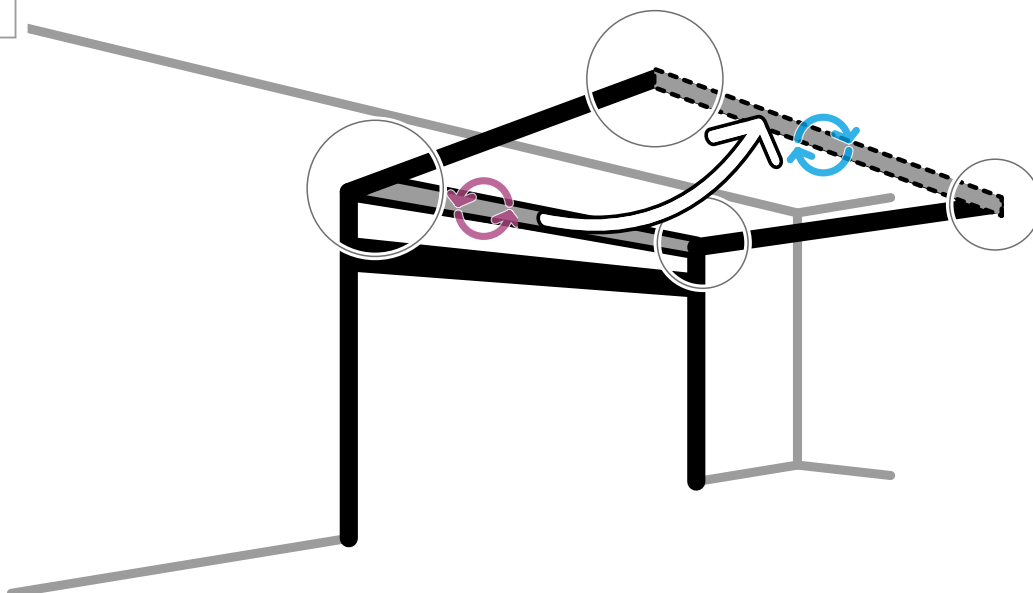
13.1    10x80  15Nm M8  M8x15



14**Sj****Sp****14.1****14.2****14.3****14.4****Sj****14.5****Sp**

15

Sj

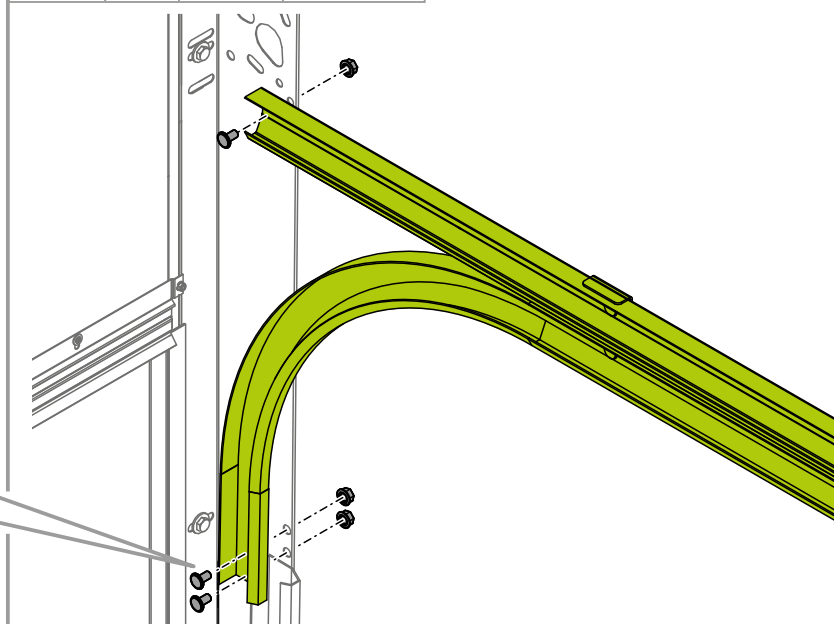
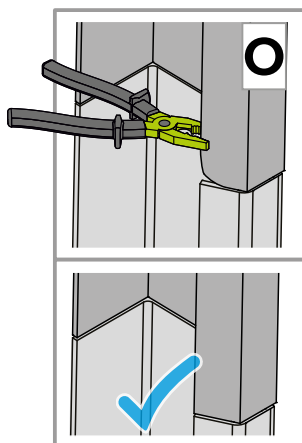


15.1



15Nm M8

M8x15

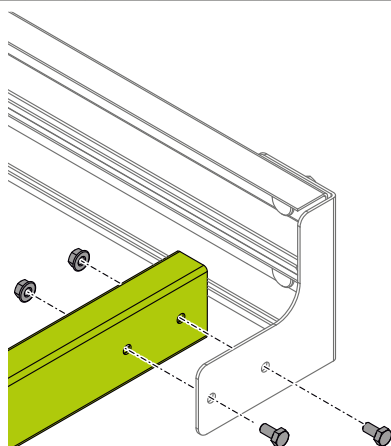


15.2



7Nm M6

M6x12

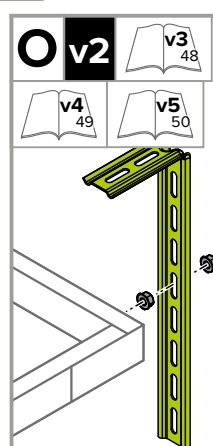
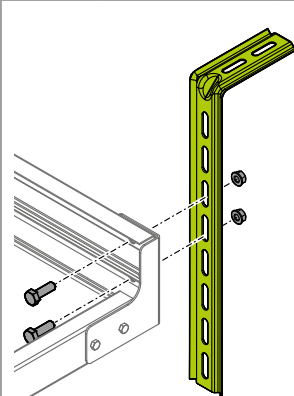


15.3



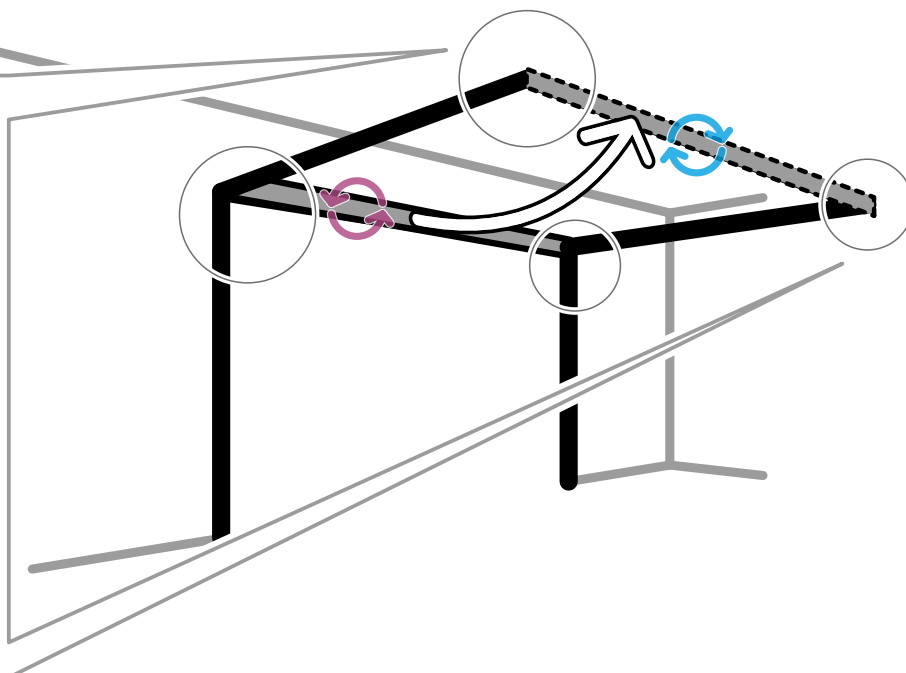
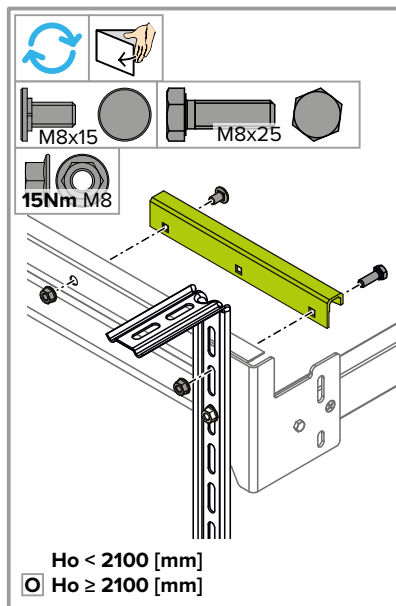
15Nm M8

M8x25

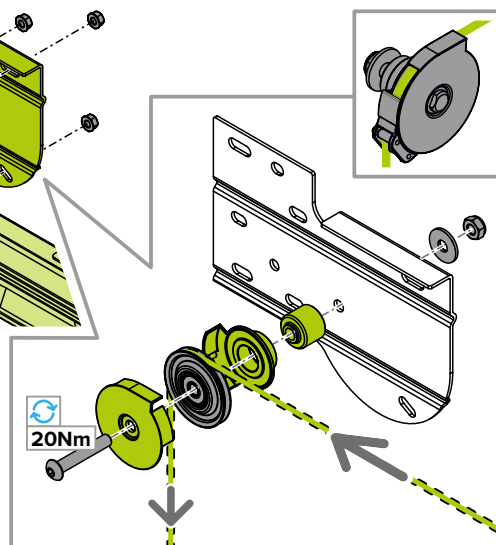
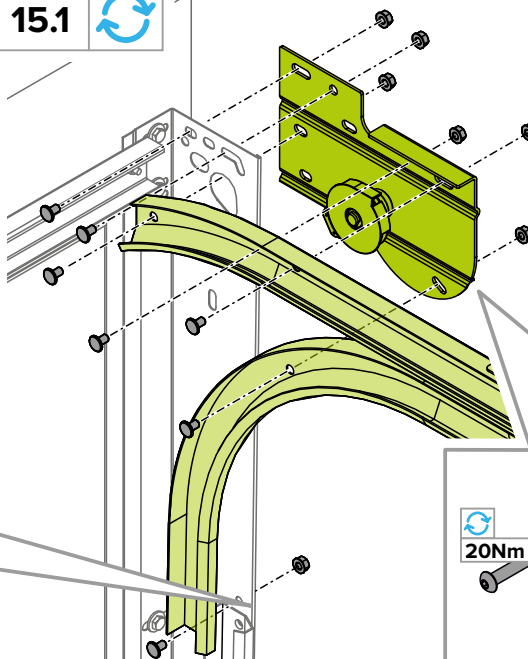
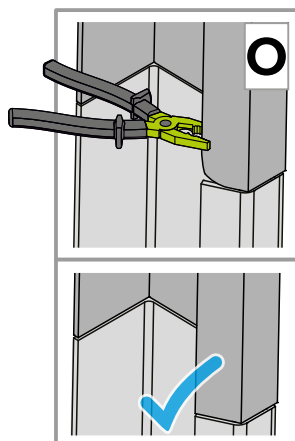
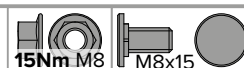


15

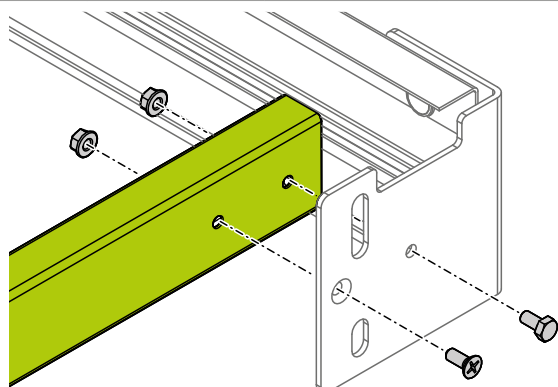
St



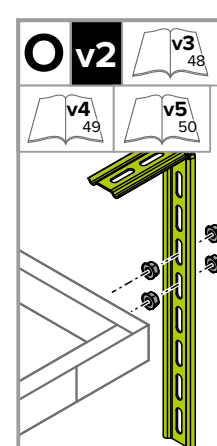
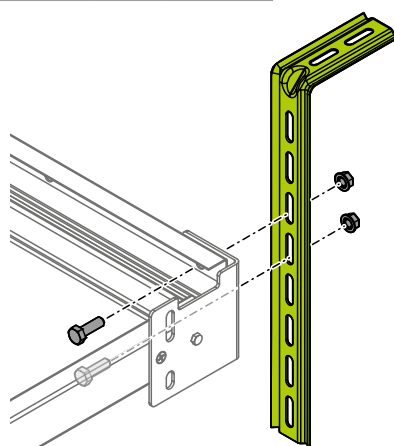
15.1



15.2

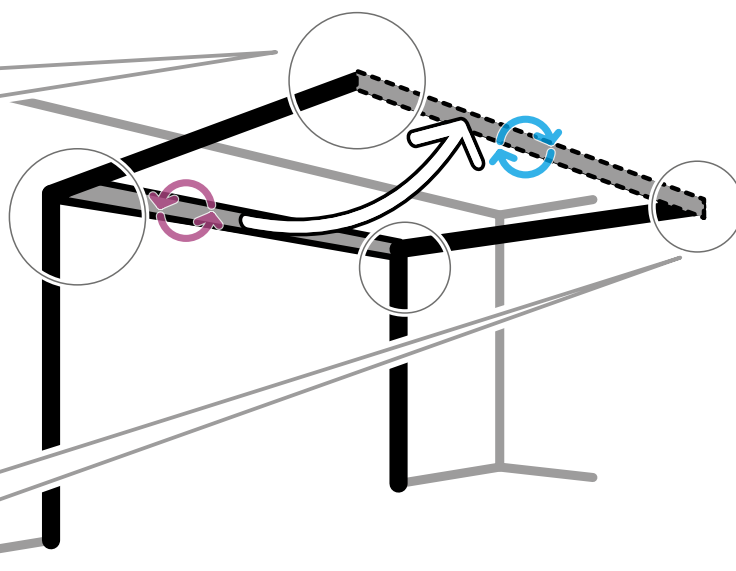
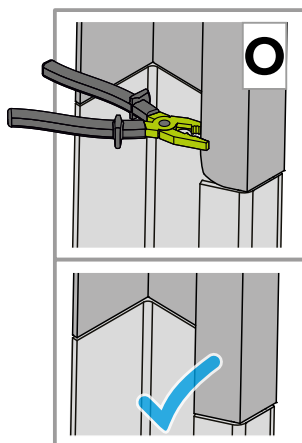
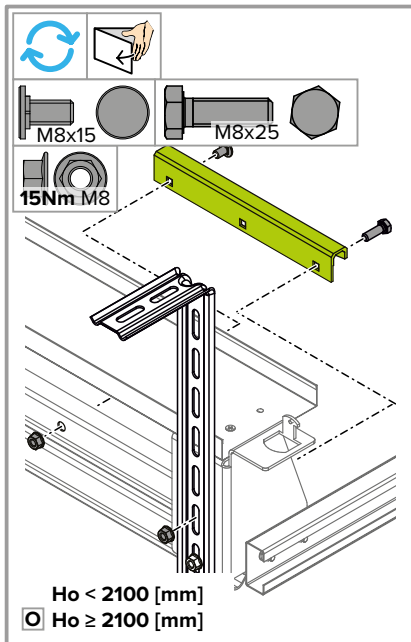


15.3

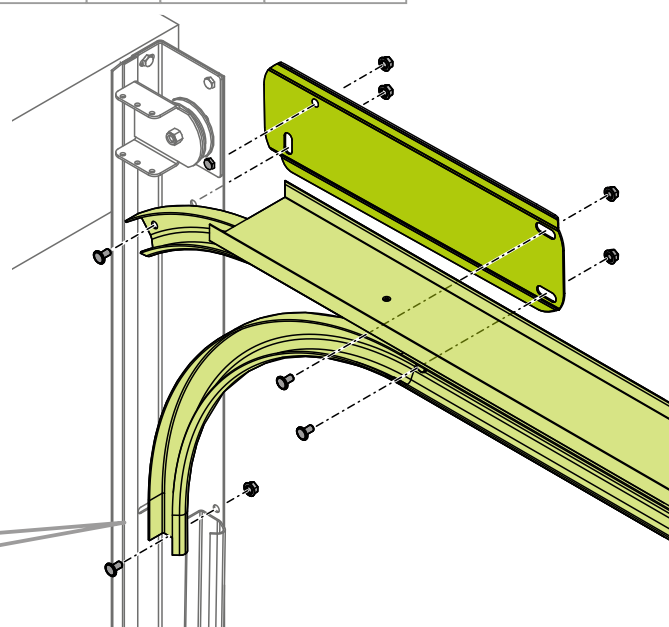


15

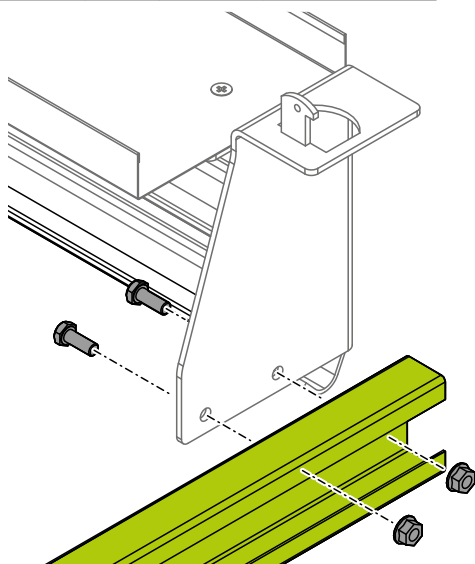
N



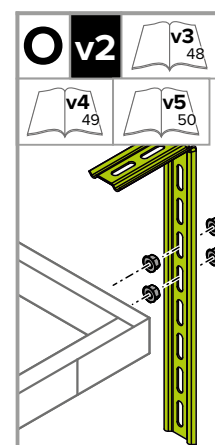
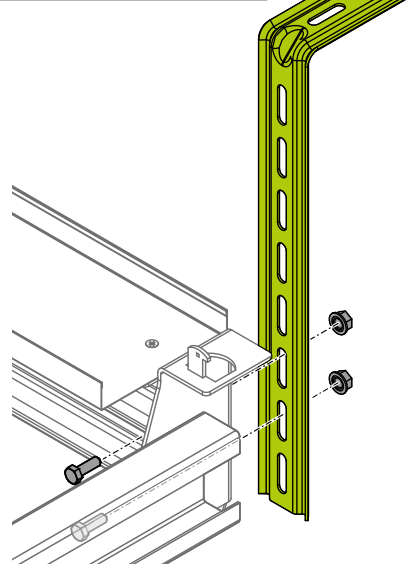
15.1

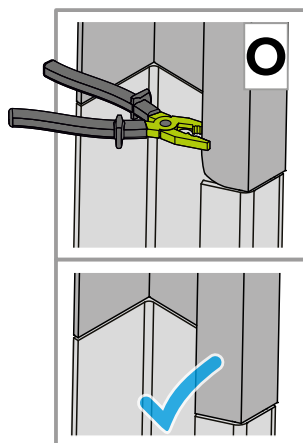
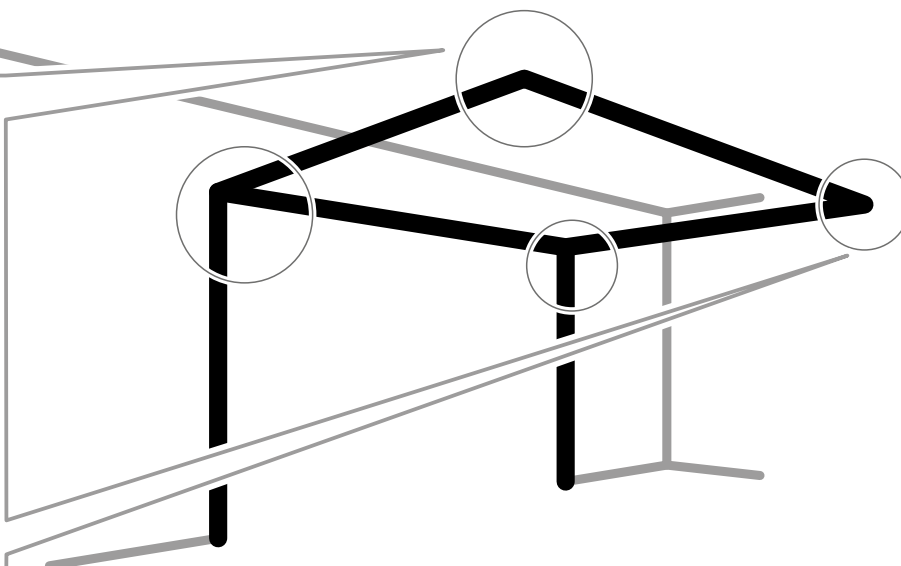
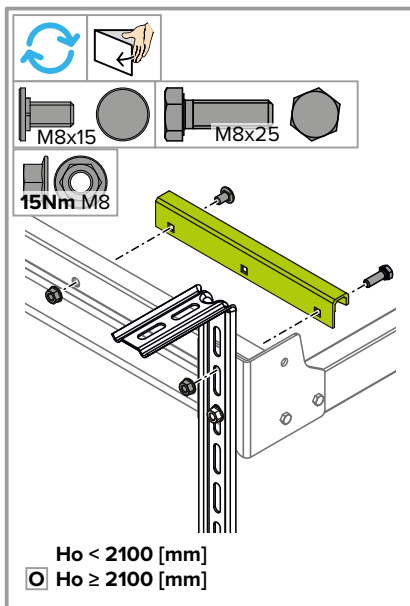


15.2

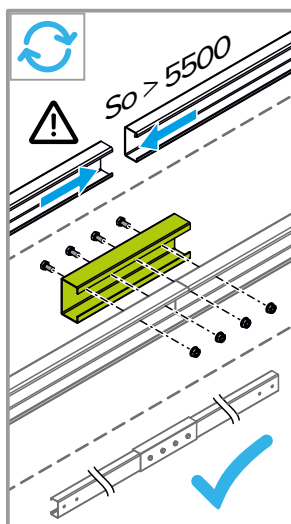
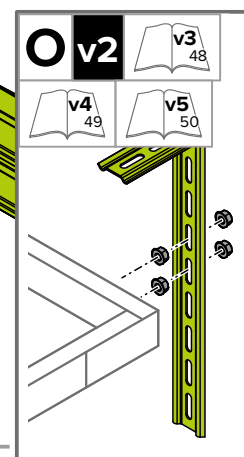
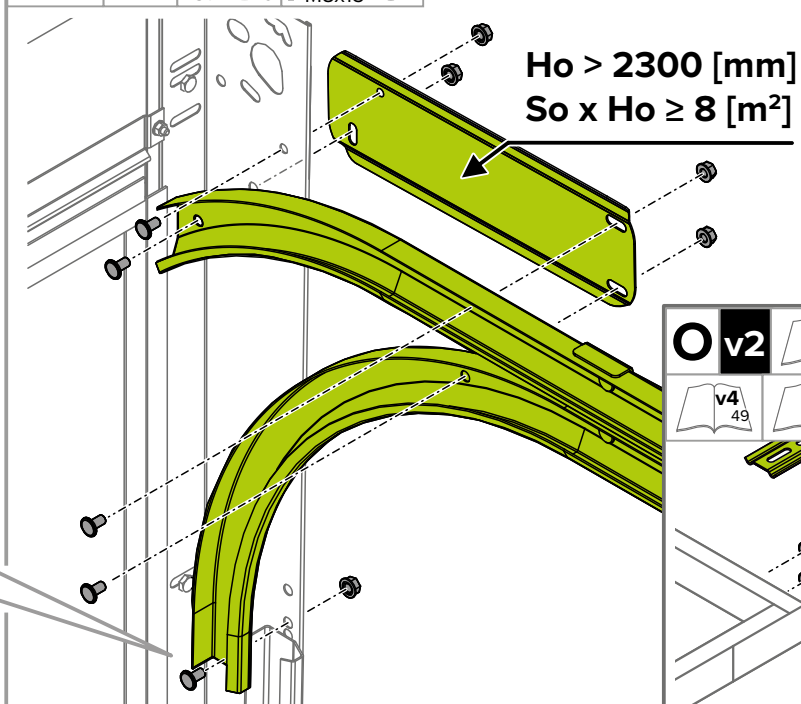


15.3

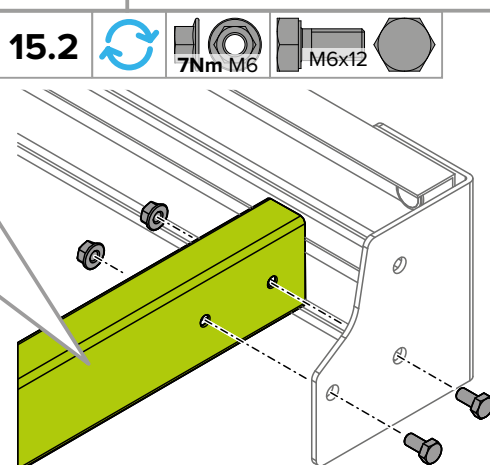




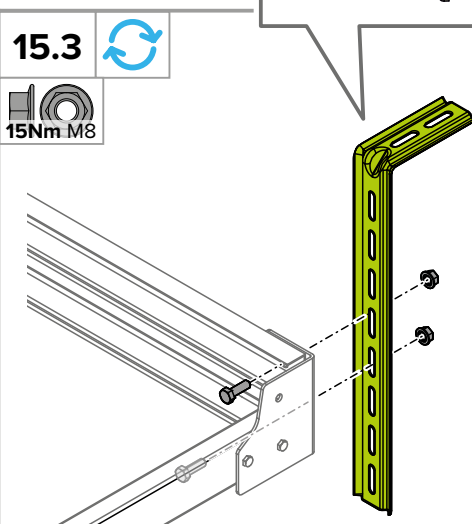
15.1



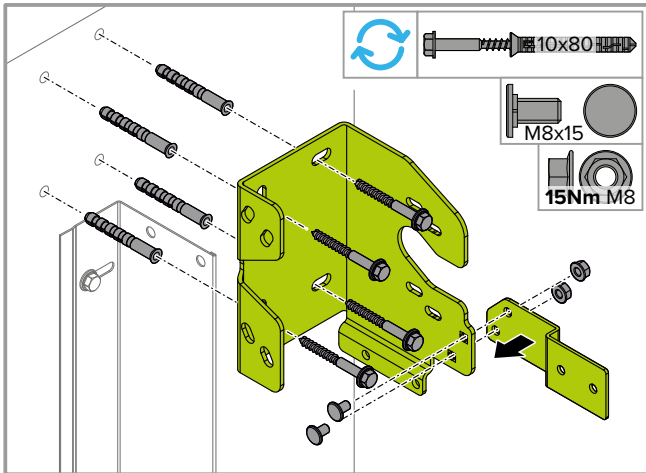
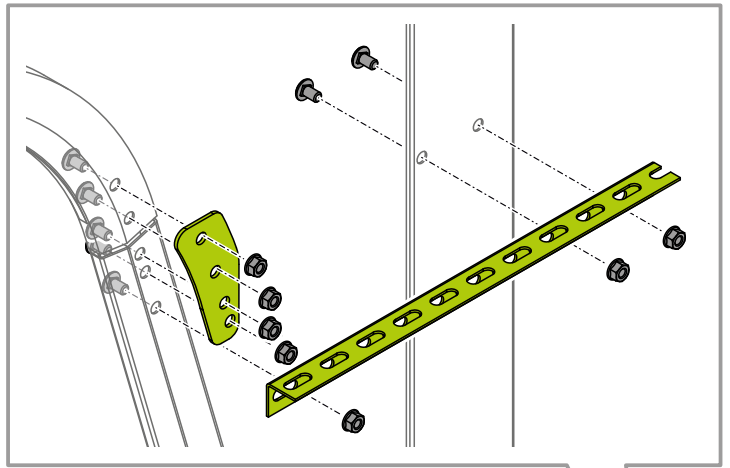
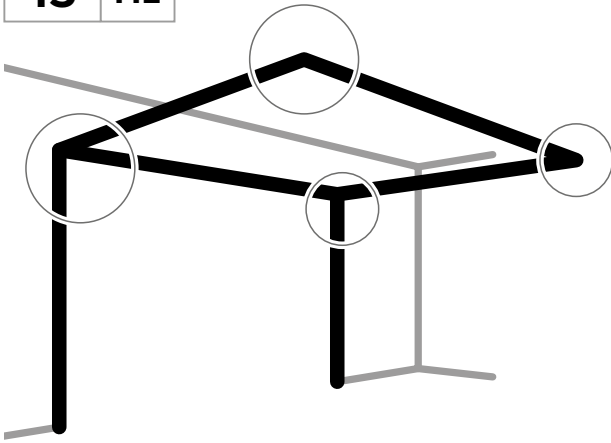
15.2



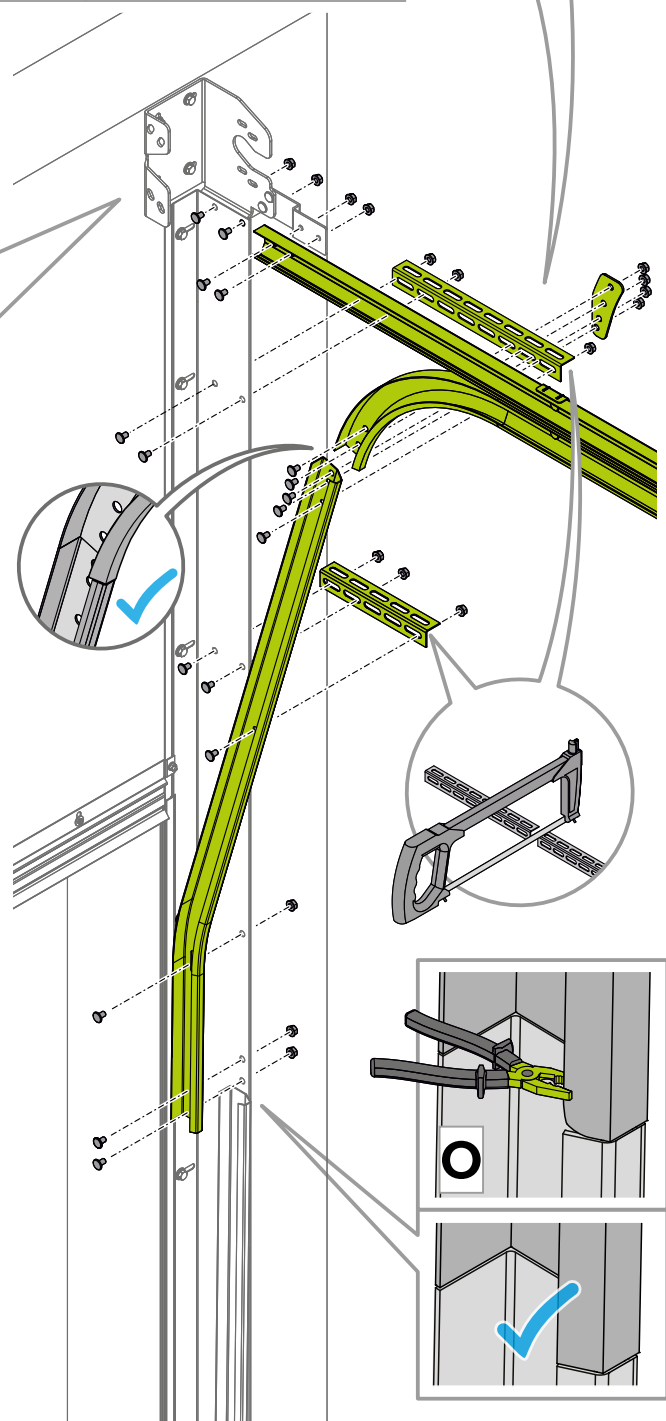
15.3



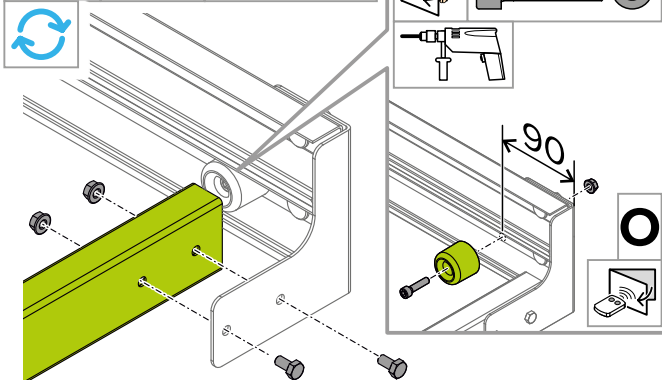
15 HL



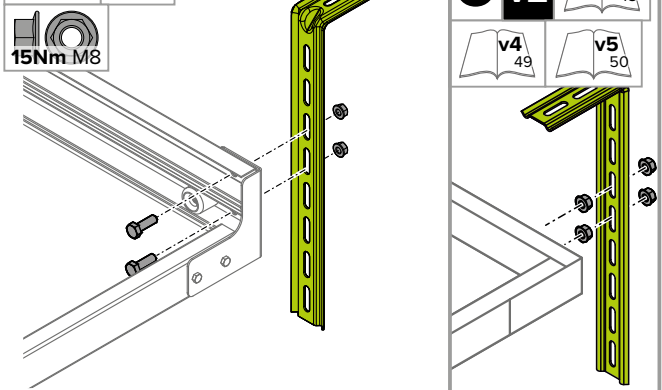
15.1



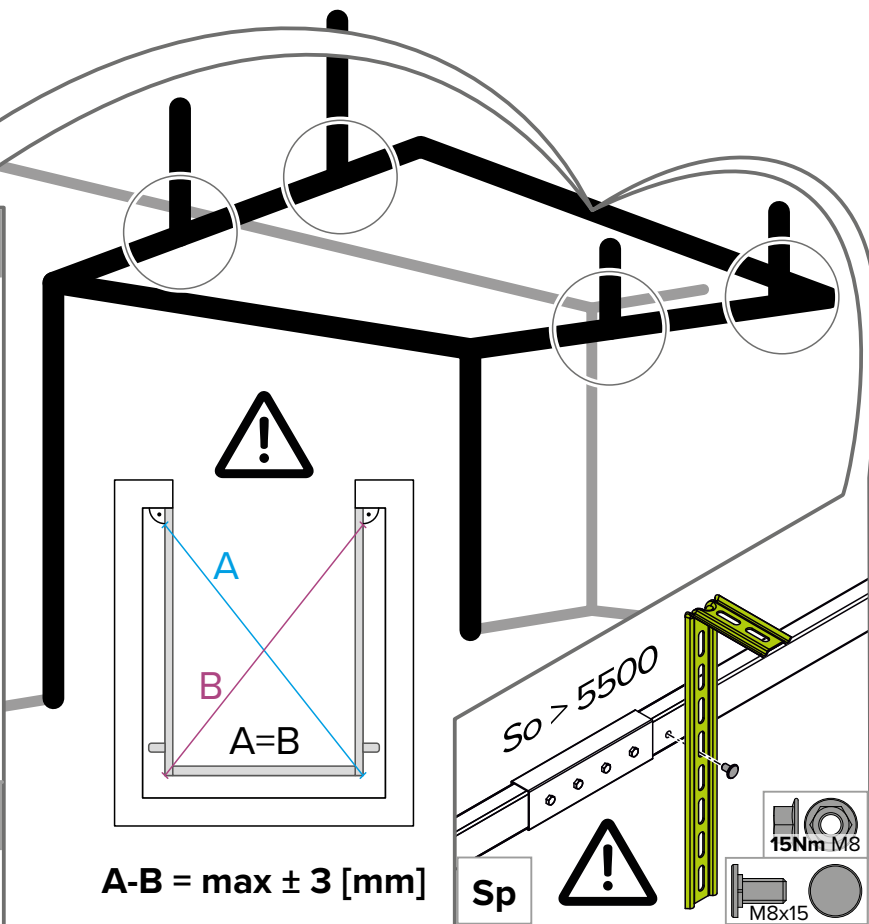
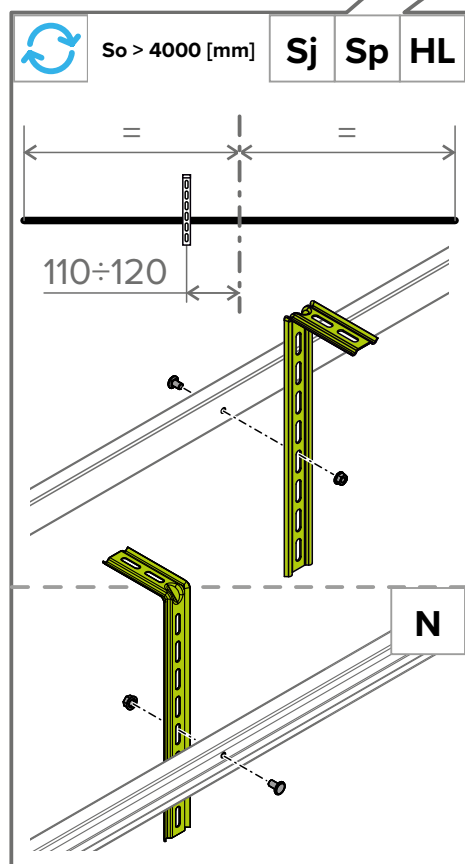
15.2



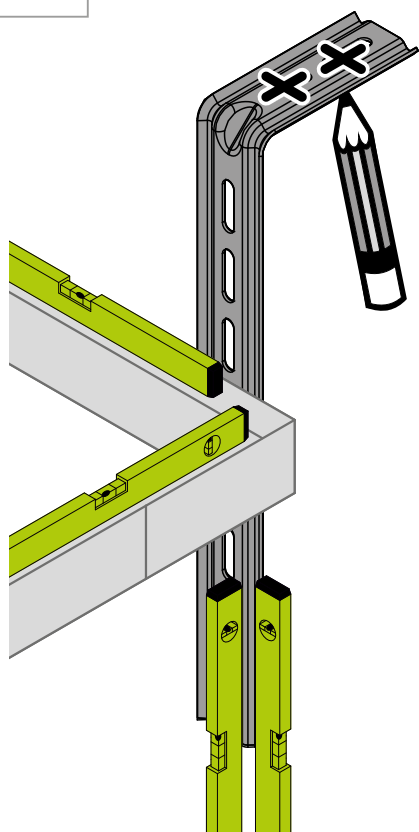
15.3



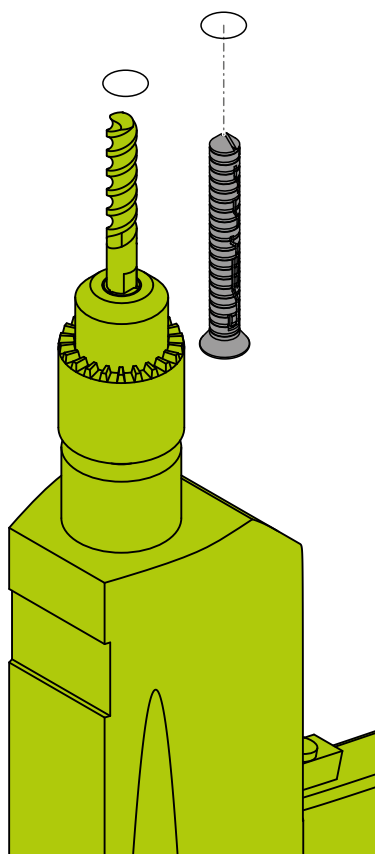
16



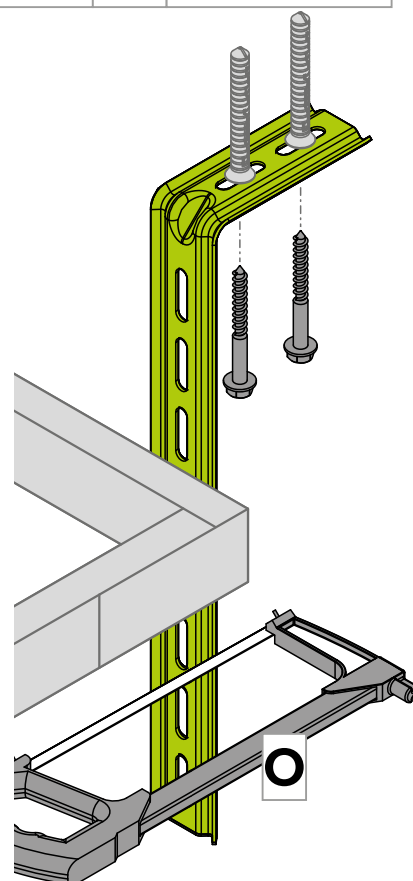
16.1

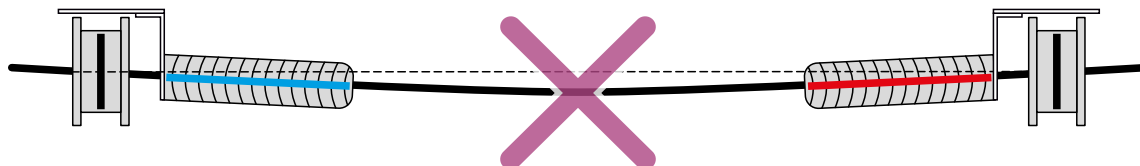
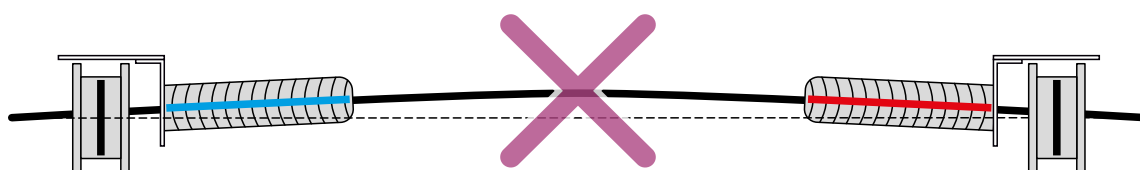
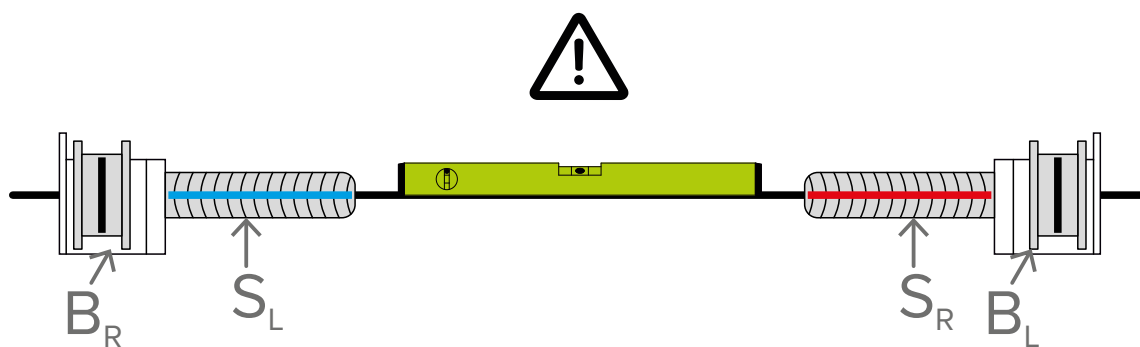


16.2

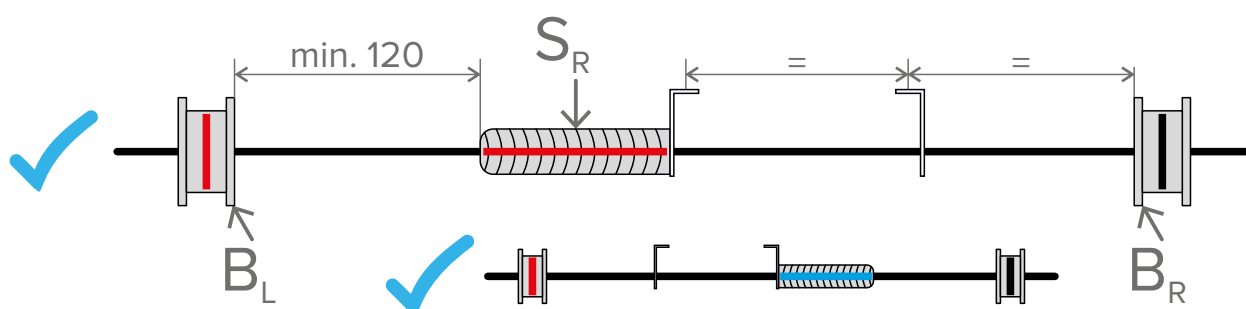


16.3

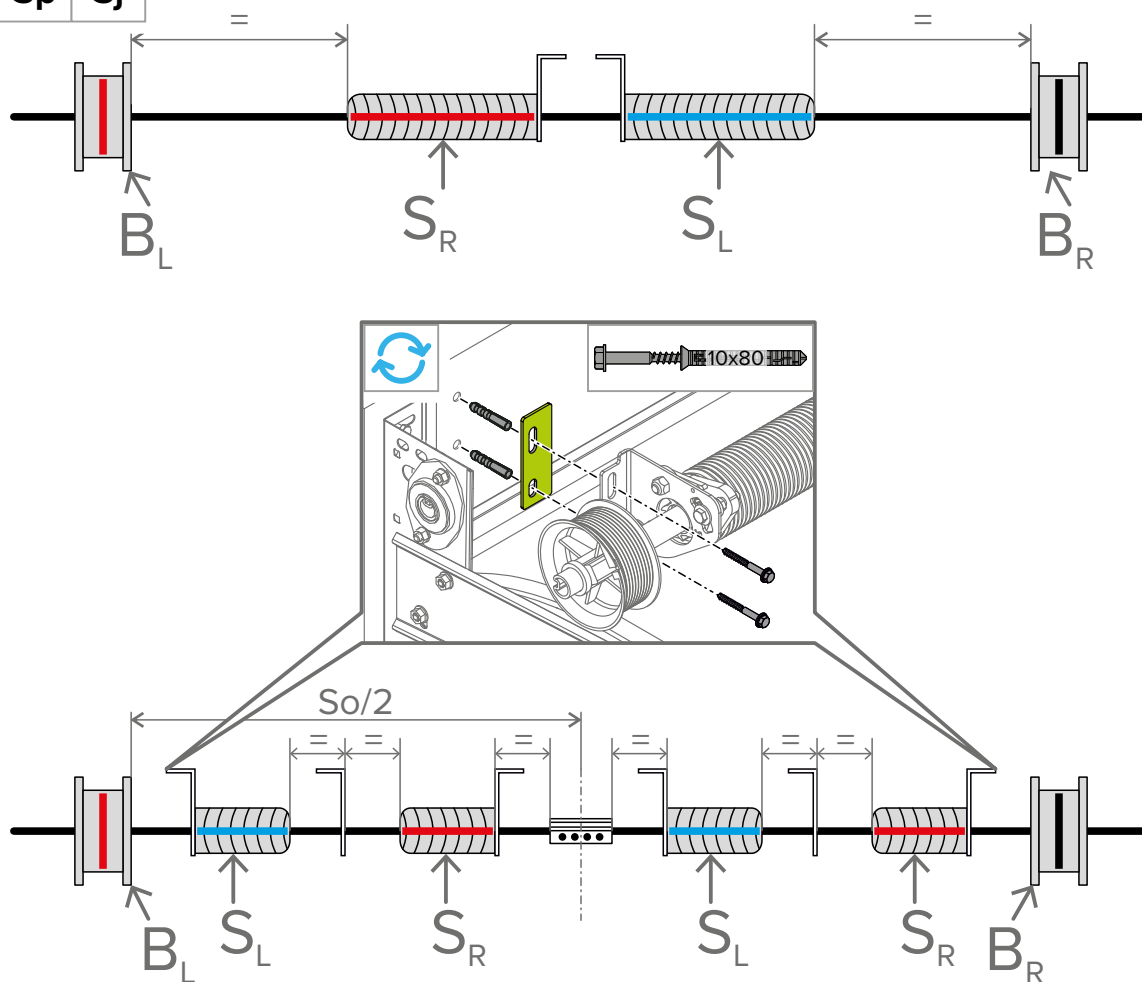




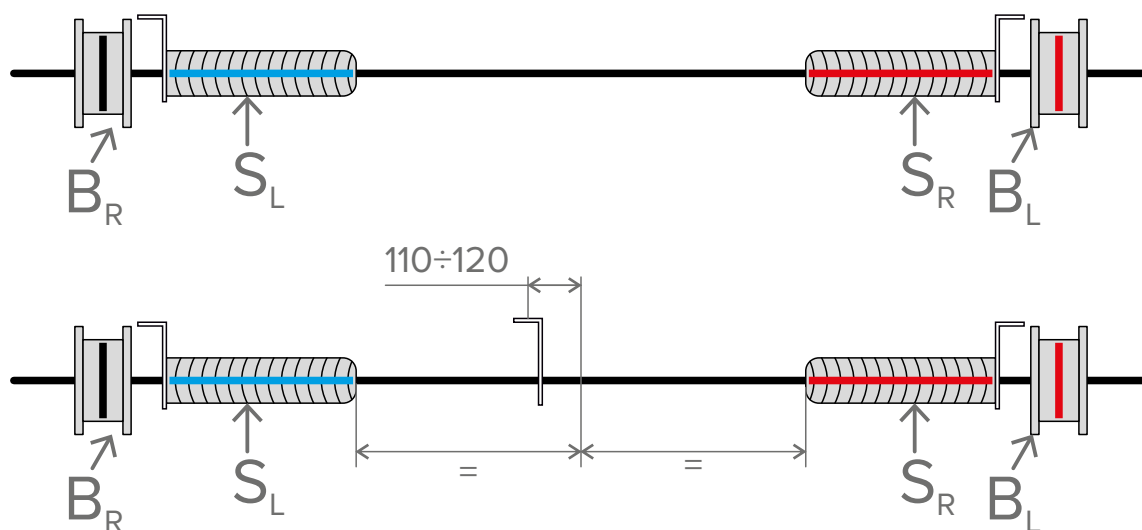
17.1	Sj	Sp
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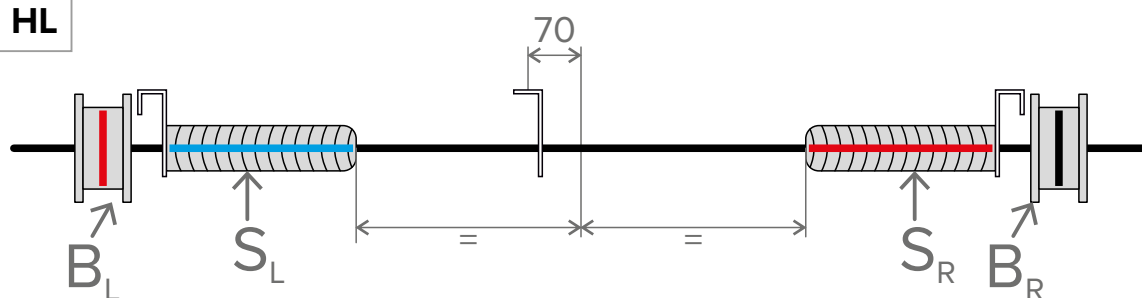
17.2	Sp	Sj
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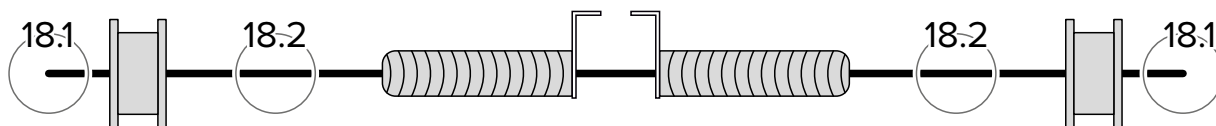


17.3	St
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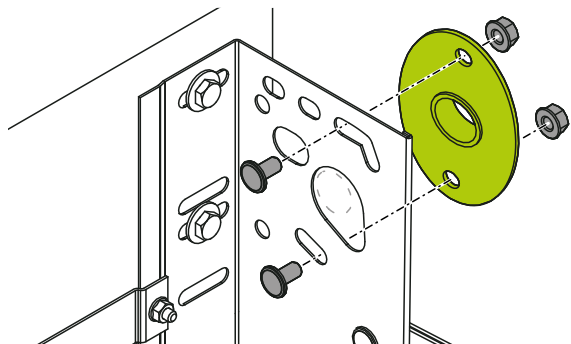
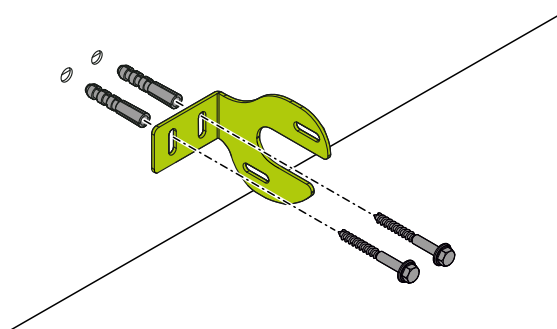
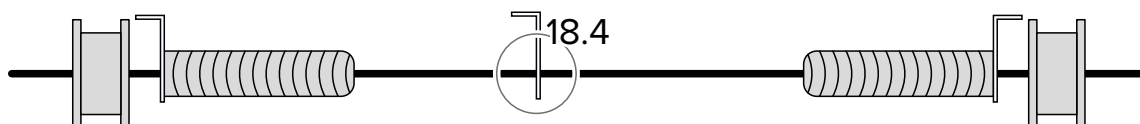
17.4	HL
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18**Sj****Sp****18.1**

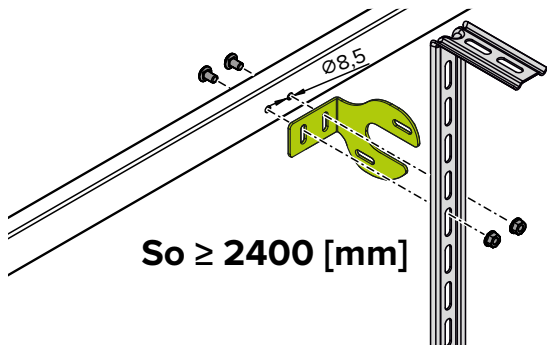
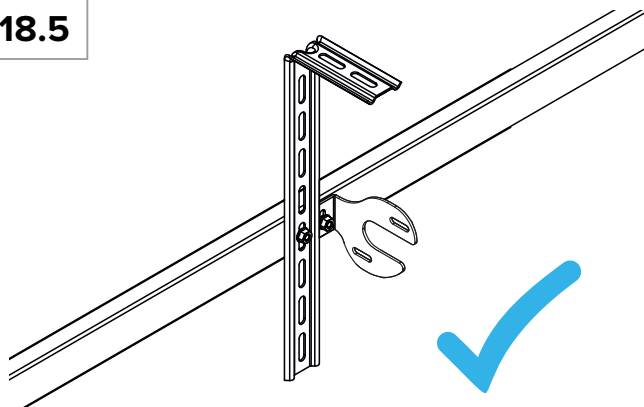
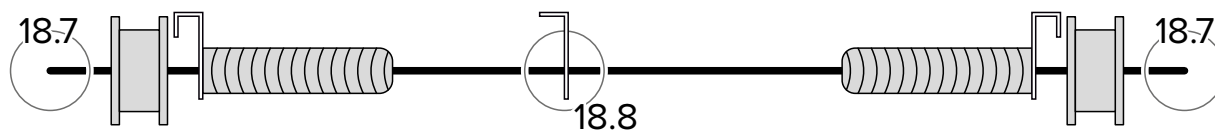
15Nm M8

M8x15

**18.2****So ≥ 4000 [mm]****18.3****St****18.4**

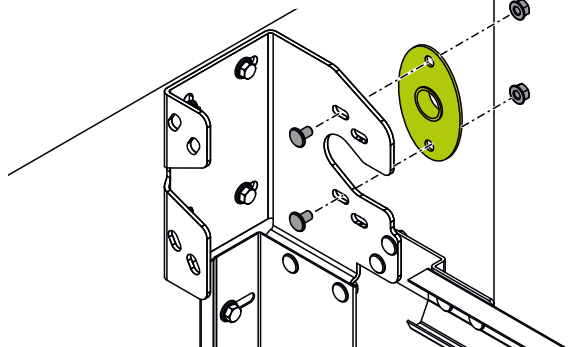
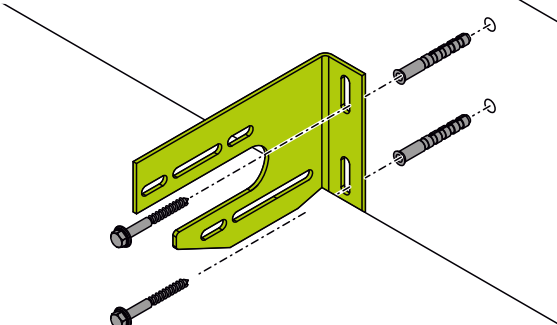
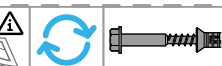
15Nm M8

M8x15

**18.5****18.6****HL****18.7**

15Nm M8

M8x15

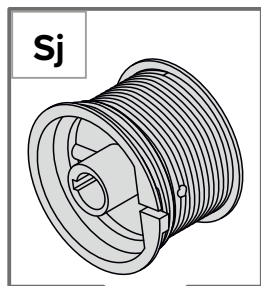
**18.8**

19



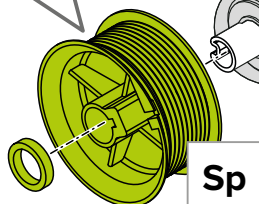
Sj

Sp



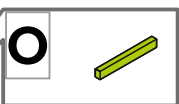
Sj

$S_o > 4000$ [mm]

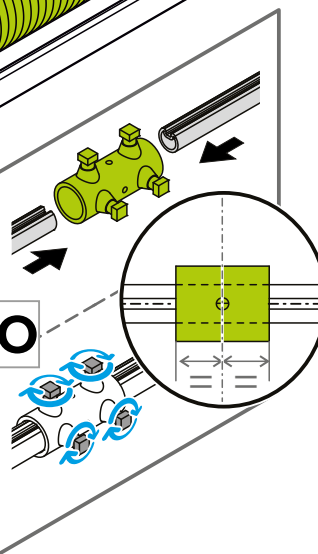
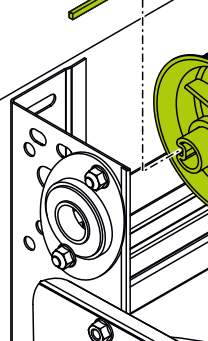


Sp

19.1



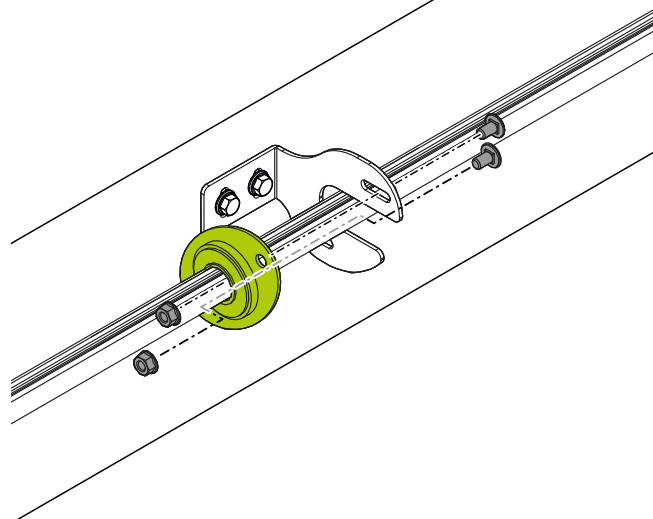
O



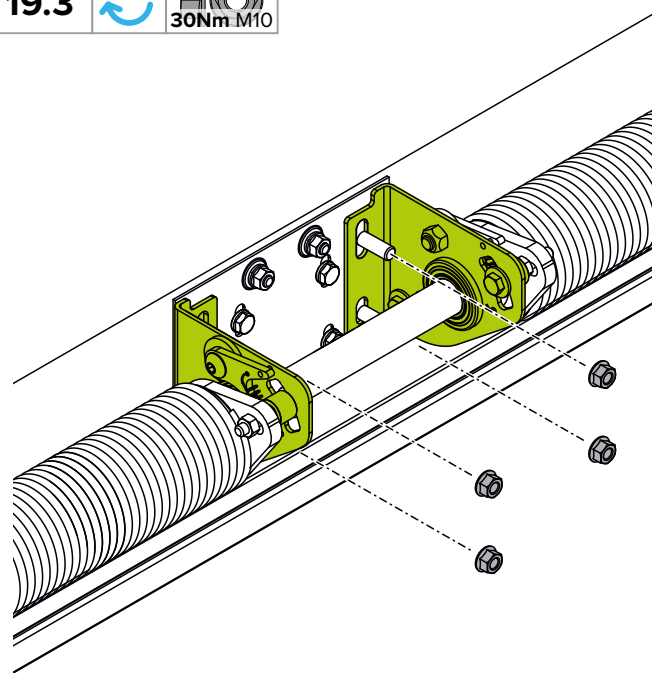
19.2



$S_o > 4000$ [mm]

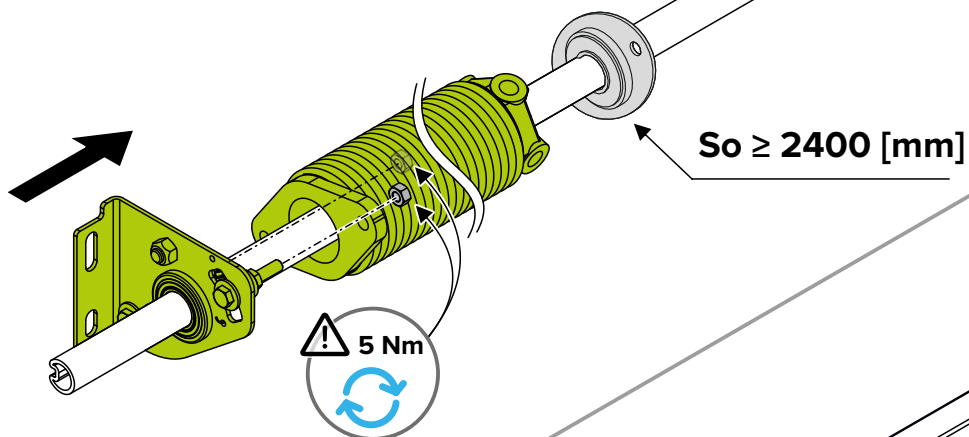


19.3



19

St

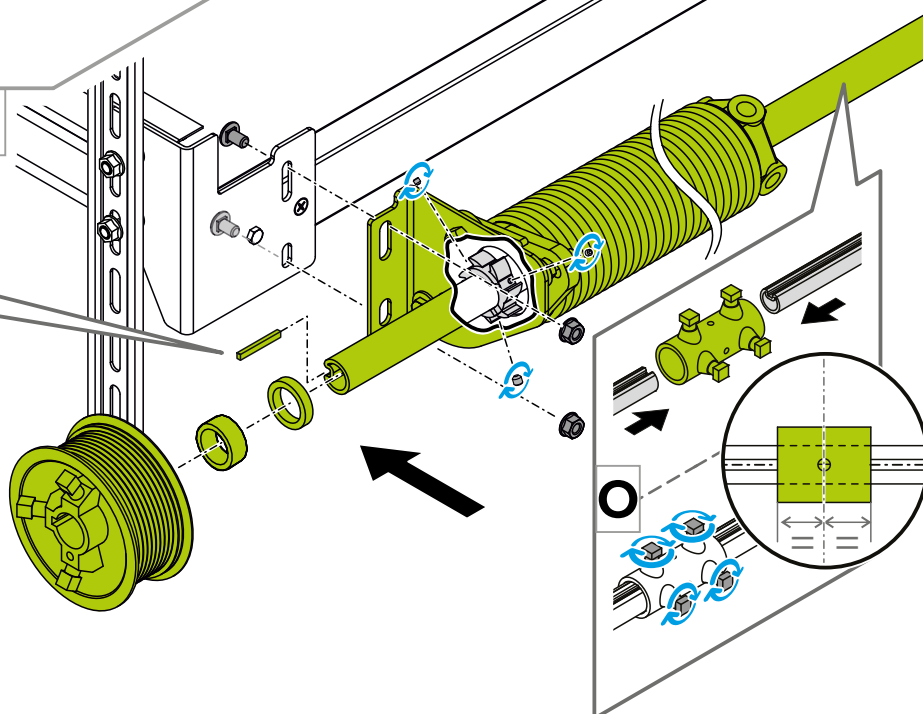
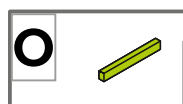


19.1



15Nm M8

M8x15

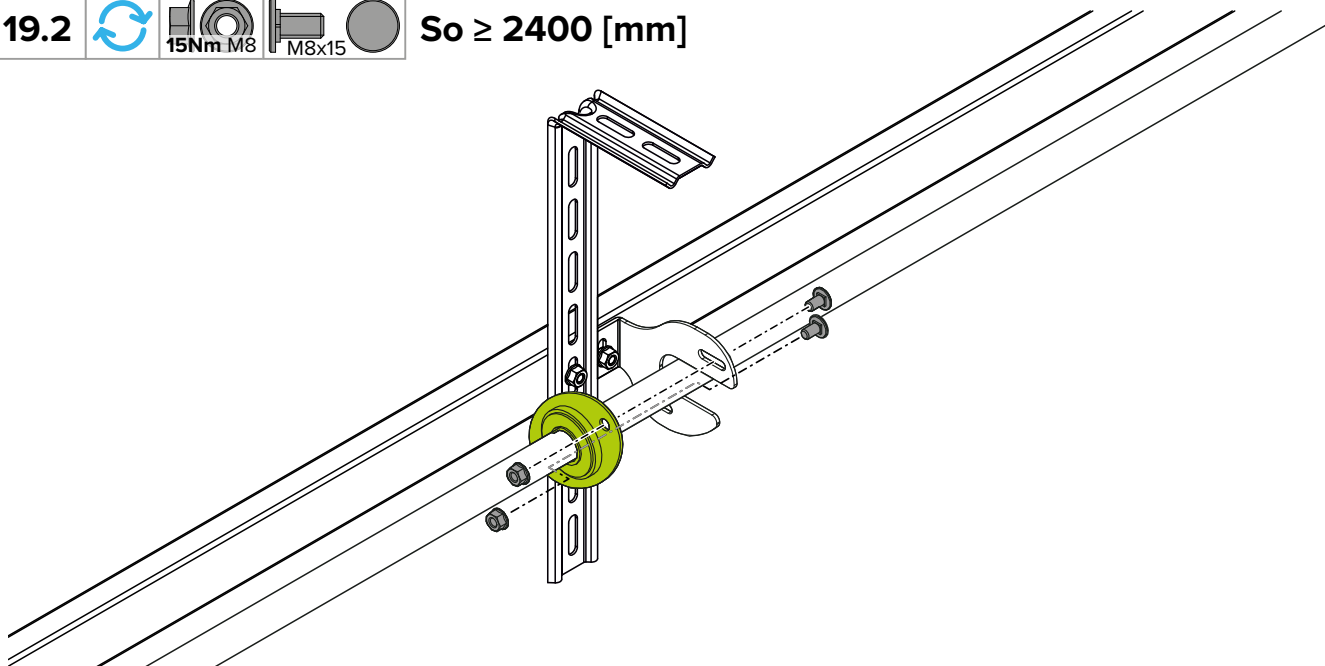


19.2



15Nm M8

M8x15

 $So \geq 2400 \text{ [mm]}$ 

19

HL

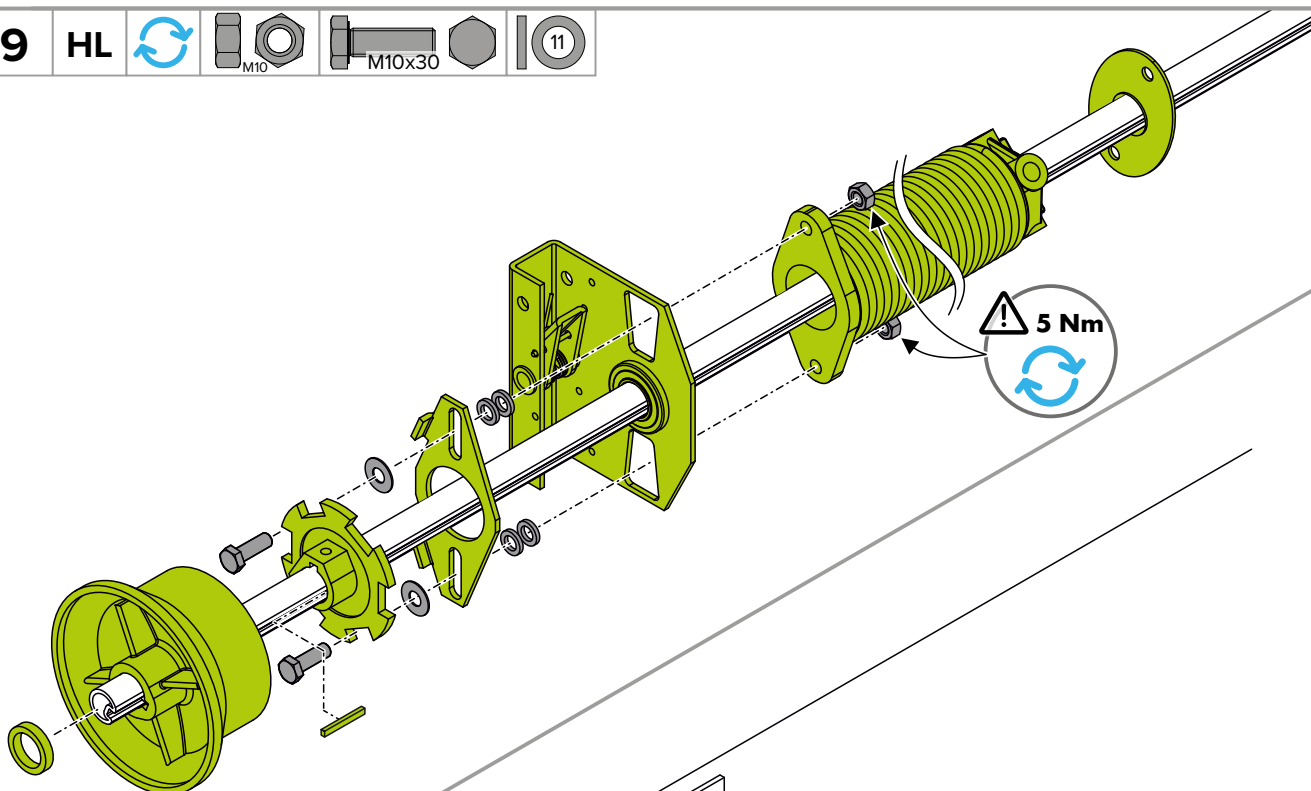


 M10

 M10x30



 11



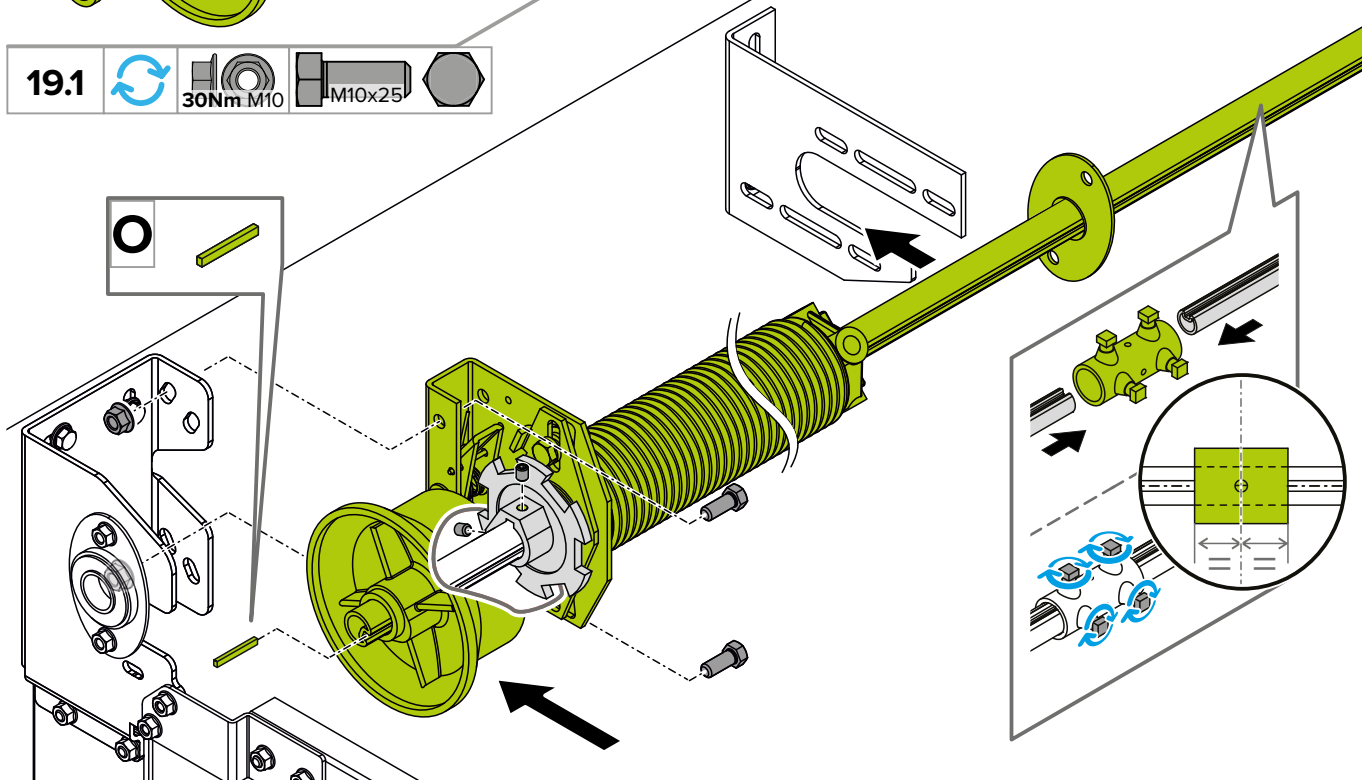
19.1




 30Nm M10


 M10x25




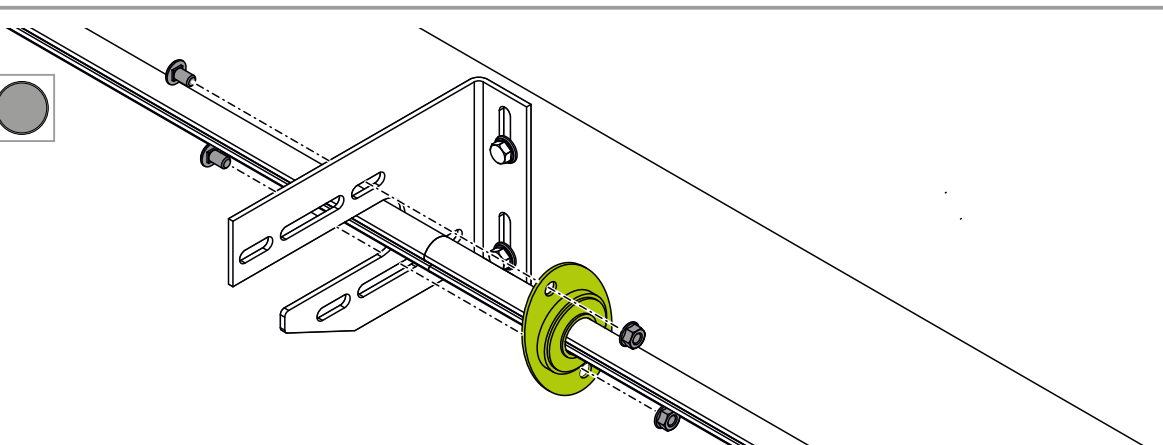


19.2

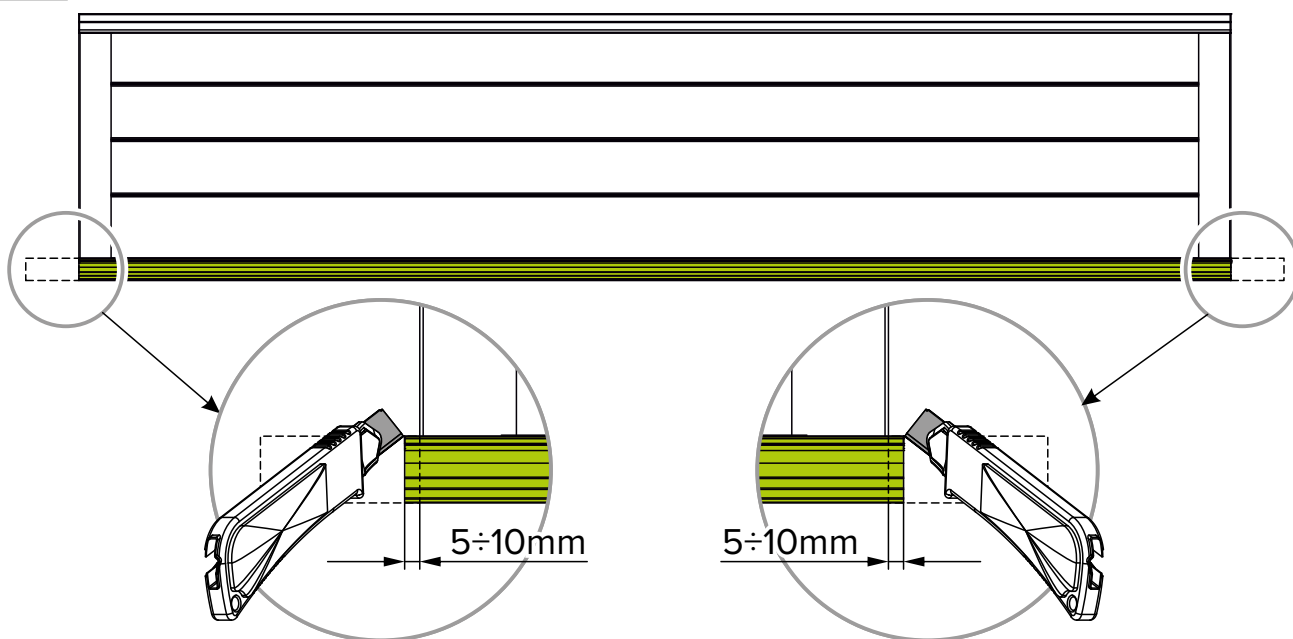


 15Nm M8

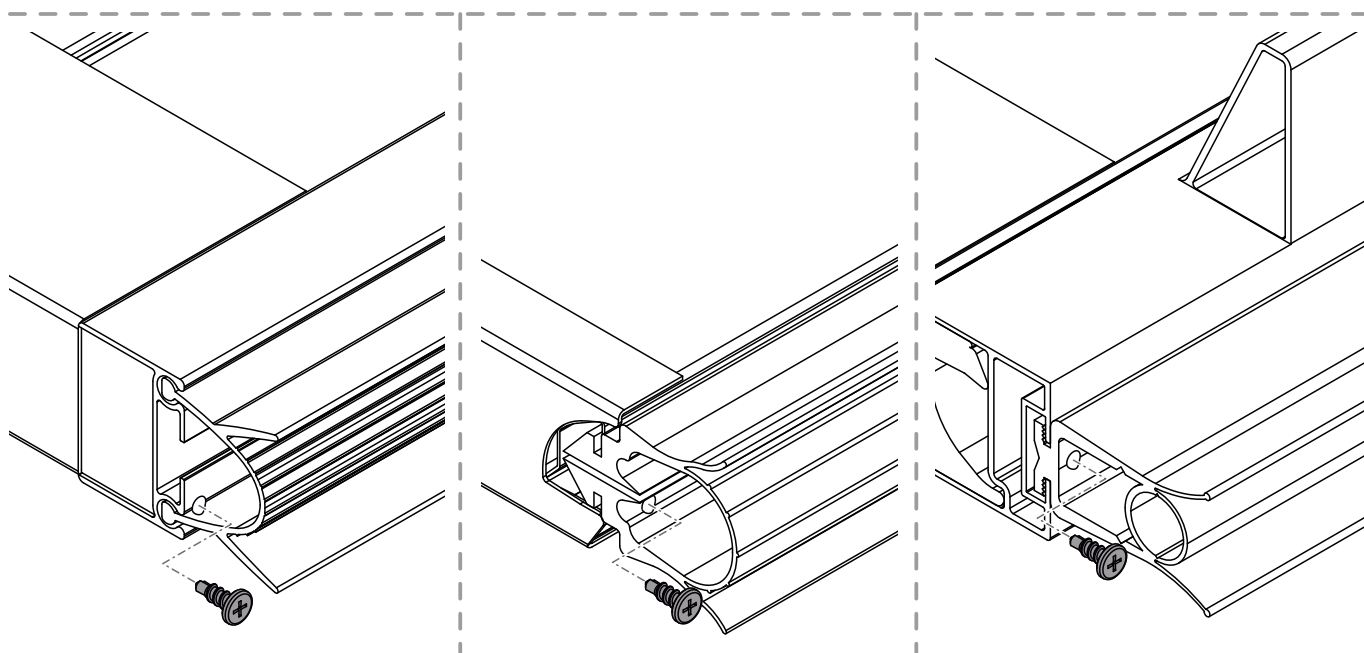
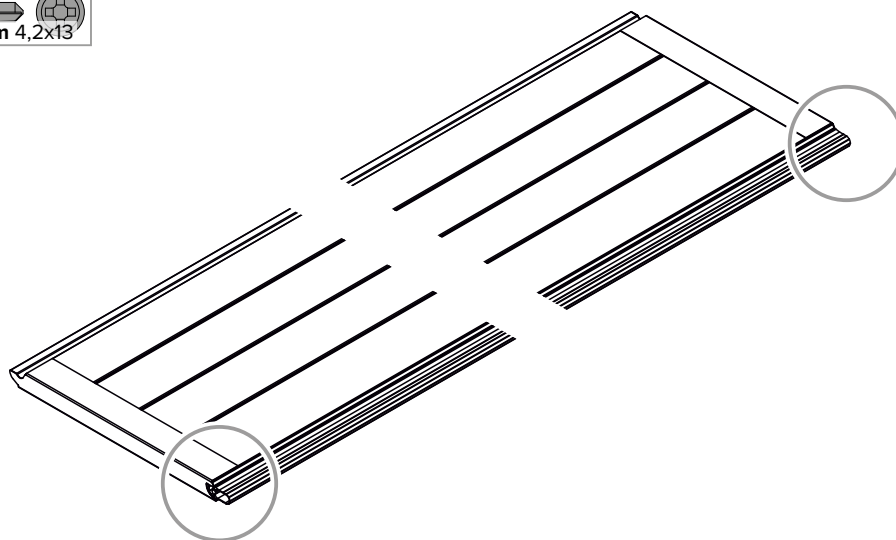
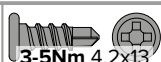
 M8x15

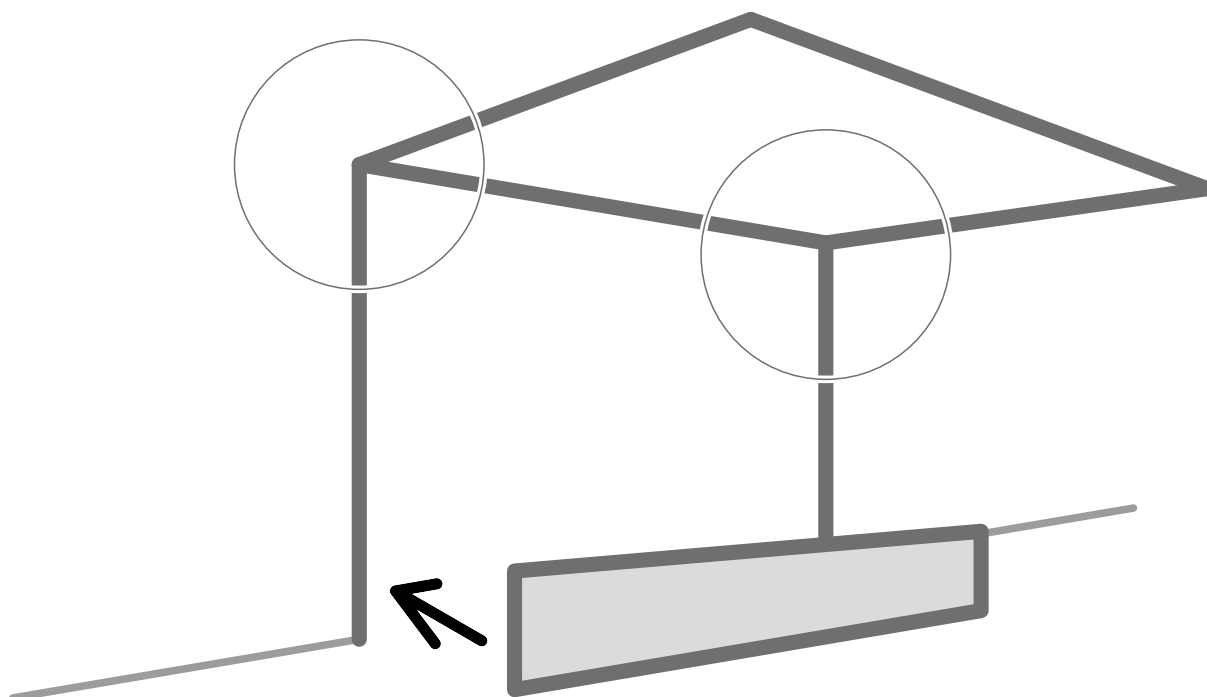


20

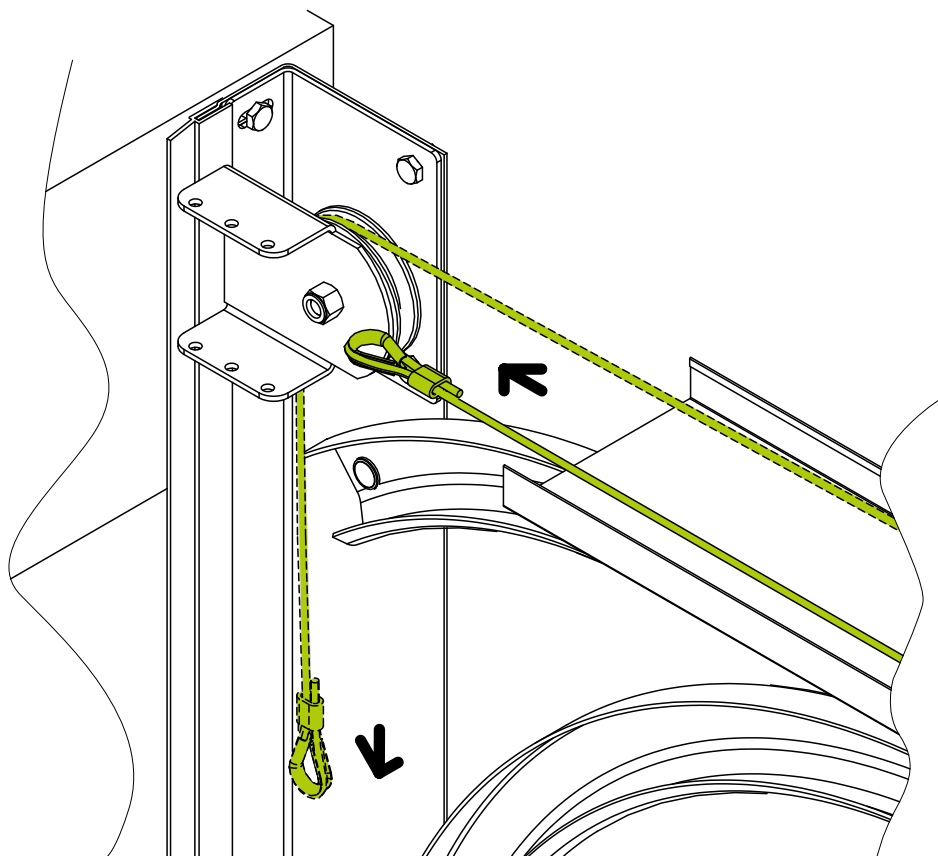


21

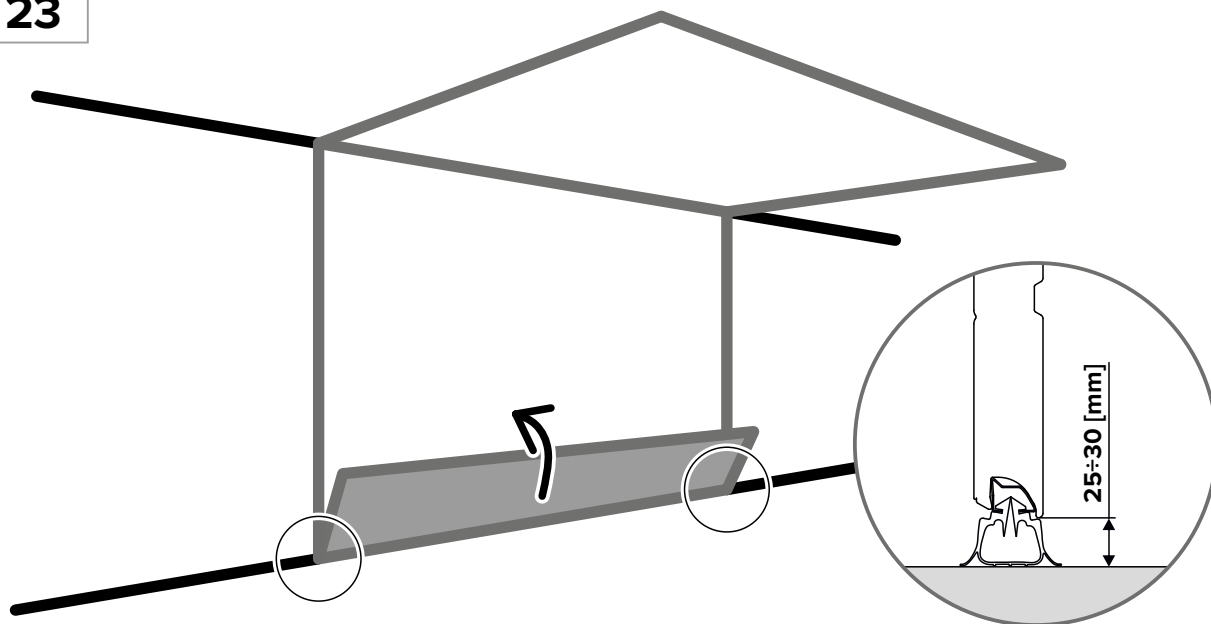




22.1



23



23.1

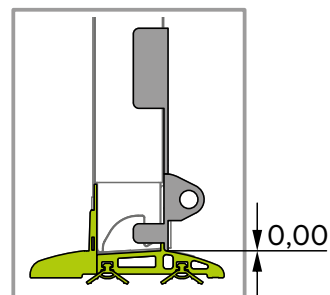
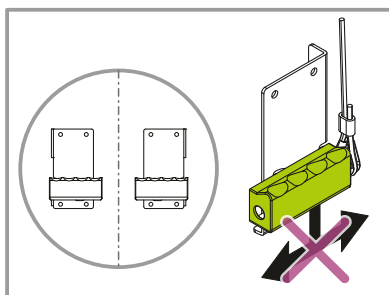
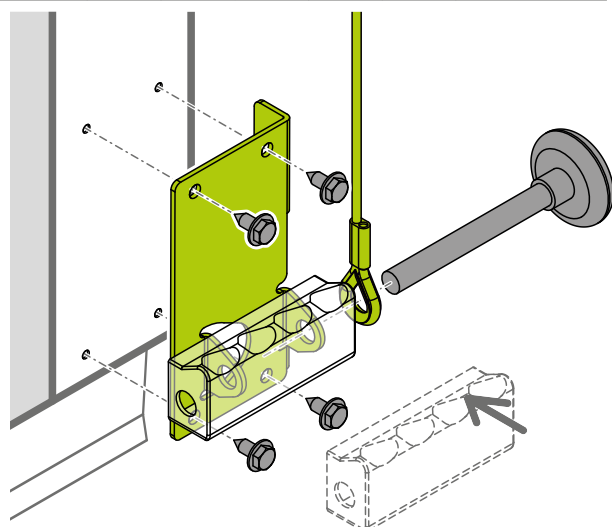
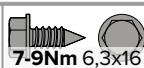


Sj

Sp

St

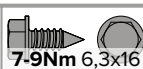
N



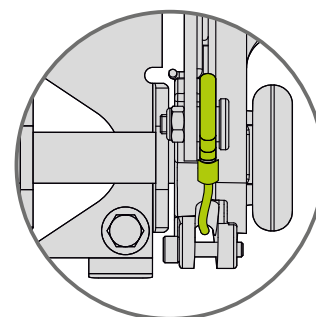
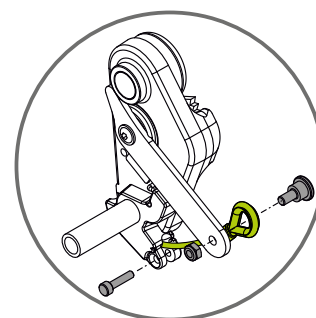
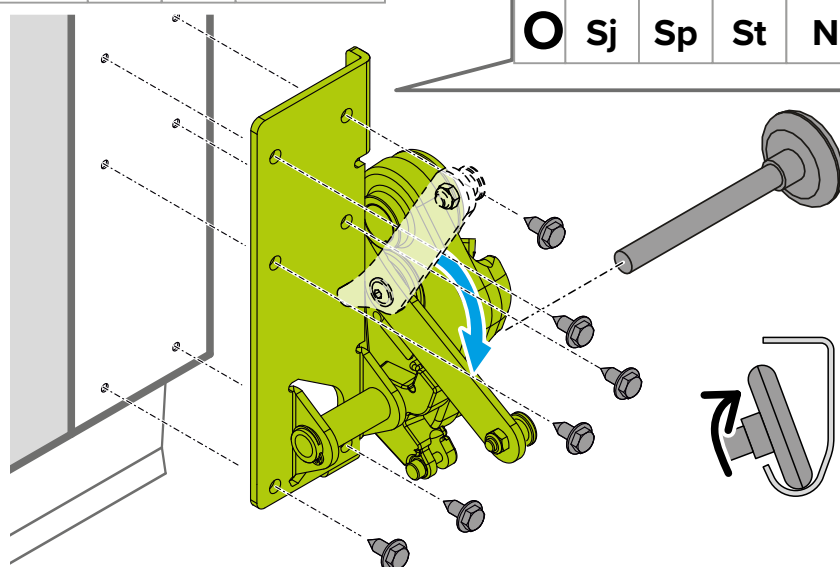
23.1



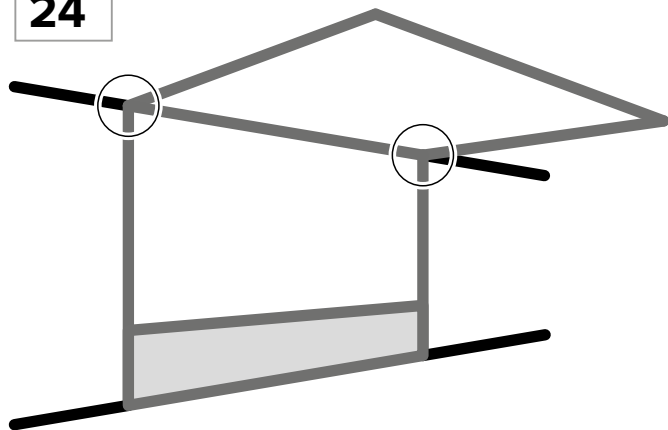
HL



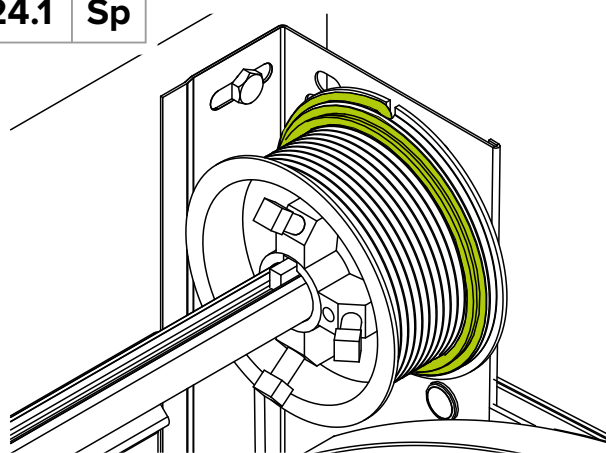
O Sj Sp St N



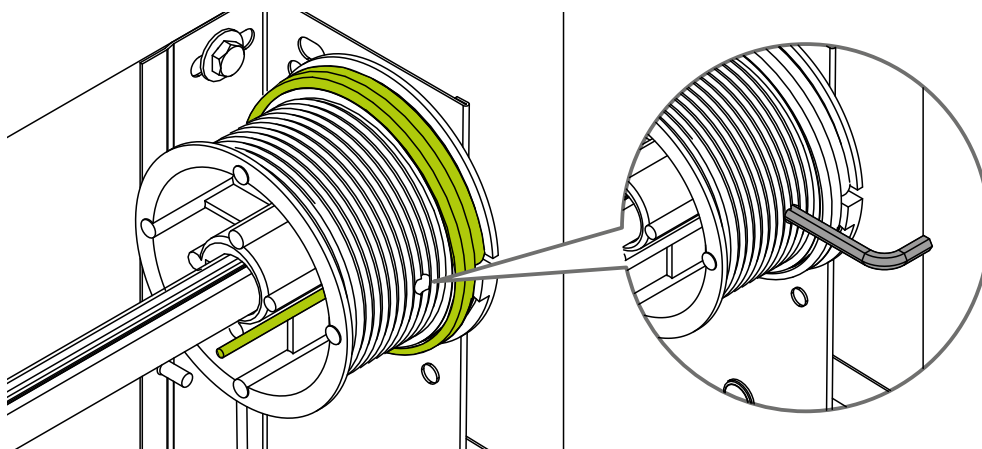
24



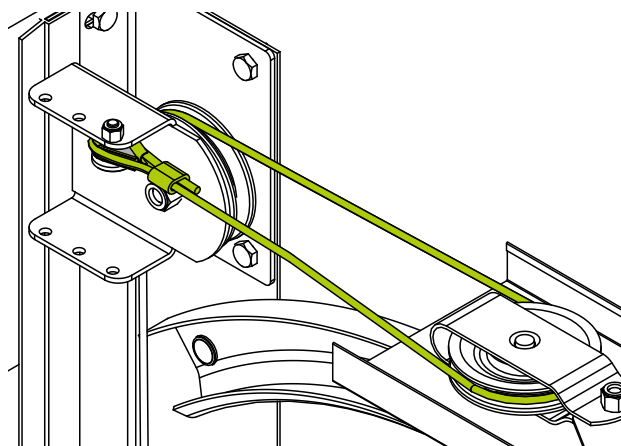
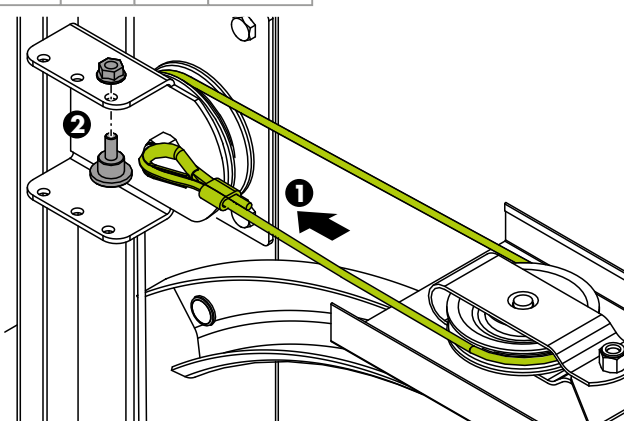
24.1 Sp



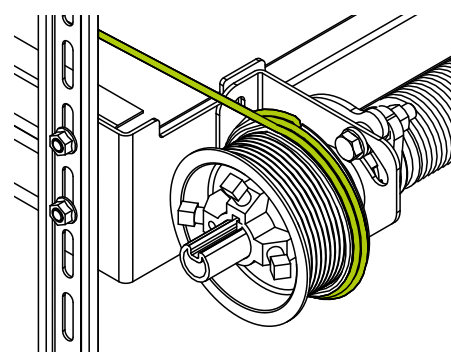
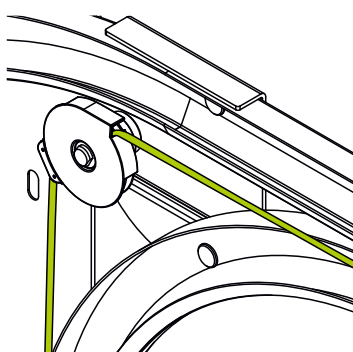
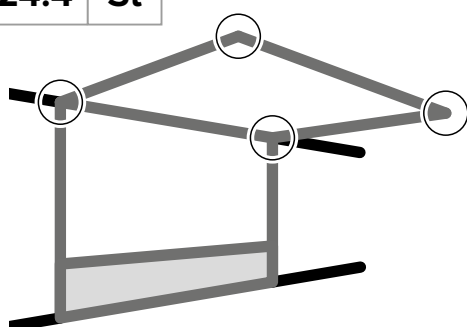
24.2 Sj

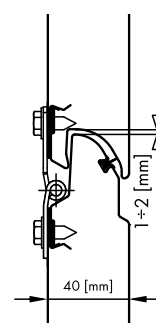
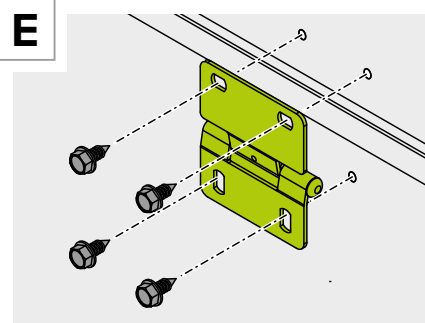
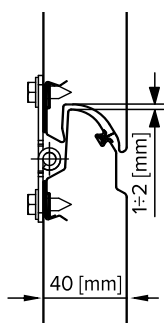
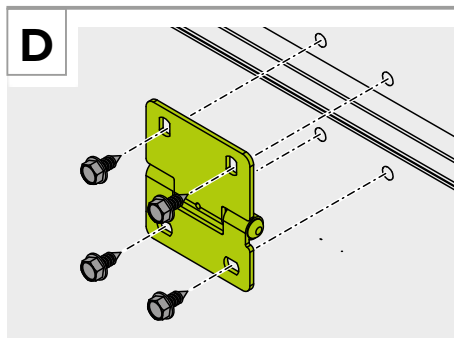
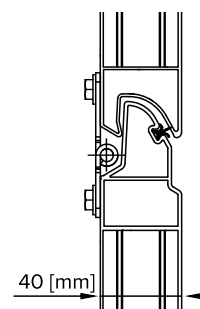
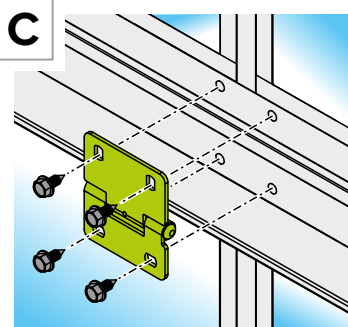
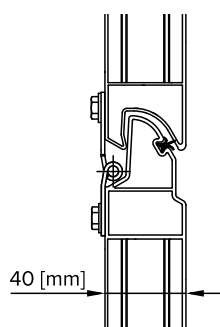
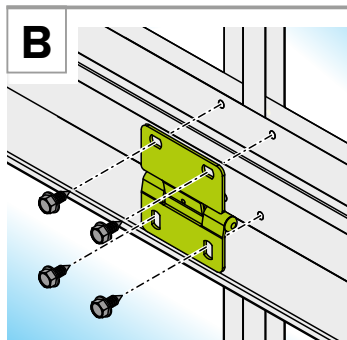
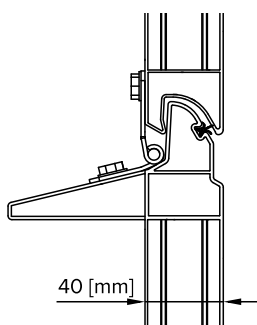
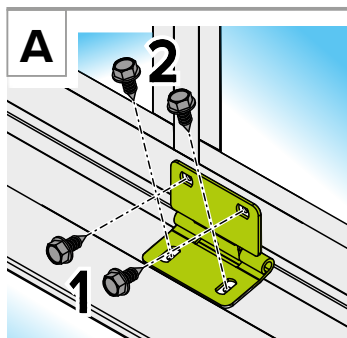
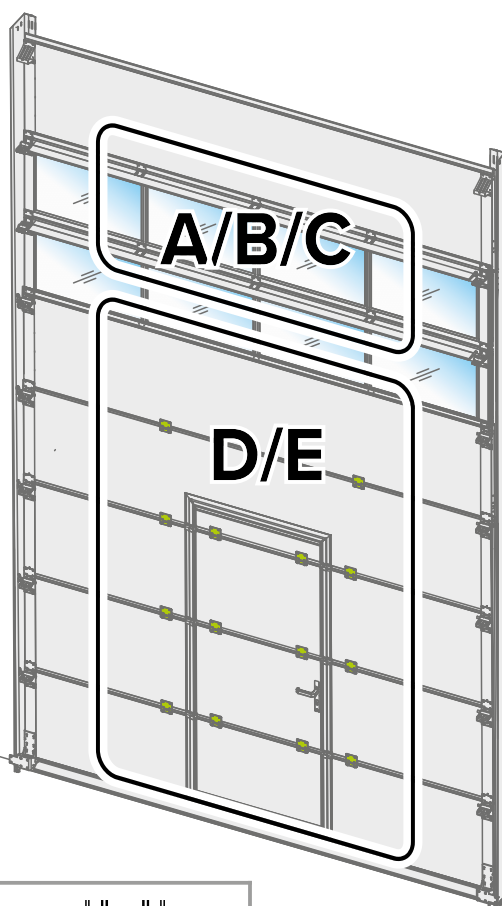


24.3 N

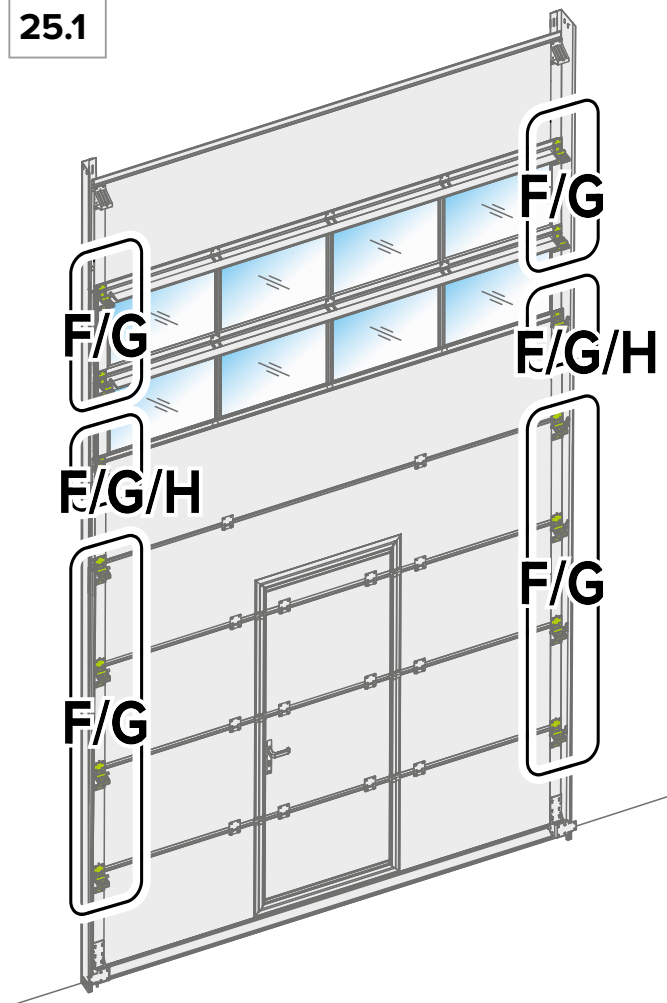


24.4 St

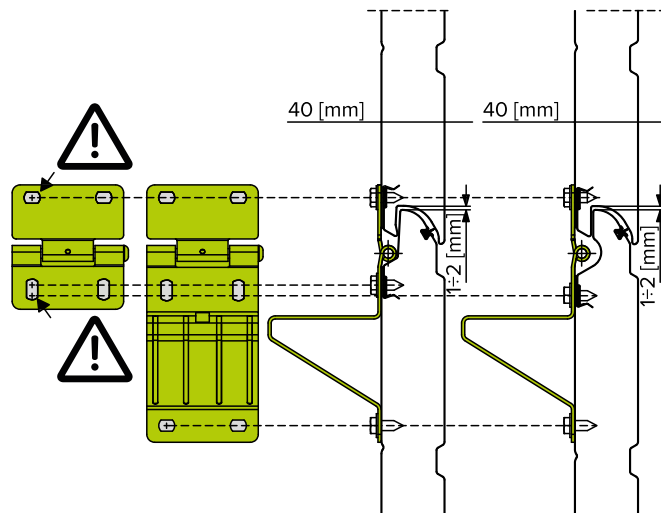




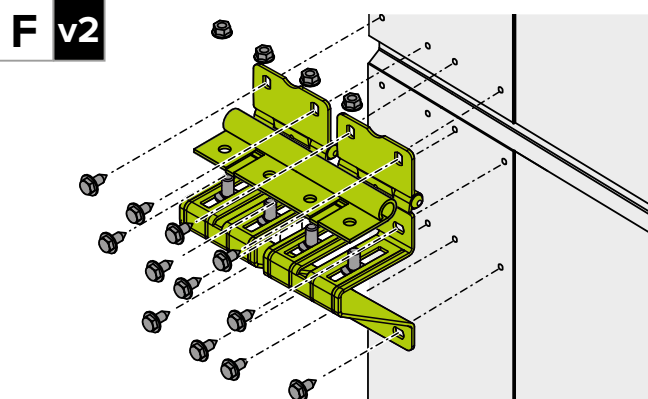
25.1



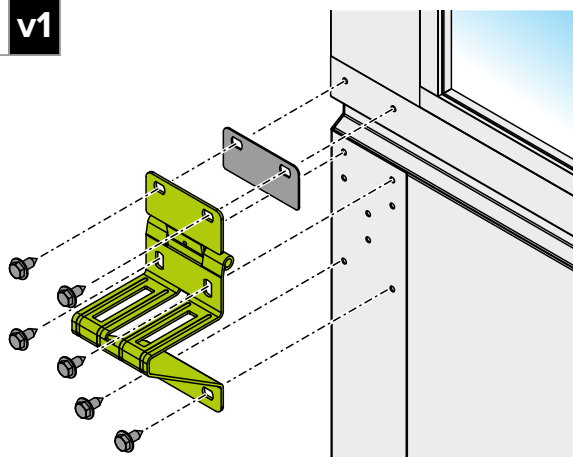
F v1



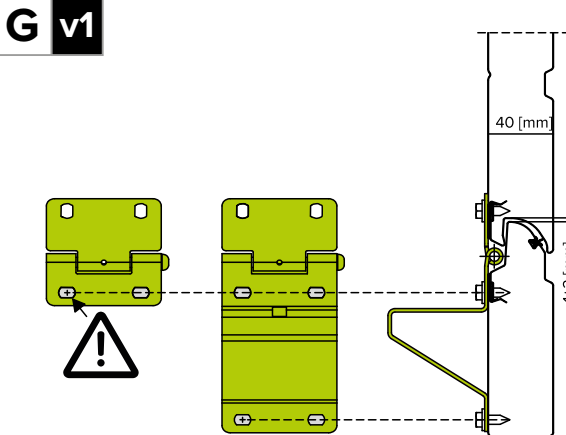
F v2



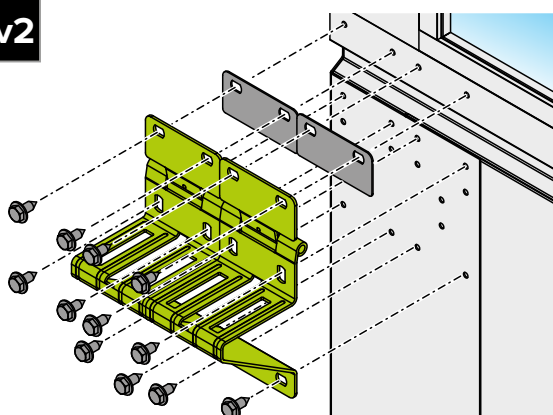
H v1



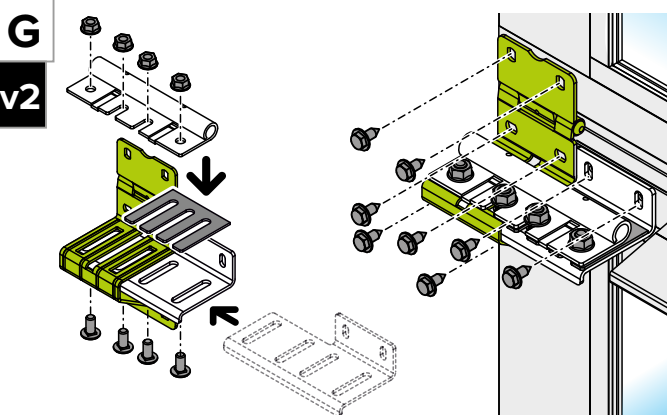
G v1

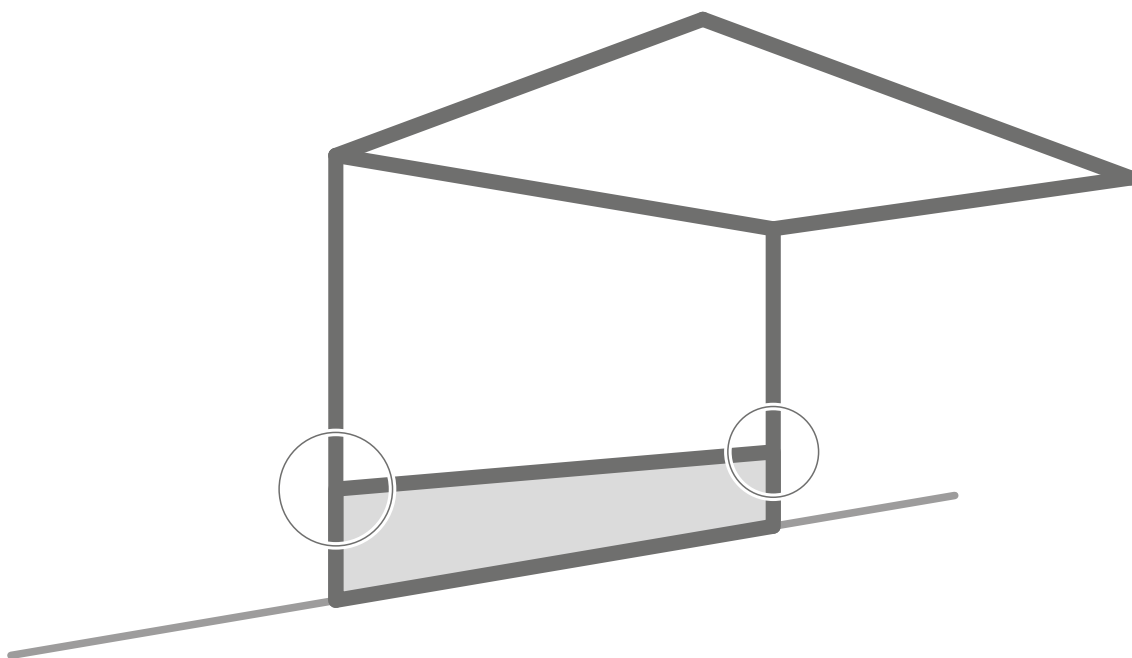


H v2



G v2





26.1

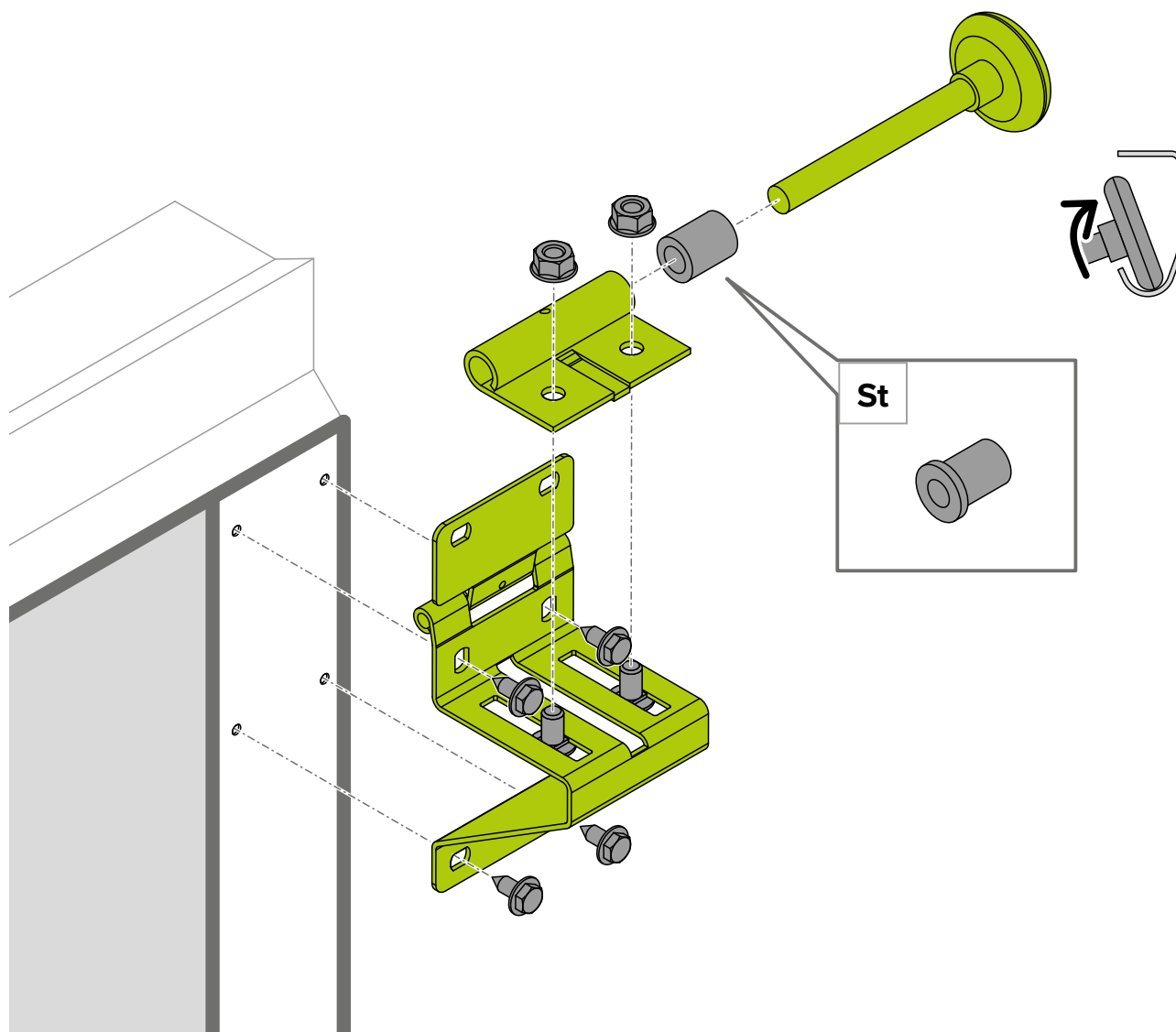


15Nm M8

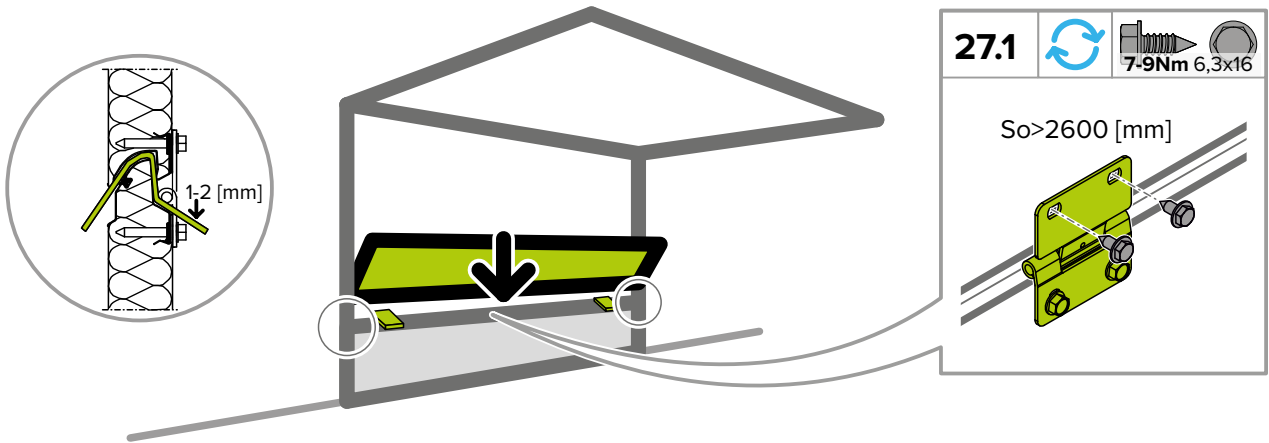
M8x15



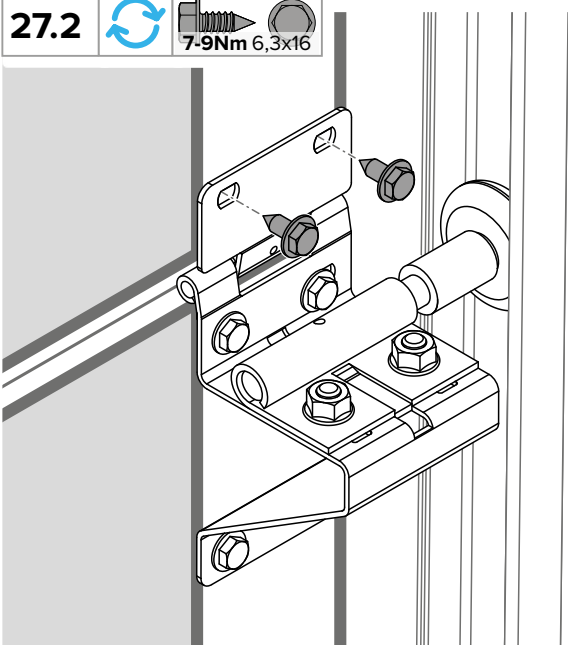
7-9Nm 6,3x16



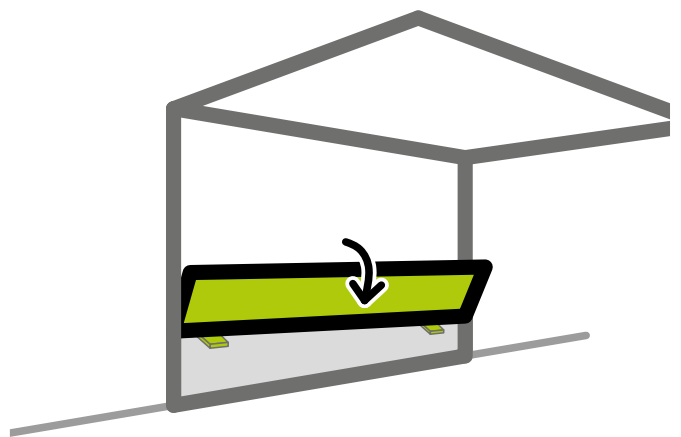
27



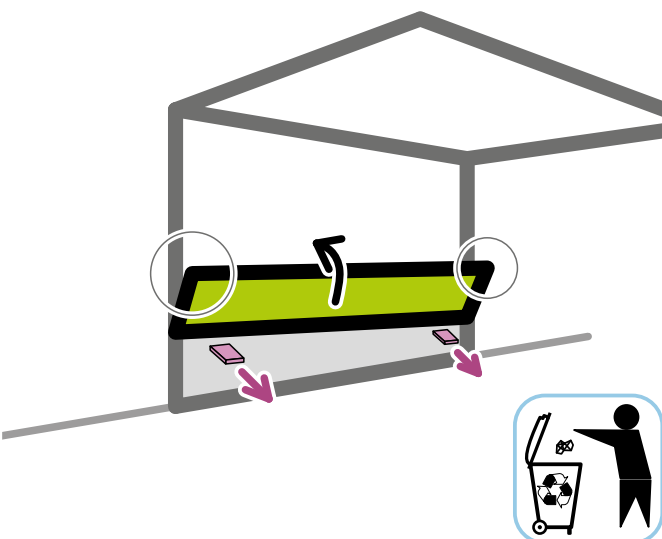
27.2



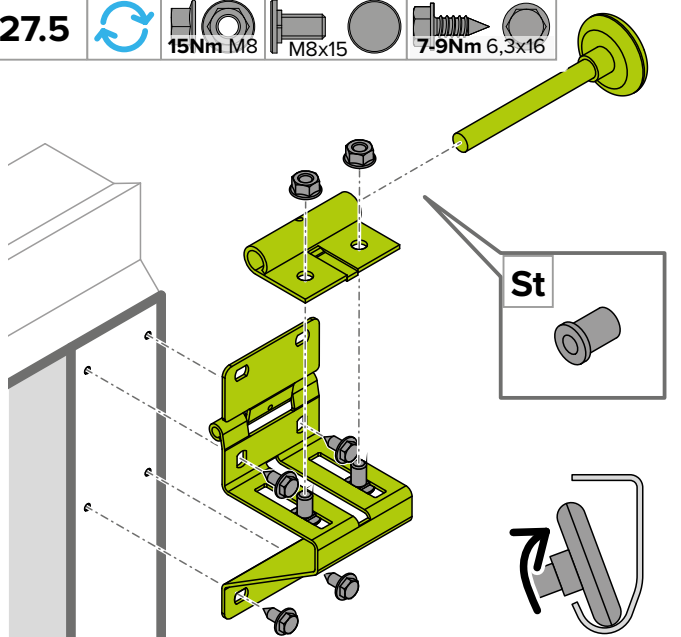
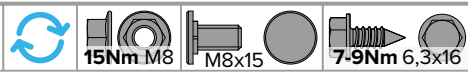
27.3

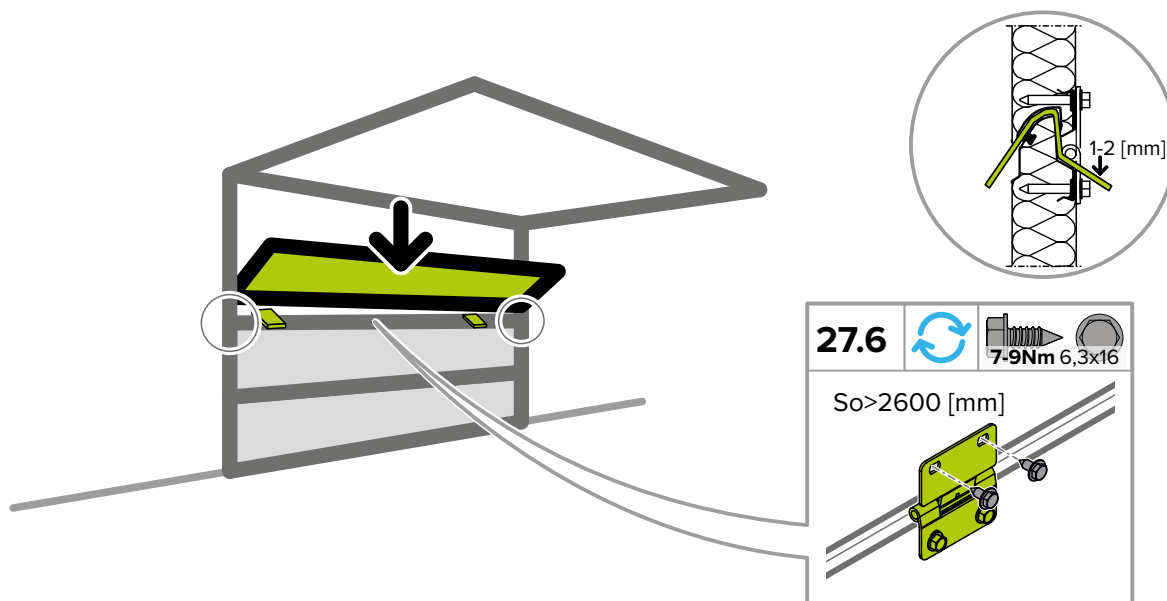


27.4

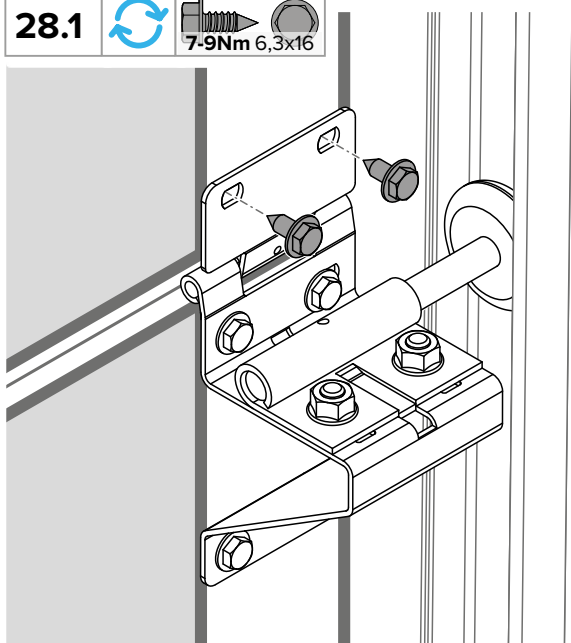


27.5

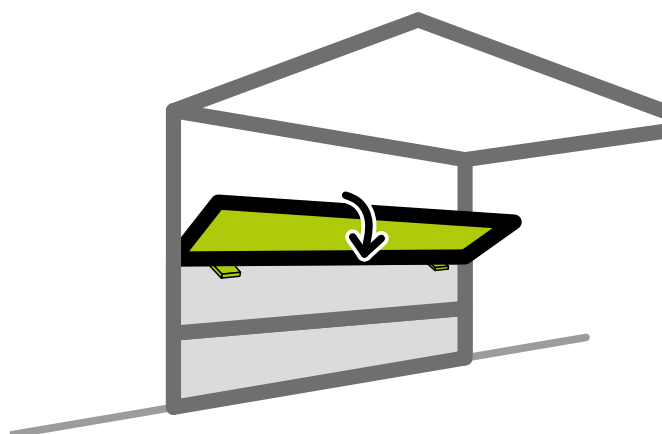




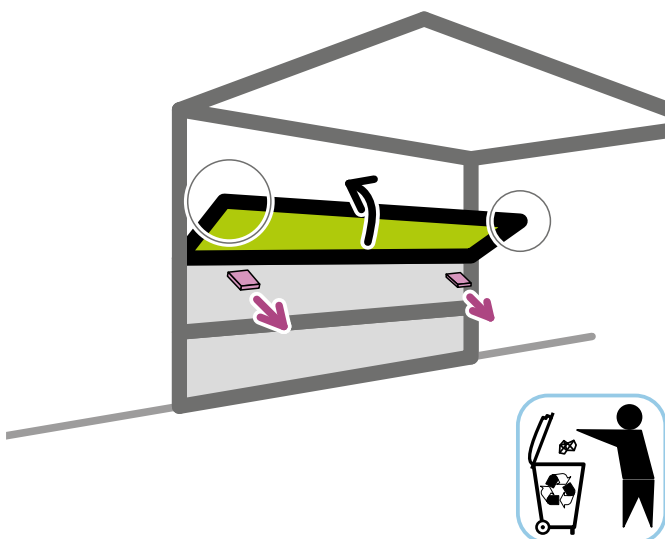
28.1



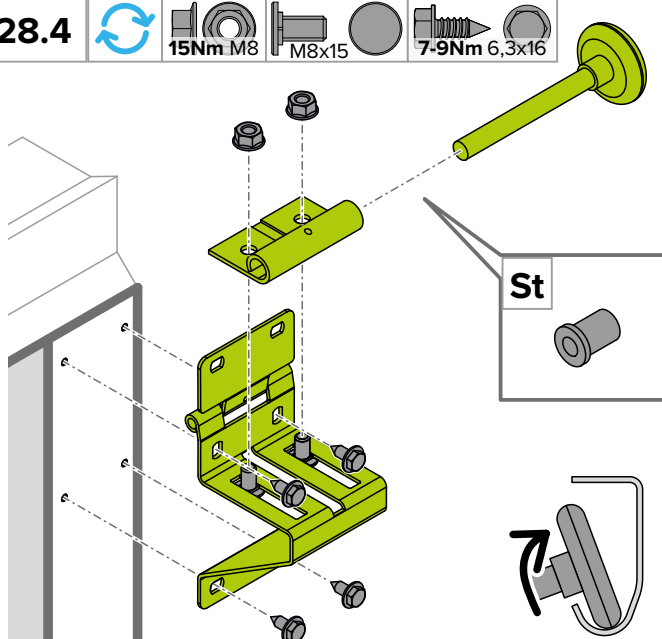
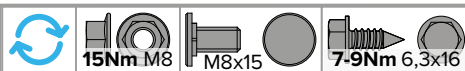
28.2



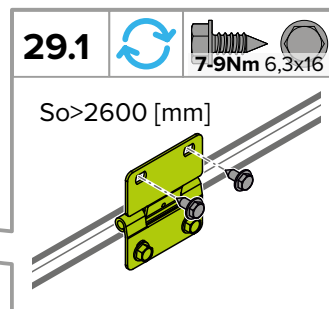
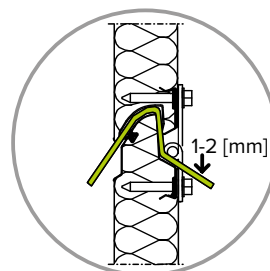
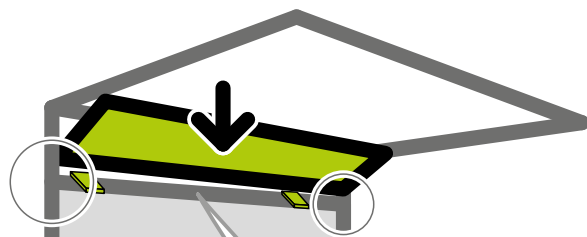
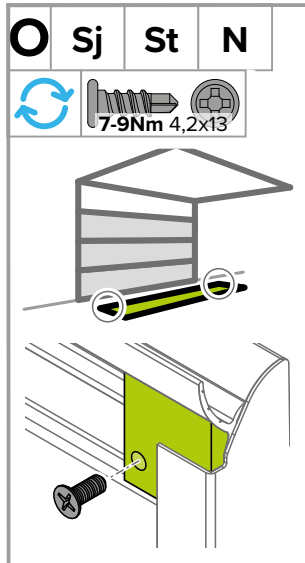
28.3



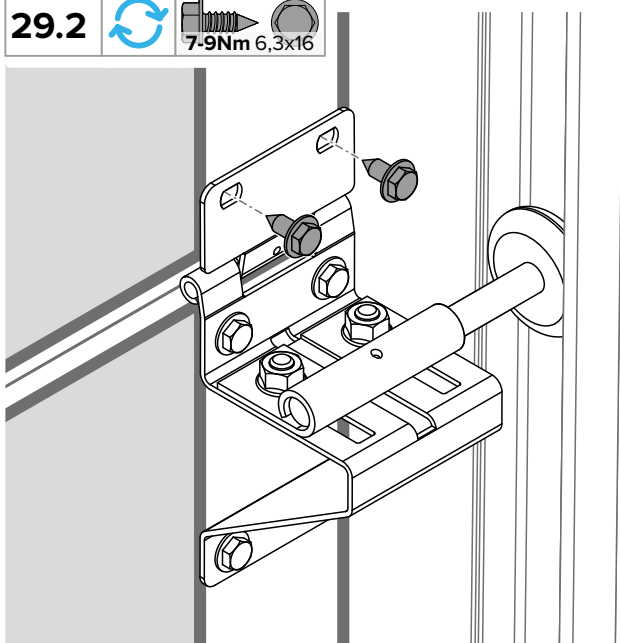
28.4



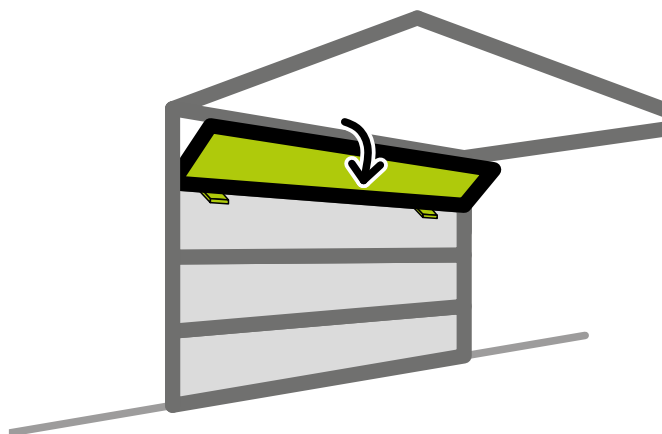
29



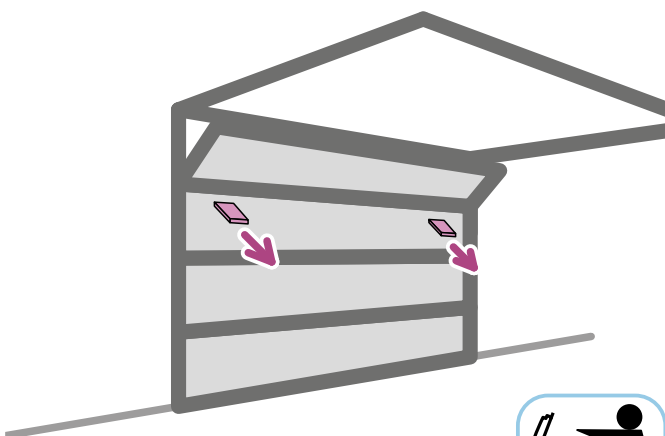
29.2



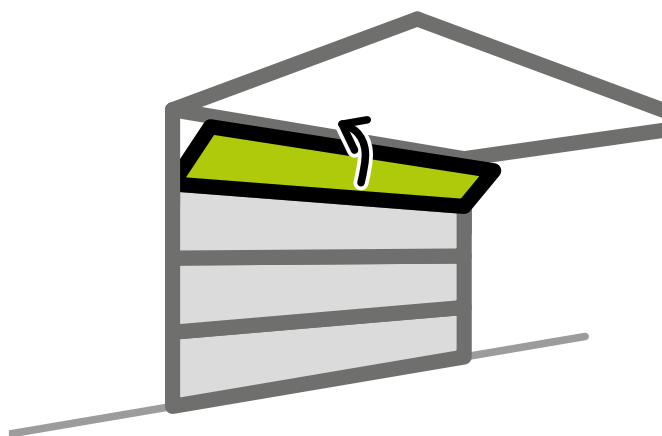
29.3

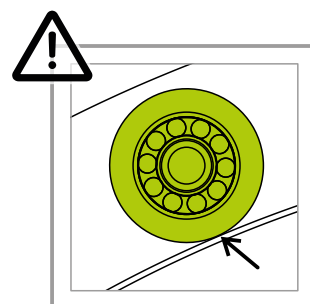
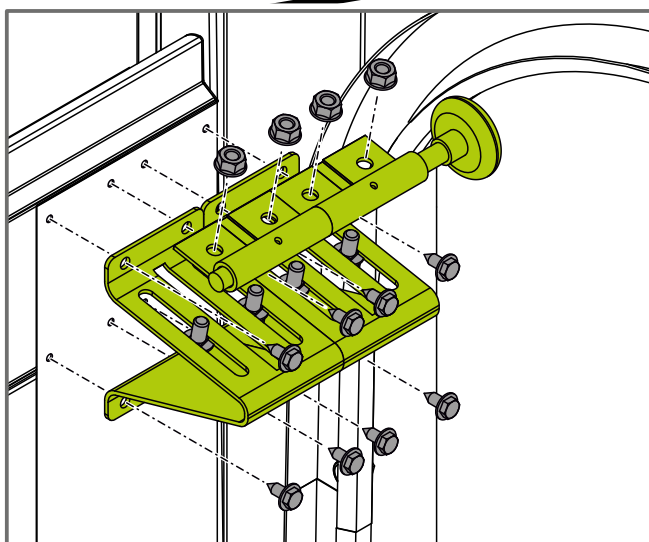
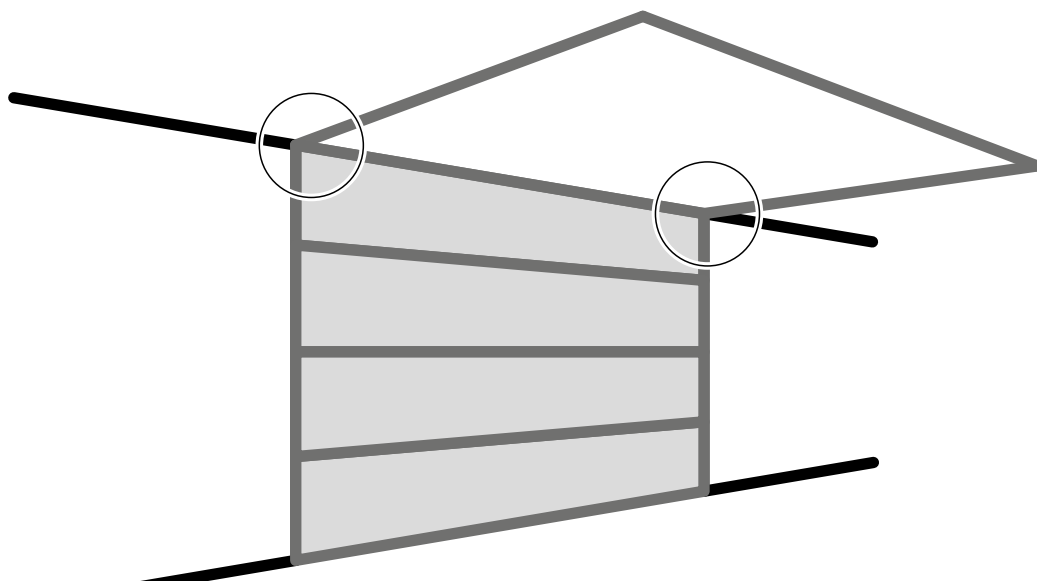


29.4



29.5



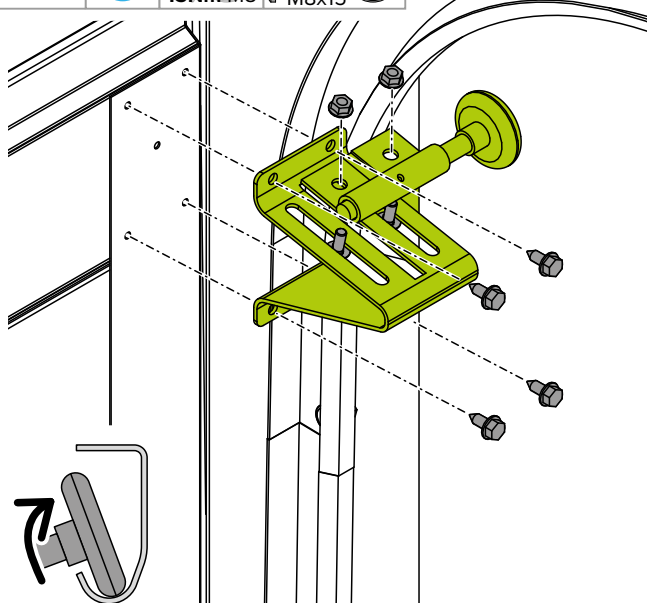


30.1

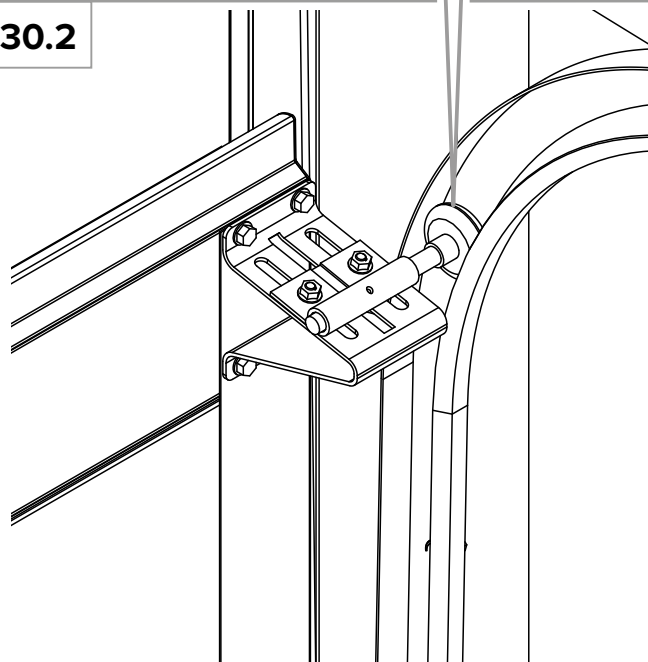


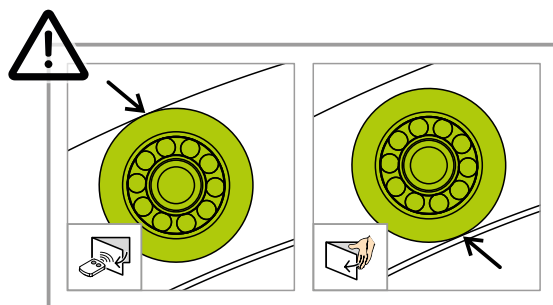
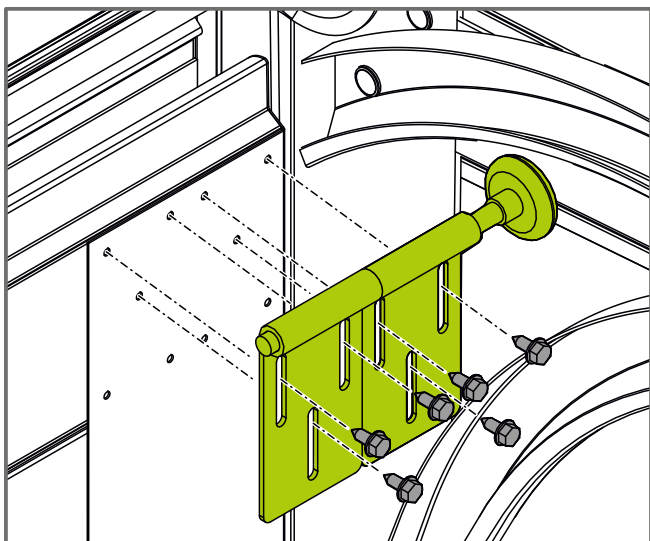
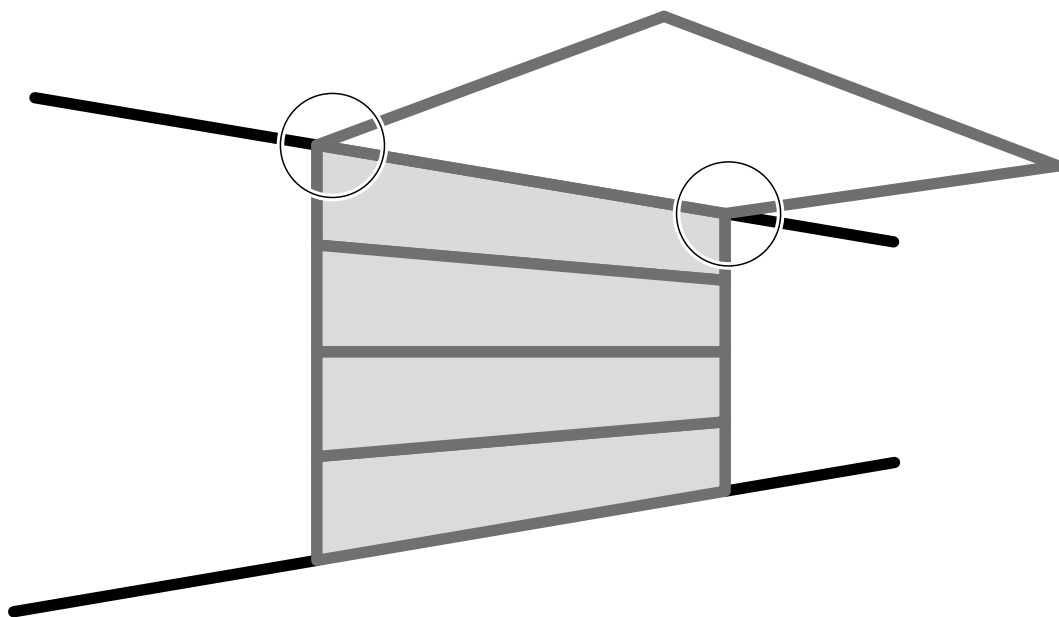
15Nm M8

M8x15



30.2

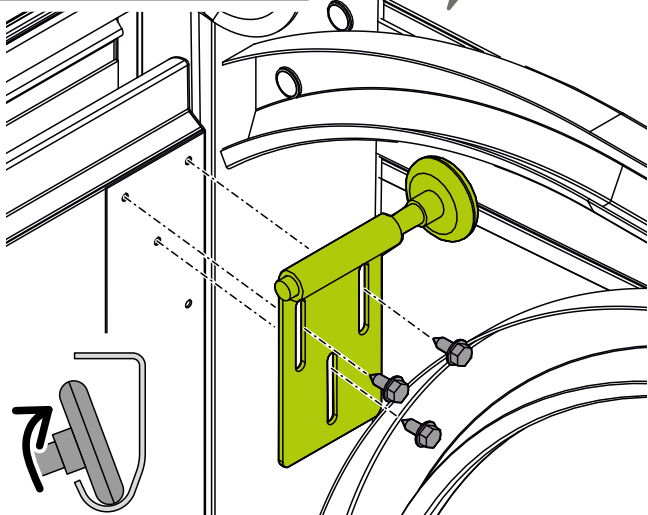




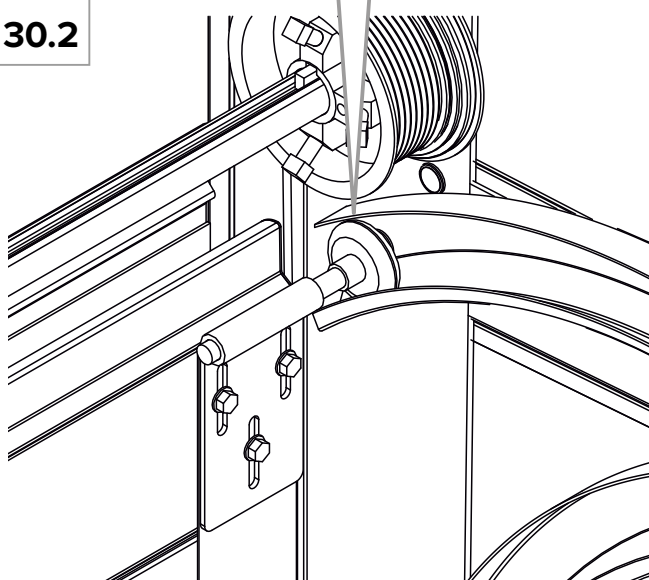
30.1

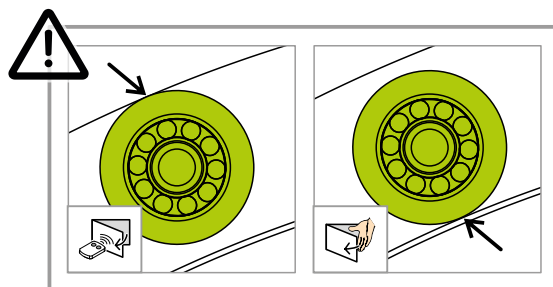
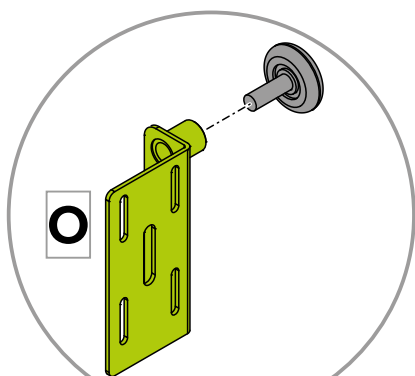
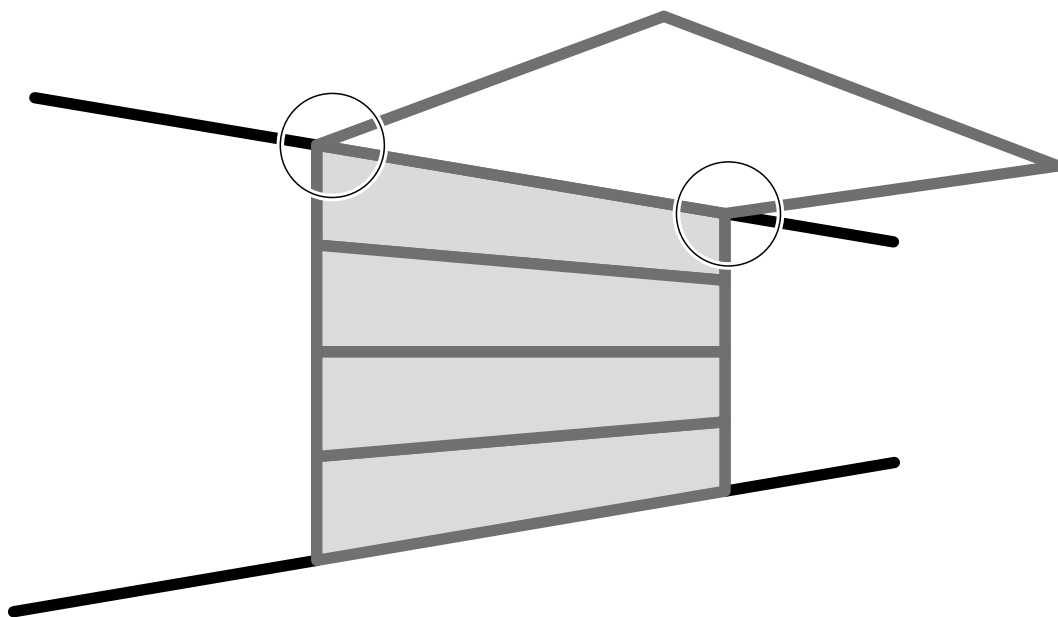


7-9Nm 6,3x16



30.2

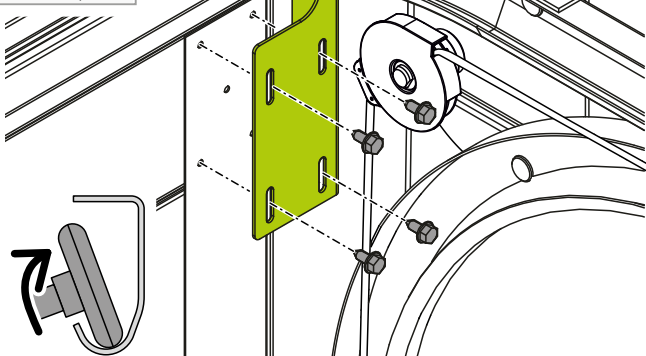




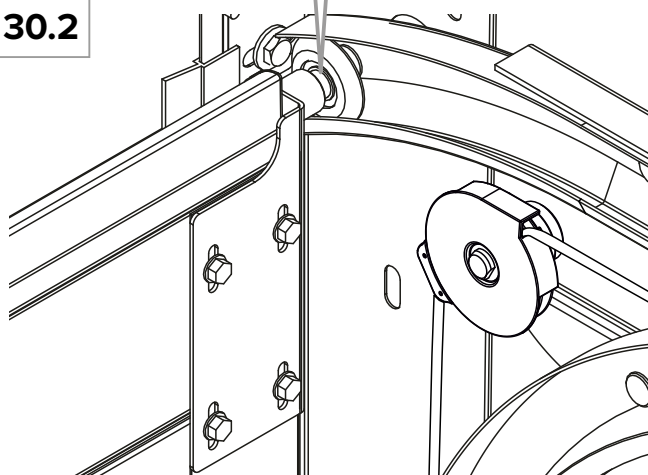
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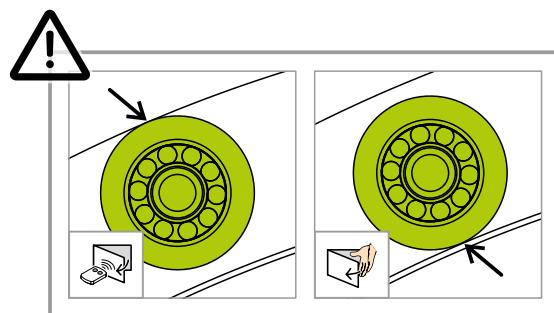
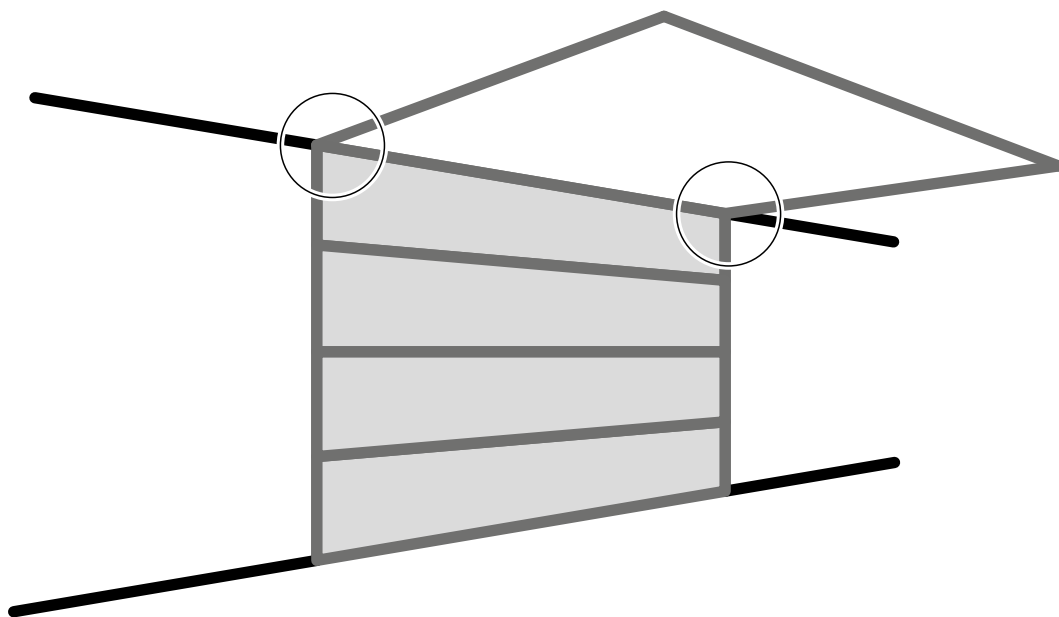


7-9Nm 6,3x16



30.2

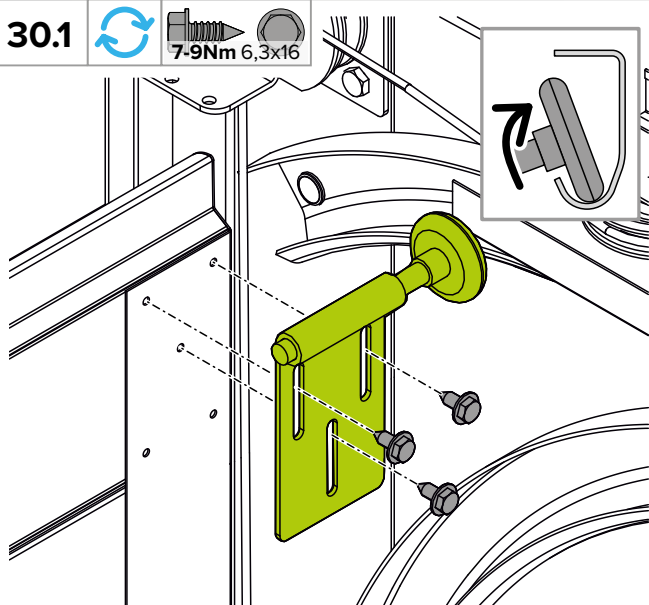




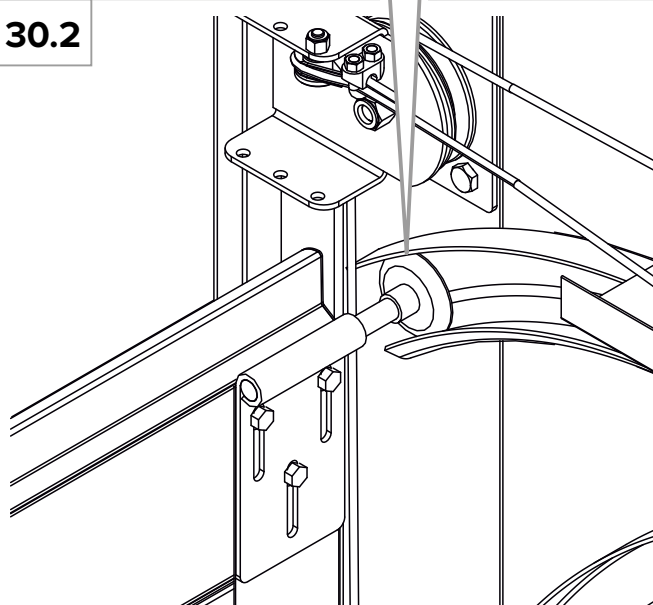
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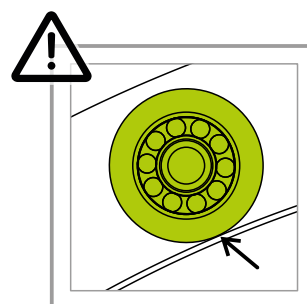
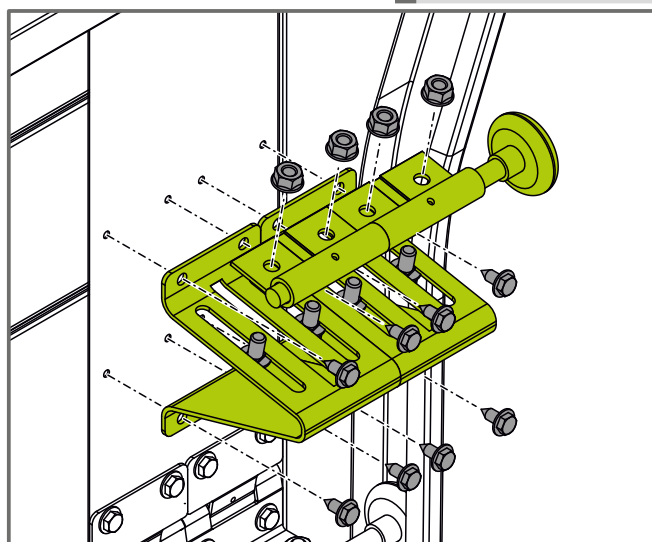
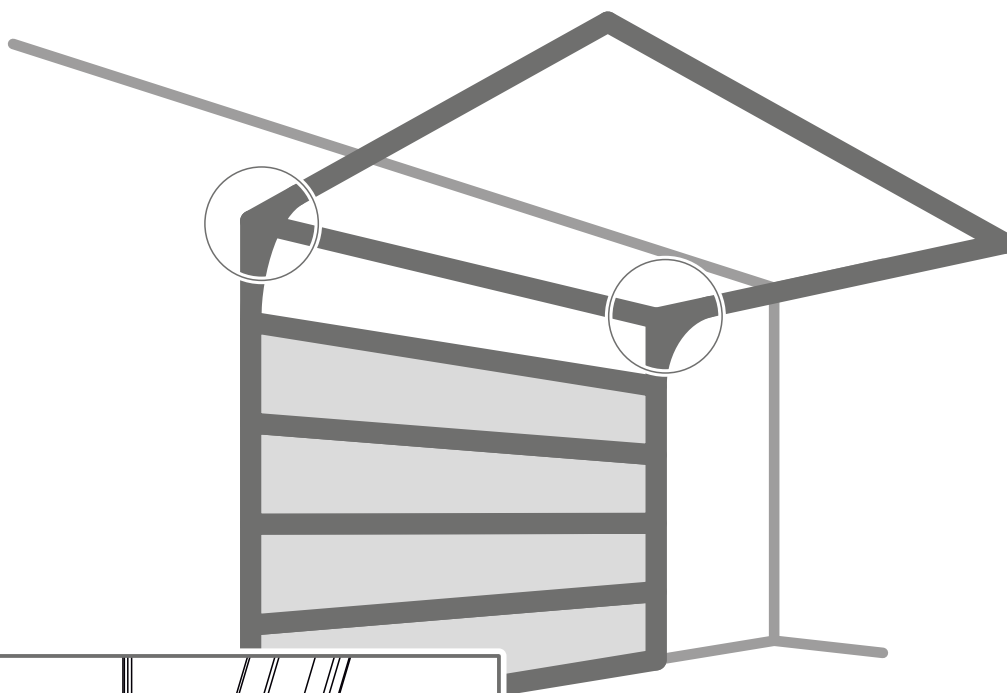


7-9Nm 6,3x16



30.2





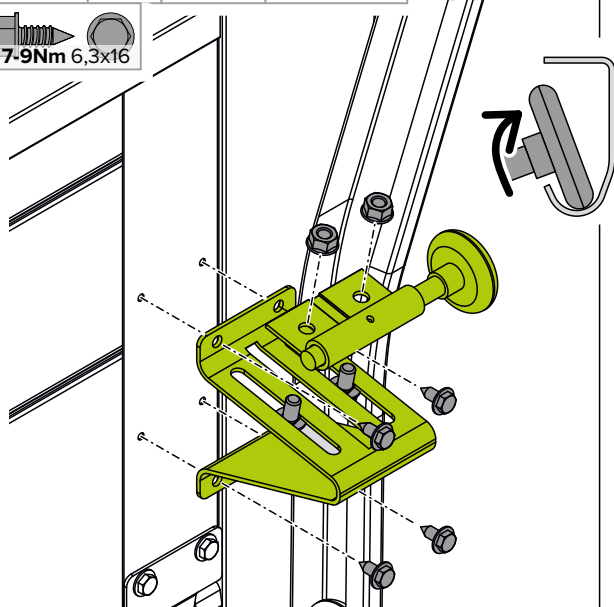
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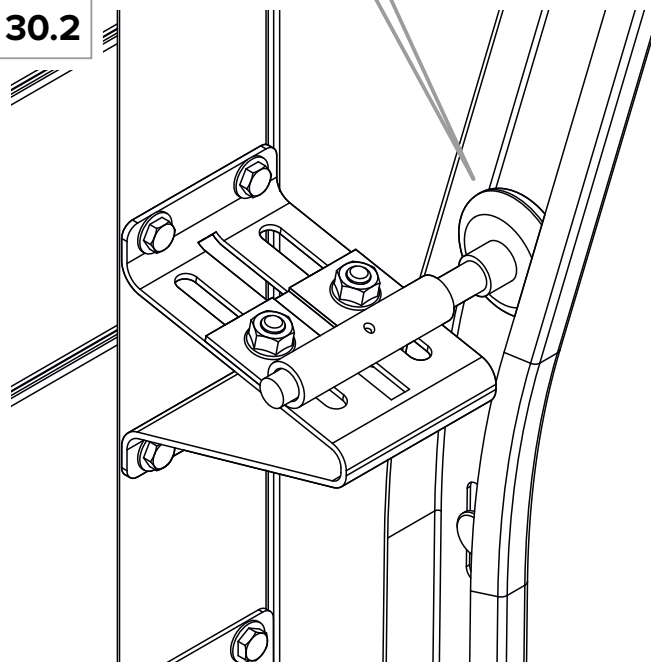
15Nm M8

M8x15

7-9Nm 6,3x16

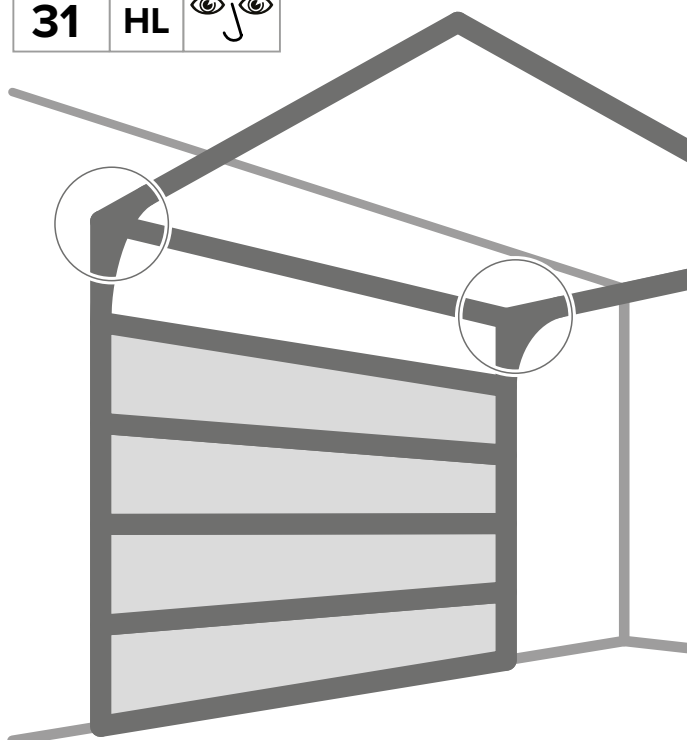


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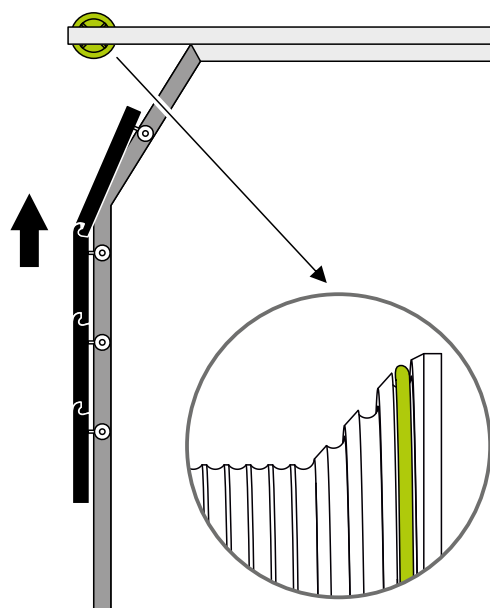


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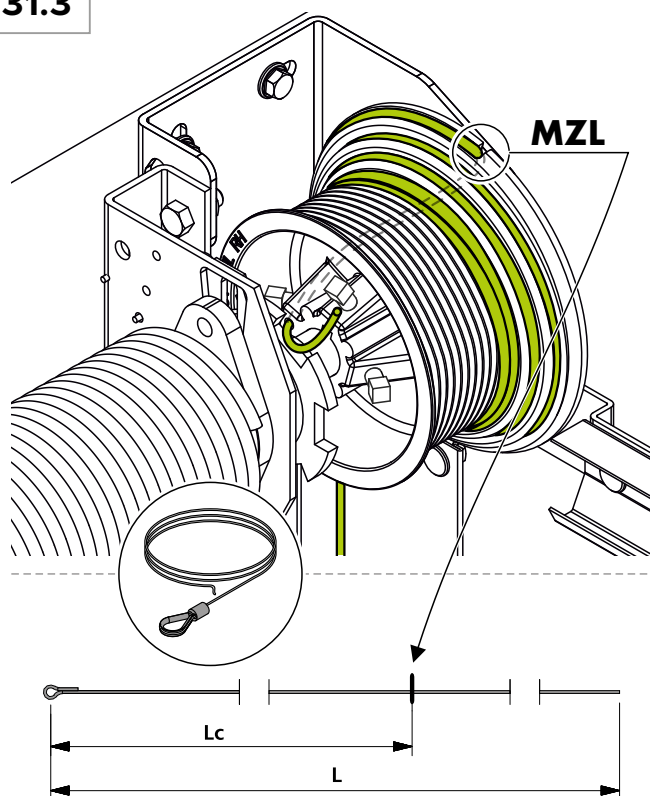
HL



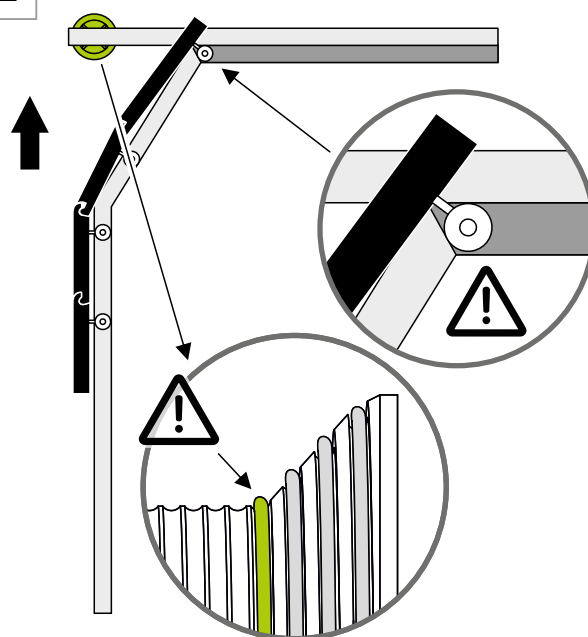
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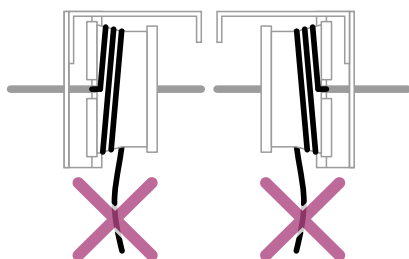
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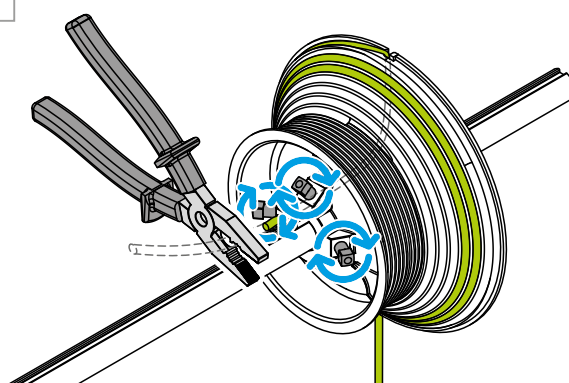
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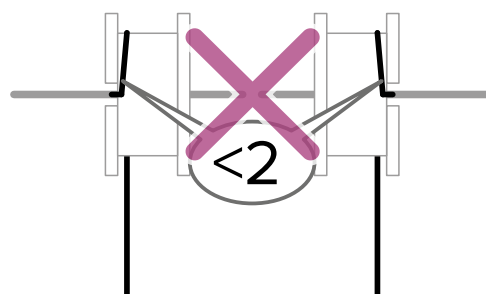
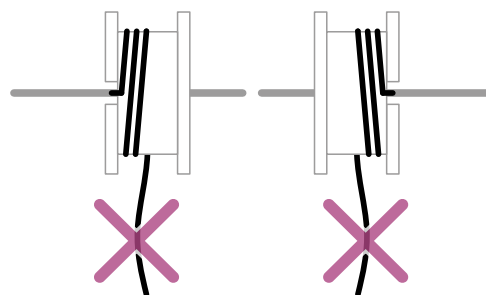
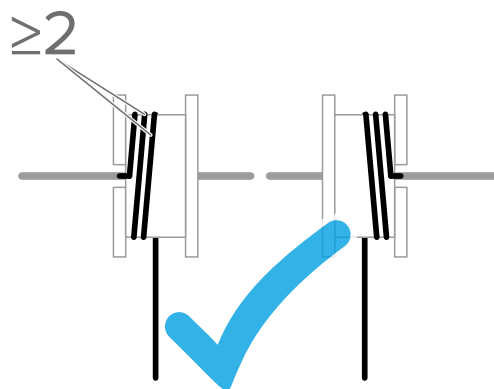
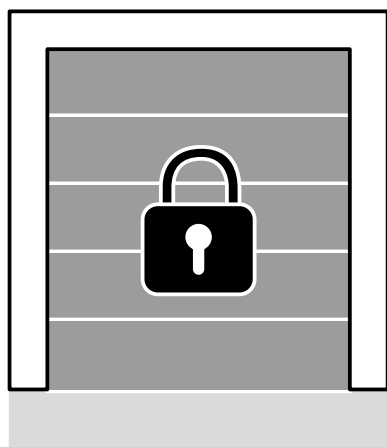


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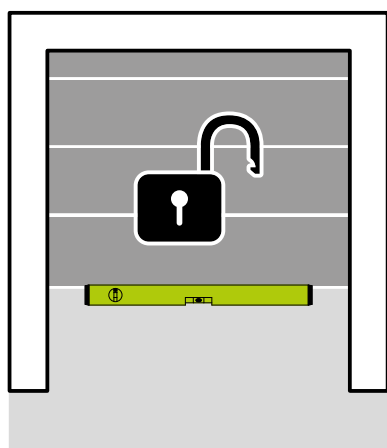


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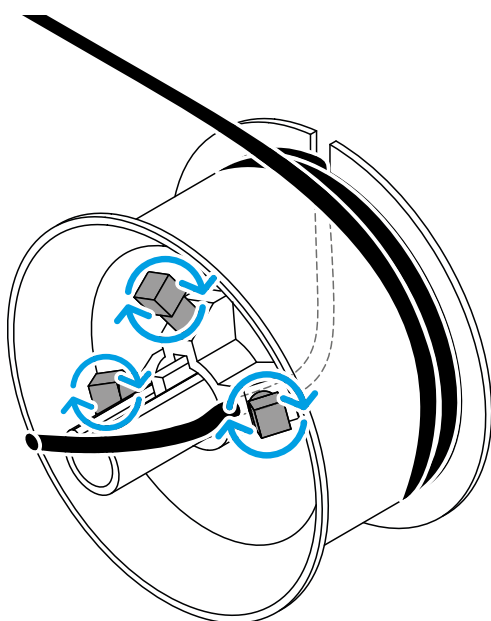




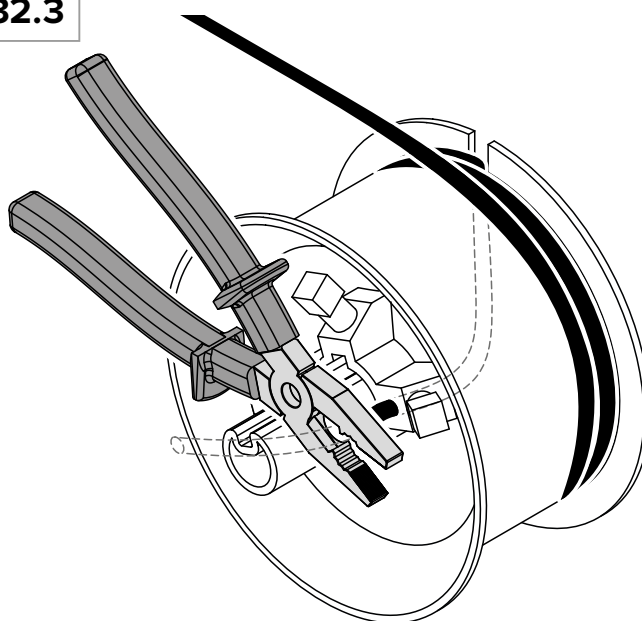
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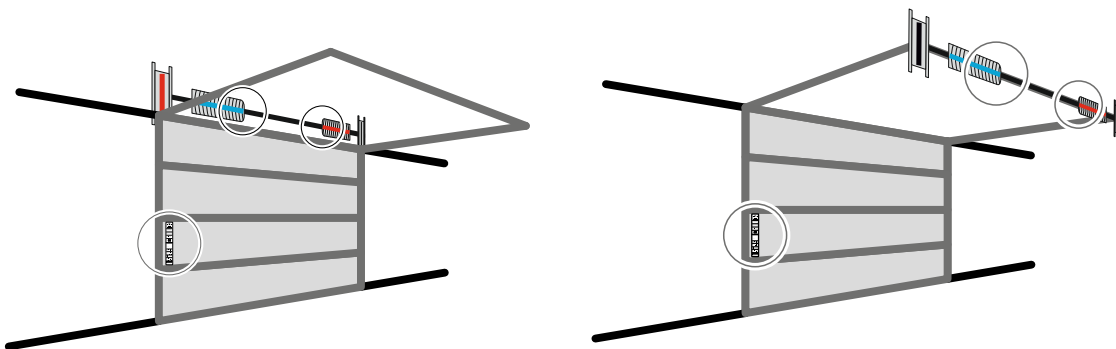


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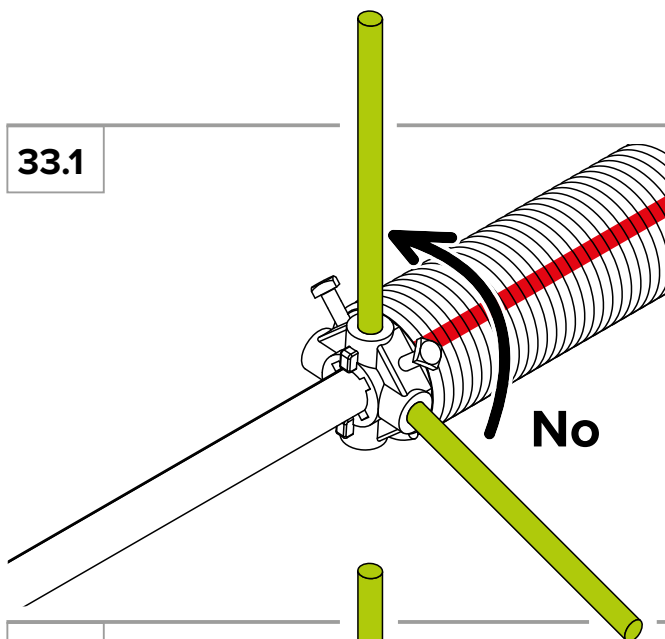


32.3

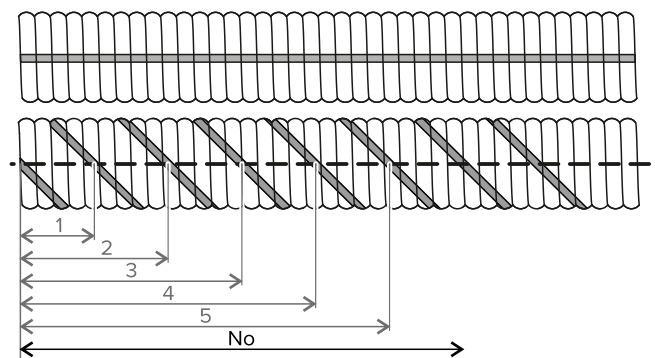




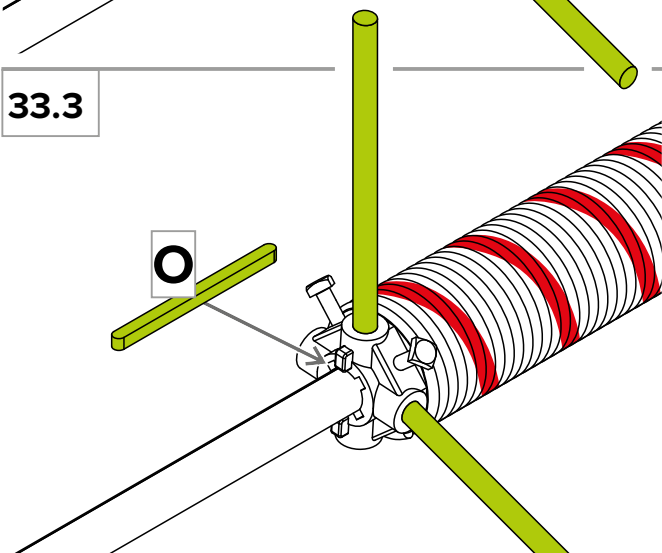
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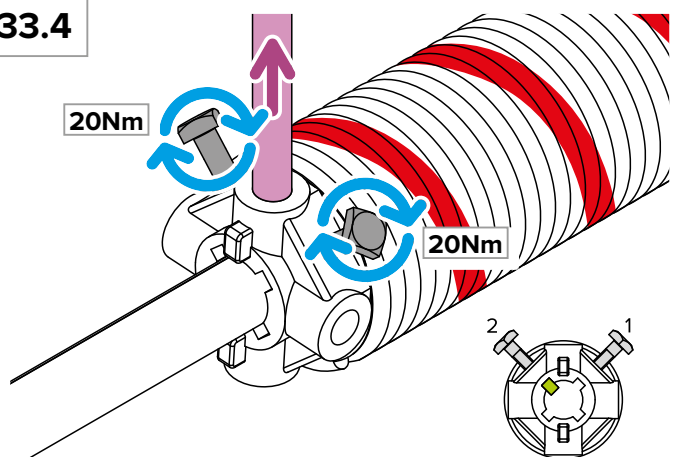
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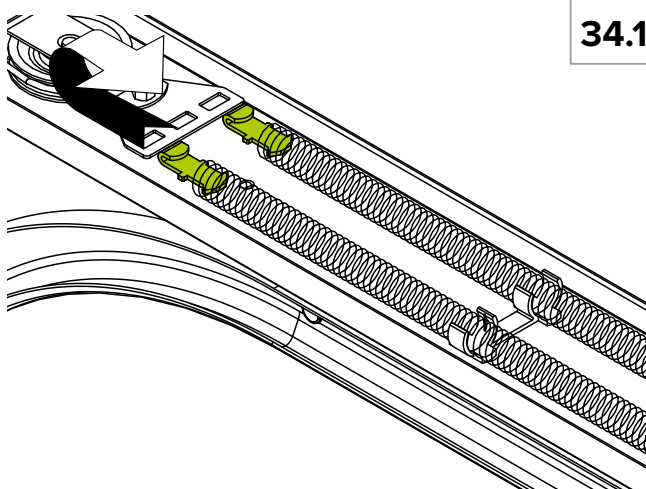
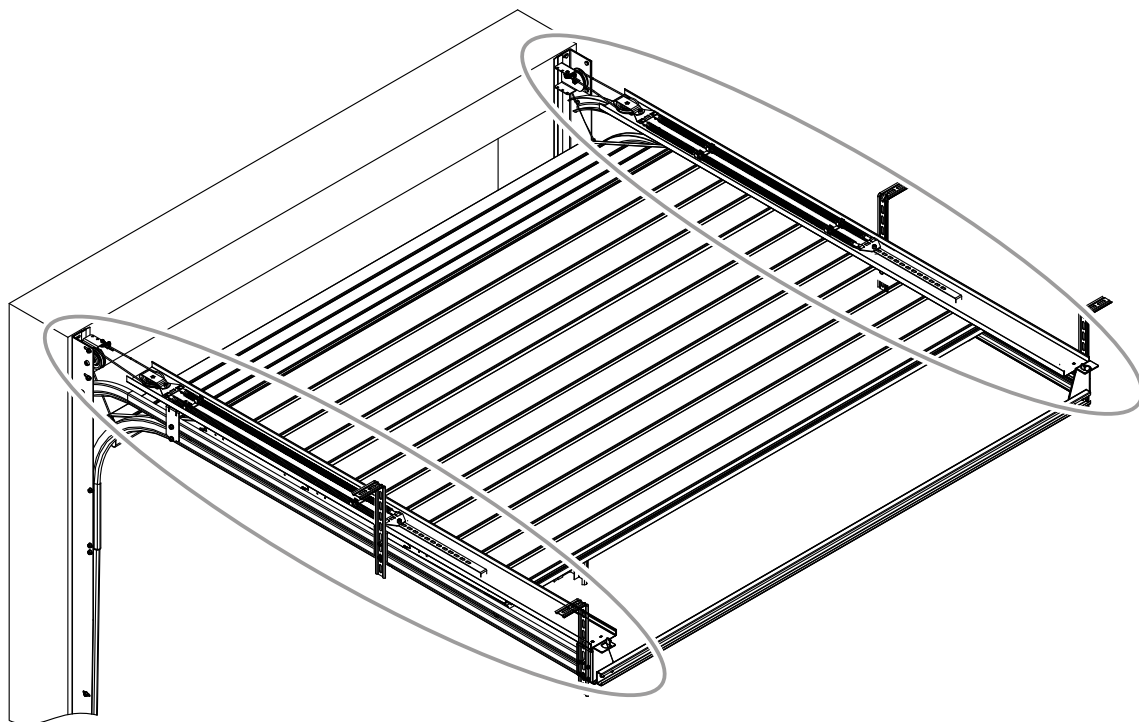


33.3

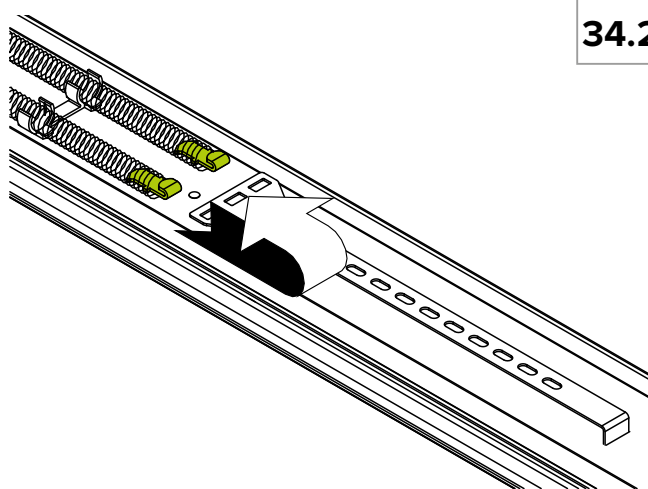


33.4

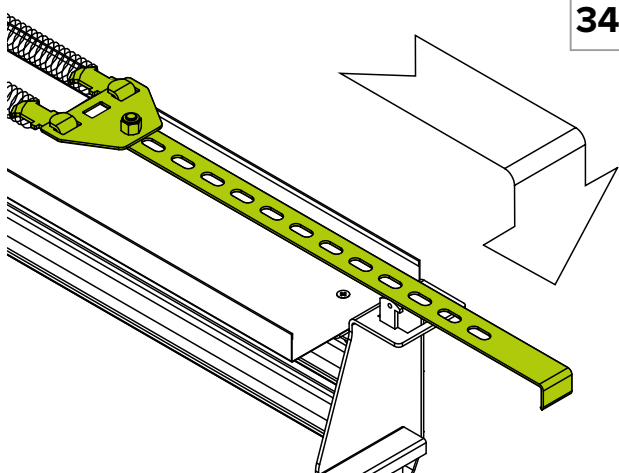




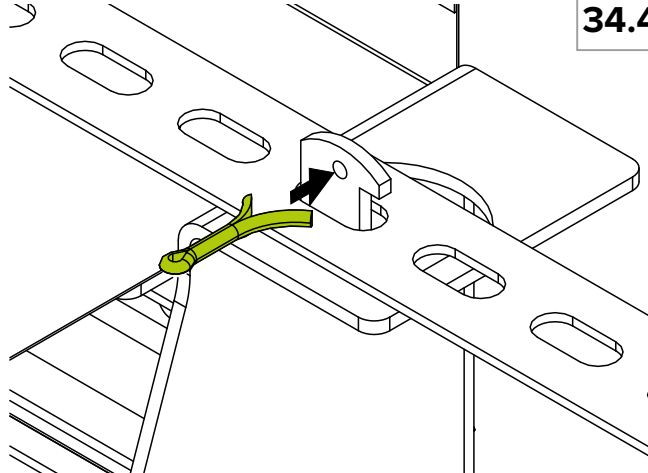
34.1



34.2



34.3



34.4

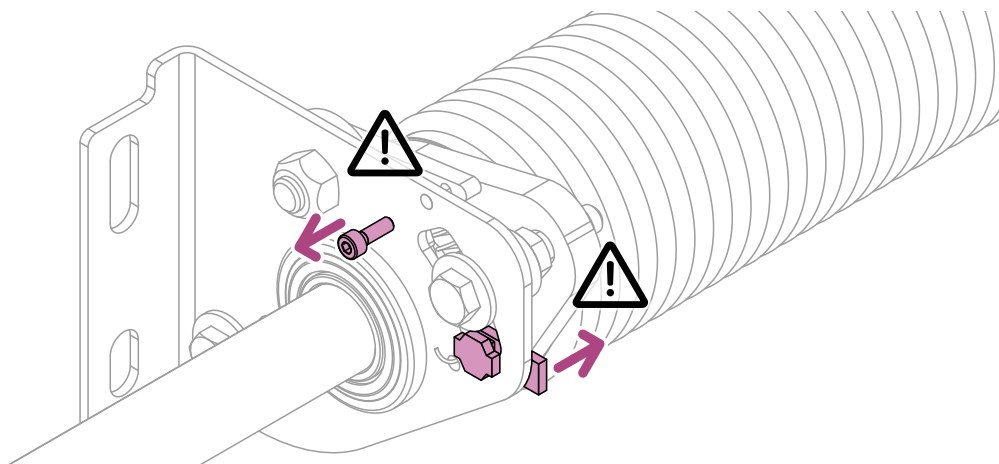
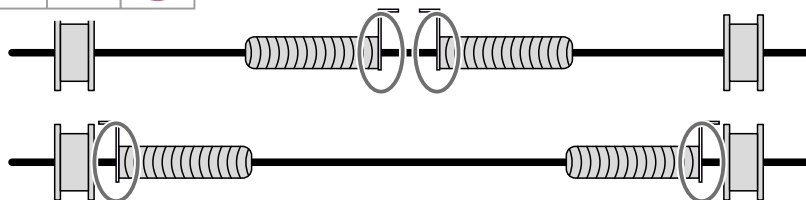
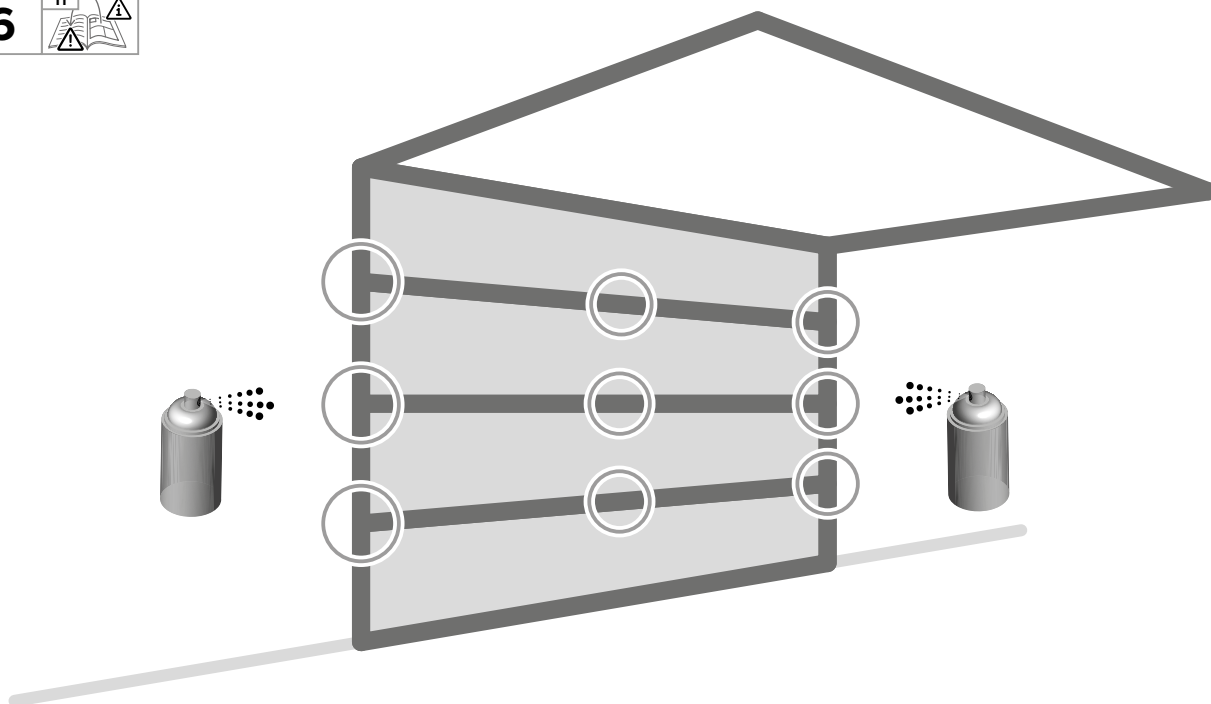
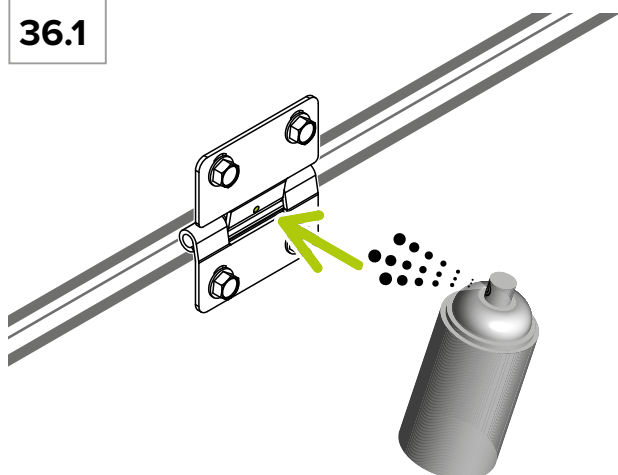
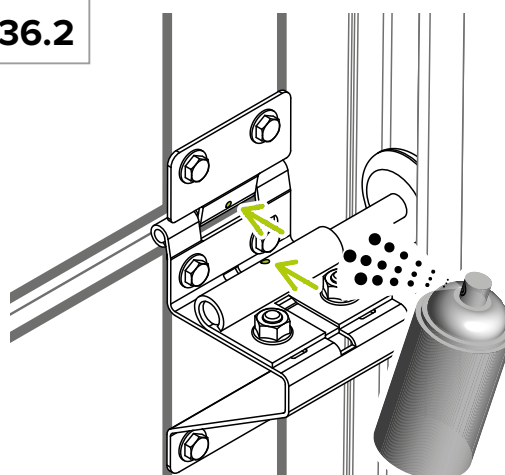
35

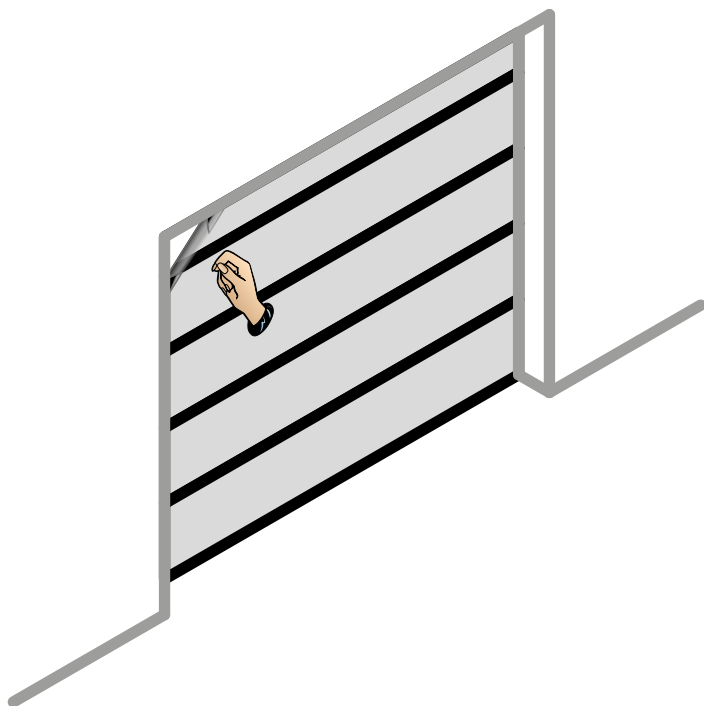
Sj

Sp

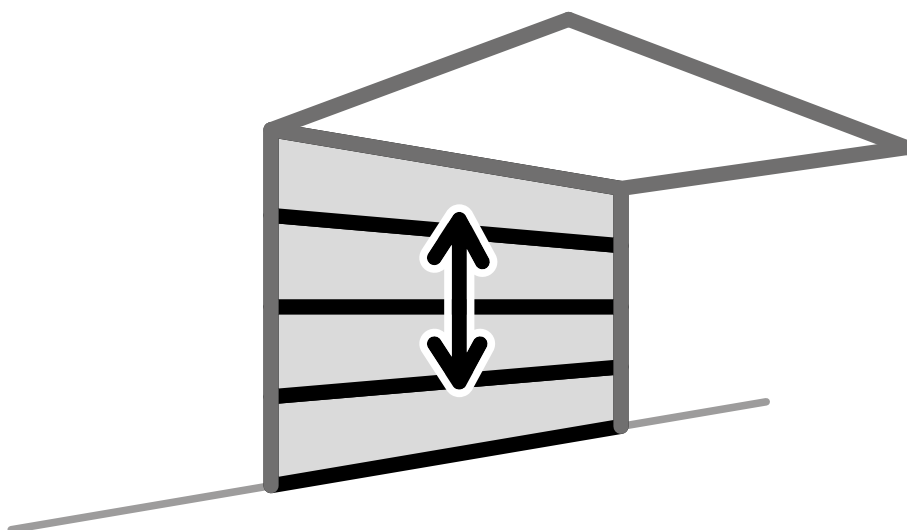
St

HL

**36****36.1****36.2**



WARNING! ACHTUNG! ATTENTION!
UWAGA! ВНИМАНИЕ! ATTENZIONE!
POZOR! VARNING! ADVARSEL!
VAROITUS! WAARSCHUWING!
UPOZORENJE! FIGYELMEZTETÉS!
ATENȚIE! ADVERTENCIA! УВАГА!



38

Sp

Sj

St

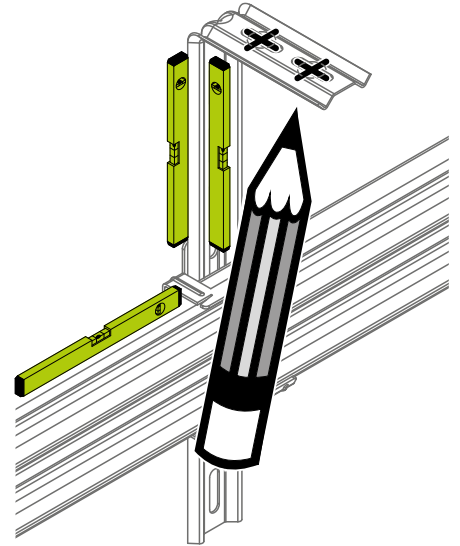
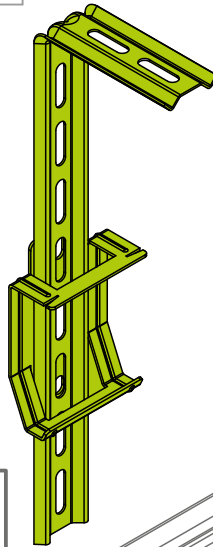
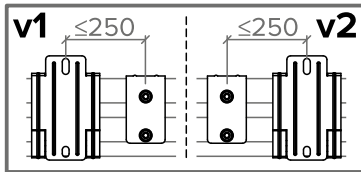
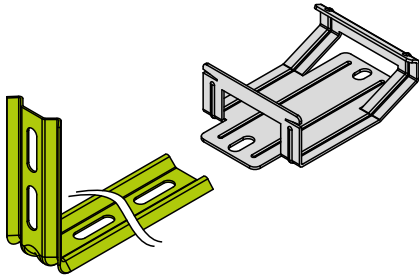
N

HL

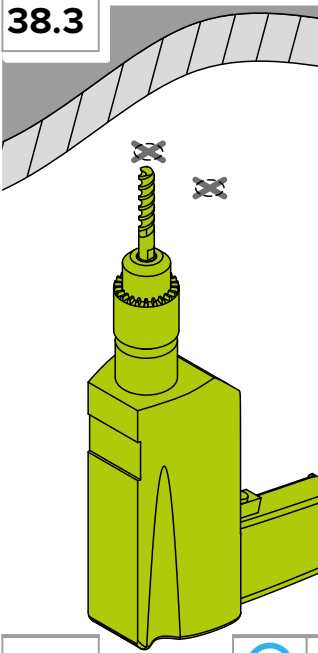
38.1

38.2

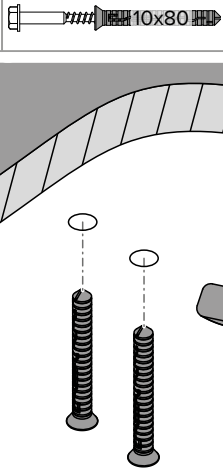
O v3



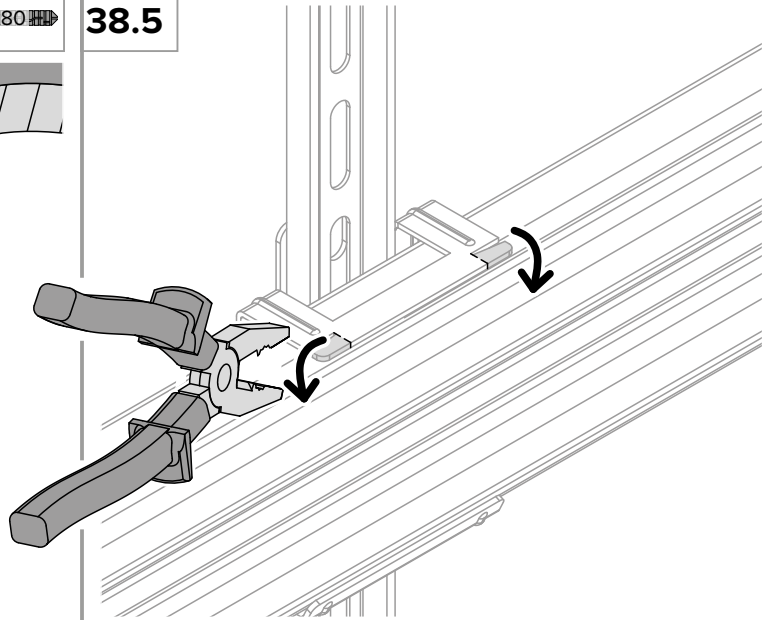
38.3



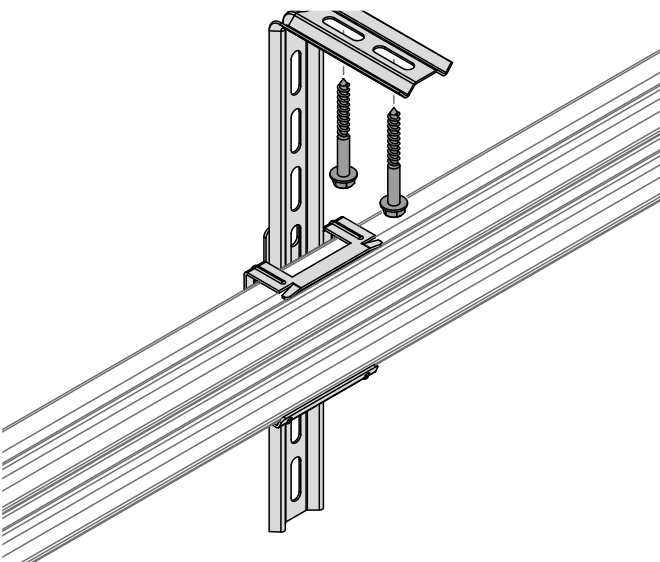
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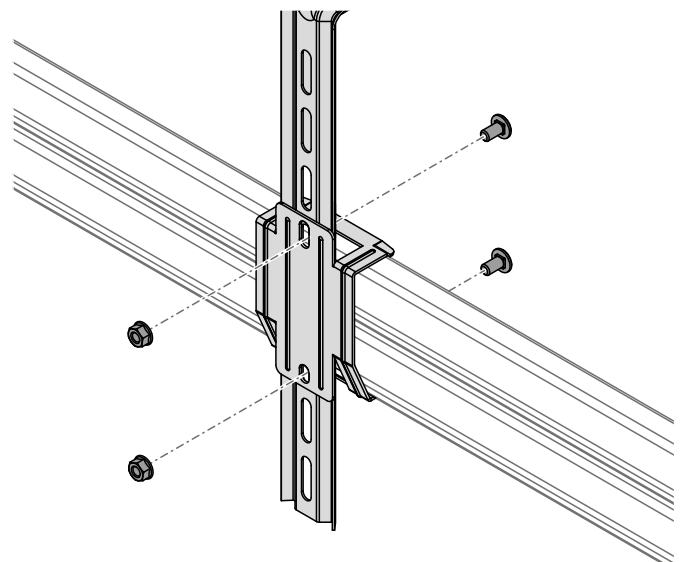
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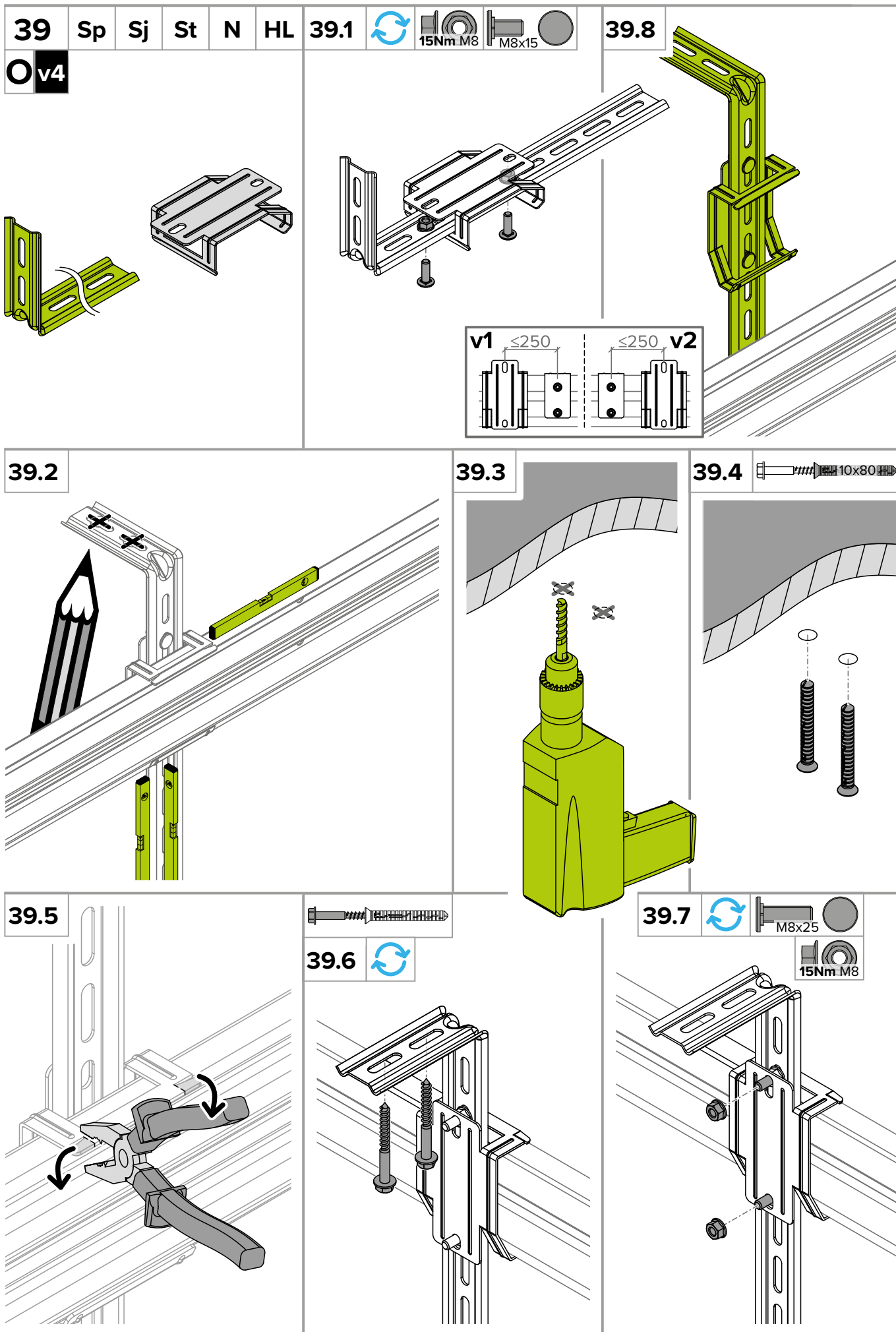


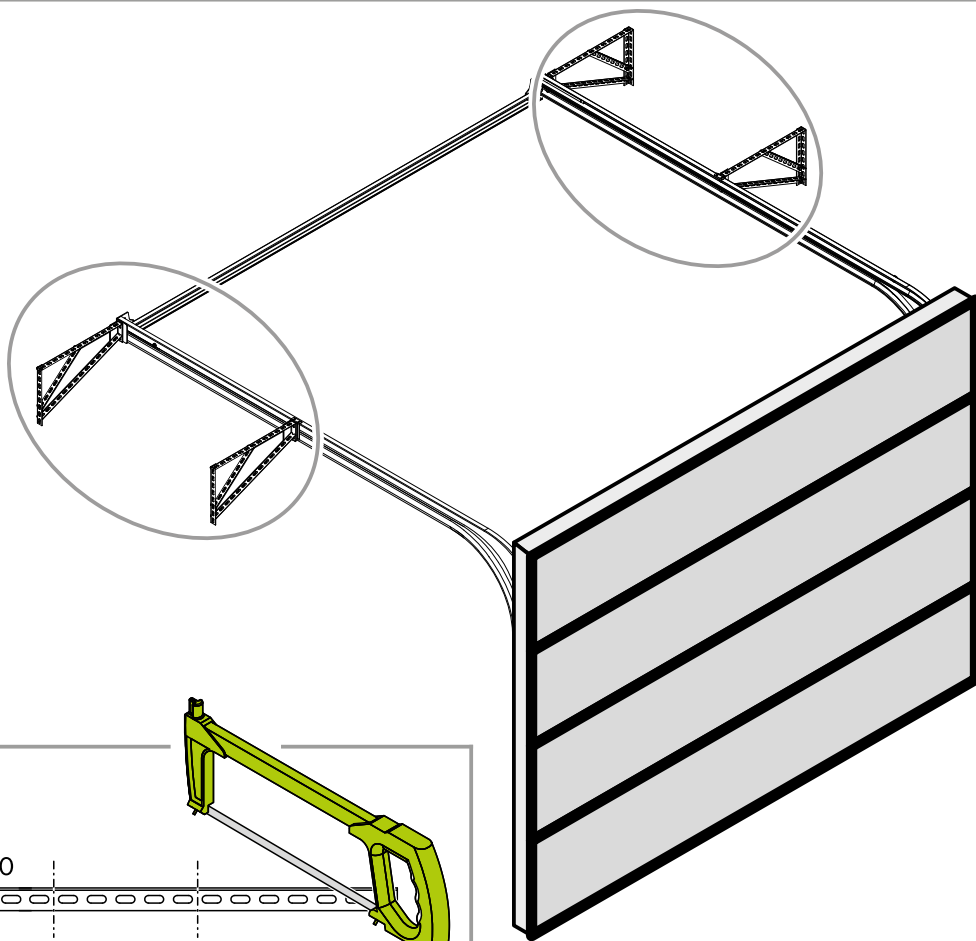
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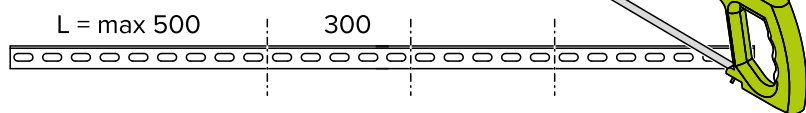
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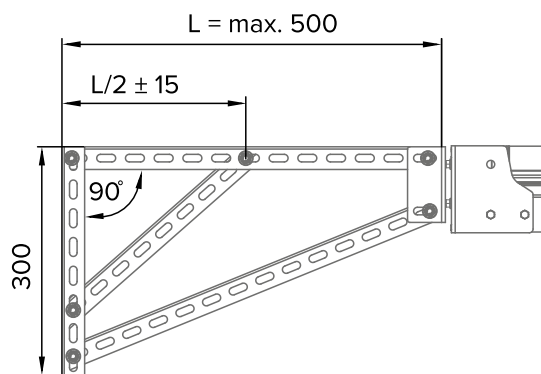
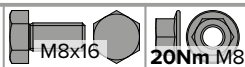




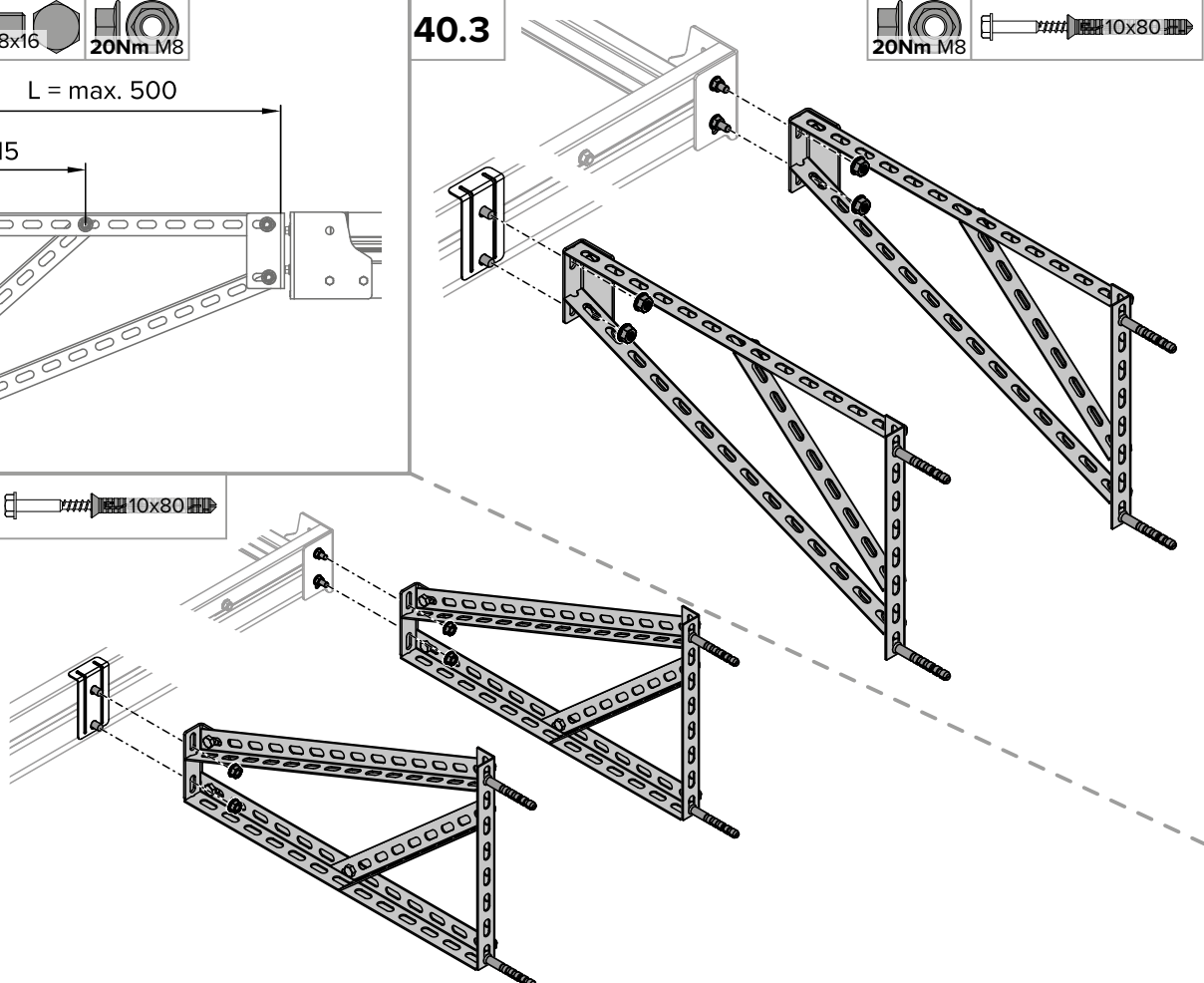
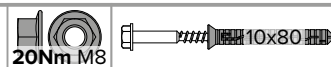
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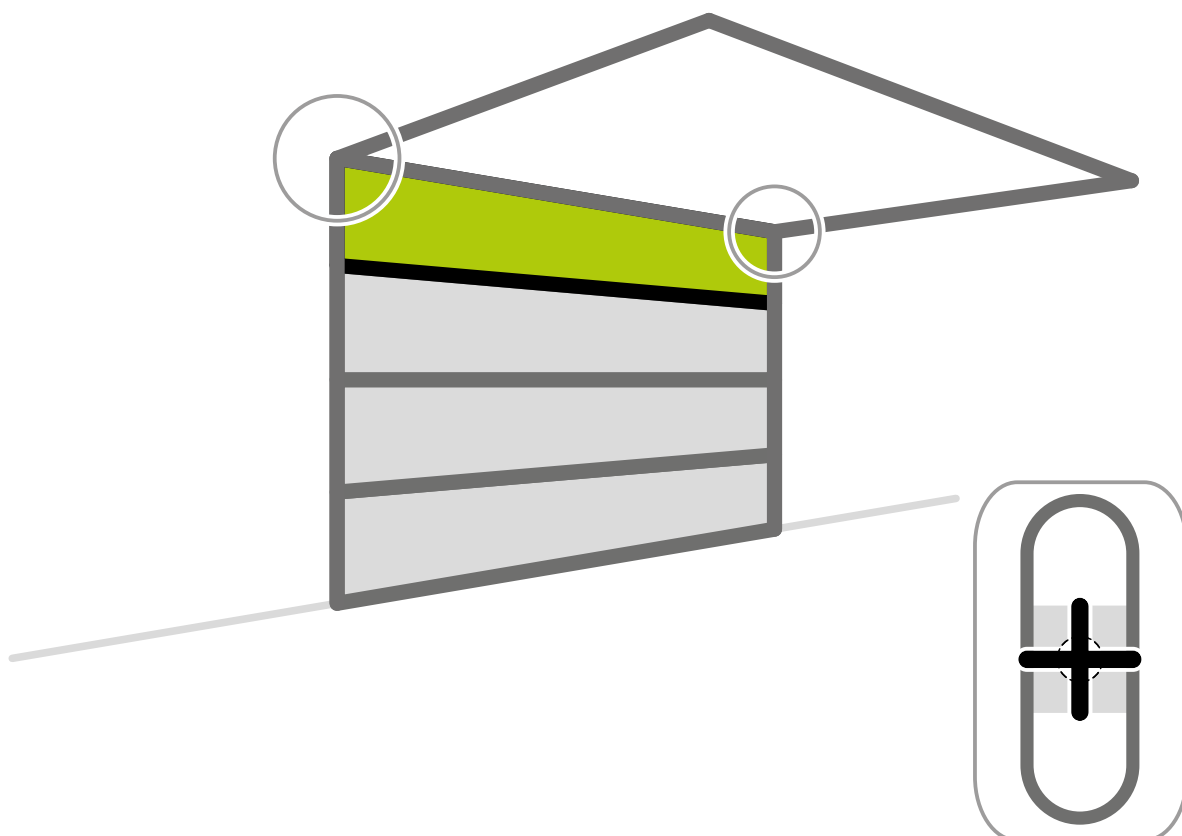


40.2

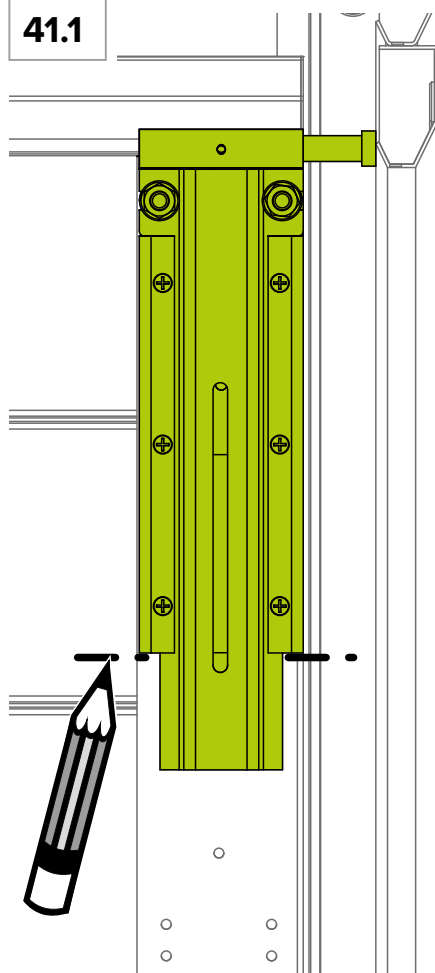


40.3

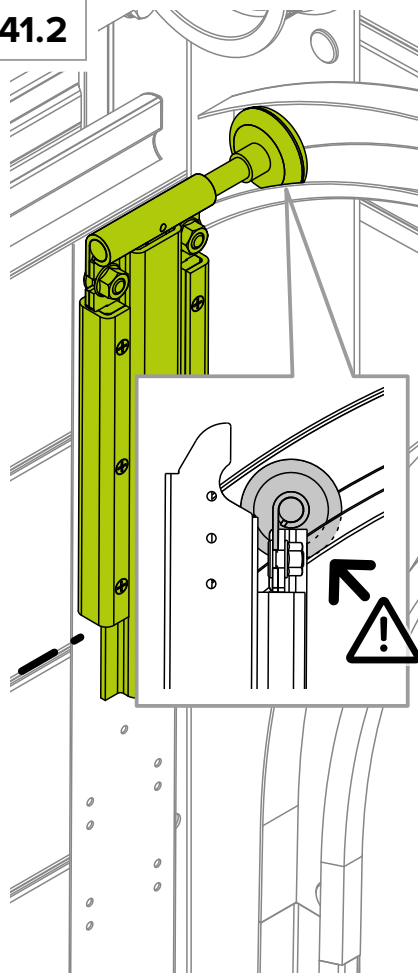




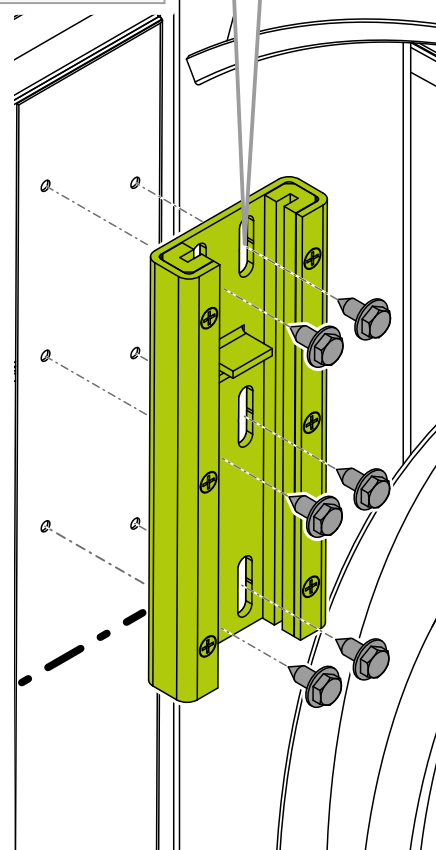
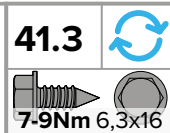
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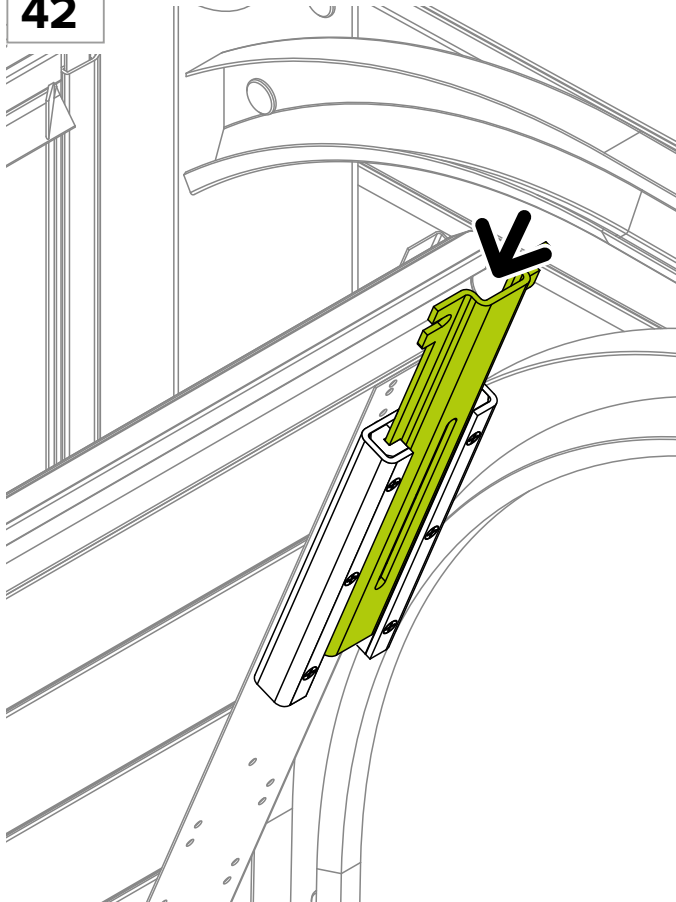
41.2



41.3



42

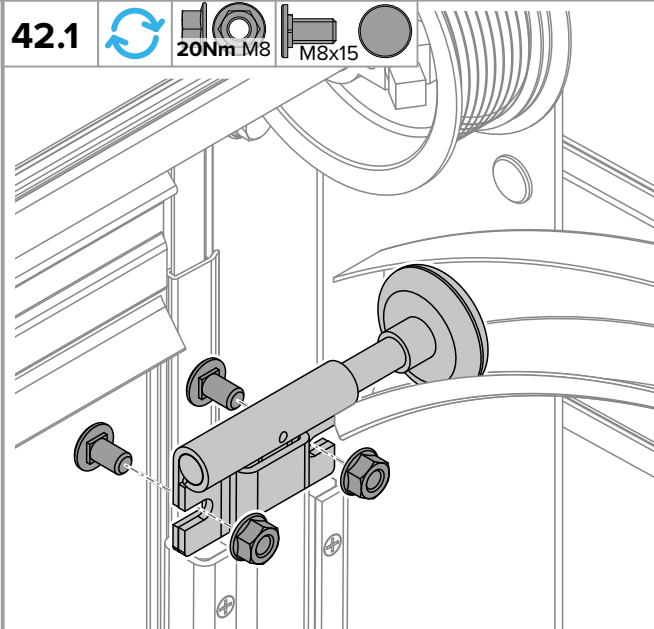


42.1

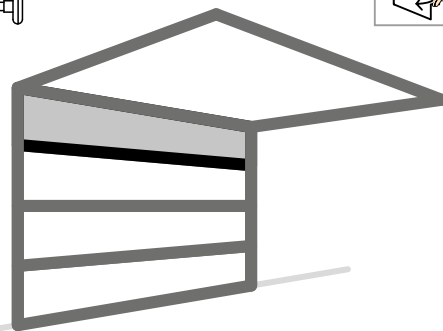
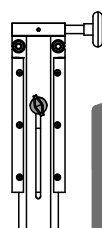


20Nm M8

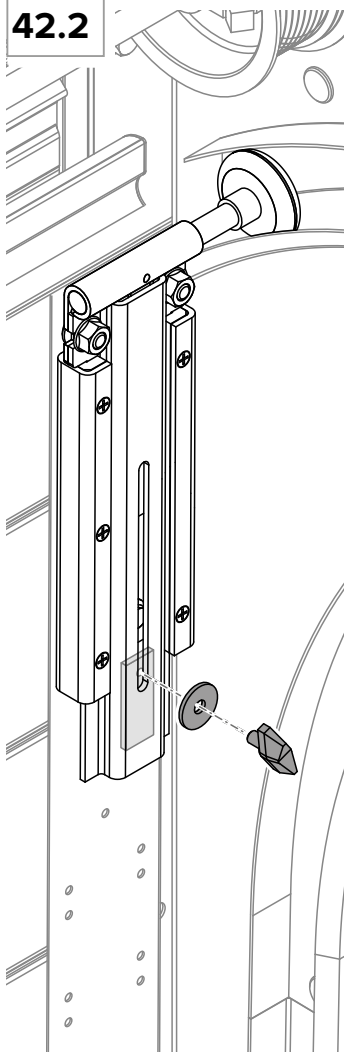
M8x15



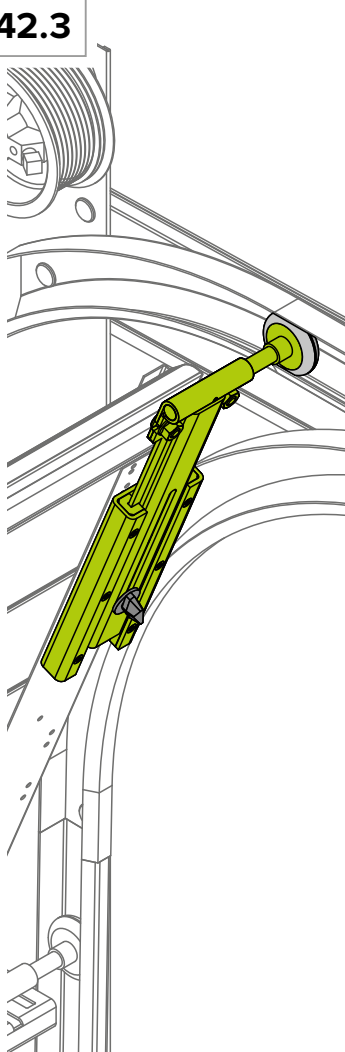
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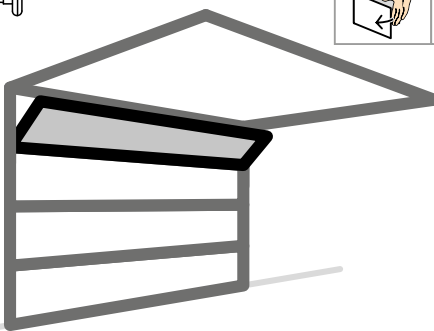
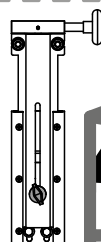
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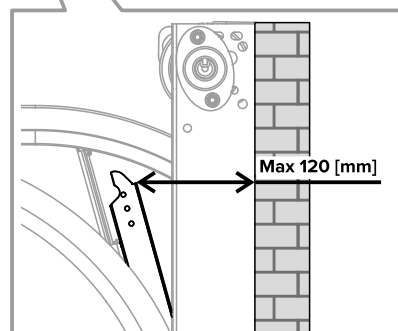
42.3



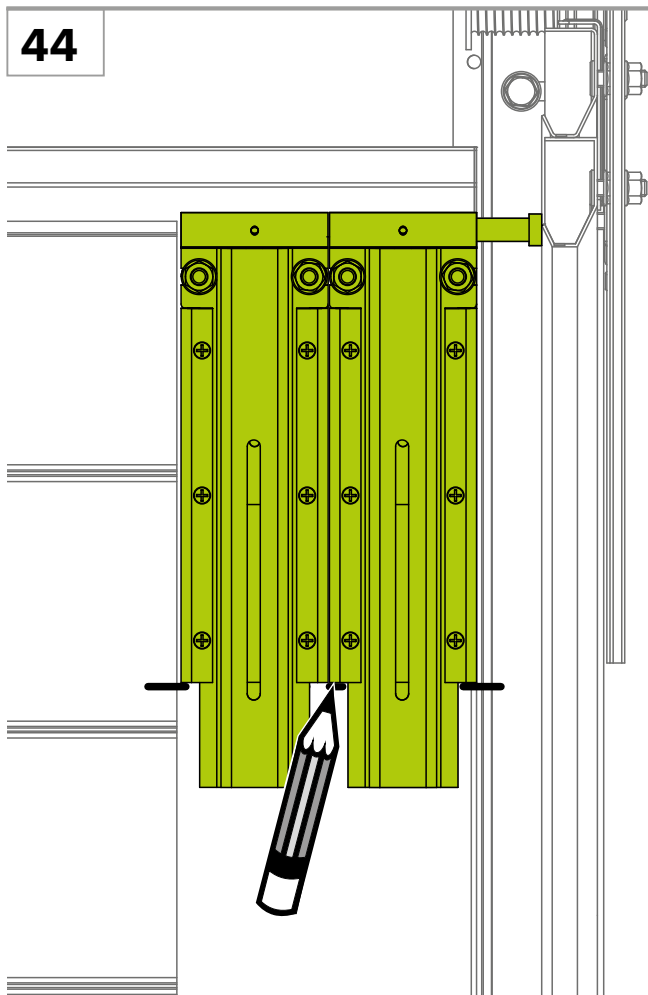
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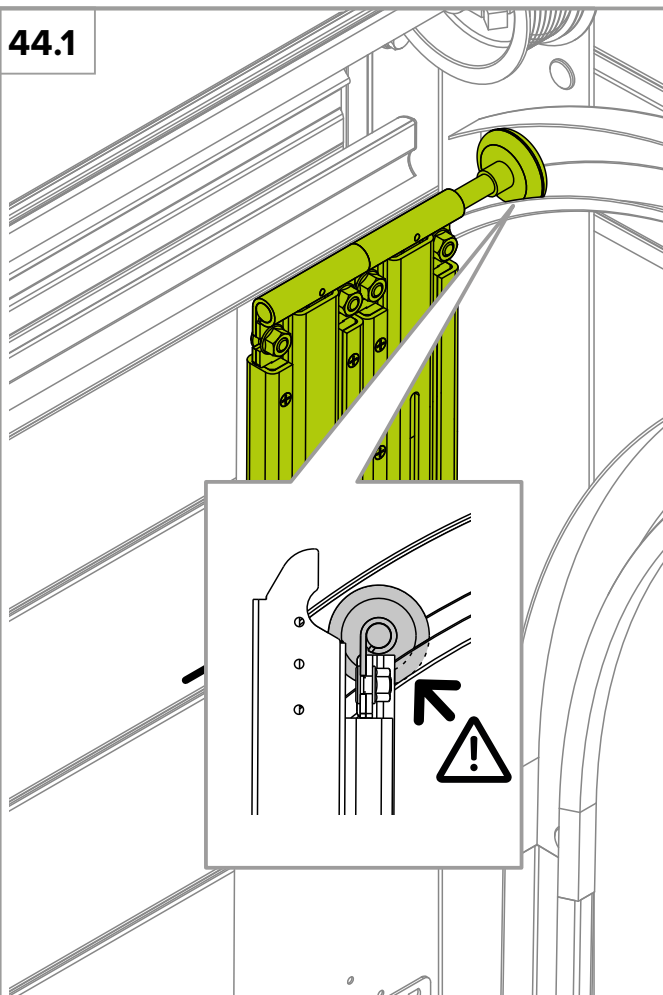
43.2



44



44.1

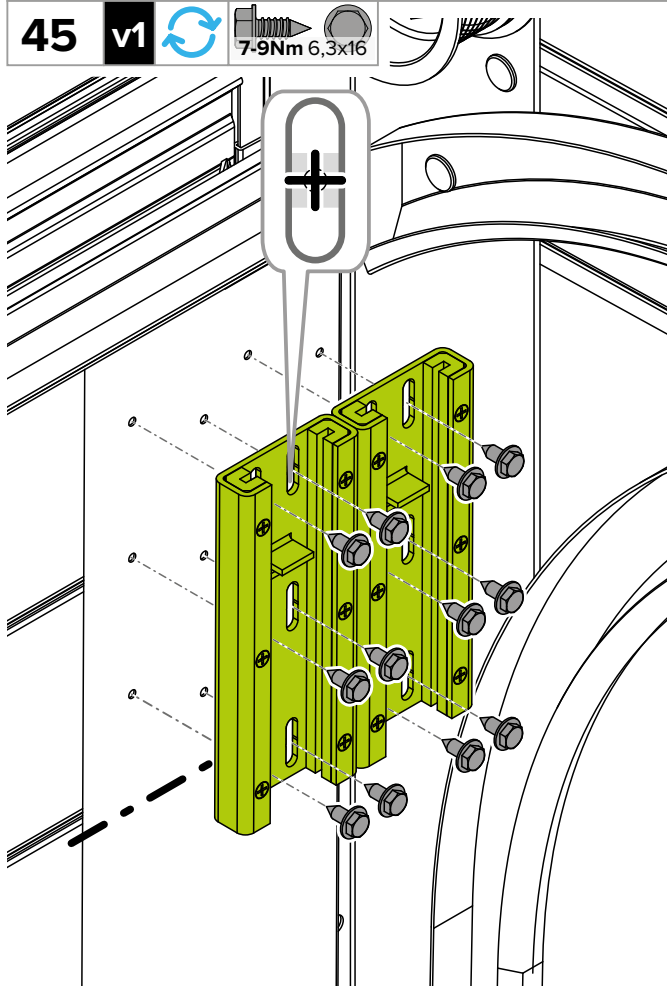


45

v1



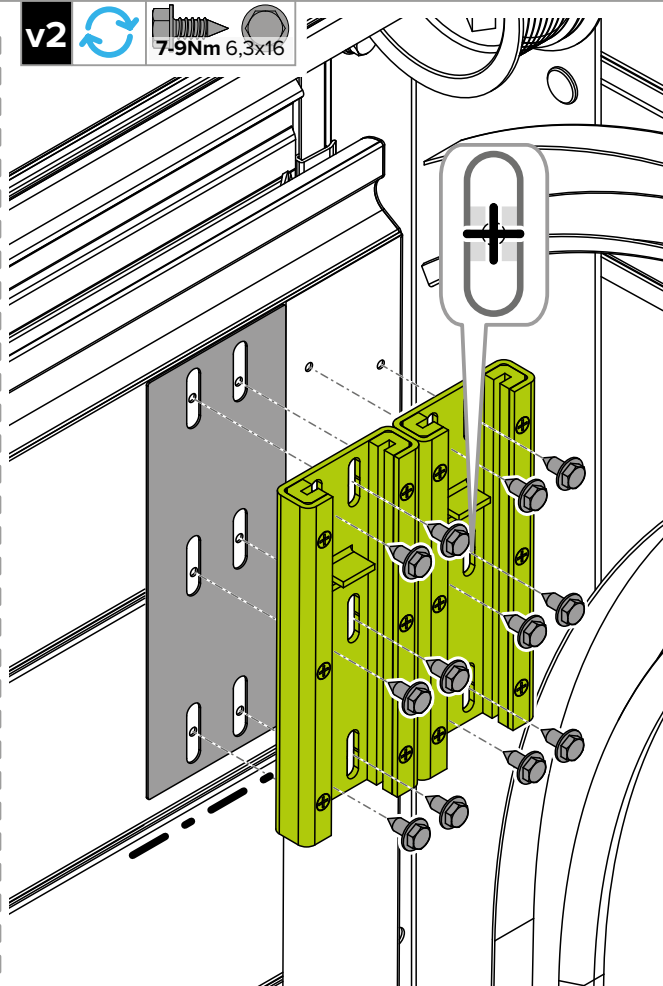
7-9Nm 6,3x16



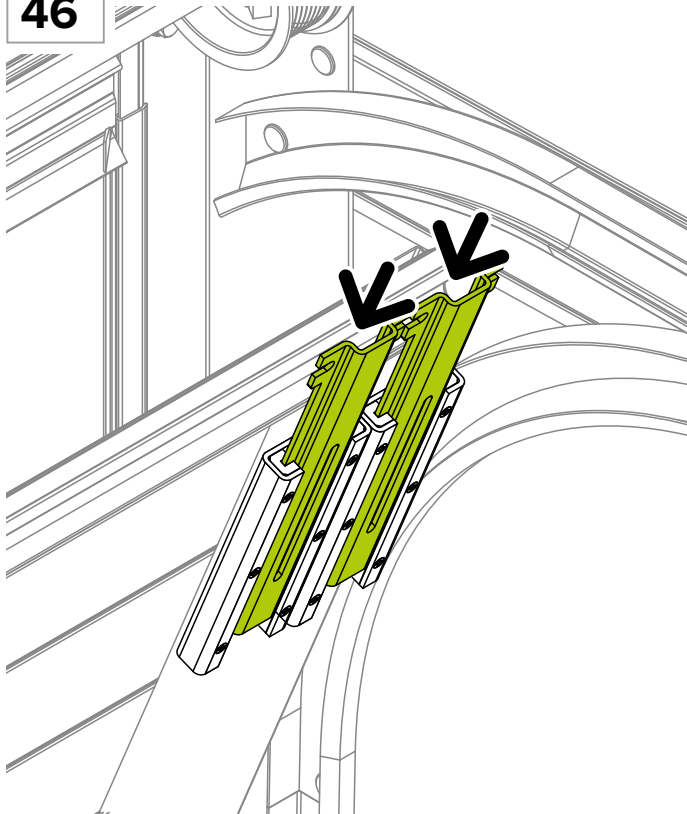
v2



7-9Nm 6,3x16



46

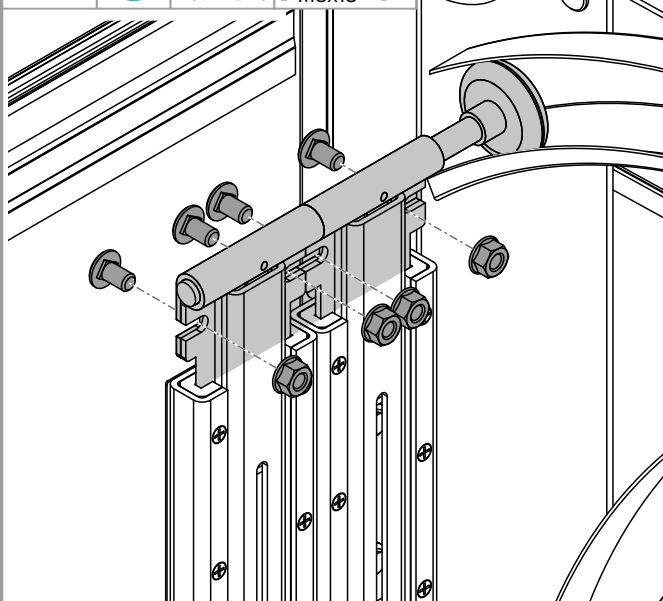


46.1

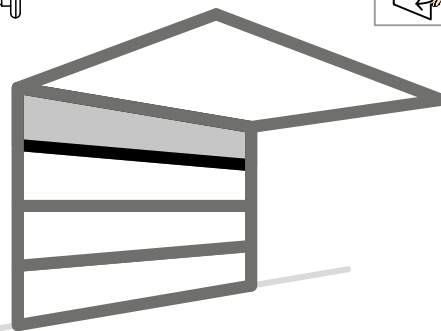
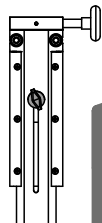


20Nm M8

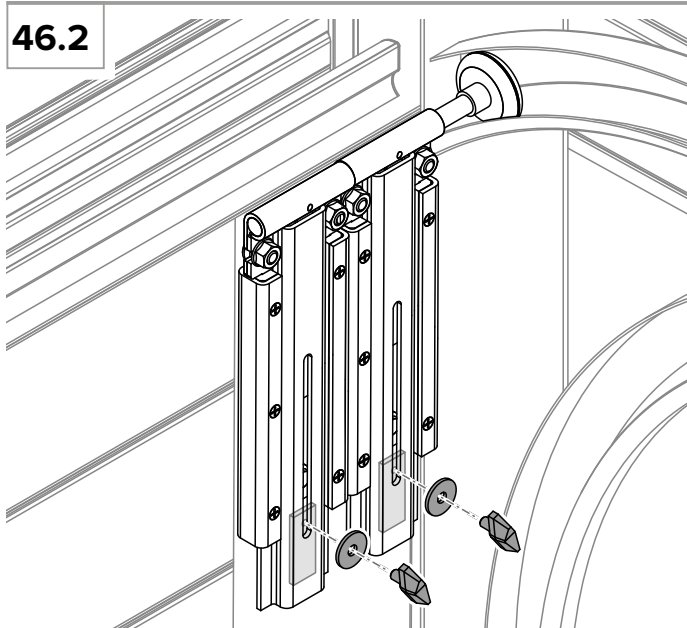
M8x15



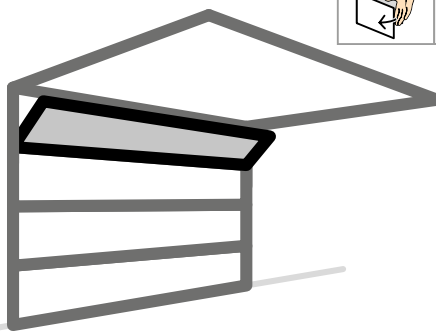
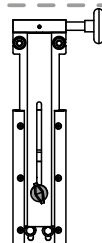
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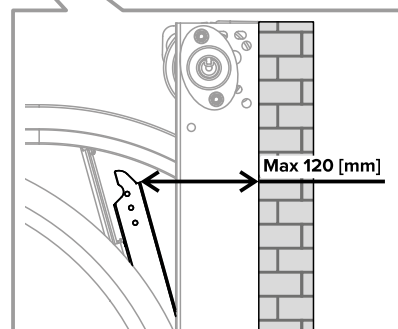
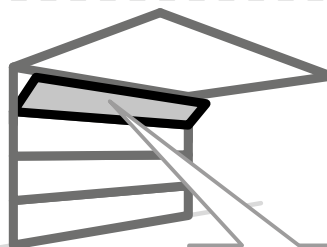
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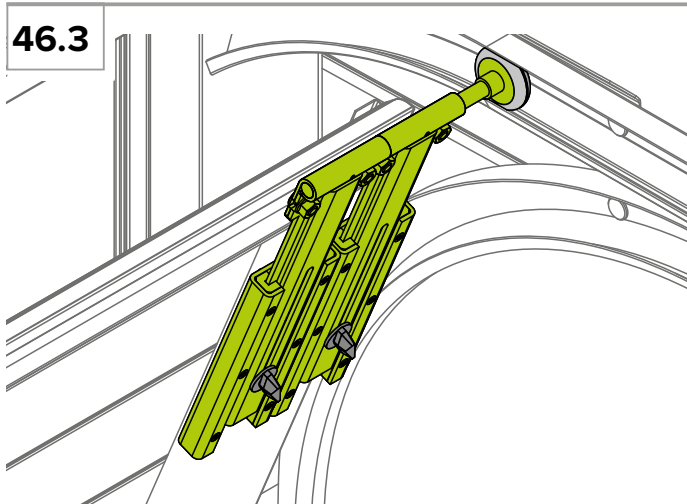
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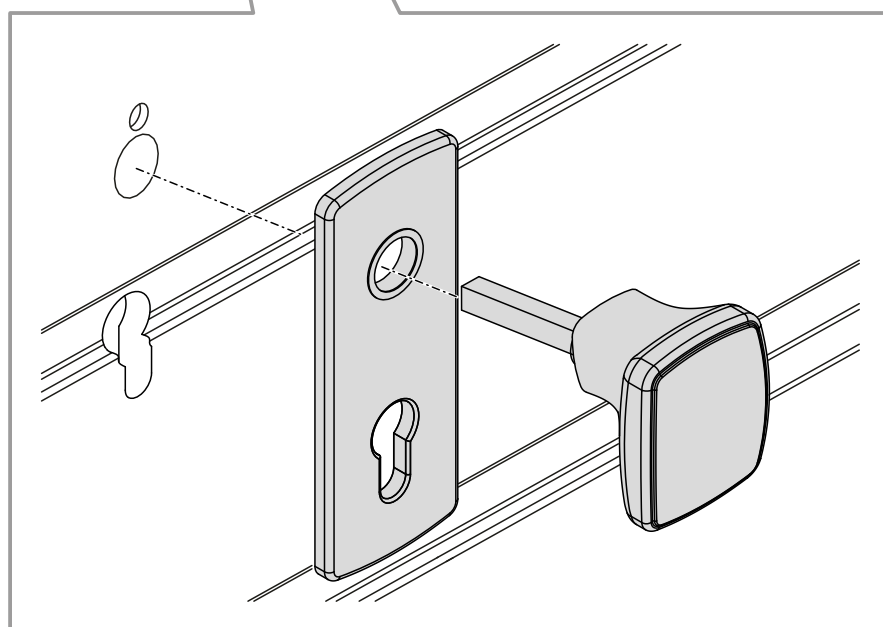
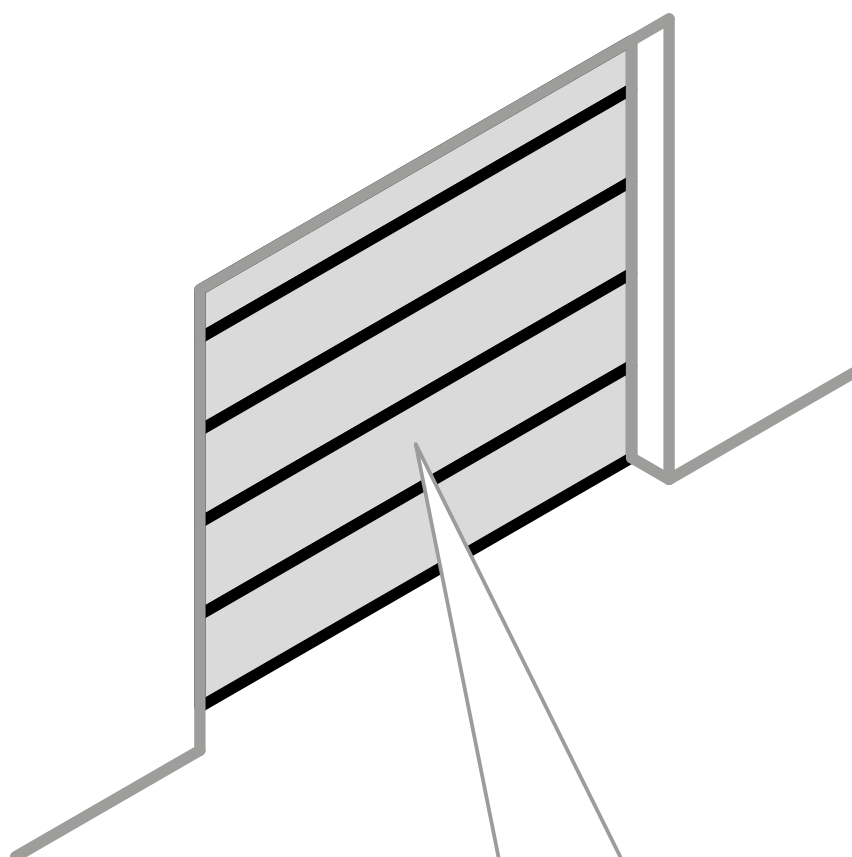


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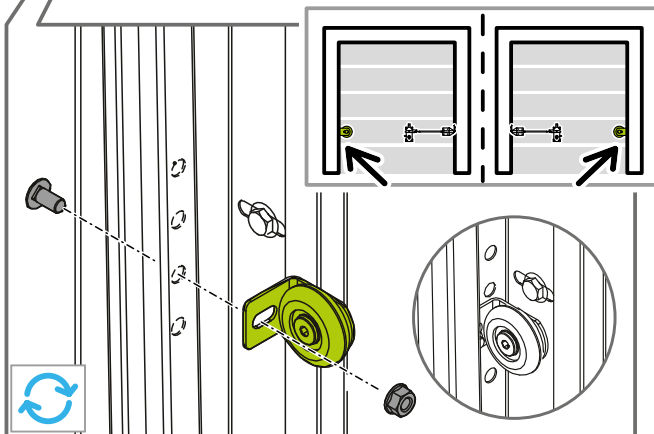
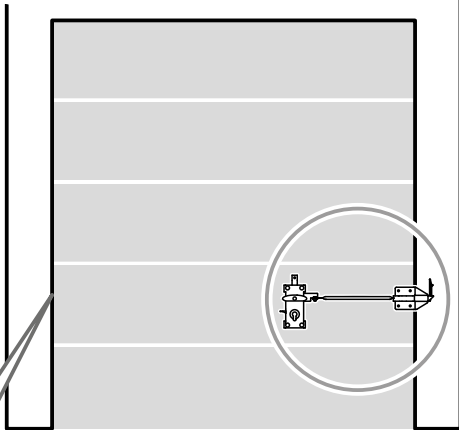


46.3

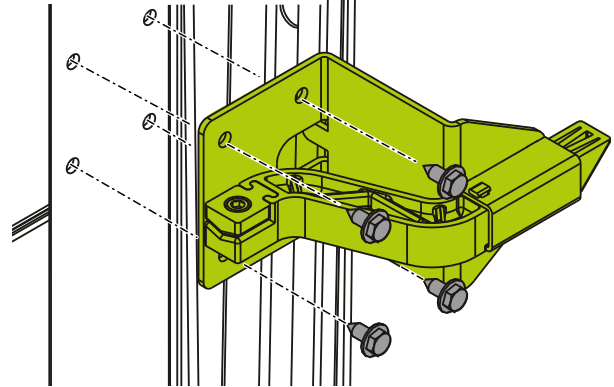




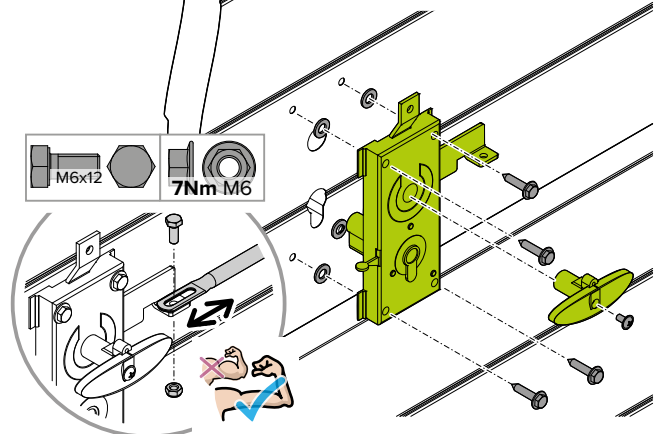
48



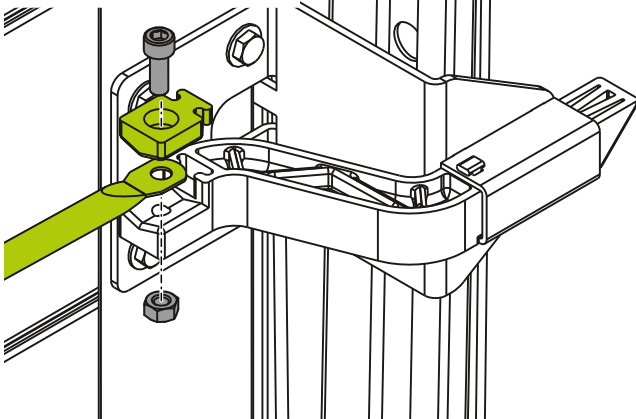
48.1



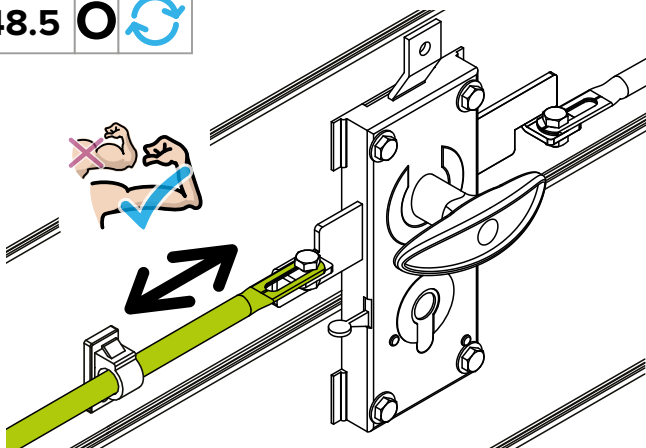
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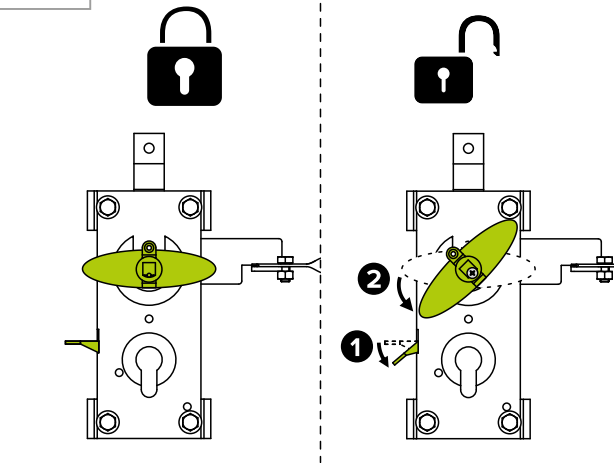
48.3

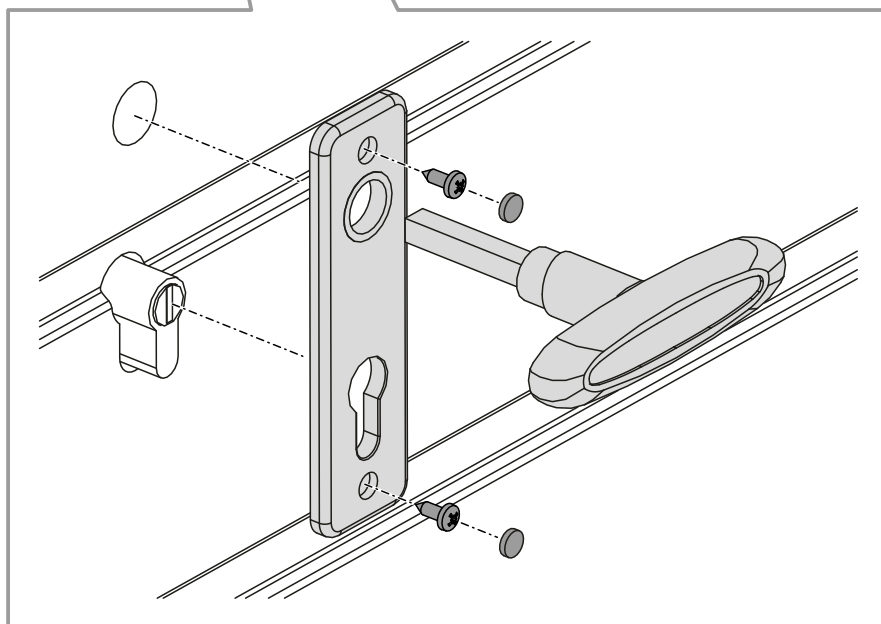
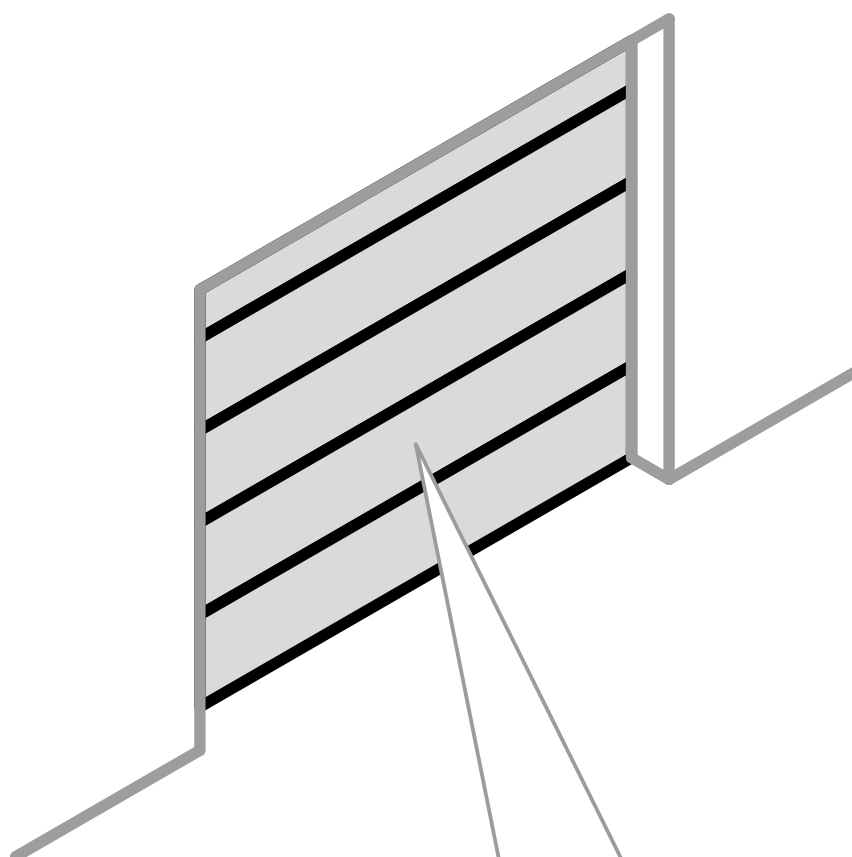


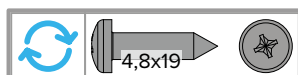
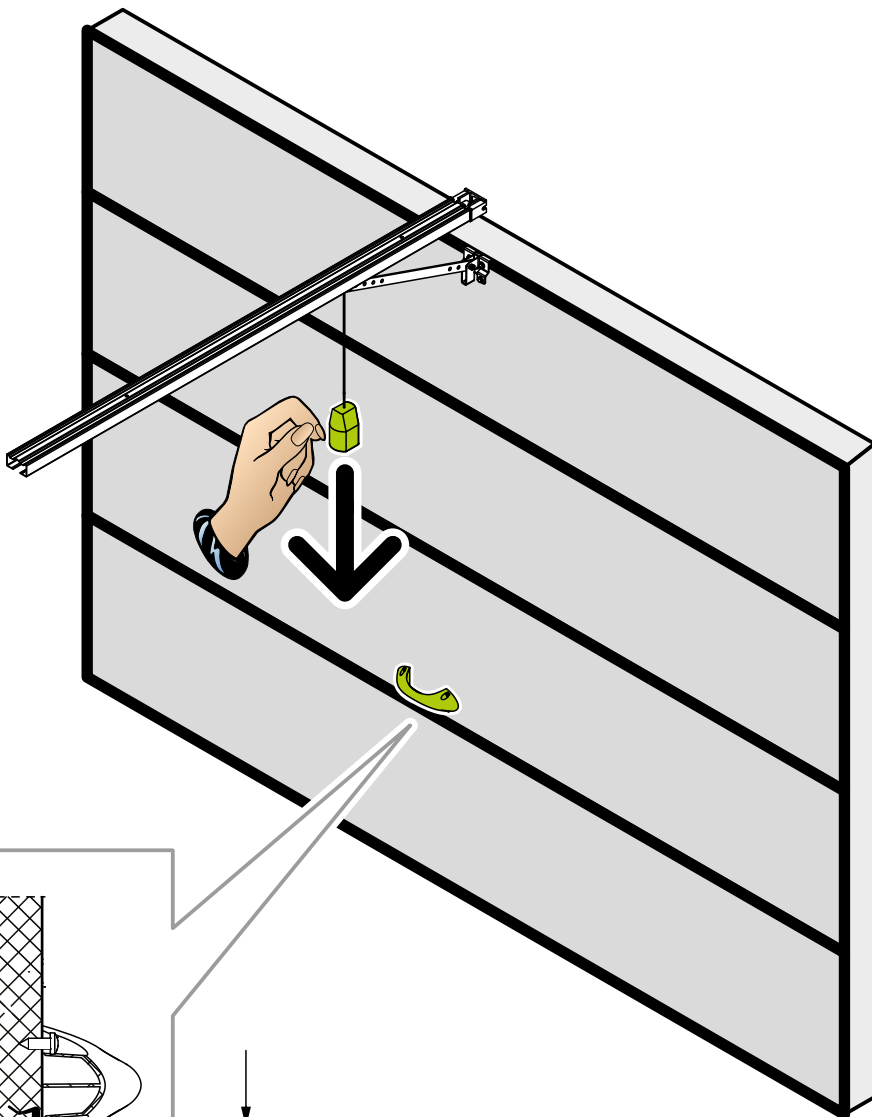
48.5



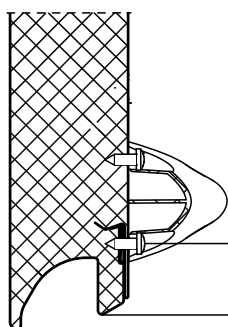
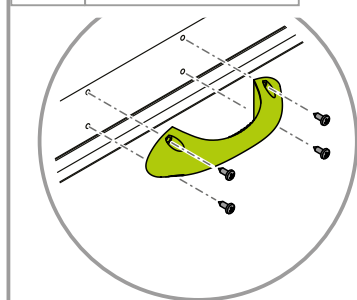
48.6



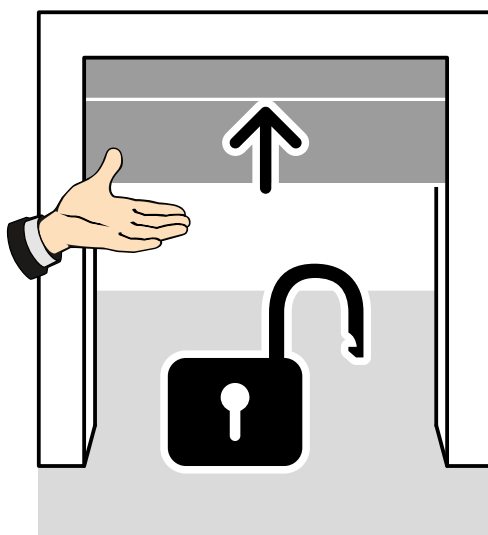


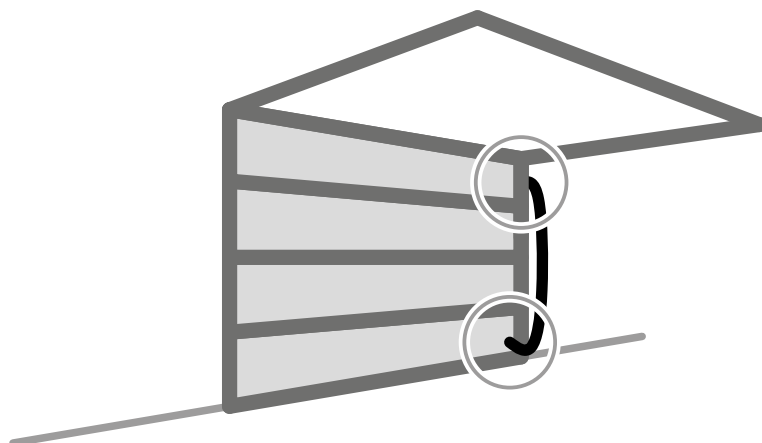
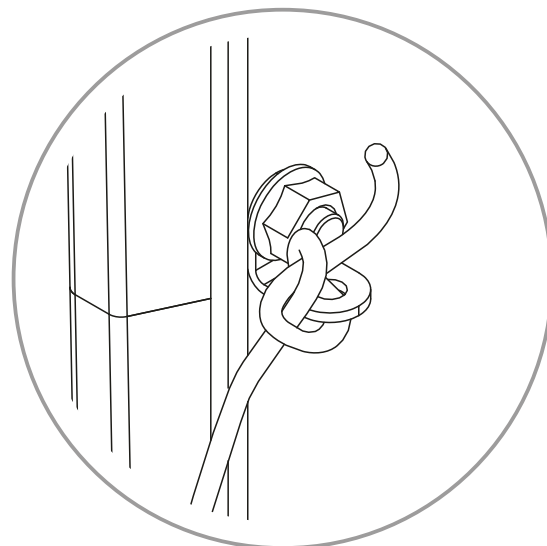
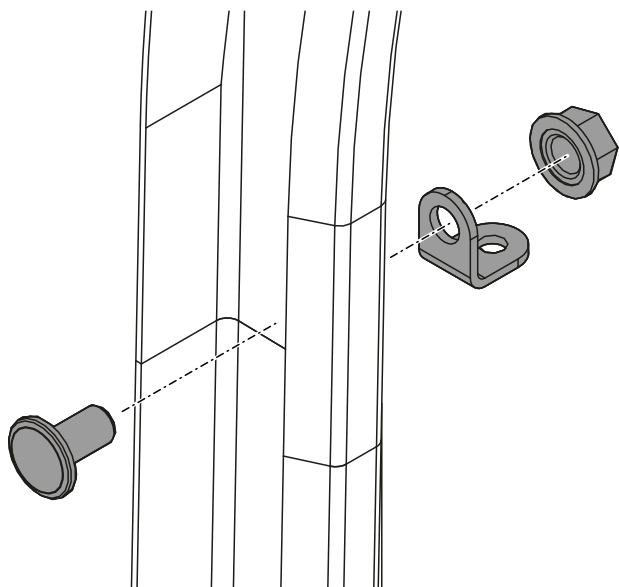
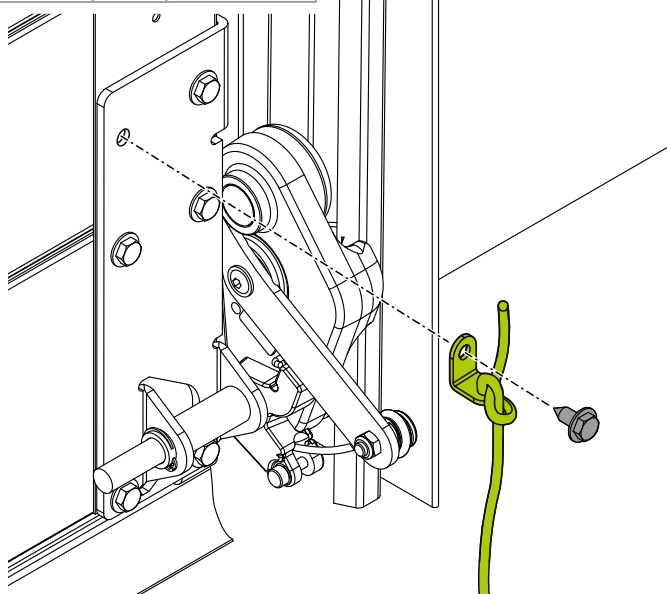
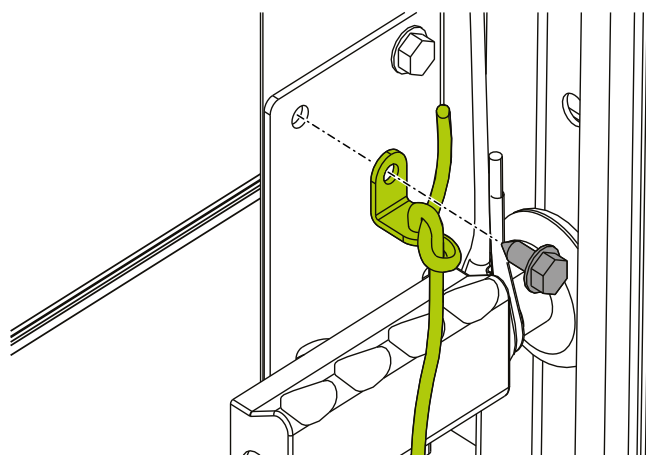


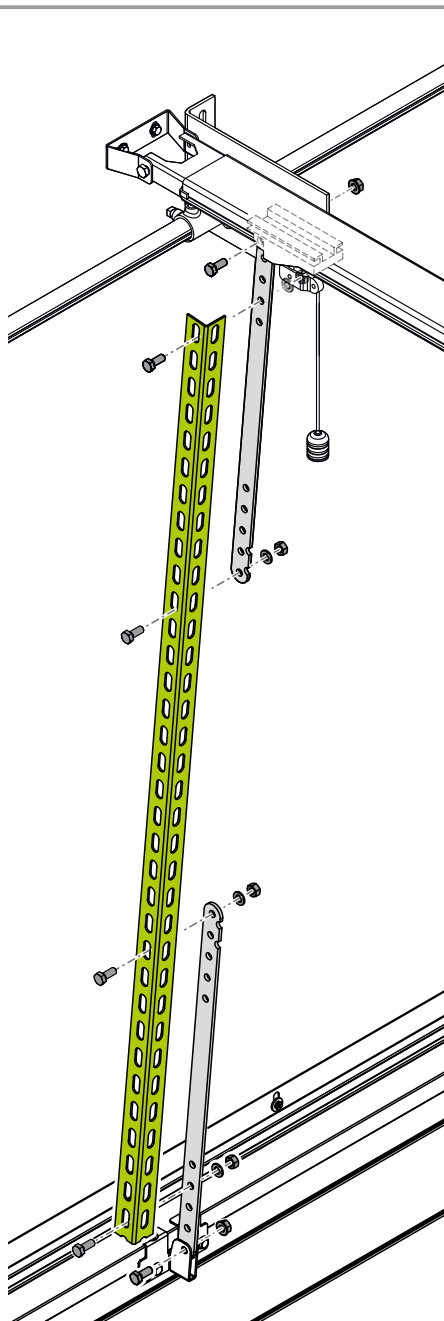
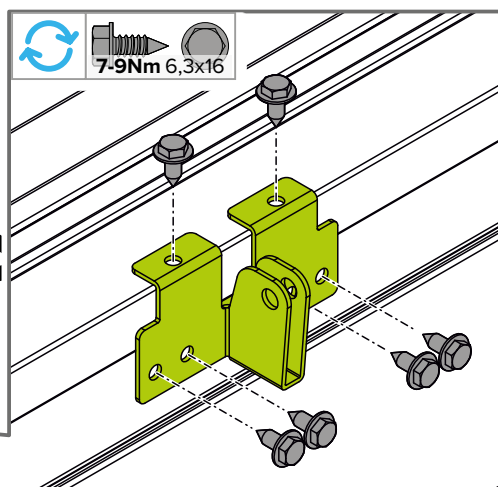
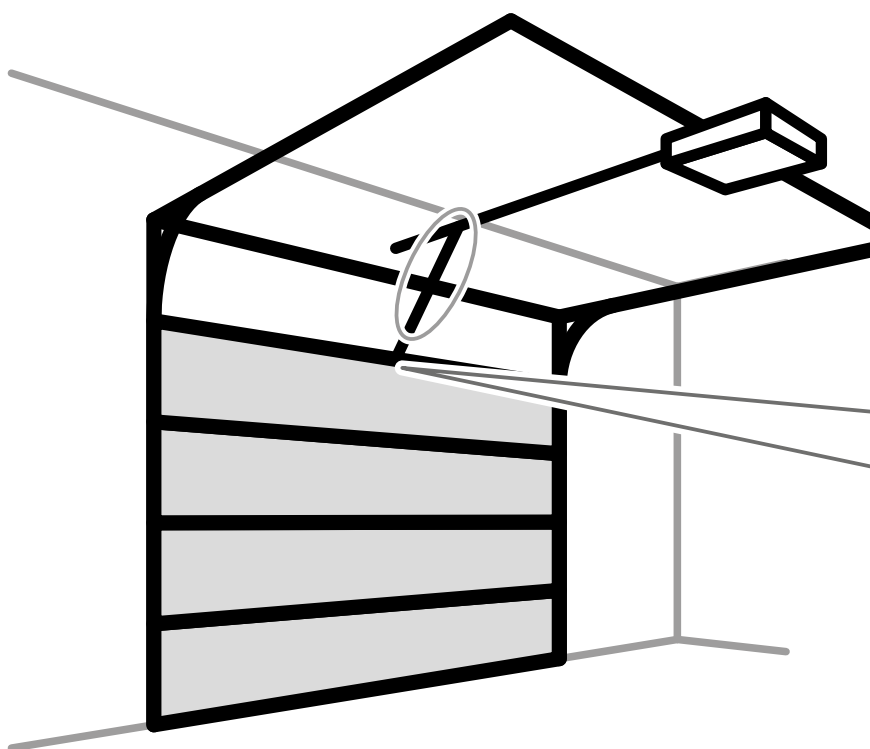
4,8x19



25 mm



51**Ho ≥ 2200 [mm]****51.1****15Nm M8****M8x15****51.2****7-9Nm 6,3x16****51.2****7-9Nm 6,3x16**



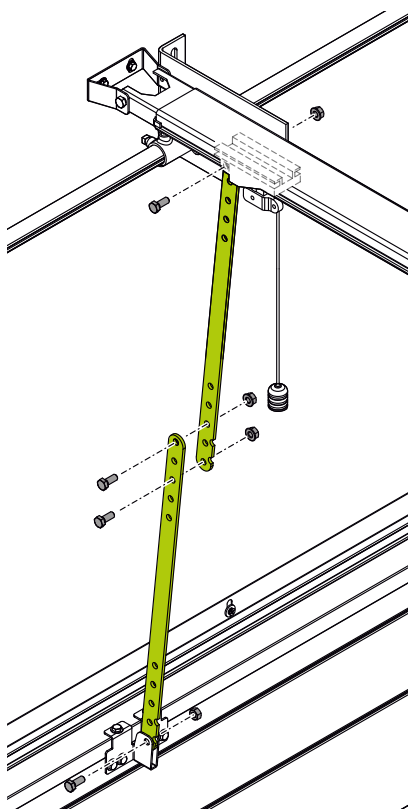
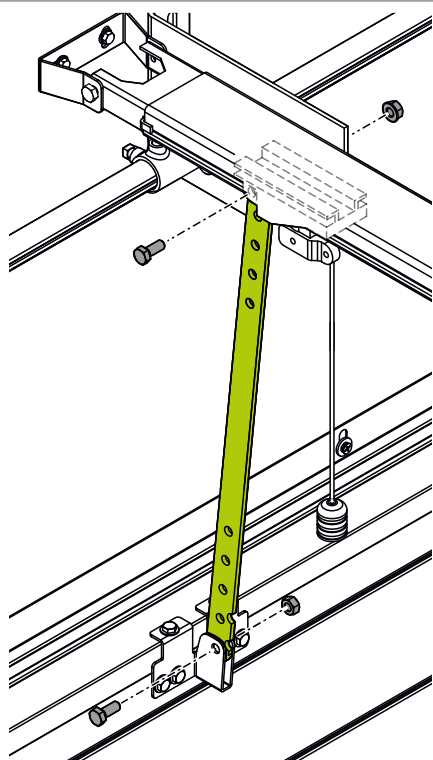
52.1

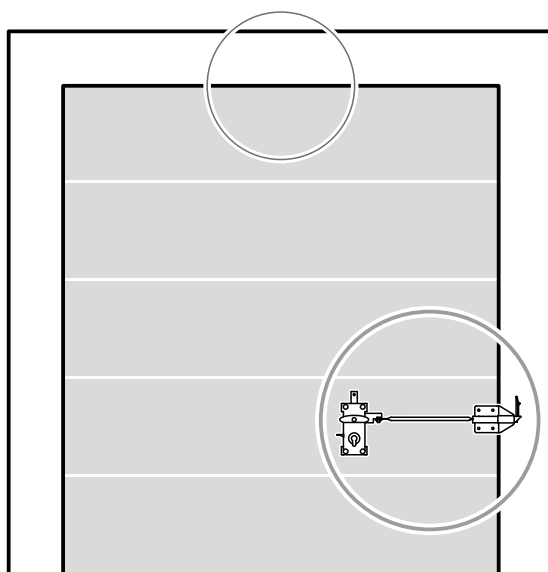


15Nm M8



M8x20

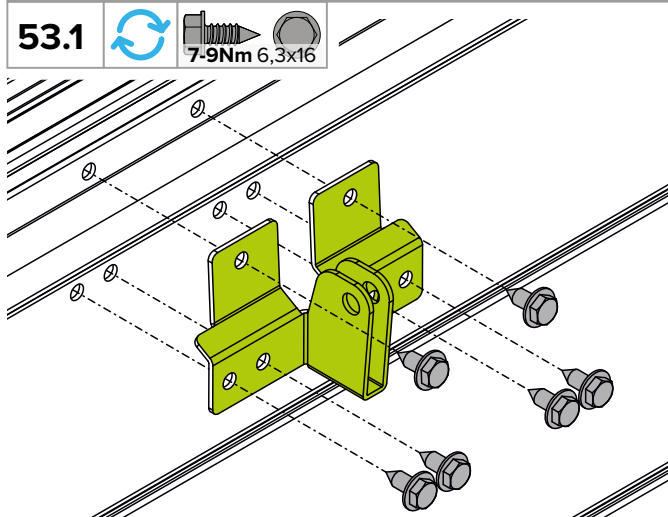




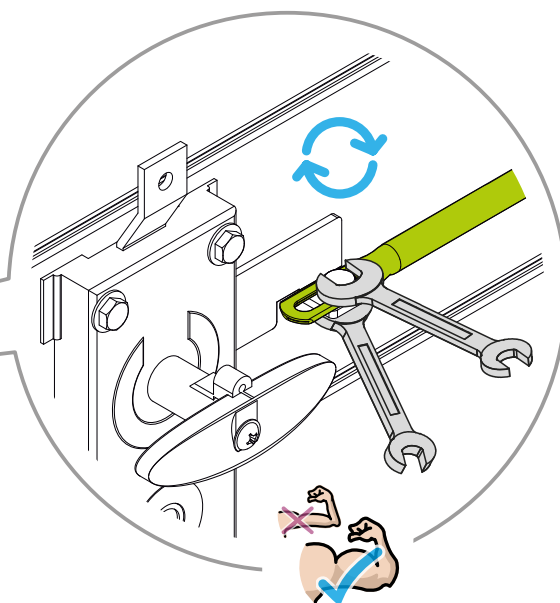
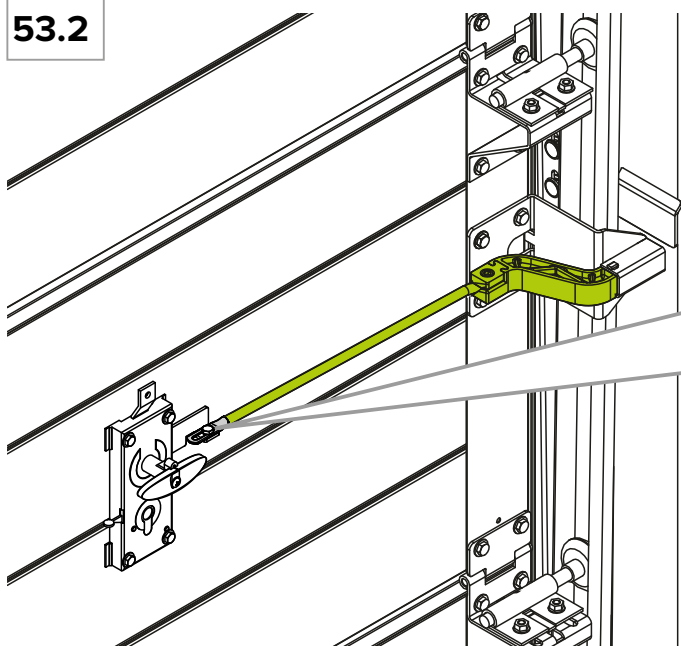
53.1

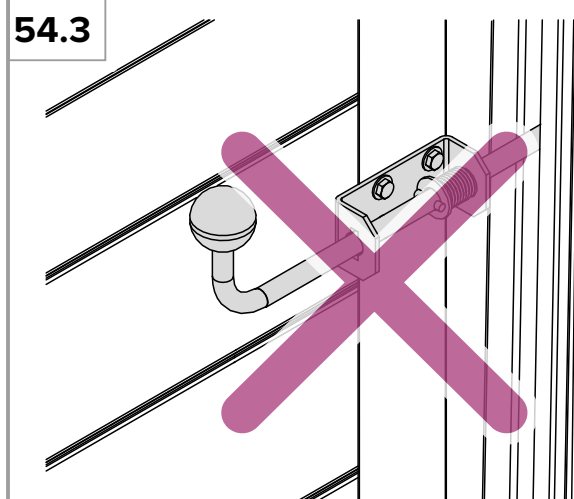
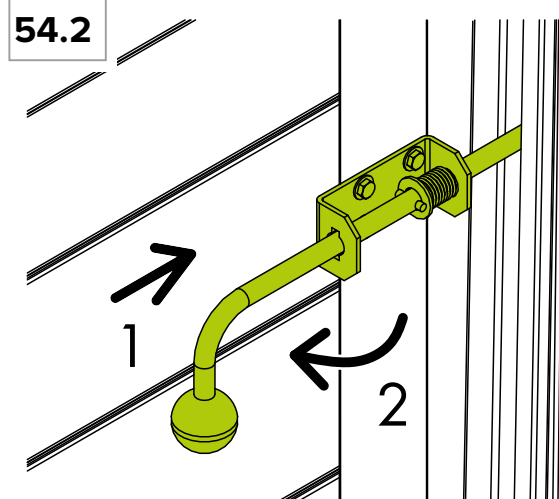
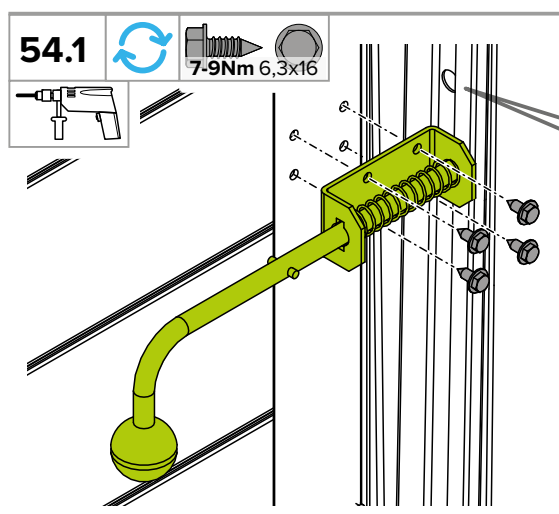
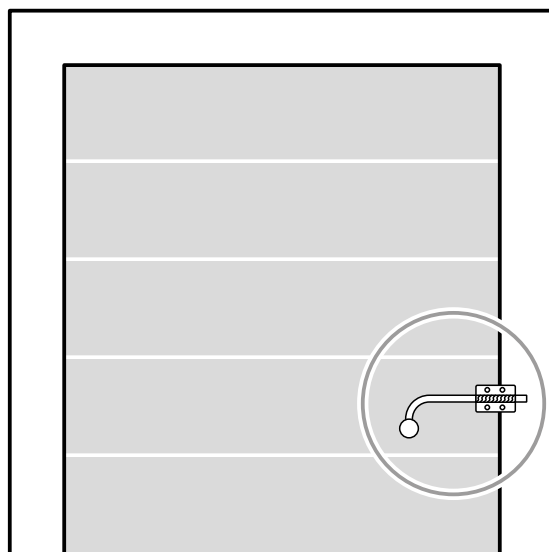


7-9Nm 6,3x16

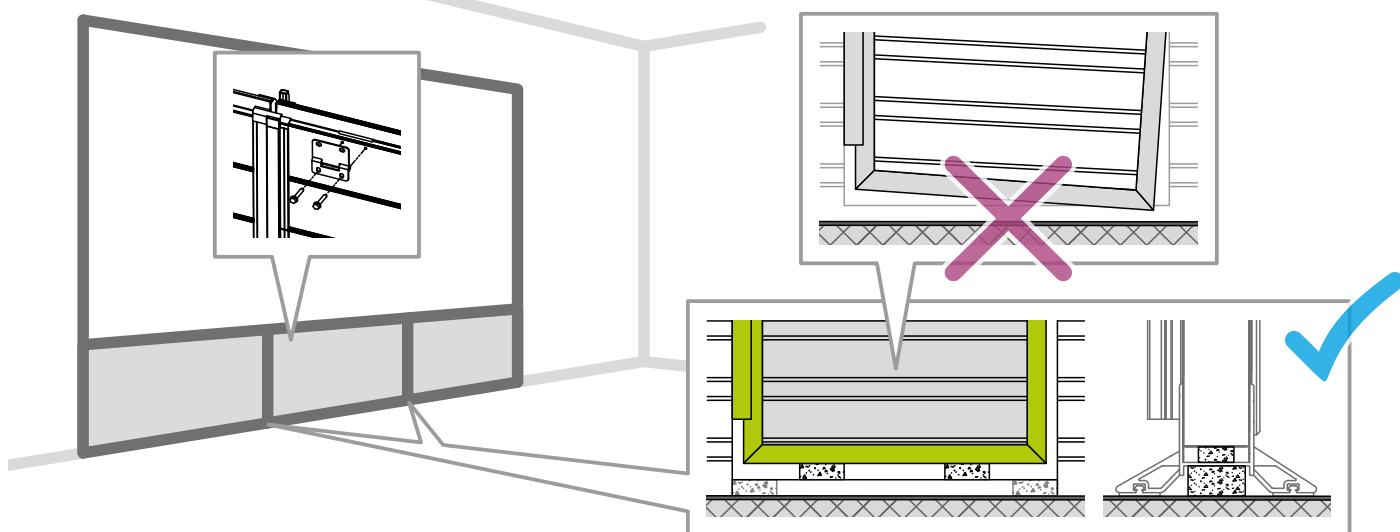


53.2

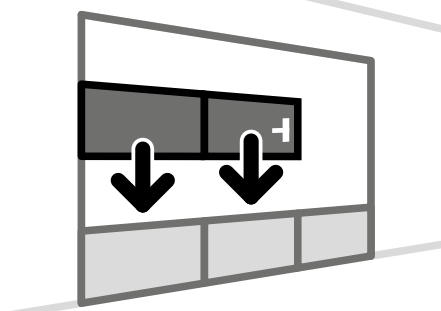




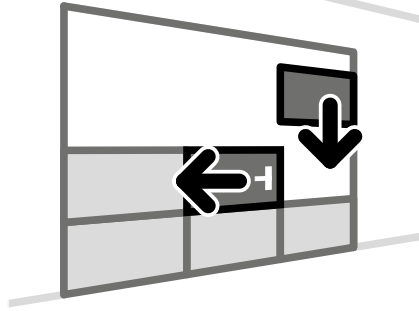
55



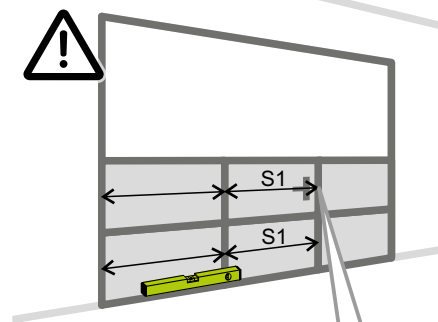
55.1



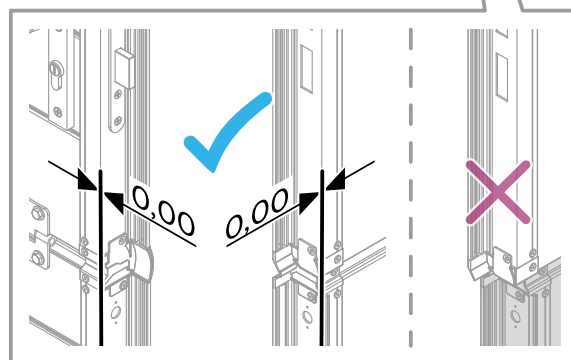
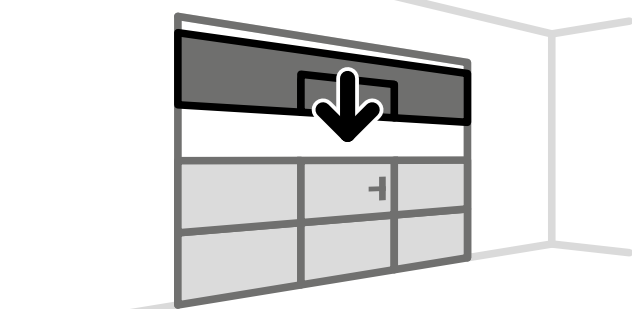
55.2



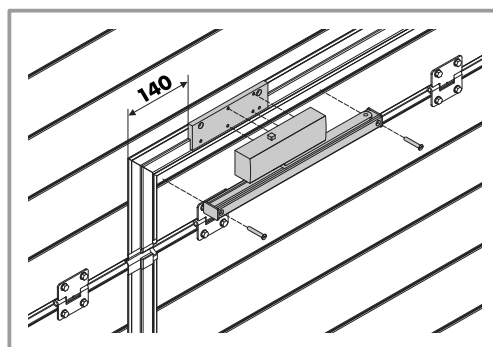
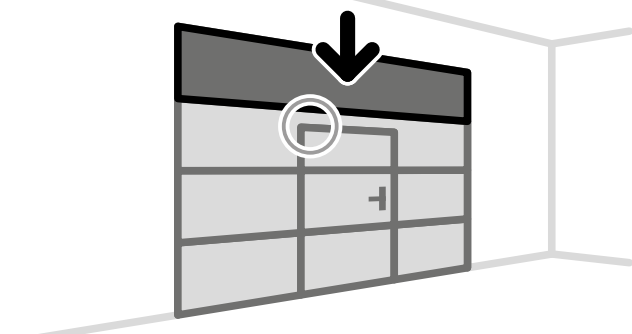
55.3



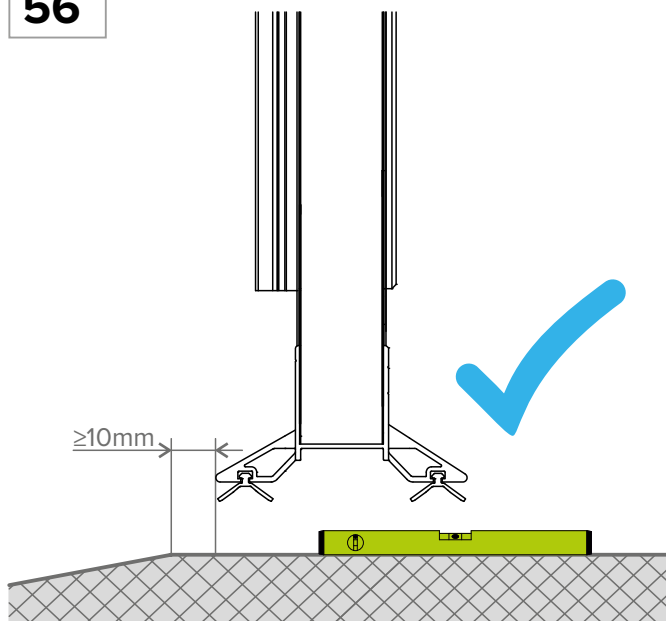
55.4



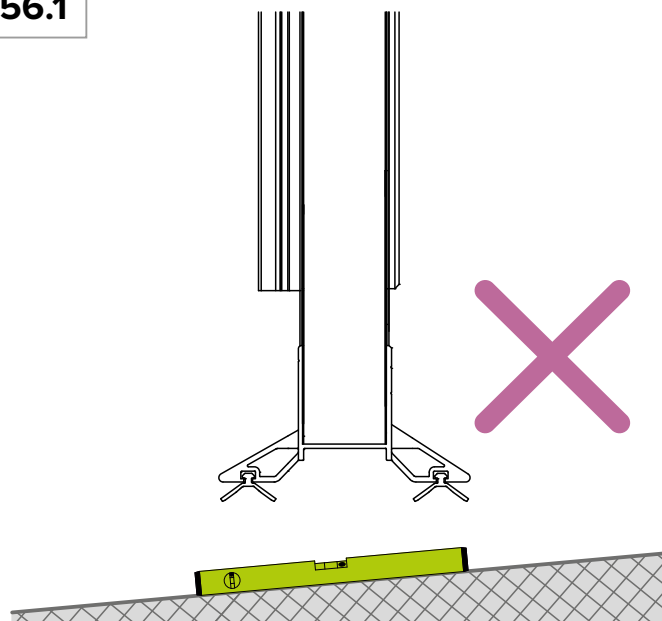
55.5



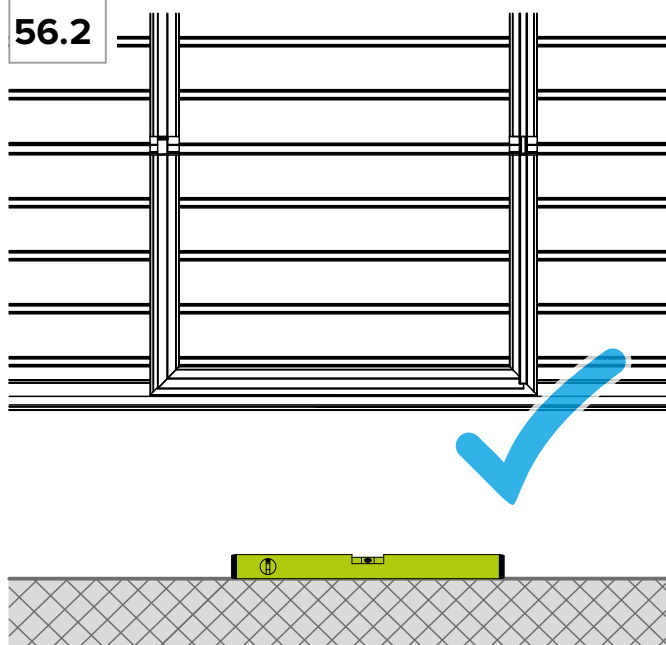
56



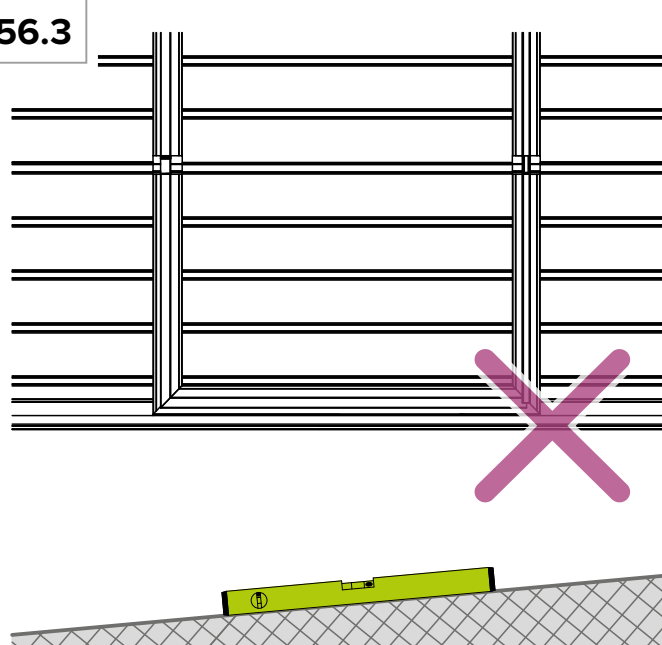
56.1



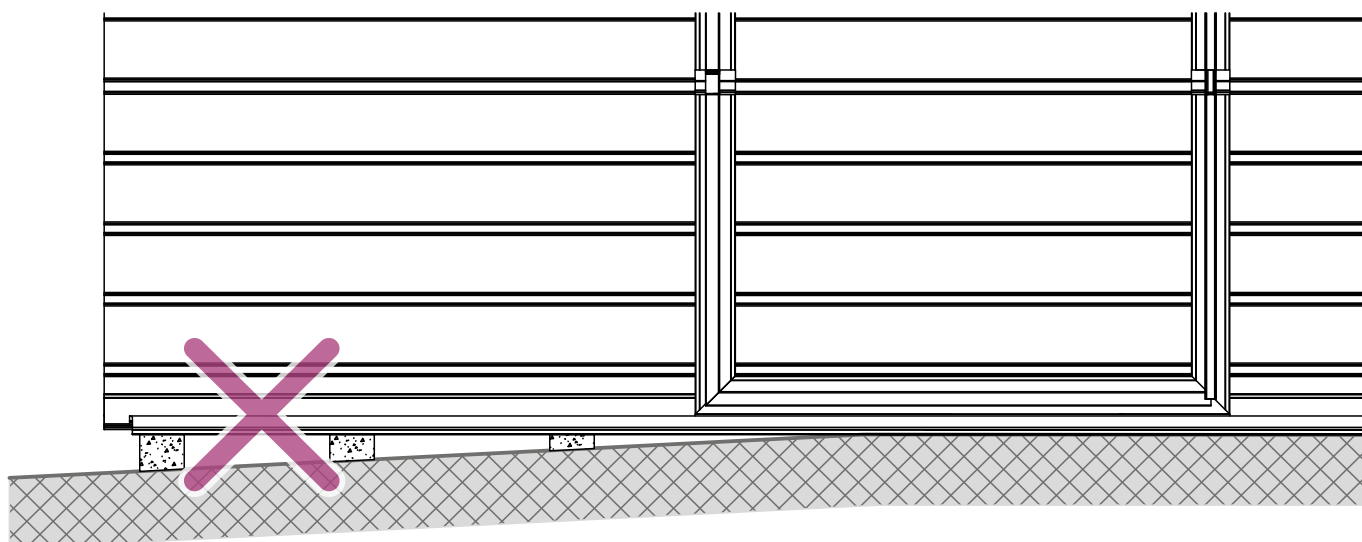
56.2



56.3

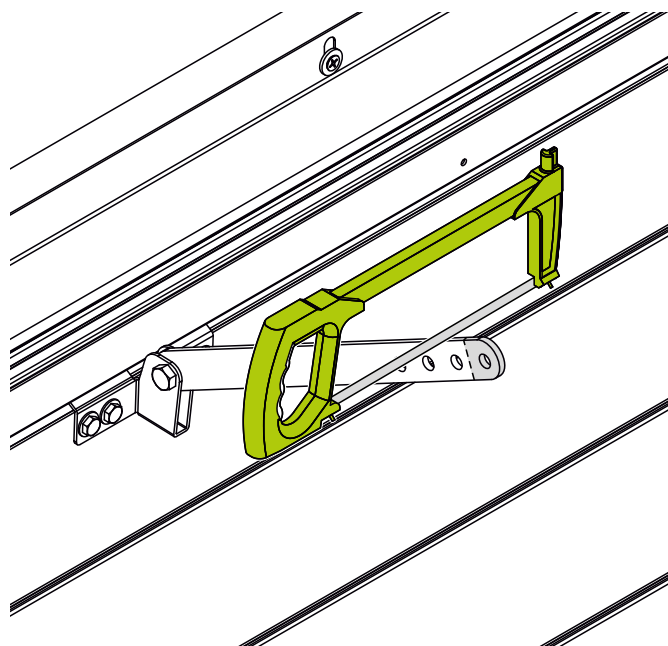
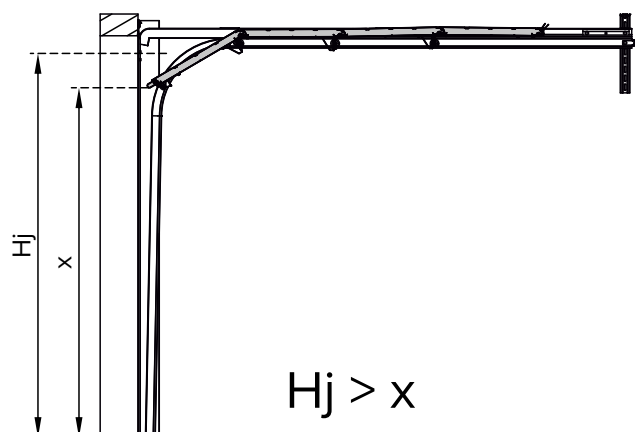


56.4

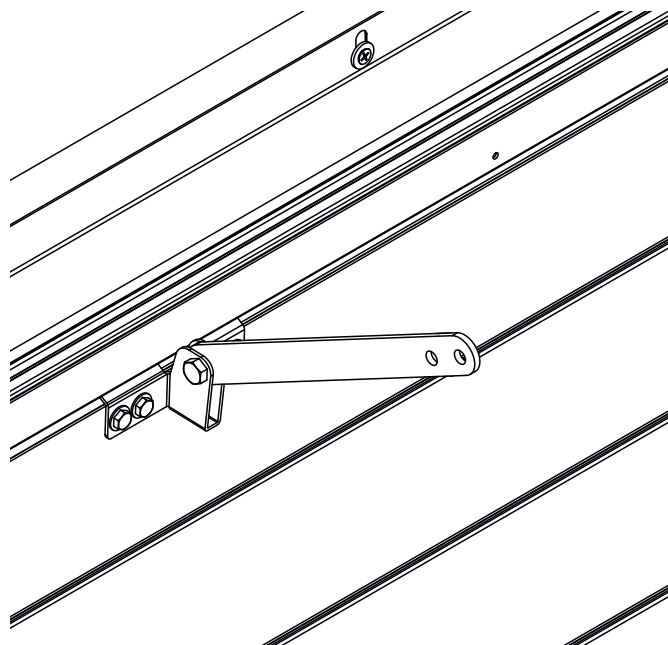
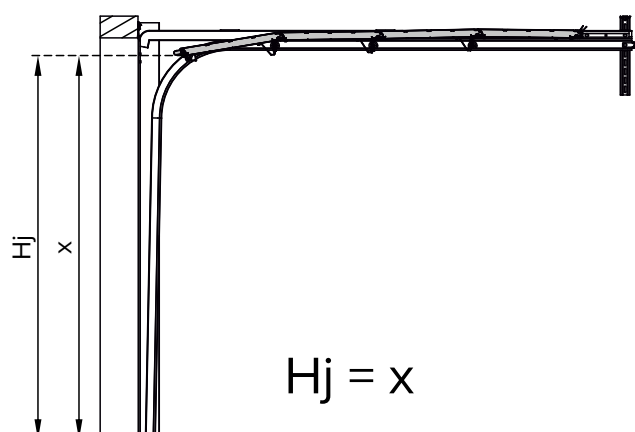


57

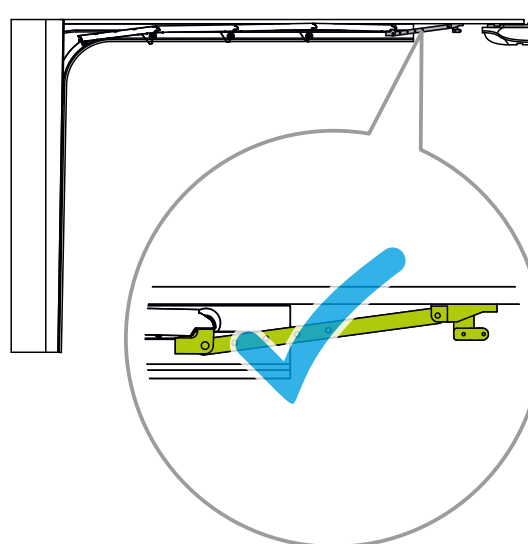
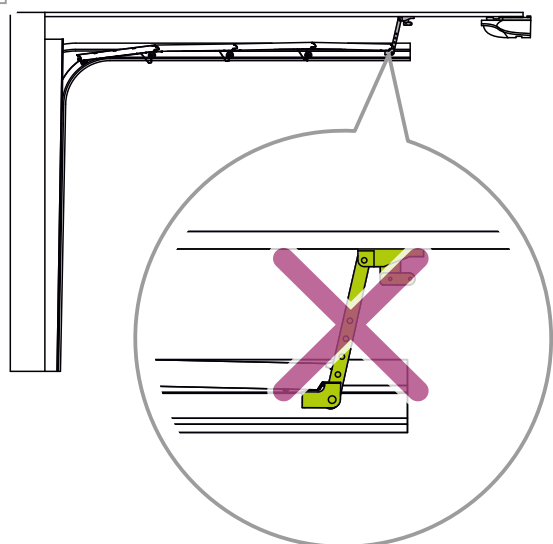
O



57.1



57.2



58

Sj



M8



7-9Nm 6,3x16



M8x20



8,5

