REFURB SG371-SG606

SECTION 15

Centre Door Refurbish

Specification

1. **Remove door leafs as per instructions in Section 15A.**
2. **Replace door shaft bushes, unibal joints, guide rollers, bottom catch pin and plate as per instructions in Section 15B.**
3. **Refit door shafts & leafs as per instruction in Section 15C.**
4. **Replace and check shelfplate parts as per instruction in Section 15D**
5. **Adjust doors mechanically as per instructions in Section 15E.**
6. **Replace micro switches and check door controls and safety systems as per instructions in Section 15F.**
7. **Torque mechanical fixings as per instruction in Section 15G**
8. **Replace broken/missing exterior emergency controls flap.**

N.B. All replacement parts supplied by BAC

Section 15A

Refurbish Door Leafs

1. Remove air from system.

2. Remove the door arm 4 Torx screws from the door frame and disconnect the sensitive edge plug (see Figure 1 below).

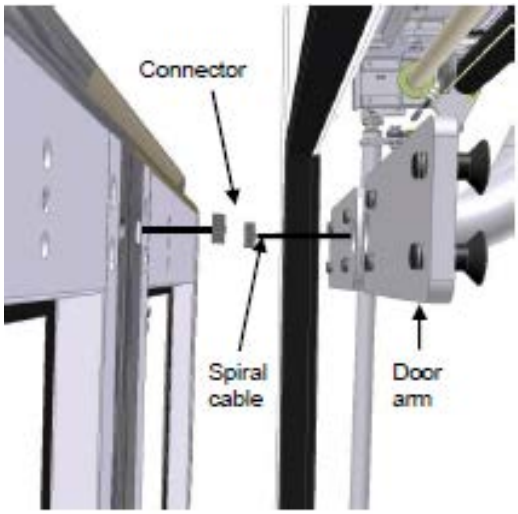


Figure 1

3. Lift the door leaf off the bottom guide roller (see Figure 2 below)

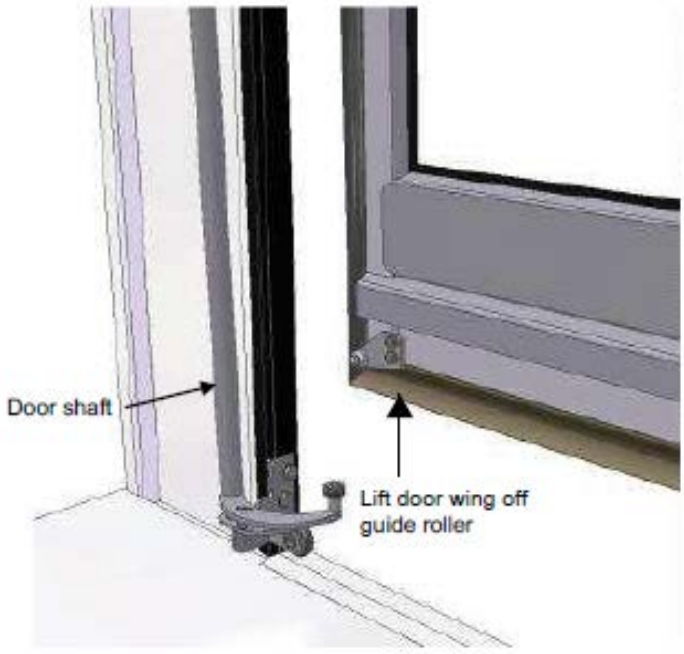


Figure 2

4. Remove top connecting rod from door shaft and door mechanism (see Figure 3 below).

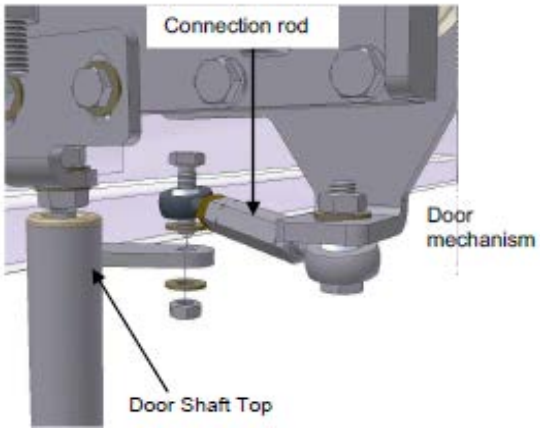


Figure 3

5. Remove lower door shaft support from vehicle pillar and drop door shaft from top pivot bolt (see Figure 4 below).

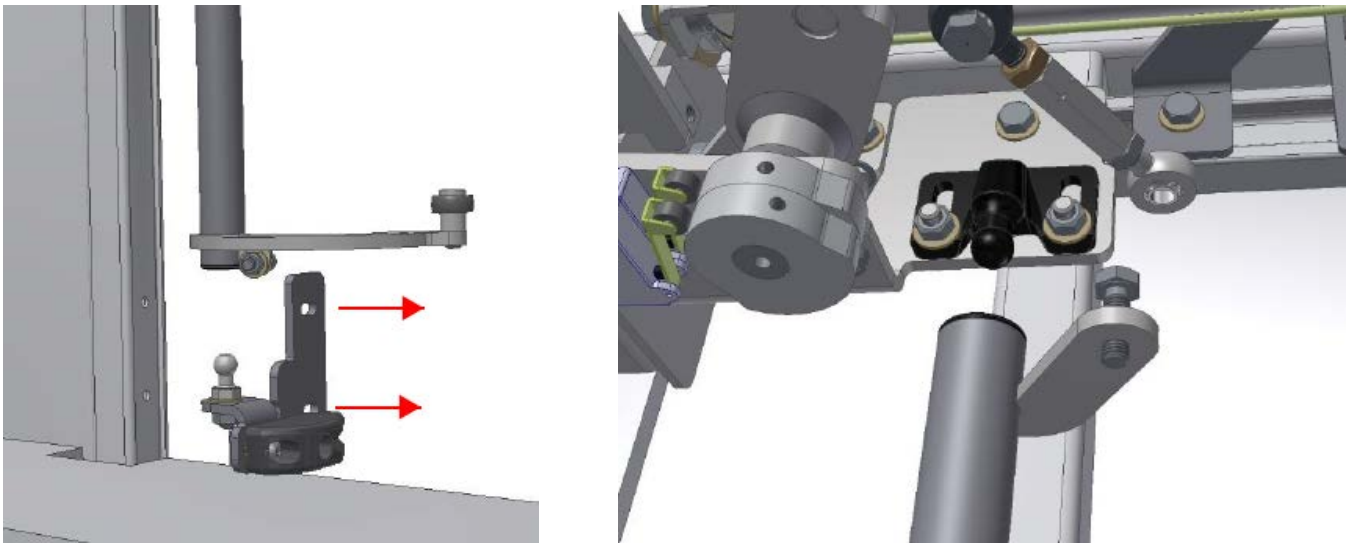


Figure 4

Section 15B

Replace Bushes, Uniball, Rollers & Catch Pins

1. Remove existing door shaft top & bottom bushes and fit new bushes. Replace damaged/pitted pivot bolts (see Figure 5 below).

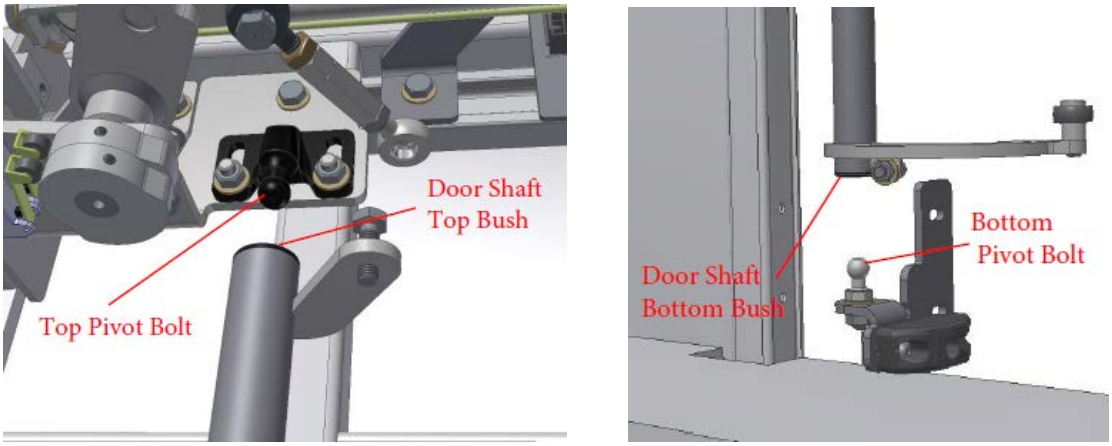


Figure 5

2. Replace both connection rods with new rods (see Figure 6 below).

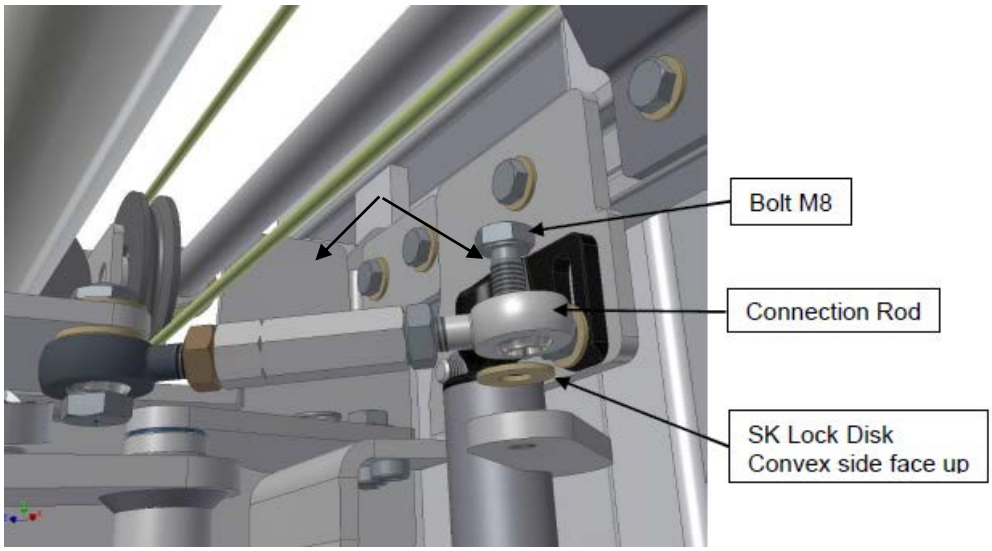


Figure 6

3. Replace door shaft bottom guide rollers & vibration dampers with new rollers & dampers (see Figure 7 below).

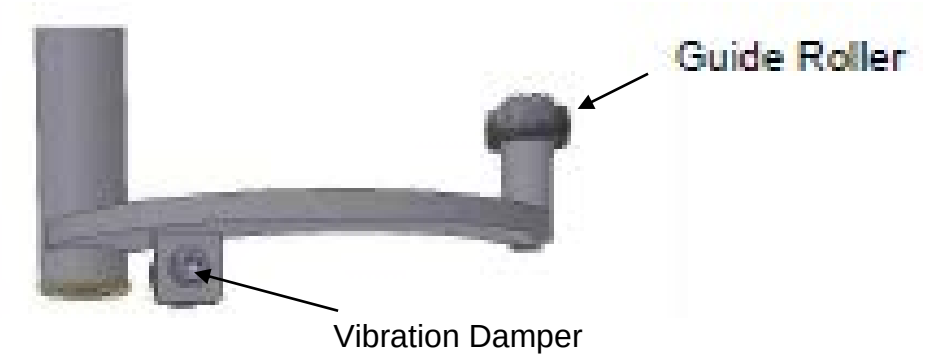


Figure 7

4. Replace bottom catch blocks and catch wedges with new blocks and wedges (see Figure 8 below).

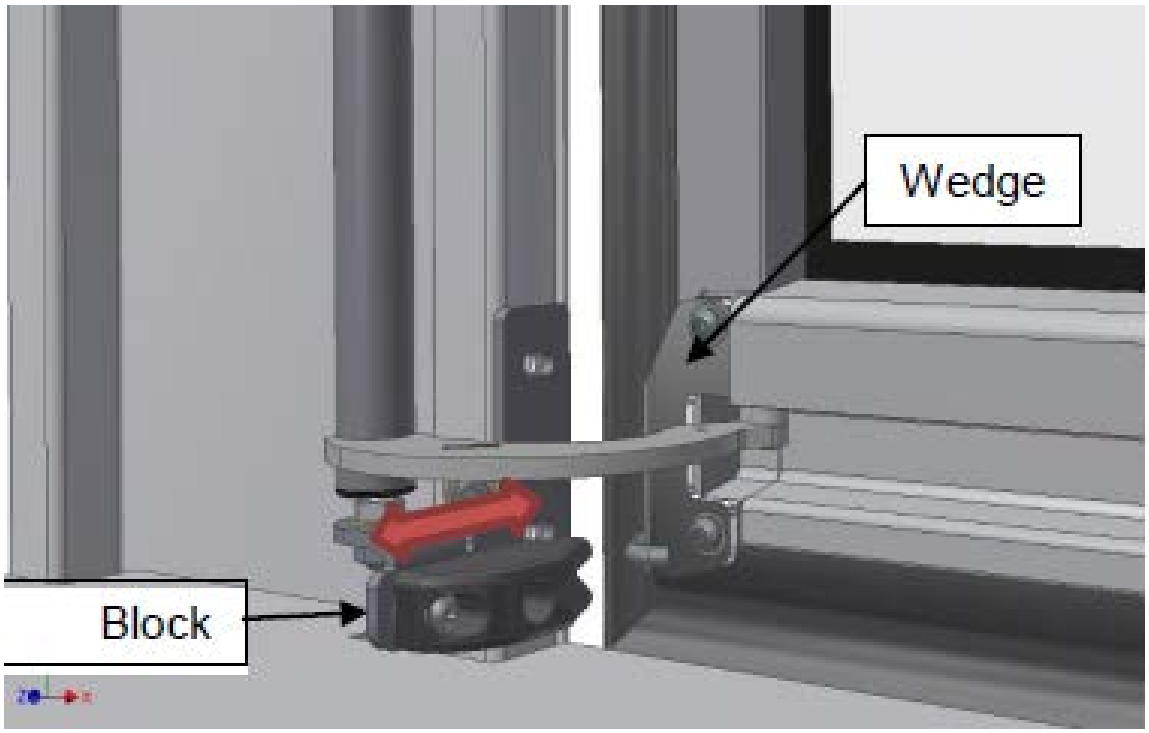


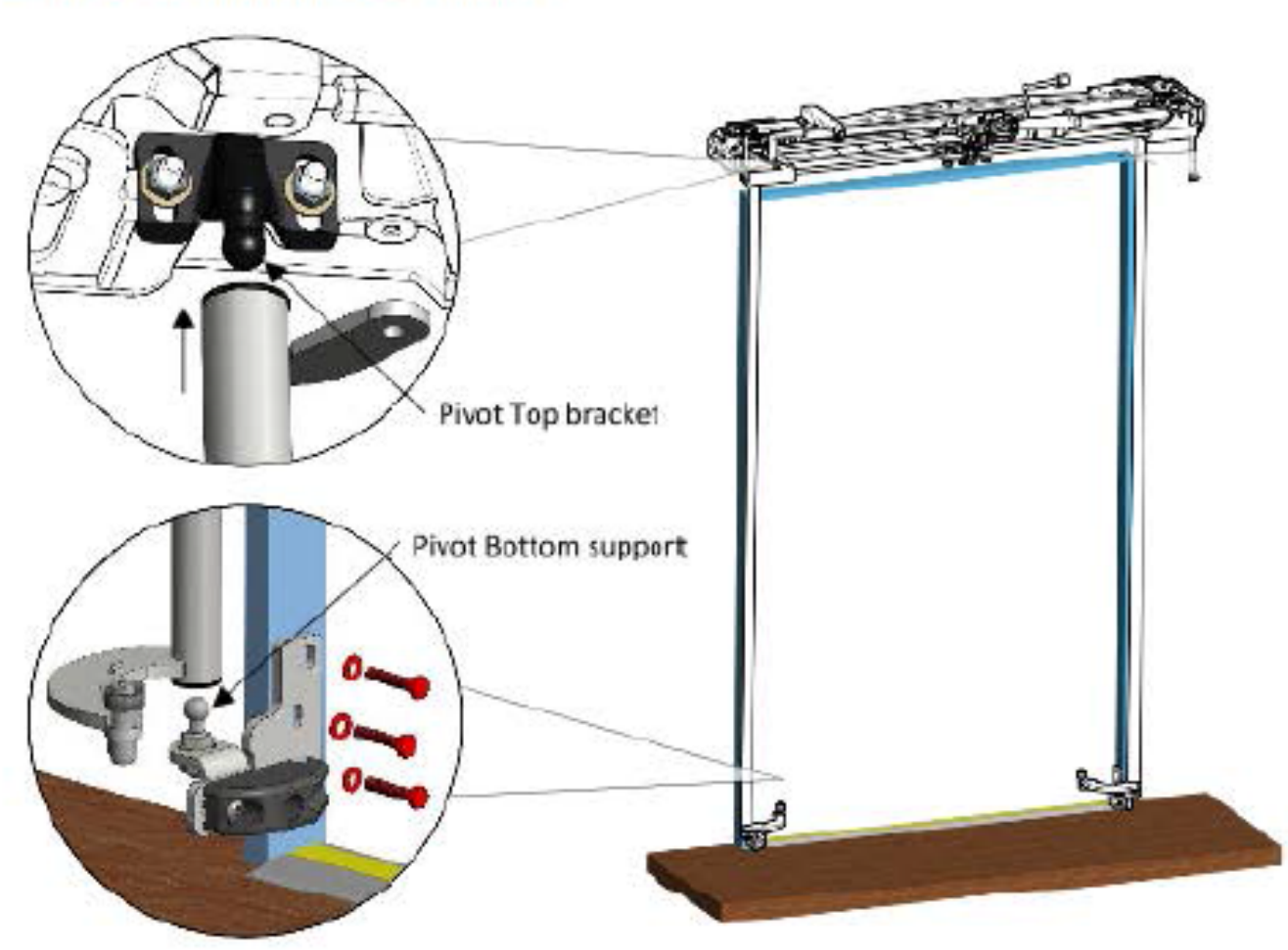
Figure 8

Section 15C

Refit Door Shafts & Leafs

1. Replace any damaged sensitive edge rubbers with new rubbers. Fit new sensitive edge strips where necessary.

2. Refit door shafts as detailed in Figure 9 below.

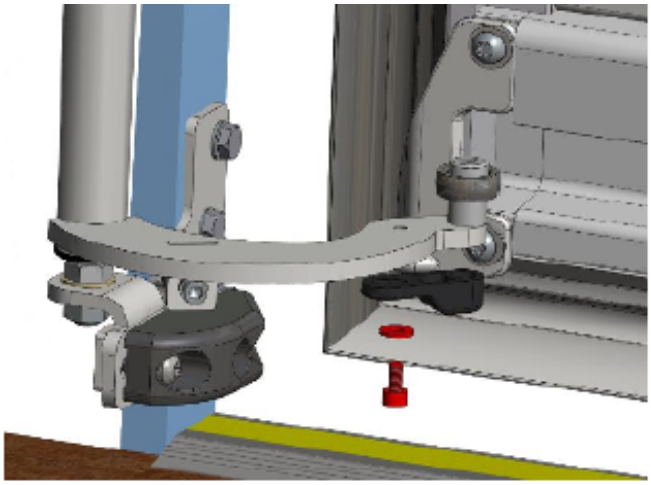


Mount the door shaft

- Apply multi-purpose grease on the pivots on the bottom support and top bracket.
- Fit the top of the door shaft onto the pivot on the top bracket and hold the door shaft.
- Fit the door shaft over the pivot on the bottom support and hold the door shaft and bottom support.
- Move the bottom support into position while holding both the bottom support and door shaft.
- Use self-supplied fasteners for mounting the bottom support to the aperture.

Figure 9

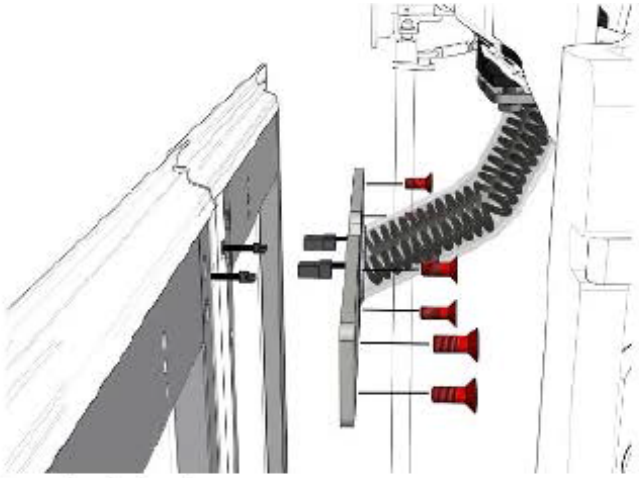
3. Refit door leafs & connect sensitive edges as detailed in Figure 10 below.



Fit door leaf onto door shaft lever

- Loosen the lever block and rotate to be able to fit the door leaf over the door shaft lower lever.
- Fit the door leaf over the door shaft lower lever and make sure the guide roller on the lower lever fits well inside the door leaf guiding rail.
- Rotate the lever block back to its original place.

Note- Apply Loctite 243 to the lever block fixing screw and torque to 8 Nm.



Mount door leafs to door arms

- Connect the connector of the sensitive edge on the door leaf to the spiral cable that runs through the door arm.
- Put the cable tie on the end of the spiral cable inside the door leaf or door arm. Do not cut-off the cable tie.
- Mount the top of the door leaf to the door arm using the supplied fasteners and make sure there is not any loose cable caught between the door leaf and the door arm.

Figure 10

4. Refit the connection rods as detailed in Figure 11 below.

Link the connection rods with the upper lever of the door shafts.
Tighten the bolts and nuts
Do not tighten the nut of the connection rod, later some adjustment takes place.

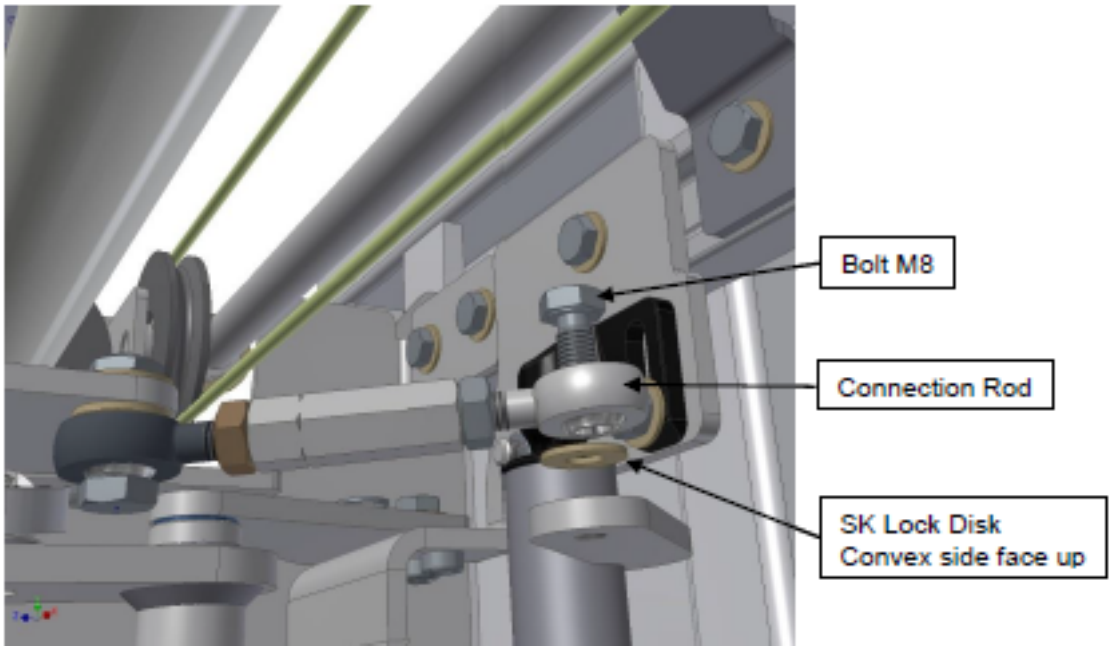


Figure 11

Section 15D

Replacement and Checking of Shelfplate Parts

1. Replace both soft stopper assemblies shown in Figure 12 below.

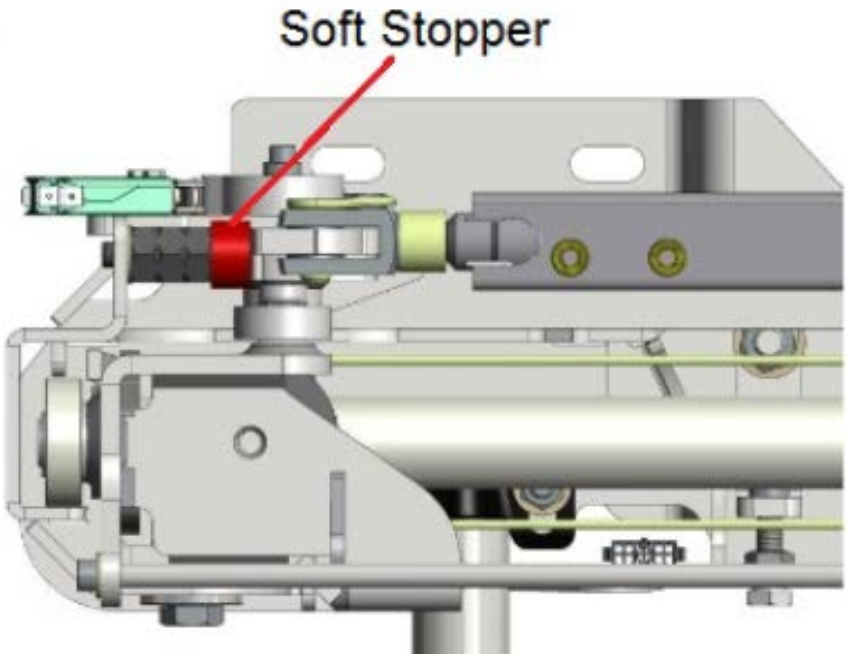


Figure 12

2. Replace both cable pulleys and any worn/damaged cables as shown in Figure 13 below.

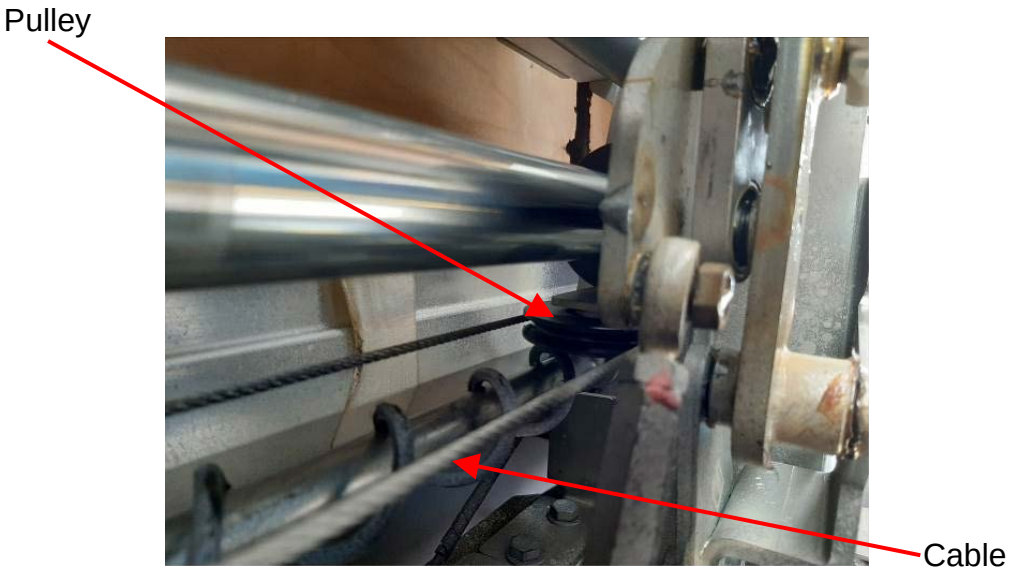


Figure 13

3. Check torque stripe paint on the fork joint. If it is broken or missing, following instructions outlined in Appendix 1.

Section 15E

Mechanical Adjustment of Doors

1. Check door operating pressure and adjust door pressure regulating valve to 110 p.s.i (7.5 bar) if necessary.

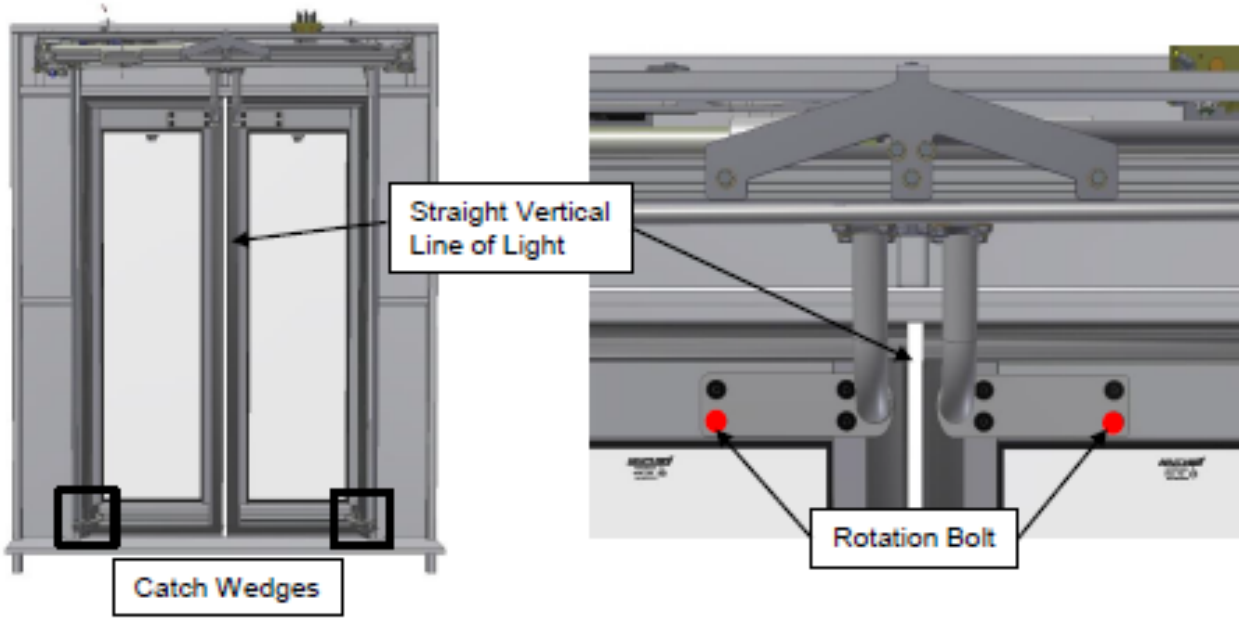
2. Isolate the air supply to the doors and carefully release any compressed air held within the door system. Check the steel cables with the Ventura tension gauge. The tension should be within 260-310 Newton (Doors at least in half open position and without pressure). If necessary, adjust cable length in areas shown on Figure 14 below.



Figure 14

3. Adjust door leafs parallel with each other as detailed in Figure 15 below.

- Put the door leafs in an almost closed position till the middle seals contact.
- The door leaves have to be adjusted without a slit between the seals. Just before the middle seals touch there should be seen a straight line of light. Pay attention to the catch bolt, this should not influence the adjustment. If necessary loosen the bolts of the catch block.
- If necessary to adjust, loosen the bolts of door leafs / door arms (except the rotation bolt),
- Rotate the door leafs around the rotation bolt until they are parallel and in a straight line down. Look at the left and right side to check if they are parallel with the portal frame. Tighten the bolts of the door arms and tighten the bolts of the catch plate (if loosened) lightly.



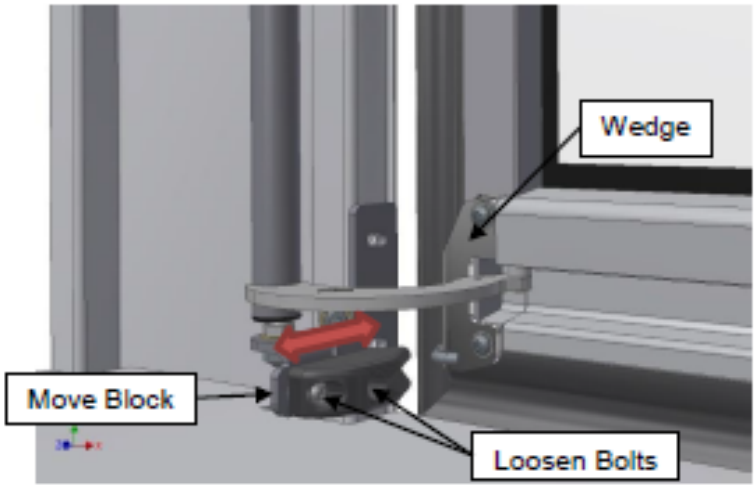
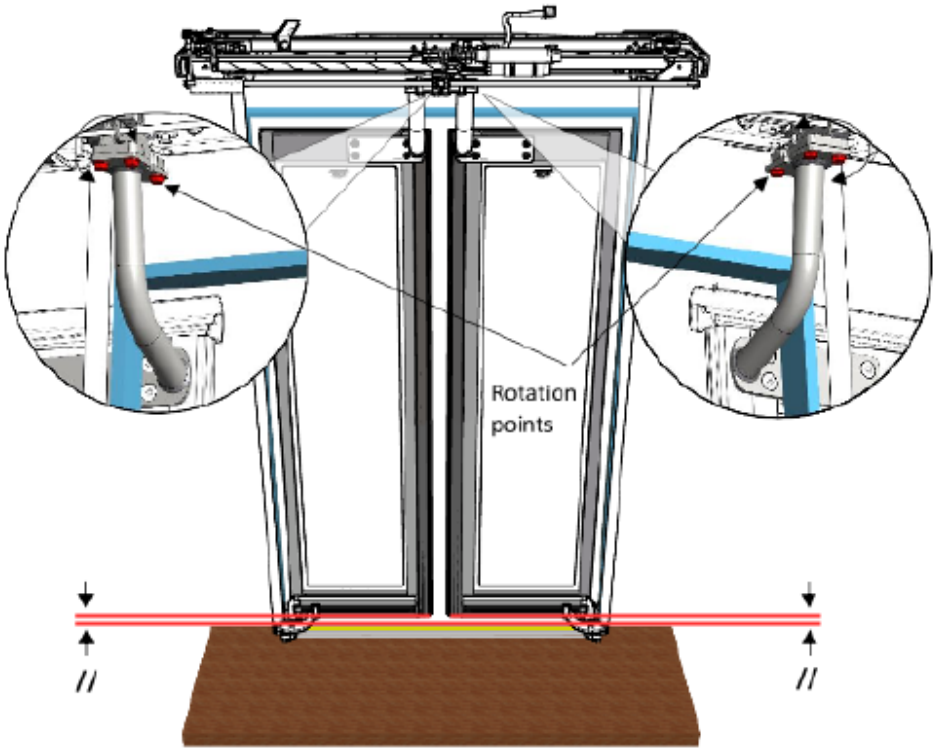


Figure 15

4. Align door leafs parallel with step edge as detailed in Figure 16 below.



Adjust doors to be parallel with the step edge

- Put the door leafs in almost closed position and check if the door leafs are parallel to the step edge.
- Loosen the rotation point slightly and also fully loosen the other 3 fasteners.
- Rotate the door leaf until it is parallel with the step edge.
- Tighten the fasteners.

Figure 16

5. Adjust door height as detailed in Figure 17 below.

- Put the door system with help of AIR PRESSURE in a closed position, until the mid seals contact each other.
- Check if the distance at the top of the door leafs is **50±2mm** (Measured between the door leaf profile and the aperture).
- If necessary to adjust the door height;
  Loose the bolts of the door shaft support, bottom.
  Loose the bolts of the adjusting bracket, top and adjust height by lifting or lowering the door mechanism.
- The distance between the lower lever of the door shaft and guiding rail of the door leaf should be **4-8mm** (closed position), otherwise re-adjust door height.
- After adjustment, tighten the bolts of the adjusting bracket (top) and door shaft support (bottom).
- Check if the door shaft is free from axial play (up and downward movement), otherwise loosen the bolts of the adjusting bracket (top), till there is NO axial play and tighten the bolts. ATTENTION (in closed position the lever of the door shaft should not contact the catch plate).

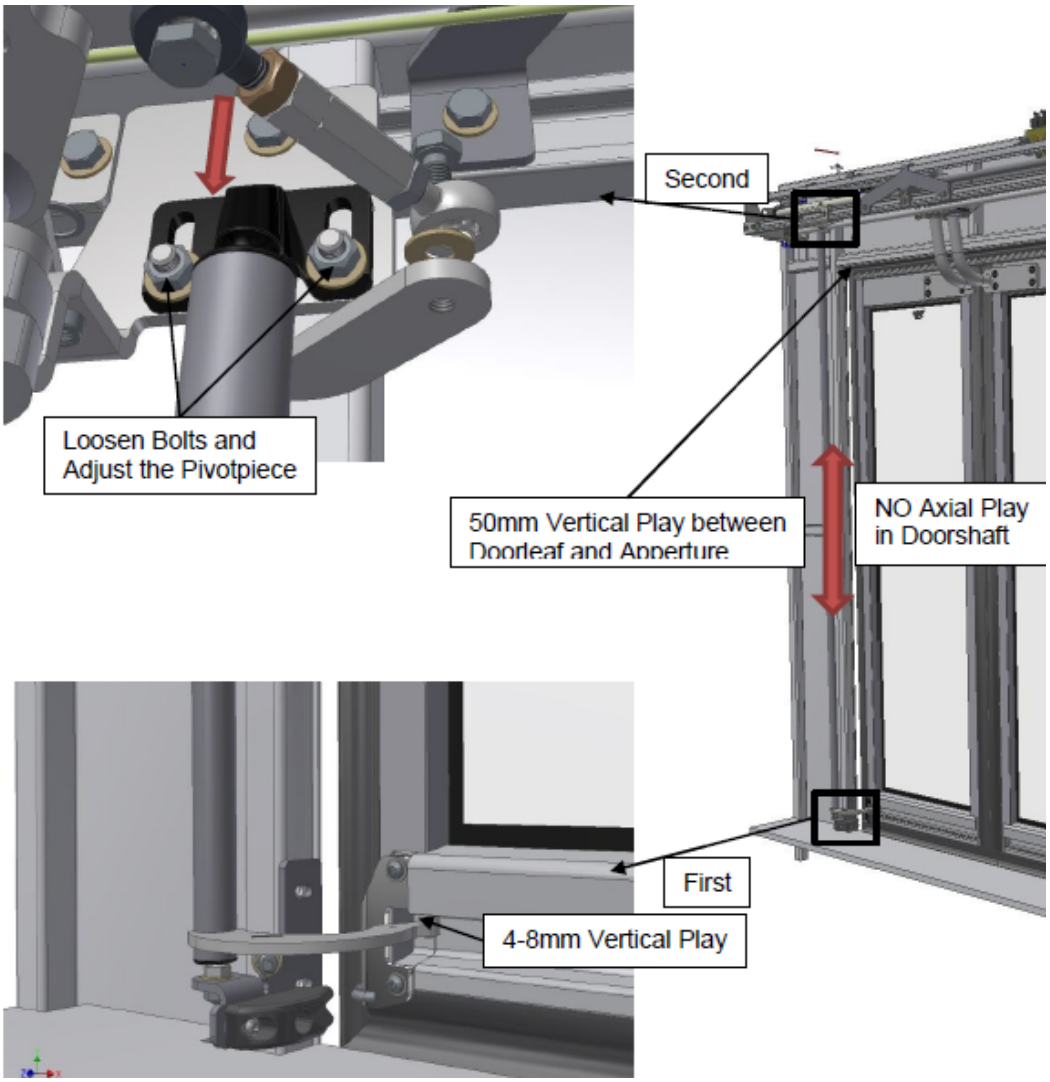


Figure 17

6. Adjust door leafs as detailed in Figure 18 below.

- Close the door by hand using the parallel bar.
- Pay attention to the catch wedge, this should not influence the adjustment (loosen bolts)
- Check if the theoretically distance between the door leafs is **102** mm. In practice, this distance can vary + or - 2mm.
- Check if the door leafs seals properly at top. There should be no gap and no more than 2mm compression between the upper rubber surfaces.
  To change the distance between the doorleafs, move the doorarms equally in the right direction. To do so open the door, loosen the bolts and move the doorarms equally in the right direction.
- Check if the doors stay parallel to the step edge and are equal distance to door aperture on both sides.
- After adjustment, tighten the bolts.

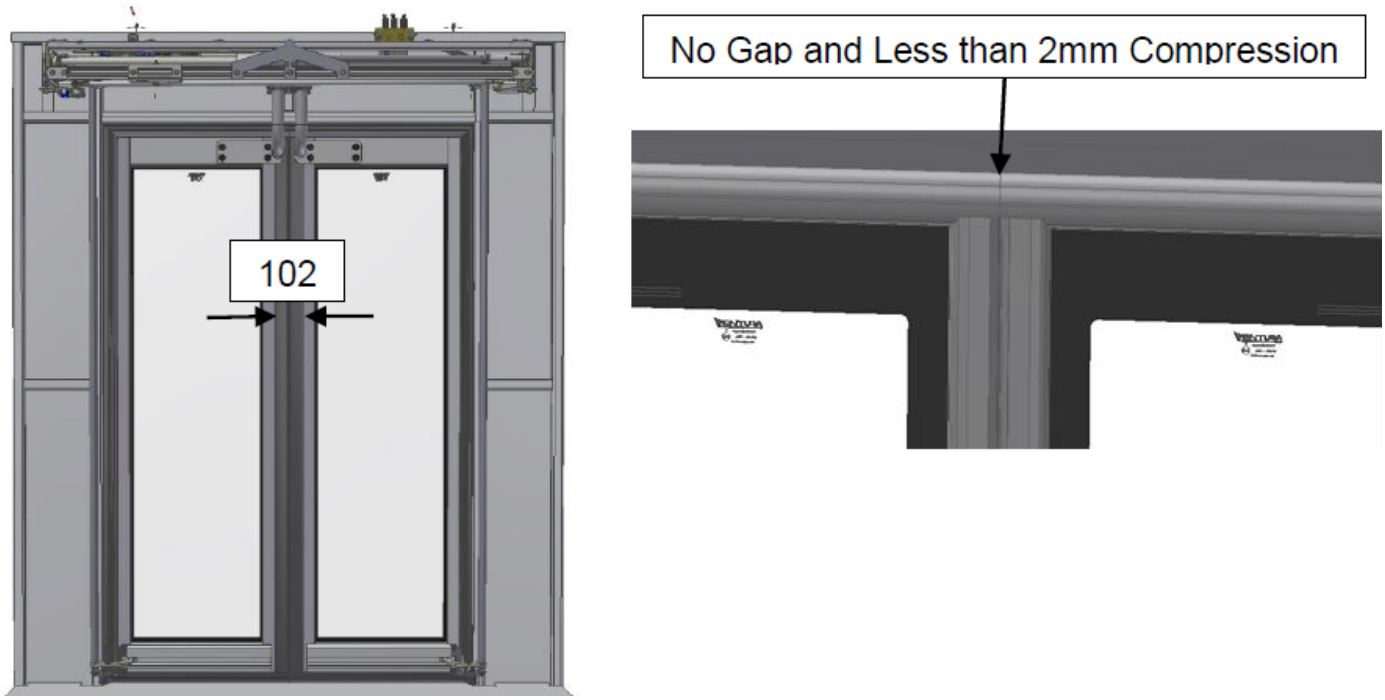
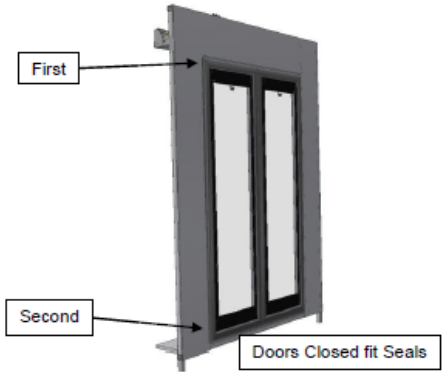
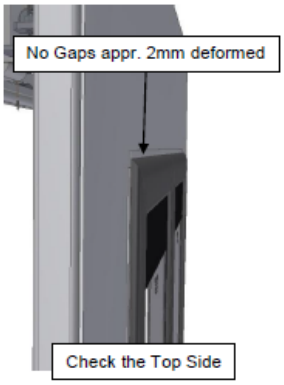


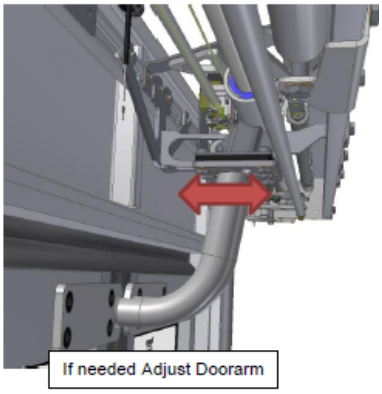
Figure 18

7. Adjust door side seals as detailed in Figure 19 below.

- Put the door with help of AIR PRESSURE in a fully closed position.
- Check if the side seal of the door leaf fits well with side of the aperture.
- First if necessary to adjust the side seal of the door leafs, loosen the bolts of the doorarm and move the doorarm in the right direction. Check if the door leafs are still parallel to the step edge.
- When the side seals forms a proper sealing with the aperture, tighten the bolts of the Doorarm.







- Second if necessary to adjust the side seal of the door leafs, loosen the nut of the bottom support and move the doorshaft in the right direction.
- When the side seals forms a proper sealing with the aperture, tighten the nut of the bottom support.



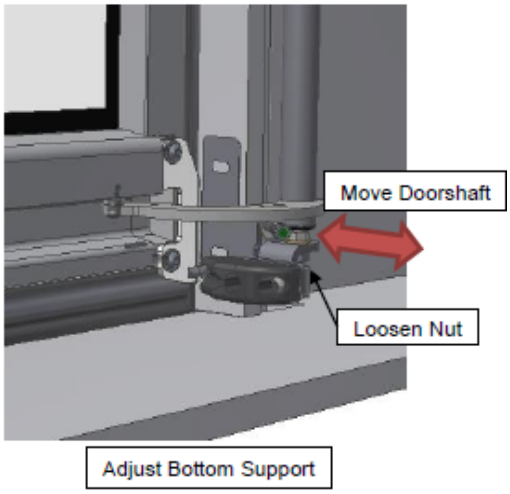
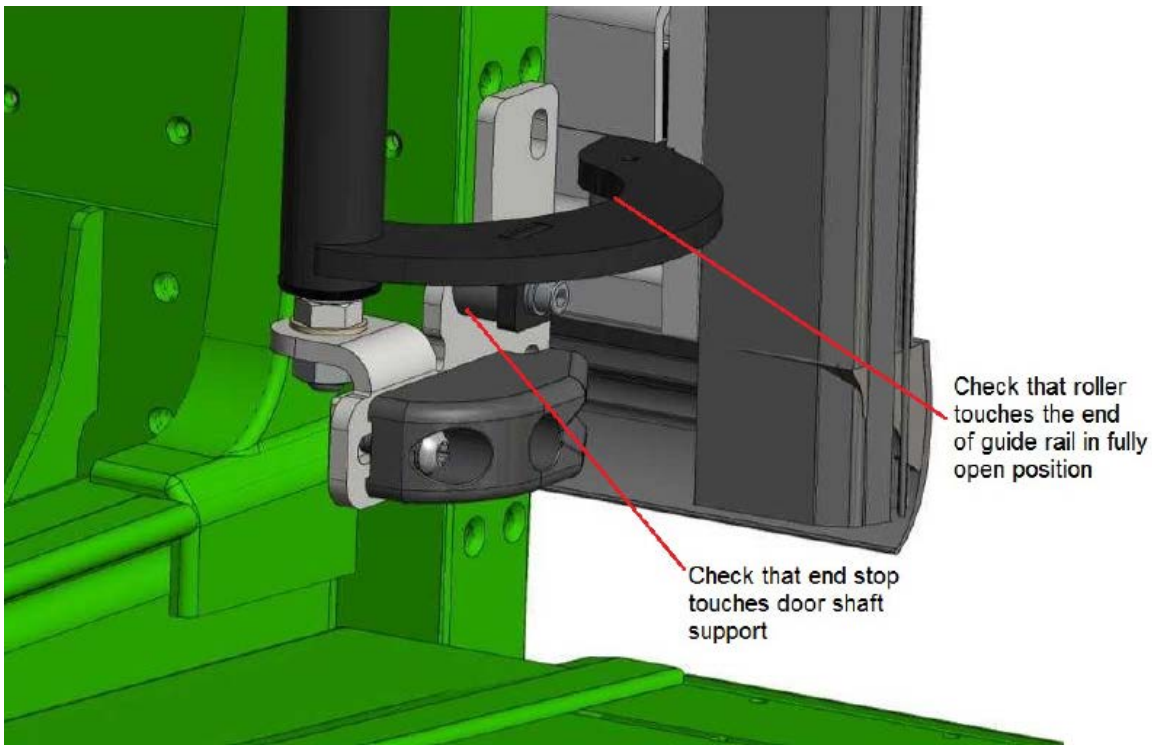


Figure 19

8. Check the end stopper of the door shafts as detailed in Figure 20 below.

Check if the guiding roller on the door shaft lower lever is touching the end of the door leaf rail. Also check if the end stop is touching the bottom support.

- Adjust the connection rod so the end stop touches the bottom support and the guiding roller touches the end of the guiding rail.



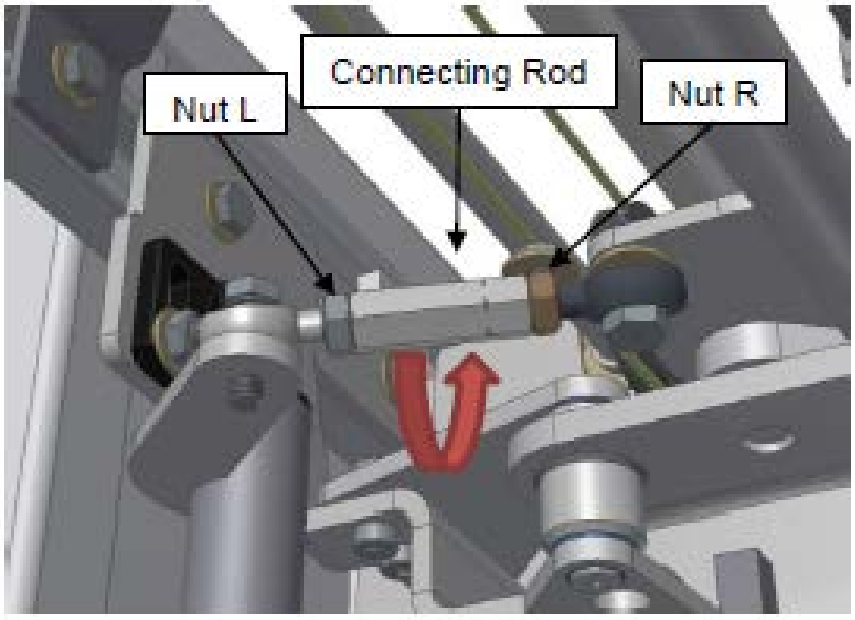


Figure 20

9. Check bearing housing bushes and position of door leafs in aperture as detailed in Figure 21 below.

Check that the bearing housing bushes touch the cushioning rubber on the frame of the door mechanism.
Check that the distance “X” between the aperture and the door arm of both door leafs is equal.

If necessary, adjust door leafs as follows:

- Put the door leafs in open position by hand.
- Loosen the tension bracke:.
- Push the left door leaf so it will move into fully open position until the bearing housing is touching the rubber on the end.
- Hand-tighten the tension bracket.

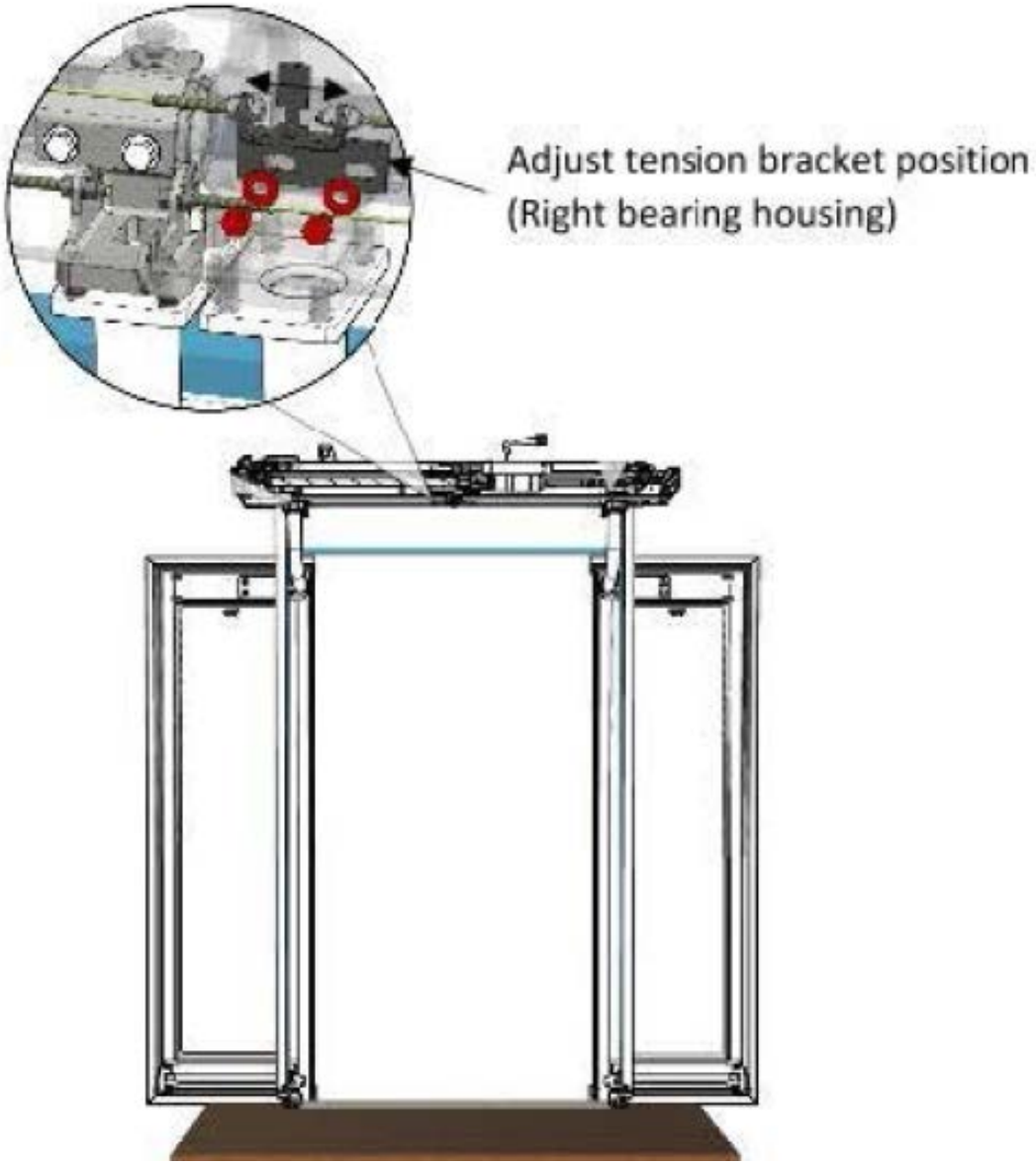


Figure 21

10. Check distance between door leafs with air pressure as detailed in Figure 22 below.
    - Loosen the bolts of the catch block.
    - Put AIR PRESSSURE to the door system and close the door system.
    - Put the catch block neutral in the catch wedge. The catch block prevents the door leafs to open during travel and prevent leakage of the middle seals when the doors are closed.
    - The theoretically distance between the door leafs is **102**mm. In practice, this distance can vary + or - 2mm.
    - Check if the door leafs seals properly at top. There should be no gap and no more than 2mm compression between the upper rubber surfaces
    - To achieve sufficient sealing. If the tension (contact pressure) in the seals is too small or too high, then the catch block should be re-adjusted.
    - If the catch block are moved to the outside the tension will increase
    - If the catch block are moved to the inside the tension will decrease
    - After adjustment tighten bolts of the catch block

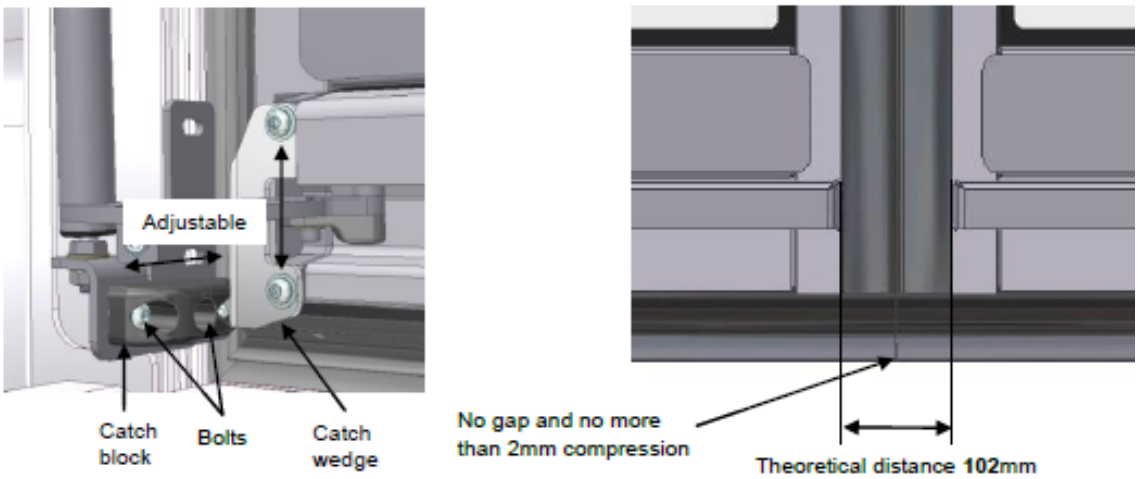


Figure 22

11. Check that that the lever touches the soft stopper when in closed position (Figure 23)

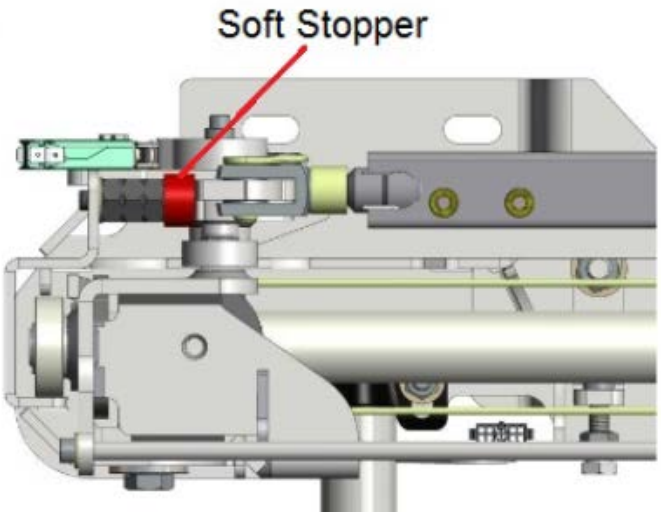


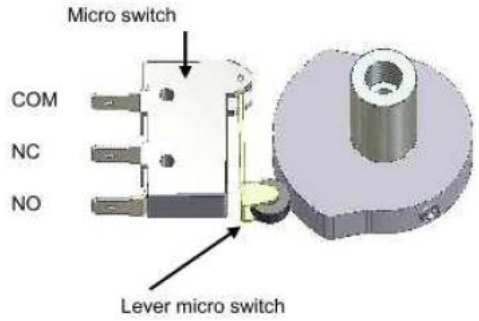
Figure 23

12. When all adjustments are completed and without air in the system, move the door leafs by hand. If they do not open and close freely, identify obstruction/misalignment and rectify.

Section 15F

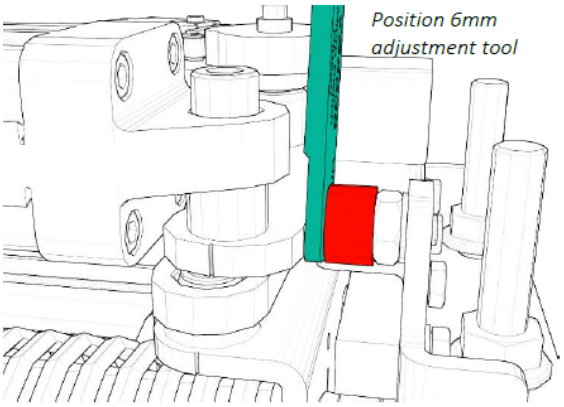
Check/Adjustment of Door Controls

1. Replace open & close control micro switches. Check if the pins on the cable loom are applied to the NO and COM pins of a 3 pin micro switch (as shown below) and the two outer pins of a 4 pin micro switch.

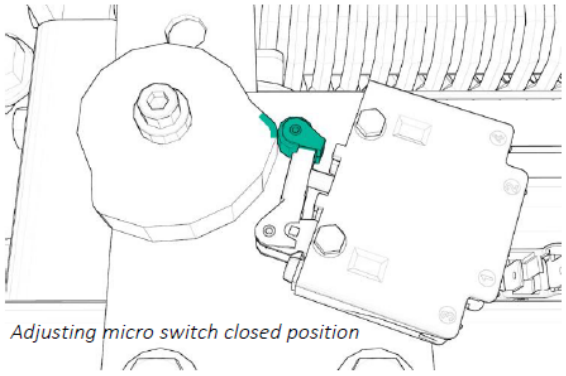


2. With the air removed from the system, set up new close control micro switches as follows:

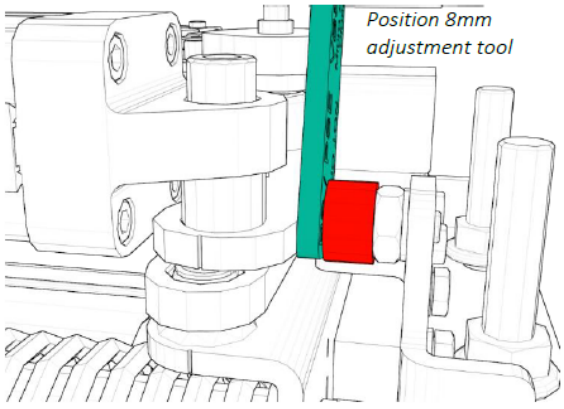
- Place the door in an open position
- Place the 6mm side of the adjustment tool (SAP code 196751) between the door mechanism and the end stopper (See image)
- Close the door and move on to the next steps. Be aware of pinch point hazard.



- Unscrew the cam with an Allen key
- Turn the cam to a position where the micro switch activates (See image)
- Fasten the cam with an Allen key
- Place the door in an open position and move on to the next steps



- Place the 8mm side of the adjustment tool between the door mechanism and the end stopper. (see image) Be aware of pinch point hazard.
- Close the door
- Check if the micro switch closed position activates. The micro switch should NOT be activated.
- If the micro switch activates redo the previous steps.



Note - There is no requirement to adjust the door open micro switch.

3. Set up Wabco valve as follows where necessary:

   With air in the system, operate doors from driver's controls. If the doors take longer than 4 seconds to open or close, or the cushioning is set too low causing door slamming or set too high causing the door to judder or to time-out on the closing cycle, adjust the cushion on the Wabco Solenoid valve (see Figure 24 below).

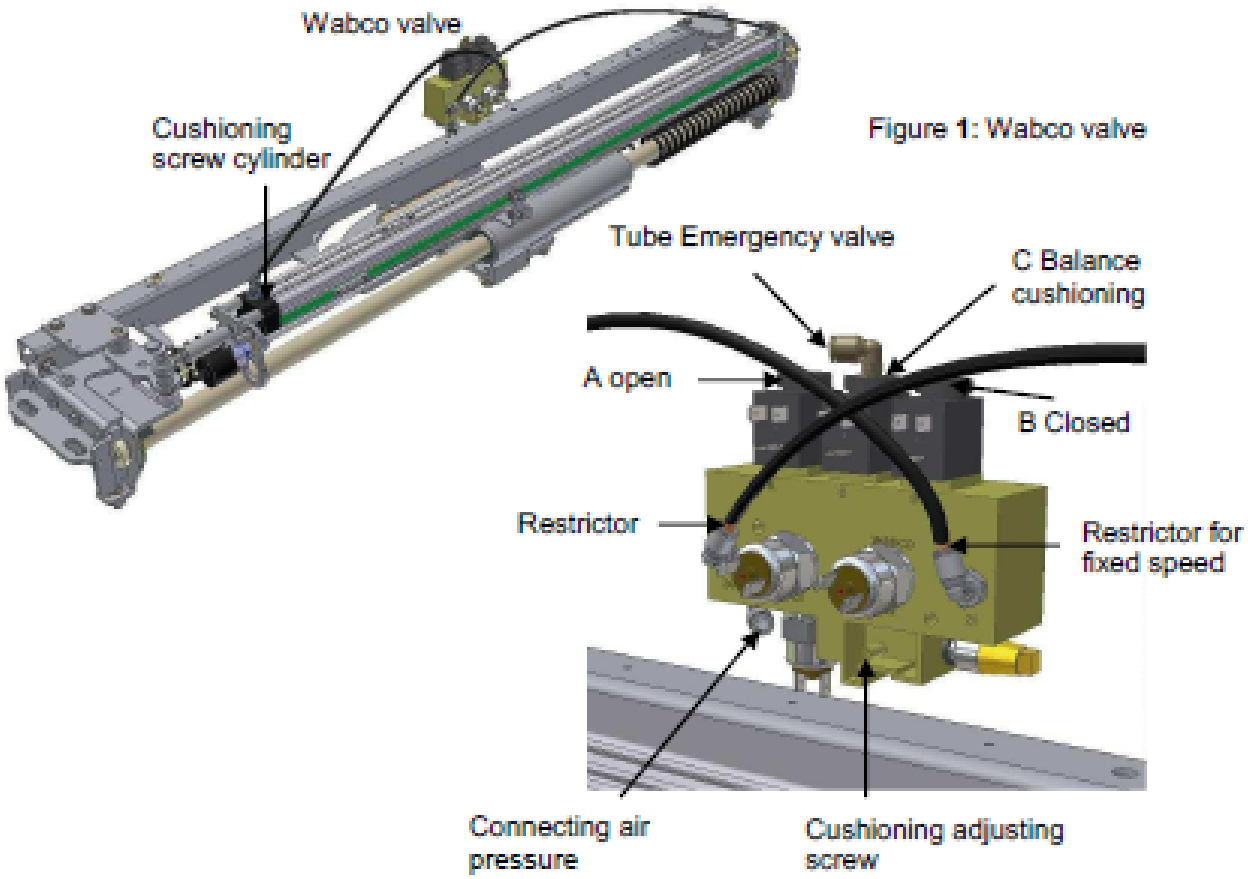


Figure 24

4. Check the pneumatic system for leaks during opening and closing cycle.
5. Check the electrical system by looking for short circuits or damage.
6. Check that emergency buttons are working.
7. Check obstruction detection system as follows;

*Basic principle, See figure **26a**.*
The pins of the cable loom should be applied to the NC pins of the obstruction detection.
The obstruction detection will be pre-adjusted by Ventura Systems, the adjustment screw is set at a theoretical distance of 10mm. The screw of the obstruction detection can be adjusted to specific wishes.
The obstruction detection is active in close direction. If the pressure in the obstruction detection reaches the adjusted value, a contact within the obstruction detection is made and the control system reverses the door.

Adjustment
The sensitivity of this detection-unit is adjustable with the adjustment screw. See figure below. Turning clockwise will result in a higher closing-force and the unit will react less sensitive. Turning counter clockwise will result in a lower closing force and the unit will react more sensitive. When the obstruction detection device is adjusted too sensitive it can react spontaneously when there is no obstruction.

Troubleshooting
- Remove air pressure from the obstruction detection.
- Apply the pins of the voltmeter device to the pins of the outer pins of the obstruction detection, as shown in figure **26b**. When a signal is noticeable the obstruction detection still works properly.

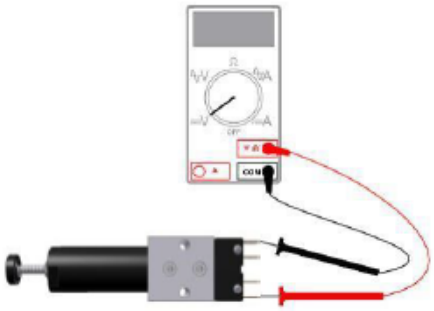


Figure 26b: A signal is noticeable when obstruction detection works properly

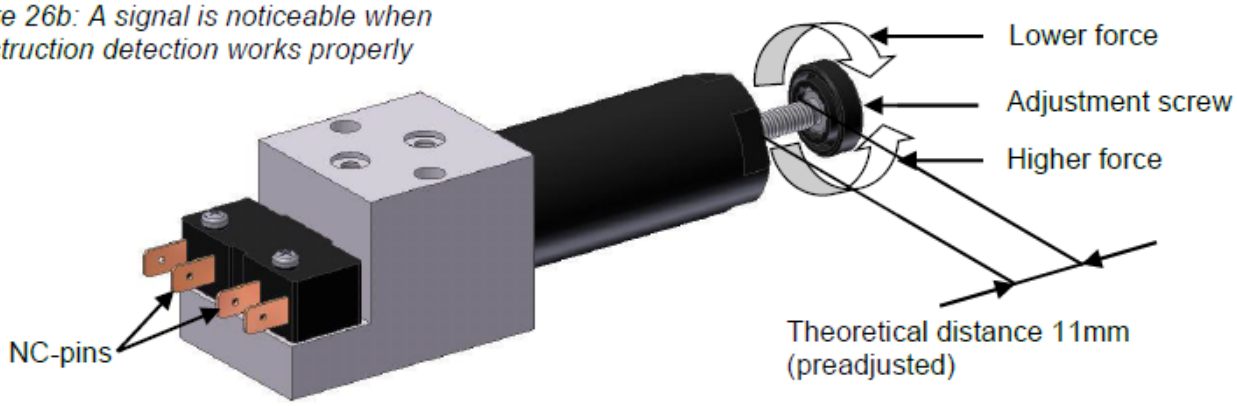


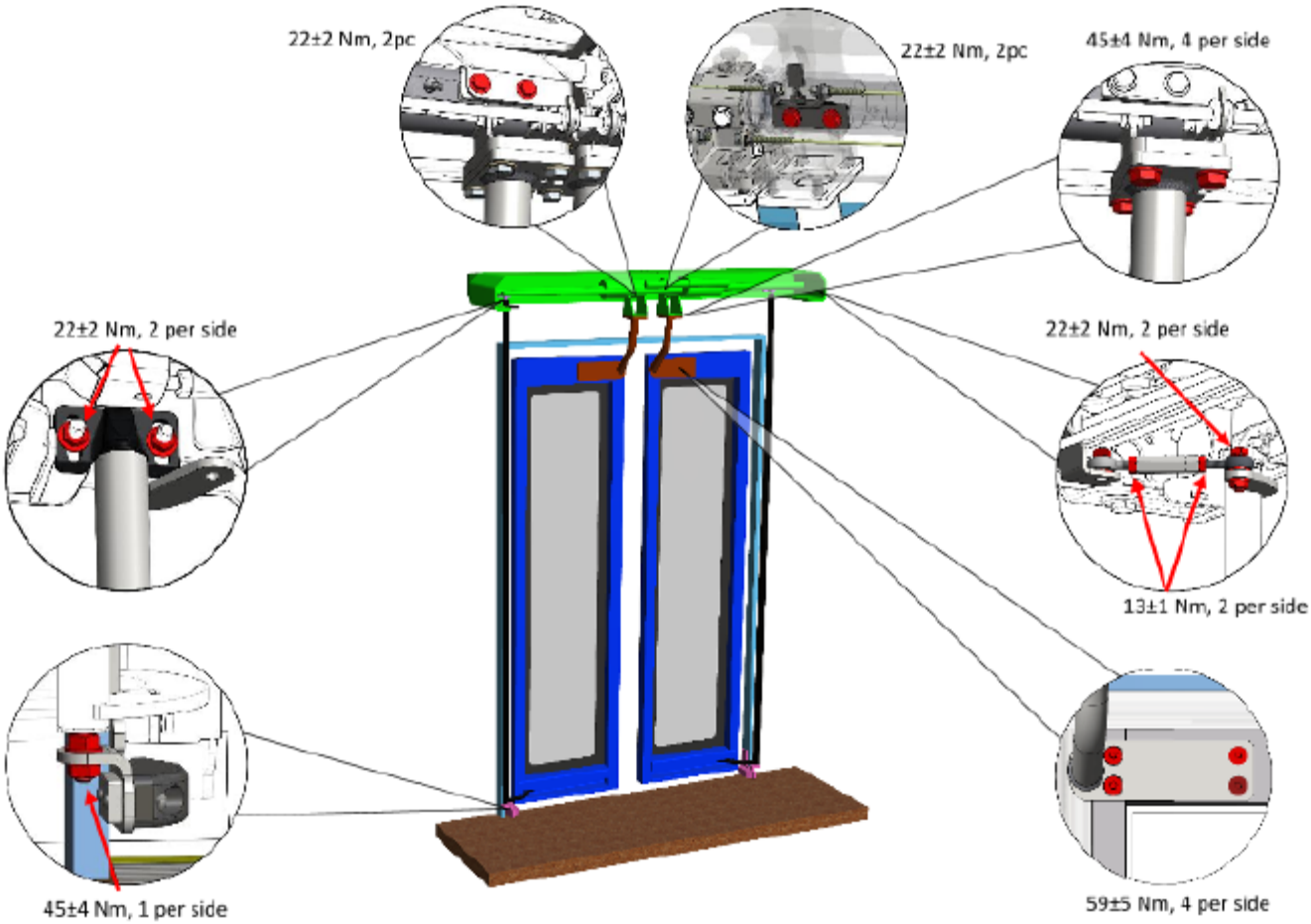
Figure 26a: Obstruction detection

Figure 26

Section 15G

Torque Settings

Tighten fixings to torque shown in figure 27 below.



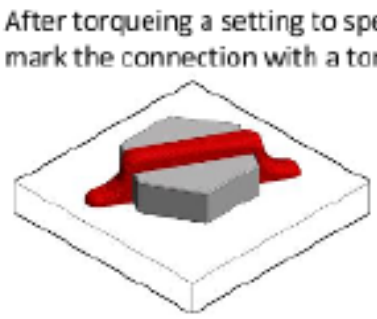


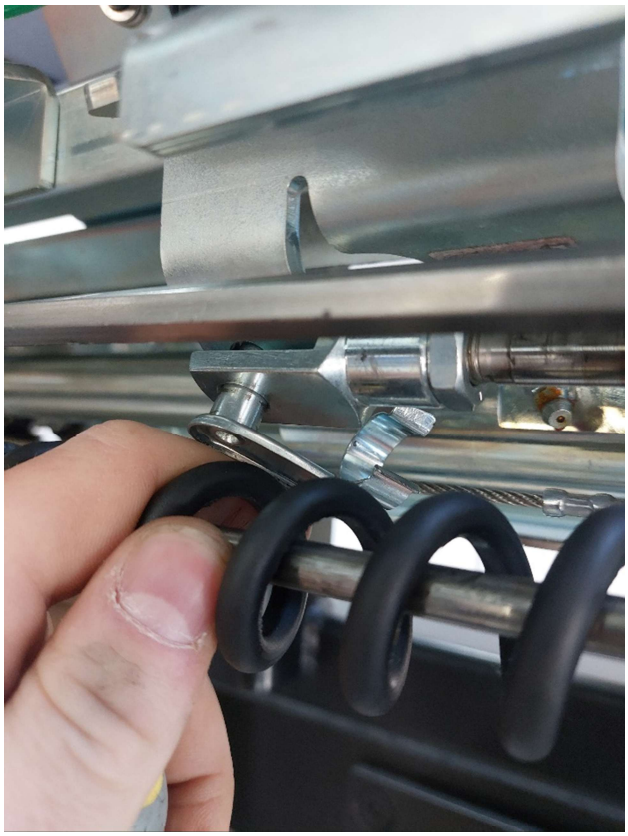
Figure 27

Appendix 1

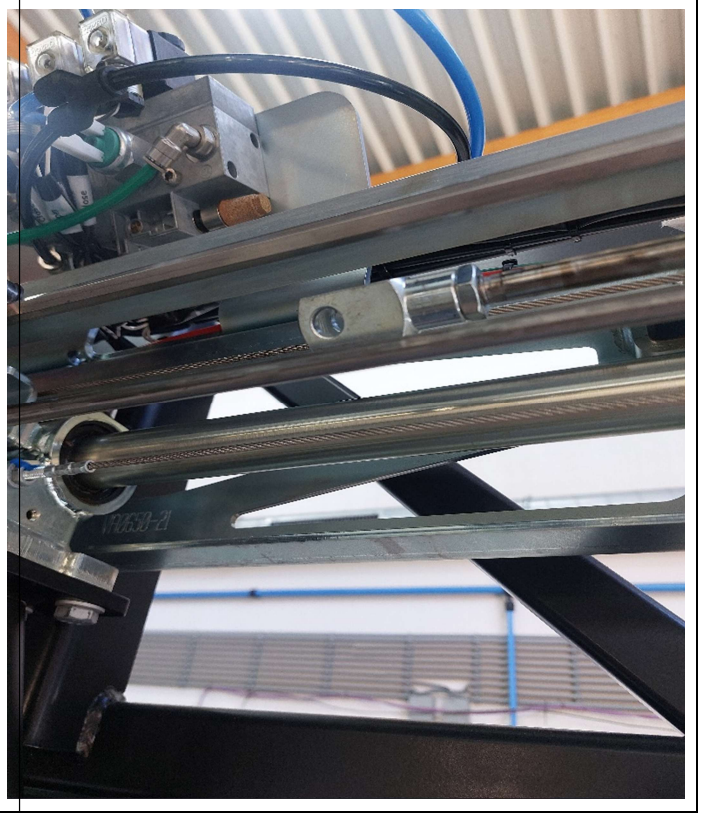
If torque stripe paint on the fork joint is broken or missing, follow instructions below.

Note - Before checking the fork joint, the air must be released from the door system.

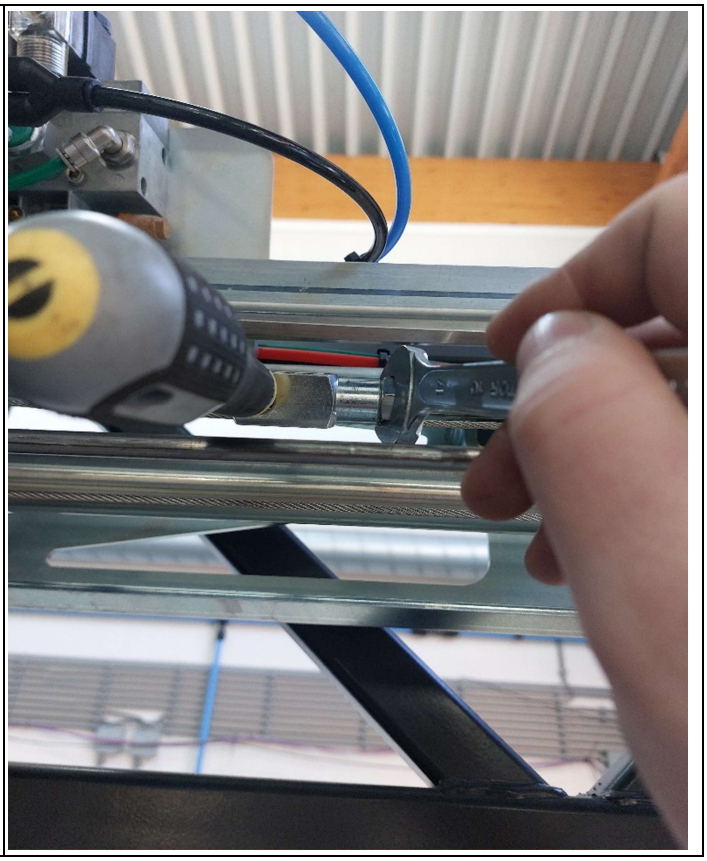
- Remove the clip from the fork joint.



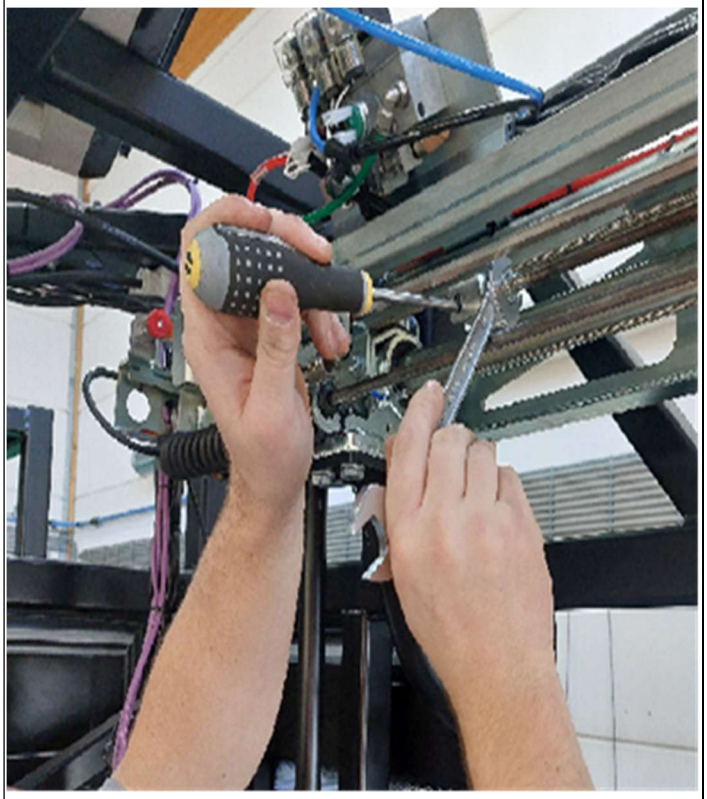
- Put the doors in fully open position so you have free space.



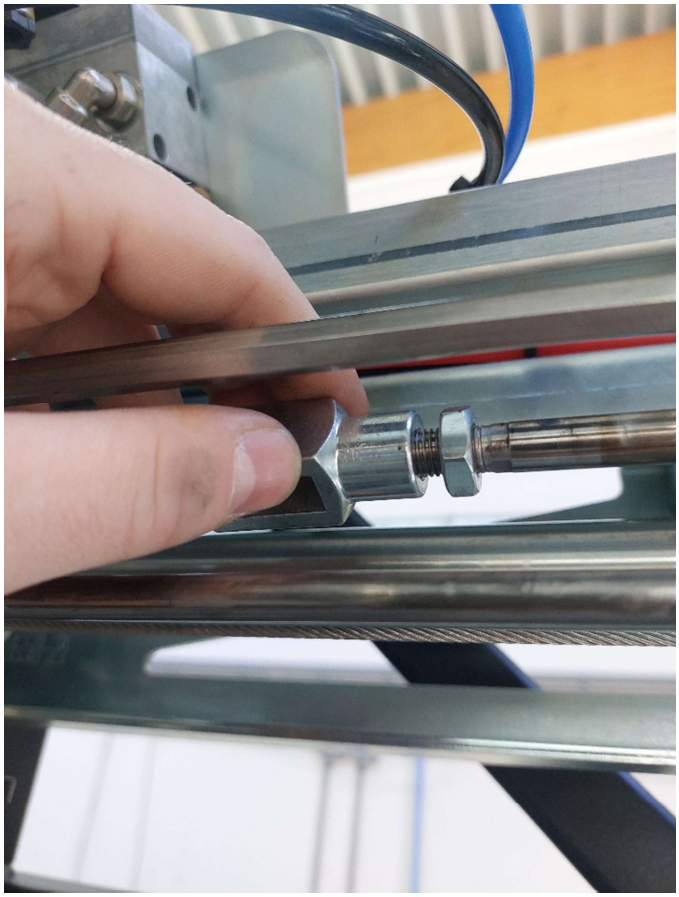
- Put a screwdriver through the hole of the fork joint and use a 17mm wrench to hold the nut.



- Turn the nut to loosen the fork joint.



- Remove the fork joint from the cylinder.



- Turn the nut all the way to the right.



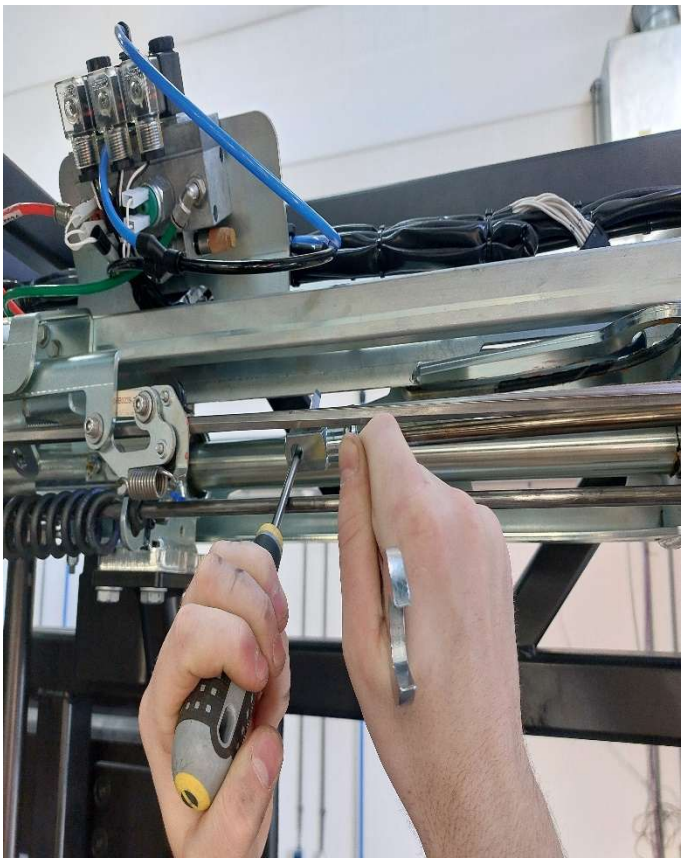
- Put Loctite 243 on the thread of the cylinder.



- Place the Fork joint back on the cylinder. (hold on to the nut so it does not move)

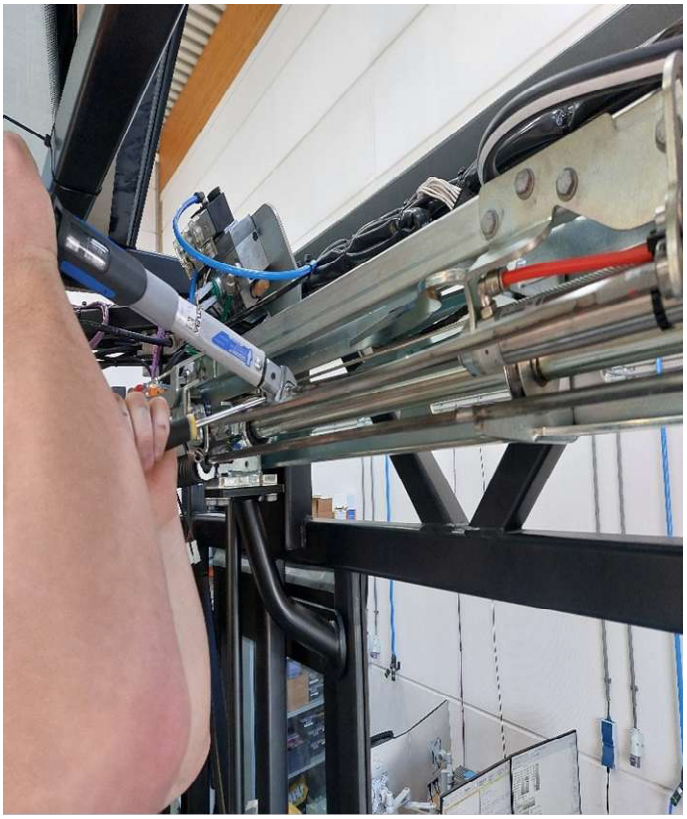


- Hand tight the fork joint before using the torque wrench



- Torque **<u>the nut</u>** with the 17mm torque wrench and mark the nut with torque stripe paint.

  *(Torque the nut to **20 Nm**)*



• Reconnect the cylinder and bracket with the clip.	