DAZEN

# Installation Diagram

# Content

**General View** ..... **1**
**General Safety Rules for Elevator Installations** ..... **3**
**Preparation for Elevator Installation** ..... **4**
1. Familiarity with installation process flow diagrams ..... 4
2. Inspection of shaft, PIT and machine room. ..... 4
3. Inspection of scaffold ..... 5
4. Set-up of the installation site. ..... 5
5. Power checks and construction electricity ..... 5
6. Handling and storage of equipment ..... 7
7. Unpacking of equipment and inventory of items ..... 8
8. Safety protection of shaft ..... 8
**Shaft Measurement and Sample Frame Placement** ..... 10
1. Shaft measurement ..... 10
2. Sample rack production ..... 10
3. Sample rack positioning ..... 12
4. Shaft release and fixing ..... 12
**Installation without scaffold.** ..... 13
1. Preparation ..... 18
2. Placing the sample line. ..... 18
3. Work in the machine room. ..... 18
4. PIT equipment installation ..... 18
5. PIT assembly car frame ..... 19
6. Installing the top level platform ..... 21
7. Alignment into shaft PIT ..... 21
8. Installing the traction rope with cable ..... 21
9. Removing the top deck ..... 23
10. Car roof protection and car roof wiring ..... 24
11. Install the second loop of rail ..... 25
12. Debugging slow ride ..... 26
13. Install the remaining rail ..... 27
14. Installation of alignment guide shoe ..... 28
15. Installation of alignment guide shoe ..... 29
16. Installation of alignment guide shoe ..... 30
17. Alignment into shaft PIT ..... 30
18. Alignment into shaft PIT ..... 32
**Entrance/Exit Installation** ..... 34
1. Inventory of landing door sill ..... 34
2. Landing door sill installation ..... 34
3. Door pocket installation ..... 35
4. Installation of the landing door unit ..... 34
5. Installation of the landing door ..... 34
6. Adjustment of the landing door lock ..... 34

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7. Installation of forced closing device for hall doors ..... 34
8. Toe guard and landing door cover installation ..... 35
9. Triangulation chain installation ..... 34
**Installation of Rail Bracket** ..... 34
1. Positioning of the rail bracket ..... 34
2. Fixing of the rail bracket ..... 34
3. Welding requirements for rail bracket ..... 35
**Rail Mounting and Adjustment** ..... 34
1. Rail cleaning ..... 34
2. Rail lifting into shaft ..... 34
3. Rail connection and fixing ..... 35
4. Rail calibration ..... 37
**Traction Engine Installation** ..... **39**
1. Installation of machine room spandrel girder ..... 39
2. Install shock pad ..... 40
3. Installation of the traction machine rack ..... 41
4. Traction engine positioning ..... 41
5. Guide pulley adjustment ..... 42
6. Rope hitch plate welding ..... 43
7. Installation of machine room spandrel girder ..... 43
8. Installation of shock pad ..... 44
9. Installation of the traction engine rack ..... 44
10. Rope hitch plate welding ..... 44
**Control Box Positioning and Machine Room Wiring** ..... **46**
1. Installation of the control box ..... 46
2. Machine room cabling ..... 46
3. Trunking fixed ..... 47
**Shaft Prewire Installation** ..... **48**
**Reference Diagram for Shaft Wiring** ..... **48**
**Fixing of the Shaft Wire** ..... **50**
**PIT Wiring Reference Detail** ..... **50**
**Shaft Lighting Installation** ..... **51**
1. Installation of shaft lighting ..... 51
**Car Frame and Car Mounting** ..... **52**
1. With machine room car frame assembly ..... 52
2. With machine room platform assembly ..... 54
3. Without machine room car frame assembly ..... 56
4. No machine room platform assembly ..... 57
5. Car wall, car roof and car roof protective guard assembly ..... 58
6. Installation of car roof car diversion sheave and car door toe guard ..... 60
7. Table of common parts for car installation ..... 61
8. Table of common parts for car frame installation (Q ≤ 1000 kg) ..... 62
9. Car frame mounting common parts (1000 < Q ≤ 1600 kg) ..... 63

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**Installation of Door Lifter and Car Door ..... 64**
1. Door lifter installation ..... 64
2. Car door panel installation ..... 65
3. Light curtain installation ..... 64
**Alignment Installation ..... 67**
**Suspension traction wirerope ..... 71**
1Wirerope pre-suspension preparation and precautions ..... 71
2 Taper sleeve production ..... 72
3 Wirerope suspension ..... 73
4 Wirerope fixing ..... 74
5 Wirerope adjustment ..... 76
**Installation of Car Prewire and Follow-up Cable ..... 77**
1 Car prewire installation ..... 77
2 Preparation and precautions for follow-up cable installation ..... 77
3 Follow-up cable installation ..... 78
**Bumper Installation ..... 80**
1. Alignment hydraulic bumper installation ..... 80
2. Installation of the car hydraulic bumper ..... 80
3. Installation of car polyurethane bumper ..... 81
4. Installation of the alignment polyurethane bumper ..... 81
5. Bumper installation related instructions ..... 82
6. Selection of various bumper models and the range ..... 82
**Installation of Speed Restrictor and Tensioning Gear ..... 83**
1 Speed restrictor installation ..... 83
2 Tensioning gear installation ..... 82
3 Speed restrictor wirerope suspension ..... 85
**Speed Reduction Limit Switch Installation ..... 86**
1. Overview of upper and lower forced reduction limit ..... 86
2. Upstream deceleration limit switch installation ..... 87
3. Limit switch installation for downstream speed limiters ..... 87
4. Table of deceleration distances L for forced deceleration ..... 87
**Car Leveling Device Installation ..... 88**
1. Installation of car leveling switches ..... 88
2. Installation of leveling inductor plates ..... 88
**Human-machine Exchange Installation ..... 89**
1. Installation of the car control box ..... 89
2. Installation of shaft outsourcing ..... 90
**PIT Alignment Protective Guard Installation ..... 91**
1. Installation of the PIT alignment protective guard ..... 91
**Bucking-out System Installation ..... 92**
1. Overview of the bucking-out system ..... 92
2. Compensation chain bracket mounting ..... 92
3. Compensation chain suspension ..... 93
4. Installation of compensation chain anti-sway device ..... 93

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5. Installation of the all-plastic compensation chain ..... 93
**PIT Ladder Stand Installation ..... 95**
1. Installation of the PIT ladder stand ..... 95
**Commissioning and Operational Readiness ..... 96**
1. Slow test run to check commissioning ..... 96
2. Fast ride run check debugging ..... 97

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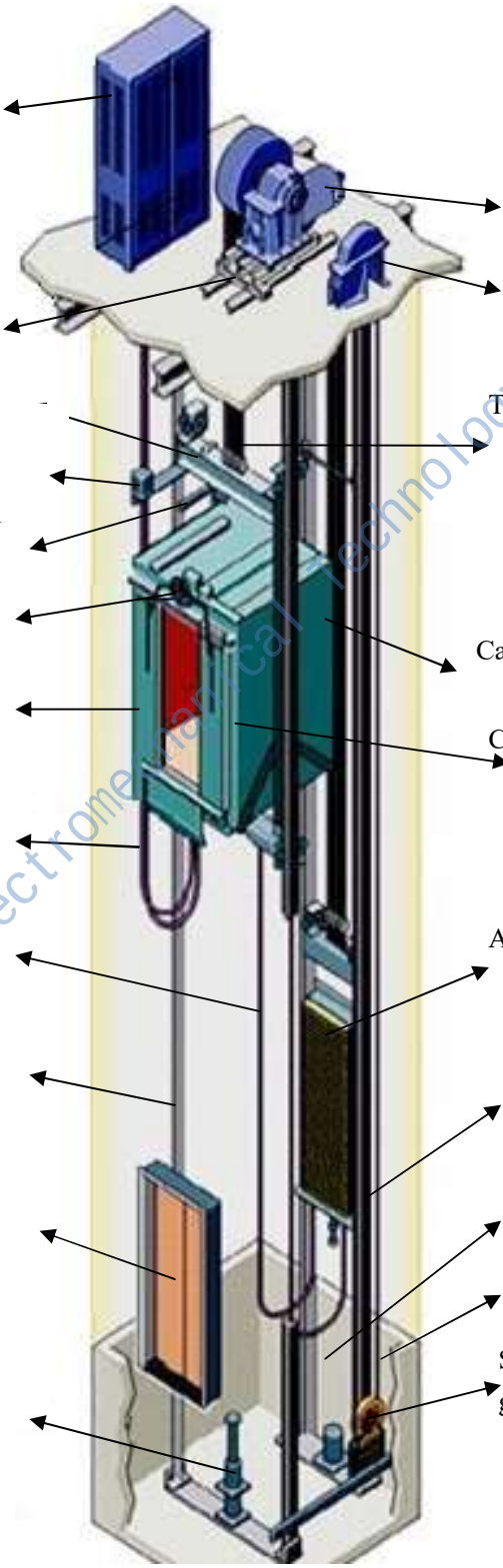
# General View

1. With machine room

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2. Without machine room

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# General Safety Rules for Elevator Installations

1. This manual has been prepared with the default assumption that the installation has been started and the lift is delivered to the installation site.
2. This manual is for installations with a scaffold and are written as if it has been erected properly.
3. Installers must remember the concept of "safety first". When the installers enter the site they must wear helmets, appropriate clothing and safety shoes. They must not wear bracelets, rings or other accessories. It is strictly forbidden to play, tease or drink alcohol while working.
4. When working on the scaffold, climb up and down with a firm grip and wear a safety belt.
5. Two lifelines hang from the top of each shaft, secured with brackets of sufficient strength.
6. When the lift is installed, access to the shaft shall be in accordance with the construction safety requirements for lift works sites.
7. Avoid carrying out two or more jobs on different floors within the shaft.
8. The work area and surrounding area must be kept clean and a safe environment must be maintained at all times to prevent tripping or other damage. In machine rooms where pre-drilled holes are left, objects shall be secured by boards or moved with heavy objects covering the pre-drilled holes so that they fall into the shaft.
9. There should be sufficient lighting in the shaft and the use of open flame lighting is strictly prohibited.
10. When flammable, explosive and hazardous liquids are used, there must be adequate air circulation, protection and fire-fighting equipment set up. Smoking and the introduction of fire are strictly forbidden on site. If in an enclosed area and no ventilation is available, a permitted mask must be worn to prevent the solution coming into contact with the skin. Do not mix oxygen, chlorine etc. with these solutions as this may lead to an explosion.
11. When using power tools, ensure that they are reliably and effectively earthed and equipped with an electric leakage protector. Power tools must not be used in wet or water and must not be used for other purposes.
12. Gas cutting equipment should be placed in a proper place with "No Smoking" signs, fire fighting measures and fire extinguishing tools. Oxygen and acetylene cylinders should be stored at a distance of not less than 7m and at least 10m away from sources of ignition.
13. It is forbidden to climb or slide down on cables, wires, rails, compensation chains.
14. At the end of each day, check that no tools or useless items have been picked up and see that the work scheduled has been completed. Check that switches and cables are on. You should also make sure that fire protection equipment is in good order.
15. A first aid kit is required on site.

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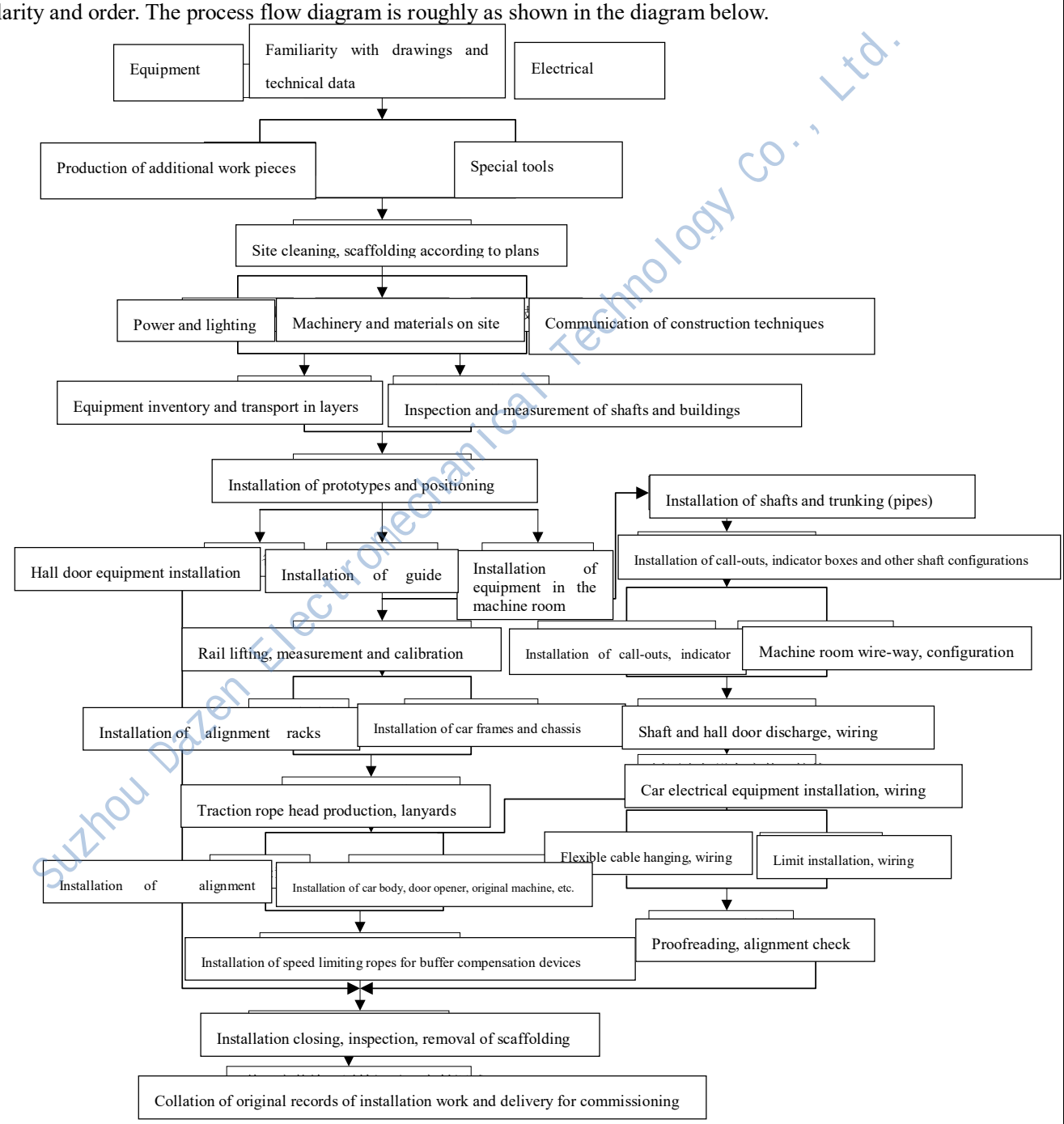
# Preparation for Elevator Installation

1. Familiarity with installation process flow diagrams

2. The process flow diagram is the general outline and framework for the installation of a lift. Installers need to be familiar with the process flow diagram so that they can have a general grasp of the installation process and achieve clarity and order. The process flow diagram is roughly as shown in the diagram below.

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3. Inspection of shaft, PIT and machine room

4. 2.1 Check that the inner surface of the shaft meets the installation requirements, that the shaft is clear and that there are no fillings or protrusions, etc.

2.2 Measure the shaft width, shaft net depth, PIT depth, top floor height and hall door opening dimensions at the ground floor and top floor, and check the dimensions with the drawings for any discrepancies.

2.3 Check the position of the holes left in the machine room and the position, size and requirements of the shaft pre-built parts are correct.

2.4 Check that the load-bearing hooks meet the requirements.

2.5 If there is a raised platform above 500 in the machine room, are there stairs, handrails, guardrails, etc.

2.6 Check the PIT for rubbish, debris, standing water, etc.

2.7 Organize space for storage of equipment, items and living accommodation for installation personnel.

Any of the above items that do not comply with the lift installation will need to be addressed and cleared up promptly.

5. Scaffold check

The scaffold is already set up by default in these instructions. Before the scaffold is set up, advice and guidance should be provided by the person concerned with the installation of the lift. Before installing the lift, check that the scaffold meets the requirements of the lift installation.

3.1 According to the civil layout drawing or installation drawing, refer to the installation position of various components in the shaft and the operating distance during construction, and check whether the scaffold prevents the installation of the lift, such as the installation position of the large and small rail, the operating distance of the ticking rack hole, and the installation position and distance of the speed restrictor wirerope, hall door, electrical pipe channel, intermediate junction box, etc. distances, etc. The following diagram shows the space plan of the scaffold after alignment.

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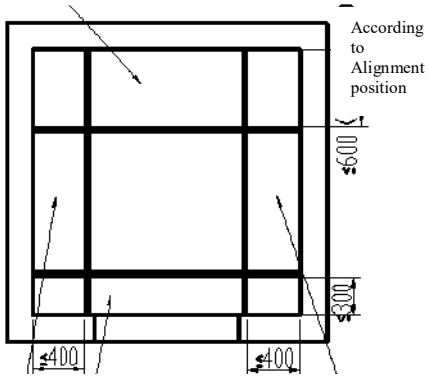
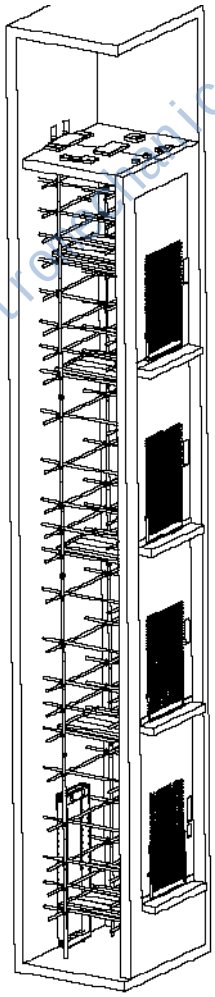
Alignment , Alignment rail and bracket mounting space




Installation space for floor door unit, floor cantilever, floor

Space for installation of car rails, rail brackets

3.2 The erection must be in strict compliance with the specification requirements of JGJ130-2001 "Safety Technical Code for Fastening Steel Pipe Scaffold for Building Construction".



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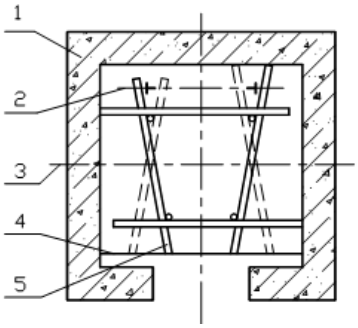
3.3 The scaffold should be safe and secure with a load capacity of not less than 2500 Newton/$m^2$ (250 kg force/$m^2$ ) and the scaffold may be in the form of a single tic-tac-toe steel pipe scaffold, as shown in the diagram.



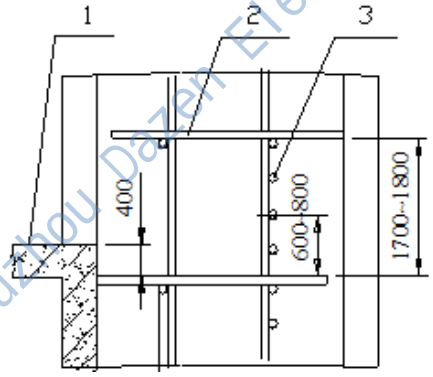

1 - floor level; 2 - scaffold beams; 3 - stairs for climbing

3.4 Scaffolding must be fastened with tight fasteners; the spacing of the crossbeams should be 600-800mm, and the crossbeams at the entrance of the layer doors should be erected according to the requirements of the diagram; each layer on the door crossbeam, two or more scaffolding boards are laid, each layer should be staggered, the scaffolding boards protrude 50mm from the crossbeam and the ends should be firmly tied to the crossbeam. Bamboo fences may be laid on the door beams at each level, but both ends must be firmly tied to the beams.

3.5 In order to facilitate climbing up and down, additional steps are added between the beams on each level on one side of the scaffold at intervals of 300-400MM.

3.6 Scaffold erection from the top floor upwards should be considered for easy removal when installing the car.

3.7 The scaffold must have passed a safety inspection before it can be used.




1 - floor level; 2 - scaffold beams; 3 - stairs for climbing

Installation site layout

4.1 Clear a suitable warehouse for the storage of equipment, materials, items etc. The warehouse can be securely locked and the ground is now dry; electricity is provided for lighting; protection and fire protection measures are provided; and the handling of equipment, materials and items is facilitated.

4.2 Clear the place where the installers live and rest, guaranteeing adequate rest for the installers, good fire, burglary

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and electricity protection measures.

## 6. Power check and construction electricity

5.1 Check whether the special power cable for the lift goes to the machine room, if there is no power supply or if it is a temporary power supply, the ordering unit should be notified and the power supply should be installed as an official power supply in time.

5.2 Whether the specifications of the lift power conductor, cable and other control lines meet the requirements of the drawings, and the quality of the zero line should meet the requirements of use.

5.3 Electricity for construction must be provided with a special gate box with warning markings, short-circuit and overload protection devices for each load, and electricity for hand tools must be controlled by matching earth leakage protectors.

## 7. Handling and storage of equipment

Proper lifting equipment must be used when unloading, and boxes must be stored in a watertight area and not stacked too high.

Move the materials into the store prepared in advance, arrange all kinds of objects neatly according to the category, when the objects are stored, pay attention not to damage the equipment, parts, etc., and do a good job of 5S management in the store; the store needs to do a good job of anti-theft, damage prevention and fire prevention measures.

## 8. Unpacking equipment and inventory of items

Check the packing list carefully, open the box and check whether the quantity, specification and size of materials and objects are in accordance with the packing list, if there is any discrepancy, you need to contact the relevant personnel to ask for it.

## 9. Security of the shaft

8.1 Build a step of not less than 50mm around the hole in the floor of the machine room leading to the shaft and cover it with a cover plate.

8.2 Entrance protection bar

Each floor landing door entrance is fitted with a safety-compliant protective device (guardrail), as shown below, which can withstand a force of 90kgf in both vertical and horizontal directions.

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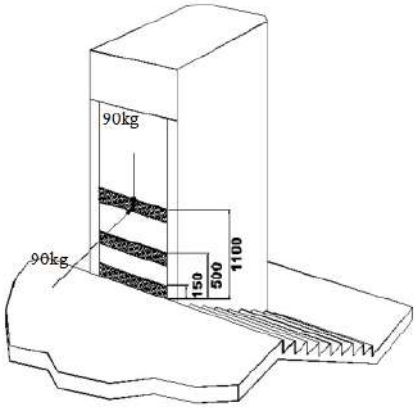
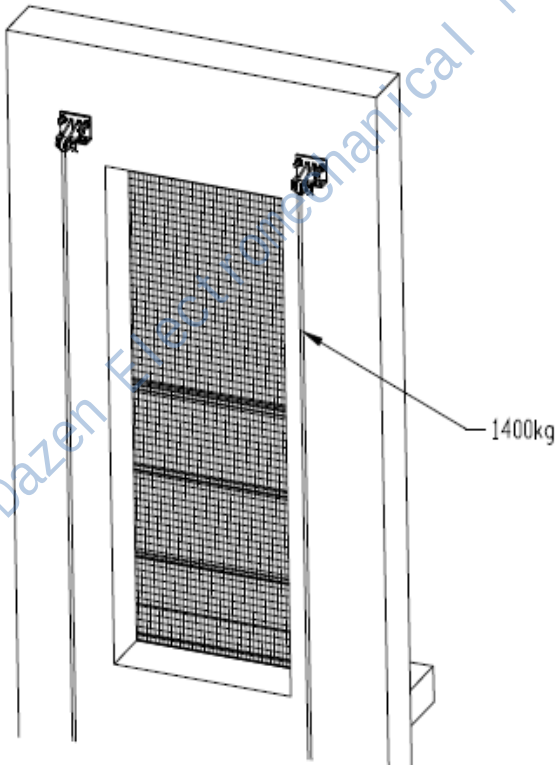



8.3 Lifeline installation

Before entering the shaft, two lifelines are fixed and connected in the shaft. To facilitate operation in the shaft, we use lifelines that are fixed in a reliable position, depending on the site conditions and local regulations.

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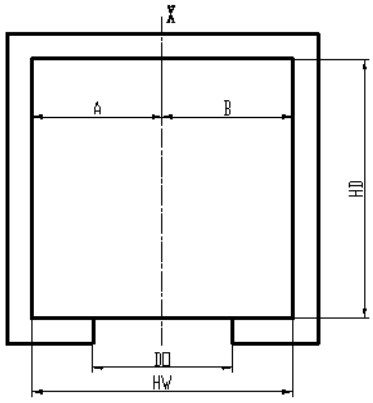
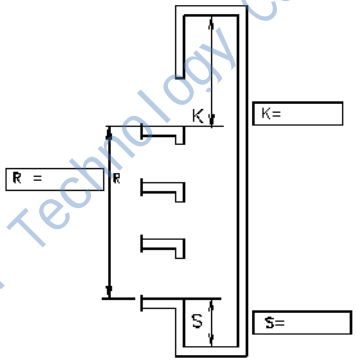
# Shaft Measurement and Sample Frame Placement

## 1. Shaft measurement

2.1 According to the civil layout drawing of the lift equipment in the contract, determine the car centre line, try to make A equal to B. At the same time, you need to measure the basic dimensions of shaft: shaft net width HW, shaft net depth HD, hall door opening width DO, hall door depth net height SO, shaft lifting height R, shaft top floor height K, shaft PIT depth S.




2.2 Measure shaft lift height R, shaft top height K and shaft PIT depth S to match the civil drawings.

2.3 shaft vertical direction, according to the provisions of GB/T 7025.1-1997, check the lift shaft horizontal dimension is the minimum headroom dimension measured with a lead hammer, the allowable deviation of which is as bellow.

0 to +25mm, when height ≤ 30m

0 to +35mm, when height ≤ 60m

0 to +50mm, when height ≤ 90m

To ensure installation, the above deviations need to be fully taken into account.

## 10. Sample rack production

3.1 The sample frame is the foundation of the lift installation, which is directly related to the installation of the lift rail and the dimensional accuracy of the mainframe positioning. Moreover, in order to put a stable line, the weight of the plumbing hammer is often added during construction, which makes the sample plate bear a large tension, so the production of the sample plate must ensure quality and strength.

3.2 The material of the sample frame is generally made of easy to make, low cost, high toughness, good rigidity, high

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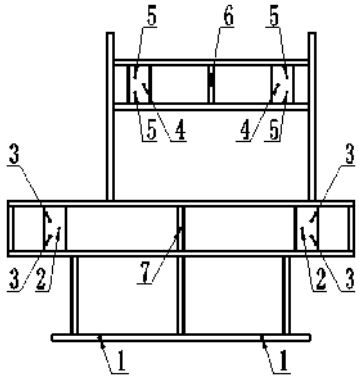
strength and not easy to deformation, such as 40# angle steel.

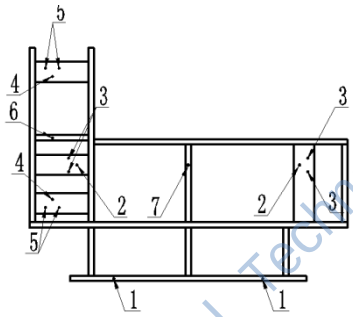
3.3 After the angles of the sample are cut according to the specific dimensions, they are burned by electric welding, the bottom surface should be in the same plane, the angle is vertical and the diagonal error is as far as possible

Possibly small.

3.4 Find the accurate release point. For the convenience of installation, a certain measuring distance (e.g. 50mm) can be left between the wirerope and the positioning target (e.g. rail bracket, rail, landing door sill, etc.) when placing the upper sample frame. The surface should be placed below.



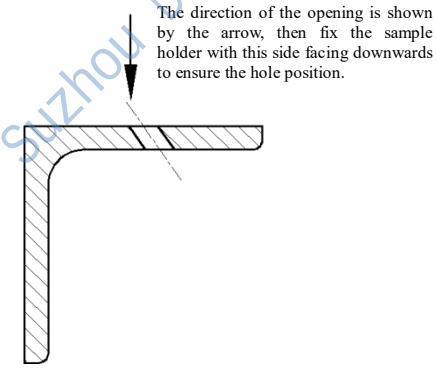

Alignment rear sample frame

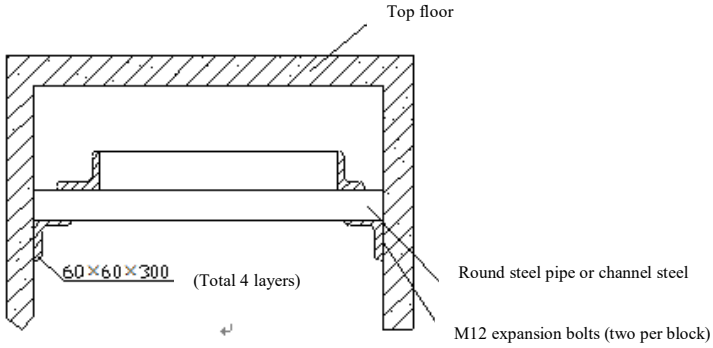



Alignment side-mounted sample frame

1-landing door unit, sill; 2- car rail; 3- car rail bracket, rail; 4-alignment rail hole; 5-alignment rail bracket, rail; 6-alignment centre; 7- car centre

3.5 The upper sample frame needs to be an integral sample frame, as shown above, and the lower sample frame can also be a partial sample frame, holding the wirerope hanging down from the upper sample frame.

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## 11. Sample rack positioning

4.1 The upper sample plate is mounted within approximately 1m below the floor of the machine room in the SHAFT and the lower sample plate is mounted within 1m above the floor of the PIT. 1m means that it is easy for the operator to measure and that there is some space to move around.

4.2 According to the width of the sample plate in the concrete wall with 4 not less than 60mm x 60mm x 300mm angle, with not less than M12 expansion bolts to angle plane up parallel fixed in shaft wall, with steel pipe or channel steel frame flat, the sample plate frame position should be as horizontal as possible, should be not less than 300 pig iron level measuring tape. After the level is found, the standard line of stair shaft is to be measured, and finally the sample frame is welded to the steel pipe.

## 12. Shaft release and fixing

5.1 Elevator floors≤ 30 floors, generally with 0.6mm wirerope for discharge.

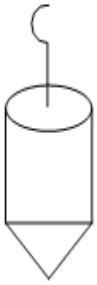
5.2 At the upper sample plate, put the wirerope through the drilled hole, fix one end to the sample plate with a nail or nut, suspend a weight at the other end and lower it slowly in sequence to the PIT. the middle vertical line must not be in contact with the scaffold or other objects or penetrate into the scaffold, and the wirerope must not have dead knots.

5.3 After the wire has been placed in the PIT, remove the weight dropped on the wirerope and replace it with a pig iron wire hammer, whose weight is usually around 13 to 15 kg and should not be too large. As shown in the diagram

5.4 Each working line should be placed to the bottom so that it is naturally stationary, and no hands or other objects should be used to cause it to be falsely stationary. If the floor is high, the stroke is large, the wind in the shaft force is high, and the stability of the working line on each surface is affected, the weight of the line hammer can be increased. Or use a bucket of water, a bucket of engine oil or a bucket of a more viscous paste at the PIT paste to make a damping movement.

5.5 After the upper sample frame has been positioned and the wirerope is stationary, the wirerope is fixed with the lower sample frame.

5.6 The car rail distance, alignment rail distance and diagonal distance and error measured on the upper and lower samples shall be recorded for inspection and review purposes.



Pig iron wire hammers, typically 13 to 15 kg

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# Installation without Scaffold

## 1. Preparation

In addition to the preparation work required for a conventional lift installation, the main pre-installation tasks for a scaffold-free installation are: power supply and landing doorway protection.

A three-phase power cable must be provided to the machine room.

The landing door must be well protected.

Temporary lifeline (proposed in conventional installations)

## 2. Placement of sample lines

The accurate placement of the prototype line plays a vital role in the quality of the installation of the rail and directly affects the quality of the lift's operation.

1) Based on the lift layout drawing and the adopted calibration guide, choose your own material to make the sample frame (mentioned in the conventional installation).

2) Drill two holes at the approximate location of the floor level door sample points in the machine room and pre-place two door sample lines at the holes to the PIT. Measure the shaft data of each floor and finalize the location of the door sample lines on the sample shelf according to the shaft data.

3) After the hall door sample line has been determined, then determine the location of the rail sample line holes on top of the machine room. Use the electric drill to punch out the hole location.

Place the sample line through the release hole to the PIT to secure it in place.

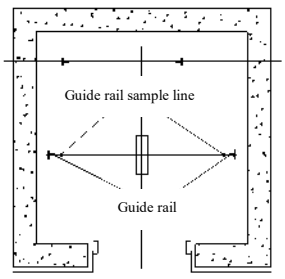
4) The machine room sample is fixed to the machine room floor; the hall door sample is fixed at PIT with the PIT sample wire bracket and the rail sample is fixed at PIT with the method on the rail bracket.

It should be noted here that the rail sample line is different from the regular sample line and the special calibration scale **The usual practice is to make a transposition line 10mm-30mm from the rail directly in front of the working surface of the rail and the lift.**

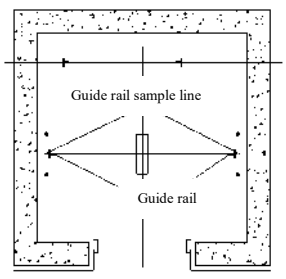
The rail sample line without scaffold is 150mm - 200mm from the work surface on the rail side after the rail.

The details are shown in the diagram.

Conventional installation




Installation without scaffolding

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Picture of the rail without scaffold correction is as follows.

Mounting brackets calibrated with alignment guides (homemade alignment guides are rough but accurate)

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3. Work in the machine room

1) Mainframe; speed restrictor; control box in place laying machine room trunking and wiring. Press the safety circuit on the control box terminal block. Mainframe insulation test, no-load test run.

2) Install the winch end onto the ALIGNMENT side.

4. PIT equipment installation

1) Build a temporary scaffold platform to install the rail bracket, install the first rail and align it.

2) Install the bumper base for car and alignment (if available).

3) Safety ropes, self-locking devices and full body harnesses must be used as required when installing the first loop of the rail.

4) Installation of speed restrictor wirerope tensioning device.

5. PIT assembly car frame

1) Use the rail clamp to hold the guide shoe and assemble the car frame on top of it. use the car mounting jig to hold the guide shoe and assemble the car frame on top of it. if the car frame is a CFE car frame, a liner should be installed on the rail mounting jig.

2) Once the car frame is in place, place the speed restrictor wirerope and connect it to the safety clamp lever.

3) Adjust the safety clamp gap and synchronization on both sides.

4) Assembled car frame, base plate.

After installation as shown.

Installation of lower beam after installation of one section of track

Installation of the base plate

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5) Lay boards at the level of the upper beam to make a good platform for the installation of the rail.

As illustrated below

Re-installation of a temporary springboard to facilitate the installation of the track

## 6. Installation of top working platform

1) In the civil construction process of the lift shaft, two holes larger than θ60 are reserved on the doorway surface and the opposite wall at the same elevation as the top floor floor, if they are reserved in the civil construction. then they can be excavated in the construction of the lift itself, using the reserved holes to build a working platform for assembling the alignment frame.

2) Make a second protection and hang a warning sign with a wooden board on top.

Platform framework installation graphics as bellow

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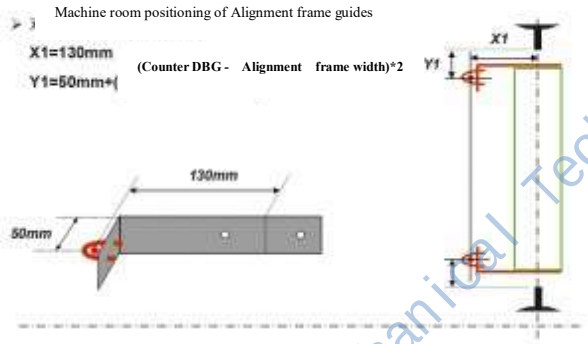
7. Transport the alignment rack into the SHAFT PIT and install the alignment guides.

1) Transport the alignment rack to the SHAFT PIT and place it in the corresponding position.

2) Installation of alignment guides in the machine room and PIT respectively, with the exact fixing position calculated according to the lift layout and temporary guide shoe dimensions. wirerope is stretched from the machine room towards the PIT and the excess length of wirerope is placed in the PIT.

3) Four temporary guide shoes are installed on the alignment frame and the U-rings on the temporary guide shoes are placed on the alignment guide wirerope, thus ensuring that no violent shaking occurs on or off the alignment frame during the entire installation of the lift.

As illustrated below




4) Lift the alignment rack from the PIT to the top level with a winch.

Warning! The secondary protection of the top platform must always be in effect during the entire operation with the top platform! Persons working on the top platform must wear a full body harness and hang high from the self-locking device on the safety rope!

8. Installation of traction ropes and speed restrictor ropes with cable

1) Use a hoist to suspend the alignment frame from the machine room fixing point, place the traction rope and alignment block with the help of the top platform and install the alignment block pressure plate.

2) Fit speed restrictor wirerope

3) Temporary installation of the follow-up cable fixing bracket and placement of the follow-up cable with the aid of the top platform.

9. Removal of the top platform

1) Select the best time to remove the top working platform according to the different positions of the alignment

2) For ALIGNMENT side-mounted lifts, remove the platform at this point.

3) Use the winch to lift the top platform and remove the secondary protection wirerope. use the winch to slightly raise the front of the top platform, while the installer pulls the top platform out of the shaft (there should be at least two installers to do this), immediately protect the landing door of the level station and dismantle the platform.

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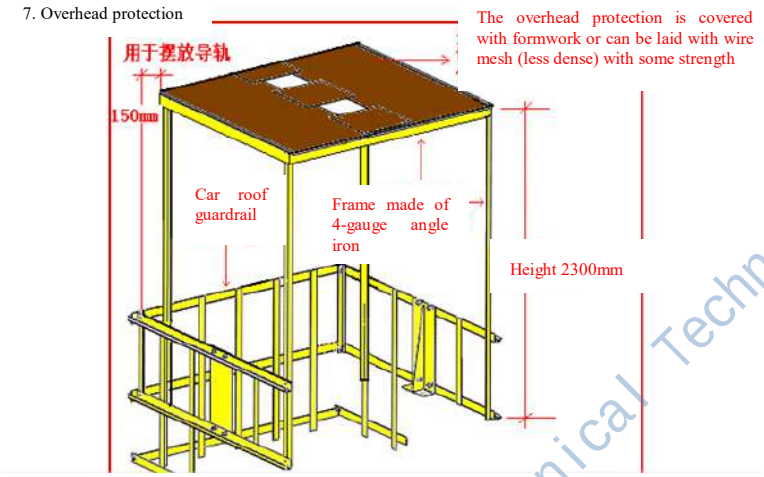
10. car roof protection and car roof wiring

1) Install the operating platform 1m from the GUIDE shoe on the car.

2) Installation of overhead protection on the car roof to prevent falling objects from injuring car roof staff.

3) Installation of a protective guard (net) on the alignment side of the car roof protection device.

As shown in the diagram




11. Installing the second car rail

1) The installation of the lift rail is crucial, the perpendicularity and parallelism of the rail directly affects the comfort of the lift, we use the school guide during the installation process.

12. Debugging slow ride

1) The company commissioning personnel check and slow ride commissioning against the checklist; any non-compliance with the requirements is strictly prohibited for slow ride commissioning! Except for the short grounding pit safety circuit and the landing door car door electrical circuit, other safety circuits should be in good working order and short connections are strictly forbidden. Special short-circuiting must be used.

13. Install the remaining car rail, then install the remaining alignment rail.

1) Use the car as a moving platform to lift the rail, work on the car roof working platform and install the remaining car rail with the alignment guide based on the car rail sample line. After the car rail is installed, install the remaining alignment rail.

14. Attach the alignment guide shoe and remove the alignment frame guide.

15. Installation of shaft components and shaft cabling; (same as conventional ladder installation)

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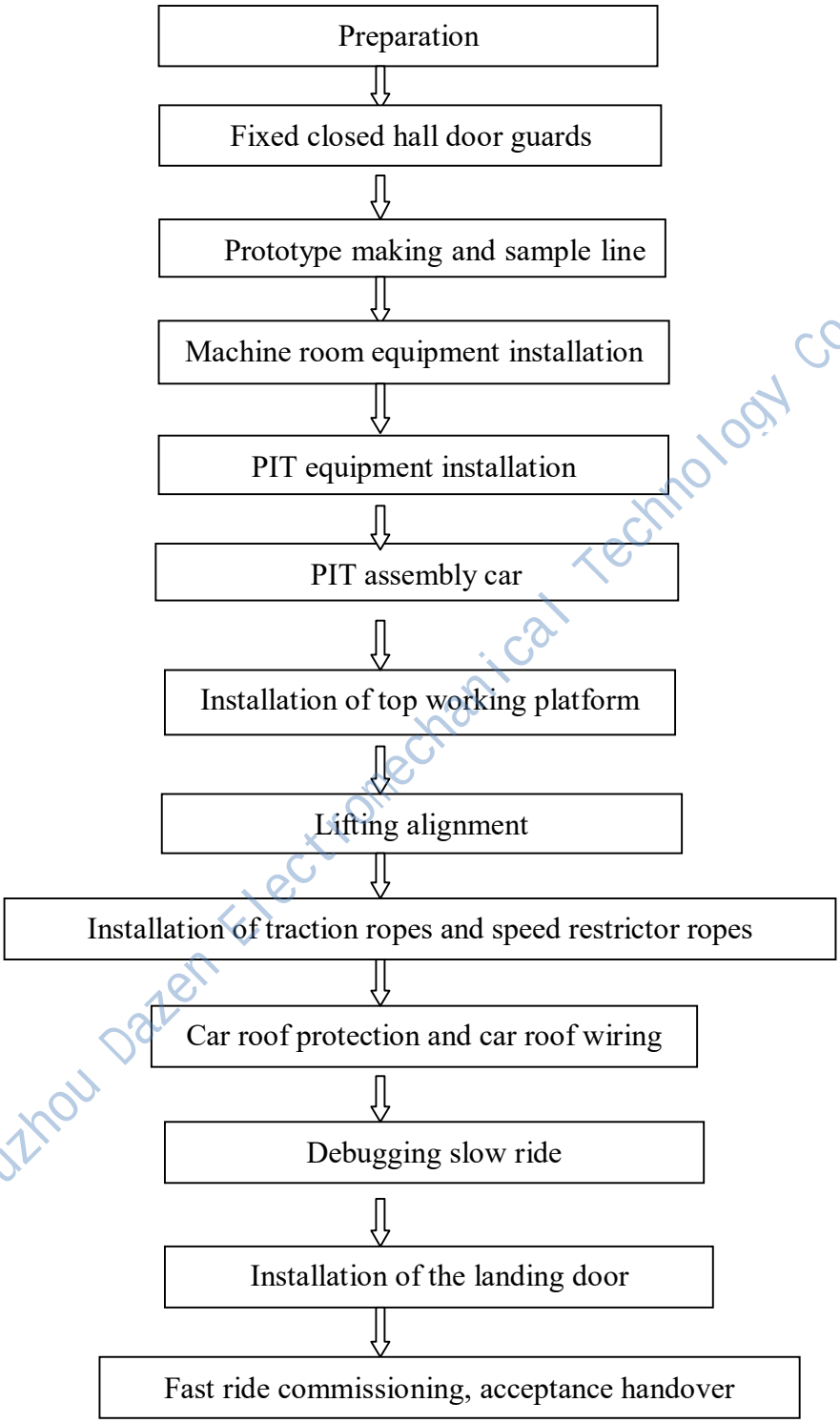
16. Debugging fast ride

Diagram of the installation process without scaffold

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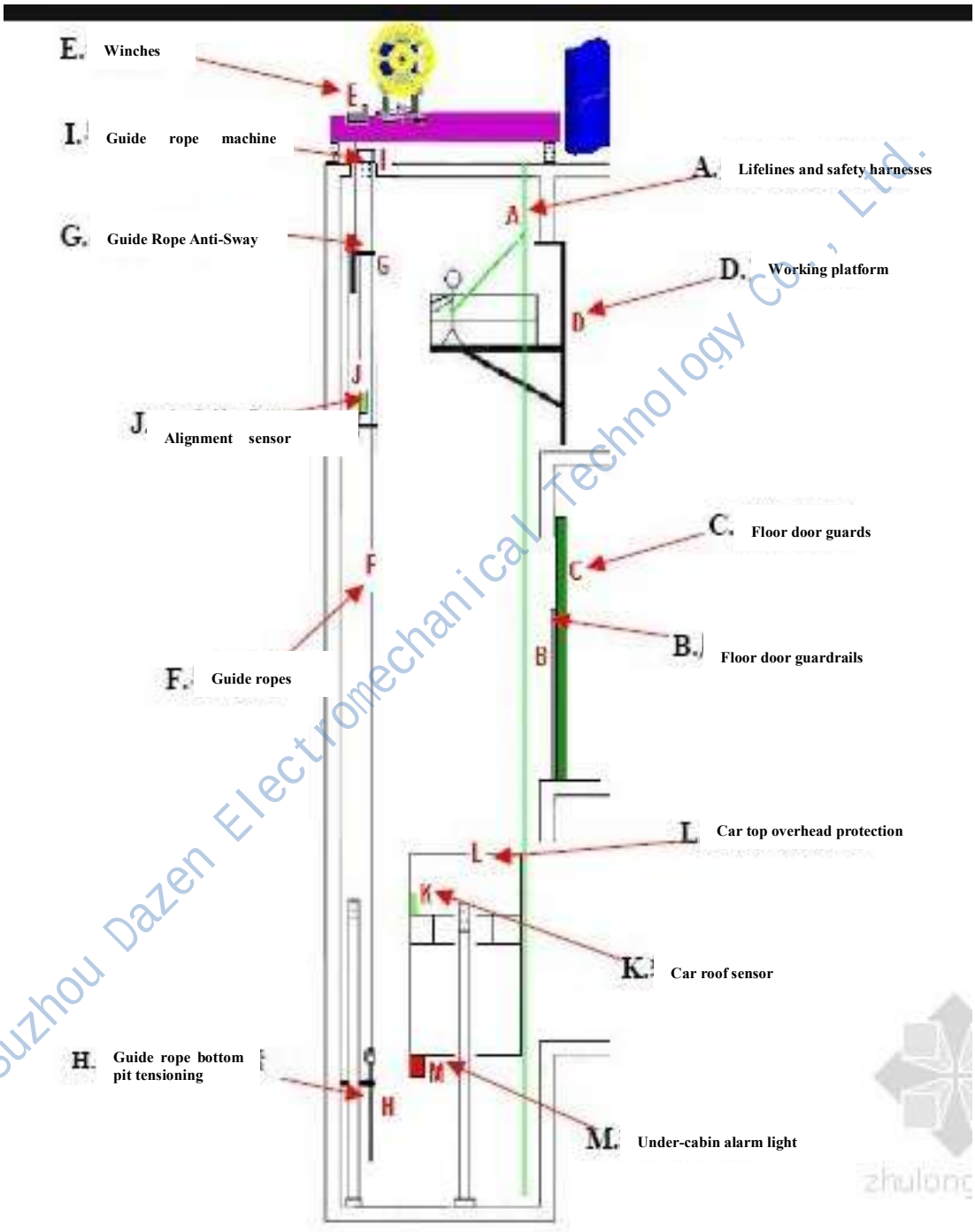
Installation diagram without scaffold

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# Entrance/Exit Installation

1. Inventory landing door small package

| Landing door small package list | | | | |
|---|---|---|---|---|
| Serial number | Name | Item No. | Number | Remarks |
| 1 | Door slider | GEL2Z010001 | 4 | |
| 2 | 0.5mm slider spacer | GEL1E078001 | 5 | |
| | 1.0mm slider spacer | GEL1E078002 | 6 | |
| 3 | Upper Cantilever Suspension | GEL1E085001 | 2 | |
| 4 | Pallet | GEL1E086001 | 2 | |
| 5 | Bolt M8×20 | GB5781-86 | 2 | |
| | Bolt M8×30 | GB5781-86 | 2 | |
| | Bouncing pad 8 | GB93-87 | 4 | |
| | Flat pad 8 | GB97.1-85 | 4 | |
| 6 | Adjustment shim 1mm | GEL1E087001 | 14 | |
| | Adjustment shim 0.3mm | GEL1E087002 | 14 | |
| | Adjustment spacer 0.5mm | GEL1E087003 | 12 | |
| 7 | Bolt M6*16 | GB5781-86 | 8 | |
| | Bouncing pad 6 | GB93-87 | 8 | |
| | Flat pad 6 | GB97.1-85 | 8 | |
| 8 | Bolt M8×30 | GB5781-86 | 4 | |
| | Bouncing pad 8 | GB93-87 | 4 | |
| | Flat pad 8 | GB97.1-85 | 4 | |
| 9 | Special nuts | | 8 | |
| 10 | Remove the rod assembly | GEL1E088001 | 1 | |
| 11 | Spacers | VKS1E089001 | 4 | |
| 12 | Self-tapping screws | GB845-85 | 2 | |
| 13 | Wire Clips | | 2 | |

2. Installation of the landing door sill

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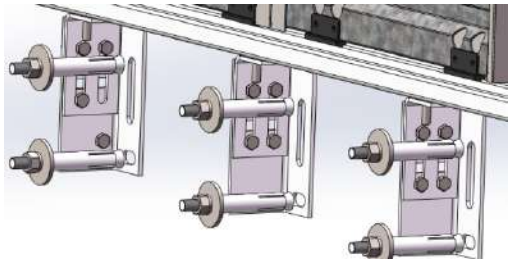
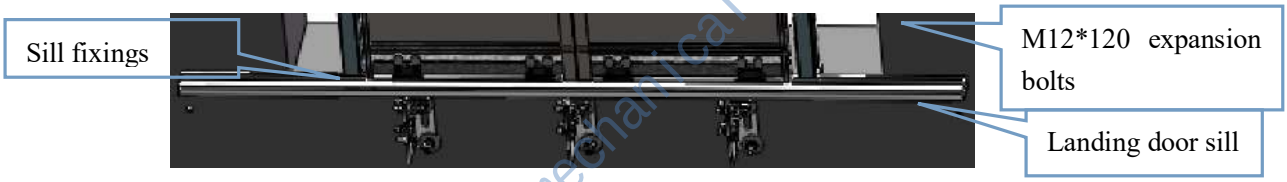
2.1 Fixing the sill bracket. The finished surface of the floor minus the thickness of the sill is the mounting height of the bracket, the inside width of the bracket mounting hall door door pocket is positioned to coincide with the two plumb alignment lines of the sill and the distance from the two plumb alignment lines to the sill is the running clearance. Once



the position is basically determined, check that the sill is in the centre of the supporting angle iron and then mark the wall with a marker through the mounting holes of the brackets, no less than three brackets for each hall door sill. This is shown in the diagram below.

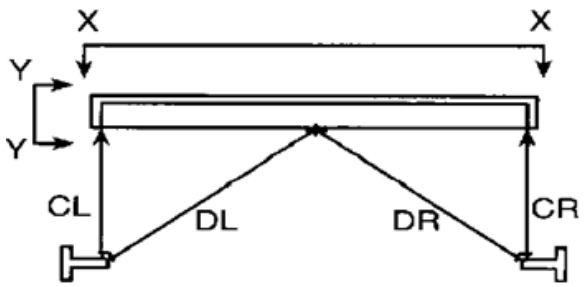
2.2 Drill holes in the marks with an impact drill, fix the sill bracket to the wall with expansion bolts M12 x 120, adjust the left and right level of the bracket with a leveling tape and lock the bracket in place.




2.3 Use a scribe to draw the centre line on the sill and the mark of the inner width of the door pocket of the hall, install the sill on the bracket, adjust the sill so that the two mark lines on the sill coincide with the two plumb calibration lines of the sill, and ensure that the distance between the two plumb calibration lines and the sill has a running clearance distance, adjust the level deviation of the sill less than 0.5/600. Complete the sill installation as shown in the figure below.

2.4 The distance between rail and sill CL, CR should be guaranteed to be within +1mm error and the equilateral error between the midpoint of sill and rail should not exceed ±0.5mm. as shown in the figure below.

2.5 When you have finished confirming that everything is correct, lock all the screws in place and confirm again.

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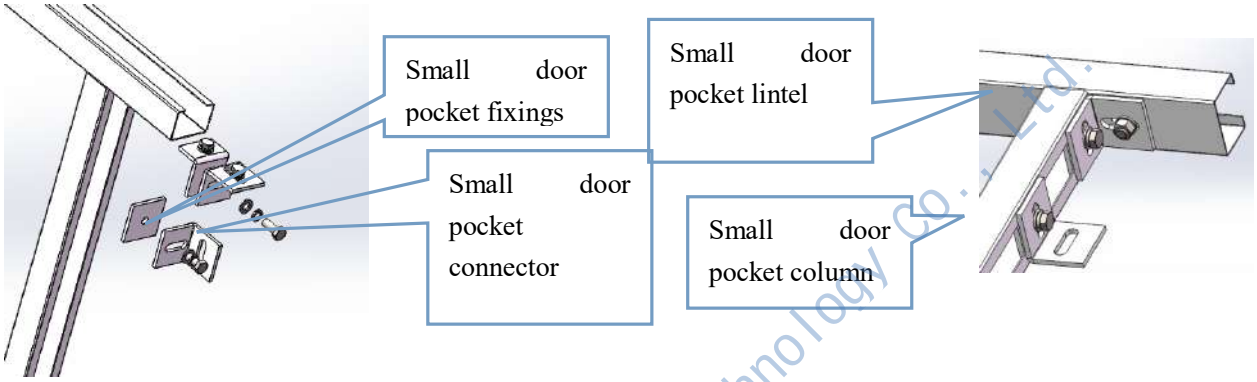
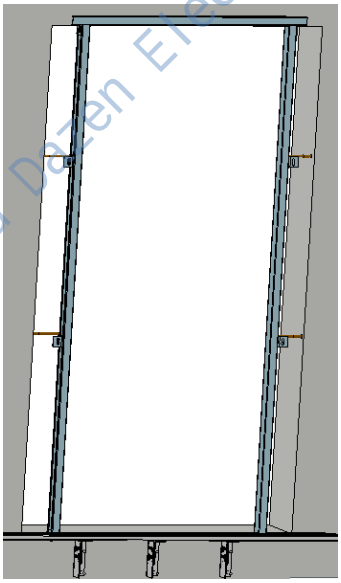
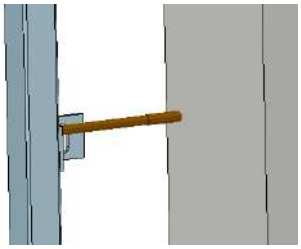
3. Door pocket Installation

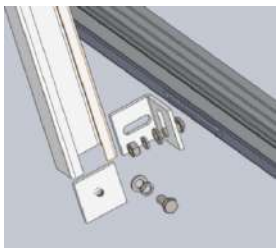
3.1 Centre the top frame of the door pocket and extend the centre line to the sides, marking with a marker where the door will be when it is fully open. Assemble the two outer door pocket columns to the top frame according to these two lines and check with a tape measure that the inner width of the door pocket meets the required opening width.




3.2 After assembling the outer door pocket, the lower fixing foot of the door pocket is bolted to the installation hole of the sill mounting door pocket, the fixing foot of the door pocket column is fixed to the wall by means of expansion bolts and welded steel bars, the verticality of the front and rear, left and right of the door pocket is checked by using the magnetic pendant and is appropriately The perpendicularity of the door pocket is checked by means of magnetic wire drops and adjusted appropriately so that the error in perpendicularity is within 1mm.







3.3 Once the upper door can be installed, the door pocket is mounted on the door header and sill bracket using the door pocket ounting kit.

3.4 In shaft, the upper cant edge should never extend beyond the sill edge, check this with a magnetic wire drop after

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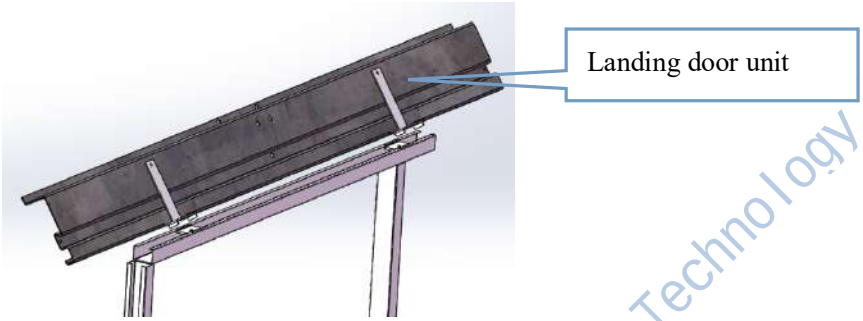
installing the door frame.

3.5 Once the door pocket has been installed, the two diagonal dimensions must be checked and guaranteed to be equal before final fixing.

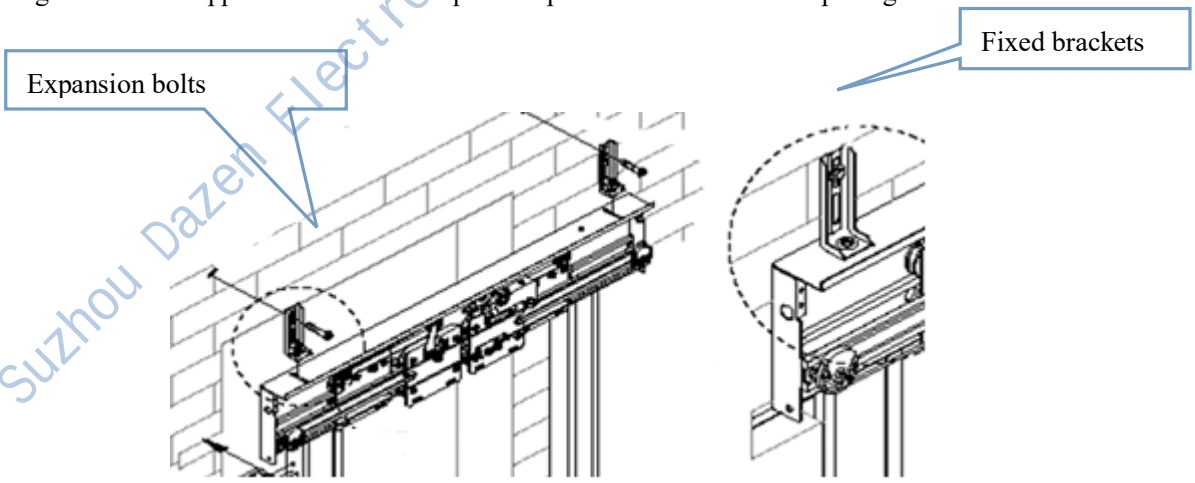
## 4. Installation of the landing door unit

4.1 First pre-set the door sill on top of the door pocket. Use a magnetic wire hammer to hang the door from the centre




of the door sill to the door sill, keeping it coincident with the centre of the door sill. Mark the position of the bolt fixing holes on the wall of the shaft with a marker according to the position of the bolt fixing holes on the suspension plate on both sides of the door sill.

4.2 Place the upper hall door can on the door pocket, the expansion bolts on the wall of the shaft are passed through the fixing holes of the upper hall door can suspension plate and the screws are pre-tightened.

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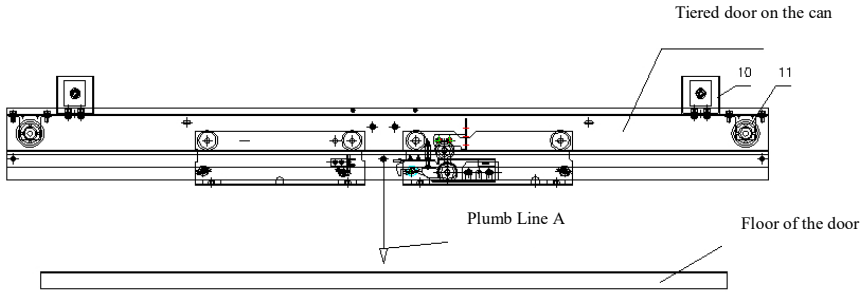
4.3 Adjust the front-to-back, left-to-right perpendicularity of the upper kan to within ±1mm using a magnetic wire hammer, or adjust the position of the upper kan using sill two plumb calibration lines.

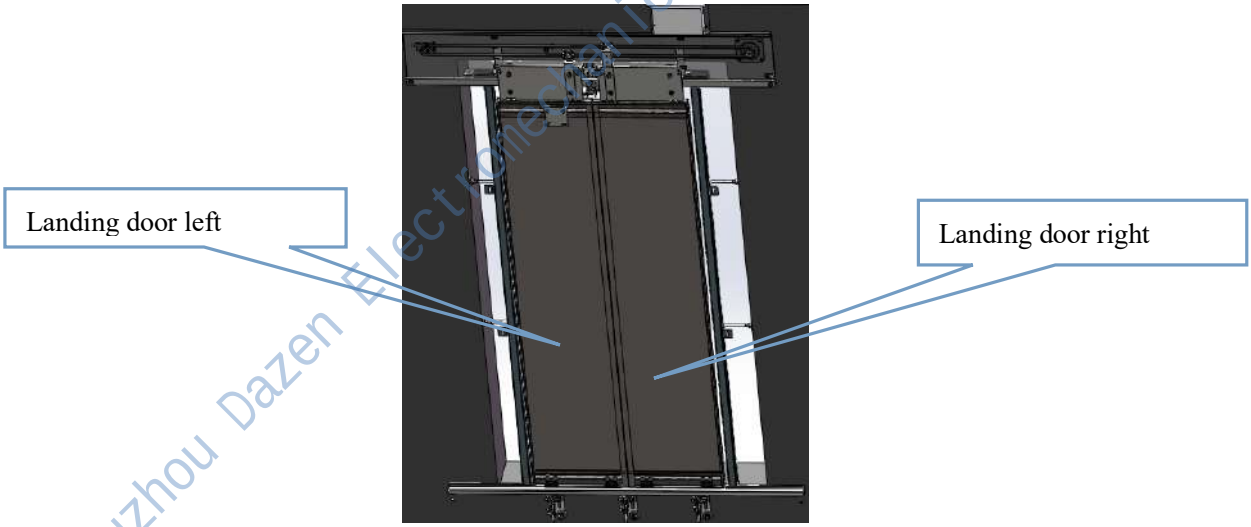



4.4 Adjust the level deviation of the upper can by less than 0.5/600 using a level.

4.5 Fasten the fixing screws of the upper cantilever suspension plate

## 5. Installation of the landing door

5.1 Clean out the door upper canrail, landing door sill slot and attach the door peg to the hall door door panel.




5.2 Adjust the four eccentric wheels on the hall door pegboard with a single screwdriver so that there is a clearance of 0.2 to 0.5 mm between them and the track.

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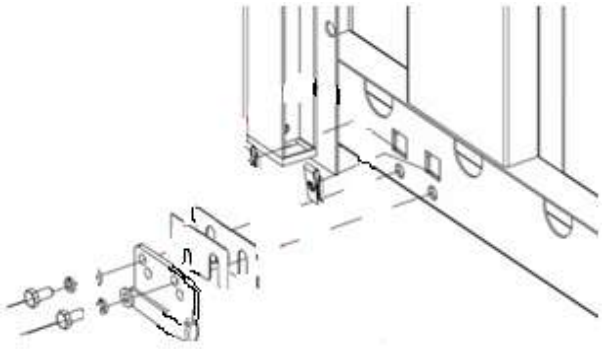
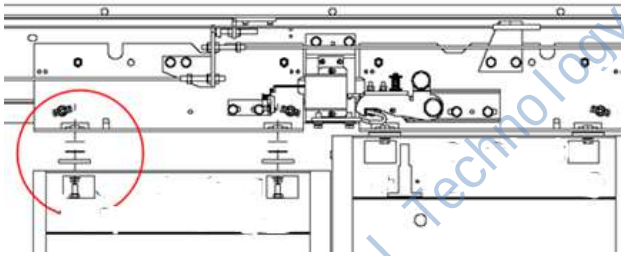


5.3 Install the under-door slider and adjust the height of the door panel by adding or removing shims.



5.4 Adjust the height of the door panel with shims and measure the gap between the lower end of the door panel and the sill plane so that this gap meets the standard of 3 to 6 mm.

The hall door gap should be the same at the top and bottom, no greater than 2mm max. The hall door slider should engage the sill slot to a depth of 6~8mm.

5.5 Check that the gap between the door panel and the door pocket surround is within 4 to 6 mm when the door is open and closed for the entire duration.

5.6 Open the hall door and make one door flush with the door pocket, check whether the other door is flush with the door pocket, if there is a deviation it means that there is a deviation between the centre of the hall door and the centre of the door pocket, which needs to be readjusted, generally by adjusting the linkage wirerope connecting the two hall doors and adjusting its position at the left and right of the fixed pegboard.

## 6. Adjustment of the landing door lock

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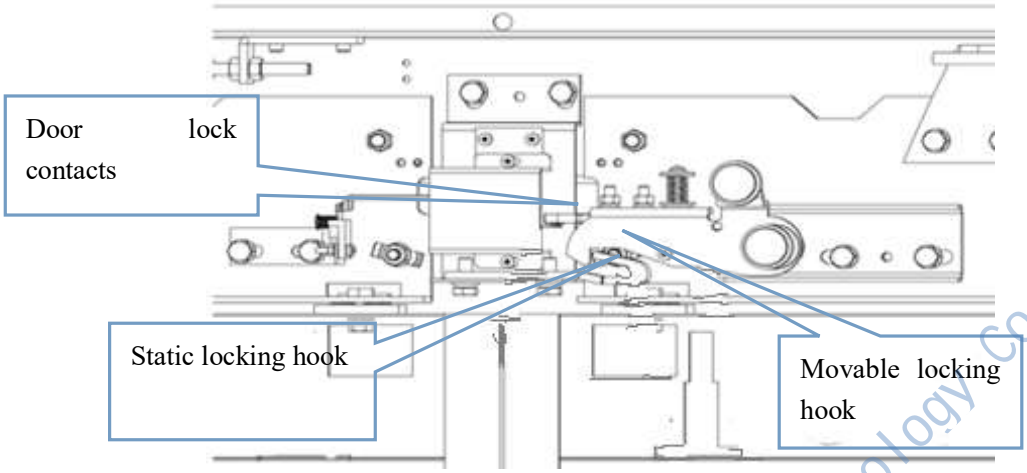
The lobby door lock consists of a main door lock and a passive door lock. The landing door lock shall be installed and adjusted in accordance with the following requirements.




6.1 No abnormal noise when the hall door lock is in action, the main door locking piece and contacts have a margin of action, the passive door lock is in reliable contact, and the length of the passive door locking compression spring is 8~10mm when it is in action.

6.2 In the direction of door opening in the lower part of the hall door at the same time with a force of 120 N pull two hall doors, the maximum gap of the door should be ≤ 30 mm, and the passive door lock can not be broken.

6.3 When the door lock is open, the hook engagement (hooked dimension) is at least 7 mm and the contacts of the main door lock can be finely adjusted so that the adjusted contacts are at the physical centre of the contacts when in contact with the contacts.

6.4 The stationary locking hooks working in conjunction with the main door lock can be adjusted to the left and right of the active locking hooks, which are adjusted to be in the centre of the stationary locking hooks.

6.5 The hall door lock should be reliably earthed.

## 7. Installation of forced closing devices for hall doors

7.1 Connect the wirerope attachment bolts of the forced closing weight of the hall door to the wirerope attachment plate of the hall door hanging plate, tighten the wirerope attachment bolts and lock the nuts.

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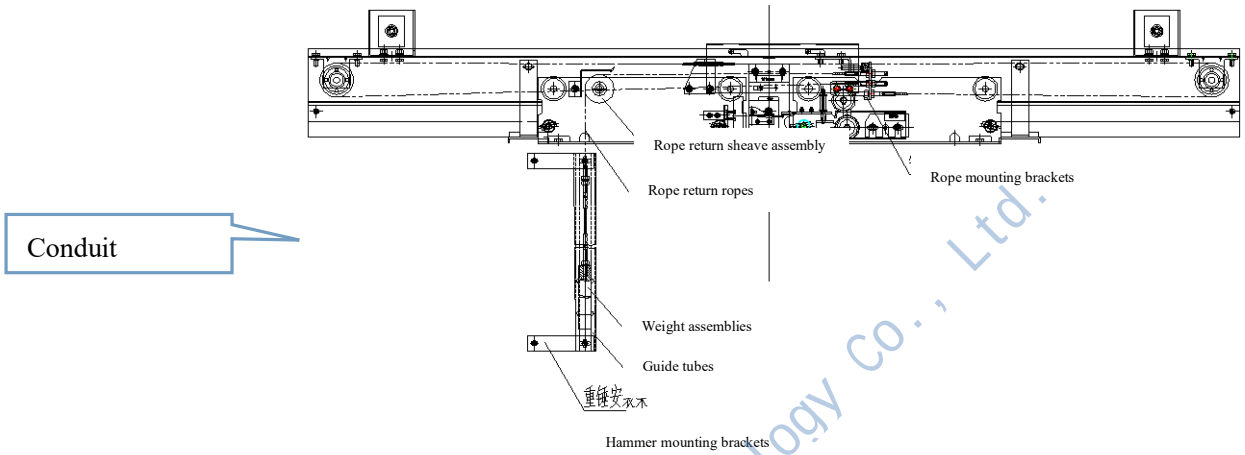
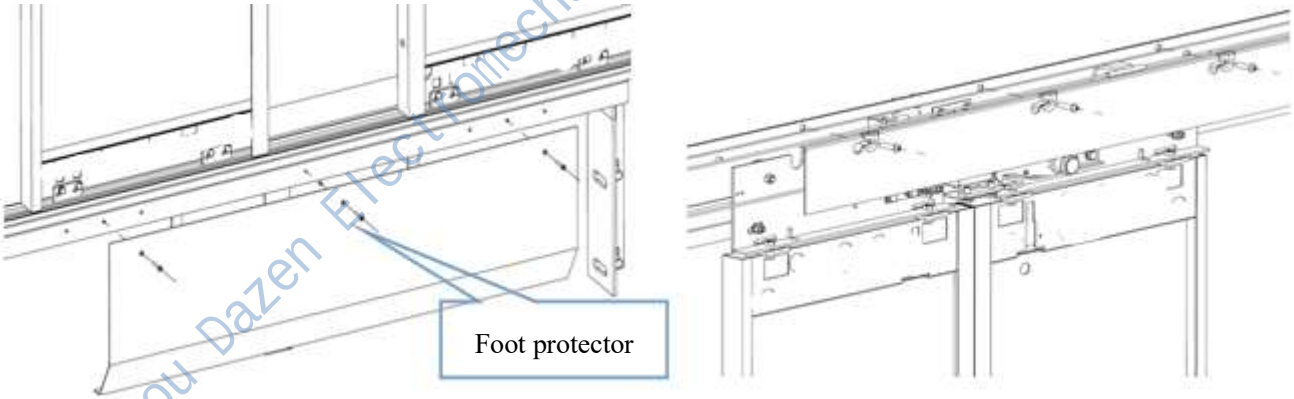
7.2 Test the effect of forced closing by opening the hall door completely; the forced weight shall operate without noise and with flexible action. The forced closing shall be effective under the most unfavourable conditions. The hammer shall be fitted with a fall arrest bolt to prevent the hammer from falling.




8. Toe guard and landing door unit cover installation

The hall door silltoe guard and the upper canopy are required to be fixed at least at three points, with screws fastened flat and not protruding.

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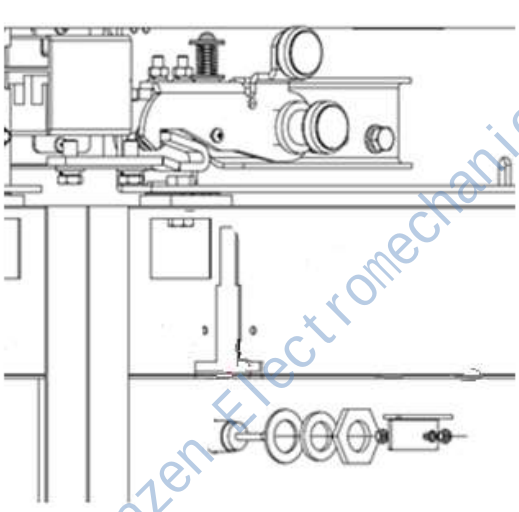
9. Triangulation chain installation

The triangulation chain is an important component for emergency lift repair and maintenance and should be installed with the following requirements in mind.

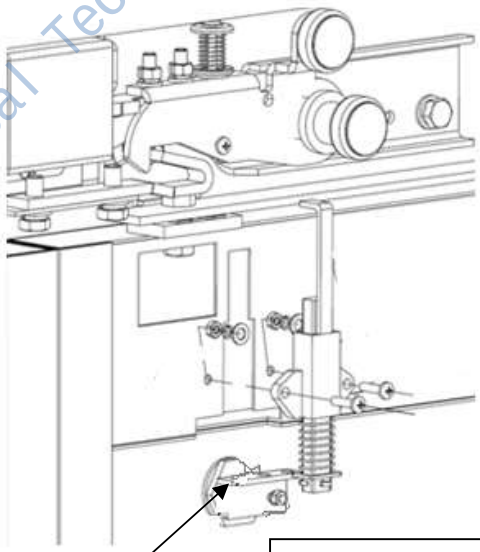
**A.** The triangulation chain's locking core and the triangulation chain's slider are fixed to the door panel on the left side of the hall door (facing the hall door) and fastened with screws.

**B.** The triangulation chain's push bar is fixed to the mounting holes in the door panel on the left side of the hall door, fasten the screws.

**C.** The hall door triangulation chain should move flexibly, open and reset easily and effectively with repeated use.



Installation diagram of the triangulation chain



Note: Ensure rotation to the actuator is exactly horizontal.

Triangulation chain actuator installation diagram

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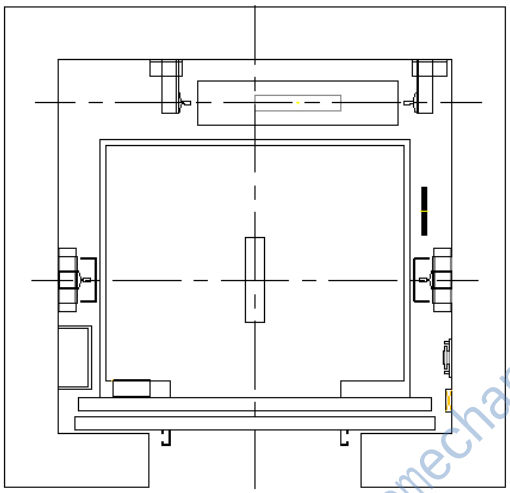
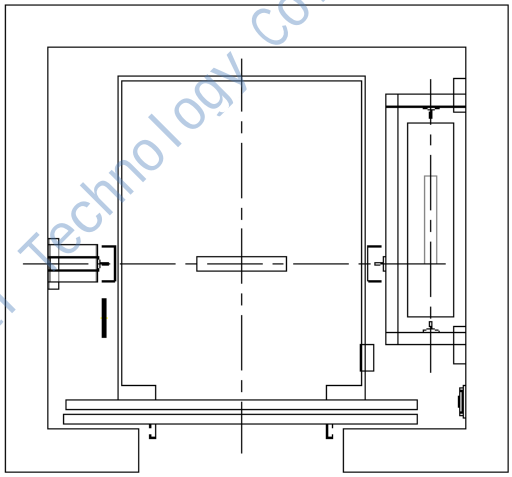
# Rail Bracket Mounting

## 1. Determination of rail bracket position

1.1 There is a machine room

1.1.1 Determine the position of the rail bracket in the shaft according to the position of the rail in the shaft plan in the installation drawing. The following diagram shows the alignment rear arrangement on the left and the alignment side arrangement on the right.





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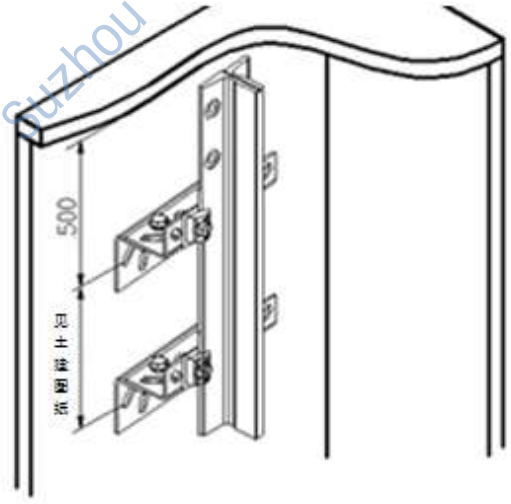
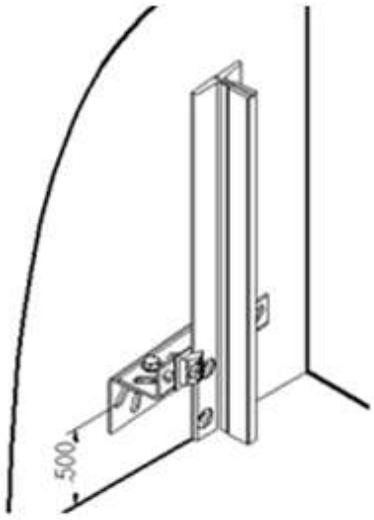
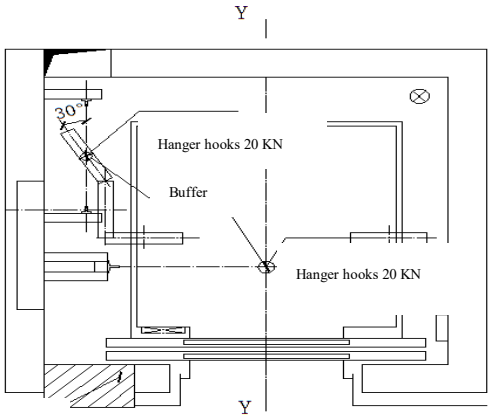
1.1.2 In the vertical direction of the shaft, the first rail bracket at the top and bottom is 500mm away from the top of the shaft or PIT, and the spacing between each rail bracket in the middle is not more than 2.5m according to the installation drawing, and it is necessary to ensure that there are at least two rails brackets on each rail.



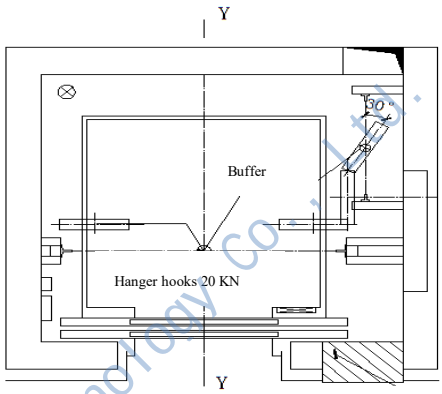



1.2 Without machine room

1.2.1 The position of the rail bracket in the shaft is determined by the position of the rail in the shaft plan in the installation drawing. The diagram below shows the alignment left layout on the left and the alignment right layout on the right.

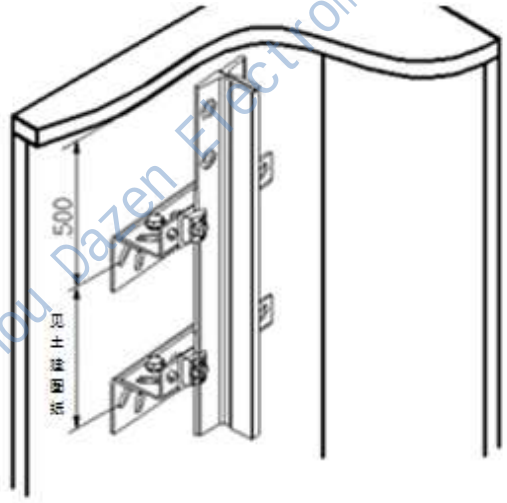


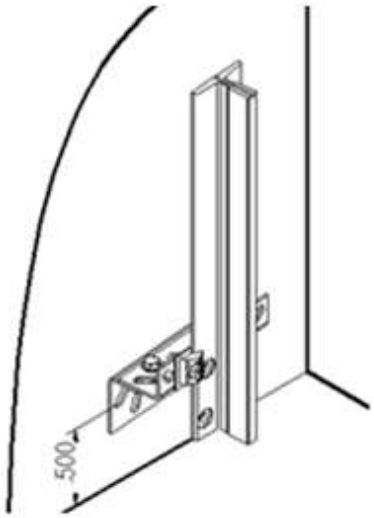

Control panel at top station




Control panel at top station

1.2.2 In the vertical direction of the shaft, the first rail bracket at the top and bottom is 500mm away from the top of the shaft or the PIT, and the spacing between each rail bracket in the middle is not more than 2.5m according to the installation drawing, and it is necessary to ensure that there are at least two rails on each rail.

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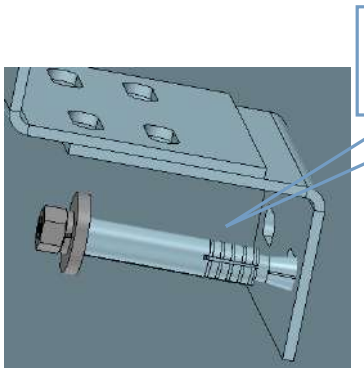
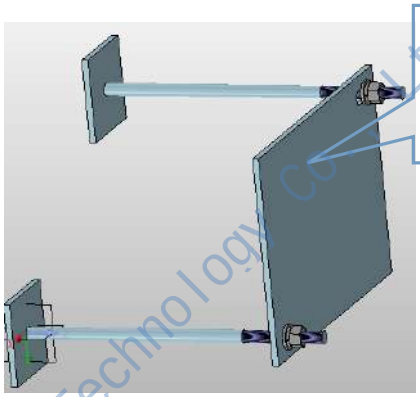
## 2. Fixing of the rail bracket

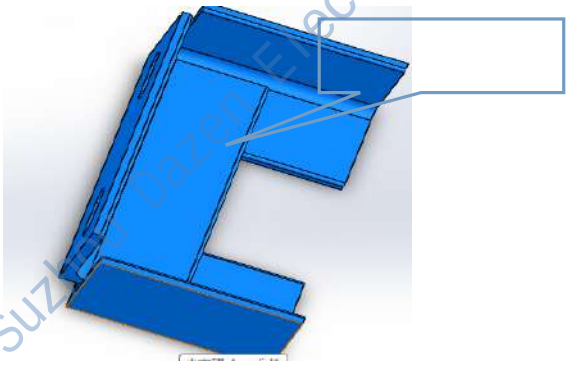
2.1 When there is a concrete rim beam at the location of the rail bracket or the shaft itself is made of concrete, the bottom plate of the rail bracket is fixed with expansion bolts. When the bracket is installed in a brick wall structure, a through-wall screw should be installed at the location of the rail bracket to connect the steel plate to fix the base plate and the bracket, the through-wall screw and steel plate are shown in the figure.



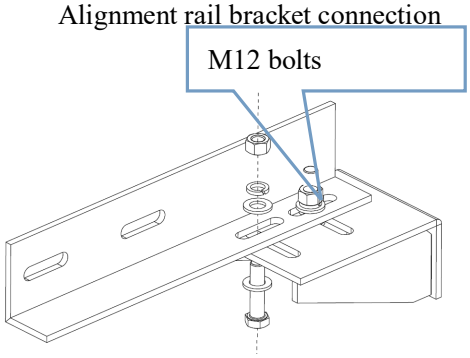




2.2 Determine the height of the working surface of the rail bracket by putting wirerope. When determining the height of the working surface of the bracket, the rail distance needs to be considered to ensure that the rail has 2 to 3mm pad adjustment. The bracket is connected to the through-wall steel plate or to the base plate of the wall by welding or bolting. The parts of the bracket are first bolted together, and when the rail is corrected, the parts of the bracket are welded.

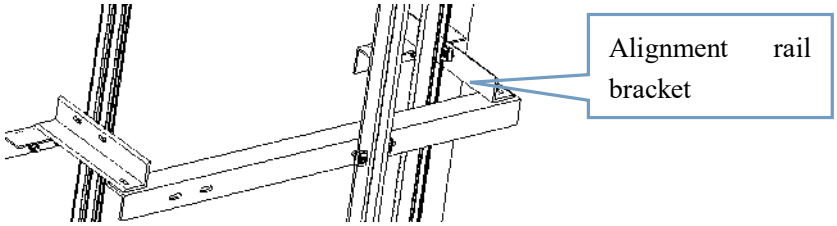
Car rail bracket connections



Alignment rail bracket connection




2.3 For side mounting with machine room alignment, a rectangular rail bracket is required and is fitted as described in 2.2

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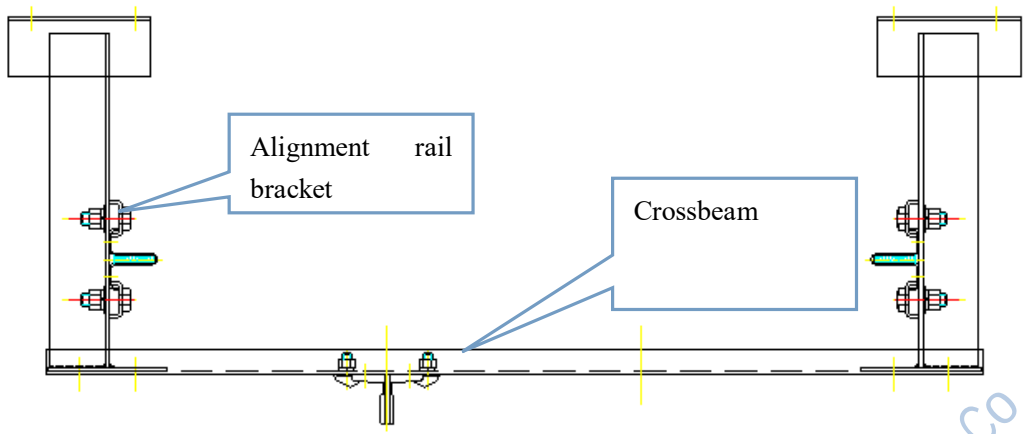
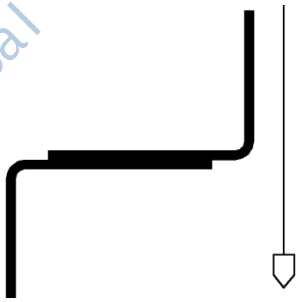
2.4 For lifts without machine room, the alignment is done with a rectangular rail bracket, as described in 2.2.




## 3. Welding requirements for rail bracket

3.1 The rail bracket is leveled with a leveling tape to a maximum of 1.5% and it must be ensured that the installed rail is vertical and parallel to the opposing rail.



3.2 Rail bracket and pre-built iron welding seam should be continuous and not false welding, bracket and pre-built iron contact with the four edges must be all welded on, and should remove welding surface welding slag, welding place brush anti-rust paint.

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# Rail Mounting and Adjustment

## 1. Rail cleaning

Before the rail is installed, the rail needs to be cleaned, the rail interface protection is reserved until the installation of the interface, so that the rail joint and tenon fit tightly, the local gap should not be greater than 0.5MM, THE interface has burrs to use a file to repair the light. The rail should be pre-matched to the installation sequence position number, install the rail connection plate and stagger with the rail's bracket, rail into the shaft should be in the PIT laying board, to protect the track surface from damage.

## 2. Rail lifting into shaft

2.1 Using a winch or hand hoist, lift the rails into the PIT with the female end down and the male end up, and using the space in the shaft, place one end of the rails against the wall of the shaft, with each rail placed vertically, and install the interface plate at the male end.

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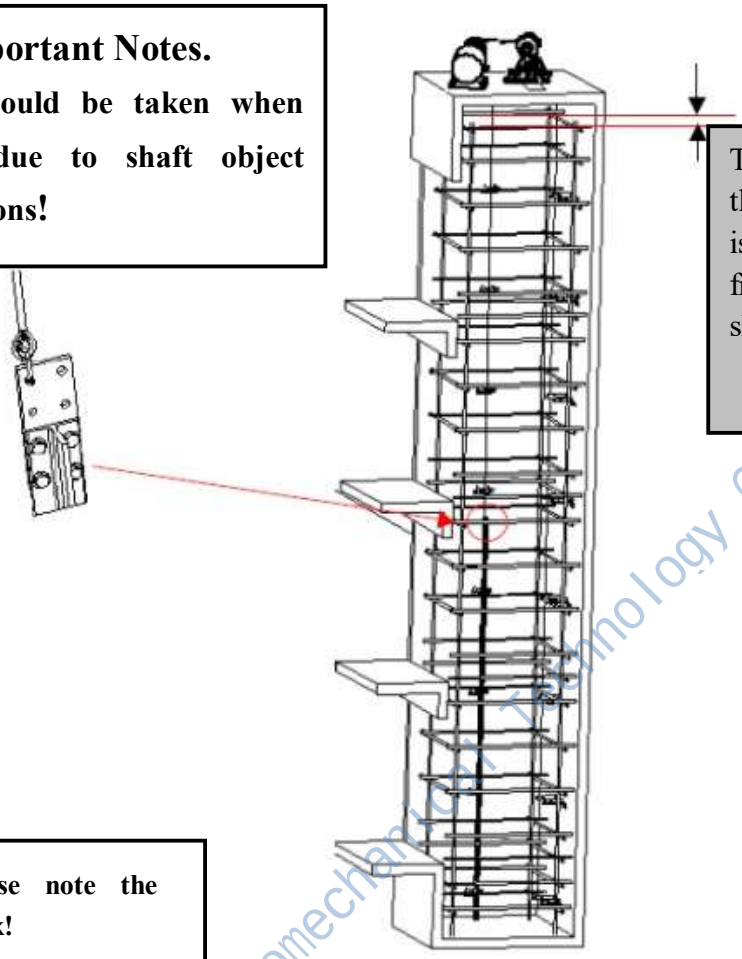
**Important Notes.**

**Care should be taken when lifting due to shaft object restrictions!**



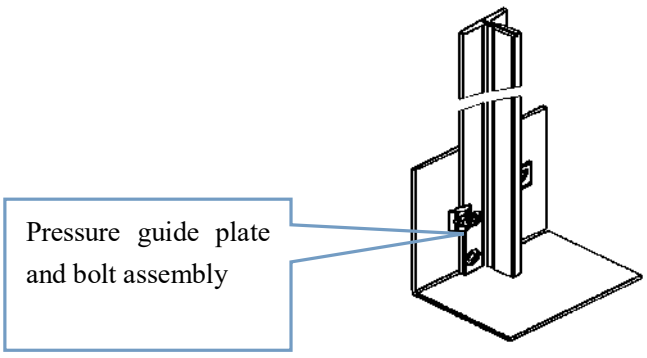
The top surface of the uppermost rail is 100-150mm from the top of the shaft

**Please note the hook!**

2.2 Lift the rail with a winch or hand chain hoist and fix it to the rail frame from the bottom up.

## 3. Rail connection and fixing

3.1 Install the rail base, which is an angular bent piece as shown in the diagram, and fix it to the bottom of the first rail using a press guide.



Pressure guide plate and bolt assembly

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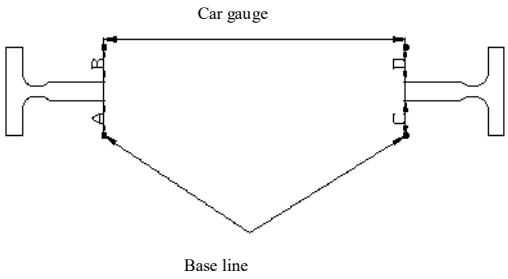
3.2 Install the first rail. install the first rail at the bottom on the bracket with the convex side up and measure A, B, C and D against the rail datum line of the sample frame drop, the 4 dimensions should be the same. Secure the rail to the rail bracket with the press guide.

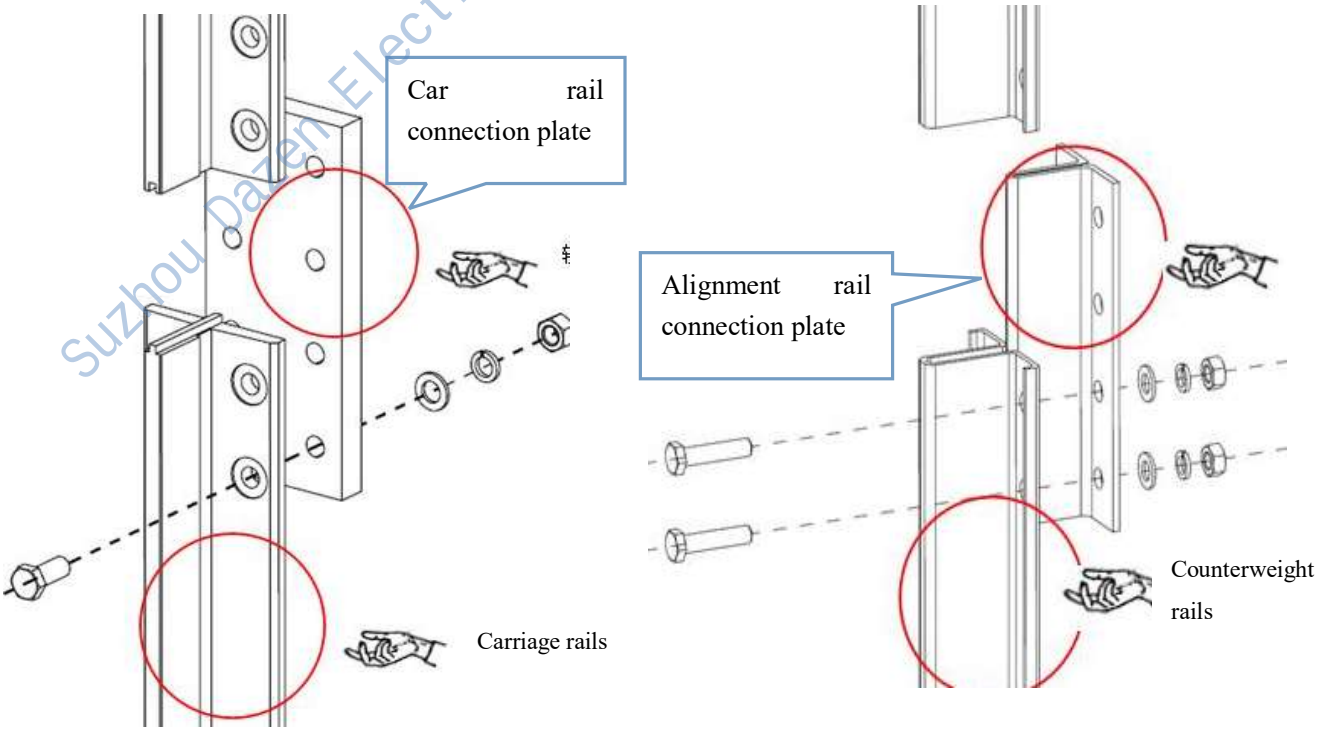



3.3 Installation of the remaining rails. After the first one at the bottom is installed, the rest of the rails are lifted into the shaft, connected to the first rail with the connecting plate and fixed to the rail bracket with the press guide. rails are connected as shown in the diagram.

3.4 Caution is required when installing the rail.

A. A minimum of two supports are required on each rail.

B. The first rail bracket at the top and bottom is 500mm from the top of the shaft or PIT in the vertical direction of the shaft.

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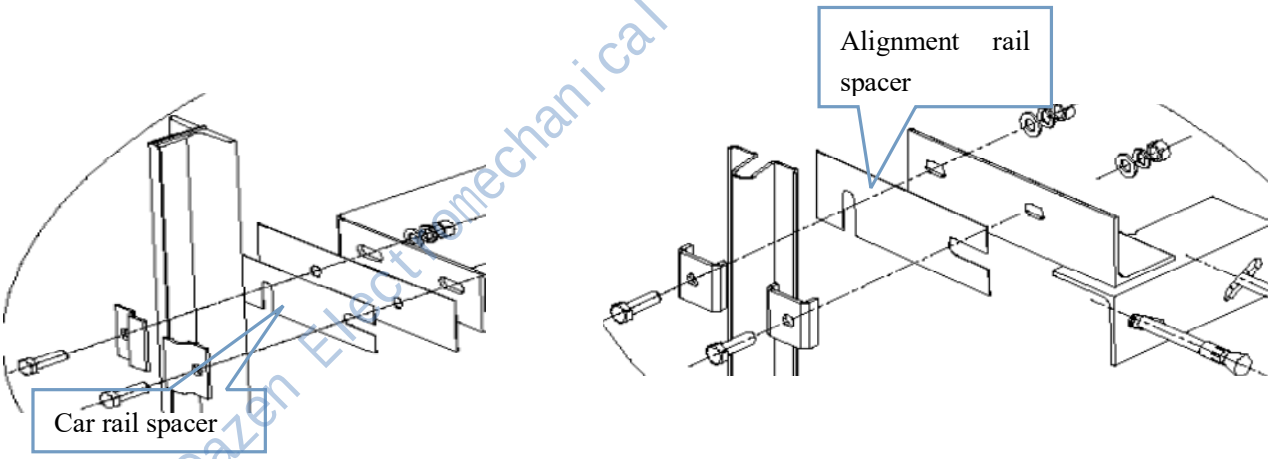
## 4. Rail calibration

After the rail has been installed, it must be carefully adjusted and calibrated. rail's installation quality is directly related to the performance of the lift in terms of operating comfort and noise.

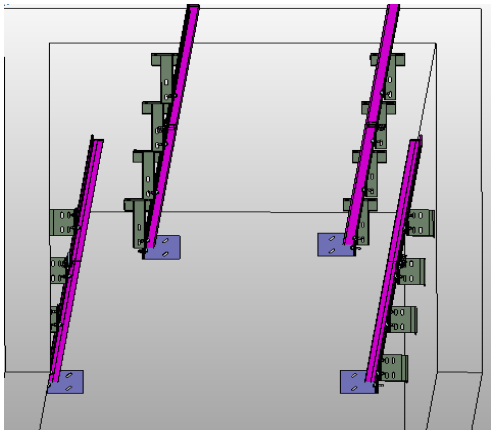
4.1 rail calibration first school the top two gear bracket, to sample frame as a benchmark, measuring A, B, C, D to rail surface consistent, will school guide ruler end flat, and make the two pointer tail side and rail side working surface paste flat, paste tight. Both ends of the pointer tip should point to the 0 position line, the school guide ruler between the two rail should be free to pass, with 1mm plug into the school guide ruler and rail working surface, the school guide ruler should be stuck in the middle of the two can not pass. At this time to correct the rail verticality (straightness), parallelism, track distance should all meet the requirements. Then use the same method to calibrate the bottom three brackets. After the bottom correction of the rail meets the requirements of verticality (straightness), parallelism and gauge, the relevant dimensions are reviewed from the top, and the requirements are met from the colonel to the bottom.

4.2 When calibrating the rail, the distance between the car and the alignment rail is corrected by adding or subtracting shims.




4.3 Inspection of the rail.

The completed installation of the rail is shown below.



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After straightening the two columns of car and alignment, check from top to bottom that the following requirements are met.

A The two columns of rails should be perpendicular and parallel to each other, with a mutual deviation of not more than 1mm over the entire height.

B The side working surfaces of the two rails shall deviate from the datum line by <0.6MM per 5m and by <1.0MM throughout the height.

C Rail joints should have a gap of no more than 0.5 MM.

D The step at the rail joint should be no greater than 0.05mm with a 300mm long steel tape against the working surface.

E Rail joint step trim length ≥ 150MM, trimmed projection should be no more than 0.02MM.

F Car rail gauge should be controlled within a tolerance of 0 to +2MM.

G Rail should be fixed to the rail bracket by means of a pressure plate and should not be welded or bolted.

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# Traction Engine Installation

## I. With machine room passenger lift series

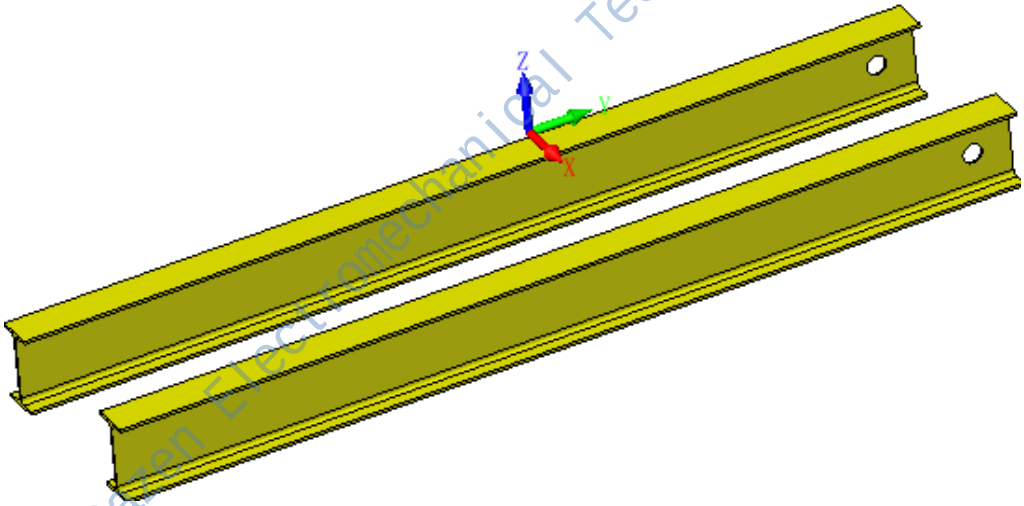
### 1. Installation of machine room spandrel girder

1.1 The machine room spandrel girder is made of I-beams and is fixed to the wall in the machine room, carrying the full weight of the car, alignment and traction engine.

1.2 The I-beam should be firmly welded to the concrete load-bearing wall of the machine room, and a pre-buried steel plate should be set in the wall fixing part of the I-beam (this pre-buried steel plate is at the user's expense), and the I-beam should be welded to the pre-buried steel plate.

1.3 When laying out the spandrel girder I-beam, the centre of the two spandrel girder should be determined in accordance with the shaft layout drawing and the spandrel girder installation drawing to ensure the matching of the traction wheel wirerope with the car and alignment.

1.4 The arrangement of the spandrel girder I-beam is to be levelled with a level, which must meet the requirements shown in the diagram below

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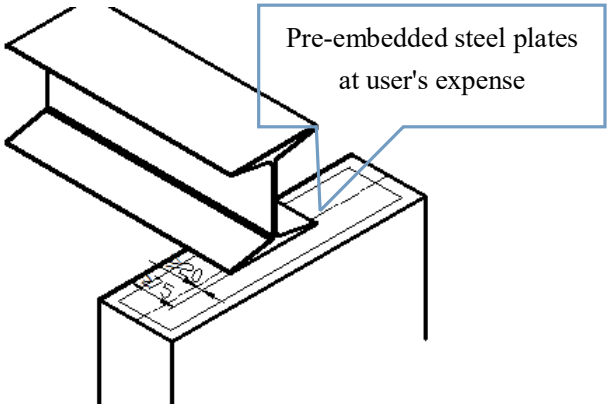
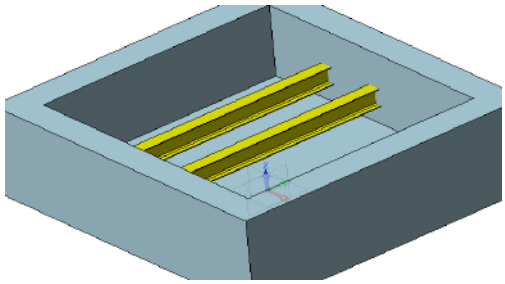
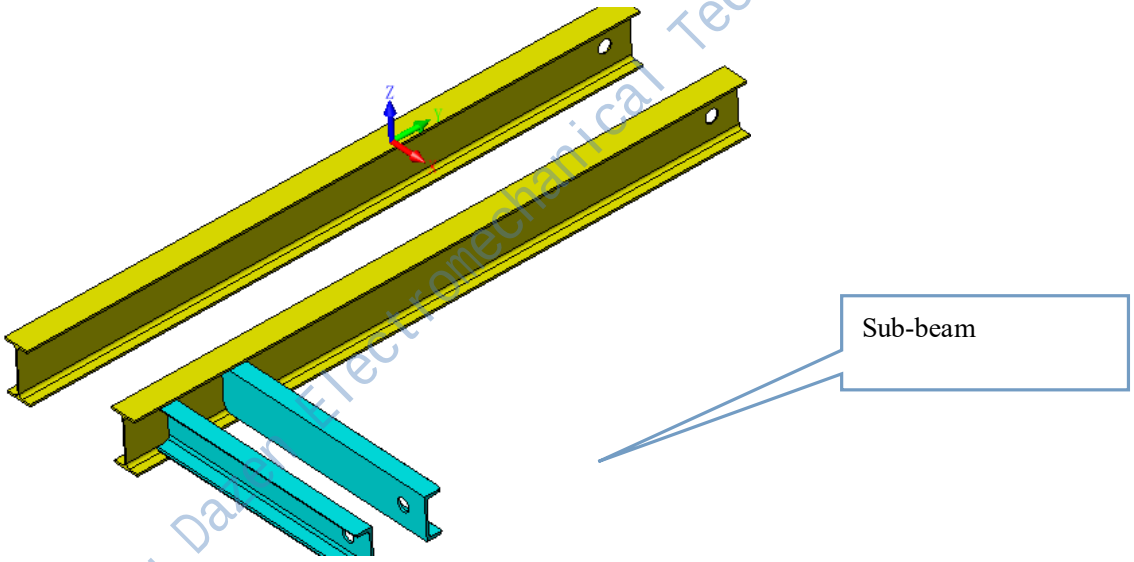
1.5 The ends of the spandrel girder should exceed the centre of the wall thickness by more than 20mm and should be erected in the wall by no less than 75mm, as shown below left. The completed spandrel girder is shown below on the right. When fixing the spandrel girder, it can be spot welded in place first in case the position is inaccurate, it will also need to be ground off and moved until the final position is determined to be correct and the I-beam is welded firmly to the wall.



1.6 Welding alignment rope hitch plate channels

The alignment rope hitch plate consists of two channels, one end of which is welded to the main spandrel girder and the other end is fixed to the load-bearing concrete wall, the fixing methods and requirements are the same as for the main spandrel girder. When welding with the main spandrel girder, it can also be spot welded first and then welded firmly after the position has been determined.

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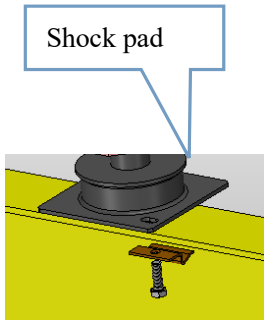
## 2. Install shock pad

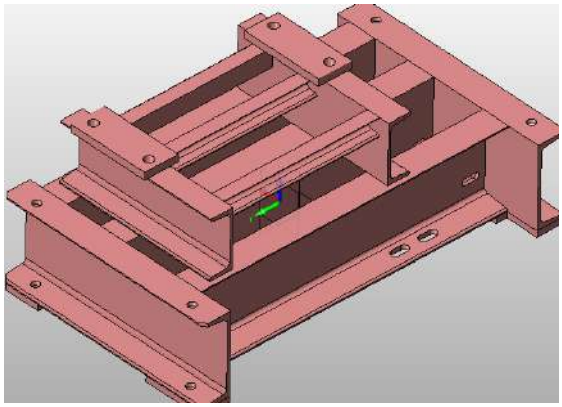
2.1 The traction engine shock pad consists of four shock absorbing rubbers. The shock pad is connected to the spandrel girder by means of a pressure guide.



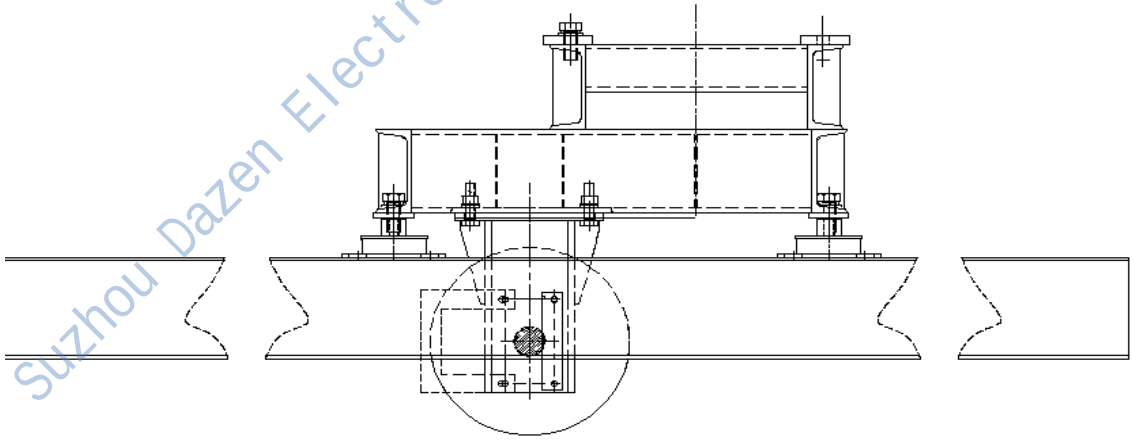
## 3. Installation of the traction machine rack

3.1 The traction machine rack is the base for the direct mounting of the traction engine and is connected to the vibration damping rubber by means of bottom bolts. The lower rack has four holes in the longitudinal channel for the mounting of the guide pulley shaft.

3.2 The requirements for the level of the rack installation are the same as those for the spandrel girder I-beam, and attention must be paid to the correct position of the connection holes with the traction engine, spandrel girder and guide pulley when installing the rack.



3 Before the rack is positioned, the guide pulley is assembled with the rack and adjusted after the traction engine has been installed. guide pulley is fixed by means of a card plate and then bolted together.



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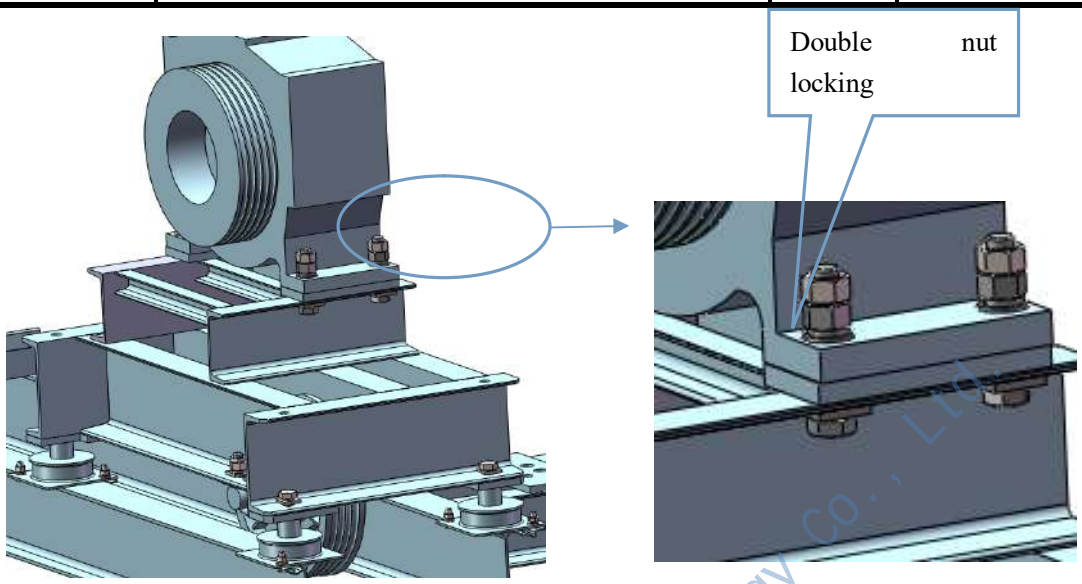
## 4.Traction engine positioning

4.1 After the spandrel girder and traction engine frame have been installed and levelled, the traction engine is lifted, placed lightly on the rack (i.e. traction engine base), threaded with M24*130 all-thread bolts and locked with double nuts.




4.2 The following steps fine tune the position of the mainframe so that the position of the mainframe corresponds to the dimensions required by the installation drawing.

A The main engine traction sheave and rope hitch plate must be aligned to their respective positions. The distance between the centre of the wirerope of the car and alignment mounted on the guide pulley and drive sheave shall be equal to the vertical distance from the centre line of the inner diameter of the groove of the car counter sheave plus the radius of the wirerope to the centre line of the alignment counter sheave.

B Mark the rail distance line for each pair of rails and place a plumb line representing the centre of the wirerope to the shaft sample frame on each of the guide pulley and the centre slot of the traction sheave to correct the position of the mainframe, note: the mounting position of the wirerope on the alignment side should be offset from the alignment rail by The distance of the alignment sheave radius.

C Measure the perpendicularity of the mainframe traction wheel with a wire pendant to check whether the perpendicularity error is within ±0.5mm and ensure that the parallelism between the traction wheel and the guide pulley is within ±0.5mm. If it does not meet the requirements, use special shims to pad between the anti-vibration rubber and the mainframe spandrel girder to make the error meet the requirements.

After the main machine has been adjusted in place, it is fastened by welding and the traction wheel guard is installed.

## 5. Guide pulley adjustment

5.1 After the installation and adjustment of the traction wheel, adjust the position, verticality and parallelism of the guide pulley with the traction wheel: ensure that the guide pulley coincides with the centre of the traction wheel with an error of ±0.5mm, the parallelism with the traction wheel with an error of ±0.5mm and the verticality of the guide pulley with an error of ±0.5mm.

5.2 Install and adjust the guide pulley rope stopper as shown in the diagram below.

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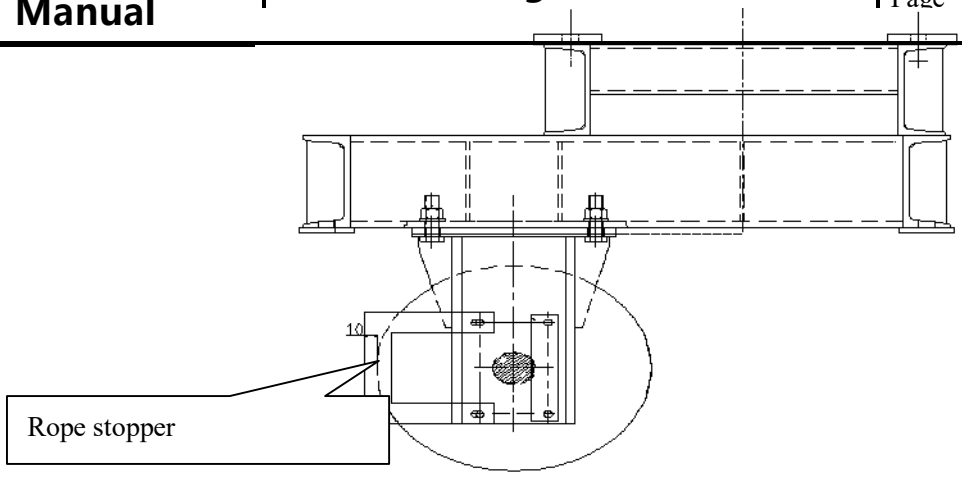
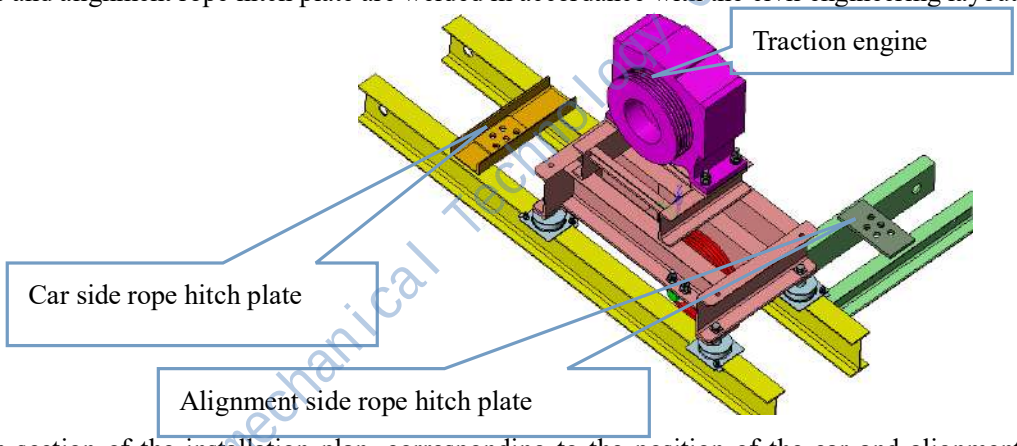



**6. Rope hitch plate welding**

The carrope hitch plate and alignment rope hitch plate are welded in accordance with the civil engineering layout plan




and the machine room section of the installation plan, corresponding to the position of the car and alignment, the welding is solid and reliable, and the welding quality is in accordance with the provisions of the technical requirements.

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## 2. TKWJ series traction engine installation

**1. Installation of machine room spandrel girder**

1.1machine room spandrel girder made from a combination of I-beams and plates, fixed to the wall in the shaft, carrying the full weight of the car, alignment and traction engine.

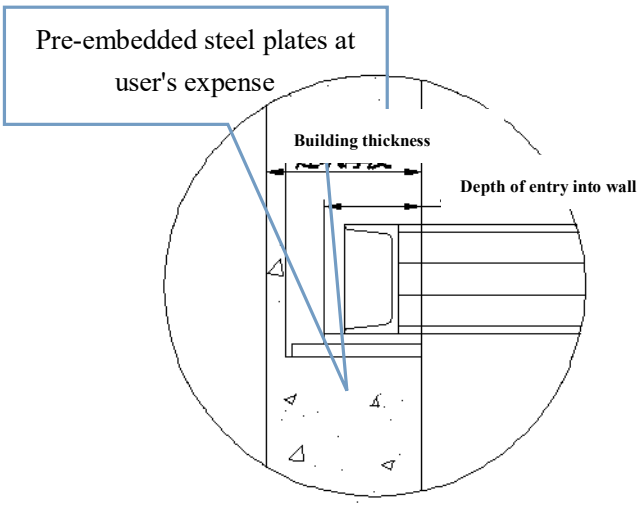
1.2 The I-beam should be firmly welded to the concrete load-bearing wall of the machine room, and a pre-buried steel plate should be set at the part of the wall where the I-beam is fixed (this pre-buried steel plate is at the user's expense), and the I-beam should be welded to the pre-buried steel plate.

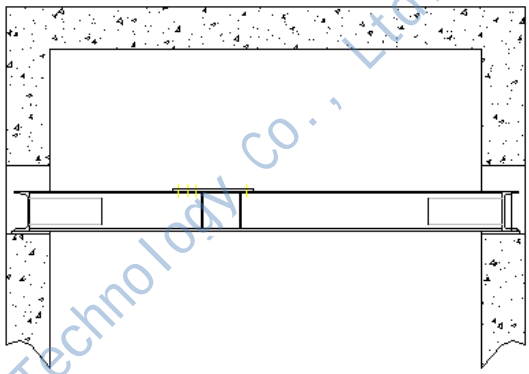
1.3 When laying out the spandrel girder I-beam, the centre of the spandrel girder must be determined in accordance with the shaft layout drawing and the spandrel girder installation drawing to ensure the matching of the traction wheel wirerope with the car and alignment.

1.4 The spandrel girder is a one-piece spandrel girder, the arrangement needs to be leveled with a leveling tape to

ensure that the spandrel girder is level.

1.5 The ends of the spandrel girder should have a depth of entry into the wall of not less than half the thickness of the building, as shown below left. The completed spandrel girder is shown below on the right. When fixing the spandrel girder, it can be spot welded in place first in case the position is inaccurate, it will also need to be ground off and moved until the final position is determined to be correct and the spandrel girder is welded firmly to the wall.

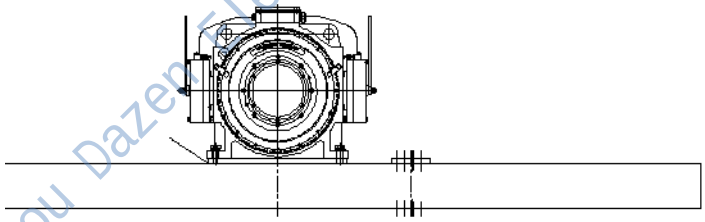


## 2 Installation of the traction engine rack

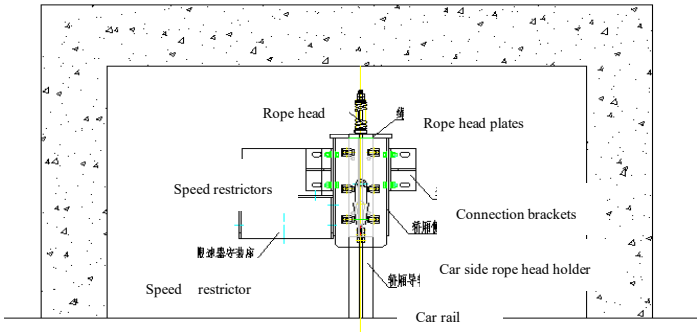
2.1 The traction engine mounting plate is the base for the direct mounting of the traction engine, which is bolted on via the bottom.

2.2 The level of the traction engine mounting plate is the same as that of the spandrel girder, and attention must be paid to the correct position of the connection holes with the traction engine and spandrel girder.



## 3. Rope hitch plate welding

3.1 The car rope hitch plate is mounted on the upper end of the car rail in connection with the car side rope head frame, see the following diagram.

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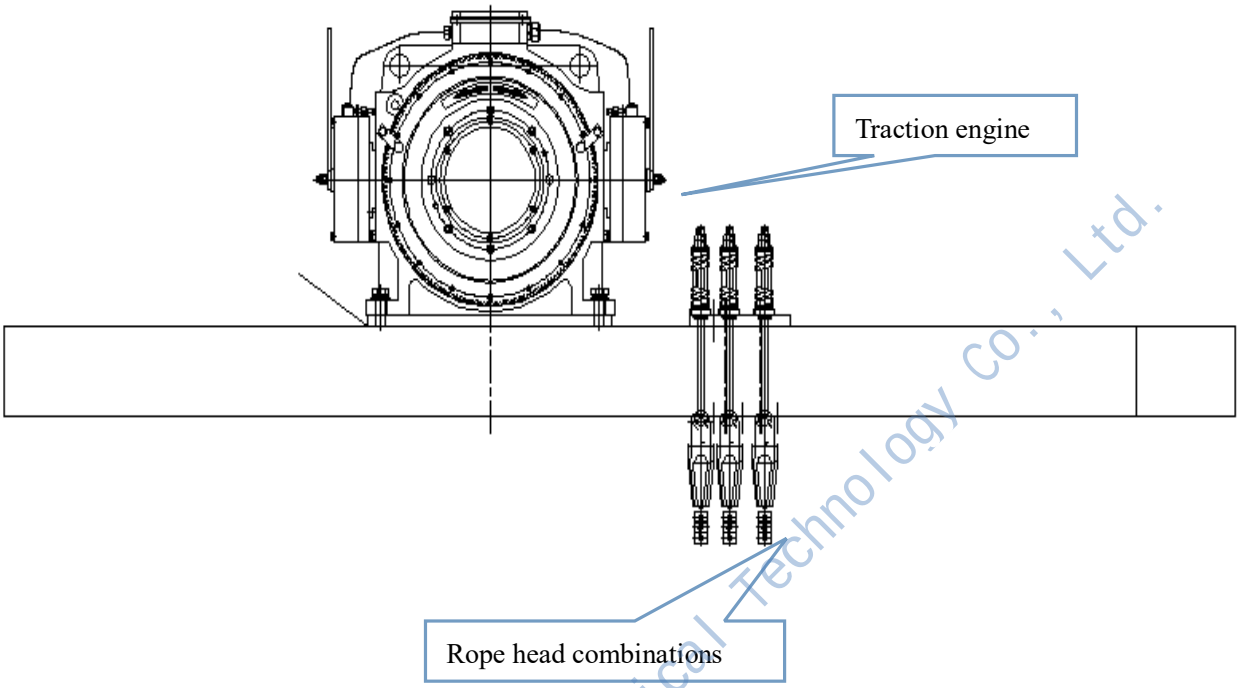
3. 2 Alignment rope hitch plates are welded to the spandrel girder via and installed as follows.

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# Control Box Positioning and Machine Room Wiring

## 1. Installation of the control box

1.1 Fix the control box to the floor of the machine room with expansion screws.

1.2 The arrangement of the control box shall meet the following conditions

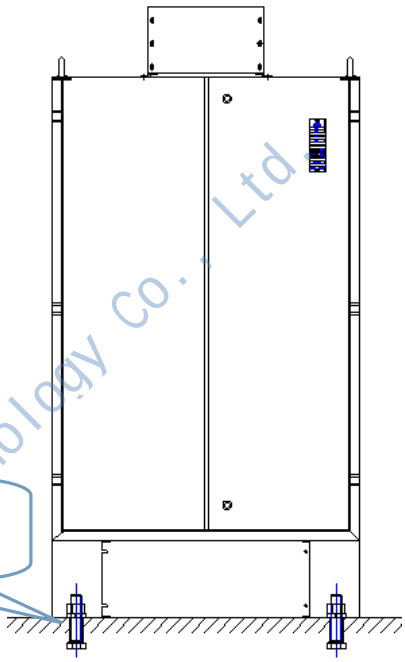
Frontage not less than 600 mm from doors and windows.

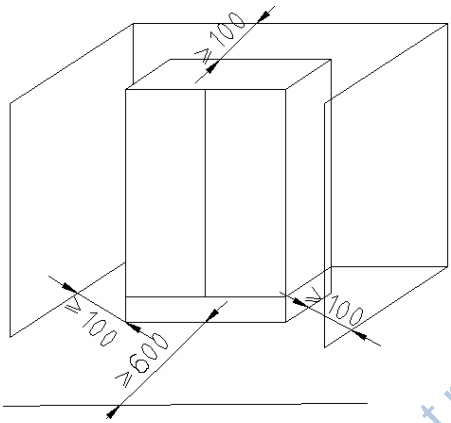
Not less than 600 mm from the wall on the maintenance side.

Not less than 500 mm from machinery and equipment.

Not less than 100 mm from the wall on any side.

The verticality of the control box should be measured with a wire drop to within ±2/1000mm.



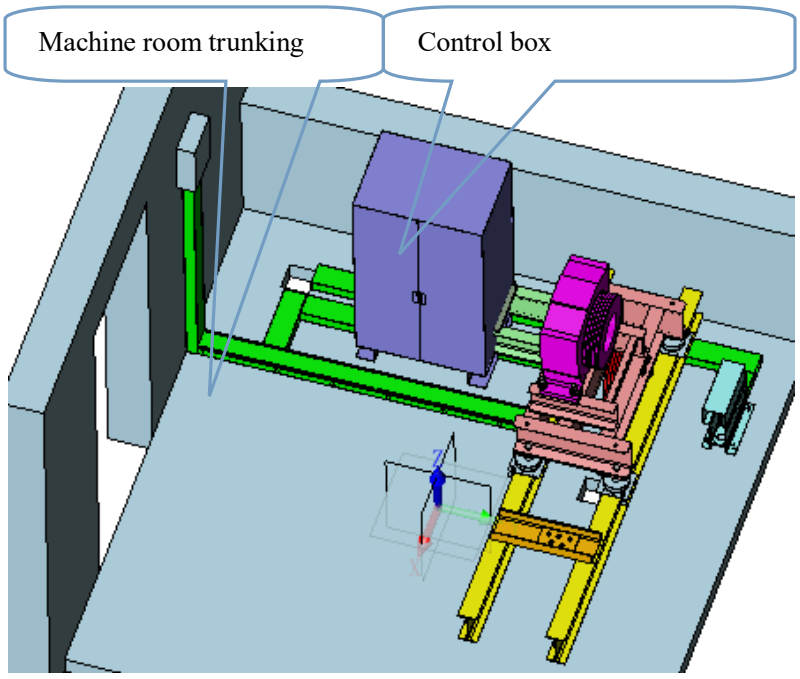




## 2. Machine room cabling

The machine room wiring is shown in the diagram below for reference.

Motor, holding brake wiring, speed restrictor wiring into metal tube first, then into trunking.

When both power and control wires are routed in the same trunking, place the power wire conduit in the trunking and secure both ends so that the power wire is separated from the control wire. Ground the wire conduit and trunking separately.




The size of the opening in the trunking sub-section head to the outer lead-through pipe is handled on site.

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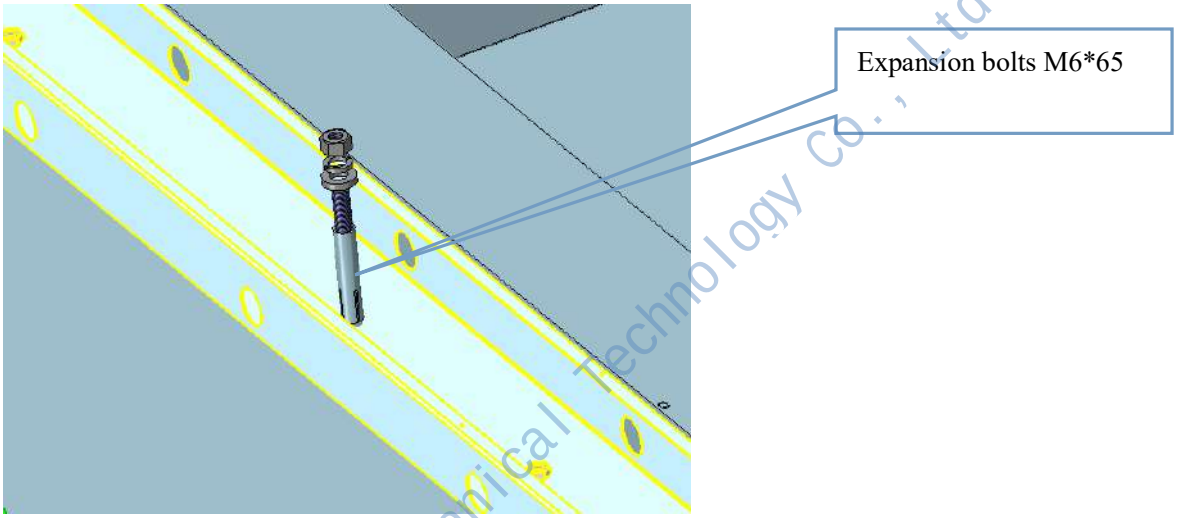
Note: When the machine room power box is far away from the control box or traction engine, it should be specified in the shaft survey so that sufficient trunking can be issued during installation, otherwise the number of trunking will be issued as standard.

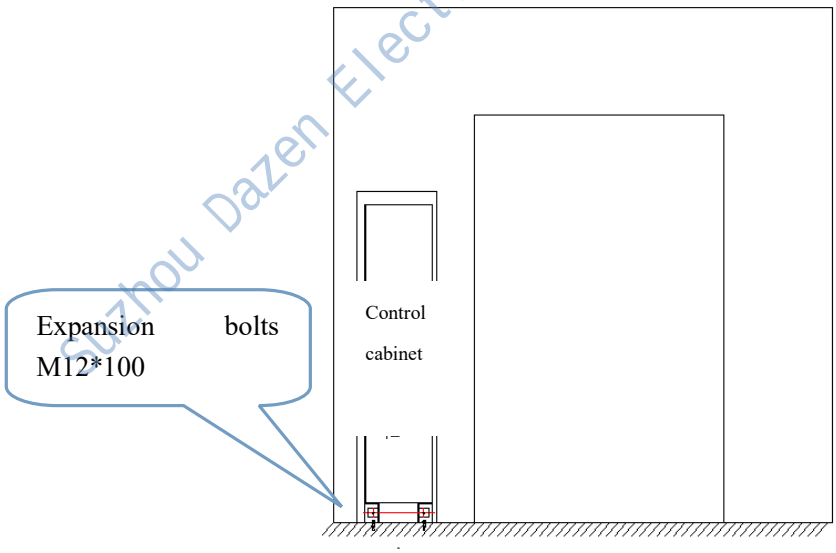
### 3. Trunking fixed

The machine room trunking is fixed to the floor with expansion bolts, as shown in the diagram below.




4. Installation without machine room control box

4.1 Place the control box into the hole reserved by the top hall door and secure it with expansion bolts.

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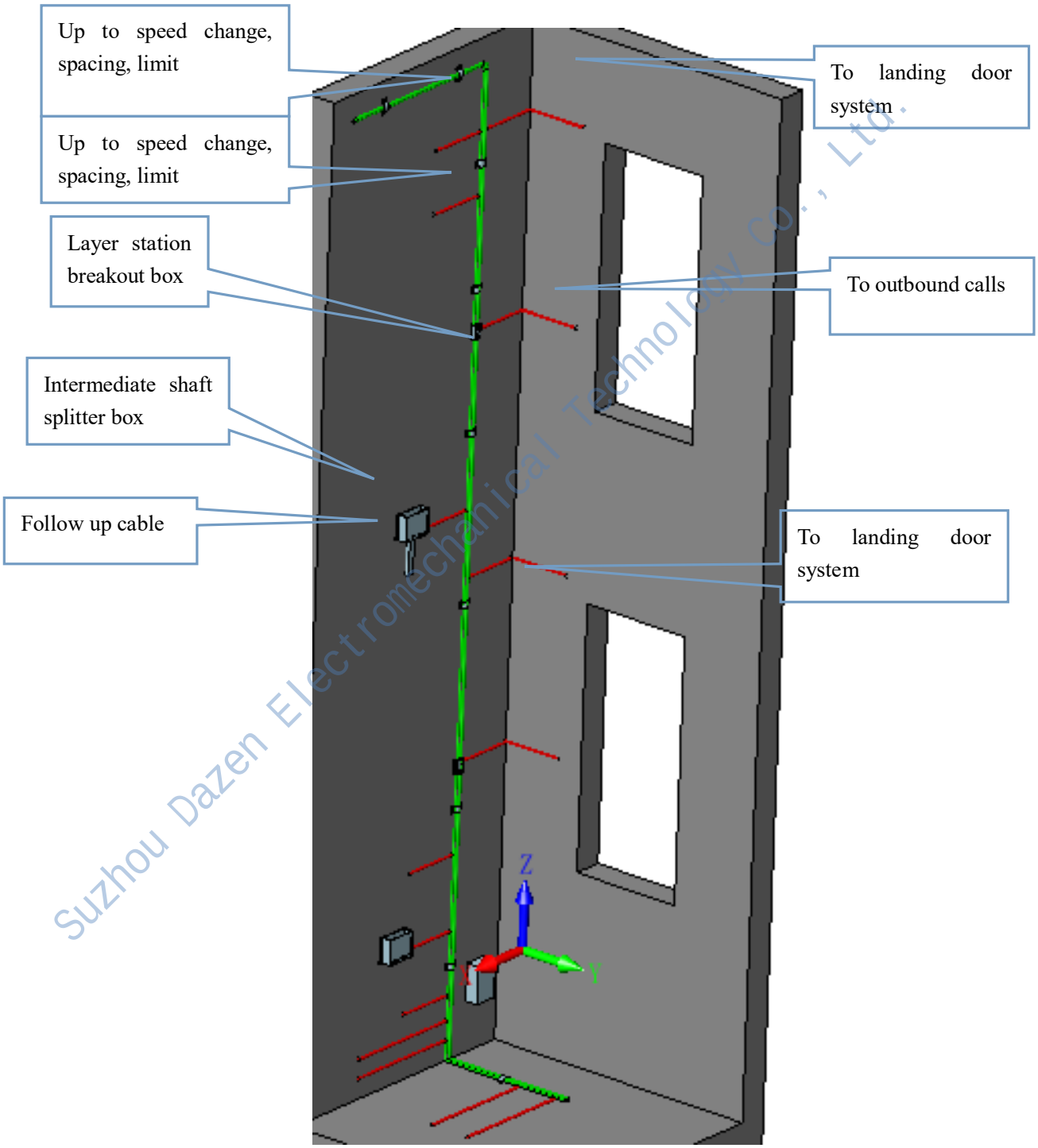
# Shaft Prewire Installation

## Reference diagram for shaft wiring

1. With machine room wiring

Pre-lay shaft wiring in accordance with the electrical schematic and civil layout drawing, refer to the following diagram.

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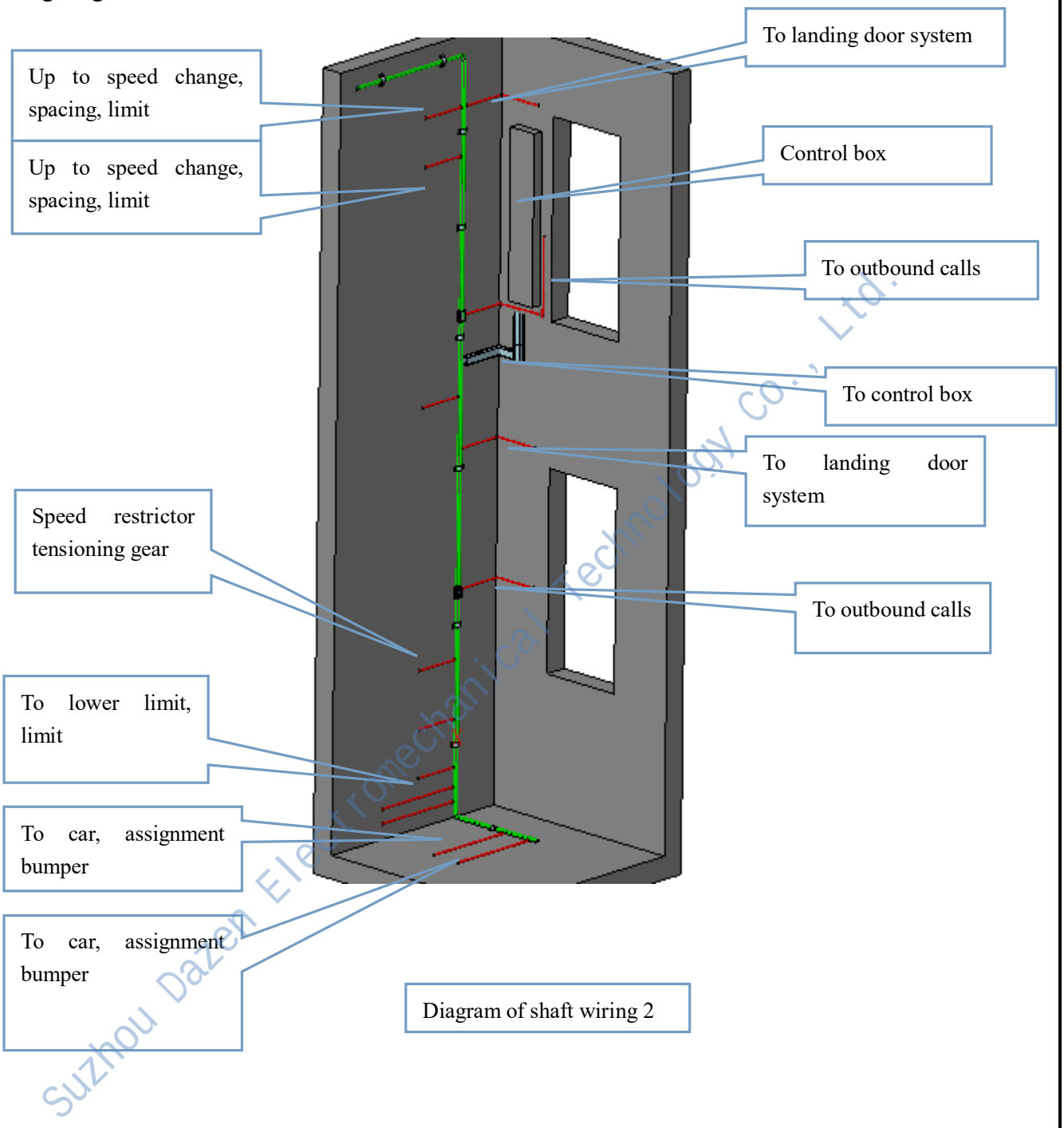
2. Wiring diagram without machine room shaft

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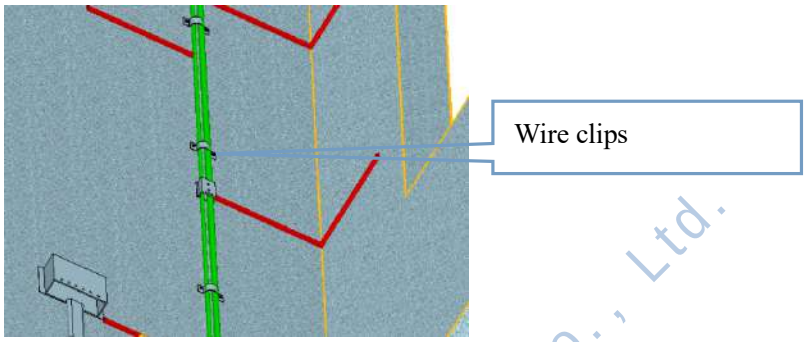
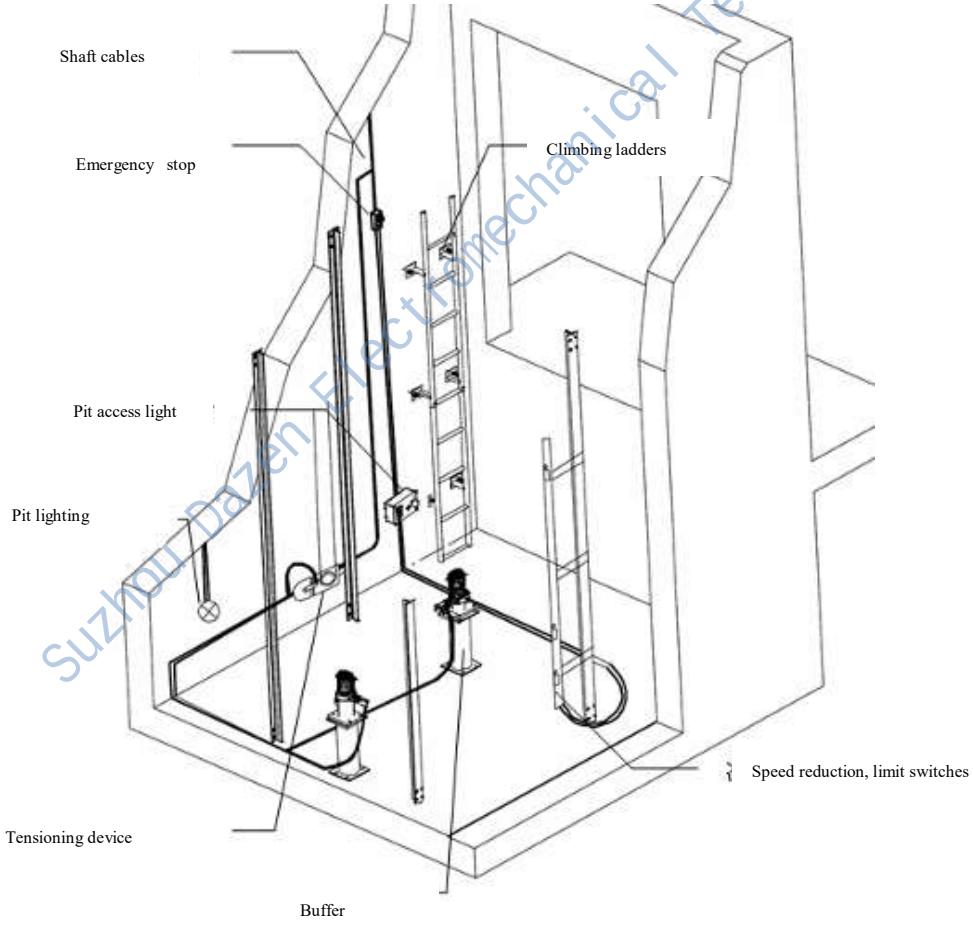
## Fixing of the shaft wire

The shaft line pipe is fixed with semi-circular clips, which are fixed to the inner wall of the shaft by means of expansion nuts and wood screws, the clips are spaced approximately 1.5 to 2.0 meters apart.




## PIT Wiring Reference Detail

PIT diagram

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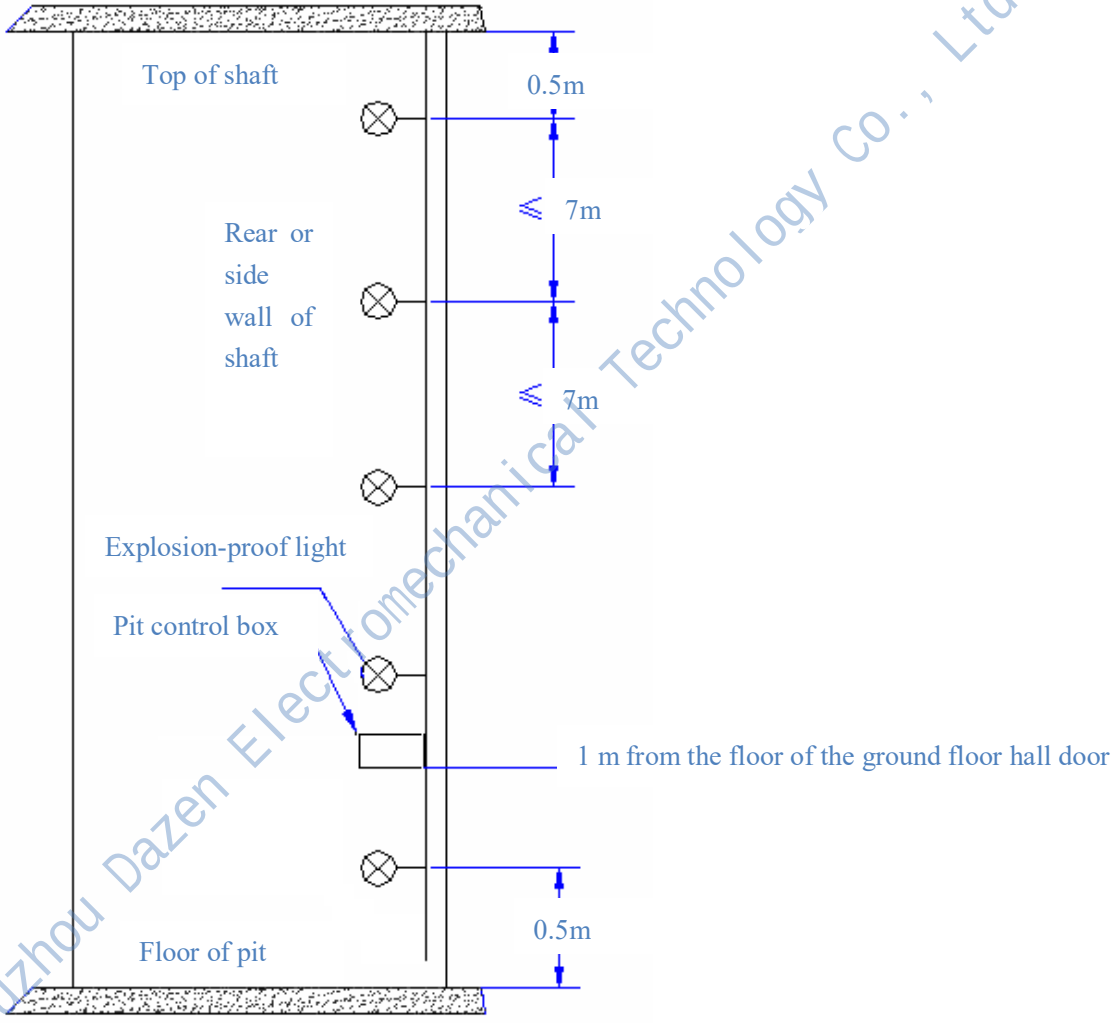
# Shaft Lighting Installation

## 1. Installation of shaft lighting

1.1 The position of the shaft lighting conforms to the requirements of GB7588-2003, i.e. the distance between the two lights at the end of the shaft from the top (bottom) of the shaft is no more than 0.5m, and the distance between the two adjacent lights in the middle is no more than 7m, as shown in the diagram below.

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1.2 An interconnecting control switch shall be provided in the machine room and in the PIT, which can control the shaft light individually. This power switch shall be set up to supply power independently of the power supply and be protected against short circuits and overloads.

1.3 The shaft lighting shall take into account the protection of the bulb from possible shattering by falling particles in the shaft.

1.4 Shaft lighting should be sufficiently bright and have socket switches in appropriate locations.

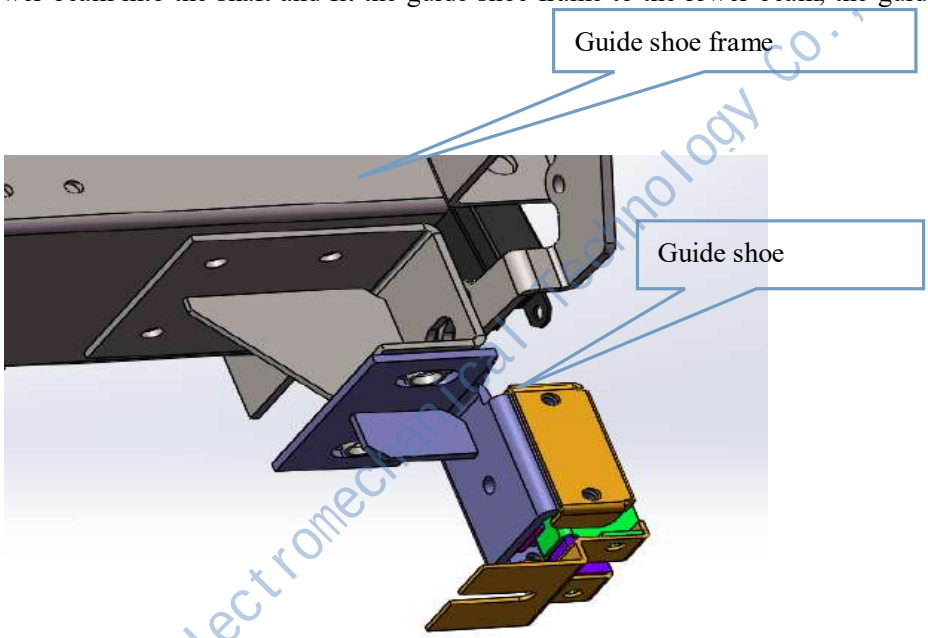
## Car Frame and Car Mounting

### 1. With machine room car frame assembly

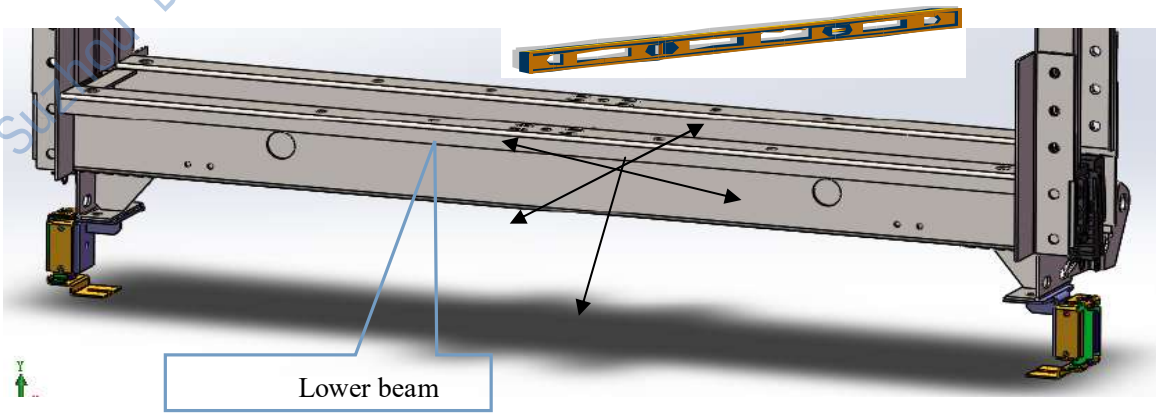
1.1 Preparation for car frame installation.

Transporting the car frame components to the top floor. Remove the top scaffold to make room for the installation. Prepare the mounting position for the hand puller, hang it from the machine room spandrel girder and secure the hand puller.

1.2 Lift the lower beam into the shaft and fit the guide shoe frame to the lower beam, the guide shoe sits under the guide shoe frame.




1.3 Make the GUIDE shoe fit in the safety clamp and level the lower beam with a leveling error of no more than 2mm.

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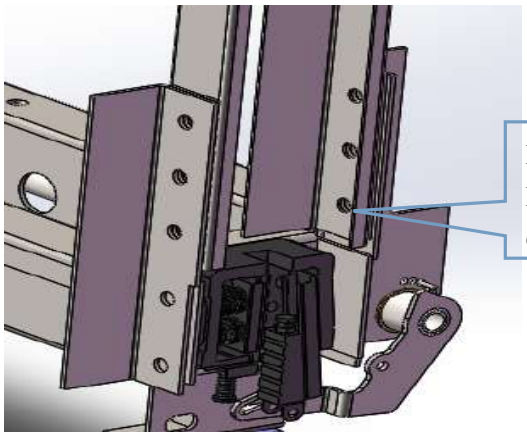
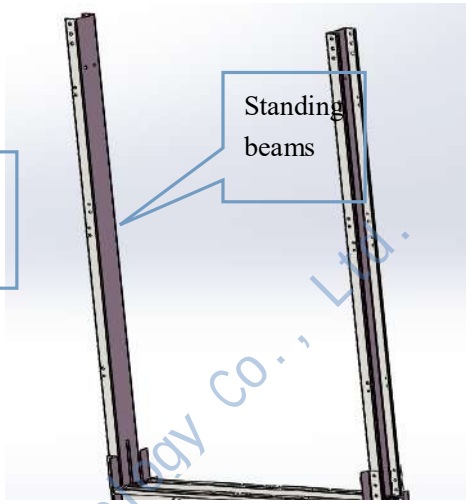
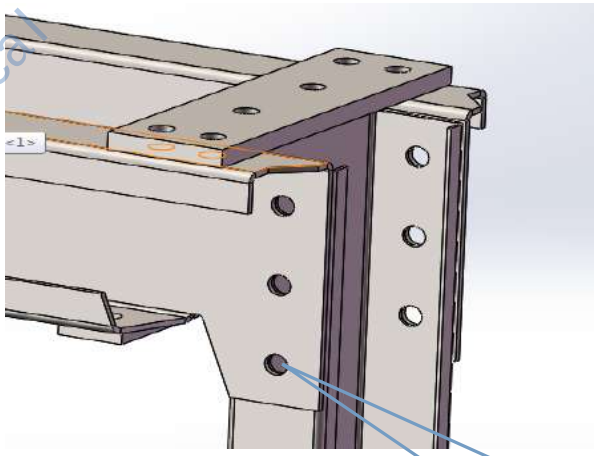
1.4 With fitted uprights



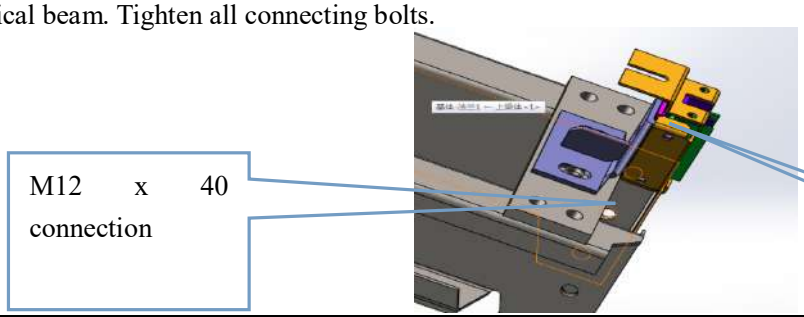




1.5 Install the upper beam, adjust the level of the upper and lower beams not more than 2mm, the vertical straightness of the vertical beam not more than 1mm, the diagonal error not more than 2mm.




1.6 Attach the guide shoe

Adjust the upper and lower guide shoe gap to maintain a gap of around 2mm between it and the top surface of the rail. Adjust the gap between the safety clamp and the rail so that there is a 2-3mm gap between the safety clamp block and the working surface on both sides of the rail. Check again the level of the upper and lower beams of the car frame and the uprightness of the vertical beam. Tighten all connecting bolts.

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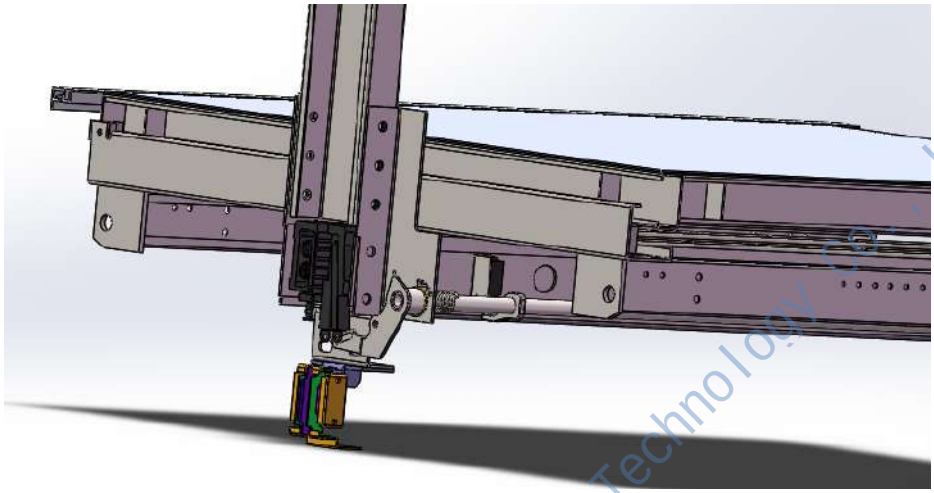
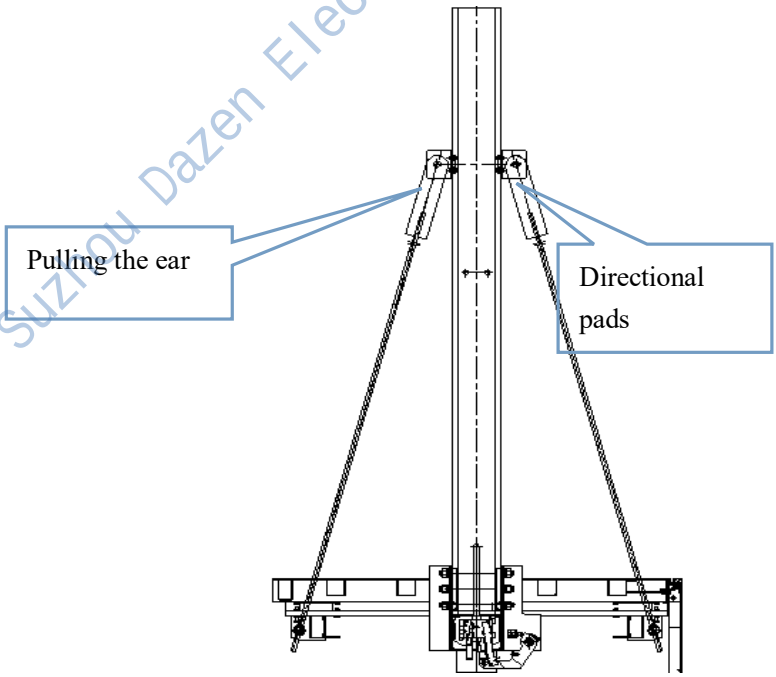
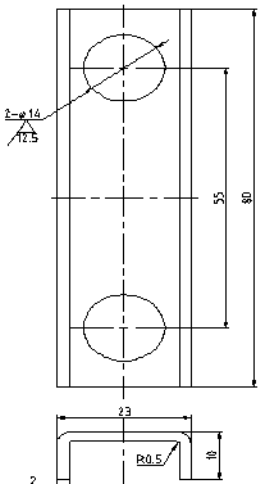
## 2. With machine room platform assembly

2.1 Lift the assembled base plate into the gantry, put on the attachment bolts and adjust the clearance from the front of the car door sill to the landing door sill by 30 mm.



2.3 Install the car frame tilt rod, adjust the surface level of the platform by adjusting the screw below the tilt rod, and lock the bolts of the platform and the tilt rod. Orienting pad is installed inside the column and outside the pulling lug screw connection fixed.

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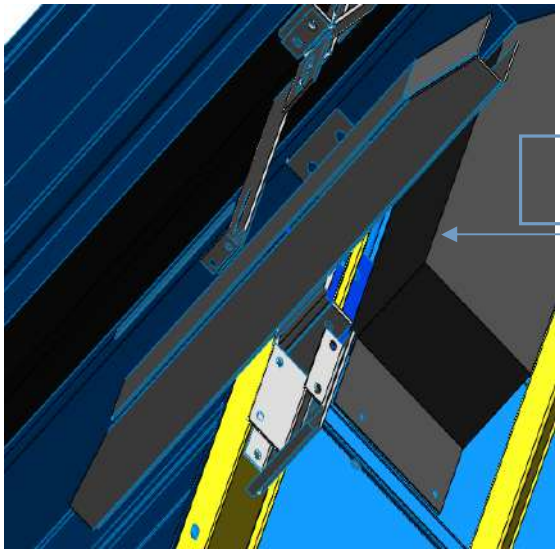
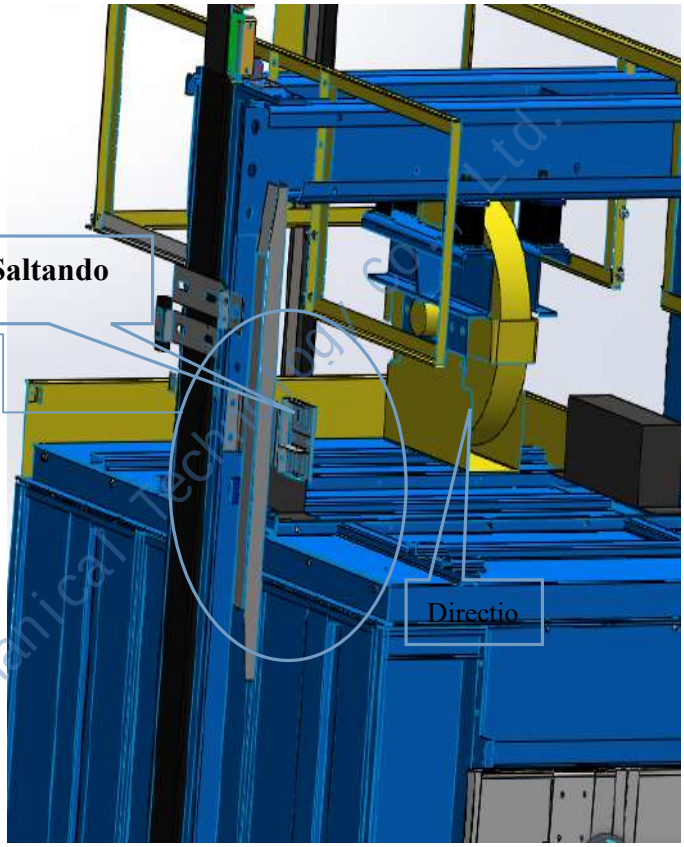
2.4 Install the saltando on the corresponding side of the car frame upright beam according to the position on the installation drawing.



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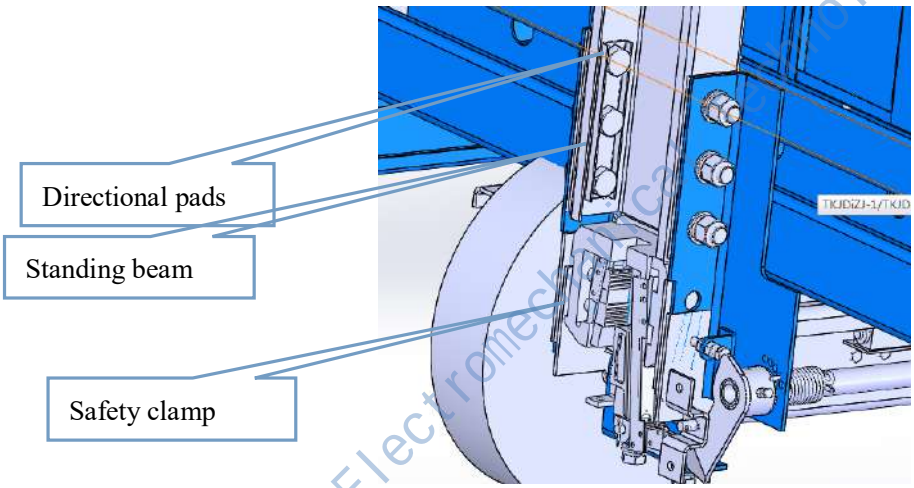
## 3. Without machine room car frame assembly

3.1 Preparation of the car frame before installation

Transporting the car frame components to the top floor. Remove the top scaffold to make room for the installation. Prepare the mounting position for the hand chain hoist, suspend it from the spandrel girder and fix it in place.

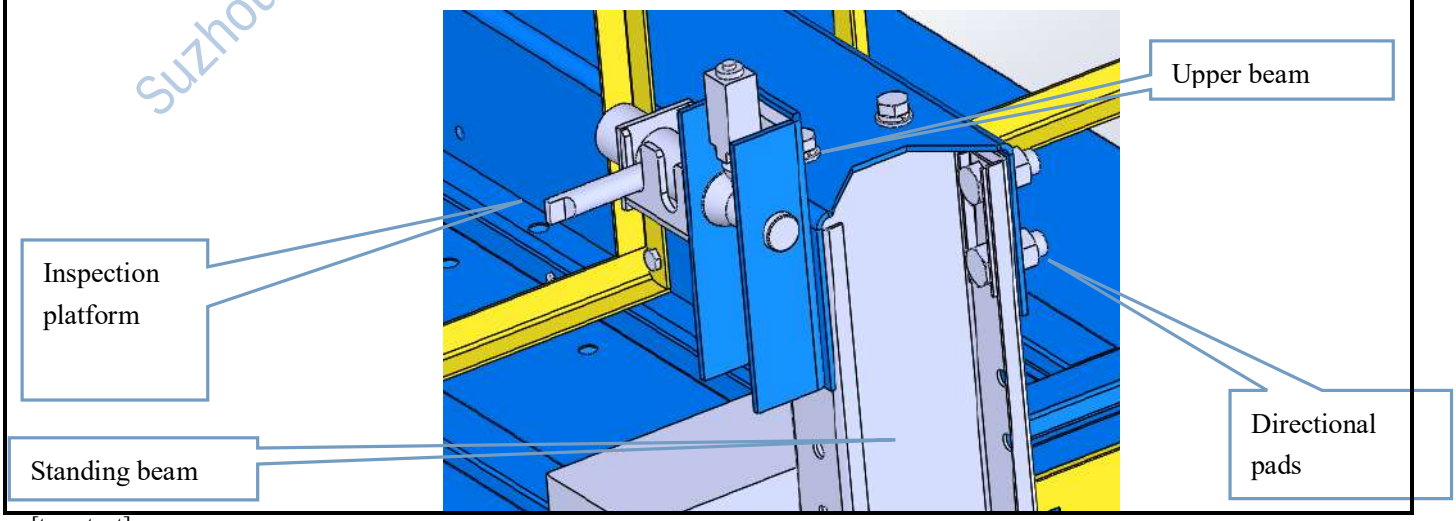
3.2 The upright and lower beams are lifted into shaft for assembly.

3.3 Fit the safety clamp to the lower beam so that the guide shoe is connected to the safety clamp and level the lower beam with a leveling error of no more than 2mm.




3.4 Install the upper beam and adjust the level of the upper and lower beams to no more than 2mm, the vertical straightness of the vertical beam to no more than 1mm and the diagonal error to no more than 2mm.

3.5 The upper beam is fitted with a guide shoe and an access platform is fitted at the end of the upper beam

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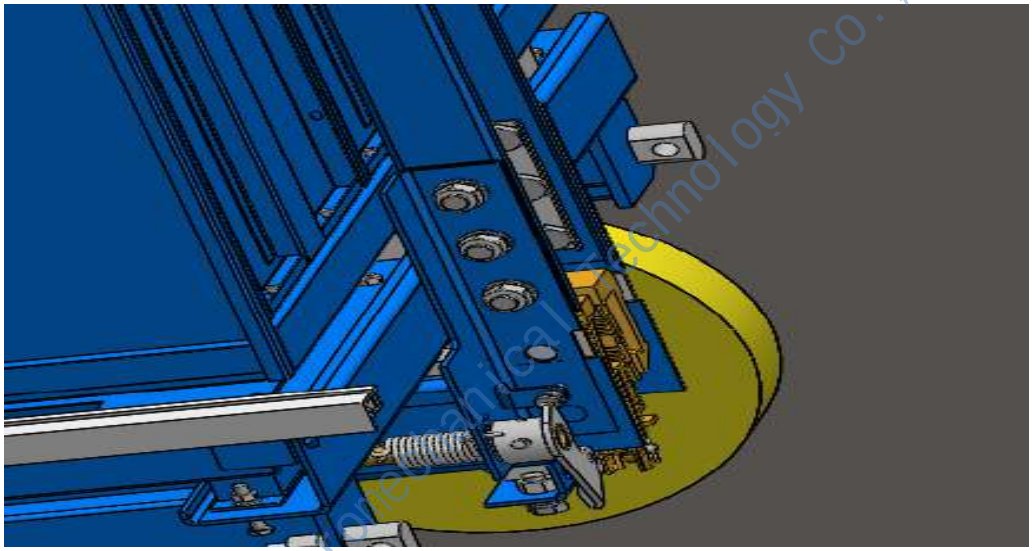
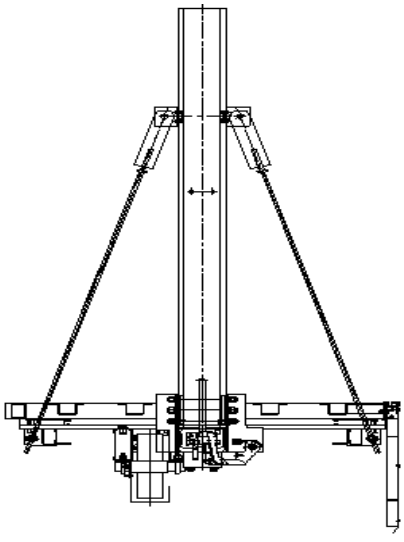
3.6 Adjust the upper and lower guide shoe gap to maintain a gap of around 2mm between it and the top surface of the rail. Adjust the gap between the safety clamp and the rail so that there is a 2-3mm gap between the safety clamp block and the working surface on both sides of the rail. Check again the level of the upper and lower beams of the car frame and the uprightness of the vertical beam. Tighten all connecting bolts.

## 4. No machine room platform assembly

4.1 The platform is pre-assembled, the assembled base plate is lifted into the gantry, the attachment bolts are put on and the gap between the front of the car door sill and the landing door sill is adjusted by 30mm.



4.2 Install the car frame tilt rod, adjust the level of the platform surface by adjusting the screw under the tilt rod to not more than 1mm, and lock the bolts of the platform and the tilt rod.



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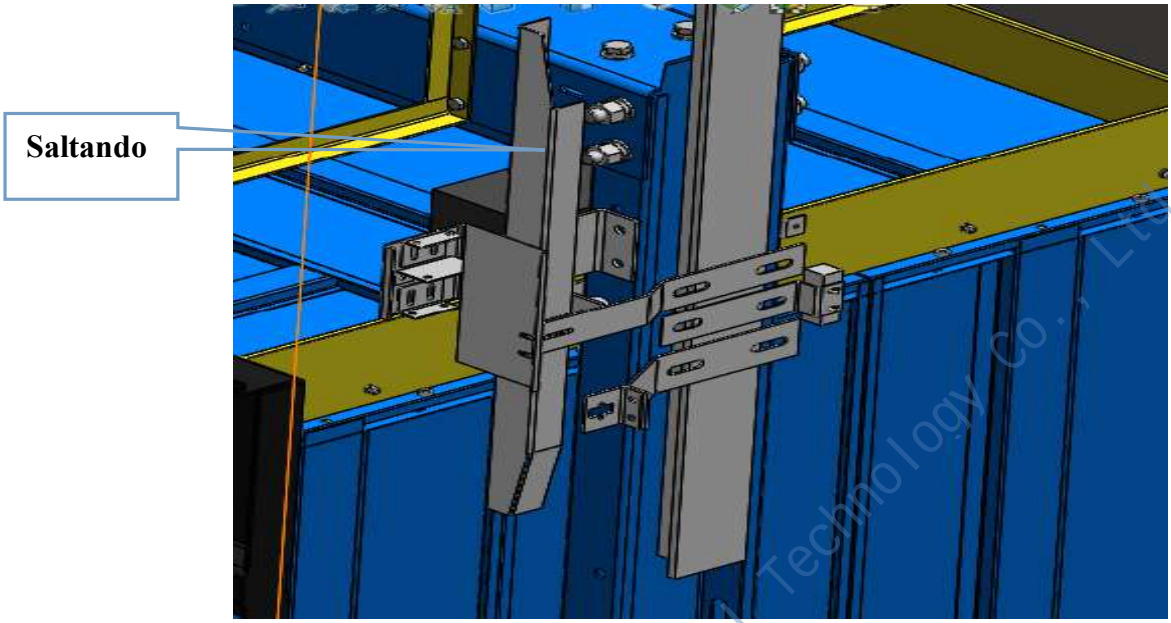
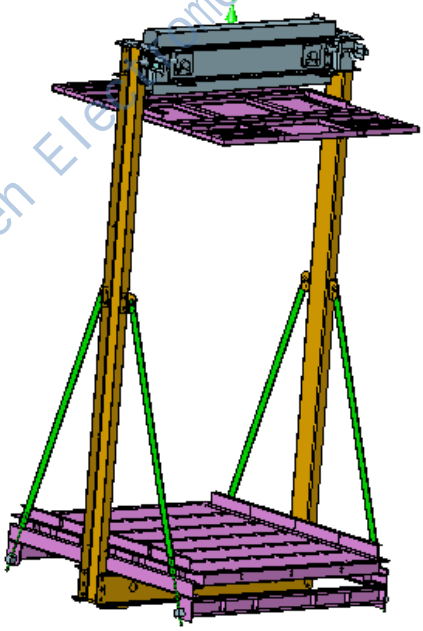
4.3 Install the saltando. install the saltando on the corresponding side of the car frame upright beam according to the position on the installation drawing.




5. Car wall, car roof and car roof protective guard assembly



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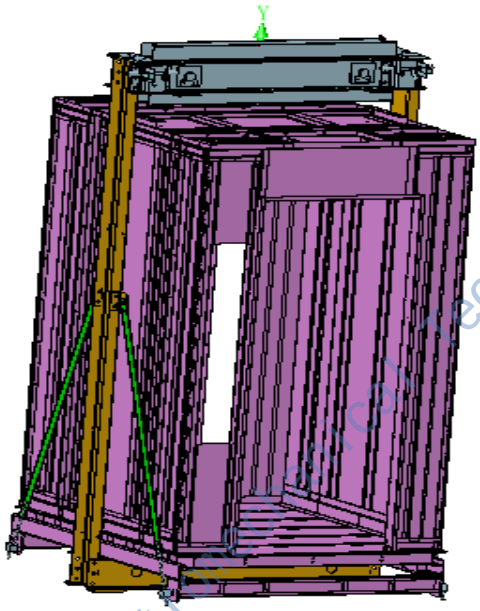
5.1 Suspend the car roof over the lower end of the upper beam, close to the upper beam.

5.2 Putting together the front wall, adjusting the vertical straightness with a magnetic wire pendant no more than 1mm, measuring the width of the open door with an error of no more than 1mm, the symmetrical surface of the front wall also landing doordoor pocket symmetrical surface overlap no more than 1mm.

5.3 Assembled three-sided sidewalls with a vertical straightness of no more than 1mm.



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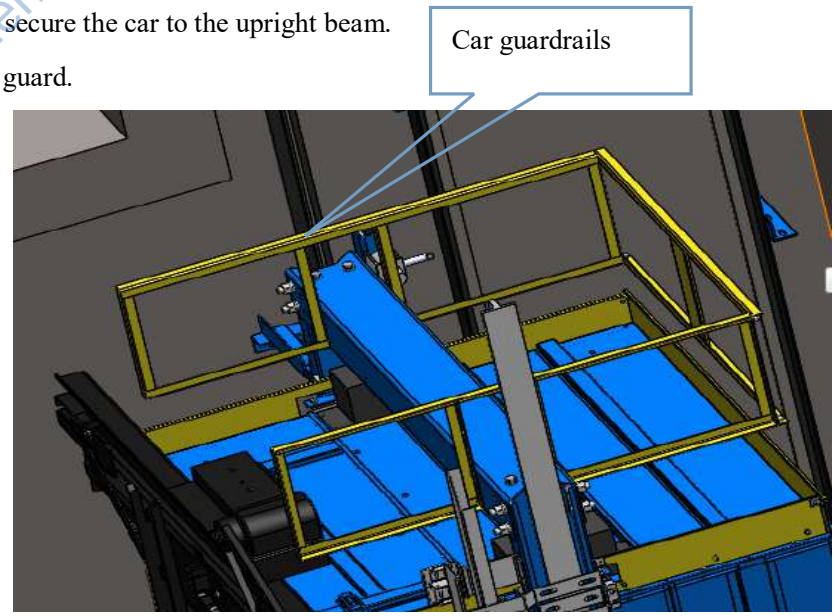
5.4 Lower the car roof suspended from the lower end of the upper beam and fix it to the enclosure wall; when finished, check the verticality of each car wall and lock the bolts.

5.5 Install car roof limiters to secure the car to the upright beam.

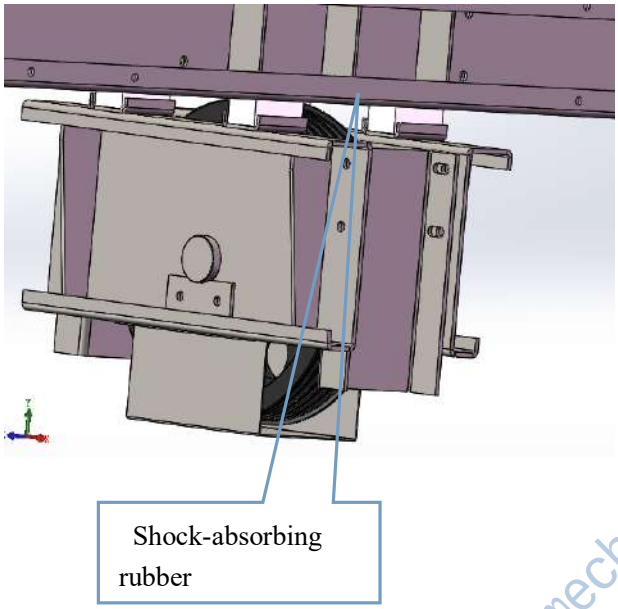
5.6 Install car roof protective guard.

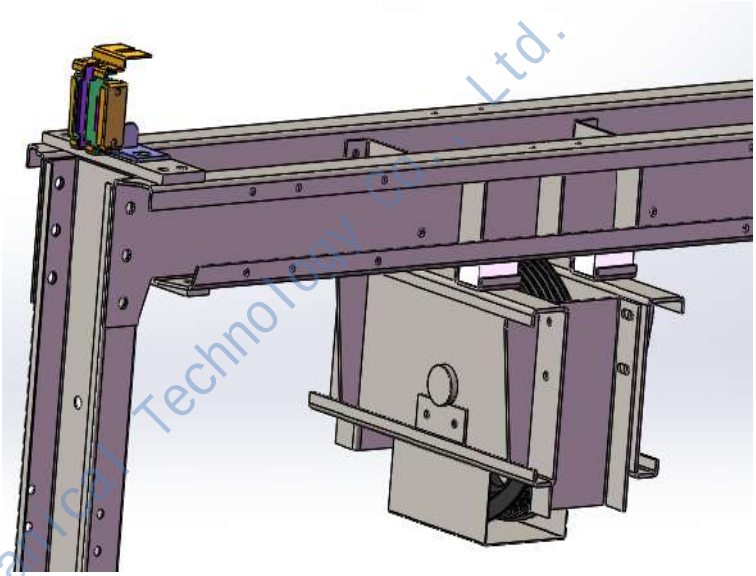


## 6. Installation of car roof car diversion sheave and car door toe guard

6.1 Install the car roof car diversion sheave and check that the position of the car diversion sheave corresponds to the wirerope position of the traction sheave sag.

(Note: no machine room car roof car diversion sheave installed under platform, can ignore this step)



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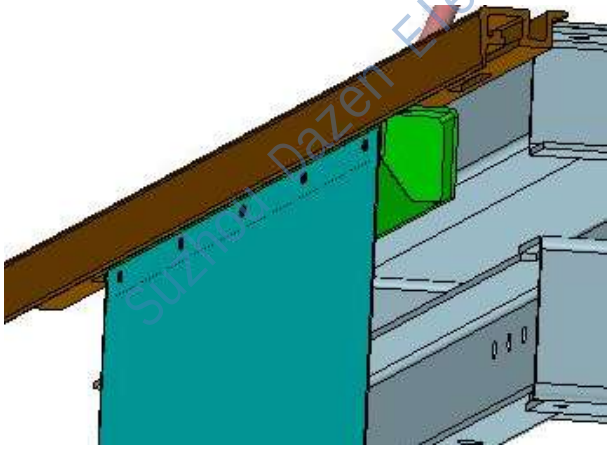
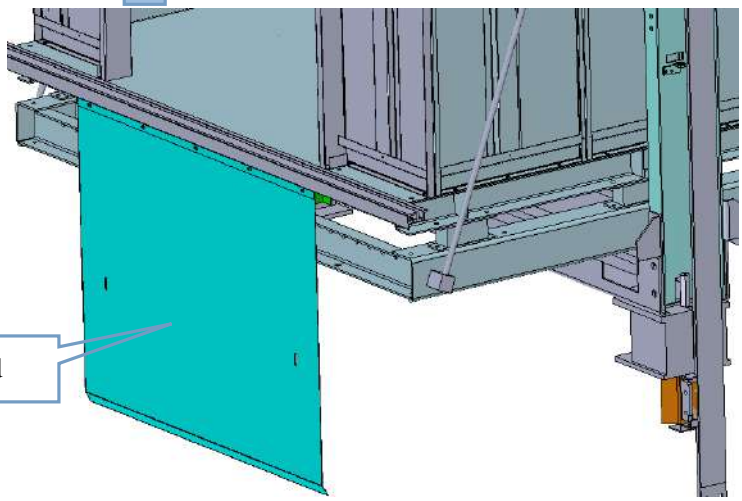
6.2 Assemble the cartoe guard. fix the car doortoe guard to the sill bracket, lock it with countersunk screws and install the two fixing braces.





7. Table of common parts for car installation

| Serial number | National Standard Number | Name | Connecting part 1 | Connecting part 2 | Number |
|---|---|---|---|---|---|
| 1 | GB5783-M6×16 | Hexagonal bolts | Surrounding walls | Surrounding walls | N |
| 2 | GB6170-M6 | Hexagonal nuts | | | |
| 3 | GB97.1-6 | Flat Cushion | | | |
| 4 | GBT93-6 | Bounce pads | | | |
| 5 | GB5783-M6×25 | Hexagonal bolts | Surrounding walls | car roof, platform | N |
| 6 | GB97.1-6 | Flat Cushion | | | |
| 7 | GBT93-6 | Bounce pads | | | |
| 8 | GB5783-M8×35 | Hexagonal bolts | Car roof | Limit brackets | 8 |
| 9 | GB6170-M8 | Hexagonal nuts | | | |
| 10 | GB97.1-8 | Flat Cushion | | | |
| 11 | GBT93-8 | Bounce pads | | | |
| 12 | GB5783-M8×25 | Hexagonal bolts | Sill frame | Sill | 5 |
| 13 | GB6170-M8 | Hexagonal nuts | | | |
| 14 | GB97.1-8 | Flat Cushion | | | |
| 15 | GBT93-8 | Bounce pads | | | |
| 16 | GB5783-M10×35 | Hexagonal bolts | Sill frame | Platform | 5 |
| 17 | GB6170-M10 | Hexagonal nuts | | | |
| 18 | GB97.1-10 | Flat Cushion | | | |
| 19 | GBT93-10 | Bounce pads | | | |
| 20 | GB5783-M6×16 | Hexagonal bolts | Sill frame | Toe guard | 5 |
| 21 | GB97.1-6 | Flat Cushion | | | |
| 22 | GBT93-6 | Bounce pads | | | |

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8. Table of common parts for car frame installation (Q ≤ 1000 kg)

| Serial number | Standard Parts Pack | Name | National Standard Number | Name | Number |
|---|---|---|---|---|---|
| | GEL3Z004401 | Common parts for car frames | | | |
| 1 | | Standing beams and top and bottom beams | GB5783 | Bolt M16*45 | 24 |
| | | | GB6170 | Nut M16 | 24 |
| | | | GB97.1 | Flat pad 16 | 24 |
| | | | GB93 | Bouncing pad 16 | 24 |
| 2 | | Safety clamp with lower beam | GB5783 | Bolt M16*65 | 8 |
| | | | GB6170 | Nut M16 | 8 |
| | | | GB97.1 | Flat pad 16 | 8 |
| | | | GB93 | Bouncing pad 16 | 8 |
| 3 | | Safety clamp lever locking | GB6170 | Nut M10 | 2 |
| 4 | | Car ties with uprights, platform | GB6170 | Nut M16 | 12 |
| | | | GB97.1 | Flat pad 16 | 12 |
| | | | GB93 | Bouncing pad 16 | 12 |
| 5 | | Guide shoe with upper and lower beams | GB5783 | Bolt M16*35 | 8 |
| | | | GB6170 | Nut M16 | 4 |
| | | | GB97.1 | Flat pad 16 | 8 |
| | | | GB93 | Bouncing pad 16 | 8 |
| 6 | | Car frame connection | GB5783 | Bolt M16*45 | 4 |
| | | | GB6170 | Nut M16 | 4 |
| | | | GB97.1 | Flat pad 16 | 4 |
| | | | GB93 | Bouncing pad 16 | 4 |
| 7 | | Follow-up cable with lower beam | GB5783 | Bolt M10*80 | 4 |
| | | | GB6170 | Nut M10 | 4 |
| | | | GB97.1 | Flat pad 10 | 4 |
| | | | GB93 | Bouncing pad 10 | 4 |

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## 9. Car frame mounting common parts (1000 < Q ≤ 1600 kg)

| Serial number | Standard part number | For connection names | National Standard Number | Name | Number |
|---|---|---|---|---|---|
| 1 | | Platform brackets and balancing blocks | GB5783/M12*25-8.8Z | Hexagonal bolt M12*25 | 8 |
| | | | gb97.1/m12-140hv-z | Flat washers 12 | 8 |
| | | | gb93/m12-430hv-z | Spring washers 12 | 8 |
| 2 | | Inclined tie rods and lugs | GB/T6170/M20-8Z | Hexagonal nut M20 | 8 |
| | | | GB93/M20-430HV-Z | Spring washers 20 | 4 |
| 3 | | Saltando with saltando bracket | GB5783/M10*30-8.8Z | Hexagonal bolt M10*30 | 2 |
| | | | GB/T6170/M10-8Z | Hexagonal nut M10 | 2 |
| | | | gb97.1/m10-140hv-z | Flat washers 10 | 2 |
| | | | GB93/M10-430HV-Z | Spring washers 10 | 2 |
| 4 | | Column and top and bottom beams | GB5783/M16*40-8.8Z | Hexagonal bolt M16*40 | 52 |
| | | | GB/T6170/M16-8Z | Hexagonal nut M16 | 52 |
| | | | gb97.1/m16-140hv-z | Flat washers 16 | 52 |
| | | | GB93/M16-430HV-Z | Spring washers 16 | 52 |
| 5 | | Connection of the safety clamp to the lower beam | GB5783/M12*80-10.9Z | Hexagonal bolt M12*80 | 4 |
| | | | GB5783/M12*50-10.9Z | Hexagonal bolt M12*50 | 4 |
| | | | GB/T6170/M12-10Z | Hexagonal nut M12 | 8 |
| | | | gb97.1/m12-300hv-z | Flat washers 12 | 8 |
| | | | gb93/m12-430hv-z | Spring washers 12 | 8 |
| 6 | | Guide shoe with upper beam | GB5783/M16*60-8.8Z | Hexagonal bolt M16*60 | 8 |
| | | | GB/T6170/M16-8Z | Hexagonal nut M16 | 8 |
| | | | gb97.1/m16-140hv-z | Flat washers 16 | 8 |
| | | | GB93/M16-430HV-Z | Spring washers 16 | 8 |
| 7 | | Car roof wheel and upper beam | GB/T6170/M16-8Z | Hexagonal nut M16 | 8 |
| | | | GB/T6170//M16-8Z | Locking nut M16 | 8 |
| 8 | | Oil cup with upperguide shoe | GB5783/M8*20-8.8Z | Hexagonal bolt M8*20 | 2 |
| | | | GB/T6170/M8-8Z | Hexagonal nut M8 | 2 |
| | | | gb97.1/m8-140hv-z | Flat washers 8 | 2 |
| | | | GB93/M8-430HV-Z | Spring washers 8 | 2 |
| 9 | | Tilt rods and columns | GB5783/M16*40-8.8Z | Hexagonal bolt M16*40 | 4 |
| | | | GB/T6170/M16-8Z | Hexagonal nut M16 | 4 |
| | | | gb97.1/m16-140hv-z | Flat washers 16 | 4 |
| | | | GB93/M16-430HV-Z | Spring washers 16 | 4 |

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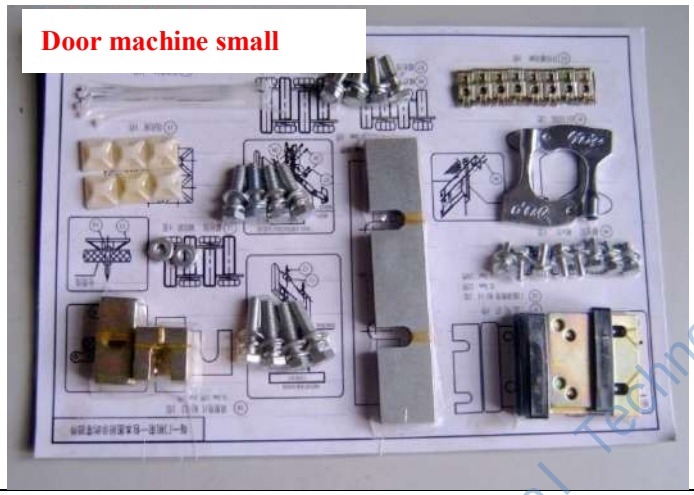
# Installation of Door Lifter and Car Door

## 1. Door lifter installation

### 1.1 Counting of small packages for door machines




List of small packages for door machines

| Serial number | Name | Number | Unit | Remarks |
|---|---|---|---|---|
| 1 | Nylon wire fasteners | 10 | Pieces | |
| 2 | Wire fastener | 6 | Pieces | |
| 3 | Bolt set M8X30 | 4 | Set | Bolts, flat washers, spring washers, nuts |
| 4 | Adjustment shim MJ-12 | 1 | Set | 0.5mmX12;1mmX24 |
| 5 | Bolt set M8X35 | 4 | Set | Bolts, flat washers, spring washers, nuts |
| 6 | Door lock adjustment shims | 1 | Set | 0.5mmX5;1mmX10 |
| 7 | Bolt set M8X20 | 4 | Set | Bolts, flat washers, spring washers |
| 8 | Shaped nuts M6 | 8 | Pieces | |
| 9 | landing door key | 2 | Pieces | |
| 10 | Bolt set M6X16 | 8 | Pieces | |
| 11 | Door slider MJ-27 | 4 | Pieces | |
| 12 | Door slider adjustment pad MJ-14 | 1 | Set | 0.5mmX12;1mmX24 |

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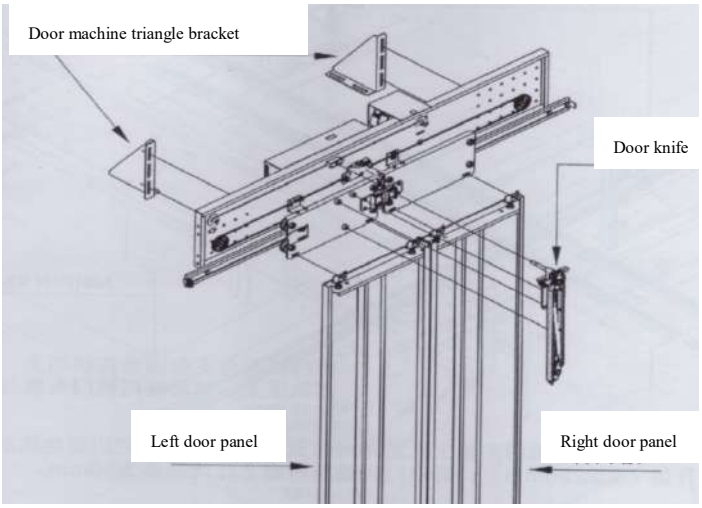
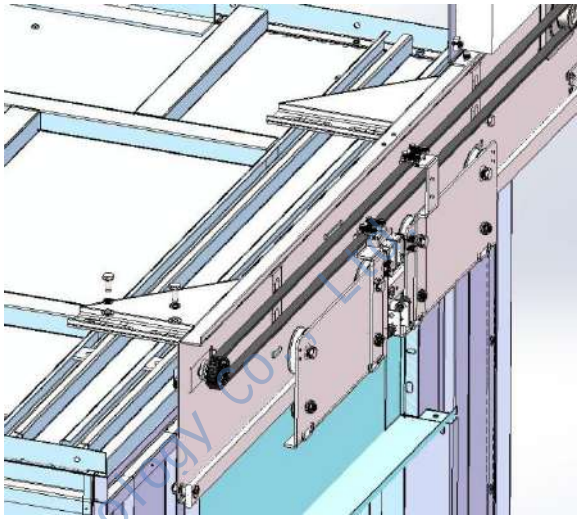
### 1.2 Door machine installation

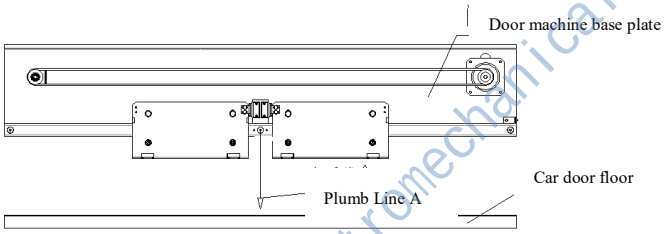
The door lifter consists of the main body of the door machine, the car door pendant, the door knife, the mounting bracket and the control system, which is installed in the car roof C-channel and controls the movement of the car door. the car

door plate slides in the car slide and is protected by a car toe guard under the car entrance.



During the installation of the door machine, it is necessary to ensure that the upper cantilever of the door machine is vertical and that the centre plumb line A of the centre split door is aligned with the centre of the sill (car centre).

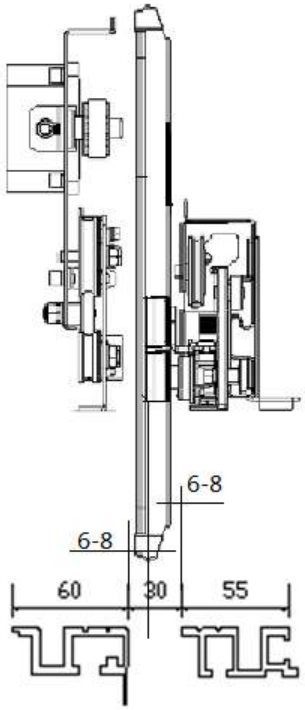



1.3 Door knife installation

1.3.1 After the lift is leveled, the door knife clamps the landing door wheel, driving the landing door pegboard to transport and open the landing door.

1.3.2 The door knife is fixed to the door knife frame by means of M8*25 bolts.

1.3.3 The door knife has sufficient engagement depth with the door wheel of the landing door unit. Adjust the distance between the outer edge of the door knife and the outer edge of the landing door sill to approx. 6-8 mm and the distance between the landing door door wheel and the outer edge of the car door sill to approx. 6-8 mm.




## 2. Car door panel installation

2.1 The car door sill is suspended from the door pegboard and the lower part of the door sill is fitted with nylon door sliders that slide in the car door sill.

2.2 Adjust the door gap to within 1mm, taking care that the top and bottom are even.

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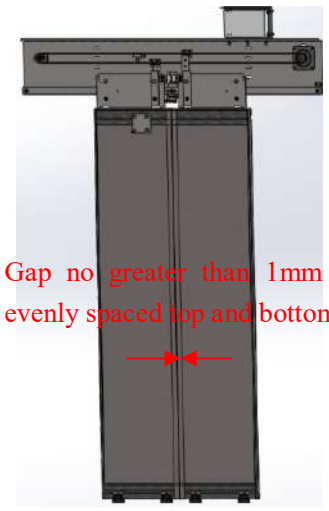
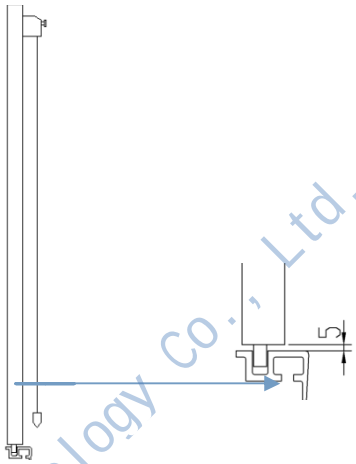
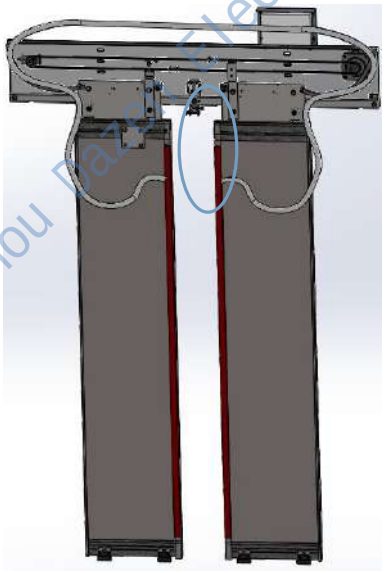
2.3 Door surface plumbness not greater than 1mm. sill clearance below door approximately 5mm.

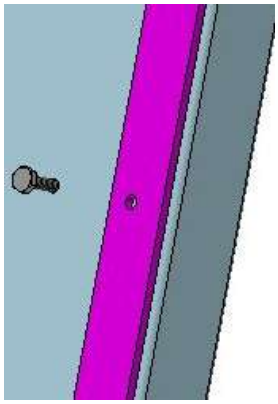


3. Light curtain installation

The light curtain is a door protection device, usually mounted on the edge of the car door, consisting of three main parts: an infrared emitter and receiver mounted on both sides of the lift car door and a special flexible cable. The emitter-receiver tube is opened in sequence and the light emitted by one emitter head is received by several receivers, forming a multiplex scan. When the light curtain is blocked, the receiver feeds the signal to the lift control system and the door machine drives the car door into action.





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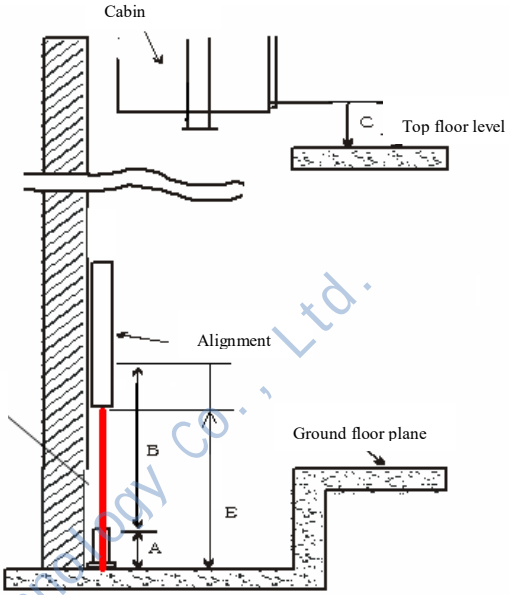
## Alignment Installation

1. Alignment frame lifting

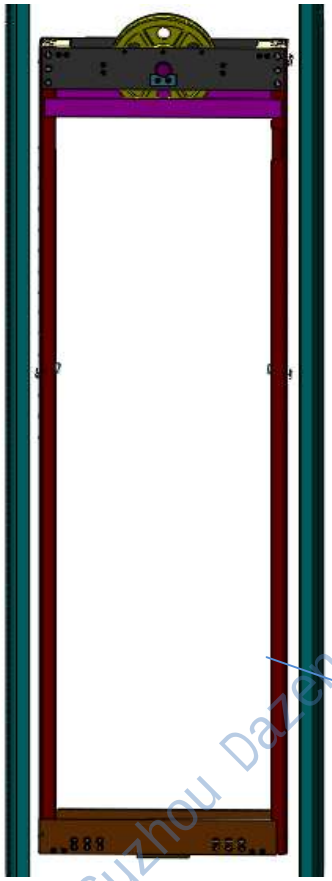
Steps:

① Before lifting the alignment rack, calculate the length of the alignment rack, after the length of the square timber is determined (square timber size 100MM x 100MM), put 2 square timbers vertically into the PIT bundle on the alignment rail

② Use the hoist to slowly feed the entire alignment frame into the shaft. Place onto the two vertical squares of wood prepared in advance




Square timber



Length of square wood: E=A+B-C

A = whole bumper height + bumper base height

B = buffer distance

When choosing a spring bumper, take 350 mm

400 mm when choosing an oil pressure bumper

When choosing a B value, it is additionally necessary to consider the wirerope elongation distance

C = distance between the car sill and the highest floor sill

(With machine room)
(Without machine room)

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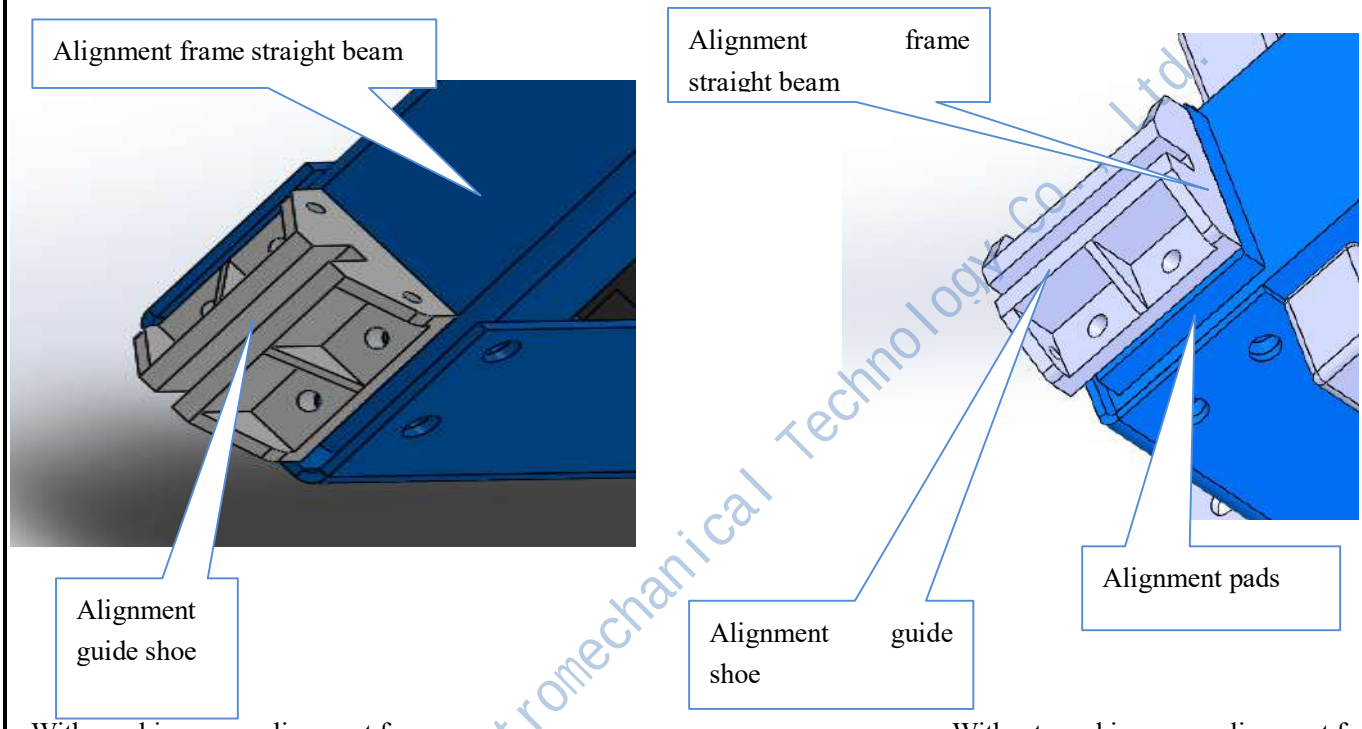
**2.** Alignment guide shoe mounting

First, fit the sliding guide shoe on one side and make the alignment frame parallel to the rail, check that the alignment frame is not twisted, then adjust the gap between the sliding guide shoe and the rail to 1~2mm on each side.

Fit the sliding guide shoe on the other side and then use the manual hoist to lift the alignment frame up to a predetermined height E, E=A+B+C, calculated as shown in the diagram above



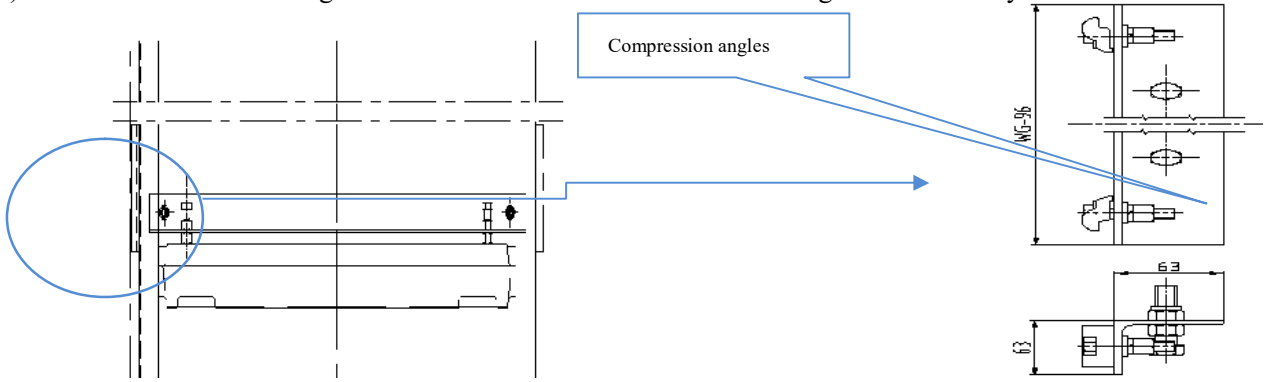

With machine room alignment frame

Without machine room alignment frame

3. Alignment block installation

1) After the machine room alignment frame has been installed and adjusted, an appropriate amount of alignment blocks (approximately 20% of the complete alignment weight) need to be added in advance so that the lift can run on a slow ride. the final number of alignment blocks needs to be added accurately after the lift has determined the exact balance coefficient and has been commissioned, and can be adjusted by The final number of alignment blocks must be added after the exact balance coefficient has been determined and the lift has been commissioned, and the weight of the alignment can be precisely adjusted by one or two adjustment blocks. Finally, the alignment blocks are pressed into place using the alignment block pressing device.

2) Without machine room alignment frame installation and commissioning in the same way as with machine room.

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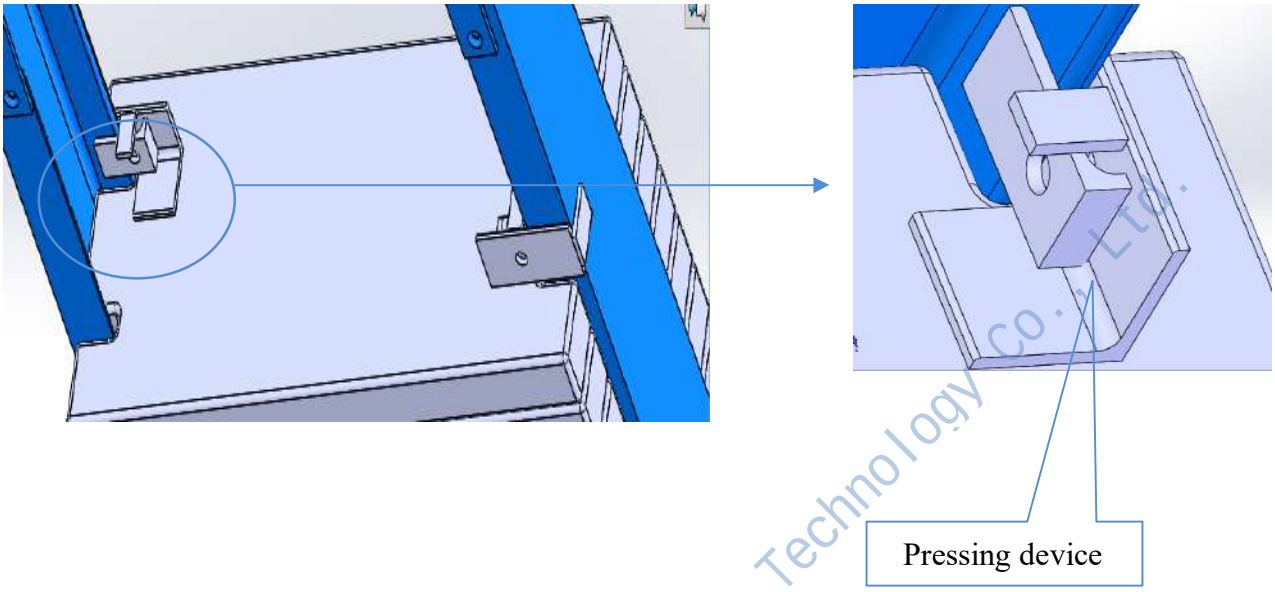
With machine room alignment rack

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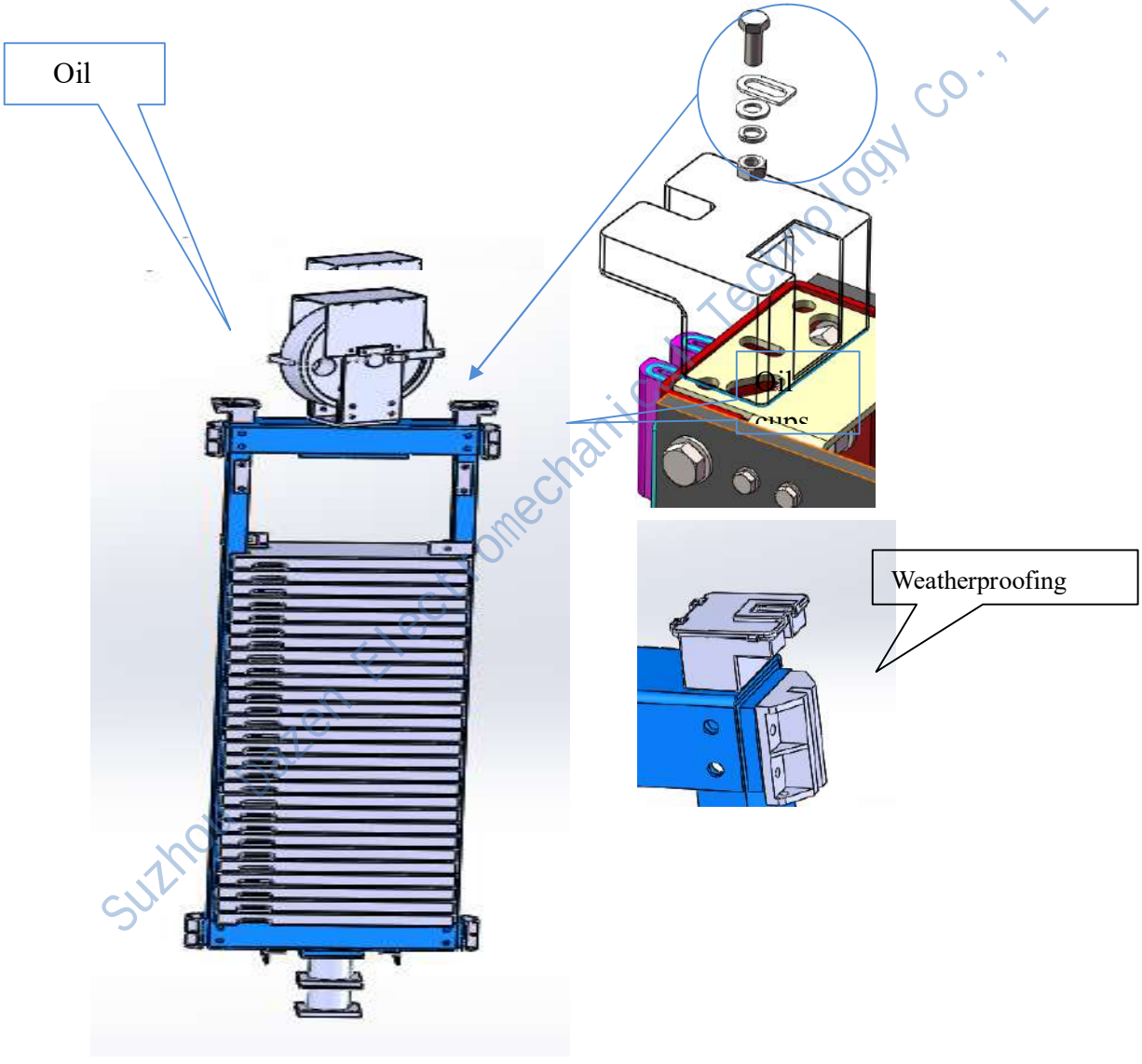
Without machine room alignment rack

Notes:

① When placing the alignment block, you must observe whether the alignment block is tilted, if so, use shims to level it and adjust it with a hammer until it is neat.

② The pressing bolts on the compression device are firmly held against the alignment block and the screws are tightened at the same time.

**4.** Alignment oil cup mounting With machine room alignment

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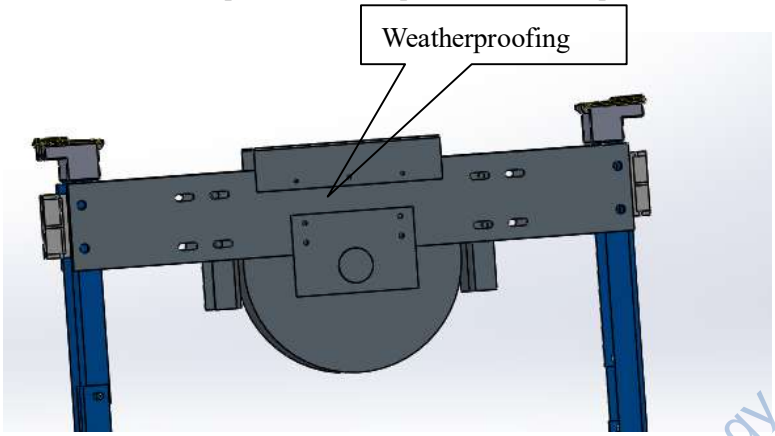
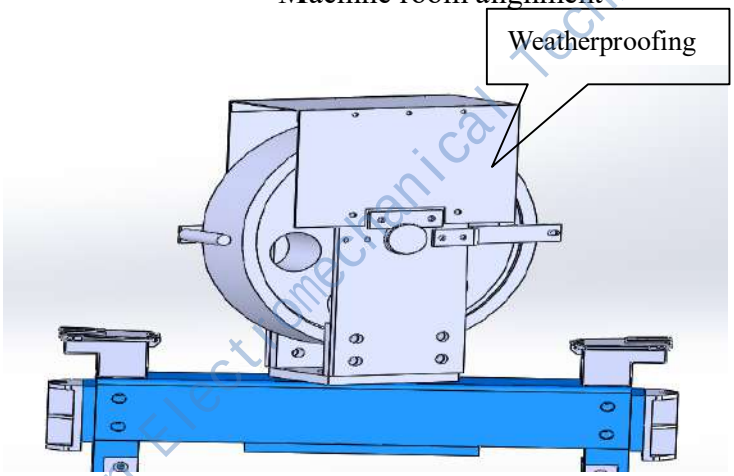
Without machine room alignment

5. Reverse rope sheave cover installation

After the wirerope has been hooked up to the counterpoise, the counterpoise cover is fitted.




**M**achine room alignment




No machine room alignment

**Suspension traction wirerope**

## 1 Wirerope pre-suspension preparation and precautions

1.1 Our traction wirerope has been cut into roots before leaving the factory, when loading and unloading the rope reel, please make sure to gently load and unload through which lifting equipment or skids, so as not to cause damage to the rope reel, disorderly roll or knot, strictly prevent the rope end from loosening, loose strands and other phenomena.

1.2 When handling on the ground, wirerope discs are not allowed to be rolled or dragged on uneven ground so that the wirerope surface is crushed.

1.3 It is strictly forbidden to move the wirerope on the shaft with the wirerope surface as the pivot point of the lever.

1.4 The surface of the wirerope must not be sticky with stones, clay, etc. that interfere with its use; the rope must be wound or placed in the correct direction.

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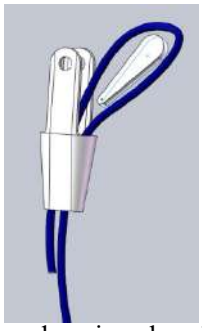
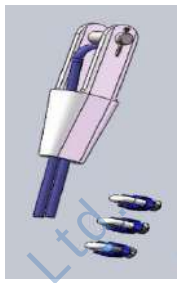
## 2 Taper sleeve production

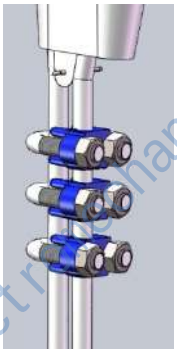
A. Thread the wire rope through the penetration entrance as shown.



B. The wedge is placed in contact with the contact with the wire rope at the arc.



C. Pull the wirerope tight and take the rope clip to lock it in place.



| Commonly used rope clamp sizes | 8 | 10 | 12 | 13 | 16 |
|---|---|---|---|---|---|

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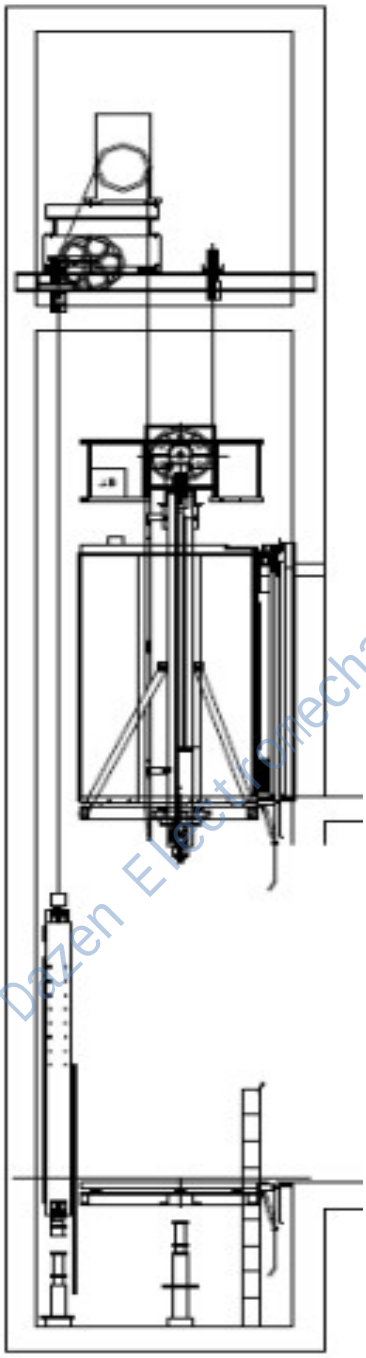
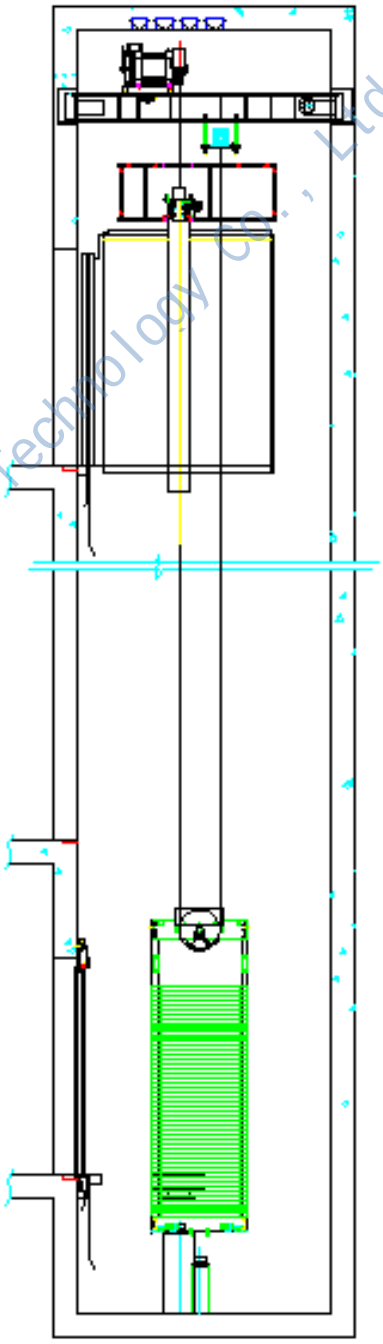
**3 Wirerope suspension**

Lanyard diagram:

With machine room lanyard



Without machine room lanyard



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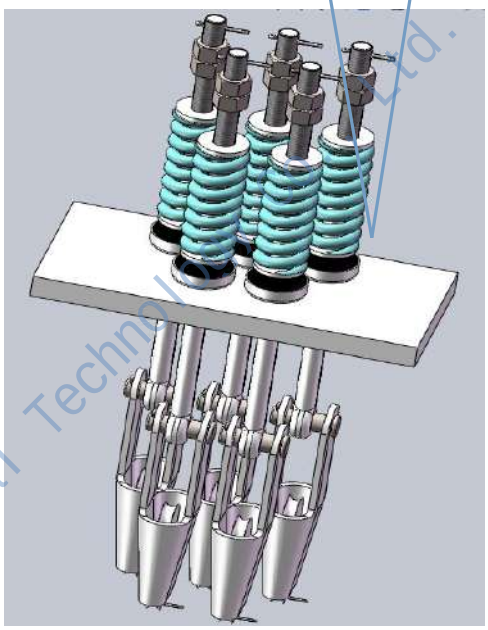
## 4 Wirerope fixing

4.1 Wirerope rope head fixing

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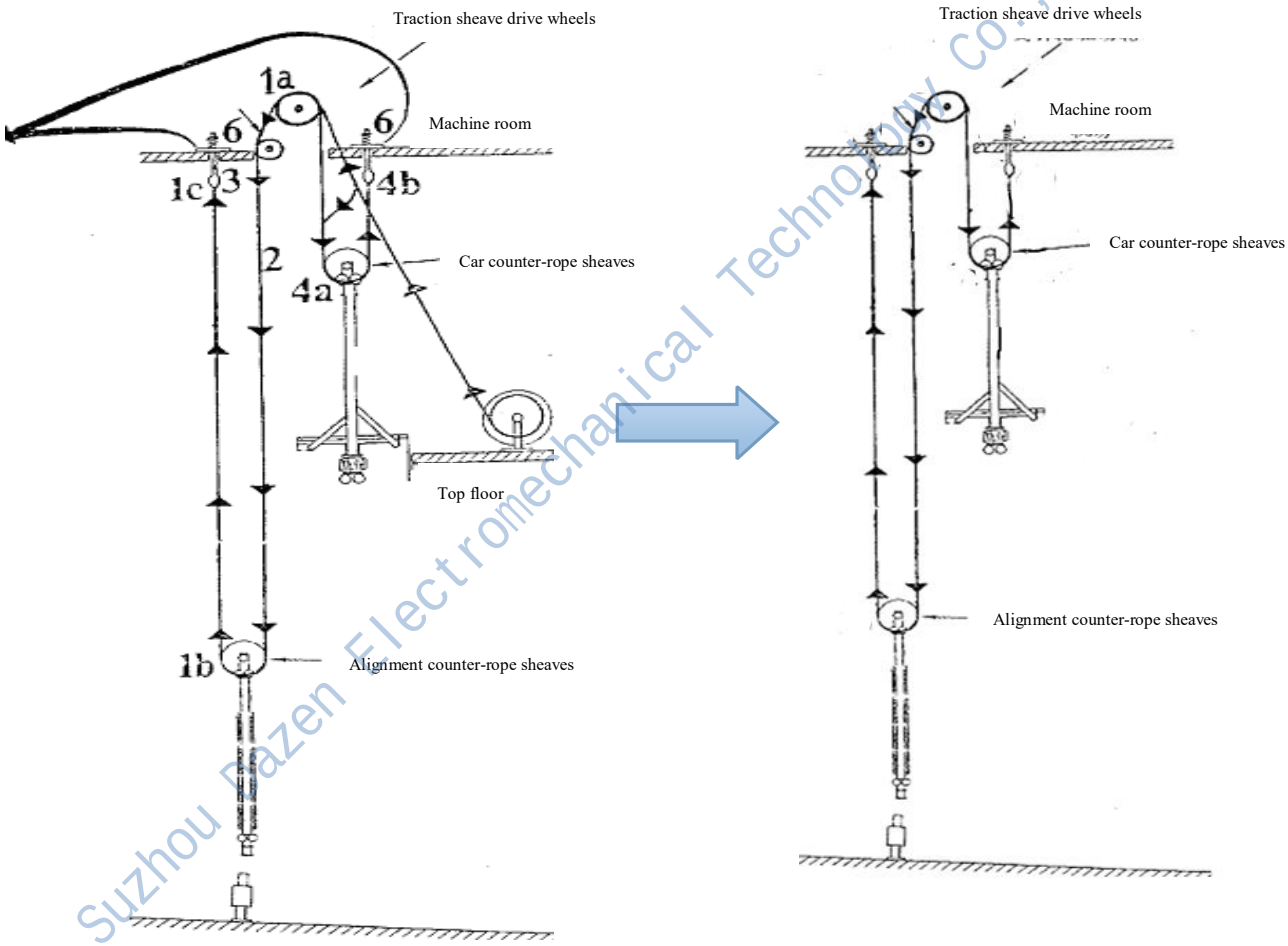
4.2 Winding of the wirerope

4.2.1 The wirerope is wound in the order of the table on the right, as shown in the diagram below.

4.2.2 When removing the wirerope, it is necessary to avoid looping or twisting the wirerope, which can cause a reduction in the strength of the wirerope.

4.2.3 Avoid loose wirerope cuts by tying and wrapping the cut end of the wirerope tightly with fine wire.

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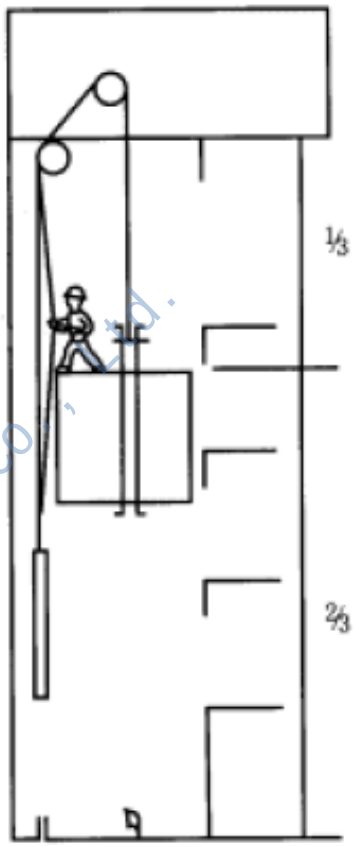
## 5 Wirerope adjustment




Adjusting the tension of the wire rope

Use 10~15kg spring scale to pull out the wirerope horizontally, measure the difference of each wirerope tension in turn (facing alignment), the difference of rope tension should not exceed 5%, each rope head is basically flush, the error is within 5mm.

After adjustment, run the lift up and down fast ride several times. Check and adjust each wirerope tension again using the above method.

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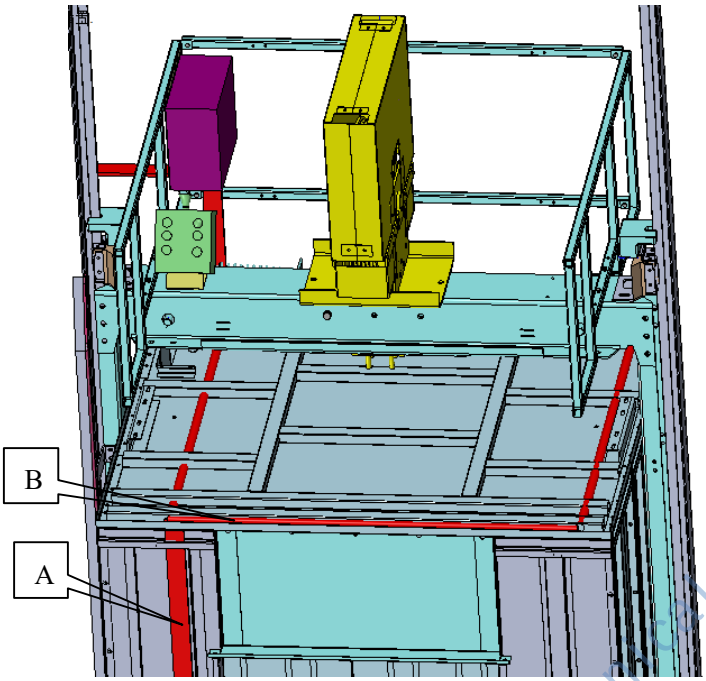
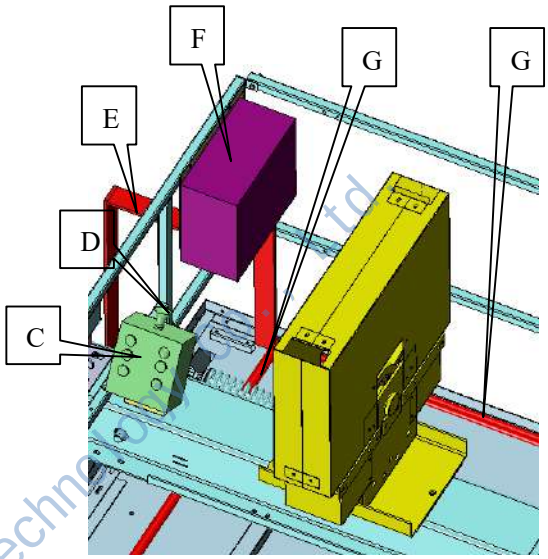
## Installation of Car Prewire and Follow-up Cable

### 1 Car prewire installation




With machine room car prewire arrangement

Follow-up cable to car roof junction box, from the junction box to the control panel, fan, door machine, access box, car roof lighting, etc. Refer to the electrical schematic and wiring diagram for specific wiring.

| Serial number | Description |
|---|---|
| A | To the control panel |
| B | To door machines |
| C | Inspection box |
| D | Car roof lighting |
| E | Follow up cable |
| F | Car roof junction box |
| G | To fans |
| H | To car lighting |

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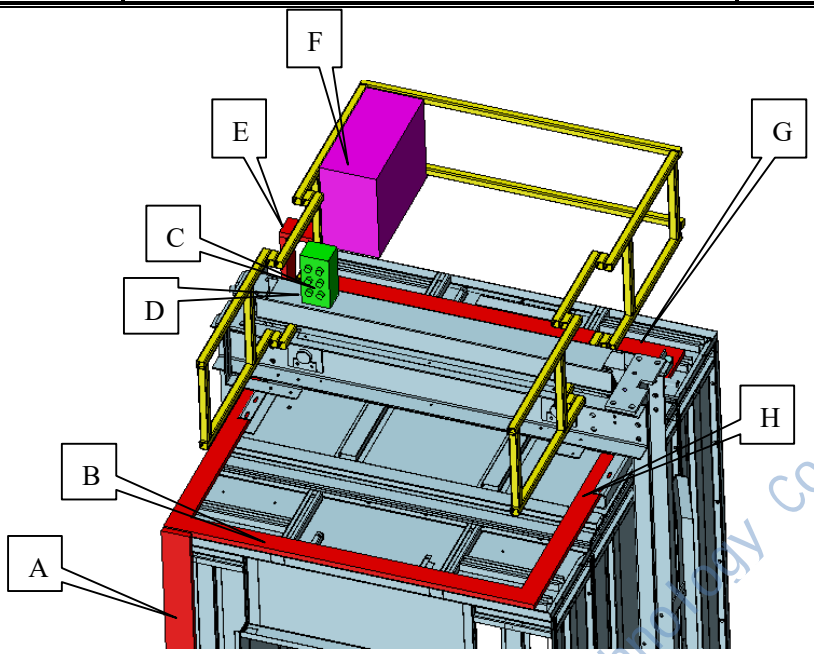


Withot machine room car prewire arrangement

Follow-up cable to car roof junction box, from the junction box to the control panel, fan, door machine, access box, car roof lighting, etc. Refer to the electrical schematic and wiring diagram for specific wiring.

## 2 Follow-up cable preparation and precautions before installation

2.1 The cable shall be checked for specifications, number of cores and position verification prior to placement, in accordance with the design provisions.

2.2 The cable should be laid out straight and should not be twisted, looped, knotted, etc. It should not be squeezed or damaged by external forces, and when fixed, the tension should be moderate.

2.3 The bending radius of cable should not be less than 6 times its thickness for flat cable and 6 times its outer diameter for round cable.

## 3 Follow-up cable installation

One end of the follow-up cable comes out of the middle distribution box of the shaft and is secured by a cable clamp. The other end is fixed to the carcable frame and goes into the car roof junction box and moves with the car.

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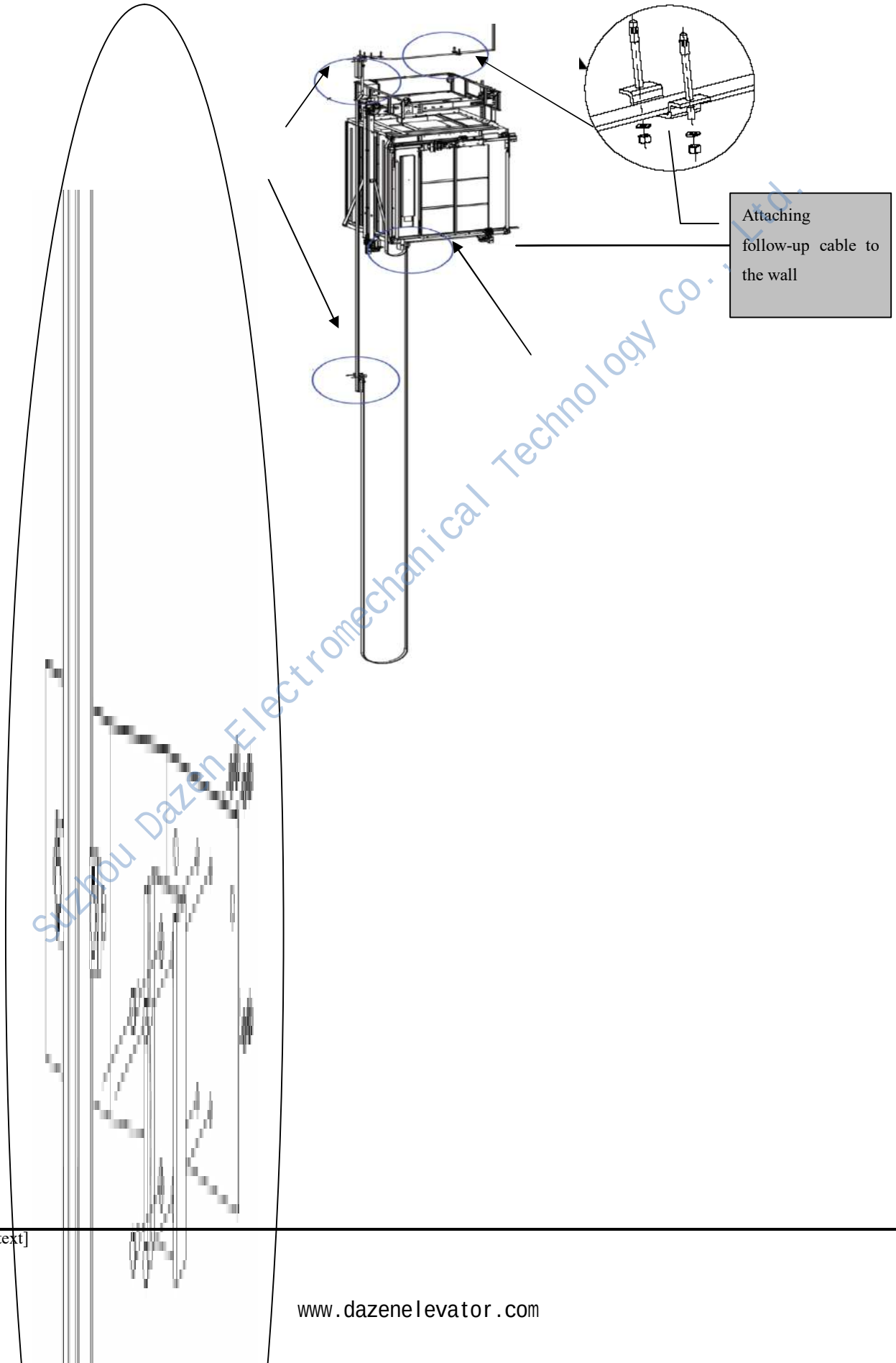


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## Bumper Installation

1. Alignment hydraulic bumper installation

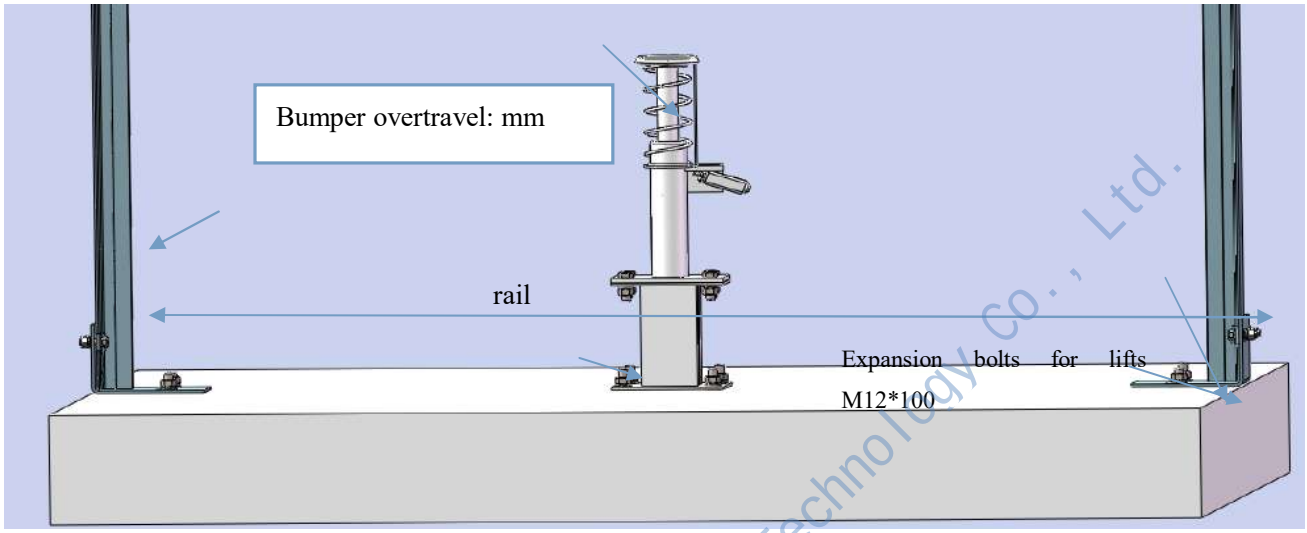


Figure 16-1 Alignment bumper diagram

2. Installation of the car hydraulic bumper

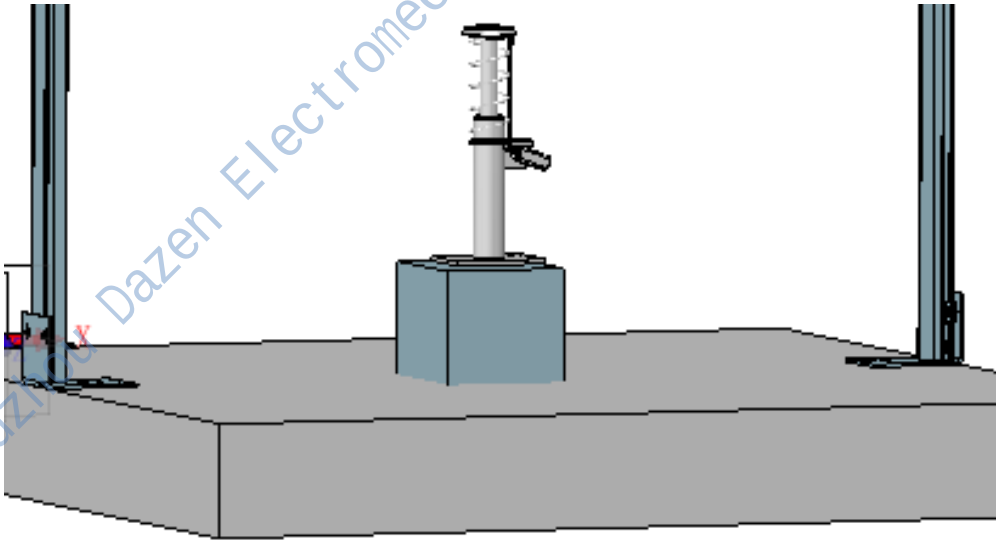

Figure 16-2 Diagram of the car bumper

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3. Installation of car polyurethane bumper

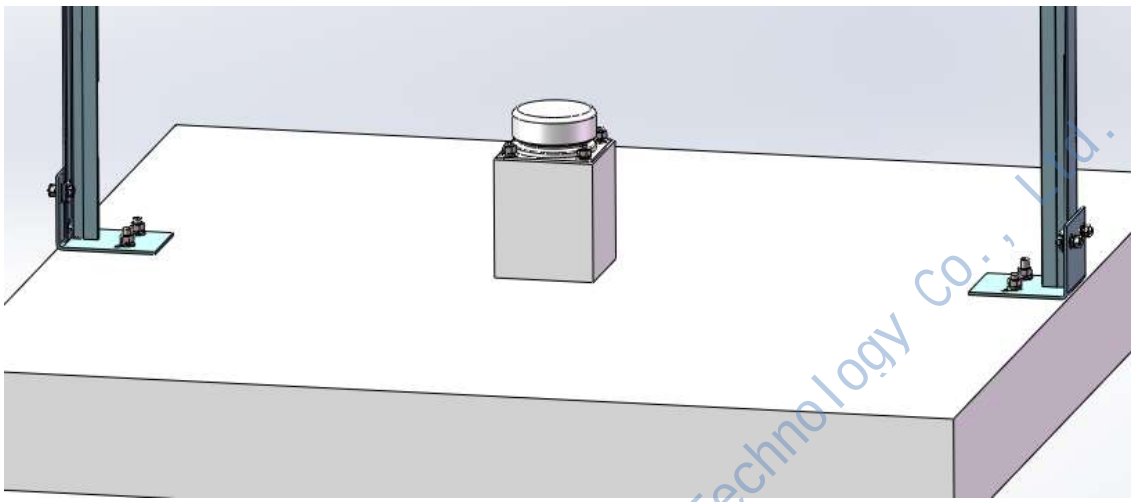

Figure 16-3 Diagram of the car bumper

4. Installation of the alignment polyurethane bumper

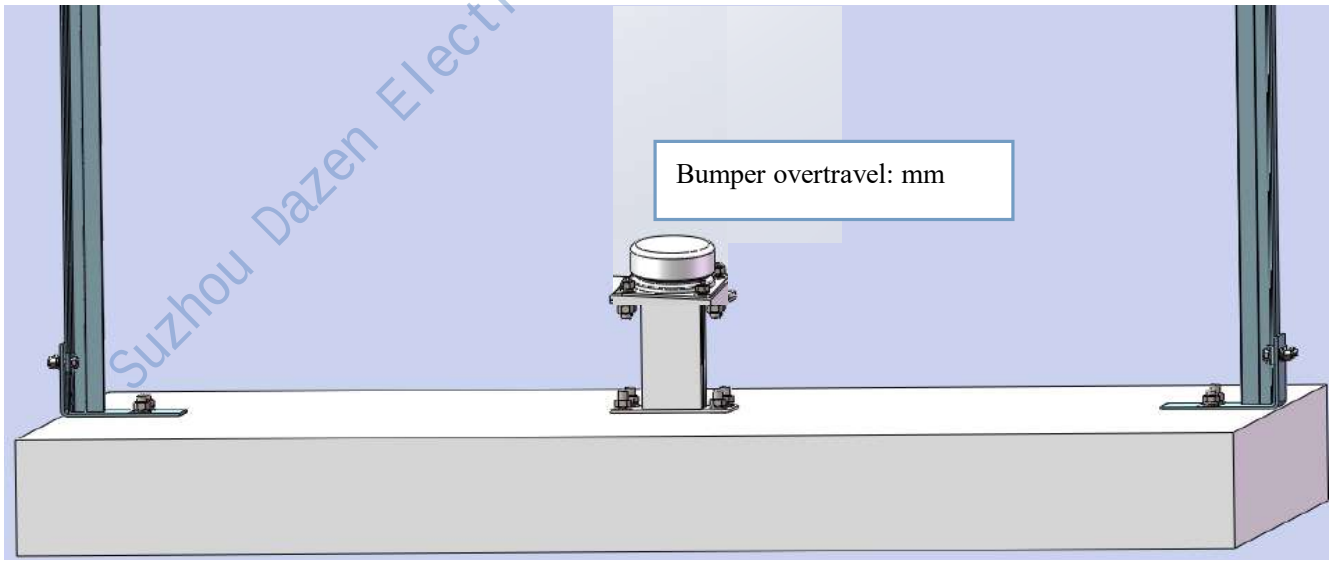


Figure 16-4 Alignment polyurethane bumper diagram

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5. Bumper installation related instructions

- bumper cushion seat level error, within 3mm over its full length.
- the verticality (skew) of the bumper as shown in Figure 16-5, the difference between A and B should be within 2mm.
- The overtravel of the bumper is set according to the requirements of the shaft installation drawing and the overtravel value is marked near the alignment bumper.
- bumper vertical centre lines coincide with the vertical centre line of the car (alignment) impact plate as far as possible, with a deviation of not more than 20 mm.
- The relative error between the top of the two bumper and the car frame buffer plate should be $|e| \leq 2$ mm.

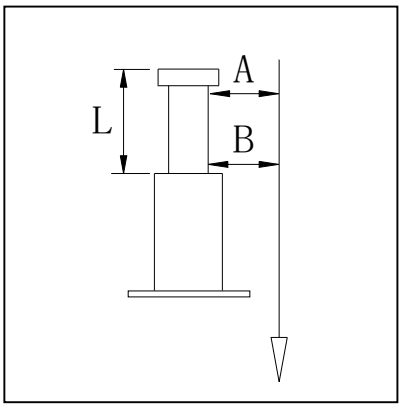


Fig. 16-5 Illustration of bumper verticality

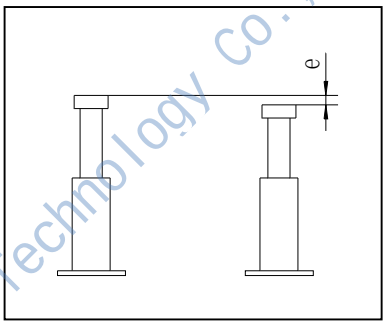


Fig. 16-6 Height difference between bumper

6. Selection of various bumper models and the range

| Serial number | Ladder speed (m/s) | Bumper type | Bumper models | Item No. | Maximum stroke (mm) |
|---|---|---|---|---|---|
| 1 | v ≤ 1.0 | Polyurethane | HP8113 | GEL0K001001 | 65 |
| 2 | 1.0 <v≤1.5 | Oil pressure | GOB1160 | GEL0J006001 | 175 |
| 3 | 1.5 <v≤1.75 | Oil pressure | GOB1175 | GEL0J007001 | 210 |
| 4 | 1.75 <v≤2.0 | Oil pressure | GOB1200 | GEL0J008001 | 275 |
| 5 | 2.0 <v≤2.5 | Oil pressure | GOB1250 | GEL0J008001 | 425 |

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## Installation of Speed Restrictor and Tensioning Gear

### 1 Speed restrictor installation

1.1 With machine room lift

1.1.1 The speed restrictor body is fixed to the machine room floor by means of expansion bolts or bolted to a special speed restrictor bracket.

1.1.2 According to the machine room equipment layout, hang a plumb line from the centre of the speed restrictor wheel groove to the centre of the car safety clamp rope head, and hang a plumb line along the centre of the rope groove on the other side of the speed restrictor wheel to the centre of the rope groove of the speed restrictor tensioning gear, so as to adjust and determine the position of the speed restrictor.

1.1.3 The speed restrictor is installed according to the identification on the shaft installation diagram.

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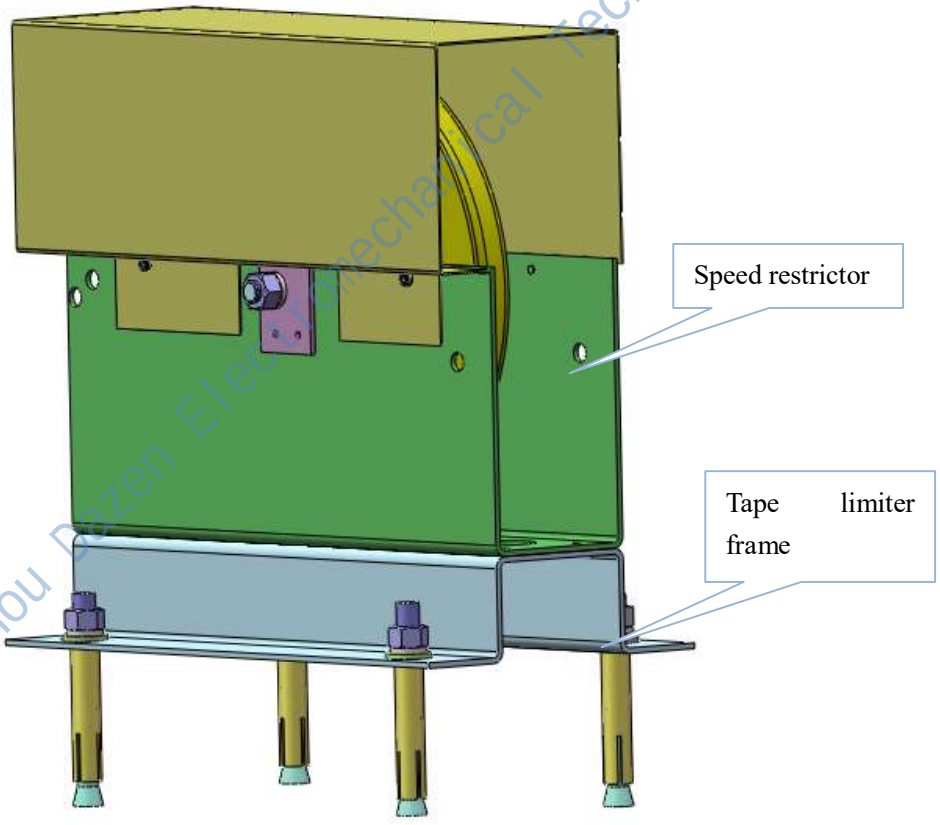


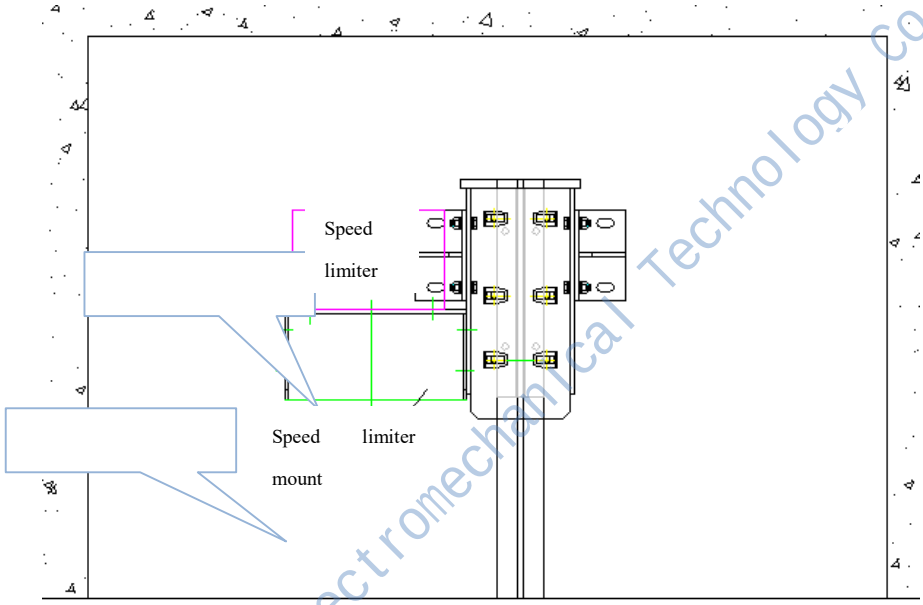

Note: The height of the speed restrictor base is not less than 50 mm.

1.2 No machine room lift

1.2.1 The speed restrictor body is bolted to the speed restrictor bracket, which is attached to the car rope headstock.

1.2.2 According to the shaft layout, suspend a plumb line from the centre of the speed restrictor wheel groove to the centre of the car safety clamp rope head, and suspend a plumb line along the centre of the rope groove on the other side of the speed restrictor wheel to the centre of the rope groove of the speed restrictor tensioning gear, so as to adjust and determine the position of the speed restrictor.

1.2.3 The speed restrictor is installed according to the identification on the shaft installation diagram.

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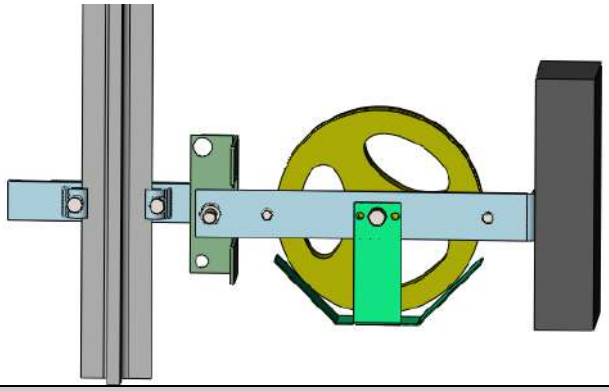
## 2 Tensioning gear mounting

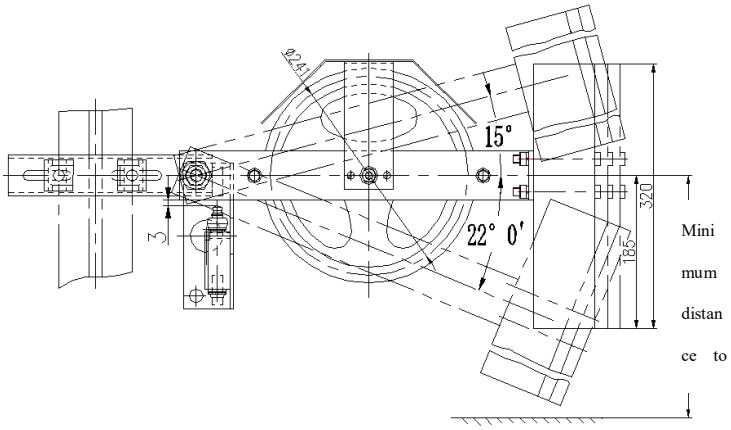
2.1 Tensioning gear speed restrictor for steel ropes, mounted in the PIT section, in the same position as the machine room speed restrictor.

2.2 The mounting bracket for the tensioning gear is fixed to the car rail by means of a pressure guide.



Note: The bottom surface of the car tensioning weight is required to be at a height of H=200± 50mm from the ground.

2.3 Install the tensioning gear switch and adjust the switch and its beater clearance to approx. 3 mm.



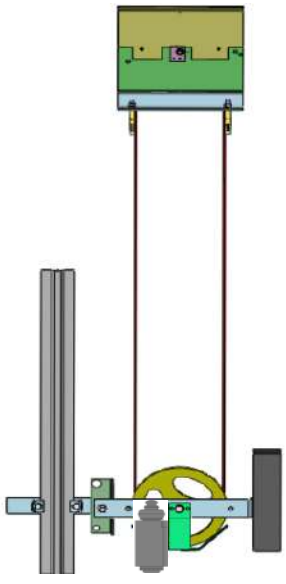

## 3 Speed restrictor wirerope suspension

3.1 Temporarily remove the guard from the speed restrictor and the tensioning gear, suspend the two ends of the wirerope from the speed restrictor wheel and the tensioning wheel respectively, fix the two ends of the wirerope to the car and move together with the car, when the car exceeds a certain rate of rated speed, the speed restrictor triggers the safety clamp. When the car exceeds a certain speed rating, the speed restrictor triggers the safety clamp through the wirerope.

3.2 The installation requirements for the speed restrictor wirerope are the same as for the traction wirerope.

3.3 After the speed restrictor wirerope has been suspended, reattach the speed restrictor and tensioning gear guards.

3.4 speed restrictor rope sheaves and tensioning sheaves are flexible and the tensioning gear switch has a sensitive action.



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# Speed Reduction Limit Switch Installation

## 1. Overview of upper and lower forced reduction limit

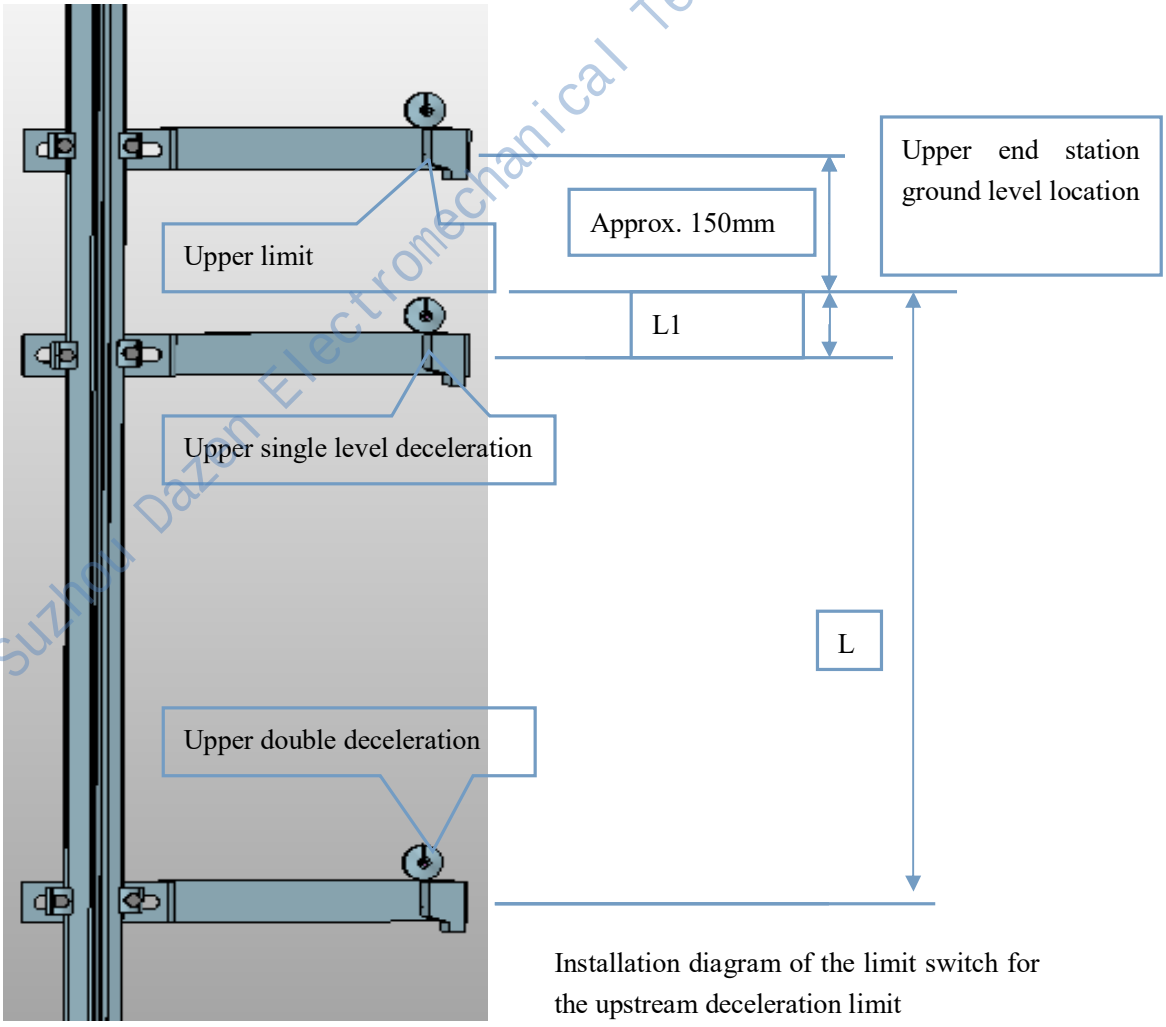
1.1 Forced deceleration switches are one of the most important means of protection for lift safety, ensuring that in the event of an abnormal lift position, no topping out or bottoming out occurs at the highest speed. Low speed lifts can be fitted with just one pair of forced deceleration switches, while high speed lifts require two or three pairs to provide a secondary or tertiary forced deceleration of the lift.

1.2 The upper and lower limit switches are stop switches set up to prevent the lift from going over the top or squatting when the lift has not stopped at the end station level position.

The upper and lower limit switch is an electrically forced stop switch to prevent the lift from topping out or bottoming out when the lift passes through the upper and lower limit switches and does not come to a complete stop.

1.3 The above-mentioned types of switches are mounted on a switch bracket which is pressed onto the car rail by means of a pressure guide. The switches are operated by means of a saltando mounted on the car.

## 2. Upstream deceleration limit switch installation




Installation diagram of the limit switch for the upstream deceleration limit

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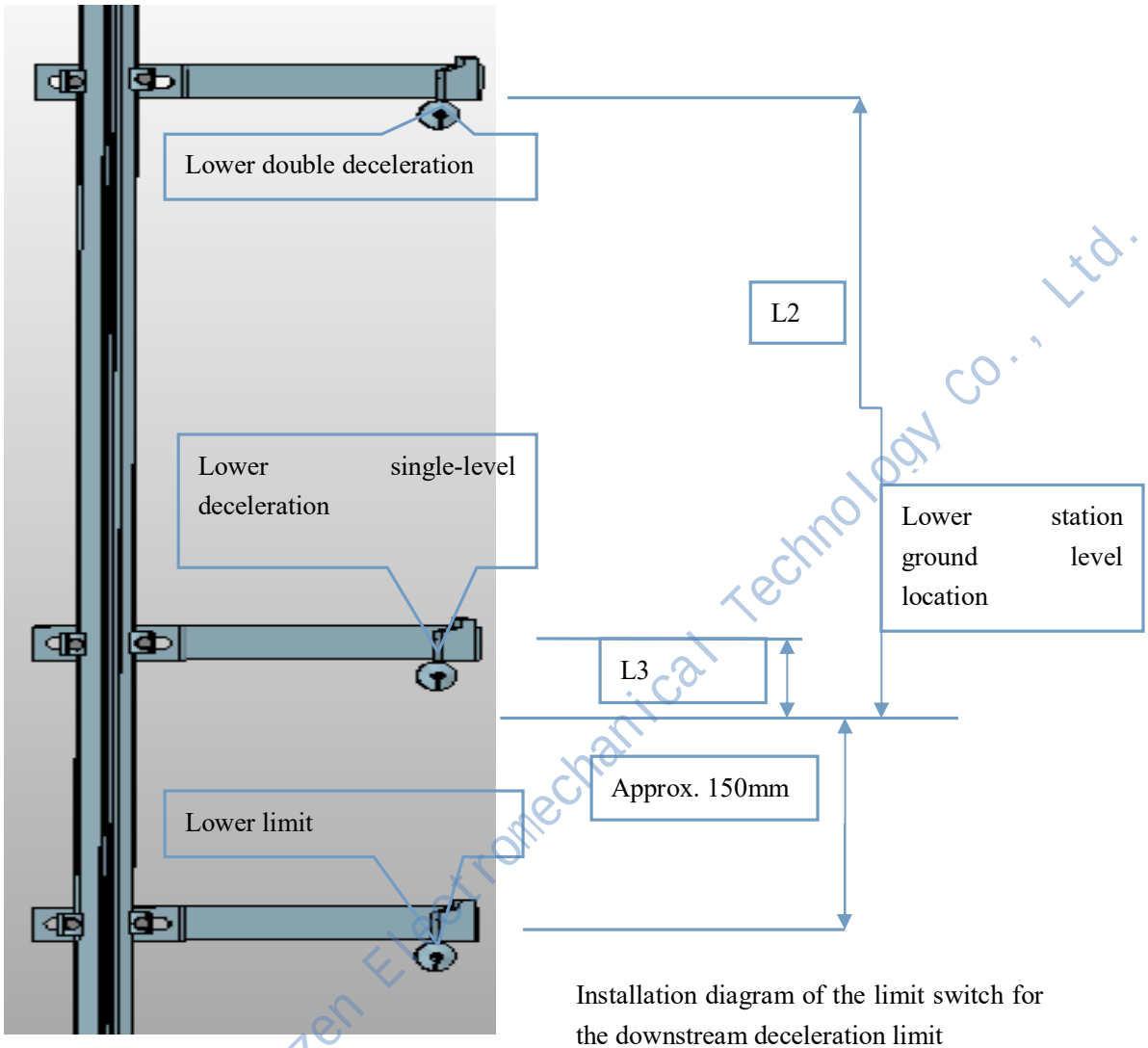
3. Limit switch installation for downstream speed limiters




Installation diagram of the limit switch for the downstream deceleration limit

4. Table of deceleration distances L for forced deceleration

| Serial number | Ladder speed (m/s) | Upper double deceleration L | Upper single level reduction L1 | Lower double deceleration L2 | Lower single-level deceleration L2 |
|---|---|---|---|---|---|
| 1 | v ≤ 1.5 | | 1.2m - 2.0m | | 1.2m - 2.0m |
| 2 | 1.5 | 1.3m | 2.2m - 2.6m | | 2.2m - 2.6m |
| 3 | 1.6 | 1.3 | 2.4m - 2.6m | | 2.4m - 2.6m |
| 4 | 1.75 | | 2.2m - 2.6m | | 2.2m - 2.6m |
| 5 | 2.0 | 3.4m - 4.0m | 2.2m - 2.6m | 3.4m - 4.0m | 2.2m - 2.6m |
| 6 | 2.5 | 4.9m - 5.6m | 2.2m - 2.6m | 4.9m - 5.6m | 2.2m - 2.6m |

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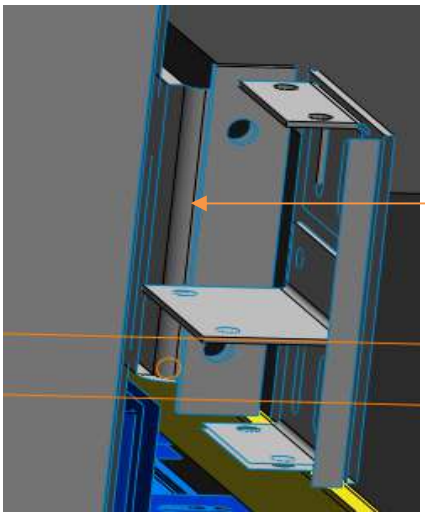
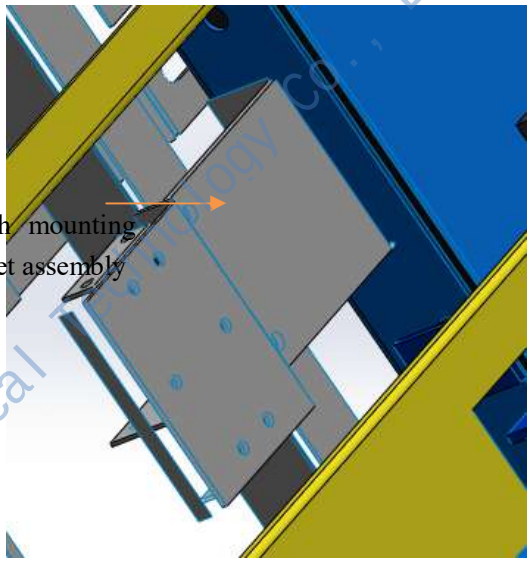
## Car Leveling Device Installation

1. Installation of car leveling switches

There is a leveling switch installation which is a photoelectric or magnetic induction switch mounted on a leveling switch bracket which is mounted on the car frame upper beam and moves together with the car. When the car passes the leveling position, the leveling switch operates under the action of the induction plate and transmits the leveling signal to the lift. The passenger elevator is fitted with three leveling switches, spaced approximately 86° apart.



Switch mounting bracket assembly



2. Installation of leveling inductor plates

The leveling inductor plate is commonly known as the magnetic shield or magnetic barrier plate, the inductor plate is installed on the rail by means of a bracket with a pressure guide plate, the installation position is near the door area, when the lift is installed and commissioned, the position of the inductor plate also needs to be adjusted.

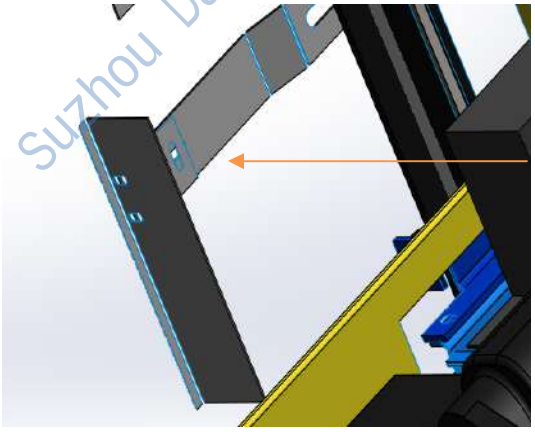


Diagram of the leveling inductor plate installation

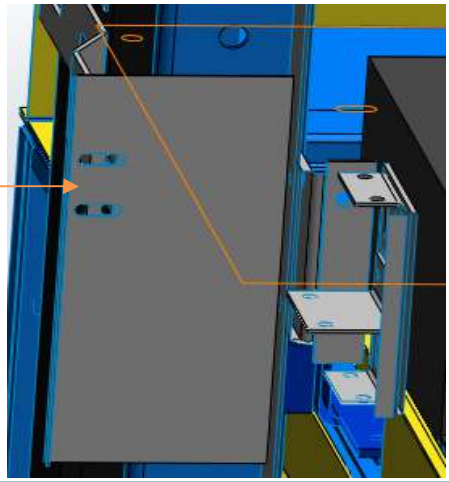


Diagram of the effect of the inductor plate on the leveling switch

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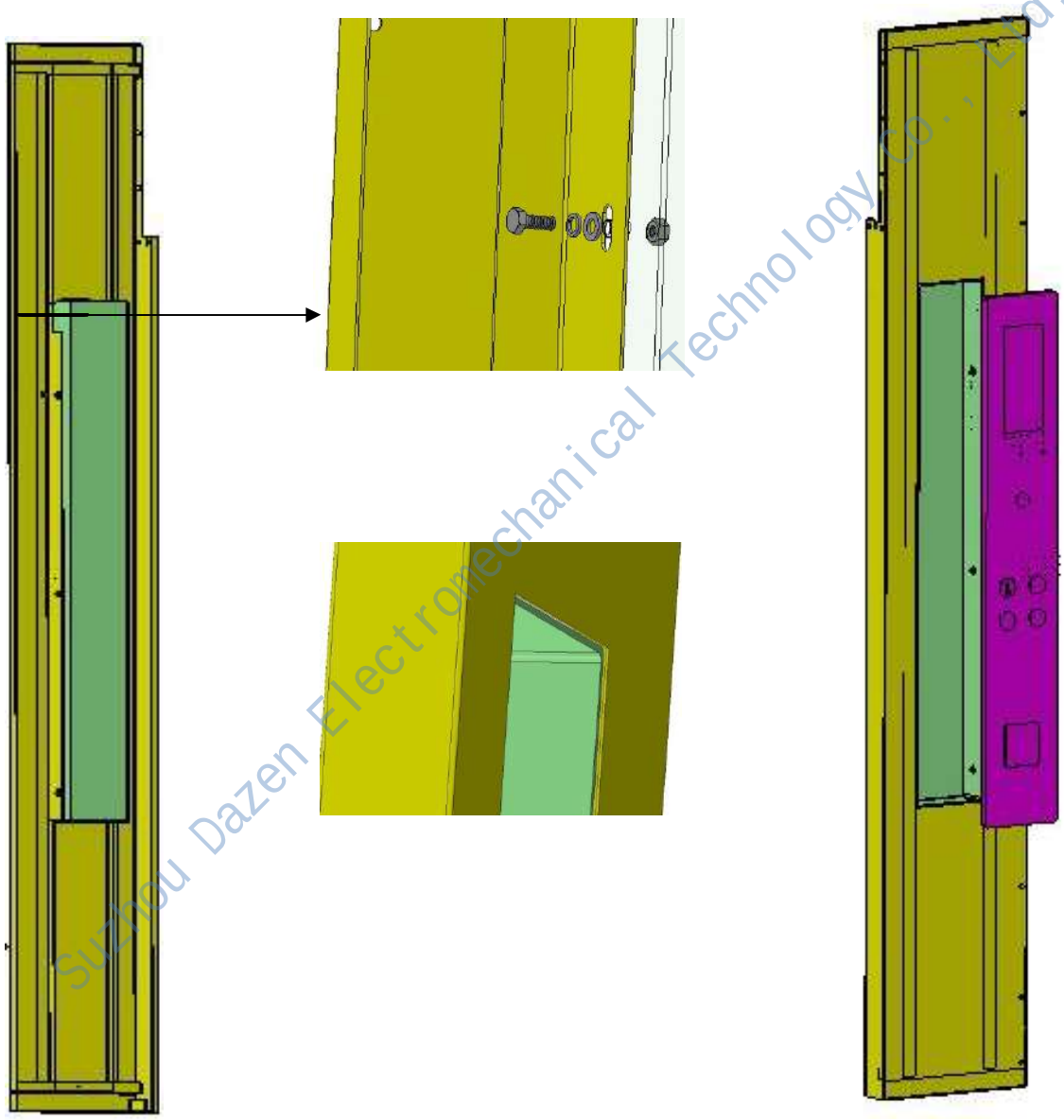
# Human-machine Exchange Installation

## 1. Installation of the car control box

Dismantle the control box panel and the bottom box, fit the bottom box into the hole reserved for the control wall, lock it with bolts, finish the wiring and cover the panel.

Take care that the bottom box does not extend beyond the operating wall panel.



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2. Installation of shaft outsourcing

2.1 With the bottom box outside the recruiting installation, first install the bottom box into the reserved wall hole to fix, after the wiring is completed, then cover the panel. Pay attention to the verticality of the bottom box when installing it.

2.2 No bottom box outside the beckoning installation, first placed in the wall expansion nuts, the outside call line from shaft in through the outside call bottom plate through the hole, with ST6.3 × 20 self-tapping screws to fix the bottom plate on the wall, pay attention to adjust the vertical degree of the bottom plate. After the various lines are connected and installed, cover the panel along the base plate slots.

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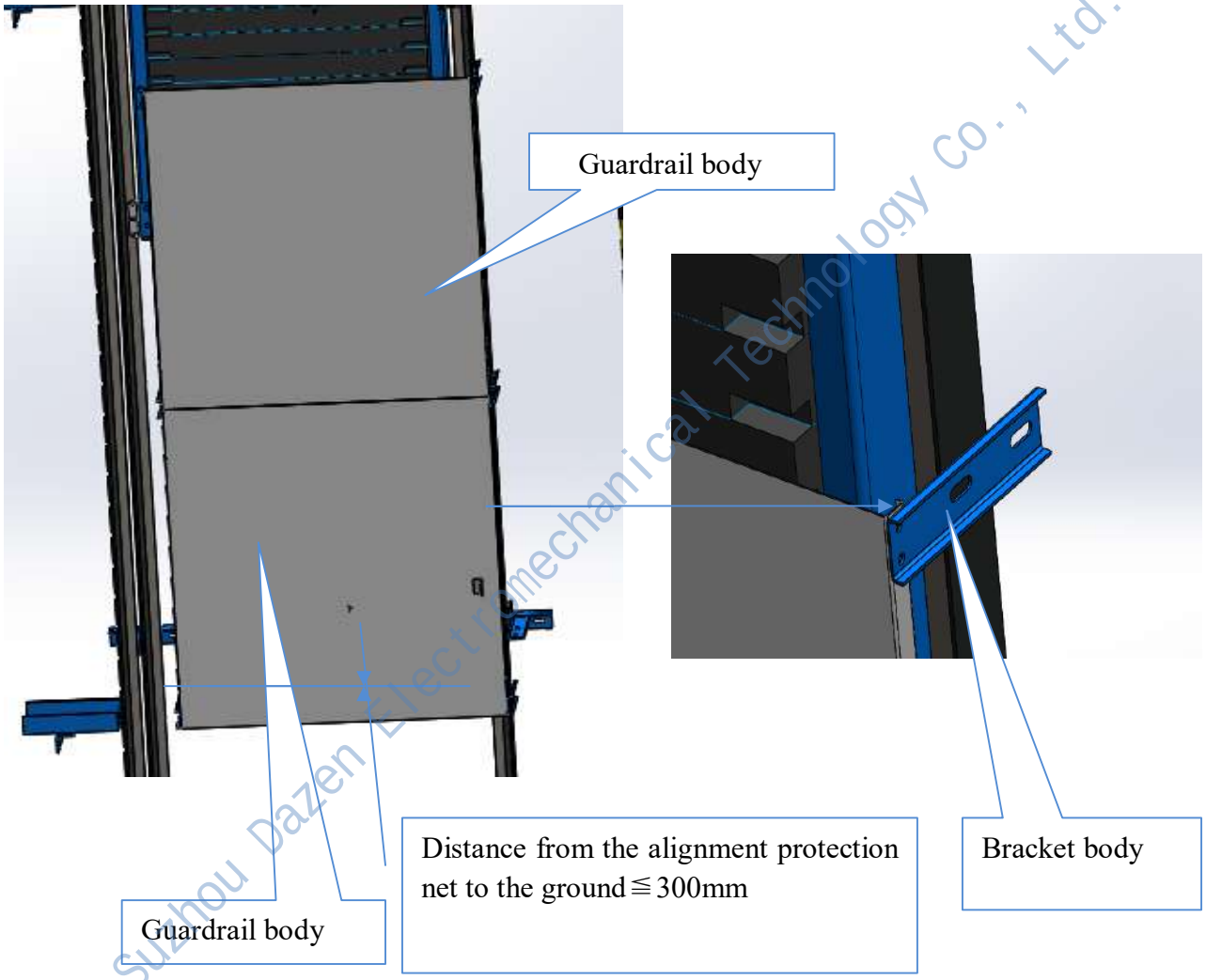
# PIT Alignment Protective Guard Installation

1. Installation of the PIT alignment protective guard

The alignment rail is installed at the PIT to protect the safety of people entering the PIT. The guardrail is installed in two pieces and is fixed to the alignment rail by means of a pressure guide, with the lower edge of the guardrail at a distance of no more than 300 from the PIT floor.

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# Bucking-out System Installation

## 1. Overview of the bucking-out system

1.1 The bucking-out system is used to balance the weight of the wirerope and is suspended at one end from the bottom of the car and at the other end from the bottom of the alignment.

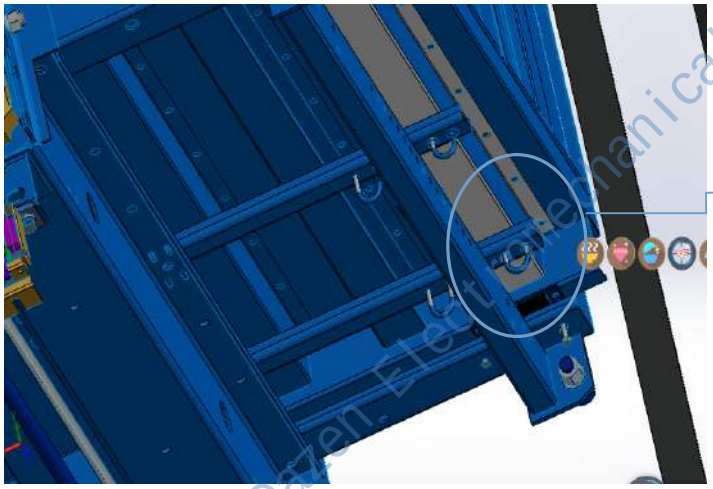
1.2 The suspension device can be adjusted for the length of the balance chain, and secondary protection measures are required for the suspension parts of the compensation chain and the car.

1.3 The center line of the guide should be on the same vertical line as the suspension point of the balance chain to prevent accidental failure due to excessive friction between the balance chain and the guide.

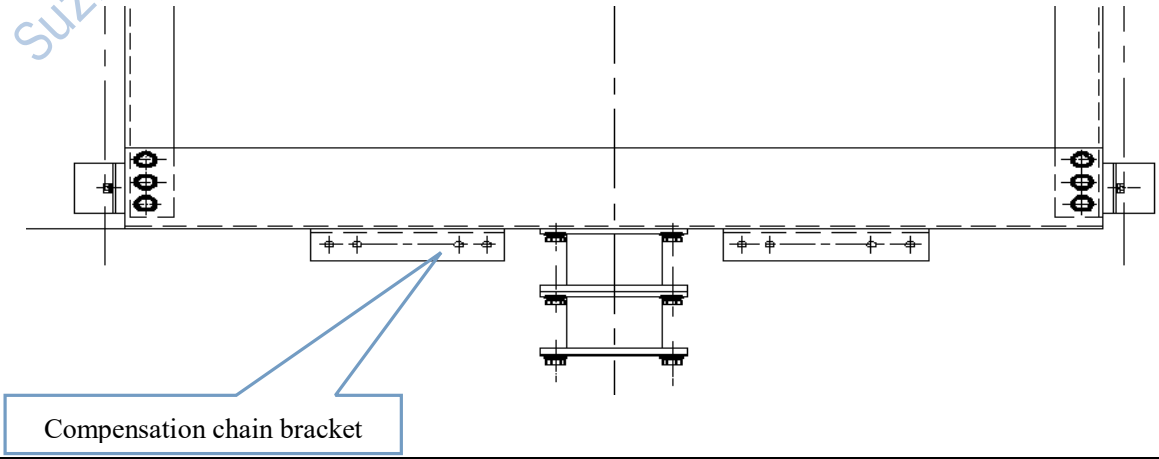
1.4 When installing the balancing compensation chain, remove any spirals or tangles created during the winding process, hang one end of the balancing chain on the car, drive the slow ride to the top, let the other end of the balancing chain off the ground, let the spiral clear by static suspension, install the guide and hang the other end.

## 2. Compensation chain bracket mounting

1. On platform mounting brackets. car bottom compensation chain mounting bracket via M16*40 bolt assembly, one end connected to car frame lower beam, other end connected to platform frame.



2. The compensation chain bracket is installed at the bottom of the alignment. the bottom of the alignment frame has a support for mounting the compensation chain.

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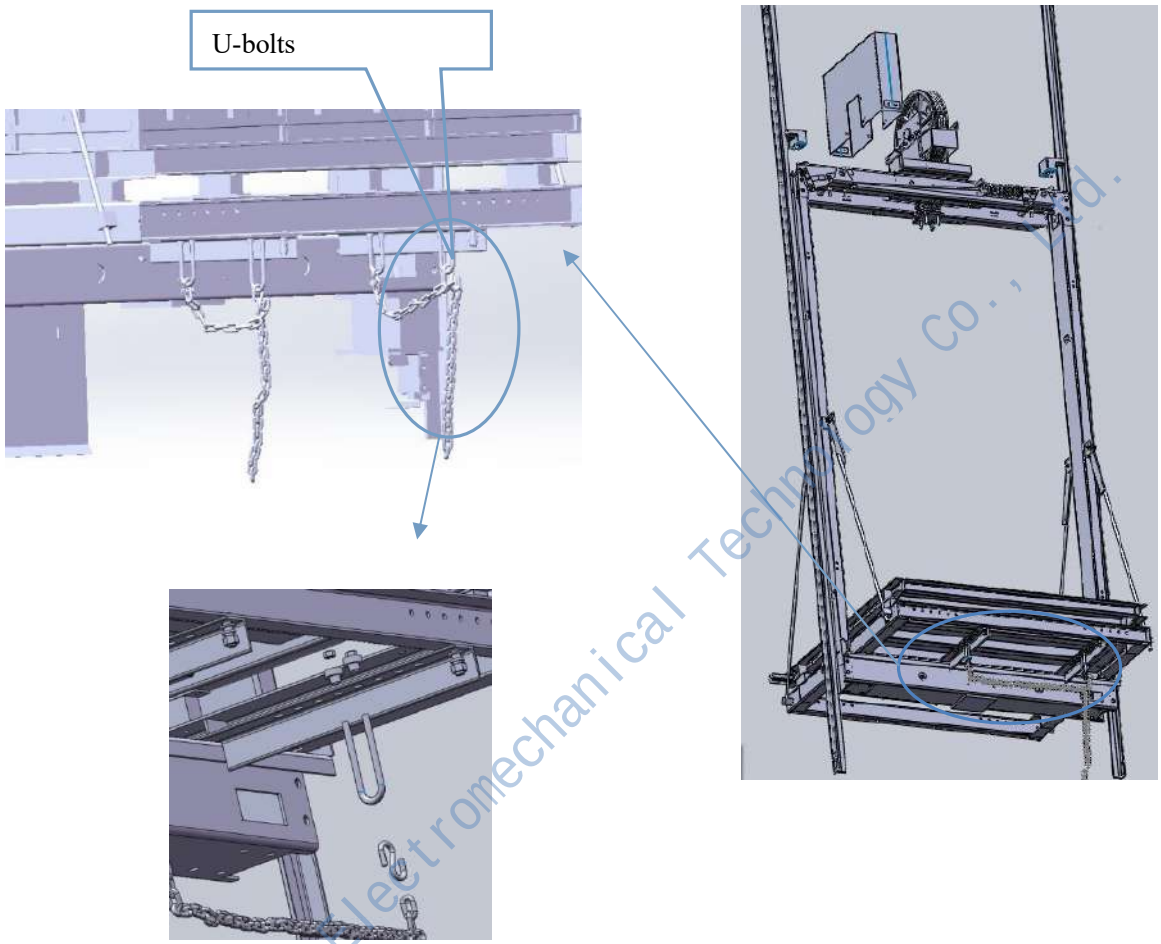
3. Compensation chain suspension

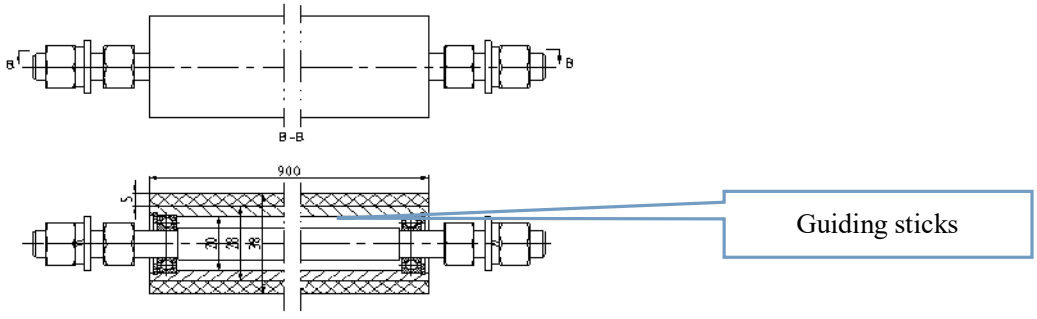
1. Installation of the compensation chain on the platform, which is connected to the platform compensation chain bracket by means of U-bolts and S-hooks with secondary protection.




2. Wrap the compensation chain around the alignment guard and connect it to the bottom of the alignment.

4. Installation of compensation chain anti-sway device

The compensation chain anti-sway device is mounted in the shaft PIT section as shown in the diagram and its bracket is pressed against the floor by means of bolts and pressure guides. The pivot section is connected to the bracket with U-shaped bolts.

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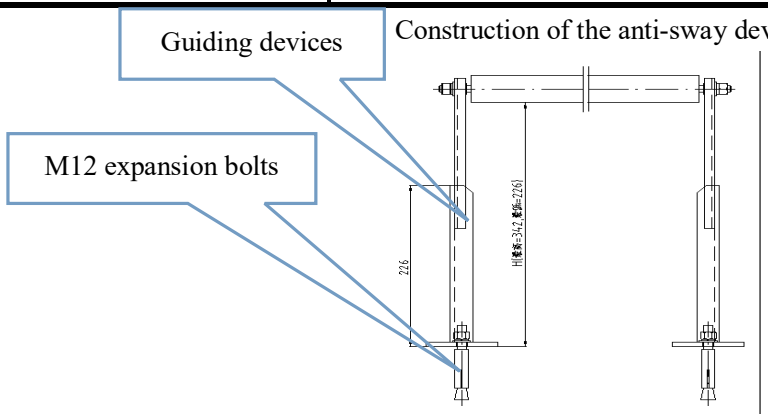
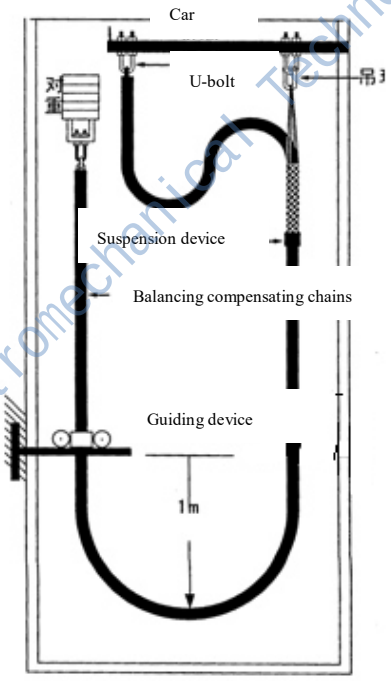



Installation of anti-sway devices

5. Installation of the all-plastic compensation chain

5.1 The all-plastic compensation chain can be used for medium and high speed lifts, where secondary protection requires special suspension devices for suspension.

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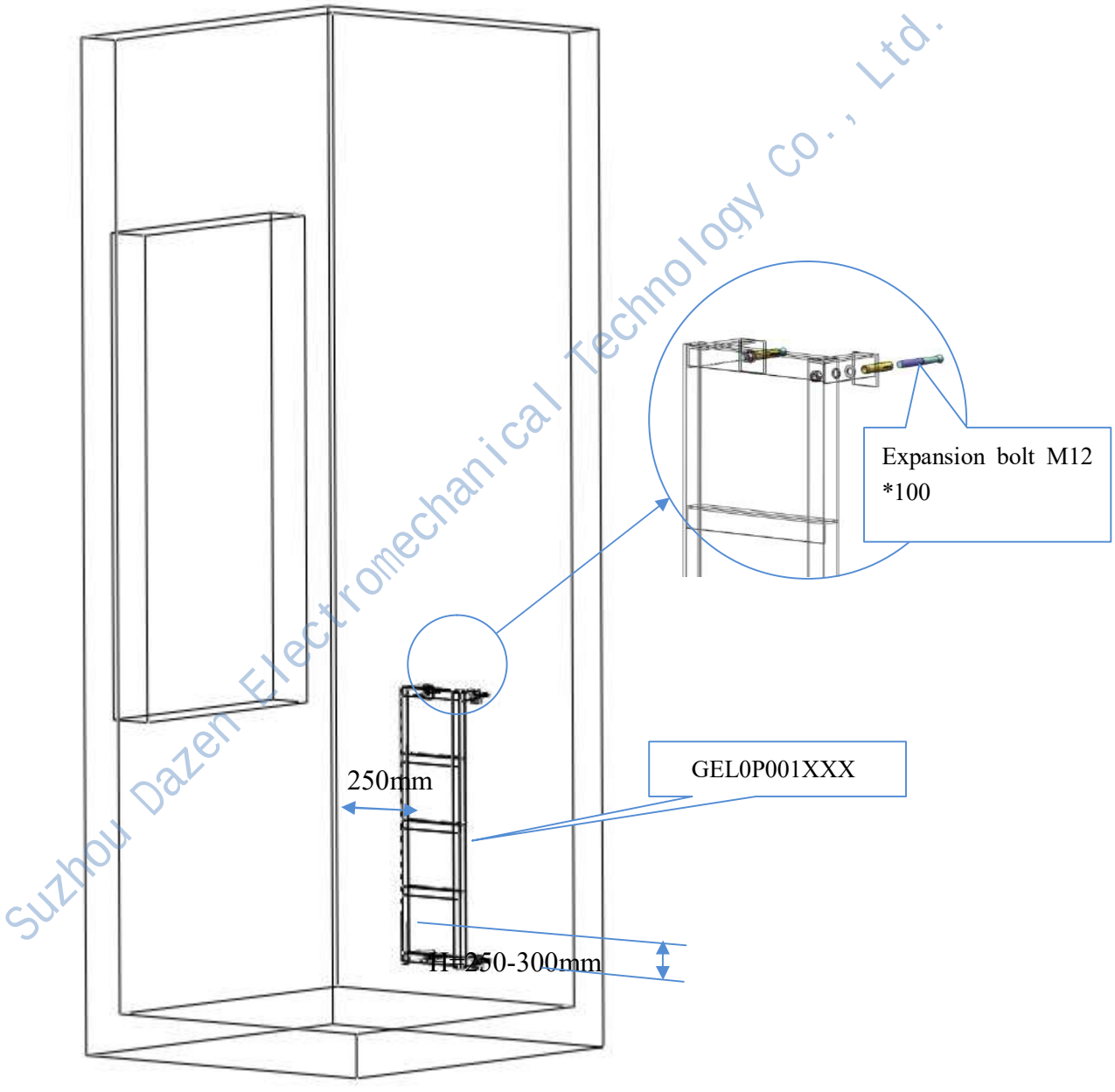
5.2 The installation point of the guiding device is at a sufficient distance (approx. 1m) from the vertical distance of the bottom of the balance chain bend to prevent the chain from breaking due to resistance caused by too small a bend radius.

# PIT Ladder Stand Installation

1. Installation of the PIT ladder stand

The PIT ladder stand is a tool for access to the PIT for service personnel and is fixed to the side wall of the PIT with expansion bolts, approximately 250 mm from the entrance wall.

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Note: The distance H between the walking surface of the PIT floor and the first step of the treadle below should be equal to the distance between adjacent treadles, 250-300 mm.

# Commissioning and Operational Readiness

## 1. Slow test run to check commissioning

1.1 The installation team cooperates with the inspection engineer for inspection, while the commissioning operator carries out commissioning: during the trial run of the slow ride, the shaft is inspected to check whether there are any obstacles in the shaft that hinder the operation of the lift, and whether there are water leaks and holes in the shaft. The rails in the shaft were cleaned, the rails were smoothed at the sand joints, the tension of the steel cables was adjusted and checked for the presence of cotter pins, the installation position of the limit and limit reduction switches and the feasibility of the safety dimensions, the installation position of the movable cable fixing frame, the installation position of the speed restrictor and tensioning wheel, the height of the tensioning wheel weights from the ground and the distortion of the steel cables.

1.2 Car parts inspection and adjustment

Adjustment inside the car: check the installation of the connecting plates inside the car, check the verticality of the car, the installation of the COP and the tightness of the screws in the various parts of the car body.

1.3 Under car adjustment: installation and adjustment of the under car boot, adjustment of the under car balance bar, check the position of the low car movable cable and the travel twist, check the clearance between the car safety clamp wedge and the rail, check the installation and operation of the simple load compensation device, check the grease quantity of the parts.

1.4 Adjustment on the car: check the installation of the guide shoe and adjust the gap, install and adjust the anti-vibration rubber gasket on the side of the car, check the safety switch of the safety clamp linkage, check the safety window switch, check whether the power supply of the car door motor is wired correctly, check whether the steel cable bar is fitted with a cotter pin. Check the safety switch of the safety clamp linkage, check the safety window switch, check the correct wiring of the power supply of the door motor, check whether the steel cable bar is fitted with cotter pins. Check the parallelism of the pulley and sprocket of the door machine system, the looseness of the belt and chain, and check for abnormal sounds. Check for abnormal sound.

1.5 Car door inspection and adjustment: door closing switch inspection and dimensional test, installation of door protection action emergency wiring, adjustment of door protection and car door, adjustment of car door and car door frame gap. Adjustment of the car door and car door gap, adjustment of the car door speed. Adjustment of the safety door opener and door linkage.

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1.6 Hall door check and adjustment: check the installation of the hall door, hall door and door pocket clearance, hall door verticality, hall door linkage. Forced closing device, door hook gap and copper compression distance when the door is closed, dust cover coverage, door lock lever size check the door knife and door roller gap adjustment.

1.7 External inspection and adjustment of the lobby: inspection of the hole of the ladder box outside the lobby, ladder response test, inspection of the installation height and vertical height of the ladder box, fixation of the ladder box and the panel, confirmation of the operation of the electric lock switch of the base station, inspection of the flatness of the ladder box panel and floor display.

1.8 Flat floor bracket plate assembly: The flat floor bracket plate assembly is the responsibility of the installation team. The level sensor should be leveled when installed and the layer brackets should be installed firmly and in the correct position.

## 2. Fast ride run check debugging

2.1 fast ride Before the trial run turn, check and adjust again according to the above requirements, and prepare the tools, instruments and materials required for the fast run.

2.2 Balance weight and current tests, various waveforms, speed restrictor electrical and mechanical jump test, check the status of the floor signal display, each load voltage and current measurement, all performance can be carried out at high speed after the requirements are met.

2.3 The leveling accuracy during automatic leveling stops should be checked during high speed operation and adjusted for comfort during operation.

2.4 The above data will be entered in the "Self-check Report".

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