








/// QSD-R000589-030

IR PLUG DOOR

Maintenance manual

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Revision history

Sl.no	Revision	Chapter	Change Description	Remarks
1	A01	1.1	QSD-R000589 -033 to QSD-R00589-032	
2	A01	1.5.1	Part number updated FT0054903-000	
3	A01	1.5.2	Door System picture updated	
4	A01	3.2.3	Spelling correction Change to Change	
5	A01	3.2.3, 7.1	Push button instructions corrected	
6	A01	5.1.2	Spelling error Tighening to Tightening	
7	A01	5.1.3	Spelling error shoudl to should, adjsuting to adjusting and accroding to according	
8	A01	5.1.4	Spelling error requirment to requirement, e tighening to tightening	
9	A01	8.36.1	PCU picture changed	
10	A01	5.1.7	Noted updated for language fine tuning	
11	B00	1.3	Abbreviation of EMS removed	
12		1.5.3	Master lock Image updated	
13		2	Electro-magnet removed from 10-year maintenance schedule	
14		5.1.3	Master lock Image updated	
15		5.3.3	Master lock Image updated	
16		7.2	Electro-magnet removed from 10-year maintenance schedule	
17		8.22.1	Master lock Image updated	
18		8.28	Electro-magnet removed from 10-year maintenance schedule	
19		8.29	Electro-magnet removed from 10-year maintenance schedule	
20		8.40	Master lock Image updated	
21		5.1.2	Image updated & Closing Push button removed from BOM.	
22		2	Electromagnet& Replace indication lamp (external	
23		5.6	Bowden cable image updated	
24		8.28.1	Master lock Image updated	
25		8.29.1	Master lock Image updated	

///1. Introduction

1.1 General

The aim of this document is to give necessary technical information and procedures in order to correctly perform all maintenance routines tasks during the passenger access door service life.

The repair of the door system consists in adjustment and exchange of LRU or SRU as defined in the spare part catalogues QSD-R000589-032

The repair of the LRU or SRU of the lowest level is not supported in this manual.

Some of them like EDCU (not in standard scope of supply) must be returned to Faiveley for repair when this operation is economically worthwhile.

This maintenance manual is intended to be the basic document for maintenance operators.

1.2 Safety notices

During all the maintenance operations, the electric power supply has to be isolated. Power supply will be restored only for final checks.



Failure of isolate may cause a trapping Hazard resulting in personal injury.

The working environment must be clean and safe.

To get rid of possible car body deflection it is advised to have the car positioned on a calibrated horizontal track with brakes ON during all installation process.

Unless explicitly specified, the installation operations have to be conducted with care by qualified mechanic personnel. A good knowledge of the door set composition and operation is essential, particularly regarding the technical information given in this manual.

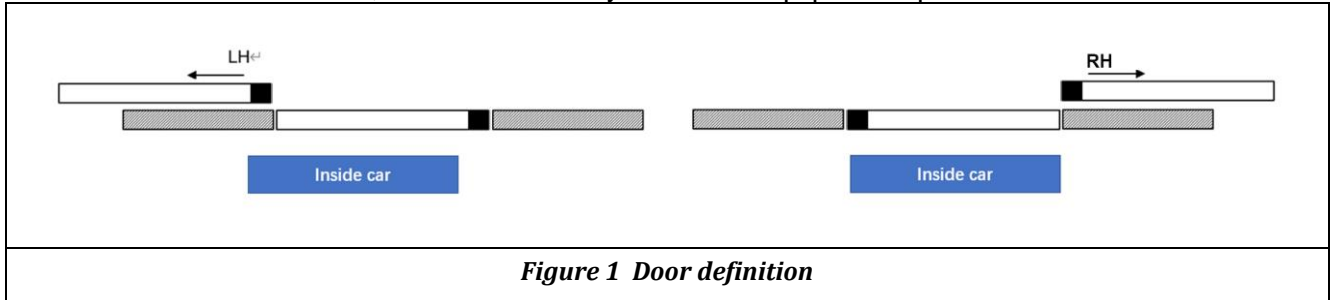
1.3 Abbreviations

EDCU/DCU:	Electronic Door Control Unit	LRU:	Line Replaceable Unit
DLS:	Door Locked Switch	SRU:	Shop Replaceable Unit
DCS:	Door Closed Switch	NC:	Normally Closed
LOS:	Locked Out Switch	NO:	Normally Opened
EED:	Emergency Egress Device	NA:	Not Applicable
EAD:	Emergency Access Device	TBC:	To Be Confirmed
EEPROM:	Electrical Erasable Programmable Read Only Memory	TBD:	To Be Defined
		TL:	Train Line

		LH: Left Hand
FMT:	Faiveley Metro Technology (Shanghai) Co., Ltd.	RH: Right Hand
FTRTIL	Faiveley Transport Rail Technologies India private limited	

1.4 Door definition and layout

There are 2 doors assemblies, which have the symmetrical equipment apart between LH and RH doors.



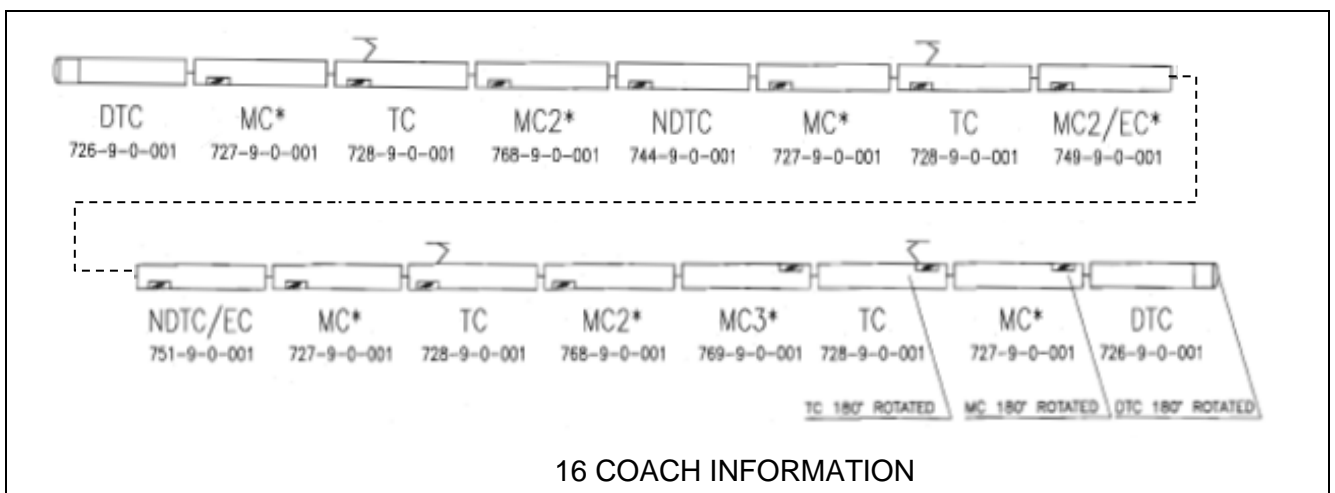
There are two train platform IR is working currently. One is LHB based Loco-hauled train called Tejas or Humsafar. The other one is EMU train with four car configuration unit.

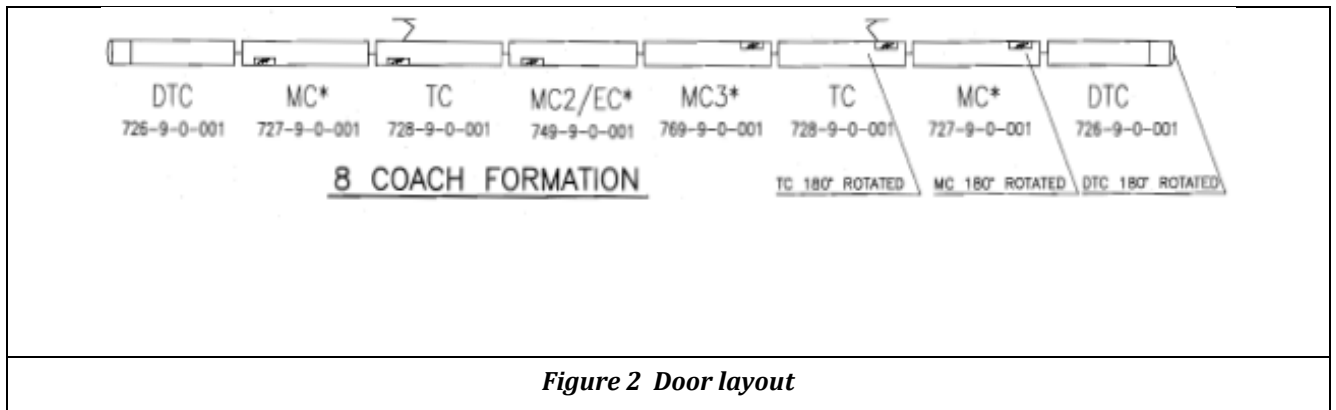
TS18 is an EMU based train has the following configuration, each coach will have four Plug Doors.

- DTC + 8MCs + 4TCs + 2 DNTC + DTC (16 Car Formation)
- DTC + 4MCs + 2TCs + DTC (8 Car Formation)
- DTC + 6MCs + 3TCs + 1 NDTC + DTC (12 Car Formation)

With:

- DTC: Driving Trailer Coach,
- MC: Motor Coach
- TC: Trailer Coach
- NDTC: Non-Driving Trailer Coach.



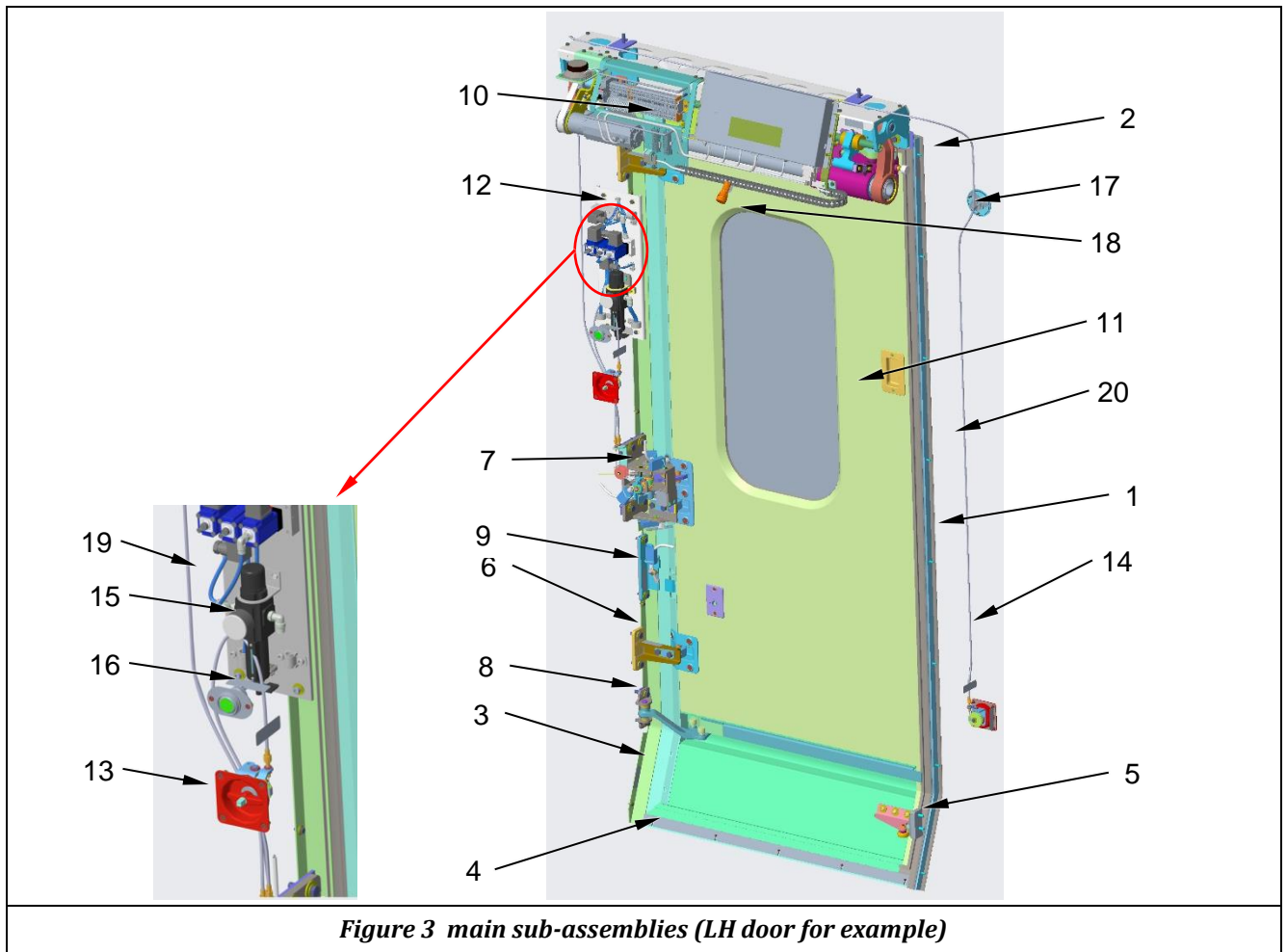


1.5 Main characteristics

1.5.1 Overall data

- Overall assembly drawing: FT0054903-000-ssfr
- Electrical principal diagram: FT0130190-000-csfr

1.5.2 Main sub-components



item	Description	Remarks
1	Front seal assembly (LH&RH)	
2	Upper seal land kit (LH&RH)	
3	Rear seal land kit (LH&RH)	
4	Bottom seal land kit	
5	Retention block kit (LH&RH)	
6	Auxiliary hook assembly	
7	Master lock device (LH&RH)	
8	Lower swing arm assembly (LH&RH)	
9	Lockout switch assembly (LH&RH)	
10	Operator (LH&RH)	
11	Door leaf (LH&RH)	
12	Pneumatic control unit assembly	
13	Emergency egress device	
14	Emergency access device	
15	Push button kit (opening)	
16	Outside lamp kit	
17	Internal lamp	
18	Bowden cable (EED)	
19	Bowden cable (EAD)	

///2. Preventive maintenance plan

The preventive maintenance schedule and actions are indicated in the following table:

Interval	Task	Refer to Section	Estimated man hours
Every 180 days	• General inspection	§3.1	
	• Functional and safety checks		
	○ Manual operation check	§3.2.1	
	○ Automatic opening and closing check	§3.2.2	
	○ Local opening and closing test (Push Button)	§3.2.3	
	○ Obstacle detection test	§3.2.4	
	○ Lock-out check	§3.2.5	
	○ EED and EAD test	§3.2.6	
Every 1 year	Cleaning and greasing		
	• Cleaning and greasing the operator	§4.1	
	• Cleaning and greasing the lock device	§4.2	
	• Cleaning and greasing the retention block	§4.3	
	• Cleaning and greasing the EED and EAD	§4.4	
	• Cleaning and greasing the lockout device	§4.5	
	Adjustment check		
	• Check adjustment of the door leaf	§5.1	
	• Check the adjustment of operator	§5.2	
	• Check adjustment of master lock device	§5.3	
	• Check the adjustment of auxiliary lock hook	§5.4	
	• Check the adjustment of lower swing arm	§5.5	
	• Check the adjustment of lockout switch assembly	§0	
	• Check the adjustment of EED & EAD	§5.6	
Every 10 years (overhaul)	Operator		
	• Replace driving screw assembly	§6.1.1	
	• Replace coordinate bar bearing	§6.1.3	
	• Replace rod bearing	§6.1.3	
	• Replace roller kit	§6.1.4	
	• Replace open end stop	§6.1.5	
	• Replace close end stop	§6.1.6	
	• Replace extremity bearing	§6.1.7	
	• Replace synchronous belt	§6.1.8	
• Replace flexible chain assembly	§6.1.9		

	Door leaf		
	• Replace peripheral seal	§6.2.1	
	• Replace retention roller	§6.2.2	
	Lower swing arm		
	• Replace rollers	§6.3.1	
	Front rubber seal assembly		
	• Replace female front seal	§6.4.1	
Every 15 years (overhaul)	Operator		
	• Replace EDCU	§7.1.1	
	• Replace motor	§7.1.2	
	• Replace loudspeaker	§7.1.3	
	Master lock device		
	• Replace unlocking cylinder	§7.2.1	
	• Replace locking cylinder	§7.2.2	
	• Replace fork spring	§7.2.3	
	• Replace latch spring	§7.2.4	
	• Replace emergency spring	§7.2.5	
	• Replace DLS1 wire layout	§7.2.6	
	• Replace DLS2 wire layout	§7.2.7	
	• Replace DCS wire layout	§7.2.9	
	• Door leaf		
	• Replace push button wiring	§7.3.1	
	• Lockout switch assembly		
	Replace LOS wire layout		§7.4.1
	• PCU assembly		
	Replace PCU		§7.5.1
	• Replace EAD	§7.6	
	Replace Bowden cable (EAD)	§7.8	
	• Replace EED	§7.7	
	• Replace Bowden cable (EED)	§7.9	
	• Replace push button kit (opening)	§7.10	
	Replace the push button kit (closing)	§7.3.1	
	Replace the indication lamp (external)	§7.11	
	Replace the indication lamp (internal)	§7.12	

///3. Instructions

3.1 General inspection



Isolate the door power supply



The top and lateral cover should be opened to make door components accessible

- Look for scratched or broken windows
- Check that the rubber seals are not torn or cracked
- Look for vandalism actions, damaged, tagged or missing parts.
- Check the rollers of lower swing arm is not broken
- Check abnormal worn the retention roller on the front bottom of door leaf
- Look for missing or loose fasteners, check screw marking on screw heads.
- Check that all the rubber end stops are not deformed, torn or cleft.
- Check that the door moves freely without hard points or abnormal noise
- Check that the locking fork and hook work correctly during door closing and opening

With electrical power supplied, check electrical parts that:

- all electric cables are correctly fastened and do not interfere with moving parts.
- all the connectors are connected reliably (mainly on the terminal board and EDCU).
- all the switches are working well, including DLS1, DLS2, DCS, EDS, LOS, MMS
- push buttons are working well,
- the lamps are working well
- Loudspeaker works well

If necessary, proceed to an appropriate corrective maintenance:

- Isolate the power supply
- Exchange or replace a part.
- Tighten a screw and mark its head with sealing varnish
- Refit clamping collars on electric wires.
- Close the door operator and hanging device access panels.
- Restore the power supply of the car.

3.2 Functional and safety checks

3.2.1 Manual force on door opening

The aim of this test is to measure the force to open the door, to be able to check if a passenger can manually open the door leaf (after loss of power or manual emergency unlocking).



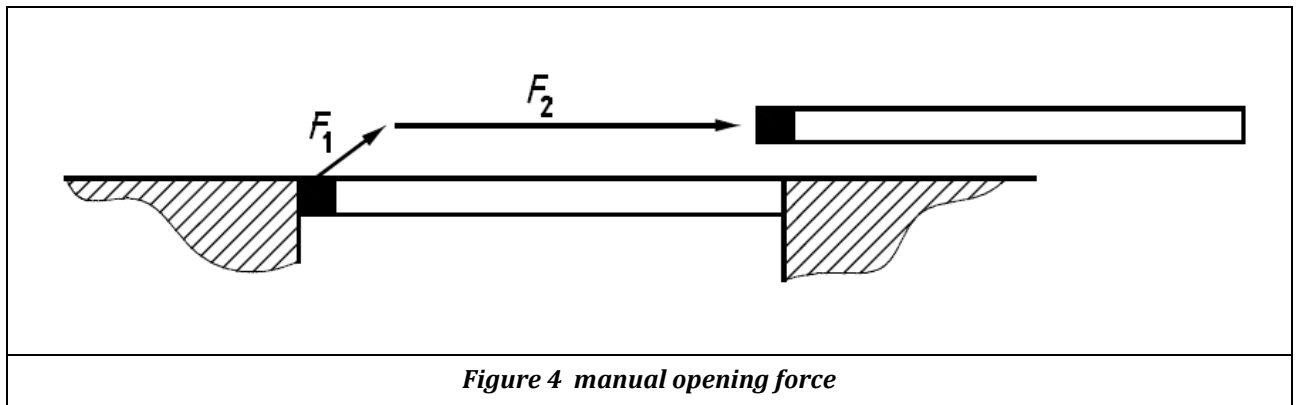
Isolate the door power supply

Acceptable criteria:

Concerning the door, the maximum manual opening forces are **250 N (F1)** for the plugging movement and **150 N (F2)** for the sliding movement

Test:

- 1) Activate the emergency device.
- 2) Open manually after the door leaf is closed. With a dynamometer apply on the door leaf a force in opening direction.
- 3) Record the maximum force on the dynamometer during the plugging opening movement of the door.
- 4) Record the maximum force on the dynamometer during the sliding opening movement of the door.



3.2.2 Automatic opening and closing check

The aim of this test is to measure the door, the gap filler opening and closing times

Note: make sure that the voltage supply is within 110VDC (tolerance: +25% / -30%).

Opening:

- 1) Initiate a door opening command from train line.
- 2) Check that the door moves smoothly with end of stroke breaking.
- 3) Check the opening time (5 ± 1 s), from command to end of stroke.
- 4) Make sure that the motor is not supplied with power after the end of the opening operation. Check that the motor is supplied with power to re-open the door if we try to close manually (min. 20cm).

Closing:

- 1) Initiate door closing command using the release train line
- 2) Check that the door moves smoothly with end of stroke breaking.

- 3) Check the closing time (5 ± 1 s), from command to end of stroke.
- 4) Check that the door is locked, by trying to open the door manually.

3.2.3 Local opening and closing test

The aim of the test is to check if the push button is working or not

Note: make sure that the voltage supply is within 110VDC (tolerance: +25% / -30%).

Push button on door leaf (external side):

- 1) Make sure that the door is in closed & locked position
- 2) Check that the green LED is ON
- 3) Press the push button, check that the red LED change to ON, and door moves smoothly with end of stroke breaking.

Push button (green):

- 1) Make sure that the door is in closed & locked position
- 2) Press the push button, check that the LED change to ON, and door moves smoothly with end of stroke breaking.

3.2.4 Obstacle detection test

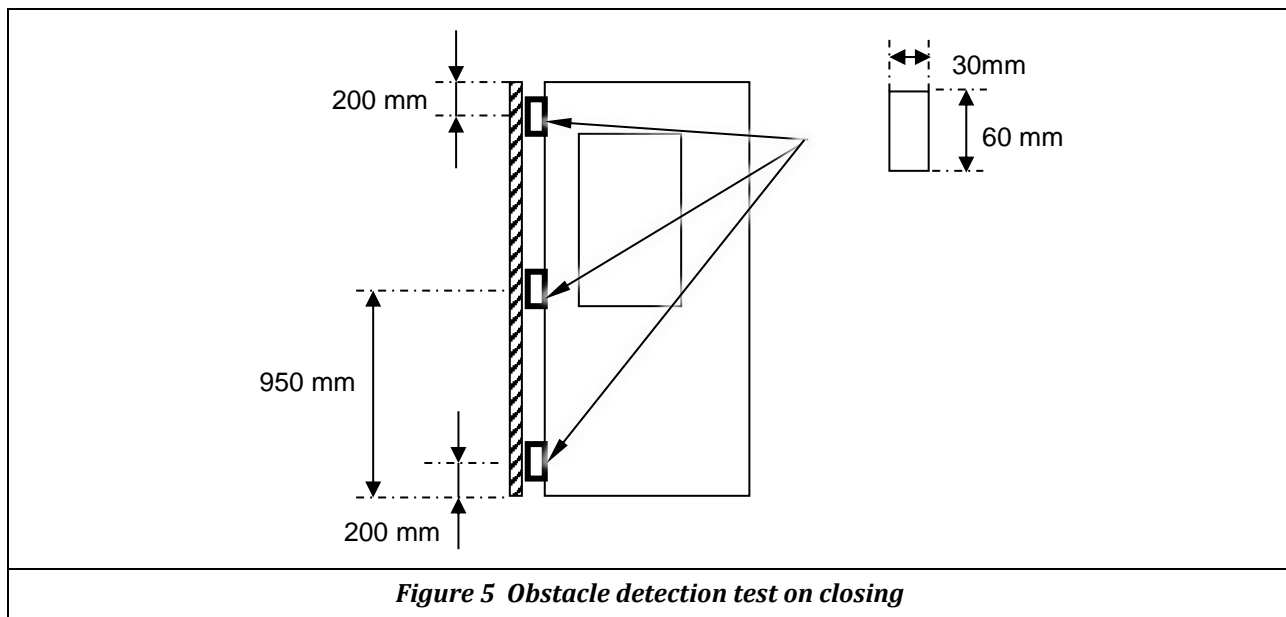
The aim of the test is to check the existence and the different steps of the obstacle detection cycle when a 30 mm x 60 mm obstacle is between door leaf and front rubber seal and whether this obstacle is detected or not at three different heights from the bottom, the middle and the top of the door.

Acceptable criteria:

- Door will re-open by 200 mm and stays free
- Door tries to close again after 2s with 5 times
- If obstruction persists. The door will fully open and stays free, until next valid open/close command

Test:

- 1) Open the door leaf.
- 2) Place the 30x60 mm rectangular bar at 200mm above the bottom edge.
- 3) Initiate a closing command and observe that the door lock switch is not activated, and that the obstacle detection cycle is performed.
- 4) Place the rectangular bar at door leaf mid-height and repeat step 3.
- 5) Place the rectangular bar at 200mm lower from the top edge and repeat the step 3.



3.2.5 Lockout check

The aim of the test is to check the mechanical and electric function of lock out device.

- 1) Check that the voltage supply is within 110VDC (tolerance: +25% / -30%).
- 2) Close and lock the door in 2nd locked position.
- 3) Use the RIC key to turn the lock out shaft on door leaf from either inside or outside.
- 4) Check that the lock out bar engages into the lockout bracket, and it could not be pushed back.
- 5) Check that the door leaf is isolated electrically and does not respond to the local or train line commands.
- 6) Check the internal lamp on top cover will be illuminated
- 7) Reset the lock out device.
- 8) Check that the door leaf has recovered its normal functioning mode and that no failure is detected

3.2.6 EED & EAD check

The aim of the test is to check that the interior and exterior emergency devices (EED and EAD) could be operated and unlock the door correctly. Under the condition that low-speed TL is activated or powered off.

Note: Only proceed function test without measuring the activating force at 3 months inspection is acceptable, but the force must be checked every 1-year maintenance.

Acceptance criteria:

When the low-speed TL is activated, the maximum force to operator the EED handle should be 7.5 N.m and 10Nm for EAD handle.

Test:

- 1) Attach the dynamometer to the EED handle and clockwise turn the shaft by 90°. Measure the opening force.
- 2) Verify that the door is free and can be opened manually.
- 3) Close the door leaf manually to activate DCS and DLS or activate the close switch on local panel. Check the door leaf return to normal functioning mode and no failure is detected.
- 4) Attach the dynamometer to the EAD handle.
- 5) Repeat step 2~3 to check the operation force and function of EAD.

///4. Cleaning and greasing



Isolate the door power supply before any operation

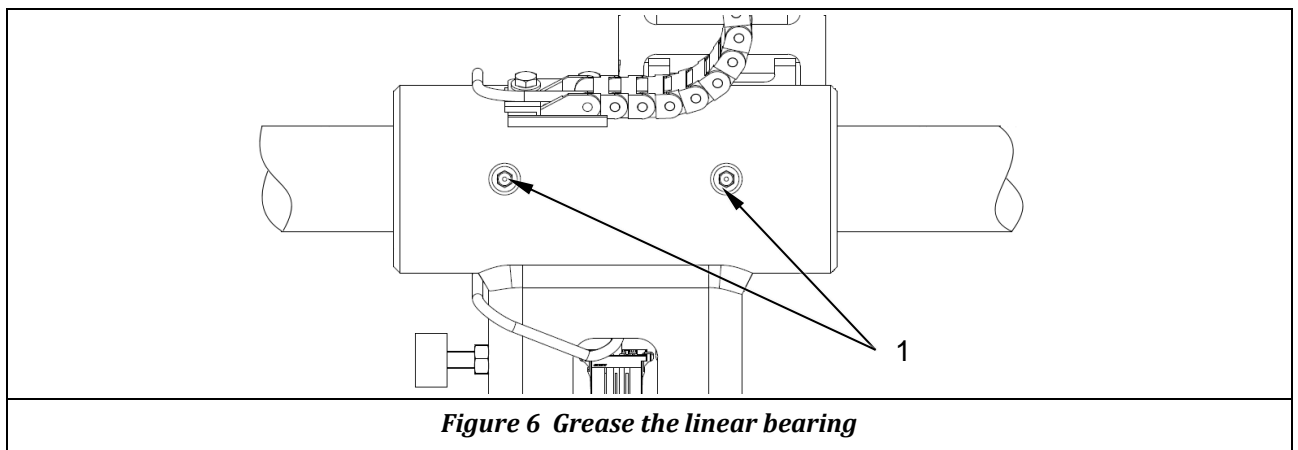


The top and lateral cover should be opened to make door components accessible
After greasing, manually open and close the door for several time to make the greasing sufficiently and equably

4.1 Cleaning and greasing the operator

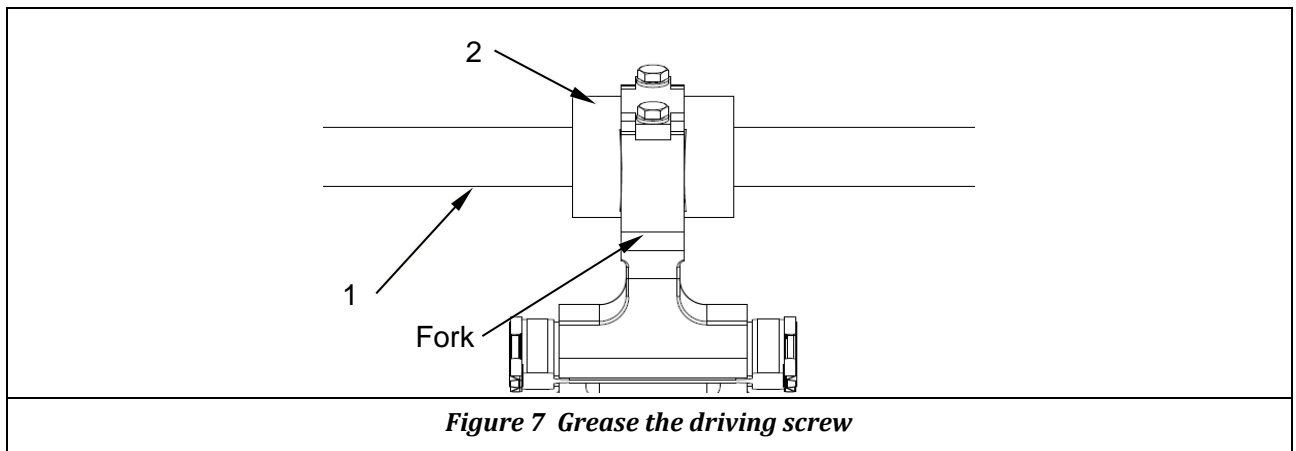
4.1.1 Linear bearing and guiding rod

- 1) Clean the guiding rod with a clean lit free cloth soaked with thinner [C4]
- 2) Apply SKF LGEP2 into the linear bearing though the 2 grease nipples (*item 1, Figure 6*) located on the driving arm
- 3) Stop when the grease overflows
- 4) Clean the overflowed grease



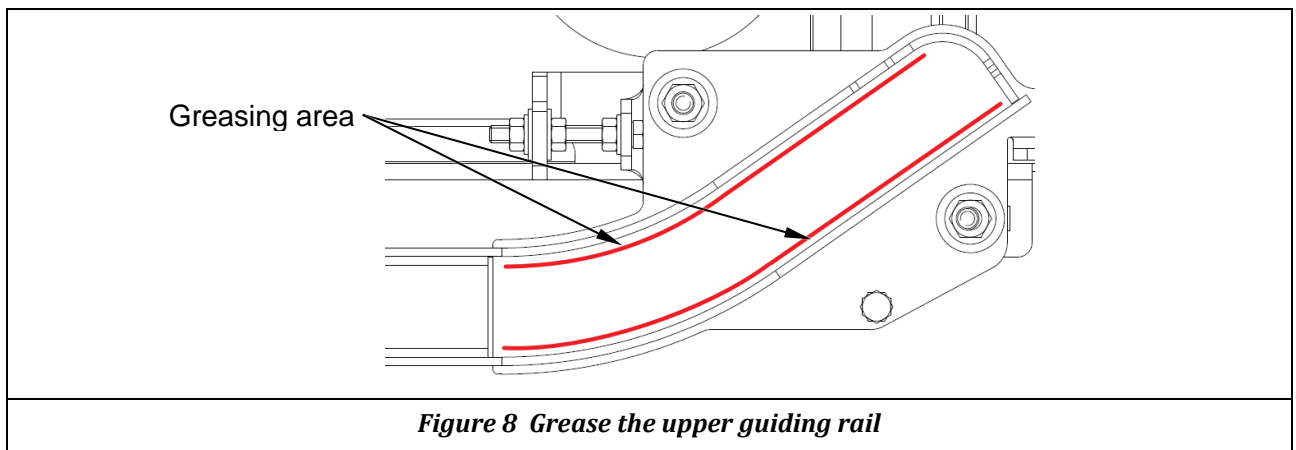
4.1.2 Driving screw

- 1) Clean the driving screw with a clean lit free cloth soaked with thinner [C4]
- 2) Grease the driving screw (*item 1, Figure 7*) over the whole length with SKF LGEP2 via a brush



4.1.3 Upper guiding rail

- 1) Manually open the door
- 2) Clean the upper guiding rail over the whole length with a clean lit free cloth soaked with thinner [C4]
- 3) Slightly grease the lateral surface of curving area with SKF LGEP2



4.2 Cleaning and greasing locking device

4.2.1 Spring

- 1) Manually open the door
- 2) Clean the spring with a clean lit free cloth soaked with thinner [C4]
- 3) Grease the sliding surface with SKF LGEP2

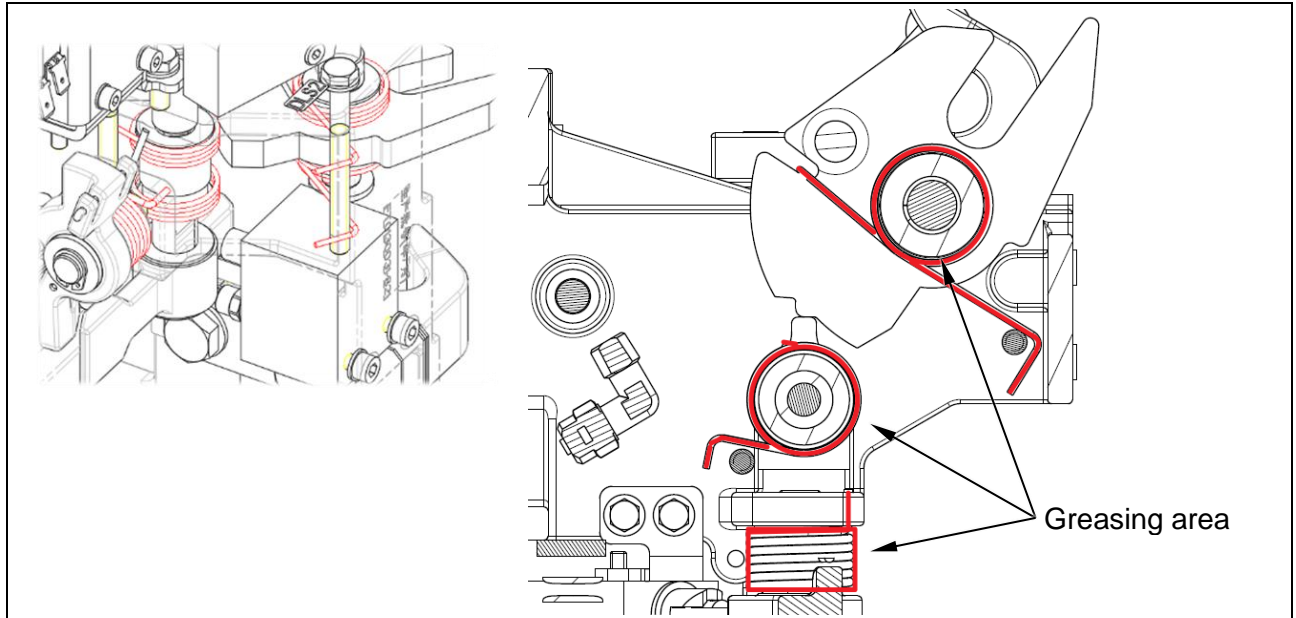


Figure 9 Grease the spring

4.2.2 Locking fork

- 1) Manually open the door
- 2) Clean the locking fork with a clean lit free cloth soaked with thinner [C4]
- 3) Grease the sliding surface with SKF LGEP2

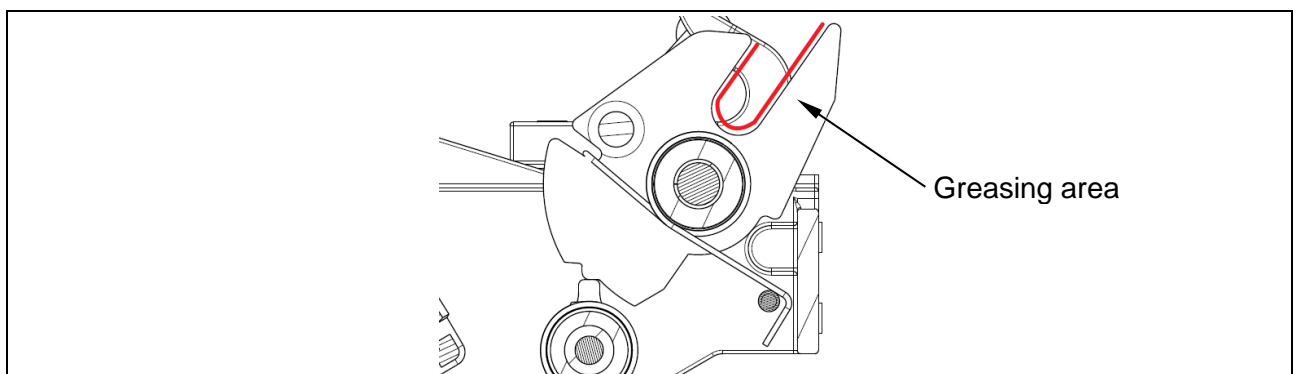
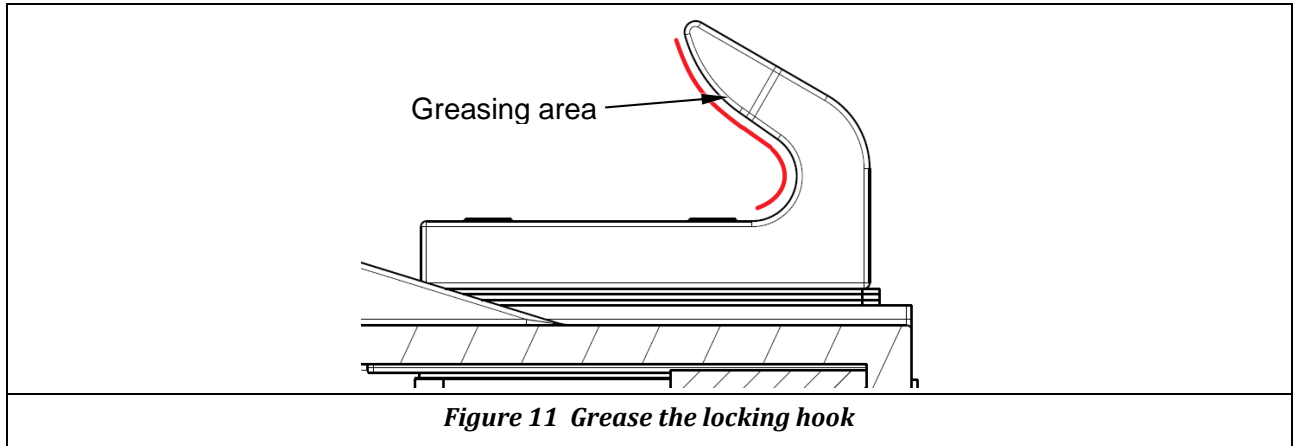


Figure 10 Grease the locking fork

4.2.3 Locking hook

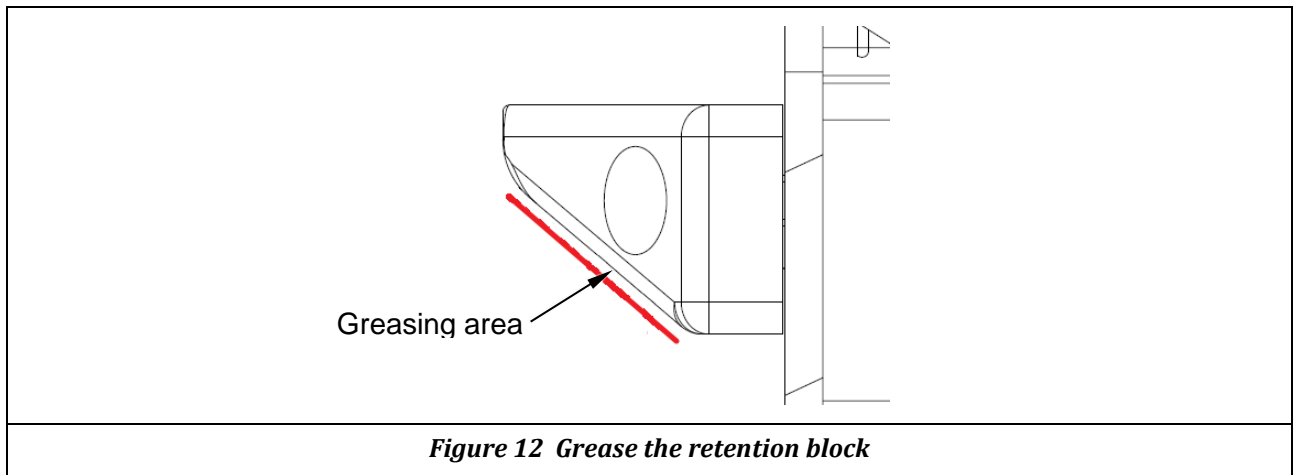
- 1) Manually open the door
- 2) Clean the locking hook with a clean lint free cloth soaked with thinner [C4]
- 3) Grease the lateral surface of curving area with SKF LGEP2

Note that there are 3 locking hooks where need to be cleaned and greased.



4.3 Cleaning and greasing the retention block

- 1) Manually open the door
- 2) Clean the retention block with a clean lint free cloth soaked with thinner [C4]
- 3) Grease the slant surface with SKF LGEP2

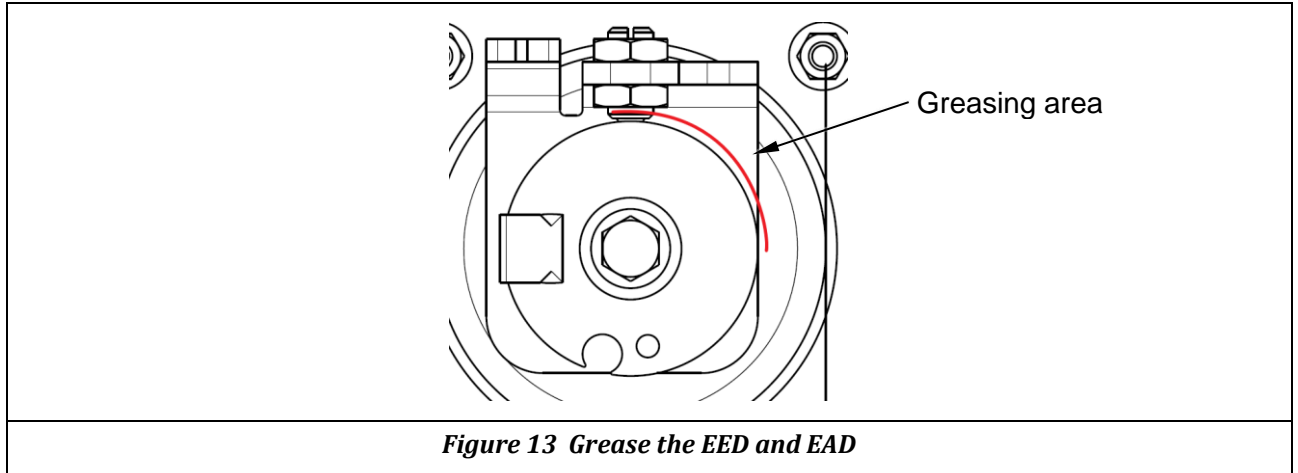


4.4 Cleaning and greasing EED and EAD



The lateral cover should be opened to make back side of EED accessible
The EAD should be dismantled from carbody before maintenance

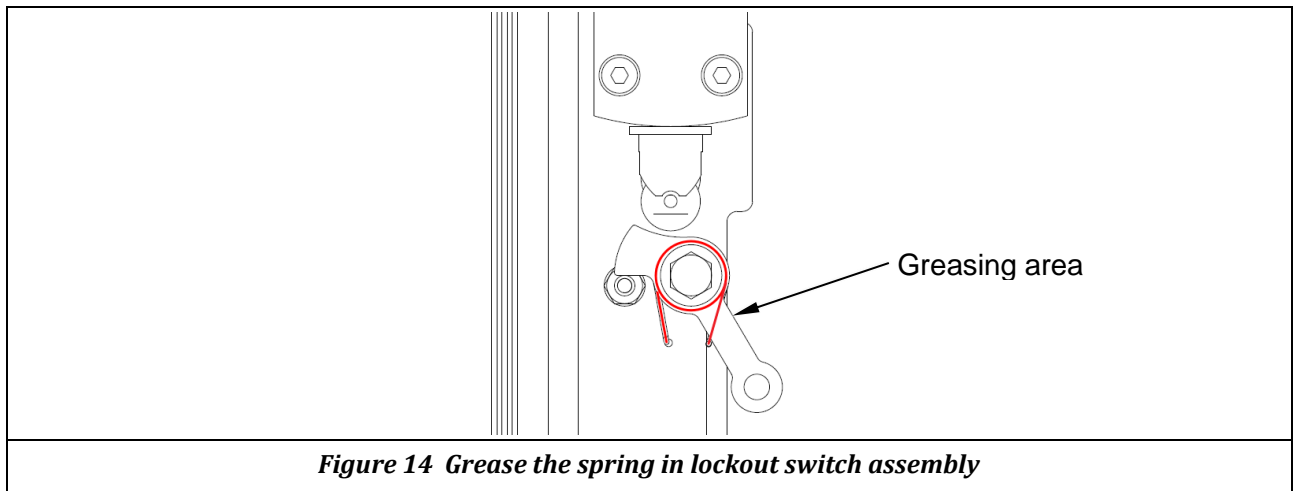
- 1) Clean the surface of the pulley with a clean lit free cloth soaked with thinner [C4]
- 2) Grease the surface with SKF LGEP2



4.5 Cleaning and greasing lockout device

Spring in lockout switch assembly:

- 1) Clean the surface of the spring with a clean lit free cloth soaked with thinner [C4]
- 2) Grease the spring with SKF LGEP2



Lock-out bar:

- 1) Activate the lockout device via a RIC key
- 2) Clean the surface of the lockout bar with a clean lit free cloth soaked with thinner [C4]
- 3) Grease the lockout bar with SKF LGEP2

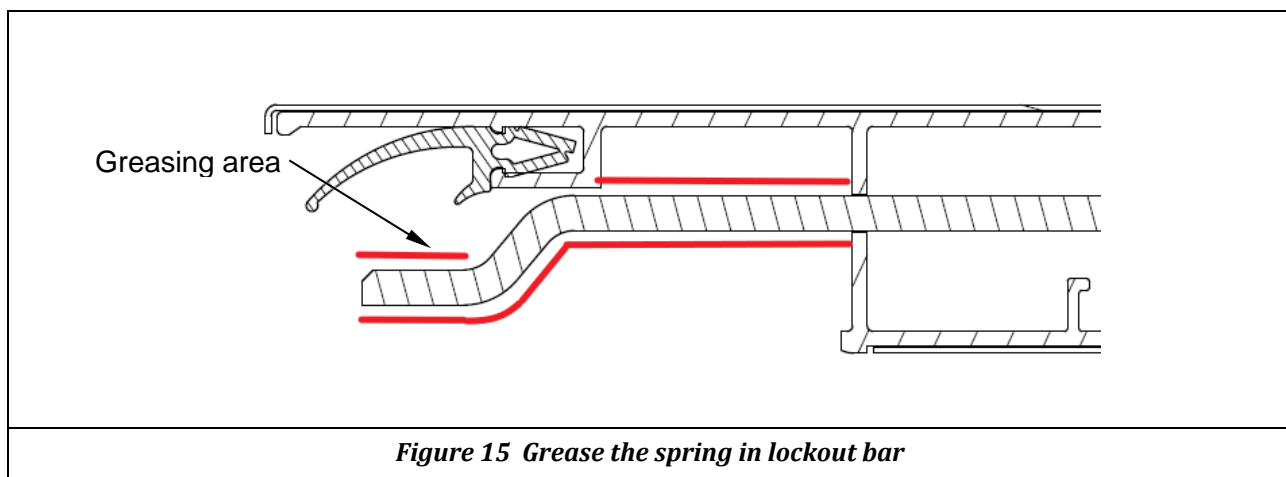


Figure 15 Grease the spring in lockout bar

5. Adjustment check



Isolate the door power supply before any operation

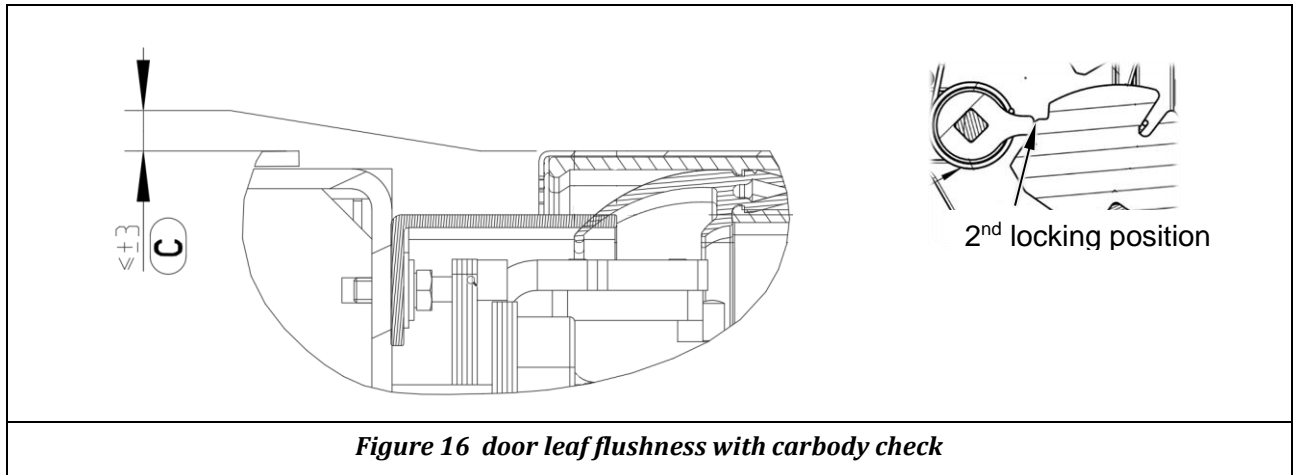
5.1 Door leaf adjustment check

5.1.1 Checking list and criteria

No.	Item	Criteria	Refer to section
1	Flushness of outer door skin with the carbody side wall (no air supply)	$\leq \pm 3\text{mm}$	§5.1.2
2	Gap between the front male and female rubber seal (measured at middle height)	$3.8 \pm 1\text{mm}$	§5.1.3
3	The height of door leaf	$13.8 \pm 2\text{mm}$	§5.1.4
4	V-shape of the door leaf	1~3mm	§5.1.5
5	Plug-out stroke (top and bottom)	$70 \pm 2\text{mm}$	§5.1.6
6	Gap between retention roller and block	0~1 mm	§5.1.7
7	Horizontal gap between roller bracket and block	6~9mm	
8	Vertical gap between roller bracket and block	$53 \pm 2\text{ mm}$	

5.1.2 Flushness check

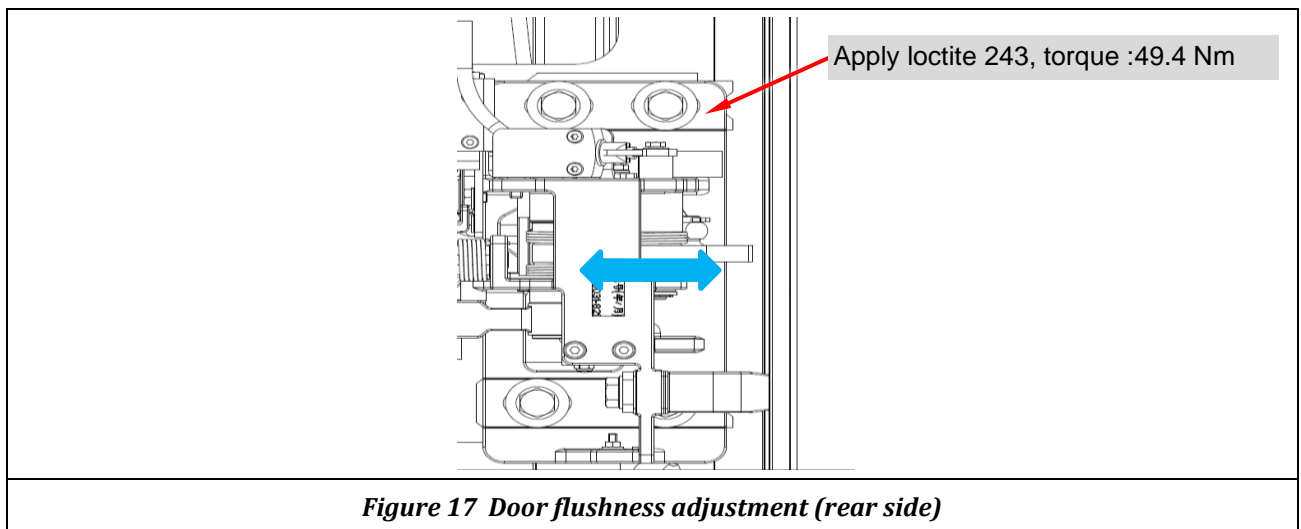
- 1) Manually close and lock the door to 2nd locking position
- 2) Check the flushness of:
 - The front male and female rubber seal should be $\pm 2\text{mm}$
 - The outer door skin and the carbody side wall at rear side should be $\leq \pm 3\text{mm}$



3) Adjust the door leaf if need with following procedure:

Rear side:

- a) Manually fully close the door to the 2nd locking position
- b) Check the flushness between the door outer skin and carbody side wall and record the deviation should be $\leq \pm 3\text{mm}$
- c) Manually open the door
- d) Slightly loosen the 4 fixing screws, move the master lock device along the slot hole accordingly
- e) Tighten the screws.
- f) Manually fully close the door and check the flushness again.
- g) Repeat step 3~6 if need.
- h) Tighten the screws with torque 49.4Nm, apply Loctite 243 and tightening mark.



Front side:

- a) Slightly loosen the 3 fixing M8 nuts (*item 1, Figure 18*) of top guiding rail
- b) Slightly loosened the adjusting nut (*item 2~4, Figure 18*)
- c) Adjust the nut (*item 2, Figure 18*) to move the guiding rail, until the door leaf flushness satisfy the requirement
- d) Fasten the 4 M8 nut with correct torque **25.4Nm**, apply Loctite 243 and tightening mark

e) Tighten all the adjusting nuts with torque 10.4Nm and apply tightening mark

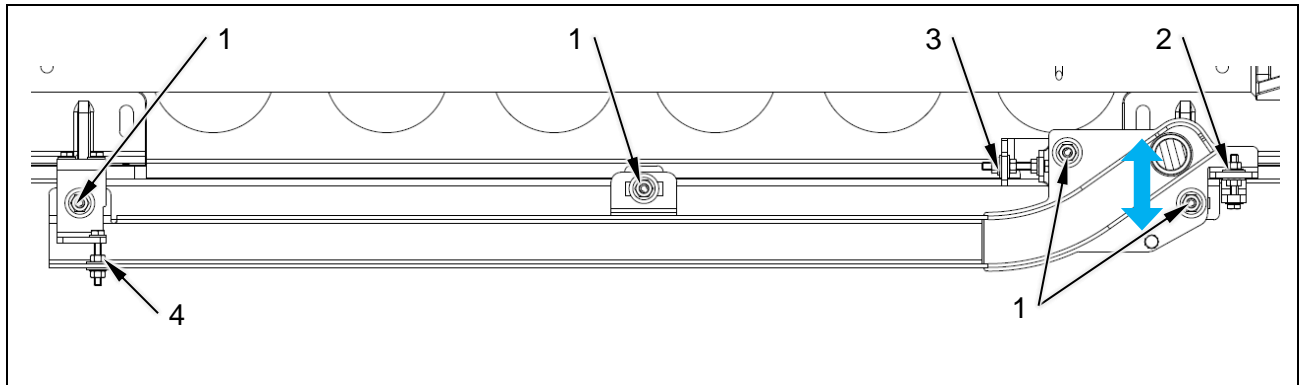


Figure 18 Door flushness adjustment (front side)

5.1.3 Horizontal gap between front male & female rubber seal

- 1) Manually close and lock the door to 2nd locking position
- 2) Measure the outside gap between the front male & female rubber seal at middle height area, which should be 3.8 ± 1 mm (measured at the middle height area)

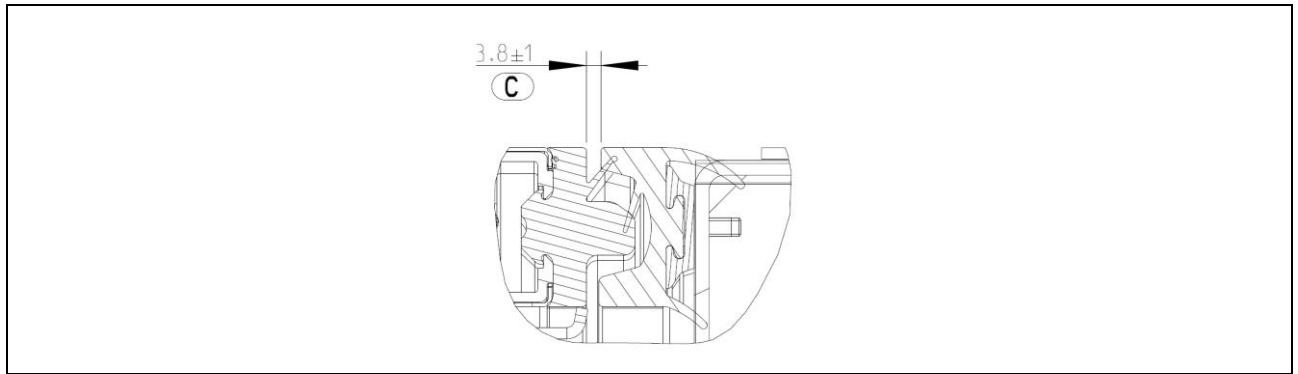


Figure 19 horizontal gap between front male & female rubber seal

- 3) Adjust the door leaf if need with following procedure:
 - a) Manually open the door
 - b) Loosen the 4 fixing screws on master locking device
 - c) Add or remove the adjusting shim accordingly (add shim will decrease the gap or vice-versa)
 - d) Repeat step 2~4 if need
 - e) Tighten the 4 screws with torque 49.4Nm, apply Loctite 243 and tightening mark

Note that after the gap adjustment finished, the flushness should be double checked, adjusting according to §5.1.2 should be proceeded if needed.

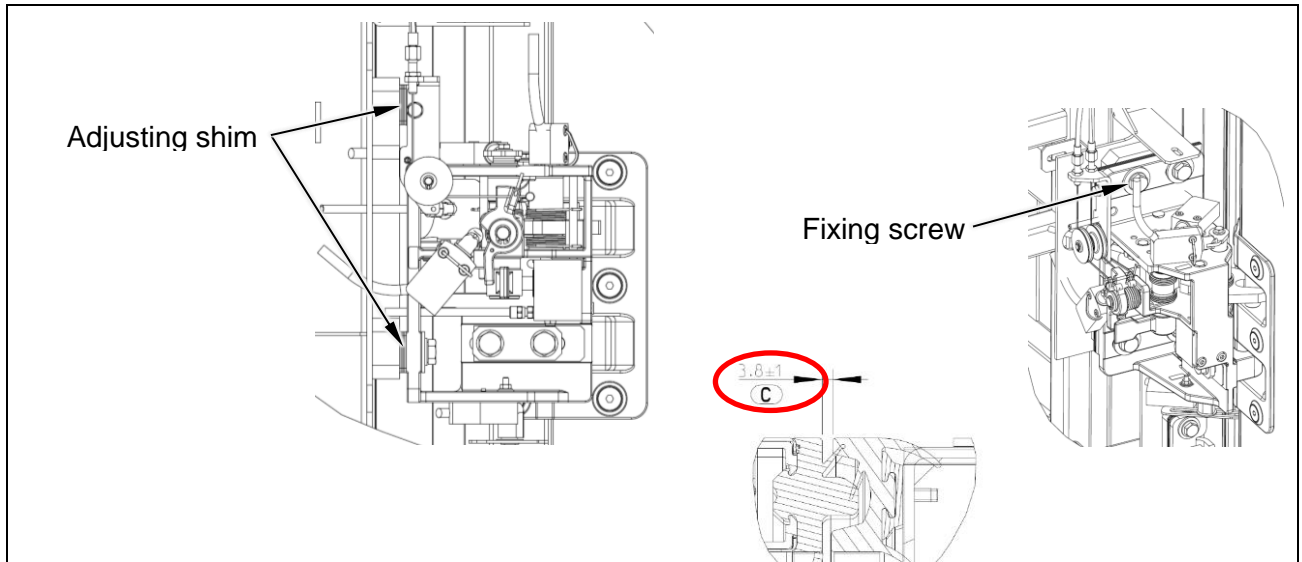


Figure 20 adjustment of door horizontal gap

5.1.4 Door leaf height check

- 1) Manually close and lock the door to 2nd locking position
- 2) Measure the height of door leaf at top edge, which should be 13.8mm \pm 2mm from the top of carbody portal, for both front side and rear side

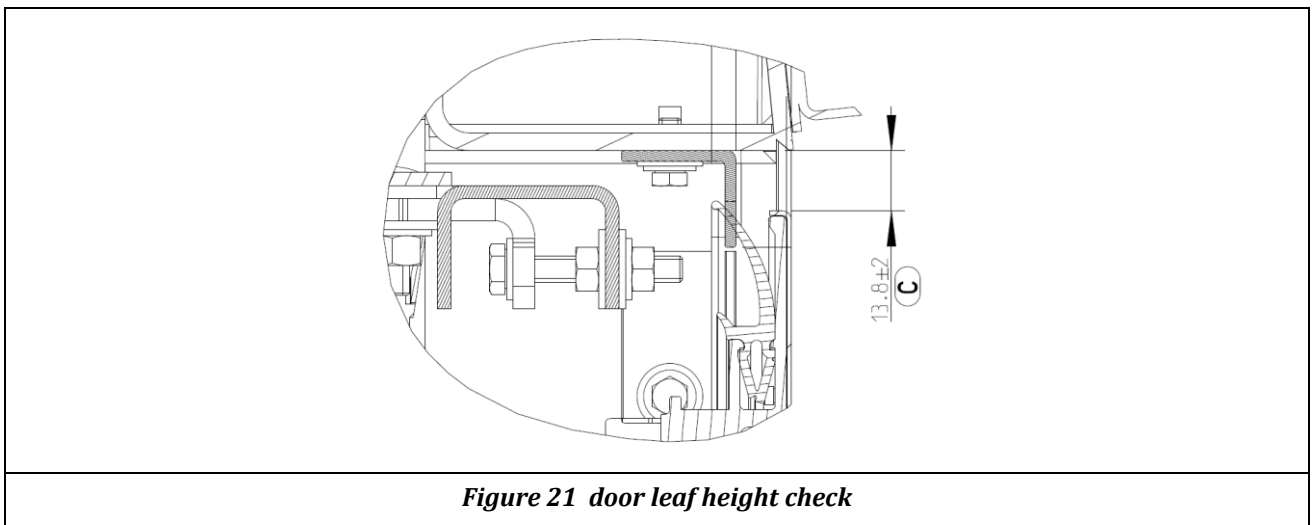
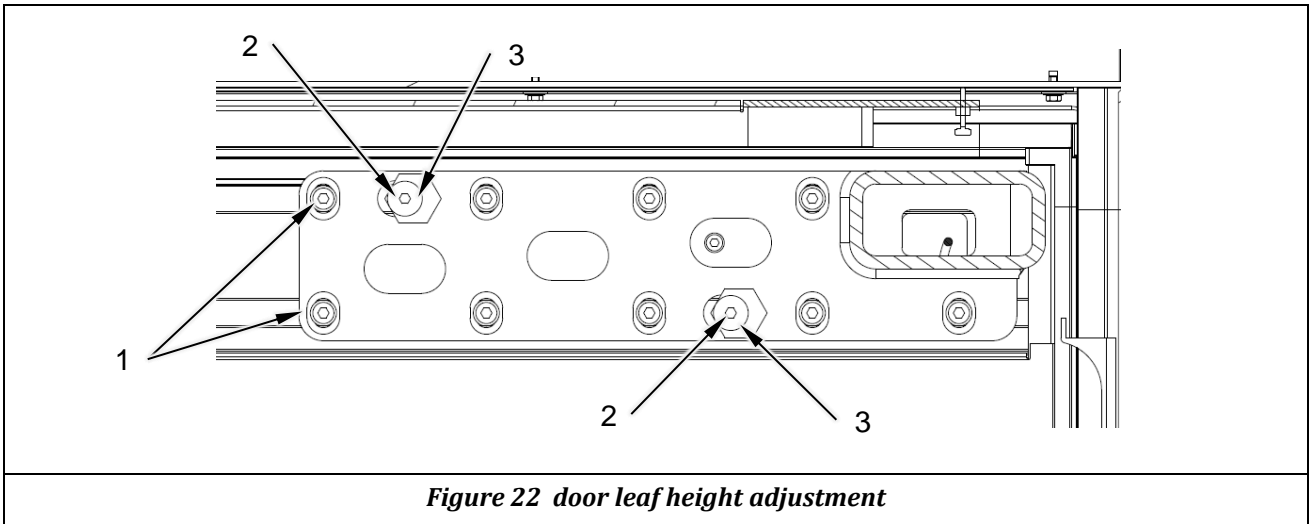


Figure 21 door leaf height check

- 3) Adjust the door leaf if need with following procedure:
 - a) Slightly loosen the 9 pcs of fixing screws (item 1, *Figure 22*)
 - b) Slightly loosen the countersunk screw (item 2&4, *Figure 22*)
 - c) Turn the Eccentric (item 3&5, *Figure 22*) **synchronously**, until the height satisfy the requirement.
 - d) Fasten the countersunk screw with torque 20Nm, and apply tightening mark
 - e) Tighten the 9 fixing screws with torque 25.3Nm, and apply tightening mark

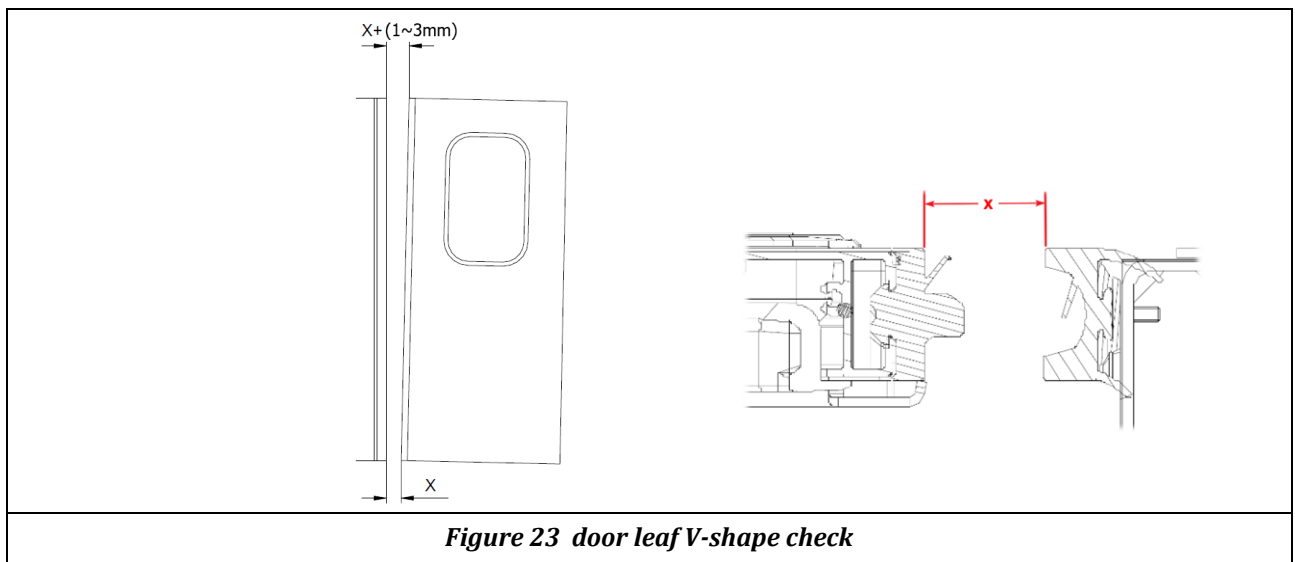


Note that:

- if the adjustment still could not be satisfied even the screw (item 1, Figure 22) moved to end of slot hole, then the height of operator should be checked and adjusted as detailed in §5.2.2

5.1.5 V-shape

- 1) Manually open the door by around 100mm
- 2) Measure the distance from front male rubber seal and female rubber seal
- 3) Check that the top distance should be bigger than bottom distance with 1~3mm



- 4) Adjust the door leaf if need with following procedure:
 - a) Slightly loosen the 9 pcs of fixing screws (item 1, Figure 22)
 - b) Slightly loosen the countersunk screw (item 2, Figure 22)
 - c) Turn either Eccentric (item 3, Figure 22), until the V-shape satisfy the requirement.
 - d) Fasten the countersunk screw (item 2, Figure 22) with torque 8Nm, and apply tightening mark
 - e) Tighten the 9 fixing screws (item 1, Figure 22) with torque 25.3Nm, and apply tightening mark

5.1.6 Plug-out stroke check

- 1) Manually fully open the door
- 2) Check the plug-out distance at the top and bottom area of vertical area of door leaf, which should be 70 ± 2 mm, or measure from the inner door skin to rear seal land, which is 40.3 ± 2 mm

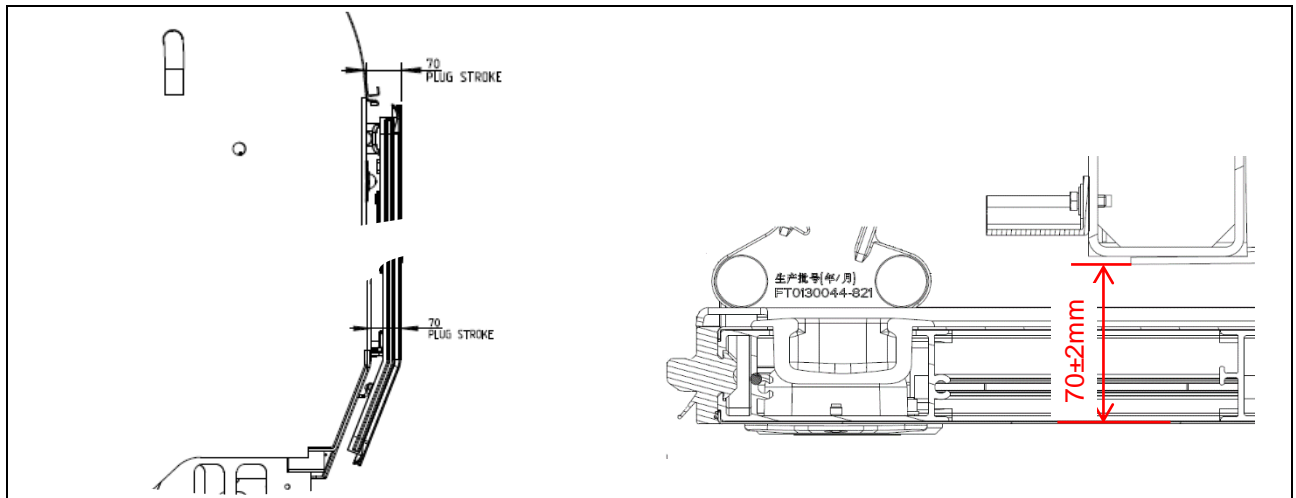


Figure 24 door leaf plug-out stroke check

- 3) Adjust the door leaf if need with following procedure:

Top area:

- a) Slightly loosen the 4 fixing M8 nuts (item 1, Figure 18) of top guiding rail
- b) Slightly loosened the adjusting nuts (item 2~4, Figure 18)
- c) Adjust the nut (item 4, Figure 18) to move the guiding rail, until the plug-out stroke satisfy the requirement
- d) Fasten the 4 M8 nuts with correct torque 25.4Nm, apply Loctite 243 and tightening mark
- e) Tighten all the adjusting nuts with torque 10.4Nm and apply tightening mark

Bottom area:

- a) Slightly loosen the fixing screw (item 1, Figure 25),
- b) Move the lower swing arm to adjust the bottom plug-out stroke
- c) Tighten the fixing screw with torque 49.4Nm, apply Loctite 243 and tightening mark

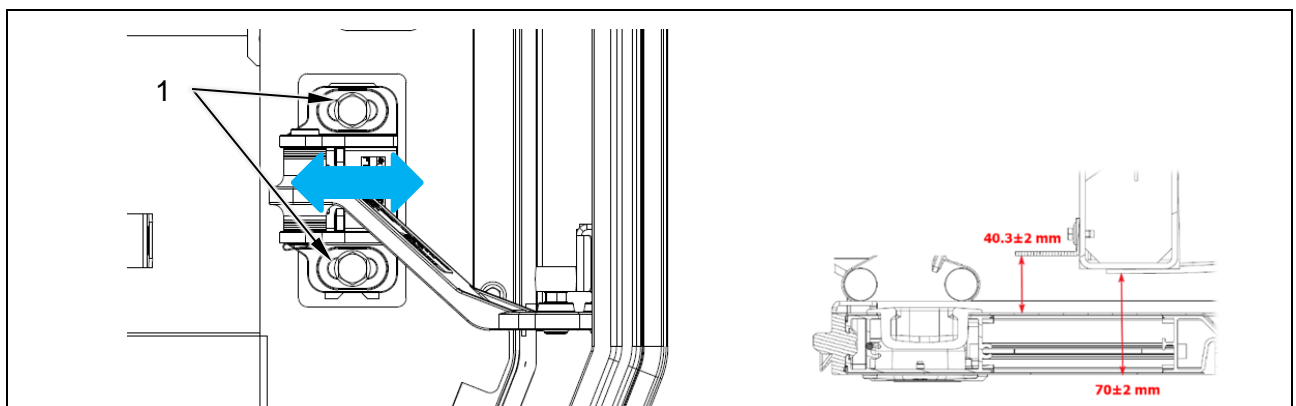


Figure 25 door leaf plug-out stroke adjustment (bottom)



Ensure that the swing arm is mounted horizontally

Manually open and close the door for 3~5 times and check if the roller on the bottom and bottom moves free and no hard point during the movement

5.1.7 Retention roller check

- 1) Manually close and lock the door to 2nd locking position
- 2) Check the gap between the retention roller (item 1, Figure 26) and block (item 2, Figure 26) at the front bottom area of door leaf, which should be 0~1 mm
- 3) Check that the gap between bracket (item 3, Figure 26) and block should be 6~9mm, to ensure that the roller comes into the straight-line area of the block,
- 4) Check that the height deviation between bracket and block should be 53 ± 2 mm, to ensure roller could be held by the block.

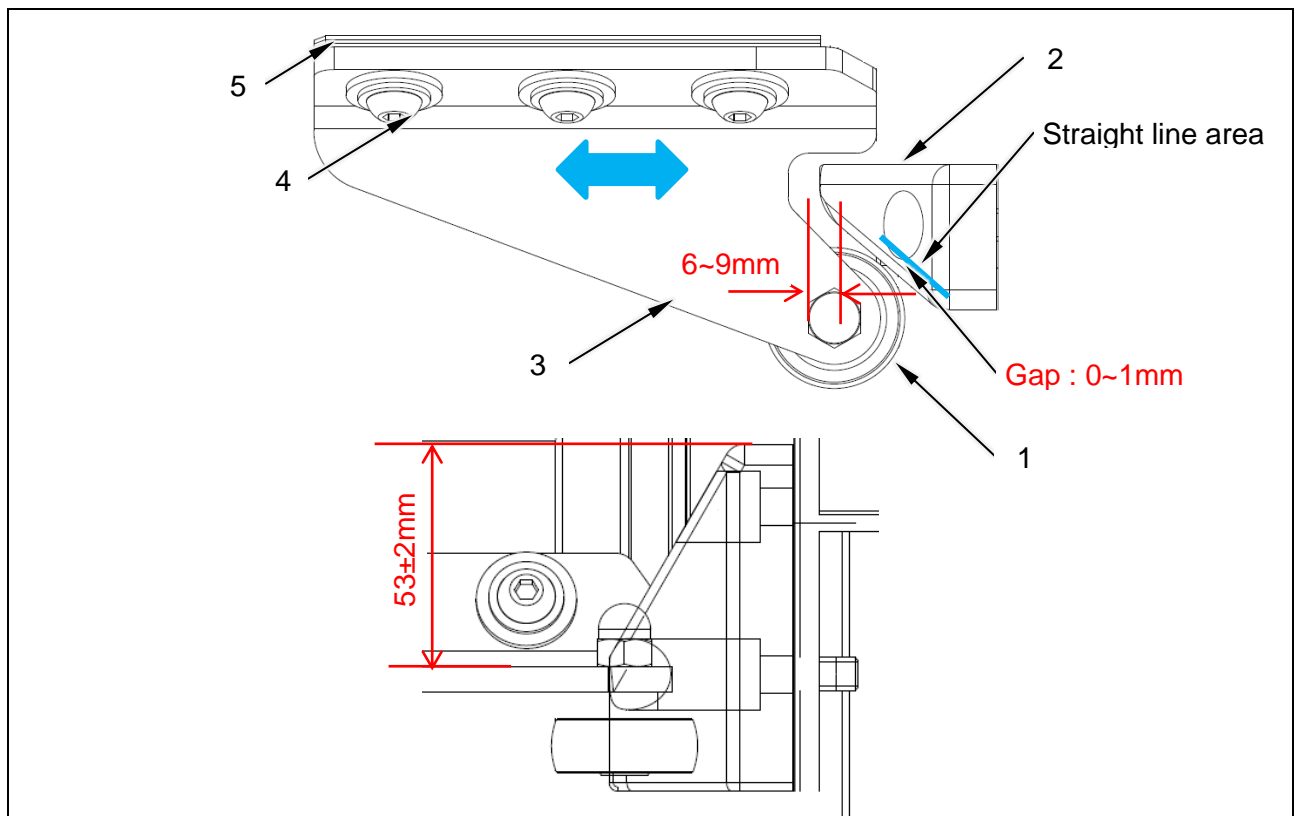


Figure 26 Retention roller check

- 5) Adjust the door leaf if need with following procedure:
 - a. Loosen the fixing screw (item 4, Figure 26)
 - b. Add or remove the adjusting shims (item 5, Figure 26) and move the bracket (item 3, Figure 26) to get the gap 0~1mm and 6~9mm
 - c. Tighten the screws with torque 25.3Nm, apply Loctite 243 and tightening mark
 - d. Adjusting the door height (refer to §5.1.4) to make the height deviation as 53 ± 2 mm.

Note: if the height in §5.1.4 and 53 ± 2.5 mm could not be satisfied simultaneously, make sure §5.1.4 should be guaranteed firstly, then adjust the height of block which need redrill the hole on car body.

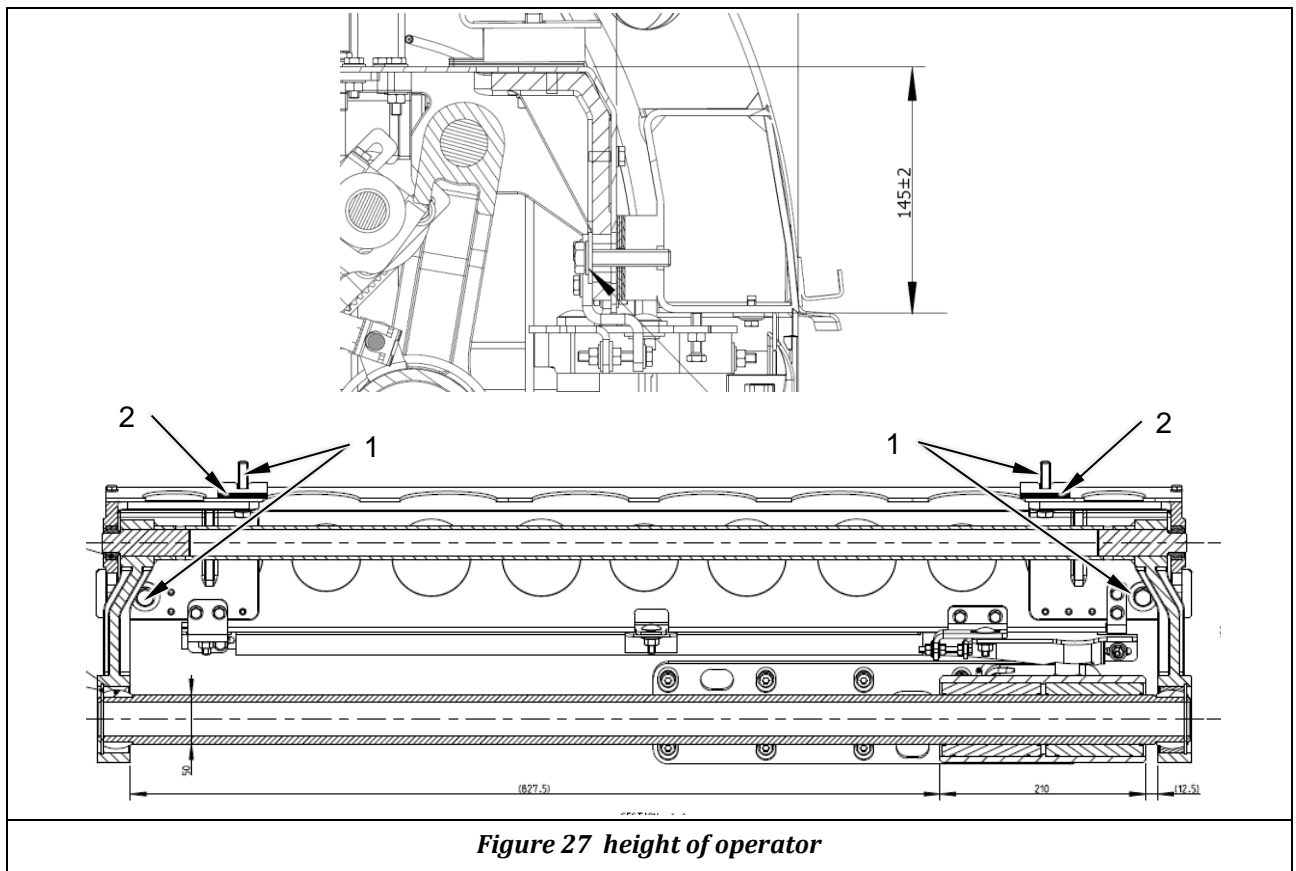
5.2 Operator adjustment check

5.2.1 Checking list and Criteria

No.	Item	Criteria	Refer to section
1	Height of the operator (Reference only)	145±2	§5.2.2
2	Horizontal position of operator in Y-direction	107.5±1 mm	§5.2.3
3	The distance between closing end stops and carbody structure (without air supply)	2~3 mm	§5.2.4
4	Door free open width (opening end stop)	800 ⁺¹⁰ ₀ mm	§5.2.5
5	Tightness of synchronize belt	2~2.5mm under 9.8N	§5.2.6

5.2.2 Height of door operator

- 1) Check that the height from top of operator to top of carbody cutting should be 145±2 mm, for both front and rear side
- 2) Adjust if need with following method:
 - a. Loosen the fixing screws (item 1, *Figure 27*);
 - b. Add or remove the shims (item 2, *Figure 27*) to make the height as 145±2 mm
 - c. Tighten the screws with torque 49.4Nm, apply Loctite 243 and locking mark



5.2.3 Horizontal position of operator

- 1) Check that the distance from operator to carbody side wall should be 107.5 ± 1 mm
- 2) Adjust if need with following method:
 - a. Loosen the fixing screws (item 1, *Figure 28*);
 - b. Add or remove the shims (item 2, *Figure 28*) to make the height as 145 ± 2 mm
 - c. Tighten the screws with torque 49.4Nm, apply Loctite 243 and tightening mark

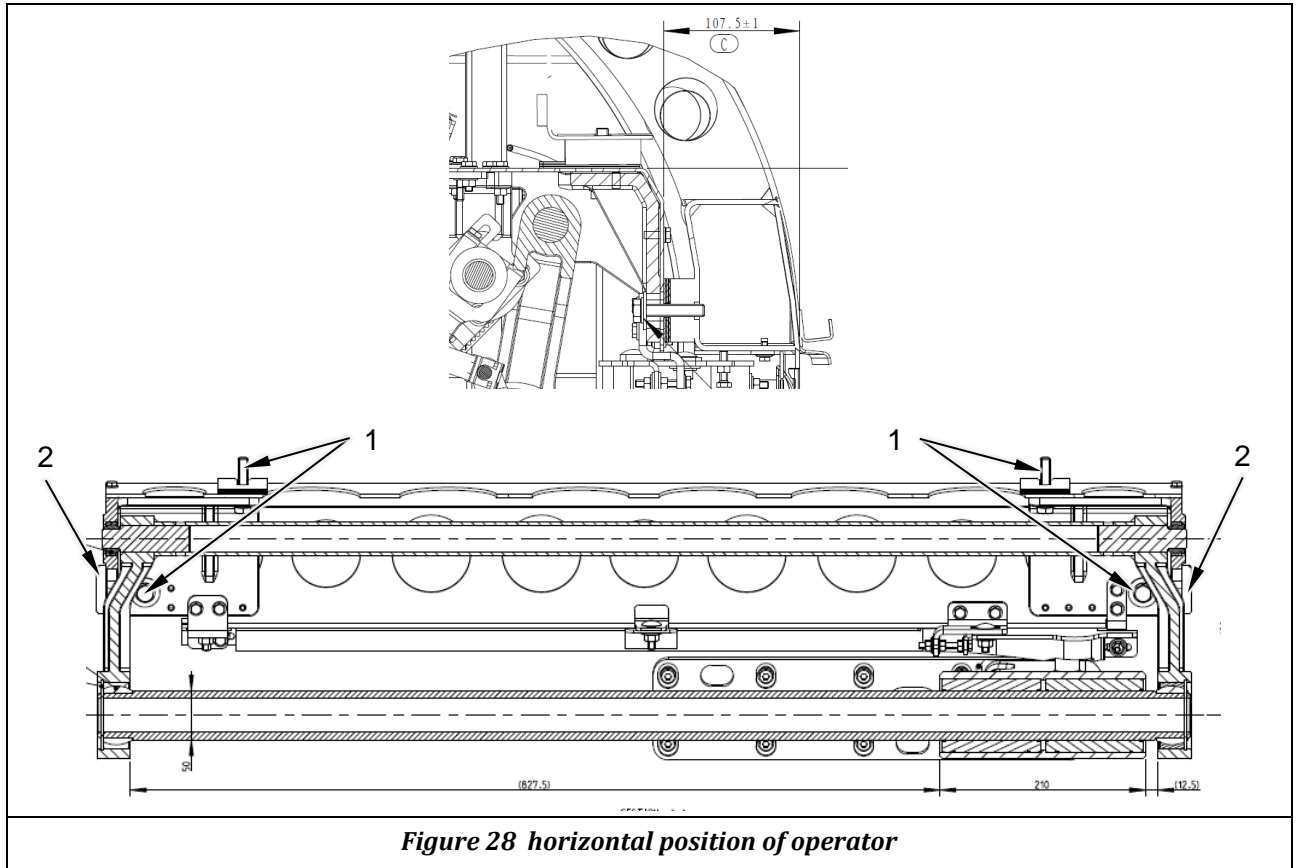


Figure 28 horizontal position of operator

5.2.4 Closing end stop

- 1) Manually close the door to 2nd locking position
- 2) Check that the distance between door closing end stop and carbody should be 2~3mm

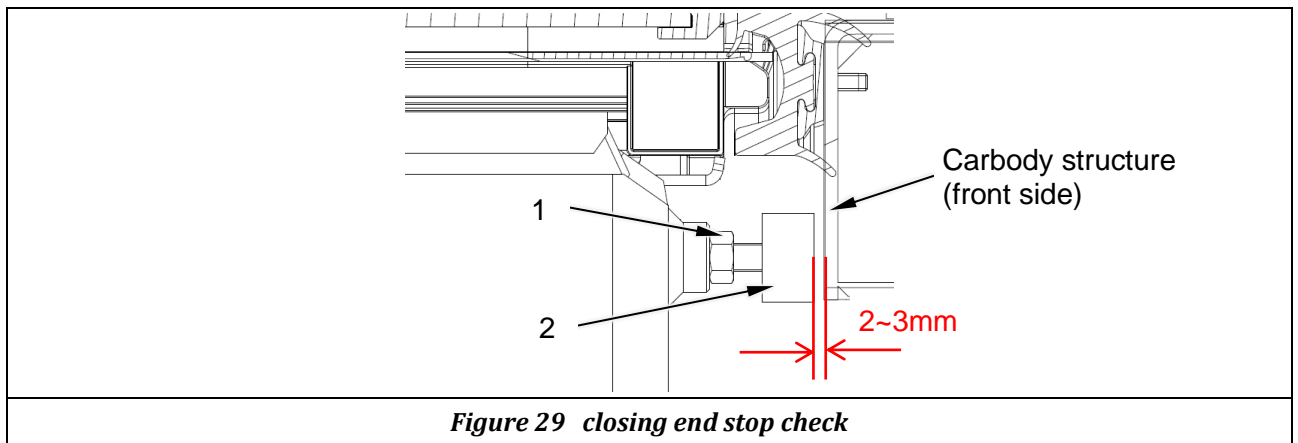
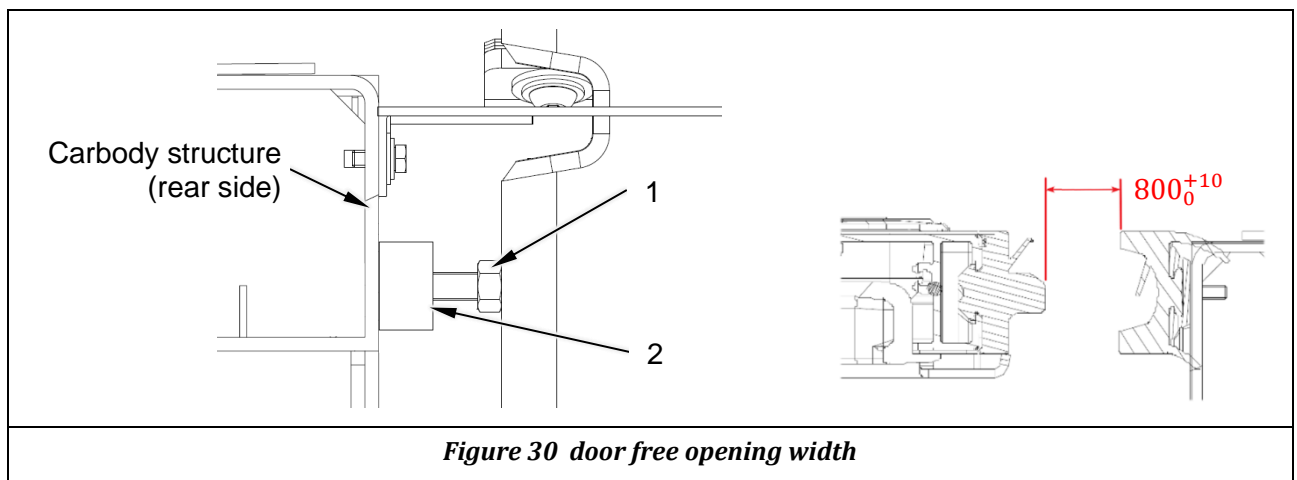


Figure 29 closing end stop check

- 3) Adjust the end stop if needed with following method:
 - a. Loosen the fixing nut (*item 1, Figure 29*)
 - b. Screw the end stop (*item 2, Figure 29*) to make the distance as 2~3 mm
 - c. Tighten the nut with torque 8Nm, apply Loctite 243, and tightening mark

5.2.5 Door free opening width

- 1) Fully open the door manually.
- 2) Measure the distance from the female front seal (*item 1, Figure 30*) to male front seal (*item 2, Figure 30*). Which should be 800^{+10}_0 mm



- 3) Adjust if need with following method:
 - a. Loosen the fixing nut (*item 1, Figure 30*)
 - b. Move the door leaf to make the free opening width as 800^{+10}_0 mm
 - c. Screw the end stop to make it contact with carbody.
 - d. Tighten the nut with torque 8Nm, apply Loctite 243 and tightening mark

5.2.6 Check tightness of synchronize belt

- 1) Apply perpendicular loading of 9.8N at the middle of the belt between the 2 pulleys
- 2) Check that the deformation at loading point should be 2~2.5Nm
- 3) Adjust with following method if need:
 - a. Slightly loosen the fixing screws (*item 1, Figure 31*),
 - b. Loosen the nuts (*item 2, Figure 31*)
 - c. Apply local loading 9.8N on the middle of belt.
 - d. Adjust the bolts (*item 3, Figure 31*), until the deformation reach 2~2.5Nm
 - e. Tighten nuts (*item 2, Figure 31*). Torque 8Nm, apply Loctite 243 and tightening mark
 - f. Tighten the screws (*item 1, Figure 31*) with torque 10.4Nm, apply Loctite 243 and tightening mark

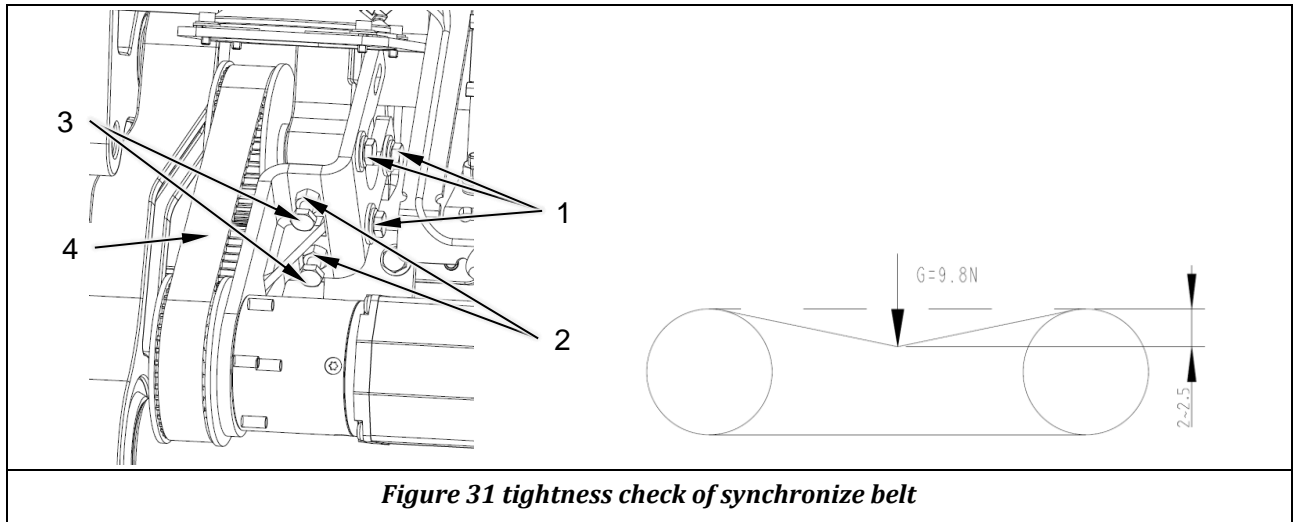


Figure 31 tightness check of synchronize belt

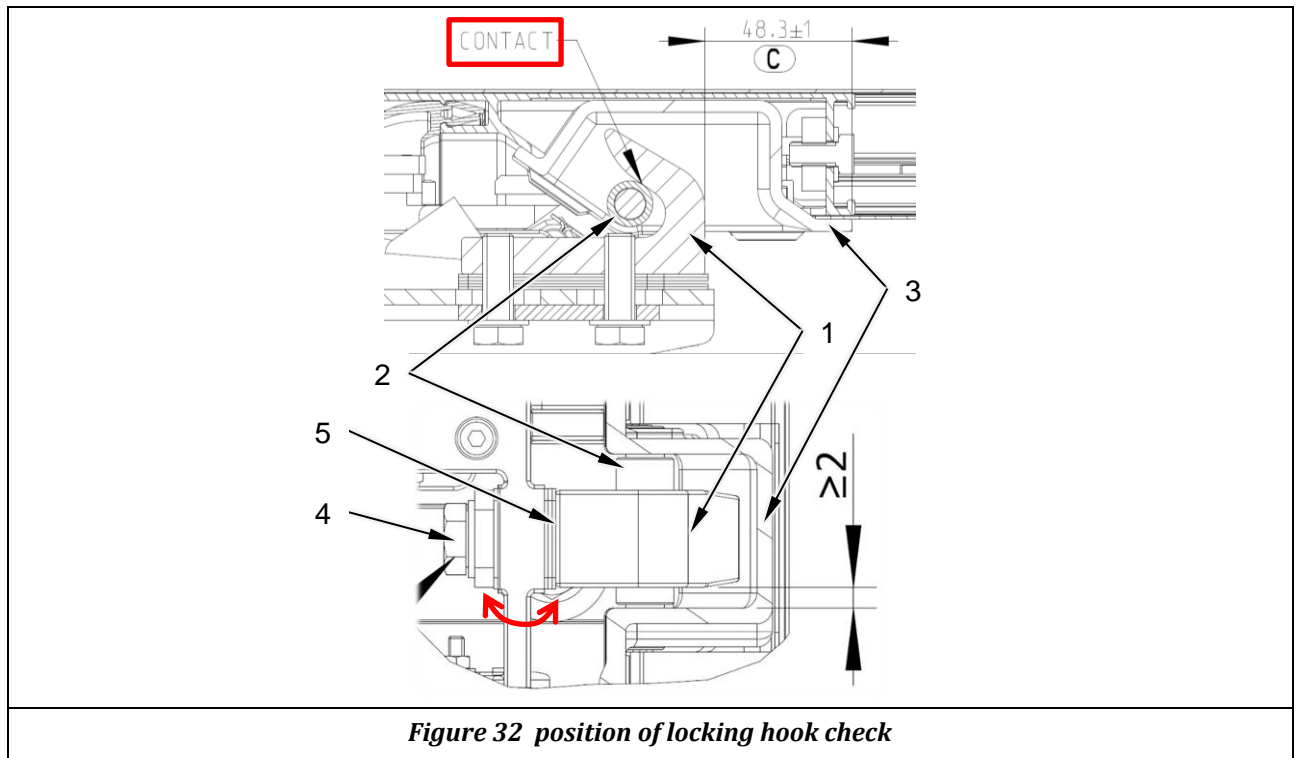
5.3 Master lock device adjustment check

5.3.1 Checking list and Criteria

No.	Item	Criteria	Refer to section
1	The gap between locking column and locking hook	0mm	§5.3.2
2	the horizontal distance from locking hook to locking land	48.3±1 mm	
3	The vertical distance from locking hook to locking land	≥2mm	
5	DCS could be activated when door opened by 16~20mm		§5.3.3

5.3.2 Position of locking hook check

- 1) Manually close the door to 2nd locking position
- 2) Check that the hook (*item 1, Figure 32*) contact the locking column (*item 2, Figure 32*)
- 3) Check that the horizontal distance from hook (*item 1, Figure 32*) to locking land (*item 3, Figure 32*) is 48.3±1 mm
- 4) Checking that the vertical distance from hook (*item 1, Figure 32*) to locking land (*item 3, Figure 32*) is ≥2mm, and no interference during door movement



5) Proceed adjustment if need with following method:

- a. Loosen the fixing screw (item 4, Figure 32), and
 - Move the position of hook to get the horizontal distance 48.3 ± 1 mm
 - Add or remove the adjusting shims (item 5, Figure 32), to make the hook contact with the column

Note that the redundant shims should be put on the back side to ensure a same total thickness

- b. Tighten the fixing screw (item 4, Figure 32) with torque 49.4 Nm, apply Loctite 243 and tightening mark
- c. Adjust the height of door leaf (refer to §5.1.4) to make the vertical distance ≥ 2 mm

5.3.3 DCS check

- 1) Manually move the door to opening width around 20mm and keep its position
- 2) Check that the DCS is not activated at this position
- 3) Move the door to opened width around 16~20mm and keep its position
- 4) Check that the DCS is activated at this position
- 5) Adjust with following procedure if need:
 - a. Keep the door in 16~20mm opened position
 - b. Loosen the fixing screws (item 1, Figure 33)
 - c. Rotate the switch to make it just activated, there will be 'click' sound when it is activated
 - d. Keep the position of switch
 - e. Tighten the screws with torque 2.7Nm, apply Loctite 243 and tightening mark

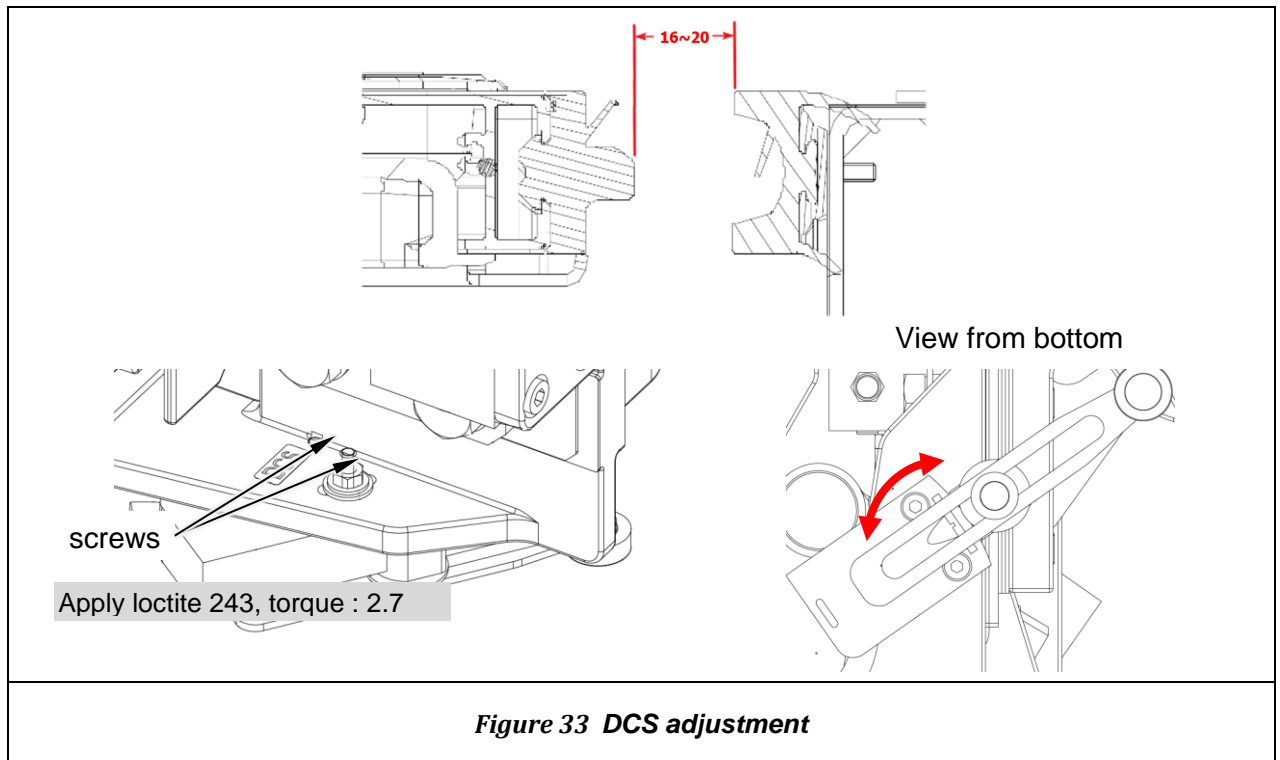


Figure 33 DCS adjustment

5.4 Auxiliary locking hook adjustment check

5.4.1 Checking list and criteria

No.	Item	Criteria
1	the gap between locking column and locking hook	0
2	the horizontal distance from locking hook to locking land	48.3±2 mm
3	The vertical distance from locking hook to locking land	5.5±2mm

- 1) Manually close the door to 2nd locking position
- 2) Check that the hook (*item 1, Figure 34*) contact the locking column (*item 2, Figure 34*)
- 3) Check that the horizontal distance from hook (*item 1, Figure 31*) to locking land (*item 3, Figure 34*) is 48.3±1 mm
- 4) Checking that the vertical distance from hook (*item 1, Figure 34*) to locking land (*item 3, Figure 34*) is 5.5±2 mm

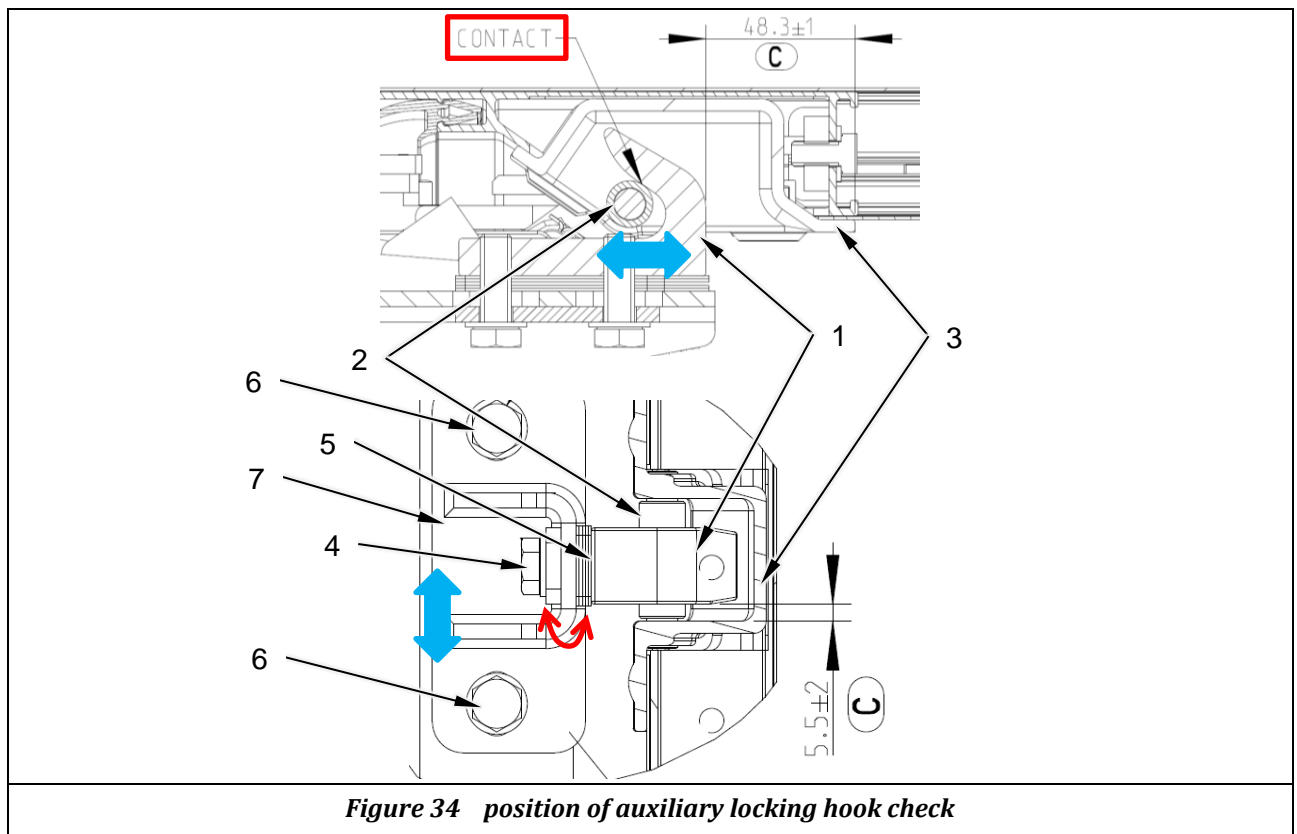


Figure 34 position of auxiliary locking hook check

- 5) Proceed adjustment if need with following method :
 - a. Loosen the fixing screw (item 4 Figure 34), and
 - Move the position of hook to get the horizontal distance 48.3 ± 1 mm
 - Add or remove the adjusting shims (item 5, Figure 34), make the hook contact with the column

Note that the redundant shims should be put on the back side to ensure a same total thickness
 - b. Tighten the fixing screw (item 4, Figure 34) with torque 49.4 Nm, apply Loctite 243 and tightening mark.
 - c. Loosen the fixing screw (item 6, Figure 34);
 - d. Adjust the height of hook bracket (item 7, Figure 34) to ensure the height distance 5.5 ± 2 mm;
 - e. Tighten the fixing screw (item 6, Figure 34) with torque 49.4 Nm, apply Loctite 243 and tightening mark.

5.5 Lower swing arm adjustment check

5.5.1 Checking list and acceptance criteria

No.	Item	Criteria
1	Vertical gap between lower guide rail and lower swing arm	9.5 ± 2 mm

- 1) Manually close the door to 2nd locking position
- 2) Check the gap between lower guide rail (item 1, Figure 35) and lower swing arm (item 2, Figure 35), which should be 9.5 ± 2 mm
- 3) Proceed adjustment with following method if need:
 - a. Keep the door in 2nd locked position

- b. Remove the clip (*item 3, Figure 35*) and extract the shaft (*item 4, Figure 35*);
- c. Move the shims (*item 5, Figure 35*) from top to bottom or vice-verse, to adjust the height of lower swing arm, until the gap is 9.5 ± 2 mm
- d. Re-mount the shaft and clip

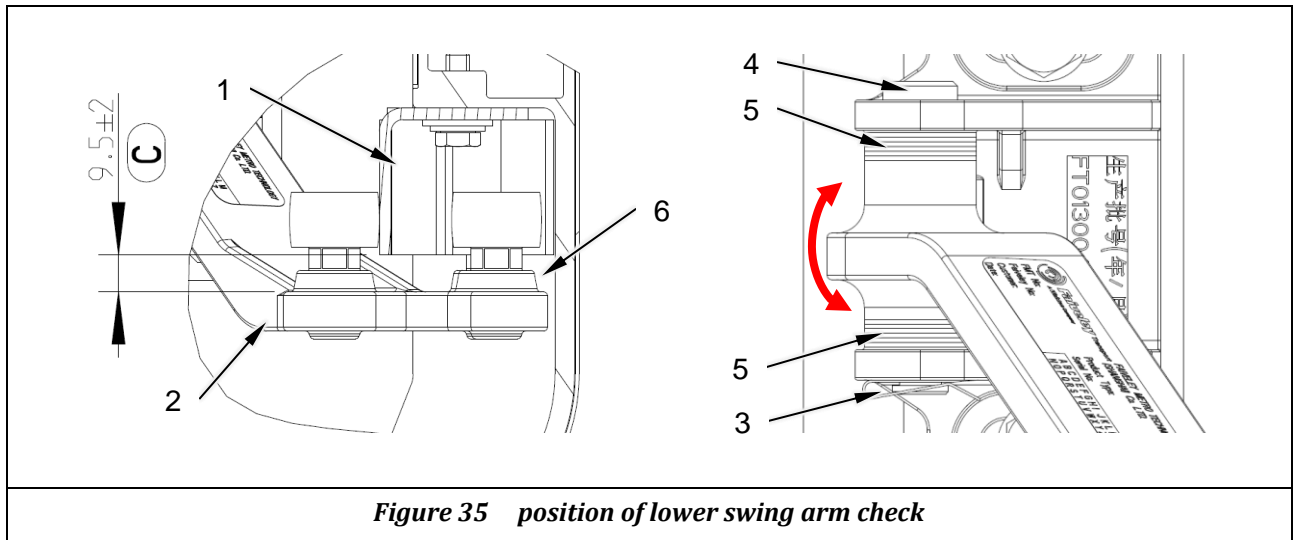


Figure 35 position of lower swing arm check



Ensure that the swing arm is mounted horizontally

Manually open and close the door for 3~5 times and check if the roller on the bottom and bottom moves free and no hard point during the movement

Lockout switch assembly adjustment check

5.5.2 Check list and acceptance criteria

No.	Item	Criteria
1	The gap between lockout bar and lockout bracket	0~1 mm
2	The overlap between the lockout bar and bracket	12.2 ± 2 mm

- 1) Manually close the door to 2nd locking position
- 2) Activate the lockout via a RIC key
- 3) Check the gap between lockout bar (*item 2, Figure 36*) and bracket (*item 3, Figure 36*), which should be 0~1mm
- 4) Check the overlap between lockout bar and bracket, which should be 12.2 ± 2 mm
- 5) Adjust if need with following procedure:
 - a. Loosen the 2 fixing screws (*item 1, Figure 36*)
 - b. Move the lockout bracket (*item 2, Figure 36*) to make it contact the lockout bar, gap should be no more than 1mm
 - c. Add or remove the shims (*item 3, Figure 36*) to adjust the overlap as 12.2 ± 2 mm
 - d. Tighten the screw with torque 25.3Nm, apply Loctite 243 and tightening mark

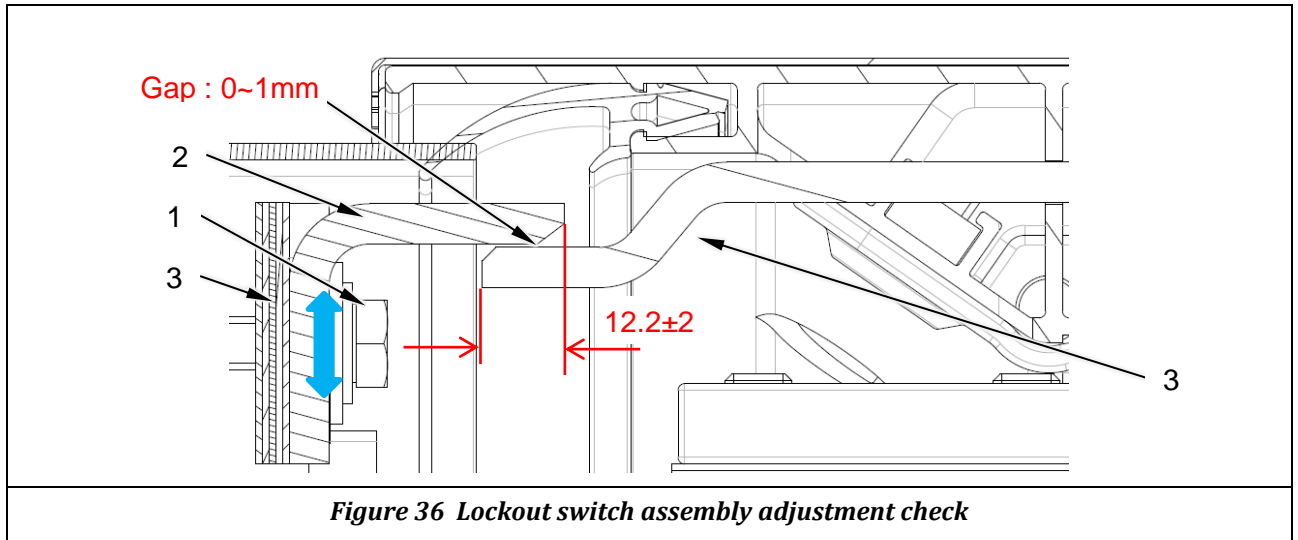


Figure 36 Lockout switch assembly adjustment check

5.6 Bowden cable adjustment check

5.6.1 Acceptance criteria

No.	Criteria
1	The door could be unlocked after the EED or EAD handle operated
2	The handle could be held in activated position

Adjust the Bowden cable with following procedure if need:

- 1) Adjust the adjusting nut (Item 1/2, Figure 37) to increase or decrease the length of Bowden cable for EED or EAD. Until the door can be unlocked by EED or EAD
- 2) Tighten the nuts with torque 7Nm, apply tightening mark



Both side of Bowden cable can be adjusted to ensure the unlocking function

The EAD need to be dismantled from carbody when need to adjust the Bowden cable on EAD side, then install back onto carbody according to installation manual.

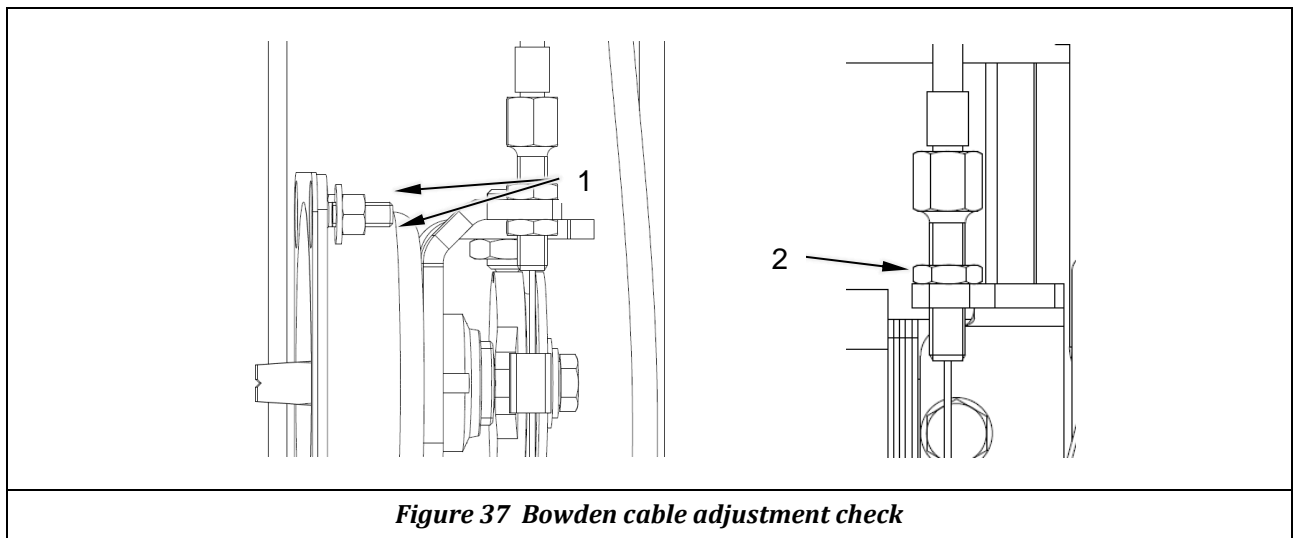


Figure 37 Bowden cable adjustment check

///6. Overhaul every 10 years



Isolate the door power supply before any operation

6.1 Operator

6.1.1 Replace Driving screw assembly

Proceed as detailed in §8.18

6.1.2 Replace coordinate bar bearing

Proceed as detailed in §8.19

6.1.3 Replace rod bearing

Proceed as detailed in §8.20

6.1.4 Replace roller kit (on driving arm)

Proceed as detailed in §8.10

6.1.5 Replace open end stop

Proceed as detailed in §8.11

6.1.6 Replace close end stop

Proceed as detailed in §8.12

6.1.7 Replace extremity bearing

Proceed as detailed in §8.21

6.1.8 Replace synchronous belt

Proceed as detailed in §8.14

6.1.9 Replace flexible chain assembly

Proceed as detailed in §8.16

6.2 Door leaf

6.2.1 Replace peripheral seal

Proceed as detailed in §8.4

6.2.2 Replace retention roller

Proceed as detailed in §8.6

6.3 Lower swing arm

6.3.1 Replace rollers

Proceed as detailed in § 5.5.1

6.4 Front rubber seal assembly

6.4.1 Replace front rubber seal

Proceed as detailed in § 8.4

///7. Overhaul every 15 years



Isolate the door power supply before any operation

7.1 Door operator

7.1.1 Replace EDCU

Proceed as detailed in §8.13

7.1.2 Replace motor

Proceed as detailed in §8.15

7.1.3 Replace loudspeaker

Proceed as detailed in §8.17

7.2 Master lock device

7.2.1 Replace unlocking cylinder

Proceed as detailed in §8.23

7.2.2 Replace locking cylinder

Proceed as detailed in §8.24

7.2.3 Replace fork spring

Proceed as detailed in §8.25

7.2.4 Replace latch spring

Proceed as detailed in §8.26

7.2.5 Replace emergency spring

Proceed as detailed in §8.27

7.2.6 Replace DLS1 wiring layout

Proceed as detailed in §8.28

7.2.7 Replace DLS2 wiring layout

Proceed as detailed in §8.29

7.2.8 Replace EDS wiring layout

Proceed as detailed in §8.31

7.2.9 Replace DCS wiring layout

Proceed as detailed in §8.30

7.3 Door leaf

7.3.1 Replace push button

Proceed as detailed in §8.8

7.4 Lockout switch assembly

7.4.1 Replace LOS wiring layout

Proceed as detailed in §8.33

7.5 PCU assembly

7.5.1 Replace PCU

Proceed as detailed in §8.34

7.6 EAD

Proceed as detailed in §8.38

7.7 EED

Proceed as detailed in §8.36

7.8 Bowden cable (EAD)

Proceed as detailed in §8.40

7.9 Bowden cable (EED)

Proceed as detailed in §8.37

7.10 Push button kit (opening)

Proceed as detailed in §8.43

7.11 Indication lamp assembly (external)

Proceed as detailed in §8.45

7.12 Indication lamp (internal)

Proceed as detailed in §8.44

///8. Corrective maintenance

8.1 Trouble shooting

See the document QSD-R000589-025 Trouble shooting manual

8.2 Exchange instructions

This chapter lists the mounting / dismounting procedures of all spare parts (LRU and SRU) as defined in Spare part catalogue QSD-R000589-033.

The exchange or dismounting of one LRU or SRU may be requested in different occasions:

- Replacement scheduled in the preventive maintenance.
- Replacement of a defective part identified in the periodic inspection.
- Replacement of a defective part identified in the trouble shooting process.
- To get access to another part.
- Dismount from the train for repair or refurbishment in workshop.

Some procedures are only corrective and may never be used, if they do not fail in the service life. The removal of car builder components or access panels to the Faiveley door system components is not supported in this manual; please refer to car builder relevant manuals for these tasks.

It is assumed that the refitting procedure follows immediately the dismounting procedure or if it is not the case that all retrieved parts (screws, washers ...) or components have been carefully saved together to be still available for refitting when required.

Required adjustment instructions and functional checks links are given at the end of refitting procedures. They assume that the door was correctly adjusted before the dismounting of the part and that only this single part is exchanged at that time.

If several LRU are dismantled at the same time on a same door, too many adjustments may be lost, and a complete readjustment of the door may be required. Follow then all adjustment instructions of §4.4 in the chapter order after refitting of all LRU on the door.

Most procedures applicable on train may also be used in workshop on dismantled parts by skipping the irrelevant steps.

To avoid repetitions, a dismounting or a refitting procedure may call another dismounting or refitting procedure like a subroutine.

Proceed to the called procedure without eventually the (first) isolation step and the (last) restoring step and return to the parent procedure where it has been left.

Use of bookmarks or post-it may be useful in this case to keep his track back.

8.3 Replace of the door leaf



Isolate the power supply before any operation



The door leaf must be lifted with proper tools / jigs

Caution that the driving arm will drop down after remove the fixing screws, hold it after loosen all the screw on door leaf

When dismantled, put the door leaf on a soft support to prevent damage



The top cover should be opened to make door operator accessible

Diagnosis: Deformations, Replace the seal, glass

8.3.1 Dismounting

- 1) Hold the door leaf with correct lift equipment's:
- 2) Unplug the connector from door leaf wiring to flexible chain wiring which is inside the driving arm body.
- 3) Loosen the fixing screw (*item 1 Figure 38,*) for eccentrics (*item 2 , Figure 38*), and remove the eccentrics
- 4) Loosen the fixing screw (*item 3, Figure 38*) for door leaf
- 5) Lift up the door leaf to make the lower rollers (*item 4,*) go out from the lower guiding rail (*item 5, Figure 38*)
- 6) Remove the door leaf from the carbody

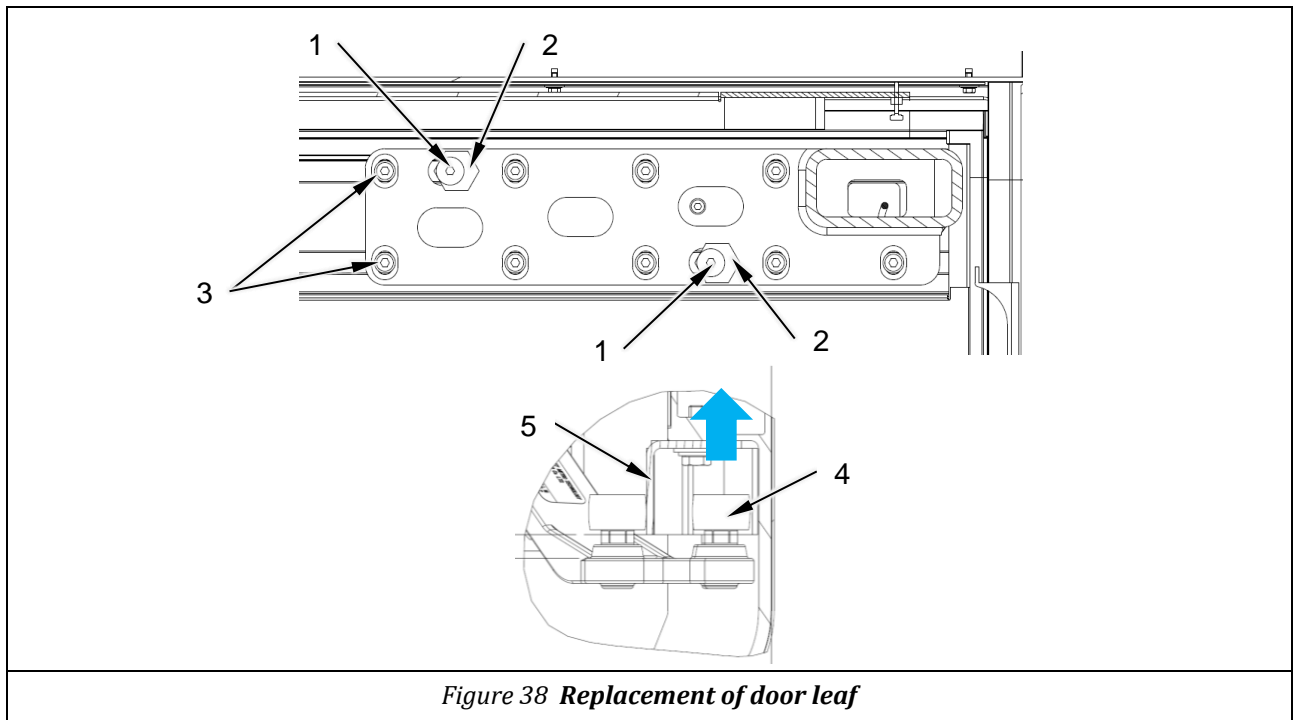


Figure 38 Replacement of door leaf

8.3.2 Replace

- 1) Lift the door leaf to make the lower guiding rail (*item 5 Figure 38,*) a little bit higher than the rollers (*item 4,*)
- 2) Insert the rollers (*item 4, Figure 38*) into the guiding rail (*item 5, Figure 38*)
- 3) upswing the driving arm and make the roller inside the upper guiding rail ;
- 4) Fix the door leaf with driving arm with 9 screws (*item 3, Figure 38*) ; slightly tighten the screws ;
- 5) Install the eccentric onto the door leaf and fix with countersunk screws
- 6) Plug the connector with flexible chain wiring and put the connector inside the chamber of driving arm
- 7) Tie the wiring on proper position

8.3.3 Adjustment check

- 1) Proceed a complete adjustment check and adjust if need (see §//5)
- 2) Proceed a manual operation check (see §3.2.1)
- 3) Restore the power supply
- 4) Proceed a automatic operation check (see §3.2.2)

8.4 Replace the peripheral seal



The peripheral seal must be replaced after dismount the door from the carbody

Diagnosis: Deformations, cracks, broken

8.4.1 Dismount

- 1) Dismount the door from carbody (see §8.3)
- 2) Dismount the peripheral seal from the door leaf
- 3) Clean the glue on the front top and bottom corner
- 4) Clear the anchor groove surrounding the door

8.4.2 Replace

- 1) Install the peripheral seal onto the door leaf, make sure that the corner is aligned with door frame;
- 2) Hit to make the rubber seal inserted with a mallet, proper wax could be used if needed ;

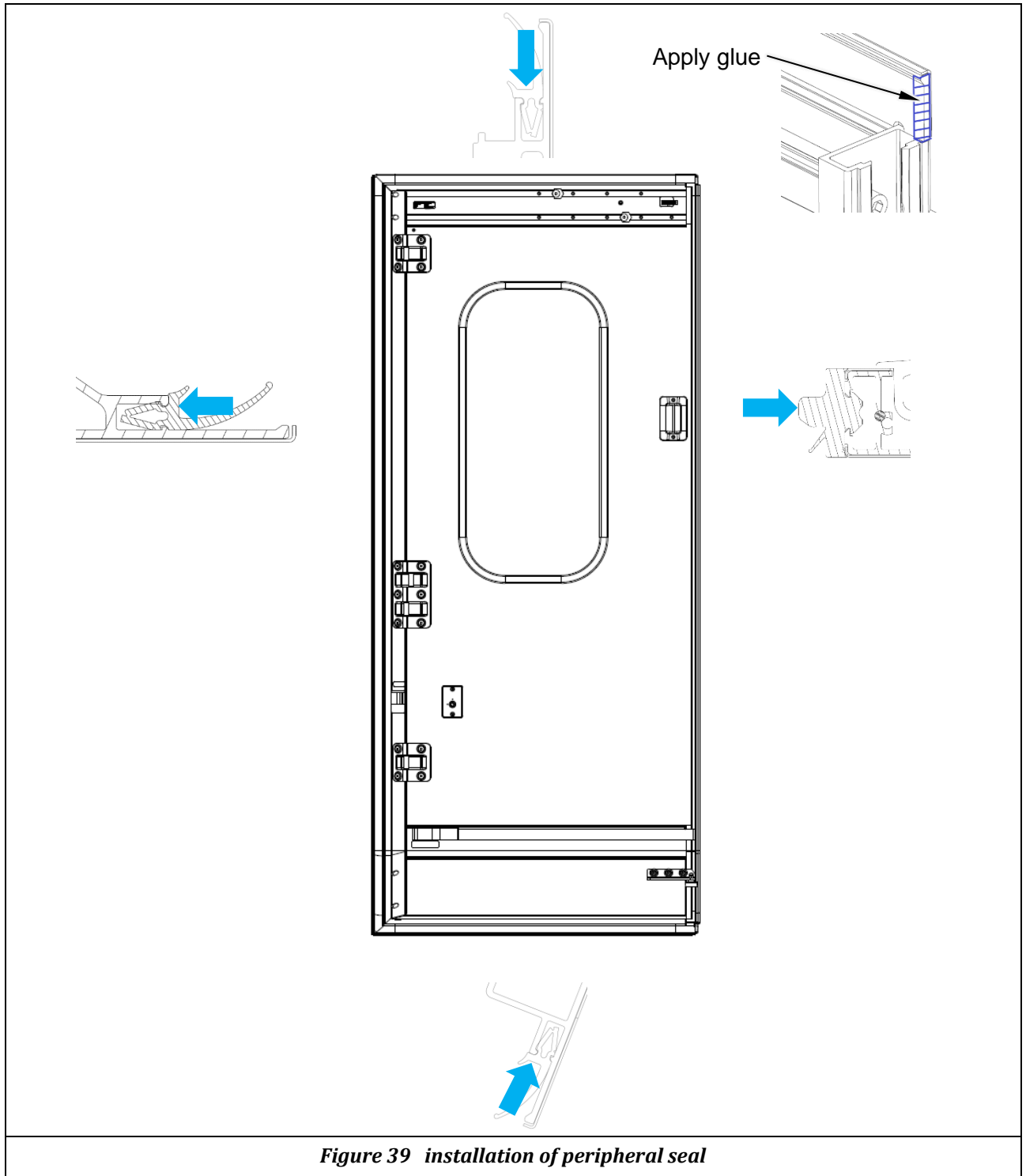


Figure 39 installation of peripheral seal

- 3) Apply Bostik 7008 on the front top and bottom corner to bond the rubber on to door leaf
- 4) Clean the wax and glue:
- 5) Install the door leaf (see §0)

8.4.3 Adjustment check

- 1) Proceed adjustment check as detailed in §8.3.3

8.5 Replace window glass



Window glass should be replaced after door dismounted from car body



The dismounting and bonding of window glass is a special process, check with Faiveley method team for further instruction regarding the procedure.

After the glass Bonded, it must wait for at least 24 hours before operating the door leaf

Diagnosis: cracks, broken, scratch

8.5.1 Dismount

- 1) Dismount the door from carbody (see §8.3.1)
- 2) Remove the window glass from door leaf

8.5.2 Replace

- 1) Bonding the glass on door leaf
- 2) Install the door leaf (see §8.3.2)

8.5.3 Adjustment check

- 1) Proceed adjustment check as detailed in §8.3.3

8.6 Replacement of retention roller

Diagnosis: heavy worn, broken, jam

8.6.1 Dismount

- 1) Detach the circlips (*item 4, Figure 40*) from the shaft:
- 2) Dismount the roller (*item 5, Figure 40*) from the shaft

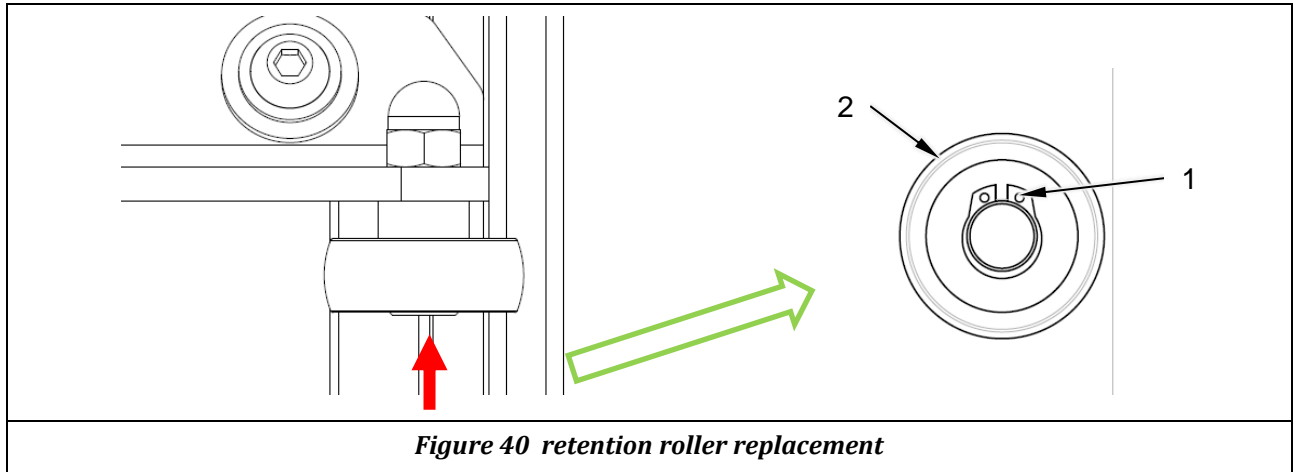


Figure 40 retention roller replacement

8.6.2 Replacement

- 1) Install the roller onto the shaft, check that the roller can roll freely:
- 2) Install the circlips on the shaft

8.6.3 Adjustment check

- 1) Check that the roller can rotate freely
- 2) Proceed adjustment check as detailed in §5.1.7

8.7 Replacement of lockout spring

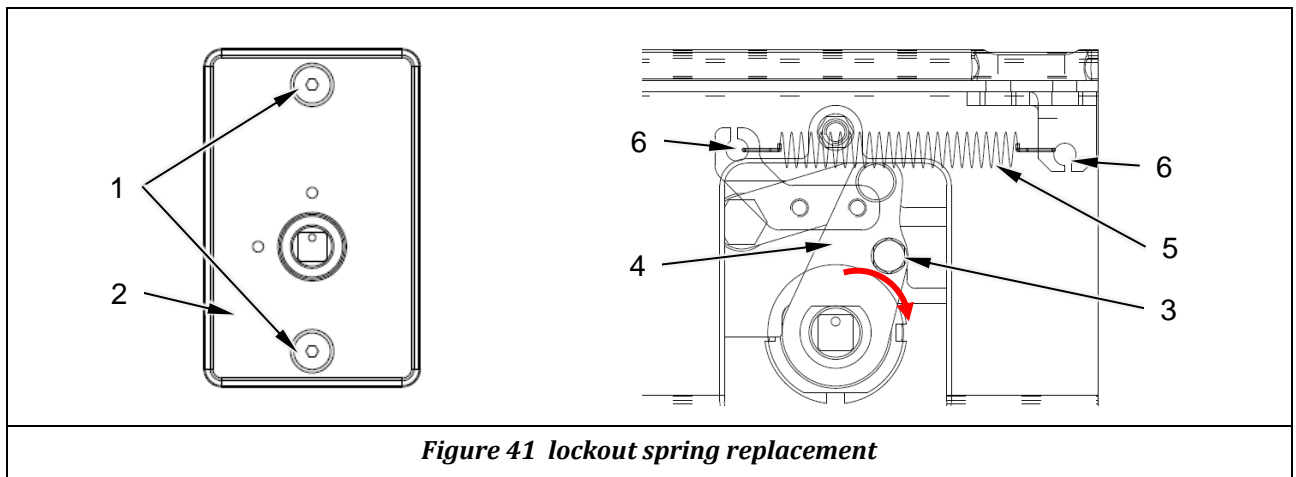


This job is suggested to be finished after door dismantled from train for a easy operation

Diagnosis: broken, loss of force

8.7.1 Dismounting

- 1) Loosen the fixing screw (item 1, *Figure 41*), and dismount the internal cover (item 2, *Figure 41*),
- 2) Remove the limit screw (item 3, *Figure 41*) and turn the lever (item 4, *Figure 41*) towards door centre to make the spring (item 5, *Figure 41*) accessible ;
- 3) Remove the spring (item 5, *Figure 41*) from the hook (item 6,) inside the door leaf,
- 4) Take the spring out from the door leaf:



8.7.2 Replacement

- 1) Install the spring to make it hooked on both side
- 2) Install and tighten the limit screw (item 3, *Figure 41*) with torque 10.4Nm, apply **Loctite 2701** and tightening mark
- 3) Install the internal cover (item 2, *Figure 41*)
- 4) Install and tighten the fixing screw (item 1, *Figure 41*) with torque 2.5Nm, apply Loctite 243 and tightening mark

8.7.3 Adjustment check

- 1) Proceed a check according to §3.2.5

8.8 Replacement of push button



Isolate the door power supply

Diagnosis: broken, surface crack,

8.8.1 Dismount

- 1) Loosen the fixing screw (*item 1, Figure 42*) and remove the cover (*item 2, Figure 42*) and O-ring (*item 3, Figure 42*)
- 2) Take the push button (*item 4, Figure 42*) out of the door leaf chamber, Mind that the wiring should be protected from the damage of sharp edge
- 3) Unplug the connector (*item 5, Figure 42*) from door leaf wiring (*item 6, Figure 42*)

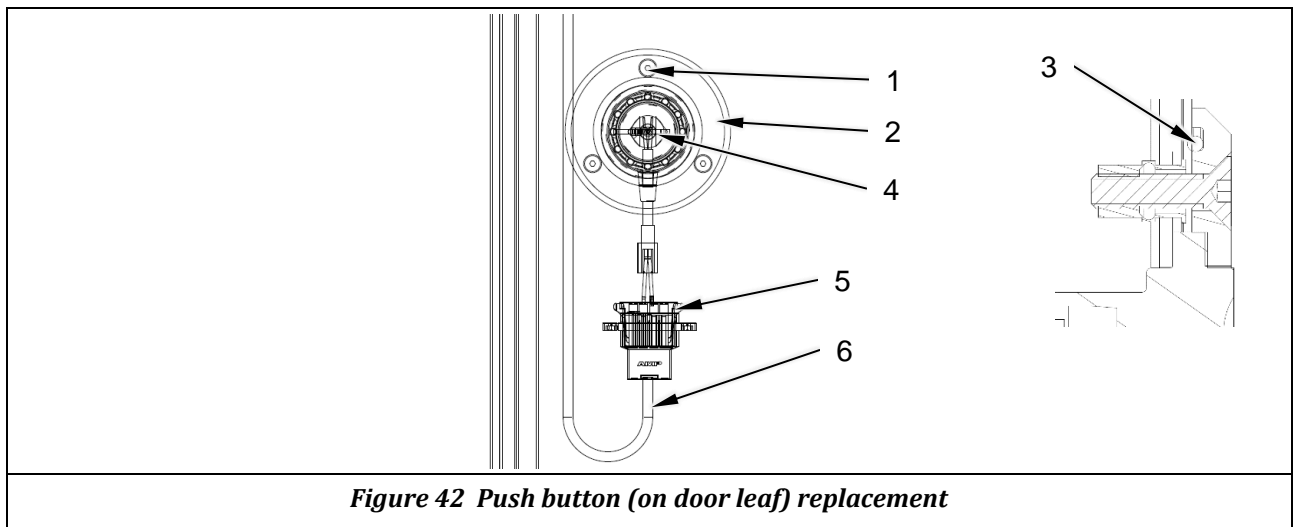


Figure 42 Push button (on door leaf) replacement

8.8.2 Replacement

- 1) Plug the connector to connect the push button with door leaf wiring
- 2) Insert the push button into the door leaf chamber. **Make sure that the push button wiring is adown**
- 3) Install the cover and O-ring, make sure the O-ring in groove of cover
- 4) Tighten the screw with torque 1Nm, apply Loctite 243 and tightening mark

8.8.3 Adjustment check

- 1) Proceed adjustment check as detailed in §3.2.3 (only the part 'push button on door leaf' is applicable)

8.9 Replacement of the Door Operator



Isolate the power supply before any operation

The operator must be held staley before Loosen the fixing screw



The top cover should be opened to make door operator accessible

Diagnosis: major failure

8.9.1 Dismount

- 1) Unplug all the train connectors from the terminal board
- 2) Unplug all the wirings of limit switches from the terminal board
- 3) Dismount the door leaf according to §8.3.1
- 4) Loosen the fixing screw (item 1, *Figure 43*),
- 5) Record the amount of the adjusting shims (item 2, *Figure 43*) for each position and keep them:
- 6) Dismount the operator from car body:

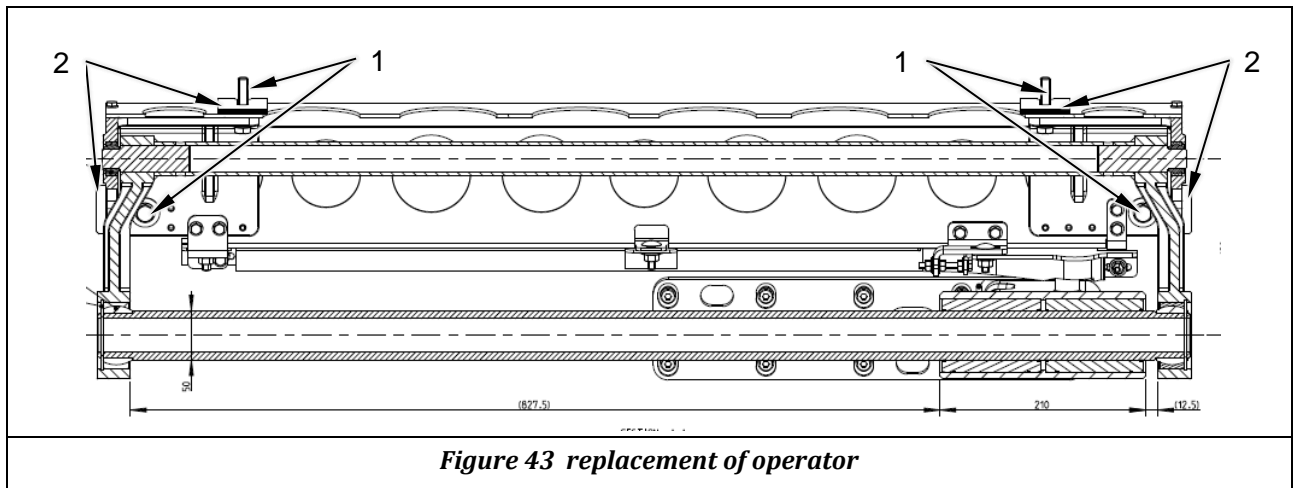


Figure 43 replacement of operator

8.9.2 Replace

- 1) Lift the operator to make the interface holes aligned
- 2) Install the fixing screw (item 1, *Figure 43*)
- 3) Put the saved adjusting shims (item 2, *Figure 43*) to corresponding position, tighten the screw
- 4) Plug all the wirings of limit switches into the terminal board
- 5) Plug all the connectors onto the terminal board
- 6) Install the door leaf according to §8.3.2

8.9.3 Adjustment check

- 1) Proceed a complete adjustment check and adjust if need (see §//5)
- 2) Restore the power supply

- 3) Proceed a manual operation check (see §3.2.1)
- 4) Proceed an automatic operation check (see §3.2.2)
- 5) Proceed an obstacle detection test check (see §3.2.4)

8.10 Replacement of guiding roller



This job should be finished after door dismantled from the train

Diagnosis: heavy worn, abnormal noise, jam

8.10.1 Dismount

- 1) Dismount the operator as detailed in §8.3.1
- 2) Downswing the driving arm (*item 1, Figure 44*) to make the guiding roller accessible:
- 3) Remove the circlips (*item 2, Figure 44*) from the shaft (*item 3, Figure 44*)
- 4) Detach the roller (*item 4, Figure 44*) from the shaft

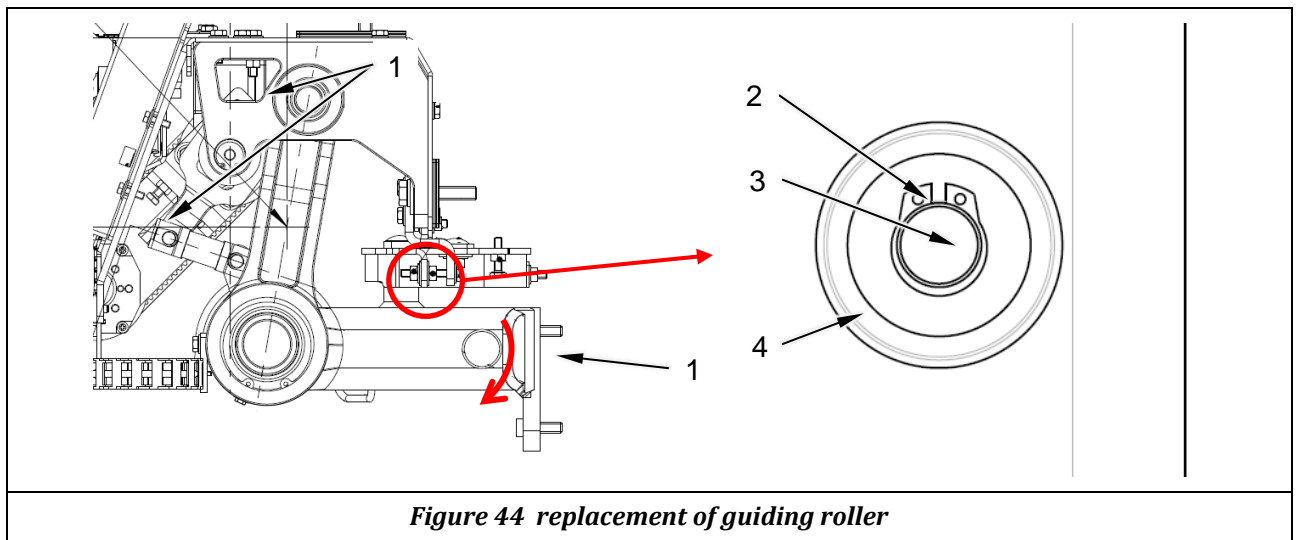


Figure 44 replacement of guiding roller

8.10.2 Replace

- 1) Install the roller (item 4, Figure 44) on the shaft (item 3, Figure 44)
- 2) Mount the circlips (item 2, Figure 44) onto the shaft
- 3) Check that the roller can rotate freely
- 4) Install the door leaf as detailed in §8.3.2

8.10.3 Adjustment check

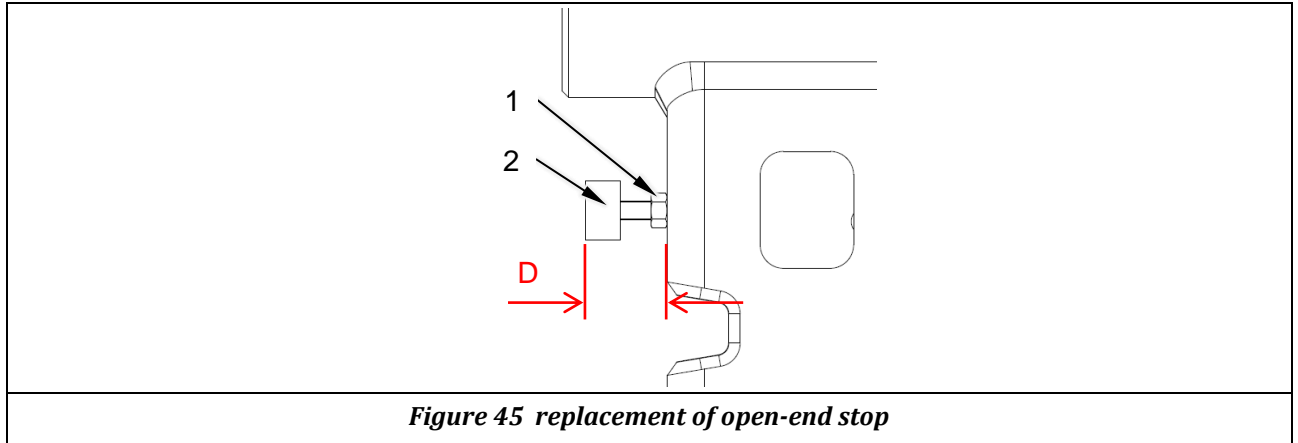
- 1) Proceed the adjustment check as detailed in §8.3.3

8.11 Replacement of open-end stop

Diagnosis: crack, deformation, broken

8.11.1 Dismount

- 1) Manually move the door to around half opened position
- 2) Measure and record the distance D from the end stop to driving arm body
- 3) Loosen the nut (*item 1, Figure 45*) and unscrew the end stop (*item 2, Figure 45*) from the driving arm



8.11.2 Replacement

- 1) Install and screw the end stop with a same distance D
- 2) Tighten the nut with torque 19.5Nm. apply Loctite 243 and tightening mark

8.11.3 Adjustment check

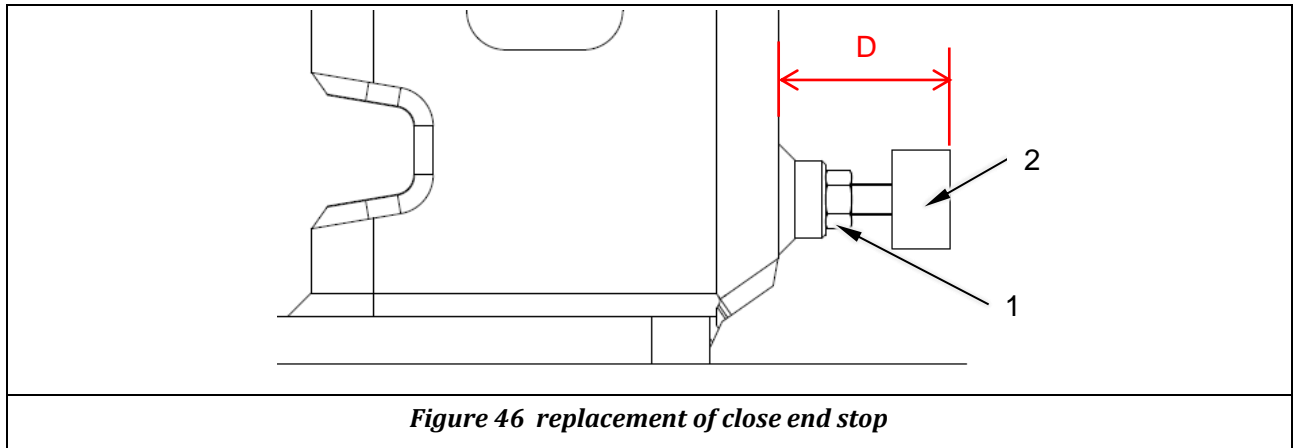
- 1) Proceed adjustment check as detailed in §5.2.5

8.12 Replacement of close end stop

Diagnosis: crack, deformation, broken

8.12.1 Dismount

- 1) Manually move the door to around half opened position
- 2) Measure and record the distance D from the end stop to driving arm
- 3) Loosen the nut (*item 1, Figure 46*) and dismount the end stop (*item 2, Figure 46*) from the driving arm



8.12.2 Replacement

- 1) Install and screw the end stop with a same distance D
- 2) Tighten the nut with torque 19.5Nm. apply Loctite 243 and tightening mark

8.12.3 Adjustment check

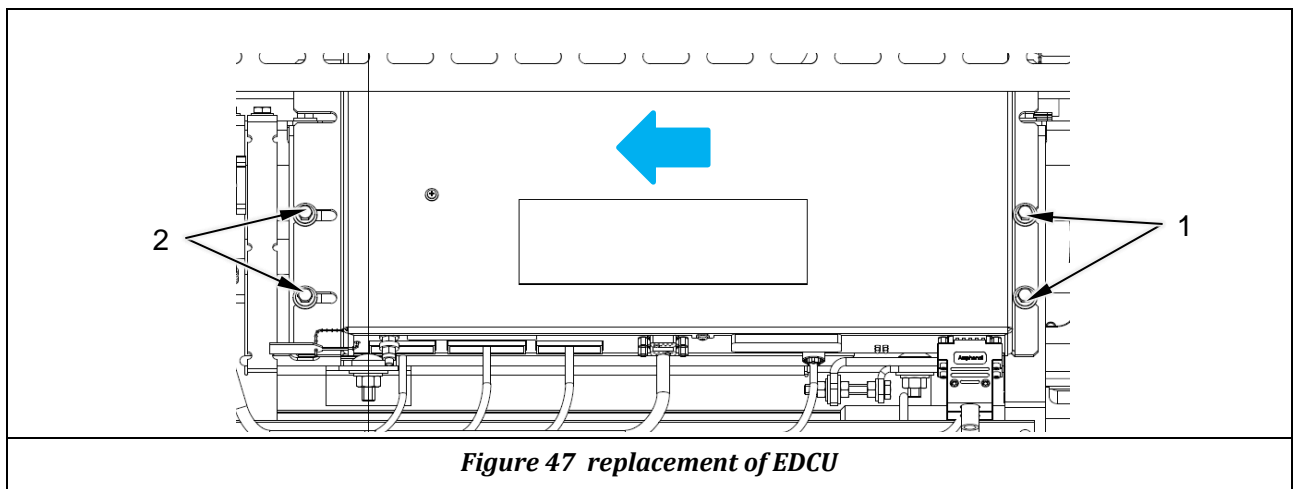
- 1) Proceed adjustment check as detailed in §5.2.4

8.13 Replacement of the EDCU

Diagnosis: major failure

8.13.1 Dismount

- 1) Unplug all the connectors from the EDCU
- 2) Loosen the fixing screws (item 1/2, *Figure 47*).
- 3) Slide the EDCU towards left side to make the right side out of the screw.
- 4) Remove the EDCU



8.13.2 Replacement

- 1) Insert the EDCU to make the left side screws (item 2, *Figure 47*) into the openings

- 2) Slide EDCU to right side to make the screws (item 1, *Figure 47*) into the openings
- 3) Tighten the screws with torque 5.5Nm, apply Loctite 243 and tightening mark
- 4) Plug the connectors onto EDCU in correct port

8.13.3 Adjustment check

- 1) Proceed an automatic operation as §3.2.2
- 2) Proceed a local opening and closing as §3.2.3

8.14 Replacement of synchronize belt

Diagnosis: crack, broken

8.14.1 Dismount

- 1) Slightly loosen the fixing screws (*item 1, Figure 48*),
- 2) Loosen the nut (*item 2 Figure 48,*) and the bolts (*item 3, Figure 48*), until the belt (*item 4, Figure 48*) is slack
- 3) Remove the belt from the pulley

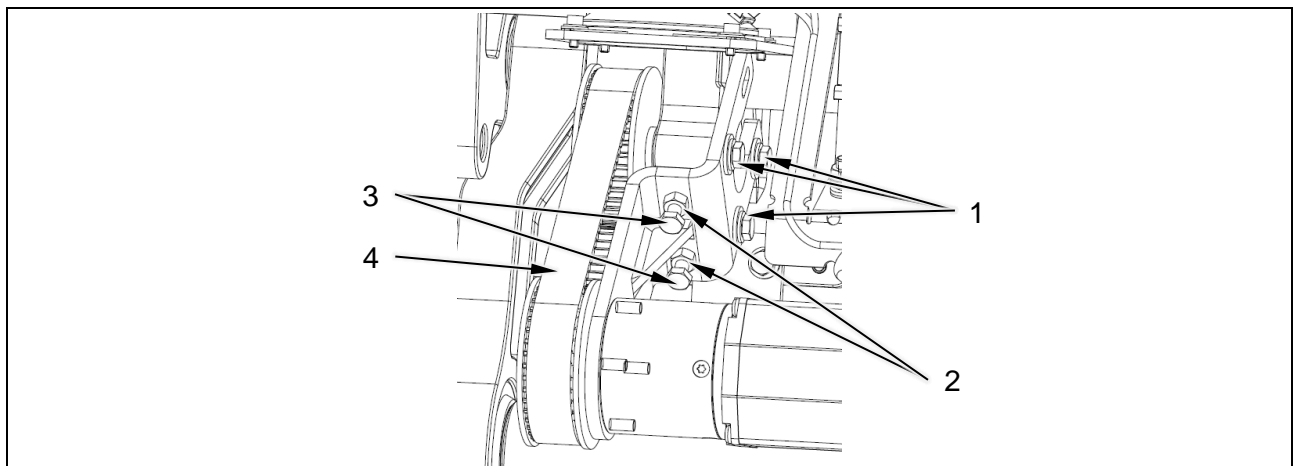


Figure 48 replacement of synchronize belt

8.14.2 Replacement

- 1) Install the belt onto the pulley, make sure that the tooth is well engaged;
- 2) Adjust the tightness of the belt as detailed in §5.2.6

8.14.3 Adjustment check

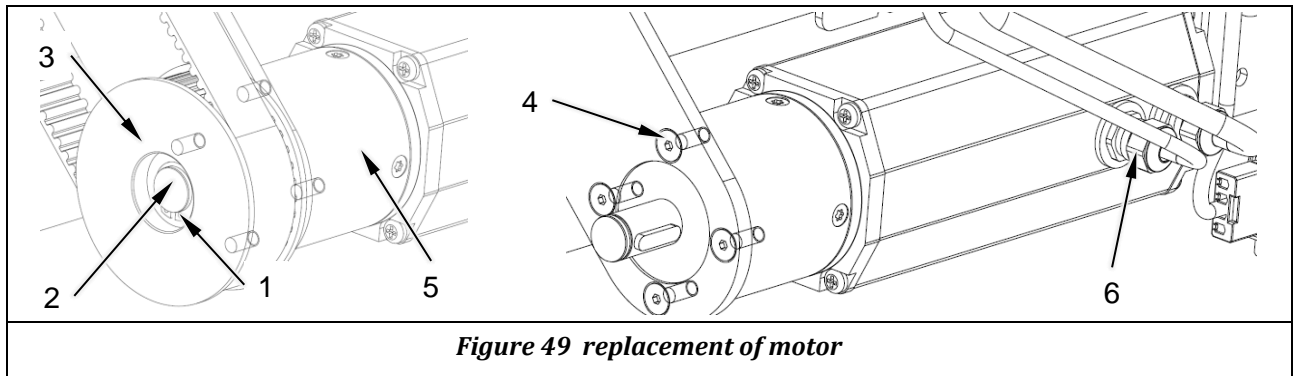
- 1) Proceed a manual operation check as detailed in §3.2.1
- 2) Proceed a automatic operation check as detailed in §3.2.2

8.15 Replacement of motor

Diagnosis: broken

8.15.1 Dismount

- 1) Unplug all the motor wirings from terminal board and EDCU
- 2) Dismount the synchronize belt as detailed in §8.14.1
- 3) Remove the circlips (*item 1, Figure 49*) from the motor shaft (*item 2, Figure 49*)
- 4) Remove the pulley (*item 3, Figure 49,*) from motor shaft
- 5) Unscrew the fixings screws (*item 4, Figure 49*)
- 6) Dismount the motor



8.15.2 Replacement

- 1) Install the motor on the bracket and fixing with 4 screws, tighten with torque 2.5Nm, apply Loctite 243 and tightening mark
Mind the orientation of the motor wiring (*item 6, Figure 49*)
- 2) Install pulley (*item 3, Figure 49*) onto motor shaft
- 3) Install the circlips (*item 1, Figure 49*) onto motor shaft
- 4) Install and adjust synchronize belt as detailed in §8.14.2

8.15.3 Adjustment check

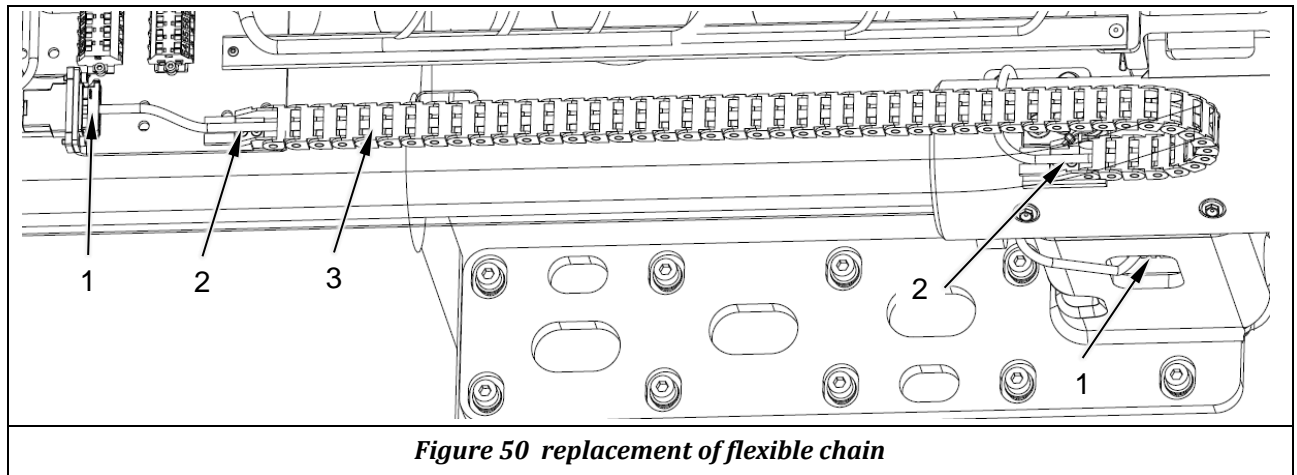
- 1) Proceed a manual operation check as detailed in §3.2.1
- 2) Proceed a automatic operation check as detailed in §3.2.2

8.16 Replacement of flexible chain assembly

Diagnosis: broken

8.16.1 Dismount

- 1) Unplug the connectors (*item 1, Figure 50*) on both side
- 2) Remove the cable ties
- 3) Unscrew the fixing bolts (*item 2, Figure 50*) on both ends
- 4) Remove the flexible chain (*item 3, Figure 50*) from operator



8.16.2 Replacement

- 1) Install the flexible chain and fix with screws (*item 2, Figure 50*) on both sides, tightening torque is 0.5Nm, apply Loctite 243 and tightening mark
- 2) Plug the connectors (*item 1, Figure 50*) on both side
- 3) Fix the cables with ties
- 4) Manually move the door, check that there is no interference between flexible chain and other components

8.16.3 Adjustment check

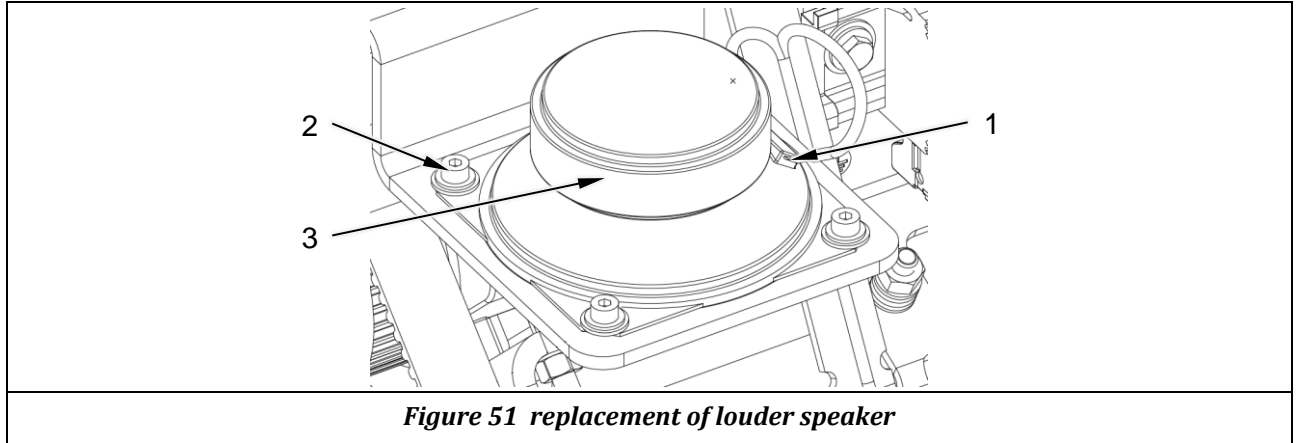
- 1) Proceed a manual operation check as detailed in §3.2.1
- 2) Proceed a automatic operation check as detailed in §3.2.2

8.17 Replacement of loudspeaker

Diagnosis: broken

8.17.1 Dismount

- 1) Unplug the connectors (*item 1, Figure 51*) on both side
- 2) Unscrew the 4 fixing bolts (*item 2, Figure 51*) and remove the loudspeaker (*item 3, Figure 51*)



8.17.2 Replacement

- 1) Install the loudspeaker and fix with 4 sets of screws (*item 2, Figure 51*), tightening torque is 2.7Nm, apply Loctite 243 and tightening mark
- 2) Plug the connectors (*item 1, Figure 51*) on both side

8.17.3 Adjustment check

- 1) Proceed a automatic operation check as detailed in §3.2.2 to check if the loudspeaker works correctly.

8.18 Replacement of driving screw assembly

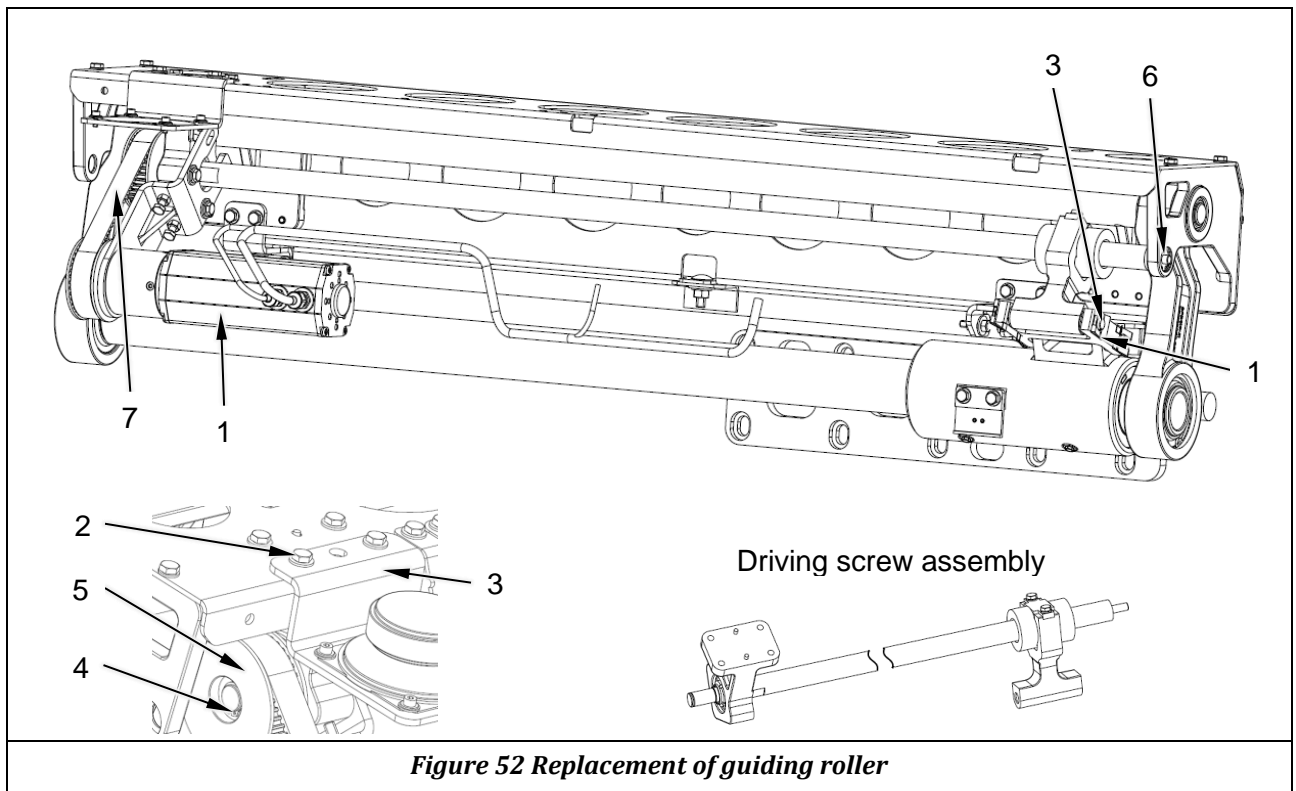


This job should be finished in workshop after operator dismantled since it is SRU

Diagnosis: heavy worn, abnormal noise, jam

8.18.1 Dismount

- 1) Dismount the operator as detailed in §8.3.1
- 2) Loosen the adjusting screws (*item 3, Figure 52*)
- 3) Loosen the fixing screws (*item 1, Figure 52*) for motor bracket, and dismount the motor (*item 1, Figure 52*) together with the bracket
- 4) Loosen the 4 fixing screws (*item 2, Figure 52*)
- 5) Keep the bracket (*item 3, Figure 52*) for loudspeaker.
- 6) Extract the driving screw from the extreme bearing (*item 6, Figure 52*)
- 7) Unclip the circlip (*item 4, Figure 52*) and remove the pulley (*item 5, Figure 52*)



8.18.2 Replace

- 1) Align the key groove and install the pulley onto the shaft of driving screw
- 2) Install the circlip (*item 4, Figure 52*)
- 3) Insert the driving screw into the extreme bearing (*item 6, Figure 52*)
- 4) Fix the driving screw on the operator via 4 sets of screws (*item 2, Figure 52*), tighten torque is 10.4Nm, apply Loctite 243 and tightening mark
- 5) Install the motor on the driving screw support
- 6) Install the synchronize belt (*item 7, Figure 52*) and adjust the tightness according to §5.2.6
- 7) Connect the fork and insert the shaft (*item 3, Figure 52*) and install the clip (*item 1, Figure 52*)
- 8) Move the driving arm along the guiding rod, make sure that there is not hard point or jamming.
- 9) Install the operator onto carbody according to §3.2.1

8.18.3 Adjustment check

- 2) Proceed the adjustment check as detailed in §8.9.3

8.19 Replacement of coordinate bar bearing



This job should be finished in workshop after operator dismantled since it is SRU

Diagnosis: broken, abnormal noise, jam

8.19.1 Dismount

- 1) Dismount the operator from train as detailed in §8.9.1
- 2) Dismount the clip (*item 1, Figure 53*) and extract the shaft (*item 2, Figure 53*), to split driving arm (*item 3, Figure 53*) and fork (*item 4, Figure 53*)
- 3) Unscrew the countersunk bolt (*item 5, Figure 53*) and detach the flexible chain (*item 6, Figure 53*) from driving arm
- 4) Dismount the screws (*item 7&8, Figure 53*)
- 5) Knock with rubber hammer to slide the operator support (*item 9, Figure 53*), detach it from operator
- 6) hit at another side of the coordinate bar (*item 10, Figure 53*) to remove the coordinate bar from operator
- 7) Dismount the bearing (*item 11, Figure 53*) from coordinate bar
- 8) Dismount the bearing from coordinate bar on another side with same method

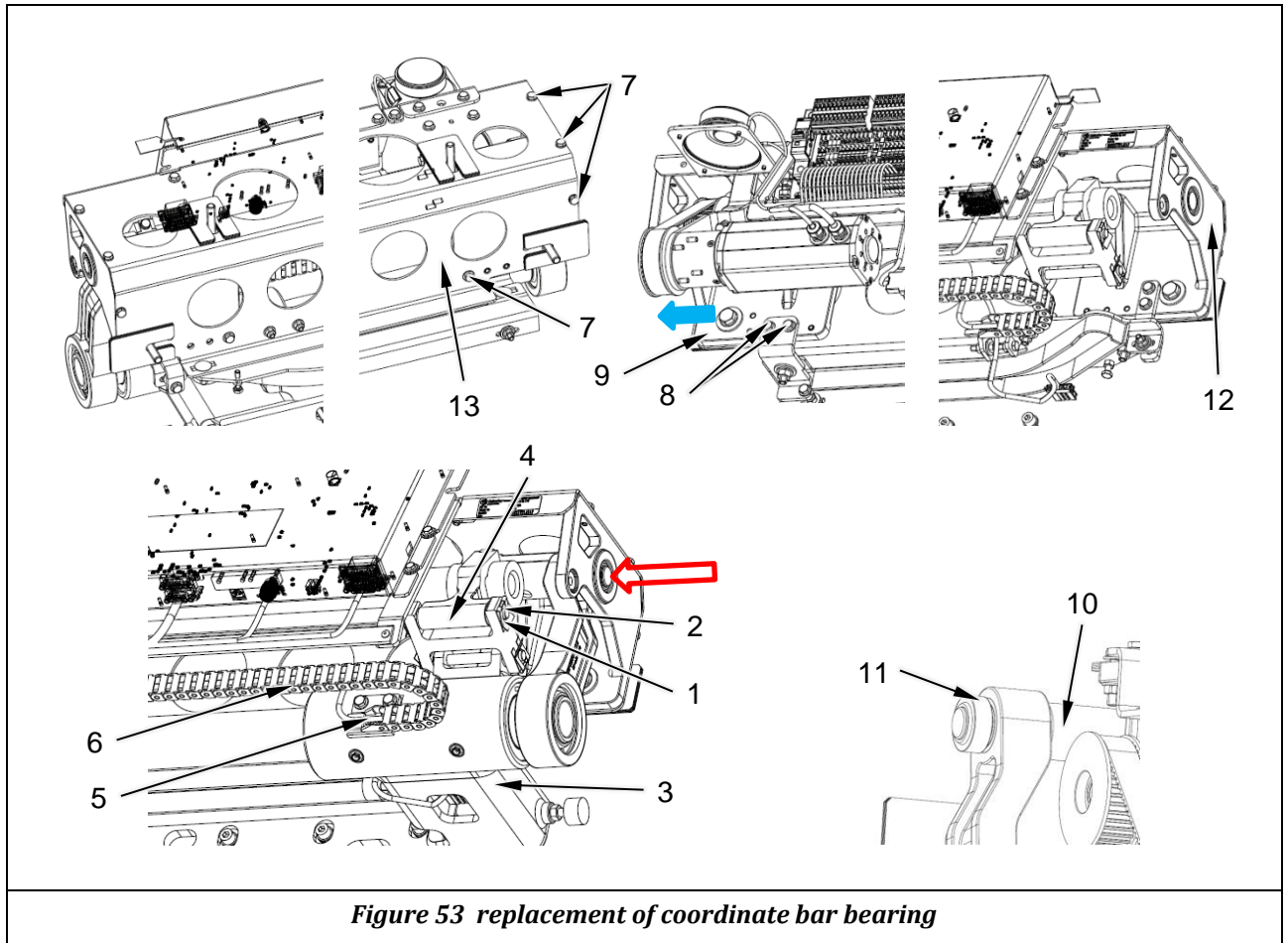


Figure 53 replacement of coordinate bar bearing

8.19.2 Replace

- 1) Install the bearing (*item 11, Figure 53*) into the support (*item 9&12, Figure 53*) on both side
- 2) Insert the coordinate bar into the bearing
- 3) Connect the support (*item 9, Figure 53*) and operator bracket (*item 13, Figure 53*), align the holes
- 4) Screw the bolts (*item 7&8, Figure 53*) with tightening torque 10.4Nm, apply Loctite 243 and tightening mark
- 5) Check that the coordinate bar can rotate freely
- 6) Align the fork (*item 4, Figure 53*) and driving arm part, insert the shaft (*item 2, Figure 53*) and install the clip (*item 1, Figure 53*)
- 7) Fixing the flexible chain (*item 6, Figure 53*) with countersunk screw (*item 5, Figure 53*) and tighten with torque 0.5Nm, apply Loctite 243 and tightening mark
- 8) Install the operator onto train as detailed in §8.9.2

8.19.3 Adjustment check

- 1) Proceed adjustment check as detailed in §8.9.3

8.20 Replacement of guide rod bearing



This job should be finished in workshop after operator dismantled since it is SRU

Diagnosis: broken, abnormal noise, jam

8.20.1 Dismount

- 1) Dismount the operator as detailed in §8.9.1
- 2) Move the driving arm to the middle position (*item 5, Figure 54*)
- 3) Remove both circlips (*item 1, Figure 54*) from the coordinate lever hole on each side
- 4) hit the outer ring of bearing (*item 2, Figure 54*) from one side along the axial direction, until both bearing comes out from the coordinate lever (*item 3, Figure 54*)
- 5) Remove the driving arm from the guiding rod, mind that do not damage the flexible chain
- 6) Dismount the bearing from the guiding rod (*item 4, Figure 54*)

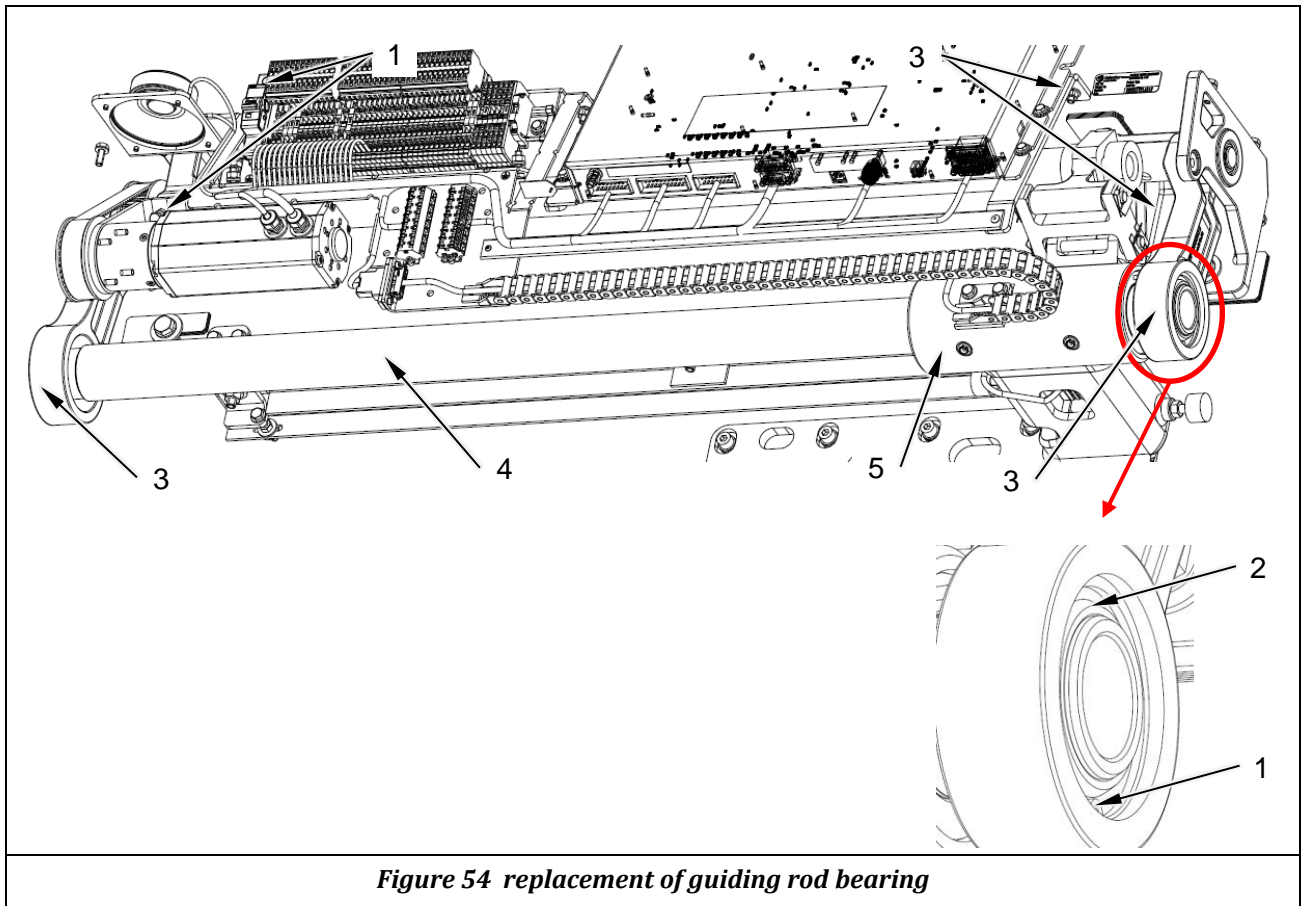


Figure 54 replacement of guiding rod bearing

8.20.2 Replacement

- 1) Insert 1st bearing into coordinate lever
- 2) Install 2nd bearing on the guiding rod
- 3) Insert the guiding rod (*item 4, Figure 54*) from another coordinate lever, and into the driving arm, until 1st bearing position

- 4) Slow hit the make the guiding rod into the 1st bearing
- 5) Check that both bearing are in correct position
- 6) Install the clips (*item 1, Figure 54*) into the hole of coordinate lever (*item 3, Figure 54*)
- 7) Install the operator onto carbody as detailed in §8.9.2

8.20.3 Adjustment check

- 1) Proceed adjustment as detailed in §8.9.3

8.21 Replacement of extremity bearing



This job should be finished in workshop after operator dismantled since it is SRU

Diagnosis: broken, abnormal noise, jam

8.21.1 Dismount

- 1) Dismount operator from carbody as detailed in §8.9.1
- 2) Dismount the driving screw assembly as detailed in §8.18.1
- 3) Remove the circlips (*item 1, Figure 55*) from the hole
- 4) Dismount the bearing (*item 2, Figure 55*) from the hole

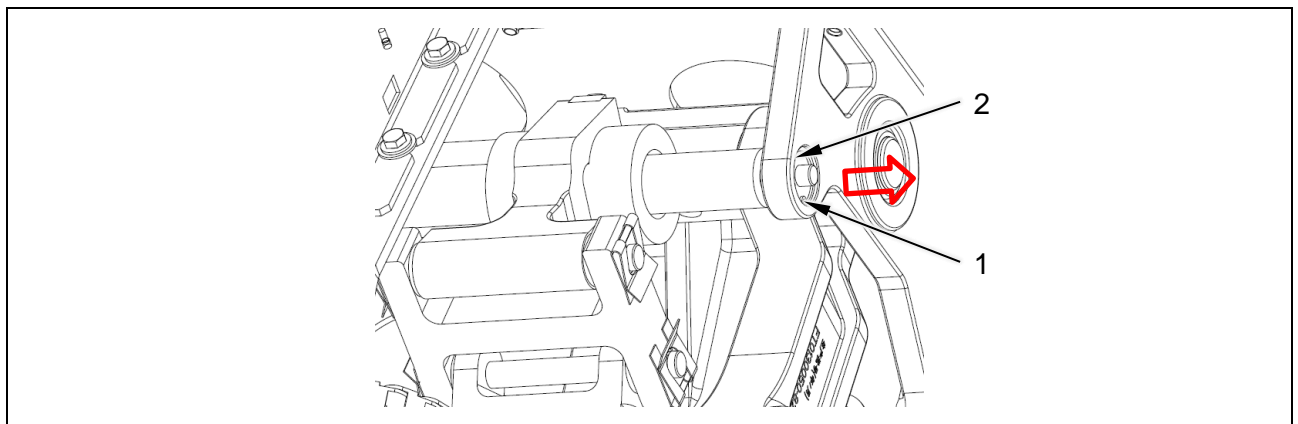


Figure 55 replacement of extreme bearing

8.21.2 Replacement

- 1) Install the bearing (*item 2, Figure 55*) into the hole
- 2) Install the circlips (*item 1, Figure 55*) into the hole
- 3) Install the driving screw assembly as detailed in §8.18.2
- 4) Install operator onto carbody as detailed in §8.9.2

8.21.3 Adjustment check

- 1) Proceed adjustment check as detailed in §8.9.3

8.22 Replacement of master lock device



Isolate the power supply before any operation



The lateral cover should be opened to make master lock device accessible

Diagnosis: major failure

8.22.1 Dismount

- 1) Manually open the door
- 2) Dismount the air hose from locking cylinder and unlocking cylinder
- 3) Dismount the split pin (*item 1, Figure 56*), remove the Bowed cables (*item 2, Figure 56*) from master lock device
- 4) Unplug all the switch wirings (DLS1, DLS2, EDS, EMS, DCS) from the terminal board
- 5) Record the quantity of adjusting shims (*item 2, Figure 56*) in both position
- 6) Loosen the fixing screws (*item 1, Figure 56*), dismount the master lock device from carbody

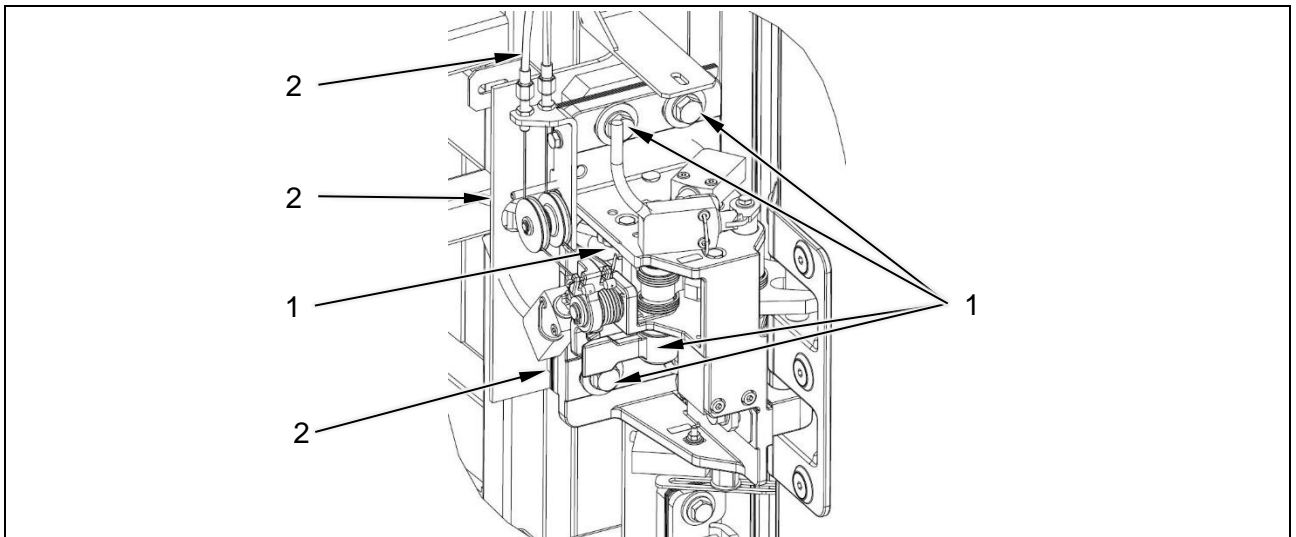


Figure 56 replacement of master lock device

8.22.2 Replace

- 1) Install the master lock device onto the carbody
- 2) Put the adjusting shims (*item 2, Figure 56*) in its position with same quantity recorded
- 3) Adjust the master lock device as detailed in §5.3
- 4) Tighten the screws (*item 1, Figure 56*) with torque 49.4Nm, apply Loctite 243 and tightening mark
- 5) Connect the switch wirings and air hose accordingly

8.22.3 Adjustment check

- 1) Proceed an complete adjustment check (see §5.1)

- 2) Proceed a automatic opening and closing check as detailed in §3.2.2

8.23 Replacement of unlocking cylinder

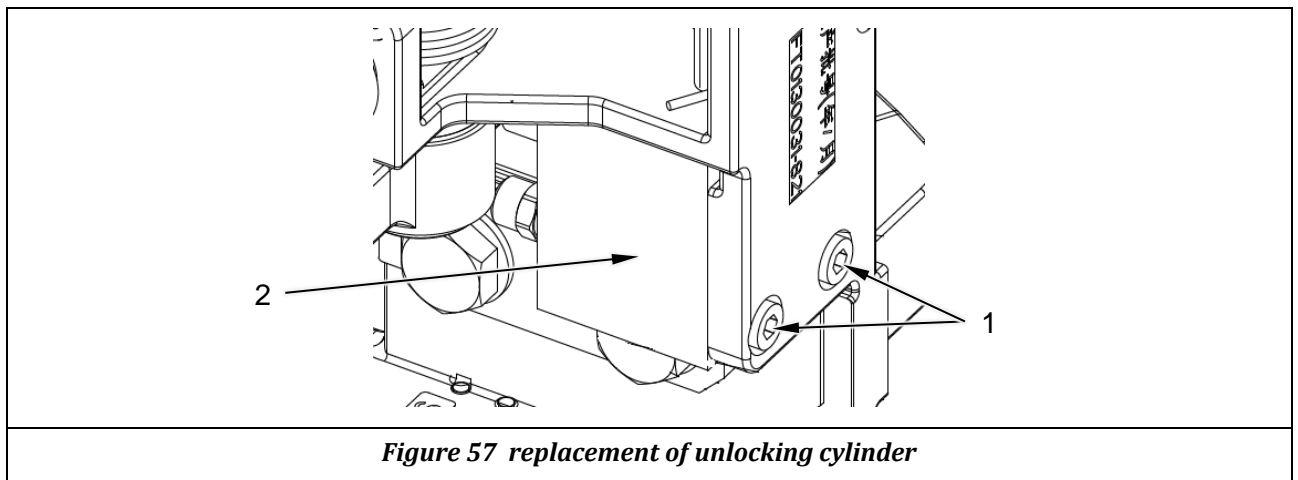


This job should be finished in workshop after master lock device dismantled since it is SRU

Diagnosis: broken, abnormal noise, jam

8.23.1 Dismount

- 1) Dismount master lock device from carbody as detailed in §8.22.1
- 2) Dismount the screws (item 1, *Figure 57*)
- 3) Dismount the unlocking cylinder (item 2, *Figure 577*) from master lock device



8.23.2 Replacement

- 1) Install the unlocking cylinder (item 2, *Figure 57*)
- 2) Fix the screw (item 1, *Figure 57*) with torque 5.5Nm, apply Loctite 243 and tightening mark
- 3) Install the master lock device onto carbody as detailed in §8.22.2

8.23.3 Adjustment check

- 1) Proceed an automatic operation as detailed in §3.2.2

8.24 Replacement of locking cylinder

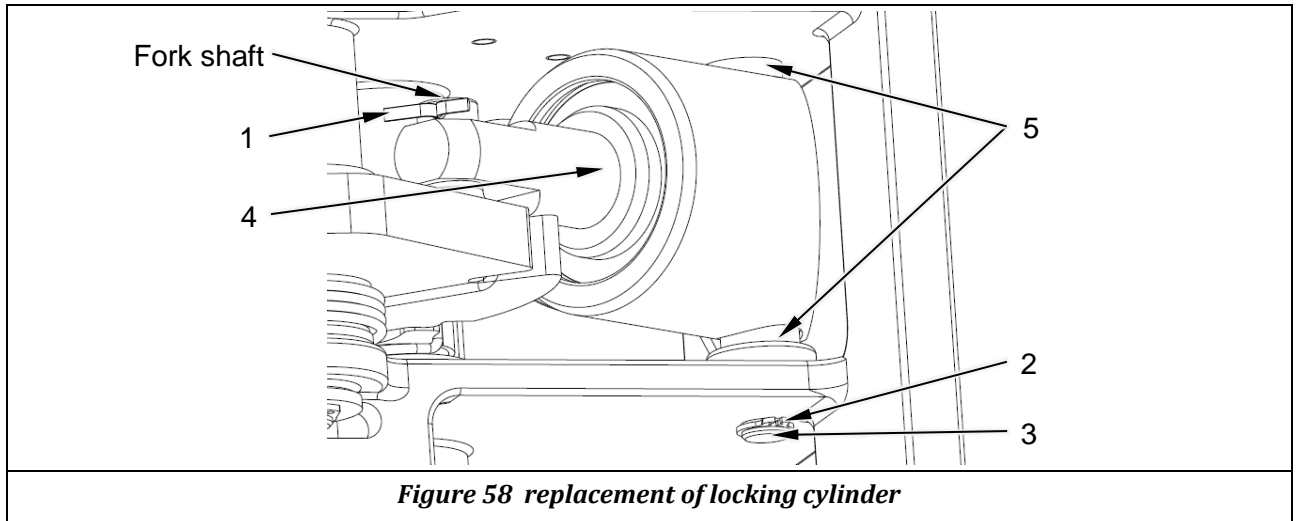


This job should be finished in workshop after master lock device dismantled since it is SRU

Diagnosis: broken, abnormal noise, jam

8.24.1 Dismount

- 1) Dismount master lock device from car body as detailed in §8.22.1
- 2) Remove the split pin (item 1, *Figure 58*) from the fork shaft
- 3) Remove the circlip (item 2, *Figure 58*) from the shaft (item 3, *Figure 58*)
- 4) Extract the shaft (item 3, *Figure 58*) from the top
- 5) Rotate the cylinder body to outside and remove it from the fork shaft Dismount the unlocking cylinder (item 4, *Figure 58*) from master lock device
- 6) Keep the spacers (item 5, *Figure 58*) on the top and bottom of cylinder;



8.24.2 Replacement

- 1) Install the unlocking cylinder (item 2, *Figure 58*)
- 2) Insert the fork shaft into the piston hole
- 3) Install the split pin on the fork shaft and bend the 2 legs to 90 degrees
- 4) Rotate the cylinder to align the hole with master lock structure
- 5) Put the spacers in its position (top and bottom)
- 6) Insert the shaft (item 3, *Figure 58*) and install the circlip (item 2, *Figure 58*)
- 7) Install the master lock device onto carbody as detailed in §8.22.2

8.24.3 Adjustment check

- 1) Proceed an automatic operation as detailed in §3.2.2

8.25 Replacement of fork spring



This job should be finished in workshop after master lock device dismantled since it is SRU

Diagnosis: broken, loss of force

8.25.1 Dismount

- 1) Dismount master lock device from carbody as detailed in §8.22.1
- 2) Dismount the locking cylinder as detailed in §8.24.1
- 3) Remove the circlip (item 1, *Figure 59*) from the shaft (item 2, *Figure 59*)
- 4) Extract the shaft (item 2, *Figure 59*) from the top
- 5) save the washers (item 3&4, *Figure 59*)
- 6) remove the spring (item 5, *Figure 59*) together with fork (item 6, *Figure 59*)
- 7) Dismount the spring from the fork

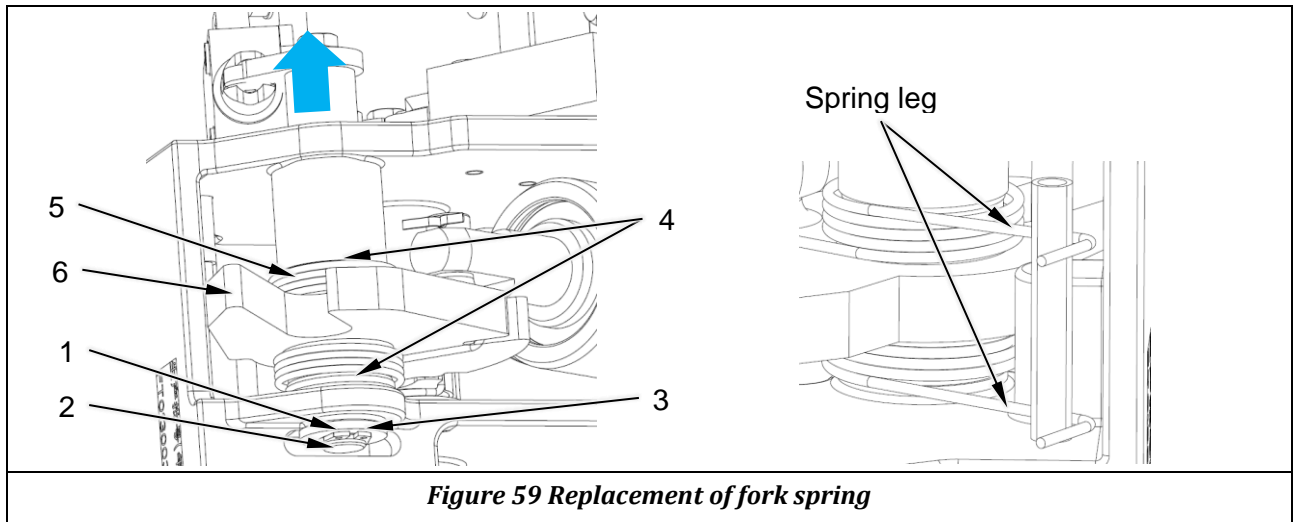


Figure 59 Replacement of fork spring

8.25.2 Replacement

- 1) Install the fork spring on the fork (item 2, *Figure 59*)
- 2) Put the fork in its position, and put the washer (item 4, *Figure 59*) on top and bottom of fork
- 3) Insert the shaft (item 2, *Figure 59*)
- 4) Put the washer (item 3, *Figure 59*) on the shaft
- 5) Install the circlip (item 1, *Figure 59*) on the shaft
- 6) Install the locking cylinder as detailed in §7.2.2
- 7) Install the master lock device onto carbody as detailed in §8.22.2

8.25.3 Adjustment check

- 1) Proceed an automatic operation as detailed in §3.2.2

8.26 Replacement of latch spring



This job should be finished in workshop after master lock device dismantled since it is SRU

Diagnosis: broken, loss of force

8.26.1 Dismount

- 1) Dismount master lock device from carbody as detailed in §8.22.1
- 2) Loosen the screw (*item 1, Figure 60*), remove the cam (*item 2, Figure 60*) and 3 washers (*item 3, Figure 60*) and save them
- 3) Extract the shaft (*item 4, Figure 60*) from the bottom
- 4) Remove the lever (*item 5, Figure 60*) from the master lock device
- 5) Remove the latch (*item 6, Figure 60*) from the master lock device, together with the latch spring
- 6) Keep the washer (*item 7, Figure 60*) on the top and bottom of latch
- 7) Dismount the spring (*item 8, Figure 60*) from the latch

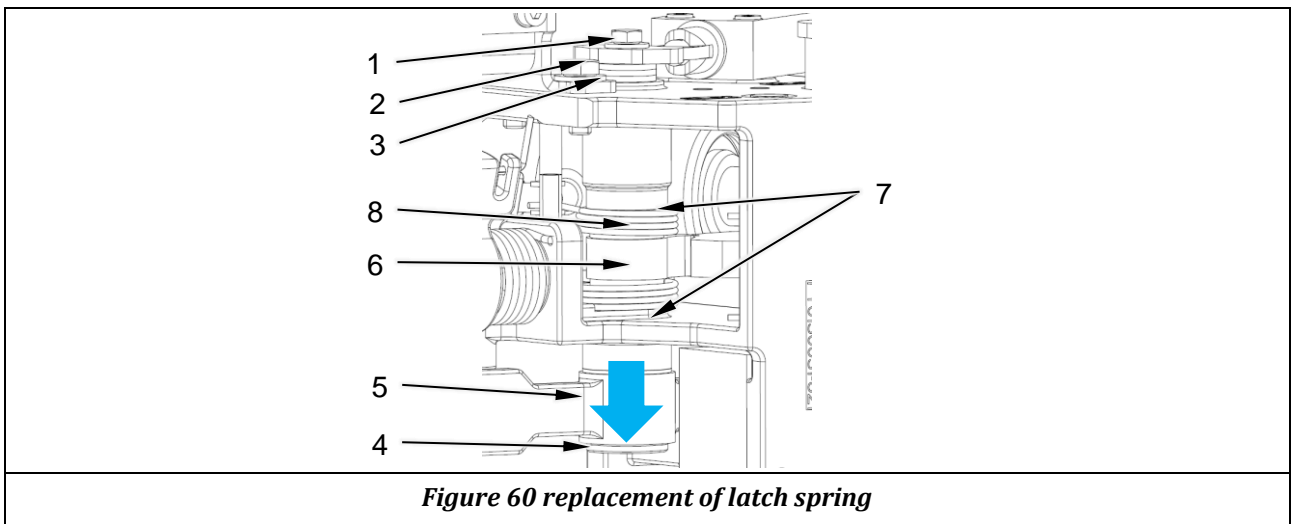


Figure 60 replacement of latch spring

8.26.2 Replacement

- 1) Install the latch spring (*item 8, Figure 60*) on the latch (*item 7, Figure 60*)
- 2) Put the latch in its position, and put the washer (*item 7, Figure 60*) on top and bottom of latch
- 3) Insert the shaft into the lever (*item 5, Figure 60*), then insert into the master lock device
- 4) Put the 3 washers (*item 3, Figure 60*) and cam (*item 2, Figure 60*) on the shaft
- 5) Tighten the screw (*item 1, Figure 60*) with torque 6Nm, apply Loctite 243 and tightening mark
- 6) Install the master lock device onto carbody as detailed in §8.22.2

8.26.3 Adjustment check

- 1) Proceed a emergency device check as detailed in §3.2.6
- 2) Proceed an automatic operation as detailed in §3.2.2

8.27 Replacement of emergency spring

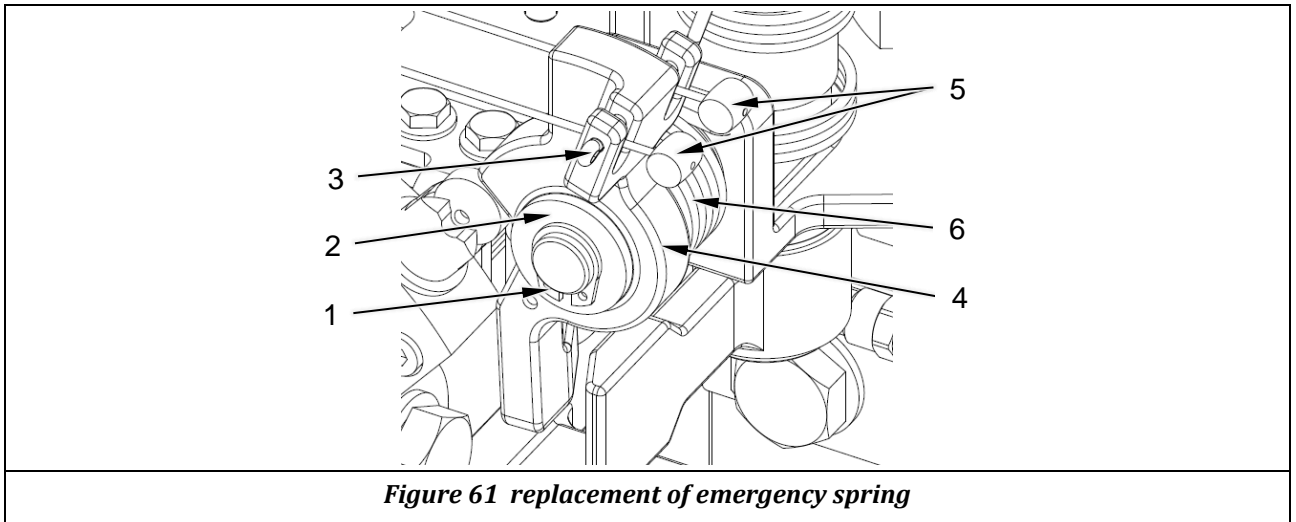


This job should be finished in workshop after master lock device dismantled since it is SRU

Diagnosis: broken, loss of force

8.27.1 Dismount

- 1) Dismount master lock device from carbody as detailed in §8.22.1
- 2) Dismount the circlip (*item 1, Figure 61*) from the shaft, remove the washer (*item 2, Figure 61*) and save it
- 3) Dismount the split-pin (*item 3, Figure 61*) from the cam (*item 4, Figure 61*) and remove the Bowden cable (*item 5, Figure 61*) from the cam.
- 4) Extract the cam from the shaft
- 5) Remove the spring (*item 6, Figure 61*) from the shaft



8.27.2 Replacement

- 1) Install the emergency spring (*item 6, Figure 61*) on the shaft
- 2) Install the cam (*item 4, Figure 61*) on the shaft, keep the spring leg into the holes
- 3) Insert the washer (*item 3, Figure 61*) on the shaft, and install the circlip (*item 1, Figure 61*)
- 4) Put the Bowden cable into its position and install the split-pin, bend the leg of the pin
- 5) Install the master lock device onto carbody as detailed in §8.22.2

8.27.3 Adjustment check

- 1) Proceed a emergency device check as detailed in §3.2.6

8.28 Replacement of DLS1 wiring layout



Isolate the power supply before any operation

Diagnosis: broken, loss of function

8.28.1 Dismount

- 1) Unplug the switch wiring from the Terminal board on the operator overhead.
- 2) Remove all the cable ties on the wiring.
- 3) Loosen the screws (*item 1, Figure 62*)
- 4) Dismount the DLS1 (*item 2, Figure 62*) from the master lock device

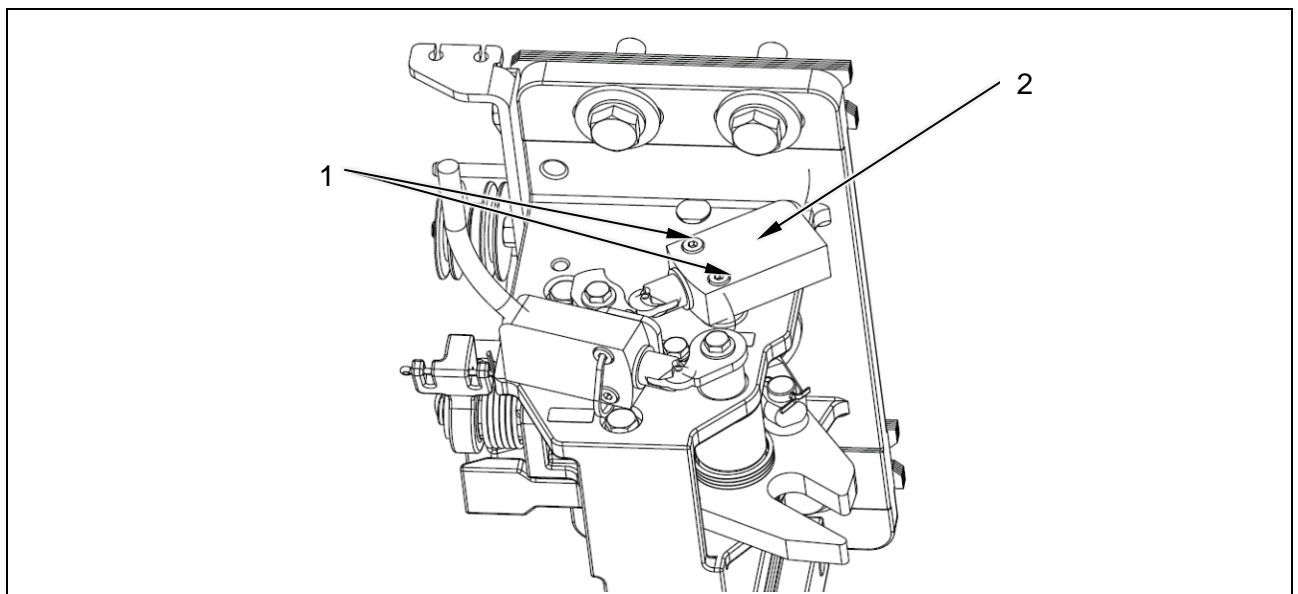


Figure 62 replacement of DLS1 wiring layout

8.28.2 Replacement

- 1) Install the switch (*item 2, Figure 62*) with 2 sets of screws
- 2) Tighten the screws with torque 2.7Nm. apply Loctite 243 and tightening mark
- 3) Plug the wirings into the terminal board accordingly

8.28.3 Adjustment check

- 1) Proceed an automatic operation as detailed in §3.2.2

8.29 Replacement of DLS2 wiring layout



Isolate the power supply before any operation

Diagnosis: broken, loss of function

8.29.1 Dismount

- 1) Unplug the switch wiring from the Terminal board on the operator overhead
- 2) Remove all the cable ties on the wiring
- 3) Loosen the screws (*item 1, Figure 63*)
- 4) Dismount the DLS2 (*item 2, Figure 63*) from the master lock device

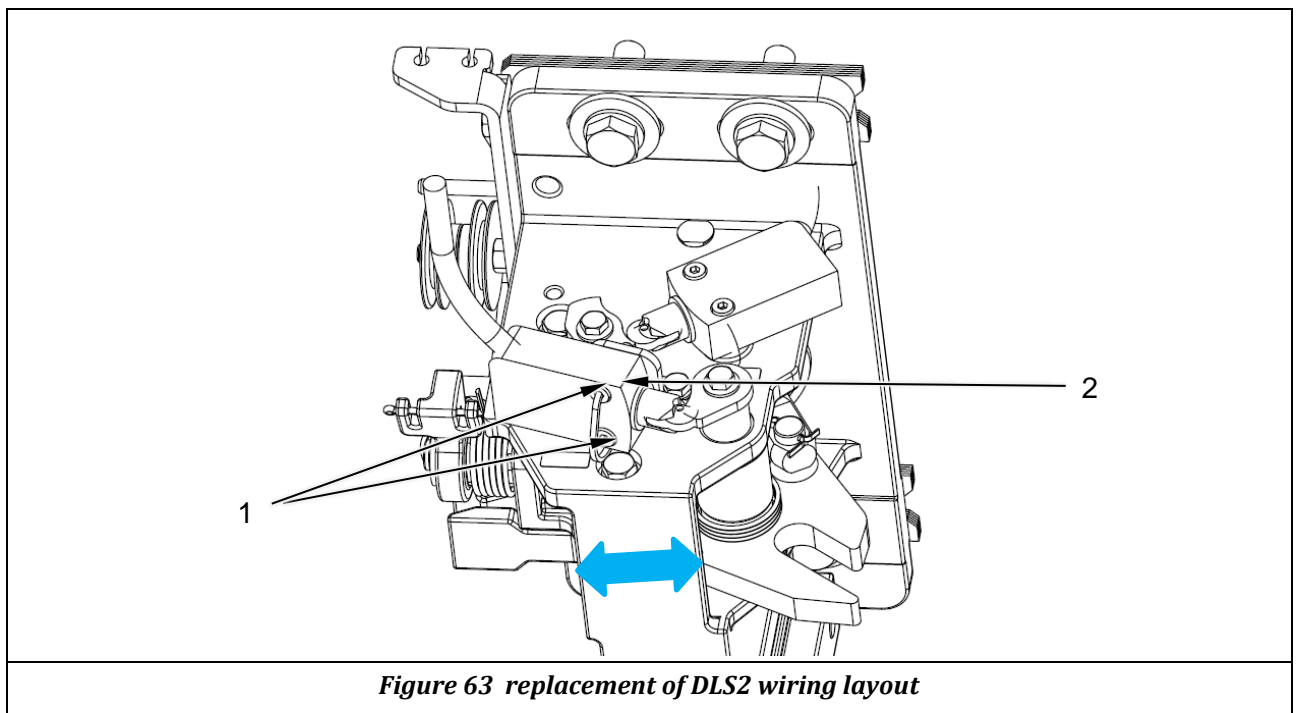


Figure 63 replacement of DLS2 wiring layout

8.29.2 Replacement

- 1) Install the switch (*item 2, Figure 63*) with 2 sets of screws,
- 2) Manually move the locking fork to 1st locking position
- 3) Move the switch to make it just activated at the position
- 4) Tighten the screws with torque 2.7Nm, apply Loctite 243 and tightening mark
- 5) Plug the wirings into the terminal board accordingly

8.29.3 Adjustment check

- 1) Proceed an automatic operation as detailed in §3.2.2

8.30 Replacement of DCS wiring layout

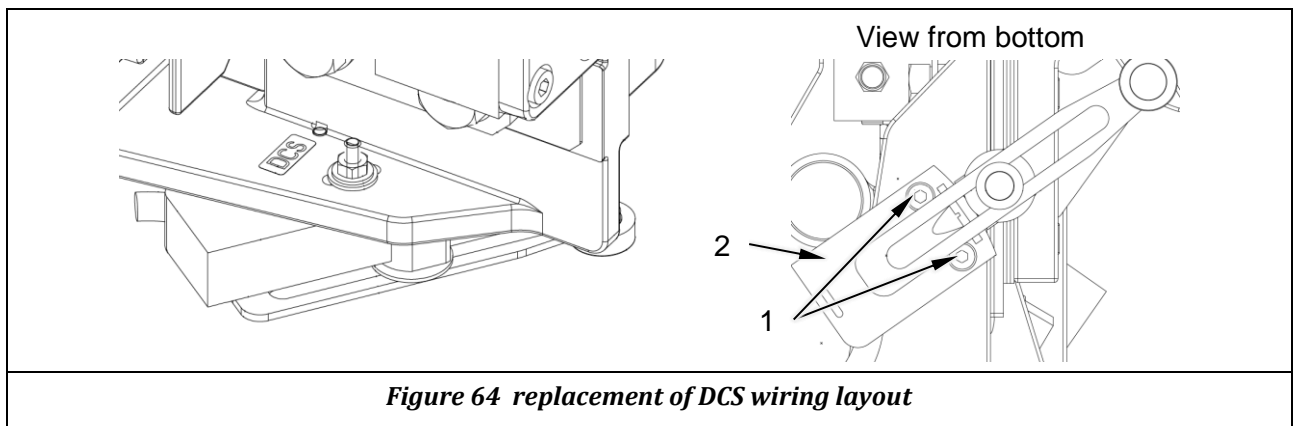


Isolate the power supply before any operation

Diagnosis: broken, loss of function

8.30.1 Dismount

- 1) Unplug the switch wiring from the Terminal board on the operator overhead
- 2) Remove all the cable ties on the wiring
- 3) Loosen the screws (*item 1, Figure 64*)
- 4) Dismount the DCS (*item 2, Figure 64*) from the master lock device



8.30.2 Replacement

- 1) Install the switch (*item 2, Figure 64*) with 2 sets of screws,
- 2) Check and adjust the DCS if need as detailed in §5.3.3
- 3) Tighten the screws with torque 2.7Nm, apply Loctite 243 and tightening mark
- 4) Plug the wirings into the terminal board accordingly

8.30.3 Adjustment check

- 1) Proceed an automatic operation as detailed in §3.2.2

8.31 Replacement of EDS wiring layout



Isolate the power supply before any operation

Diagnosis: broken, loss of function

8.31.1 Dismount

- 1) Unplug the switch wiring from the Terminal board on the operator overhead
- 2) Remove all the cable ties on the wiring
- 3) Loosen the screws (item 1, Figure 65)
- 4) Dismount the EDS (item 2, Figure 65)

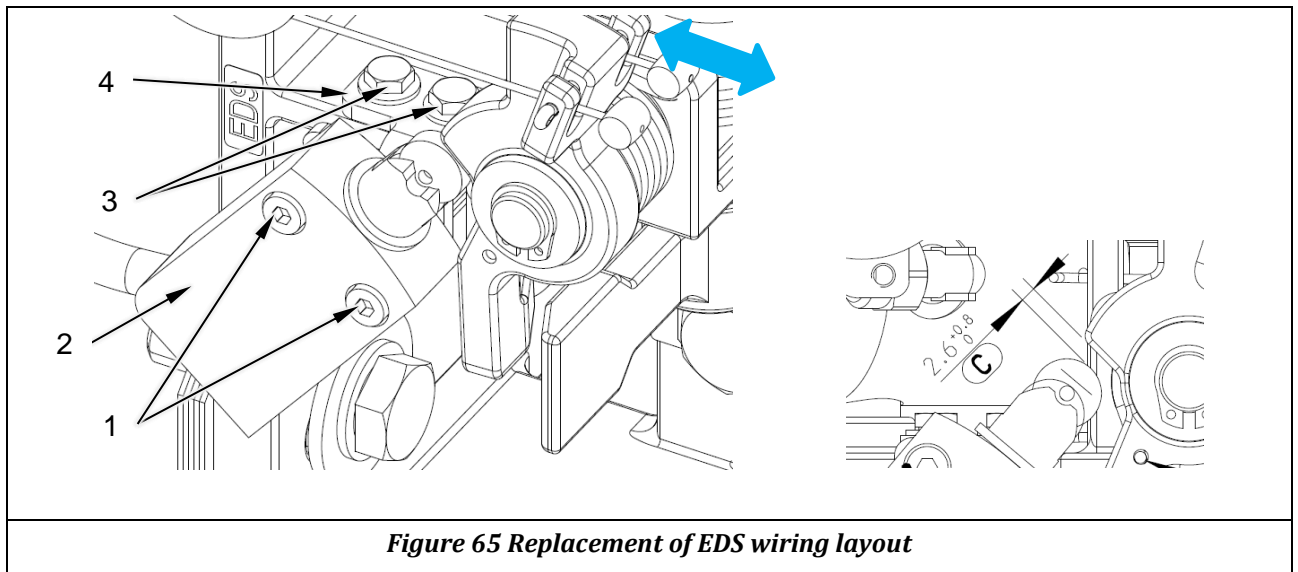


Figure 65 Replacement of EDS wiring layout

8.31.2 Replacement

- 1) Install the switch (item 2, Figure 65) with 2 sets of screws,
- 2) Tighten the screws with torque 2.7Nm, apply Loctite 243 and tightening mark
- 3) Plug the wirings into the terminal board accordingly
- 4) Adjust the EDS as below if need
 - Loosen the screws (item 3, Figure 65)
 - Move the bracket (item 3, Figure 65) to make the gap between switch roller and cam as $2.6^{+0.8}mm$
 - Tighten the screws (item 3, Figure 65) with torque 2.7Nm, apply Loctite 243 and tightening mark

8.31.3 Adjustment check

- 1) Proceed an emergency operation as detailed in §3.2.6 to check if the switch can work correctly

8.32 Replacement lockout switch assembly



Isolate the power supply before any operation



The lateral cover should be opened to make lockout switch assembly accessible

Diagnosis: major failure

8.32.1 Dismount

- 1) Unplug the LOS wiring from the terminal board
- 2) Loosen the fixing screws (*item 1, Figure 66*)
- 3) Record the quantity of adjusting shims (*item 2, Figure 66*)
- 4) Dismount the lockout switch assembly from carbody

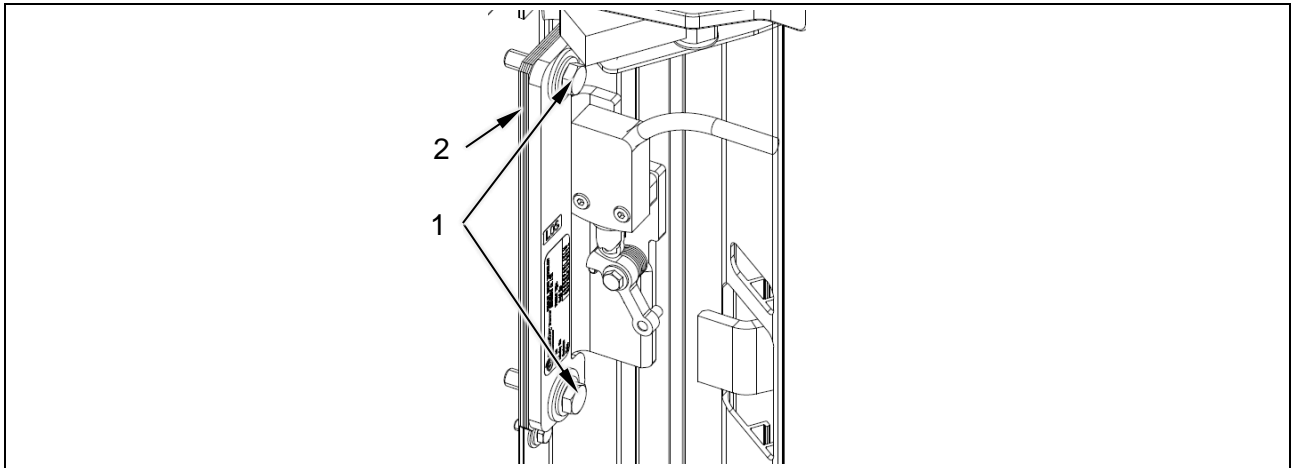


Figure 66 replacement of lockout switch assembly

8.32.2 Replace

- 1) Install the lockout switch assembly onto the carbody
- 2) Put the adjusting shims (*item 2, Figure 66*) between lockout switch assembly and carbody with same quantity
- 3) Adjust the lockout switch assembly as detailed in §0
- 4) Tighten the screws (*item 1, Figure 66*) with torque 25.3Nm, apply Loctite 243 and tightening mark

8.32.3 Adjustment check

- 1) Proceed an lockout function check (see §3.2.5)

8.33 Replacement of LOS wiring layout



Isolate the power supply before any operation

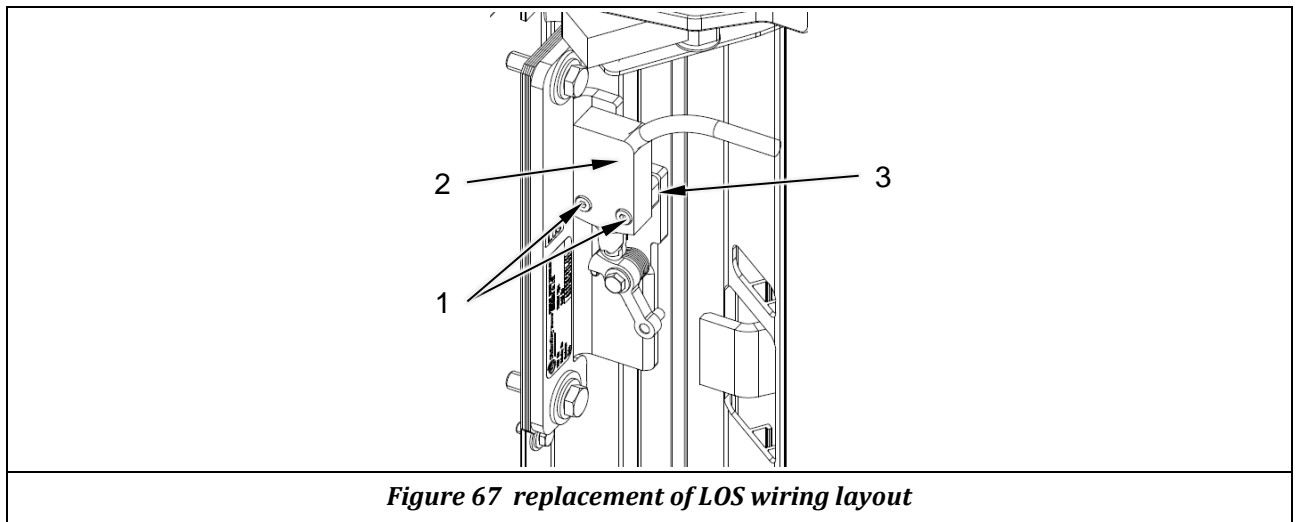


The lateral cover should be opened to make lockout switch assembly accessible

Diagnosis: damage, loss of function

8.33.1 Dismount

- 1) Unplug the LOS wiring from the terminal board
- 2) Loosen the fixing screws (*item 1, Figure 67*)
- 3) Dismount the LOS (*item 2, Figure 67*) from car body and save the spacer (*item 3, Figure 67*)



8.33.2 Replace

- 1) Install the LOS onto the bracket with screws, put the spacer in its position
- 2) Tighten the screws (*item 1, 67*) with torque 2.7Nm, apply Loctite 243 and tightening mark

8.33.3 Adjustment check

- 1) Proceed an lockout function check (see §3.2.5)

8.34 Replacement of PCU assembly



Isolate the power supply before any operation

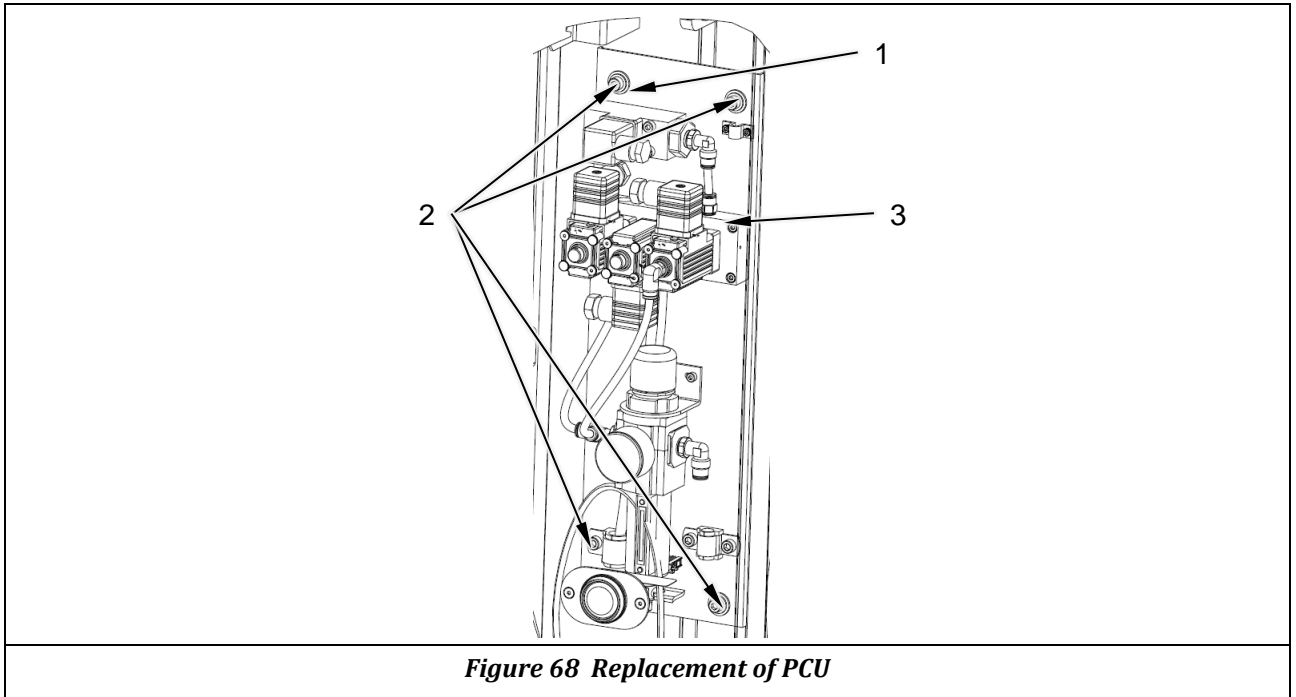


The lateral cover should be opened to make PCU assembly accessible

Diagnosis: major failure

8.34.1 Dismount

- 1) Unplug all the wirings from the terminal board (item 1, *Figure 68*) on PCU
- 2) Unplug the air hoses from locking cylinder and unlocking cylinder
- 3) Unscrew the 4 sets of bolts (item 2, *Figure 68*)
- 4) Remove the PCU from carbody



8.34.2 Replace

- 1) Install the PCU onto carbody with 4 sets of bolts (item 2, *Figure 68*), tighten torque is 10.4Nm, apply Loctite 243 and tightening mark
- 2) Connect the air hose to locking cylinder and unlocking cylinder as detailed in §8.22.2
- 3) Plug the wirings into the terminal board (item 1, *Figure 68*)

8.34.3 Adjustment check

- 1) Proceed an automatic operation check (see §3.2.2)

8.35 Replacement of S1,S2,S3 value and F&R kit

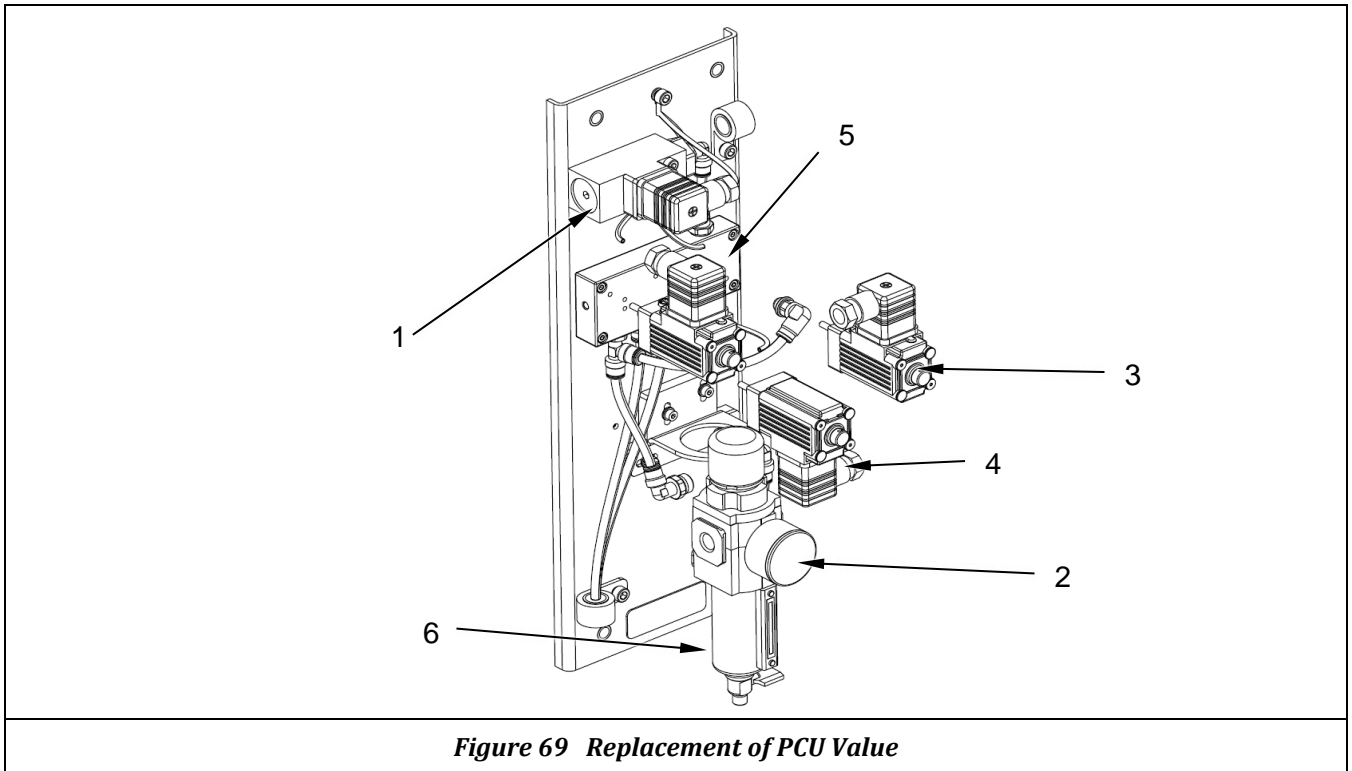


Figure 69 Replacement of PCU Value

8.36 Replacement of EED



The lateral cover should be opened to make EED assembly accessible

Diagnosis: major failure

8.36.1 Dismount

- 1) Remove the quick clip (*item 1 Figure 70,*) from the pulley (*item 2, Figure 70*) of EED
- 2) Loosen the adjusting nuts (*item 3, Figure 70*) and remove the nipple (*item 4, Figure 70*) from the pulley
- 3) Remove the adjusting screw (*item 5, Figure 70*) from EED, mind that there are nuts and washers on the back side
- 4) Unscrew the 4 fixing nuts (*item 6, Figure 70*),
- 5) Dismount the EED (*item 6,*) from the chamber of FRP cover

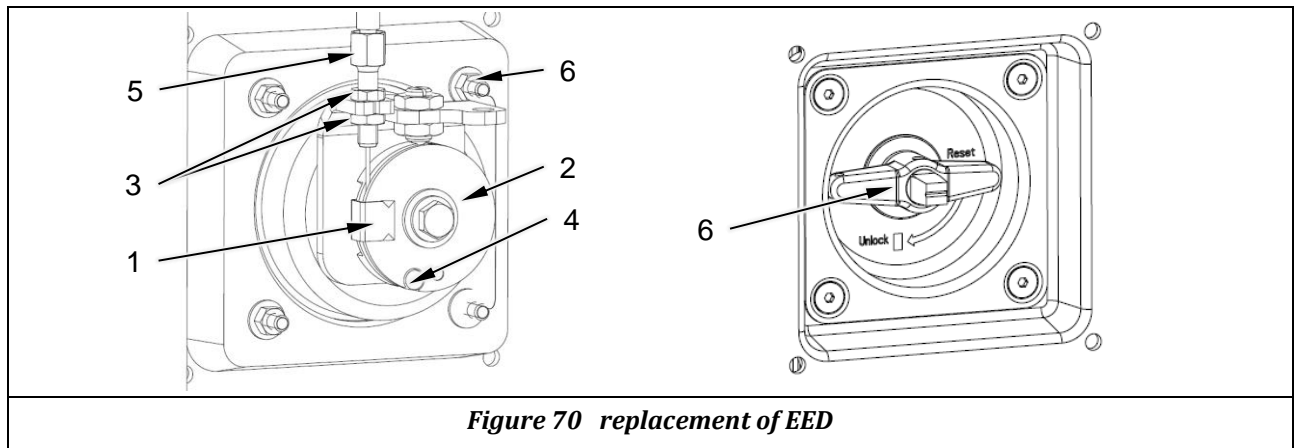


Figure 70 replacement of EED

8.36.2 Replace

- 1) Insert the EED into the chamber of FRP cover, fix with 4 sets of fasteners with tightening torque 2.5Nm. apply Loctite 243 and tightening mark
- 2) Put the nipple (*item 3, Figure 70*) into the hole of pulley, cable in the groove
- 3) Install the adjusting screw on the bracket, 2 adjusting nuts (*item 2, Figure 70*) located on each side
- 4) Install the quick clip (*item 1, Figure 70*) on the pulley
- 5) Adjust the Bowden cable as detailed in §5.6

8.36.3 Adjustment check

- 1) Proceed an emergency operation as detailed in §3.2.6

8.37 Replacement of Bowden cable (EED)



The lateral cover should be opened to make EED Bowden cable accessible

Diagnosis: broken

8.37.1 Dismount

EED side:

- 1) Proceed step 1~3 as detailed in §8.36.1 to remove the Bowden cable

Master lock device side:

- 2) Dismount the split pin (*item 3, Figure 71*) from the cam (*item 4, Figure 71*) and remove the Bowden cable (*item 5, Figure 71*) from the cam.
- 3) Remove the Bowden cable from the pulley (*item 1, Figure 71*)
- 4) Loosen the nut (*item 2,*) and unscrew the adjusting screw (*item 3, Figure 71*)
- 5) Remove the Bowden cable from master lock device

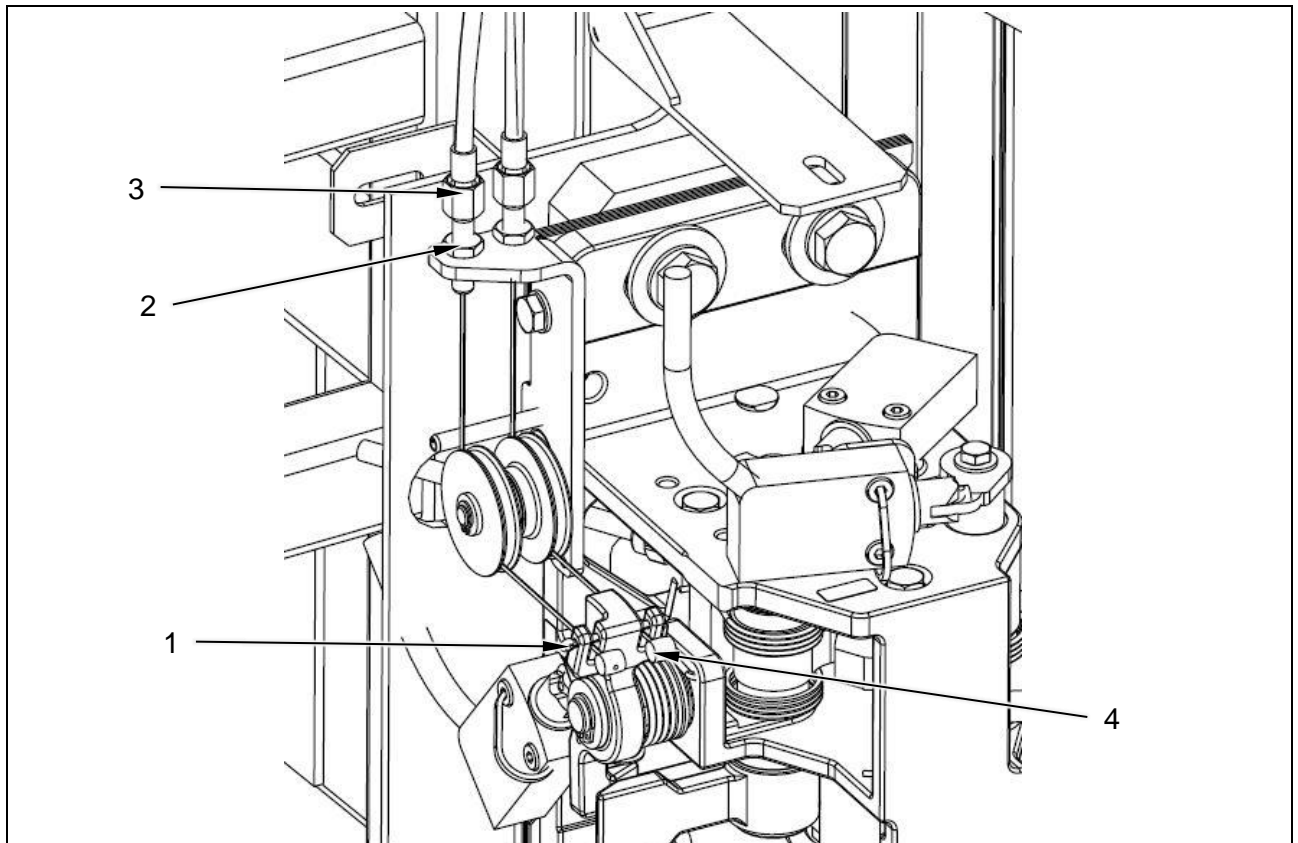


Figure 71 replacement of EED Bowden cable

8.37.2 Replace

EED side:

- 1) Install the Bowden cable as detailed in §8.36.2

Master lock device side:

- 2) Screw the adjusting screw (*item 3, Figure 71*) on the bracket
- 3) Put the Bowden cable in the groove of pulley (*item 3, Figure 71*),
- 4) Put the nipple (*item 4, Figure 71*) cross the groove of cam (*item 4, Figure 71*)
- 5) Install the split pin (*item 3, Figure 71*) and bend the legs
- 6) Adjust the Bowden cable as detailed in §5.6

8.37.3 Adjustment check

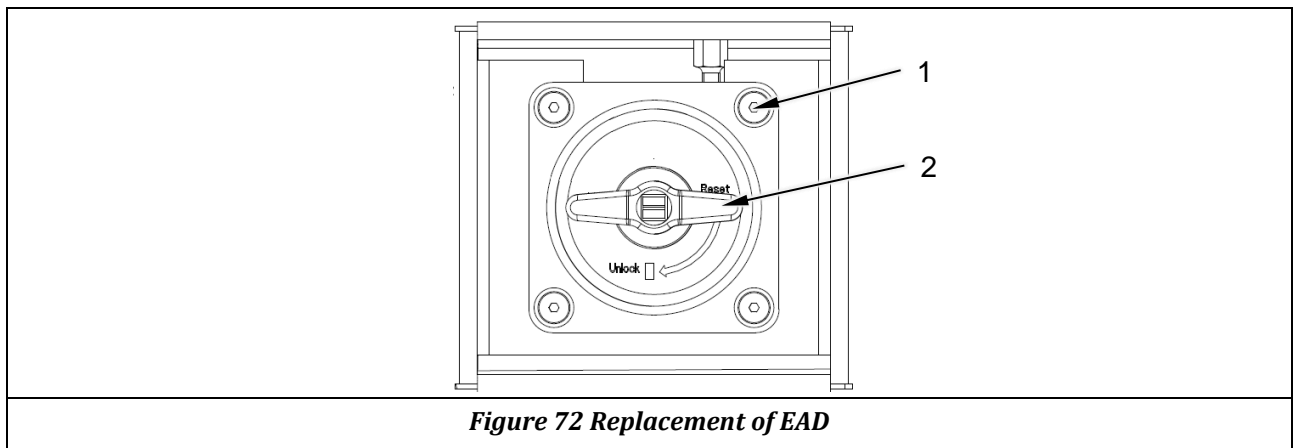
- 1) Proceed an emergency operation as detailed in §3.2.6

8.38 Replacement of EAD

Diagnosis: major failure

8.38.1 Dismount

- 1) Unscrew the fixing bolts (*item 1, Figure 72*),
- 2) Extract the EAD (*item 2, Figure 72*) from the car body, mind that the Bowden cable is still connected with EAD
- 3) Proceed step 1~3 as detailed in §8.36.1 to remove the Bowden cable from EAD



8.38.2 Replace

- 1) Connect the Bowden cable as step 2~4 in §8.36.2
- 2) Adjust the Bowden cable as detailed in §5.6
- 3) Insert the EAD into the car body, fix with 4 sets of fasteners with tightening torque 2.5Nm. apply Loctite 243 and tightening mark

8.38.3 Adjustment check

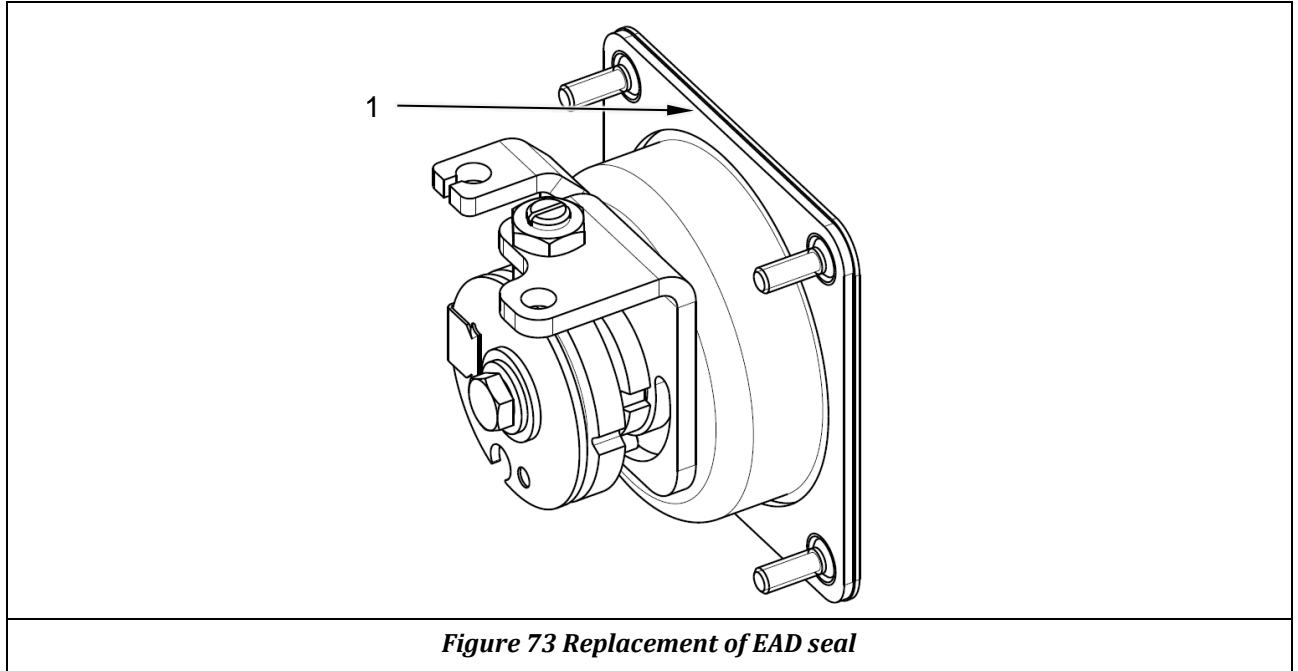
- 1) Proceed an emergency operation as detailed in §3.2.6

8.39 Replacement of seal in EAD

Diagnosis: major failure

8.39.1 Dismount

- 1) Proceed as detailed in §8.38.1
- 2) Remove the rubber seal (*item 1, Figure 73*) from EAD



8.39.2 Replace

- 1) Install the seal on the EAD
- 2) Install the EAD as detailed in §8.38.2

8.39.3 Adjustment check

- 1) Proceed an emergency operation as detailed in §3.2.6

8.40 Replacement of Bowden cable (EAD)



The lateral and top cover should be opened to make EAD Bowden cable accessible

Diagnosis: broken

8.40.1 Dismount

EAD side:

- 1) Dismount the Bowden cable as detailed in §8.38.1

Master lock device side:

- 2) Dismount the Bowden cable as detailed in step 2~5 of §8.37.1

8.40.2 Replace

EED side:

- 1) Install the Bowden cable as detailed in §8.38.2

Master lock device side:

- 1) Proceed step 2~6 in §8.37.2 to install the Bowden cable on master lock device
- 2) Adjust the Bowden cable as detailed in §5.6

8.40.3 Adjustment check

- 1) Proceed an emergency operation as detailed in §3.2.6

8.41 Replacement of female front rubber seal

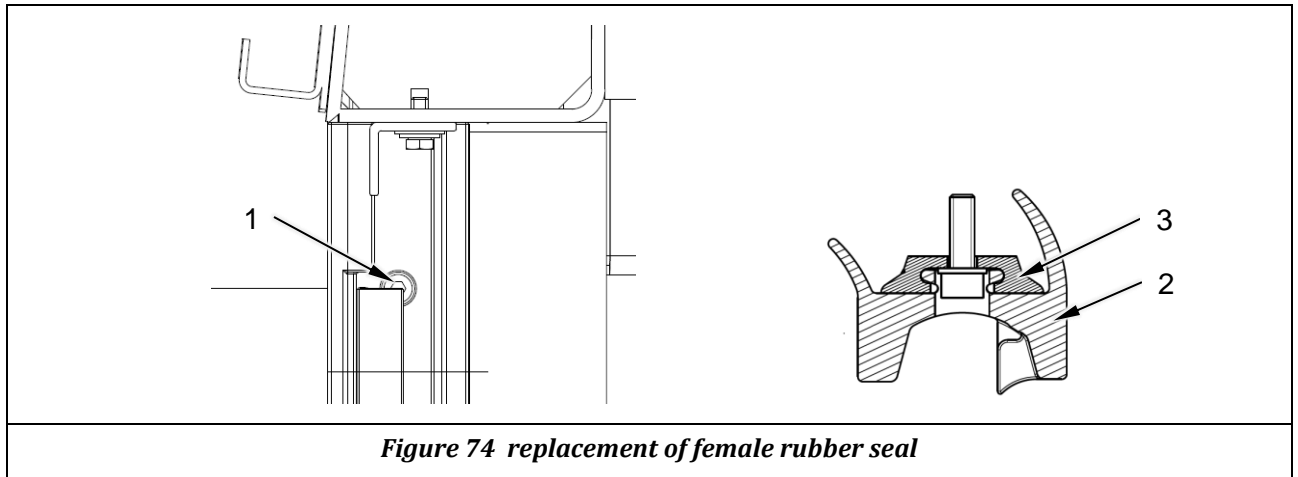


This job should be finished in workshop after female front seal assembly dismantled since it is SRU

Diagnosis: crack, damage, deformation

8.41.1 Dismount

- 1) Manually open the door
- 2) Clean the glue on the top and bottom of the rubber seal
- 3) Loosen the 8 sets of fixing screws (*item 1, Figure 74*) then dismantled the female front seal assembly
- 4) Slide the rubber seal (*item 2, Figure 74*) along the groove to remove the rubber seal from the support (*item 3, Figure 74*)



8.41.2 Replacement

- 1) Slide to install the rubber seal (*item 2, Figure 74*) on the support (*item 3, Figure 74*)
- 2) Install the female seal on the car body, fix with 8 sets of screws, tightening torque 6Nm, apply Loctite 243 and tightening mark.

Make sure that the lips are well pressed against the car body

8.41.3 Adjustment check

- 1) Proceed a automatic operation as detailed in §3.2.2

8.42 Replacement of lower swing arm assembly

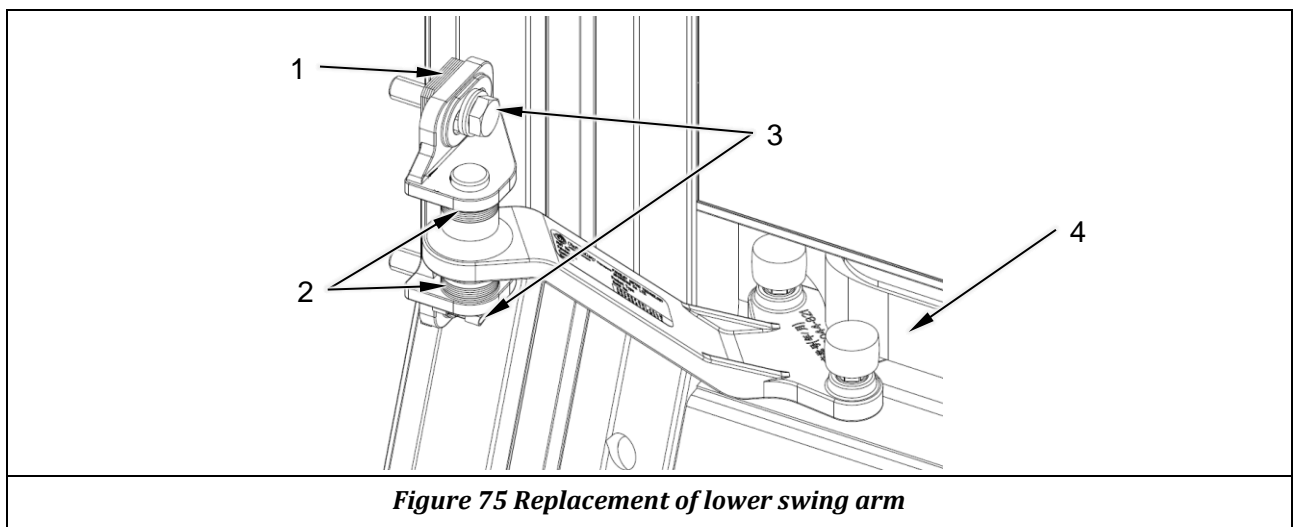


The lateral and top cover should be opened to make EAD Bowden cable accessible

Diagnosis: major failure

8.42.1 Dismount

- 1) Record the quantity of adjusting shims (*item 1, Figure 75*)
- 2) Record the quantity of adjusting washers (*item 2, Figure 75*) on both top and bottom
- 3) Loosen the screws (*item 3, Figure 75*)
- 4) Dismount the lower swing arm assembly from car body



8.42.2 Replace

- 1) Adjust the quantity of adjusting washer (*item 2, Figure 75*) as recorded according to §5.5
- 2) Insert the roller into the lower guiding rail (*item 4, Figure 75*)
- 3) Put the lower swing arm in its position, put same quantity of adjusting shims (*item 1, Figure 75*) as recorded
- 4) Manually open the door,
- 5) Move the position of lower swing arm to adjust the plug-out stroke as detailed in §5.1.6
- 6) Slightly tighten the screws
- 7) Manually operate the door to make sure the door leaf can move smoothly without hard point
- 8) Tighten the screws (*item 3, Figure 75*) with torque 49.4Nm, apply Loctite 243 and tightening mark

8.42.3 Adjustment check

- 1) Proceed an automatic operation as detailed in §3.2.2

8.43 Replacement of local push button



Isolate the power supply before any operation



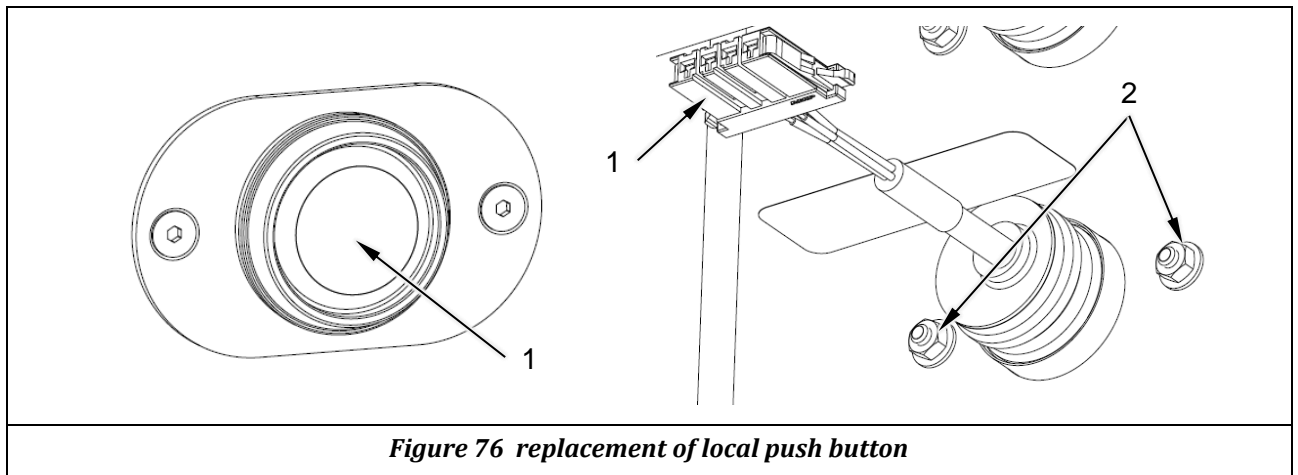
The lateral cover should be opened to make push button accessible

Diagnosis: loss of function

Note that there are 2 local push buttons for each door, which have the same procedure for replacement.

8.43.1 Dismount

- 1) Unplug the connector (*item 1, Figure 76*)
- 2) Unscrew the nut (*item 2, Figure 76*) from the back side
- 3) Extract the push button (*item 3, Figure 76*) from the FRP cover



8.43.2 Replace

- 1) Install the push button into FRP cover, fix with 2 sets of fasteners, tightening the screws with torque 1Nm, apply Loctite 243 and tightening mark
- 2) Plug the connector

8.43.3 Adjustment check

- 1) Proceed an local operation check as detailed in §3.2.3

8.44 Replacement of internal indication lamp



Isolate the power supply before any operation

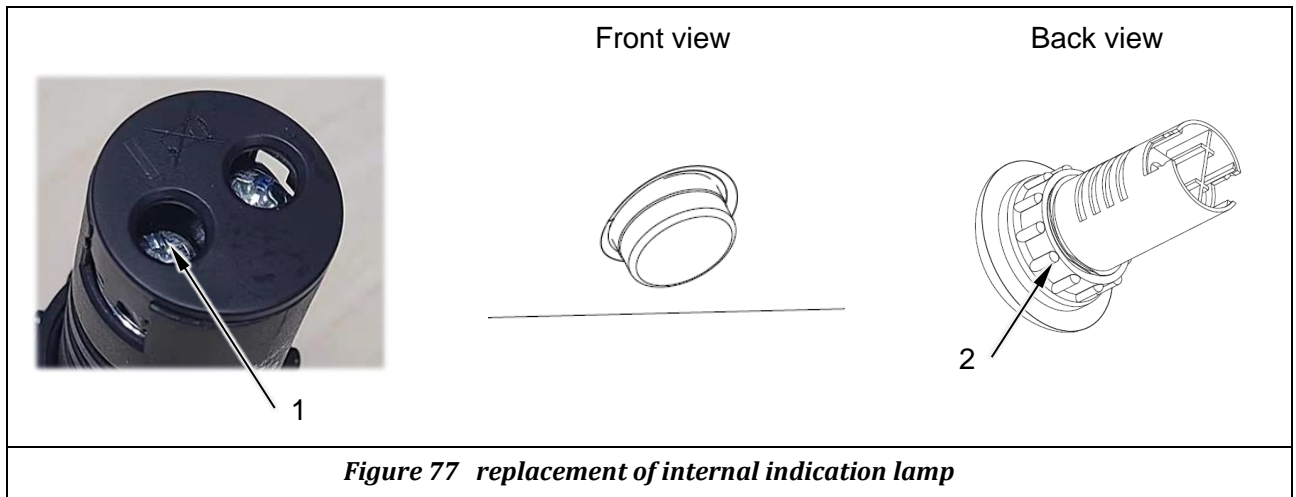


The top cover should be opened to make internal indication lamp accessible

Diagnosis: loss of function

8.44.1 Dismount

- 1) Loosen the fixing screws (*item 1, Figure 77*) and remove the wiring from lamp
- 2) Unscrew the nut (*item 2, Figure 77*) on the back side
- 3) Extract the lamp from the front side



8.44.2 Replace

- 1) **Remove the nut (*item 2, Figure 77*)** from the lamp
- 2) Insert the lamp into the FRP hole from front side
- 3) Screw the nut from back side and tighten it
- 4) Connect the wiring and tighten the screws (*item 1,*)

8.44.3 Adjustment check

- 1) Proceed an automatic operation check as detailed in §3.2.2 to check if the lamp works correctly

8.45 Replacement of external indication lamp



Isolate the power supply before any operation

The external indication lamp is on the top area of outside car, proper lift should be used to access the lamp

Diagnosis: loss of function

8.45.1 Dismount

- 1) Loosen the 3 bolts (*item 1, Figure 78*)
- 2) Remove the external lamp kit from carbody, save the O-ring inside the cover
- 3) Unplug the wiring from the lamp with special tool
- 4) Unscrew the nuts (*item 2, Figure 78*) and remove the lamp from the cover (*item 3,*)

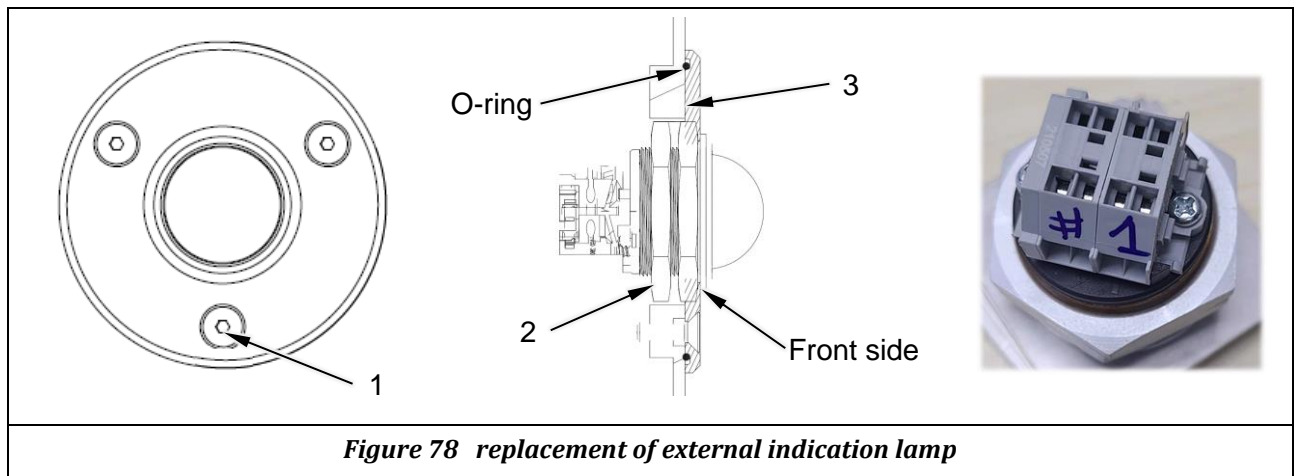


Figure 78 replacement of external indication lamp

8.45.2 Replace

- 1) Remove the nut (*item 2, Figure 78*) from the lamp
- 2) Insert the lamp into the cover and tighten with 2 screws, mind that the rubber shim should be put on the front side
- 3) Connect the wiring into the lamp
- 4) Install the lamp kit on car body, make sure that the O-ring in its correct position
- 5) Tighten the screw (*item 1, Figure 78*) with torque 2.5Nm, apply Loctite 243 and tightening mark

8.45.3 Adjustment check

- 1) Proceed an automatic operation check as detailed in §3.2.2 to check if the lamp works correctly