TRITON Curved Glass Turnstile

Assembly & Testing Manual

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1. Copyright & Liability

1.1 Assembly & Testing

This manual is intended to train in the successful assembly and test of the unit described herein. It is advantageous for the reader of this manual to consider all the steps and notations carefully before attempting an assembly.

Turnstar will not accept any breakages or undesired or unintended results that might arise from not reading through this manual.

2. Safety

During Maintenance:

- Avoid contact with moving parts.
- Ensure power supply is off.

During Operation:

- Children and minors must be accompanied and supervised.

3. Notes on Assembly

3.1 Preparation

At least 2 persons are needed to assemble the TRITON curved glass turnstile, but 3 would be more beneficial.

When assembling the Turnstile, take care to not damage or dent fragile parts. Use polycarbonate or foam skins/ panels to place the parts on.

Take note of assembly area codes to identify parts required to successfully complete an assembly or sub-assembly. Any parts left out or substituted may achieve undesired results.

IMPORTANT: This product is not designed for outdoor use as it is not weather-proof. In the case of outdoor installation, ensure that an additional roof is placed over the unit for sheltering from rain.

IMPORTANT: The product is not wind-proof and cannot be used as a draft-blocker. In case of this requirement, rather consider a revolving door.

4. Plinth details

4.1 Parts Identification

Note well: All part quantities are for one halve drum outer frame assembly. Full quantities are given at the end of this document in the structured parts list.

4.2 Floor Marking

Before marking the position of the turnstile, ensure the level across the planned area does not deviate by more than 3mm in height.

Starting with a chalk line, measure the position as shown in Figure 1. The center of the 1600mm length will be the center of the turnstile. The edges of the 1600mm length will be the outer edges of the turnstile. The dashed line shows the chalk outlines required.

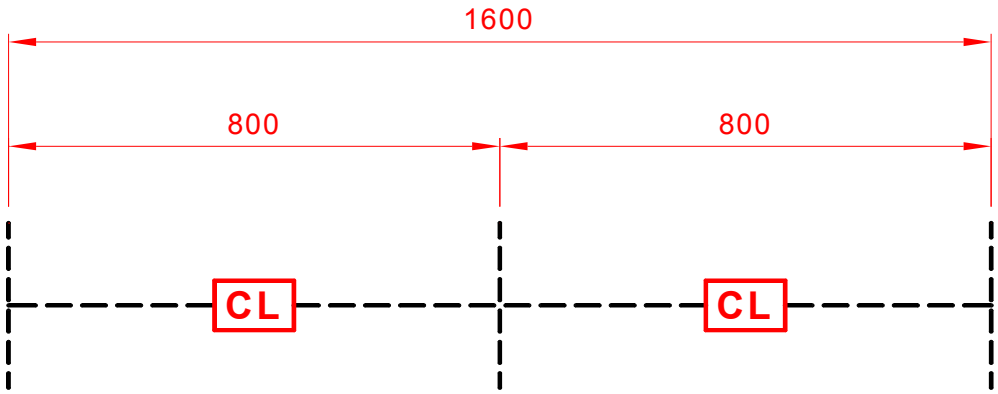


Figure 1: Marking Floor, Step 1

Append the original chalk outline of Figure 1 with another outline as shown in Figure 2. This will be the radial extent of the turnstile.

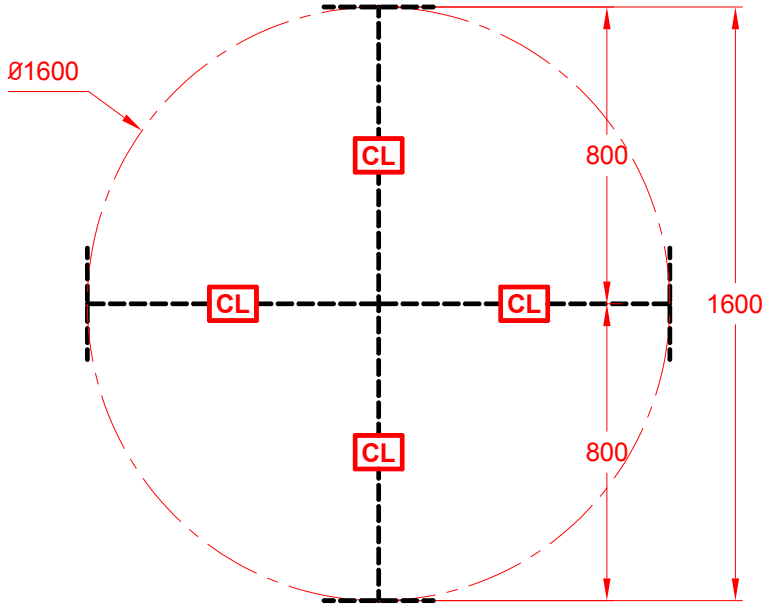


Figure 2: Marking Floor, Step 2

If power and control cables are routed from floor level, either through conduits chased into the floor or core drilled, see Figure 3 for conduit positions and marking of chalk outline.

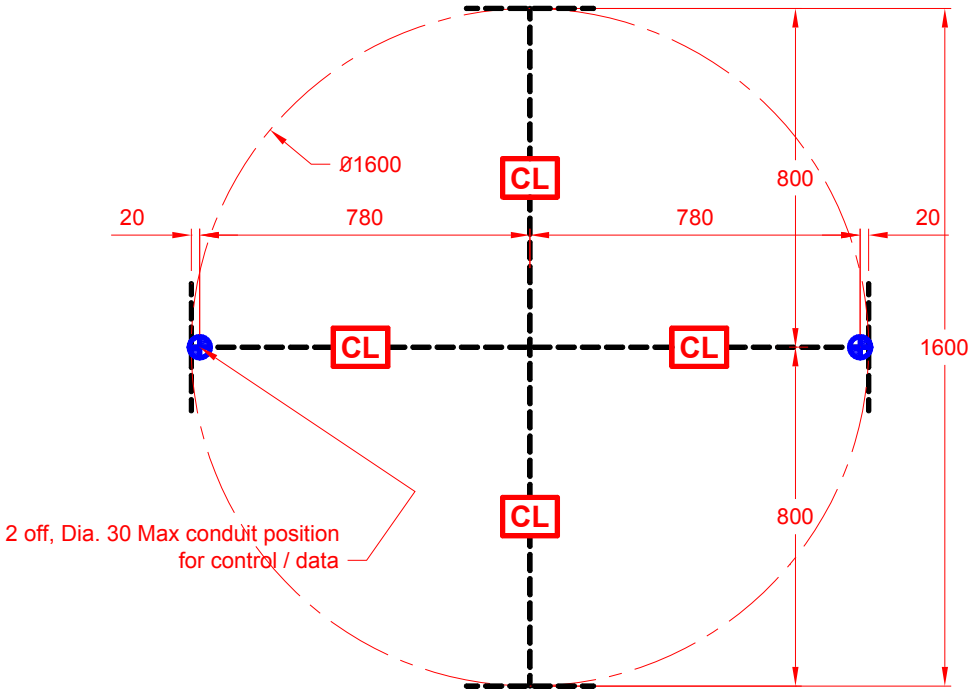


Figure 3: Conduit Positions marking

5. Assembly

5.1 Outer frame halve drum

The outer frame consists of two halve drums that in turn consists of 2 off uprights A, 1 off upright B, a right and a left side top weldment, a right and a left side base weldment and screws supplied that connects these members together.

Figure 5 and 6 details the positions of the frame members and the screws.

List no 5a: Outer frame halve drum			
No	**Description**	**Part No.**	**Quantity**
1	Side base weldment - right		1
2	Side base weldment - left		1
3	Upright A		2
4	Upright B		1
5	Top side weldment - left		1
6	Top side weldment - right		1
7	M12 x 30 Countersunk Capscrew, zinc plated		6
8	M12 x 35 Countersunk Capscrew, zinc plated		6
9	M12 Hexnut, zinc plated		6

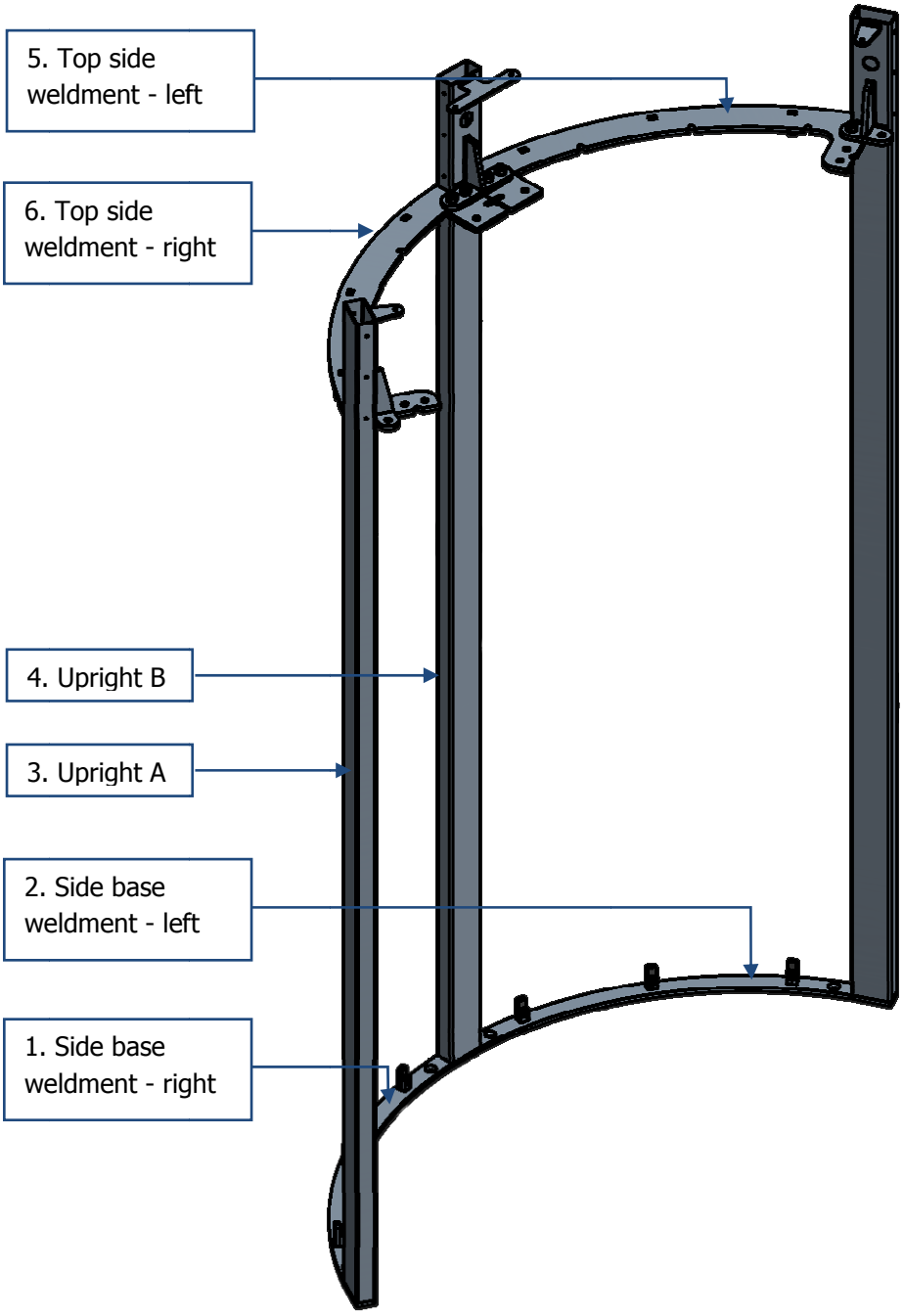


Figure 4: Overview of halve drum

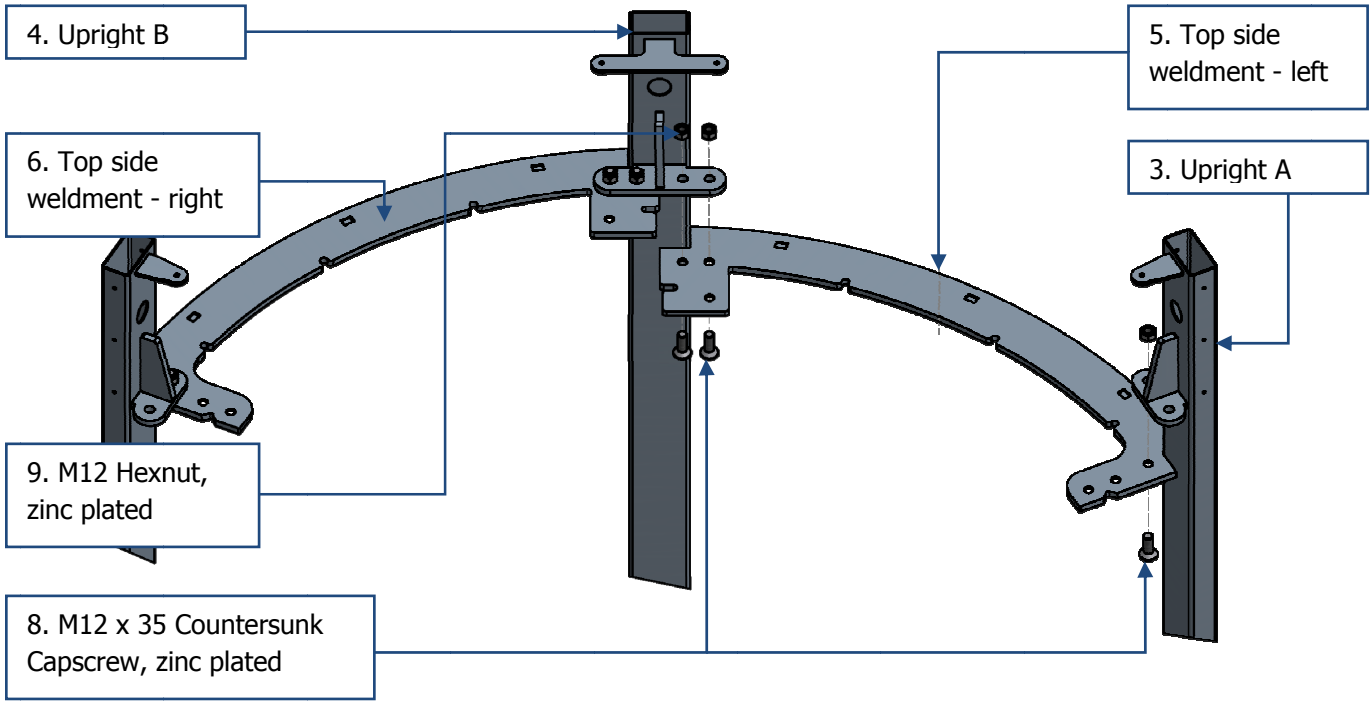


Figure 5: Top of halve drum assembly

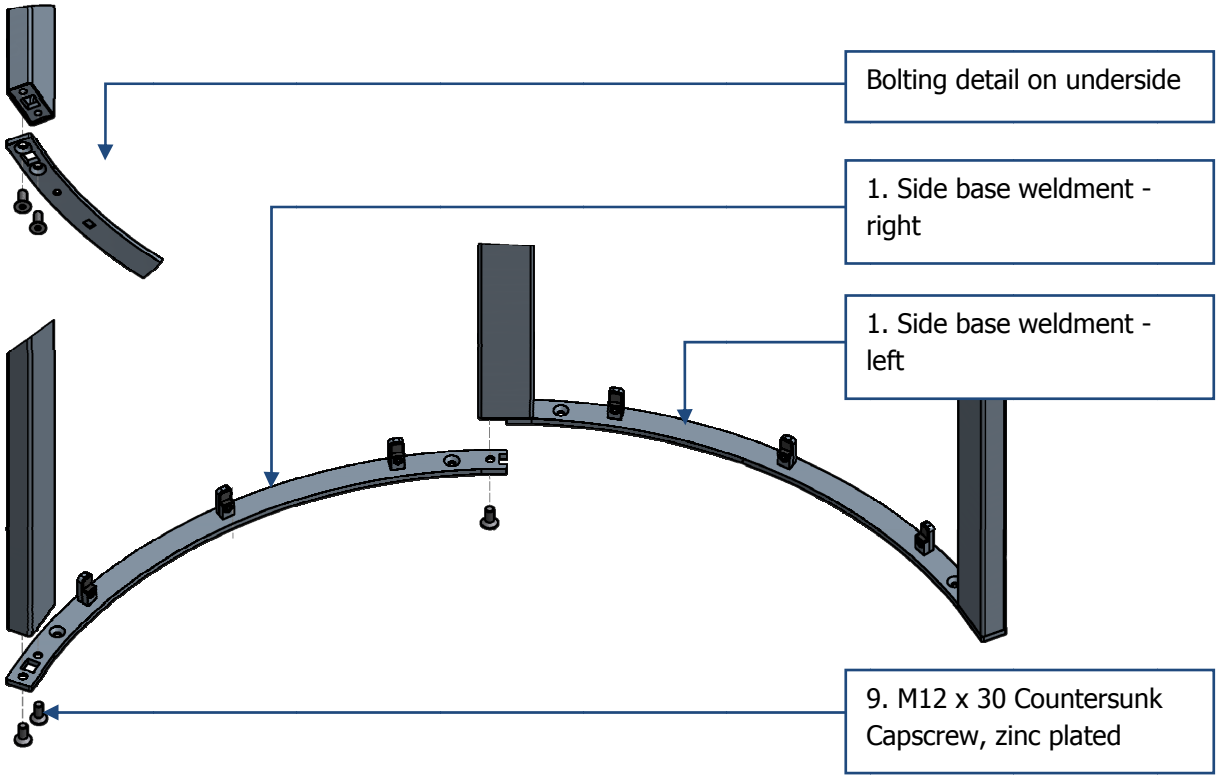


Figure 6: Bottom of halve drum assembly

5.2 Drum assembly

The top front member connects the 2 halve drums to form the drum assembly. Take note to route the cables (if protruding from plinth) through the opening in the bottom of Upright B. Draw wire should be used for this.

Figure 7 details the connection of the top front member.

List no 5b: Drum assembly			
No	**Description**	**Part No.**	**Quantity**
1	Outer frame halve drum		2
2	Top front member		2
3	M12 x 35 Countersunk Capscrew, zinc plated		4
4	M12 Hexnut, zinc plated		4

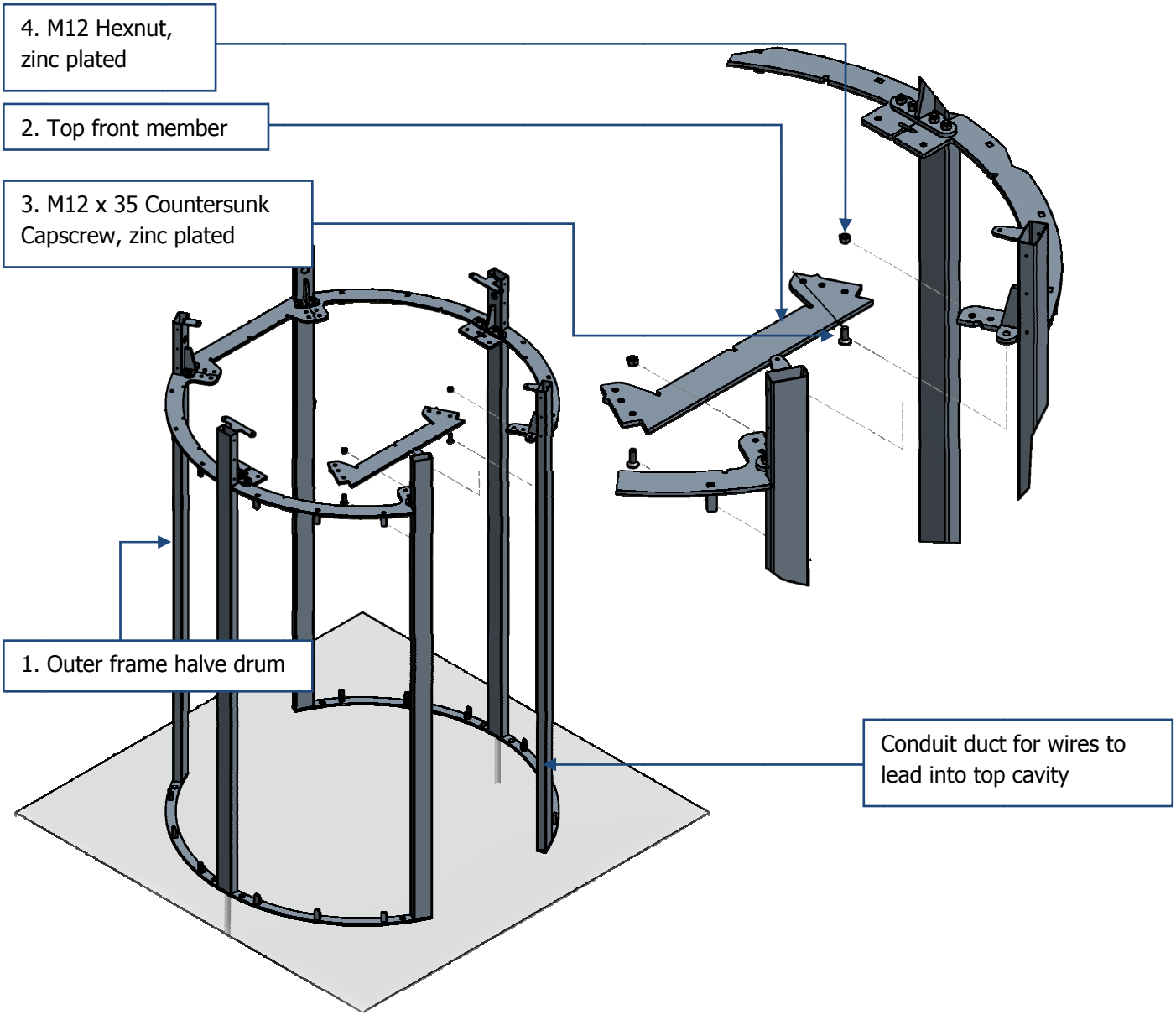


Figure 7: Top front member assembly

Place the two halves on the plinth where the side extents of the chalk line is marked out as in Figure 8. Connect the two drum halves with the top front member and bolt together using the specified screws and hex nuts as shown in Figure 7.

Do not bolt the unit to the floor yet.

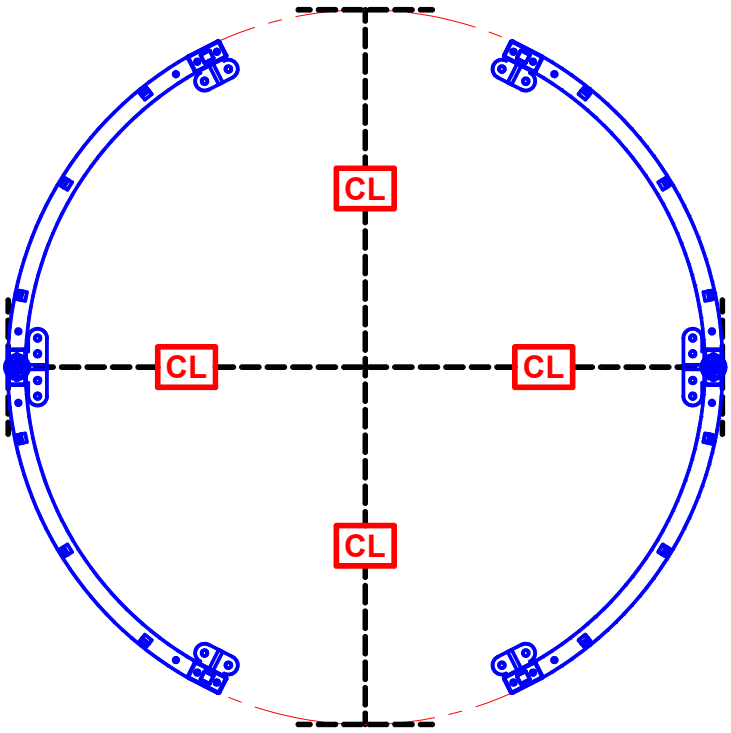


Figure 8: Drum assembly placement on floor markings

5.3 Top structure

The top structure needs to be bolted together to provide extra rigidity to the unit.

After bolting together the top structure in Figure 9 and 10, check the dimensions are correct as per Figure 11 before bolting unit down.

List no 5c: Top structure assembly			
No	**Description**	**Part No.**	**Quantity**
1	Drum assembly		1
2	Structural member		2
3	Support member		2
4	Channel		1
5	M12 x 35 Countersunk Capscrew, zinc plated		16
6	M12 Hexnut, zinc plated		16
7	M12 x 25 Hexbolt, zinc plated		6
8	M8 x 75 Countersunk anchor bolt		4
9	Diameter 10 anchor sleeve		4

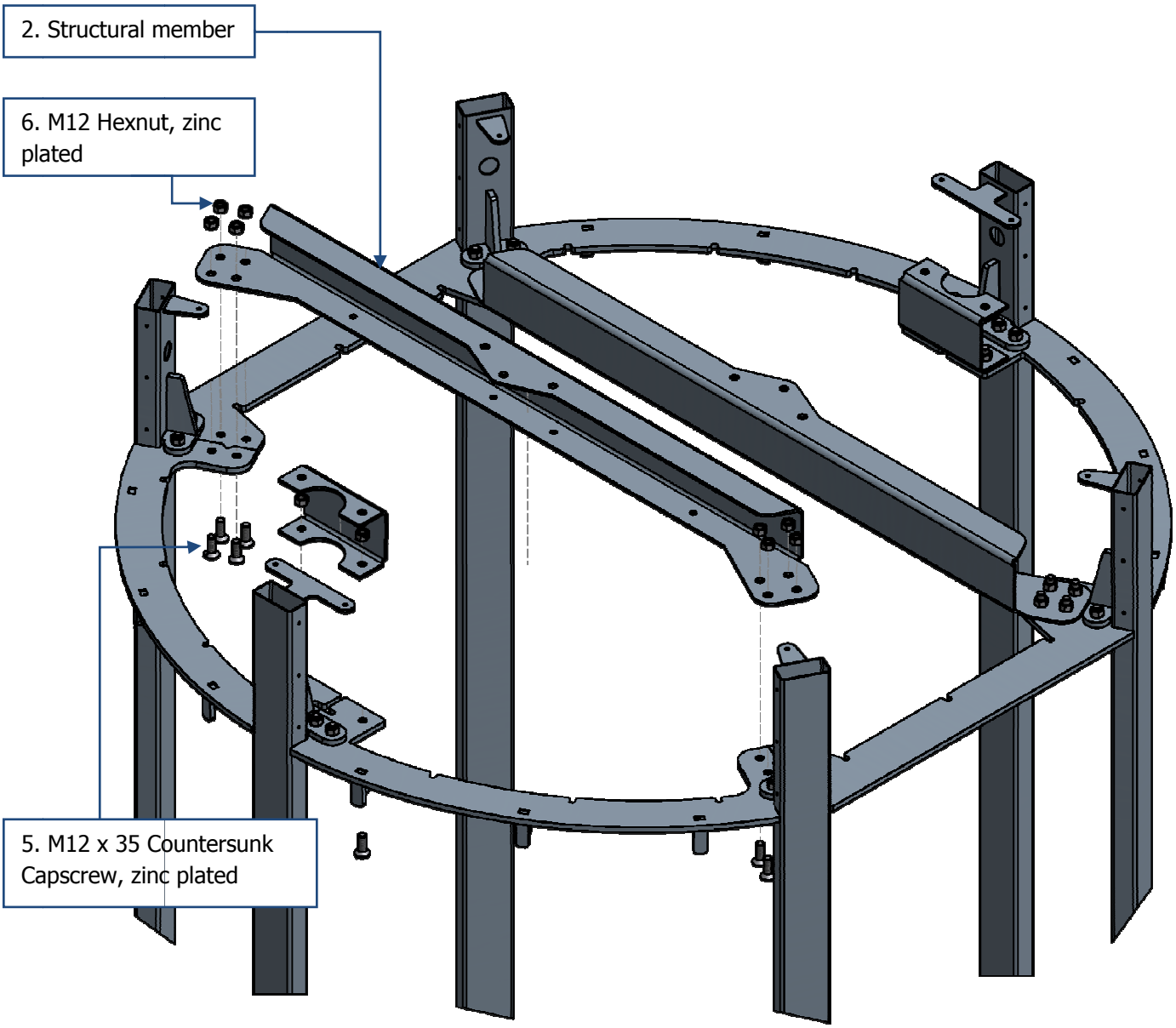


Figure 9: Structural Frame

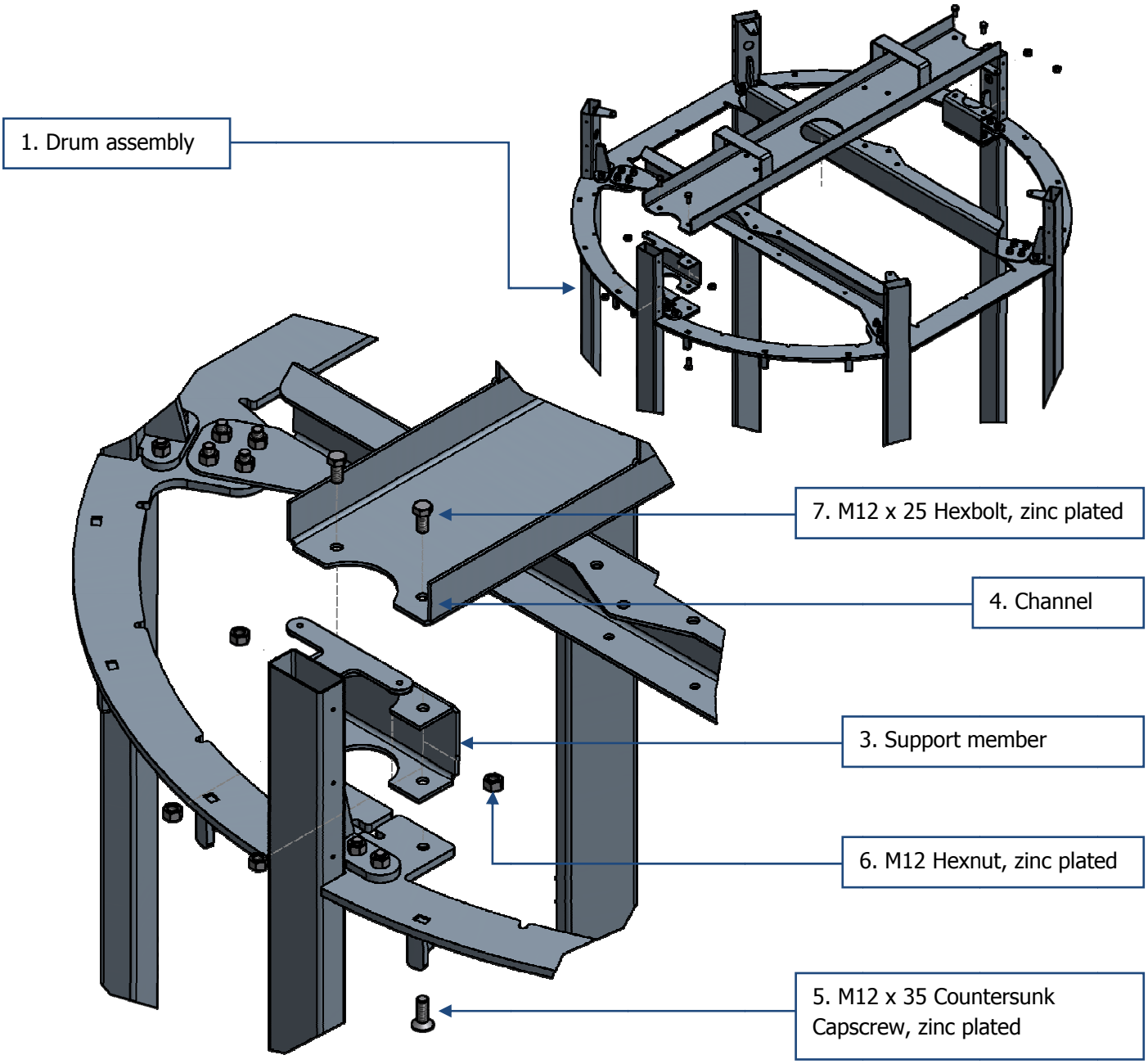


Figure 10: Top structure assembly

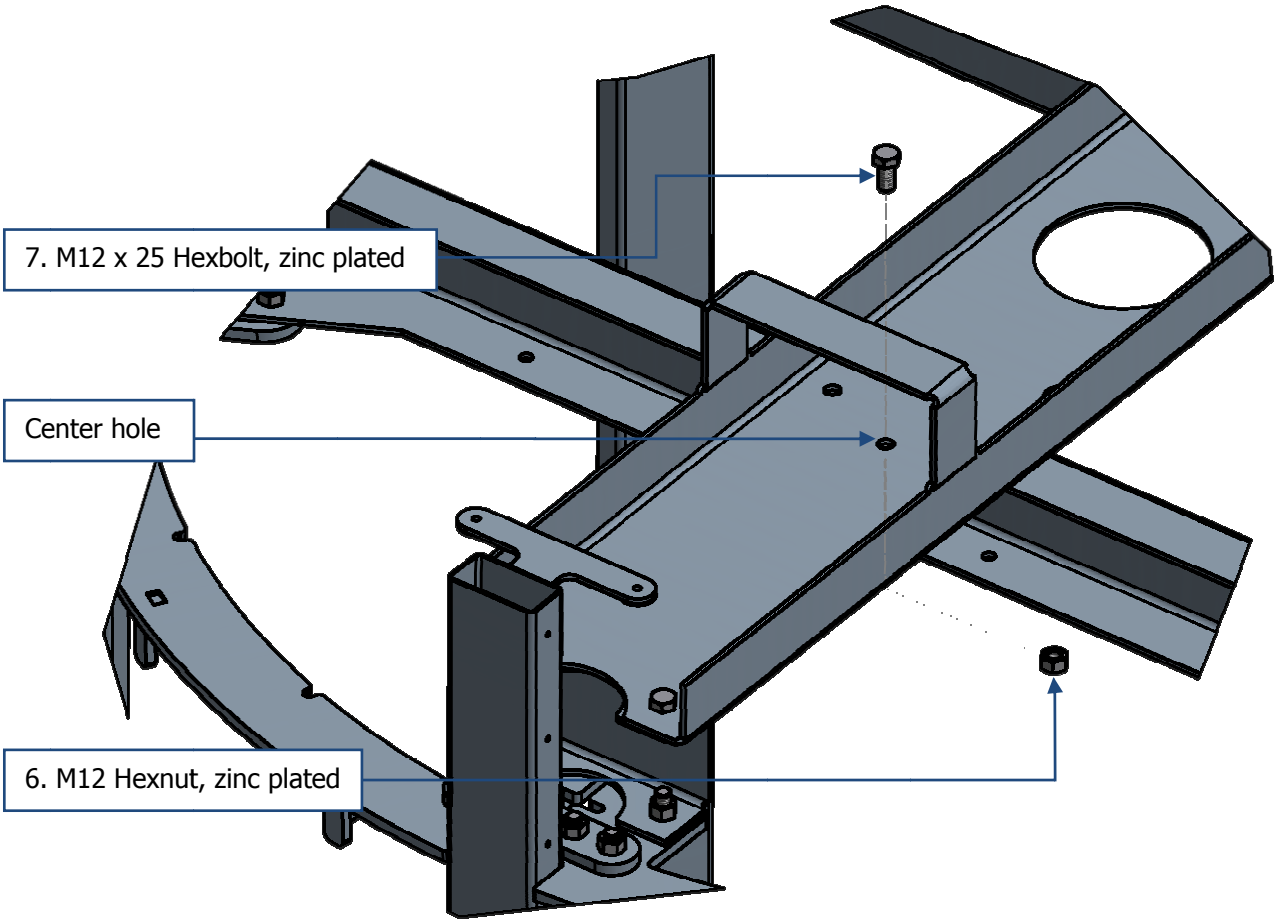


Figure 11: Fixing center bolt

A center bolt is placed on either side as shown on Figure 11. Only fix this bolt to the structural member.

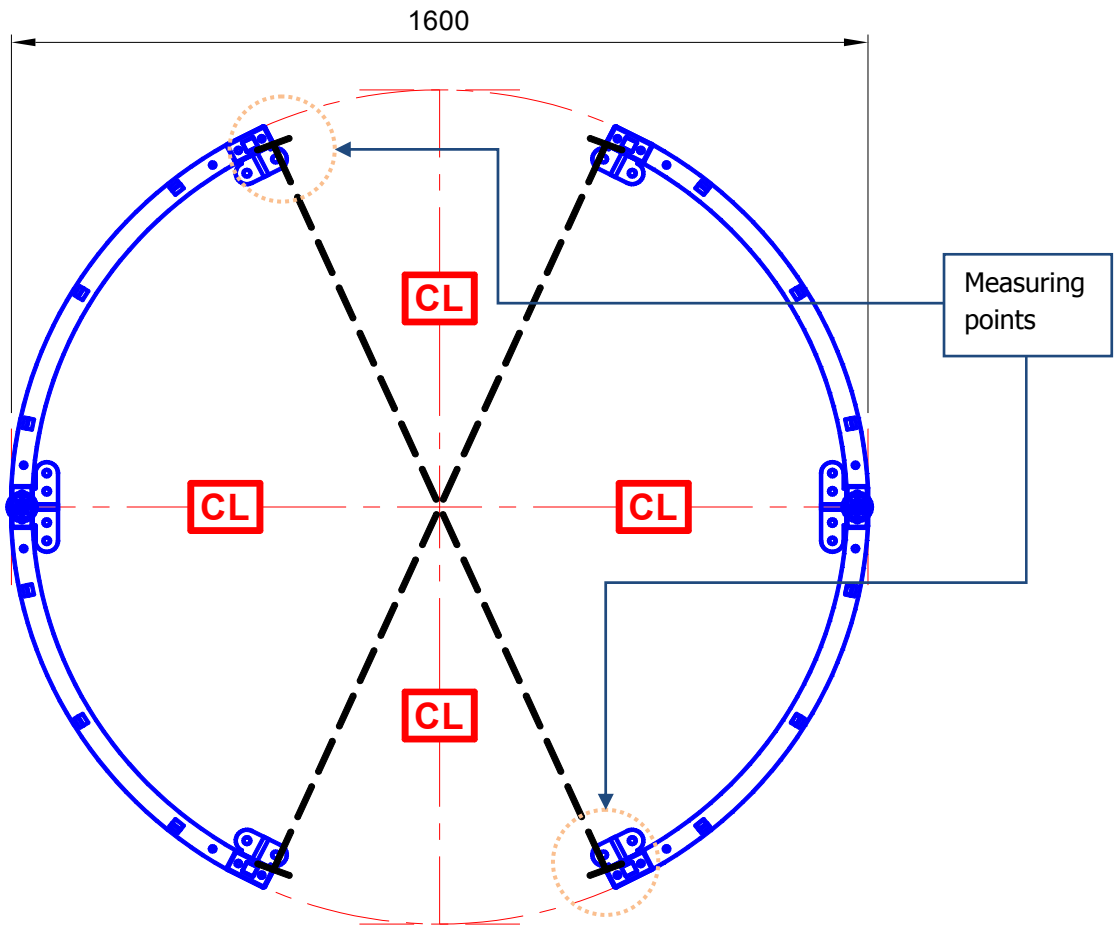


Figure 12: Cross checking and overall dimension

Check that dimensions from post to post is equal to the dimension from post to post on opposite side.

These points must intersect on the center of the door and is important to ensure rotation of rotor will be balanced. Also check that outside dimension is maintained to 1600mm.

In the side base, where the 11 diameter countersunk holes are found, drill into the concrete with a Diameter 10 drill bit to 80mm deep from floor level.

Use (8) M10 x 75 Anchor sleeve and (9) M10 x 55 Countersunk screw to bolt unit to floor. Ensure unit does not move while anchoring.

IMPORTANT: If bolting to flooring other than concrete screed or tiles, contact Turnstar for advice.

IMPORTANT: Do not use a hammer to force the countersunk screws as this will only damage both the bolt and the sleeve. A drill with an allen head socket drive is required.

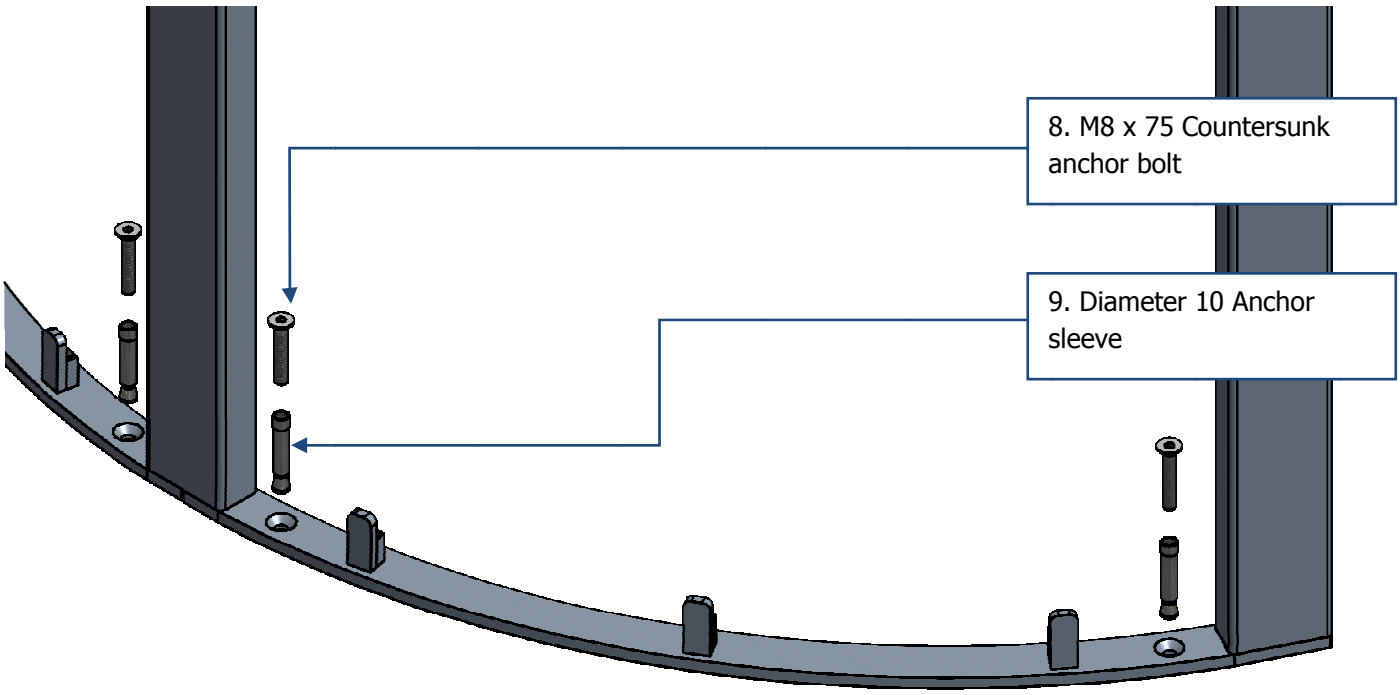


Figure 13: Bolting side frame

5.4: Curved Glass assembly

IMPORTANT: Use glass lifting clamps when handling glass. The glass is toughened and banging it with the steel of the frame will cause it to shatter instantaneously.

IMPORTANT: At least 2 persons are required to move glass into place. Do not attempt to do this alone.

There are 4 curved glass quarter panels to be placed and fixed with the supplied glass clamps. Identify all parts and tools before starting this assembly.

Lift the Glass piece and put into position from the inside of the frame as shown in Figure 14.

INFO: Assembling the glass will strengthen the rigidity of the frame structure considerably.

List no 5d: Curved Glass assembly			
No	**Description**	**Part No.**	**Quantity**
1	Curved Glass Part		4
2	Glass clamps (with gasket)		24
3	M8 x 16 Countersunk capscrew, zinc plated		24

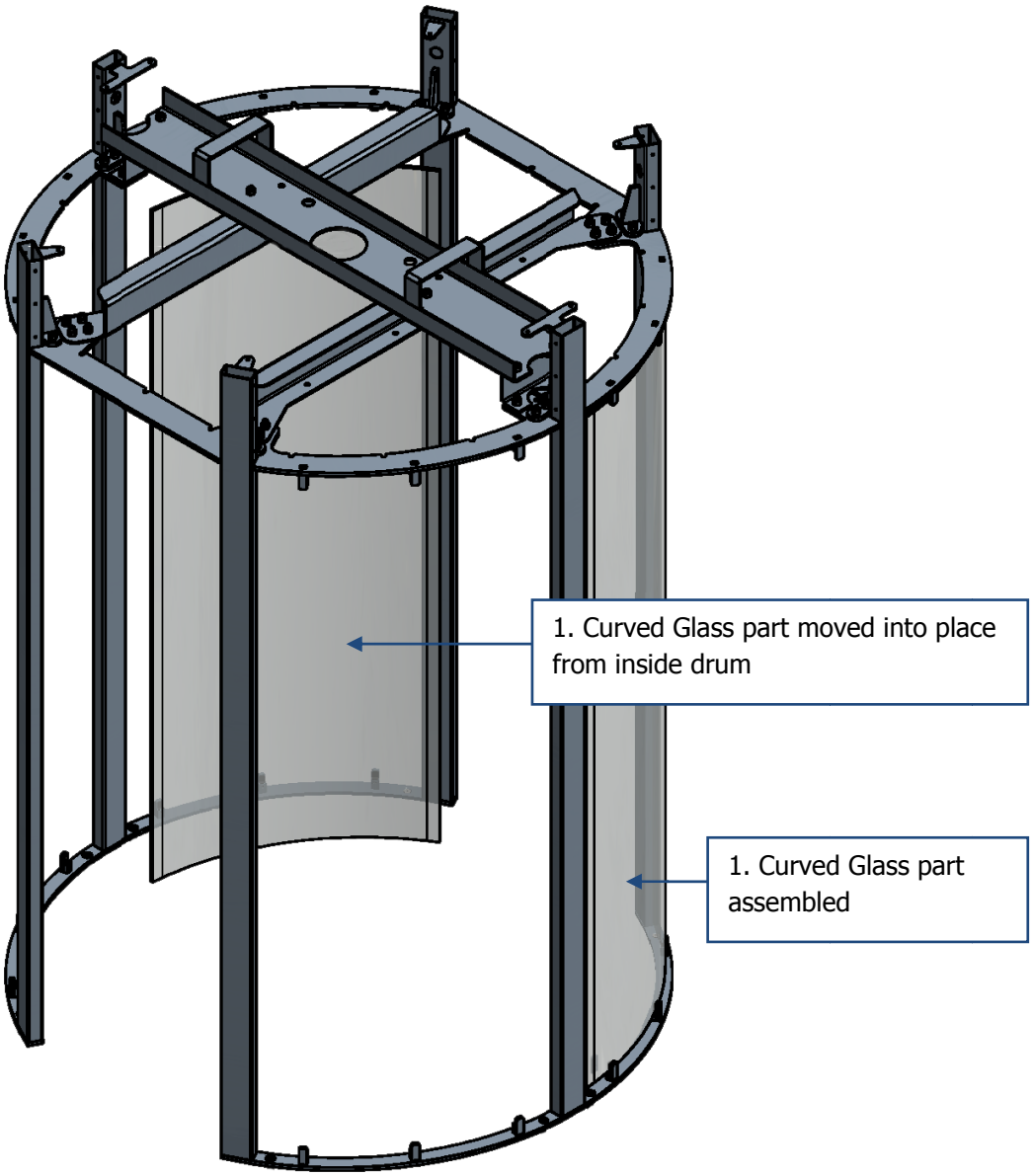


Figure 14: Glass placement

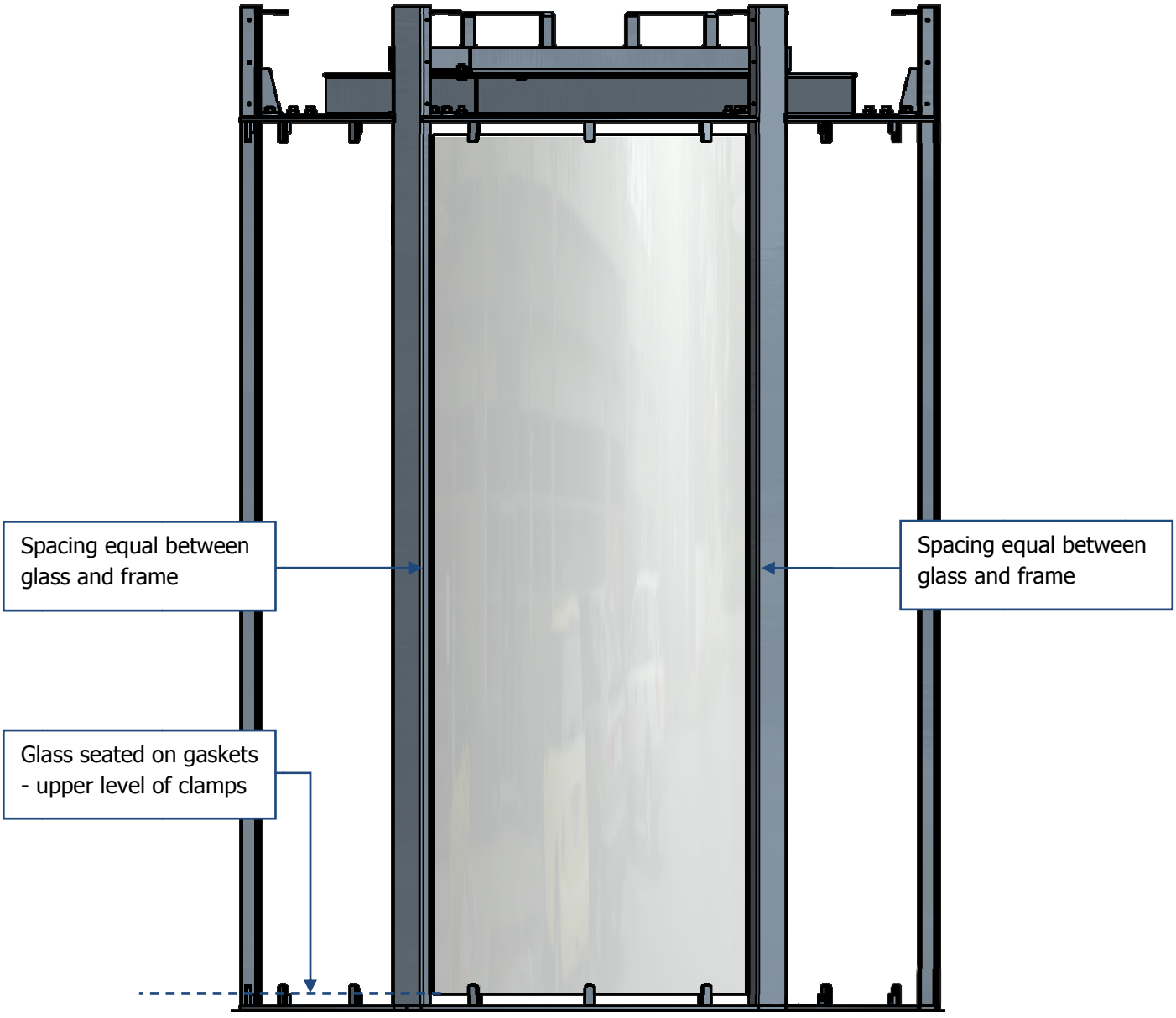


Figure 15: Glass spacing

Place glass onto gaskets on the base level as shown in Figure 15. Check that gaps between steel posts and glass are equal.

Fix the glass clamps with the screws provided as shown in Figure 16 and 17. Do not over-tighten. The gasket on the glass clamps will compress to hold the glass into place.

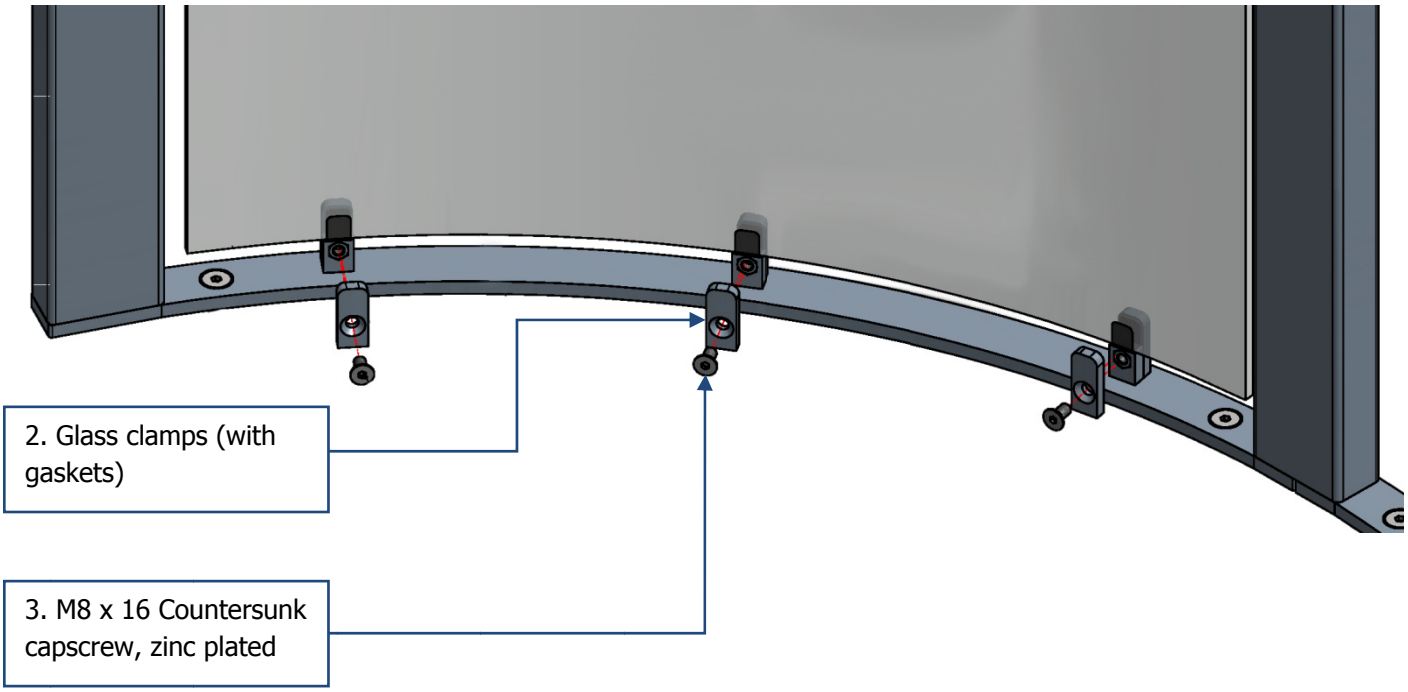


Figure 16: Glass clamp fixing on base

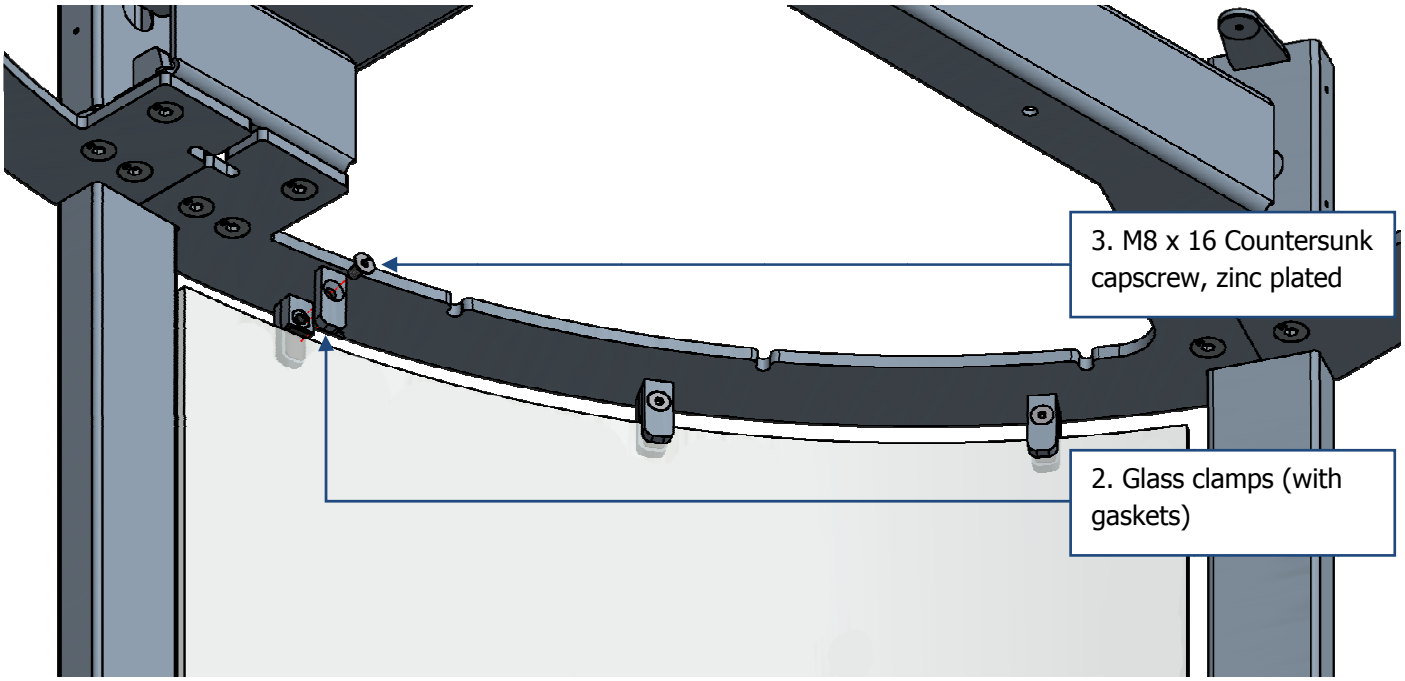


Figure 17: Glass clamp fixing on top

5.5: Center Bearing

IMPORTANT: The bearing must be placed level with the frame. Any deviation in horisontal line more than 3mm may cause inoperability.

List no 5e: Bearing Assembly			
No	**Description**	**Part No.**	**Quantity**
1	Bearing holder		1
2	M8 x 55 Capscrew, zinc plated		3
3	Diameter 10 Anchor sleeve		3
4	2206.2RS1 Bearing		1

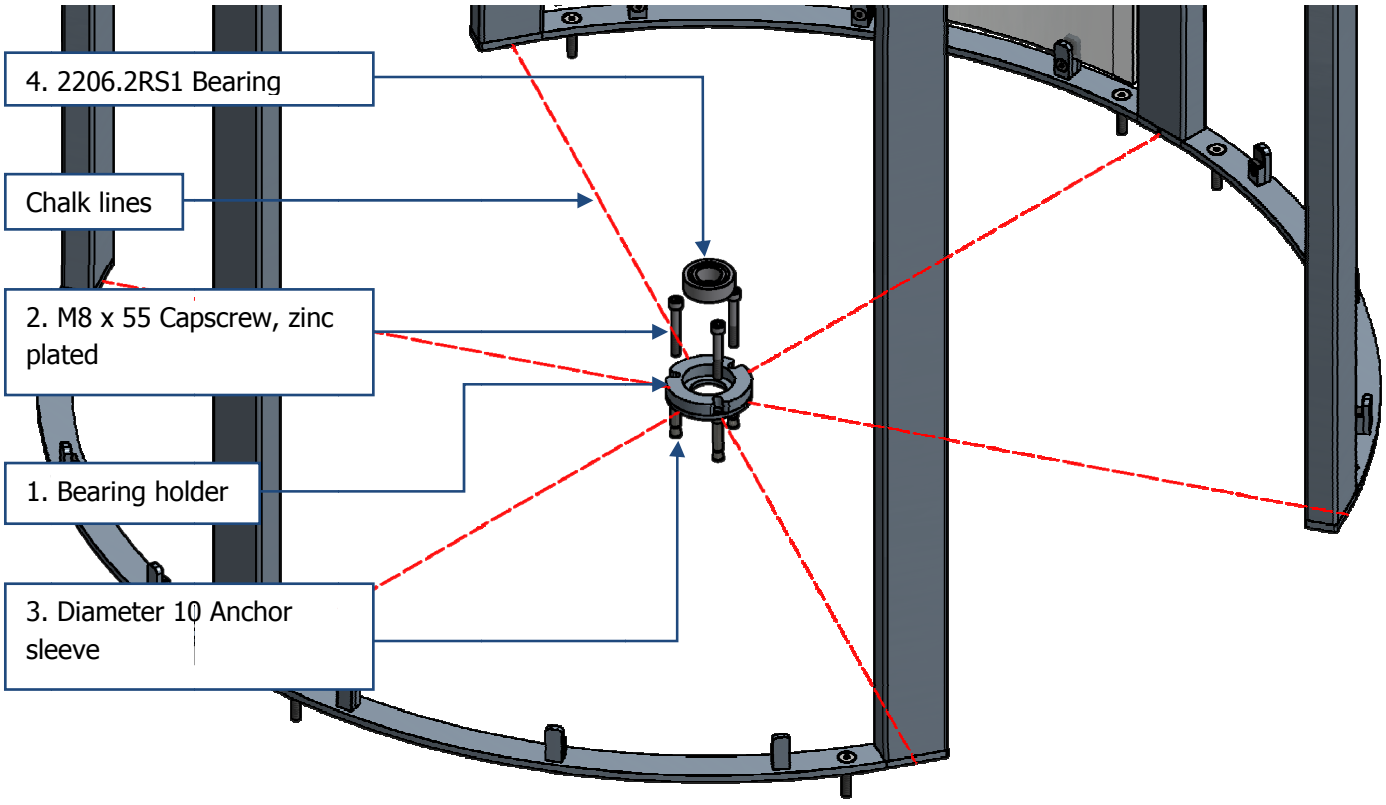


Figure 18: Center bearing arrangement & bolting

Ensure that the bearing holder center is placed over the center chalk line crossing mark on the floor. Mark the three holes through the holder and drill with a diameter 10 drill, 80mm deep into concrete / tile. Place M10 anchors into holes and knock in gently with a rubber mallet until flush with floor level.

IMPORTANT: Do not use a hammer to force the countersunk screws as this will only damage both the bolt and the sleeve. A drill with an allen head socket drive is required.

Place bearing holder and bolt into anchors using the supplied M10 x 55 Allen head Capscrews, all the while ensuring that the bearing holder has not deviated from the center chalk line crossing. Insert the bearing and use a rubber mallet and a wooden flat to knock the bearing to seat properly inside the housing.

IMPORTANT: Before proceeding to next step, ensure all quarter curved glass panels are installed and clamped.

5.6: Mechanism placement and Spiders

The mechanism is assembled after the frame structure is complete.

List no 5f: Mechanism & Spiders assembly			
No	**Description**	**Part No.**	**Quantity**
1	3-arm Heavy-duty Full Height Mechanism (Fail-safe / Fail-secure)		1
2	M12 x 35 Hexbolt, zinc plated		4
3	M12 Hexnut, zinc plated		4
4	Bean washer		2
5	M16 Hex Nylock nuts, zinc plated		4
6	M16 Flatwashers, zinc plated		4
7	Rubber disk buffers		4
8	Top spider assembly		1
9	Bottom spider assembly		1

IMPORTANT: The mechanism must be assembled with the top spider and fixed in place with the bean washers and M16 nylock hex nuts before continuing with the bottom spider and the glass.

Place mechanism into the top channel as shown in Figure 19, ensuring the over-ride locks corrospond to the holes in the channel. Insert the M12 x 35 Hexbolts through the mechanism plate as shown. The bolts will pass through the top channel and the structural frame member. Use M12 hexnuts from below and tighten.

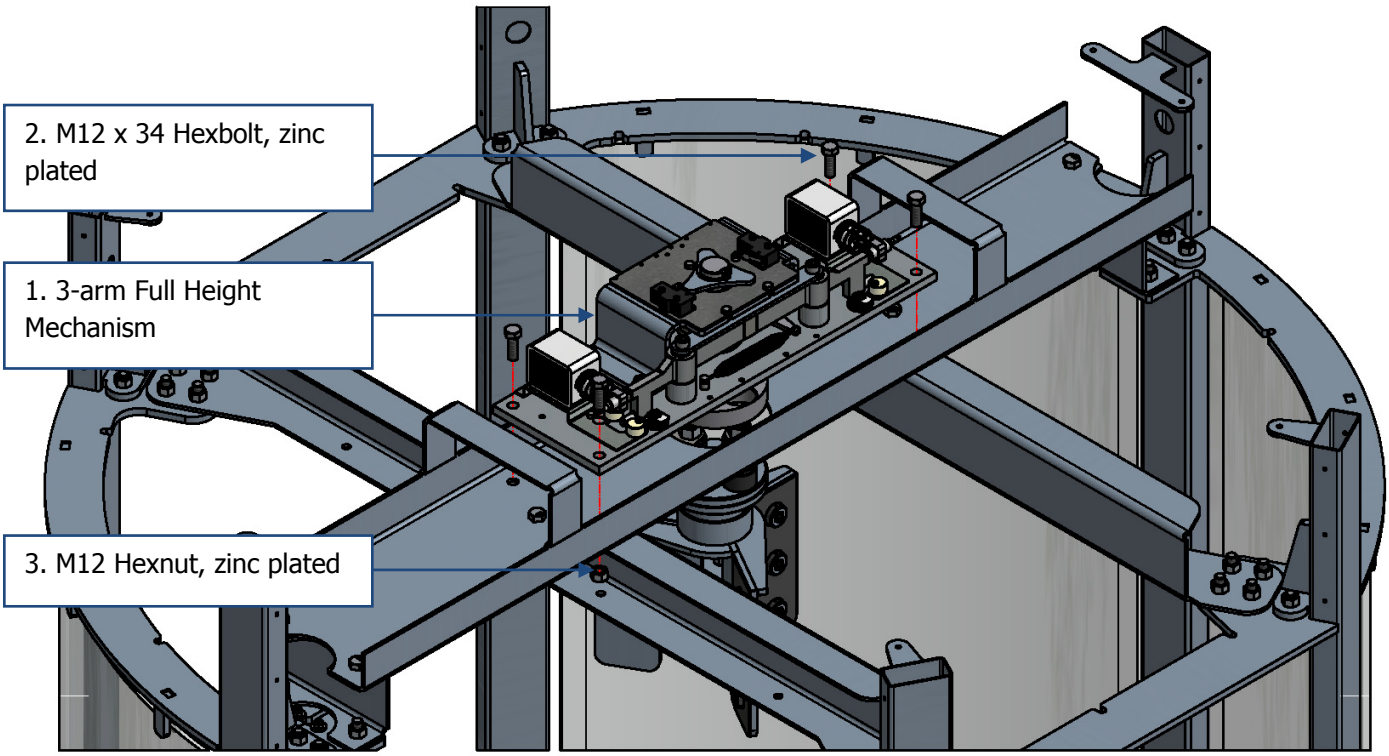


Figure 19: Mechanism placement

See Figure 20 for the standard arrangement of attaching the Top Spider to the mechanism disk.

Place Rubber Disk Buffers over studs on the Top Spider and insert into the disk. Place bean washers over studs (over the mechanism disk) and fix with M16 hex nylock nuts.

The required effect is that the bean washers will hold the top disk in place connected to the mechanism. The rubber buffers will compress under the bean washer to provide a solid fixing, yet still allowing slight movement that will compensate for any misalignment.

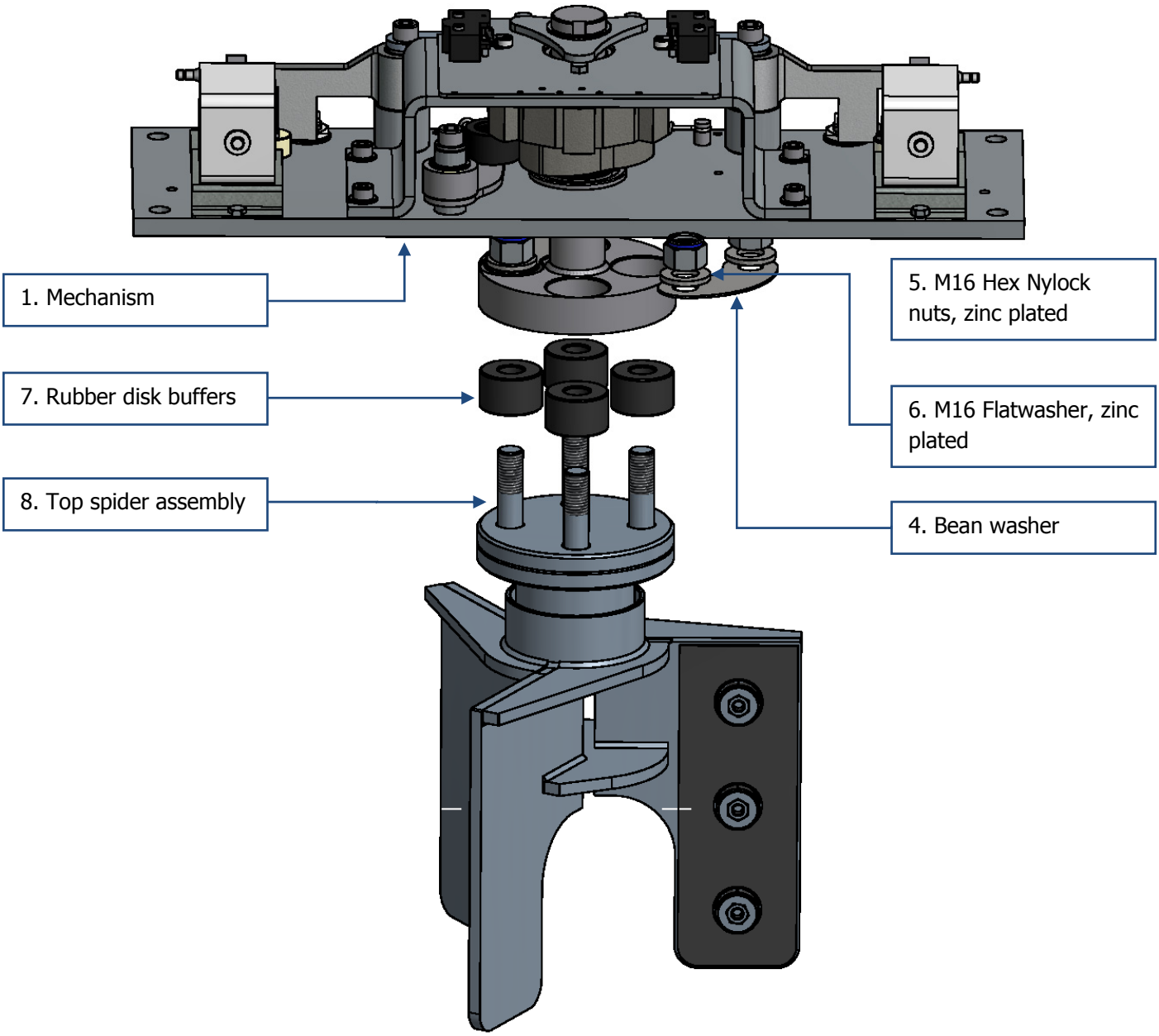


Figure 20: Top spider to mechanism arrangement

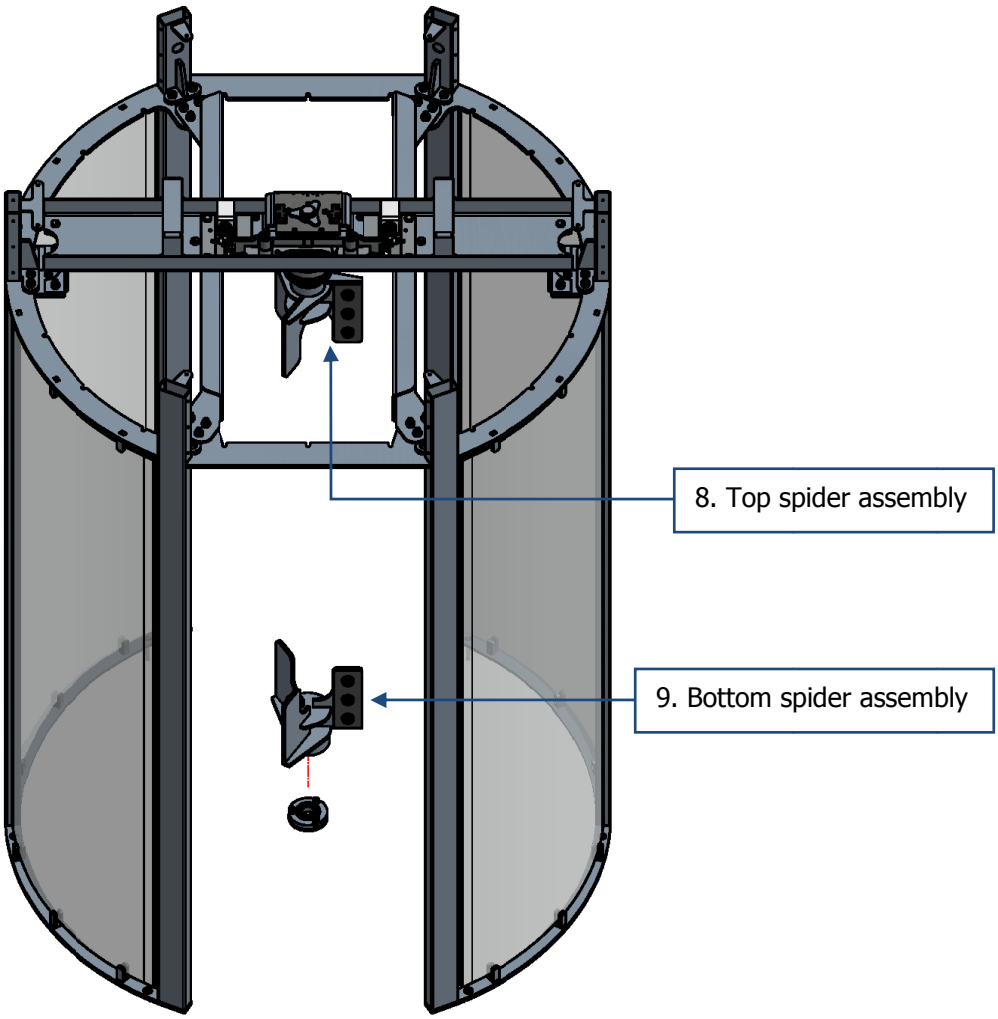


Figure 21: Bottom spider placement & alignment

The Bottom spider is placed inside the base bearing. The spider will be free-spinning until the glass panels are fixed. Keep the Bottom spider aligned with the Top spider until glass panels are fixed.

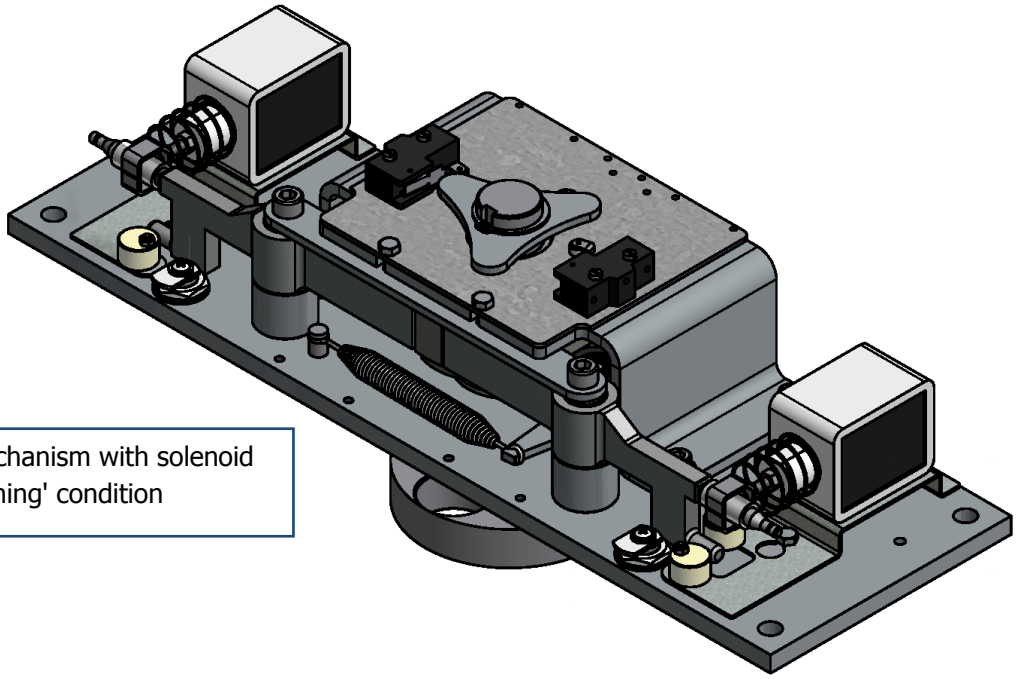
5.7: Fail-safe or Fail-secure

There are two types of mechanism and both have a different operation when a power failure occurs.

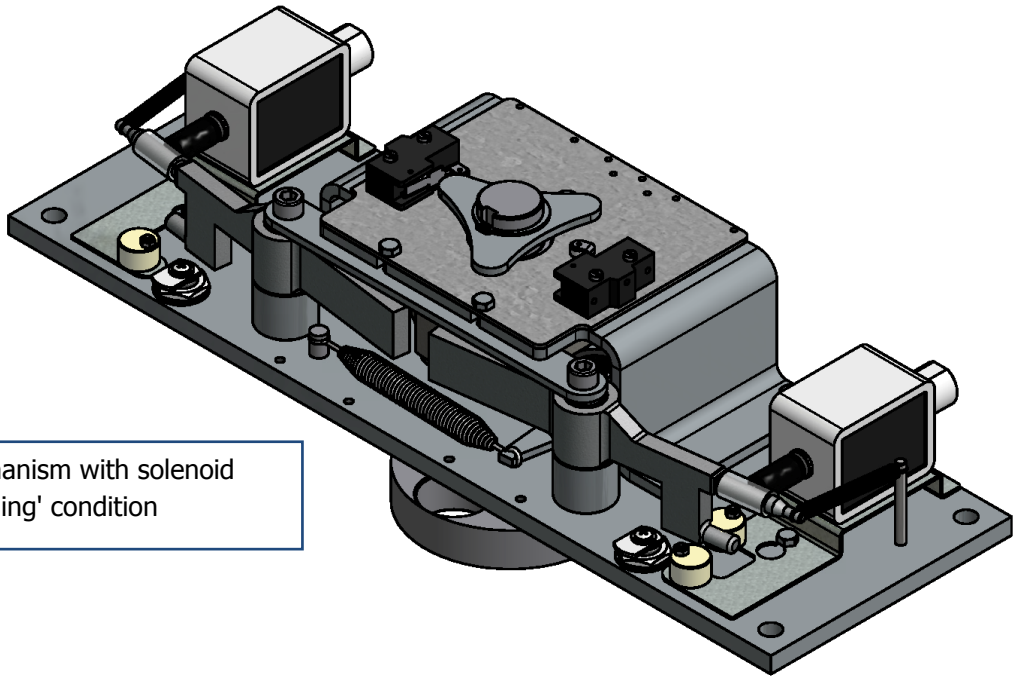
The type of mechanism will depend on customer specification, although the Curved Glass Turnstile is supplied with a fail-safe mechanism as standard. See Figure 22 for difference between fail-safe and fail-secure.

The fail-secure mechanism is configured to lock when power fails. It can opened with the over-ride locks if this scenario occurs. See position of return spring to identify this type of mechanism.

The fail-safe mechanism is configured to open when power fails. This allows pedestrians to move through the door freely in case of emergency. See position of return spring to identify this type of mechanism.



Fail-secure mechanism with solenoid springs in 'pushing' condition



Fail-safe mechanism with solenoid springs in 'pulling' condition

Figure 22: Fail-safe & Fail-secure mechanisms

5.8: Pressure mat installation

The pressure mat should be installed before the rotor as it provides ease of access to the section normally closed by the glass panels.

List no 5g: Pressure mat installation			
No	**Description**	**Part No.**	**Quantity**
1	Pressure mat assembly (with connected wiring harness)		1
2	Carpet trim - 695mm 16x16x1.5mm Alu Trim		2
3	6x45 Eureka Anchor Plug Sleeve		6
4	6x45 Eureka Anchor Plug Screw		6

Mark the area on the floor as shown in Figure 23. The angle between the chalk lines are 120 degrees. Use the corner of the upright post as a setting out point to the center mark.

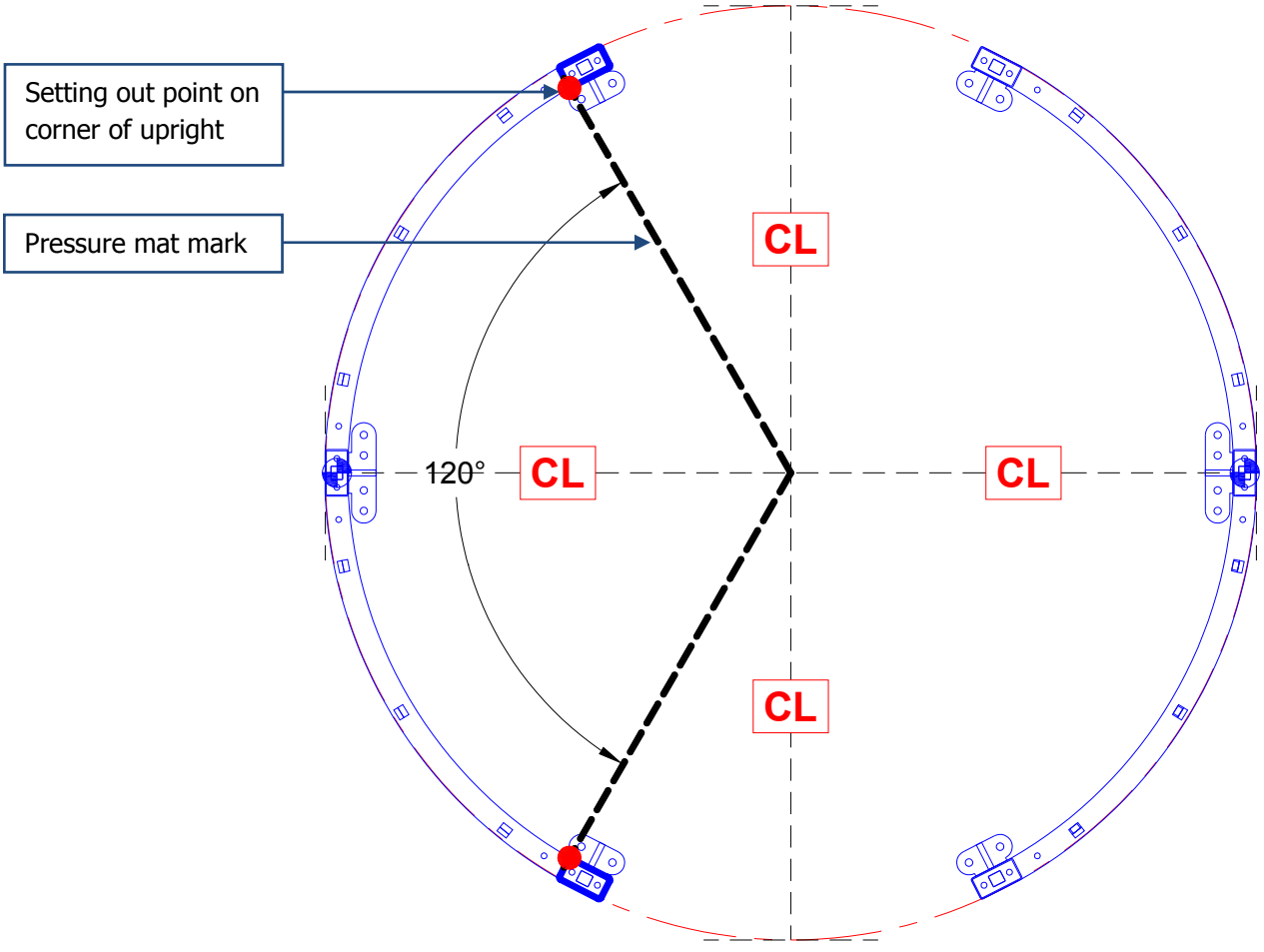


Figure 23: Pressure Mat floor marking

To allow access to the section where the pressure mat assembly will take place, remove the bottom spider from the bearing holder as shown in Figure 24. Place the carpet trims with the outside edge of the 'L' section flush with the

chalk line. Drill three Diameter 8 holes, 45mm deep through the holes in the carpet trim. Use a pozi drive attached to a drill to screw in anchors.

Lead the wire connected on the pressure plate through the hole in the side upright. Use draw wire to lead wire into top cavity as this will have to be connected to the control panel.

Place carpet inside trims as shown, with pressure plate facing down.

IMPORTANT: Ensure the wire connected to the pressure plate is not twisted or damaged when placing carpet, as this can result in operation failure.

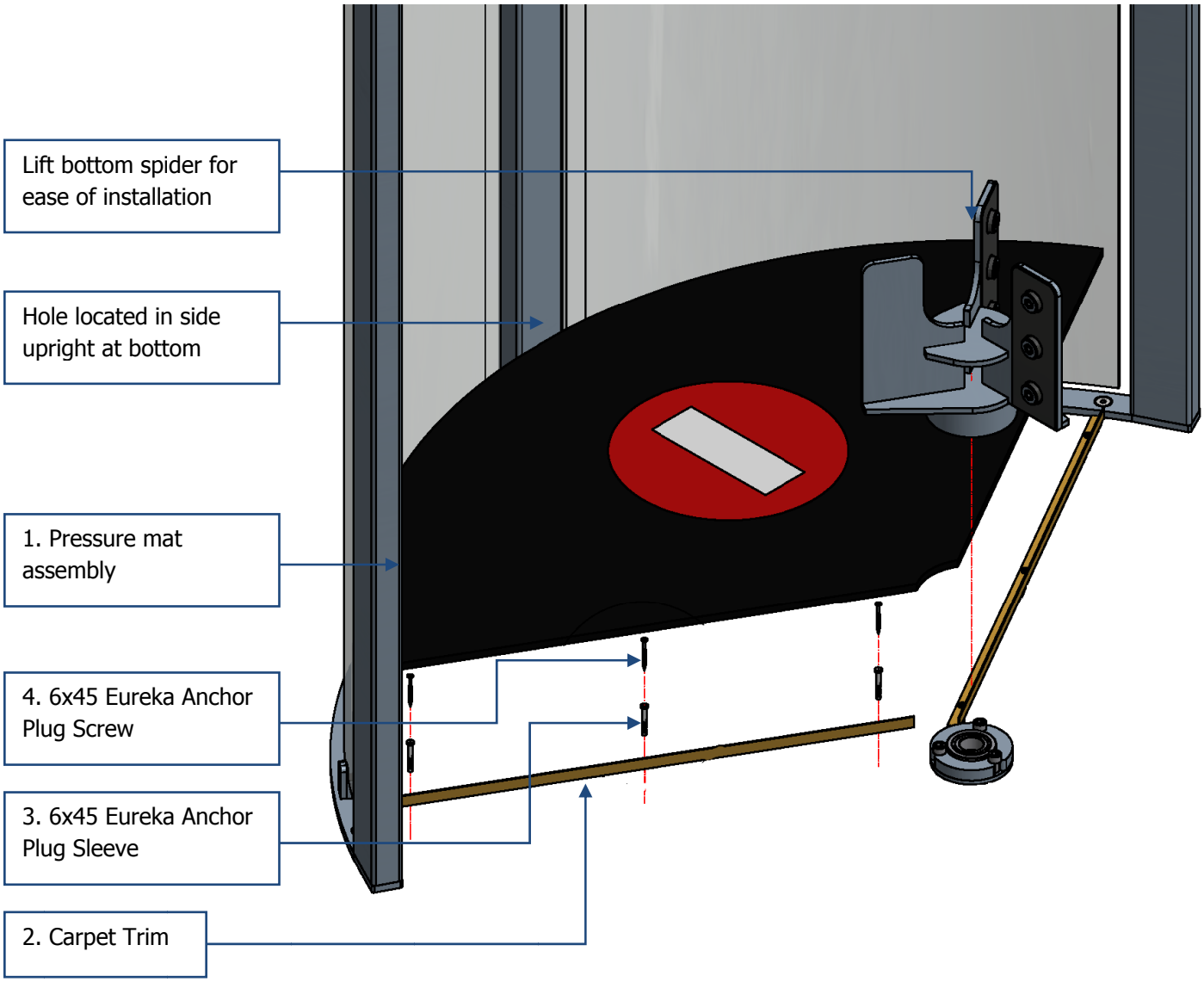


Figure 24: Pressure Mat assembly

5.9: Center Glass assembly (with Handles)

The center rotor consists of three toughened 10mm thick glass panels and three sets of vertical handle pairs. The glass will be bolted to the top and bottom spider, which was specified earlier.

List no 5h: Center Glass assembly (with Handles)			
No	**Description**	**Part No.**	**Quantity**
1	Rotor Glass panel for 1600 CGTS		3
2	Glass bolting rubber		18
3	Spider clamp plate (with gasket)		6
4	M8 x 16 Countersunk Capscrew, zinc plated		18
5	Handlebar, threaded		3
6	Handlebar, countersunk		3
7	M8 x 25 Countersunk Capscrew, zinc plated		6

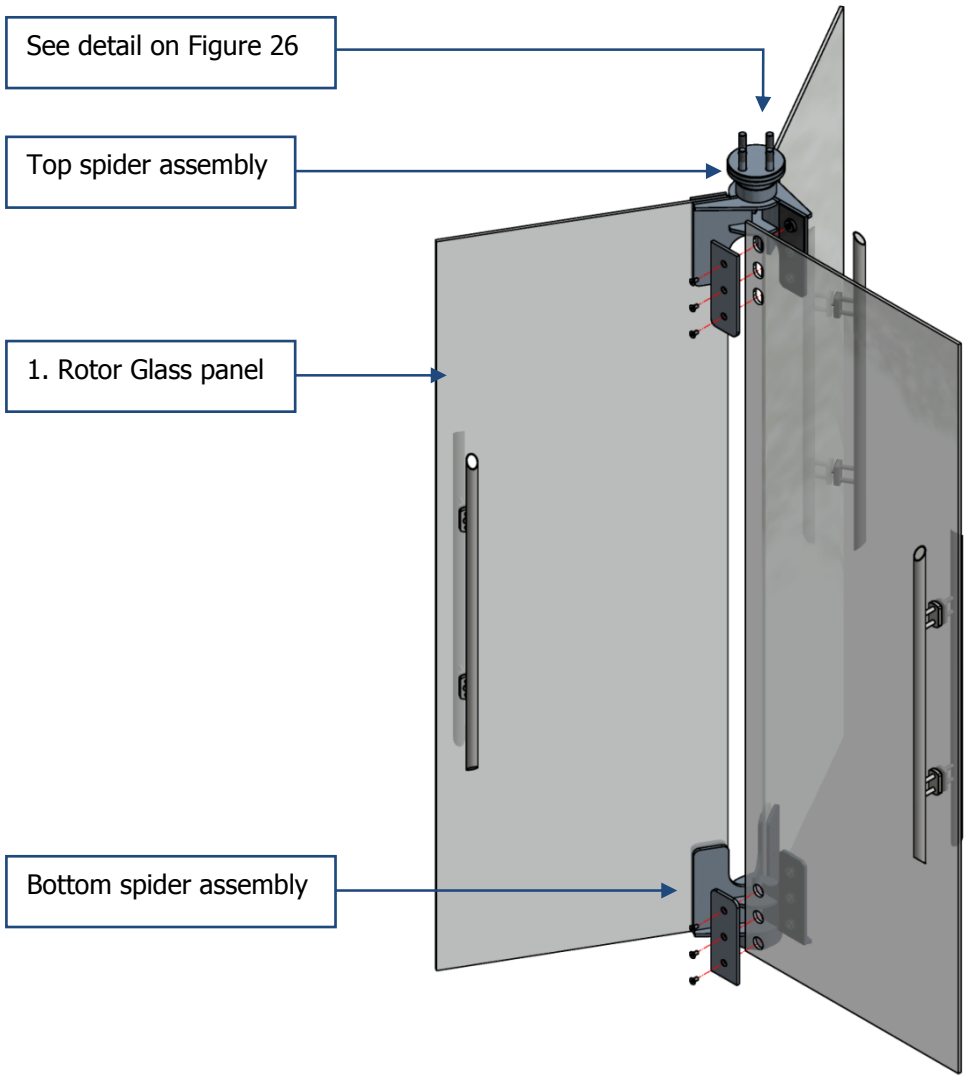


Figure 25: Rotor Glass assembly

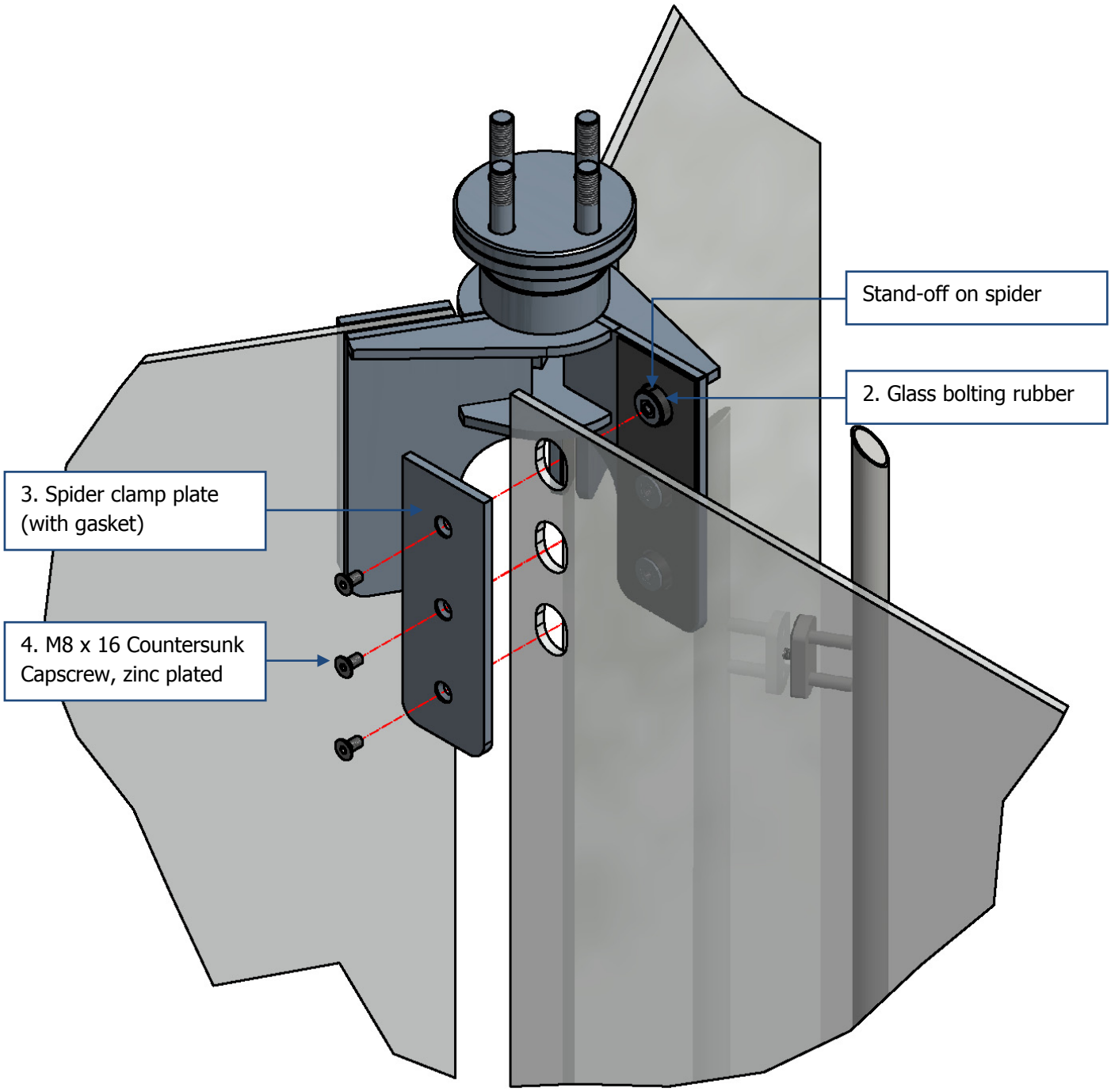


Figure 26: Detail on Glass bolting

At least three persons are required for this assembly. Two to hold the glass and one to proceed placing clamp plates and bolts.

IMPORTANT: Use glass lifting clamps when handling glass. The glass is toughened and banging it with the steel of the frame will cause it to shatter instantaneously.

IMPORTANT: At least 3 persons are required to move glass into place and bolt. Do not attempt to do this alone.

IMPORTANT: Ensure that glass bolting rubber strips are glued to round stand-offs on both the top and bottom spiders as shown in Figure 26. Without these, the glass will shatter on tightening. These are 78 x 8mm, 1.5Thk solid rubber.

With two persons holding the glass in place with suitable glass lifting clamps, place the glass into the stand-offs. Note well that the glass at the bottom has diameter 30 holes, while the glass at the top has slots. The slots allows a slight adjustment in a difference between the top spider and the bottom spider, but the installer should aim for placing the glass top slot in center of stand-off.

The bottom spider can be lifted (and temporarily spaced) to allow the glass to be fitted. Use the Spider clamp plates and M8 x 16 countersunk capscrews to bolt the glass to the bottom spider. After bolting the clamp plate at the bottom, repeat the operation at the top.

IMPORTANT: Do not over-tighten glass clamps. Tighten until sufficient resistance is met and rubber compresses slightly. Over tightening can cause the glass to shatter.

After one panel is in place, use the over-ride keys supplied with the locking mechanism to allow the rotor to turn freely (in case of fail-secure mechanism, fail-safe will allow the rotor to turn without power). The installation of the remaining two glass panels will be considerably easier. Fit the handlebars as shown in Figure 27.

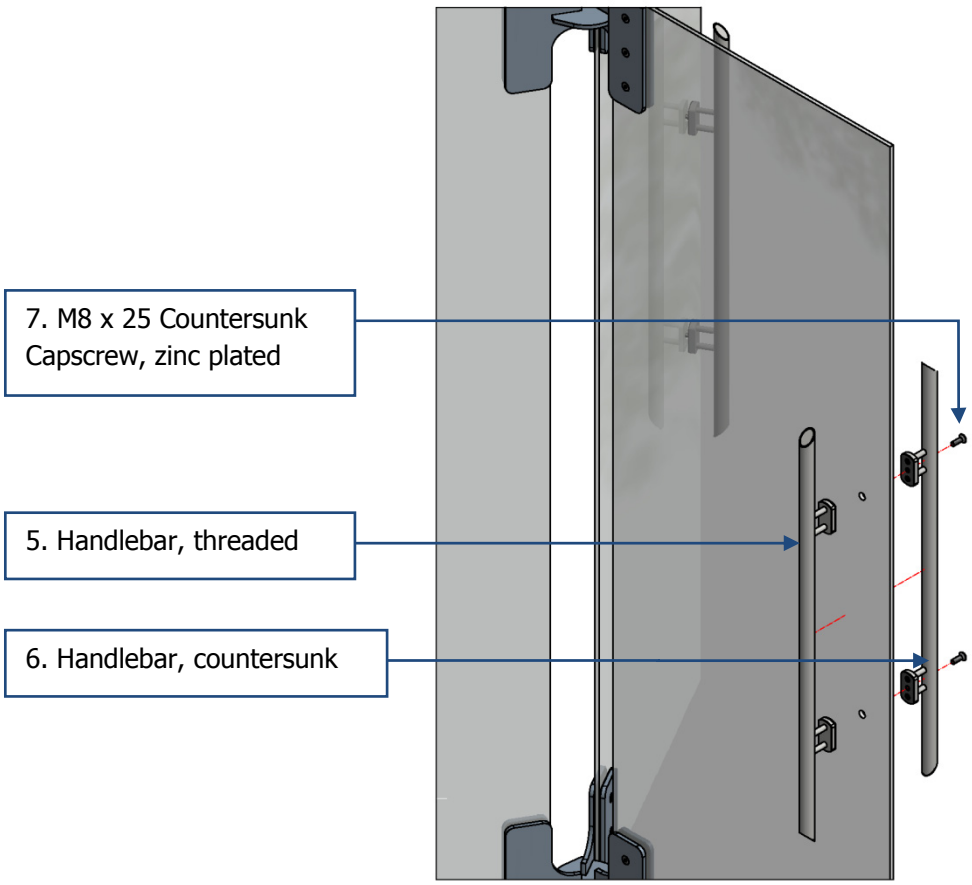


Figure 27: Handlebar assembly

6. Wiring and Connections

6.1: Pressure mat connections

The pressure mat has two wires that need to be connected to input 'I' on the control panel. The wires are connected to two steel segments sandwiched below the carpet which are separated by foam. When a person steps onto the carpet, the two steel segments touch closing the circuit between the Input 'I' and common ground on the panel. This notifies the controller that a person is in the no-go section.

Pressure Mat -> Control Panel (MKII Controller)

- Wire 1 -> Input 'I'
- Wire 2 -> Common Ground

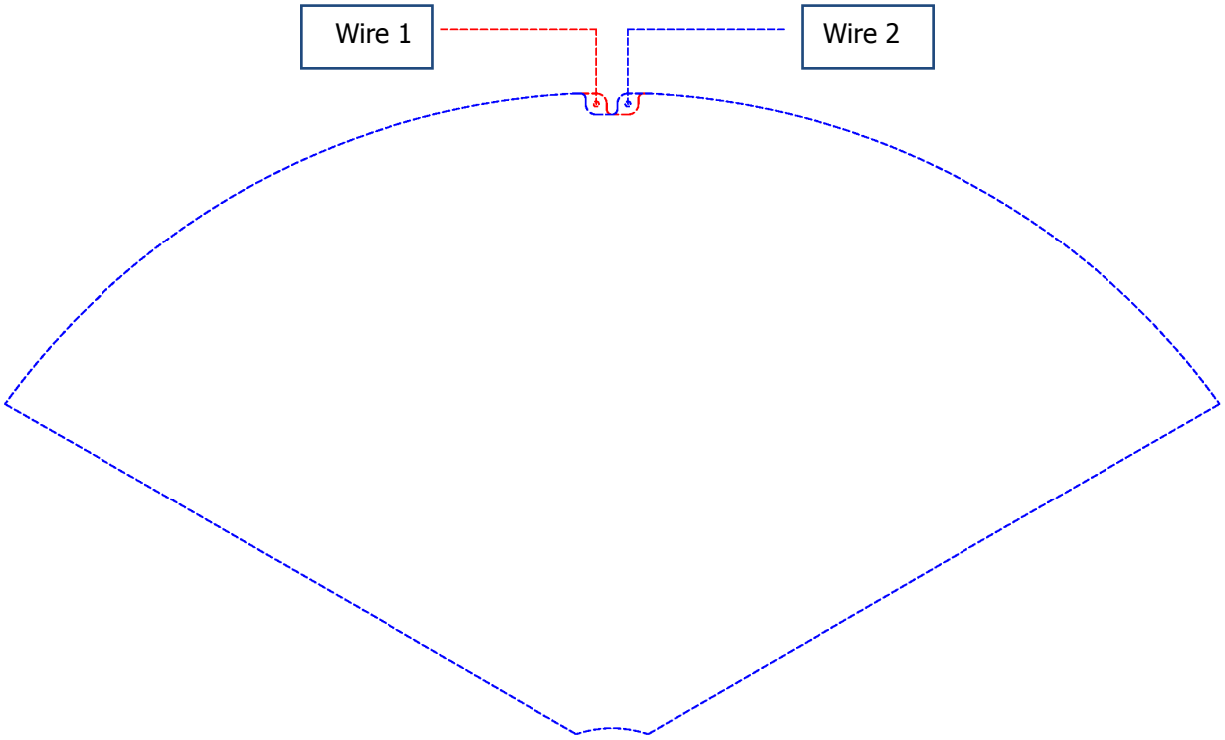


Figure 28: Pressure Mat connection

6.2: Wiring Diagram

Place the control panel in the bulkhead cavity (bolt to structural frame) and wire harnesses as per Figure 29. Live power needs to be wired to the connector block on the panel.

Ensure the triggers are wired correctly to inputs 'A' and 'B'. Connect the mechanism harness for the solenoids and micro-switches as shown.

Client Trigger -> Control Panel (MKII Controller)

- Direction 1 -> Input 'A'
- Direction 2 -> Input 'B'
- Common -> Common Ground

Client Options -> Control Panel (MKII Controller)

- Release -> Input 'J' (Used for when pedestrian is trapped in 'no-go' area)
- Common -> Common Ground

Client Power 220V 50Hz -> Control Panel (MKII Controller)

- Live -> Terminal Block RED
- Neutral -> Terminal Block BLACK
- Earth -> Terminal Block GREEN / YELLOW

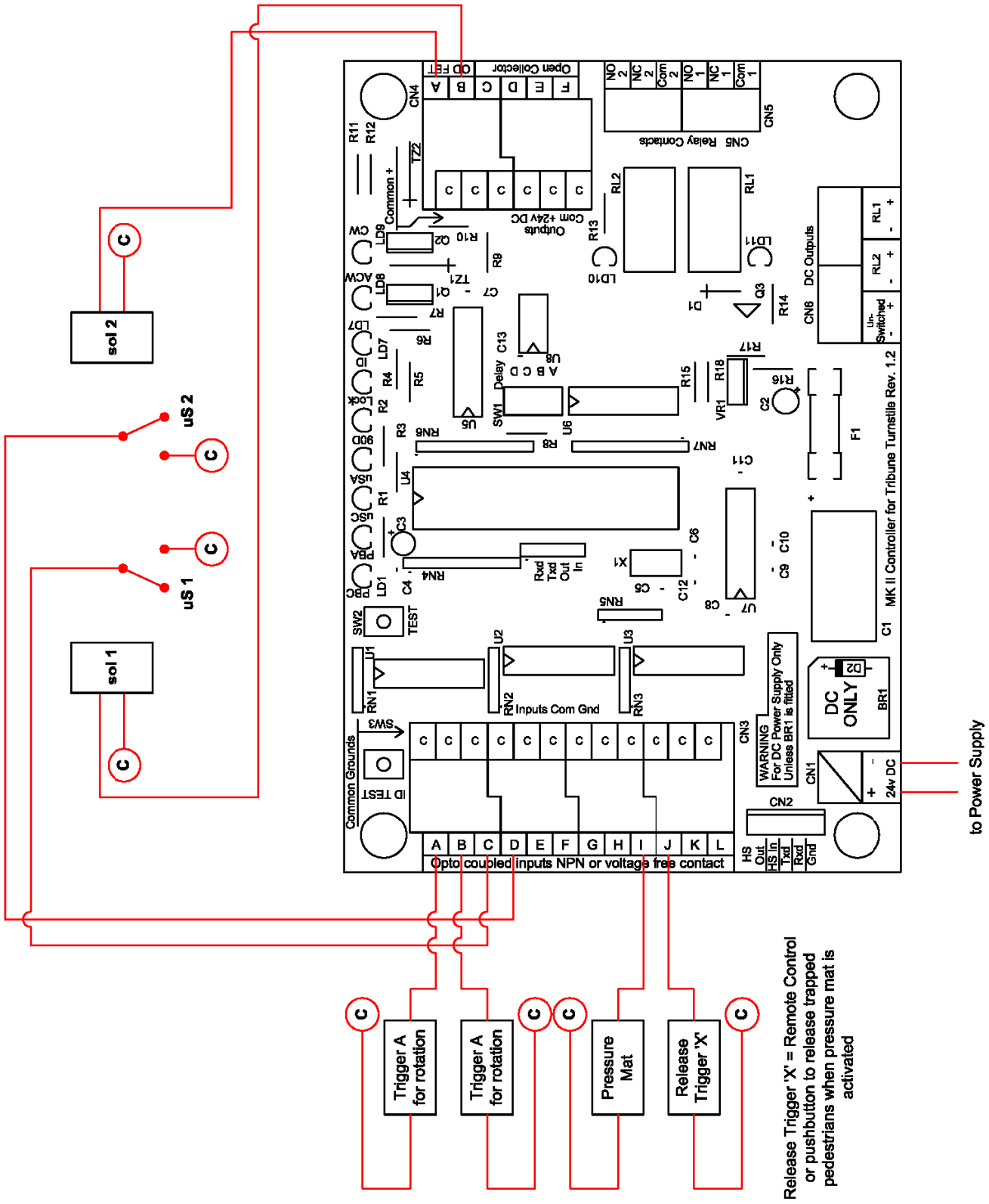


Figure 29: Wiring Diagram for Curved Glass Turnstile

7. Testing & Operation

7.1: Valid Transaction

A valid transaction occurs when one pedestrian triggers the turnstile and moves through as shown on Figure 30-32.

Only one person at a time can enter from side A to B or from side B to A at a time.

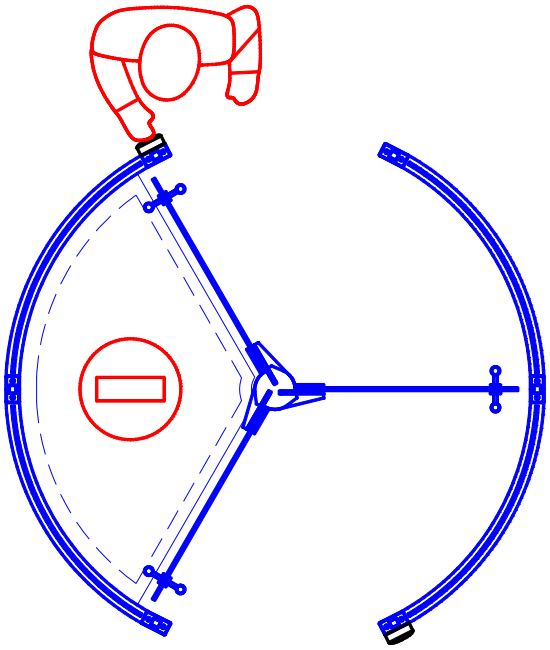


Figure 30: Pedestrian triggers reader on turnstile

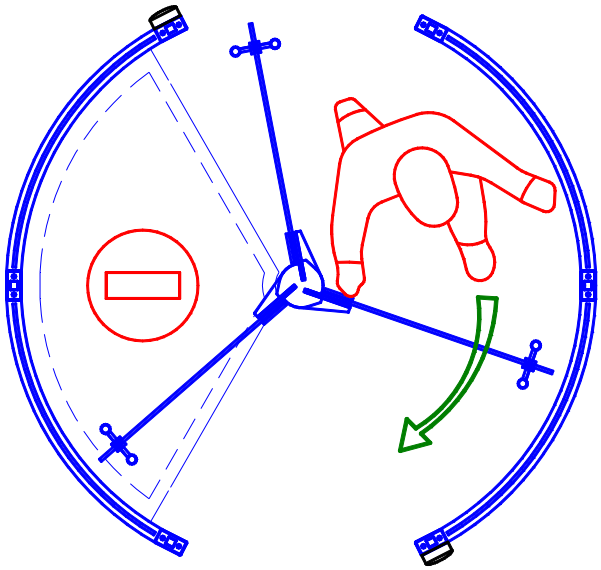


Figure 31: Pedestrian enters turnstile

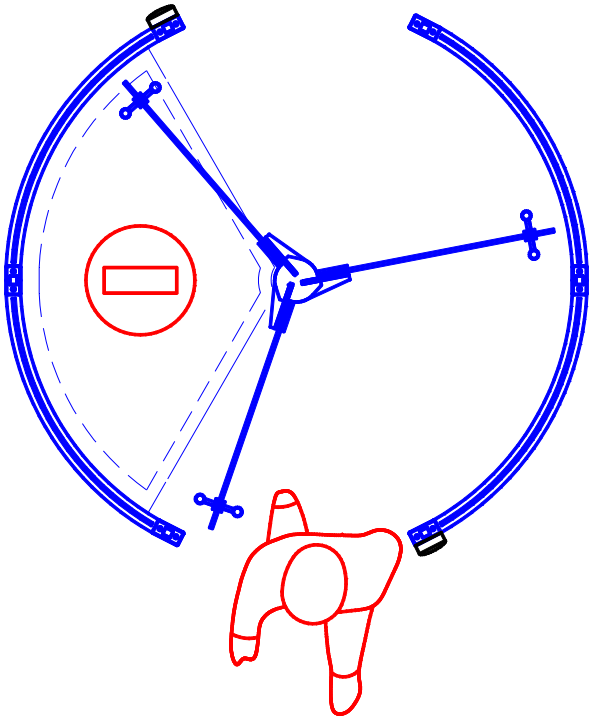


Figure 32: Pedestrian leaves turnstile. Completed transaction successfully

7.2: Valid Transaction & restricted entry

A person attempting to enter from the opposite side while a valid transaction is in place will get trapped and will be ejected to the side he/she originally entered as shown in Figure 33-36.

The 'No-Go' carpet triggers the controller and locks the mechanism, and will unlock only to exit as shown.

It is important to note that in the event of a pedestrian getting trapped indefinitely, the release trigger needs to be activated to allow the person to exit.

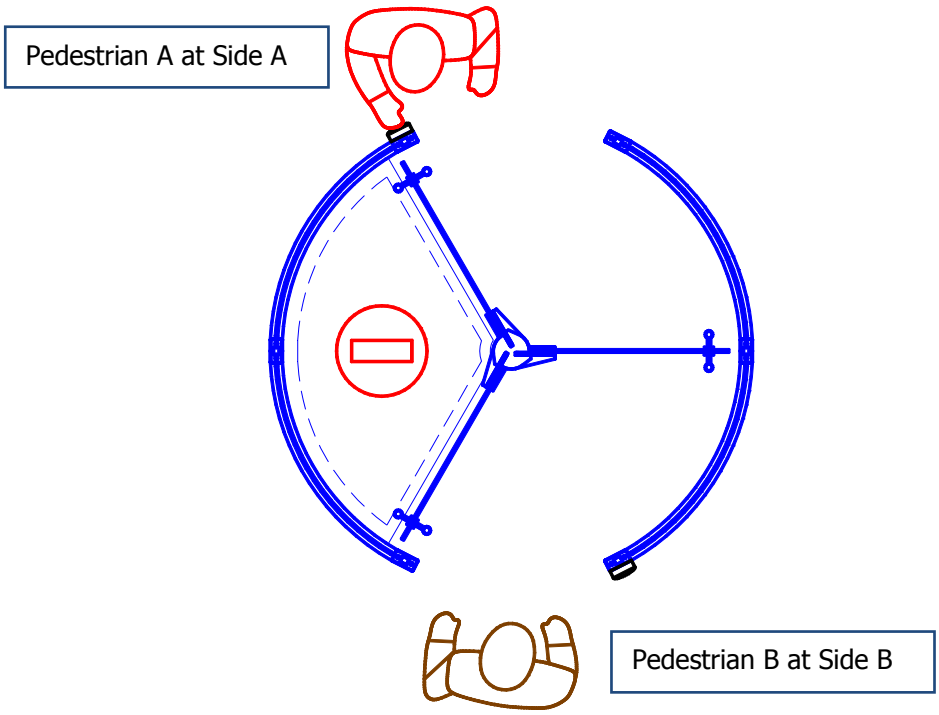


Figure 33: Pedestrian A triggers reader on Side A. Pedestrian B waits on Side B.

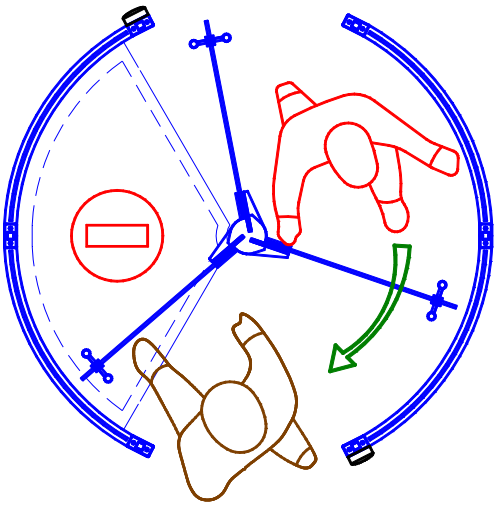


Figure 34: Pedestrian A enters turnstile while pedestrian B enters from opposite side.

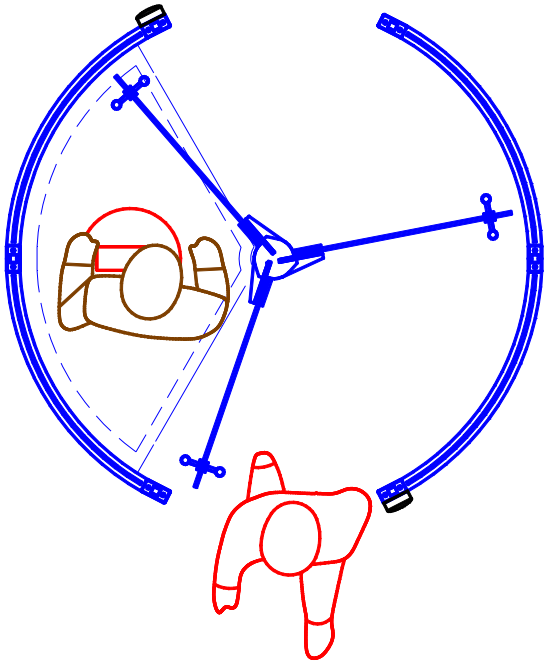


Figure 35: Pedestrian A successfully leaves turnstile and completes transaction while pedestrian B steps on 'No-Go' area and gets trapped.

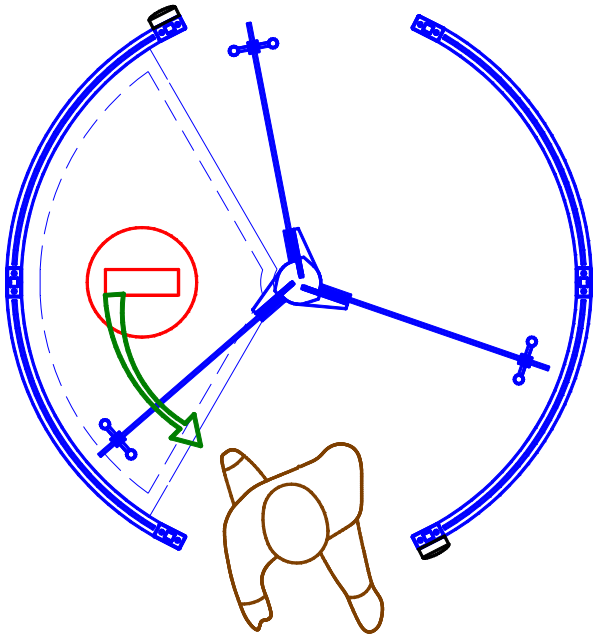


Figure 36: Pedestrian B gets ejected to the side he/she originally entered

8. Finishing

8.1: Ceiling installation

List no 8a: Ceiling assembly			
No	**Description**	**Part No.**	**Quantity**
1	Ceiling halve (Blank)		1
2	Ceiling halve (with Lock circle cut-outs)		1
3	Diameter 62 Down-light ring, Chromed		4
4	Diameter 62 LED fitting		4
5	M6 x 20 Buttonhead capscrew, zinc plated		22
6	M6 x 30 Buttonhead capscrew, zinc plated		8
7	M6 x 10 Sockethead caspscrew, zinc plated		6
8	M6 Plain Flatwasher, zinc plated		26
9	M6 Hex Nylock nut, zinc plated		32

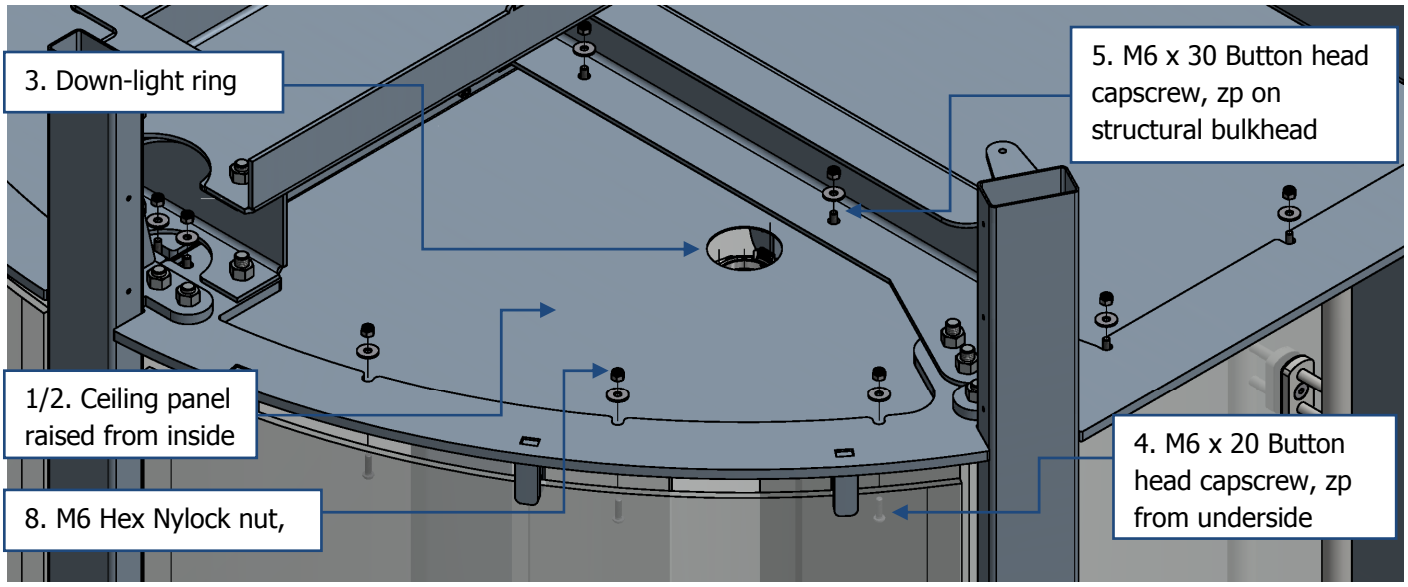


Figure 37: Ceiling panel installation

The ceiling panels is installed after the unit has been tested.

Take note there are two ceiling panel halves, one which is blank and one which has two circular cut-outs for the mechanism's over-ride locks. When placing the ceiling panels from inside the drum, the correct panels need to be placed to allow access to the over-ride locks from underneath.

The Bolting arrangements can be seen on Figure 38.

Bolting Arrangement 1: Starting with the sides, use M6 x 20 Buttonhead capscrews, M6 Plain flatwashers and M6 Hex Nylock nuts as shown in Figure 30. There are 22 off.

Bolting Arrangement 2: Use M6 x 30 Buttonhead capscrews (with washers and Nylock nuts) to bolt the ceiling to the structural frame as shown in Figure 30. There are 8 off

Bolting Arrangement 3: Use M6 x 10 Sockethead capscrews (with Nylock nuts) to bolt the two ceiling halves to each other. There are 6 off.

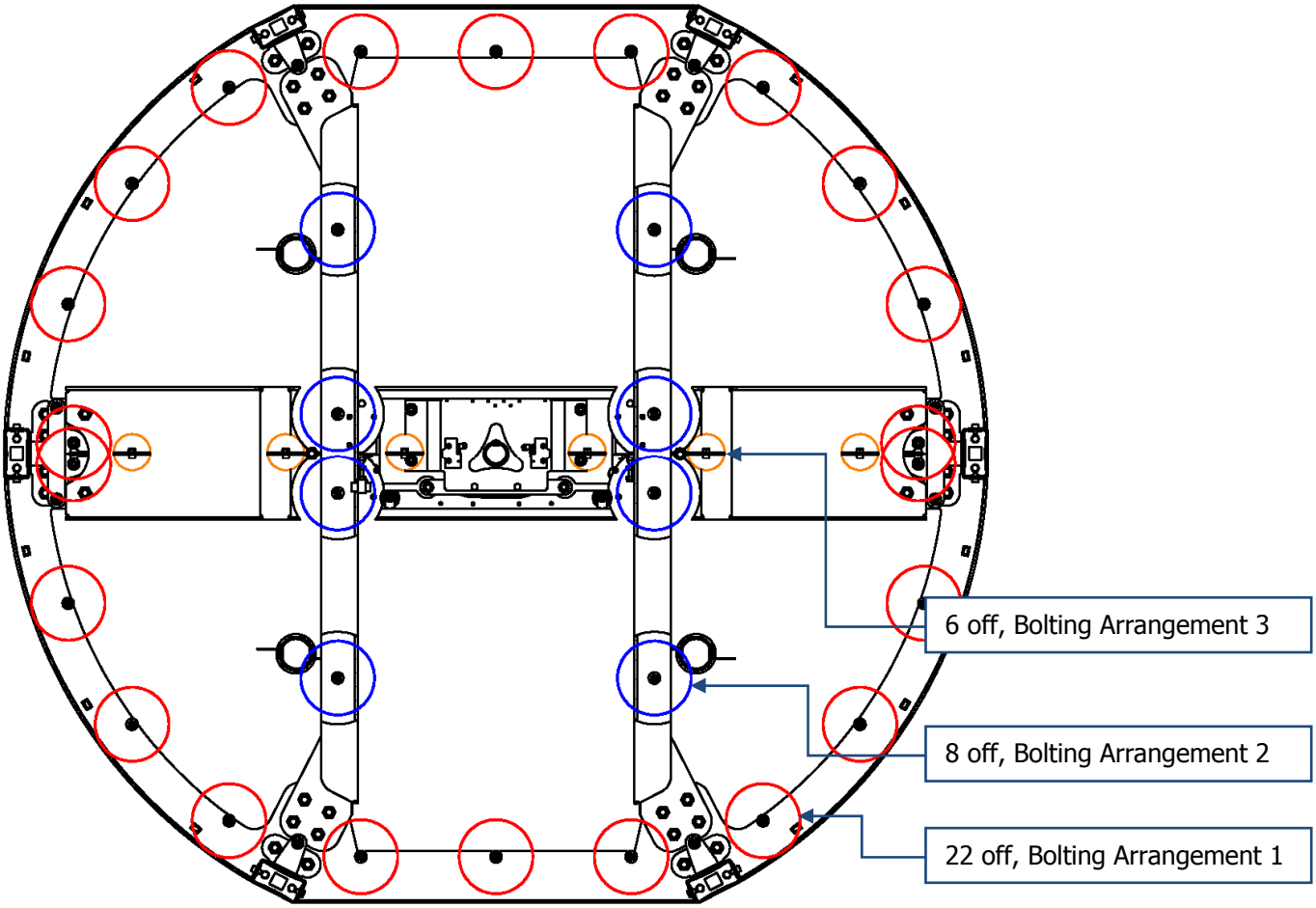


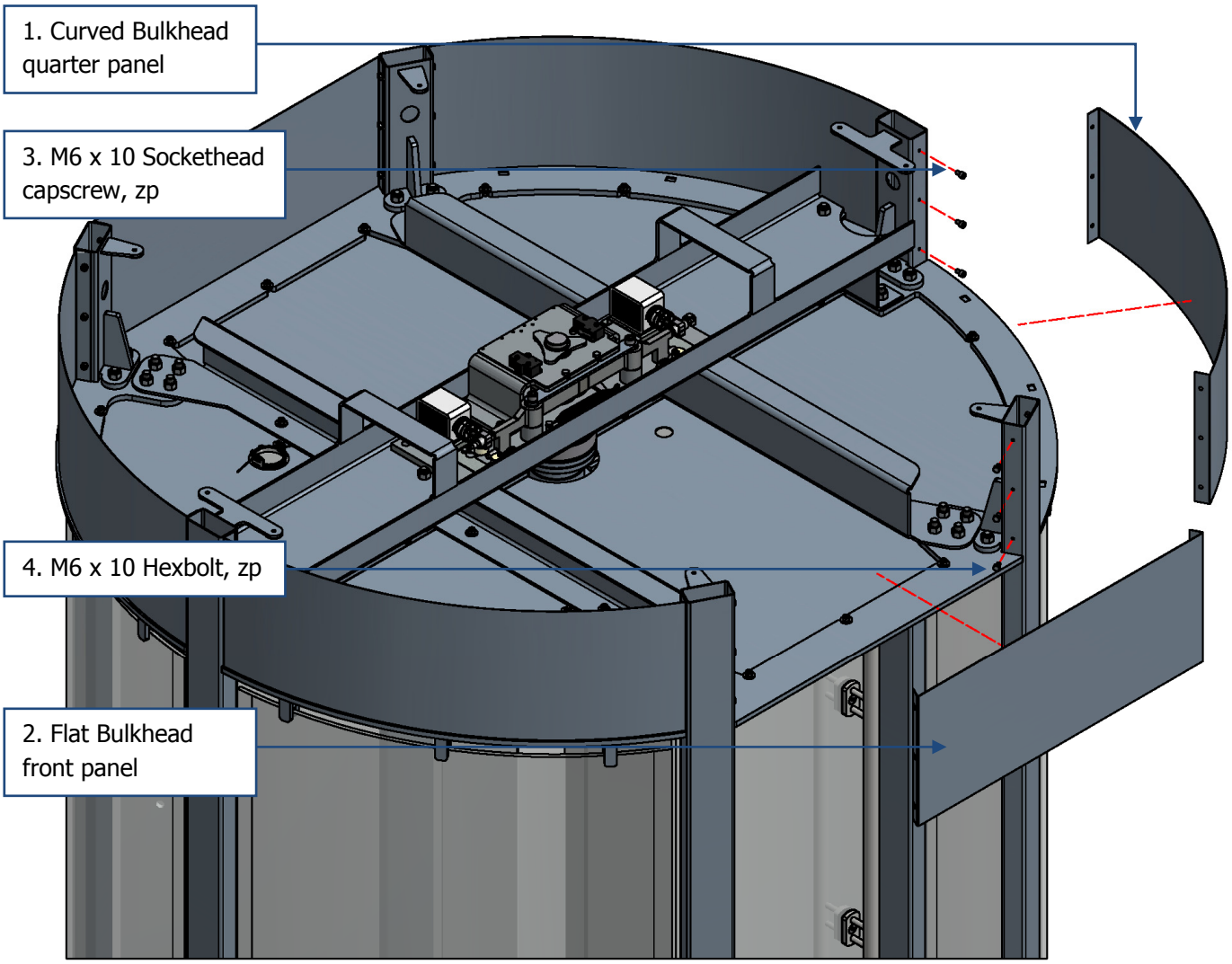
Figure 38: Top view on ceiling panel installation

8.2: Wiring tidying

The wires leading into the top cavity and to the control panel from the mechanism and pressure mat needs to be cable tied into a harness and in turn cable tied to the inside channels of the structural frame.

8.3: Fascia plates installation

List no 8b: Fascia assembly			
No	**Description**	**Part No.**	**Quantity**
1	Curved Bulkhead quarter panel		4
2	Flat Bulkhead front panel		2
3	M6 x 10 Sockethead caspscrew, zinc plated		24
4	M6 x 10 Hexbolt, zinc plated		12

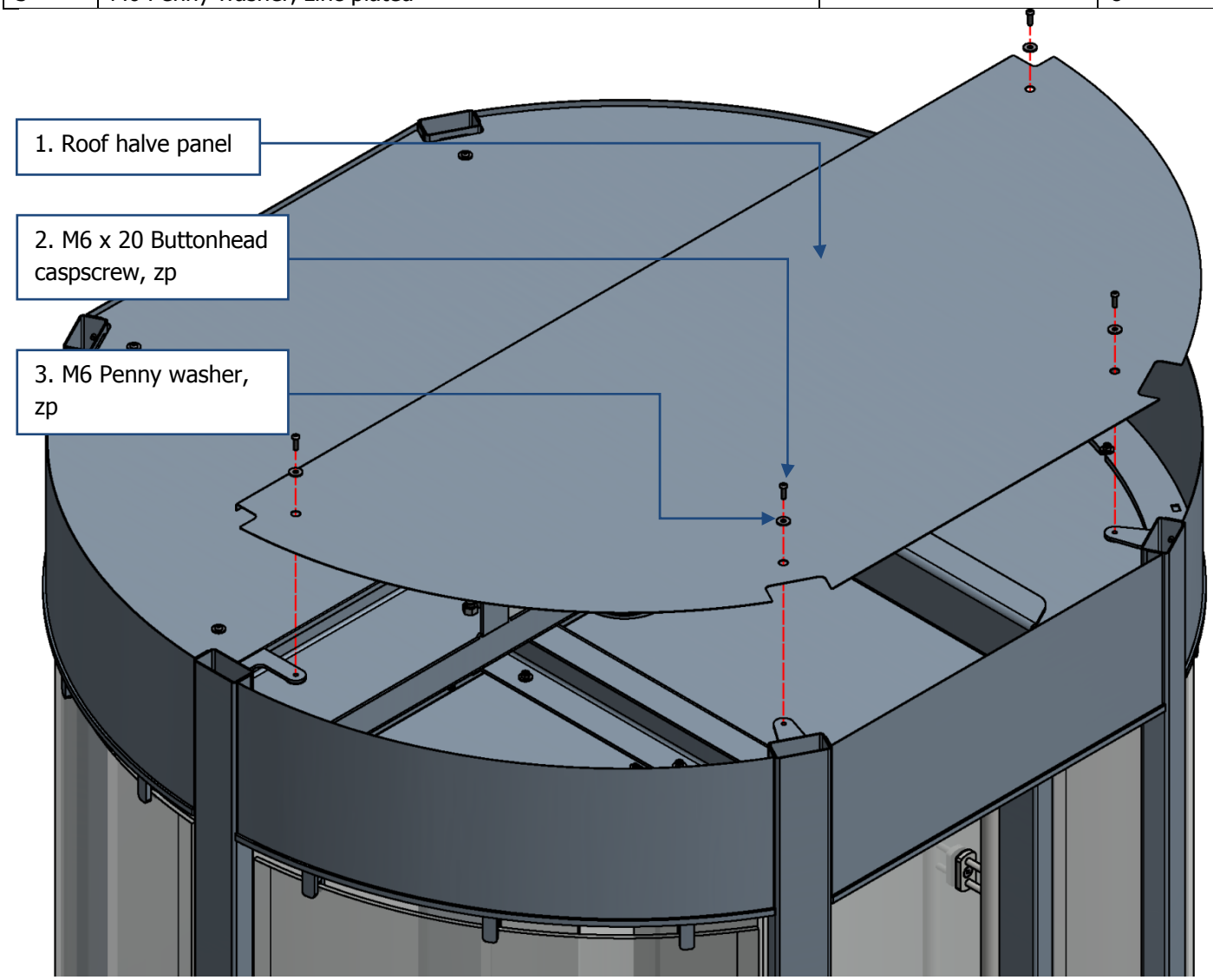


The Curved bulkhead panel installation is relatively simple, with each panel bolting to the top of the upright with 6 off M6 x 10 Sockethead bolts. Ensure that the panel follows the curvature of the top side weldment.

The Flat bulkhead front panel has an internal bend and the screws used to bolt this are hexbolts. Use a socket drive to insert the bolts before panel is placed. Leave a space of 5mm approx between the bolt head and the upright. Place the panel into position and use a spanner to tighten the panel to the uprights. A slight pull will occur, so do not over-tighten.

8.4: Roof fixing & sealing

List no 8c: Roof assembly			
No	**Description**	**Part No.**	**Quantity**
1	Roof halve panel		2
2	M6 x 20 Buttonhead caspscrew, zinc plated		8
3	M6 Penny washer, zinc plated		8



Place the Roof halve panel, with the bend facing down and the cut-outs fitting around the uprights, onto the bolting plates on the uprights. Use M6 x 20 Buttonhead screws with large diameter penny washers (to close enlarged holes in roof panel) to bolt down.

Suitable silicone can be used to seal the center line where the two roof panels join and all around where the roof panel meets the fascias (bulkhead panels) and the uprights.

8.5: Cleaning

After installation, all dust and grime needs to be removed properly.

The carpet can be cleaned with a soft brush. Avoid using anything that can cause tearing.

The glass should be cleaned inside and out with a suitable glass cleaner. Use a soft cloth and avoid any material that could cause scratches or smudges.

The frame should be cleaned with mild detergent and water and wiped clean with a soft nylon cloth. Avoid using cloth that could catch and tear easily as the frame's structural powder-coating is of a rough finish.

9. Maintenance

9.1: Maintaining operation of unit

Maintenance of this unit is at manufacturer discretion. Contact manufacturer for maintenance instructions.

10. Checklists

All documents attached at the end of this document. These are detailed lists required for assembly and packing of this unit.

10.1: Assembly Parts Checklist

10.2: Bolts & Fasteners Checklist

10.3: Tools Checklist

10.4: Contingency Tools Checklist

10.5: Consumables Checklist