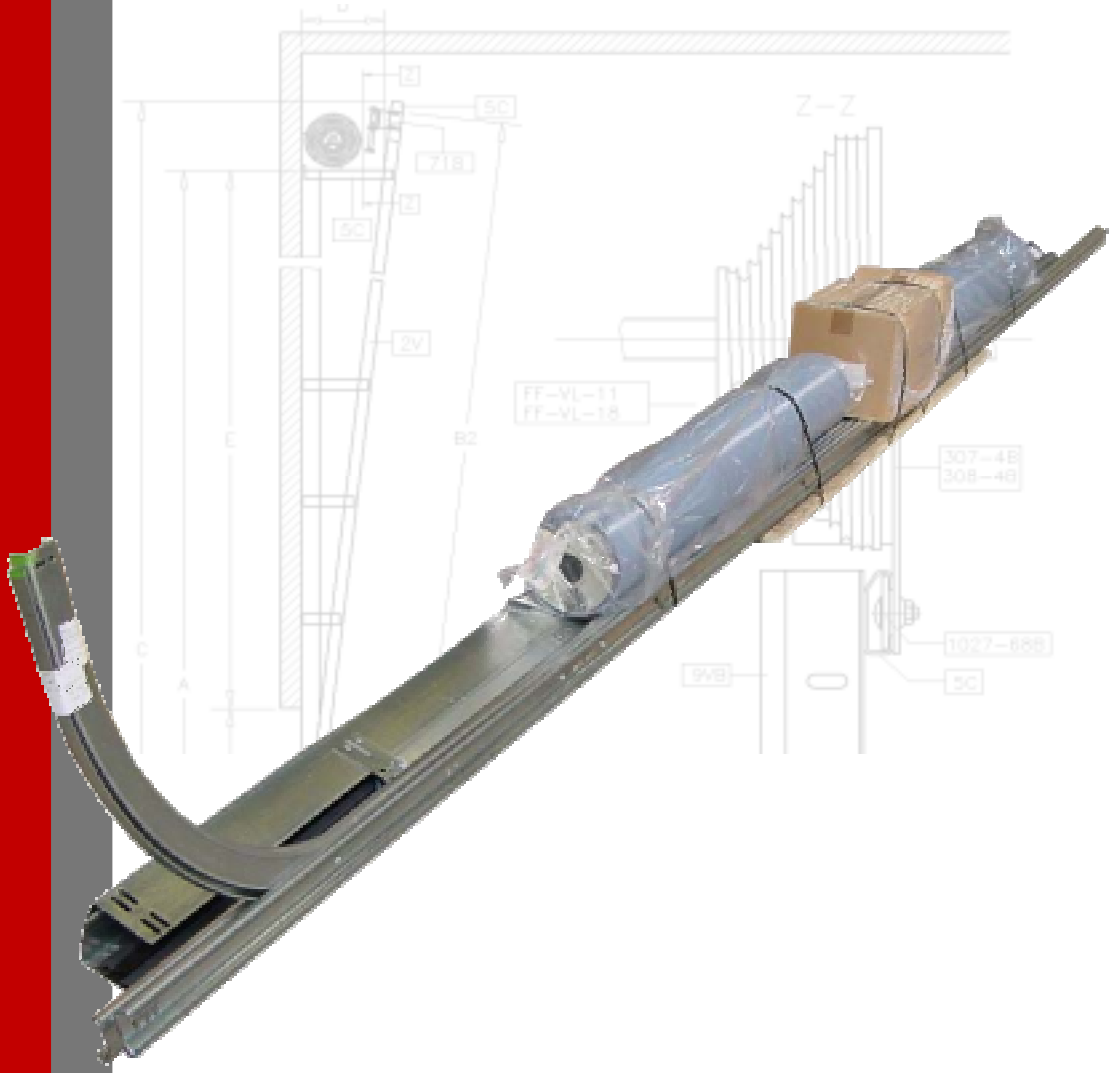
FlexiForce



IND-BS

hardware set for industrial (commercial) overhead doors

GB

INSTALLATION MANUAL

MANUAL

ATTENTION! GENERAL WARNINGS!

To assemble, install and use this hardware set safely, a number of precautions must be taken. For the safety of all concerned pay heed to the warnings and instructions given below! If in doubt, contact your supplier.

! This manual has been written for use by experienced fitters and as such is not suitable for d.i.y. purposes or for use by trainee fitters.
! This manual only describes the installation of hardware for overhead doors and as such must be supplemented with instructions for any additional components.
! Before starting, read this manual carefully.
! Certain components may be sharp or have jagged edges. As such you are advised to wear safety gloves.
! All the components which have been supplied are designed for use with this specific overhead door. Including additional components may have an adverse effect on the safety of, and the guarantee on, the door.
! Ensure that there is sufficient light during installation. Remove obstacles and dirt. Make sure that there is no one else present other than the fitters. Other people (children!) may get in the way or endanger themselves during the installation.

GUARANTEE, CONDITIONS AND TERMS

- The general terms and conditions of delivery and payment issued by the Metaalunie and designated as METAALUNIE CONDITIONS are fully applicable to all our quotations, contracts and their implementation. We expressly reject all other terms and conditions. On request we will send you a copy of these terms and conditions free of charge. A copy may also be downloaded from our website www.flexiforce.com.
- Flexi-Force strives to deliver 100 % in conformance with the order. In practice, in spite of all our controls, this is not always possible. However we will rectify any errors as quickly as possible, in order to minimise the inconvenience caused to you or the user. As such, it is important that you inform us as soon as possible about any problem with the delivery (include the order number and week of delivery) and give us the opportunity to offer a suitable solution.
- FlexiForce will only reimburse third party costs if we have given explicit permission for this in advance. The reimbursement is based on normal rates and travelling expenses over distances of 1 hour away at most.
- This manual does not confer any rights. Technical modifications may be made without written notice.
- Flexi-Force has endeavoured to design and put together this hardware set in conformance with the applicable laws and CE-norms. However, please check our interpretation with your local national specifications body.

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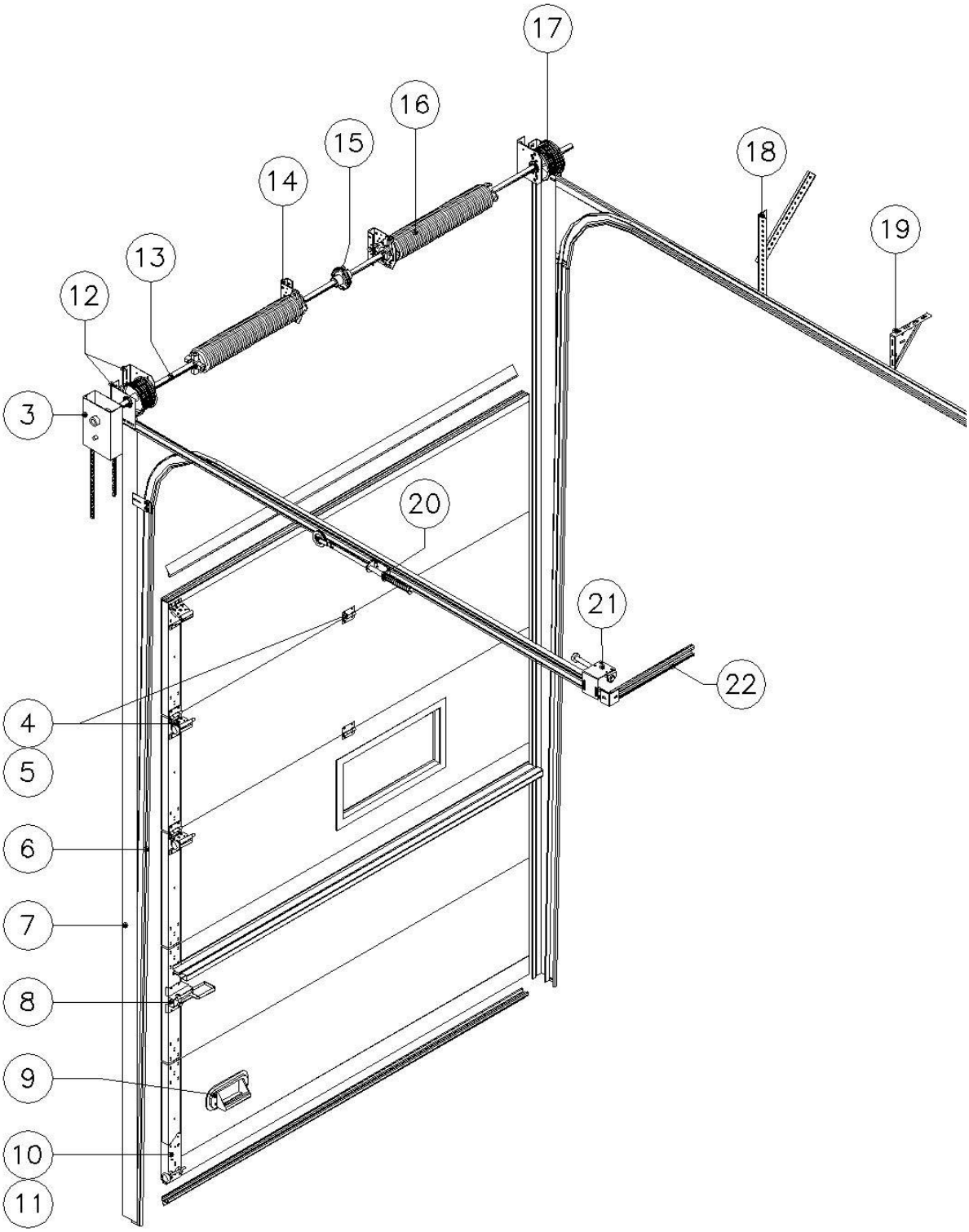


FlexiForce

MANUAL

ATTENTION!

In this manual we limit ourselves to the instructions for proper installation of our hardware set parts. For the installation of the complete door, with added components, and for a proper user manual, we put the responsibility to the supplier of the complete overhead door. The installer / supplier is also responsible for the proper CE-marking of the door. This manual has been written for use by experienced fitters and as such is not suitable for d.i.y. purposes or for use by trainee fitters.

The article codes are mentioned between brackets ( ).

We wish you a smooth installation of this set. If you have any questions or remarks, please contact us.

Flexi-Force B.V..

1 GENERAL

SPECIFICATION OF DELIVERY HARDWARE SET

With the Flexi-Force supplied hardware set for industrial doors, depending on selected door dimensions and lift systems, the next mentioned articles are included in the standard delivery.

⚠ Check, before starting the installation, if your set has been delivered according to the packing list!

The set contains:

- cable drums
- side bearing plates
- intermediate bearing plates
- spring breaking device*
- shaft with key way
- roller bearings
- vertical track set with angle
- side seal
- horizontal track set with reinforcement and curve
- coupler*
- rollers
- assembled torsion springs, black or powder coated
- suspension profiles
- chain hoist with chain or rope*
- intermediate hinges
- side hinges
- toproller bracket
- bottom bracket or cable break device*
- lock or slide bolt*
- grip*
- springbumpers*
- cables
- keys
- triangular plate*
- cable tension set*
- box beam*
- fixing material

Not supplied in the set:

- windows
- top/bottom profile with seal
- needed material for fixing to the wall
- endcaps
- struts

Fixing material:

* these articles are selected by option and therefore can be missing in the set.

⚠

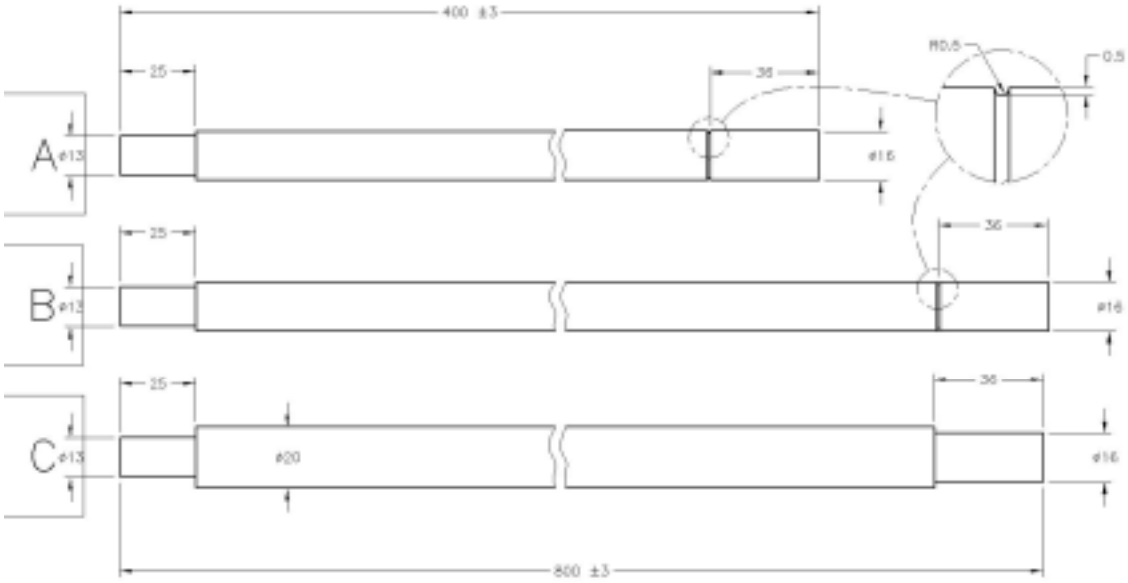
ATTENTION!

Adding other components or using different fixing materials can influence the safety and quality of our configured set. We take no responsibillity for sets which differ on the level of components from our original configuration packing list.

MINIMAL NEEDED TOOLS AND EQUIPMENT

Effective and safe assembly requires that the proper tools be used. Below a list of the tools required at a minimum.

- Cord (rope)
- tension irons (as per drawing)
- grip or gluing clamp (to block the door)
- grease and oil
- CE plate and warning labels
- spirit level or transparent hose
- chain punch (for 721A)
- measuring tape
- protractor (for roofline matching system)
- screwdriver with straight blade
- screwdriver with crossed blade
- pliers (for split pin)
- iron file
- jigsaw
- socket/open-end/ring spanners, size:
  - 5,5
  - 8
  - 10
  - 13
  - 14 or 9/16"
  - 15
  - 17
  - 24 (for 440REGL)
- socket keys, size 3 and 4
- drilled hole diameters:
  - Ø 5
  - Ø 7
  - Ø 10
  - Ø 13
  - Ø 15
  - Ø 16
- pliers for system plugs (E-transmission, article code 97030)
- cable clamps 511C and 531 (not required for standard set)



Type	Toepassing ø13	Toepassing ø16	Opmerkingen
A	FF2.00 FF2.63TAI FM51 FM67	FM95 FF3.75TAI FF3.75LE FF6.00	Lichte veren
B			Algemeen gebruik
C			Zware veren

Tension irons to use with Flexi-Force spring fittings.

INSTALLATION GENERAL

Checking dimensions

Before assembling the set the details below should be checked on the basis of this figure..
A = Clear width (packing list)
B = Clear height (packing list)
C = Side area (see 10. Bottom brackets)
D = Top area (see 2. Lift systems)

Bases for further instructions are:
Panelwidth including end caps = A + 45 mm.
Panelheight stapled incl. bottom rubber = B + 25 mm

NB! The material used for mounting the track set and the spring system to the wall or roof, is not a part of the delivery. Use proper material for this, conform the norms and proper for the material in which you mount.

Checking built-in depth

Check if there is sufficient space available for the track set (see 2. Lift systems).

Checking section width

When the section length (door panel width) differs from the above mentioned data, all sizes related to the side-space change.

Checking vertical track set

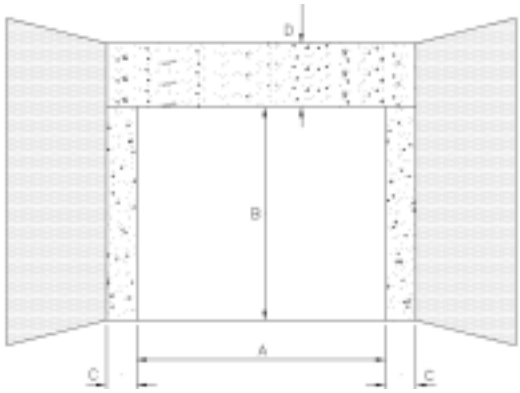
First mark "A" en "B" on both piers using a spirit level or water level hose and then mark "C" (picture)

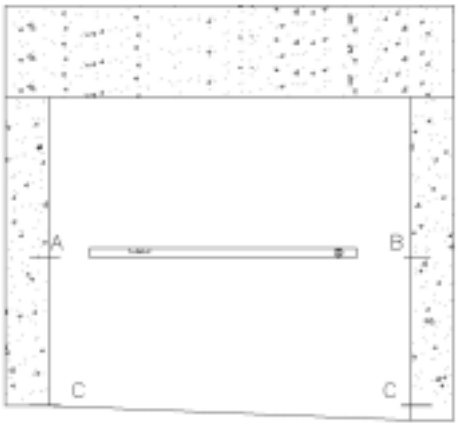
Fit both vertical tracks with the lower surface on mark line C (picture). The two bearing tracks should be parallel to one another.

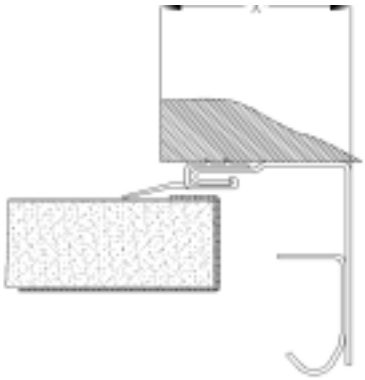
For sloping floors, one of the bearing tracks may be compensated (for example with a wedge).
Size X (Picture) is being determined by the bottom bracket type delivered to the set. (See 10, Bottom brackets).

Installation track set

The table below refers to (see 2 Lift systems) the equivalent page of the manual, belonging to the actual lift system.



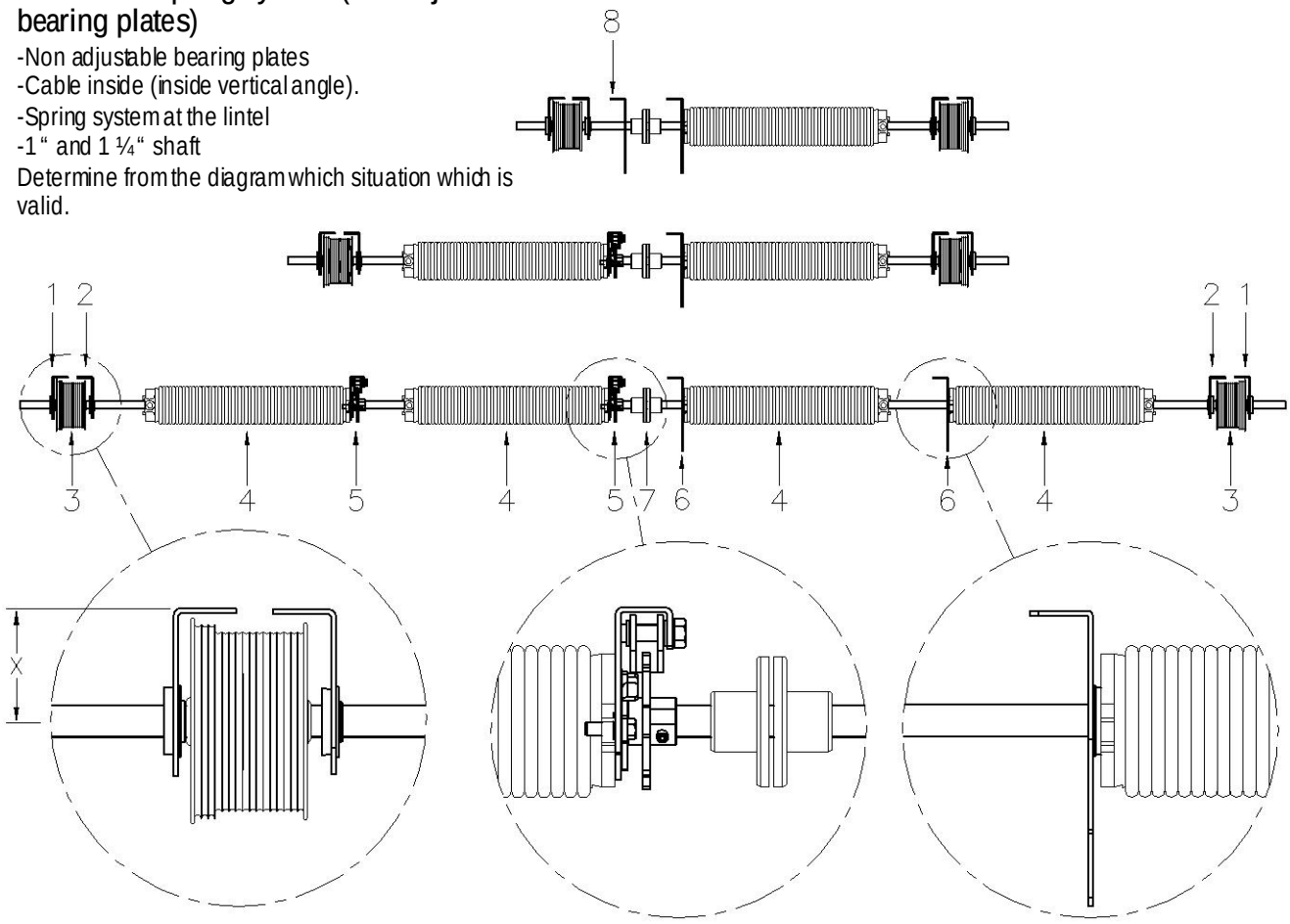




	System	Page Nr.
NL	Normal	15
VL	Vertical	18
HL	High	17
FHL	Following High Lift	21
LHR	Low Head Room	16
FLH	Following Low Lift	20
FTR	Following Normal	19

Installation spring system (non-adjustable bearing plates)

-Non adjustable bearing plates
-Cable inside (inside vertical angle).
-Spring system at the lintel
-1 " and 1 ¼" shaft
Determine from the diagram which situation which is valid.



Situation	Size X (mm)	1	2 *	3	4	5	6	7	8
Non adjustable 1"	86	305-4B	315-4B	fix drums with 2 safety wraps to outside	LHW = black RHW = red	670 or 675	USA-8 USA-B	708-90 703ST 705ST100	USA-8 USA-B 325
	111	306-4B	316-4B			670+661 675+322BAS			
	127	307-4B	317-4B						
	152	308-4B	318-4B			(675+674 HOEK+322BA or (675) or (670/675+322BAS)			
Non adjustable 1 1/4"	152	308-4CP	308-4C			675-5/4" + 674HOEK 322BAS		704ST 706ST100	-

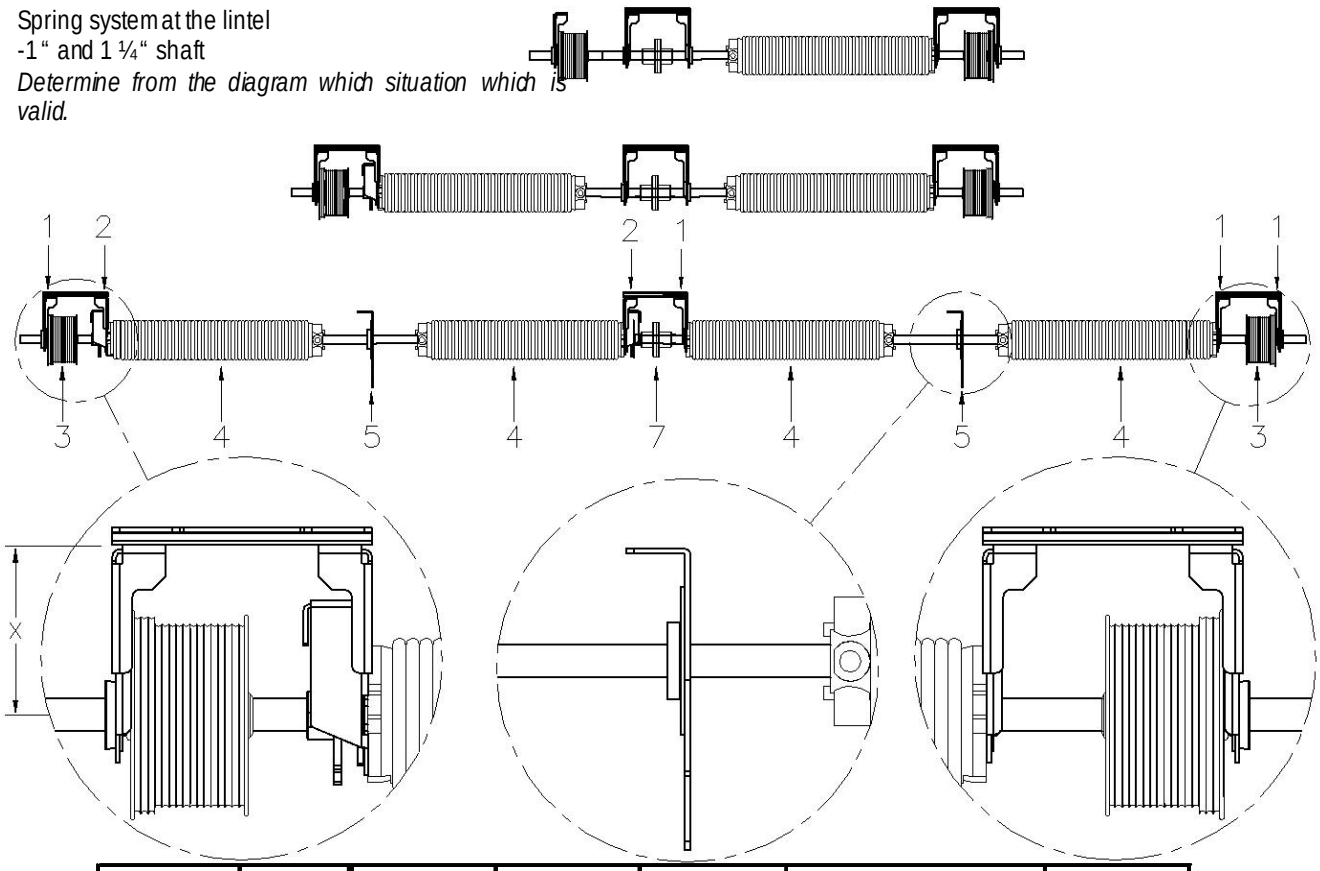
* = only for 6"spring and/or W>5000

ATTENTION! Installation method torsion springs: from the middle (stationairy plug) to the side (winder plug)

Installation spring system (adjustable bearing plates)

-Adjustable bearing plates
-cable inside
Spring system at the lintel
-1 " and 1 ¼" shaft
Determine from the diagram which situation which is valid.

ATTENTION! Installation method torsion springs: partly from side (stationairy plug to the middle (winder plug)



Situation	Size X (mm)	1	2	3	4	5	6
Adjustable 1"	86	322BAS USA-B	675	Fix drums with 2 safety wraps to the outside	LHW = black RHW = red	USA-8 USA-B 325	708-90 703ST 705ST100
	>86	322BAS 323LAG-B	675 322BAS				
	152		675 322BAS 674HOEK				
Adjustable 1 1/4"	86	322BAS USA-A	308-4C			USA-8 USA-B 325	704ST 706ST100
	>86	322BAS 323LAG USA-A	675-5/4 322BAS				
	152		675-5/4 322BAS 674HOEK				
With Wall plate	86-152	321WAL					

Fit the bearing plates (1) to the wall. Trace a centre line (spirit level) between the two side bearing plates in order to be able to fit the remaining bearing plates and the shaft in proper alignment.
Fit the remaining parts to the shaft (See assembly spring package, bearing plates and spring break device).
Secure a rope with loop to the structure to support the shaft during assembly. Fit the spring package to the wall.

Assembly door panels

For fitting purposes the assumption has been made that the panels are already fitted with end caps, top and bottom profile and top/bottom rubber.
Remove the protective foil from the panels.

(See 4 Hinges / top roller holders)
Fit base of the side hinges to the panels. The position will in many instances be determined by the holes in the end caps.
For doors > 5000 clear width double side hinges will be used as standard.

Fit the lower hinge blades of the intermediate hinges at equal intervals to the panel. The number of intermediate hinges to be fitted to one panel is determined as in the table below, unless ordered otherwise.

Clear width [mm]	Intermediate hinges [pieces]
0000 – 2749	1
2750 – 3999	2
4000 – 4999	3
5000 – 5999	4
6000 – 6999	5
7000 – 7999	6
8000 – 8999	7

Place the lower panel in the clear width and support it with a pair of blocks.

(See 10 Bottom brackets)
Place the rollers (where necessary beforehand ; type dependent) in the bottom brackets and fit the bottom brackets (with secured cables) to the panel in such fashion that the rollers are already located in the track.

Remove the blocks and fit the slides with roller on the hinge blocks.
Place the first intermediate panel on the lower panel such that the edges are aligned. Secure for the time being with a glue clamp or similar. Fit first the side hinges and then the intermediate hinge.

Repeat this procedure with the other intermediate panels.

Place finally the top panel. Secure this also temporarily with a glue clamp or similar. Fit the side hinges and then the intermediate hinges.
Fit the accompanying top roller holder as per specification (See 4 Hinges / top roller holders).

Fitting cable and tensioning the spring package

Align the shaft.

Roll out the steel cables until all the kinks have disappeared (already secured to the bottom bracket).

Guide the first cable from the bottom bracket, behind the bearing roller shafts to the cable drum (See figure).

Feed the cable into the drum and secure it with the screw in the drum.
The cable should protrude from the drum (see 17 cable drums or download the specification sheets from our site www.flexiforce.com)
Slide the cable drum against the bearing plate and rotate the drum such that the windings (min. 2 safety windings) rest next to each other in the grooves of the drum.

When the cable is taut the shaft should be turned such that the keyways in the shaft and drum correspond to each other.
Fit the key and tighten the setscrews in the drum (10 Nm).

Block the shaft with for example a clamp.

Place a locking pin in the spring break device such that the pawl is free of the pawl wheel.

Secure the other cable in the same fashion. Both cables should be under equal tension while the door panel is perfectly level.

Protect the door from rising. This can be achieved for example by placing clamps on the vertical track.

Tension the springs by the number of turns prescribed (see label springs and packaging list in the box), pull the spring ±5 mm apart (to reduce friction) and secure the spring to the shaft using the screws of the tension plug (25Nm).

CAUTION !
Torsion springs are under high tension.
Exercise at all times great caution. Installation, maintenance and repair should be carried out only by experienced and properly trained overhead door fitters. Use properly fitting and maintained tension irons (see drawing).

Tensioning the spring

1. Ensure that the brand strip on the spring forms a straight line.
2. Insert the 1st tensioning iron fully into the tensioning aperture.
3. Turn the 1st tensioning iron a quarter turn so that the spring is tensioned.
4. Insert the 2nd tensioning iron fully into the next tensioning aperture.
5. Take over the tensioning of the spring from the 1st tensioning iron with the 2nd tensioning iron..
6. Remove the 1st tensioning iron from the aperture.
7. Turn the 2nd tensioning iron a quarter turn so that the spring is tensioned.
8. Repeat steps 2 through 7 for as long as it takes for the spring to make the prescribed number of turns.
9. Secure the spring plug to the shaft by fitting the key and tightening the bolts in the tensioning plug on the shaft.
10. Remove the last tensioning iron.
11. Check the number of turns by counting the number of turns that the brand strip has made.

Remove the blocking of the door in the track and from the shaft and check that the door is properly balanced. Should this not be the case then correct by de-tensioning and/or tensioning of the springs by at most 1 turn per spring. Ensure that both springs are corrected equally.

Correction of the spring tension

1. Insert the 1st tensioning iron fully into the tensioning aperture.
2. Take over the tension of the spring with this tensioning iron.
3. Loosen the bolts in the tensioning plug and remove the key.
4. Turn the 1st tensioning iron in the direction required.
5. Insert the 2nd tensioning iron fully into the next tensioning aperture.
6. Take over the tensioning of the spring from the 1st tensioning iron with the 2nd tensioning iron..
7. Remove the 1st tensioning iron from the aperture.
8. Turn the 2nd tensioning iron a quarter turn in the direction required.
9. Insert the 1st tensioning iron fully into the tensioning aperture.
10. Take over the tensioning of the spring from the 2nd tensioning iron with the1st tensioning iron.
11. Repeat steps 4 through 10 until the correction required has been made.
12. Secure the spring plug to the shaft by fitting the key and tightening the bolts in the tensioning plug on the shaft.
13. Remove the last tensioning iron.

Fitting spring bumpers

(See 21 Spring bumpers)
Fit the spring bumper in accordance with the appropriate instruction.

Suspension horizontal track set

Set the door in the opened position so that the horizontal track that can still move freely is able to adjust to the door panels.
Ensure that the bearing rollers on left and right have the same play so that rail and door panel run parallel.
Conduct a cross measurement as per the figure to check the adjustment.

Secure further in this position the suspension of the horizontal track set.

Completing the door

Cord / Chain operation: See 3 Controls
Handgrip / Foot pedal: See 9 Handgrips
Lock : See 8 Locks

- Lubricate all hinges and bearing rollers with one drop of oil.
- Grease the cables
- Grease the bearing roller shafts.
- The torsion springs are already lightly oiled.
- Place your CE identification plate on the door together with any warning labels required.

Option electrical operator

This should be assembled in accordance with the handbook supplied with the operator.

ATTENTION!

The assembly of door sections is not included in this handbook since Flexi-Force does not supply panels. For this we refer you to the supplier of the panels or to other sources in the market.

TROUBLESHOOTING :

What should I check if the door is not balanced properly?

When a door is not well in balance, then it is necessary to check first the following details :

Is the given information correct :

- weight of the door leaf (including hardware)
- is the division of the weight equal on each panel, or are there panels with a different weight than the others, for instance by the application of different panels (glass, pass door with heavy profiles).

Were the correct parts supplied and fitted?
Especially the drums and springs are important :

- correct dimensions supplied ?

Is the door properly installed?

- horizontal tracks really horizontally and not with inclination.
- for High Lift doors : shaft on the correct height? Otherwise the cable length is not correct and the door is badly balanced.

Were modifications made afterwards ?

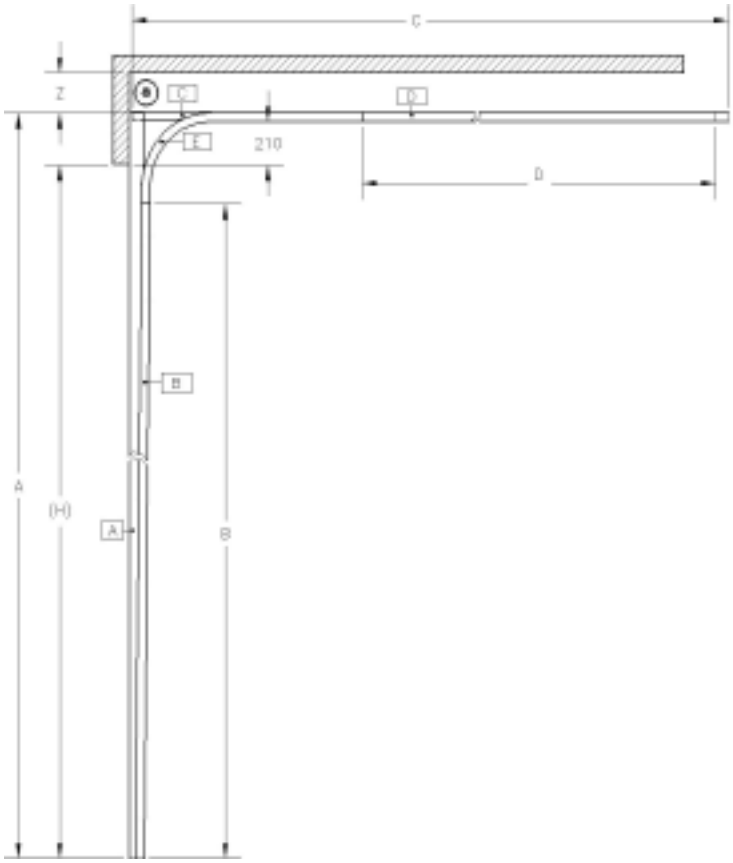
- check if any changes were made during the fitting, or if a pass door was fitted later, or any reinforcement profiles fitted etc.

2. BUILD-IN SYSTEMS

2.1 NL, Normal lift 2”

Distinguishing feature

With Normal systems the door turns through the bend directly above the clear height and the horizontal section consists of a single rail. See figure.



Tracks

The track system of the Normal System consists of a vertical and a horizontal section.

Vertical track set

This is made up of a left-hand and right-hand assembled corner lines with a guide track and side seal (See 7 Vertical corner lines).

Horizontal track set

The horizontal track set consists of a left-hand and right-hand bend and a reinforcement profile that is secured to the bend and the straight guide track.

Assembly vertical track set

Slide the side seal onto the corner line and shorten this where necessary. Secure the vertical track set level to the pendent (See 1 General).

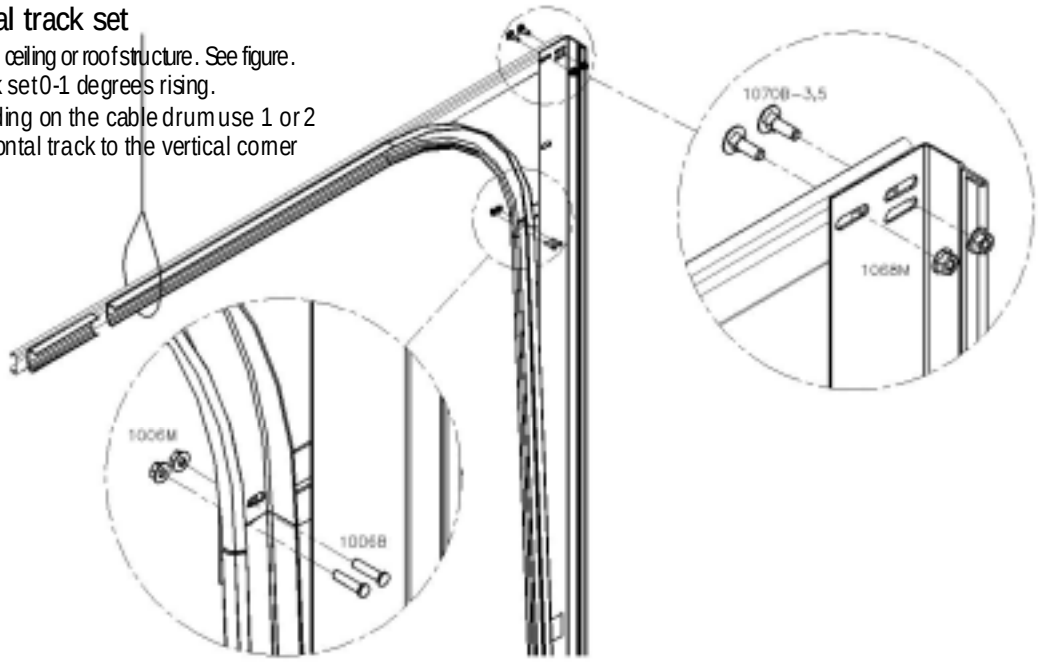
Ensure that the side seal cannot be displaced. When necessary deform the rim of the corner line above the side seal.

Assembly horizontal track set

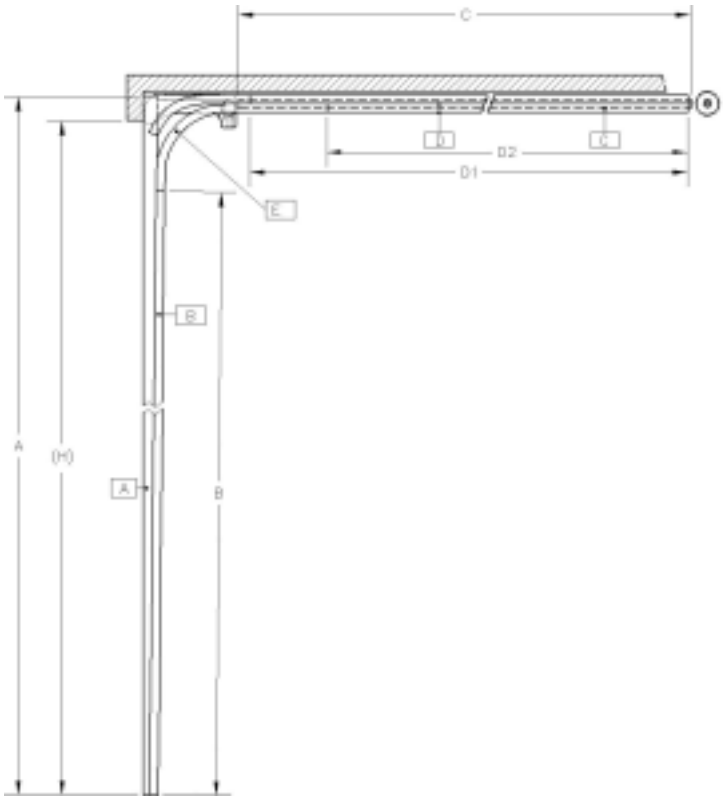
Secure a piece of cord to the ceiling or roof structure. See figure.

Adjust the horizontal track set 0-1 degrees rising.

Tighten all bolts. Depending on the cable drum use 1 or 2 bolts to secure the horizontal track to the vertical corner line.



2.2 LHR, Low Head Room System 2”



Distinguishing feature

With Low systems the door turns through the bend directly above the clear height and the horizontal section consists of a double track. See figure.

Tracks

The track system of the Low System consists of a vertical and a horizontal section.

Vertical track set

This is made up of a left-hand and right-hand assembled corner line with a guide track and side seal (See 7 Vertical corner lines).

Horizontal track set

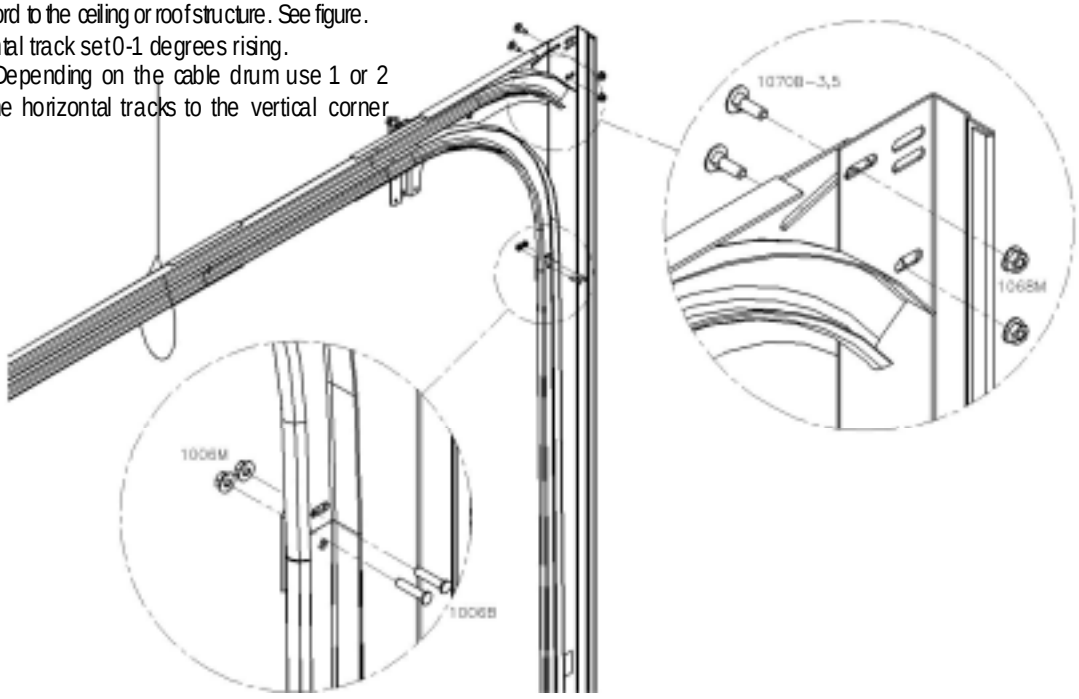
The horizontal track set consists of a left-hand and right-hand section with a double bend, straight tracks and a reinforcement profile.
The bends and the straight guide tracks are attached to one another by junction plates and a side plate. The side plate is fitted with a cable pulley.

Assembly vertical track set

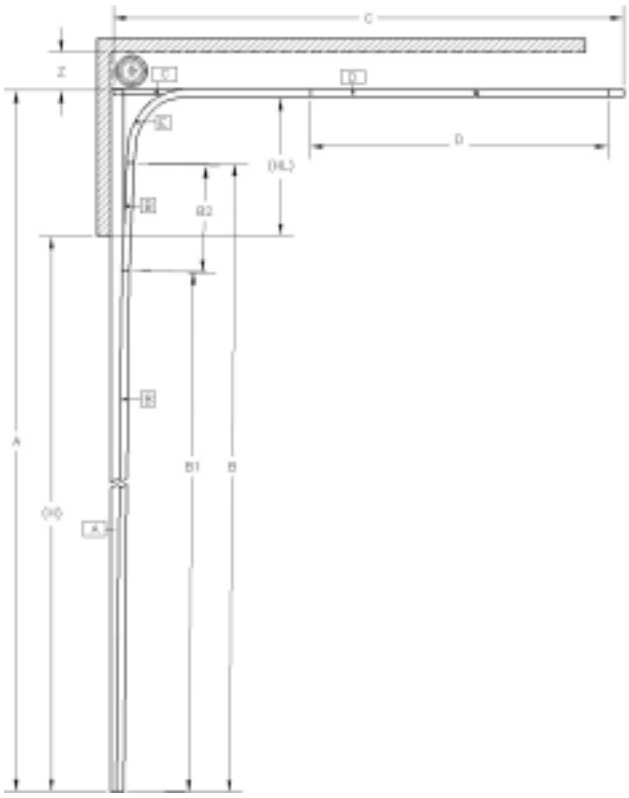
Slide the side seal onto the corner line and shorten this where necessary. Secure the vertical track set level to the pendent (See 1 General). Ensure that the side seal cannot be displaced. When necessary deform the rim of the corner line above the side seal.

Assembly horizontal track set

Secure a piece of cord to the ceiling or roof structure. See figure.
Adjust the horizontal track set 0-1 degrees rising.
Tighten all bolts. Depending on the cable drum use 1 or 2 bolts to secure the horizontal tracks to the vertical corner line.



2.3 HL, High lift 2”



Distinguishing feature

With High Systems the door rises vertically first above the clear height before the upper panel turns through the bend. See figure.

Tracks

The track system of the High System consists of a vertical and a horizontal section.

Vertical track set

This is made up of a left-hand and right-hand corner line with a guide track and side seal (See 7 Vertical corner lines).

For large clear heights and/or large high-lift the vertical track set is supplied in two sections.

Horizontal track set

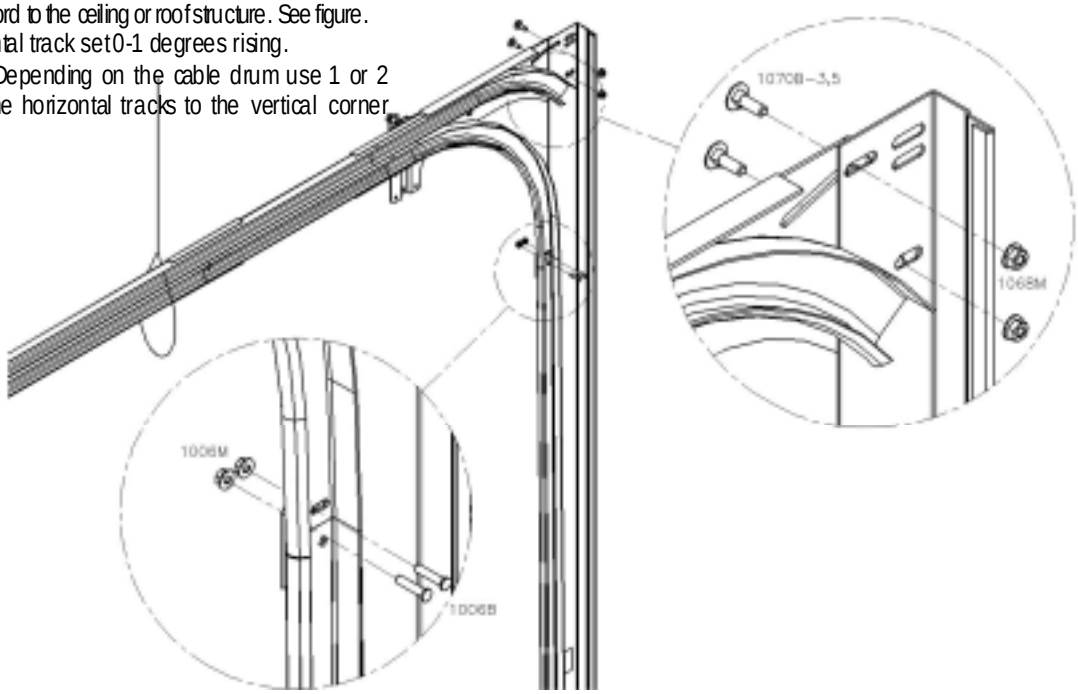
The horizontal track set consists of a left-hand and right-hand bend and a reinforcement profile that is secured to the bend and the straight guide track.

Assembly vertical track set

Slide the side seal onto the corner line and shorten this where necessary. Secure the vertical track set level to the pendent (See 1 General). Ensure that the side seal cannot be displaced. When necessary deform the rim of the corner line above the side seal.

Assembly horizontal track set

Secure a piece of cord to the ceiling or roof structure. See figure.
Adjust the horizontal track set 0-1 degrees rising.
Tighten all bolts. Depending on the cable drum use 1 or 2 bolts to secure the horizontal tracks to the vertical corner line.



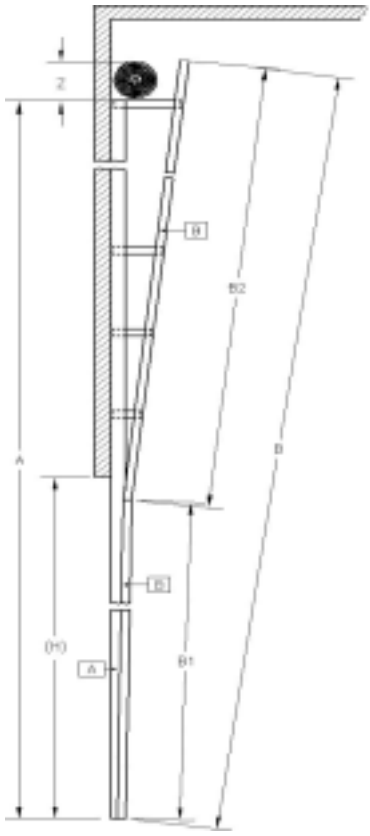
2.4 VL, Vertical lift 2”

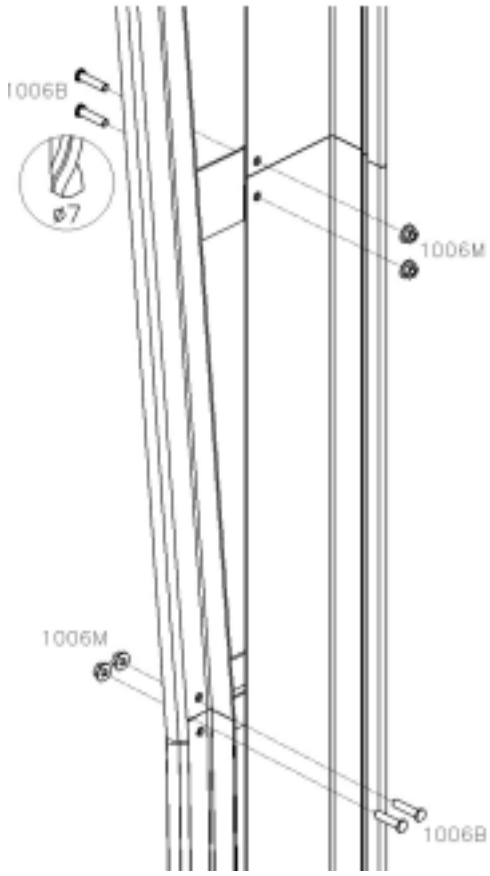
Distinguishing feature
With Vertical systems the door rises straight upward. See figure.

Tracks
The track system of the Vertical system consists only of a vertical section.

Vertical track set
This is made up of a left-hand and right-hand corner line with a guide track and side seal (See 7 Vertical corner lines).
For large clear heights the vertical track set is supplied in two sections.

Assembly vertical track set
Slide the side seal onto the corner line. Secure the vertical track set level to the pendent (See 1 General).
When the vertical set consists of two sections then assemble as depicted in the figure. For a single vertical set only the lower fastener is present.

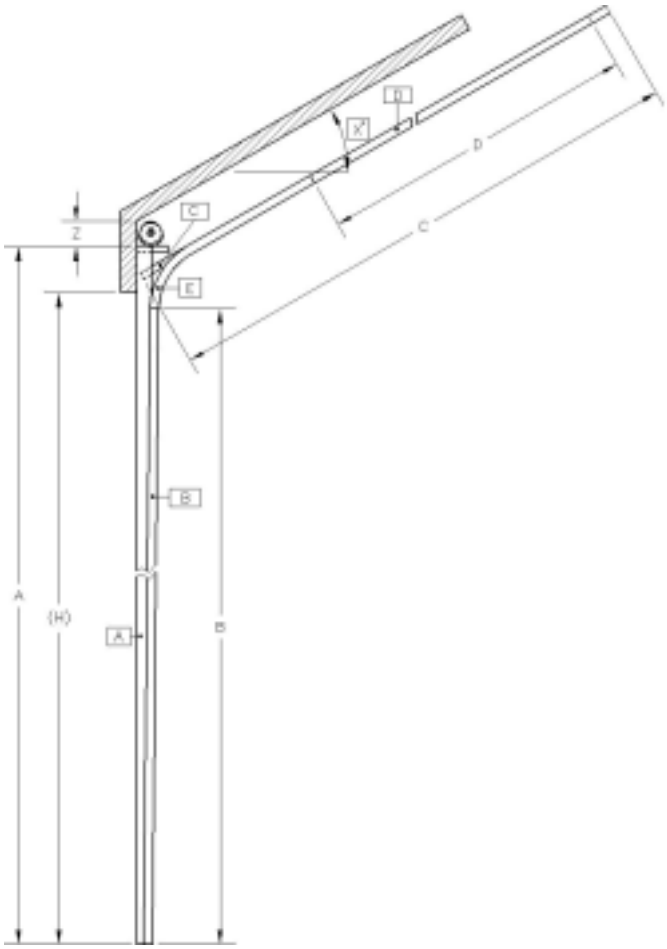




2.5 FTR, Following The Roof System, Normal 2”

Distinguishing feature

With FTR-Normal systems the door turns through the bend directly above the clear height and then tracks the angle of the roof. The horizontal section consists of a single track. See figure.



Tracks

The track system of the FTR-System consists of a vertical and a horizontal section.

Vertical track set

This is made up of a left-hand and right-hand assembled corner line with a guide track and side seal (See 7 Vertical corner lines).

Horizontal track set

The horizontal track set consists of a left-hand and right-hand bend and a reinforcement profile that is secured to the bend and the straight guide track.

Assembly vertical track set

Slide the side seal onto the corner line and shorten this where necessary. Secure the vertical track set level to the pendent (See 1 General).

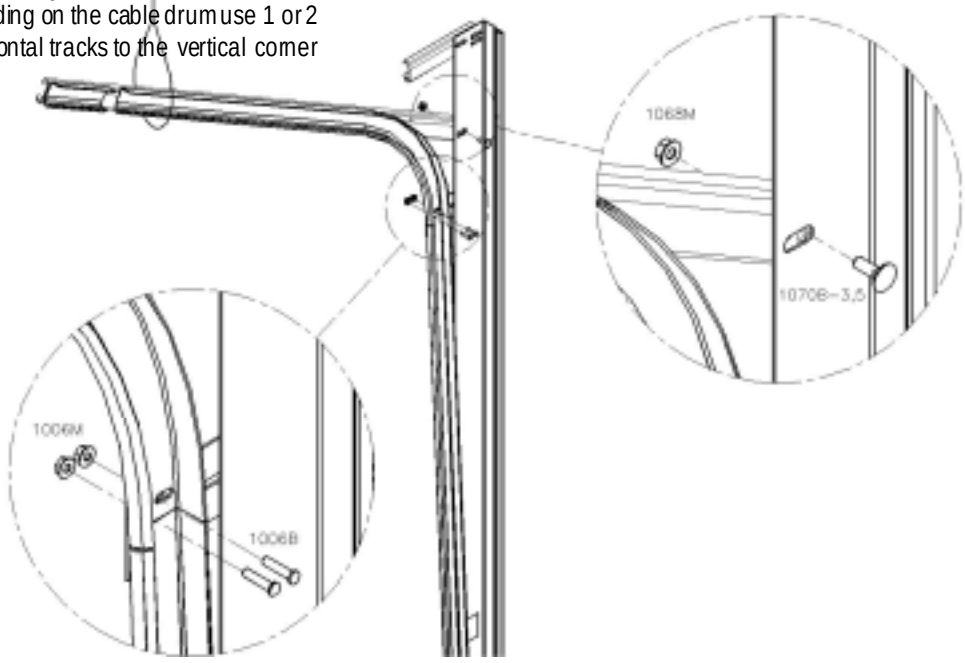
Ensure that the side seal cannot be displaced. When necessary deform the rim of the corner line above the side seal.

Assembly horizontal track set

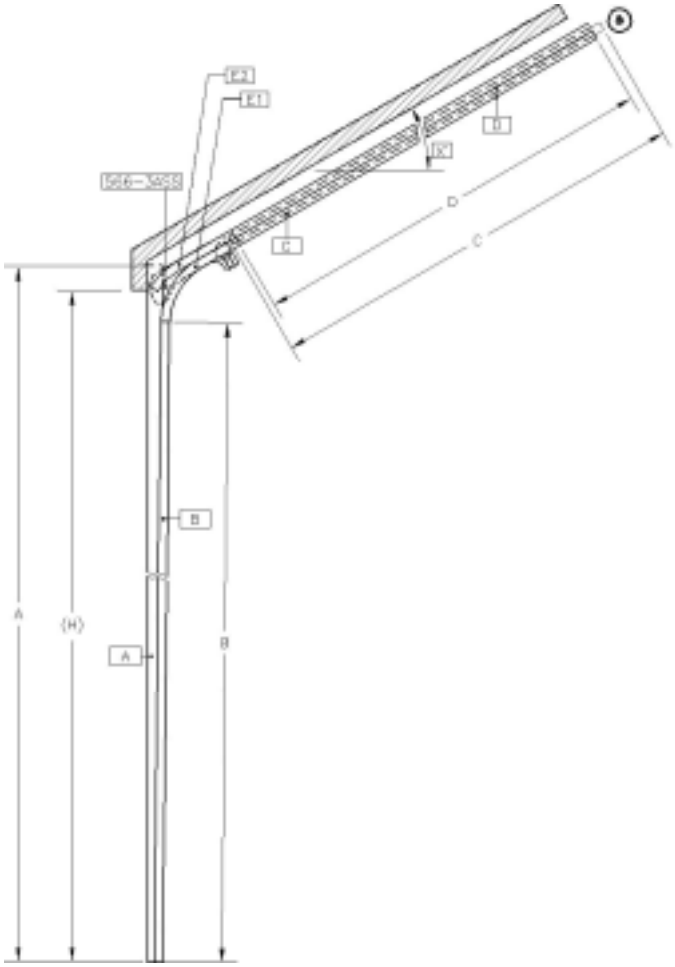
Secure a piece of cord to the ceiling or roof structure. See figure.

Adjust the horizontal track lining with the roof.

Tighten all bolts. Depending on the cable drum use 1 or 2 bolts to secure the horizontal tracks to the vertical corner line.



2.6 FLH, Following The Roof System, Low 2”



Distinguishing feature

With FLH-systems the door turns through the bend directly above the clear height and then tracks the angle of the roof. The horizontal section consists of a double track. See figure.

Tracks

The track system of the FLH-System consists of a vertical and a horizontal section.

Vertical track set

This is made up of a left-hand and right-hand assembled corner lines with a guide track and side seal (See 7 Vertical corner lines).

Horizontal track set

The horizontal track set consists of a left-hand and right-hand section with a double bend, straight tracks and a reinforcement profile. The bends and the straight guide tracks are fitted to each other by connection plates and a side plate. The side plate is fitted with a return pulley.

Assembly vertical track set

Slide the side seal onto the corner line and shorten this where necessary. Secure the vertical track set level to the pendent (See 1 General).

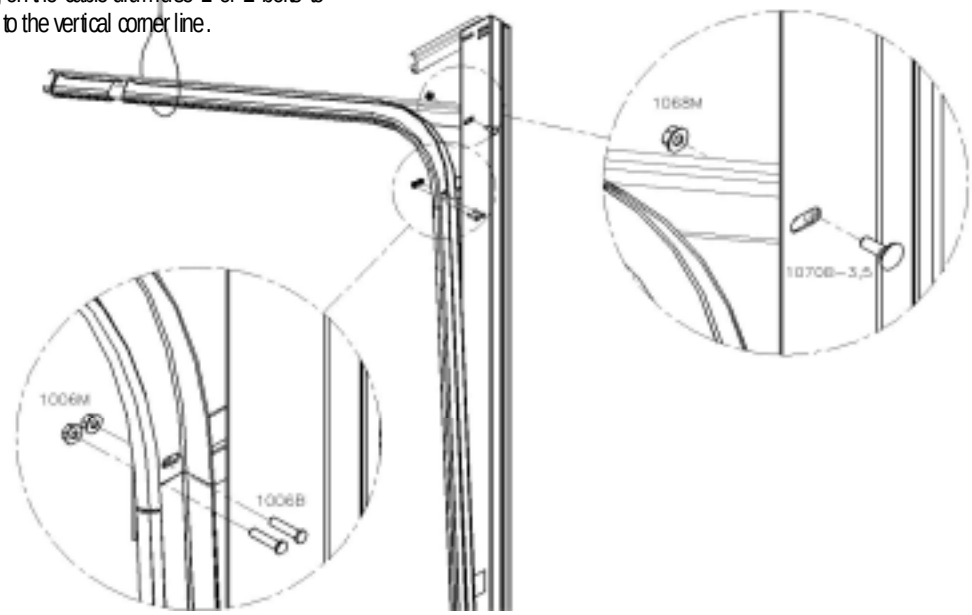
Ensure that the side seal cannot be displaced. When necessary deform the rim of the corner line above the side seal.

Assembly horizontal track set

Secure a piece of cord to the ceiling or roof structure. See figure.

Adjust the horizontal track lining with the roof.

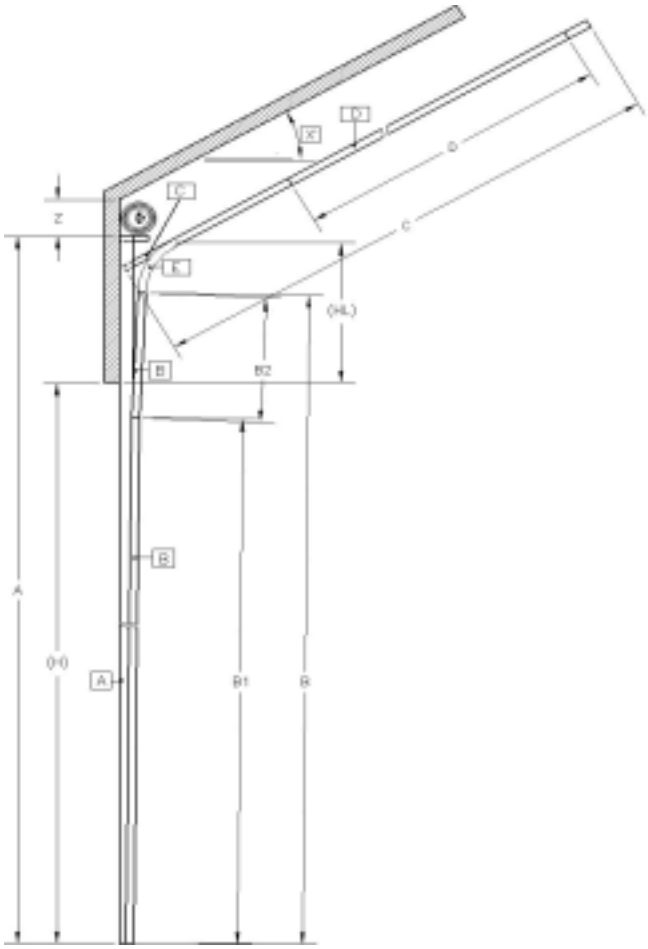
Tighten all bolts. Depending on the cable drum use 1 or 2 bolts to secure the horizontal tracks to the vertical corner line.



2.7 FHL, Following The Roof System, High 2”

Distinguishing feature

With FHL-Systems the door first rises directly above the clear height and then, after turning through the bend tracks the angle of the roof. The FHL track section consists of one single track. See figure.



Tracks

The track system of the FHL-System consists of a vertical and a horizontal section.

Vertical track set

This is made up of a left-hand and right-hand assembled corner line with a guide track and side seal (See 7 Vertical corner lines).

For large clear heights and/or large high-lift the vertical track set is supplied in two sections.

Horizontal track set

The horizontal track set is constructed from a left-hand and a right-hand bend and a reinforcement profile that is secured to the bend and the straight guide track.

Assembly vertical track set

Slide the side seal onto the corner line and shorten this where necessary. Secure the vertical track set level to the pendent (See 1 General).

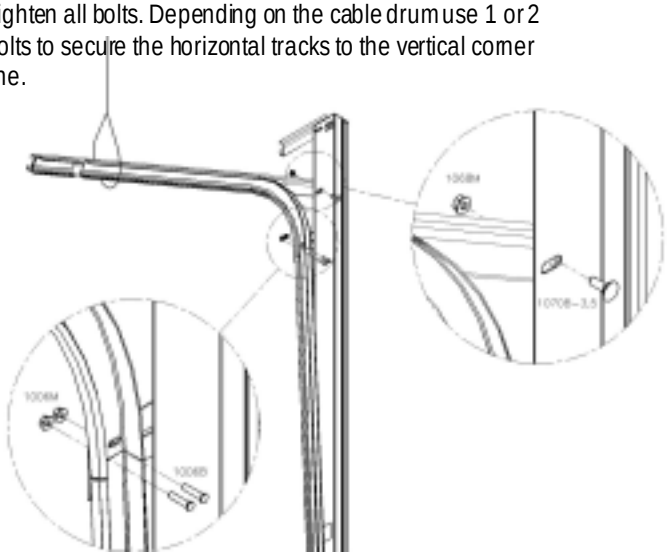
When the vertical set consists of two sections then assemble as depicted in the figure. For a few vertical sets only the lower fastener is present.

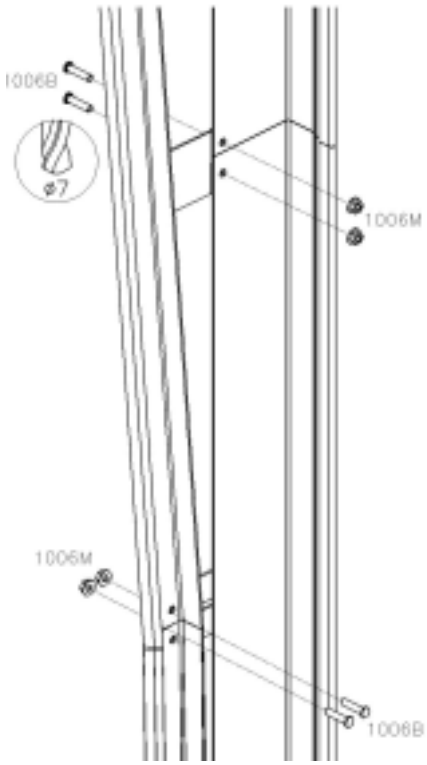
Assembly horizontal track set

Secure a piece of cord to the ceiling or roof structure. See figure.

Adjust the horizontal track lining with the roof.

Tighten all bolts. Depending on the cable drum use 1 or 2 bolts to secure the horizontal tracks to the vertical corner line.

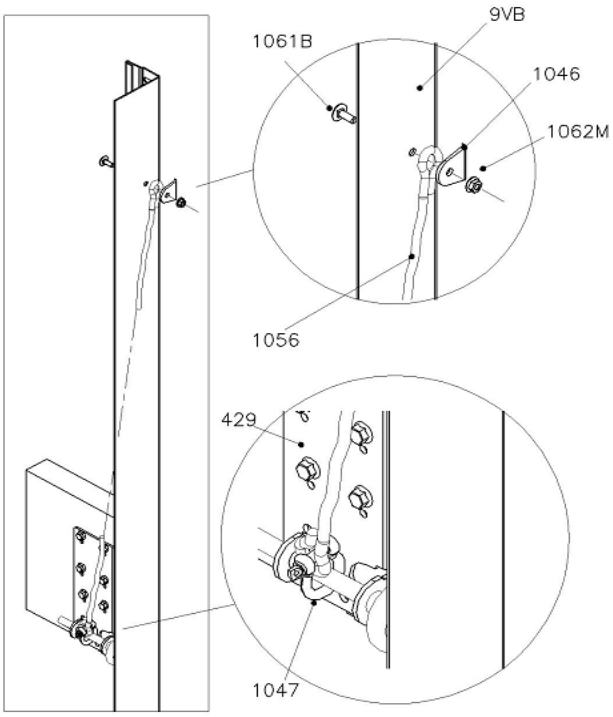




3. OPERATION

3.1 Rope operation

Fit the cord supplied using the clip and coupling to the bottom console at a point on the corner line at shoulder height.



3.2 Chain hoist 1:1, type 722A

The 722A chain hoist (transmission ratio 1:1) is suitable for 1" spindles.

The set consists of the following parts:

- Chain guide
- Sprocket wheel
- Manual chain 8 metre
- Chain stop
- Adjustment ring
- Key

Order of assembly (see figure)

Check whether the chain of the chain hoist to be fitted can run freely and whether the chain stop can be fitted.

Slide the adjustment ring onto the spindle. Then slide the chain guide and the sprocket wheel with the chain onto the spindle.

Tighten the adjustment ring and slide the guide with sprocket wheel against it. Apply the key between sprocket wheel and spindle and tighten the securing screw of the sprocket wheel.

Now secure the chain stop on the edge of the vertical corner line or elsewhere on the structure (Height indication 1250mm)

Depending on the height of the spindle the chain should be shortend or an extra separate length of chain supplied that can be inserted.

This can be arranged simply by bending a link open and then shut (Height indication floor to underside chain 750mm)

Ensure that the manual chain is not distorted!

3.3 Chain hoist 1:3, type 721A

The 721A chain hoist (transmission ratio 1:3) is suitable as standard for 1" spindles.

The set consists of the following parts:

- Frame with sprocket wheel and gear wheel (small)
- Manual chain 8 metre
- Chain stop
- Sprocket wheel (large)
- (Bicycle) Chain
- Key

Order of assembly (see figure)

Check whether the chain of the chain hoist to be fitted can run freely and whether the chain stop can be fitted. Slide the large sprocket wheel onto the spindle. Determine the position of the frame. Then fit the frame hand-tight to the wall. Place the (bicycle) chain on the gear wheels and connect both ends with the connection link. Apply the key between gear wheel and spindle and tighten the securing screws of the gear wheel.

Tension the (bicycle) chain by sliding the frame into the slotted holes and secure the frame. Depending on the position of the frame the (bicycle) chained should be shortened or lengthened. *See for further instructions italicized text at 722A.*

3.4 Chain hoist 1:4, type 724

The 724A chain hoist (transmission ratio 1:4) is suitable as standard for 1" spindles.

The set consists of the following parts:

- Casing with sprocket wheel
- Manual chain 8 metre
- Chain stop
- Connector
- Key

Order of assembly (see figure)

Check whether the chain of the chain hoist to be fitted can run freely and whether the chain stop can be fitted.

Allow the spindle to protrude circa 60 mm from the bearing plate.

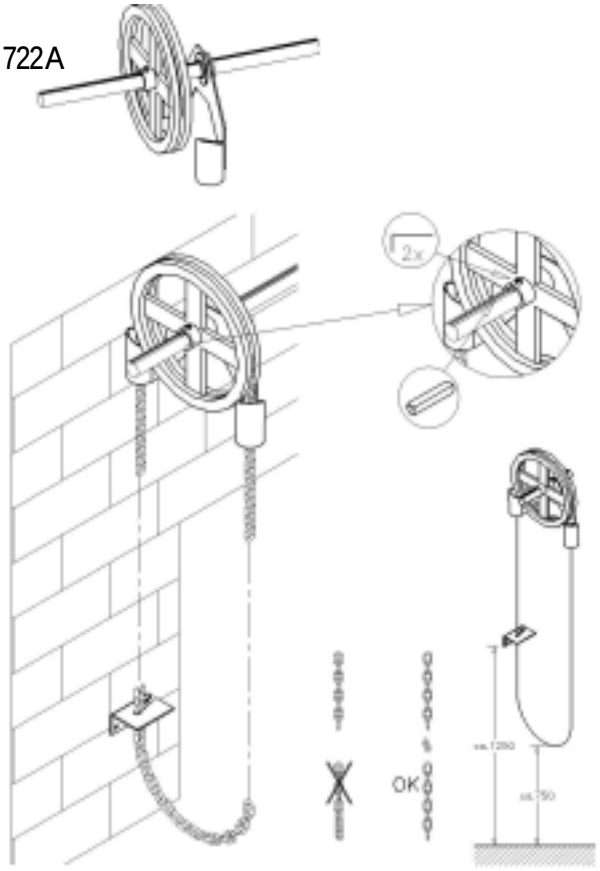
Slide the connector onto the spindle of the chain hoist and fit the key supplied.

Slide the chain hoist with the connector onto the spindle and secure the entire assembly to the bearing plate with a bolt (see drawing).

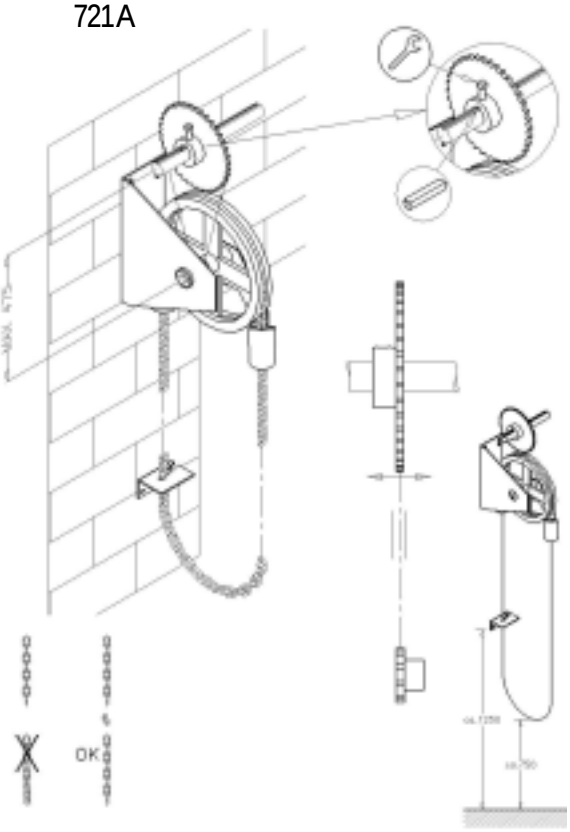
Secure the connector by tightening both screws.

See for further instructions italicized text at 722A.!

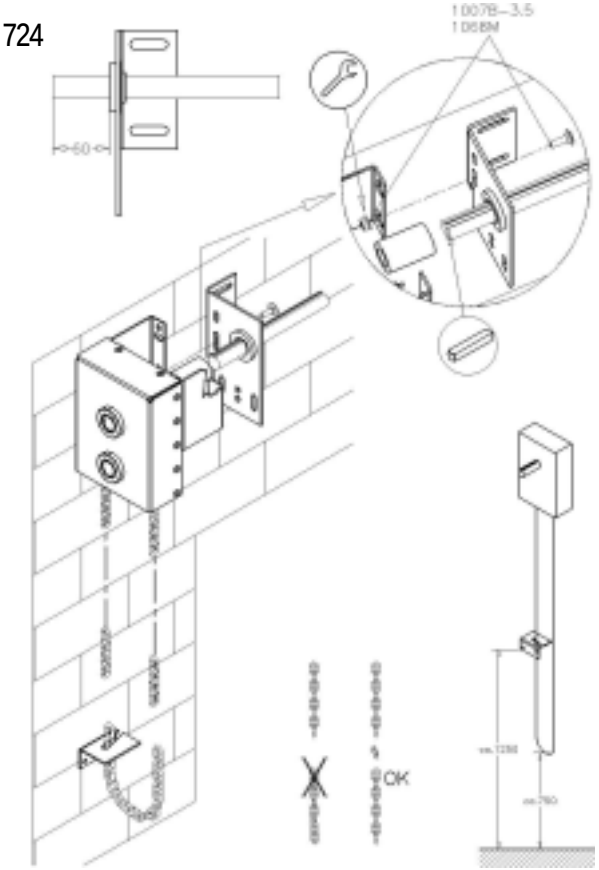
722A



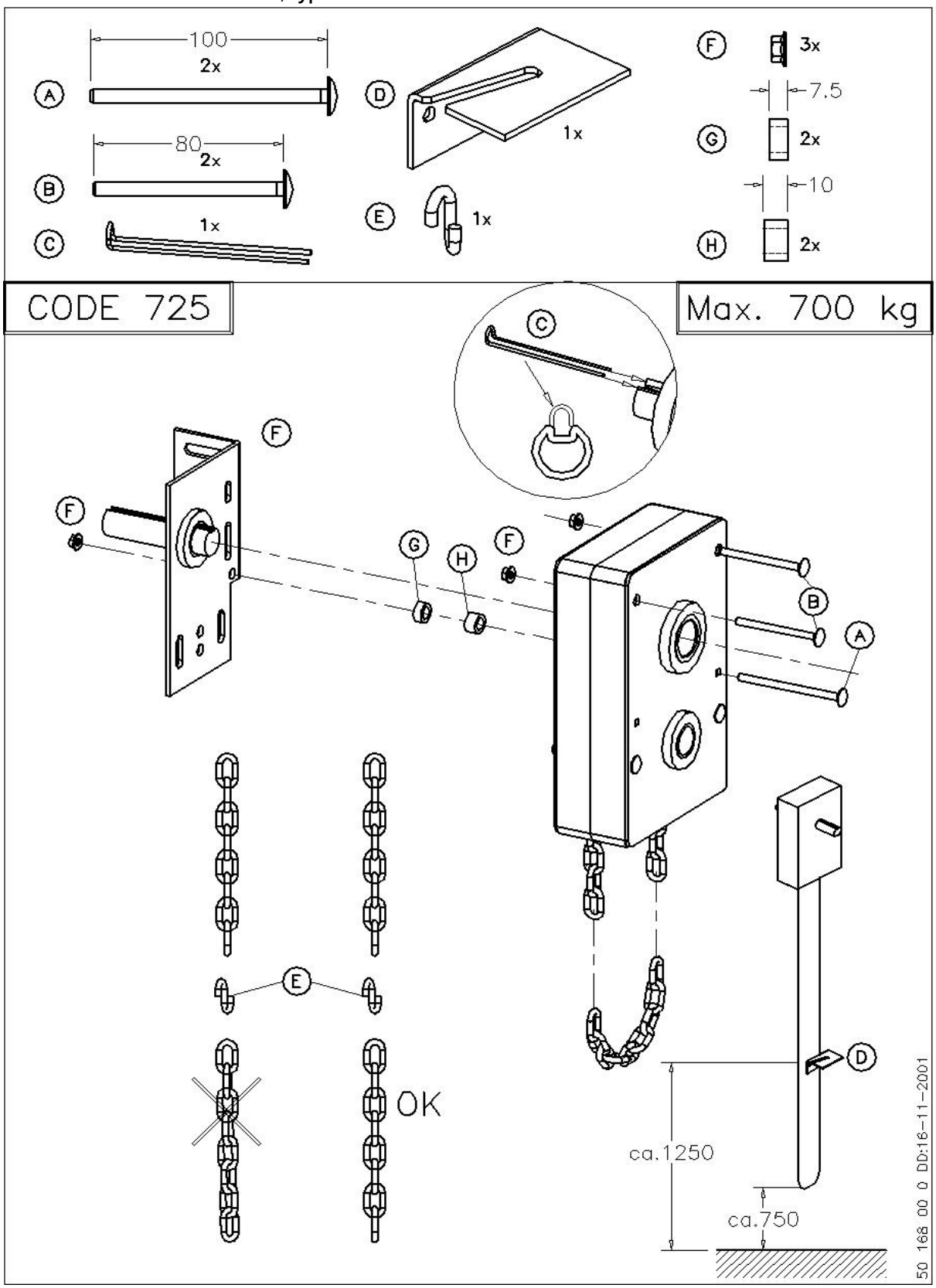
721A



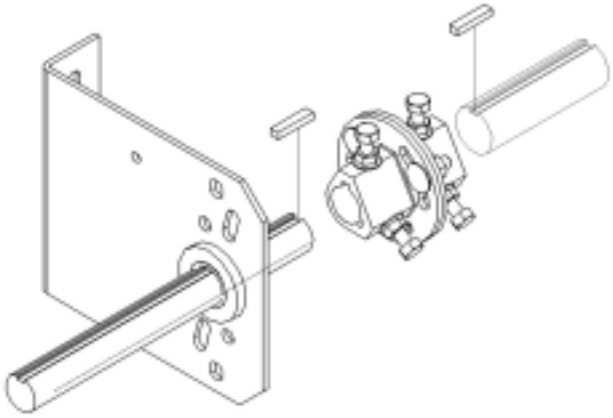
724



3.5 Chain Hoist 1:4 direct, type 725



3.6 Option: Reducing socket 1" -> 1 ¼"



When the door is produced with a 1¼" spindle and a (1") chain hoist a reducing socket set is supplied with the spindle.

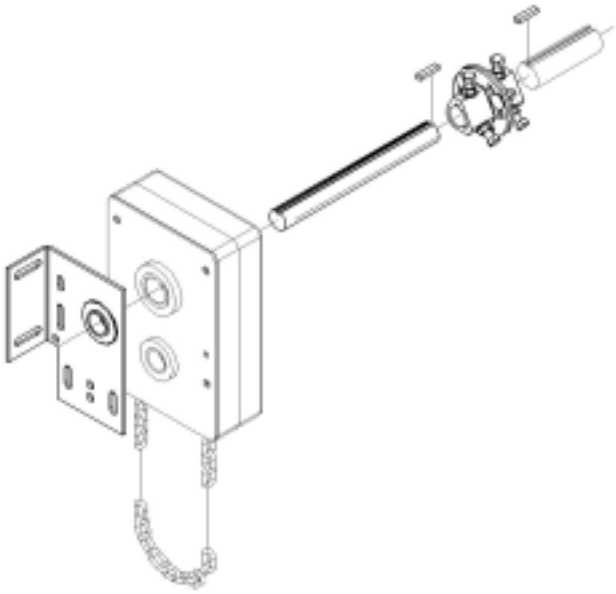
The set consists of the following parts:

- 702ST-1/2 Coupler 1"-1 ¼"
- 700A38 Key, 2 pieces
- 702-0250Z Galvanized spindle, length 25 cm

Assembly

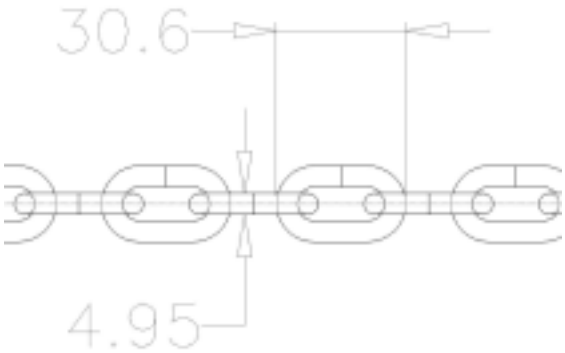
Slide the connector onto the 1¼" spindle, fit the key and tighten the securing bolts.

Insert the 1" spindle in the other socket half, also fitting the key here and tighten the securing bolts.
Where necessary shorten the spindle.
The extra bearing plate that may need to be fitted to support or secure the spindle / chain hoist is not included in the delivery.
See also assembly instructions for chain hoist.



3.7 Extra Chain

When the spindle is placed at greater heights an extra separate chain is supplied for extension of the chain. Extension (insertion) can be realized easily by opening and then closing a link. The article involved is 723A manual chain.



4. HINGES

4.1 Intermediate hinges, galvanised

- 450HZ See Picture
- 447DOUB See Picture
- 420HZ+10RES See Picture
- 450HZ+10 See Picture

4.2 Intermediate hinges, RVS

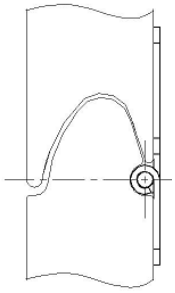
- 450H304 See Picture

4.3 Side hinges, galvanised

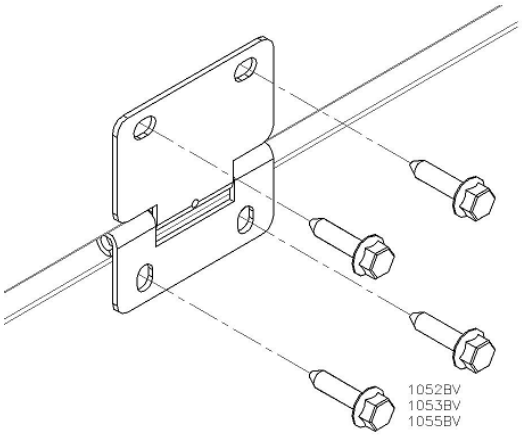
- 450CZ See Picture
- 420CZ+10RES See Picture
- 450CZ+10 See Picture

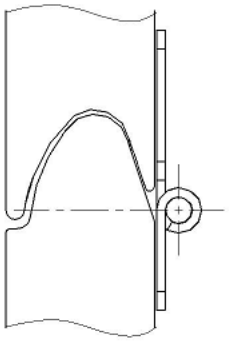
4.4 Side hinges, galvanised

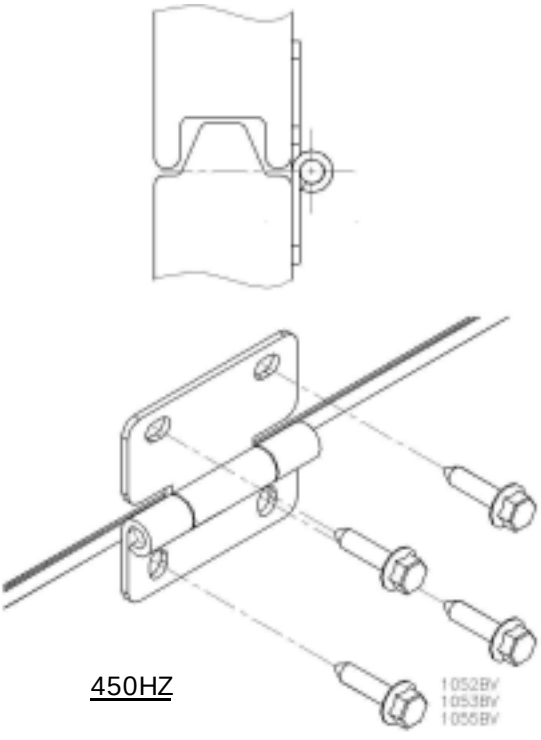
- 450C304 See Picture



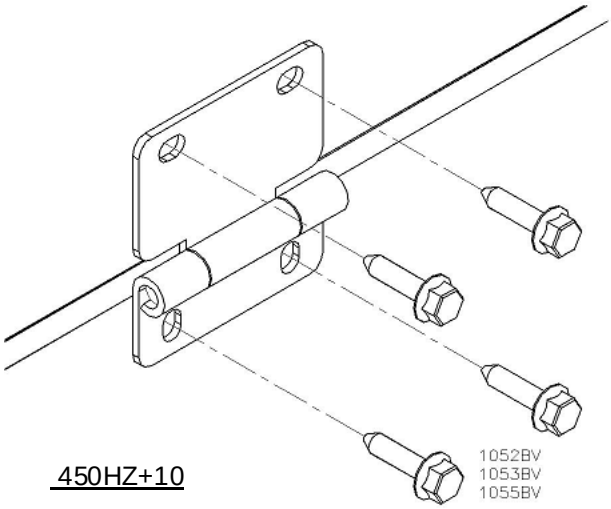
420HZ+10RES



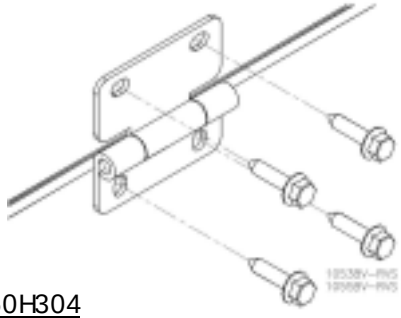




450HZ

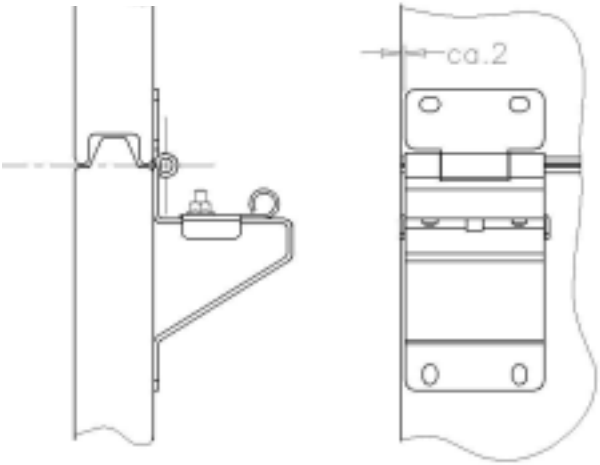


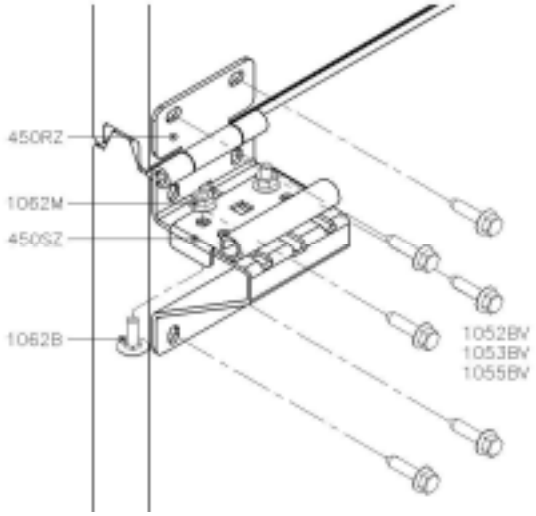
450HZ+10



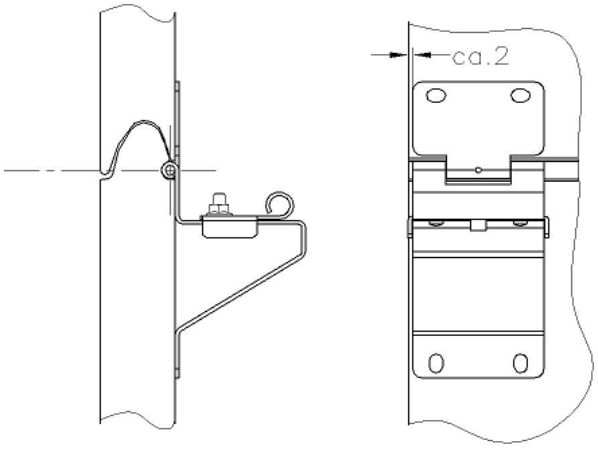
450H304

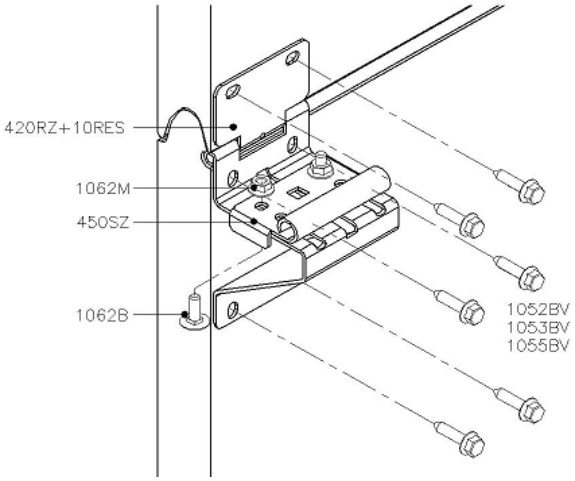
450CZ



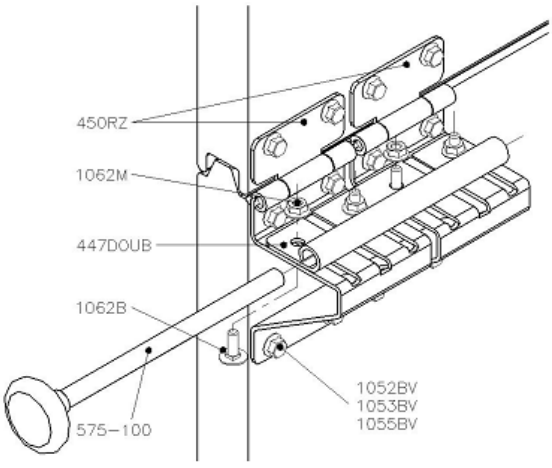


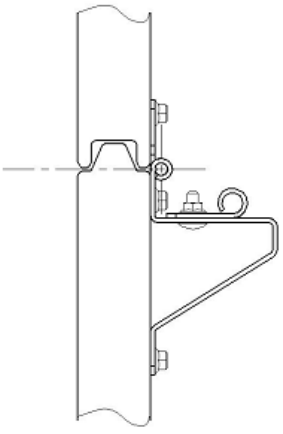
420CZ+10RES

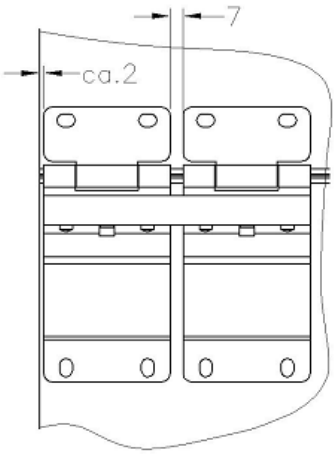




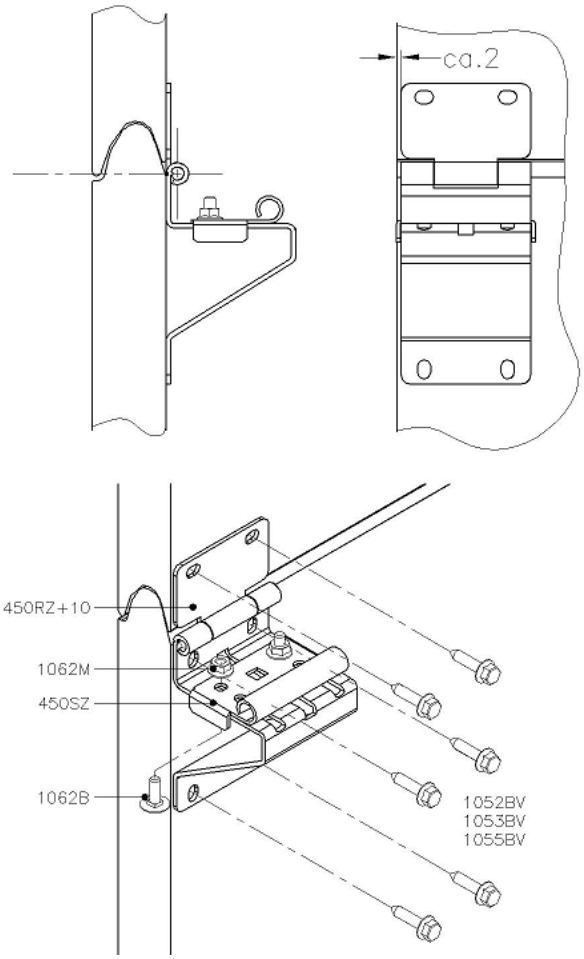
447DOUB



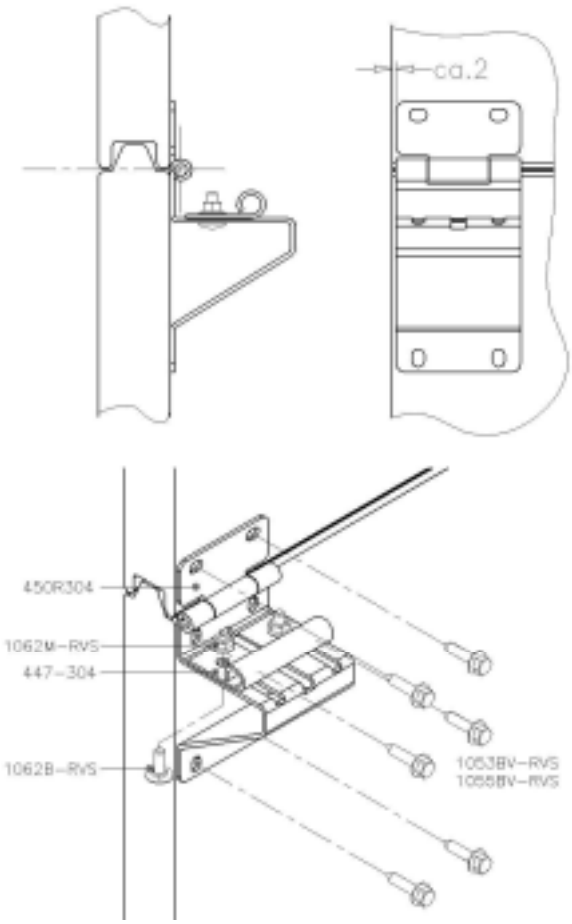




450CZ+10

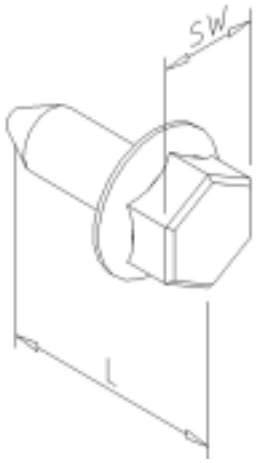


450C304



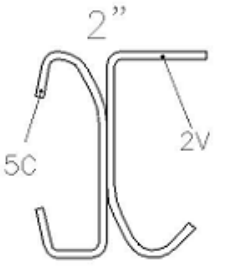
5. SCREWS

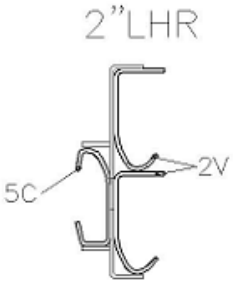
TYPE	L [mm]	SW [mm]	Max. torque [Nm]
1052BV	16	10	9.8
1053BV	35		
1055BV	25		
1053BV-RVS	35		-
1055BV-RVS	25		-

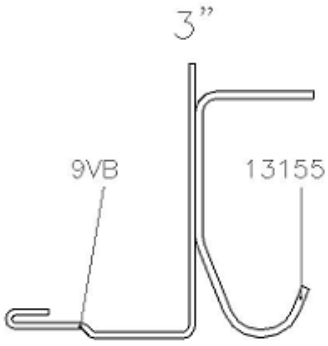


Material tichkness [mm]	Drill diameter [mm]	
	Steel	Aluminium
0-1.38	4.9	-
1.38-1.75	5.5	-
1.75-2,00	5.2	5.0
2.00-3.00	5.3	5.2
3.00-4.00	5.8	5.3

6. TRACK

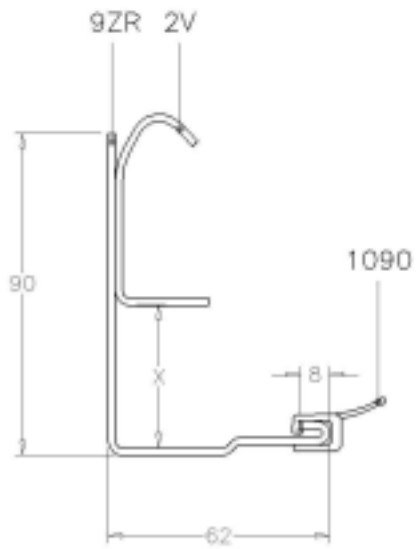




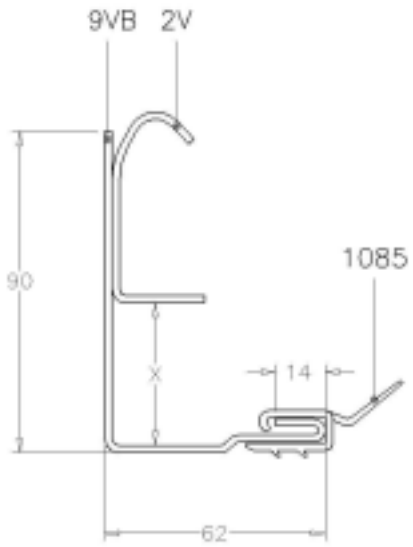


7. VERTICAL ANGLE

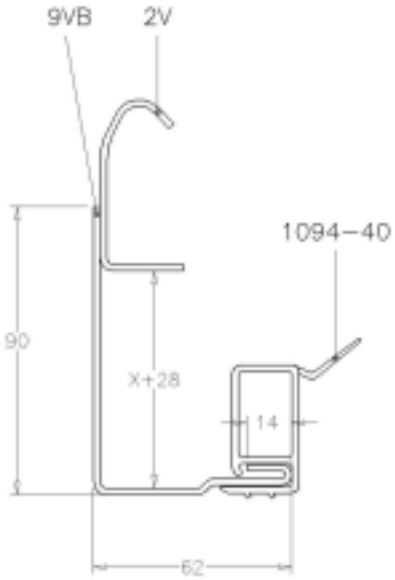
7.1 9ZR and 1090 (2" track)



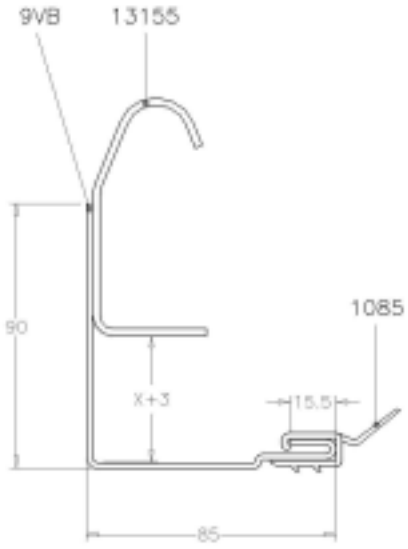
7.2 9VB and 1085 (2" track)



7.3 9VB and 1094-40 (2" track)

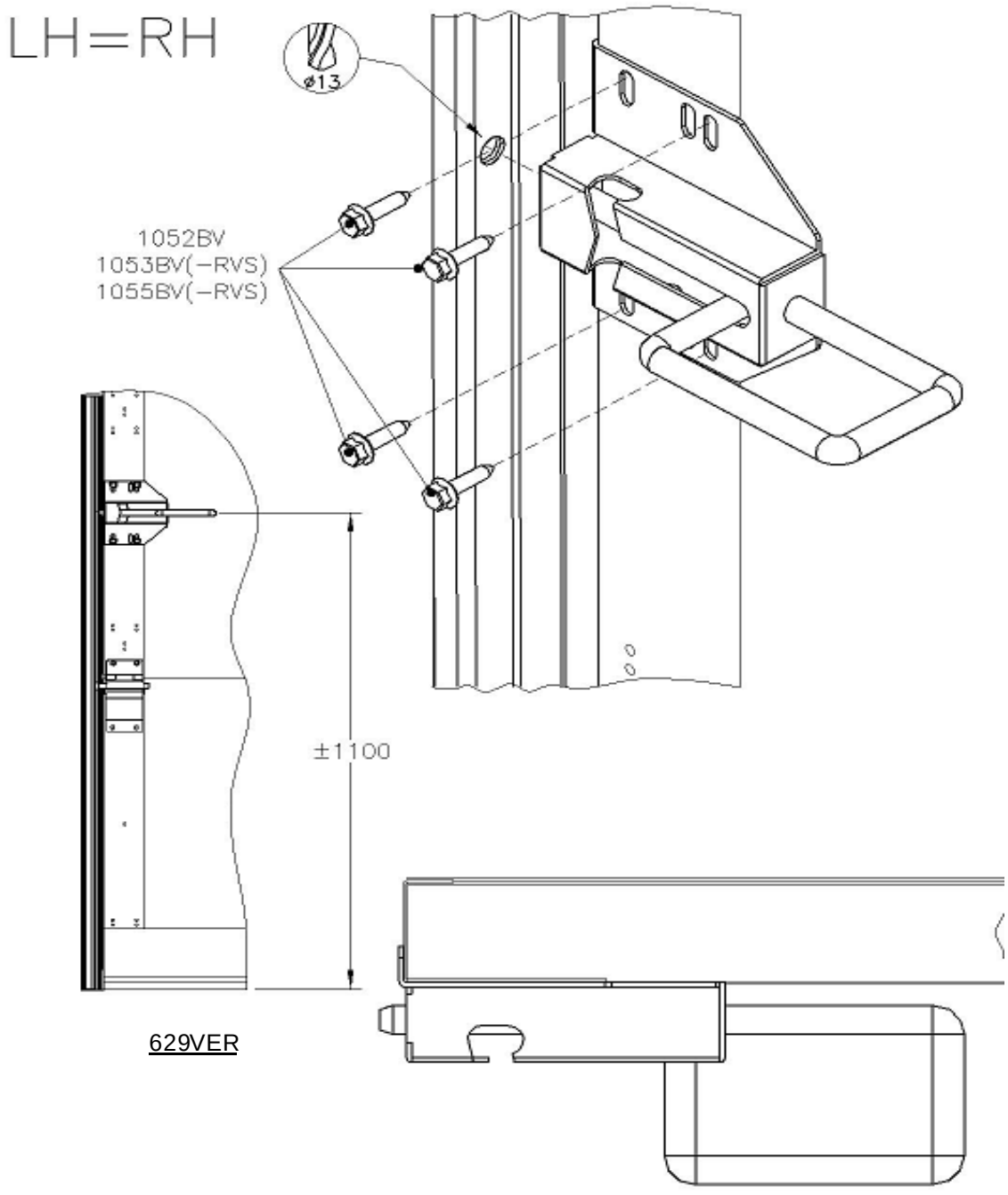


7.4 9K and 1085 (3" track)



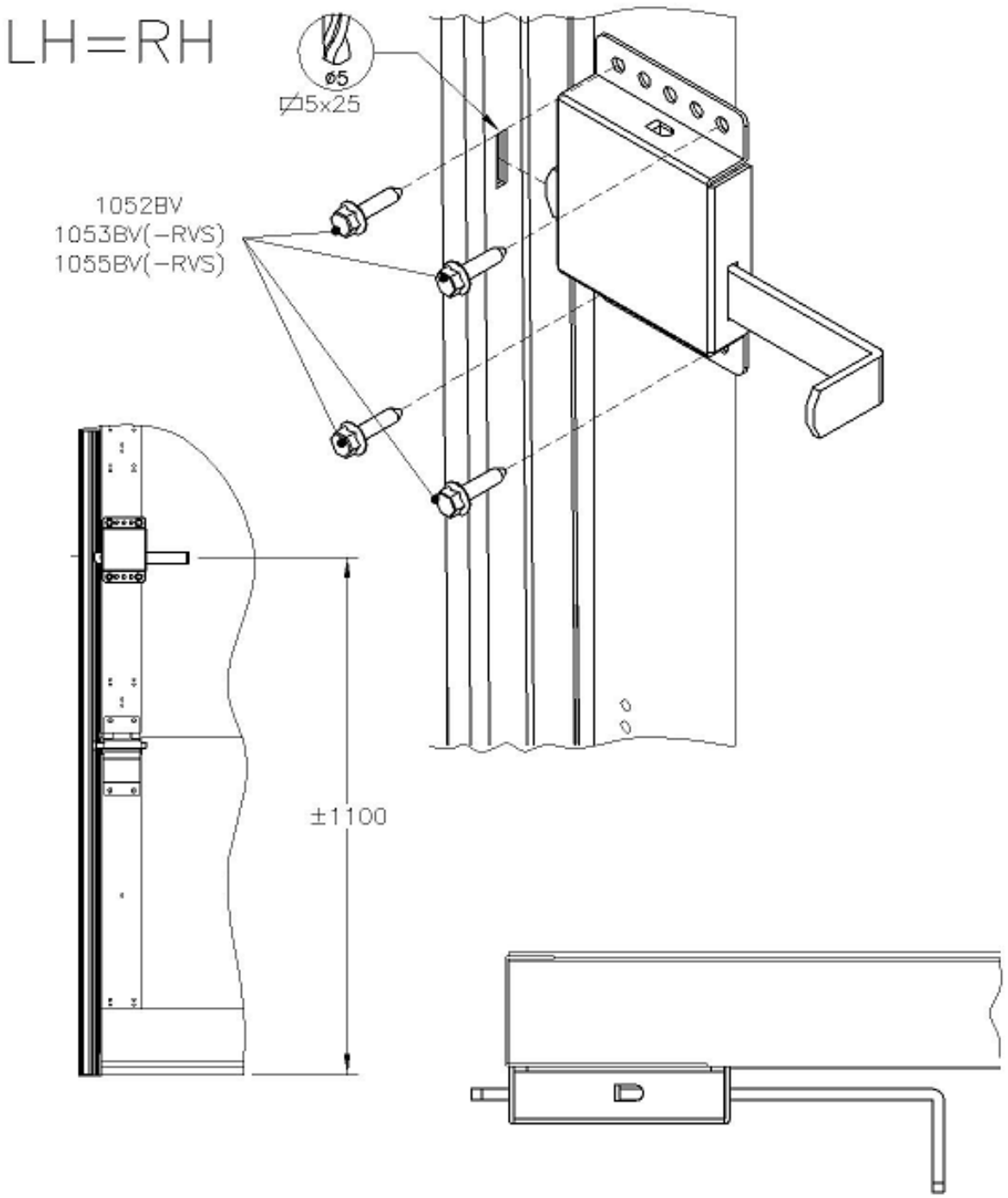
8. LOCKS

- Slide bolt 629VER See Picture
- Slide bolt 630D See Picture
- Slide bolt 632 See Picture
- Cilinder lock 635 See Picture
- Cilinder lock 637-40/50 See Picture
- Cilinder lock 638-40/56 See Picture
- Cilinder lock 668-40 See Picture

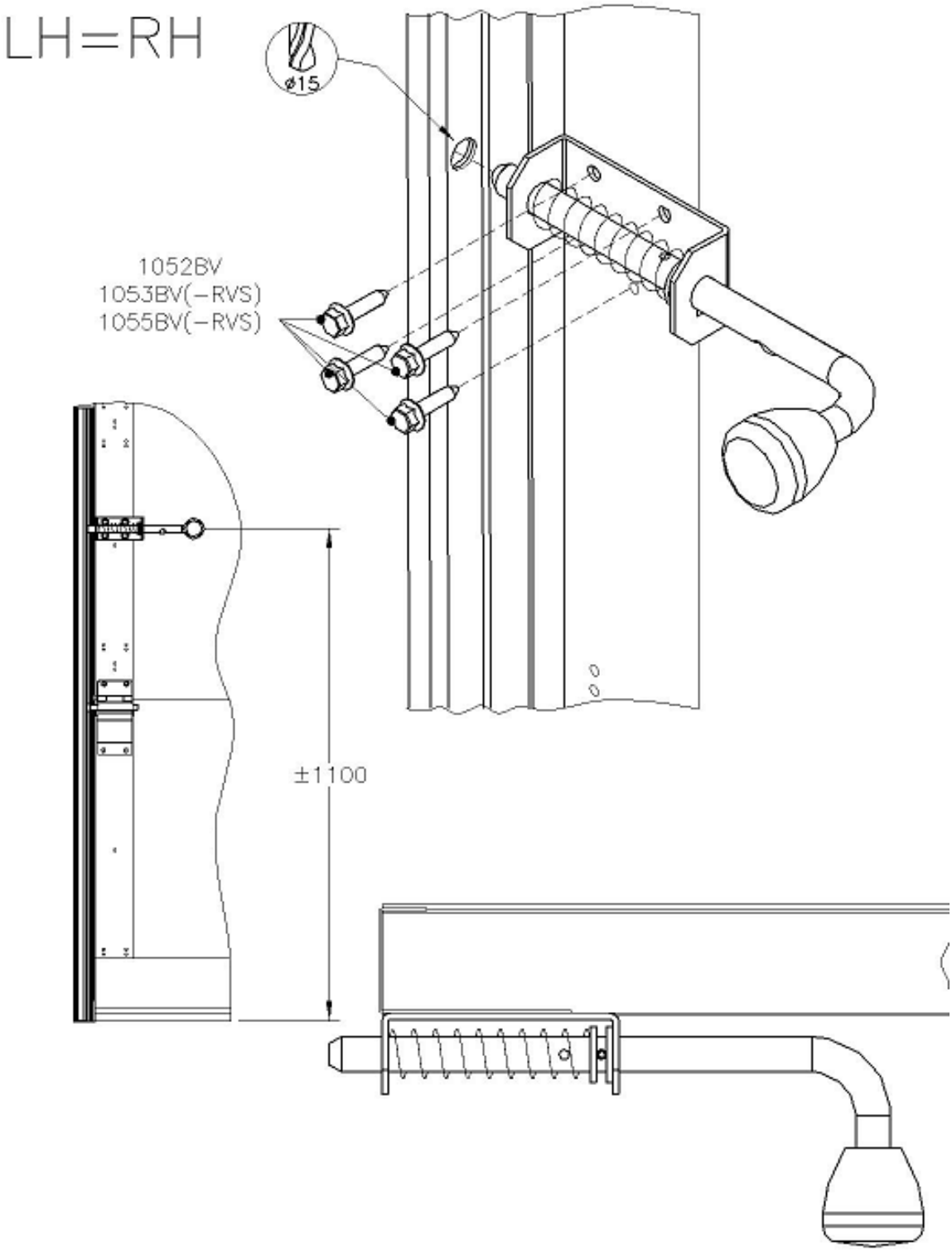


629VER

630D

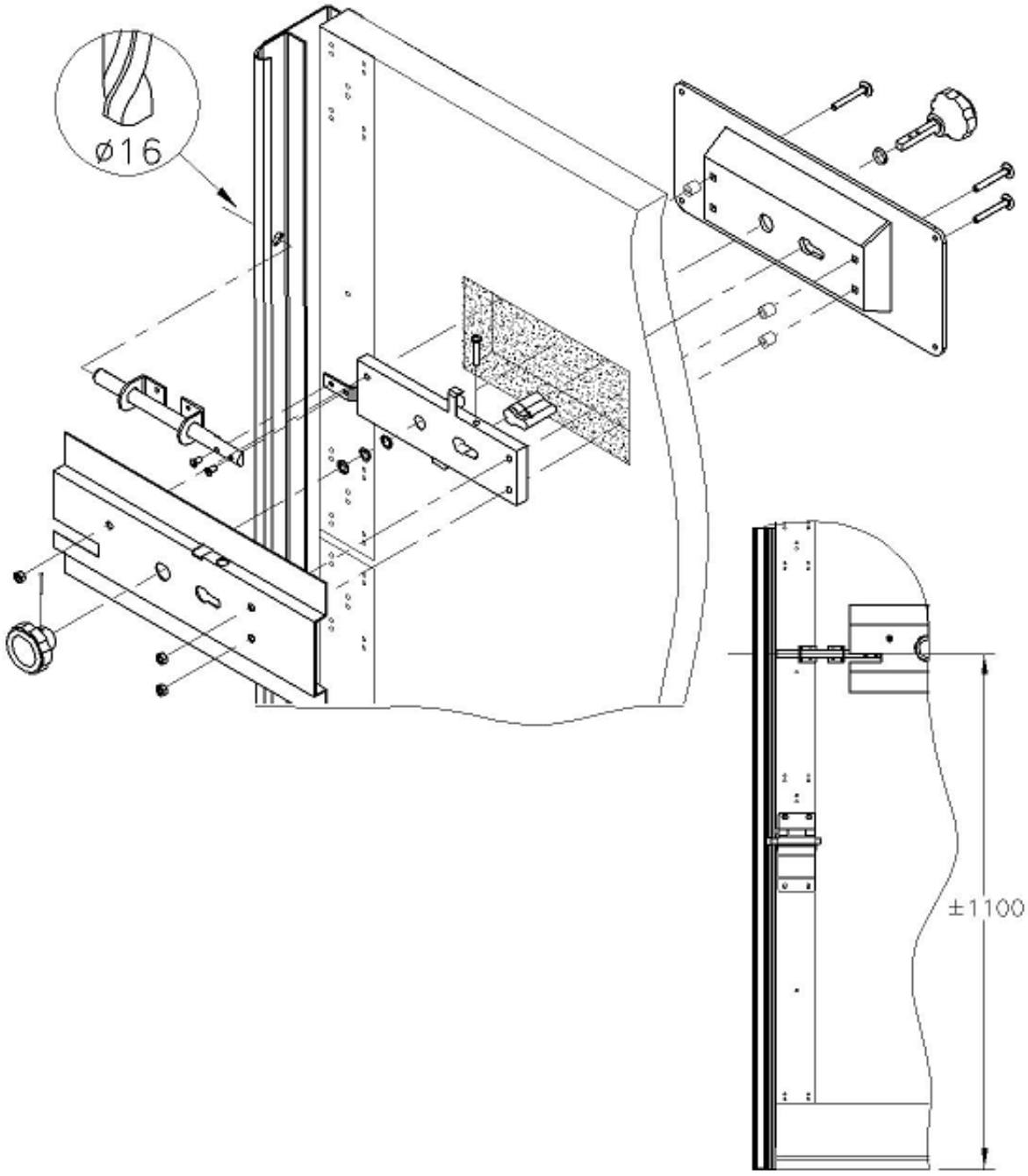


632

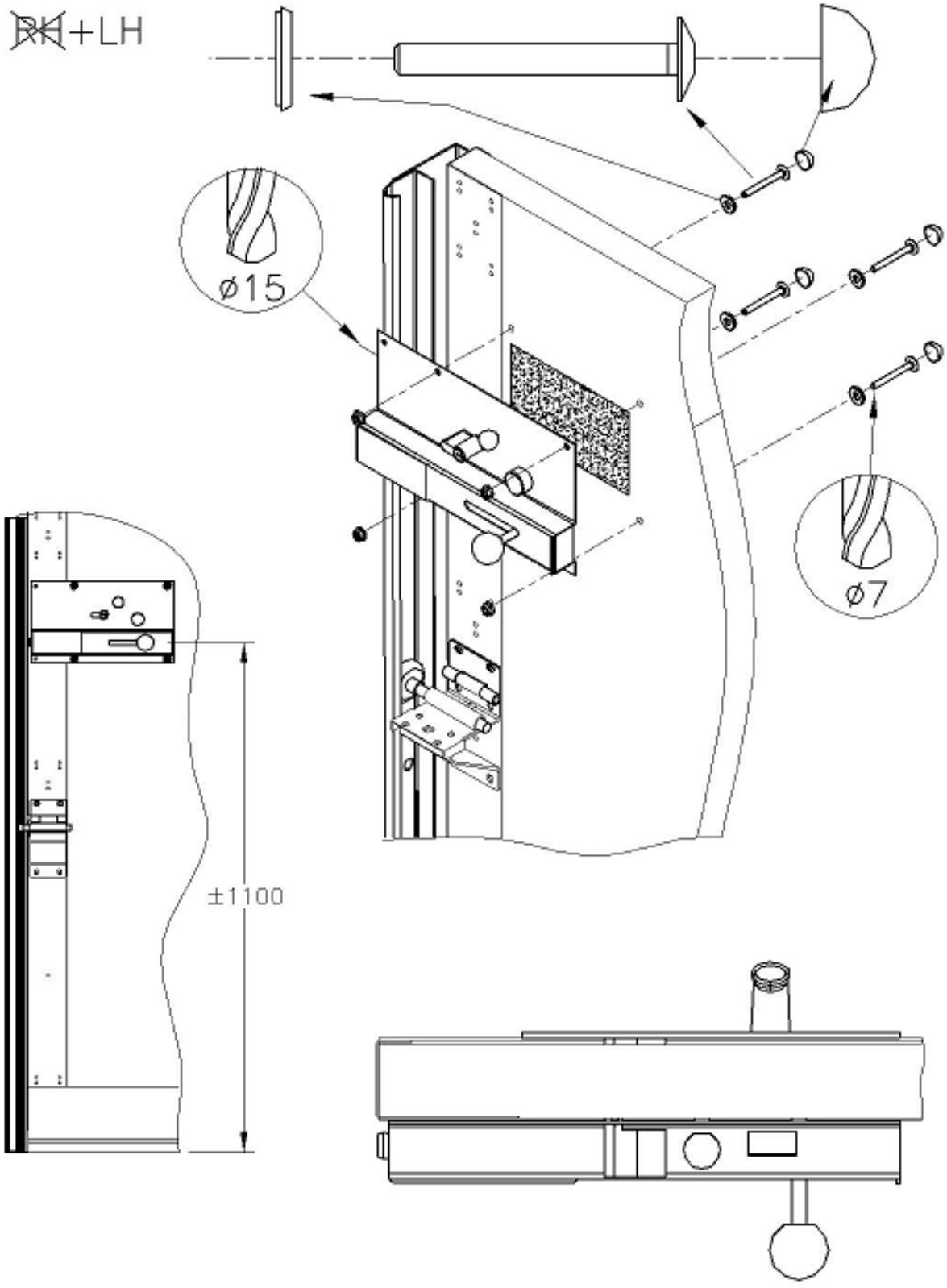


635

~~RH~~+LH

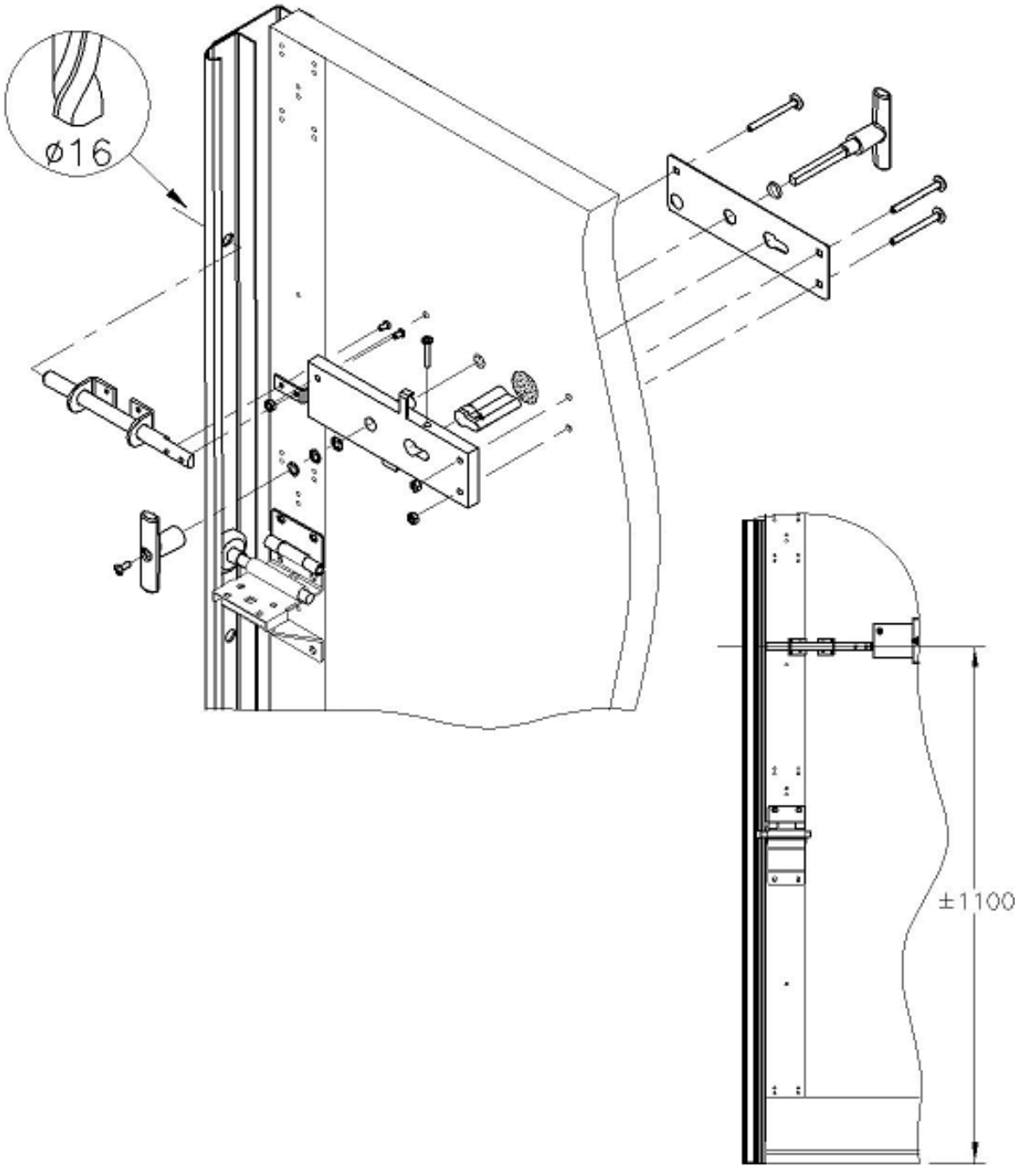


637-40/50

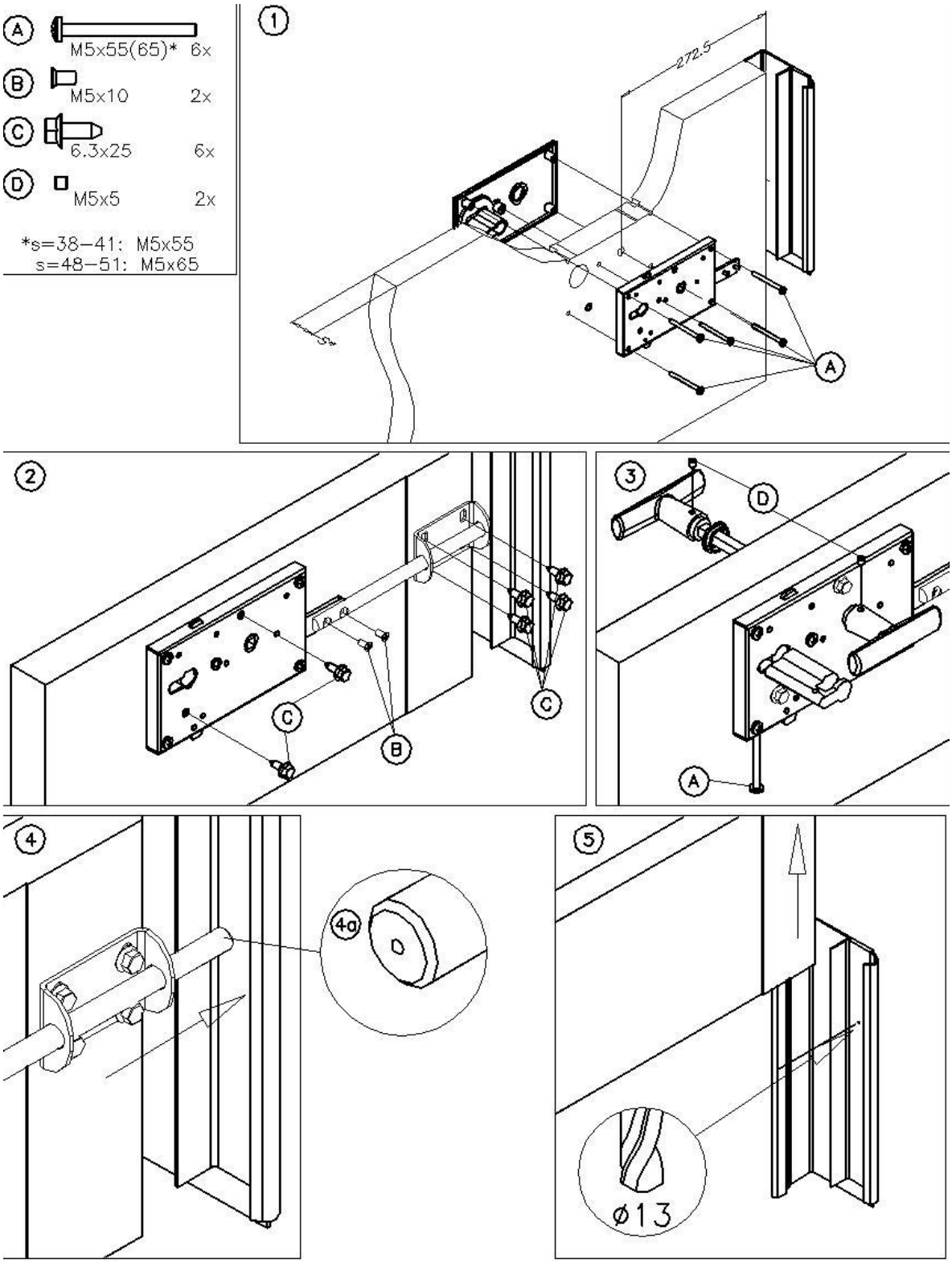


638-40/56

~~RH~~+LH

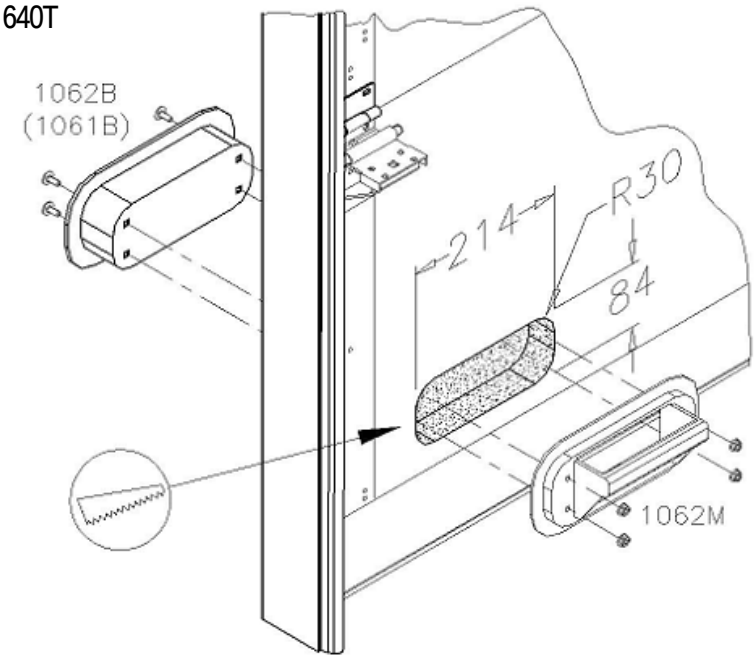


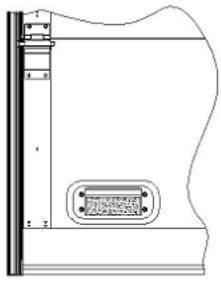
668-40BL


A M5x55(65)* 6x
B M5x10 2x
C 6.3x25 6x
D M5x5 2x
*s=38–41: M5x55
s=48–51: M5x65
1
272.5
A
2
C
B
C
3
D
A
4
4a
D
5
ø13

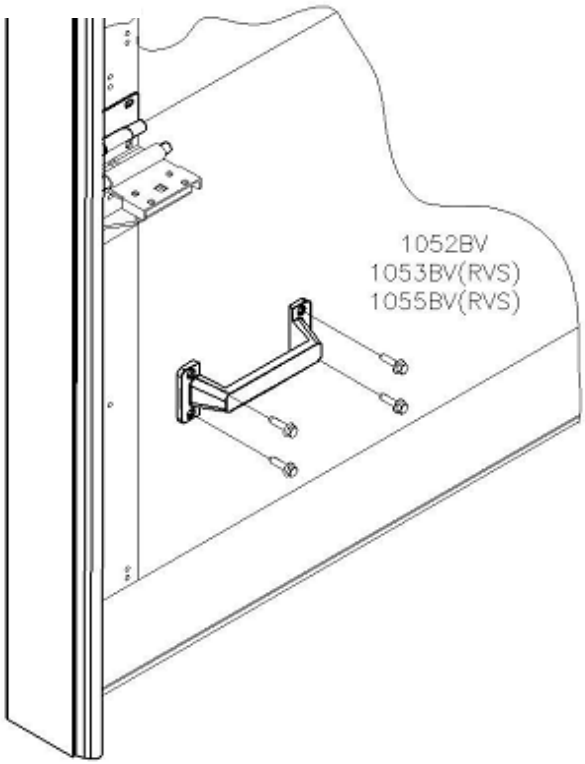
9. GRIPS

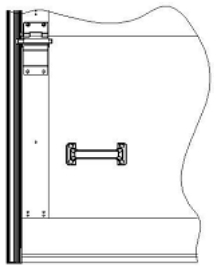
640T





634





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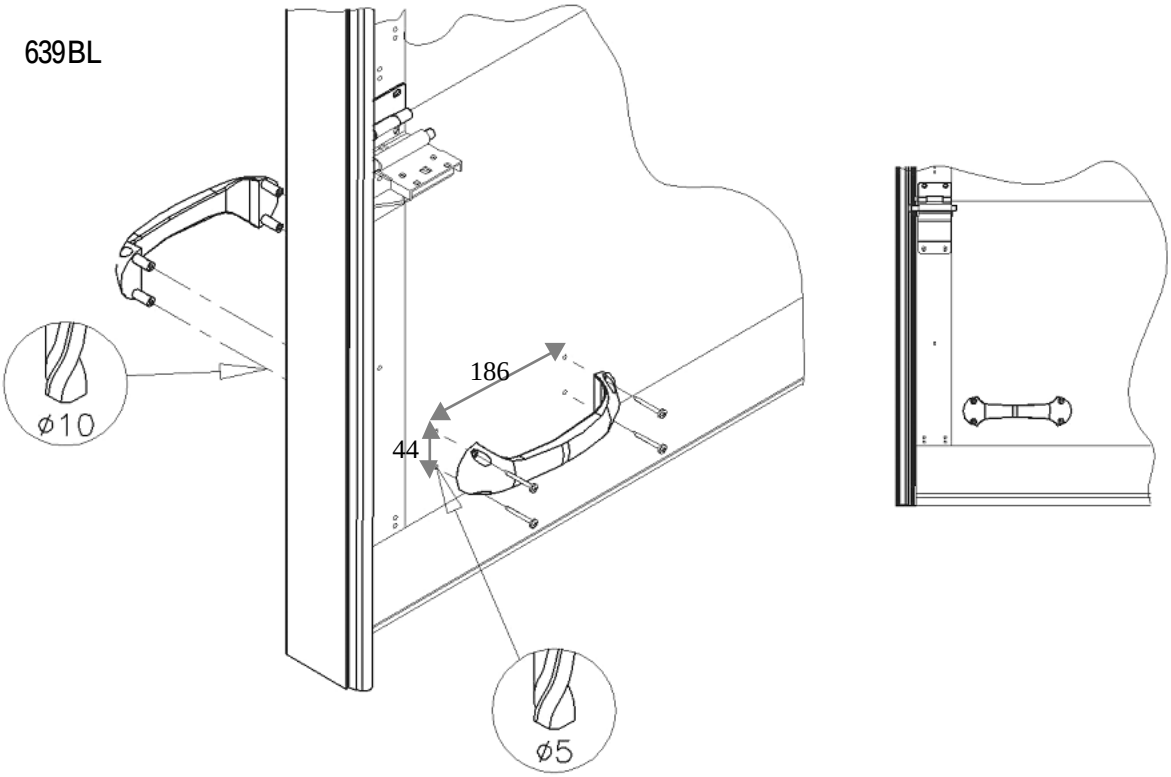

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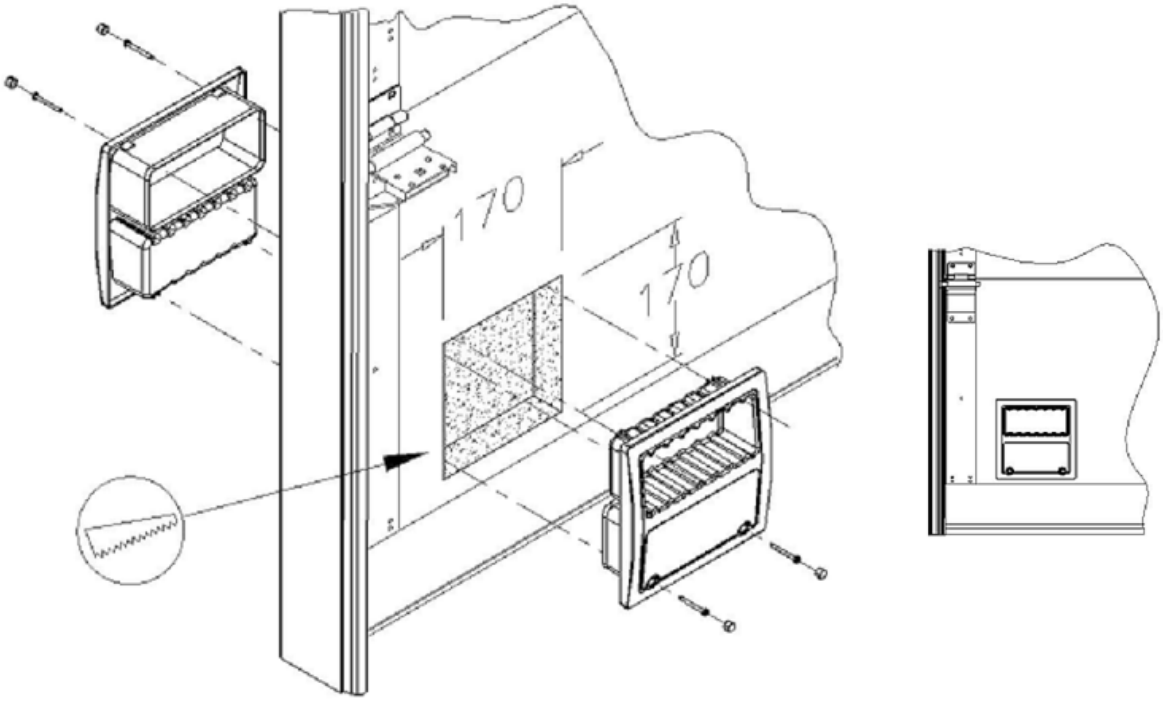


10 BOTTOM CONSOLES AND VERTICAL TRACK SET

10.1 Vertical track set

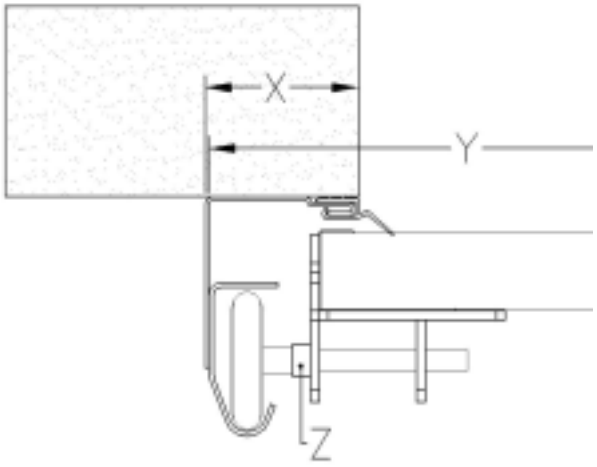
The distance between the vertical angles is determined by the type of bottom console or cable break safety device.

Basic criteria for application of the table below:

1) panel width=Clear width+45mm
2) oscillation 10mm.

The latter is the free lateral movement that a door panel is able to make between the vertical tracks, required for smooth operation without too much friction.

	2"		3"	
Type	X	Z	X	Z
	(mm)	Fill with spacer bush		Fill with pacer bush
425HD	75	2066-10 (10mm)	87	2066-05 (5mm)
427SX	70	2066-10 (10mm)		
427S-RVS	71	2066-10 (10mm)		
428TAI	71			
429	64			
430HD	65	-	87	2066-05 (5mm)
432	64			
437	64			
437VERS	64			
437RVS	64	2066-05 (5mm)		
440-600	74			
440-REGL	76			
440-HD	74			
440-3"	-	-	92	-



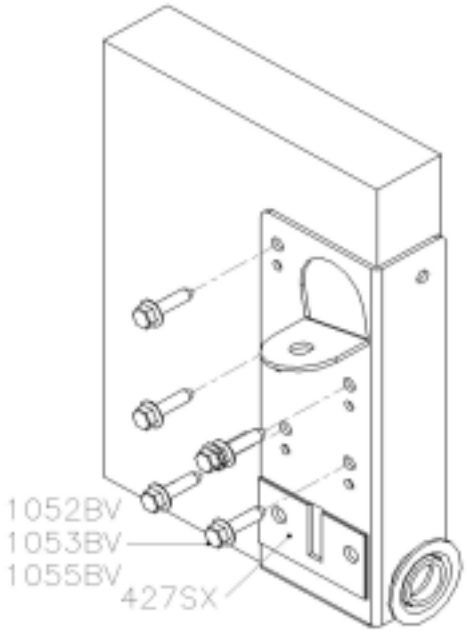
10.2 Bottom console 427SX

The bottom console 427SX consists of the following parts:

- Console 427SX
- Self-tapping screws -
- Bearing roller holder 447Z
- Spacer bush 10mm 2066-10
- Eye bolt (with cable) 427OOG/1050B
- Flanged nut M10 1058F

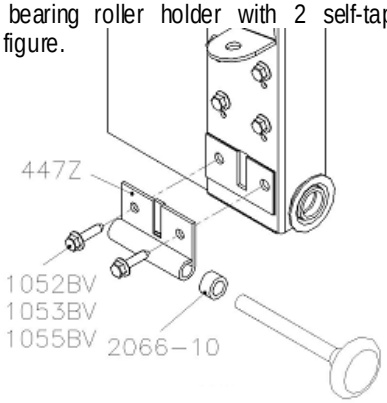
Order of assembly

Position the bottom console on the panel such that the side and underside are flush with the panel. Secure the console with 5 self-tapping screws. See figure.



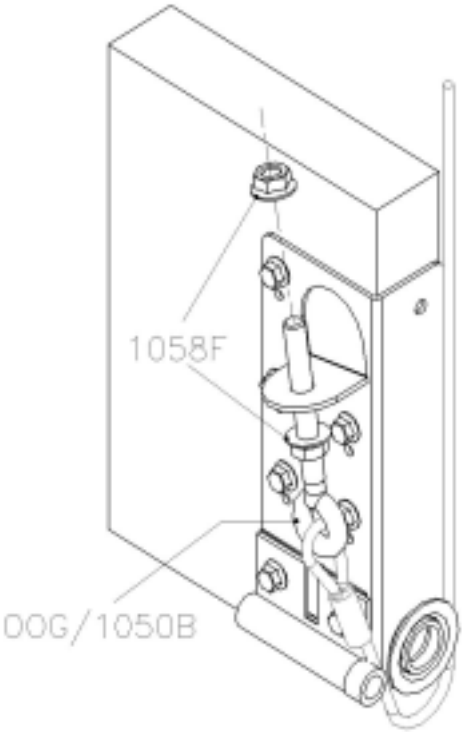
Fit the spacer bush to the bearing roller. Fit the bearing roller holder to the spindle of the bearing roller. Place the bearing roller with spacer bush and bearing roller holder in the vertical guide tracks at the level of the console. Secure the bearing roller holder with 2 self-tapping screws. See figure.

.



The cable is secured to the console with an eyebolt. First tighten as far as possible an M10 flanged nut on the eye bolt. Guide the cable around the reverse pulley of the console, insert the eyebolt from below through the console and tighten the 2nd nut on the eyebolt. See figure.

To prevent the console distorting or breaking, the cable may only be set looser (adjust eye downwards).



10.3 428TAI bodemconsole

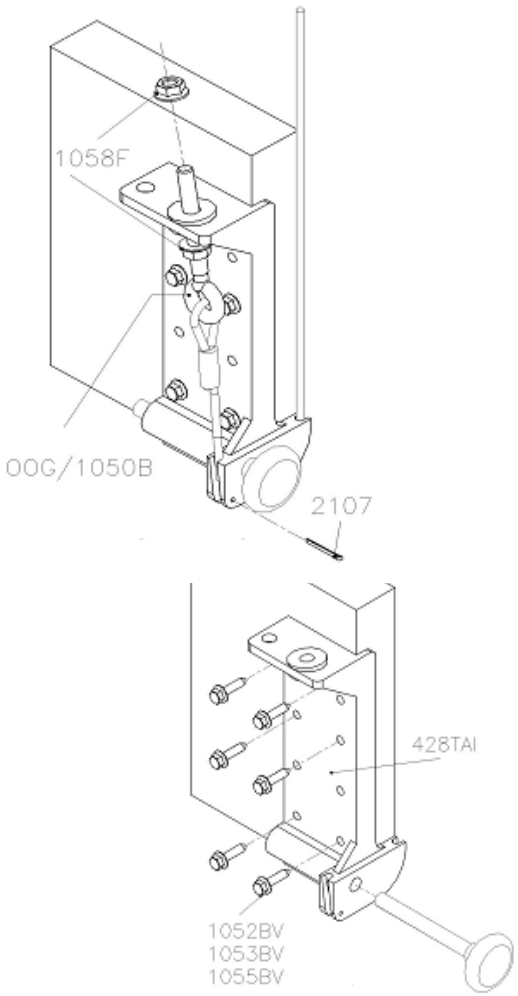
Bottom console 428TAI consists of the following parts:

- Console 428TAI
- Self-tapping screws -
- Eye bolt (with cable) 427OOG/1050B
- Flanged nut M10 1058F
- Split pin 2107

Order of assembly

Insert the bearing roller into the bottom console and "turn" this in the vertical guide tracks. One of the two bottom consoles may be fitted beforehand to the panel. Position the bottom console on the panel such that the side and underside are flush with the panel. Secure the console with 6 self-tapping screws. See figure.

The cable is secured to the console with an eyebolt. First tighten as far as possible an M10 flanged nut on the eye



bolt. Guide the cable around the reverse pulley of the console, insert the eyebolt from below through the console and tighten the 2nd nut on the eyebolt. Now insert the split pin as per drawing into the aperture designed for that purpose and bend its ends out. The aperture next to the eyebolt serves to secure when required a cord for manual operation. See figure.

To prevent the console distorting or breaking, the cable may only be set looser (adjust eye downwards).

10.4 429 Bottom console

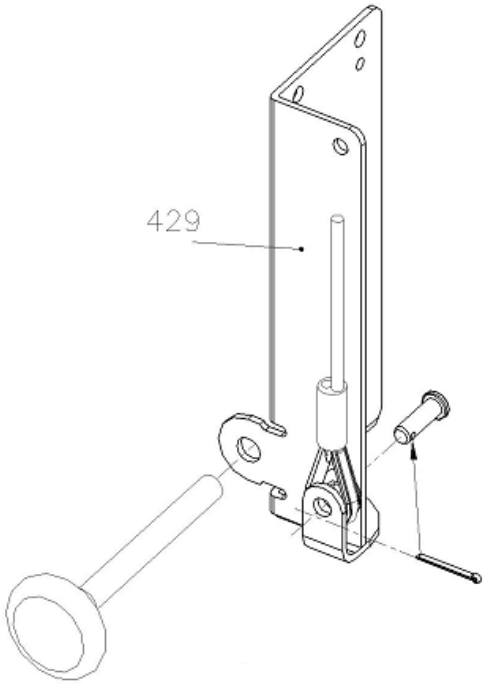
Bottom console 429 consists of the following parts:

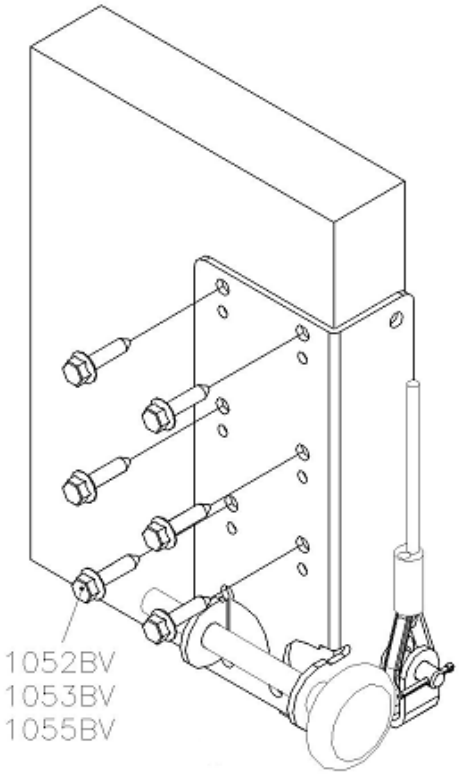
- Console 429
- Self-tapping screws -
- Split pin -
- Pin -

Order of assembly

Secure the cable to the console by inserting the pin from the interior through the console and the loop in the cable. Secure the pin with the split pin and bend the extremities of the split pin out. Insert the bearing roller in the bottom console. See figure.

Now "rotate" the bearing roller with console in the vertical guide tracks. One of the two bottom consoles may be fitted beforehand on the panel.
Position the bottom console on the panel such that the side and underside are flush with the panel. Secure the console with 6 self-tapping screws. See figure.





10.5 432 Bottom console

Bottom console 432 consists of the following parts:

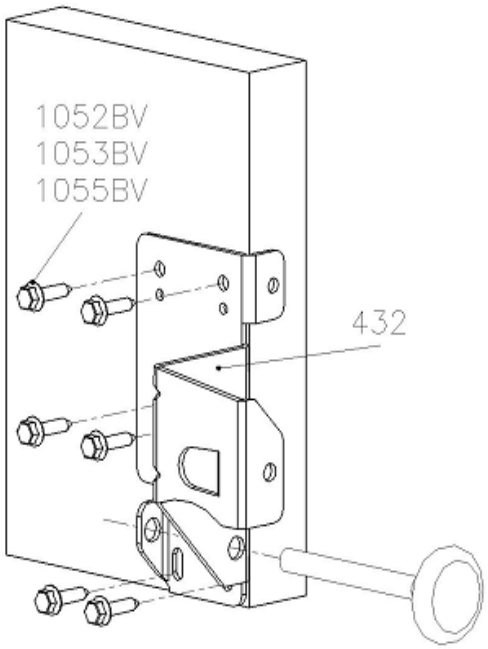
- Console 432
- Self-tapping screws -
- Split pin -
- Pin -

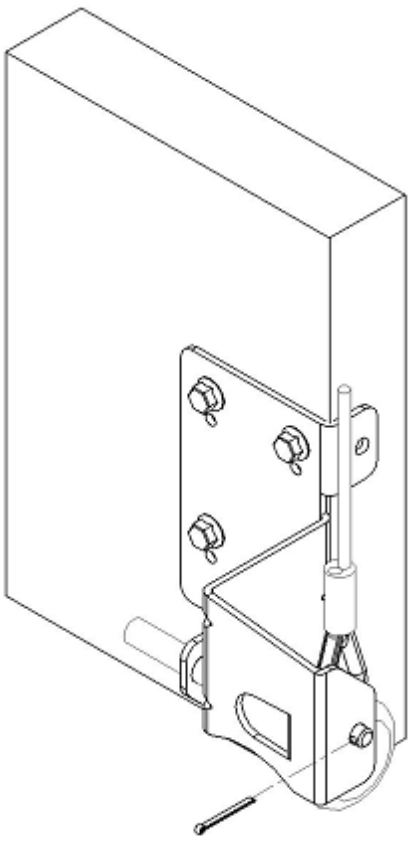
Order of assembly

Insert the bearing roller into the bottom console. "Rotate" the bearing roller with console in the vertical guide tracks. One of the two bottom consoles may be fitted beforehand on the panel.

Position the bottom console on the panel such that the side is flush with the panel. The underside of the console should be level with the underside of the panel. Secure the console with 6 self-tapping screws. See figure.

Secure the cable to the console by inserting the pin through the console and the loop in the cable. Secure the pin with the split pin and bend the extremities of the split pin out. See figure.





10.6a 437 bottom console + 437VERS

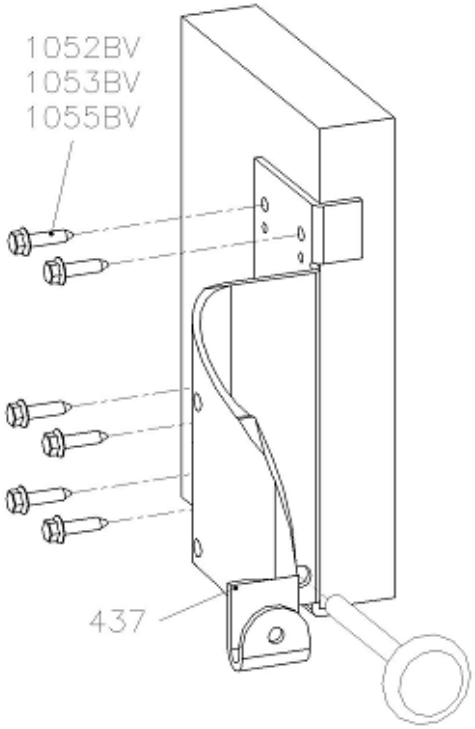
Bottom console 437 consists of the following parts:

- Console 437
- Self-tapping screws -
- Split pin 2107
- Pin 1042

Order of assembly

Insert the bearing roller into the bottom console. "Rotate" the bearing roller with console in the vertical guide tracks. One of the two bottom consoles may be fitted beforehand on the panel. Position the bottom console on the panel such that the side and underside are flush with the panel. Secure the console with 6 self-tapping screws. See figure.

Secure the cable to the console by inserting the pin through the console and the loop in the cable. Secure the pin with the split pin and bend the extremities of the split pin out. See figure.



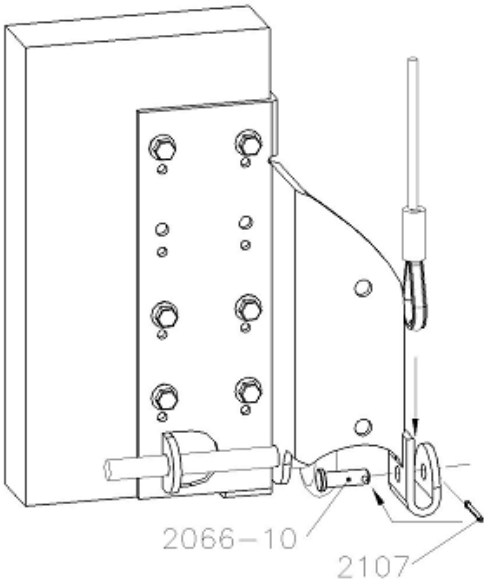
10.6b 10.6b 437VERS + 437 bottom console

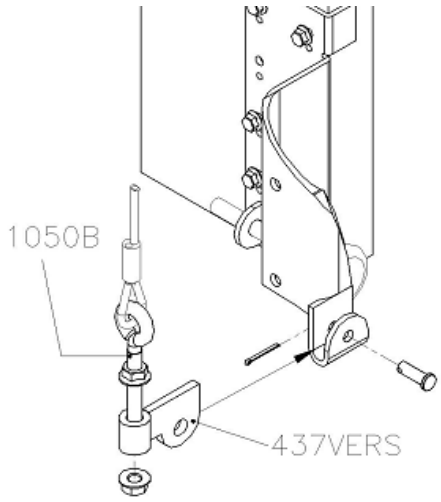
The cable adjustment bracket 437VERS consists of the following parts:

- Bracket 437VERS
- Eyebolt M10 1050B
- Nuts M10 1058F

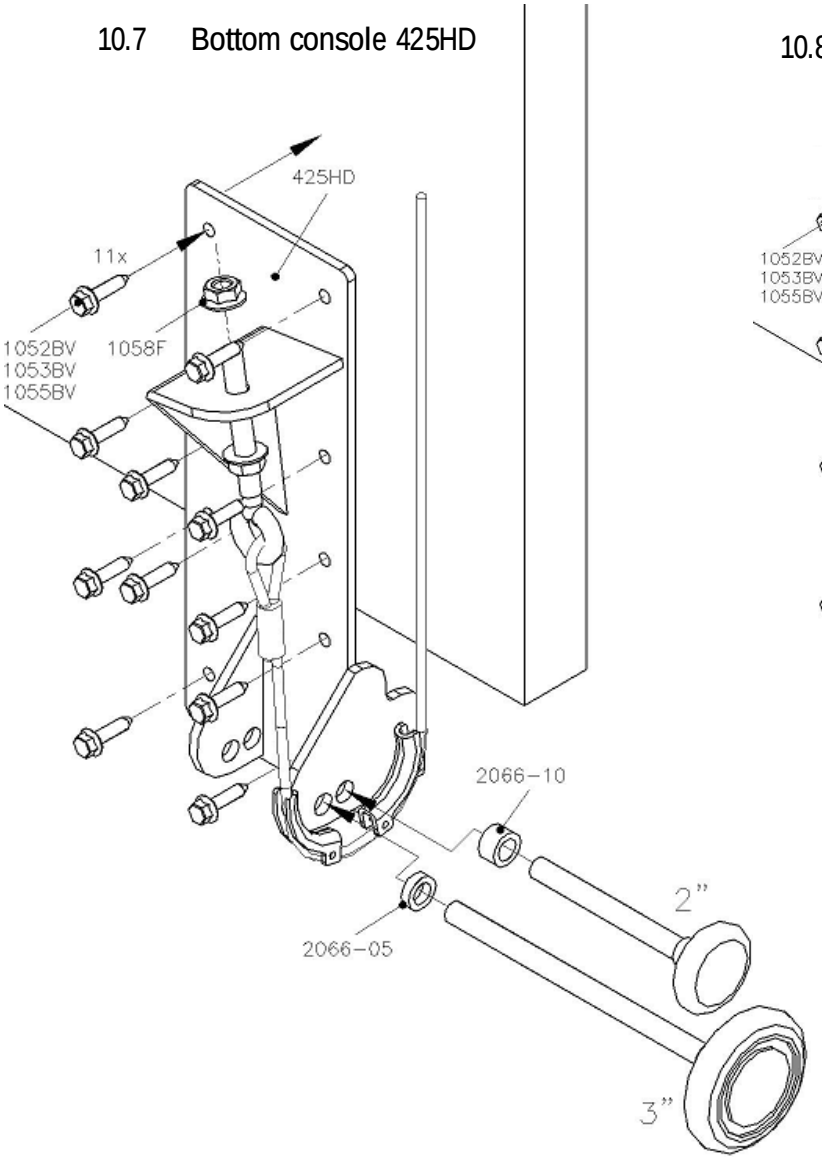
Order of assembly

Secure the bracket to the console by inserting the pin through the console and the aperture of the bracket. Secure the pin with the split pin and bend the extremities of the split pin out. The cable should be secured to the bracket with an eyebolt. First tighten an M10 flanged nut as far as possible on the eyebolt. Insert the eyebolt from above through the bracket and tighten the 2nd nut on the eyebolt. See figure.

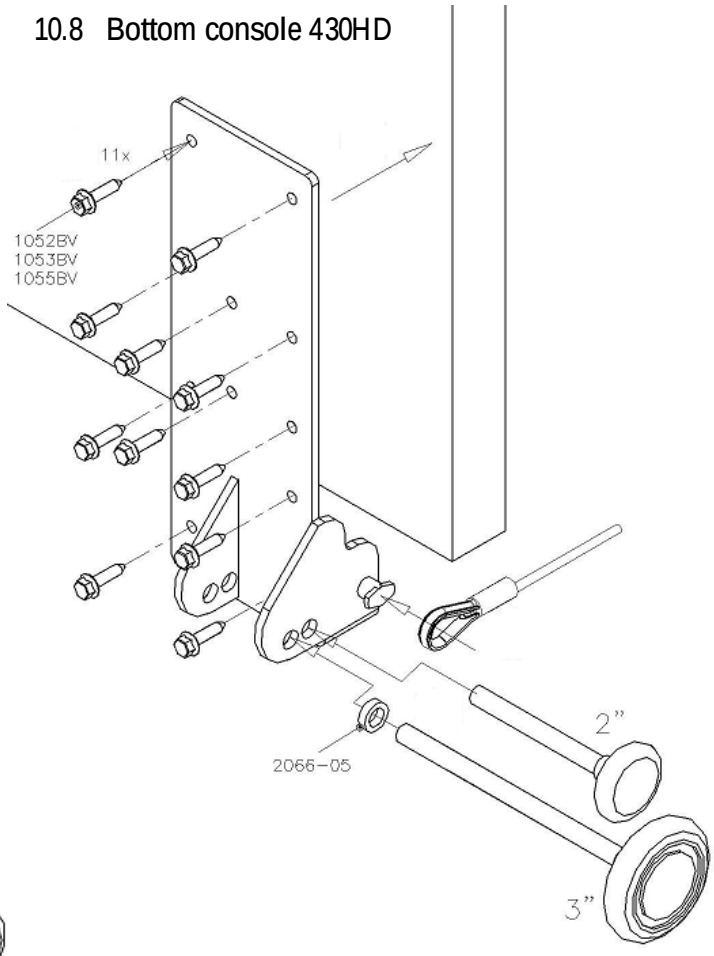




10.7 Bottom console 425HD



10.8 Bottom console 430HD



10.8 440-600 Cable break device

The cable break device (CBD) 440-600 consists of the following parts:

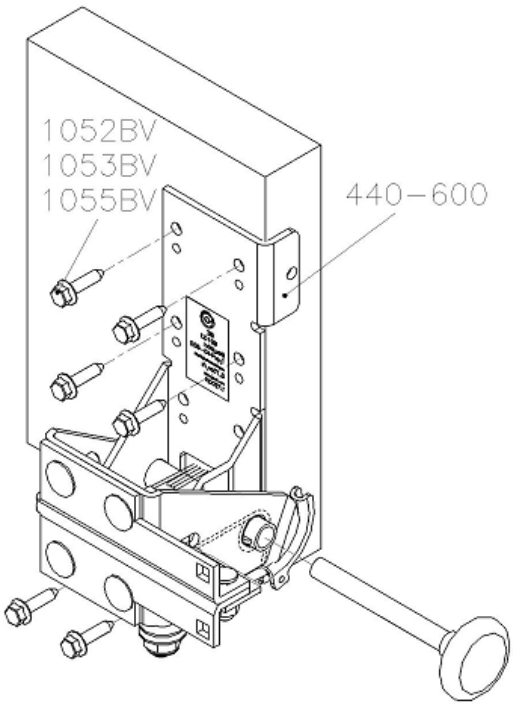
- CBD 440-600
- Self-tapping screws -

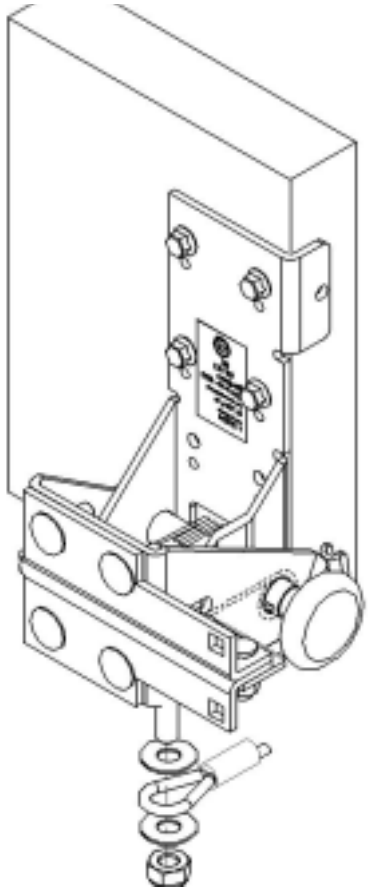
See for area of application and other information also our separate handbook CBD, download from www.flexiforce.com.

Order of assembly

Move the hinged section of the CBD against the spring resistance and insert a locking pin in the aperture through which this is fixed relative to the base plate.
Insert the bearing roller in the CBD and 'rotate" this in the vertical guide tracks. One of the two bottom consoles may be fitted beforehand on the panel. Position the CBD on the panel such that the side and underside are flush with the panel. Secure the CBD with 6 self-tapping screws. See figure.

Secure the cable to the CBD by placing one after the other a ring, the cable eye and once more a ring on the screw thread and securing it with the self-locking nut. See figure.
The cable can be secured to the cable duct by squeezing together the lips of the cable duct.





When the cable is secured with a split pin (not supplied) make sure that the operation of the safety device is not impeded.
REMOVE THE LOCKING PIN FITTED! !

10.9 Cable break device 440-600 icm. 441HBR en 441BR-2HD

See also separate handbook CBD.

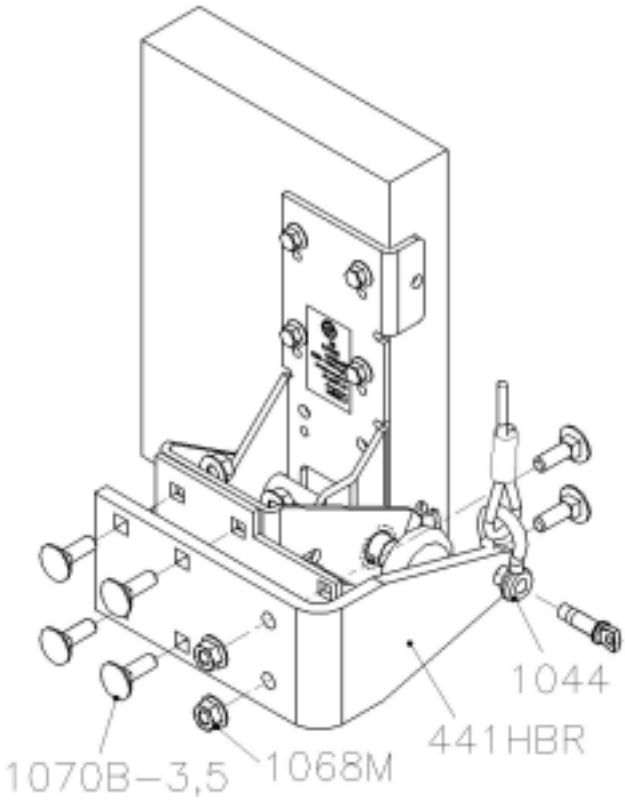
Assembly exterior bracket 441HBR

The exterior bracket 441HBR consists of the following parts:

- Exterior bracket 441HBR-INK
- Locking bolts M8x25 1070B-3.5
- Flanged nuts M8 1068M
- Clip 1044

Order of assembly

Remove the 4 locking bolts with which the angles are secured to the U-bracket. Mount the exterior bracket with these 4 bolts and with the two extra bolts to the console (see dwg.).
Then fit the cable to the bracket using the clip. See figure.



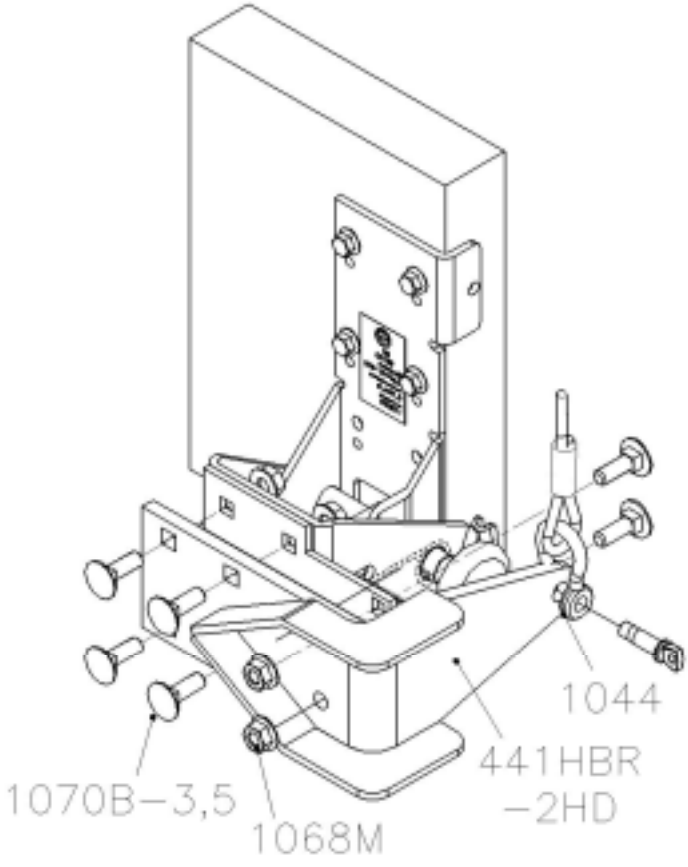
Assembly exterior bracket 441HBR-2HD

The exterior bracket 441HBR-2HD consists of the following parts:

- Exterior bracket 441HBR-2HD-INK
- Locking bolts M8x25 1070B-3.5
- Flanged nuts M8 1068M
- Clip 1044

Order of assembly

The assembly procedure is the same as for exterior bracket 441HBR. See figure.



10.10 Cable break device 440REGL

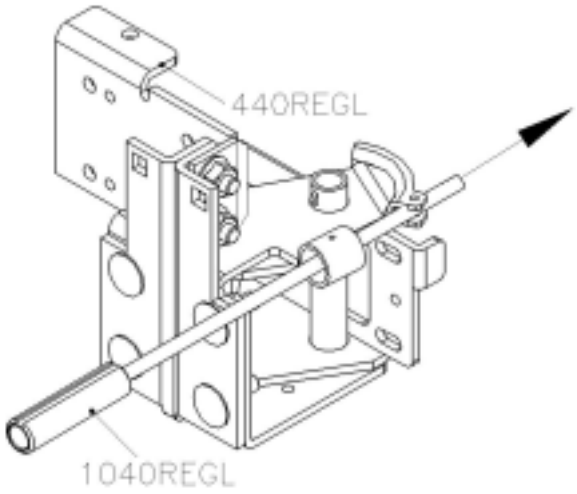
Cable break device (CBD) 440REGL consists of the following parts:

- CBD 440REGL
- Nut M16 1040M
- Hollow adjustment bolt 1040REGL
- Self-tapping screws -

See also separate handbook CBD.

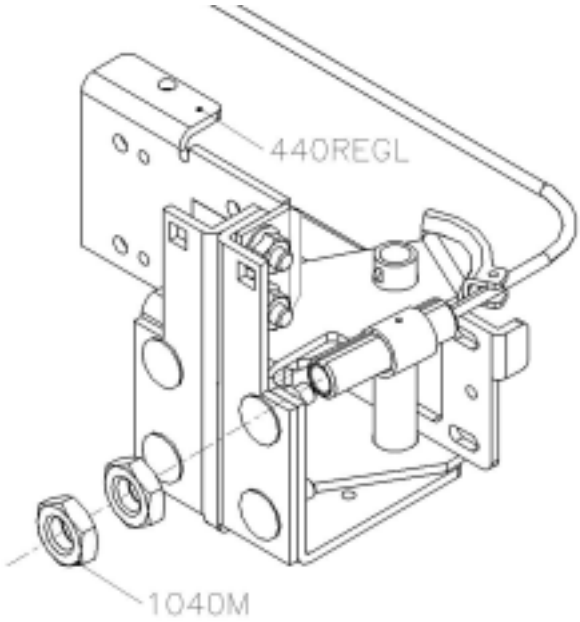
Order of assembly

Remove the M16 nuts from the hollow adjustment bolt. Insert the cable through the largest aperture of the adjustment bolt so that the end pressure clamps of the cable disappear into the hollow adjustment bolt=supplied this way as standard. See figure.



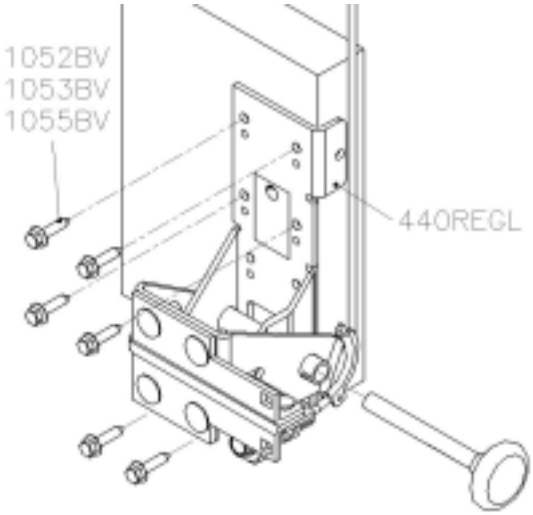
Insert the adjustment bolt with the cable through the bush on the CBD. Tighten both nuts on the adjustment bolt. See figure. When the cable has been finally set the 2nd nut should be secured as locking nut.

Move the hinged section of the CBD against the spring resistance and insert a locking pin in the aperture through which this is fixed relative to the base plate.
Insert the bearing roller in the CBD and 'rotate" this in the vertical guide tracks. Position the CBD on the panel such that the side and underside are flush with the panel.
Secure the CBD with 6 self-tapping screws. See figure.



The cable can be secured to the cable duct by squeezing together the lips of the cable duct.

When the cable is secured with a split pin (not supplied) make sure that the operation of the safety device is not impeded.
REMOVE THE LOCKING PIN FITTED!
In order to prevent deformation or breaking of the cable, the cable may only be set more loose !!



10.11 440REGL cable break device with 441HBR-REGL

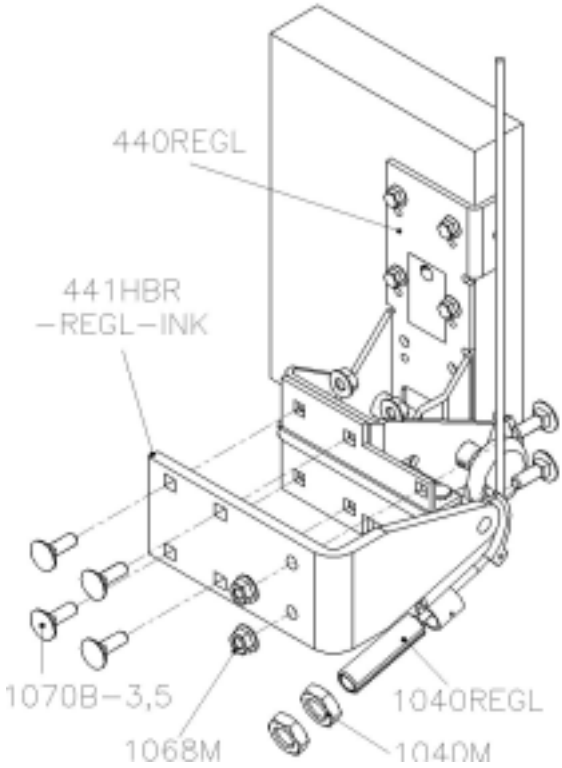
Exterior bracket 441HBR-REGL consists of the following parts:

- Exterior bracket 441HBR-REGL-INK
- Locking bolts M8x25 1070B-3.5
- Flanged nuts M8 1068M
- Nut M16 1040M
- Hollow adjustment bolt 1040REGL

See also separate handbook CBD.

Order of assembly

Remove the 4 locking bolts that secure the angles to the U-bracket. Fit the exterior bracket to the CBD with these 4 bolts and the two extra bolts. See figure.
Then fit the cable to the bracket as specified for 440REGL.



When the cable is secured with a split pin (not supplied) make sure that the operation of the safetydevice is not impeded.
REMOVE THE LOCKING PIN FITTED!
In order to prevent deformation or breaking of the cable, the cable may only be set more loose !!

10.12 440-HD cable break device

Cable break device (CBD) 440-HD consists of the following parts:

- CBD 440HD
- Self-tapping screws -

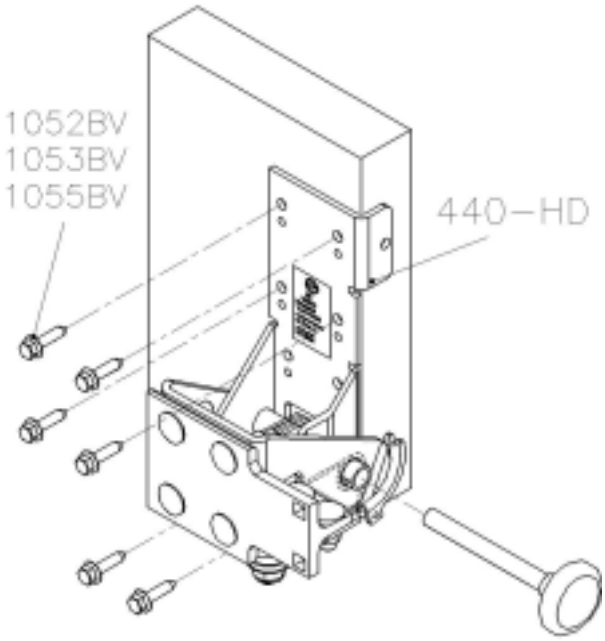
See also separate handbook CBD.

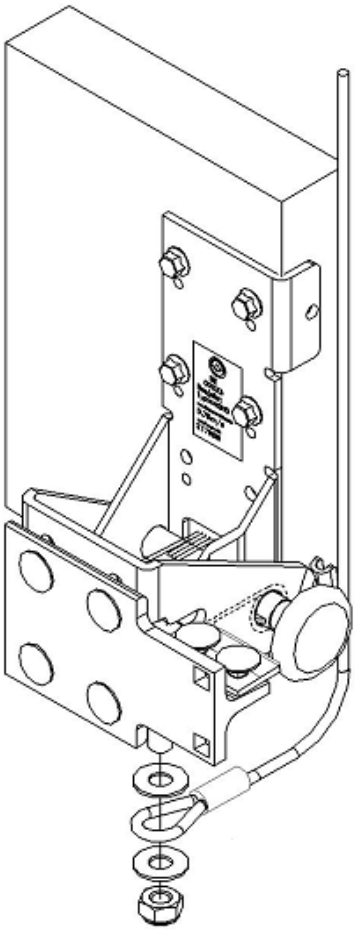
Order of assembly

Move the hinged section of the CBD against the spring resistance and insert a locking pin in the aperture through which this is fixed relative to the base plate.
Insert the bearing roller in the CBD and 'rotate" this in the vertical guide tracks. Position the CBD on the panel such that the side and underside are flush with the panel.
Secure the CBD with 6 self-tapping screws. See figure.

Secure the cable to the CBD by successively placing a ring, the cable eye and again a ring on the screw thread and to lock them with a self-locking nut. See figure.

The cable can be secured to the cable duct by squeezing together the lips of the cable duct.





When the cable is secured with a split pin (not supplied) make sure that the operation of the safetydevice is not impeded.
REMOVE THE LOCKING PIN FITTED!
In order to prevent deformation or breaking of the cable, the cable may only be set more loose !!

10.12 440-3" Cable break device

Cable break device (CBD) 440-3" consists of the following parts:

- CBD 440-3"
- Self-tapping screws -

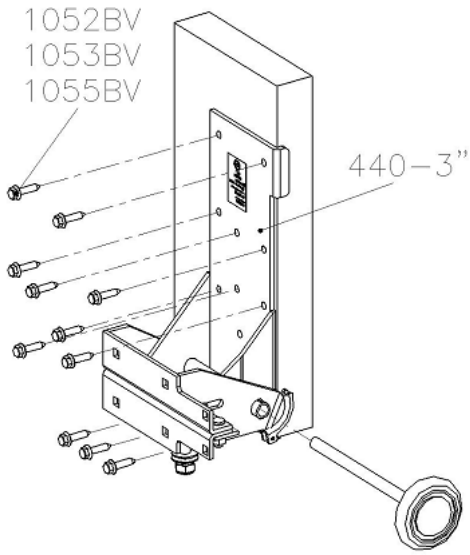
See also separate handbook CBD.

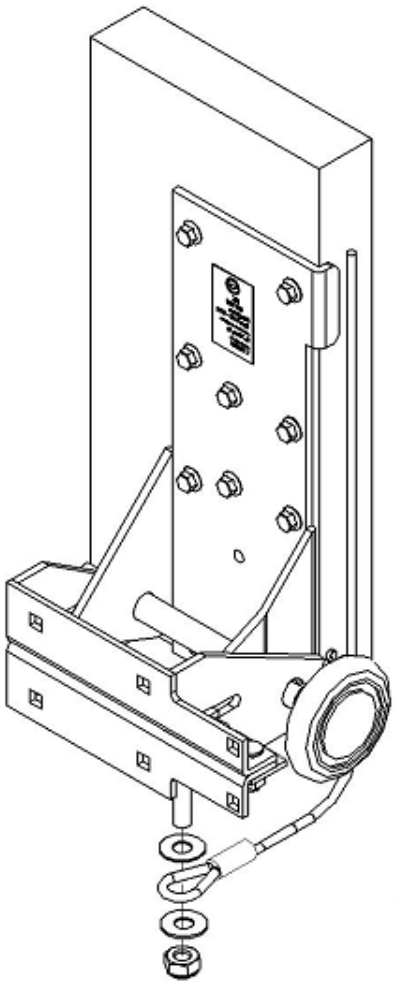
Order of assembly

Move the hinged section of the CBD against the spring resistance and insert a locking pin in the aperture through which this is fixed relative to the base plate.
Insert the bearing roller in the CBD and 'rotate" this in the vertical guide tracks. Position the CBD on the panel such that the side and underside are flush with the panel. Secure the CBD with 11 self-tapping screws. See figure.

Secure the cable to the CBD by successively placing a ring, the cable eye and again a ring on the screw thread and to lock them with a self-locking nut. See figure.

The cable can be secured to the cable duct by squeezing together the lips of the cable duct.





Indien de kabel geborgt wordt met een splitpen (niet meegeleverd), dient men er zich van te overtuigen dat de werking van de beveiliging niet belemmerd wordt.

VERWIJDER DE GEPLAATSTE BORGPEN !

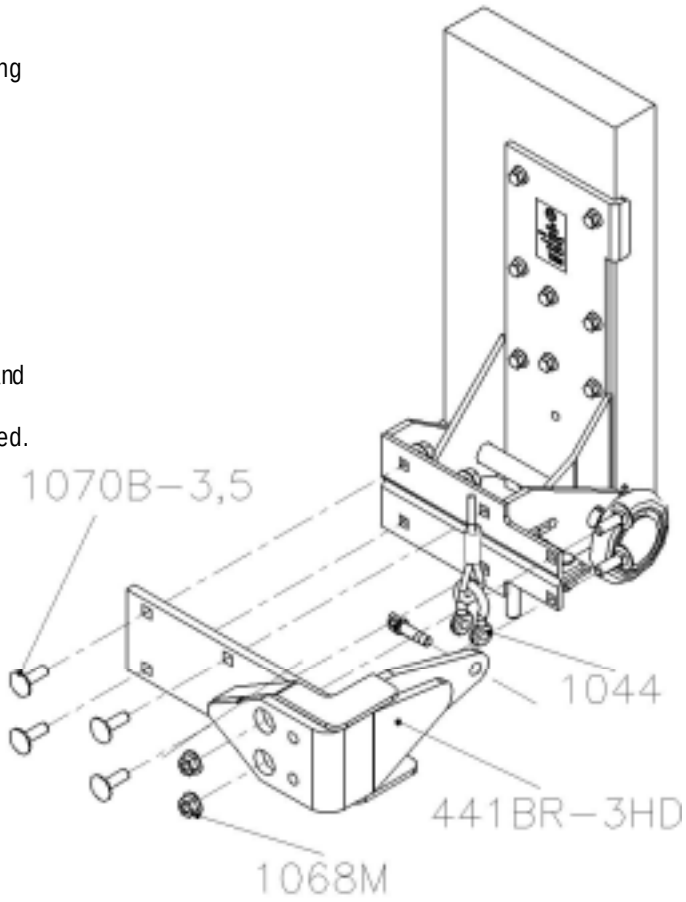
10.13 440-3" cable break device icm. 441BR-3HD

<u>Assembly exterior bracket</u>
Exterior bracket 441BR-3HD consists of the following parts:

- Exterior bracket 441BR-3HD-INK
- Locking bolts M8x25 1070B-3.5
- Flanged nuts M8 1068M
- Clip 1044

See also separate handbook CBD.

<u>Order of assembly</u>
Fit the exterior bracket to the console with 6 bolts and nuts. See figure.
Then fit the cable to the bracket with the clip supplied.



10.14 427S-RVS bottom console

Bottom console 427S-RVS consists of the following parts:

▪ Console RVS	427S-RVS
▪ Self-tapping screws	-
▪ Bearing roller holder	447-304
▪ Spacer bush 10mm	2066-10
▪ Eyebolt (with cable)	2530RVS
▪ Flanged nut M8	2535M-RVS

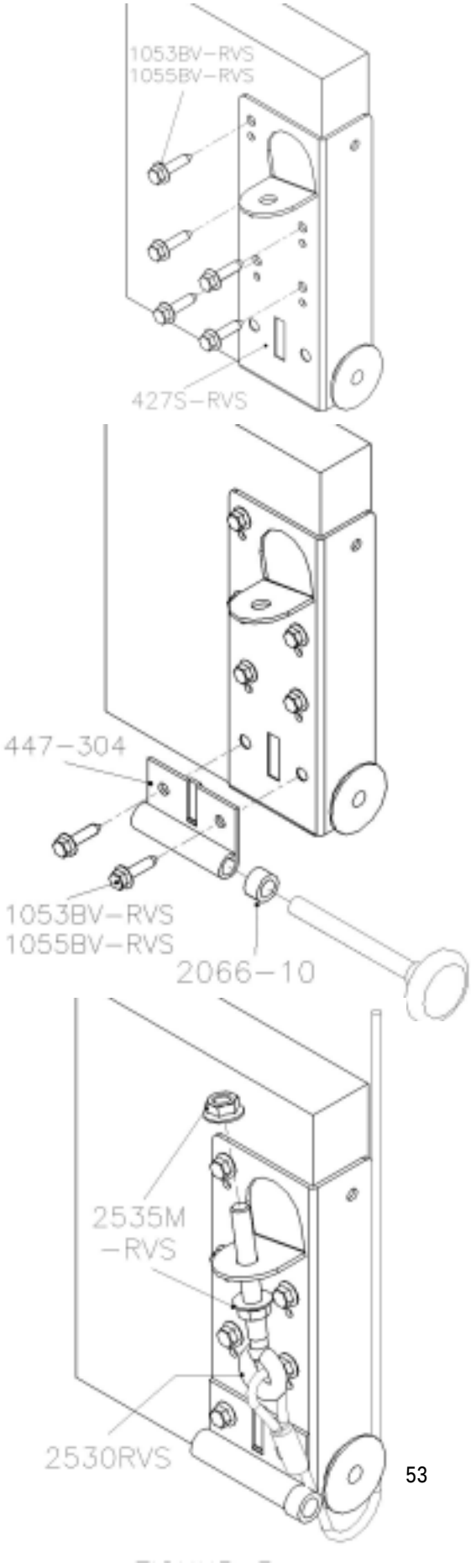
Order of assembly

Position the bottom console on the panel such that the side and underside are flush with the panel. Secure the console with 5 self-tapping screws. See figure.

Fit the spacer bush to the bearing roller. Fit the bearing roller holder to the spindle of the bearing roller. See figure 80. Place the bearing roller in the vertical guide tracks at the level of the console. Secure the bearing roller holder with 2 self-tapping screws.

The cable is secured to the console with an eyebolt. First tighten as far as possible an M8 flanged nut on the eye bolt. See figure.

Guide the cable around the reverse pulley of the console, insert the eyebolt from below through the console and tighten the 2nd nut on the eyebolt. See figure.



In order to prevent deformation or breaking of the cable, the cable may only be set more loose !!

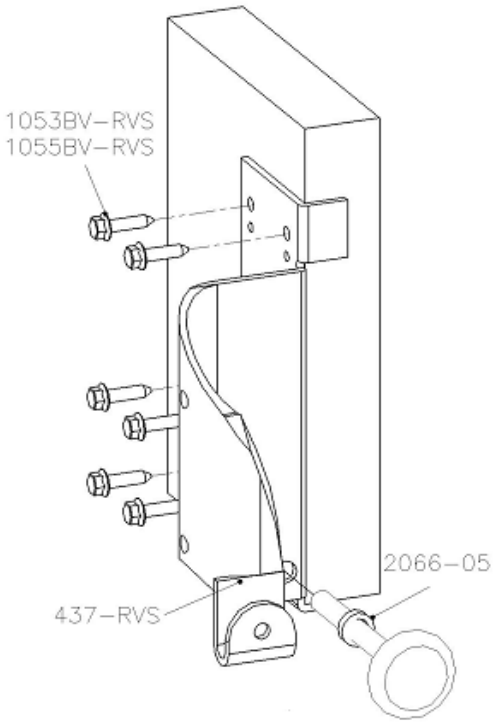
10.15 437RVS bottom console

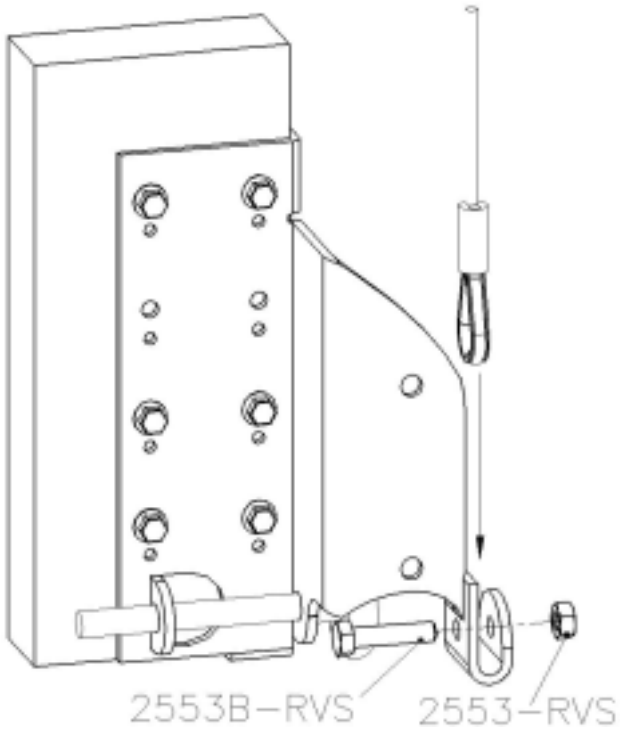
Bottom console 437RVS consists of the following parts:

- Console RVS 437-RVS
- Self-tapping screws RVS -
- Bolt M8x35 RVS 2535B-RVS
- Nut M8 RVS 2535M-RVS
- Spacer bush 2066-05

Order of assembly

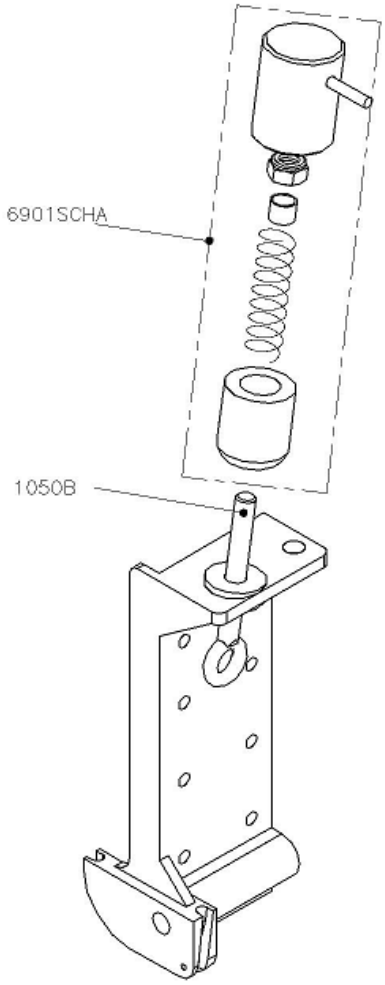
Place the spacer bush on the bearing roller. Insert the bearing roller into the bottom console.
"Rotate" the bearing roller with console in the vertical guide tracks.
Position the bottom console on the panel such that the side is flush with the panel. Secure the console with 6 self-tapping screws. See figure.
Secure the cable to the console by inserting the bolt M8x35 from within through the console and the loop in the cable. Then tighten the nut on the bolt. See figure.

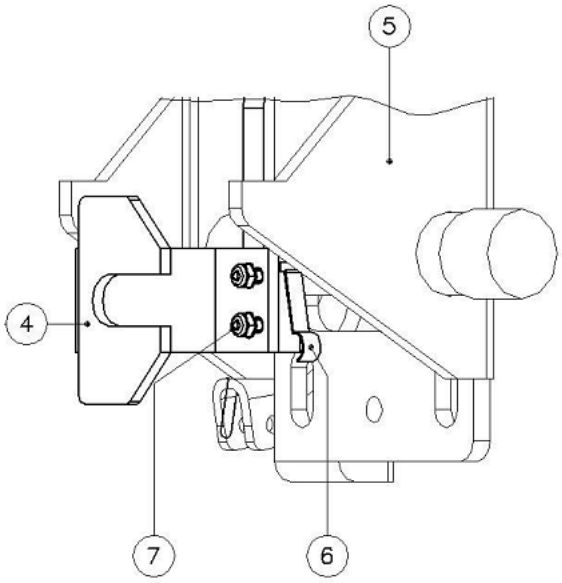




11. BOTTOM CONSOLE SWITCHES

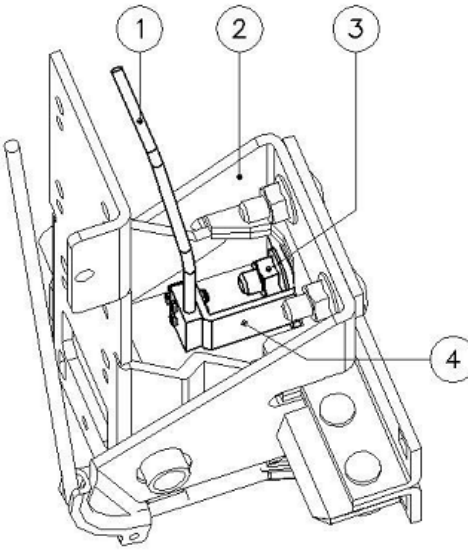
11.1 6901SCHA





11.2 440SWL/R

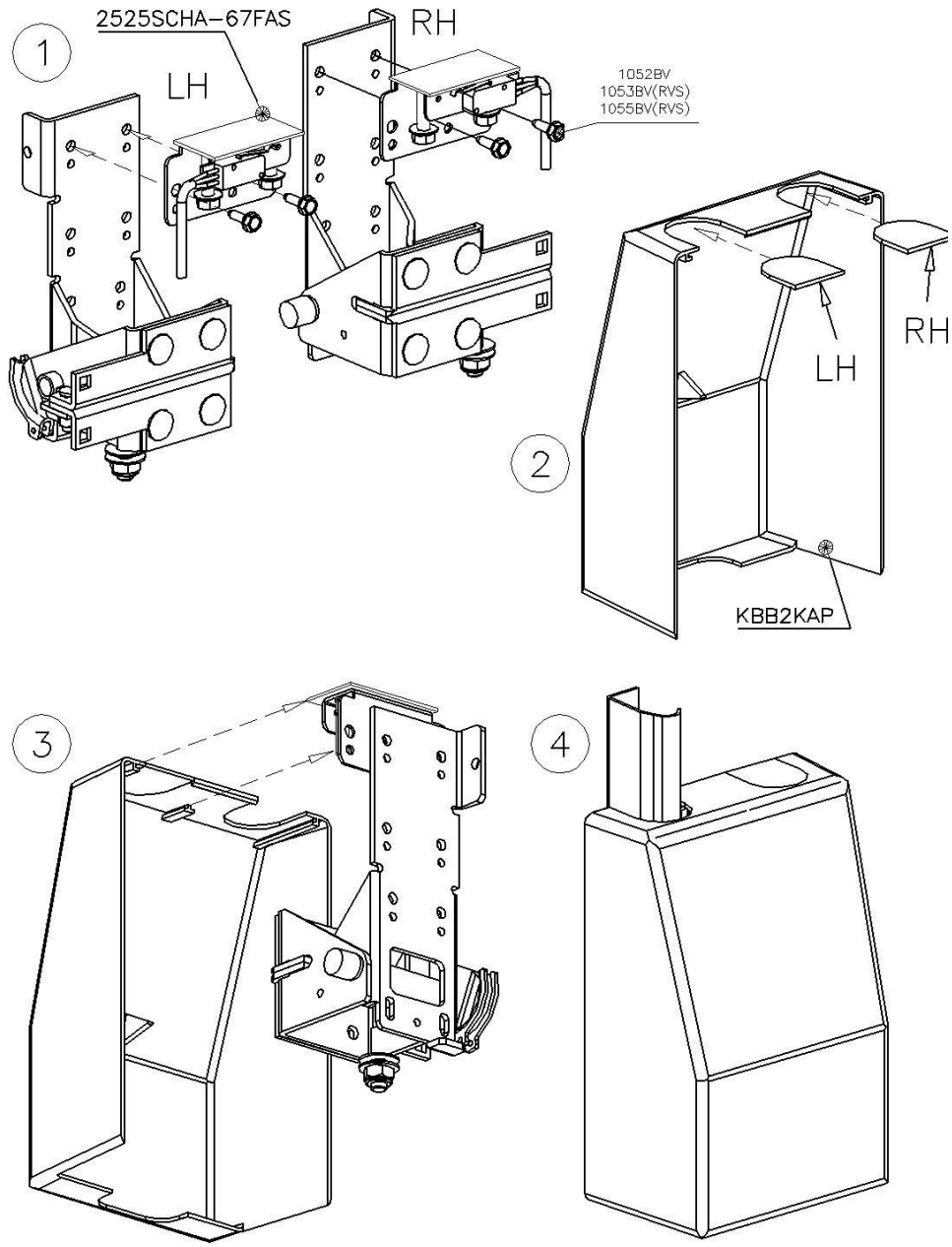
On electrically operated doors install a switch 440SW on both devices. Make sure that the Ubracket (5) activates the switch. The switch needs wiring to the operator in order to stop the operator when activated.



1) Release the nut (3) and shift the bracket (4) with the open slotted hole under the nut and then fixen the nut (handtight). The switch has to be mounted on the non-busted flange of the base plate. The wire (1) of the switch must point upwards.
2) Adjust the lip (6) of the switch in such a way that it is activated through turning the U-bracket (2) by contacting the flange 5) of the base plate. When using model 440-3" the switch first has to be slided in the slotted holes (7) of the bracket.
3) Fasten the nut (3) now definitively.

11.3 440KAP, Cover with switch

The 440KAP (2) covers a mounted 2" cable break device, with internal cable fixing (code 440-600, 440REGL en 440HD), completely. This is according to CE-norms.
1) Install the switch mechanism (9) with two screws in the upper holes (11) of the base plate of the device.
2) Lead the cable (6) free through the cable break device with attention to preventing that after installation of the cover, it can
obstruct the functioning or damaging the cable. With side mounted cable under the cover, the cable must be positioned flat
on the panel and a hole must be created in the cover.
3) Shift, depending on the installation side, a cap (1) in the right or left hole of the cover. The free hole is needed for guiding the
vertical track.
4) Shift the cover (2) with the foreseen guidance over the balanced mounted plate (8) of the switch mechanism.
When the cover is mounted to weakly, remove the cover and tighten the nuts (10) more heavily.
With cable breaking, the lip (3) in the cover is pushed away by means of the turning U-bracket (4/5) thus activating the
switch.



12. BEARING PLATES

12.1 Non adjustable bearing plates

Side bearing plates	305-4B, etc.	See Picture
Side bearing plates	318-4CP	See Picture
Side bearing plates	315-4B, etc.	See Picture
Sice bearing plates	318-4C	See Picture
Bearing plates	320-4	See Picture

12.2 Adjustable bearing plates

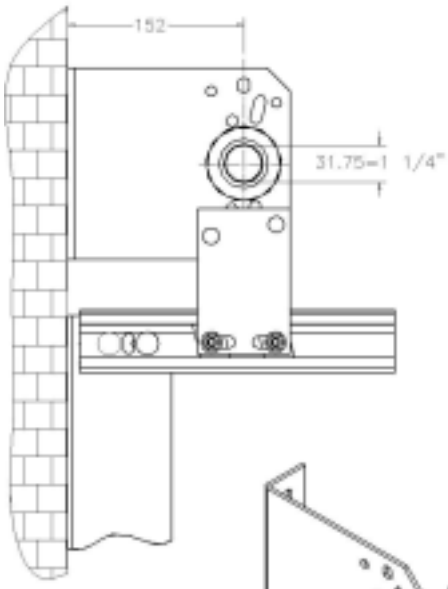
Base plate	322BAS	See Picture
Bearing plate	323LAG	See Picture
	323LAG-B	See Picture

12.3 Universal bearing plates

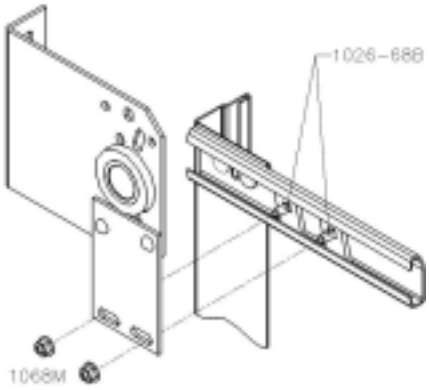
Interm. Bearing plate USA-8 + retainer	See Pict.
Interm. Bearing plate USA-8 + fitting	See Picture

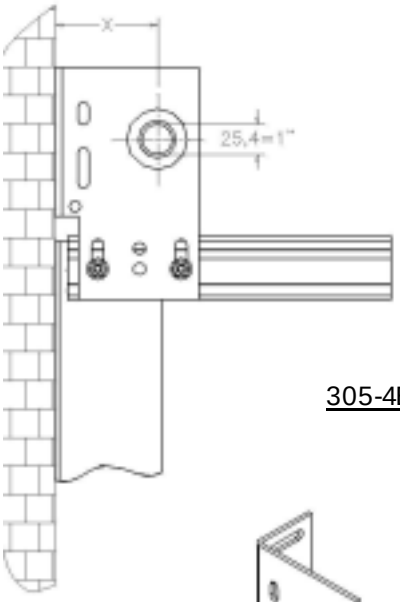
12.4 Several

Wall plate	321WAL	See Picture
Bearing 1¼"	USA A	See Picture
Bearing 1"	USA B	See Picture
Retainer	325	See Picture



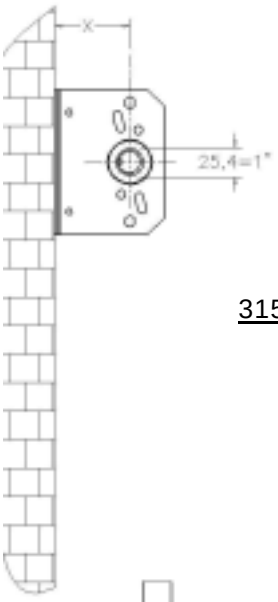
318-4CP





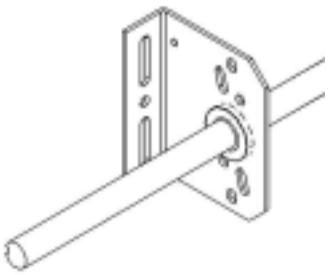
	X
305-4B	86
306-4B	111
307-4B	127
308-4B	152

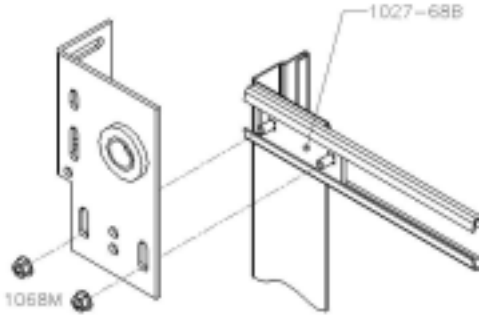
305-4B etc.

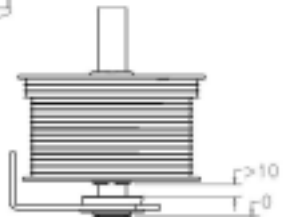


	X
315-4B	86
315-4B	111
315-4B	127
315-4B	152

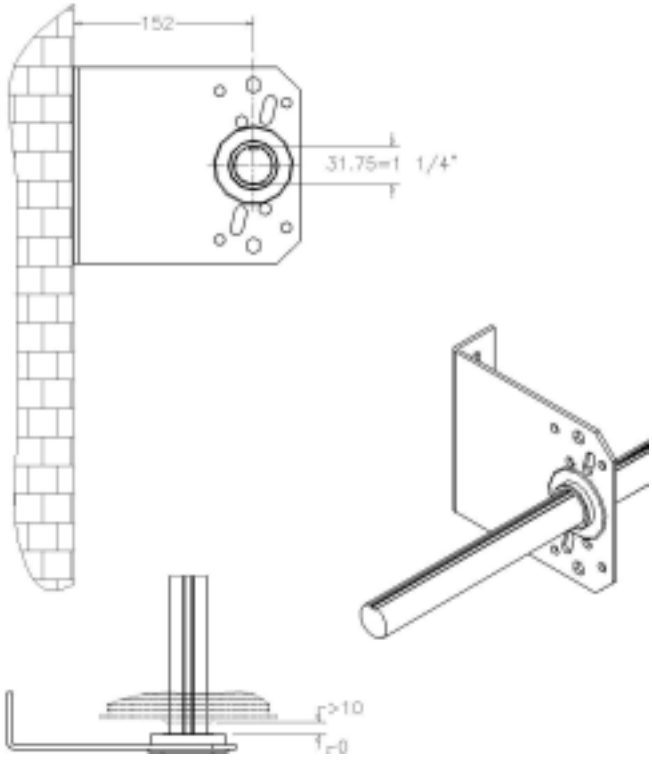
315-4B etc



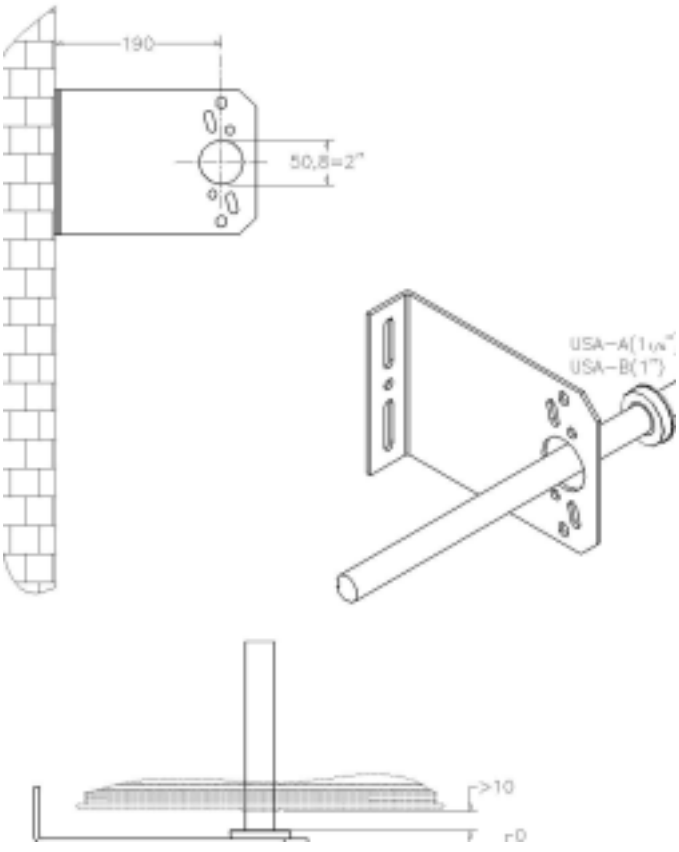


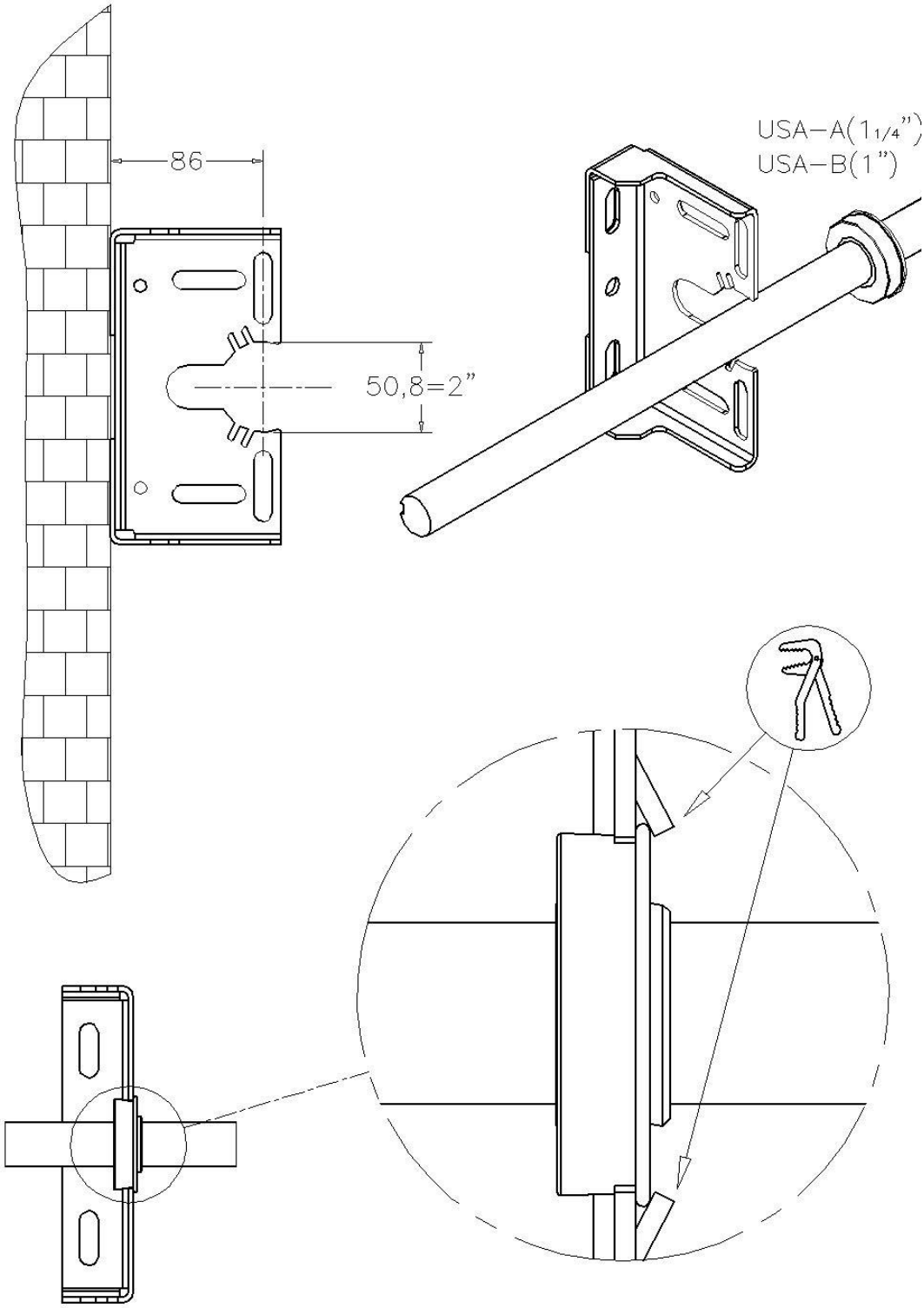


318-4C etc.



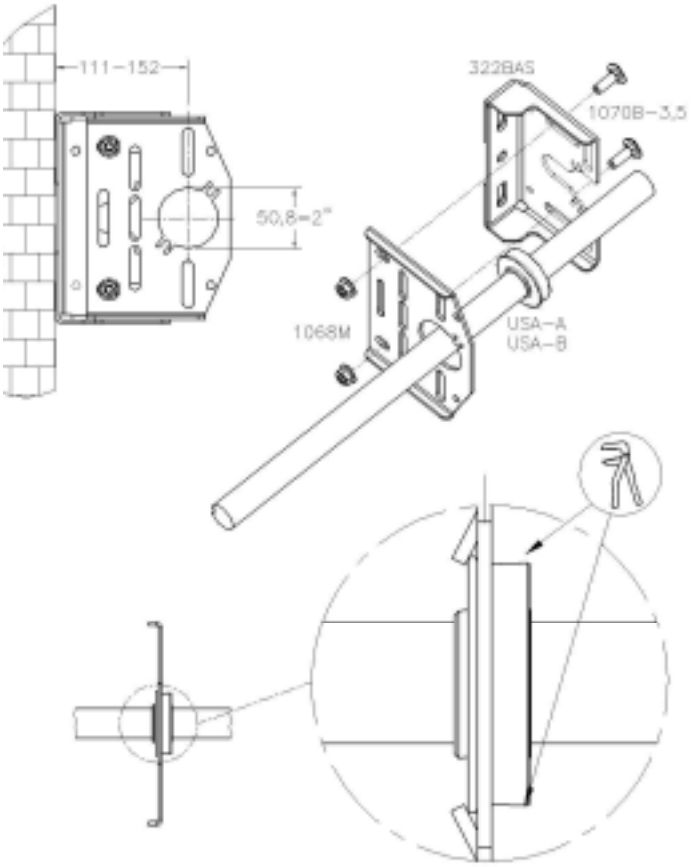
320-4 etc.

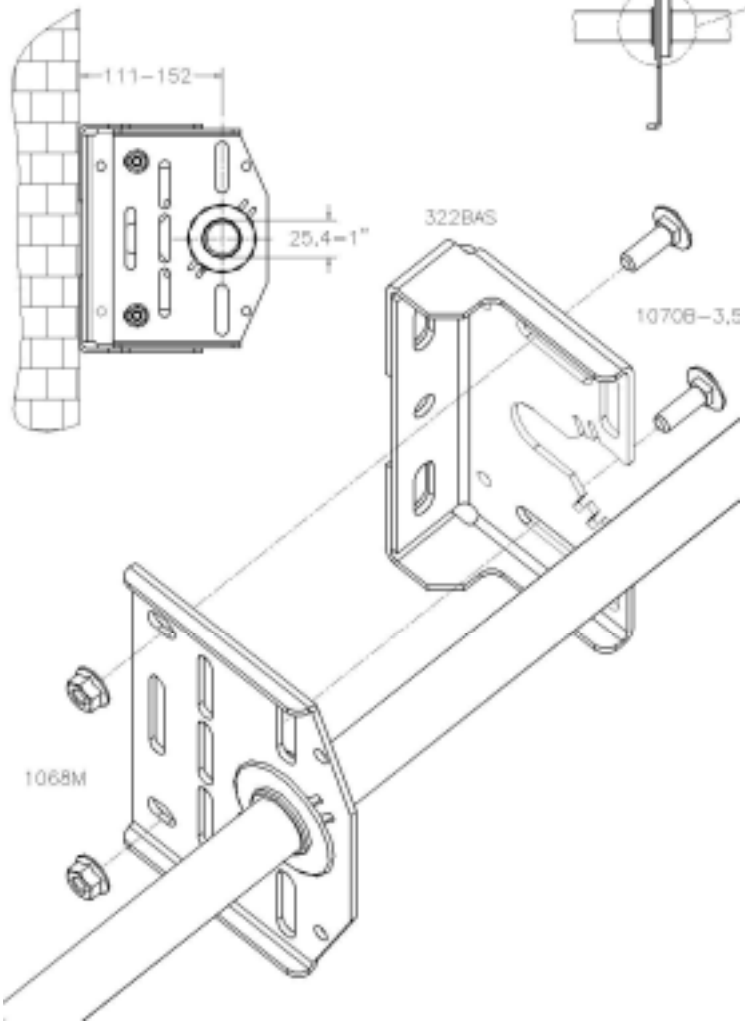




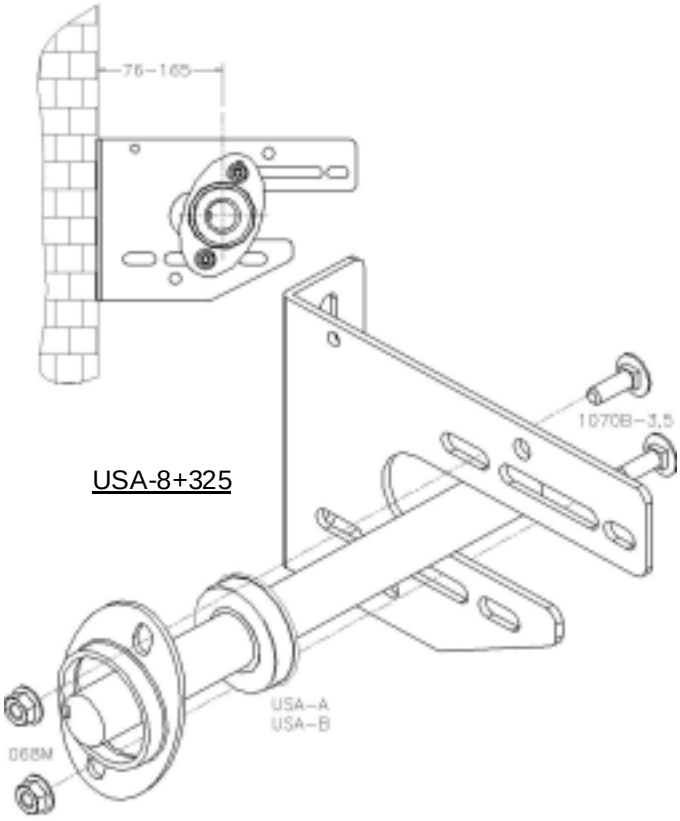
322BAS

323LAG

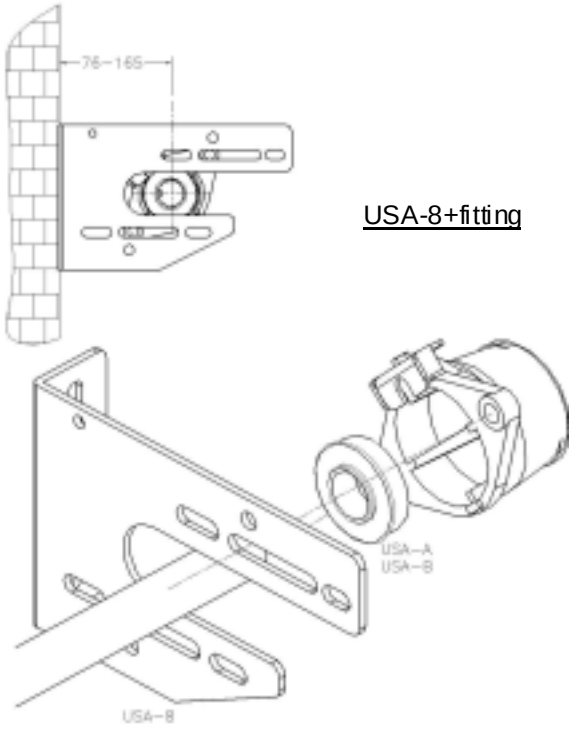




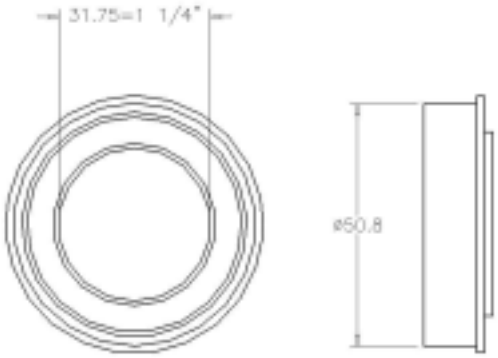
323LAG-B

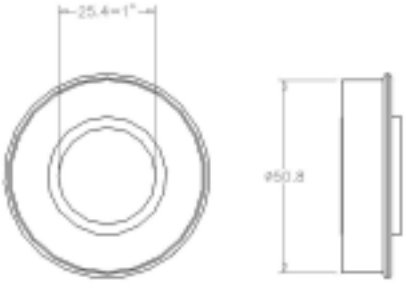


USA-8+325



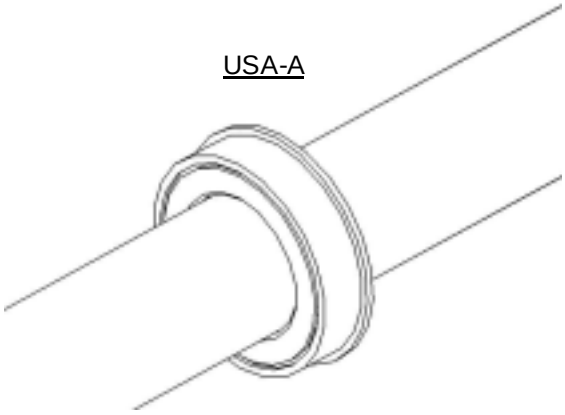
USA-8+fitting

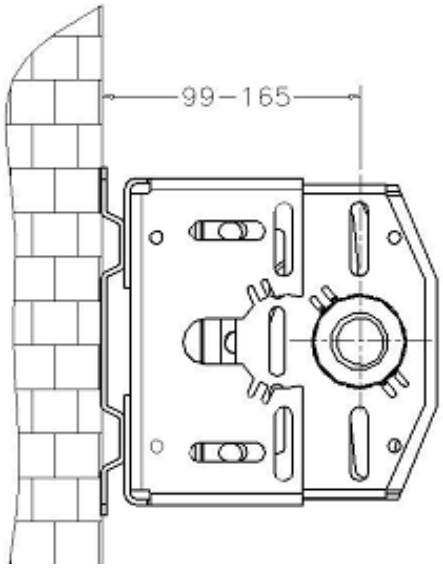


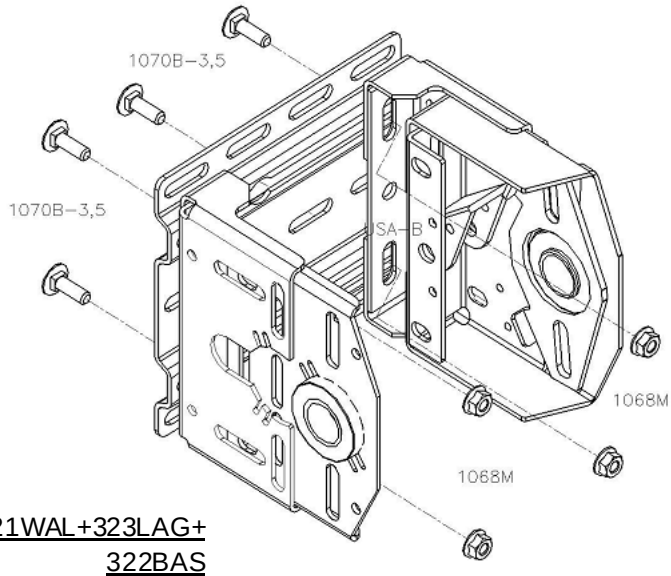


USA-B

USA-A

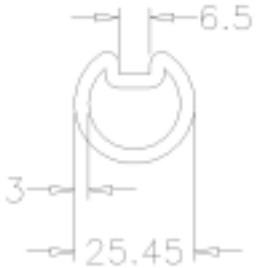






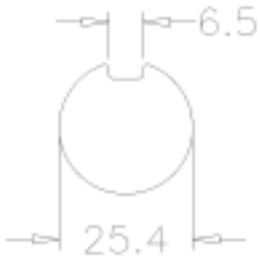
321WAL+323LAG+
322BAS

13. SHAFTS



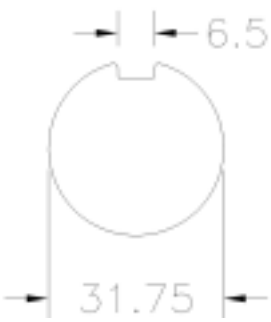
KEY-WAYED TUBE (1")

Article code 705GB-.....



KEY WAYED SOLID, 1"

Article codes
702K-.... (black)
702....Z (galvanised)



KEY WAYED SOLID SHAFT, 1 ¼"

Article code 699-....Z

14. SPRING BREAKING DEVICE (SBD) 670LH/RH, 675LH/RH, 675LH/RH-5/4

ATTENTION! GENERAL WARNING!
Torsion springs are under high tension!
Do not try to remove, adjust or repair, without releasing the tension!Always be careful during installation!
Installation, maintenance and repairs only can be done by qualified and experienced overhead door mechanics.

APPLICATION RANGE

The Flexi-Force spring break devices 670LH/RH, 675LH/RH and 675LH/RH-5/4 can be applied on industrial sectional overhead doors which are rope-, chain- or electrical operated.
Model 670LH/RH and 675LH/RH are suitable for industrial overhead doors having a 1" (25,4 mm) key way shaft. Model 675LH/RH-5/4 is suitable for industrial overhead doors having a 1 1/4" (31,75 mm) key way shaft.
We advise you to apply the reinforced version, model 675LH/RH, on heavy springs especially on 6" (152 mm) springs. This reinforced version can withstand larger axial forces thanks to the flanges. The combination of weight and length of the spring as well as the distance between the shaft supports (bearing plates) influence the amount of axial force; the distance of the shaft towards the door installation surface and the number of turns on the spring are also of influence.

The maximum moment of rotation per spring break device is 210 Nm (Newton Meter).

For a specific drum the minimum number of spring break devices per door* can be determined as follows:

$$\frac{\text{Maximum moment of rotation}}{0{,}5 \times \text{drum diameter} \times g} = \_\_\_\_\_ \text{ kg}$$

Drum diameter: in meters measured from the point where the cable peels off the drum when door is fully closed.

Example: FF-NL-18 drum for normal lift having 5 mm cable, gives a diameter of 138,4 mm =

$$\frac{210}{0{,}5 \times 0.1384 \times 10} = 303 \text{ kg} = 3034 \text{ N}$$

So for a door weight, as lifted by the cables, up to 303 kg you may apply the minimum of 1, or more spring break devices. Over 303 kg you need a minimum of 2, or more spring break devices*.

ATTENTION!
Never exceed the maximum weight per pair of drums as given by your drum supplier. Apply one spring break device per torsion spring.

The spring break device model 670LH/RH has approval number 94073 of the BG (Berufs Genossenschaft Bauliche Einrichtungen) at Bonn Germany and has been tested by the TUV (Technische Uberwachungs Verein Bayern) at Munich. The spring break devices model 675LH/RH and 675LH/RH-5/4 have approval number 98098 of the BG.
* The number of spring break devices must be equal to the number of springs.

METHOD OF OPERATION

When tensioning the counter balancing torsion spring (B) the blocking plate (J) turns about 5 degrees and the lip (M) blocks the pawl (N). The small double torsion spring (T) pushes the pawl to the lip (M). The pawl wheel (L), which is fixed to the door shaft (A) by means of a key (G), can turn freely and the door can be opened and closed. In case of a spring breakage the moment of the balancing spring (B) is no longer appearing, and so the blocking plate (J) can turn. The small torsion spring and gravity push the pawl (N) away and the pawl catches into the pawl wheel (L) by which the fall of the door is blocked. If electrically operated, the lip (P) will touch the switch (R) rendering the motor inoperable, which will avoid overload by the motor on the safety device and other door parts.

INSTALLATION INSTRUCTIONS

1) Block temporarily the pawl (N) by placing a bolt or nail into hole (O).
2) If electrically operated install switch (R) and check if lip (P) activates the switch! ($g = 9{,}81$ m/s^2)
3) Place the torsion spring (B) with the stationary spring fitting (D) and the spring device with pawl wheel (L) on the door shaft (A).
4) Fix the stationary fitting (D) with help of the bolts (F) and distance rings (H) on the blocking plate.

Please note:
a) The stationary fitting (D) has to turn freely around the bearing (E). If necessary widen the hole of the fitting.

b) The spring fitting (D) and blocking plate (J) must have a play of 2 mm which is created by the distance rings (H) and have to be free of the centre plate (K).
c) For certain stationary fittings (e.g. FF-2.63TAI) one distance ring per hole has to be deleted because that type of fitting is already provided with cast rings.

5) Install the central plate (K) on the door frame where normally the centre bearing plate is installed. If the centreline is over 86 mm utilise the adjusting plate (S). In case of a centre line of 152 mm apply the reinforcing angle (U) on the models 675LH/RH and 675LH/RH-5/4.
6) Take care that lip (M) is placed above the door shaft.
7) Fix the pawl wheel (L) with help of the set screw(s) and a 1/4" key of 30 mm minimum length.
8) Wind the torsion spring (B) in the prescribed usual way. All torsion springs on one door must be given an equal number of turns.
9) Remove the temporary blocking of the pawl. The pawl must be pushed to the lip (M) of the blocking plate by the small double torsion spring (T).
10) If electrically operated the wiring of the switch (R) must be connected in such a way that after a short touch the door operator stops.
11) If the centreline is 152 mm the reinforcing angle (U) should be installed on models 675STR and 675STR-5/4.

WHAT TO DO AFTER BLOCKING OF THE DEVICE AFTER SPRING BREAKAGE

1) The installer has to prevent the door from falling by supporting the bottom section (e.g. by placing the forks of a forklift truck under the section).
2) Remove the spring break device and the adjusting plate, if installed, and remove the broken spring.
3) Install a new spring and a new spring break device and (if applied) an adjusting plate, according to the installation instruction.
4) If a tubular key way shaft is installed this should also be replaced.

ATTENTION!
If the spring break device has been activated due to spring breakage the device and/or its parts may not be used again.

MALFUNCTIONING

In case of malfunctioning of the spring break device the cause has to be determined and solved. If necessary the spring break device has to be replaced and send to the manufacturer, indicating :

1) nature of malfunctioning
2) door leaf panel weight applied
3) cable drum diameter
4) The falling distance, if known

The manufacturer will research the reason of the malfunctioning.

TESTS

A skilled door installer has to check the tension of the pawl (N) during the regular 6 months maintenance/check of the door. If the double torsion spring (T) is broken it has to be replaced.

MAINTENANCE

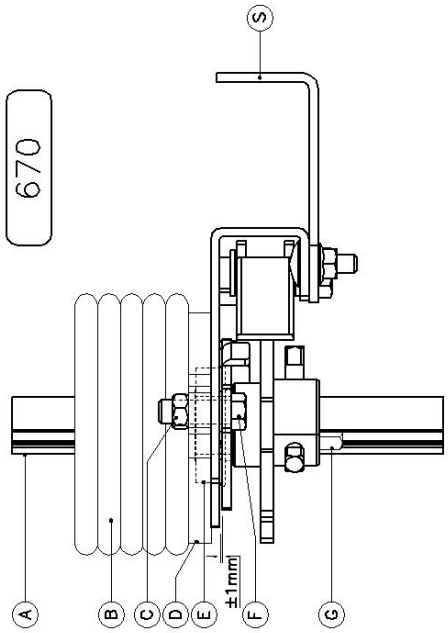
In principle the spring break device does not need maintenance. However, it is advisable to prevent dirt entering or to remove this regularly.

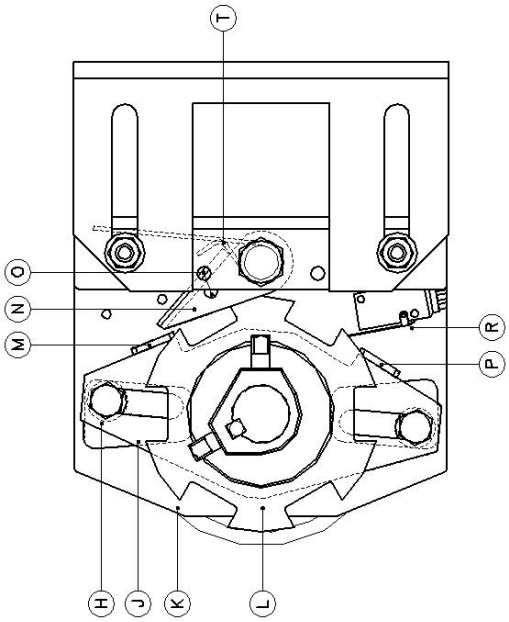
677-67 SWITCH INSTALLATION

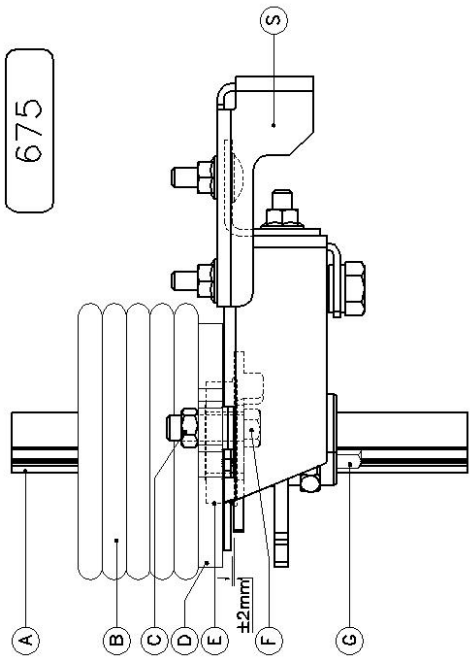
The set consists of

- 677-67 Switch
- 1024SCHROE Scew M3x16
- 2513MOE Nut M3

The switch has to be mounted inside of the SBD. The lever (1) of the switch must touch the lip of the blocking plate (2). The cables may not hinder the proper functioning of the device.
Check if the activation of the SBD also activates the switch. Connect according to the schedule on the next pages.


670
S
A
B
C
D
E
±1mm
F
G


T
O
N
M
R
P
H
J
K
L


675
S
A
B
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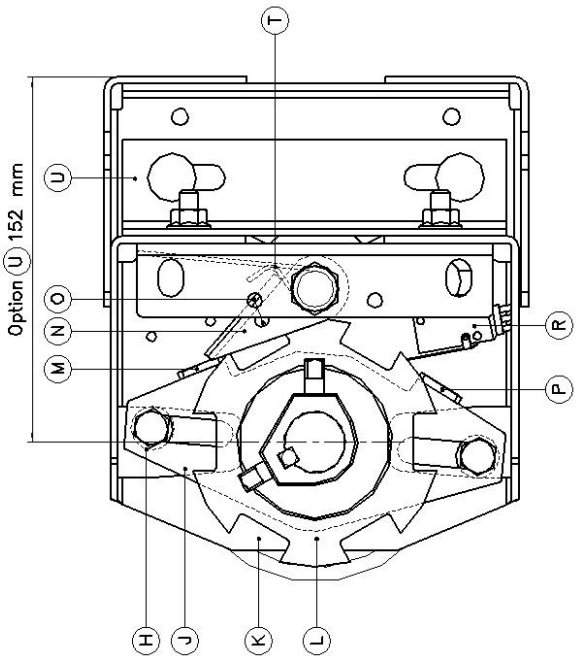
D
E
±2mm
F
G


T
Option U 152 mm
U
O
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K
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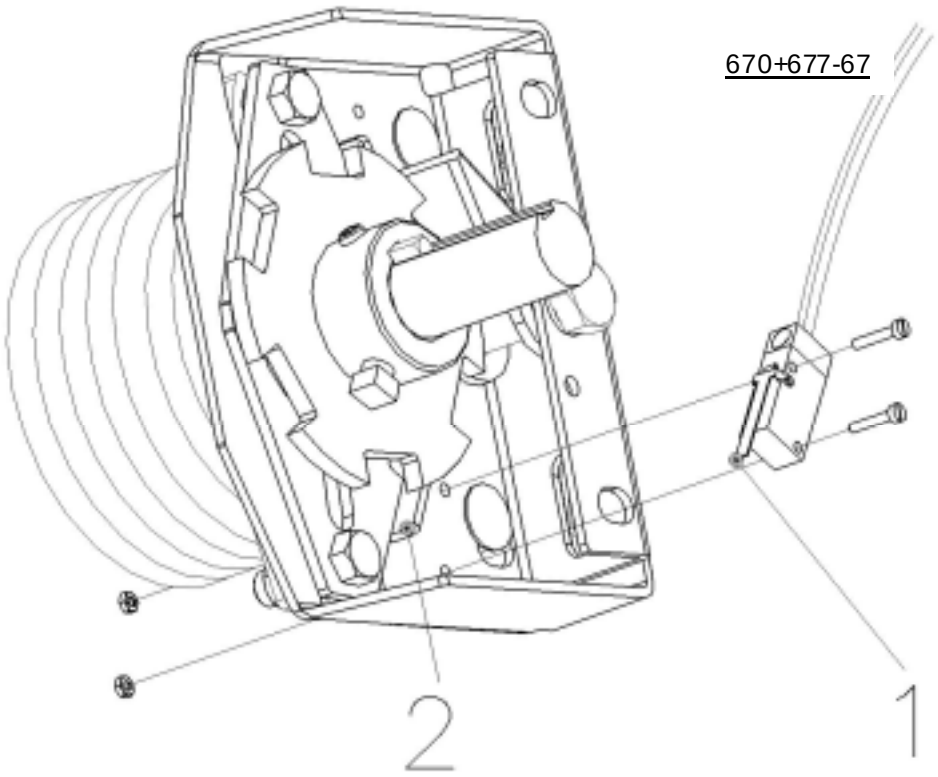
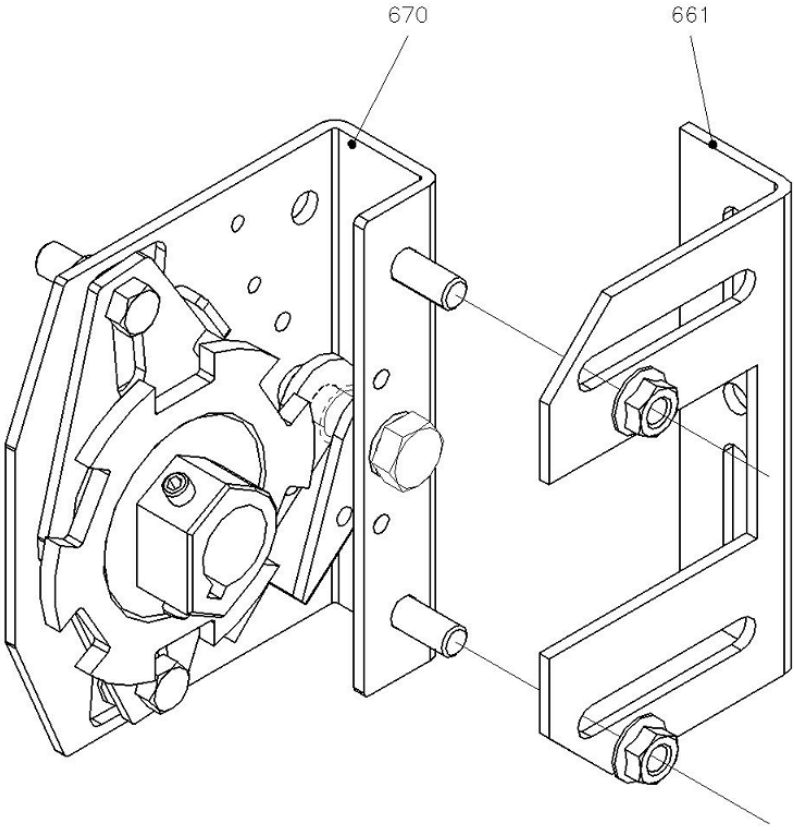
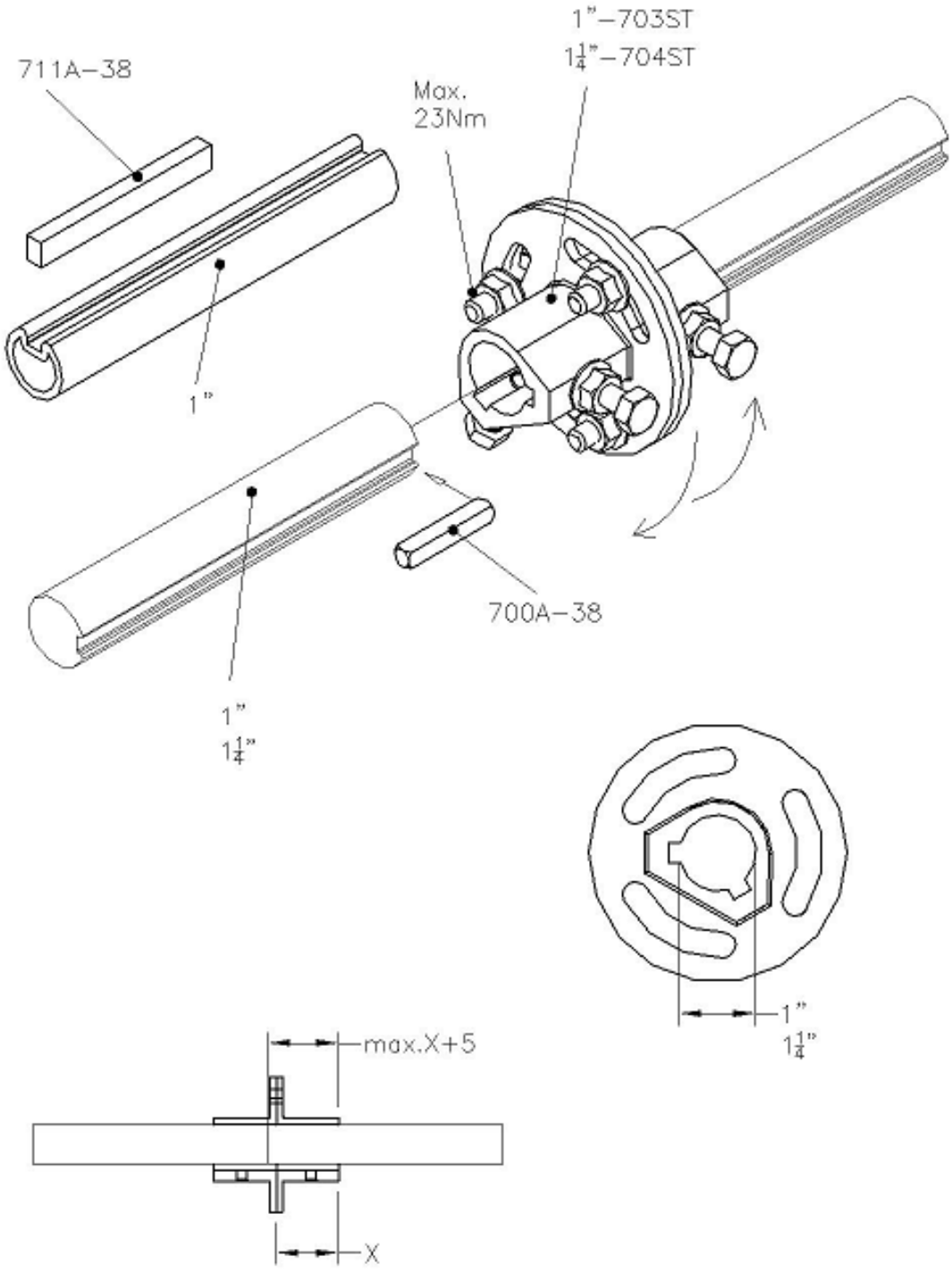

670+677-67
2
1

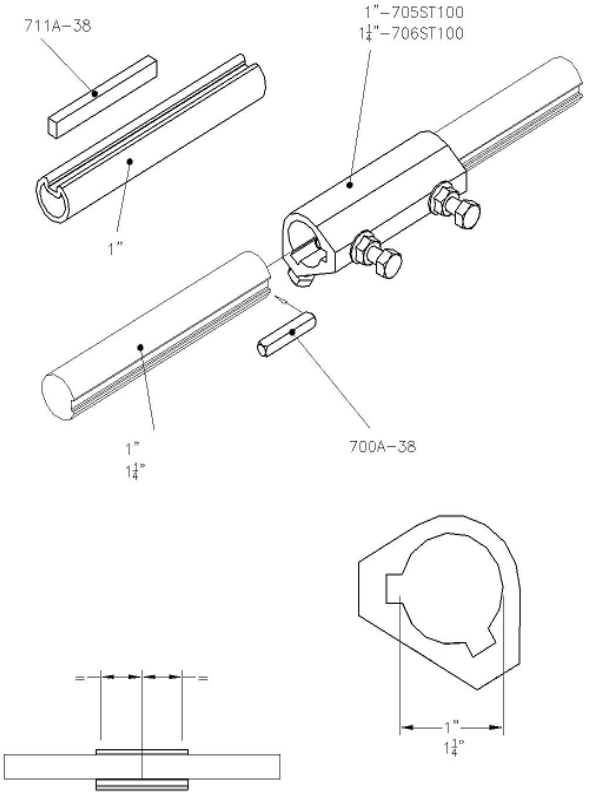

670
661

15. COUPLERS

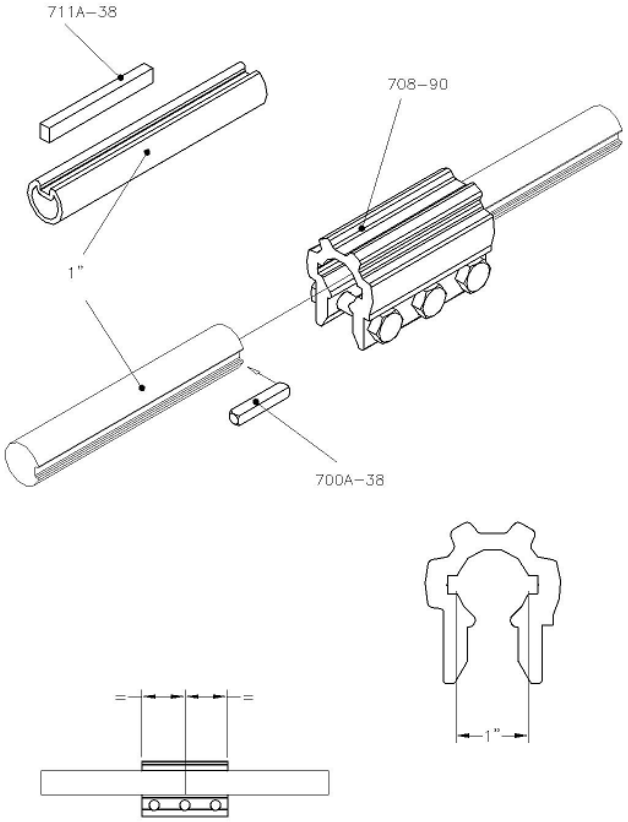
703ST, 704ST. ADJUSTABLE COUPLER



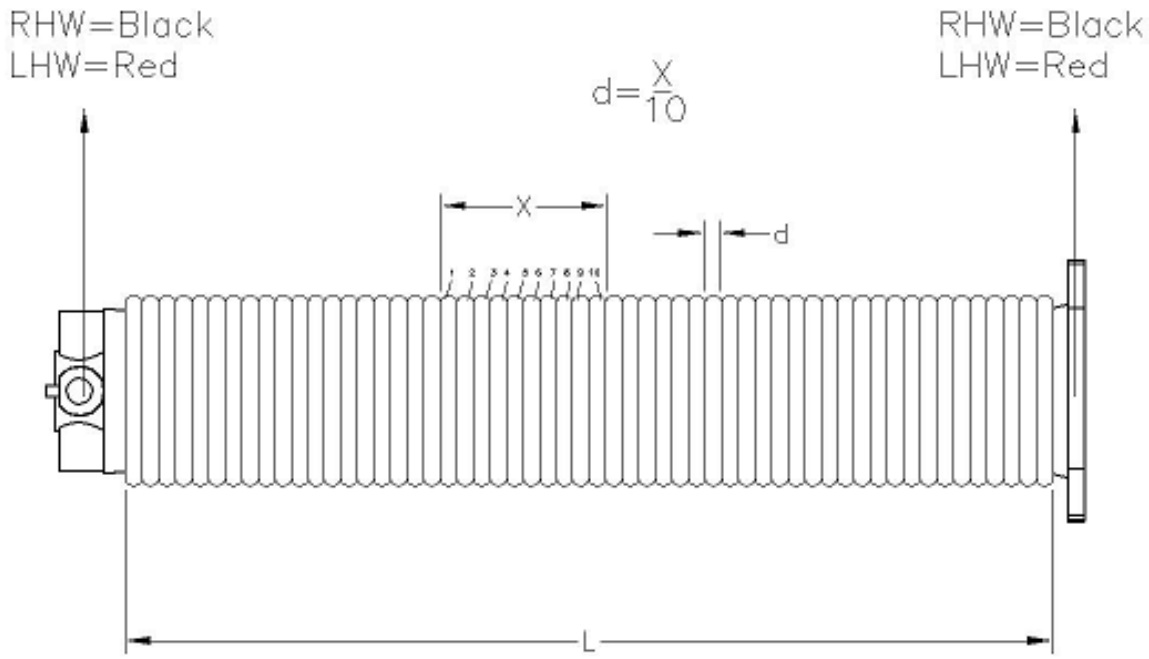
705ST100. 706ST100 FIXED COUPLER

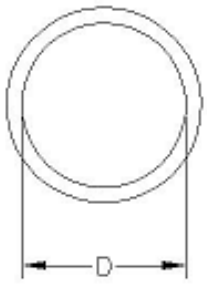


708-90. FIXED COUPLER

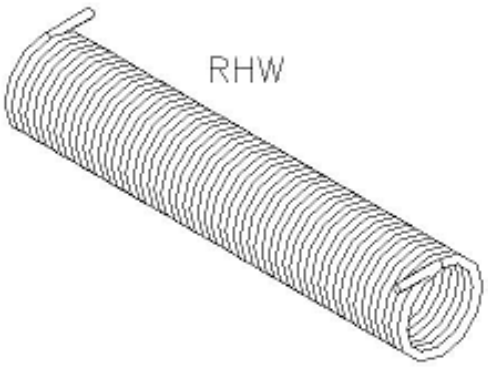


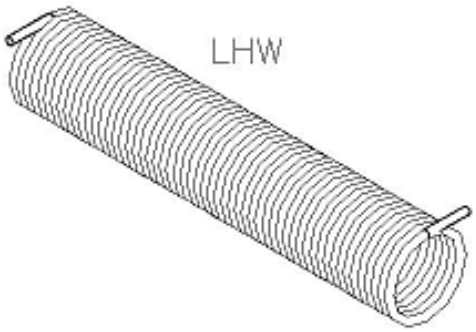
16. TORSION SPRINGS





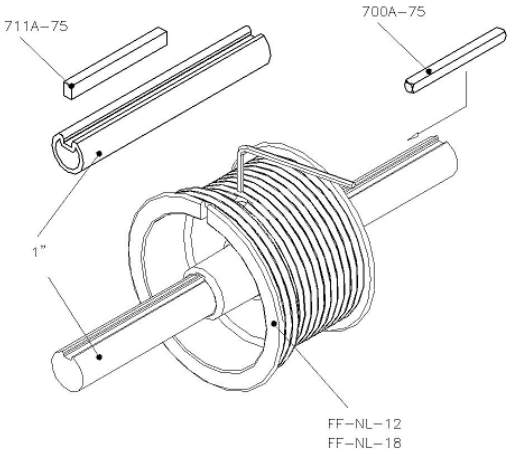
	D
2”	51mm
2 5/8”	67mm
3 3/4"	95mm
6”	152mm

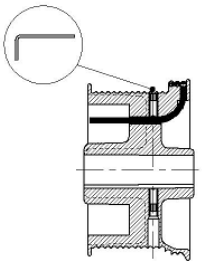


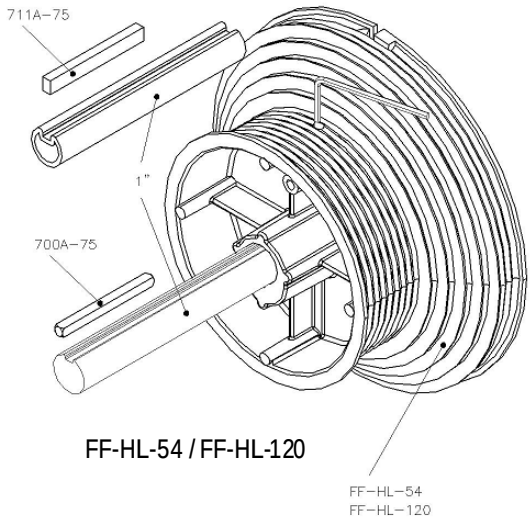


17. CABLE DRUMS

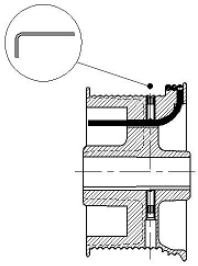
FF-NL-12, FF-NL-18



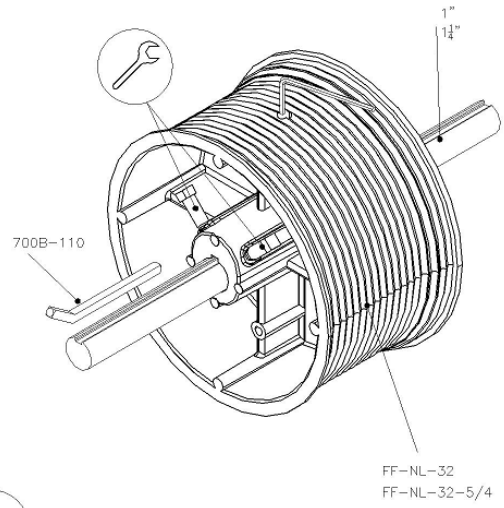


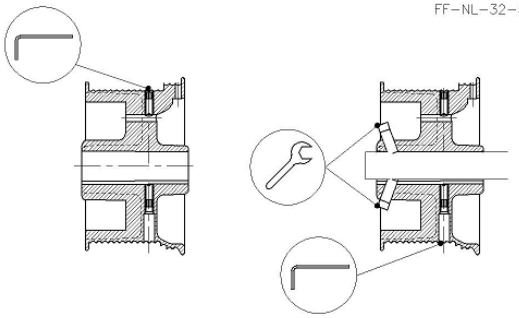


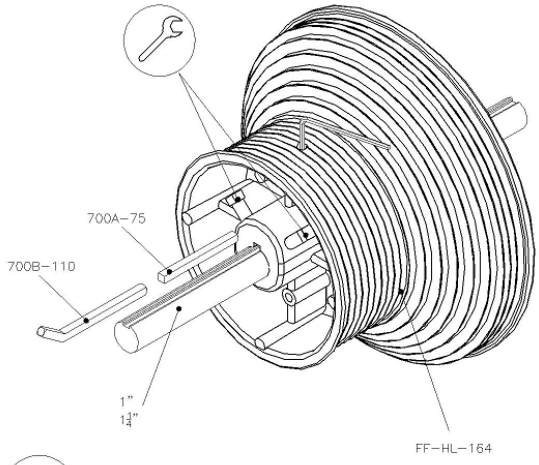
FF-HL-54 / FF-HL-120



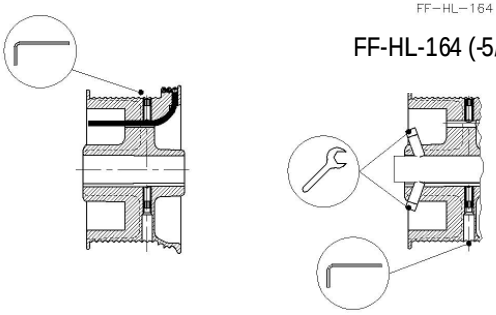
FF-NL-32 (-5/4)

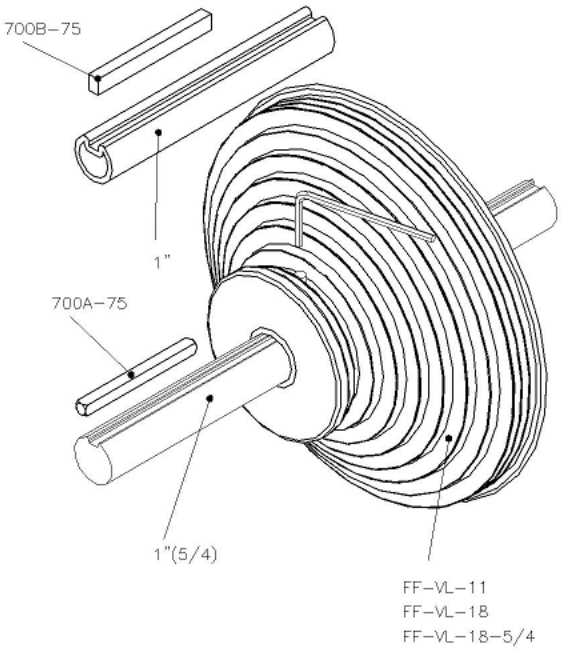


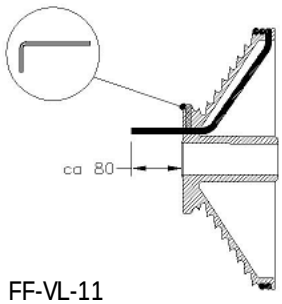




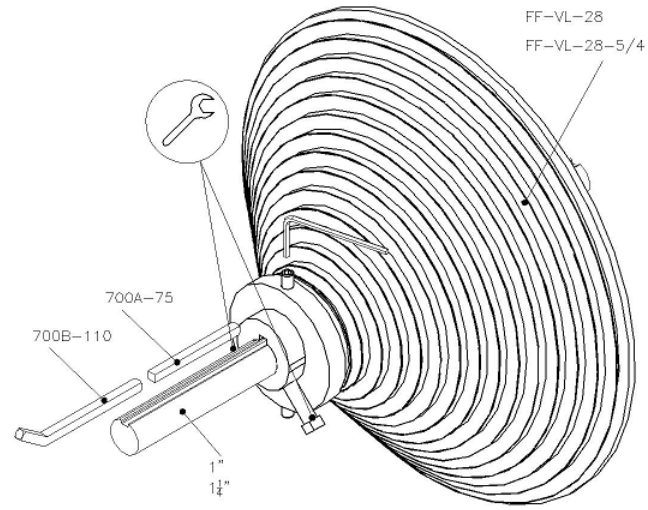
FF-HL-164 (-5/4)

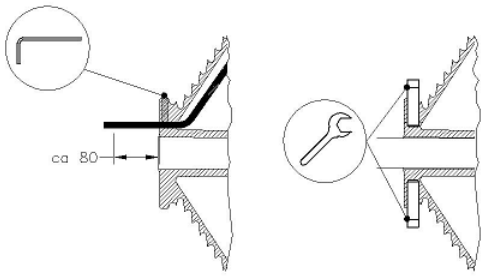






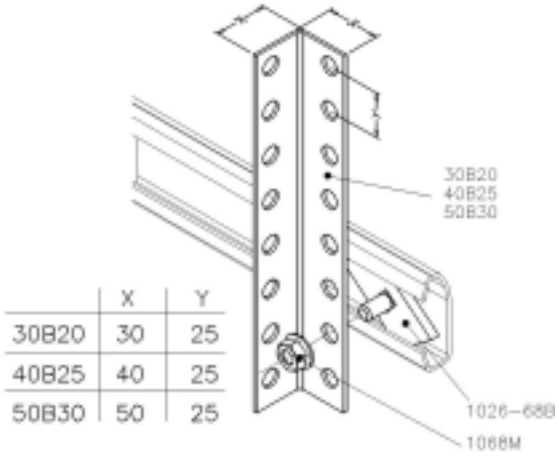
FF-VL-11
FF-VL-18 (-5/4)



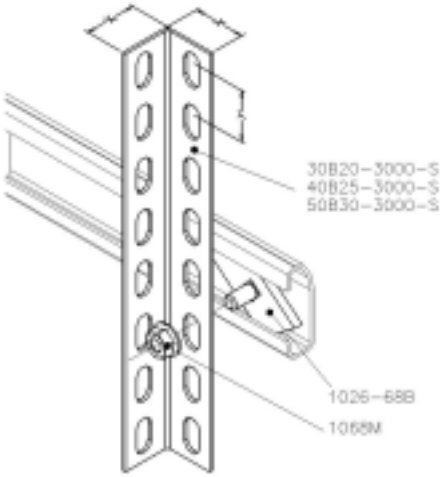


FF-VL-28
FF-VL-28 (-5/4)

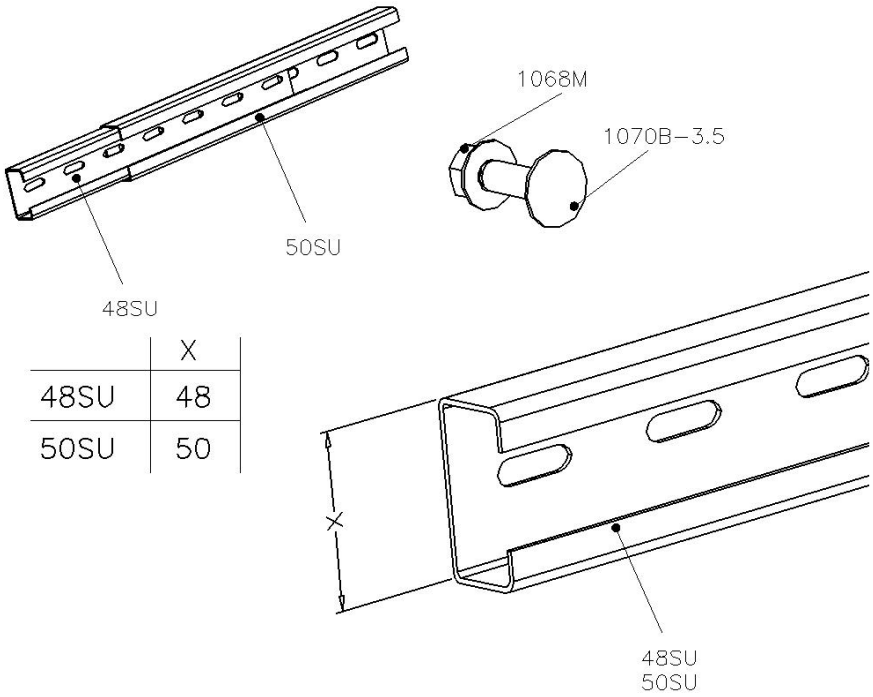
18. SUSPENSION SYSTEMS



	X	Y
30B20	30	25
40B25	40	25
50B30	50	25

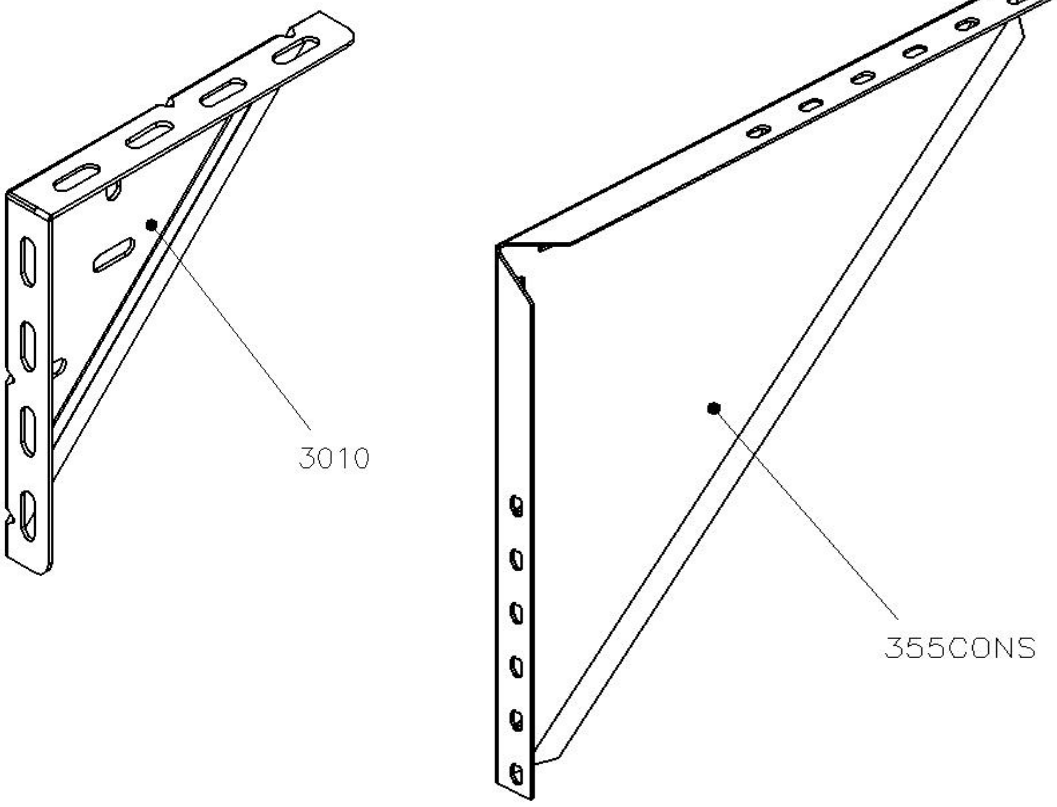


48SU, 50SU

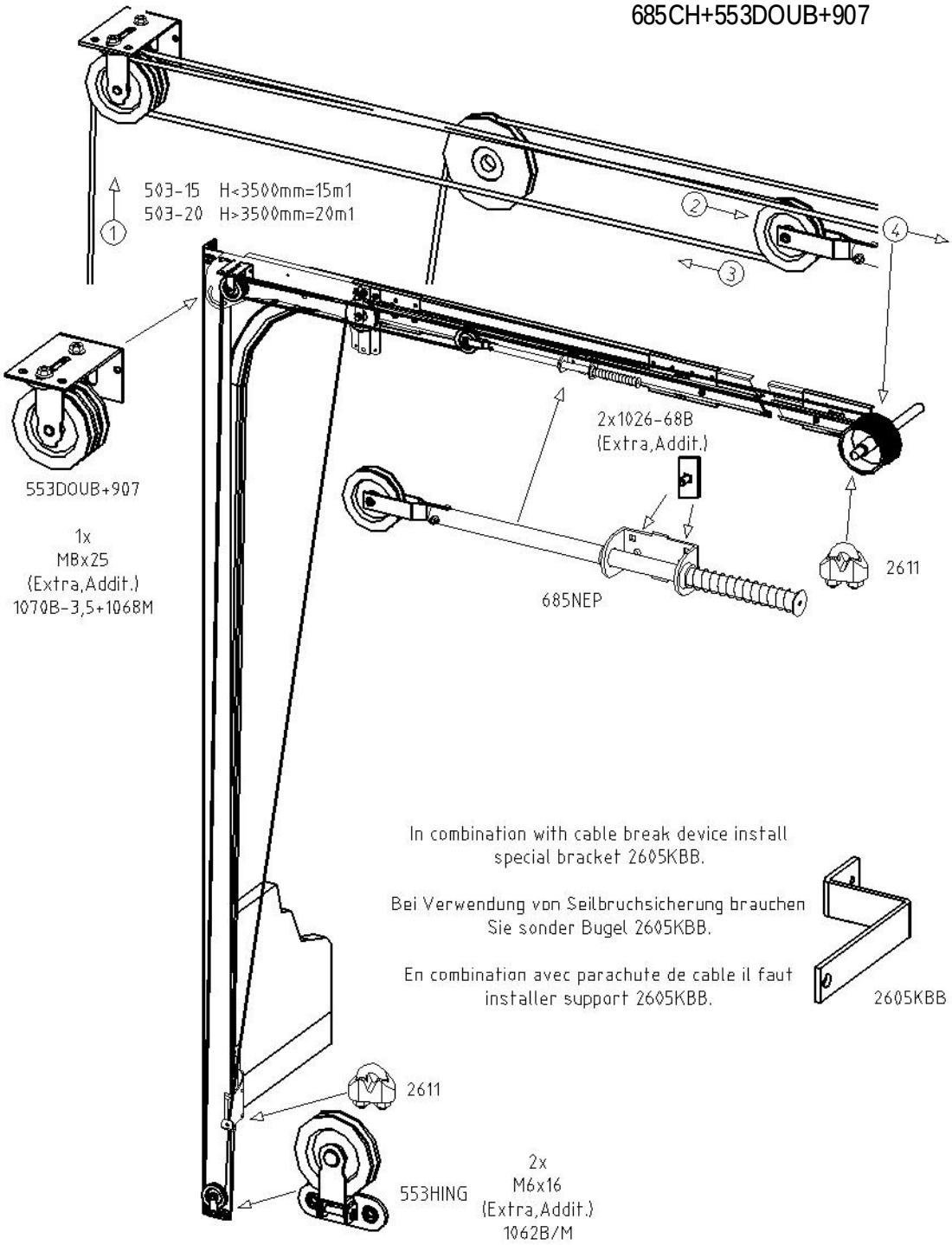


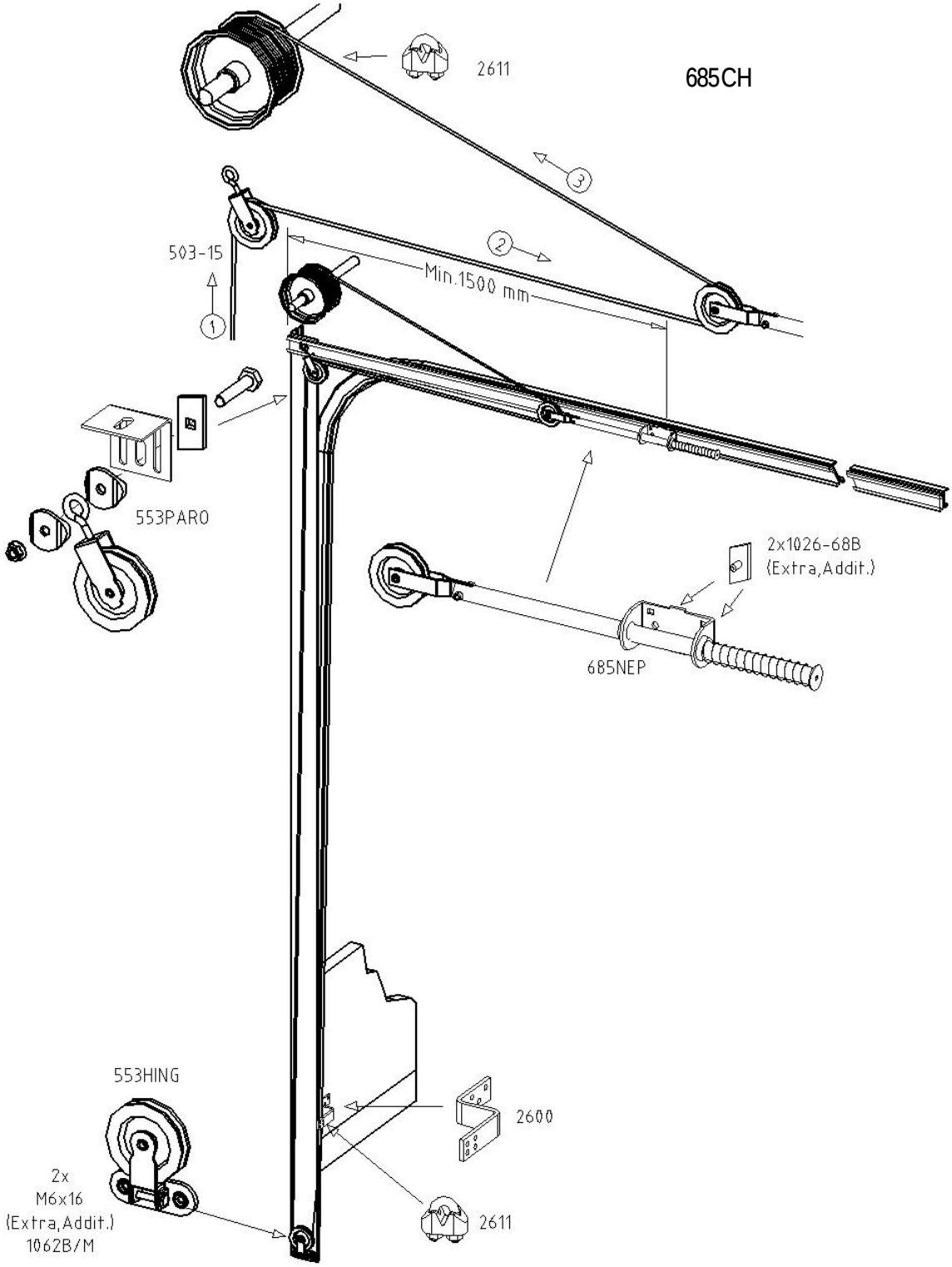
	X
48SU	48
50SU	50

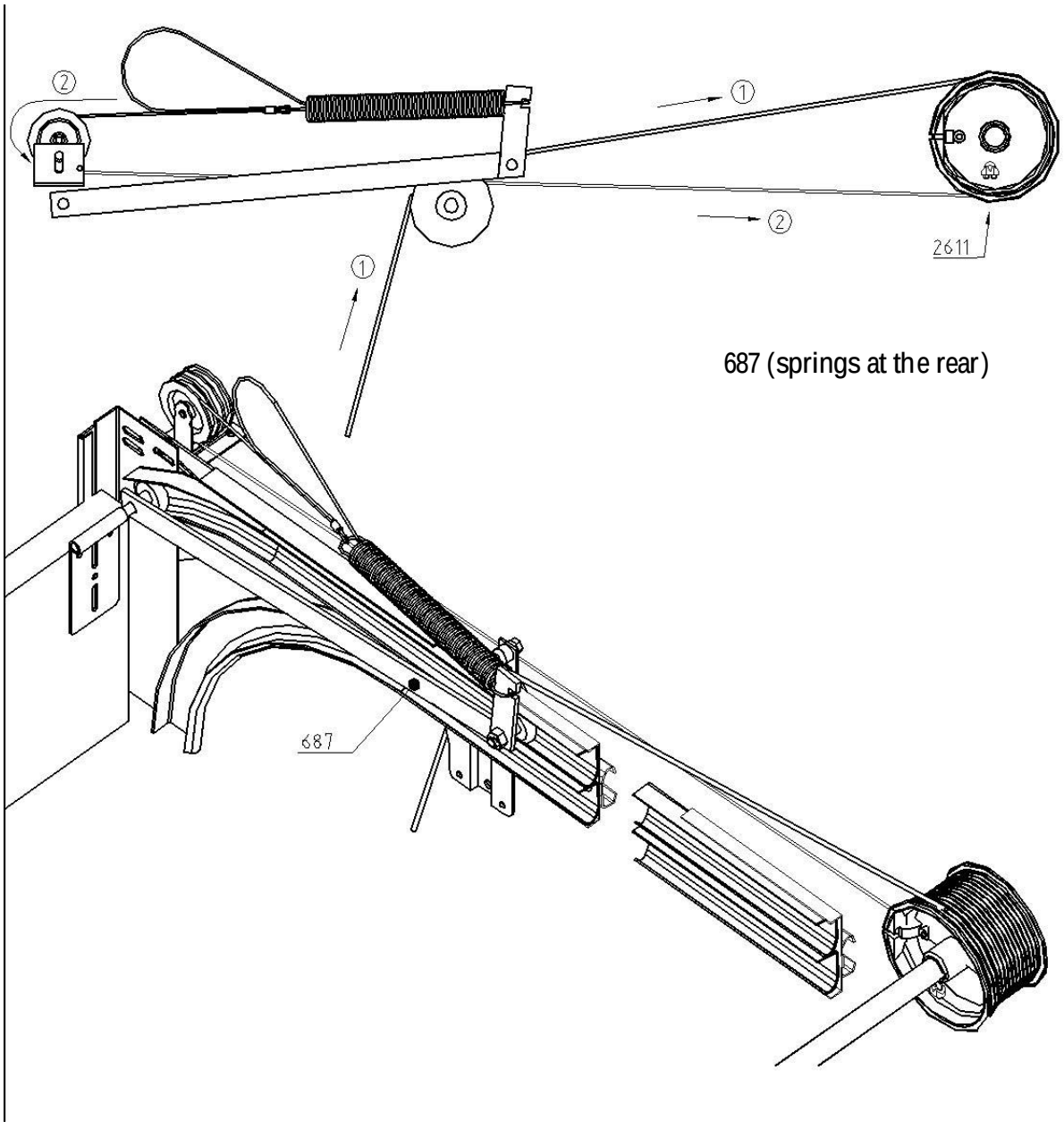
19. TRIANGULAR PLATE



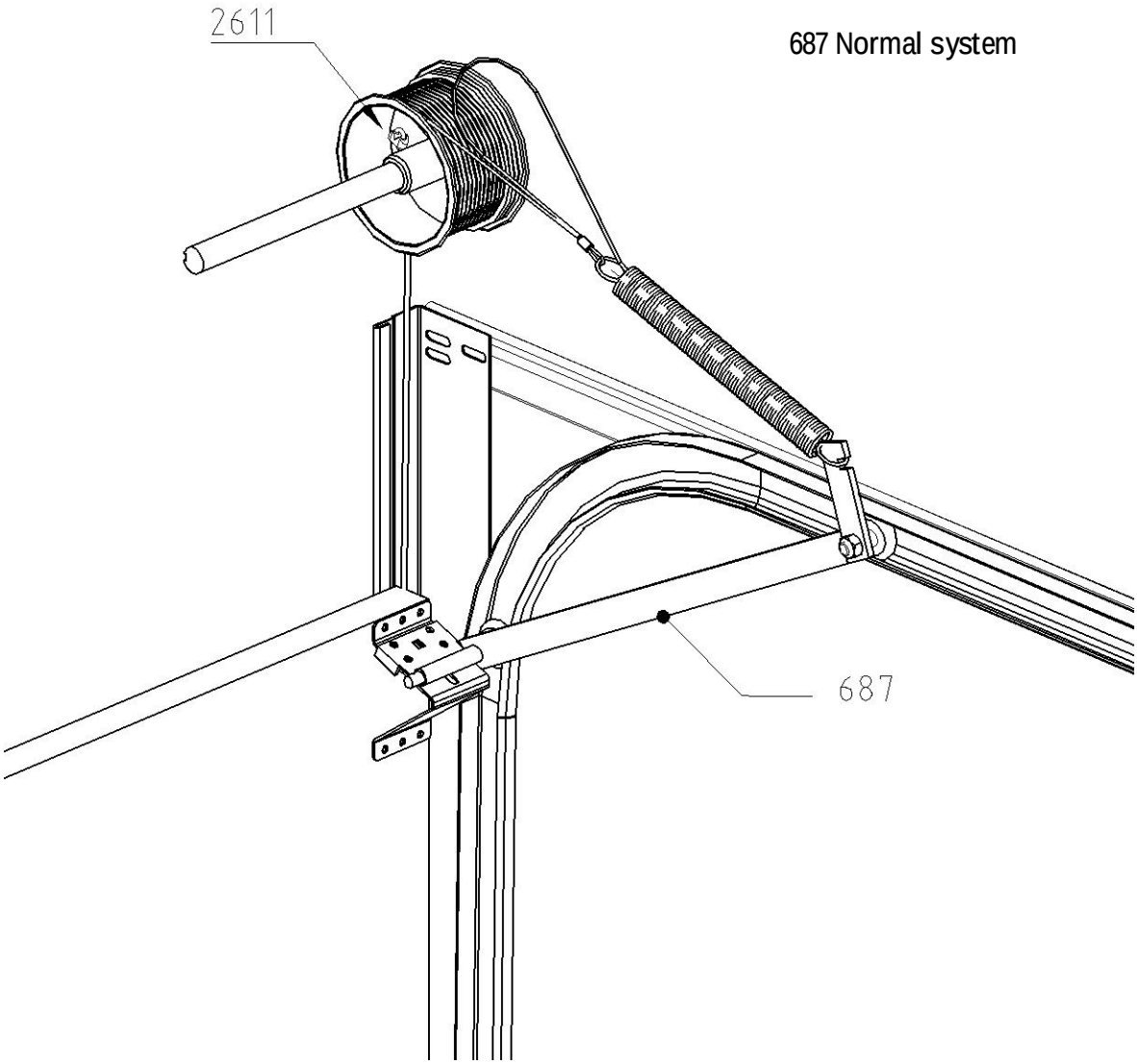
20. CABLE TENSIONING SETS



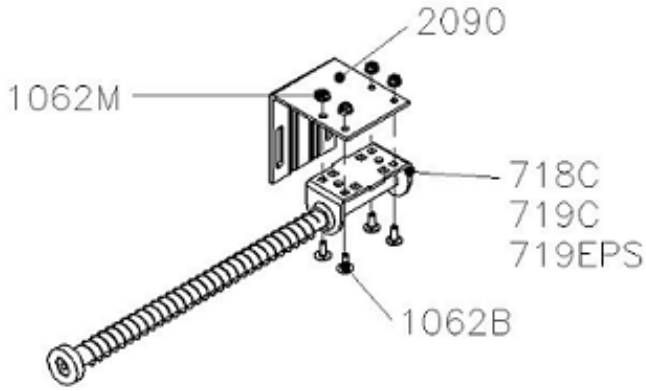

685CH
2611
503-15
Min.1500 mm
553PARO
2x1026-68B
(Extra,Addit.)
685NEP
553HING
2600
2x
M6x16
(Extra,Addit.)
1062B/M
2611

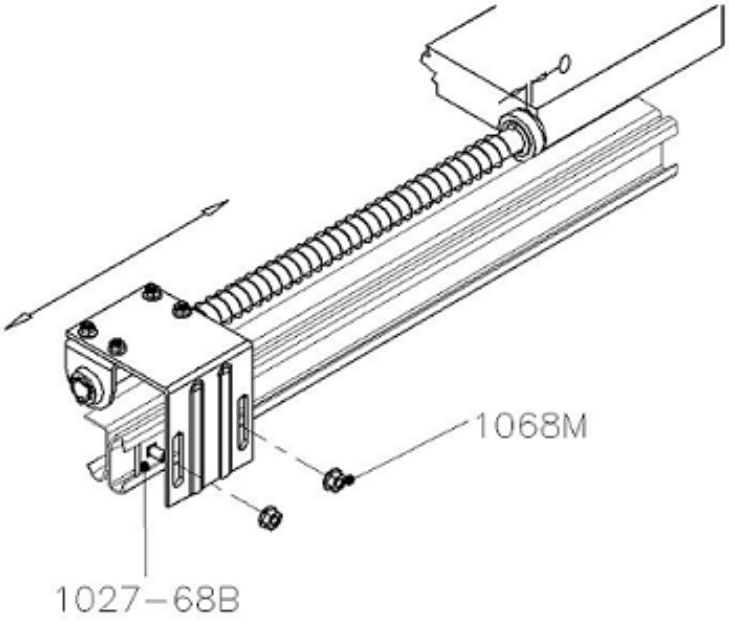

②
①
②
2611
①
687 (springs at the rear)
687

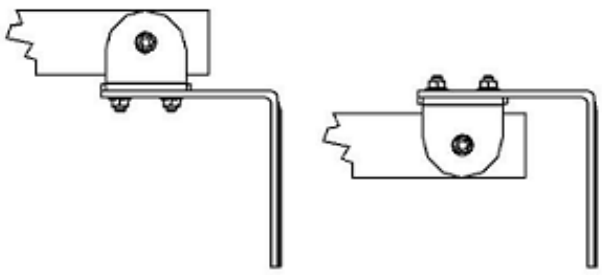
687 Normal system



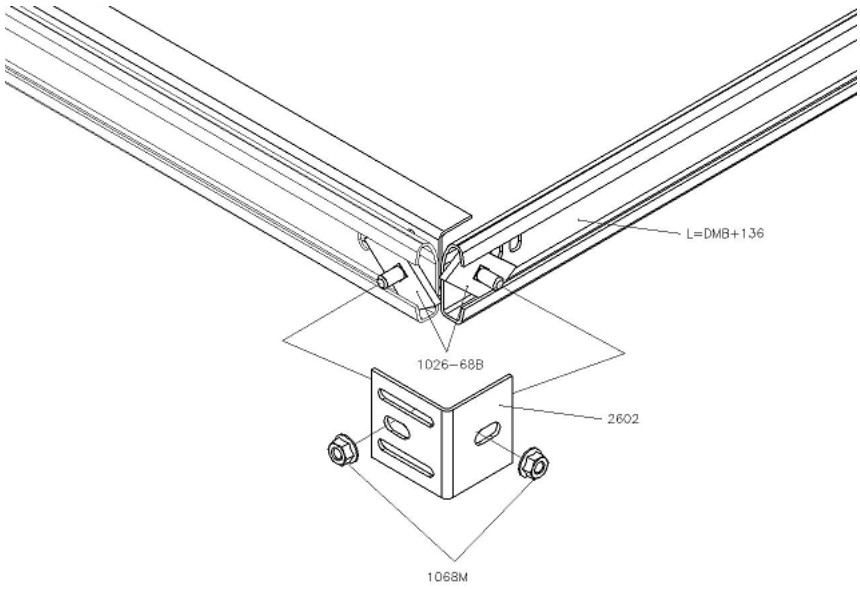
21. SPRING BUMPERS

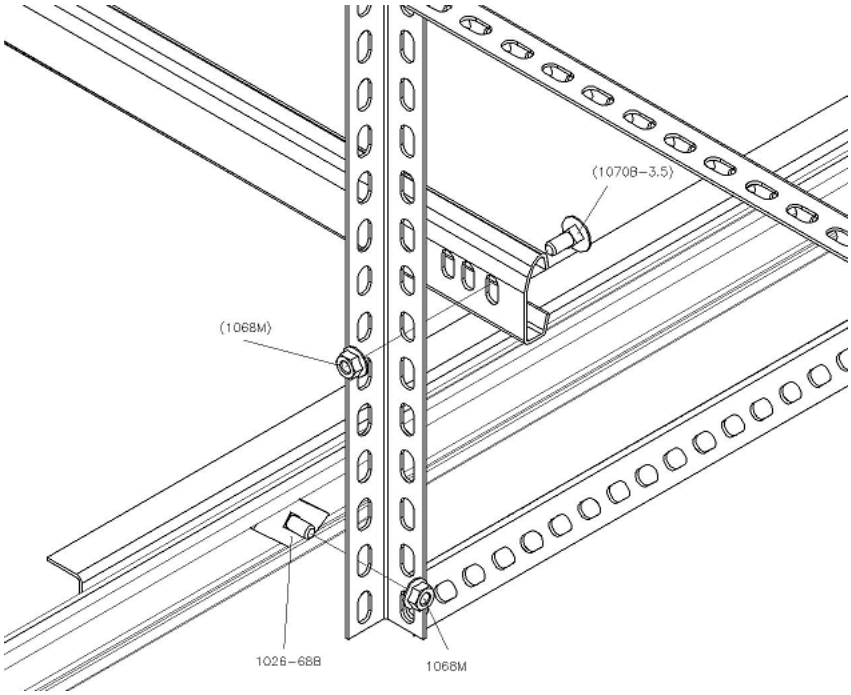




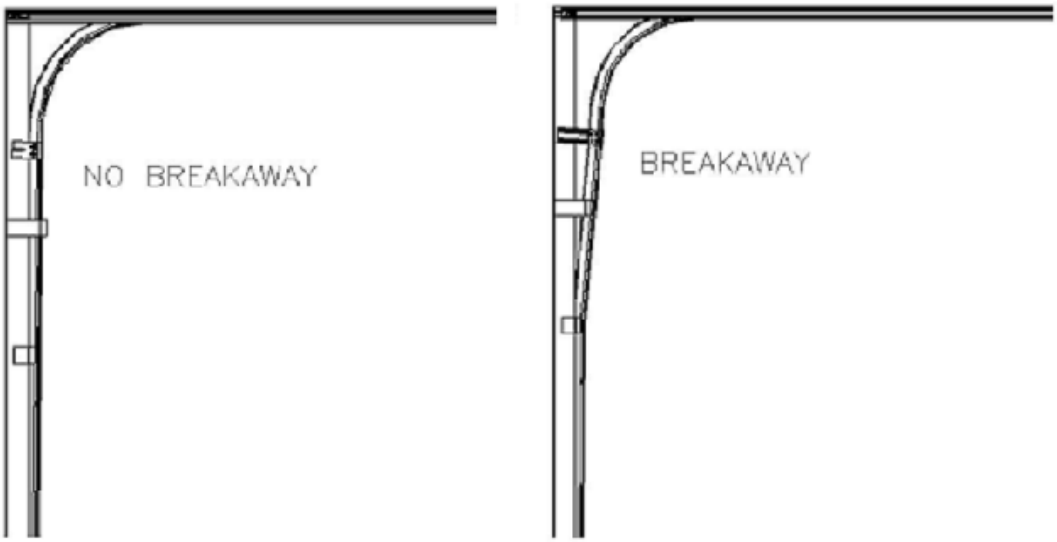


22. HORIZONTAL CONNECTION TRACK

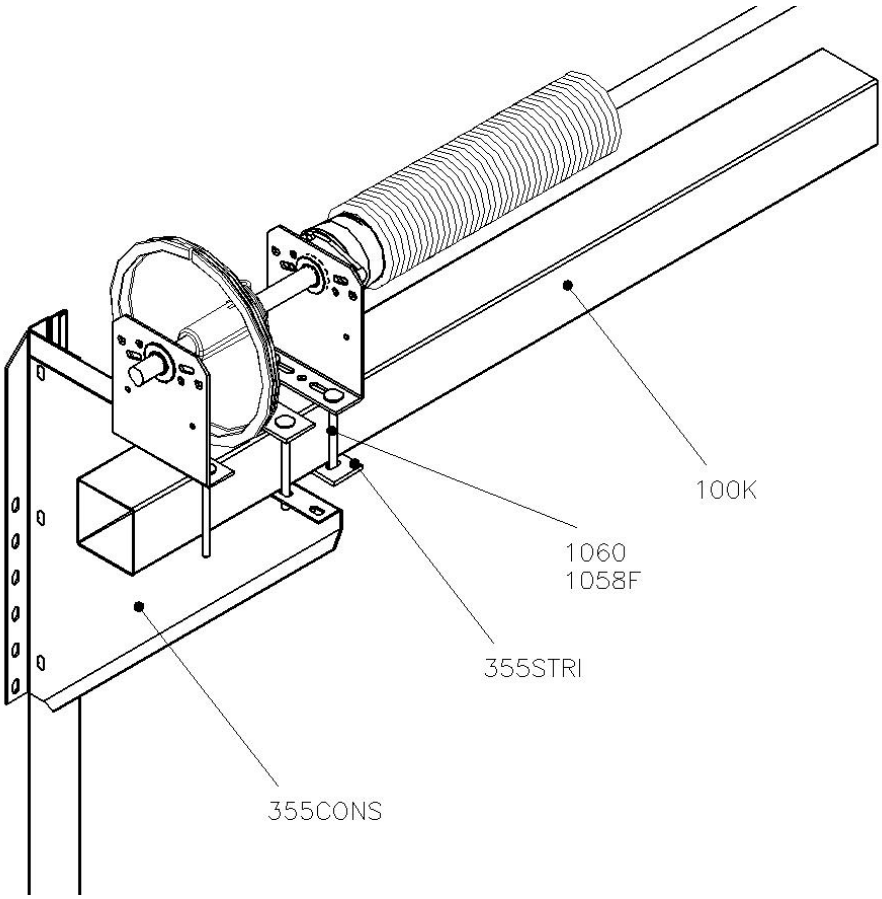




23. BREAK AWAY



24. HORIZONTAL SPRING CONSTRUCTION



25. PANELPRODUCTION