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J5801-C2A Car Door Installation and Maintenance Manual

Compiled by: Xu Mingqiang

Reviewed by: Wang Jianqi

Approved by: Xie Youming

BST Machinery & Electronics (Jiaxing) Co., Ltd

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Statements

Preface:

Thank you for choosing BST door operator.

Read carefully the manual to ensure safe and reliable work before the installation.

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1 Safety Precautions

1.1 This installation manual contains the following safety signs.



DANGER

It indicates that failure to comply with the notice may result in severe personal injuries.



HIGH VOLTAGE

It indicates that failure to comply with the notice may result in electric shock.



WARNING

It indicates that there are important instructions. Failure to comply with the notice may result in personal injuries or property damage.



CAUTION

It indicates that there are important instructions. Failure to comply with the notice may result in elevator damage and breakdown.



INSPECTION

It indicates that there is inspection information that shall be followed and acted upon. Failure to comply with the notice may result in personal injuries or property damage.

1.2 Emergency Safety Measures

Emergency Unlocking



Only trained professionals who are familiar with elevator safety regulations are allowed to perform manual open of the landing door and car door.

2 Installation Tools

There are mainly the following types of installation tools for the PMSM door operator system, as shown in Table 2-1.

Table 2-1 Installation tools

No.	Name	Specification	Quantity	Notes
Common tools				
1	Spirit level	500 mm	1	
2	Plumb bob	Steel 1 kg	1	
3	Screwdriver	75 to 200 mm air-suction type	2	
4	Single head wrench	10/13/18	2 sets each	
5	Socket wrench	10/13	1 sets each	
6	Internal hexagonal wrench	3/4/5/6	1 sets each	
7	Ratchet wrench	10	1 set	

2 See Table 3-1 for spare part list.

Table 3-1 Spare part list

Name	Applied	Notes
Door hanger roller ϕ 56	Door operator	
Synchronous belt	Door operator	S5M-12
Door slider assembly	Door operator	
Door contact	Door operator contact	JY08-A1Z-1
Steel rope	Door operator	The clear open width should be indicated
Encoder	Door operator	
Driving pulley	Door operator	
Steel rope pulley ϕ 64	Door operator	

4 Installation Steps

4.1 Part Description

See Figure 1.

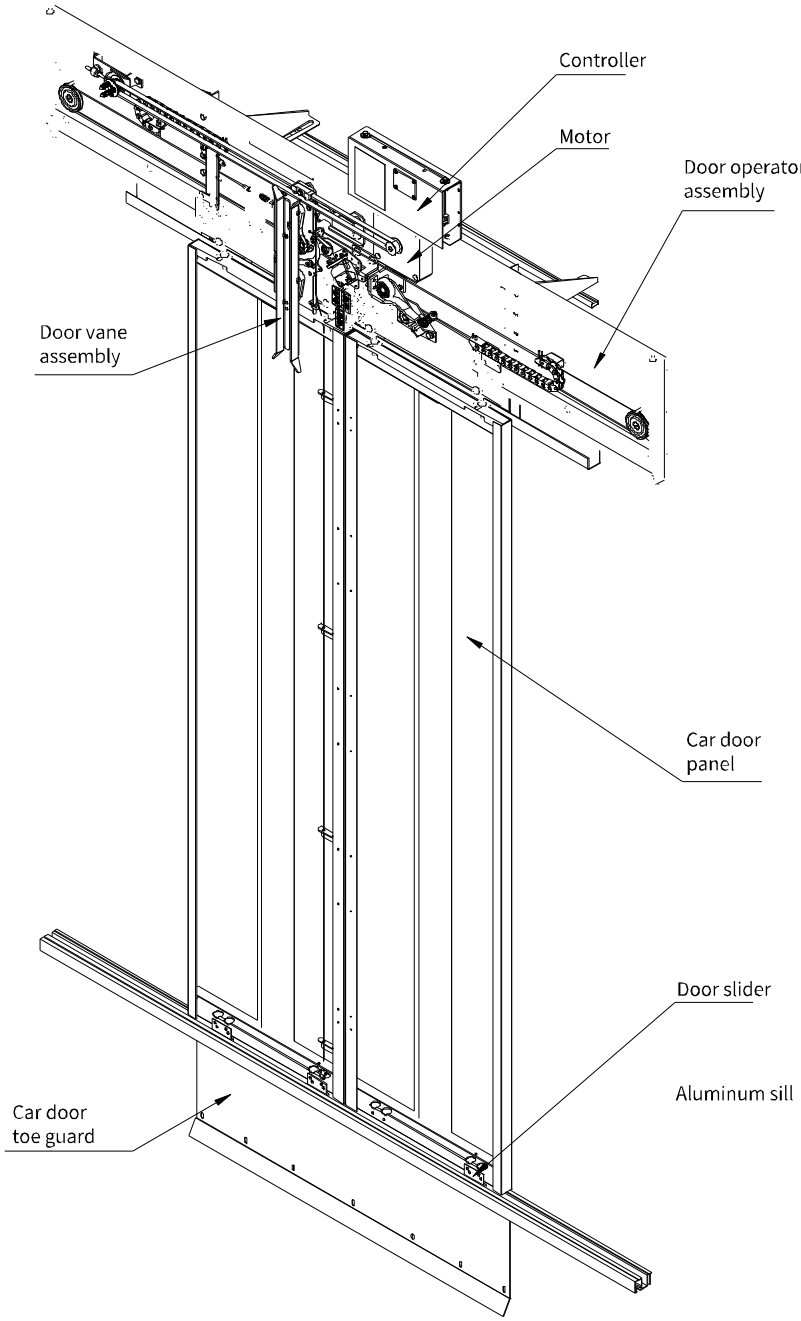


Figure 1 PMSM door operator assembly

4.2 Connection Between Door Operator and Car

4.2.1 See figure 2 for adjustment of on-site controller installation

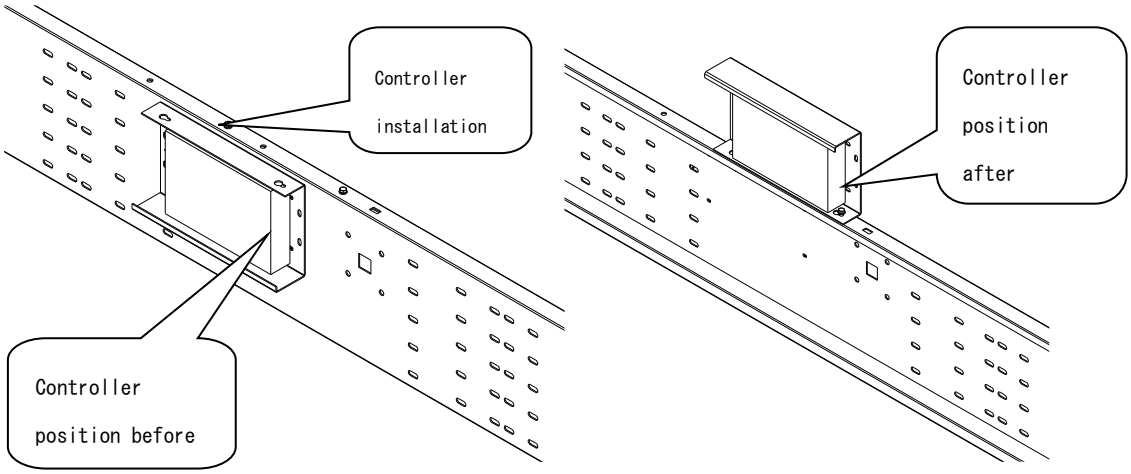


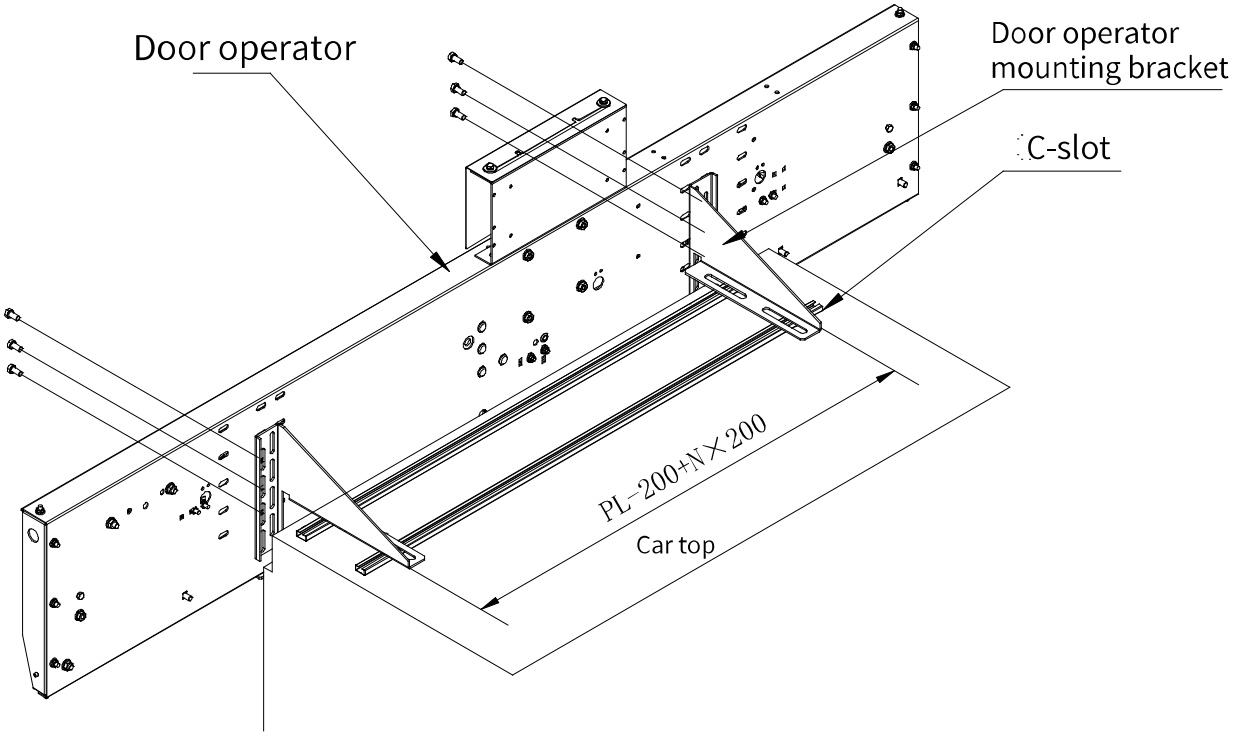
Figure 2

1. The controller is pre-assembled on the back of the header plate. There are two sets of controller mounting bolts on the upper side of the plate.

2. Remove the controller by loosening the bolts and sliding them into the gourd-shaped mounting holes of the controller bracket. Adjust the position properly and tighten the bolts, as shown in the above figure.

3.In some cases, the controller may directly be installed on the upper side of the header plate before transportation and there is no need to adjust.

4.2.2 See Figure 3.1 for connection with car top.


Door operator
Door operator
mounting bracket
C-slot
PL-200+NX200
Car top

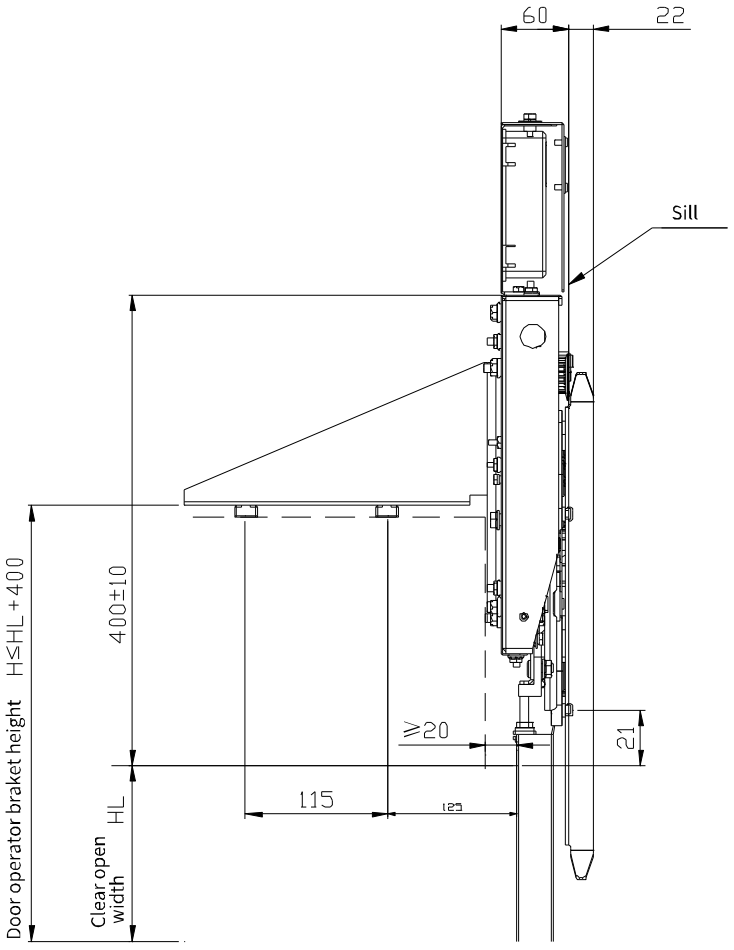

60
22
Sill
Door operator braket height H≤HL+400
400±10
≥20
21
115
123
HL
Clear open width

Figure 3.1 Connection between door operator assembly and car top

Note: When adapting to a 60 mm wide car sill, the backplate of the door operator should align with the front edge of the car, and this requirement should remain unchanged regardless of the installation method.

4.2.3 See Figure 3.2 for connection with car lintel.

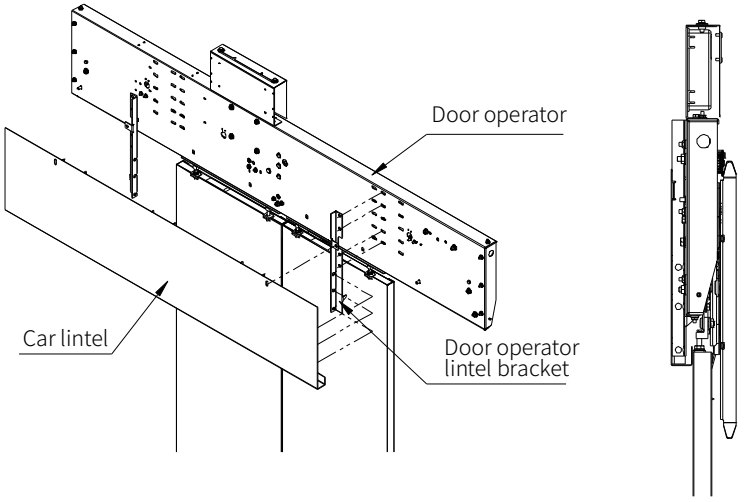


Figure 3.2 Connection between door operator assembly and car lintel

4.3 See Figure 4 for door opening width adjustment of center opening door .

Adjustment steps:

1. Move the door hanger plates to both ends of the door operator.
2. Determine the spacing: X=CO+30 (0, +2) = The distance between the door hanger plates during door open

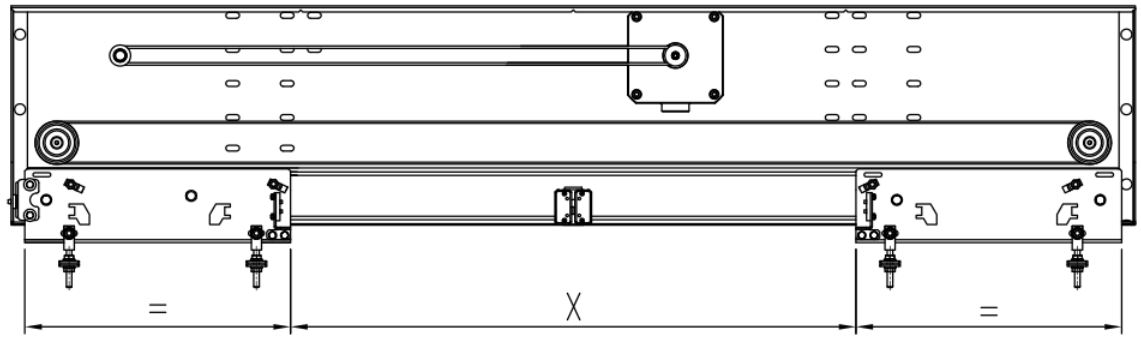


Figure 4 Door opening width adjustment of center opening door

4.4 See Figure 5 for installation of door hanger bolts.

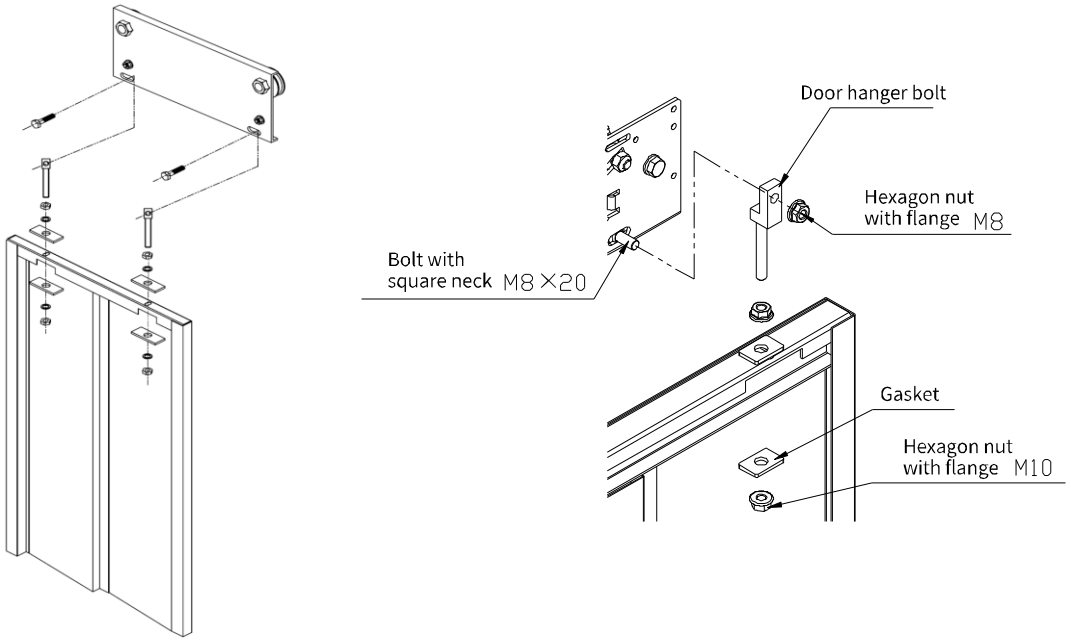


Figure 5 Installation of door hanger bolts

4.5 Eccentric Wheel Adjustment

a) Adjust the clearance with the guide rail through the eccentric wheel to ensure their frictionless contact. See Figure 6.

b) Adjust the position of the eccentric wheel through the rectangular hole on the door hanger plate to keep a gap of 0.2 to 0.5 mm with the guide rail. Then fasten the M8 screw. If the eccentric wheel is too tight, it will make the door unable to move.

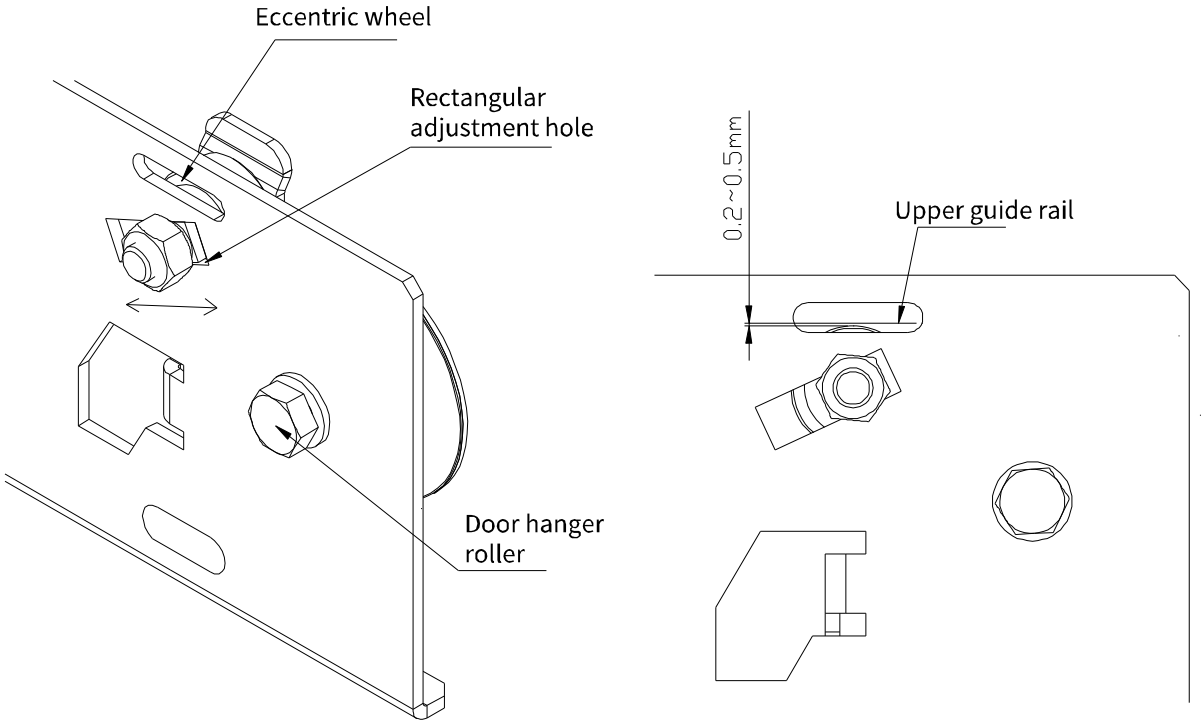


Figure 6 Eccentric wheel adjustment

* The eccentric wheel is adjusted before leaving the factory, and generally does not need to be adjusted on site.

4.6 See Figure 7 for roller adjustment on the door closer.

When the door operator and car door panel reaches the close limit and the roller on the door closer is not in the position shown in Figure 7, adjust the left/right

position of the roller bracket on the header plate to ensure that the roller is on the slope of the bracket and about 10 to 12 mm away from the edge of the bracket.

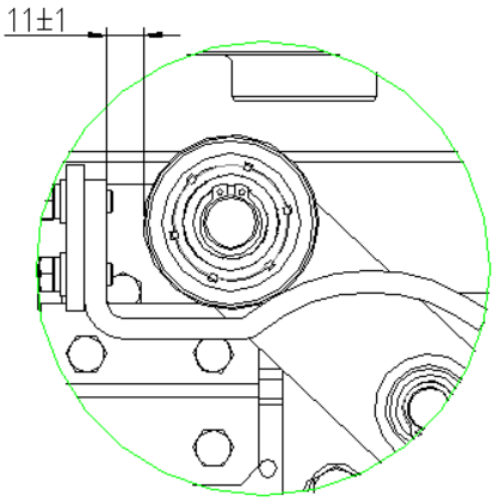
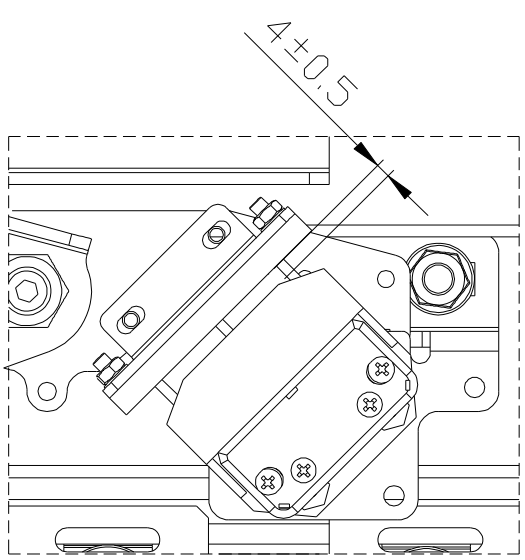


Figure 7 Roller adjustment on the door closer

* The roller on the door closer is adjusted before leaving the factory, and generally does not need to be adjusted on site.

4.7 See Figure 8 for the adjustment of the contact switch.

When the door operator and car door panel reaches the close limit, ensure that the contact switch clearance of the car door lock is 4 ± 0.5 mm (as shown in Figure 8-1) and the contact switch clearance of the door safety circuit is 3 ± 0.5 mm (as shown in Figure 8-2).



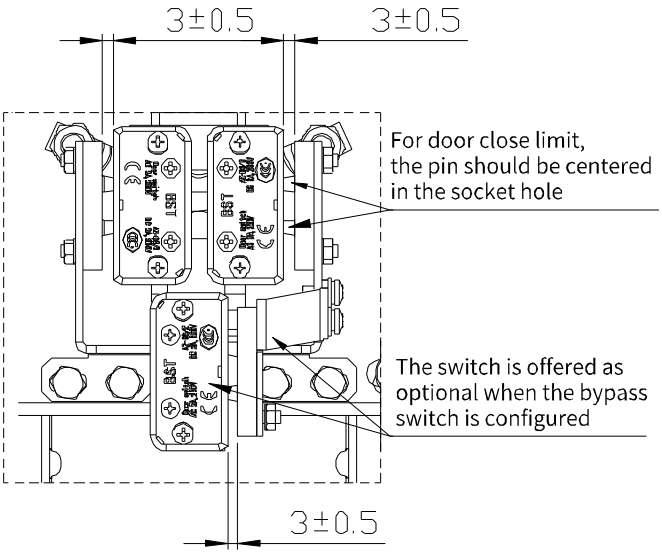


Figure 8-1 Contact switch of the car door lock Figure 8-2 Contact switch of the door safety circuit

* The contact switch clearance is adjusted before leaving the factory, and generally does not need to be adjusted on site.

4.8 See Figure 9 for adjustment of the lower lock hook bracket of the door vane.

a) Adjust the lower lock hook bracket fixed on the door header plate so that the effective distance between the door vane lock hook plate and the lower lock pin engagement is ⩾7 mm.

b) After the door is completely closed and the limit rubber block and the door hanger plate are in full contact, adjust the lower locking hook bracket to make the distance in the range of 22 to 23 mm. Reference can be made to the scale on the lock hook during adjustment.

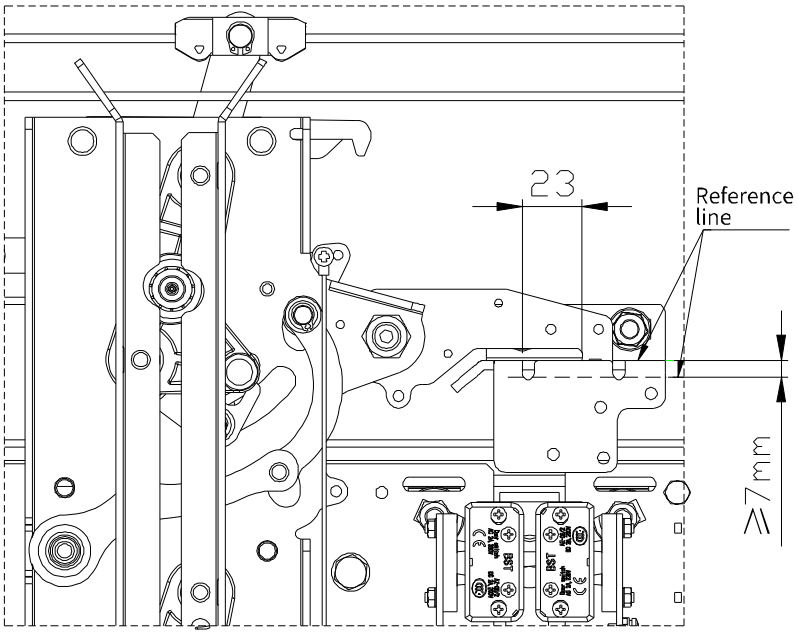


Figure 9 Lower lock hook bracket adjustment of the door vane

4.9 See Figure 10 for installation and adjustment of the remote release rope.

a) Secure the remote release rope to the screw on the door vane lock hook release plate and tighten it using a nut.

b) Pass through the steel rope fixing plate on the left door panel.

c) Pass the rope through the round hole of the sleeve and the fixing plate at the bottom of the door panel. Tighten the M5x10 screw on the sleeve using a Phillips screwdriver and cut off the excess steel rope.

d) The rope should be fastened in a way that keeps the door lock hook in a closed or locked position.

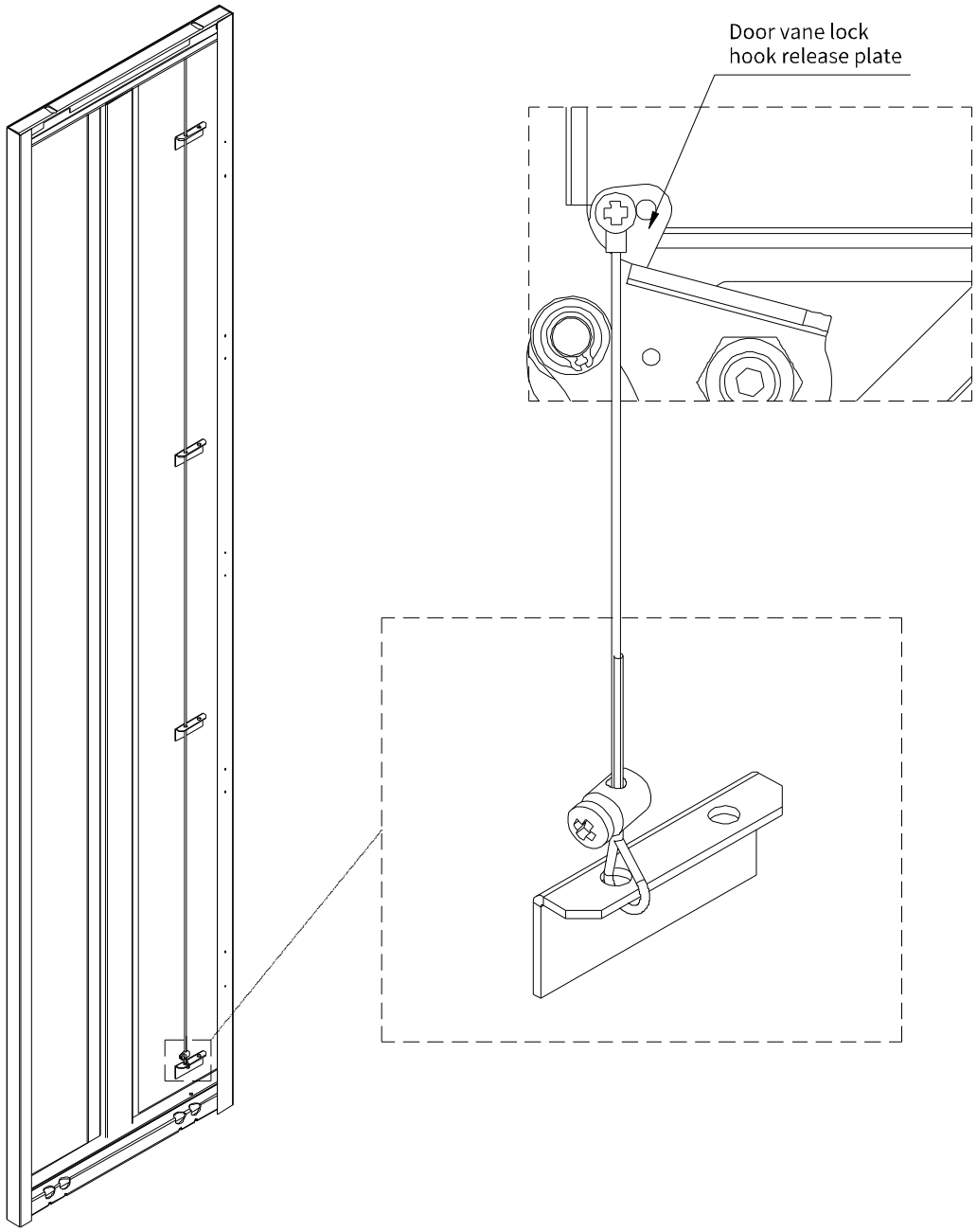


Figure 10 Installation and adjustment of the remote release rope

5 Troubleshooting Solutions

5.1 Loud noise during door close

a) Failure description and analysis: The elevator door experiences a collision

when closing at a certain floor. Upon inspection, it is determined that this issue is caused by excessive clearance between the door roller and the door vane arm, causing the landing door to close before the car door during the closing process.

b) Solution: Adjust and confirm that the gap between the door vane arm and the upper door roller is 9±1 mm, and the same adjustment should be made to the gap between the door vane arm and the lower door roller, as shown in Figure 11.

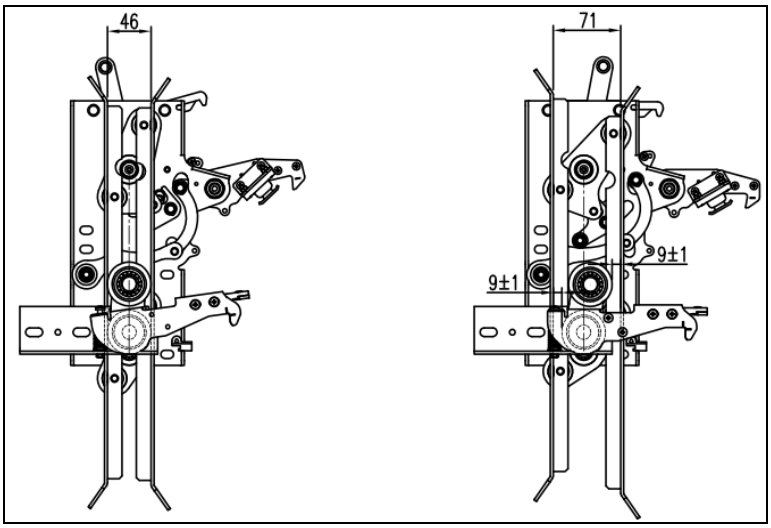


Figure 11 Fault 1

5.2 Door panel clearance is too small, resulting in door closing impact as shown in Figure 12

a) Fault description and analysis: When the door reaches the close limit, there is collision. Upon inspection, it is determined that this issue is caused by the contact failure of the close limit rubber block and the door hanger plate. As the position limit of the rubber block does not come into play, there is no gap in between door panels

closing and the sound occurs. In some cases, the door panels may have different gaps at the upper and lower parts, and the sound occurs during door close.

b) Solution: After the door is completely closed, confirm that the limit rubber block and the door hanger plate are in full contact. And readjust the gap of the door panels to a range of 1 to 2 mm and ensure that the gaps are equal. Then, perform auto-tuning again.

c) Preventive action or suggestion: When installing the door panels, adjust the gap of the door panels to a range of 1 to 2 mm and ensure that the gaps are equal.

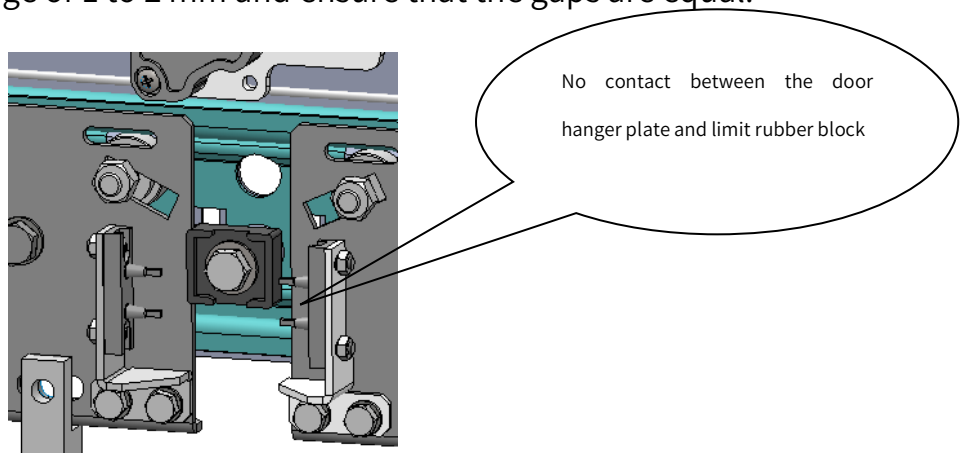


Figure 12 Fault 2.

5.3 Door open limit failure caused by mechanical resistance

5.3.1 Fault description and analysis:

a) The eccentric wheel presses the door guide rail too tight, and the door open meets large resistance.

b) The resistance between the door slider and the sill is too large.

c) The door slider collides with the bottom of the sill groove, and the door panel collides with the sill.

d) The spring exerts too large driving force for forced door close.

e) Overly tight steel ropes or toothed belts cause excessive friction and resistance.

5.3.2 Troubleshooting solutions

a) Adjust the gap between the eccentric wheel and the door guide rail to be between 0.2 mm and 0.5 mm (Figure 6).

b) Clean the sill, correct the perpendicularity of the door hanger plate and door panel by adjusting the gasket (as shown in Figure 13-1, Figure 13-2 and Figure 14), and adjust the gap between the door slider and the sill by adjusting the gasket (as shown in Figure. 14) to make it run smoothly.

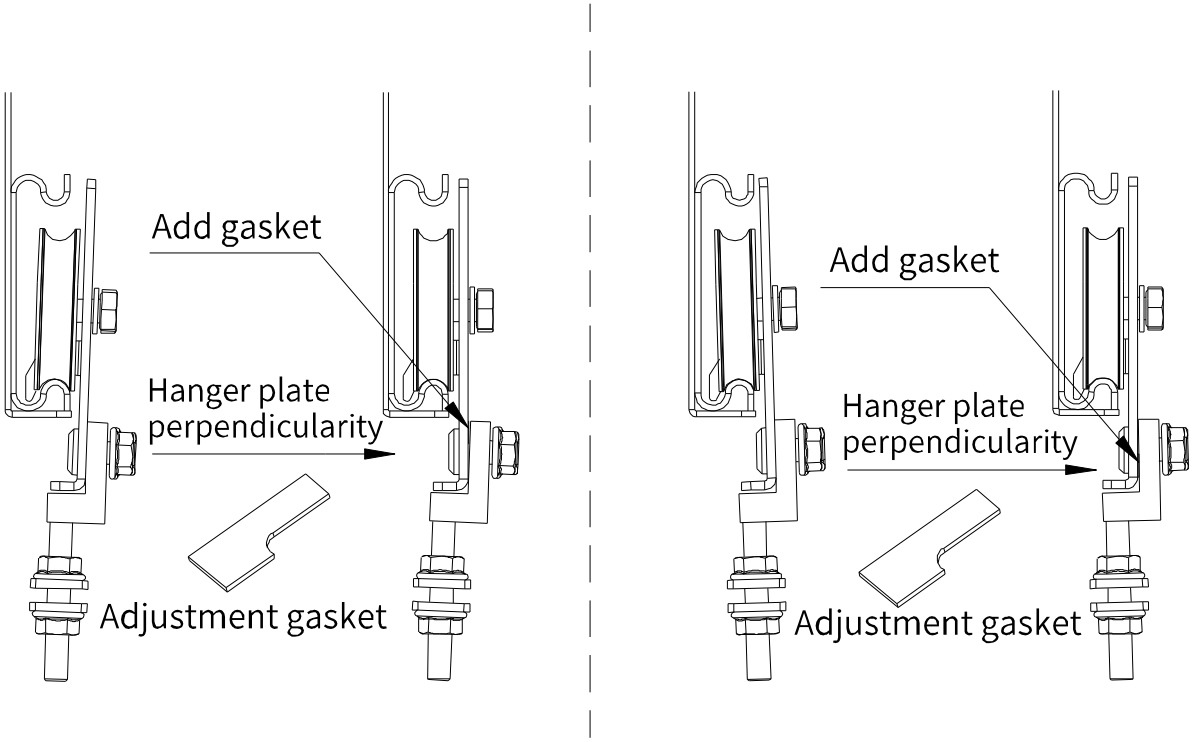


Figure 13-1 Door hanger plate and door panel adjustment

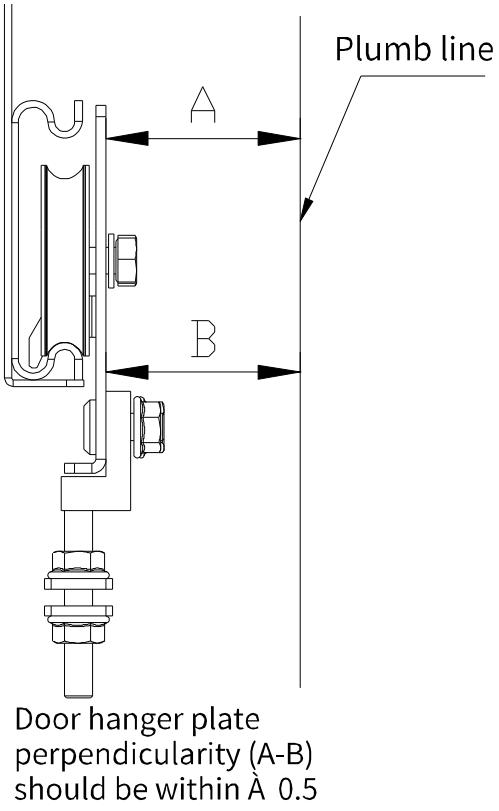


Figure 13-2 Door panel perpendicularity

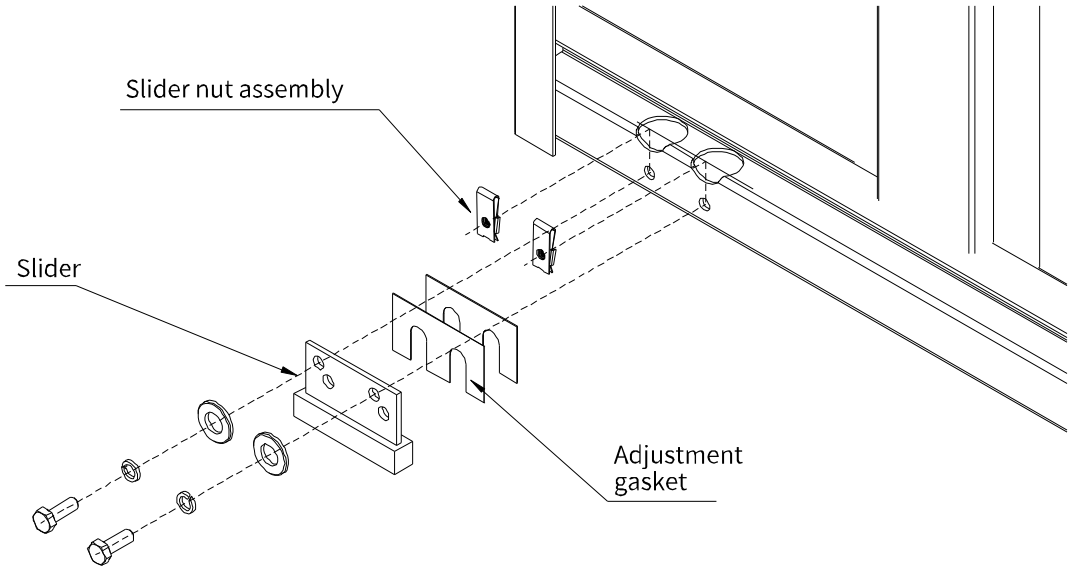


Figure 14 Door slider adjustment

c) Adjust the gap between the door panel and the sill to a range of 3 to 5 mm.

d) Move the spring traction hook to reduce the spring driving force.

e) Adjust the tightness of the steel ropes and toothed belts.

f) If the above adjustment methods do not work, seek professional help.

5.3.3 Advice

a) Refer to the operation manual during installation for details.

b) Check the running resistance of the door operator during installation.

5.4 Door open collision caused by door vane not released completely

a) Fault description and analysis: The door vane is not fully retracted for door open. As it approaches the door open limit block, it fails to creep at low speed and strike happens at the door open limit. When the door operator operates the door,

there is perfect synchronization between the car door and the landing door. The door vane should be fully retracted before it drives the landing door panel and also the landing door is unlocked. Then the toothed belt transfers motion between the two doors so that they can be moved together. The toothed belt needs to move a distance of 7 mm to make sure the door vane is fully retracted. In this case, as the door vane is not fully retracted, the toothed belt travels less than 7 mm and it continues to drive the door running at a relatively fast speed even when it reaches the door open limit.

b) Solution: Check and adjust the resistance of the door vane mechanism that may exist.

Adjust and confirm that the gap between the door vane arm and the door roller is 9±1 mm, as shown in Figure 11.

5.5 The door operator guide rail lubricant absorbs dirt and other debris, resulting in increased resistance.

a) Fault description and analysis: Lubricant (including various existing greases and liquids) should not be applied to the door operator guide rail. The lubricated rail attracts dust and debris, causing a buildup over time. This buildup can lead to increased wear and tear on both the door roller and the rail itself. In certain

situations, the door roller may not move smoothly, and this can result in increased noise during the operation of the door.

b) Solution: Clean the guide rail and door roller.

5.6 Slight bouncing back after door close

5.6.1 Fault description and analysis: In some cases, there is a slight (1 to 2mm) bouncing back after the door is closed.

5.6.2 The main causes are:

a) The roller position of the door closer shifts sideways.

b) The door close limit rubber block is too soft.

5.6.3 Troubleshooting solutions

a) Readjust the roller position of the door closer to the slope of the bracket, as shown in Figure 7.

b) Replace the door close limit rubber block and perform auto-tuning again.

5.7 Door close impact caused by excessive clearance of the door vane lock hook

a) Fault description and analysis: When the door panel approaches complete close, there is obvious acceleration, sometimes causing impact.

When the door vane is released, self-locking occurs, and it needs to work with the door vane starter bracket for retraction. If the door vane starter bracket contacts

with the lock hook too early, it causes the door vane to release in advance during close.

During normal operation, there is a low-speed creeping distance of 3 cm to 4 cm before reaching the end of door close. Once the door fully closes, the door vane starter bracket comes into contact with the lock hook, initiating the release mechanism. Also, the motor drives the toothed belt to move the door vane at a relatively high speed to complete the door vane arm release action.

For the release that starts too early, the low-speed creeping distance becomes shorter, and the door closes at a relatively high speed (the speed designed otherwise for door vane release in the program). You will see that the door panel will accelerate obviously, and sometimes there will be a crashing sound.

b) Solution: Adjust the door vane starter bracket so that it contacts the door vane lock hook for release once the door fully closes. When the door reaches the door close limit and the door vane retracts, the gap between the bracket and lock hook is about 5 to 6 mm. Figure 15 shows the details.

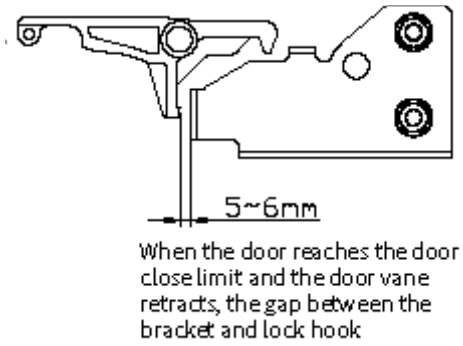


Figure 15 Gap between the starter bracket and door vane lock hook

c) Advice: Refer to the operation manual and knoe the key dimensions.

5.8 In the leveling zone, the door cannot be pried open inside or outside the car

a) Fault description: In the leveling zone, passengers in the car cannot pry the door open in emergencies that cause elevator stop. Another case is the car door cannot be opened after the personnel outside use the triangle key to open the landing door and rescue cannot be performed.

b) Solution:

Adjust and confirm that the gap between the door vane arm and the upper door roller is 9±1 mm, and the same adjustment should be made to the gap between the door vane arm and the lower door roller.

Adjust the lower lock hook bracket fixed on the door header plate so that the effective distance between the door vane lock hook plate and the lower lock hook engagement is ⩾7 mm. But the figure should not be too high.

After the door is completely closed and the limit rubber block and the door hanger plate are in full contact, adjust the lower locking hook bracket to make the distance in the range of 22 to 23 mm.

c) Advice: Check regularly the door open conditions in emergencies. Make adjustment based on solutions above if necessary.

6 Maintenance Precautions

6.1 Read the installation manual before installation and the AC drive commissioning manual before commissioning.

6.2 Shielding protection should be provided for the AC drive door open/close signal to avoid the interference from the high-voltage systems.

6.3 The electrical control system should be well protected to avoid the ingress of foreign objects, especially metal objects and chips.

6.4 See the AC drive commissioning manual for electrical commissioning.

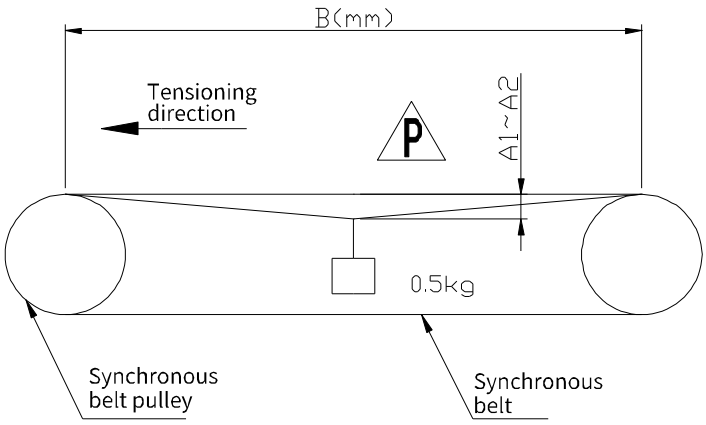
6.5 Wipe the guiding rail of the door at each maintenance session. Check the extent of wear of the door roller. Make replacement if the depth of wear exceeds 1.5 mm.

6.6 Check the tension of the steel rope and synchronous belt at each maintenance session (see Figure 16).

6.7 Check the tension of standard parts at each maintenance session.

6.8 Lubricate the movable parts of the door operator.

6.9 Check regularly the position of limit switches of the door operator to ensure normal operation.



PL	B	A1	A2
700	765	14	18
800	815	14	18
900	865	14	18
1000	915	14	18
1100	965	14	18

Figure 16 Tensioning of the door operator synchronous belt