曳引驱动乘客电梯系列

Traction Driving Passenger Elevator

安装指导说明

Installation Instructions

ZHEJIANG FUJICN ELEVATOR CO., LTD.

申明
Declaration

由于电梯规格的多样性，可能本安装指导中的某些部分不适合您的安装工作。其部件可能与安装指导中的描述不同，这种情况下请参考随机文件或相关的安装指导文件。如果背离这个安装方法是必要的，那么首先必须与富士电梯有限公司技术部门取得联系，并经慎重计划、风险评估和方法说明后才能进行！

As there are various elevator specifications, some parts of this Installation Instructions may not be applicable to your installation. Its parts may be different from what is described herein; under such case, please refer to accompanying document or related installation instruction document. If it is necessary to deviate from this installation method, firstly it is necessary to make contact with the Technology Department of Fujicn Elevator Co., Ltd. and carry out it upon prudent planning, risk assessment and method statement!

目录

1 概述

1 General

本指导书的目的是为了能高效率无故障地安装 FUJICN 乘客电梯，并且遵循安全第一的原则。

This manual aims at installing the FUJICN passenger lift efficiently with no failure and following the safety first principle.

本书所介绍的安装方法只适用于可以用以中国地区 FUJICN 乘客电梯，一体化智能控制系统，控制柜安装于顶部楼层。

The installation method introduced in this book can only be used in China area FUJICN cargo elevator, integrated intelligent control system, control cabinet installed on the top floor or the top machine room.

工地主管必须确保在安装工作中严格按照批准的方法进行。

The Site Supervisor has to ensure the installation is in strict accordance with the approved method.

由于电梯规格的多样性和产品的非标，可能本说明中的某些部分不适合你的安装工作，某些部件可能与说明中的描述不同，这种情况下请参考随机文件或相关的安装文件。工作人员在实际安装过程中，必须遵守此安装说明，如果出现违背此安装说明的情况，必须获得前线管理者的慎重计划、风险评估和方法说明后才能进行。

As there are various elevator specifications and non-standard products, some parts of this Installation Instructions may notbe applicable to your installation. Its parts may be different from what is described herein; under such case, please refer to accompanying document or related installation instruction document. During actual installation process, the installer has to comply with this Installation Instruction, for any deviation from it, the installer has to carry out prudent planning, risk assessment and method statement from the front-line manager.

为了保证高效无故障的安装，必须做到如下几点：

In order to ensure efficient and failure-free installation, the following points are required:

要求 Requirement	备注 Remark
施工现场必须符合电梯安装条件 The construction site must comply with the elevator installation condition	参照工地要求及工具 Refer to the construction site requirements and tool
部件堆放点到电梯井道畅通且距离较近 It is unblocked from the part piling-up position to the hoistway, with small distance	
项目工程师必须先检查井道尺寸公差 The Project Engineer must firstly check the dimensional tolerance of the hoistway	
电梯部件全部发货至工地 All elevator parts are delivered to the construction site	

与客户确认安装日期 Confirm the date of installation with client	
现场需有独立且可上锁的主电源 Site requires independent and lockable main power source	
配备足够的安装工具 Provide sufficient installation tools	参照安装工具 Refer to installation tools
配备推荐的手工工具 Provide recommended manual tools	参照推荐用手工工具 Refer to recommended manual tools
备齐个人安全防护用品 Prepare personal safety protection products	参考个人防护用品 Refer to personal safety protection products

1.1 缩写 Abbreviations

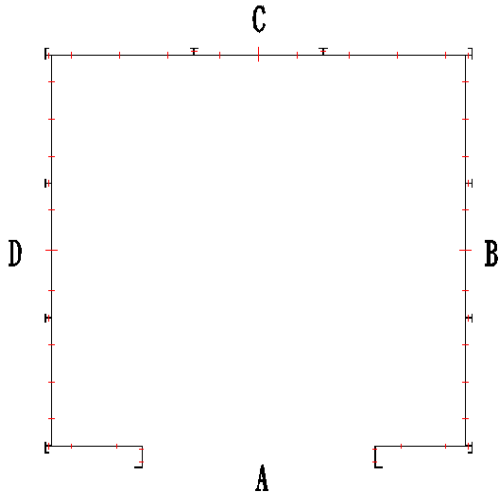


表 1-1 电梯参数缩写及井道面标识

Table 1-1 Elevator Parameter Abbreviation and Shaft Surface Marking

缩写 Abbreviation	含义 Meaning	单位 Unit	定义 Definition
Q	额定负载 Rated load	kg	客户要求的在正常操作下的最大负载 Maximum load under normal operation required by the client
V	额定速度 Rated speed	m/s	客户要求的在正常操作下轿厢的运行速度 Operation speed of car under normal operation required by the client
ELEVN	群组中电梯数 Number of		

	elevators in a group		
NOF	楼层数 Number of floors		
MF	主楼层 Main floor		
FFL	装修完成面 Finished surface of decoration		
CL	中线 Central line		
DGL	导轨顶面间距 Top surface clearance of guide rail		
A	A 门入口侧 Entrance side of Door A		通常为主楼层入口 Generally entrance of main floor
B	B 门入口侧 Entrance side of Door B		
C	C 门入口侧 Entrance side of Door C		主楼层入口门对面 Opposite of entrance door of main floor
D	D 门入口侧 Entrance side of Door D		

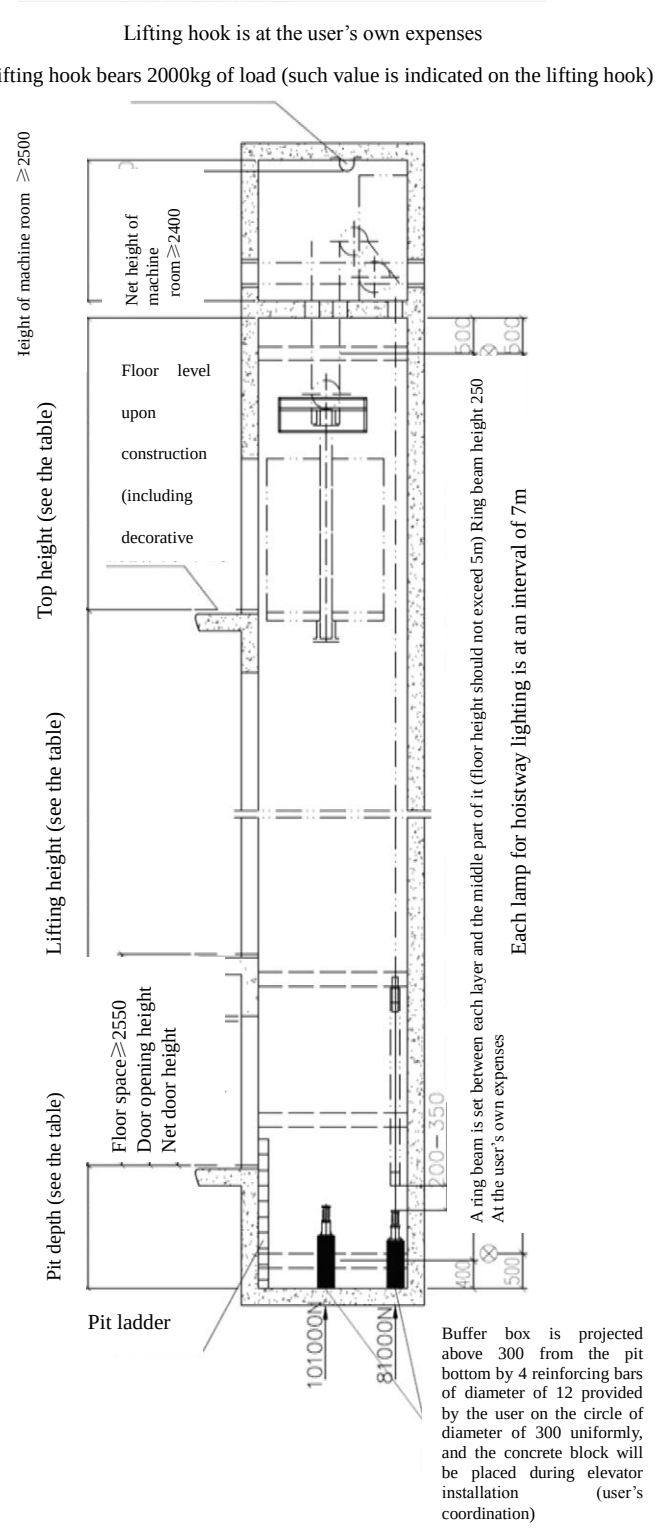
表 1-2 井道及轿厢缩写

Table 1-2 Shaft and Elevator Car Abbreviation

缩写 Abbreviation	**含义 Meaning**	**单位 Unit**	**定义 Definition**
电梯井道			
O.H	顶层高度 Top height	mm	顶层端站地坎到井道顶部的垂直距离 Vertical distance from top terminal landing sill to hoistway top
P.D	底坑深度 Pit depth	mm	由底层端站地坎到井道底坑地板之间的垂直距离 Vertical distance from bottom terminal landing sill to hoistway pit floor
H.W	井道净宽 Net width of	mm	平行于轿厢宽度方向井道壁内表面之间的水平距离 Horizontal distance between inner surfaces of hoistway

	hoistway		wall in parallel with the car width
H.D	井道净深 Net depth of hoistway	mm	平行于轿厢深度方向井道壁内表面之间的水平距离 Horizontal distance between inner surfaces of hoistway wall in parallel with the car depth
H.H	井道高度 Height of hoistway	mm	
H	提升高度 Lifting height	mm	
	层间距离 Floor to floor distance	mm	
轿厢 Car			
C.H	轿厢净高 Net height of car	mm	
C.W	轿厢净宽 Net width of car	mm	
C.D	轿厢净深 Net depth of car	mm	
	护脚板高度 Height of toe guard	mm	轿厢及层门地坎 Car and landing sill

1.2 电梯井道 Elevator hoistway



每个圈梁间距≤2m 或按土建图要求

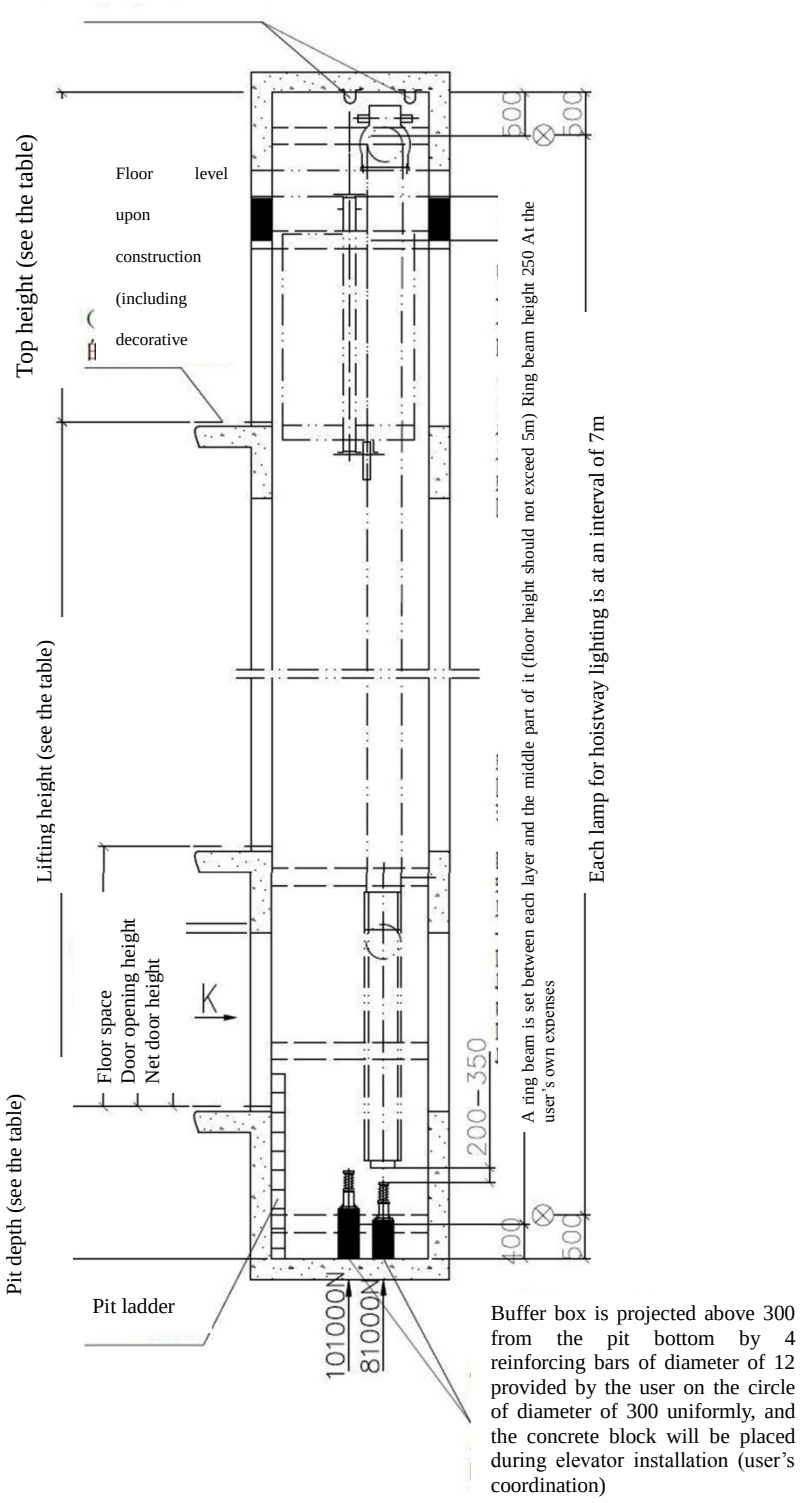
Space of each ring beam ≤2m or as required in construction layout drawing

图 1-1 有机房井道立面图

Figure1-1Elevation Drawing of Hoistway with Machine Room

Lifting hook is at the user's own expenses

The lifting hook bears 2000kg of load (such value is indicated on the lifting hook)



每个圈梁间距≤2m 或按土建图要求

Space of each ring beam ≤2m or as required in construction layout drawing

图 1-2 无机房井道立面图

Figure1-2Elevation Drawing of Hoistway without Machine Room

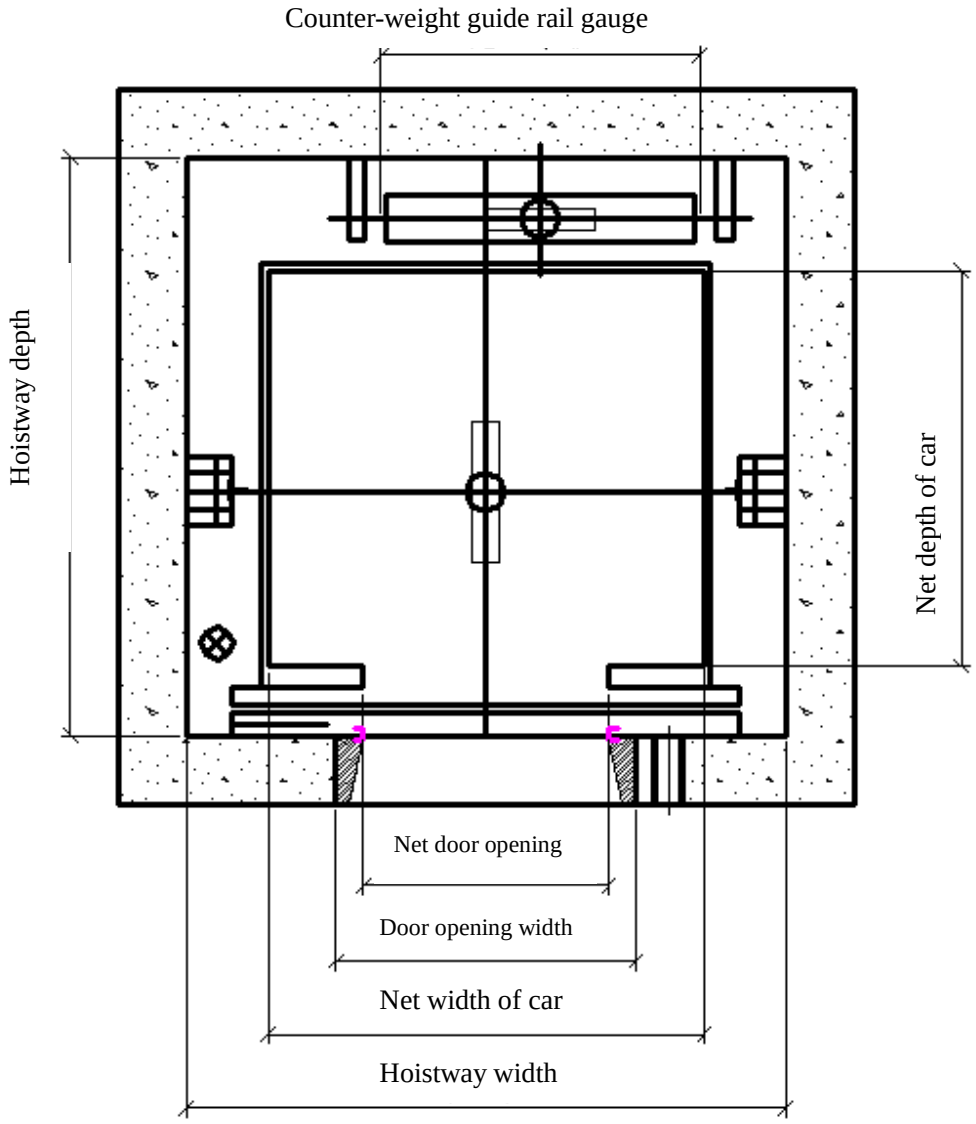


图 1-3 有机房井道平面图

Figure 1-3 Plan of the Shaft with the Machine Room

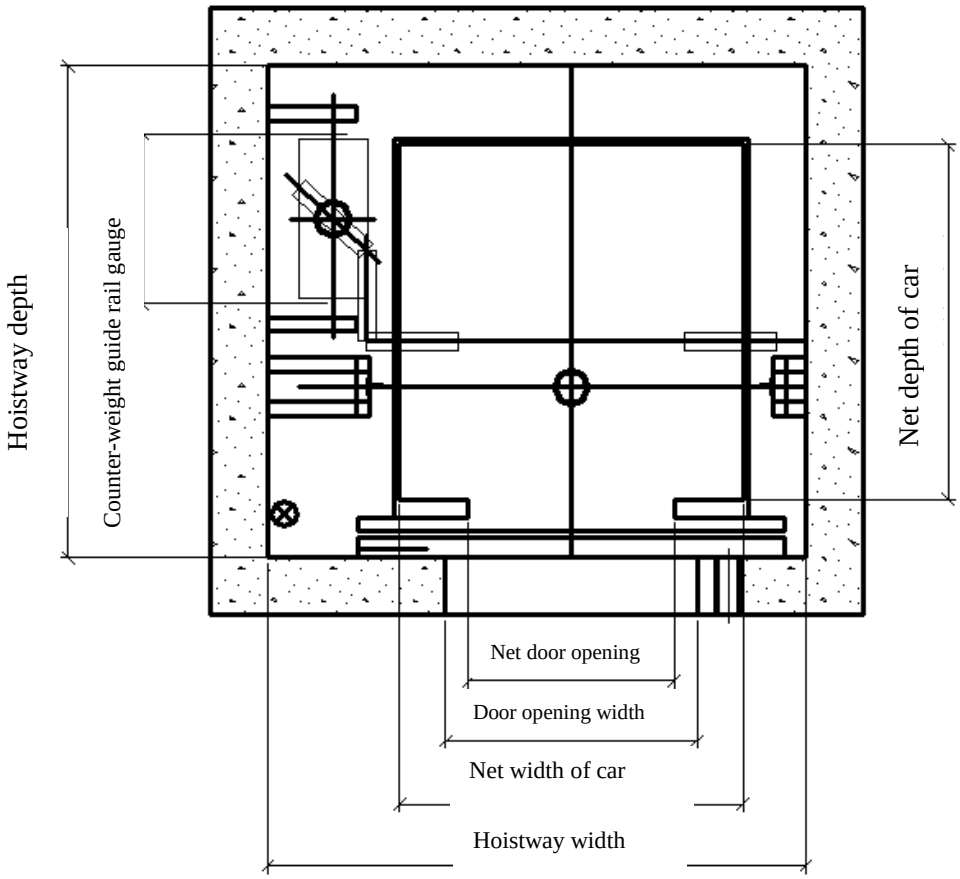


图 1-4 无机房井道平面图

Figure 1-4 Plan of the Shaft without the Machine-room-less

2. 安全事项 Safety attentions

2.1 主要安全事项 Major safety attentions

本手册中推荐使用的安装方法是为了确保安装工作过程中的安全性。由于地域性的差距，本手册有时候可能与当地的电梯规范有一定的出入，出现这种情况的时候，请联系本公司的相关技术人员，争取做到在满足本说明中安全要求的同时使得当地的安检工作顺利进行。任何当地的变更须进行仔细设计和风险评估，严格遵守本手册，否则，你会遇到不可预测的危险。

The installation methods recommended in this manual is to ensure the safety during installation. Due to regional difference, this manual may sometimes differ from the local elevation specifications; under such case, please contact related technician of the Company to smoothly

carry out the safety inspection while the safety requirements herein are satisfied. Any local change is subject to careful design and risk assessment and in strict accordance with this manual, or otherwise you may encounter unpredictable danger.

2.1.1 安全概述 Safety overview

在这个安装说明中参照相关的安全规定文件。

Refer to related safety regulation documents herein.

注意：只有持有有效合格操作证的工作人员才可进行安全工作

Attention: only workers with valid operation qualification certificate can carry out safety operation.

2.1.2 脚手架 Scaffold

任何搭建、改建或拆除脚手架的工作，必须由具备专业资格的人员完成。

Establishing, rebuilding or dismantling of scaffold must be carried out by personnel with professional qualification.

2.1.3 材料运输 Material transportation

工地的材料运输，一般都是由甲方的分包商负责，具体要求不在本说明之中。

The transportation of materials on site is generally in the charge of Party A's subcontractor, and specific requirements are not included herein.

2.1.4 电气操作安全事项 Safety attentions to electrical operation

任何时候，施工人员都必须熟悉且遵守电气安全规则文件。

At any time, constructors must know and comply with the document of electrical safety rules.

除特殊情况外，必须按照以下 5 个步骤对特殊的指令进行操作：

Except for special cases, special orders must be executed based on the following five steps:

- 确保所有电源都断开
- Ensure all power supplies are disconnected
- 确定所有电源都不能再被推上
- Confirm all power supplies will not be pushed up any more
- 核实所有安装是在无电情况下进行
- Verify all installations are carried out without power.
- 检查特殊情况下设备的接地（此项操作只可以由持有操作证的专业人员和大楼的电气管理人员共同执行）
- Check equipment grounding under special cases (such operation can only be jointly executed by professionals holding operation certificate and electrical manager of the building)
- 活动部件的周围进行防护措施
- Take protective measures for surrounding of moving parts

2.2 安全防护主要措施 Main measures for safety protectio

要求 Requirement	备注 Remark
遵循本说明中的方法 Comply with methods herein	警告标示提示潜在危险 Warning mark gives a hint of potential danger
到达工地时向工地经理汇报 Report to the Site Manager on arrival at site	
检查认可的储运安排，确定楼板的承受力 Check approved storage and transportation arrangement to determine the bearing capacity of the floor slab	
确保工地安全审核已进行 Ensure the safety examination of site has been carried out	
确保你的工作不会威胁工地周边作业人员的安全 Ensure your work will not have a safety threat to the workers around the site	

注意安装工作进行中的安装工和其他建筑工地上人员之间的通讯联系是有效的 Pay attention to effective communication between the installers and other personnel on the construction site	警示标牌，双路对讲机，通过主承包商与其他承包商的合作 Warning signs, two-way interphone and cooperation between Main Contractor and other contractor
如发现工作区有危险状况，应立即报告给你的主管、安全负责人或其他负责人 In case of any danger found in the working area, promptly report to your director, safety director or other responsible person	
在安装开始之前，对于主开关的锁闭系统或其他系统（如更换保险，加锁和加标签的手续）必须征得主承包商的同意 Before installation, it is necessary to obtain the consent of the Main Contractor on the locking system or other system of the master switch (such as the procedures of changing fuse, locking and tagging)	
所有必需的控制和进入钥匙、工具及设备应该在需要的时候能够随时获得 All necessary control and entry keys, tools and equipment should be accessible at any time as required	
警告！轿顶控制器除了电缆束和确定的接地	必须依照线路图

连接，都是非常危险的，不要擅自连接 **Warning！ Except for cable beam and determined grounding connection, it is very dangerous to arbitrary connect the car top controller**	As per the line drawing
不要跳跃台阶 Do not jump over steeps	存在你预测不到的危险 Presence of unpredictable danger
在使用前检查工具的状况 Check the tool condition before use	按照当地规范要求，特别注意电气标示、插头和插座，确保起吊设备状况正常 As required in local specification, pay special attention to the electrical mark, plug and socket to ensure normal condition of lifting equipment
钻孔时，必须佩带手套、防护镜、耳塞和防尘面具 In drilling, wear gloves, google, earplugs and dust mask	
带电作业时必须特别小心且遵从带电作业程序，并使用适当的工具，穿着防护服 During hot-line work, pay special attention and comply with the hot-line work procedure, use proper tools and wear protective clothing	
任何时候都不要在吊装物体下方区域工作 当工作进行到头顶以上区域时，任何人不得继续原位置下方区域工作 Never work under the lifted objects; no one is allowed to continuously work under the original position when the work is carried out above your head	
使用正确的起吊方法和设备，所有重型部件都应用吊装工具起吊 Use proper lifting method and equipment and use lifting tools to lift all heavy parts	
吊装-机械链式吊装和电力绳索吊装的概述： Overview of lifting-mechanical chain lifting and electric rope lifting: 确保吊装工具和所有相关设备功能正常且标注有安全起吊负载量 Ensure lifting tools and all related equipment are of normal functions and with indicated safe lifting load 吊装设备必须具有检测证书（不同国家规定不同） Lifting equipment must be provided with	

detection certificate (different regulations in different countries) 每次使用前应先检查设备有无异常 Before use, firstly check the normality of equipment 不要在无人监管的状况下吊起设备，除非标有明显的警示标识 Do not lifting the equipment without supervision, except for obvious warning mark indicated	
如果不是绝对需要在开门状态下工作的情况处，应关闭所有的层门、活板门和电梯井道可开启的任何门 In case of absolute need of work under the condition of door opening, close all landing doors, trap door and any openable door in the elevator hoistway	确保进入口保护符合要求，同业主保持联系 Ensure entrance protection in compliance with requirements and keep in touch with the Employer 进入口保护的要求请参照当地的程序规范，如果需要拆除进入口保护，在该区域的工作完成后必须马上装好拆除的进入口保护 For the requirements of entrance protection, please refer to local procedure specifications, and for the requirements of dismantling of entrance protection, install dismantled entrance protection immediately after the work completion in this area
使通路和工作区域没有不必要的材料和工具 Keep the access road and working area free of unnecessary material and tool	
当授权人不在机房工作时，必须保持控制柜门和机房门锁关闭 When the authorizer does not work in the machine room, it is necessary to keep door lock of the control cabinet and the machine room closed	
个人安全防护设备必须能用且按要求使用 Personal safety protection equipment must be available and used as required	
注意从导轨上拆除防锈保护使安全钳能够正确同步动作和调节，否则，安全钳不能正确动作 Pay attention to dismantling the rust protection from the guide rail in order to make the safety gear correctly synchronize the movement and adjustment; or the safety gear will fail to correctly move	只有在适当的通风区域，可使用除锈液 Rust removing solution can only be used in proper ventilation area

当手动释放抱闸时不可超速 Do not exceed the speed limit when the band-type brake is released manually	限制马达转动间隔 1 秒钟释放一次 Limit motor rotation interval, with release once a second

层门安装完毕后要保持关闭状态，当轿厢不在平层位置时，必须保持机械锁锁闭 Keep the landing door closed upon installation, and keep the mechanical lock closed when the car is not in the leveling position	
当 2 个或更多的人员在同一部工作中的电梯时，其中一人必须负责：控制和进入的钥匙，安全和恰当的移动轿厢 When two or more personnel work in the same elevator, one of them must be responsible for: control and entry key, safe and proper car movement	当必须移动轿厢时，在进行此操作之前，负责人必须通知其他在电梯工作的人员打算移动轿厢的信息 When it is necessary to move the car, the responsible person before operation must inform other personnel working in the elevator of his intention to move the car
光滑的轿顶极有可能导致跌落事故甚至造成人员伤亡，当人在轿顶时，应检查是否在正确位置 Smooth car top probably results in falling accident or even casualty; on the car top, workers should check its proper position	保持工作区域整洁可以最大限度的避免跌落危险 Keep the working area tidy to avoid failing danger to the greatest extent
在钢丝绳孔周围安装直立对象时，用钢板覆盖所有的孔 Use steel plate to cover all holes when the vertical object is installed around the wire rope hole	
确保所有的起吊设备和辅助吊点都有正确的载荷规定，且处于安全条件下 Ensure all lifting equipment and auxiliary lifting points are provided with correct load specification and under safe condition	
当向电梯井道内搬运物料时，应设置安全围栏或者人为的监护以防止外面的人可能从层门入口进入工作区 When materials are handled in the elevator hoistway, safety fence or personal monitoring should be provided to avoid people outside entering the working area from the landing door entrance	
当在井道底坑中工作时，应使用正确的爬梯或底坑入口门 When workers work in the hoistway pit, they	

should use proper ladder or pit opening door	
确保主电源不会通电，主电源必须断开并锁闭直到所有电气部位的工作完成 Ensure the main power supply will not be connected, but disconnected and closed till all electrical work is completed	
当电梯井道内同时进行建筑工作时，不要在井道内工作 When construction is carried out in the elevator hoistway, work in the hoistway is prohibited.	
注意不要让皮肤粘到油，油料是有害物质 Pay attention to get the skin free of oil which is harmful	
另外，除了本手册中规定的安全要求外，还应该遵守当地的规范 In addition, except for the safety requirements specified in this manual, local specifications should also be followed.	

2.3 安全的安装方法 Safe installation methods

特性 Characteristics	备注 Remark
当需要在脚手架上工作时，先确定脚手架是否稳固，且设置适当的隔板、护脚板，护栏安装在正确的高度 For the requirements of work on the scaffold, firstly confirm the stability of it, build up proper division plate and toe guard, and install the guard bar on proper height	脚手架必须由有资格的承包商安装 Scaffold must be installed by qualified contractor
确保脚手架是安全的且没有光滑表面 Ensure scaffold is safe and free of smooth surface	
决不能使脚手架超载，所有的施工平台必须就位，每次只可以吊起一根导轨 Never use scaffold over-load, put all construction platforms in place, and only lift a guide rail once	脚手架搭建每平方米的受力荷载不小于 2500N Stress load of scaffold per squire meter is no less than 2500N
脚手架必须严格按照提供的脚手架图纸中的规定和要求来搭建；所有的脚手架杆应该用合适扣件紧钳在一起，水平架杆必须至少两端固定，绝不允许有松的架杆 Scaffold must be built up as specified and required in the scaffold drawing provided; all scaffold poles should be clamped with proper fasteners, and the horizontal frame bar must be fixed at both ends, without any loosen frame bar	

2.4 危险及个人防护用品标识 Signs of danger and personal protective device

危险标识		个人防护标识	
危险	标识	必需品	标识
电击		安全帽	
坠落		连身工作服	
磁场		防护面罩	
火警		防护耳罩	
腐蚀皮肤		安全鞋	
严禁进入		安全手套	
警告标志		安全带	
		急救箱	
		护目镜	

Danger signs		Personal protective signs	
Danger	Signs	Necessities	Signs
Electric shock		Helmet	
Falling		Overall	
Magnetic field		Protective mask	
Fire alarm		Ear protector	

Corrosion of skin		Safety shoes	
No entrance		Safety gloves	
Warning mark		Safety belt	
		First-aid kit	
		Goggles	

如下所示，使用“**警告**”和“**注意**”文字表示对人或设备存在的高危险的状态：

As shown below, words “**warning**” and “**attention**” show states of high risk for people or equipment:

警告 **Warning**	**用以警告存在严重的安全隐患** **Use to warn severe safety risk**
注意 **Attention**	**用以警告可能会受到安全隐患设备的损害** **Use to warn possible damage by equipment with safety risk**

2.5 对于坠落的特殊警告 Special warning for falling

警告：如不正确使用安全带及其相关的用具，你将可能因坠落造成严重伤害甚至死亡 **Warning: improper use of safety belt and related tool may cause heavy injury or even death due to falling**
安全要求 **Safety requirements**
当有坠落的危险和你在高于 1.8 米以上的高度工作时，必须使用安全带并固定在已批准了的固定点上 In case of falling risk and work above 1.8m, you must use safety belt and fix it onto approved fixing point
固定安全带的固定点应该至少高于你的工作区 2.0 米 The fixing point for safety belt should be 2.0m (at least) above your working area
当在不可能保持绳索尽可能短以避免坠落的危险区域时，应估计可能坠落的区域和可能产生撞击点（例如导轨支架等）风险时应注意绳索和安全带的伸长的因素 When you are in dangerous area where it is impossible to keep the rope short as much as possible to avoid falling, you should estimate the area that may fall; in case of possible crack point (such as guide rail support) risk, you should pay attention to the extension factors of rope and safety belt
如果有可能落到轿厢侧面或脚手架平台上的话，你应该试着使降落高度低于 300mm In case of the possibility to fall onto the car side or the scaffold platform, you should try to make the falling height below 300mm
在井道里，如果你把安全带系在导轨支架或其他固定部件时，必须先确认轿厢绝对不会移动 In the hoistway, if you tie the safety belt to the guide rail support or other fixed part, you must firstly confirm the car will never move

当你的安全带不是系在安全绳或其他批准的固定点时，请确保它的安全绳不会勾住其他部件 When your safety belt is not tied to the safety rope or other approved fixing points, please ensure its safety rope will not hook up other parts

3. 工地要求及所需工具 Site requirements and required tools

3.1. 工地要求 Site requirements

工地检查至少在安装工作计划开始前一个星期进行。

Site inspection should be carried out once week in advance of the installation plan.

注意！如果可能的话，最好在电梯井道和机房封顶之前，由建筑商将曳引机吊装到位。在进行该操作时。

Attention: if possible, the builder had better to hoist the traction machine before the construction completion of elevator hoistway and the machine room. During such operation

要求 **Requirement**	**备注** **Remark**
工地已 100%的准备好 The site is 100% ready.	
运输通道应该被确定，且尽可能的靠近井道 The transportation channel should be determined and close to the hoistway as much as possible	
物料搬运工作必须完成，场地准备（库房）就位 The material handling must be completed, and the site (warehouse) is well prepared	
安全开始日期必须经过工程部同意 Safe starting date must be permitted by the Engineering Department	
在安装工作开始之前，主开关的锁闭系统或其他系统（如更换保险丝，锁和标示等）必须征得主承包商的同意 Before installation, it is necessary to obtain the consent of the Main Contractor on the locking system or other system of the master switch (such as the procedures of changing fuse, locking and tagging)	
工地安装工具必须齐备，详见附录一 On-site installation tools must be well prepared and shown in Annex I in details	
手持工具必须齐备，详见附录一 Hand tools must be well prepared and shown in Annex I in details	
个人安全装备必须齐备，详见附录一	

Personal protective device must be well prepared and shown in Annex I in details	
根据土建图的要求，应该设置适当的照明和为电梯及吊装设备暂时或永久设置三相电源 As required in the construction layout drawing, proper lighting should be provided, and temporary or permanent three-phase power supply should be provided for the elevator and the lifting equipment	如果需要，井道照明可以从顶部到底部，临时固定 If required, the hoistway lighting may be temporarily fixed from top to bottom
电梯井道和底坑必须整洁，且底坑应该防水 The elevator hoistway and pit must be clean, and the pit should be water-proof	
应该为安装工具提供适当的存放区域，在指定的存放区域存放物料，这样不至于造成危险 Proper storage area should be provided for the installation tool, and materials should be stored in specified storage area to avoid danger	距离井道 20 米或更近的范围内可手工搬运物料 Material may be manually handled 20m within in the hoistway or in closer distance
在底楼或紧靠底楼至少有一个整洁畅通的过道，用以搬运长的、体积较大的部件（如导轨、轿厢部件、门等）。应该审核结构楼板的载荷 There should be one clean and unblocked passage at least to handle long and bulky parts (such as guide rail, car part and door). The load of structural floor slab should be approved.	
入口防护栏（板）应置于所有层站的入口和井道安全门的地方 The entrance protection guard (slab) should be put the entrances of all terminal landings and the safety door of the hoistway 在顶部和底部层门入口的周围安装临时护栏，而且随时能移动（铰链式），且护栏高度不少于 1.5mm Temporary guard rail should be installed around top and bottom landing entrances, movable (chain-type) at any time and in height no less than 1.5mm 建议使用密实的防护栏（板） Dense guarding rail (slab) is recommended	按照当地规范要求 As required in local specifications  
电梯井道尺寸和公差应该依照土建图的要求（由工地主管检查）	

Dimension and tolerance of elevator hoistway should comply with the requirements of the construction layout drawing (checked by the Site Supervisor)	
有合适的地方堆放建筑及施工废弃物 Proper area should be used to pile up building and construction waste	按照当地要求 As locally required
如高空作业时应有可以固定安全带的固定点 Fixing point for safety belt should be provided for working at heights	按照当地要求 As locally required
每个楼层必须有装修完成的地面标高，地面已装完成除外（或从装修完成面上的 1m 标高线） Each floor must be provided with finished ground elevation, except for the finished ground (or 1m elevation line above the finished surface)	
机房一旦完成后，马上装上带锁的门 Once the machine room is completed, the door with lock should be installed immediately	当机房里无授权人在场时，门必须锁闭 When the authorizer is not in the machine room, the door must be closed

正确搭建钢质脚手架，安全标签和检测数据如下：

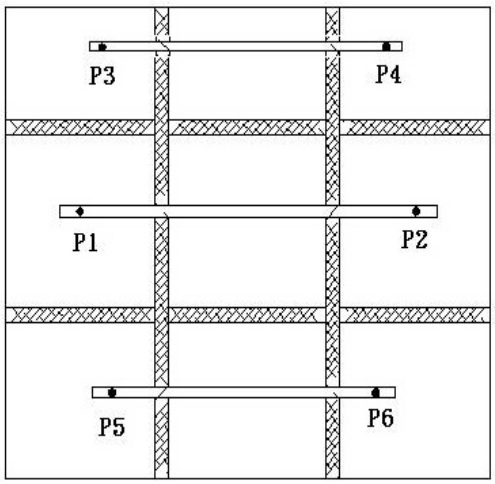
Correctly set up steel scaffold, safety label and detection data as follows:

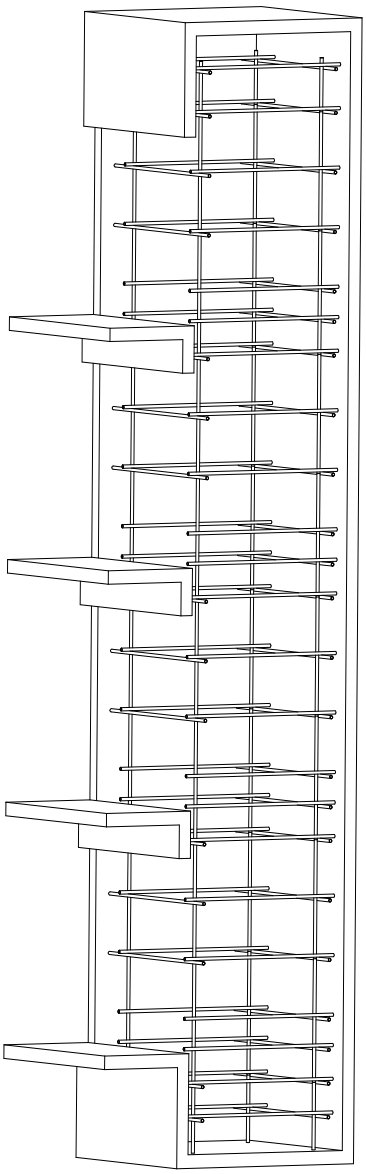
1) 第一个工作平台距底坑 1 米，第二个工作平台距第一个 2.2 米。这是允许进入安装导轨和对重的高度。 The first working platform is 1m away from the pit, and the second one 2.2m away from the working platform. It is a height to allow for guide rail installation and counterweight.

2) 中间工作平台的高度由设计部门根据导轨固定数和入口位置决定。 The height of the intermediate working platform is determined by the Design Department based on the number of guide rails fixed and the entrance position.

3) 垂直支撑杆连接位置应低于最高楼层完成面约 1.1 米。 The connection position of the vertical bracing piece should be 1.1m lower than the finished surface of the highest floor.

4) 顶层导轨接合处以下的工作平台，在电梯井道的后侧和两侧应有延长的水平架管。四根垂直架管的外侧区域应该铺设脚手架盖板。在导轨安装完毕后固定。如果此处有坠落的危险也应该安装脚手架盖板。 Working platform below the top guide rail joint should be provided with extended horizontal frame pipe at the back side and two sides of the elevator hoistway. The external area of four vertical frame pipes should be paved with scaffold cover plate and fixed upon the completion off guide rail installation. If case of any falling danger, it should be fitted with scaffold cover plate.





5) 脚手架后侧的垂直爬管之间的间隙应该是 600mm~700mm。The space between vertical climbing pipes at the back side of the scaffold should be 600mm-700mm. **注意：脚手架的搭建应严格参照土建图，不得随意搭建，否则可能导致导轨和导轨支架无法安装。** **Attention: scaffold should be set up in strict accordance with the construction layout drawing, and any arbitrary setting-up may result in the installation failure of guide rail or guide rail support.**	

3.2. 工具 Tools

安装工具见附录一。
Installation tools are shown in Annex I.

4. 卸货、发货及安装现场 5S Unloading, delivery and installation site 5S

- 首先向工地管理者介绍你自己，熟悉工地的环境及设备，了解当地政府相关条例，安全要求和工地的管理程序。
- Firstly introduce yourself to the site manager, get familiar with the site environment and equipment, and know related regulations of local government, safety requirements and the management procedures of the site.
- 保持工作场地地清洁和无障碍物。
- Keep the working site clean and free of obstacles.
- 不要在悬挂物下工作。
- Do not work under the suspension.
- 采用正确手动吊装方法。
- Apply correct manual lifting method.
- 戴好手套。
- Wear gloves.
- 戴好头盔。
- Wear helmet.
- 在容易发生坠落的危险区域工作时，正确配带安全带，并将其固定到已批准的固定点上。
- Working in dangerous area prone to falling, correctly wear helmet and fix it to approved fixing point.
- 在有需要时，带眼罩和防护面罩，保护你的眼睛和肺。
- When necessary, wear eyeshade and protective mask to protect your eyes and lungs.
- 同负责建筑物的工程师一起审核楼板载荷。

- Review the floor slab load together with the engineer responsible for the building.

注意！为保障您和他人安全，严禁损坏任何部件。

Attention! For your and others' safety, please damaging any part is prohibited.

4.1. 卸货及分发材料 Unloading and material distribution

- 物料由专门的承包商卸货及发货。
- The material is unloaded and delivered by special contractor.
- 按照安装顺序来放置工具和物料是非常重要的，这样在整个安装过程中，使安装工作环境非常有序。
- It is very important to place tools and materials as per the installation sequence, in order to keep the installation environment orderly during the whole course of installation.
- 在没有开始安装工作前，不要拆开物料包装。
- Before installation, do not unpack the material.
- 确保曳引机没有倾斜，防止倒下。
- Ensure the traction machine is not inclined to avoid falling down.
- 检查物料的装箱单。
- Check the packing list of the material.
- 如可能的话，确保物料存放于易于进行安装搬运的位置附近。
- If possible, ensure materials are stored close to the location with installation and handling convenience.
- 不要撕开曳引机上面的塑料防锈膜。
- Do not tear the anti-corrosion plastic film on the traction machine.
- 确保控制柜外包装完整，并被储存在通风干燥的库房内。
- Ensure the external packaging of the control cabinet is intact and stored in ventilating and dry warehouse.

按照安装顺序，物料堆放如下：

Based on the installation sequence, the materials are piled up as follows:

1. 井道样板 Hoistway sample plate
2. 控制柜 Control cabinet
3. 层门装置 Landing door device
4. 导轨支架 Guide rail support
5. 轿厢和对重导轨 Car and counterweight guide rail
6. 底坑设备，限速器张紧装置 Pit equipment and speed governor tension device
7. 对重架 Counterweight housing
8. 曳引机及其支架 Traction machine and its support
9. 限速器及其支架 Speed governor and its support
10. 轿厢和对重绳头装置 Car and counterweight rope-head device
11. 控制柜，检修和 Control cabinet, overhaul and
12. 井道线槽和井道预制线 Hoistway trunking and hoistway pre-wire
13. 随行电缆及固定件 Accompanying cable and mounting
14. 轿底 Car platform
15. 轿壁 Car enclosure
16. 龙门架 Gantry tower

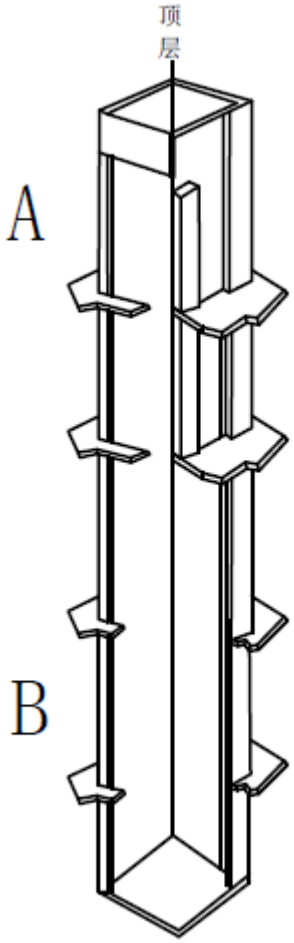
17．主钢丝绳。限速器钢丝绳 Main rope and wire rope of speed governor
18．轿顶组件 Car roof component
19．门机 Gantry crane
20．轿门 Car door
21．信号装置 Signal device

物料分层堆放 Materials Piling-up in Layers

A 井道顶层：
A Hoistway top:

- 曳引机
- Traction machine
- 顶层电气
- Electrical power of top
- 顶层承重总成
- Load bearing assembly of top
- 顶部物料吊装
- Material lifting of top
- 井道照明
- Hoistway lighting
- 控制柜
- Control cabinet
- 限速器及钢丝绳
- Speed governor and wire rope
- 曳引机铅垂线
- Plumb line of traction machine
- 手持工具
- Hand tools
- 钢丝绳固定
- Wire rope fixing
- 轿架
- Car frame
- 托架
- Bracing
- 轿厢
- Car
- 层门、门套（每层）
- Landing door and door pocket (each layer)
- 轿门及门机
- Car door and gantry crane
- 井道电气
- Electrical power in hoistway

B 入口楼层和储存区域：
B Entrance floor and storage area:



● 导轨连接板、固定材料 ● Guide rail connection plate and fixing material ● 井道机械部件 ● Mechanical part of hoistway ● 导轨校准工具 ● Guide way calibration tool ● 导轨及导轨支架 ● Guide rail and guide rail support ● 对重及对重块 ● Counterweight and counterweight block ● 补偿链及绳轮 ● Compensation chain and rope sheave	

4.2. 安装现场 5S 要求： 5S requirements for installation site:

◆ 物品悬挂整齐，位置固定，相应位置贴有标签，防止混乱；

◆ Suspend the materials in order and fixed position, and tag corresponding position to avoid disorder;

◆ 对于安全帽、安全带等劳保用品须每人一套，不得互借；

◆ Provide every one with helmet, safety belt and such labor protection appliance, but not lend or borrow them;

◆ 保持库房清洁，卫生，货物放置整齐规范；

◆ Keep the warehouse clean and tidy and place the goods orderly and clearly;

◆ 担架上所有零部件放置规范，整齐有序一目了然；

◆ Place all spare parts on the litter orderly and clearly at a glance;

◆ 部件要求分类存放，较大部件则放在用木板垫好的担架上，货架上各部件应有标签；

◆ Store parts by classification, put larger ones on the litter backed up by plank, and tag all parts on the shelf;

◆ 物料摆放好后，根据装箱明细单作物料标识，利于以后的检查；

◆ Upon placing the material in position, identify the materials based on the packing list details for future inspection;

◆ 电梯设备要确保不受损伤，特别是主机、控制柜、外呼按钮、电气部件等。

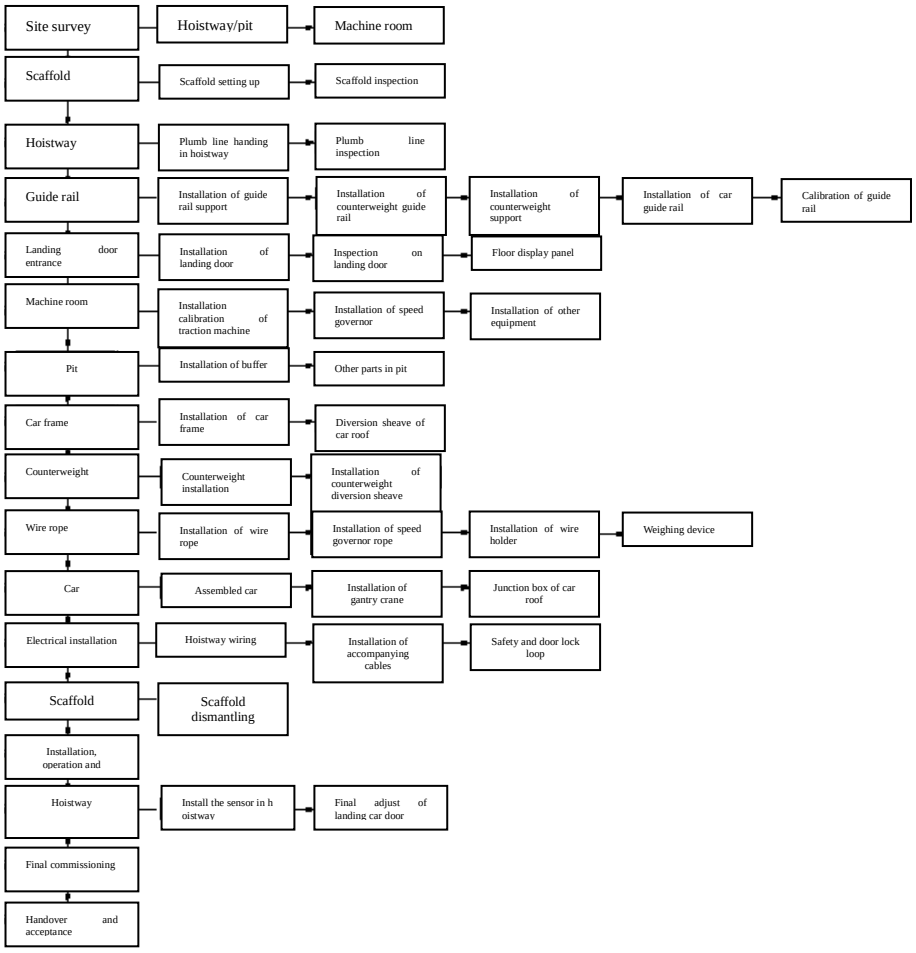
◆ Ensure the elevator equipment free of damage, especially the main engine, control cabinet, call-out button and electrical parts.

4.3 具体现场安装电梯流程

4.3 Detailed field installation process of elevator

具体现场安装电梯流程如下图所示：

Specific elevator installation procedures on site are as shown in the following figure:



5. 样板架设置与放线 Placing and setting-out of template frames

样板架是电梯安装工程中根据电梯轿厢，对重、导轨等部件的实际相关尺寸所制作的足尺放样样板，是电梯由上向下悬挂各种安装铅垂线的依据和出发点，保证安装过程中相关部件定位的准确性。因此对样板架的制作必须尺寸准确、结构牢固。

Template frames refer to full-size mold lofting templates used in elevator installation engineering which are made as per related actual dimensions of elevator cars, counterweight, guide rails and other components; they are the basis andstarting points for hanging various installation plumb lines on elevators from top to bottom, and can guarantee positioning accuracy of related components during installation. Therefore, for manufacture of template frames, accurate dimension and secure structure shall be guaranteed.

5.1. 样板架的制作依据 Manufacture basis of template frames

根据《电梯土建设计图》，要求土建单位在顶层厅门前给出基准线，并联电梯应给出厅门基准线（一般应以一层候梯厅为准）。电梯轿厢横向中线应与基准线平行，电梯轿厢纵向中线应与给出厅门中心线相重合。

According to *Civil Engineering Design Drawings for Elevators*, civil engineering

organizations are required to set out datum lines in front of landing doors at top floor; for parallel elevators, datum lines of landing doors shall be provided (the elevator hall at the first floor is usually taken as the criterion). The horizontal center line of elevator cars shall be parallel with the datum line, and the longitudinal center line of elevator cars shall coincide with the center line of landing doors.

5.2. 制作样板架 Manufacture of template frames

在离井道顶 500-800mm 处做一“八”字形或“井”字型样板架托梁木方为底梁，底梁内距须小于或大于两对重导轨内表面距离 L100-200mm。外距必须大于厅门开度 200-400mm，托梁木方不得小于 100×100 mm，在同一标高处对应位置凿出 4 个尺寸为 150×150 毫米深 200 毫米的方孔，用木楔衬在木方与墙体方孔之间，校正水平并将该梁定位牢固，做时应使两根底梁木方在同一平面上，此底梁水平度应不超过 5 毫米。在井道离底部 500-800mm 处做同样一副样板架底梁（如是高层高速梯还应在井道中间位置设同样一副样板架）。注意木方应干燥、不易变形，长度约 2200 mm 左右（根据井道尺寸具体确定长度）。

Make a splayed or groinedtemplate-frame beam-supporting batten as bottom beam at a place which is 500-800mm away from the shaft roof, of which the internal distance shall be smaller or bigger than the distance between inner surfaces of two counterweightguide rails (L100-200mm), and the external distance shall be larger than the landing dooropening which is 200-400mm; the size of beam-supporting battens shall not be less than 100×100 mm; dig out four 200mmsquare holes (150×150mm) at corresponding positions at the same elevation; use wooden wedges to calibrate the level betweenbattens and square holes on the wall and to securely locate the beam, during which the two bottom beam battens shall be made on the same level, and the levelness of such bottom beam shall not exceed 5mm. Make a set of same template-framebottom beams at a place which is 500-800mm away from the shaft bottom (for high-level-and-high-speed elevators, a set of same templateframes shall also be set at the shaft middle). Attention: Battens shall be dry and not easy to deform, with a length of about 2200 mm (specific dimension is to be determined as per shaft dimensions).

5.3. 样板架和挂放铅垂线工作中的安全技术要求。 Technical safety requirements for template frames and hanging of plumb lines

5.3.1. 样板架托梁应采用截面尺寸大于 100 毫米×100 毫米的矩形木材制作。其四角应刨成直角，凡材质疏松、有断口，扭曲的木材均应剔除。层楼高于 20 米时可用相应强度的型钢作托梁。Support beams for template frames shall be made of rectangular wood with a sectional dimension bigger than 100mm×100mm. The four corners of them shall be planed to a right angle; any porous wood, twisted wood, or wood with fractures shall be rejected. For buildings higher than 20 meters, profile steel with a corresponding strength can be used as trimmer beam.

5.3.2. 样板架托梁与井道墙必须牢固定位，保证人上去调整位置或样板架上挂线时不产生变形或塌落的情况。Support beams for template frames shall be securely located with shaft walls so as to guarantee that no deformation or collapse will occur when related personnel move onto to adjust locations or lines are hanging on template frames.

5.3.3. 样板架通常用矩形截面木材制作，应四面刨光，四个角均成直角，当电梯层高 20 米以内时，可用截面尺寸为厚度 40 毫米、宽度 80 毫米的矩形木条，20 米以上时、则应用厚 50 毫米、宽 100 毫米的矩形木条。以保证挂放铅垂线时该样板架不会发生变形或折断。Template frames are usually made of rectangular sectionalwood; the four surfaces of them shall be planed, so thatthe four corners are in a right angle; when the elevator elevation is within 20 meters, rectangularbattens with a sectional dimension of 40mm thick and 80mm wide can be used; when the elevation is higher 20 meters, rectangularbattens which are 50mm thick and 100mm wide shall be used so as to guarantee that no deformation or fracture of such template frames occurs during hanging of plumb lines.

5.3.4. 当电梯层高大于 40 米以上时，应采用相应强度的型钢制作样板架。以满足层高加高后挂线锤相应加重使样板架受载加重的要求。When the elevator elevation is higher than 40 meters, profile steel with a corresponding strength shall be used to make template frames so as to meet load increase requirements for template frames when the weight ofplumb bob is increased accordingly after the elevation is heightened.

5.3.5. 长度根据实际考虑，将木板两面刨平，用墨汁线弹在导轨用板中间，厅门用板弹在板边缘处作为基准。Length shall be determined according to actual situations; plane two surfaces of wood slabs; mark with ink lines at the center of guide rail boards; for landing doorboards, mark at board edges to be used as datum line.

5.4. 样板架的具体计算情况 Specific calculation of template frames

先计算找出轿厢和对重导轨的内表面距离 A'和 B'（从轿厢、对重上下梁的导靴长度进行核对）然后加各自导轨高度 H_1 和 H_2，每边须加上 2mm 的垫片调整间隙，计算定出轿厢、对重导轨放线尺寸 A、B。

Firstly, calculate to find out inner surface distances A' and B' of cars and counterweight guide rails (check from guide shoe lengths of cars as well as upper counterweight beam and bottom

counterweight beam); then, plus their respective guide rail heights H1and H2; to each side, a 2mmspacer shall be added to adjust the gap; calculate to determine setting-out dimensions A and B of cars andcounterweight guide rails.

$A = A'+2H_1+2+2$ $B= B'+2H_2+2+2$

A'轿厢导轨内表面距离 B'对重导轨内表面距离

A': Inner surface distance of car guide rails B': Inner surface distance of counterweight guide rails

H1 轿厢轨高度 H2 对重轨高度

H1: Car rail height H2: Counterweight rail height

A 轿厢导轨放线尺寸 B 对重导轨放线尺寸

A: Setting-out dimension of car guide rails B: Setting-out dimension of counterweight guide rails

D 轿厢中心至对重中心距离 C 厅门净开距

D: Distance between car center andcounterweight center C: Net aperture of landing doors

E 轿厢中心至轿厢地坎距离

E: Distance between car center andcar sill

5.4.1. 根据 A、B 尺寸将轿厢和导轨中心木板分别锯出，略长一点，用电工刀或薄锯在端头沿墨线上开小槽，便于稳线并分出中线 A/2、B/2。Saw center wood slabs for cars and guide rails respectivelywhich shall be a little larger in size as per dimensions of A and B; make small grooves along ink lines at ends with a electrician’s knife or thin saw foı stabilization of lines; mark center lines A/2 and B/2.

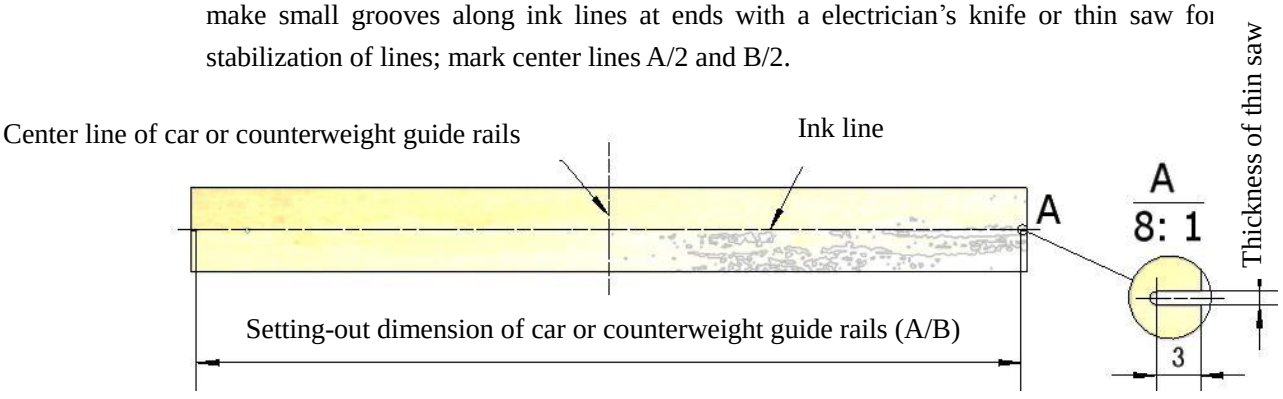


图 5-1

Figure 5-1

5.4.2. 根据 C 尺寸将厅门木板锯出并分中线，并根据厅门净宽往两边分出 C/2，用刀或薄锯开口至基准墨线，便于将垂线稳住。Saw wood slabs for landing doors as per dimension C and mark the center line; mark C/2 at both sides as per the clear width of landing doors; make openings reaching datum ink lines with a knife or thin saw for stabilization of hanging lines.

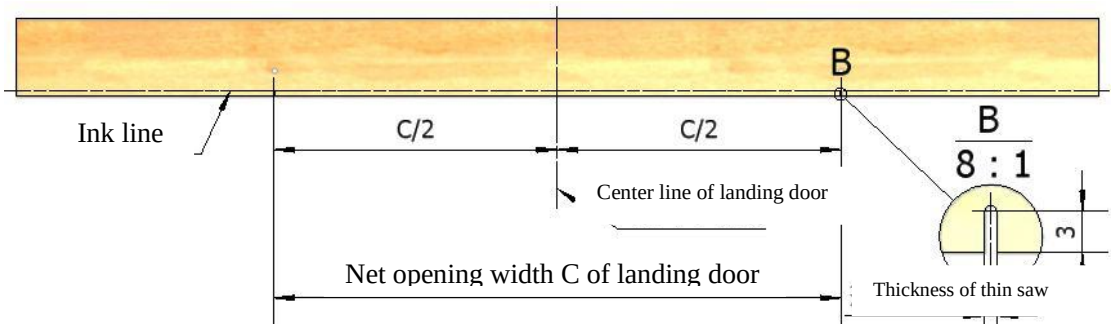


图 5-1
Figure 5-1

在井道底部做同样一副样板架，其上下样板架各部分垂直投影线应一致。
Make a same set of template frames at the shaft bottom, where vertical projection lines of all parts of upper and bottom templates shall be consistent.

5.5. 校正样板架 Calibration of template frames

a. 样板架的水平度不应超过 5mm；Thelevelness of template frames shall not exceed 5mm;
b. 样板架与井道实际净空间允许误差为 1mm；The permissible error in the actual clear spacebetweentemplate frames andthe shaft is 1mm;
c. 上样板架与下样板架间垂线间距允许误差不超过 1mm。The permissible error in vertical spacing between the upper template frame and bottom template frame shall not exceed 1mm.

5.6. 放线 Setting-out

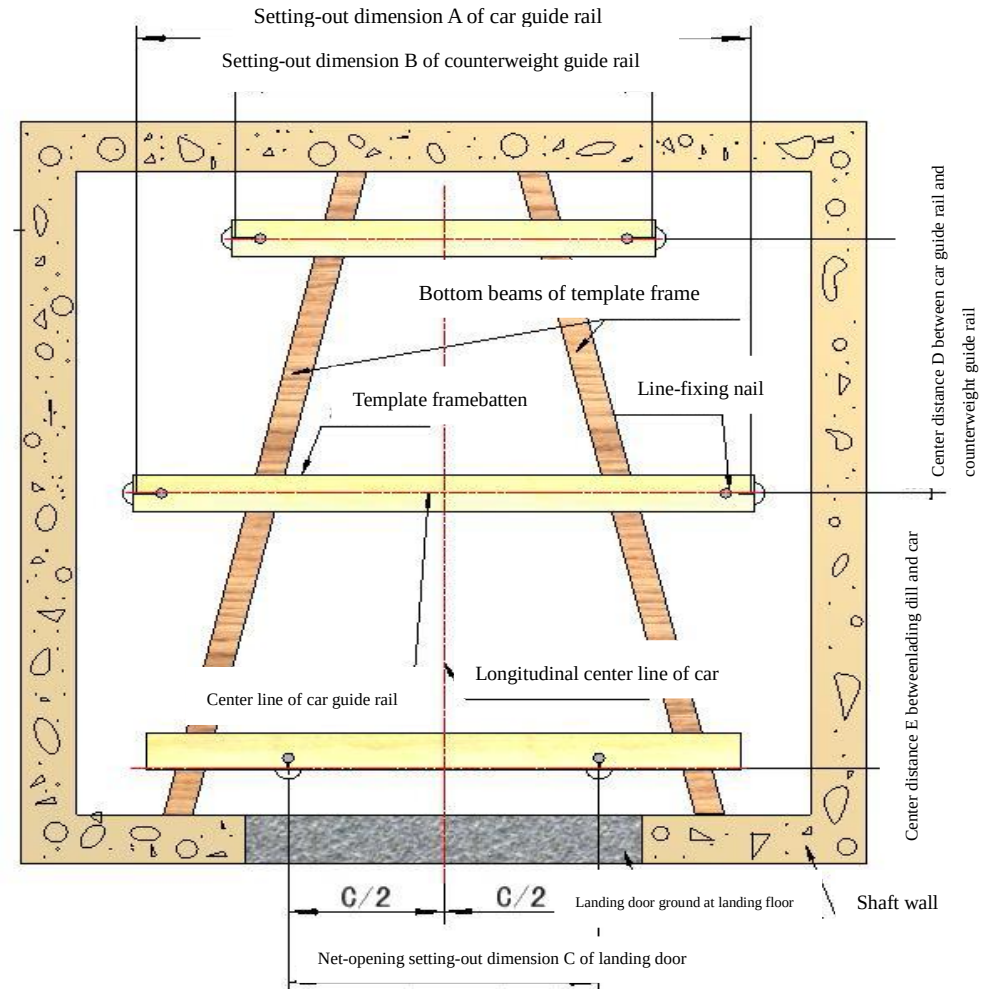
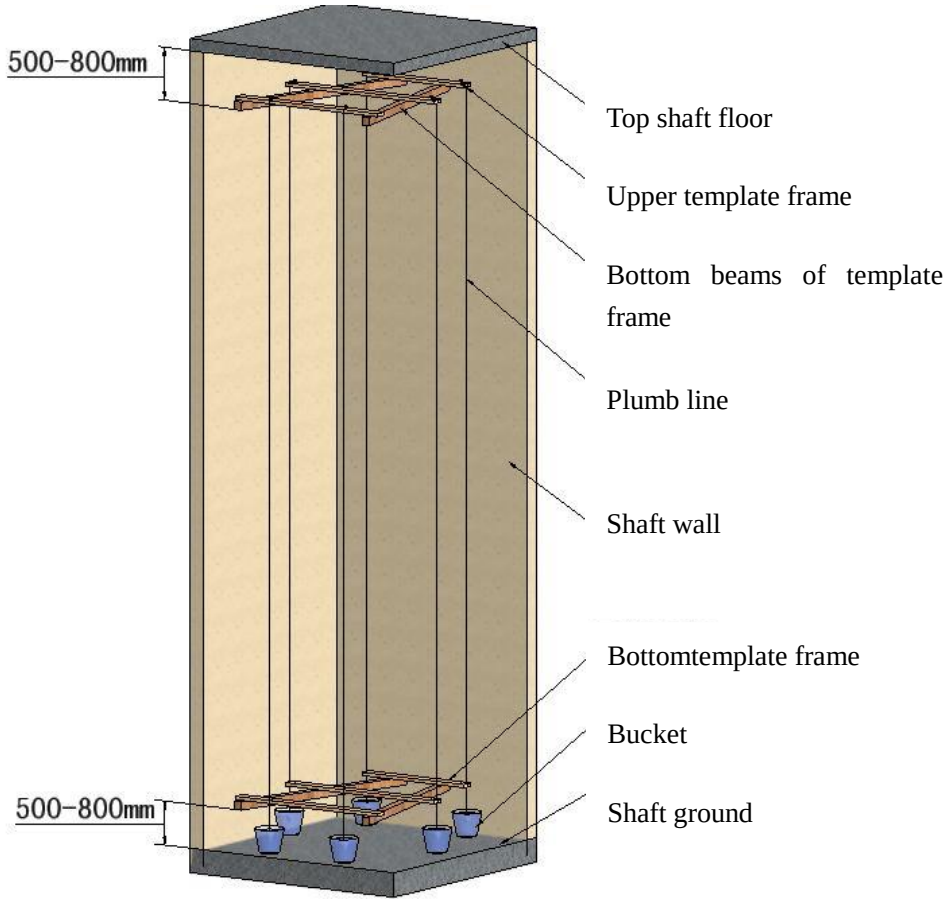


图 5-3

Figure 5-3

5.6.1. 将厅门木板临时固定在木衬上，用 22#铅丝或钢丝向下放三根线（一根门中线，二根门净开线），并用线坠使其自然坠直。Temporarily fix wood slabs for landing door on a wood liner; place three lines downward with 22# lead wires or steel wires (one for center line of the door; two for net opening lines of the door), and use a line drop to make them vertical naturally.

5.6.2. 将放线样板固定于衬板上，根据 D、E 尺寸将木板临时固定，注意木板水平度不超过 1/1000。根据厅门中心线找出轿厢及对重导轨中心线，误差不超过±0.5mm，然后向下放四根轿厢导轨底面线及对重导轨底面线，做出下样板架。Fix setting-out templates on a lining plate; temporarily fix wood slabs as per dimensions D and E; pay attention to the levelness of wood slabs which shall not exceed 1/1000. Determine center lines of car and counterweight guide rails as per the center line of landing door, with a error no more than ±0.5mm; then, place four bottom surface lines downward for car guide rails and bottom surface lines for counterweight guide rails, and make the bottom template frame.



5.6.3. 井道全面测量和调整：Comprehensive measurement and adjustment of shafts:

① 需测量门头侧墙面、牛腿与地坎线的距离，导轨距墙面距离。综合测量尺寸分析：井道是否倾斜、门头距离是否够、地坎距离是否够、以及门洞及指层按钮盒洞是否符合要求。The distance between side walls at the door head, brackets, and sill lines shall be measured, so

does the distance between guide rails and walls. Analyze by combing with measured dimensions: whether the shaft is oblique; whether door head distance and sill distance are enough; and whether door openings and position indicator holes conform to requirements.

② 井道内安装的部件对轿厢运行有无障碍，如限速器钢绳、限位开关、中线盒等。同时要考虑到轿门门机及地坎等于井道壁距离，对重与井道壁距离，**必须保证轿厢、对重上下运行时其运动部分与井道内静止的部件及建筑结构净距离不小于 30mm**。It shall be analyzed that whether components such as steel ropes for speed governor, limit switch, and center line box installed inside the shaft have interference with car operation. Besides, the distance between car door machine, sill and shaft walls, and the distance between counterweight and shaft walls shall be considered. **It shall be guaranteed that the net distance from moving parts of the car and counterweight when they are moving upwards and downwards to resting components in the shaft and building structures is not less than 30mm.**

③ 整个样板架以向左右移或前后移来确定最后基准线定位，如果误差太大应与相关方商量解决。定线原则，轿厢中心最好与井道轴线重合，照顾门头距离和地坎距离，应尽量避免土建作结构处理。The finaldatum line location for the whole template frame shall be determined by moving the template frame leftwards and rightwards or forwards and backwards; in case that the error is too big, discuss with related parties to solve it. Setting-out principles: It would be best to have the car center coincident with the shaft axis; pay attention to door head distance and sill distance; try hard to avoid structural treatment of civil engineering.

5.6.4. 定线：根据偏差移动整个样板，在合适的位置上，用钉将木板固定在样板架底梁上，然后复查各个尺寸，并测对角线偏差应小于 0.5mm。样板制作各点误差都在 0.5mm 以下。并联电梯要根据已批准的设计图纸，复核厅门中心线之间的距离是否与图纸标示的数据一致。Setting-out: Move the entire template as per the error; fix wood slabs on the bottom beam of template frame with nails at a proper position; then recheck each dimension, and measure the diagonal deviation which shall be less than 0.5mm. During manufacture of templates, the error of all points shall be within 0.5mm. For parallel elevators, the distancebetween center lines of landing doors shall be rechecked as per approved design drawings to find out whether it conforms to data indicated on drawings.

5.6.5. 通过上样板架将线返至机房，将机房各线找出。检查各预留孔是否正确，如有偏差，应提请有关方及时进行处理。Return lines to the machine room through the upper template frame, and mark all lines for the machine room. Check whether each preformed hole is correct; if there is any error, submissions shall be provided to related party for timely treatment.

6 导轨架及导轨安装 Installation of guide rail brackets and guide rails

警告！必须遵照产品施工土建图相关数据安装导轨支架并与导轨准确固定，当需要更改时，应与当地技术支持部门取得联系并经评估后进行；随意加长导轨支架、变更导轨支架安装位置、变更导轨支架间距等都将造成不可预测的后果，需谨慎注意。

Warning! Installation of guide rail brackets must be in accordance with relevant data of construction layout drawings of products, and guide rail brackets and guide rails should be fixed accurately. In case changes are necessary, they can be carried out after contact with and evaluation by the local technical support department; it should be noted that unpredictable consequences will be caused by extension of guide rail brackets, change of installation locations of guide rail brackets, change of distances between guide rail brackets, etc.

6.1 导轨支架安装 Installation of guide rail brackets

每根导轨至少应有两个支架，其支架间距不大于 2.5m；导轨支架水平度偏差不大于 5mm；导轨支架安装方式现一般混凝土井道采用膨胀螺栓固定法和在钢梁上采用电焊焊接固定。

Two brackets at least with spacing of no more than 2.5m should be provided for one guide rail; deviation of guide rail brackets should not be more than 5mm as for levelness; guide rail brackets should be fixed with expansion bolts on general concrete hoistways, while electric welding should be used to fix guide rail brackets on steel girders.

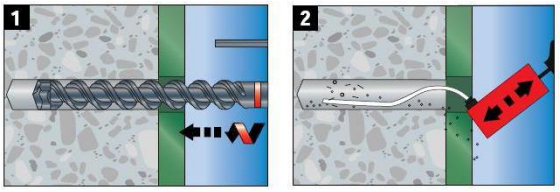
6.1.1 膨胀螺栓固定法：Fixing by expansion bolts

先根据安装图纸支架位置进行画线，并根据膨胀螺栓尺寸打眼，上膨胀螺栓时必须胀紧胀管（**注：胀管应低于墙平面 8-10mm,确保外露丝口 3-5mm**）。安装完支架底码，然后将导轨支架放于底码上，支架中线对准导轨中线，找正、找平。用大力钳将面码和底码夹住，根据要求然后进行螺栓连接或三方焊接。对于对重底码安装要考虑井道的大小。井道小时，对重架离墙较近，有可能使对重架上下运行碰撞对重底码。因此，在采用此种安装方法时，要注意将对重底码进行适当向两边移位。

At first, set out in accordance with bracket locations in installation drawings, and drill holes according to size of expansion bolts. Pipes must be expanded in full when expansion bolts are installed (**Note: tube expansion should be lower than the wall plane by 8-10mm; it is ensured that screw sockets are exposed by 3-5mm**). After the bottom base for brackets are installed, place guide rail brackets on the base with the center line of brackets aligned to the central line of guide rails as for alignment and levelness. Use lock wrenches to clamp the surface base and the bottom base, and carry out bolt connection or welding from three directions according to the requirements. Size of a hoistway should be considered for installation of heavy bottom bases. When a hoistway is small, the distance between walls and the counterweight housing is relatively short, which may cause collision of the counterweight housing toward the counterweight bottom base, therefore, it should be noted that the counterweight bottom base should be displaced towards both sides in case this installation method is used.

钻膨胀螺栓安装孔时，须按照该规格的膨胀螺栓安装孔径、孔深及相关安装距离进行。

Installation holes for expansion bolts must be drilled in accordance with installation hole diameter, hole depth and relevant installation distance of expansion bolts in that specification.



Drill holeBlow out dust and crumbled pieces

图 6-1a

Figure 6-1aFigure 6-1b

图 6-1b

6.1.2 电焊焊接固定法：Fixing by electric welding

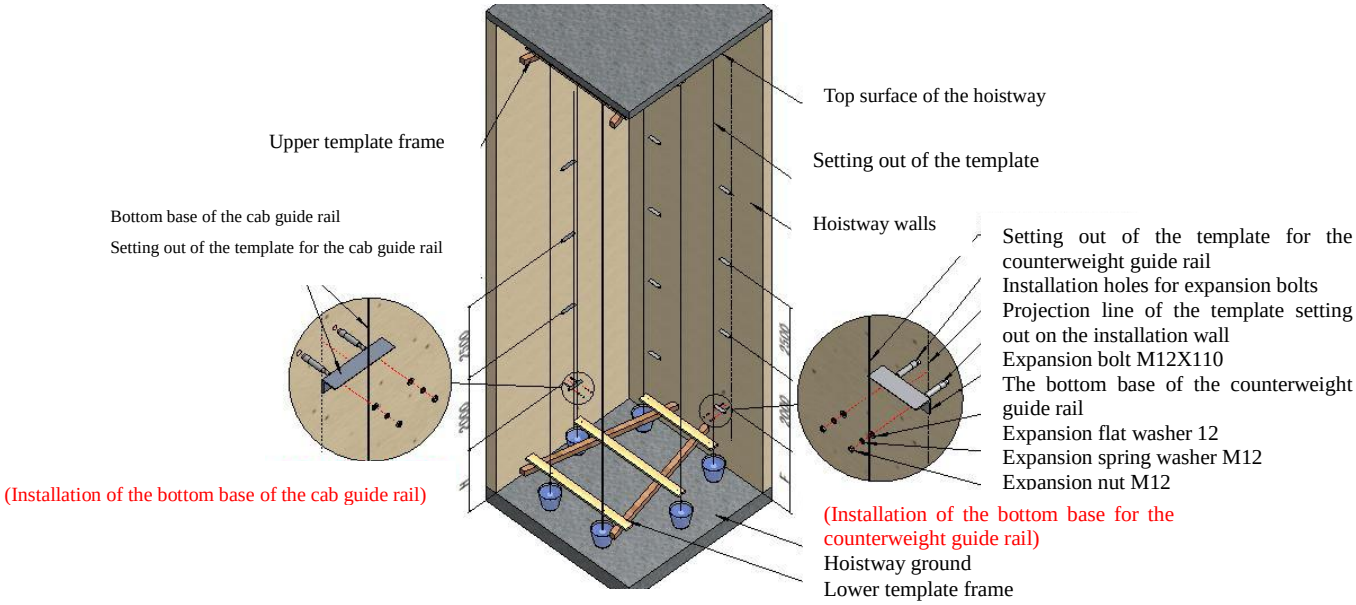
根据实际井道布置图，作出相应的垂直安装线，测量相应的距离，焊接导轨，焊接时需双面焊接，焊后应清除焊渣，检查不应有的夹渣、虚焊现象，焊后应油漆处理。

Make the corresponding vertical installation line, measure the corresponding distance and weld the guide rails according to the arrangement plan of the actual hoistway. Double side welding should be used for welding; welding slags should be cleared after welding; slag inclusion and insufficient welding should not be found during check; paintings should be coated after welding.

6.2 轿厢导轨和对重导轨底码安装 Installation of car guide rails and the bottom base for counterweight guide rails

根据样板线，在井道壁上弹出轿厢、对重导轨支架中心线的投影线，另外在导轨样板架各端放一根辅助垂线，与原导轨中线构成一平面，上下两端固定牢固；根据投影线均分出膨胀螺栓孔中心的具体位置，其中轿厢导轨最下支架距坑底距离 H 和对重导轨最下支架距坑底距离 F 根据土建图确定，在井道壁上进行钻孔、安装底码作业。

Mark the projection line for center lines of the cab and the bottom base for counterweight guide rails on the hoistway walls according to the template line. In addition, place at each end of template frames of the guide rail one auxiliary vertical line which constitutes one plate with the center line of theoriginal guide line with firmly fixation at upper and lower ends; divide specific locations of centers of expansion bolt holes according to the projection line, where the distance H between the lower bracket of the cab guide rail to the pit bottom and the distance F between the lower bracket of the counterweight guide rail to the pit bottom should be determined by the construction layout drawings. Drilling and installation of bottom bases should be carried out on the hoistway walls.



6.3 轿厢导轨支架安装 Installation of cab guide rail brackets

安装完轿厢导轨支架底码，然后将导轨支架放于底码上，支架安装孔中线对准导轨放样中线，找正、找平，再用大力钳将支架和底码夹住，根据要求进行焊接（底码和支架间焊缝为满焊）。

Install the bottom base of the cab guide rail brackets, and then, place the guide rail brackets on the bottom base, next, align the center line of the bracket installation hole to the center line for setting out of the guide rail as for alignment and levelness, finally, clamp the brackets and the bottom base with lock wrenches and weld them according to the requirements (weld joints between the bottom base and brackets are welded in full).

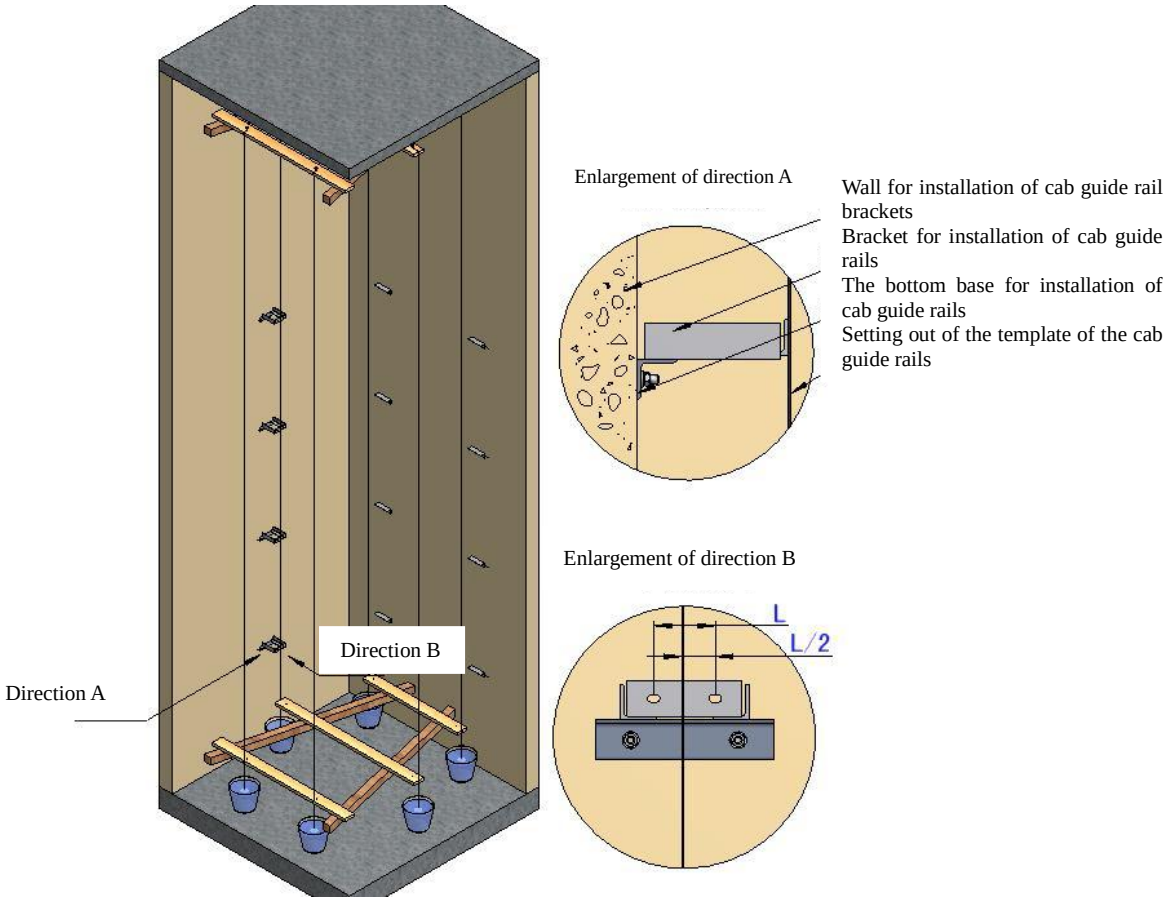


图 6-3

Figure 6-3

安装要求：导轨架的水平度≤5mm，导轨架端面 a＜1mm，见下图:

Installation requirements: levelness of the guide rail brackets ≤5mm; end face a of the guide rail brackets ＜1mm, see the following figure:

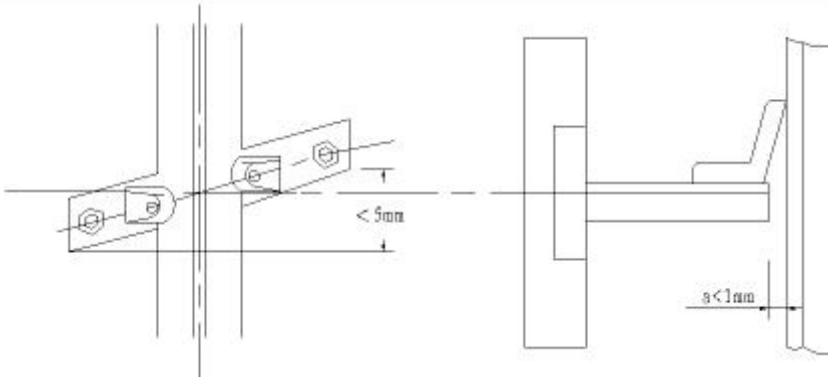


图 6-4

Figure 6-4

6.4 对重导轨支架安装 Installation of counterweight guide rail brackets

安装完对重导轨支架底码，然后将导轨支架放于底码上，支架安装孔中线对准对重导轨放样中线，找正、找平，再用大力钳将支架和底码夹住，根据要求进行焊接（底码和支架间

焊缝为满焊）。

Install the bottom base of the counterweight guide rail brackets, and then, place the guide rail brackets on the bottom base, next, align the center line of the bracket installation hole to the center line for setting out of the counterweight guide rail as for alignment and levelness, finally, clamp the brackets and the bottom base with lock wrenches and weld them according to the requirements (weld joints between the bottom base and brackets are welded in full).

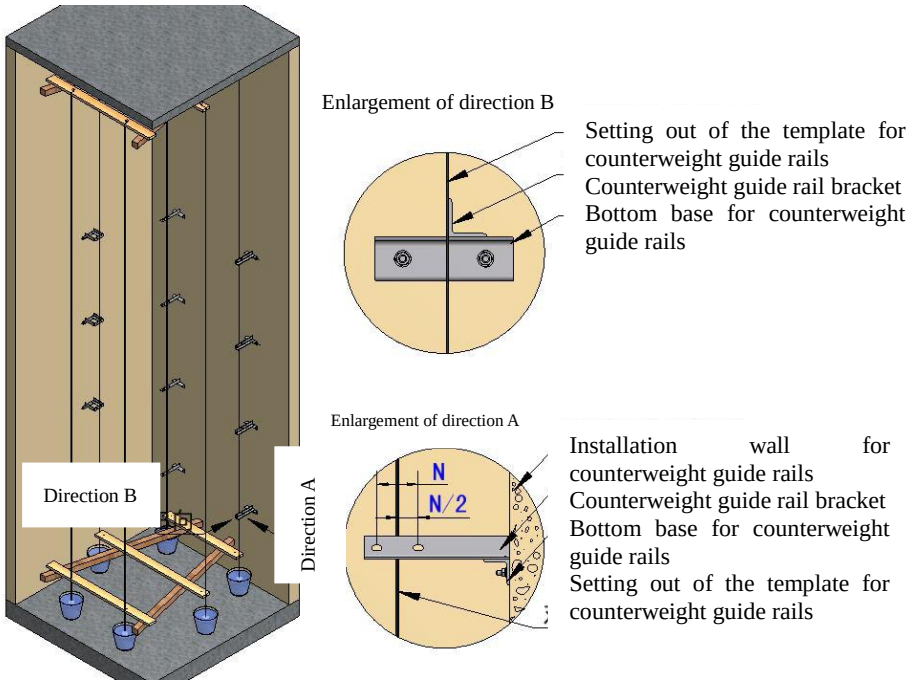


图 6-5

Figure 6-5

安装要求：导轨架的水平度≤5mm，导轨架端面 a＜1mm，见下图:

Installation requirements: levelness of the guide rail brackets ≤5mm; end face a of the guide rail brackets ＜1mm, see the following figure:

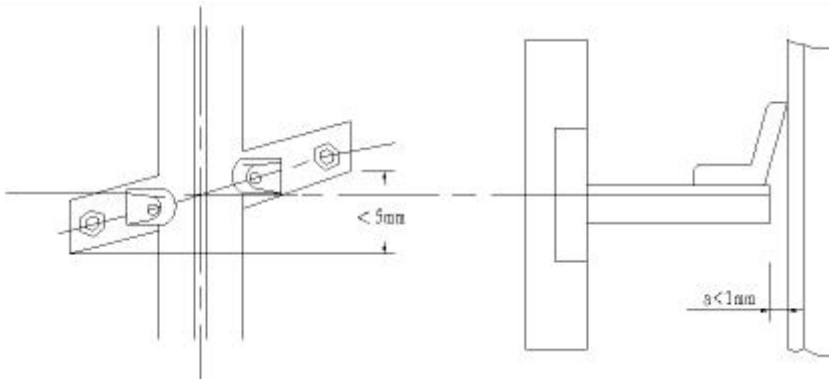


图 6-6

Figure 6-6

6.5 导轨吊装 Lifting of guide rails

先将所放基准线松掉，避免吊装导轨时将线碰断。

Work loose datum lines placed to avoid breakdown of the datum lines during lifting of guide rails.

6.5.1 导轨运输和保存 Transportation and storage of guide rails

a. 不恰当的运输方法会导致导轨的变形，从而影响后期的安装和校正。故而在起吊运输时，要保证吊点的位置，如下图所示：Inappropriate transportation methods will cause deformation of guide rails, thus affecting subsequent installation and correction, therefore, positions of lifting points shall be ensured correctly during lifting transportation, as shown in the following figures:

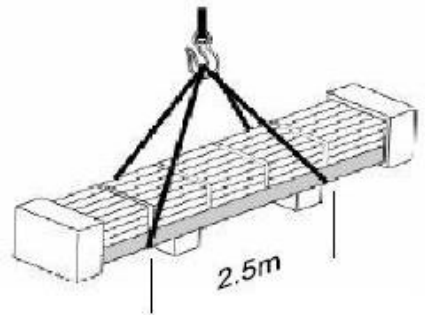


图 6-7a

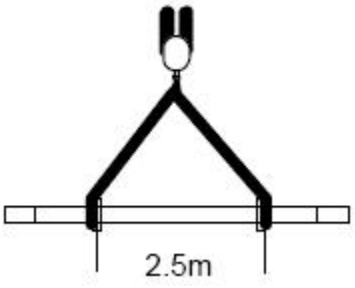


图 6-7b

Figure 6-7aFigure 6-7b

b. 每次起吊的导轨束重量必须有限制，以避免导轨的自重对导轨本身的影响。所允许的最大捆重量为 800kg。如果超过，则应将捆拆分，如下图所示：Weight of guide rails must be restrained each time of lifting to avoid influence from dead weight of the guide rails on themselves. The maximum strapping weight allowed is 800kg. In case weight is more than 800kg, it should be split, as shown in the following figures:

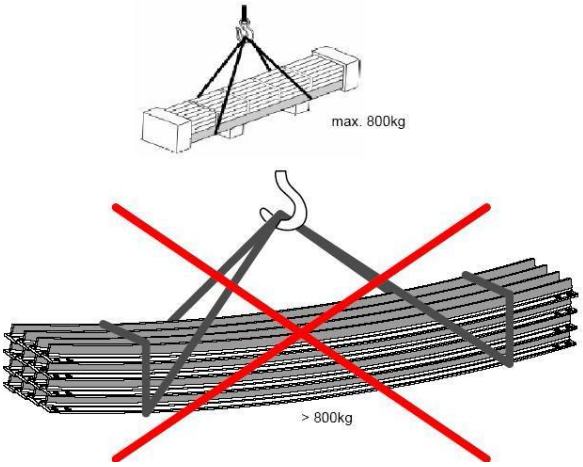


图 6-8

Figure 6-8

c. 物料仓储时需要保护导轨，防止:弄脏、受潮、受损。Guide rails should be protected during storage of materials, preventing them from contamination, dampness and damages.

导轨束应水平放在方块上。按距两端距离相等的位置在每一层导轨束之间放置方块，防止永久变形，不得叠放超过 6 束导轨束，如下图 6-9 所示：

Guide rail beams should be placed on a block horizontally. Blocks should be placed on each level of guide rail beams at positions where distance from them to both ends is the same. In order to prevent permanent deformation, number of guide rail beams stacked up should not be more than 6, as shown in the figure6-9:

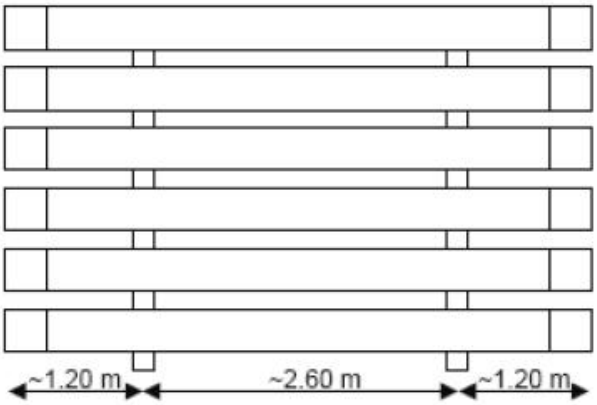


图 6-9

Figure 6-9

6.5.2 导轨编号 Number of guide rails

对于速度≧6m/s 的高速电梯的导轨，出厂前都经过预对接，导轨上有合同编号，导轨接头编号，导轨编号。如图 6-10 所示：

As for guide rails for high-speed elevators with speed ≧6m/s, installation should be carried out in advance before leaving the factory. Contract No., joint No. and Rail No. are printed on the guide rails, as shown in the figure6-10:

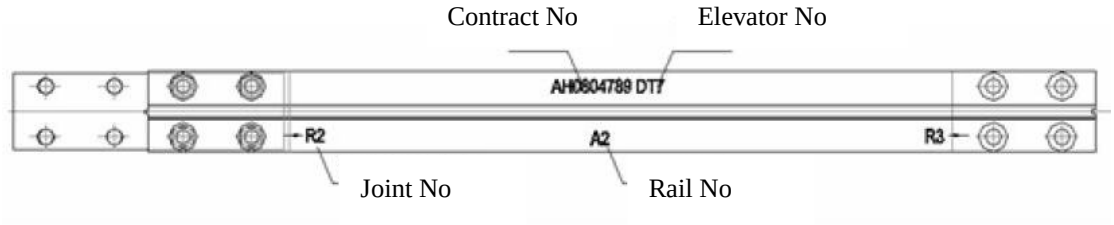


图 6-10

Figure6-10

项目编号：该项目的编号，如 E/30000000.001 等；

Item No.: number of the item, such as, E/30000000.001, etc.

导轨编号：A 表示轿厢导轨左侧，B 表示轿厢导轨右侧。如 A2 代表轿厢左侧从下向上第 2 根导轨。

Rail No.: A indicates the left side of the cab guide rail; B indicates the right side of the cab guide rail, for example, A2 indicates the second guide rail counting upward from the left side of

the cab.

导轨接头编号：对接导轨端头对接号，如 R2-R2 表示一根编号为 R2 的导轨槽端与另一根编号为 R2 的导轨的榫端对接。

Joint No.: connection No. for connecting ends of the guide rail, for example, R2-R2 indicates but joint between the groove of a guide rail numbered as R2 and a guide rail numbered as R2 at the tenon end.

导轨装箱时导轨的编号范围都注明在包装箱的标签上，方便查找。装箱时将预装的导轨连接板和导轨连接在一起，吊装时无需拆卸。

Number range of guide rails should be marked on labels of packaging boxes when guide rails are encased, in order to facilitate looking. Connection boards of guide rails which are installed in advance should be connected with guide rails at the time of encasement, for which disassembly is not required at the time of lifting.

6.5.3 导轨的检查 Check of the guide rail

开箱后在导轨安装之前，需要对每根导轨做外观检查有无可视的质量问题，必要时使用测量工具进行检查。

After unpacking and before installation of guide rails, each guide rail should be subject to appearance inspection to check any visual quality problem. Measuring tools should be used for inspection as necessary.

- 检查导轨在水平和垂直方向是否平直，无扭曲。如果有扭曲现象，立即联系相关项目部门，严禁继续安装。
- Check whether the guide rails are straight and free of distortion at horizontal and vertical directions. In case of distortion, relevant project departments should be contact immediately and it is forbidden to continue the installation.

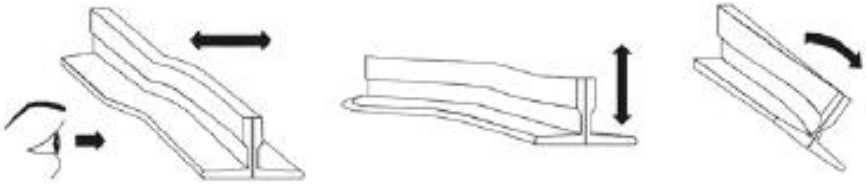


图 6-11

Figure 6-11

- 需要使用圆锉修正导轨连接板圆孔，去除毛刺。
- Round files are needed to correct round holes on connection boards of guide rails and to carry out deburring.

6.5.4 导轨布置 Arrangement of guide rails

导轨在井道内的排布依据确认的 CAD 图纸。如果底端导轨少于 5m，供货时已经将导轨截短，故底端导轨不需要现场割短，如果顶端导轨少于 5m，供货状态则是 5m，需要现场依据实际需要割短上端导轨。一般在导轨放入井道中前截短导轨。导轨排列是凹槽在下，凸槽在上，最顶端导轨的锯短是在凸槽一端。切割导轨时需要断口平整，不可以采用气割，宜采用砂轮片切割机切割，为了将导轨放置到轨道上，必须先将导轨放入底坑，这样就可以

将单根导轨进行连接了。

Arrangement of guide rails in the hoistway should be in accordance withconfirmed CAD drawings. If bottom guide rails are less than 5m long, the bottom guide rails should be cut short at the time of supply, therefore, cutting short of the bottom guide rails is not needed at site. If top guide rails are less than 5m long, they should be 5m long at the time of supply, and they should be cut short according to actual needs at site. In general, guide rails should be cut short before placing in the hoistway. The guide rails should be arranged as the groove at the bottom and the ridge at the top. Top guide rails should be cut short at the side of the ridge. Smoothness of the fracture should be ensured at the time of cutting guide rails, therefore abrasive-wheel cutting machines instead of gas cutting should be used. In order to place guide rails on rails, guide rails must be placed on the pit at first, as as to connect guide rails one by one.

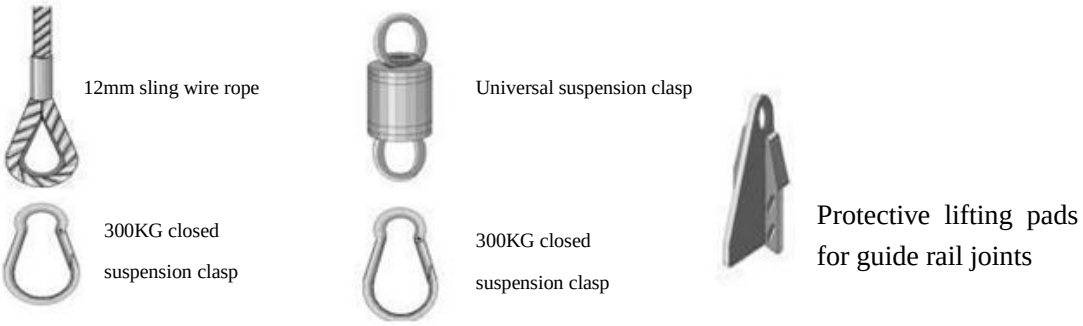


图 6-12

Figure 6-12

另外还需配备：合适载重的卷扬机；合适载重的卸扣。

In addition, a winding engine with appropriate carrying capacity and a shackle with appropriate carrying capacity should also be provided.

6.5.5 为便于导轨进入井道，可将底层脚手架的横杆拆去一些，但以不影响脚手架的稳定为原则。吊装索具应有防止吊物旋转措施，导轨吊完后立即恢复脚手架横杆。在井道的最顶层安装滑轮以便方便、安全的起吊导轨；使用卷扬机作为提升动力。安放卷扬机位置有两个选择：Tofacilitate placing of guide rails in the hoistway, some cross bars on the scaffold at the bottom can be removed, however, it should not affect stability of the scaffold. Measures to prevent rotation of items lifted should be provided on the lifting riggings. The cross bars removed should be re-installed at once after completing lifting of the guide rails. Pulleys should be installed on the top level of the hoistway, so as to ensure easy and safety lifting of the guide rails; winding engines should be used as power for lifting. There are two choices for placing of the winding engines:

方法一：卷扬机安装在顶层层门外，要求卷扬机操作人员与井道工作人员需配备对讲机，如下图：

Method 1: a winding engine is installed outside of the top landing door. It is required that walkie talkies are provided for the operator of the winding engine and the hoistway staff, as shown in the following figure:

方法二：卷扬机安装在底层，由井道工作人员操作，需保证卷扬机操作电缆足够长。

Method 2: a winding engine is installed at the bottom and operated by the hoistway staff, however, sufficient length of operation cables from the winding engines should be ensured.

使用正确的起吊工具（导轨吊装板）来起吊导轨（见下图）

Guide rails should be lifted with correct lifting tools (lifting board of the guide rails) (as shown in the following figure).

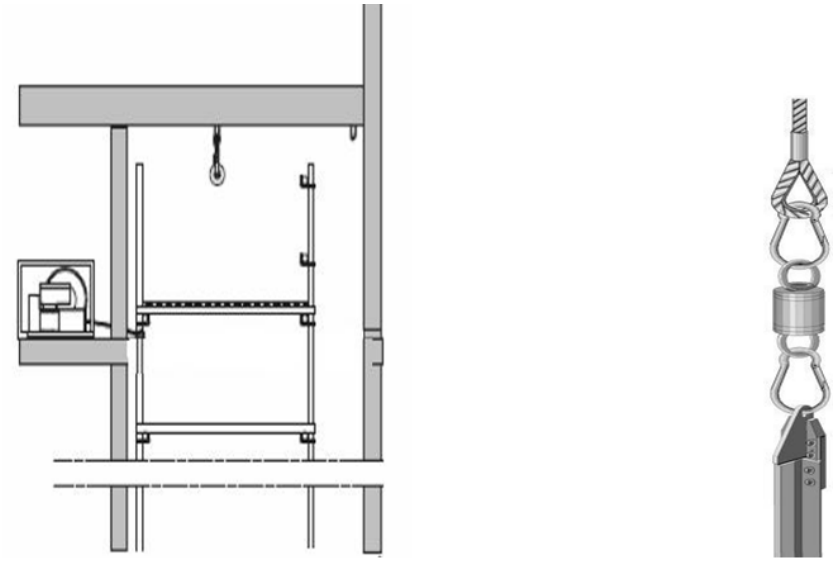


图 6-13

Figure 6-13

注意：导轨进入井道的方向，凹槽在下，凸槽在上，放置时注意保护上部的榫头。

Attention: grooves should be placed upward and ridges downward when the guide rails are placed in the hoistway. Attention should be paid to protecting the tenon end at the upper side.

6.5.6 清洗导轨接头和连接板，以免造成导轨接头处缝隙过大。Joints and connecting boards of guide rails should be cleaned to prevent too large spacing at the joints.

6.5.7 将井底清理干净，把导轨底梁（槽钢）放入井底。根据要求将其弄平垫实，其水平误差应小于 1/1000。两端与导轨固定，角钢面中心线与导轨中心线重合。At first, clean the pit bottom, and place bottom beams (box iron) of the guide rails on the bottom of the hoistway. The bottom beams should be flattened and padded in accordance with the requirements with horizontal errors less than 1/1000. Both ends should be fixed with guide rails with coincidence of the center line of the angle iron surfaces and the center line of the guide rails.

6.5.8 先立下面四根轨（二根对重、二根轿厢），并将接油盘放于导轨与底梁之间，使其稳固并初步找正。然后将其余的导轨放于井道内（底部垫上木板），便于吊装。逐根起吊、组对导轨，两导轨间的连接板要紧固，导轨压板螺丝临时固定，待校轨完成后再最后紧固。Four rails (two counterweight guide rails and two cab guide rails) at the bottom should be placed upright, and oil drip pans, which should be placed between the guide rails and the bottom beams, should be placed stably and aligned. And then, place remaining guide rails in the hoistway (with wood blocks placed at the bottom) so as to facilitate lifting. Lift the guide rails one by one, and group the guide rails. Connecting boards between two guide rails should be fastened. Besides, screws should be used for temporary fixation of pressing plates for the guide rails, and fastening should be carried out at last after completion of check on the guide rails.

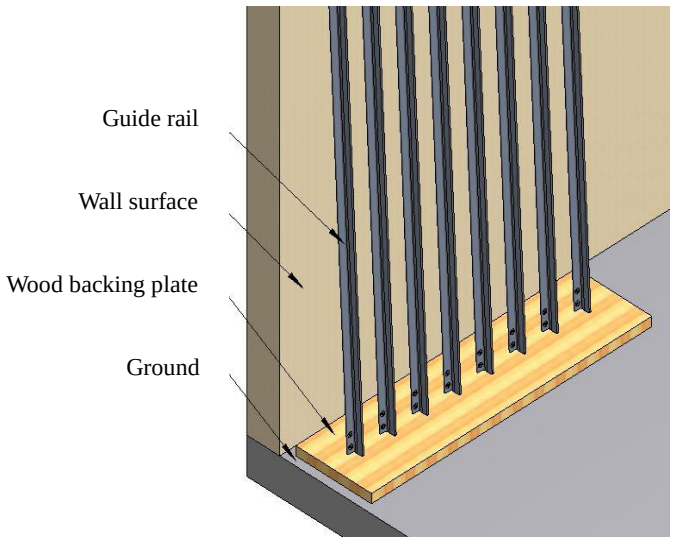


图 6-14a
Figure 6-14a

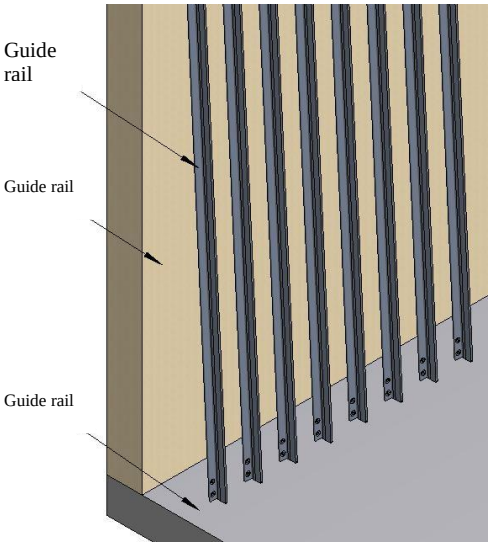


图 6-14b
Figure 6-14b

6. 6 导轨与导轨支架安装 Installation of guide rails and guide rail brackets

1) 基准线与导轨的位置要正确；Positions of datum lines and guide rails should be correct;
2) 检查导轨的直线度≯1‰，单根导轨全长偏差≯0.7mm，不符合要求的应更换；Straightness of the guide rails and overall length deviation of one piece of guide rail should be no more than 1‰ and 0.7mm separately. Those which fail to meet the requirements

should be replaced;

3) 导轨端部的榫头、连接部位的加工面应无毛刺、尘渣、油污等，以保证安装精度的要求；Tenon ends at the end of the guide rail and machining faces at the connection parts should be free of burring, dusts & ashes and oil contamination, etc. so as to ensure requirements of installation accuracy;

4) 导轨接头不宜在同一水平面上，或按厂家图纸要求施工；Joints of guide rails should not be in the same horizontal plane, or they should be constructed in accordance with drawings of the manufacturer;

5) 导轨应用压导板固定在导轨支架上，不应焊接或螺栓直接连接；每根导轨必须有两个导轨支架；Guide rails should be fixed on the guide rail brackets with pressing plates instead of welding or direct connection with bolts; two guide rail brackets must be provided for each piece of guide rail;

6) 校准导轨的量具固定在轿厢导轨和对重导轨之间以保证导轨面的平行度。Measuring tools for calibrate guide rails are fixed between the cab guide rails and the counterweight guide rails to ensure the degree of parallelism of guide rails' surfaces.

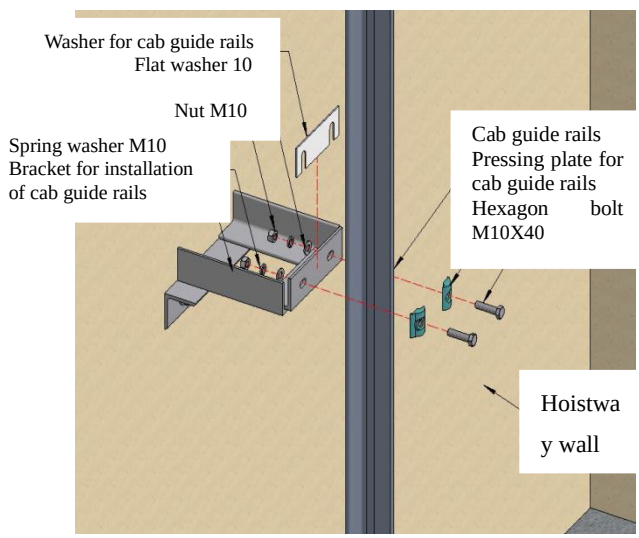


图 6-15a 轿厢导轨与导轨支架安装

Figure 6-15b Installation of Cab Guide Rails and Guide Rail Brackets

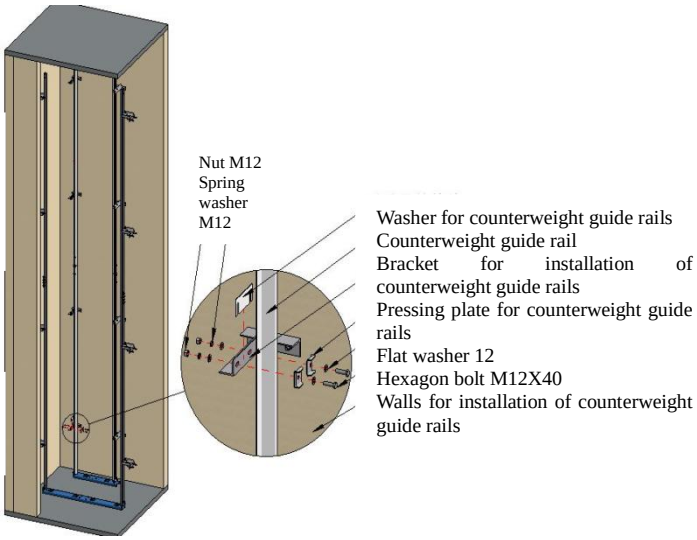


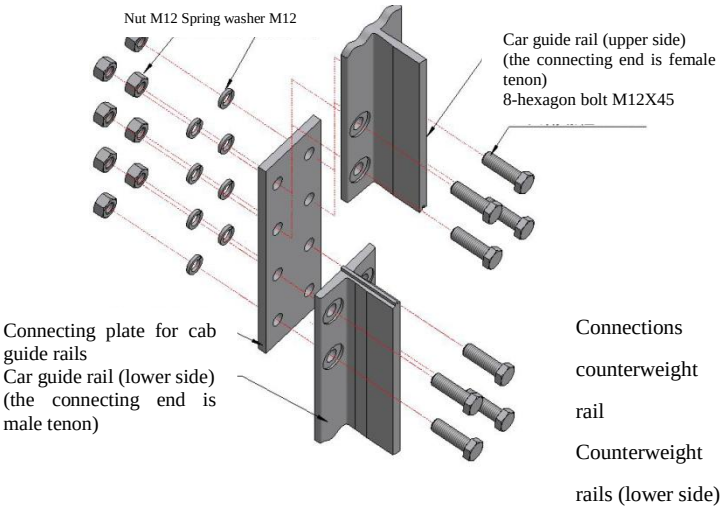
图 6-15b 对重导轨与导轨支架安装

Figure 6-15b Installation of Counterweight Guide Rails and Guide Rail Brackets

6.7 导轨对接 Connection of guide rails

按照工厂预装顺序连接导轨，参考编号说明，在校正、测量好相邻的两根导轨之后，再用连接导板固定两根导轨。

Connect guide rails according to preassembly sequence of the factory by referring to number description. After calibration and measurement of two adjacent guide rails, guide plates for connection should be used to fix the two guide rails.



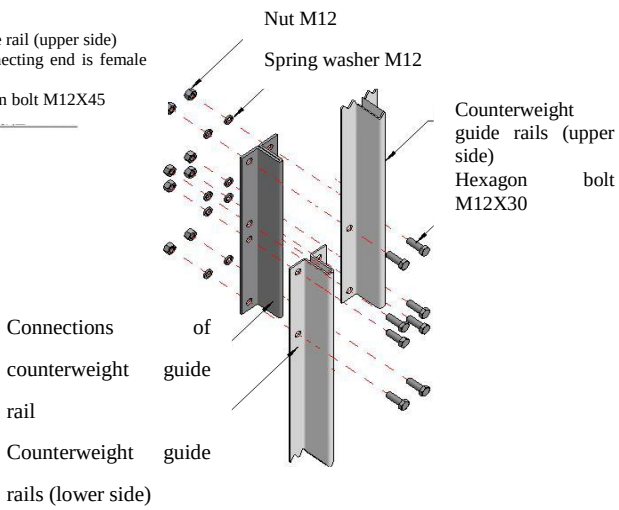


图 6-16a 轿厢导轨对接示意图

Figure 6-16a Schematic Diagram for Connection of Cab Guide Rails

图 6-16b 对重导轨对接示意图

Figure 6-16b Schematic Diagram for Connection of Counterweight Guide Rails

6.8 导轨调整 Adjustment of guide rails

6.8.1 先将上下样板架的导轨用样板铁丝松开，再锯掉各端头 K 段样板，K = H+2+25。其中，“H”为导轨高度，2mm 为调整间隙，25 mm 为校正线 Loosen iron wires on templates of guide rails for upper & lower template frames, and then cut down K sections of templates at each end with K = H+2+25, where H represents the height of guide rails, 2mm represents control gaps and 25mm represents the calibration line.

然后将各铁丝张好，并复查各个样板尺寸，如图 6-17：

Spread all iron wires, and recheck size of all templates, as shown in the following figure 6-17:

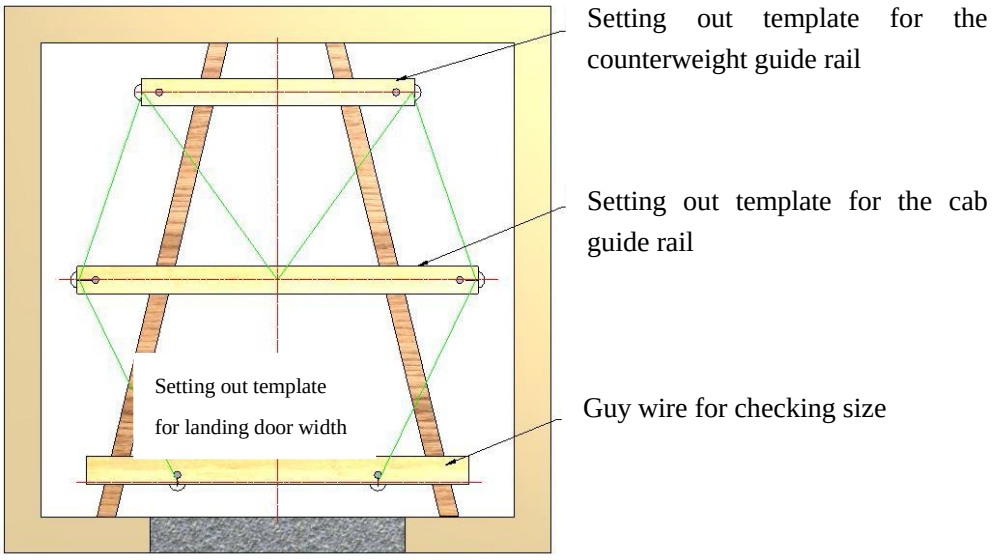


图 6-17

Figure 6-17

① 从轿厢中点拉线至对重轨基准点，两线应一样；Guy line from the midpoint of the cab to the datum line of the counterweight rail should be the same length;

② 从对重轨基准点到轿厢基准点的拉线长度一样；Guy line from the datum line of the counterweight rail to the datum line of the cab should be of the same length;

③ 从轿厢导轨基准点到厅门基准点的拉线长度一样。Guy line from the datum line of the cab rail to the datum line of the landing door should be of the same length;

6.8.2 找一长（轨距减掉 60mm）×宽（60 mm）×厚（40mm）的刨光方木，并在中心弹一根基准线。将专用校轨尺安装在方木上面并校正 Mark a datum line on a L (gauge minus 60mm) X w (60mm) X H (40mm) dressed square timber, install a special rail gauge on the square timber and carry out calibration.

6.8.3 导轨校正方法：把校轨尺紧靠导轨侧面，用钢板尺测量导轨内表面的基准线，应为 25mm，如不符则用垫片调整，要求其间距误差必须小于 0.5mm。用校轨尺的活动指针检查导轨扭曲，活动指针紧靠导轨侧面，看活动指针与固定指针尖的误差。通过加减垫片，使其两指针尖相吻合。为了使导轨内表面中心对准基线，用两直尺紧靠导轨侧表面，看其基准线是否在中（最好做一专用工具，用它的一面紧靠导轨侧面，手慢慢地将它向外移动与基准线靠近，可测出偏差。注意测量时不要碰动基准线）。校正完一个接头后，将导轨压板螺丝紧固。Method to calibrate guide rails: place the rail gauge against sides of the guide rails, and use a steel ruler to measure the datum line in the internal surface of the guide rails, the datum line should be 25mm long. In case this requirement is not met, use a washer to adjust the length, besides, it is required that its gap deviation must be smaller than 0.5mm. Use a moving pointer of the rail gauge to check straightness of the guide rails: place the moving pointer against sides of the guide rails to measure error between the moving pointer and the fixed pointer tip. Make the two pointer tips coincide by adding or removing washers. In order to make the surface center in the guide rail align with the datum line, place two straightedges against a side surface of the guide rails to check whether the datum line is at the center (the best way is to make a special tool, one side of which is used to place against the side of the guide rails, and then, move the tool outwards to be near the datum line, finding out the deviation. Attention should be paid to not touch the datum line.). After a joint is calibrated, tighten the screws on the pressing plates for the guide rail.

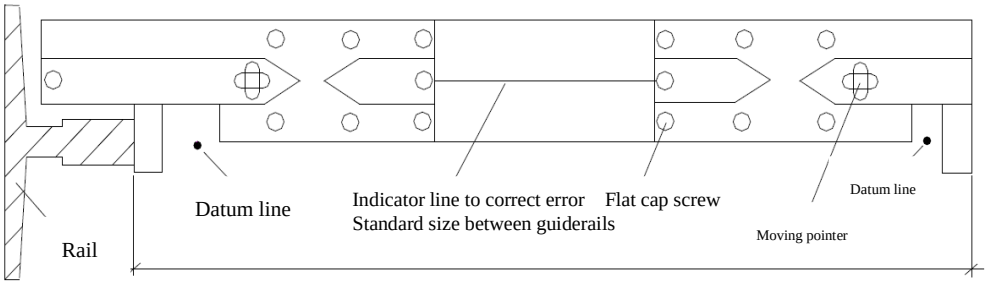


图 6-18

Figure 6-18

1) 将验导尺固定于两导轨平行部位(导轨架部位)，拧紧固定螺栓。Fix the check guide on the parallel parts of two guide rails (guiding track brackets), and tighten the fixed bolts.
2) 用钢板尺检查导轨端面与基准线的间距和中心距离如不符合要求，应调整导轨前后距离和中心距离，以符合精度要求。Check the gap and centre distance from the end face of the guide rail to the datum line with a steel ruler. In case they fails to meet the requirements, adjust the guide rail forward or backward and the center distance in order to satisfy the accuracy requirement.
3) 绷紧验导尺之间用于测量扭曲度的连线，并固定，校正导轨使该线与扭曲度刻线吻合。Tighten and fix the guy wire between the check guides for measuring the torsion, and calibrate the guide rail to make the guy wire and the torsion mark coincide.
4) 用 2000mm 长钢板尺贴紧导轨工作面，校验导轨间距 L，或用精校尺测量。Place 2000mm long steel ruler against the working surface of the guide rail to calibrate the gap L of the guide rail, or use a accurate rail gauge to measure the gap.
5) 调整导轨用垫片不能超过三片，导轨架和导轨背面的衬垫不宜超过 3mm 厚。垫片厚大于 3mm 小于 7mm 时，要在垫片间点焊，若超过 7mm，应先用与导轨宽度相当的钢板垫入，再用垫片调整。Washers to adjust the guide rails should not be more than 3 pieces. Liners for the guide rail brackets and the back of the guide rails should not be more than 3mm thick. Spot welding should be carried out between washers if thickness of the washer are more than 3mm and less than 7mm; steel plates with the same width of the guide rails should be placed at first and gaps of the guide rails should be adjusted by washers in case the washer is more than 7mm thick.
6) 调整导轨应由下而上进行。Adjust the guide rail bottom up
7) 导轨间距及扭曲度符合下表的要求。Gap and torsion of the guide rails should satisfy the requirements stipulated in the following table.

电梯速度 Elevator speed	2m/s 及以上 2m/s and above		2m/s 以下 Below 2m/s	
轨道用途 Rail usage	轿厢 Cab	对重 Counterweight	轿厢 Cab	对重 Counterweight
轨道偏差 Rail error	0~+0.8	0~+1.5	0~+0.8	0~+1.5
扭曲度偏差 Torsion error	1	1.5	1	1.5

8) 修正导轨接头处的工作面 Correct the working faces at joints of the guide rails

导轨连接处 Joint of the guide rails	A	B	C	D
导轨直线度允许偏差不大于（mm） Allowable error for straightness of the guide rails should be no more than (mm)	0.05	0.05	0.5	0.05

导轨接头处，导轨工作面直线度可用 500mm 刀口尺靠在导轨工作面，接头处对准刀口尺 300mm 处，用塞尺检查 A、B、C、D 处(见下图)，均应不大于上表的规定。

At joints of the guide rails, place a 500mm knife straight edge against the working face of the guide rail with the joints align with 300mm of knife straight edge, and check points A, B, C and D (see the following figures) with a filler gauge. The straightness of working faces of the guide rails measured should not be more than figures stipulated in the above table.

① 导轨接头处的直线度不大于 0.05mm，见上图 A 处和 B 处。Straightness at the joints should not be more than 0.05mm, refer to points A and B in the above figure.

② 导轨接头处的全长不应有连续缝隙，局部缝隙不大于 0.5mm，见上图 C 处。Continuous gaps should not be found at total length of the joints, and local gaps should not be more than 0.5mm, refer to point C in the above figure.

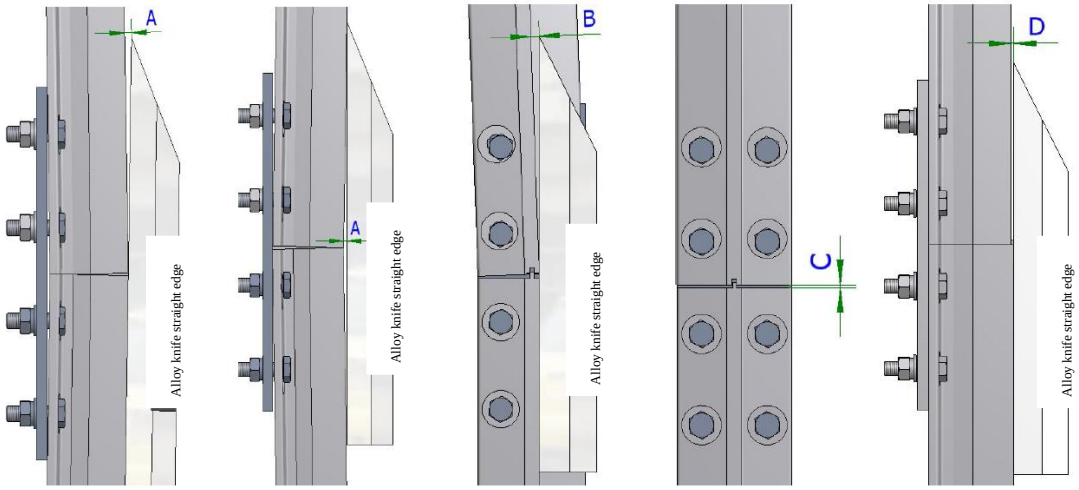


图 6-19

Figure 6-19

③ 两导轨的侧工作面和端面接头处的台阶应不大于 0.05mm，见上图 D 处和见下图。The steps at the joints between the side working face and the end surface of two guide rails should be no more than 0.05mm, refer to point D in the above figure and the following figures.

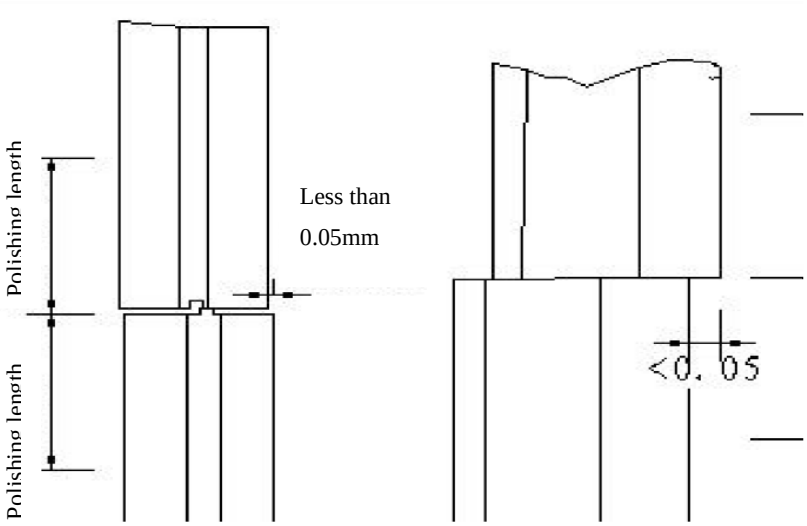


图 6-20

Figure 6-20

④ 如需调整导轨接头，建议使用磷铜垫片，最小规格厚度 0.02mm。If it is required to adjust joints of the guide rails, it will be recommended to use phosphor copper washers with the minimum specification thickness as 0.02mm.

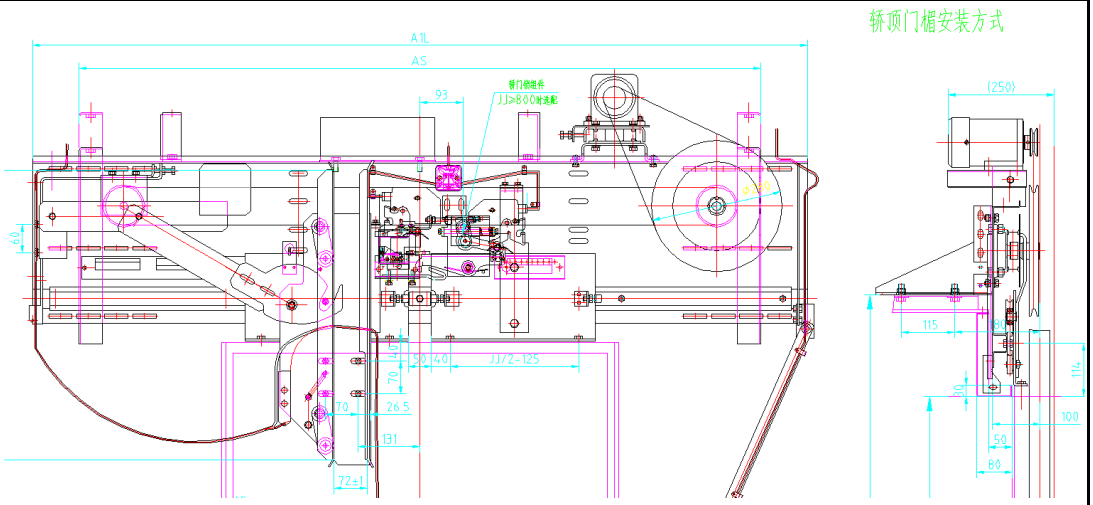
对台阶应沿斜面用专用刨刀刨平，磨修长度应符合下表的要求。

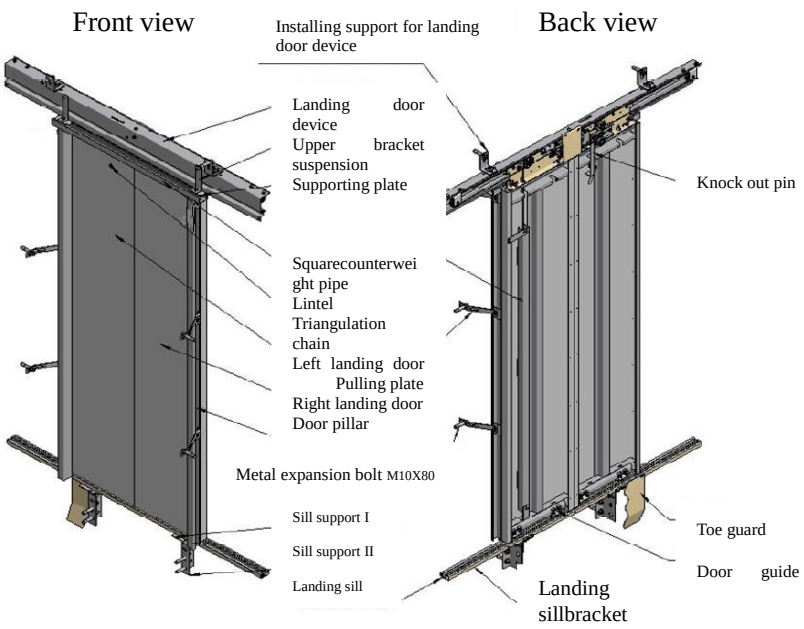
Opposite stairs should be polished with a special plane cutter along the oblique plane, and the polishing length should satisfy the requirement of the following table.

电梯速度(m/s) Elevator speed (m/s)	2.5m/s 及以上 2.5m/s and above	2.5m/s 以下 Below 2.5m/s
修整长度(mm) Polishing length (mm)	≧300	≧200

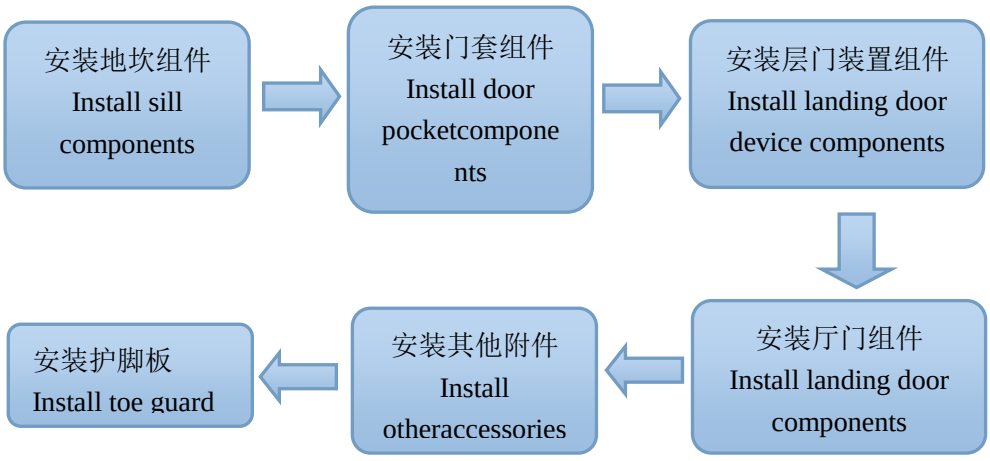
7 门系统的安装 Installation of door system

7.1 概述 Overview

门类型 Door type	门机 Door machine
门机图 Door machine drawing	
发货 Delivery	门作为一个部件发货至工地 Door will be delivered to the site as a component

层门安装图 Landing door installation drawing	
运输 Transport	门部件运送至各楼层 Door components shall be moved to each floor
指导 Guidance	参照层门装置安装文件（在层门装置箱中） Refer to installation documents for landing door devices (in the landing door box)

7.2 步骤简述 Brief procedure description



7.3 安装地坎组件 Install sill components

层门地坎的安装，关系到层门系统整体安装质量，所以必须高度重视。

The installation of landing sill determines the entire installation quality of the landing door system, and therefore high attention to shall be paid to it.

7.3.1 先用墨笔在层门地坎上画出中心线和净开门宽度线，如下图：Firstly, mark the center line and net opening width line on the landing sill with a ink pen, as shown in the following figure:

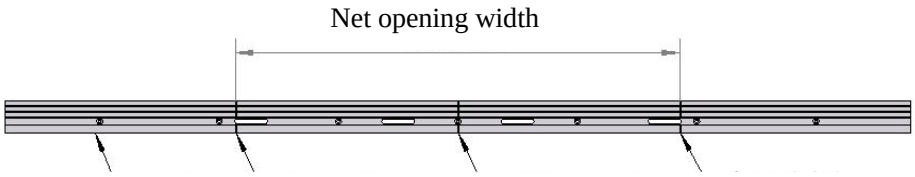


图 7-1

Figure 7-1

7.3.2 确定层门地坎支架二的安装位置 Determine the installation position of landing sill support II

重要启示：

Important attentions:

1) **在每次施工之前，必须对上下样板架及钢线进行检查，防止其移位和钢线在中间错位；Before commencement of each work, the upper and bottom template frames and steel wires shall be checked so as to avoid displacement of frames and center dislocation of steel wires;**
2) **层门地坎安装完毕后，层门地坎上平面高出楼层装饰完工地面 3～4 毫米（请见下面：视图一）。After landing sill is installed, the upper plane of landing sill shall be 3-4mm higher than finished floor decoration ground (please refer to the following View I).**

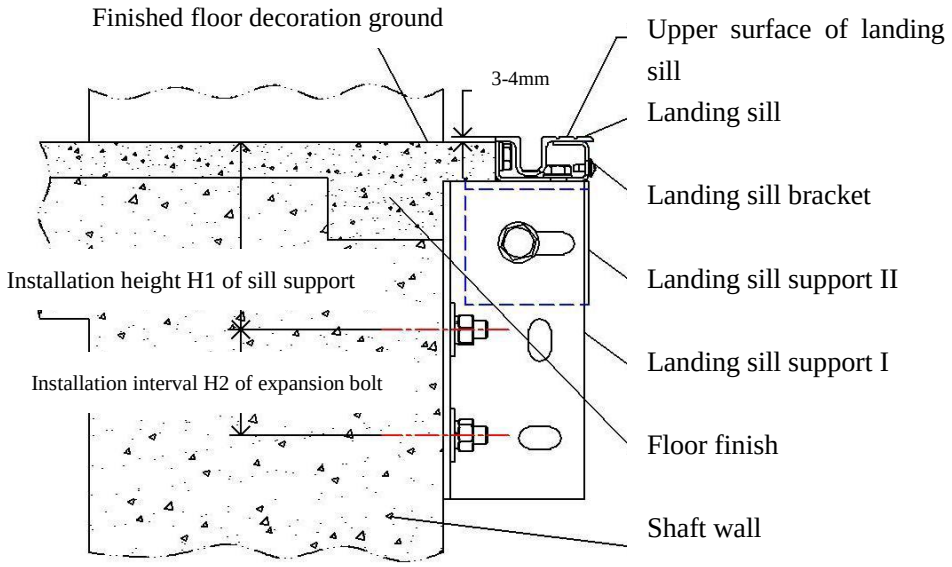


图 7-2a 视图一

Figure 7-2a View I

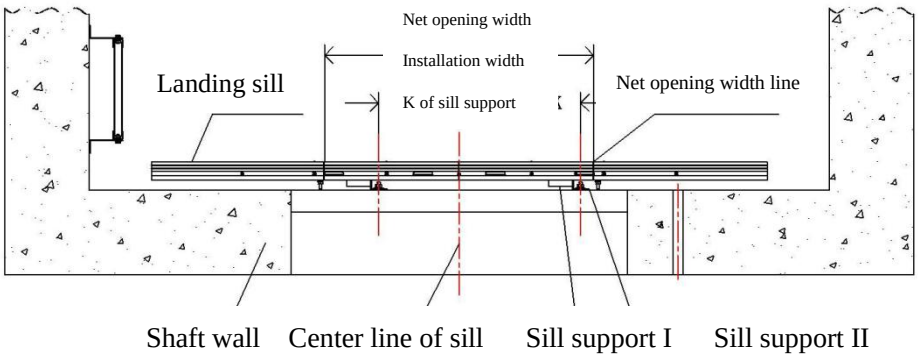


图 7-2 视图二

Figure 7-2 View II

根据以上重要提示，确认层门地坎、层门地坎托架、地坎支架一和地坎支架二之间的安装孔的位置装配关系，同时确认地坎上的净开门宽度线与样板架上的垂直钢线重合后，可以确定地坎支架安装高度 H1（请见上面：视图一）和地坎支架安装宽度 K（请见上面：视图二）。并且在井道墙壁上相应位置划垂直线 A1、垂直线 A2、水平线 B1 作为标识线（请见下图）。再依据地坎支架二上的膨胀螺栓安装间距 H2（请见上面：视图一），在井道墙壁上划另外一条水平线 B2 作为标识线（请见下图）。四根标识线的交点，就是金属膨胀螺栓 M10X80 的膨胀孔位置（即是层门地坎支架二的安装位置）。

According to important attentions in the above, determine the position assembly relation of installation holes betweenlanding sill, landing sill bracket, sill support I, and sill support II; besides, after the net opening width line on the sill is determined to be coincident with vertical steel wires on template frames, the installation height H1 of sill supports (refer to the above View I) and the installationwidth K of sill supports (refer to the above View II) can be determined. Vertical lineA1, vertical lineA2, and horizontal lineB1 shall be marked on relevant positions on shaft walls to be used as identification lines (refer to the following figure). Then, according to the installation interval H2 of expansion bolts (refer to the above View I) on sill supports, mark another horizontal line B2 on shaft walls as identification line (refer to the following figure). The intersection points of the four identification lines are the position of expansion holes for M10X80 metal expansion bolts (namely, the installation positions of landing sill support II).

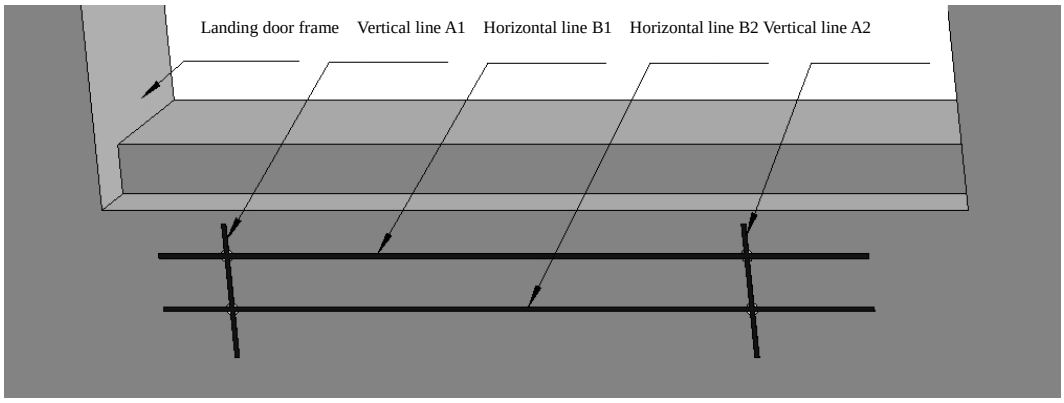


图 7-3

Figure 7-3

7.3.3 在四根标识线的交点处，钻孔安装金属膨胀螺栓 M10X80 Drill holes at intersection points of the four identification lines to install M10X80 metal expansion bolts

先安装地坎支架二，再安装地坎支架一，最后安装层门地坎托架（含层门地坎），请见下图：

Firstly, install sill support II; them, install sill support I; finally, install landing sill brackets (including landing sill); please refer to the following figure:

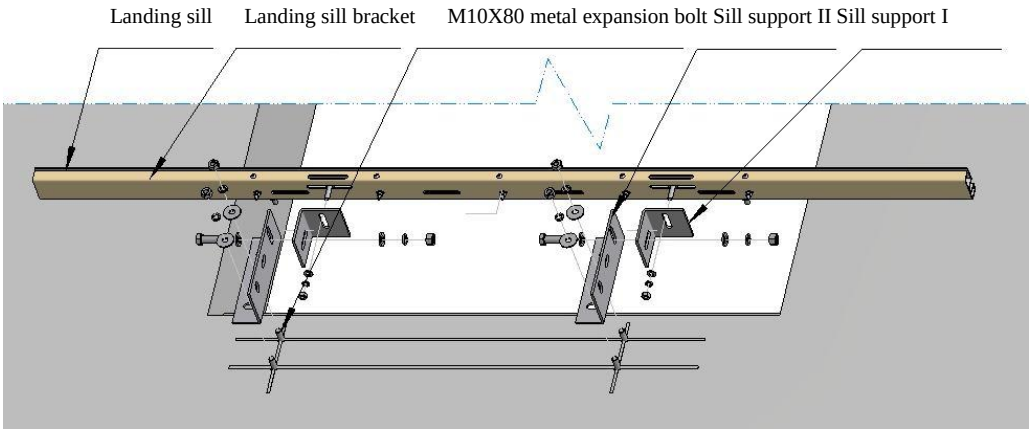


图 7-4

Figure 7-4

调整好它们的装配位置后，紧固所有连接件，请见下图。地坎支架安装完毕后全部焊死。

After adjusting their installation positions, fasten all connection pieces; please refer to the following figure. After installation, all sill supports shall be sealed by welding.

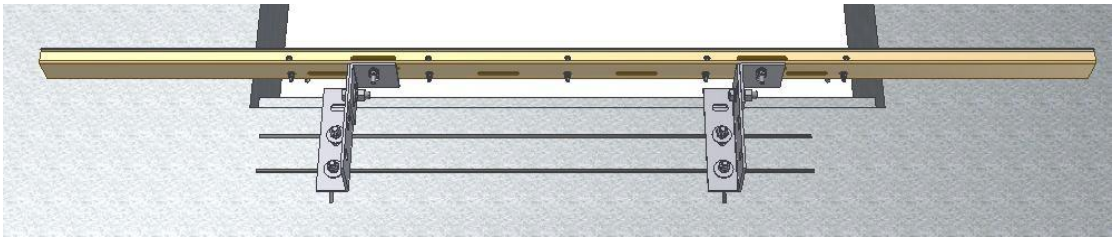


图 7-5

Figure 7-5

7.3.4 检查地坎的安装质量 Check sill installation quality

在楼层装饰地面的开关门水平方向，用水平仪测量地坎的水平度：不大于 1/1000。检查层门地坎上平面，应高出楼层装饰完工地面 3～4 毫米。**重要提示：安装完毕后，层门地坎与轿门地坎的水平距离为 30～32 毫米**。地坎中心线（即厅门开门中心线）与轿厢导轨的距离相等。层门地坎的两端与轿厢导轨的距离相等。请见下图：

Measure the sill levelnesswhich shall not exceed 1/1000 with a level-meter along the horizontal direction of doors at the floor decoration ground. Check the upper plane of landing sill which shall be 3-4mm higher than the finished floor decoration ground. **Important note: After installation, the horizontal distancebetween landing sill and car sill shall be 30-32mm.** Distances betweencenter line of sills (namely, the center opening line of landing door) and car guide rails shall be equal. Besides, distances between both ends of landing sill and car guide rails shall be equal too. Please refer to the following figure:

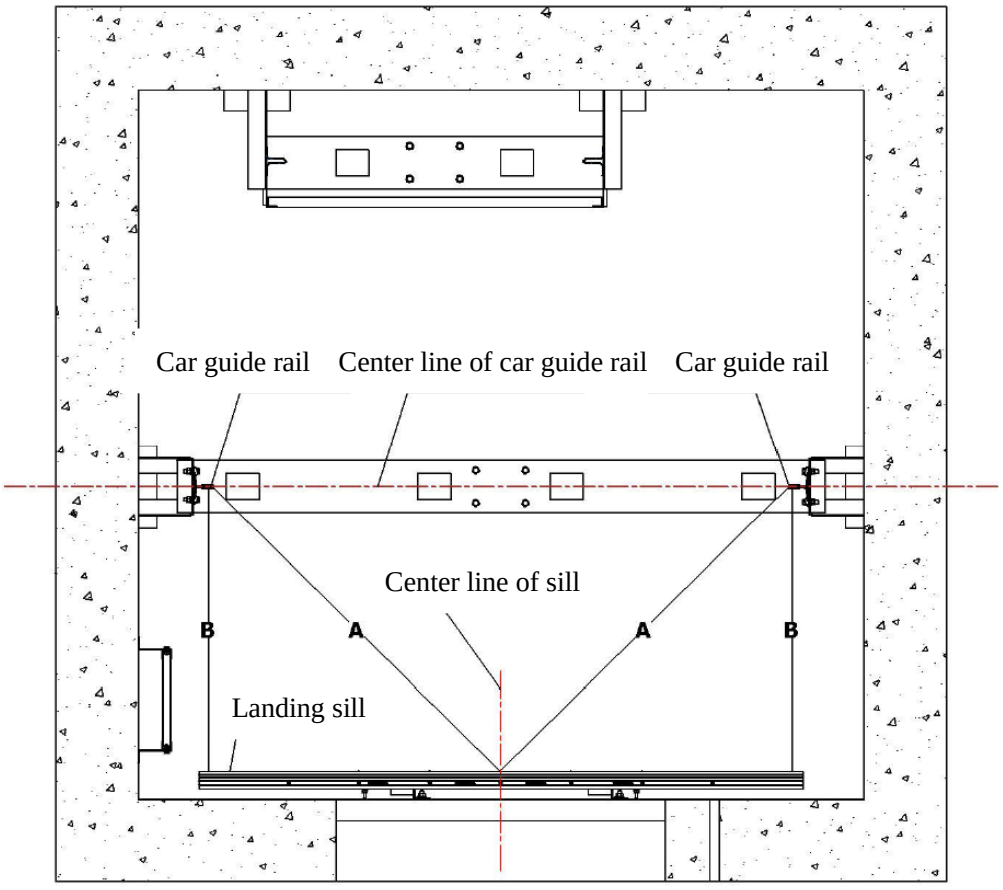


图 7-6

Figure 7-6

7.4 安装门套组件 Install door pocket components

7.4.1 先组装门套：用螺栓连接门楣和左、右立柱（要求外表面平整，用角尺检查）。请见下图：Firstly, assembly door pockets: connect the door lintel and left and right pillars with bolts (it is required that the outer surface shall be flat; check with an angle square). Please refer to the following figures:

图 7-7

Figure 7-7

根据现场安装的实际情况，将拉板（即拉筋）成型。请见图 6-28：Shapepulling plates (namely, lacing wires) according to actual situations of site installation. Please refer to the figure6-28:

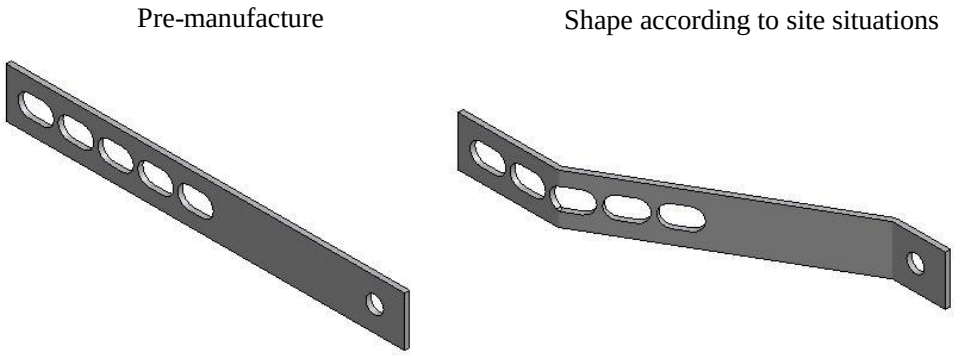


图 7-8

Figure 7-8

7.4.2 拉板成型后，与门套立柱连接，要求拉板与门套立柱垂直。请见下图：After pulling plates are shaped, connect them with door pocket pillars; pulling plates are required to be perpendicular to door pocket pillars. Please refer to the following figures:

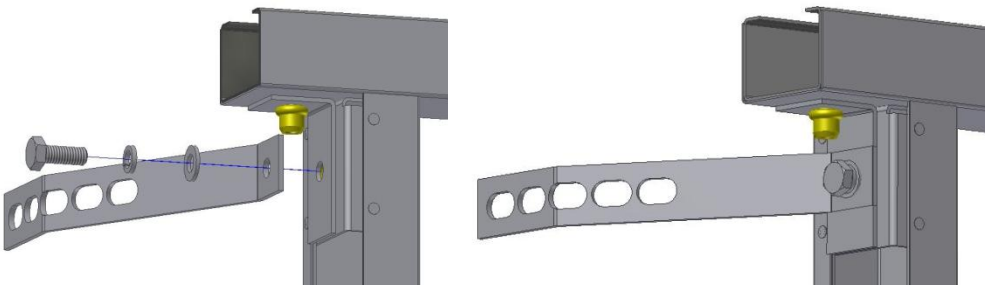


图 7-9

Figure 7-9

7.4.3 将门套与地坎相连接。请见下图：Connect door pocket with sill. Please refer to the following figures:

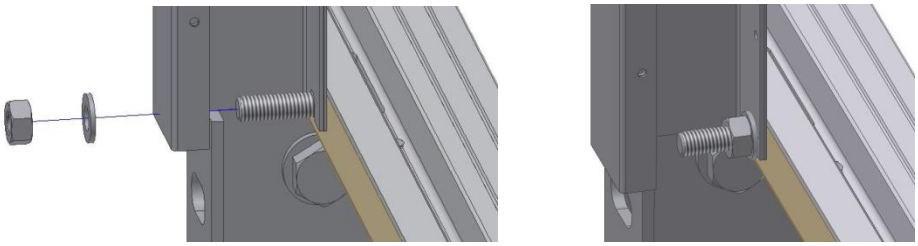


图 7-10

Figure 7-10

7.4.4 根据拉板上靠近成型位置的安装孔，在门框侧壁上划线钻孔，安装金属膨胀螺栓。先稍微松动拉板与门套立柱的连接螺栓，再将拉板与金属膨胀螺栓连接起来，用手旋紧即可。请见下图：Mark lines and drill holes on side walls of the door frame according to installation holes close to the molding position on pulling plates to install metal expansion bolts. Firstly, slightly loosen connecting bolts of pulling plates and door pocket; then, connect pulling plates with metal expansion bolts and screw up them with hands. Please refer to the following figures:

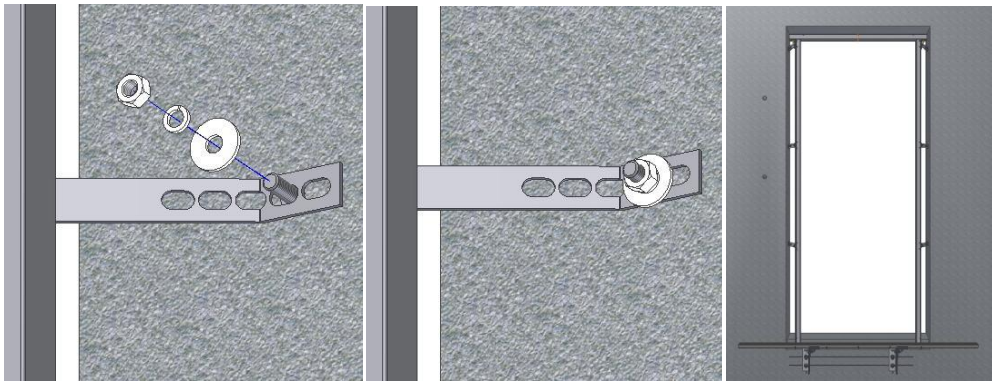


图 7-11

Figure 7-11

7.4.5 通过找正层门地坎中心线，净开门宽度线与门套立柱内侧面重合，使立柱的垂直度不超过 1/1000。门楣的水平度不超过 1/1000，开门高度符合土建确认图要求。确认后，紧固门套立柱与拉板，拉板与膨胀螺栓的所有连接件。Align center lines of landing sill and make the net opening width line coincident with the inner side face of door pocket pillars to guarantee that the verticality of pillars does not exceed 1/1000. Thelevelness of door lintel shall not exceed 1/1000; the opening height shall conform to requirements of confirmed civil engineering drawings. After determination, fasten all connectionpieces for joining door pocket pillars and pulling plates and those for joining pulling plates and expansion bolts.

7.5 安装层门装置组件 Install landing door device components

7.5.1 安装层门装置悬挂件组件，调整好安装位置，连接紧固件。请见下图：Install suspensioncomponents for landing door devices; adjustinstallation positions; connect fasteners; Please refer to the following figures:

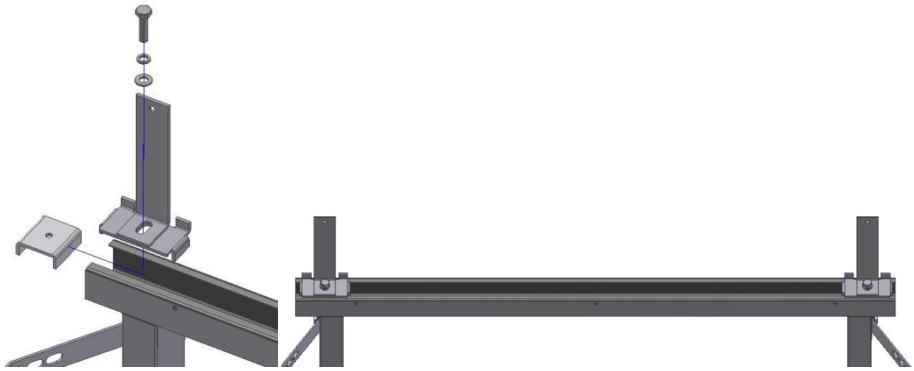


图 7-12

Figure 7-12

7.5.2 安装层门装置，调整好安装位置，连接紧固件。请见下图：Install landing door devices; adjustinstallation positions; connect fasteners; Please refer to the following figures:

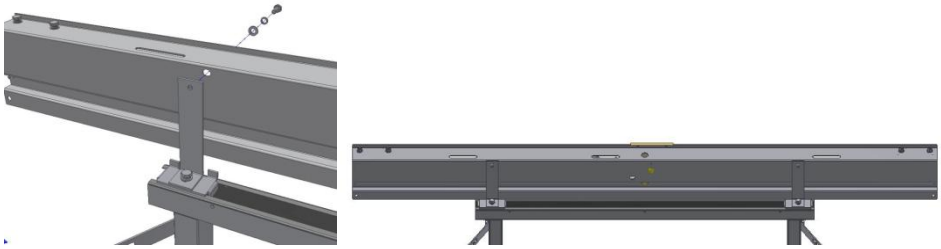


图 7-13

Figure 7-13

7.5.3 根据层门装置安装支架的安装孔，在井道墙壁的门框上侧，确认位置后划线钻孔。先安装金属膨胀螺栓，再连接层门装置安装支架和层门装置。请见下图：

On the upper side of door frame on shaft walls, make lines and drill holes after determination of positions according to installation holes for installation supports of landing door devices. Install metal expansion bolts firstly, and then connect installation supports of landing door devices and landing door devices. Please refer to the following figures:

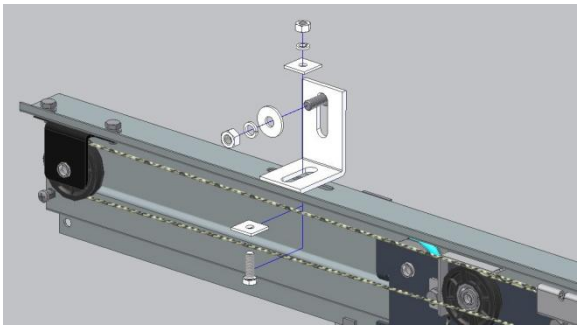


图 7-14

Figure 7-14

图 7-15

Figure 7-15

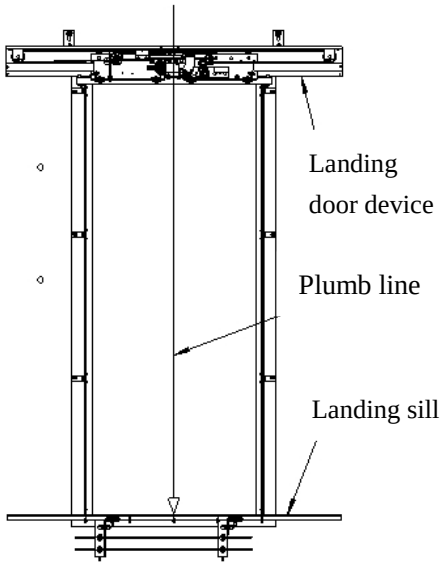
7.5.4 调整层门装置的水平度 Adjust the levelness of landing door devices

层门装置的安装质量的关键是保证层门装置门挂板导轨的水平度和直线度。层门装置门挂板导轨与层门地坎平行是层门运行好坏的关键，所以此项调整一定要精确。

The key for installation quality of landing door devices is to guarantee the levelness and straightness of door strap rails of landing door devices. Door strap rails of landing door devices shall be parallel with landing sills, for it is the key to guarantee sound operation of landing doors; therefore, this adjustment shall be accurate.

层门装置的中心铅垂线与地坎中心线对中。请见下图：

The center plumb line of landing door devices shall be in alignment with the center line of sills. Please refer to the following figures:



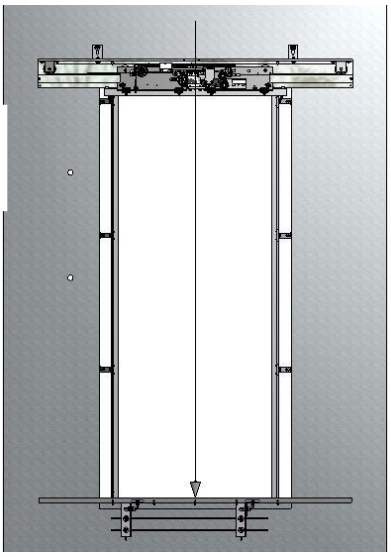


图 7-16a
Figure 7-16a

图 7-16b
Figure 7-16b

重复调整，检查确认无误后，紧固所有连接件。

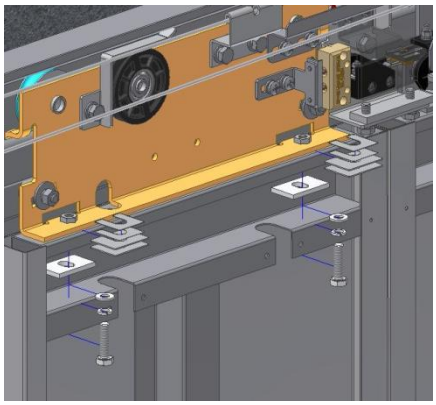
Adjust again and then fasten all connection pieces after checking and confirmation without error.

7.6 安装厅门组件 Install landing door components

7.6.1 安装左右厅门和门导靴 Install left and right landing doors and door guide shoes

层门附件包中含有厅门安装件。先用六角螺栓组 M8X30 把厅门挂在层门装置挂板上，再把门导靴（即层门滑块）安装在厅门上。根据需要，增加 U 型调节垫片或滑块调整垫片。请见下图：

Landing door installation parts are included in the landing door accessory bag. Hang landing doors on pulling plates for landing door devices with M8X30 hexagon bolt sets, and then install door guide shoes (namely, landing door sliders) on landing doors. Add U-type adjusting gaskets or slideradjusting gaskets as required. Please refer to the following figures:



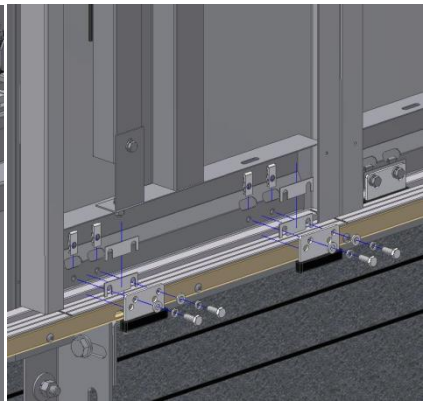


图 7-17a
Figure 7-17a

图 7-17b
Figure 7-17b

7.6.2 调节厅门间隙 Adjust door gap

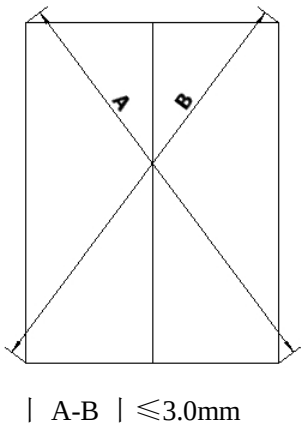
厅门门板应保持垂直，门导靴与层门地坎的配合良好，滑动正常；用手推动厅门应无噪音，无冲击或跳动现象，闭合良好。

Landing door plates shall be kept straight; door guide shoes shall well fit with landing sills to guarantee normal slide; there shall be no noise, no impact or jumping when pulling landing doors withhands; closing shall be sound.

- 调节 U 型调整垫片的数量，可以改变厅门门板底面与地坎的间隙：4～5 毫米。并保证门板与门板的底面平齐；
- By adjusting the number of U-type adjusting gaskets, the gap between the bottom surface of landing door plates and sills which shall be 4-5mm can be changed; besides, such adjustment can guarantee that door plates are parallel with the bottom surface of door plates;
- 松开六角螺栓组 M8X30，可以调节门板与门套立柱的间隙：4～5 毫米；
- By loosening M8X30 hexagon bolt sets, the gap between door plates and door pocket pillars which shall be 4-5mm can be adjusted;
- 调节滑块调整垫片的数量，可以改变门板与门套立柱的间隙：4～5 毫米，还可以调整门板的垂直度：不大于 1.0 毫米。
- By adjusting the number of slideradjusting gaskets, the gap between door plates and door pocket pillars which shall be 4-5mm can be adjusted; besides, it can guarantee the verticality of door plates which shall not be less than 1.0mm.

7.6.3 检查厅门的安装质量 Check installation quality of landing doors

1) 在关门状态下，检查左右厅门对角尺寸，尺寸差的绝对值不大于 3.0 毫米。如下左图：
When doors are closed, check diagonal sizes of the left and right landing doors, where the absolute value of sizedifference shall nor exceed 3.0mm,as shown in the following left figure:



丨 A-B 丨≤3.0mm

图 7-18a
Figure 7-18a

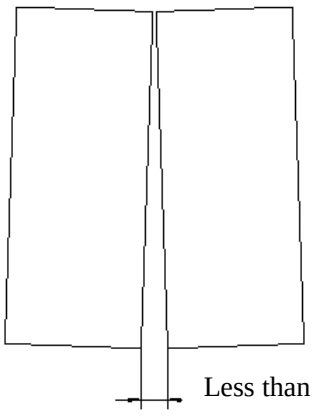


图 7-18b
Figure 7-18b

2) 在关门状态下，检查门板与门板，门板与门套立柱的间隙。When doors are closed, check the gap between door plates and the gap between door plates and door pocket pillars.

中分厅门：门板与门板的结合部为地坎的中心，也为门头组件的中点处。门板与门板的间隙小于 2.0 毫米。如上右图：

Center-opening landing door: The joint partbetween door plates is the sill center, and also the center of door head components. The gap between door plates shall be less than 2.0mm, as shown in the above rightfigure:

门板与门板在同一平面，平面度不大于 0.5 毫米。如下图：

Door plates shall be on the same level, with planeness no more than 0.5mm, as shown in the following figure:

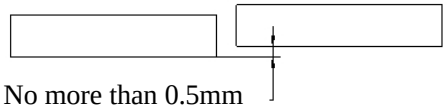


图 7-19

Figure 7-19

分别在门板垂直方向取中点，和距离门套立柱上下两端大约 200 毫米处取 2 点进行测量，保证门板与门套立柱的间隙为 4～5 毫米。如下图：

Measure the center point at thevertical direction of door plates as well as 2 points which are 200mm away from both ends of door pocket pillars respectively to guarantee that the gap between door plates and door pocket pillars is 4-5mm, as shown in the followingfigure:

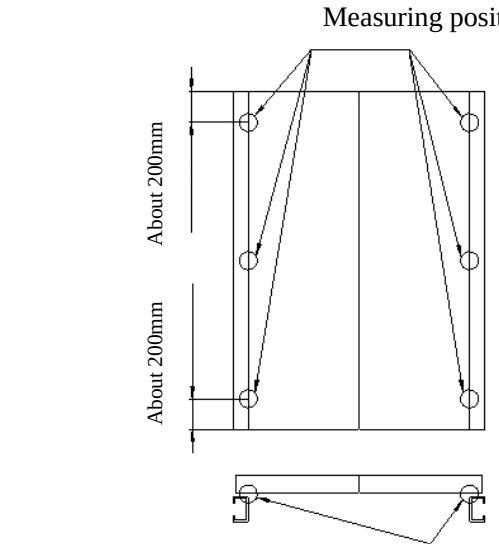
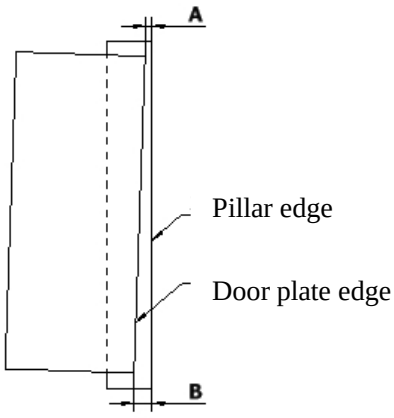


图 7-20

Figure 7-20

3) 在开门状态下，门板边缘与门套立柱边缘平齐，不平度不大于 1.0 毫米。如下图：When doors are open, door plate edges shall be parallel with edges of door pocket pillars, with unevenness no more than 1.0mm, as shown in the following figure:



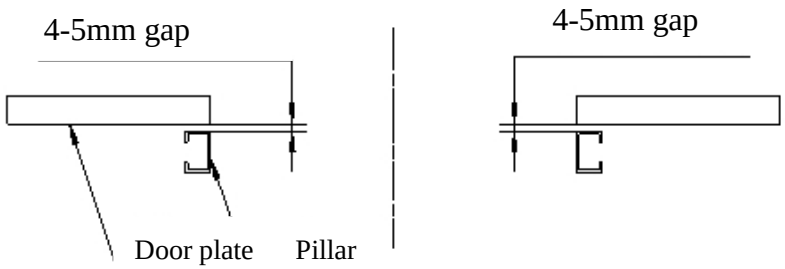
丨 A-B 丨≤1.0mm

图 7-21

Figure 7-21

门板与门套立柱的间隙为 4～ 5 毫米。如下图：

The gap between door plates and door pocket pillars shall be 4-5mm, as shown in the following figure:



Open

图 7-22

Figure 7-22

4) 门板与门板的底面平齐。门板底面与层门地坎的间隙 4～5 毫米。请见下图：Door plates shall be parallel with the bottom surface of door plates. The gap between the bottom surface of door plates and landing sill shall be 4-5mm, as shown in the following figures:

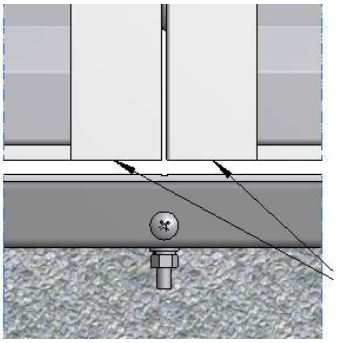


图 7-23a
Figure 7-23a

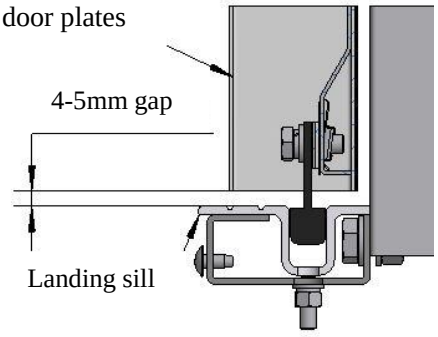


图 7-23b
Figure 7-23b

7.7 安装其他附件 Install otheraccessories

7.7.1 安装打杆 Install knock out pins

把打杆安装在 161 门锁上面。请见下图：
Installknock out pins on the 161 door lock, as shown in the following figure:

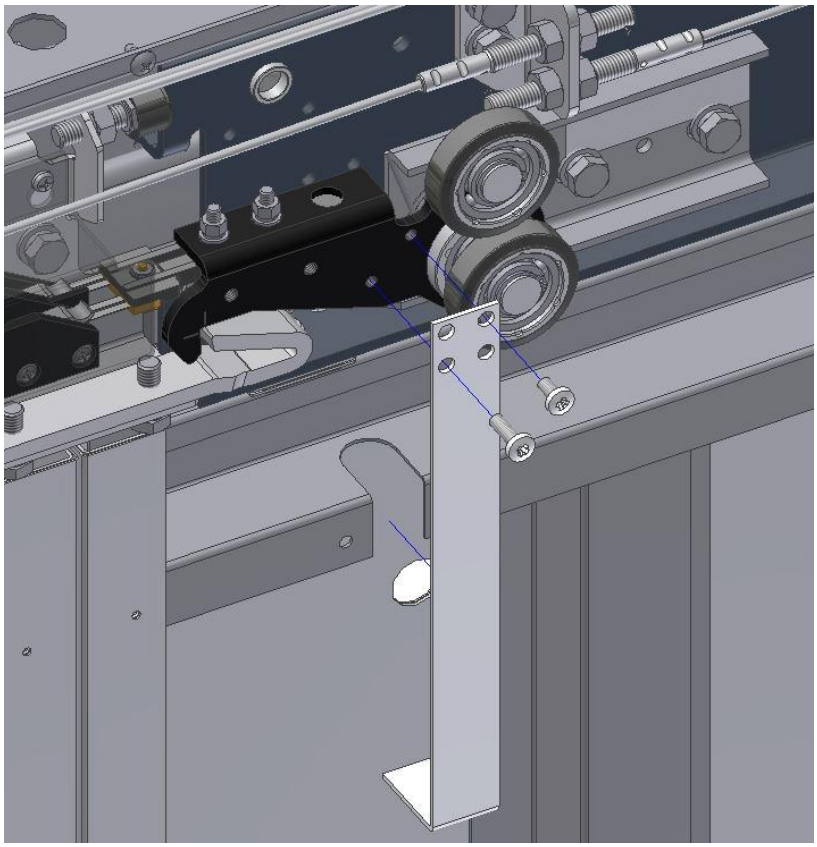


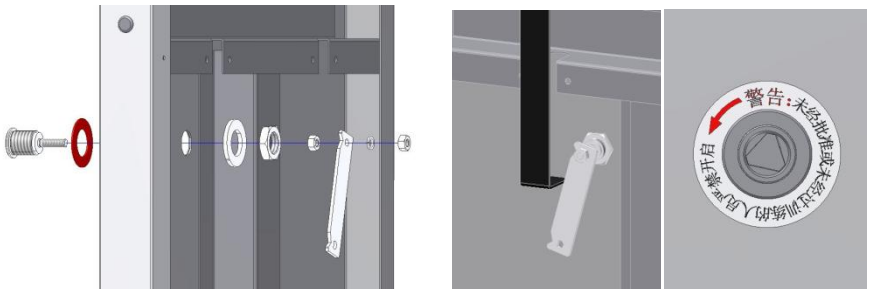
图 7-24

Figure 7-24

7.7.2 安装三角锁组件 Install triangulation chain components

调整锁芯方向，把三角锁安装在左厅门上。安装厅门锁片，调节位置紧固螺母。请见图7-25：

Adjust the direction of chain cylinder to install the triangulation chain on the left landing door. Install locking plates of landing doors, and adjust position-fastening nuts, as shown in the following figure7-25:



Warning: Unauthorized or untrained personnel are not allowed to open.

图 7-25

Figure 7-25

7.7.3 安装厅门重锤 Install landing door counterweight

必须先把重锤方管上头部安装支架螺钉松掉（避免将安装支架弄变形），才能够将重锤塞入重锤方管内，再把重锤钢丝绳穿过重锤绳轮后固定在层门装置上。调节好位置，拧紧所有紧固件，保证重锤在重锤方管内滑动灵活顺畅，无阻塞，无噪音。请见图 7-26：

Before plugging the counterweight in the square counterweight pipe, head installation bracketscrews on the square counterweight pipe shall be loosened firstly (to avoiddeformation of installation supports); then, fix counterweightwireropes on landing door devices after passing through the counterweight rope wheel. Adjust positions and screw up all fasteners so as to guarantee that the counterweight can slide flexibly inside the square counterweight pipe and that there is no blockage or noise, as shown in the figure7-26:

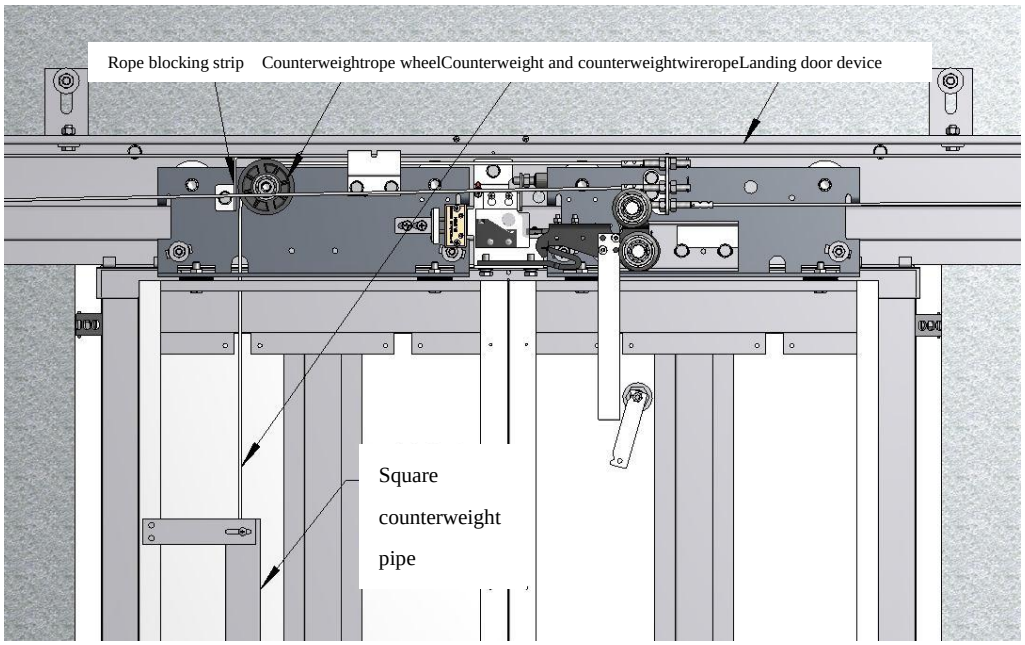


图 7-26
Figure 7-26

7.7.4 调节装配层门装置的零部件 Adjust assembly parts and components for landing door devices

a. 在关门状态下，调节层门装置的传动钢丝绳的张紧力。When doors are closed, adjust the tension of transmissionwireropes of landing door devices.

b. 在关门状态下，调节 161 门锁的安装位置 When doors are closed, adjust the installation position of 161 door lock

重要提示：轿厢地坎安装完后，161 门锁的固定转轮与轿门地坎的距离为：8±1.0 毫米。161 门锁的固定转轮的中心与层门装置中心距离为：150±1.0 毫米。请见下图 7-27：

Important note: After car sill is installed, the distance between fixed wheels of 161 door lockand landing sill is 8±1.0mm. The distance between the fixed wheel center of 161 door lockand the center of landing door devices is 150±1.0mm, as shown in the following figure7-27:

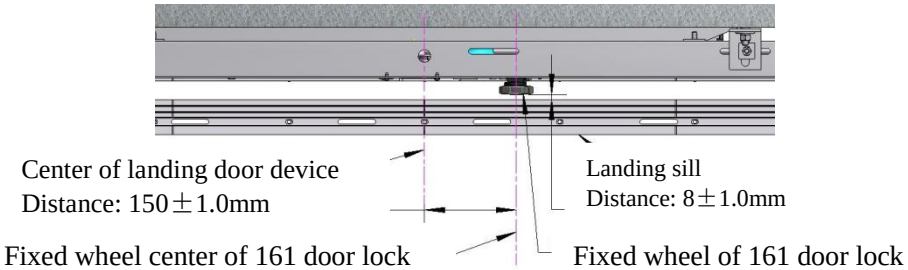


图 7-27

Figure 7-27

c. 在关门状态下，调节锁钩与 161 门锁的距离为：2±1.0 毫米。保证 161 门锁触点与主开关触点可靠接触。请见图 7-28：When doors are closed, adjust the distance between lock hook and 161 door lock to 2±1.0mm. Guarantee reliable contact between 161 door lockcontacts and master switchcontacts. Please refer to the figure 7-28:

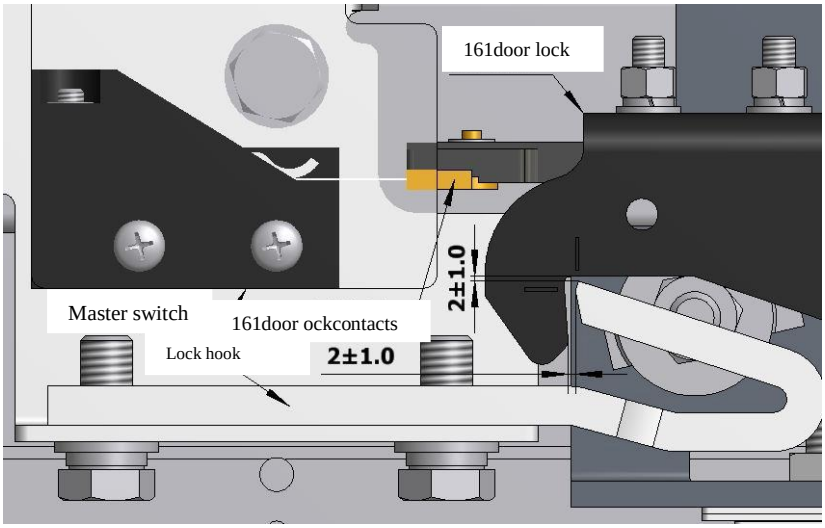


图 7-28

Figure 7-28

d. 在关门状态下，调节层门开关和动触点的配合，使层门开关内的电气触点压缩 3～5 毫米。保证层门开关和动触点的可靠接触。请见图 7-28：When doors are closed, adjust thecoordinationbetween landing door switch and movable contacts to compresselectrical contacts in the landing door switch for 3-5mm. Guarantee reliable contact between the landing door switch and movable contacts. Please refer to the figure7-28:

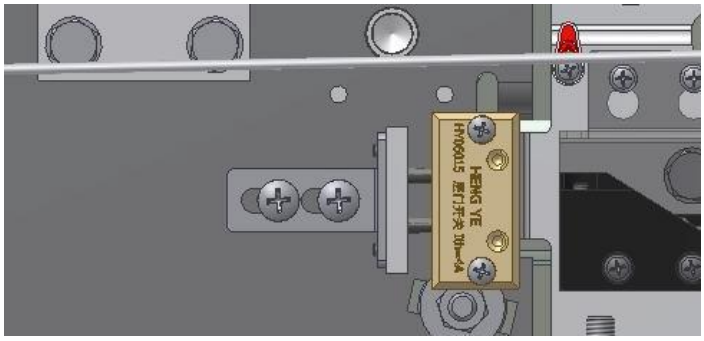


图 7-29

Figure7-29

e. 调节厅门挂板上的压导轮与厅门挂板导轨的间隙：0.3～0.5 毫米。请见图 7-30：Adjust the gap between pressed guide wheels on pulling plates of landing doors and pulling plate rails of landing doors which shall be 0.3-0.5mm. Please refer to the figure 7-30:

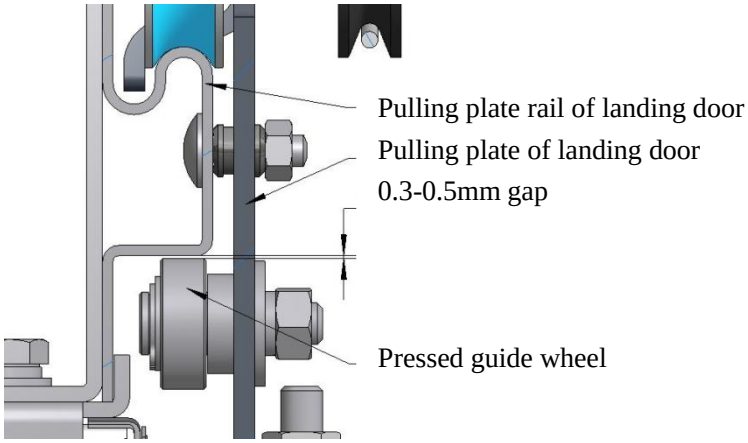


图 7-30
Figure 7-30

f. 调节挡绳条。在开关门过程中，防止重锤钢丝绳脱离重锤绳轮槽口。Adjust rope blocking strips. Separation of counterweightwireropes from the counterweightrope wheel notch shall be avoided when opening or closing doors.

g. 使用专用钥匙开启三角锁。Use a special key to open the triangulation chain.

逆时针旋转钥匙，厅门锁片推动打杆旋转，保证 161 门锁能正常的开启，厅门能够打开。161 门锁能正常复位后，锁住锁钩，厅门无法打开。

After rotating the key anticlockwise, the landing door locking plate will push knock out pins to rotate, thusguaranteeing normal opening of 161 door lockand opening operation of landing doors. After161 door lock is reset, lock the lock hook, so that landing doors can not be opened.

h. 安装盖板。Install covers

安装调试完毕后，拧松上坎架上的安装盖板螺钉，挂上盖板，向右侧推到位，拧紧螺钉即可。

After installation and commissioning, loosen cover installation screws on upper sill frame to hang the cover; then, push the cover rightwards to the right position; next, tighten screws.

7.8 安装护脚板 Install toe guards

拧松地坎托架上的安装护脚板螺钉，挂上护脚板，向右侧推到位，拧紧螺钉即可。请见下图：

Loosen installation screws for toe guards on sill brackets to hang toe guards, and then push toe guards rightwards to the right position; next, tighten screws. Please refer to the following figure:

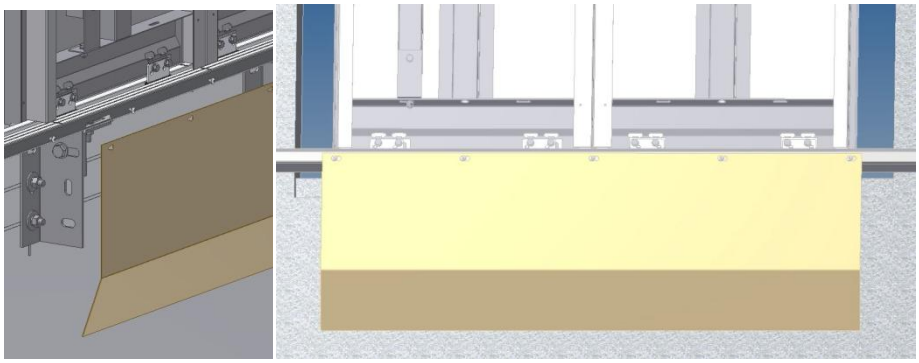


图 7-31

Figure 7-31

安装好后的层门系统，请见下图：

For installed landing door system, please refer to the following figure:

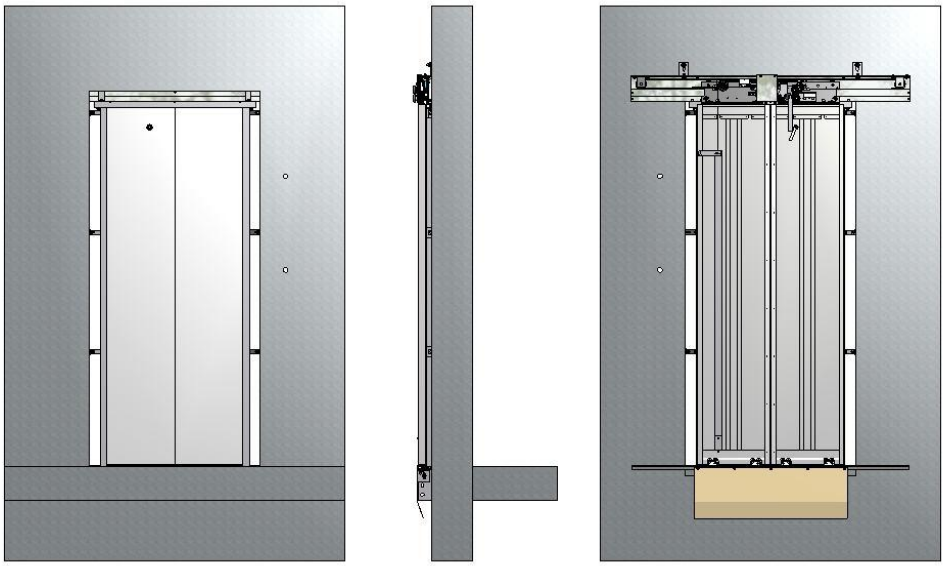


图 7-32

Figure 7-32

重要提示：请按照土建图设计要求，必须对门框进行混泥土回填。

Important note: Door frames shall be backfilled with concrete in accordance withdesignrequirements of civil engineering drawings.

为防止土建灌门框时将门框移位，宜用钢筋把门框与墙体紧密稳固(注：我公司要求拉筋必须用螺栓连接，严禁焊接)。土建灌门框时要向土建交待灌注要求和要领，加强检查和配合，不得使门框变形或移位。

In order to prevent displacement of door frames during civil engineeringpouring of door frames, it is proper to firmly fix door frames with walls using reinforcing steel bars (note: as required by our company, lacing wires shall be connected with bolts; welding is forbidden). During civil engineeringpouring of door frames, pouring requirements and main points shall be disclosed to civil engineering departments; check and cooperation shall be strengthened; and no deformation or displacement of door frames is allowed.

8 底坑的安装 Pit installation

8.1 缓冲器 Buffer

缓冲器安装示意图：

Schematic Diagram for Installation of A Buffer:

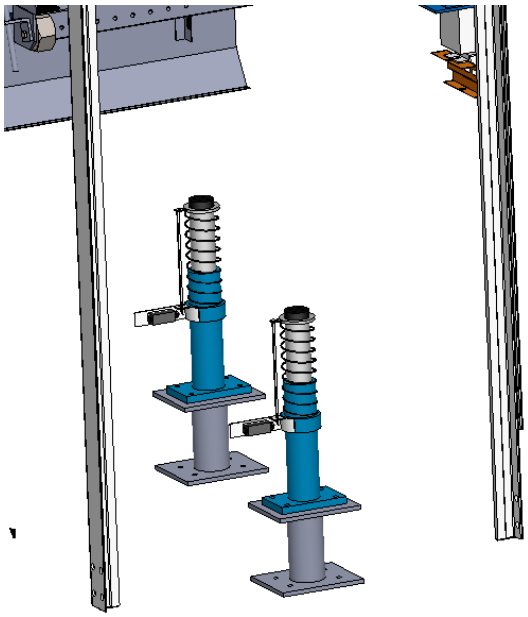
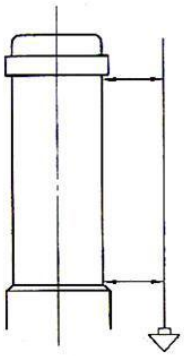


图 8-1

Figure 8-1

a. 液压缓冲器安装后要从前后左右任意两个相互垂直的位置垂吊铅垂线，测量其垂直度。柱塞的铅垂度不大于 0.5%，如右图所示；After installation of a hydraulic buffer, hang plumb lines at any two positions which are perpendicular to measure its straightness. Verticality of a plunger piston should be no more than 0.5%, as shown in the right figure:



b. 轿厢缓冲器中心与轿厢撞板中心、对重缓冲器中心与对重架撞板中心安装偏差不大于 20mm；Installation error between the center of the cab buffer and the center of the cab striking plate, between the center of the counterweight buffer and the center of the striking plate of the counterweight bracket should be no more than 20mm;

c. 两个缓冲器顶面到轿厢撞板距离偏差不超过 2mm；Distance error between top surfaces of two buffers to the striking plate of the cab should be no more than 2mm;

d. 当轿厢在底层平层时轿厢缓冲器撞板至液压缓冲器顶面垂直间距应在 150～400mm；When the cab is located at the ground floor, the vertical interval between the striking plate of the cab buffer and the top surface of the hydraulic buffer should be 150-400mm;

e. 当轿厢在顶层平层时对重架撞板至油压缓冲器顶面的垂直间距为 150～400mm。When the cab is located at the top floor, the vertical interval between the striking plate of the counterweight bracket and the top surface of the oil buffer should be 150-400mm;

8.2 安装对重装置 Installation of counterweight devices

8.2.1 检查对重框架的对角线是否相等，其误差不应大于 3mm。Check whether the diagonal line of the counterweight frame coincides, and its error should not be more than 3mm.

8.2.2 上、下导靴应在同一垂线上，不允许有扭曲变形及横向位移。Upper and lower guide shoes should be at the same vertical line without distortion and lateral displacement.

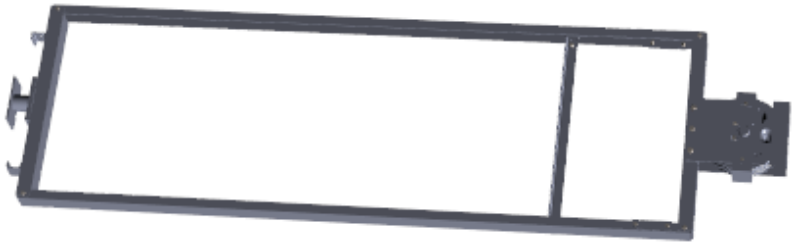


图 8-2 有机房对重架

Figure 8-2 With Counterweight Frame in the Machine Room

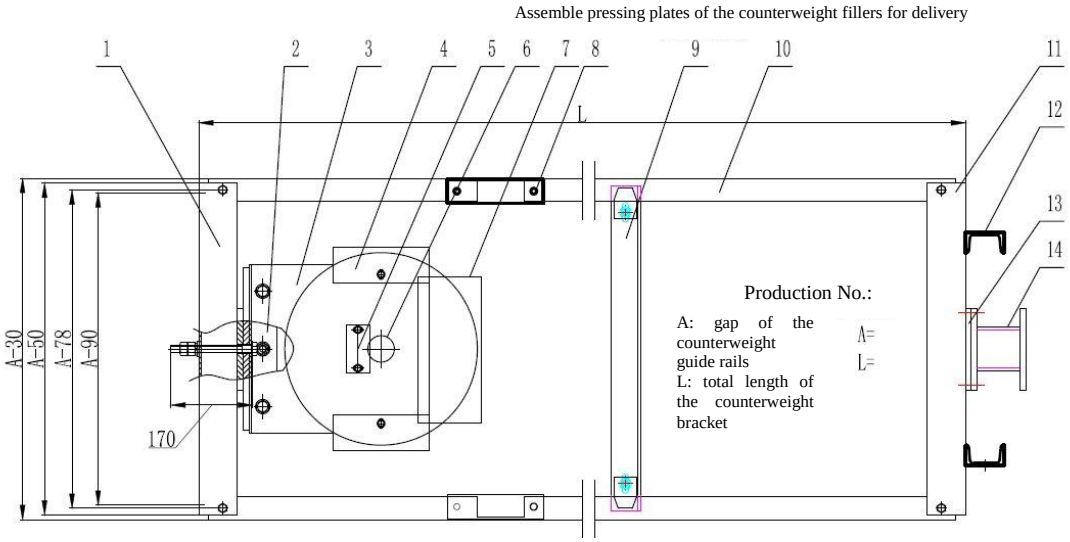


图 8-3 无机房对重架

Figure 8-3 Without Counterweight Frame in the Machine Room

8.2.3 框架就位并找正、找平。框架安装好后装对重块。装对重块时应放平、放实，装好一块，再放一块，防止全部装完后产生撞击声。Place the frame in place, and carry out alignment and levelness. Install the counterweight filler after installation of the frame. Levelness and piling up should be ensured for installation of counterweight fillers. Another counterweight filler is not allowed to place until the counterweight filler placed earlier is well handled. Production of crash should be prevented after finishing of placement.

8.2.4 固定好最上面对重块。轿厢与对重间的最小距离为 50 mm。The counterweight fillers located at the top should be well fixed. The minimum distance between the cab and the counterweight fillers is 50 mm.

8.2.5 对重架的安装 Installation of counterweight brackets

在安装前须把有碍于对重架安装的部分脚手架位置调整,测量对重缓冲器高度，缓冲器加高台，计算出对重架底框距对重底梁上平面的高度，按此高度安装现场制作一个刚性支承架。该支承架要求具有足够的刚度，强度和稳定性。对重架拼装好后吊入井道，放到支承架上。

Before installation, adjust locations of part scaffolds which block installation of the counterweight brackets, measure the height of the counterweight buffer, and lift the buffer and calculate the height between the underframe of the counterweight housing to the plane of the counterweight bottom beam, according to which a rigid support bracket of sufficient rigidity, strength and stability should be made at the installation site. Lift the counterweight hosing in the hositway and place it on the support bracket.

对重块的加入量一般是以轿厢重量加 50%额定载荷量初步计算，待作了平衡实验后，才能作最后确定,注意压铁板必须压紧对重铁后电梯才能运行。

Quantity of counterweight fillers added is initially calculated according to the cab weight plus 50% of rated carrying capacity and is able to be determined finally after completion of the

balance test. Attention should be paid to the fact that the elevator can be operated only after the counterweight iron is compressed by the pressing plates.

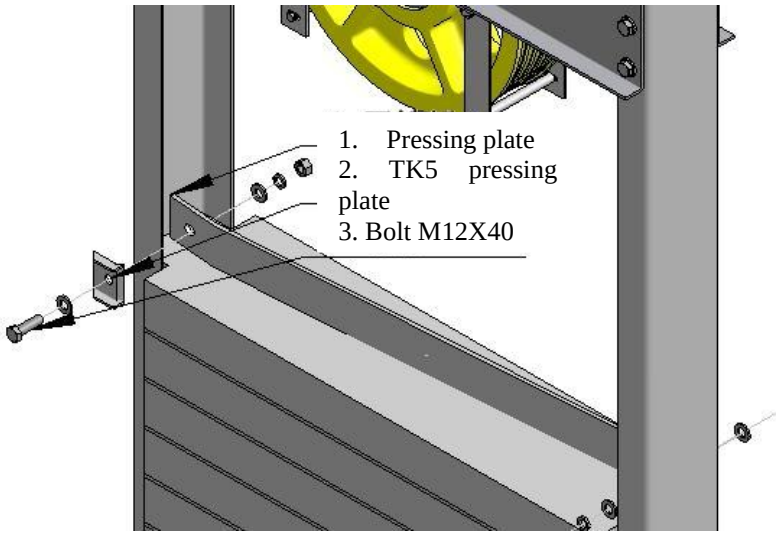


图 8-4

Figure 8-4

8.2.6 导靴安装可以通过导靴孔位调整与导轨间距以及调整两侧导靴靴衬的间隙应均匀。

Installation of the guide shoes can be adjusted according to positions of the guide shoe's holes. The distance between the guide shoe and gaps of the guide rail, between gaps of guide shoe liners at both sides should be uniform.

安装完成图：

Installation completion diagram:

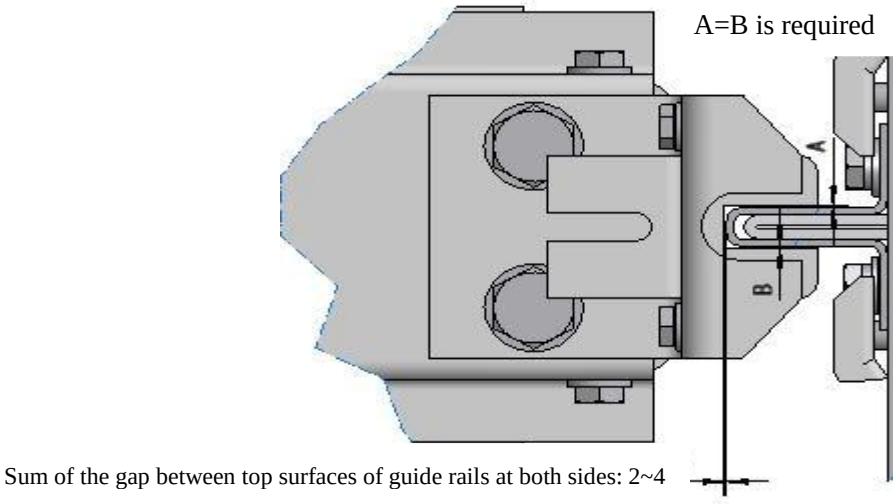


图 8-5

Figure 8-5

8.2.7 底坑对重安全栅栏底部距地应为 300mm，顶部距地应为 2500mm。Distances between the counterweight safety barrier of the pit and the ground, between the top to the ground should be 300mm and 2500mm separately.

8.3 底坑爬梯 Ladder stand for the pit

在井道内安装底坑爬梯，如图 8-6：

A ladder stand for the pit is installed in the hoistway, as shown in the following figure:

Door opening of landing door

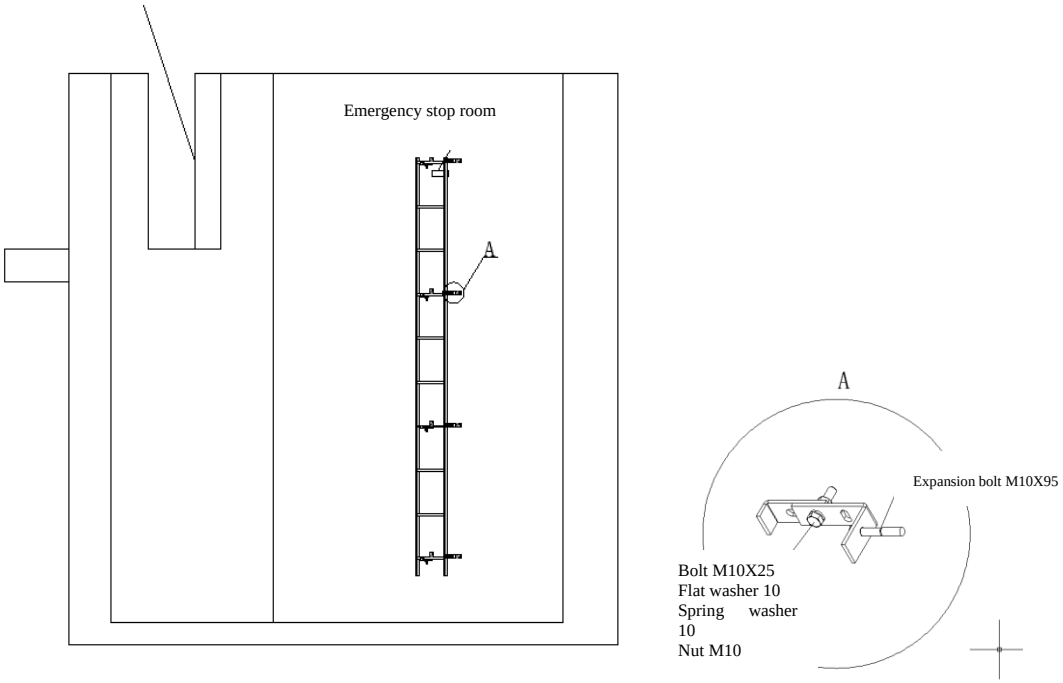


图 8-6

Figure 8-6

注意：1.底坑爬梯分两段发货，需现场组装再安装，且需安装牢固；

Attention: 1. The ladder stand for the pit is delivered in two sections and installed firmly after assembly at the site;

2.安装时需避开电梯厅门开门位置且容易从厅门口到爬梯；

2. At the time of installation, door opening positions of the landing doors should be avoided, besides, easy availability from the landing door to the ladder stand should be ensured;

3.停止开关盒安装于爬梯第一节横档下 150㎜~200㎜

3. The stop switch box should be installed at 150mm-200mm under the first crosspiece of the ladder stand.

9 曳引机的安装 Installation of the traction machine

9.1 曳引机应在组装轿厢之前进行安装。The traction machine should be installed before assembly of the cab.

9.2 有机房承重钢梁的安装 Installation with the load-bearing girder in the machine room

根据样板架上返到机房地平面的轿厢中心十字线，再实测导轨中心线。安装曳引机承重钢梁，使曳引轮下边的两根钢梁的中心线与轿厢、对重中心线符合设计图纸要求，用水平尺和钢板尺找平找正，使钢梁的安装应符合 GB10060-2011 的要求。找平找正使其符合要求后，用安装角钢将钢梁焊成整体，以防位移。如下图安装槽钢与承重钢梁也采取焊接固定。（注：工字钢埋入承重墙深度必须大于墙中心 20mm）

Measure the center line of the guide rail according to the cross curve at the cab center at the floor of the machine room cased by template frame. Install load-bearing steel girders of the traction machine to ensure the center lines of two steel girders under the traction wheel, cab and counterweight center lines satisfy the requirements of design drawings, and then, make sure alignment and levelness with a leveling instrument and a steel ruler to ensure installation of the steel girders satisfy the requirements ofGB10060-2011. After its conformation with the requirements with alignment and levelness, use angle iron installed to weld the steel girders to form an entire plane, avoiding displacement. Box iron and load-bearing steel girders installed as shown in the following figure are also fixed by welding.(Note: depth of joist steel embedded in the load-bearing walls must be larger than depth of the wall center by 20mm)

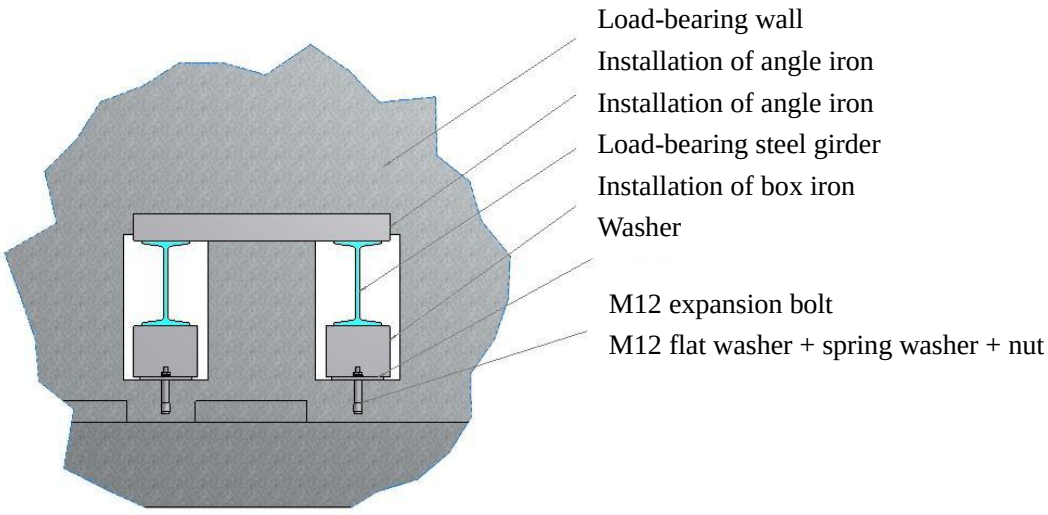


图 9-1

Figure 9-1

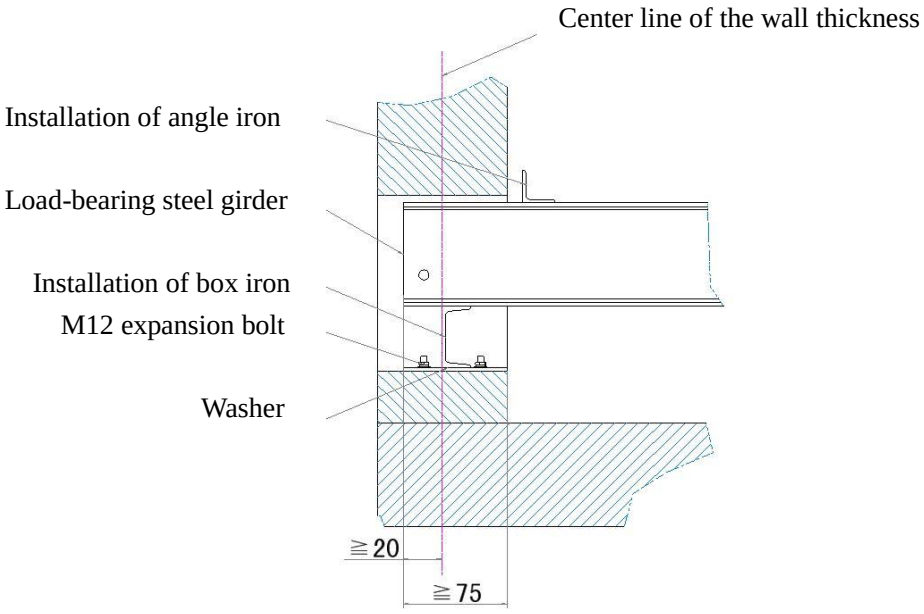


图 9-2

Figure 9-2

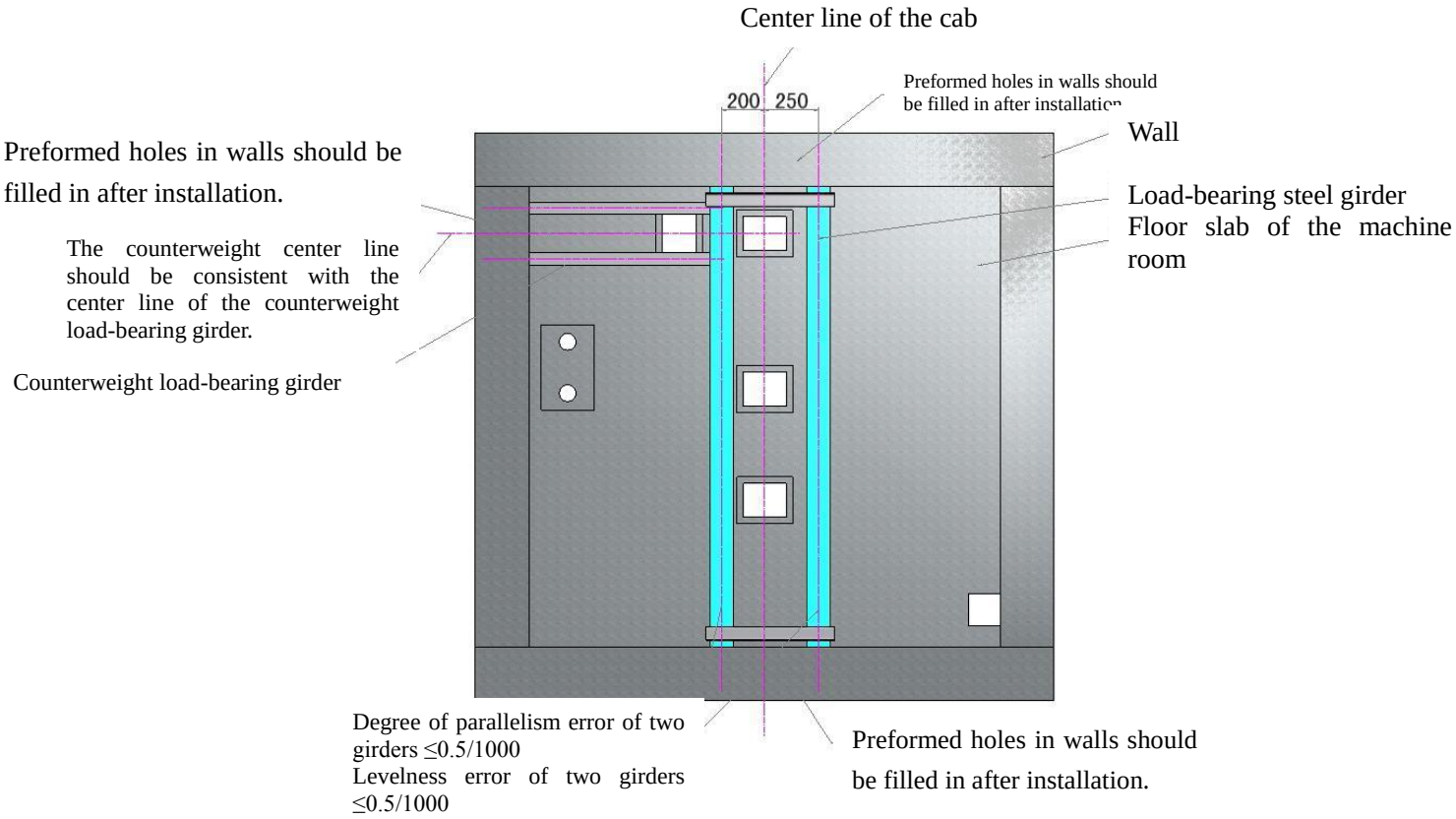


图 9-3

Figure 9-3

9.3 有机房曳引机的安装

Installation of traction machines in machine room

导向轮与曳引机的安装应符合 GB10060-2011 的要求。

Installation of guide pulleys and traction machines should satisfy the requirements of GB10060-2011.

9.3.1 确定曳引机及导向轮的正确位置。Determination of correction positions of traction machines and guide pulleys

在曳引轮和导向轮的宽度对称线上，用铅垂线分别对准轿厢架反绳轮和对重反绳轮，再用端面辅助铅垂线对准导向轮和曳引轮端面，以确定曳引机在各个方向的正确位置。

Use the plumb line align with the diversion sheave of the cab frame and the counterweight diversion sheave at the width symmetry lines of guide pulleys and traction machines. And then, use the auxiliary plumb line of the end surface to align with end surfaces of guide pulleys and traction machines to determine correction positions of the traction machines at each direction.

9.3.2 减震垫及高台的安装。Installation of shock pads and elevation stands

安装时，应先将导向轮用 U 型螺栓固定于曳引机架上，然后四角用减震垫将其安装在承重钢梁上，注意硬度较低的两个减震垫安装在对重侧，硬度较高的两个减震垫安装在轿厢一侧。如果曳引轮和导向轮的水平跨度较宽，为了增大曳引轮与钢丝绳的包角，会在曳引机与曳引机架之间设置加高台，带有加高台的曳引机架，应先将加高台安装在机架上，再将曳引机平放加高台上进行安装。如果经计算包角合适，则不用加高台，直接将曳引机装在曳引机架上就可以了。**注意：曳引机架分左置与右置，安装时应根据图纸分清楚。**

At the time of installation, fix a guide pulley on the frames of a traction machine with U-shaped bolts, and then, use shock pads to install it on the load-bearing steel girders at four corners. Attention should be paid that two shock pads with relatively low rigidity installed at the counterweight side and two shock pads with relatively high rigidity installed at the cab side. If the horizontal span between the traction wheel and the guide pulley is relatively wide, in order to increase the wrap angle between the traction wheel and steel wire rope, anelevation stand will be placed between the traction machine and the frame of the traction machine. As for the frame of a traction machine with an elevation stand, at first, place the elevation stand on the frame, and then, place the traction machine evenly on theelevation stand for installation. If the wrap angle is deemed as appropriate after calculation, adding the elevation stand is deemed as unnecessary, and it is ok to install the traction machine on the frame of the traction machine directly. **Attention: the frame of the traction machine can be installed at left or right side; therefore, it should be carried out in accordance with the drawings at the time of installation.**

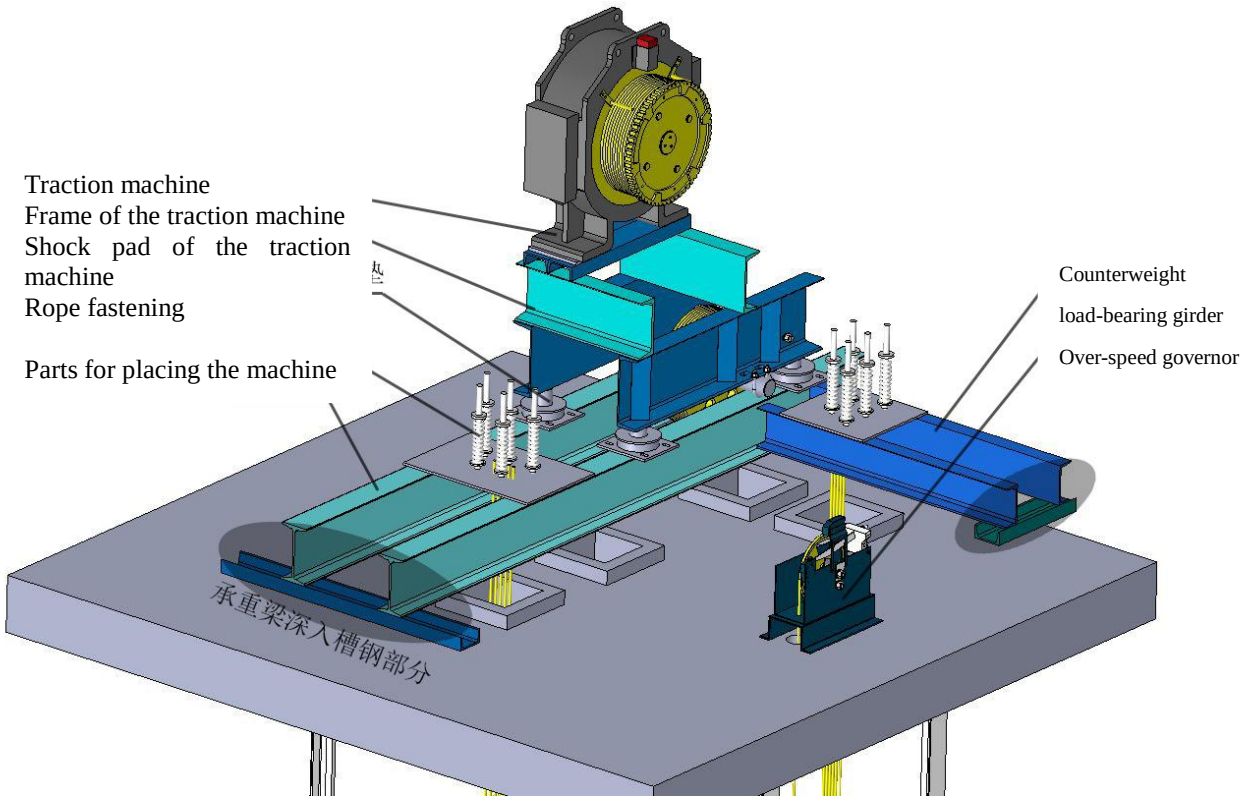


图 9-4 曳引机架安装示意图：

Figure 9-4 Schematic Diagram for Installing the Frame of the Traction Machine:

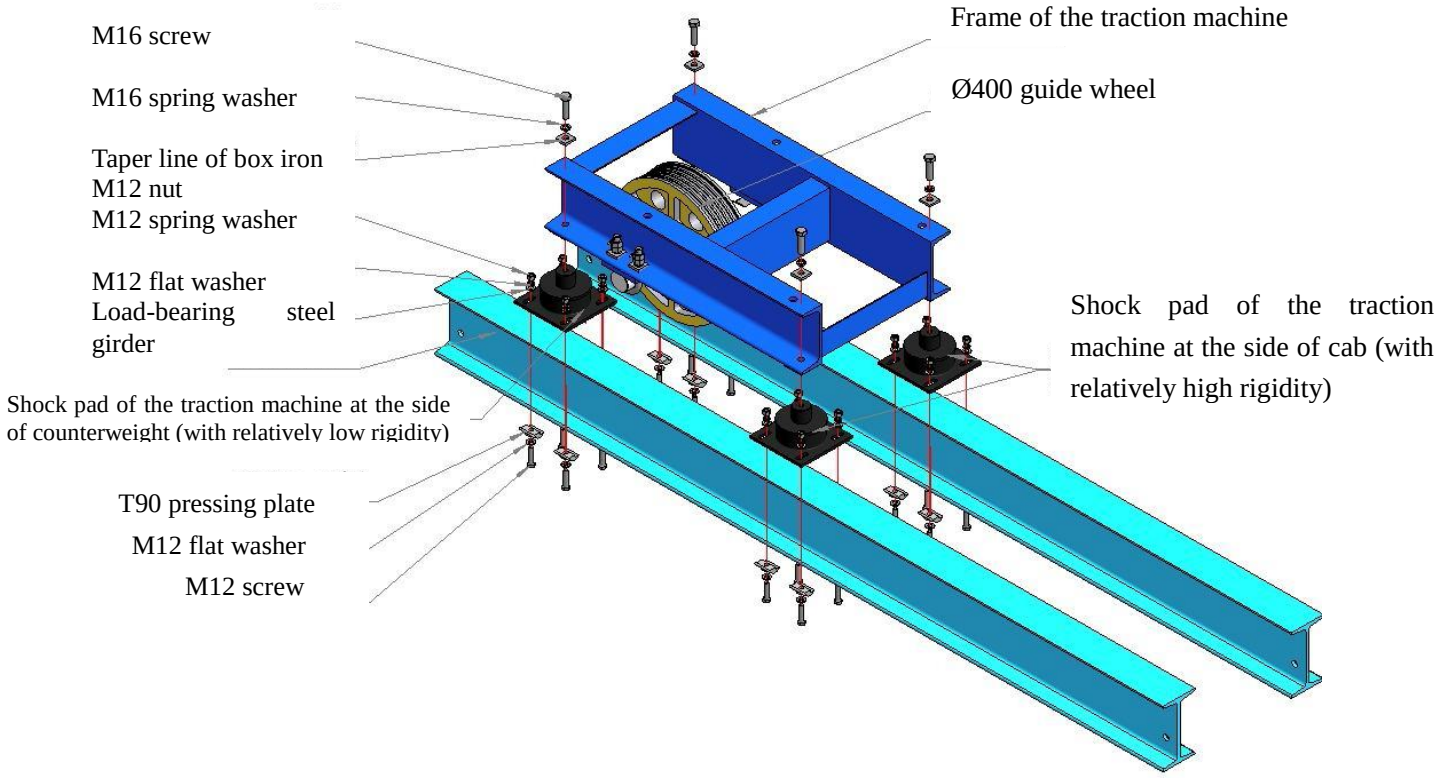


图 9-5 曳引机架安装图

Figure 9-5 Diagram for Installing the Frame of the Traction Machine

曳引轮与导向轮安装后应符合如下技术要求：

Traction wheels and guide pulleys after installation should satisfy the following technical requirements:

a. 导向轮与曳引轮同侧端面的平行度误差不大于 1mm；Degree of parallelism error between end faces of a guide pulley and a traction wheel at the same side should be no more than 1mm;

b. 曳引轮和导向轮的垂直度误差不大于 1mm；Error of perpendicularity between the guide pulley and the traction wheel should be no more than 1mm;

c. 曳引轮轴向位置与轿厢中心的位置偏差不大于 1mm；Distance error between the axial position of the traction wheel and the cab center should be no more than 1mm;

d. 导向轮轴向位置与对重中心的位置偏差不大于 1mm；Distance error between the axial position of the guide pulley and the counterweight center should be no more than 1mm;

e. 曳引轮水平径向位置与轿厢中心的位置偏差不大于 2mm；Distance error between the horizontal radial position of the traction wheel and the cab center should be no more than 2mm;

f. 导向轮水平径向位置与对重中心的位置偏差不大于 2mm；Distance error between the horizontal radial position of the guide pulley and the counterweight center should be no more than 2mm;

g. 校正后全部紧固螺栓应旋紧，拆除有关的铅垂线；After calibration, tighten all fasteningbolts and remove relevant plumb lines;

h. 在曳引机盘车手轮处应明显标出轿厢升降方向的标志；Mark obvious marks indicating up and down direction of the cab at the handwheel of the traction machine.

i. 制动器动作应灵活可靠，运行时无磨擦，制停时应无撞击声，制动时两侧闸瓦应紧密均匀地贴合在制动轮的工作面，松闸时应同步离开，在四角处间隙平均值两侧各不大于0.7mm。如未达到要求，应调整至合要求。Action of the brake should be flexible and reliable, free of friction duringoperation and crack sound during stop brake. At the time of braking, brake shoes at both sides should be tightly applied to working faces of the braking wheels and should be released at the same time when brake is released. Upper and lower average values of spaces at four corners should not be more than 0.7mm. In case it fails to meet the requirement, it should be adjusted until conformance with the requirement.

9.4 无机房曳引机的安装

9.4 Installation of tractor without machine room

导向轮与曳引机的安装应符合 GB10060-2011 的要求。安装位置参照土建图，示意图如下

Guide wheel and tractor should be installed in accordance with the requirements of GB10060-2011. Mounting position should refer to civil engineering drawing; schematic diagram is shown as follows:

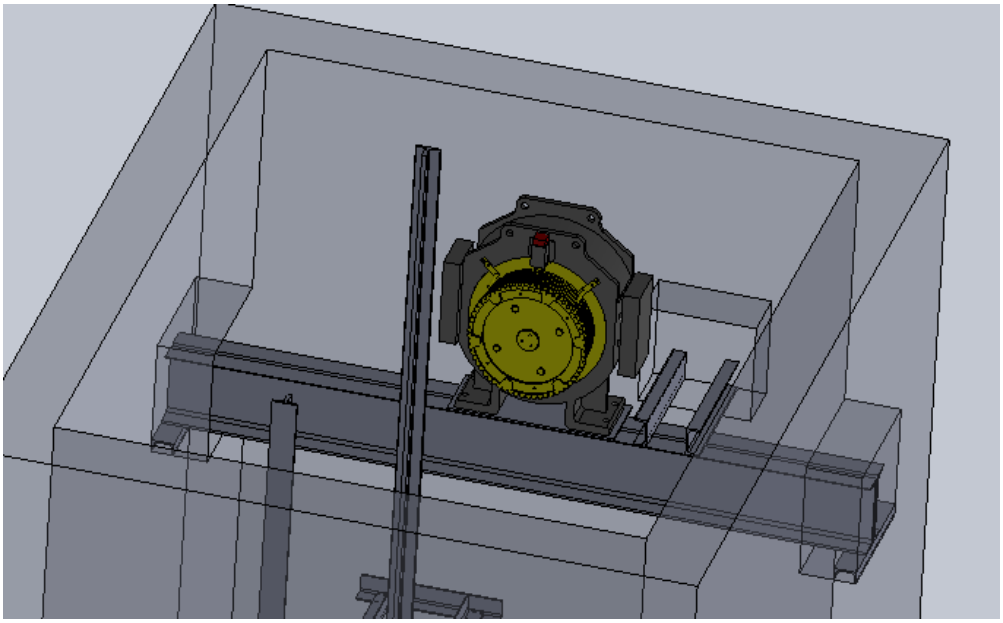


图 9-6 方式一（标准安装）

Figure 9-6Method 1(standard installation)

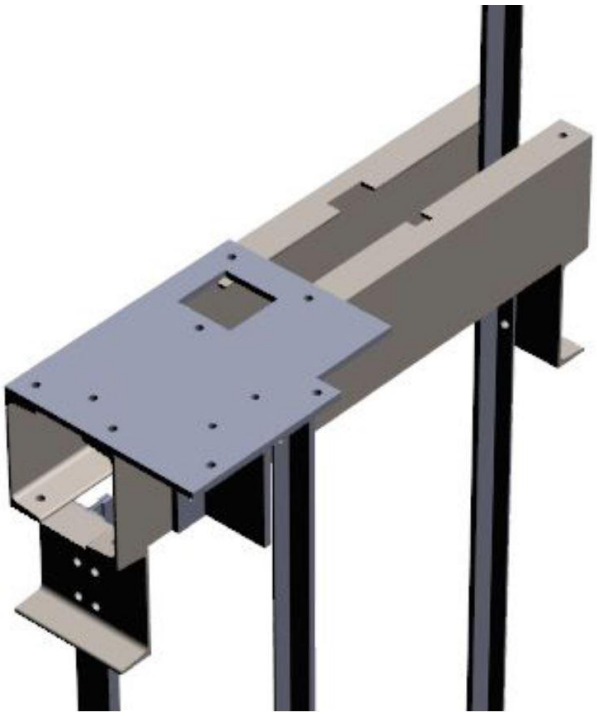


图 9-7 方式二（导轨安装）

Figure 9-7Method 2 (installation of guide rail)

9.4.1 材料吊装

9.4.1 Materials hoisting

根据电梯土建图将前支架（T 形支架）固定在主机轴线位置上，支架水平固定在墙壁上，用于曳引机梁的吊装。

The front bracket (T-shaped bracket) is fixed on the axis location of main engine according to civil engineering drawing of elevator; the bracket is horizontally fixed on the wall for hoisting of tractor beam.

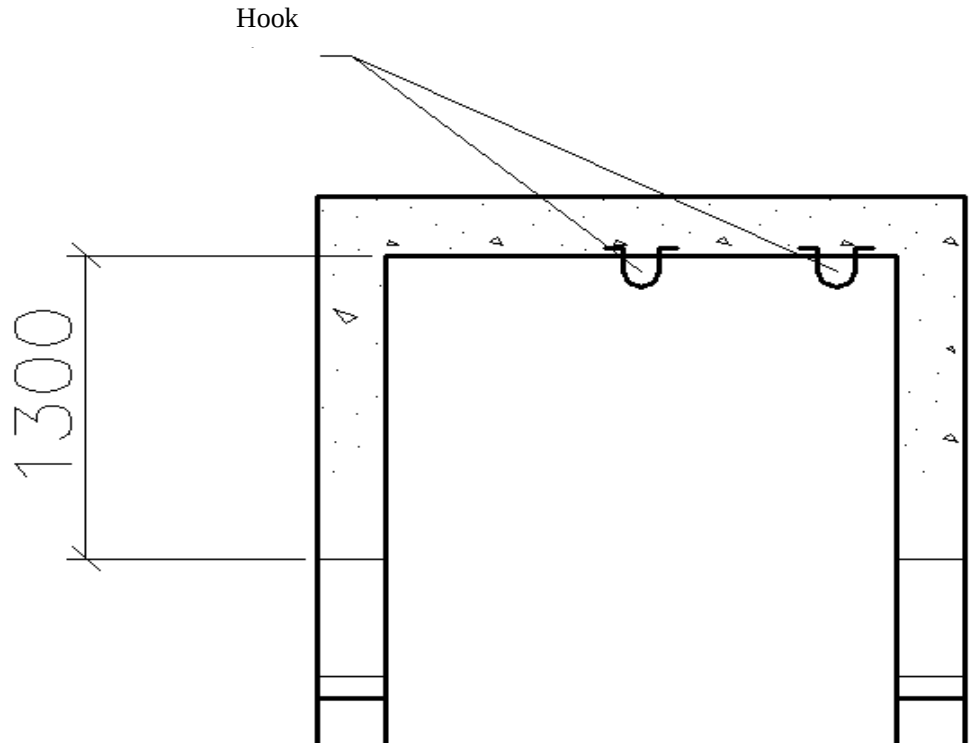
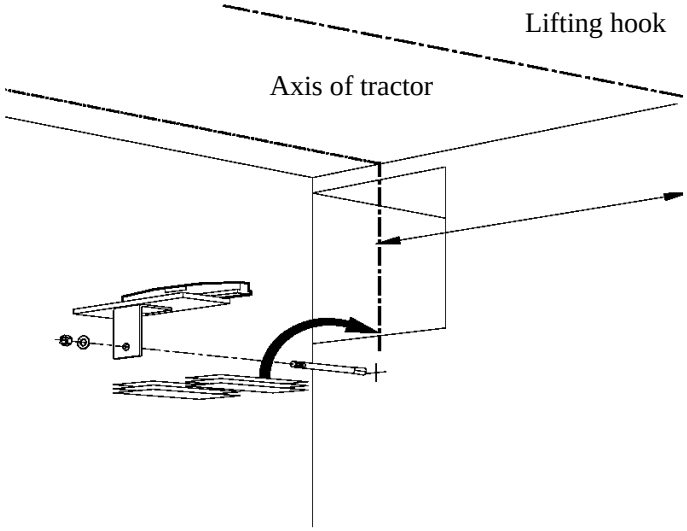


图 9-8

Figure9-8

将梁后支架板在后墙预留孔水平放好并定位在主机中心线上。假如需要，在这两个支架下加垫片以确保水平，如图 9-9。

Set the supporting plate behind the beam at the level of prepared hole and position on center line of main engine. If required, gasket is added below two brackets to ensure horizontal, as shown in figure 9-9.



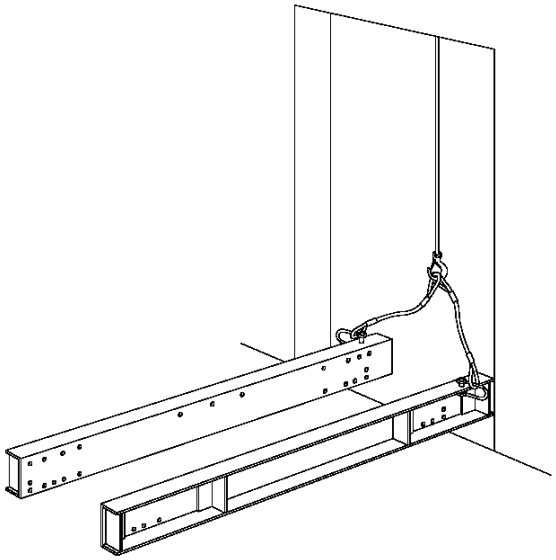


图 9-9 图 9-10

Figure9-9 Figure 9-10

把卷扬机临时悬挂在前支架上，用卷扬机把曳引机梁从底层吊到井道顶层。临时放在顶层厅门处。

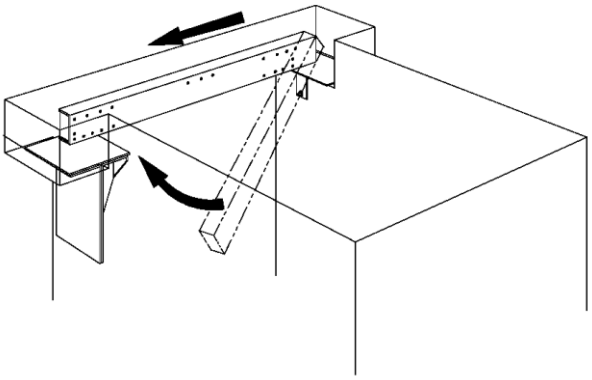
Winch is temporarily hanged on front bracket, and it is used to hoist tractor beam from ground floor to top of well and temporarily put at landing door on the top.

9.4.2 曳引机梁定位

9.4.2 Positioning of tractor beam

定位第一根梁，首先根据焊接螺母位置安装曳引机梁（螺母在墙壁侧）。并安装梁中部支撑架（安全支撑架在前面，垂直支撑架在后面），如图 9-11。

Position the first beam; first, tractor beam is installed as per the location of weld nut which is on the side of wall, and the supporting frame in the middle of the beam is installed (safety supporting frame is in front; vertical supporting frame in the rear), as shown in figure 9-11.



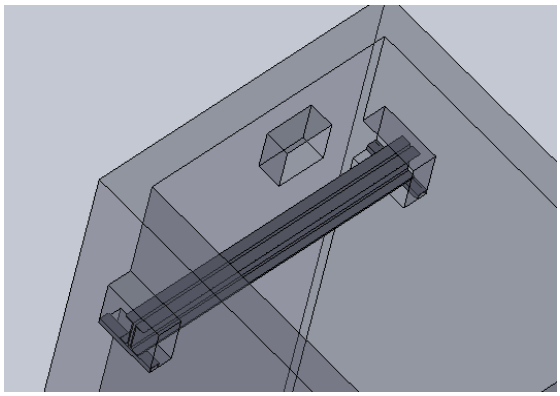


图 9-11

Figure 9-11

图 9-12

Figure 9-11

9.4.3 如图 9-13 所示，移动曳引机，使其绳轮水平节径端点 A′与轿顶轮水平节径端点中心 A 重合，使 B′与对重轮水平节径点 B 垂直重合。

9.4.3 As shown in Figure9-13, remove the tractor so that the end point of horizontal pitch diameter of rope sheave A′ coincides with that of crosshead sheave A and B′ vertically coincides with that of counter-weight sheave B.

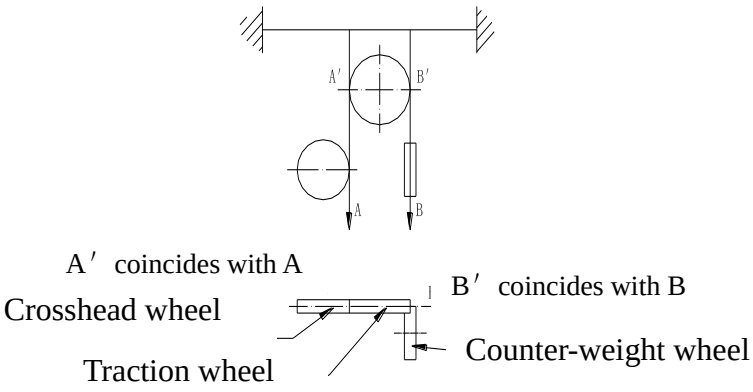


Figure 7-2

图 9-13

Figure 9-13

曳引轮与导向轮安装后应符合如下技术要求：

Traction wheels and guide pulleys after installation should satisfy the following technical requirements:

a. 曳引机旋转部件距机房楼顶的最小距离为 300mm，惯性轮距机房侧墙壁的最小距离为 200mm，以便留出维修机器的工作空间。

a. Rotating parts of tractor is at least 300mm away from roof of machine room; inertia wheel is at least 200mm away from side wall of machine room so as to leave space for maintenance.

b. 曳引轮位置偏差：在前后（向着对重）方向不应超过 2mm，在左、右方向不超过 1mm。

b. Position deviation of traction wheel: the deviation is not more than 2mm in front and rear (toward counter-weight) direction and 1mm in the left and right direction.

c.曳引机在水平方向的扭转误差不得大于 0.5mm。

c. Torsion error of tractor in the horizontal direction is not more than 0.5mm.

d.曳引轮垂直度不大于 0.5mm。

d. Perpendicularity of traction wheel is not more than 0.5mm.

e.曳引轮与导向轮或轿厢顶轮的平行度不大于 1mm。

e. Depth of parallelism of traction wheel and guide wheel or car top wheel is not more than 1mm.

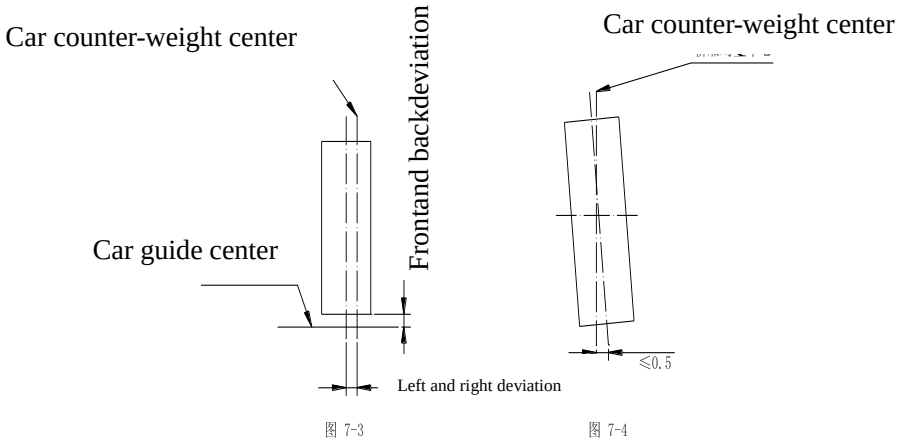


图 9-14
Figure9-14

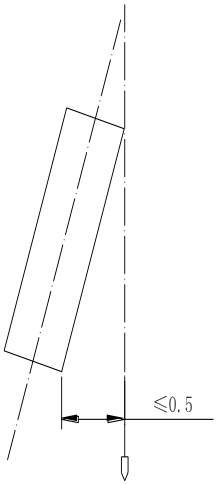


Figure 7-5

Car counter-weight center

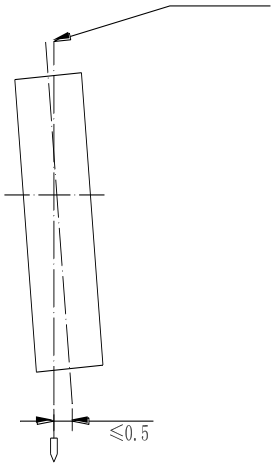


Figure 7-6

图 9-15
Figure 9-15

f.曳引轮与轿厢中心前后、左右位置误差符合下表 9-1 要求范围。

f. Error of front, rear, left and right positions of traction wheel and car center is in the range specified in Table 9-1.

表 9-1　　单位：mm

Table 9-1　　Unit: mm

要求范围 Range	A 类电梯 A-type elevator	B 类电梯 B-type elevator	C 类电梯 C-type elevator
前后方向误差 Error in the front and rear directions	2	3	4
左右方向误差 Error in the left and right directions	1	2	2

10 限速器安装 Installation of over-speed governor

限速器在出厂时经过严格检查和试验，因而安装时不准随意拆动限速器铅封。限速器上应标明与安全钳动作相应的旋转方向。**The over-speed governor is strictly inspected and tested when delivery. Therefore, it is not allow to remove its lead seal randomly when installation. Directionof rotation which corresponds with the action of safety gear should be marked on the over-speed governor.**

根据布置图规定的限速器安放位置将限速器安装在机房楼板上。为校正限速器的正确位置，从机房楼板上放 V1 铅垂线和 V 铅垂线。V1 铅垂线应对准轿架上安全钳装置上的限速器操纵杆。V 铅垂线应对准底坑内涨紧轮的绳槽中心。以这两根铅垂线为基准确定限速器的正确位置。然后再机房楼板对应位置打入膨胀螺栓，将限速器就位，再一次进行测校，使限速器位置和底座的水平度均符合要求：限速器绳轮垂直度不大于 0.5mm。然后将膨胀螺栓上的螺母拧紧。**The over-speed governor is fixed on the floor of machine room according to its mounting position specified in the layout drawing. To calibrate the position of over-speed governor, the plumb line V1 and V is laid from the floor of machine room. V1 should align with operating lever on safety gear of car frame. V should align with rope groove center of tension pulley in the pit. The position of over-speed governor is determined on the base of the two plumb lines. Then the expansionbolt is driven into a corresponding position on the floor of machine room, and the over-speed governor is in position, so as to measure and calibrate again to leave the position of over-speed governor and levelness of base meet the requirements: the perpendicularity of rope sheave of over-speed governor is not more than 0.5mm, and the nut on the expansionbolt is tightened.**

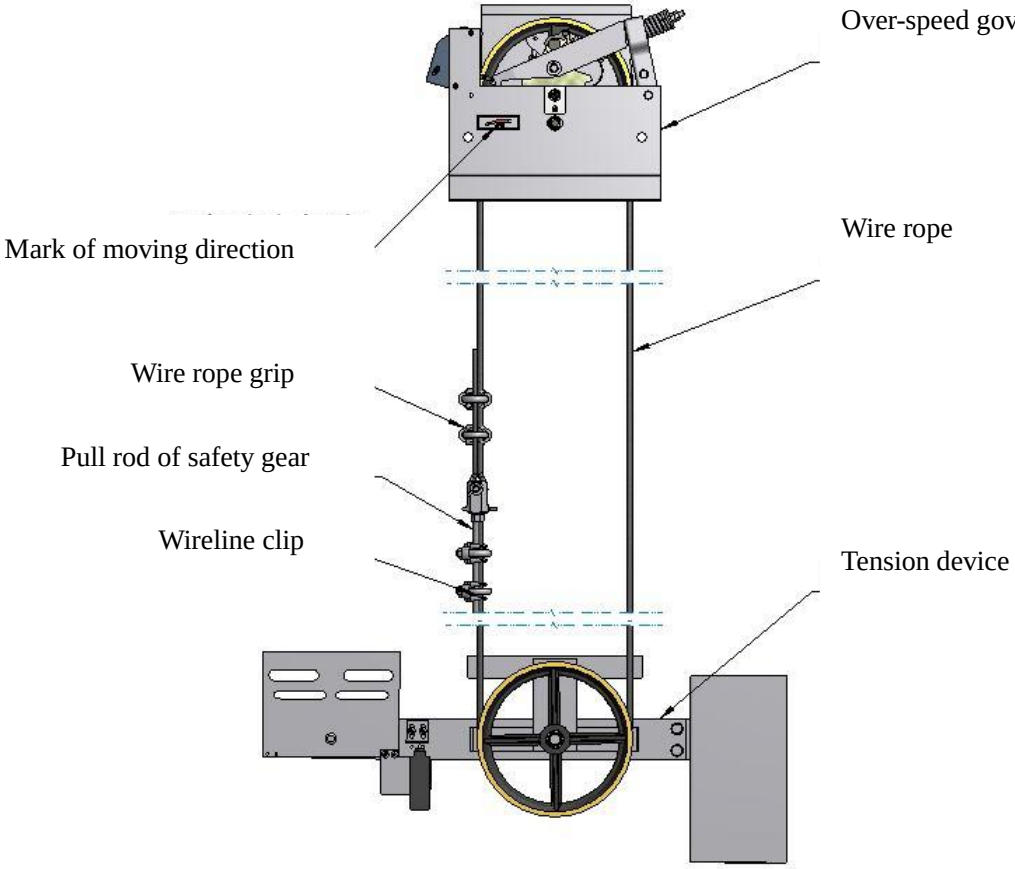


图 10-1

Figure 10-1

机房楼板混凝土厚度≥50mm 时，用规定的膨胀螺栓牢固地固定在机房地面上。机房楼板混凝土厚度 < 50mm 时，要在限速器下设置安装基础。此时限速器的安装基础可用混凝土作成，高 100mm，四周各较限速器底座大出约 50mm。When the thickness of concrete floor of machine room is more than or equal to 50mm, the over-speed governor is firmly fixed on the ground of machine room with specified expansion bolt; when the thickness is less than 50mm, installation foundation should be set below the over-speed governor. At the moment, the foundation can be made with concrete, with the height of 100mm, and the periphery is about 50mm larger than the base of over-speed governor.

限速器安装位置误差，在前后左右方向不应超过 ±3 毫米。

Error of mounting position of over-speed governor should not exceed ±3mm in the front, rear, left and right directions.

限速器绳轮的垂直度误差不大于 0.5 毫米。

Error of perpendicularity of governor rope wheel is not more than 0.5mm.

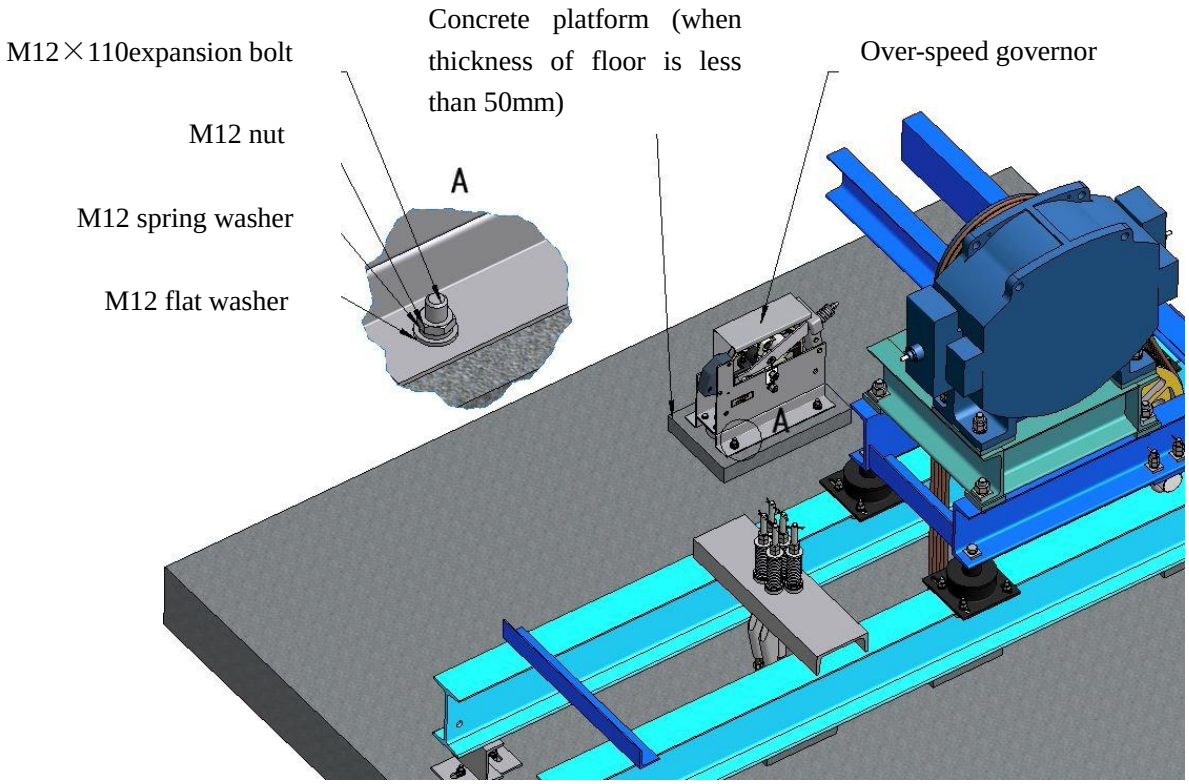


图 10-2 有机房限速器安装

Figure 10-2 Installation of governor in machine room

图 10-3 无机房限速器安装

Figure 10-3 Installation of governor without machine room

直接将钢绳绕过上、下两轮，并按所需长度截绳，限速器钢绳不得有任何死弯情况，限速器绳与轿架上安全钳拉杆连接时，如下图所示下端应用 3 个钢丝绳夹紧，每个绳夹间距离大于 6D（D 为限速器钢丝绳直径），上端穿过拉杆顶端的鸡心环，再用钢丝绳夹加紧，绳头用细铁丝加以扎结，并缠上胶带，可参考曳引钢丝绳绳头组合的做法。**The wire rope is directly round the upper and down wheels, and it is cut as per required length. Wire rope of over-speed governor is not dead turned. When the governor rope is connected with pull rod of safety gear on the car frame, the lower end should be clamped with three wire ropes. Distance between rope clip is more than 6D (D refers to the diameter of wire rope of governor; the upper end passes throughcapel on the top of pull rod and clamped with wire rope clip. Rope head is tied with fine iron wire and wrapped with adhesive tape, which can refer to the combinationof traction steel rope head.**

限速器钢绳在运行时,不得与夹绳钳磨擦或与任何部分相磨擦及接触。

Wire rope of over-speed governor should not have friction with rope gripper or have friction with and touch any part.

设定悬臂安装板，使张紧轮的平衡锤与电梯井道底面的距离 A 一般为 400±50mm（特殊情况例外）。

Cantilever mounting plate is set up so that the distance A from the counterweight of tension pulley to bottom surface of elevator shaft is generally 400±50mm (excluding exceptional circumstances).

调整涨紧轮的位置，使限速器动作时，限速器绳的张紧力不应小于安全钳装置起作用时所需力的两倍，且不小于 300N。在井道底坑根据样板图导轨至涨紧轮中心所示尺寸安装涨紧轮，调整涨紧轮位置，使限速器钢丝绳与轿厢导轨导向面与顶面两个方向的偏差均不得大于 3mm。限速器开关和涨紧轮开关，应保证在发生绳索折断、脱轮、绳夹脱钩或限速器动作时，迅速可靠地切断控制回路。

Position of tension pulley is adjusted so that the tension of governor rope for movement should not be twice less than the force required for action of safety gear and should not less than 300N. The tension wheel is installed in the well pit according to the dimension from guide rail to center of tension wheel as shown in template drawing, and its position is adjusted so that the deviation in the direction of guide surface and top surface of governor wire rope and car guide rail is not more than 3mm. The switches of over-speed governor and tension wheel should ensure that the control loop is rapidly and reliably cut off when the rope is broken off and out of the pulley; rope clip is separate from the lifting hook and the governor operates.

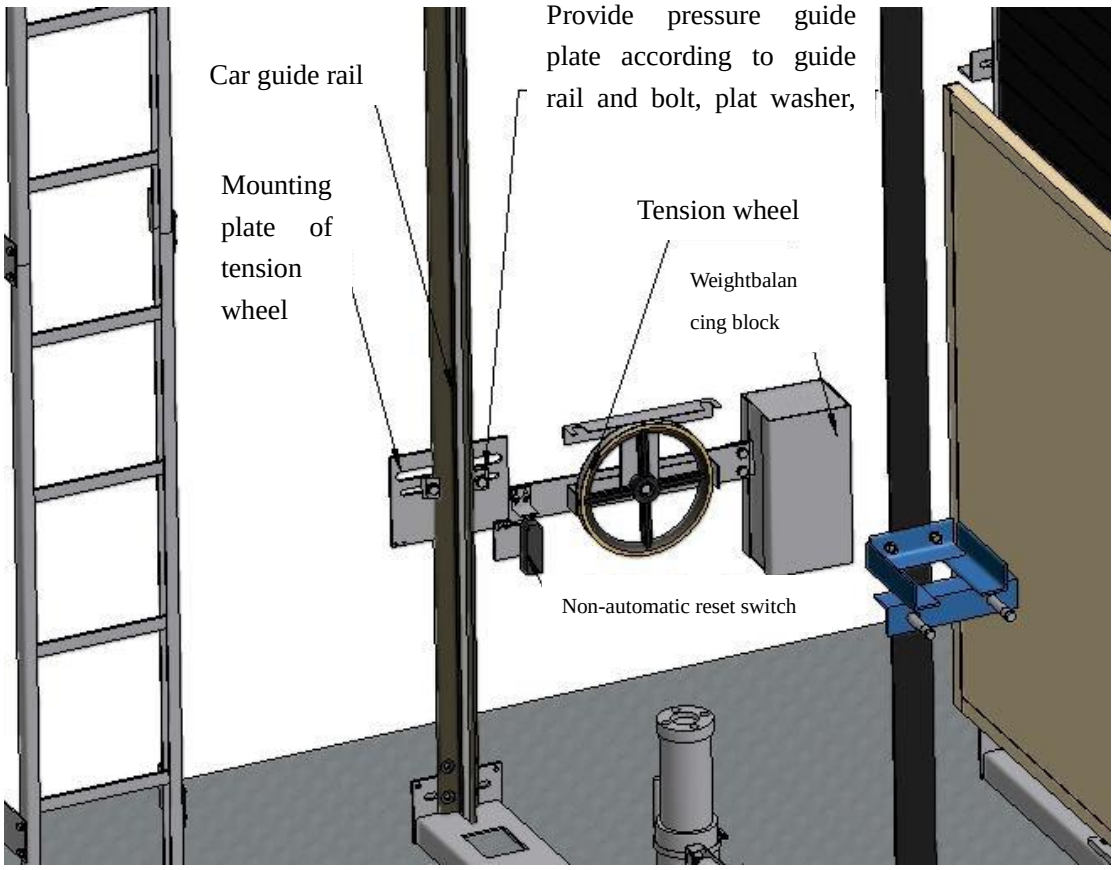


图 10-5

Figure 10-5

11 轿架的安装 Installation of car frame

11.1 有机房轿架结构 Structure of car frame in machine room

顶层安装轿厢支撑架

Supporting frame for car installed on the top layer

轿厢架、轿厢一般应在最高层的井道内安装，在轿厢架进入井道前应拆除最高层的脚手架。在正对厅门口的井道墙上，平行地凿两个与厅门口宽度一致的 250 mm×250mm 的孔洞，用两根截面不小于 200 mm×200mm 的方木或金属梁，一端插入墙内，一端架于楼板上，校正两根横梁的平行度和水平度后两端固定。

Car frame and car are generally installed in the shaft of the topmost layer, and the scaffolding of the topmost layer should be removed before the car frame enters the shaft. Two holes of 250 mm×250mm with the same width as landing door openings are cut in parallel on shaft wall directly facing shaft door openings. Two square timbers or metal beams with cross section not less than 200 mm×200mm, with one end inserted into the wall and another end set on the floor, are fixed after the depth of parallelism and levelness of two beams are calibrated.

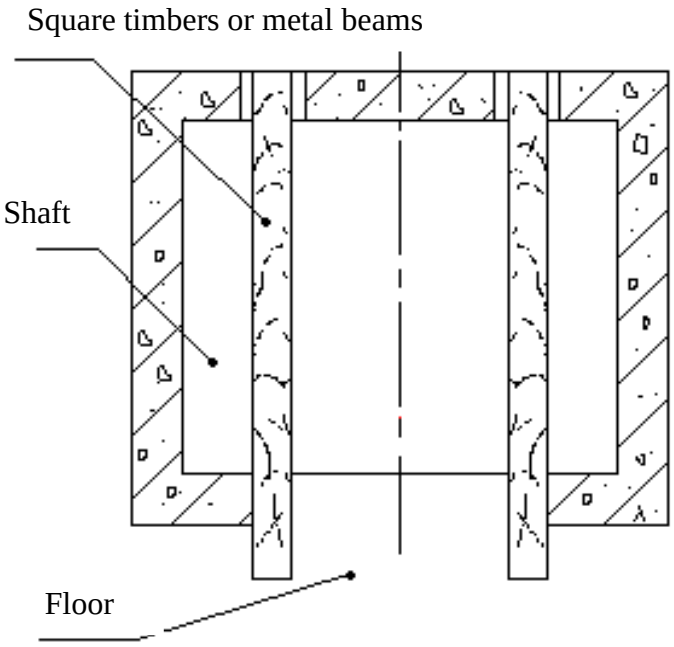


图 11-1

Figure 11-1

- 下梁定位

- **Positioning of under beam**

将下梁平放于顶层井道内的支撑横梁上，校正下梁上平面的水平度不应超过 2/1000。

The under beam is flat laid on supporting beam in the top-layer shaft, and the levelness of upper plane of under beam should be calibrated no more than 2/1000.

- 直梁安装

- **Installation of straight beam**

注意：待调准后，请用扭力扳手在 210Nm 力矩下收紧螺栓

Attention: Torquewrench is used to tighten bolt with the moment of force of 210Nm after alignment.

- 调整直梁

- **Adjust straight beam**

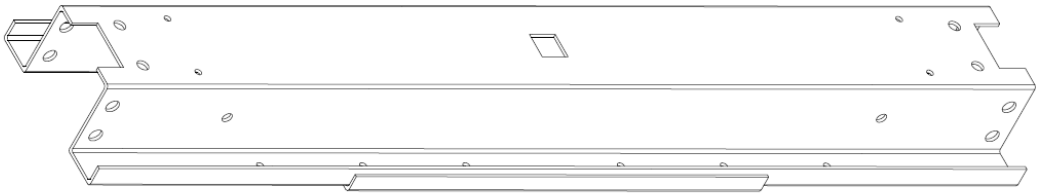
注意：利用水平仪和直角尺，使侧梁面垂直于下梁面

Attention: Level gauge and square rule are used to make side beam surface

perpendicular to beam surface.

- 安装上梁

- **Install upper beam**



注意： 待调准后，请用扭力扳手在 210Nm 力矩下收紧螺栓

Attention: Torquewrench is used to tighten bolt with the moment of force of 210Nm after alignment.

- 调整上梁

- **Adjust upper beam**

注意： 请用水平尺调节上梁水平度

Attention: Level gauge is used to adjust levelness of upper beam.

- 安装安全钳提拉机构

- **Install lifting mechanism of safety gear**

在组装完上梁后．将装在上梁的安全钳的各拉杆装好紧固。安全钳开关装好，调整两侧对称动作一致，安全钳开关动作可靠，使之在安全钳装置动作瞬时即断开控制回路，然后将带动楔块的拉杆旋人楔块，拧紧为止．最后再作一遍检查调整。

The pull rod of safety gear installed on upper beam is fastened after the upper beam is assembled. When the switch of the safety gear is installed, the symmetrical operation on both sides is adjusted to keep consistent. The switch action of safety gear is reliable so that the control loop is off instantaneouslywhen the safety gear operates, and then the pull rod driving wedge is rotated into the wedge and tightened. Finally, inspection and adjustment are conducted again.

- 安装安全钳

● Install safety gear

将安全钳与下梁用螺栓紧固，对于渐进式安全钳保证两楔块与导轨的两侧间隙为 3 mm

The safety gear and under beam are tightened with bolt. For progressive safety gear, it should be ensure that the interval at both sides of wedge and guide rail is 3mm.

注意： 安全钳用标准件，请用扭力扳手在 110Nm 力矩下收紧螺栓

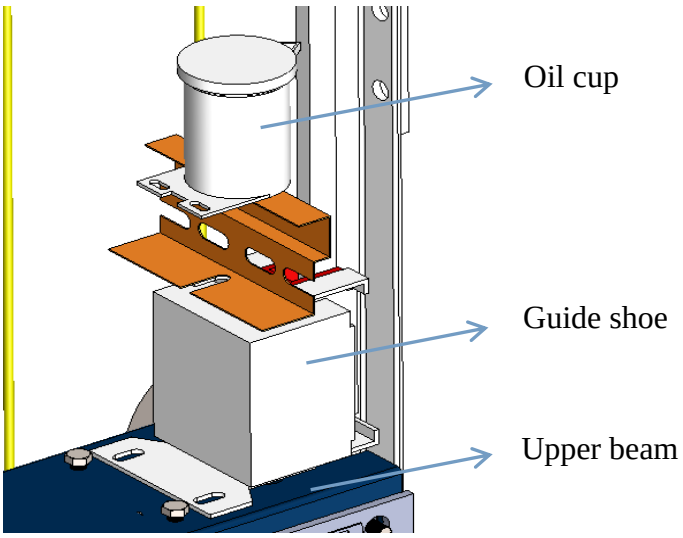
Attention: Torquewrench is used to tighten bolt with the moment of force of 110Nm for standard parts suitable for safety gear.

● 安装油杯

● Install oil cup

标准安装方式如下图，如底坑深度不够，采用上梁安装

The standard installation method is shown in the following figure. In case thepit is not deep enough, the oil cup is installed on the upper beam.



- 安装轿底与轿架拉条
- **Install the tension bar on the car platform and frame**

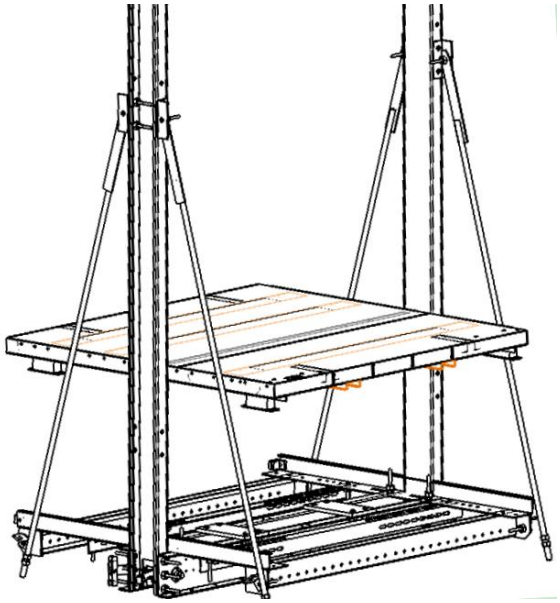


图 11-3

Figure 11-3

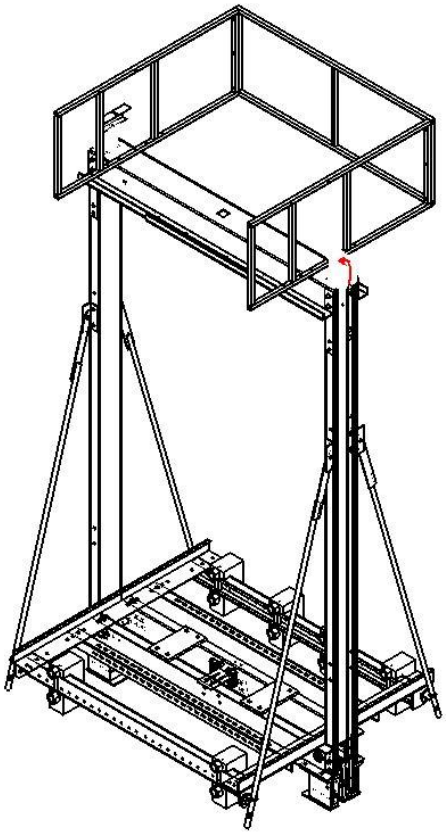


图 11-4 有机房轿架示意图

Figure 11-4 Schematic Diagram of Machine Room Car Frame

安装轿顶反绳轮

Install diversion sheave of car roof

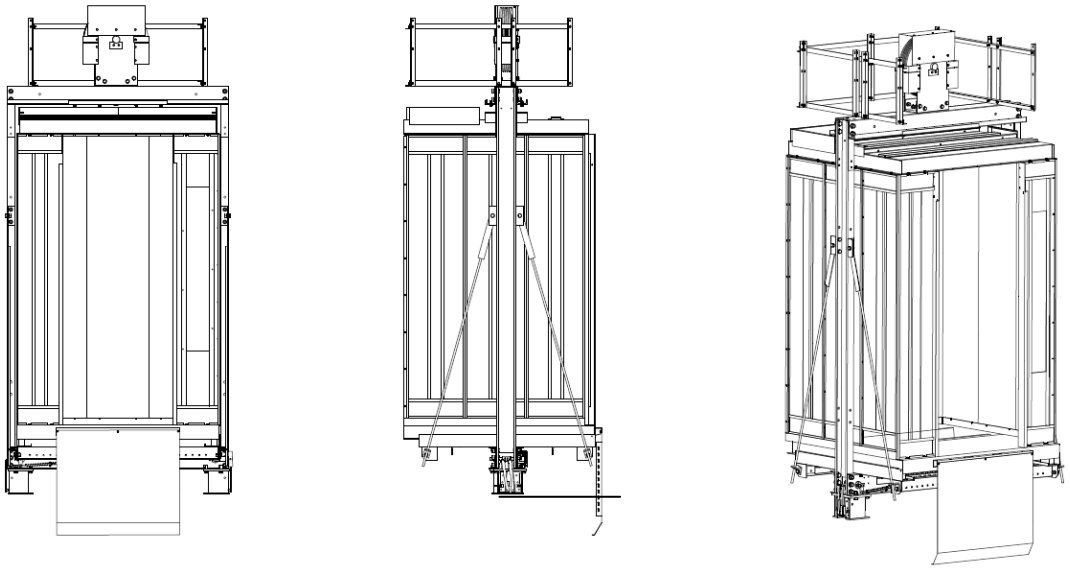


图 11-5

Figure 11-5

轿顶轮（弹簧型和橡皮型）

Car crosshead sheave (spring and rubber)

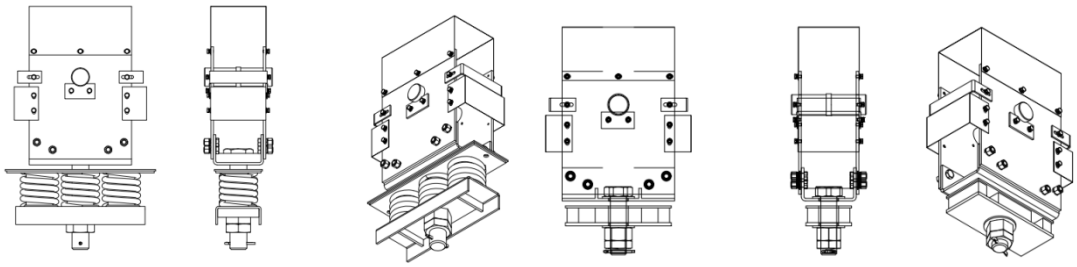


图 11-6

Figure 11-6

11.2 无机房轿架结构：

11.2 Structure of car frame without machine room

轿架由轿底、立梁、上梁、轿顶组成。

The car frame consists of car platform, vertical beam, upper beam and car roof.

为了确保曳引钢带在轿厢滑轮上的位置正确，必须检查平台和上梁水平，并用扭矩扳手收紧立梁螺栓。

To ensure correct position of traction steel strip on the car pulley, the level of platform and

upper beam must be inspected, and the torque wrench is used to tighten bolts for vertical beam.

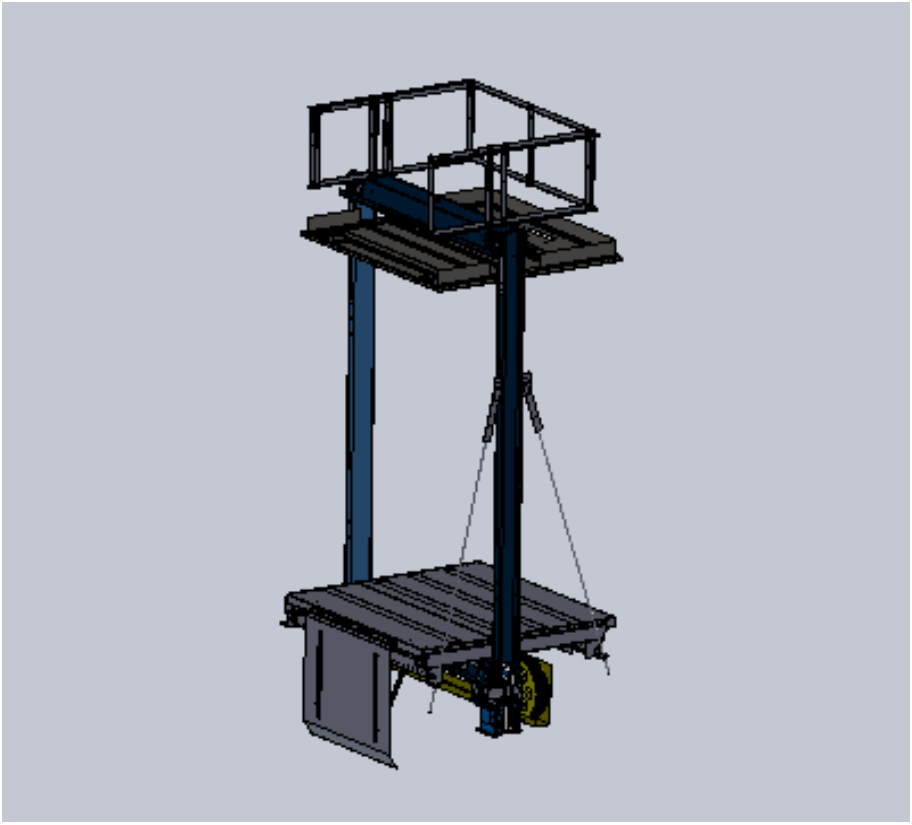


图 11-7

Figure 11-7

11.2.1 轿底的安装

11.2.1 Installation of car platform

如图所示将轿底吊入井道，根据土建图定位轿底，然后调整轿底水平，如有需要加装垫片。

The car platform is lowered into the shaft, as shown in the figure. The car platform is positioned as per the civil engineering drawing, and then its level is adjusted. Gasket is added if required.

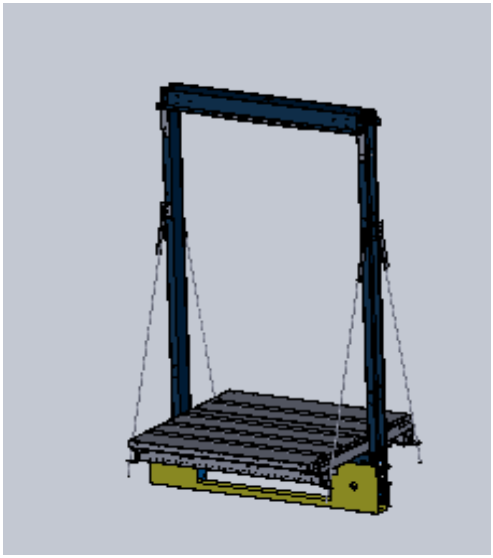


图 11-8

Figure 11-8

11.2.2 轿顶和上梁安装

11.2.2 Installation of car roof and upper beam

将轿顶和上梁吊入井道，置于轿底平台上，将轿架立梁和上梁固定，再将轿顶和上梁连接。吊起上梁并将轿厢立梁与轿底平台固定。

The car roof and upper beam are lowered into the shaft and placed at the car platform. The vertical and upper beams of the car frame are fixed, and then the car roof and upper beam are connected. The upper beam is lifted; the vertical beam and car platform are fixed.

检查轿架立梁垂直度，然后使用扭矩扳手在 210Nm 拧紧螺栓。

The perpendicularity of the vertical beam is checked; and the bolts are tightened by torque wrench with force of 210Nm.

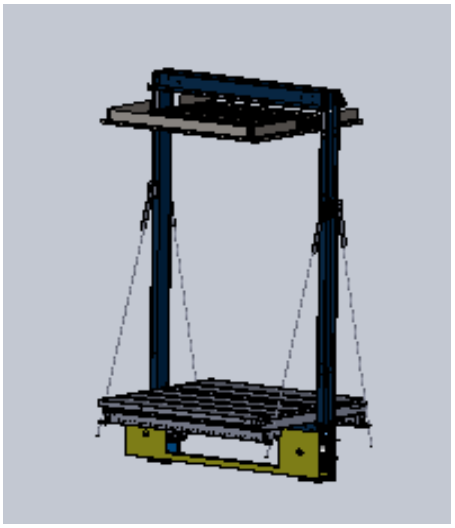


图 11-9

Figure 11-9

11.2.3 无机房电梯轿底轮安装示意图

11.2.3 Installation diagram of car platform pulley of elevator without machine room

将轿底轮安装盒子上表面与下梁下表面连接，轿底轮安装盒子下表面与安全钳上表面连接。

Connect the upper surface of installation box of car platform pulley and lower surface of under beam; connect lower surface of installation box of car platform pulley and upper surface of safety gear.

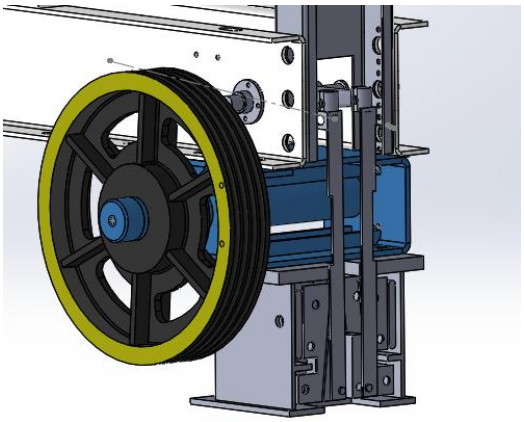


图 11-10a
Figure 11-10a

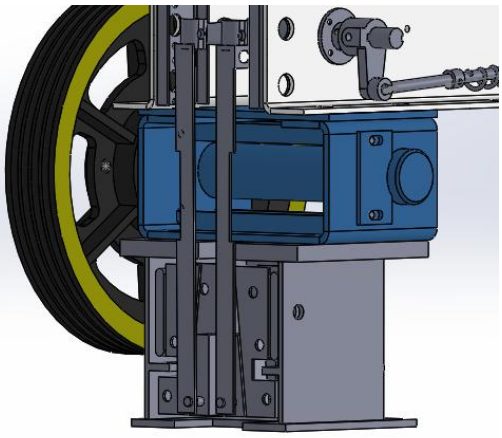


图 11-10b
Figure 11-10b

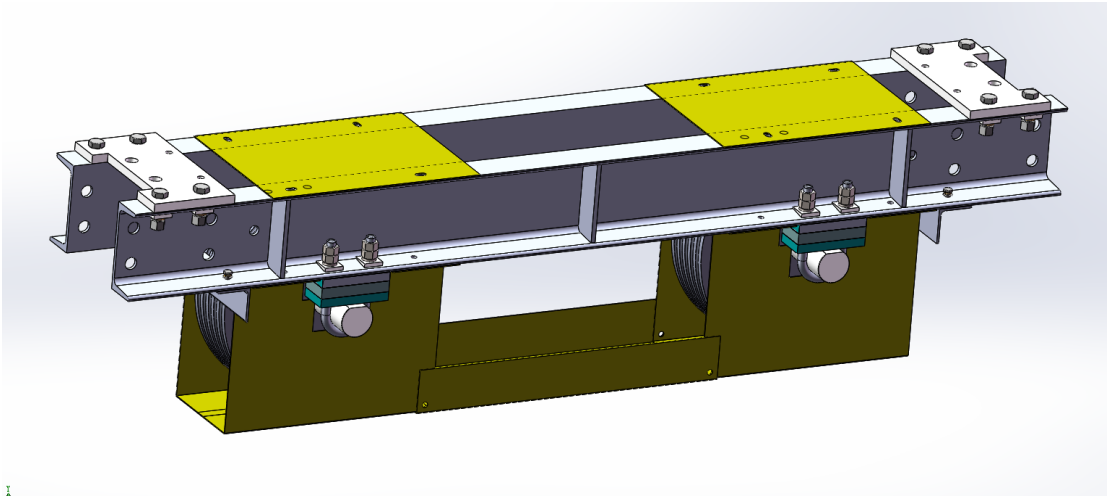


图 11-11 无机房轿顶双轮结构
Figure 11-11 Two-wheel Structure of the Machine-room-less Car Top

11.2.4 无机房电梯平台检修插销安装示意图

11.2.4 Installation diagram of platform maintenance pin of elevator without machine room

将平台检修插销安装与上梁侧面一侧，用压导板同检修安全插销板固定在导轨上，插销插入孔位。

The platform maintenance bpin is installed in a side of upper beam. The pressure guide plate and maintenance pin board are fixed on the guide rail. The pin is inserted into a hole site.

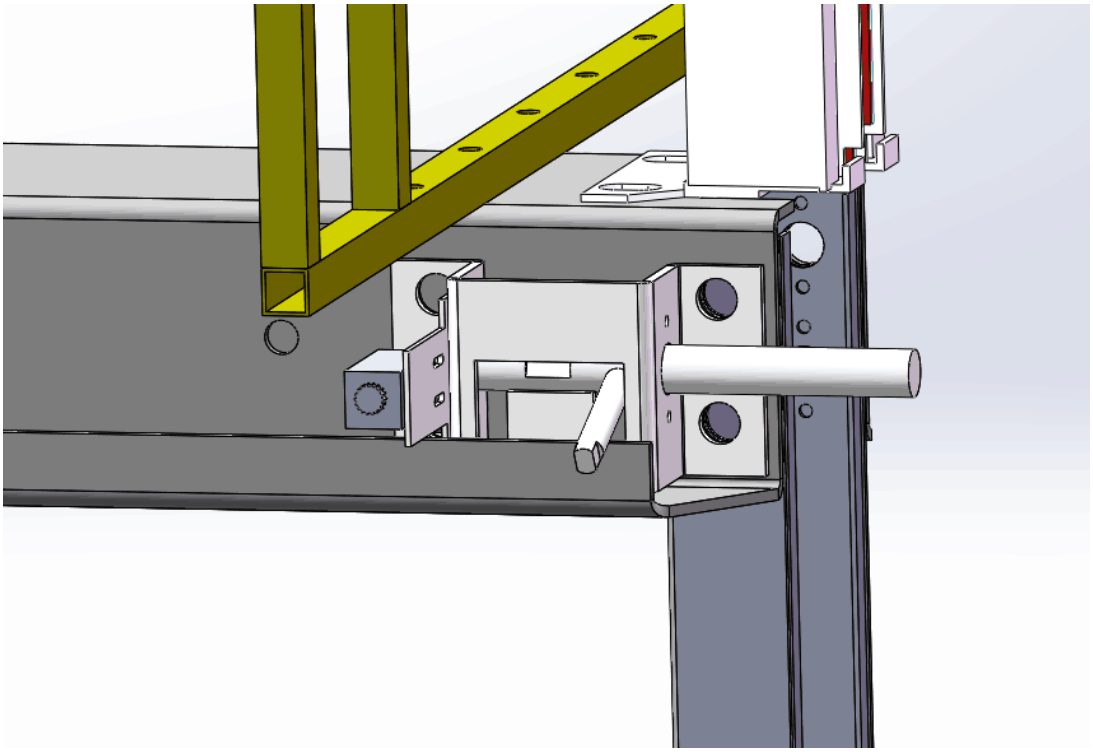


图 11-12 无机房轿顶双轮结构

Figure 11-12 Two-wheel Structure of the Machine-room-less Car Top

12．轿厢安装 Installation of car

- 安装轿厢围壁
- Install enclosure of car

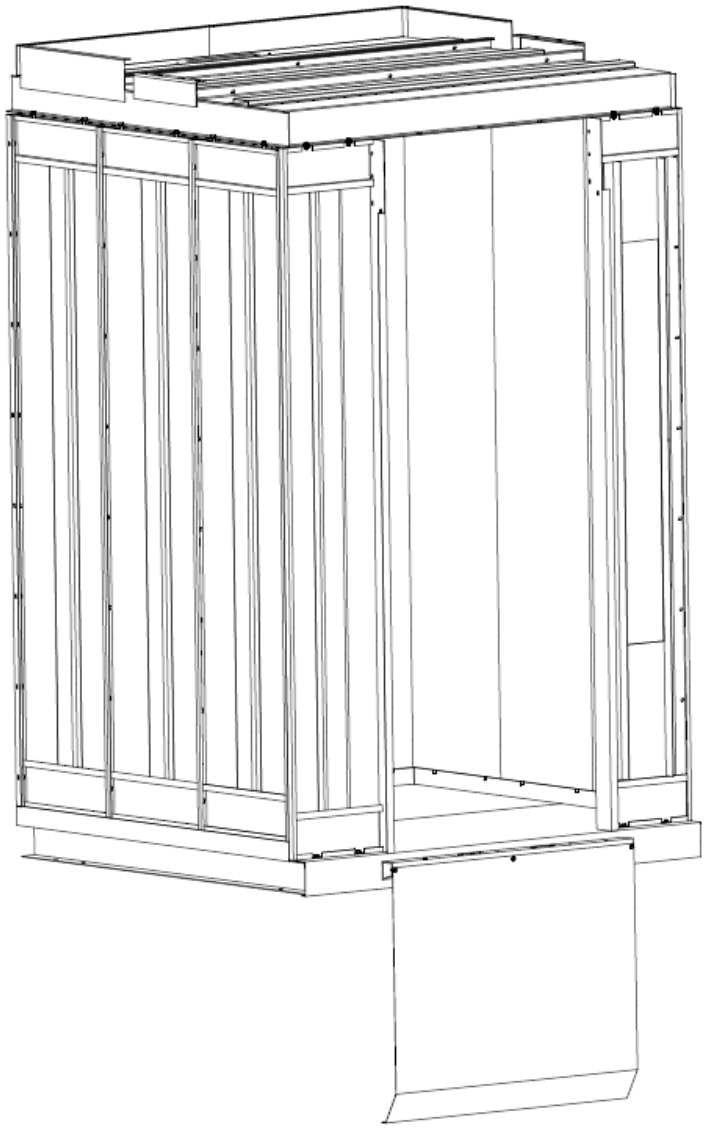


图 12-1 普通型轿箱（有围板）

Figure 12-1 Ordinary car (with hoarding)

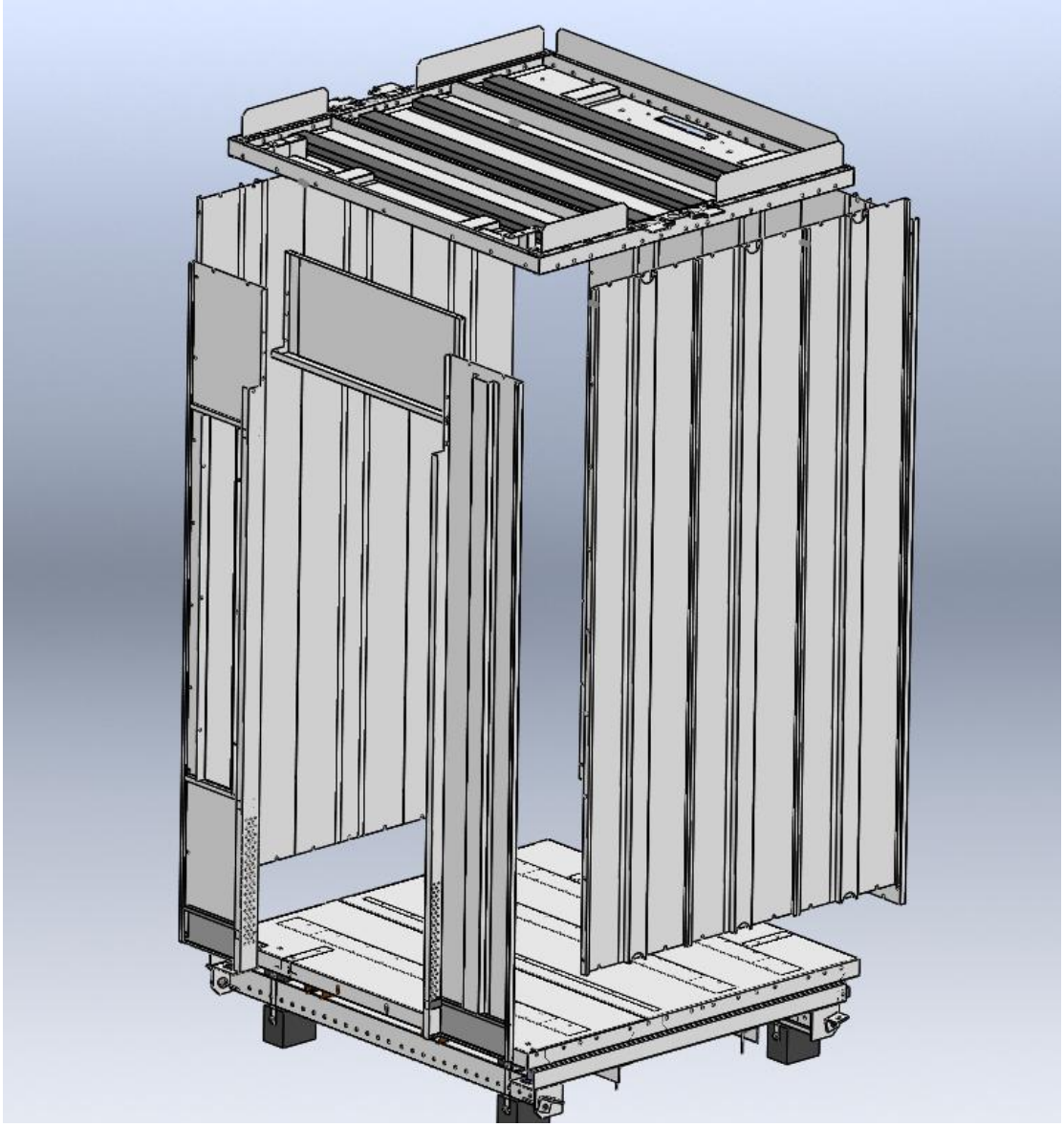


图 12-2 插壁式安装示意图

Figure 12-2: Wall-type Installation Diagram

第一步：同侧轿壁间螺栓连接；

First step: Bolted connection between the same side car wall;

第二步：松开轿底螺栓，首先后侧轿壁其次左右两侧轿壁插入轿底，并拧紧螺栓；

Second step: Loosen the bottom bolt, to first insert the car wall on the rear side and then on the left and right sides to the car platform and tighten the bolt;

第三步：轿底与前壁，门楣螺栓连接；

Third step: The car platform is connected to the front wall and the door header bolt;

第四步：松开轿顶螺栓，轿顶从上部吊装与轿壁连接；

Fourth step: Loosen the car top bolt, and lift the car top from the upper part to be connected to the car wall;

第五步：安装分体式操纵箱或一体式操纵箱（此图为分体式操纵箱示例）；

Fifth step: Install a split car operation panel or an integrated car operation panel (this Figure is an example of a split car operation panel);

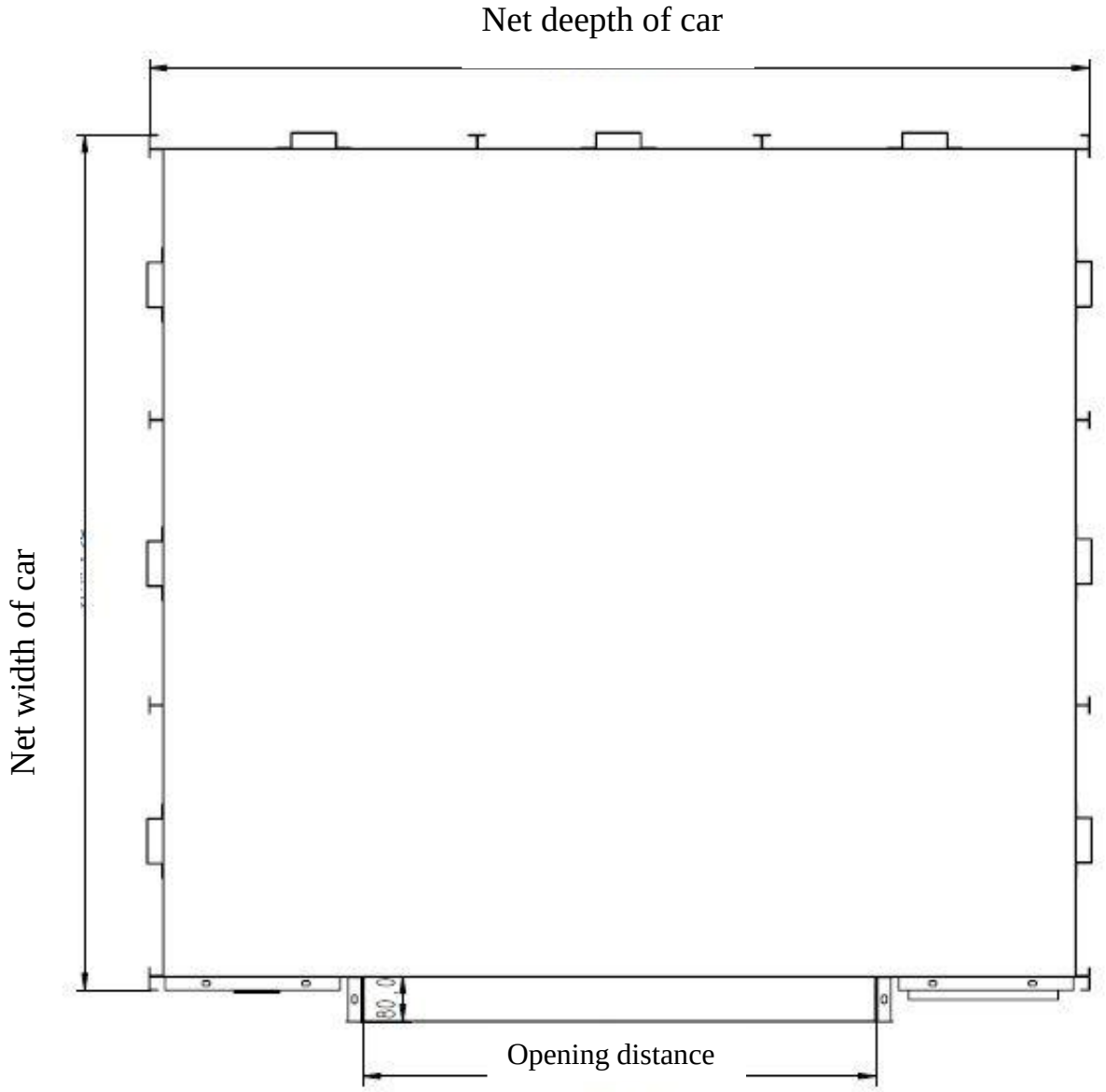


图 12-3 轿厢拼装平面图

Figure 12-3Car Assembly Plan

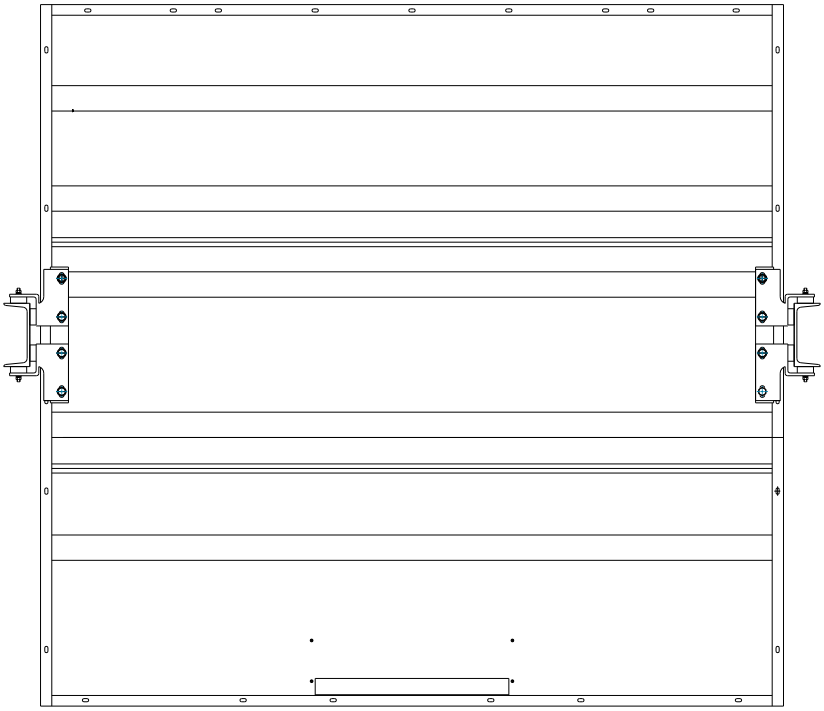


图 12-4 安装轿顶

Figure 12-4 Install car roof

标准件规格：轿顶与围壁

Specification of standard parts: car roof and enclosure

螺栓：GB5783-86 M6*25

Bolt: GB5783-86 M6*25

平垫：GB97.1-85 6

Flat washer: GB97.1-85 6

弹垫：GB93-87 6

Spring washer: GB93-87 6

螺母：GB6170-86 M6

Nut: GB6170-86 M6

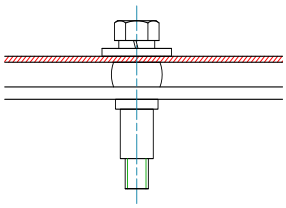


图 12-5 轿顶和围壁螺栓连接

Figure 12-5 Connection between Car Top and Wall Bolt

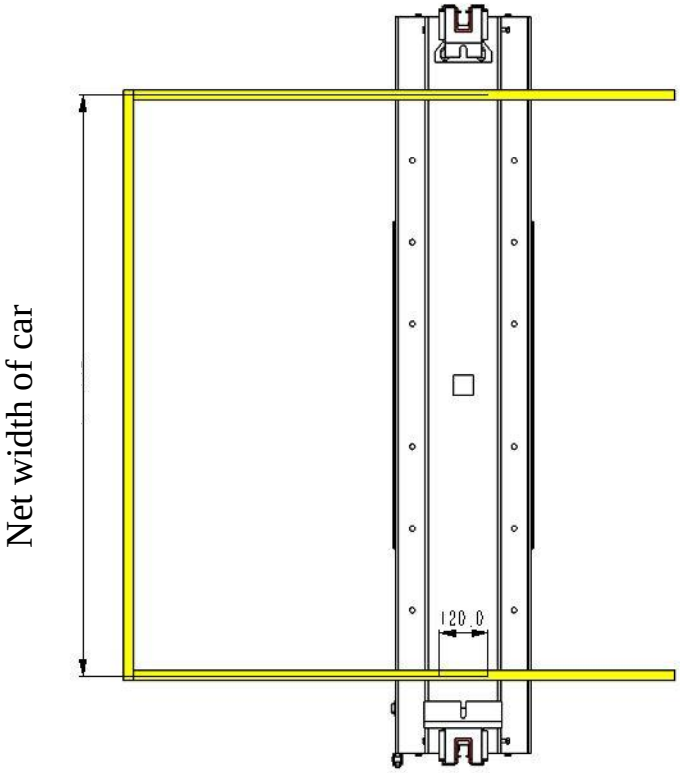


图 12-6 安装轿顶护栏

Figure 12-6Install car top guard

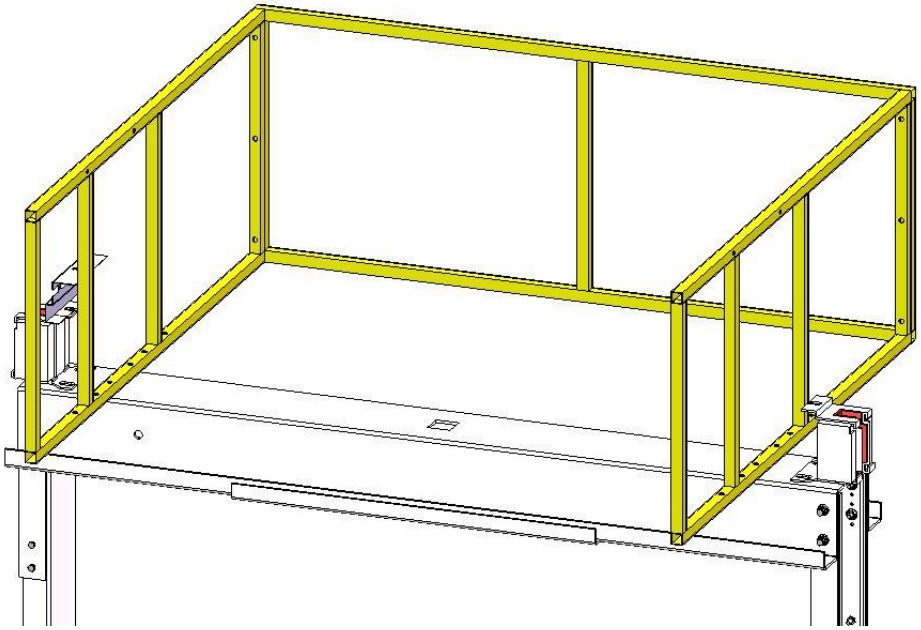


图 12-6 轿顶护栏三维示意图

Figure 12-6 Three-dimensional schematic diagram of car top guard

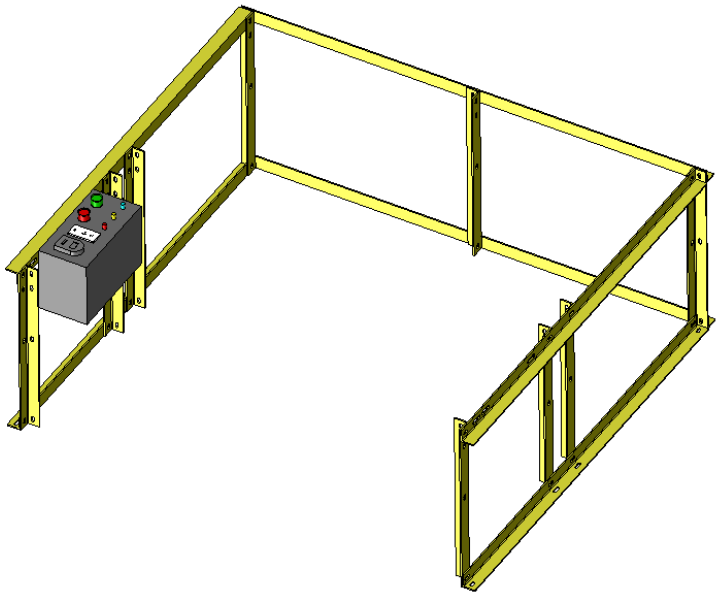


图 12-7 安装轿顶检修箱

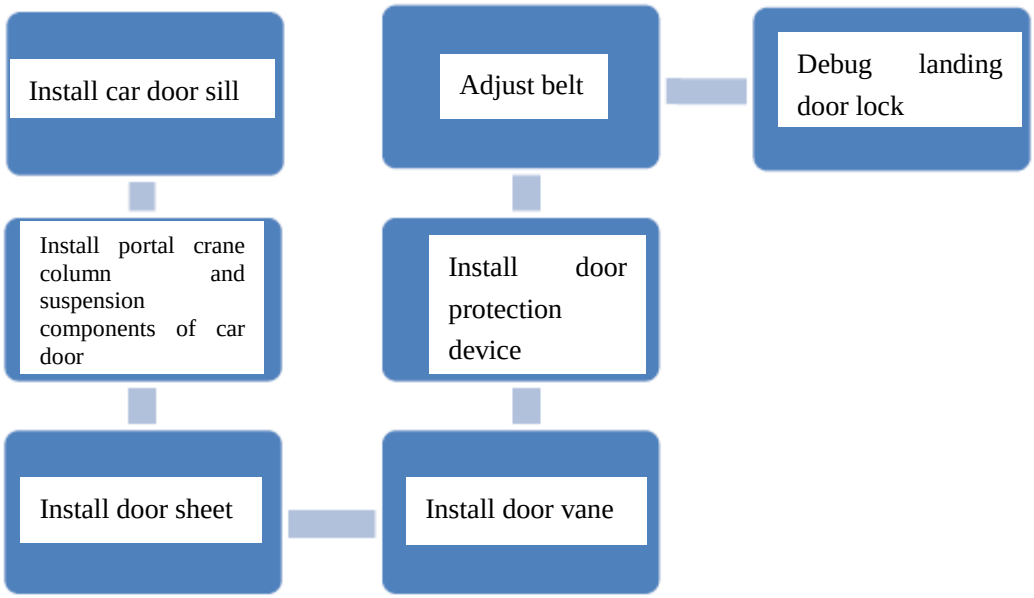
Figure 12-7 Install car top maintenance box

客梯轿顶检修盒安装在易于接近轿门方向一侧，应需打开厅门三角锁，手可以够到拍下检修开关为宜。

Car top maintenance box of passenger elevator is installed in a side easily accessible to car door so that the triangulation chain of landing door needs to be opened and people can touch the service switch.

安装电梯门机和轿门 Install elevator door motor and car door

Steps for installing car door



安装轿门地坎

Install car door sill

a. 安装地坎托架和地坎组件

a． Install sill bracket and components

b. 测量轿厢地坎的水平度，令其小于：1/1000。

b． Measure levelness of car sill so that it is less than 1/1000.

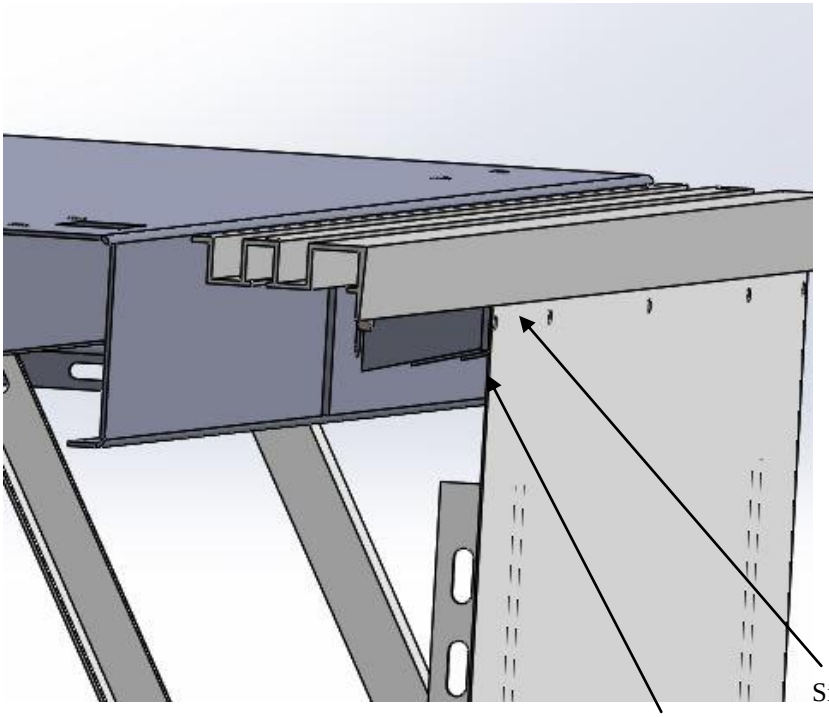


图 12-8 地坎托架

Figure 12-8 Sill bracket

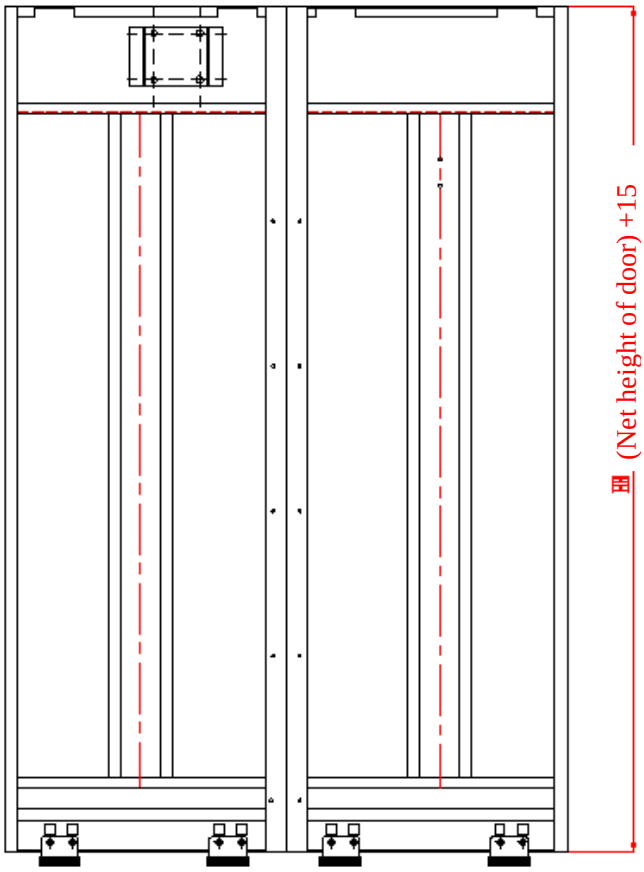


图 12-9 安装轿门

Figure 12-9 Install car door

要求装上的两块门导轨是在一条直线上。在挂上轿门后必须做到：①门板与地坎距离为4mm,轿门与轿厢前壁之间距离为 4mm；②两扇轿门上下必须在一个平面上。检查方法就是用钢直尺靠两块门板的上下端,看它是否平整；③门板的正面、侧面必须垂直，这样才能保证关闭中缝整齐，同时打开之后，与轿厢前壁并齐。安装完轿门后，可以手动开关门，整个开关过程应该轻松、平稳。

The two door guides installed should be in the same line. When the car door is mounted, it should be ensure that ①the distance between door sheet and sill is 4mm; between car door and front car wall is 4mm; ②two car doors should be on a plane. The levelness is inspected with straight steel ruler at the up and down ends of the door sheet; ③the front of the door sheet must be perpendicular to its sides to ensure that the centre joint is in order when closed and align with front car wall when opened. When the car door is installed, it can be opened and closed with hand easily and stably.

安装门机悬挂组件

Install suspension components of portal crane

连接门机与轿顶连接座安装

Install connection portal crane and connection base of car roof

因为许多门机构的门电机、门导轨、活动臂、门挂板等，在出厂前已装成一个整体，所以安装这类型开门机构在装上支撑件和开门机构后，首先要求确定门导轨的高度，同时保证它的水平度，其次是调整机架，使门导轨正面与轿厢地坎槽内侧垂直(也就是从门导机两端

吊垂线至轿厢地坎槽内侧)。第三，调整好门机本身的垂直度。检查方法就是线垂吊皮带轮，或线垂吊门机架与门导轨两端接板使之垂直，调整好后拧紧联接螺丝。

As the door motor, guide, moving arm and strap are assembled before delivery, we should first determine the height of the door guide and ensure its levelness, and then adjust rack so that the front of door guide is perpendicular to the inner side of car sill groove after the supporting parts and opening mechanism are installed (i.e. the vertical line is lowered from two ends of door guide to inner side of car sill groove); thirdly, we should adjust the perpendicularity of portal crane. The inspection method is to hang belt pulley or boards at the ends of door rank and guide with line so that they can perpendicular with each other. The connection screw is tightened after adjustment.

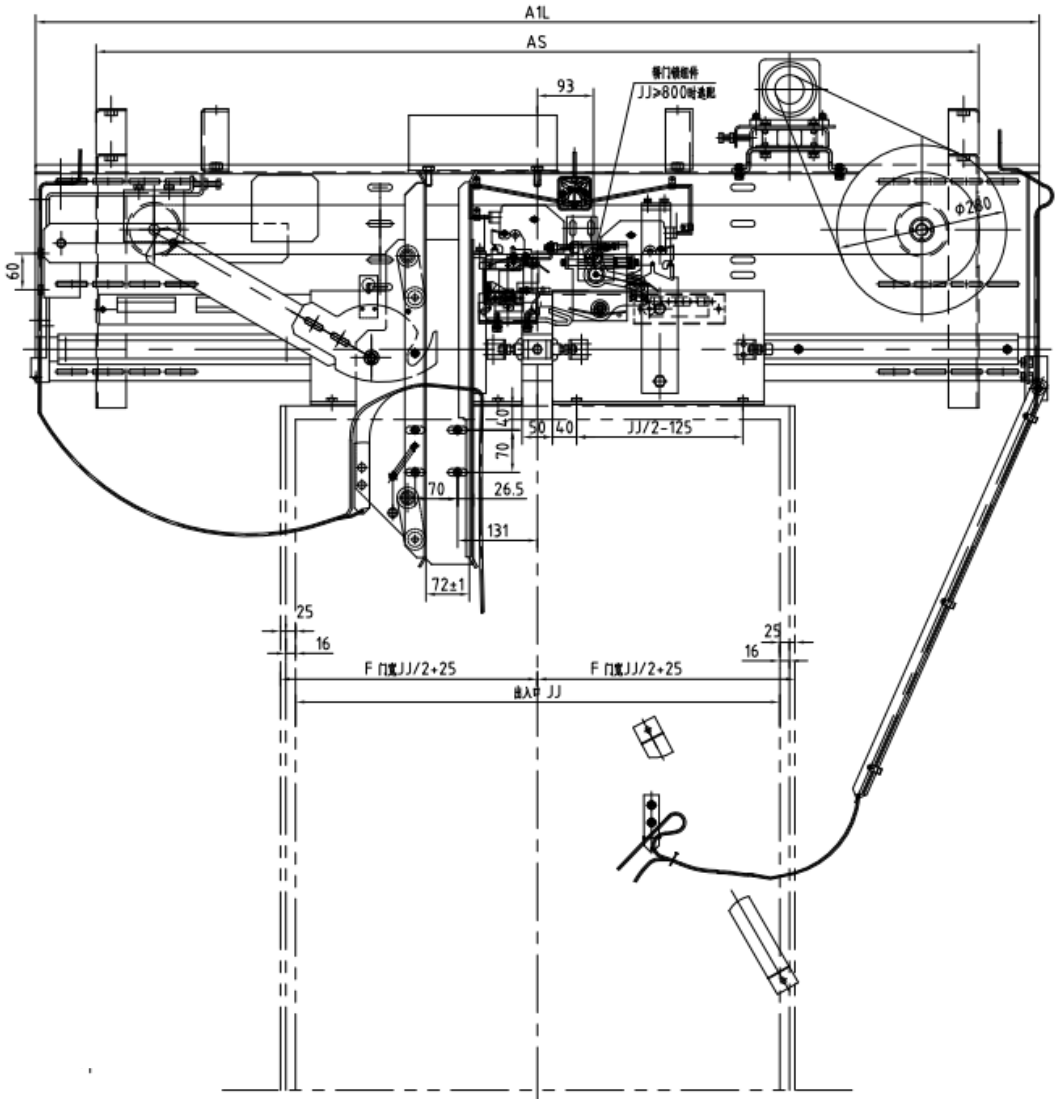


图 12-10 门机与轿门连接示意图（仅供参考，以实际为准）

Figure 12-10 Schematic Diagram of the Connection between the Portal Crane and the Car Door (for reference only, subject to the practice)

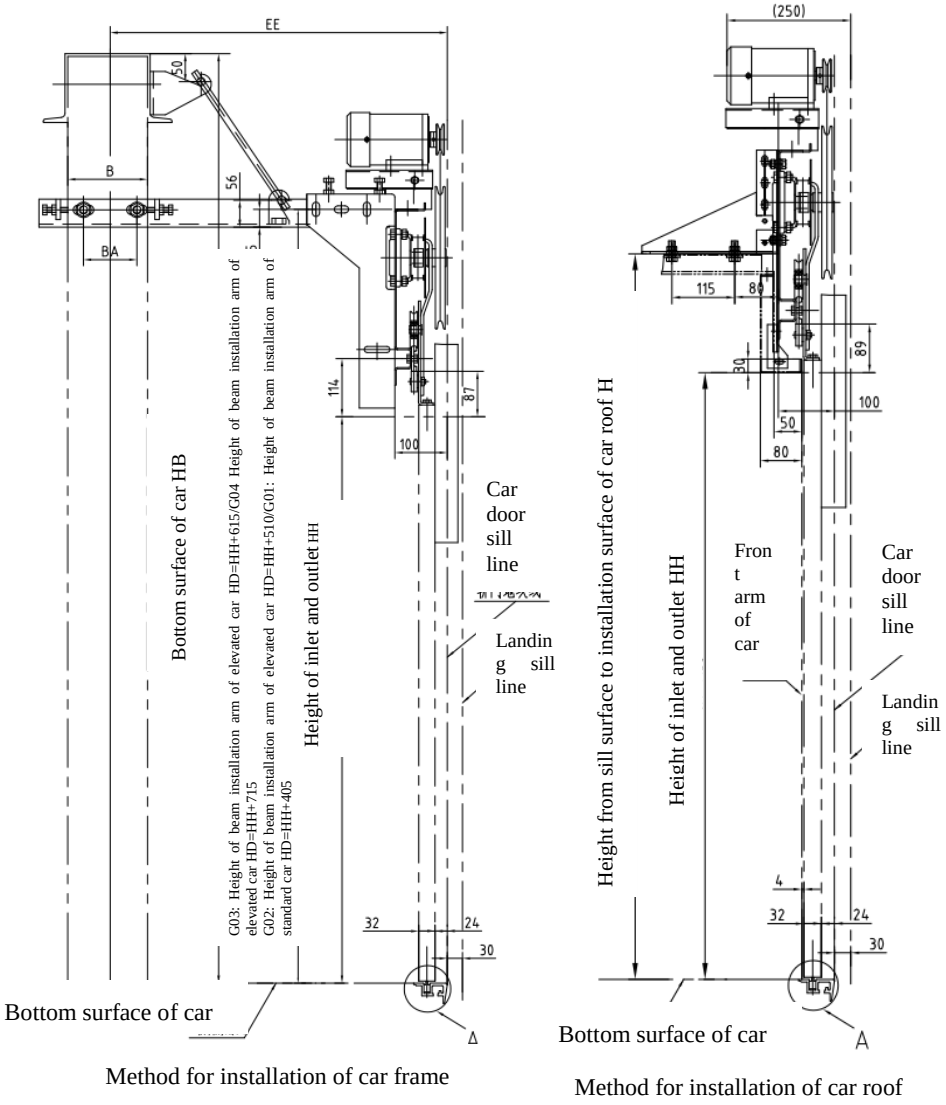


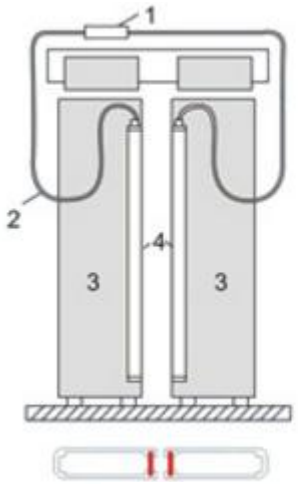
图 12-10 门机与轿门连接方式

Figure 12-10 Connection Mode of Portal Crane and Car Door

安装光幕

Install light curtain

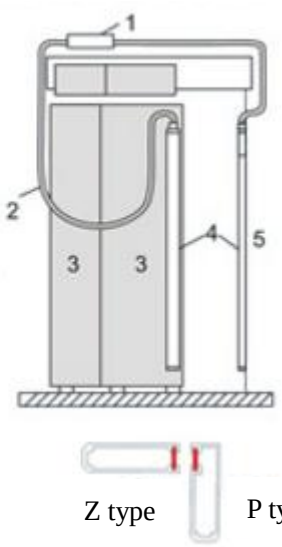
Installation diagram of center-opening elevator light curtain



Z type

1. Power supply box of main machine
2. Signal cable
3. Car door
4. Assembly of emitter and receiver
5. Car side

Installation diagram of bi-fold elevator light curtain



Z type P type

图 12-11 光幕安装

Figure 12-11 Light Curtain Installation

调整皮带

Adjust belt

调节同步带的张紧力和门头钢丝绳的张紧力，如图；

Adjust tension force of synchronous belt and door-head wirerope, as shown in the following figure:

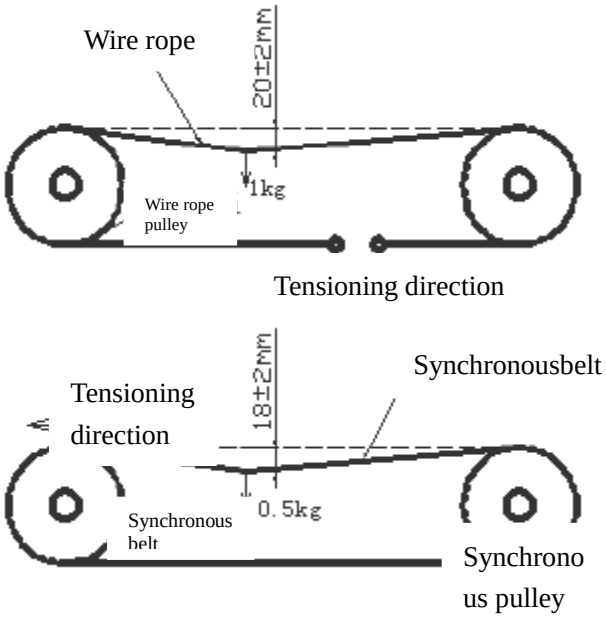


图 12-12 皮带调节

Fihure 12-12 belt adjustment

调试厅门锁

Adjust landing door lock

a. 厅门锁的调试位置，如图：

a. Debugging position of landing door lock, as shown in the following figure:

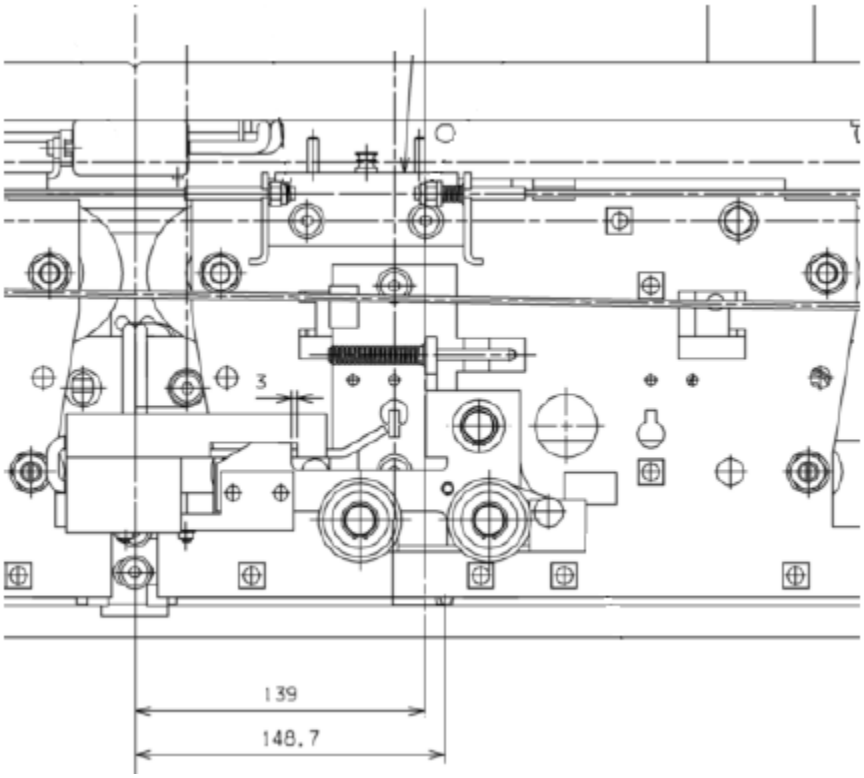


图 12-13 门锁调节

Figure 12-13 Door Lock Adjustment

b. 锁钩上的划线与锁挡块的下平面应在一平面，如图 12-14。

b. Scoring on the lock hook and lower surface of lock stop dog should be in a plane, as shown in the following figure:

Scoring on the landing lock hook and lower surface of lock stop dog are in a plane

图 12-14 锁钩调节

Figure 12-14 Latch Hook Adjustment

c. 门刀与厅门锁的滚轮中心重合（见图）。当两者不重合时，会出现厅门和轿门关门不同步的现象。

c. The centers of roller of door vane and landing door lock coincide (see the figure). When they do not coincide, the closing of landing door will be non-synchronous with car door.

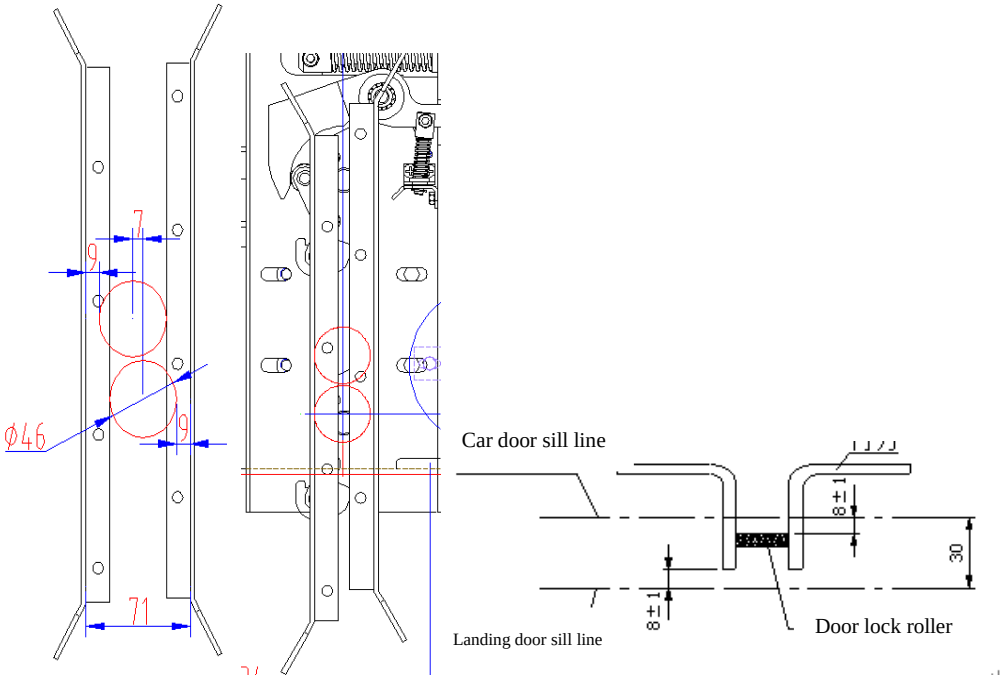


图 12-15a 门刀打开状态图 12-15b 门刀闭合状态

Figure 12-15a Open State of the Door Vane Figure 12-15b Closure State of the Door Vane

d. 厅门门锁滚轮与轿门地坎间的距离

d. Distance between roller of landing door lock and car door sill.

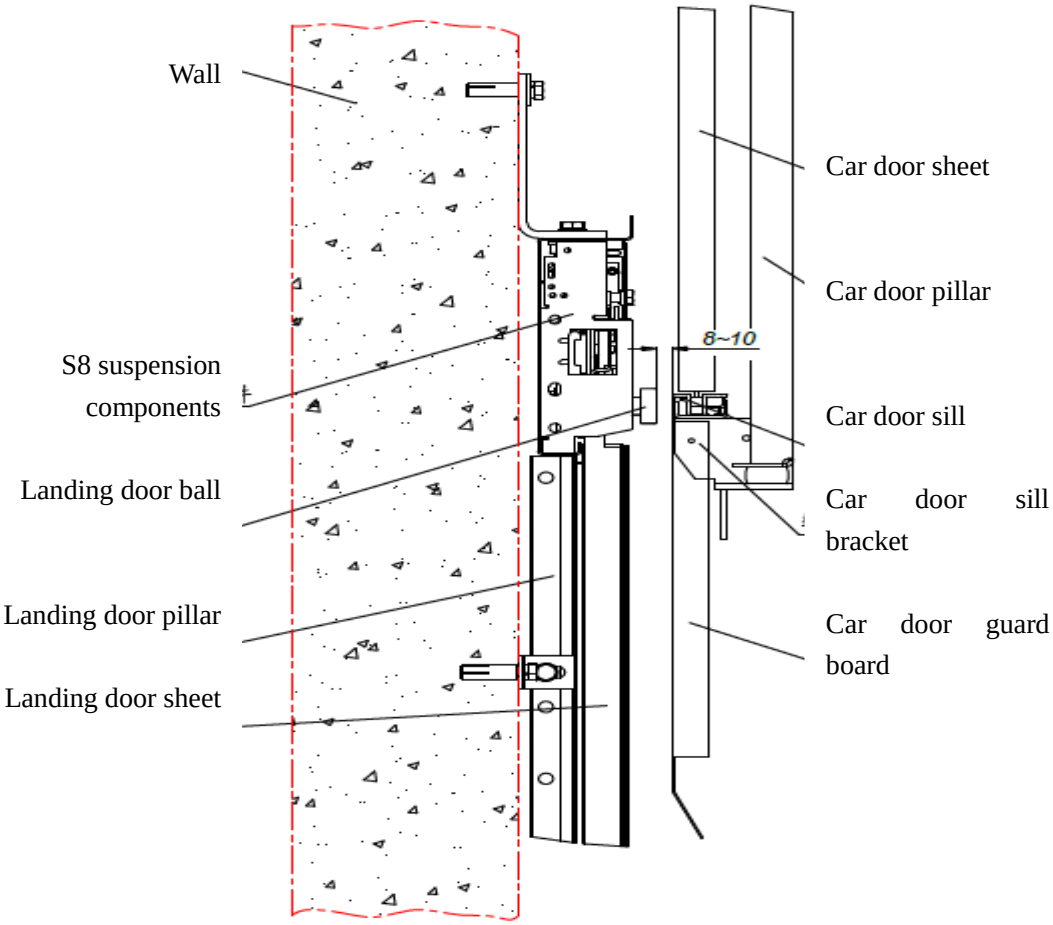


图 12-16 厅门门锁滚轮与轿门地坎

Figure 12-16 Landing Door Lock Roller and Car Door Sill

13. 安装井道信息 Information of installed hoistway

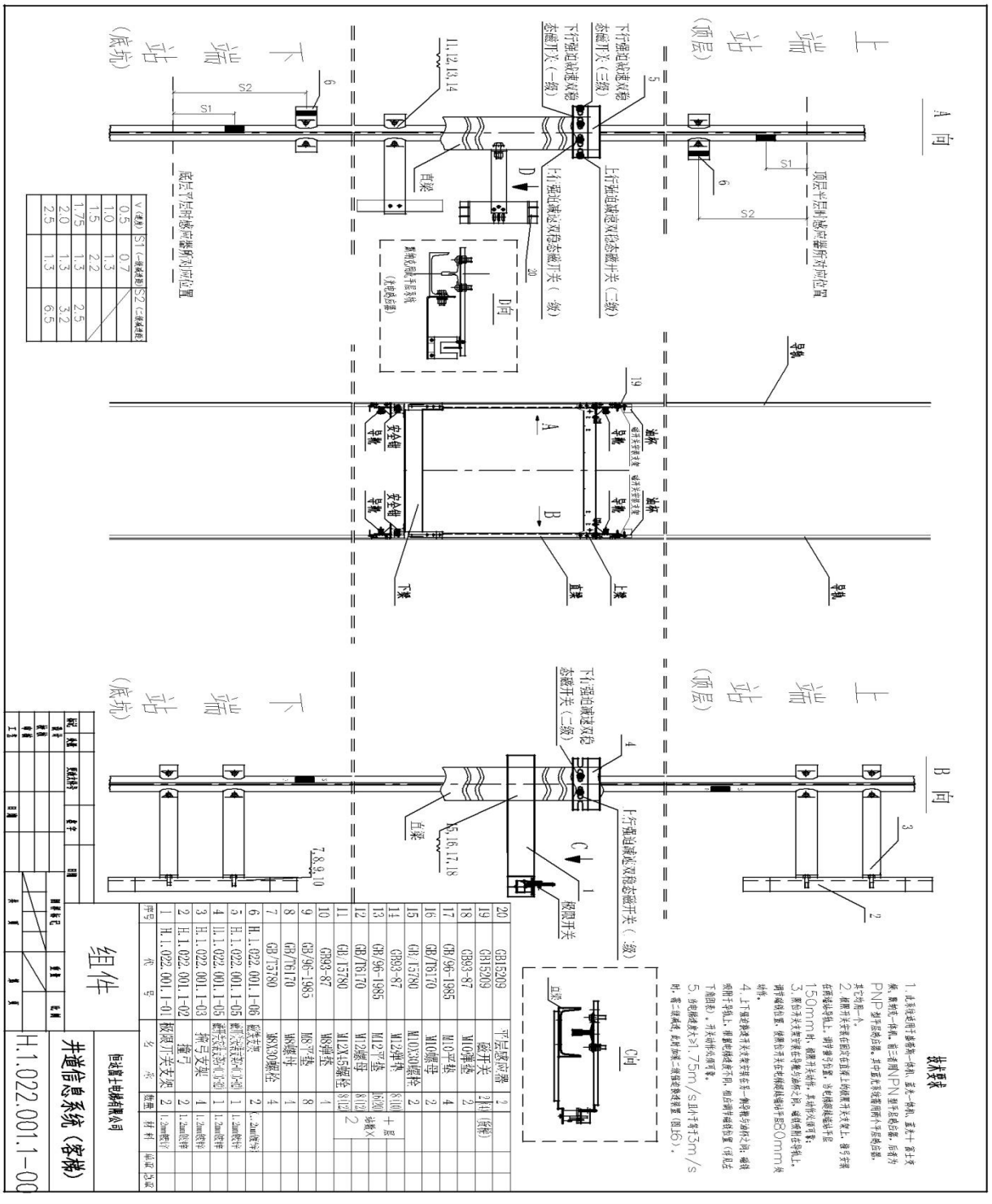


图 13-1 井道信息安装图

Figure 13-1 Shaft Information Installation Diagram

上端站（顶层）	Upper end layer (top layer)
下端站（底坑）	Lower end layer (pit)
下行强迫减速双稳态磁开关（三级）	Downward forced deceleration bi-stable magnetic switch (third level)
下行强迫减速双稳态磁开关（一级）	Downward forced deceleration bi-stable magnetic switch (first level)
顶层平层时感应器所对应位置	Corresponding position of sensor at the level of top layer
上行强迫减速双稳态磁开关（三级）	Upward forced deceleration bi-stable magnetic switch (third level)
上行强迫减速双稳态磁开关（一级）	Upward forced deceleration bi-stable magnetic switch (first level)
直梁	Straight beam
底层平层时感应器所对应位置	Corresponding position of sensor at the level of bottom layer
D 向	D direction
默纳克用平层系统（光电感应器）	Monarch leveling system (Photoelectric sensor)
油杯	Oil cup
磁开关安装支架	Magneticswitchmounting bracket
导靴	Guideshoe
安全钳	Safety gear
上梁	Straight beam
下行强迫减速双稳态磁开关（二级）	Downward forced deceleration bi-stable magnetic switch (second level)
上行强迫减速双稳态磁开关（二级）	Upward forced deceleration bi-stable magnetic switch (second level)
极限开关	Limit switch
速度	Speed
S1（一级减速距）	S1 (Primary deceleration distance)
S2（二级减速距）	S2 (Second deceleration distance)
标记	Sign
设计	Designed by
校核	Checked by
审核	Verified by
工艺	Process
更改文件号	Change file No.
签字	Signed by
日期	Date
组件	Component
重量	Weight
比例	Proportion
第页，共页	Page of

浙江富基进出口有限公司	Zhejiang FUJICN Elevator Co., Ltd.
井道信息系统（客梯）	Hoistway information system (passenger elevator)
技术要求 1．此系统适用于盛蒂斯一体机、蓝光一体机、蓝光+富士变频、默纳克一体机。前三者用NPN 型平层感应器，后者为 PNP 型平层感应器，其中蓝光系统需用两个平层感应器，其他均用一个。 2．极限开关安装在固定在直梁上的极限开关支架上。撞弓安装在两端站导轨上。调节撞弓位置，当电梯超越端站平层1500mm 时，极限开关动作，其动作必须可靠。 3．限位开关支架安装在导靴与油杯之间，磁铁吸附在导轨上。调节磁铁位置，使限位开关在电梯超越端站平层 80mm 处动作。 4．上下强迫换速开关支架安装在另一侧导靴与油杯之间：磁铁吸附于导轨上，根据电梯速度不同，相同调节磁铁位置（详见左下角图表）。开关动作必须可靠， 5．当电梯速度≥1.75m/s 且小于等于 3m/s 时，需二级减速，此时加装二级强迫换速装置（图上 6）	Technical requirements 1. The system is applicable to Shengdisi All-in-one, Languang All-in-one, Languang+Fujifrequency conversion and Monarch All-in-one. The first three is provided with NPN leveling sensor, and the latter with PNP one, of which Languang system needs two leveling sensors and others need one. 2. Limit switch is installed in its bracket fixed on straight beam. Shaftramp is installed on guide rail of station at two ends, and its position is to be adjusted. When the elevator is 1500 above level of end station, the limit switch operates reliably. 3. The bracket of limit switch is installed between guide shoe and oil cup, and magnet is absorbed on guide rail. The position of the magnet is adjusted so that the limit switch operates when the elevator is 80mm above the level of end station. 4. The bracket of upward and downward forced throw-over switch is installed between the guide shoe and oil cup at the other side: the magnet is absorbed on guide rail. The position of the magnet is adjusted according to different speed of elevator (see details in diagram left bottom). Switch operates reliably. 5. When the speed of elevator is greater than or equal to1.75m/s and less than or equal to 3m/s, second slow-down is required. Second forced throw-over device is installed (see Figure 6 above).
平层感应器	Leveling sensor
磁开关	Magneticswitch
M10 平垫	M10 flat washer
M10 弹垫	M10 spring washer
M10 螺母	M10 nut
M10X30 螺栓	M10X30 bolt
M12 弹垫	M12 spring washer
M12 平垫	M12 flat washer
M12 螺母	M12 nut
M12X45 螺栓	M12X45 bolt
M8 弹垫	M8 spring washer
M8 平垫	M8 flat washer

M8 螺母	M8 nut
M8X30 螺栓	M8X30 bolt
磁铁支架	Magnet bracket
磁开关安装支架	Installation bracket of magnetic switch
撞弓支架	Shaftramp bracket
撞弓	Shaftramp
极限开关支架	Bracket of limit switch
序号	SN.
代号	Code
名称	Name
数量	Quantity
材料	Material
单重	Piece weight
总重	Total weight
（货梯）	(Freight elevator)
镀锌	Galvanization
+层	+layer
站数×2	Number of station×2

Upper leveling switch X1, connecting to the mainboard of the frequency converter

Upper door signal FL1

Lower door signal FL2

Lower leveling switch X1, connecting to the mainboard of the frequency converter

Parameters needs to be modified

Password 13957

If the leveling switches use two permanent magnet inductors and two optoelectronic switches, the permanent magnet inductors shall be installed on the inner side of the up-down bend, and the optoelectronic switches shall be installed at the location of the two waist-type holes.

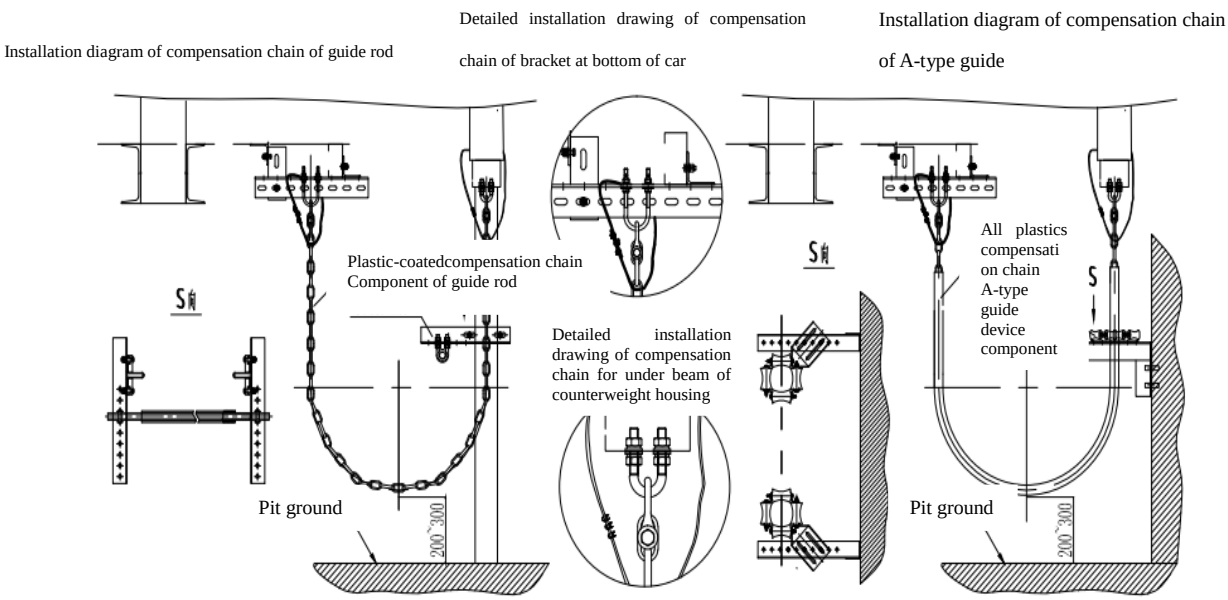


图 13-3 补偿链安装示意图图

Figure 13-3 Installation diagram of compensation chain

补偿链安装注意事项：

Precautions for installation of compensation chain:

1.安装前应将补偿链放松，放平，理直。

1. The compensation chain is loose, keeps flat and straight before installation.

2.导向装置中心线与悬挂点应在同一垂线上。

2. The center line of guide device and suspension point should be at the same vertical line.

3.轿厢侧补偿链安装在轿底托架前后梁与补偿链安装角铁上。

3. The compensation chain at car side is installed on the front and rear beam of bracket at the bottom of car and angle iron.

4.对重侧补偿链安装在对重架下梁安装座上。

4. The compensation chain at counter-weight side is installed mounting base of under beam of counter-weight housing.

5.若包塑补偿链有多余长度，则截去多余补偿链。

5. In case the plastic-coated compensation chain is longer enough, the surplus is cut off.

6.若全塑补偿链有多余长度，则截去多余包塑部分补偿链。

6. In case the all-plastic compensation chain is longer enough, the surplus is cut off.

7.二次保护装置务必安装。

7. Second protection device must be installed.

8.各种安装配合务必牢固按图安装，并按图预留到底坑地面距离。

8. All devices are installed firmly as per the drawings and the distance is reserved to the pit ground.

标准件规格：轿底称重

Specification of standard parts: weight at bottom of car

螺栓：GB5783-86 M8*30

Bolt: GB5783-86 M8*30

平垫：GB97.1-85 8

Flat washer: GB97.1-85 8

斜垫：GB853-88 8

Inclined washer: GB853-88 8

弹垫：GB93-87 8

Spring washer: GB93-87 8

螺母：GB6170-86 M8

Nut: GB6170-86 M8

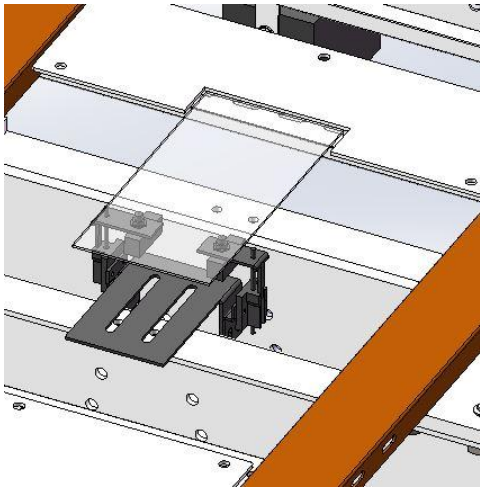


图 13-3 轿底称重安装示意图

Figure 13-3 Installation Diagram of the Weigh of the Car Bottom

标准件规格：平衡块

Specification of standard parts: balance weight

螺栓：GB5783-86 M8*85

Bolt:GB5783-86 M8*85

平垫：GB97.1-85 8

Flat washer:GB97.1-85 8

弹垫：GB93-87 8

Spring washer: GB93-87 8

螺母：GB6170-86 M8

Nut: GB6170-86 M8

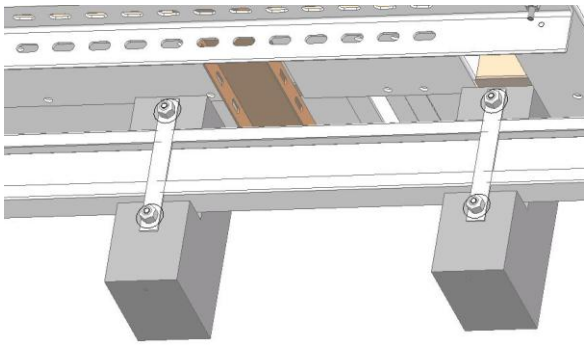


图 13-4 平衡块安装示意图

Figure 13-4 Installation Diagram of the Counterbalance

标准件规格：补偿链支架

Specification of standard parts: bracket of compensation chain

螺栓：GB5783-86 M12*35

Bolt: GB5783-86 M12*35

平垫：GB97.1-85 12

Flat washer:GB97.1-85 12

斜垫：GB853-88 12

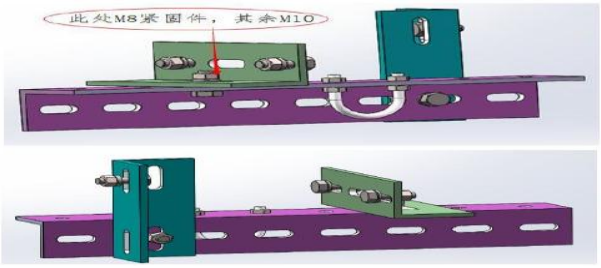
Inclined washer:GB853-88 12

弹垫：GB93-87 12

Spring washer: GB93-87 12

螺母：GB6170-86 M12

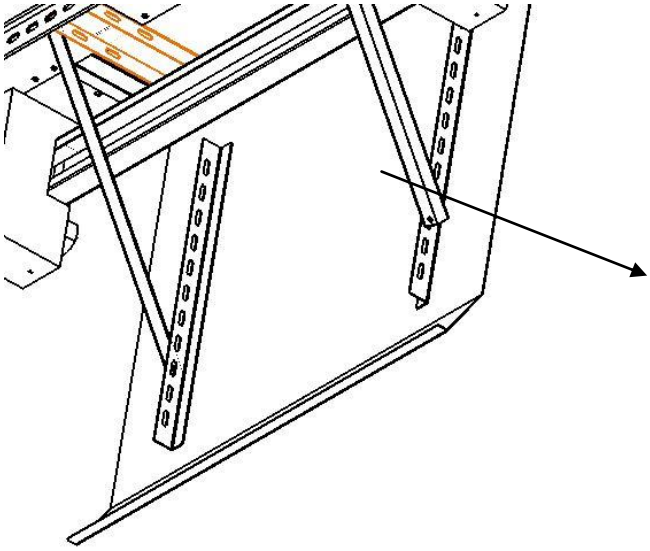
Nut: GB6170-86 M12



此处 M8 紧固件，其余 M10	M8 fastener is here, others are M10.

图 13-5 补偿链支架安装示意图

Figure 13-5 Installation Diagram of the Balance Chain Bracket



标准件规格：
Specification of standard parts:
螺栓：GB5783-86 M6*30
Bolt:GB5783-86 M6*30
平垫：GB97.1-85 6
Flat washer: GB97.1-85 6
弹垫：GB93-87 6
Spring washer: GB93-87 6
螺母：GB6170-86 M6
Nut: GB6170-86 M6

图 13-6 护脚板安装示意图
Figure 13-6 Installation Diagram of the Toe Guard

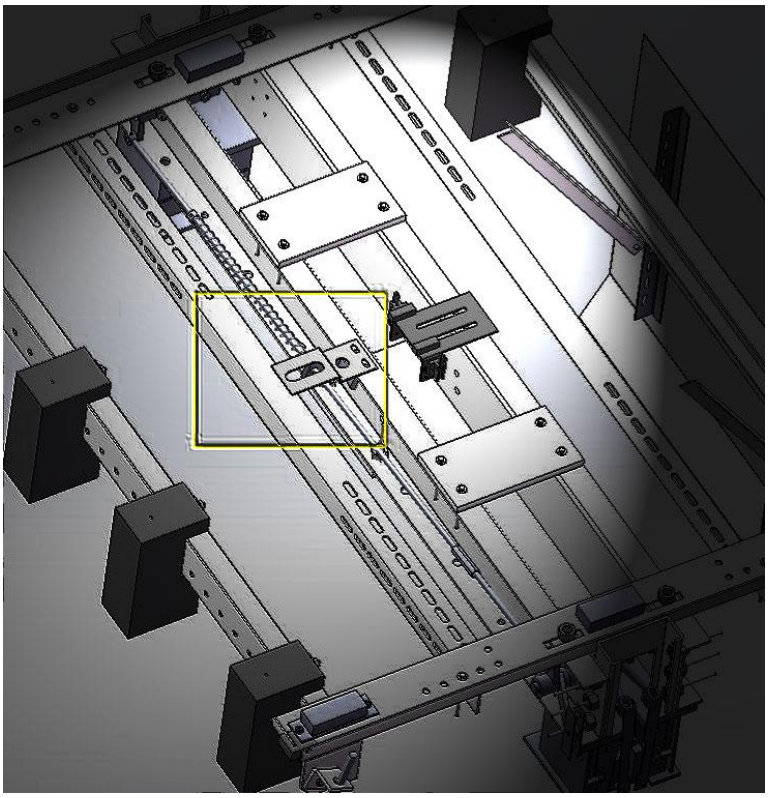


图 13-6 闪光蜂鸣器安装，安装于称重装置另一侧
Figure 13-6 Flashing Buzzer Installation, Mounted on the Other Side of the Weighing Device

至此，总体效果图：
Overall design sketch is as follows:

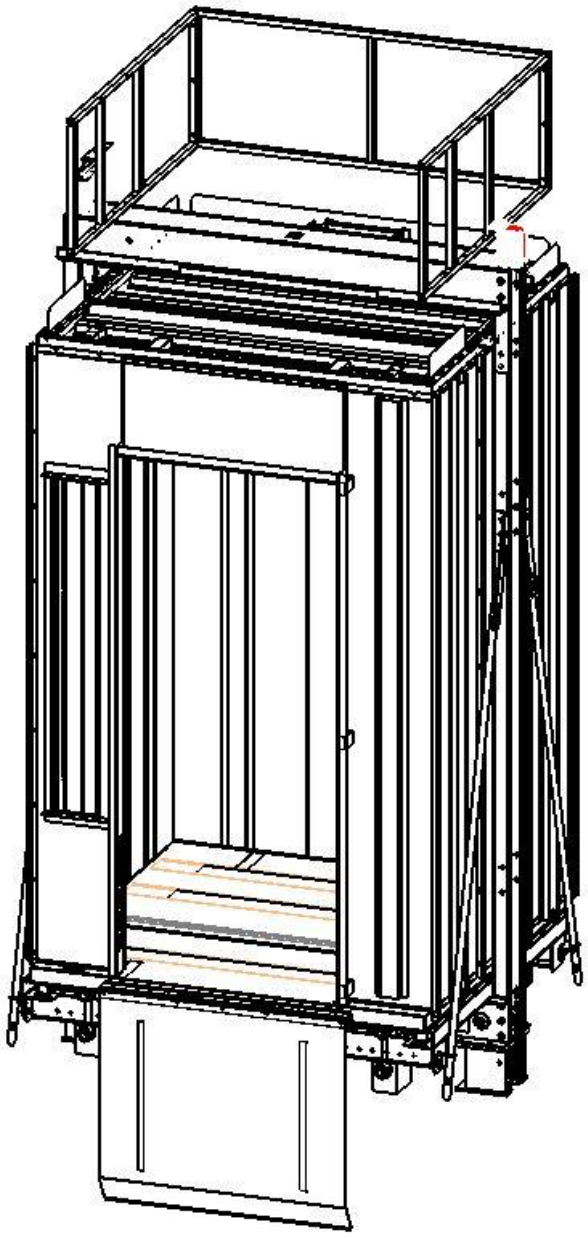


图 13-7 有机房总体效果图
Figure 13-7 Total design sketch of machine room

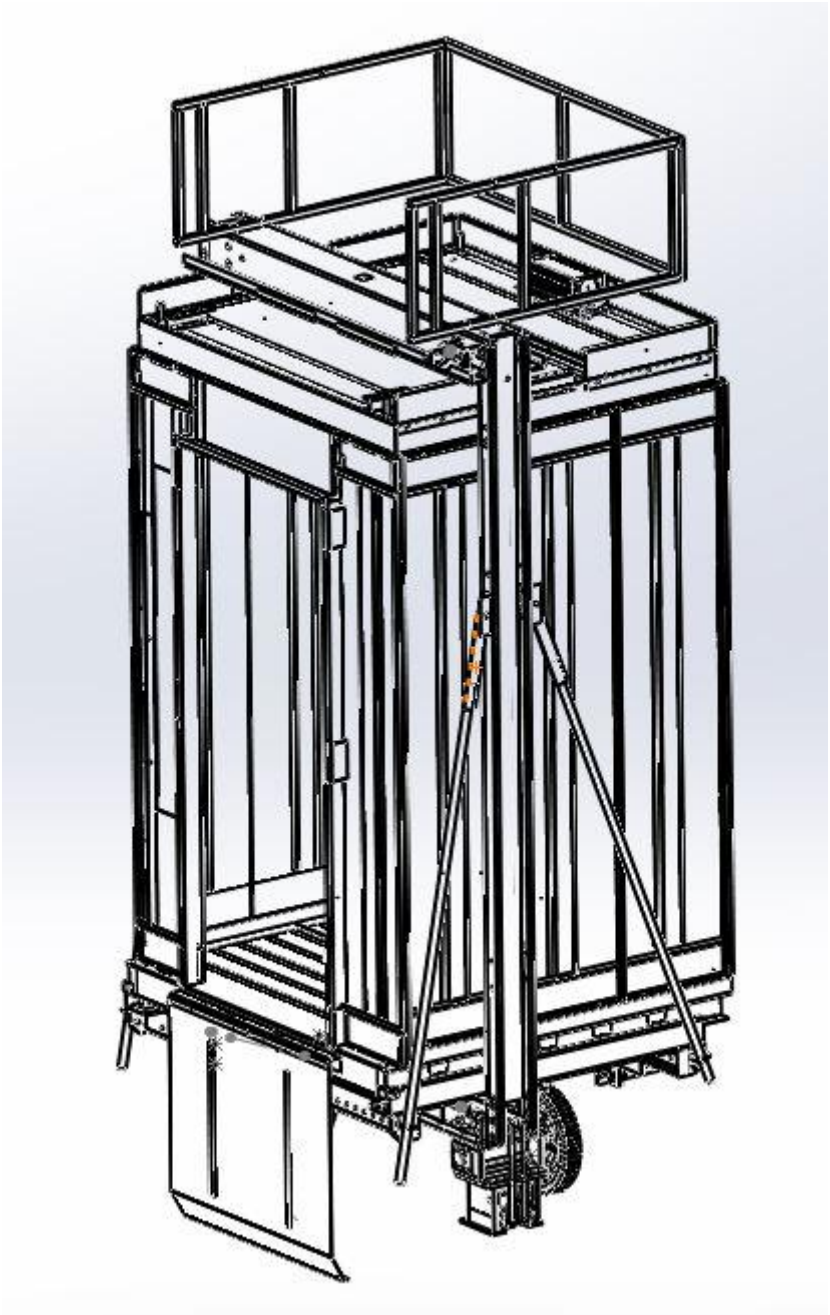


图 13-8 无机房轿底双轮总体效果图

Figure 13-8 Overall Effect Diagram of Double Wheel at the Machine-room-less Car Platform

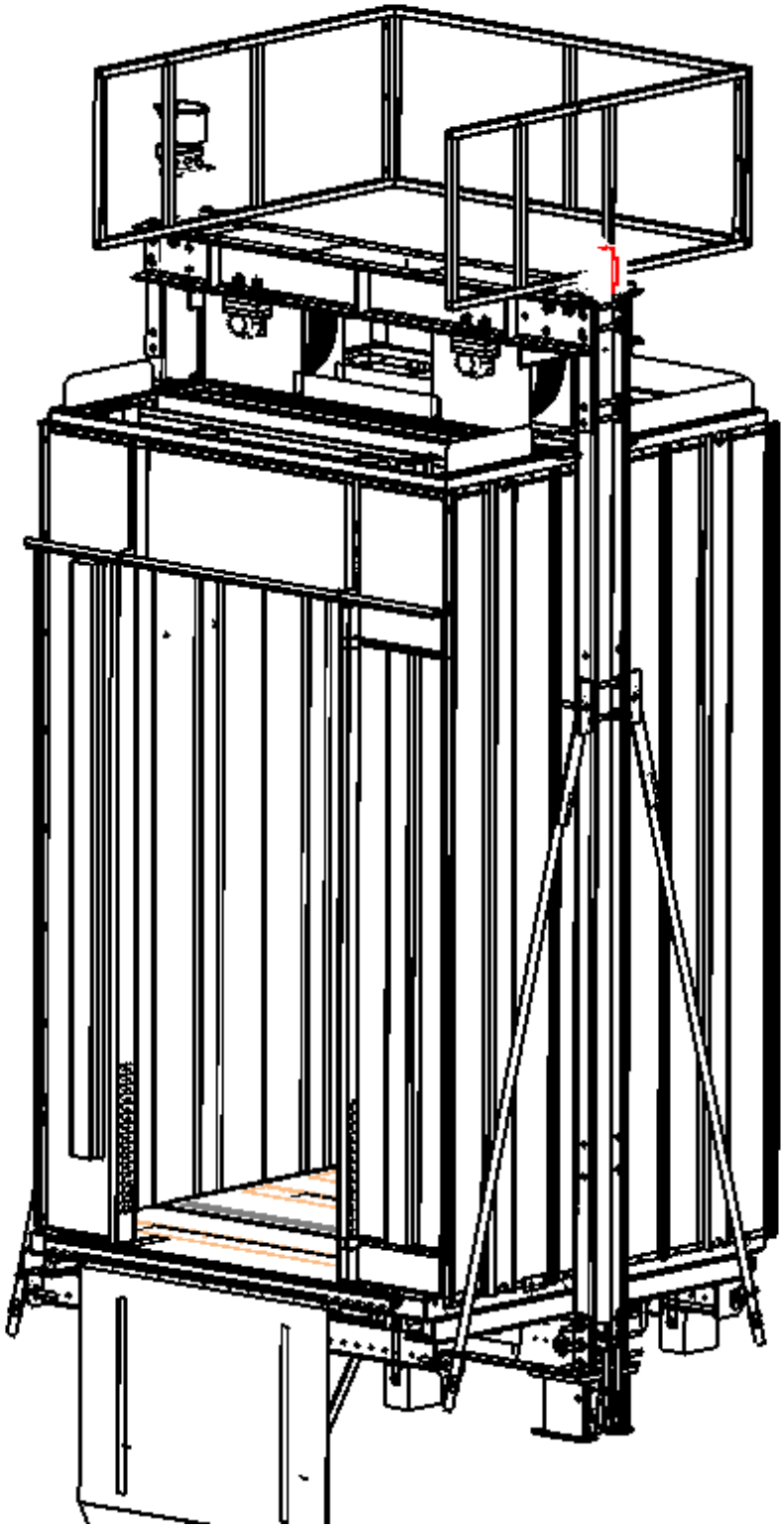


图 13-9 无机房轿顶双轮总体效果图

Figure 13-9 Overall Effect Diagram of Double Wheel at the Machine-room-less Car Top

14 曳引绳安装 Installation of towing rope

安装钢丝绳的要求

Requirements for installation of wire rope

a) 钢丝绳安装的安全要求：

a) Safety requirements for installation of wire rope

安装钢丝绳时应戴手套，防止在放钢丝绳时，起翘钢丝刺伤手指和勒伤手指。

People shall wear gloves when installing wire rope to avoid crimped steel wire stabbing or cutting fingers.

b) 保管要求：

b) Safeguard requirements:

工地保管的钢丝绳应做好防雨防湿防锈工作，钢丝绳不宜直接放在地面上，与酸碱性物质要隔离，不得将重物、设备堆压在钢丝绳上面，同时要预防沙石粘黏于钢丝绳表面。

The wire rope stored on the site shall be protected from raining, moisture and rust. It should not be put on the ground directly and be separated from alkaline substances. No weight and equipment should be put on the wire rope, while gravel should be prevented from sticking on surface of steel wire rope.

c) 施工要求：

c) Construction requirements:

1) 解开钢丝绳要使用正确的方法，可按照下列图示的正确方法进行，若方法不正确将导致钢丝绳打结，造成钢丝绳隐性受伤。

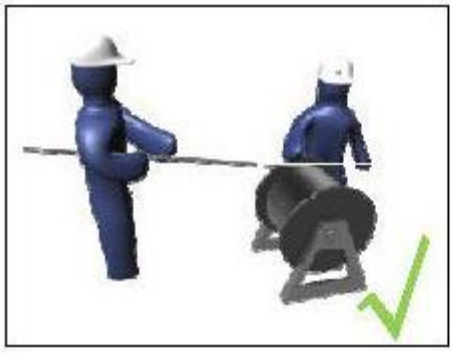
1) The wire rope is unfastened as per the method shown in the following figures; if not, the wire rope may knot and cause hidden injury.

2) 施工过程中不要将钢丝绳拖过沙石堆，以防沙石嵌入钢丝绳绳隙中。放钢丝绳时要防止钢丝绳与水泥地面、设备、脚手架磨擦，以防止钢丝绳表面损伤，使使用寿命减少。

2) Do not drag the wire rope over the gravel pile during construction to prevent gravel embedding into the rope gap. The wire rope should be prevented from grinding with concrete floor, equipment and scaffolding to avoid surface damage of wire rope and thus reduce its service life.

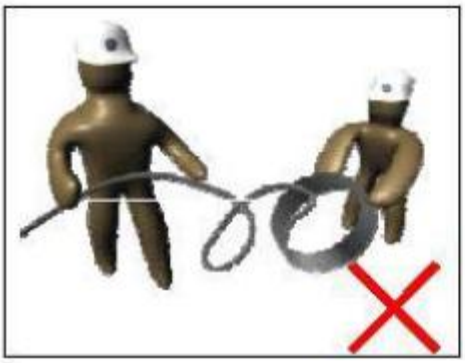
3) 钢丝绳的安装需考虑“放旋”工序。将钢丝绳悬垂于井道，利用自重力进行放旋，以改善运行质量。无机房电梯曳引比为 2:1，可先“放旋”一半的钢丝绳，再“放旋”另一半钢丝绳。

3) “Laying by rotating” process should be considered for installation of wire rope. The wire rope is hanged in the shaft and laid by rotating with its gravity to improve operating quality. Traction ratio of elevator without machine room is 2:1; a half of wire rope is laid by rotating first, and then the other half is laid by rotating.

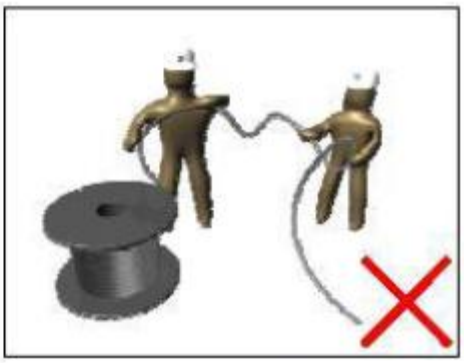


Correct method for laying the rope

Correct method for laying the rope



Incorrect method for laying the rope



Incorrect method for laying the rope

图 14-1 无机房轿顶双轮总体效果图

Figure 14-1 Overall Effect Diagram of Double Wheel at the Machine-room-less Car Top

4) 在按正确方法处理钢丝绳时，钢丝绳一般不需要放旋，只有在不正确的放、绕钢丝绳而导致钢丝绳产生扭应力时，或者每 30m 钢丝绳扭度大于 1 圈时，才需要放旋。在保证充分放旋的情况下，应尽量缩短自由悬垂时间，否则钢丝绳会由于自身重力作用产生自由旋转，甚至破坏钢丝绳的捻制参数，造成钢丝绳的局部松弛。

4) The wire rope is not required to be laid by rotating when it is handled as per the correct method, or it needs to belaid by rotating when incorrect method causes torsion stress or that torsiondegree of the rope of 30m is more than one circle. Under the circumstances that fully laying by rotating is ensure, the free suspension time should be shortened down as far as possible, otherwise the wire rope will cause free rotation due to its gravity and even damage its twisting parameter and thus cause partial loose.

5) 检查钢丝绳是否正确“放旋”可按如下方法：

5) The method for checking whether the wire rope is “laid by rotating” correctly is as follows:

a) 标记有安装线的钢丝绳可以通过检查安装线是否扭转来确认钢丝绳是否有效“放旋”。

a) The effective “laying by rotating” of wire rope marked with installation line is confirmed by checking whether the installation line is twisted.

b) 没有标记安装线的钢丝绳，可以观察通过曳引轮和轿厢反绳轮钢丝绳的状况及绳头组合扭转状况来检查钢丝绳是否有效“放旋”。

b) The effective “laying by rotating” of wire rope without installation line is confirmed by checking the condition of traction pulley and diversion sheave of car and combination twisting.

6) 每根钢丝绳安装好后截去多余的部分。施工结束，应使用机油或专门清洗剂对钢丝绳进行擦洗;并进行检查：钢丝绳有无异常？运行时有无碰擦？

6) Spare part of wire rope is cut off when it is installed. After the construction, the wire rope is scrubbed with engine oil or special cleaning agent and then checked whether it is in normal state or there is friction during operation.

注：放钢丝绳时一定要放在转盘上用外圈放，消除钢丝绳的引力，使各绳张力误差不大于5%。

Note: The wire rope shall be placed on the swivel plate by the outer ring to eliminate the gravitation of the wire rope and make the error of the tension of each rope is less than 5%.

安装绳头 Installing the rope head

先将钢丝绳端部用细铁丝扎死，防止散股，再将钢丝绳穿入锥套，按照国标要求和尺寸安装固定绳头各部位。

First, the end of the wire rope is tied with thin wire to prevent loosening, and then the wire rope is inserted into the taper sleeve, with parts of the rope head being installed and fixed according to the requirements and sizes of the national standard.

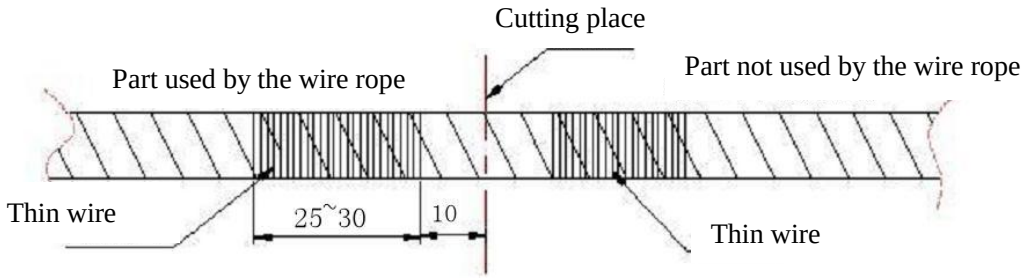


图 14-2

Figure 14-2

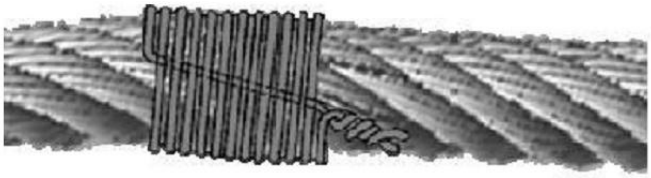
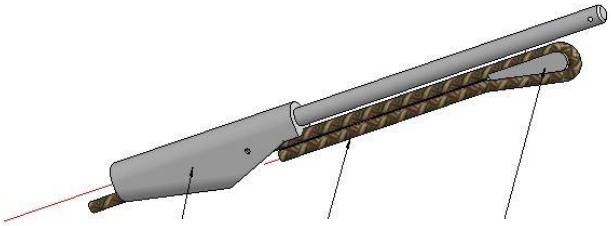


图 14-3

Figure 14-3

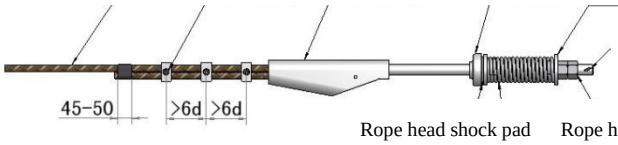


Rope head taper sleeve Wire rope Rope head wedge block

图 14-4

Figure 14-4

Wire rope Wire rope clip Rope head taper sleeve Rope head check ring Rope head plain washer

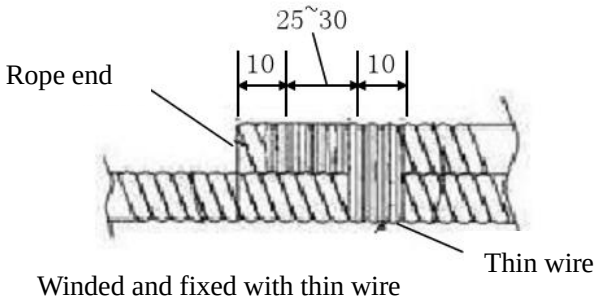


Rope head shock pad Rope head spring M16 nut

Note: The wire rope clip shall be matched with the wire rope, with a distance greater than 6 times than the nominal diameter of the wire rope, and the installation shall be firm.

图 14-5

Figure 14-5



Winded and fixed with thin wire

Tightening with tape

图 14-6

Figure 14-6

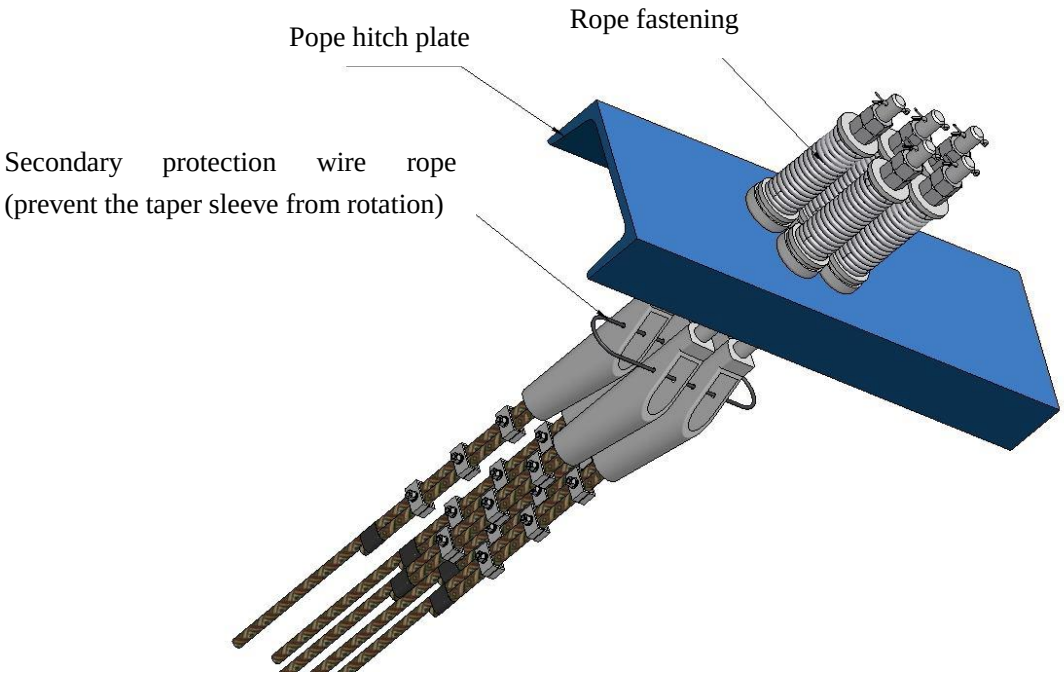


图 14-7

Figure 14-7

调整钢丝绳锥套上的组合螺母，将双螺母拧紧，插上销钉，待负荷实验后穿上防锥套旋转的二次保护钢丝绳，用钢绳卡锁牢。

Adjust the combined nut on the wire rope taper sleeve and tighten the double nut, inserting the pin, which is threaded with the secondary protection wire rope that prevents the taper sleeve from rotation after the load test, and locked with the steel rope clip.

15 随行电缆

15 Traveling cable

1.随行电缆两端应可靠固定。

1. Both ends of the traveling cable shall be securely fixed.

2.轿厢压缩缓冲器后，电缆不得与底坑地面和轿厢底边框接触。

2. After the buffer compression by the elevator car, the cable shall not touch the pit floor and the bottom frame of the elevator car.

3.随行电国家标准缆不应有打结和波浪扭曲现象。

3. There shall be no knotting and distortion on the national standard traveling cable.

4.不能以其他配件能碰撞到。

4. Collision with other accessories is not allowed.

5.随行电缆卡分井道顶端安装第一个，井道中间安装第二个，轿底下安装第三个。

5. The first traveling cable clamp is installed at the shaft top, the second one in the middle of the shaft, and the third is installed under the car platform.

6.轿底电缆挂线架应设在轿架下梁处用螺栓紧固，此挂线架的位置要保证电缆的弯曲半径不小于 450 毫米，电缆移动时不可撞击井道内的各种装置。

6. The car platform cable hanger shall be fastened with bolts at the lower beam of the car frame

with the position being such that the bending radius of the cable is not less than 450mm. Various devices in the shaft shall not be impacted when move the cable.

7.扁平型随行电缆可重叠安装，重叠根数不宜超过 3 根，每两根间应保持 30~50 mm 的活间距，应使用楔形插座或卡子固定。

7. The pancake travelling cables can be installed in an overlapping manner with less than 3 cables to be overlapped and adjustable spacing of 30-50mm for every two cables being maintained, which shall be fixed by wedge jacks or clips.

16 电源及照明、轿顶检修箱、底坑检修箱的安装

16 Installation of power supply and lighting, maintenance box on the car roof, and maintenance box at pit

16.1 井道照明电源应与电梯电源分开，并应在顶层内靠近入口处设置照明开关

16.1 The shaft lighting power source for the machine room shall be separated from that of the lift, and the lighting switch shall be set up inside the machine room and close to the entrance.

16.2 电梯主开关的安装应符合规定

16.2 Regulations observed by installation of the elevator main switch

1.每台电梯均应设置能切断该电梯最大负荷电流的开关

1. Each elevator shall be equipped with a main switch to cut off the maximum load current of the elevator.

2.主开关不应切断下列供电电路：

2. The main switch shall not cut off the following power supply circuit:

轿厢照明、通风和报警

The elevator car lighting, ventilation and alarm;

隔层和井道照明

Interlayer and shaft lighting

轿顶和底坑电源插座

The power socket in the machine room, the car top and the pit.

16.3 主开关的位置应能从顶层入口处方便、迅速地接近。

16.3 The position of the main switch shall be easily accessed from the entrance of the machine room.

在同一井道安装多台电梯时，各台电梯主开关的操作机构上应粘贴统一的标识标志。

When installing several elevators in the same shaft, paste uniform identification marks on operating mechanisms on main switches of the elevators.

注意：不能将标志粘贴在可移动、可互换的机构上

Notes: Do not paste marks on movable or interchangeable mechanisms.

轿顶应装设照明装置，或设置以安全电压供电的电源插座。

The car top shall be installed with the lighting device or the power socket powered up by the safety voltage.

轿顶检修用 220V 电源插座（2P+PE 型）应设置明显标志。

The car top inspection shall be adopted with the 220V power socket (2P+PE) and installed

with the obvious marks.

16.4 井道照明装置的安装应符合的规定

16.4 Regulations observed by installation of shaft lighting devices

应在顶层内设置具有短路保护功能的开关进行控制

Set switches with the short-circuit protection function in the top floor to control.

照明灯具应固定在不影响电梯运行的井道壁上，其间距不应大于 4m

The lighting fitting shall be fixed on the shaft wall without affecting the operation of the elevator, and the spacing shall not be more than 4m.

在井道的最高和最低点 0.5 米以内各装设一盏照明灯

Within 0.5m away from the highest and the lowest point of the shaft, a lighting fitting shall be installed respectively.

16.5 电气设备接地应符合的规定

16.5 Regulations observed by grounding of electrical equipment

1. 选用三相五线制供电电源，零线和接地保护线始终分开。

1. Choose the power supply of the three-phase and five-wire system, and the null line and grounding protection line shall be always separate.

2. 所有电气设备的外露可导电部分均应可靠接地或接零，接地电阻≦4Ω 。

2. Exposed and conductive parts of all electrical equipment shall have reliable grounding or neutral grounding and the grounding resistance shall be no more than 4Ω .

3.接地线应用黄绿双色铜材绝缘导线，最小截面不应小于 1.5 平方毫米。

3.The grounding wire shall be copper insulated wire with yellow and green, of which the minimum section area shall be no more than 1.5mm^2.

4.使用 PG 卡时，先拆掉接到 PG 卡上的屏蔽线，待确定电源为正规三相无线电源时，才接上屏蔽线。

4. When using PG card, remove the shielded wire on the PG card firstly, and then connect the shielded wire after confirming that the power supply is the standard three-phase wireless power supply.

5. 线槽和线槽之间必须用接地线连接。

5. Wire grooves must be connected with grounding wires.

备注：电梯轿厢可利用随行电缆的钢芯或芯线做保护线，当采用电缆芯线做保护线时数量不得少于 2 根

Note: The steel core or core wire of the traveling cable may be used as the protection wire of the elevator car and the number of cable core wires used as protection wires shall be no less than 2.

16.6 采用计算机控制的电源，其“逻辑地”应按产品要求处理

16.6 The elevator controlled by the computer can be handled "logically" according to the product requirements.

16.7 轿顶检修箱应用螺栓紧固在轿架上梁端，位置要远离层门口，要保持在骑跨处也触动不着检修箱上的开关。

16.7 The maintenance box on the car roof shall be fastened on the upper beam end of the car frame with bolts away from landing door, and the switch on the maintenance box shall not be touched even at riding and striding places.

16.8 底坑检修箱应设在层门口处最低在最后一限位开关位置以上并容易操作处，检修箱距离轿厢位置应大于 30 毫米，检修箱装好后应装接地线。如底坑容易积水时，检修箱位置应

装在底层平面以上，并方便观察和操作。

16.8 Pit maintenance box shall be set at the place over the last limit switch at the landing door for easy operation, and the maintenance box shall be more than 30mm away from the elevator car and grounding wire shall be installed after installation of the maintenance box. If water is apt to accumulate in the pit, the maintenance box shall be installed above the bottom level for convenient observation and operation.

17 配线

17 Pairing

17.1 电梯配线要求

17.1 Elevator wiring requirements

17.1.1 电梯电气装置的配线，应使用额定电压不低于 500V 的铜芯绝缘导线。

17.1.1 The wiring of the electric installations shall adopt the copper-core insulated wire with a nominal voltage of not lower than 500V.

17.1.2 井道内的配线应使用电线管或电线槽保护，严禁使用可燃性材料制成的电线管或电线槽。不易受机械损伤的分支线路可使用软管保护，但长度不应超过 2 m。

17.1.2 The wiring inside the shaft and the well shall be protected with the wiring tube or the wire way. It's prohibited to use the wiring tube or the wire way made of the flammable material. The branch that is not easy to mechanical damage shall be protected with the flexible pipe, but its length shall not exceed 2m.

17.1.3 轿顶配线应走向合理，防护可靠。

17.1.3 The wiring on the car top shall be paved reasonably and protected reliably.

17.1.4 电线管、电线槽、电缆架等与可移动的轿厢、钢绳等的间隔距离：井道内不应小于 20mm。

17.1.4 The spacing distances between the wiring tube, the wire way, the cable bracket and the removable elevator car and the steel sling: It shall not be less than 20mm inside the shaft.

17.2 电线管安装应符合的规定

17.2 Regulations observed by wiring tube installation

❖ 电线管应用卡子固定，固定点间距均匀，且不应大于 3 m；

❖ The wiring tube shall be fixed with the clip, and the fixed point spacing shall be even and not more than 3m.

❖ 与电线槽连接处应用锁紧螺母销紧，管口应装设护口；

❖ The joint with the wire way shall be fastened with the nut lock, and the pipe orifice shall be installed with the protective ring;

❖ 安装后应横平竖直，其水平和垂直偏差应符合下列要求：井道内不应大于 5‰，全长不应大于 50mm；

❖ After the installation, it shall be horizontal and vertical, while the horizontal and vertical deviation shall comply with the following requirements: It shall not be more than 5‰ in the shaft, and the total length shall not be more than 50mm;

❖ 暗敷时，保护层厚度不应小于 15mm

❖ When undertaking the concealed wiring, the thickness of the protective layer shall not be less than 15mm.

17.3 电线槽安装 The installation of the wire way

线槽通过线槽架安装，每根线槽固定在两根线槽架上，线槽架分别距离两端 150mm，用 PVC 涨管将线槽架固定在井道壁上，在线槽架上安装线槽。电线槽安装应符合下列规定

Wiring groove shall be installed with the wiring groove bracket, with every wiring groove fixed on two wiring groove brackets, and wiring groove brackets being 150mm away from the two ends respectively. Fix wiring groove brackets on the shaft wall with PVC expand tube and install the wiring groove on the wiring groove bracket. Installation of the wiring groove shall comply with the following regulations:

1．安装牢固，每根电线槽固定点不应少于 2 处，并列安装时，应使线槽盖便于开启。

Install the wiring groove firmly, fixed points of every wiring groove shall not be less than 2, and make it easy to open the wiring groove cover during installation.

2．安装后应横平竖直，接口严密，槽盖齐全、平整、无翘角，其水平和垂直偏差应符合下列要求：井道内不应大于 5‰，全长不应大于 10mm。

After installation, wiring grooves shall be vertical and horizontal with tight interfaces, complete and flat groove coverings without rake angle, and the horizontal and vertical deviations shall comply with the following requirements: It shall not be more than 5‰ in the shaft, and the total length shall not be more than 10mm;

3．出线口应无毛刺，位置正确。

The outlet shall be burr-free and correct in position.

17.3.1 电线管、电线槽均应可靠接地或接零，但电线槽不得作保护线使用

The wiring tube and the wire way shall be grounding or neutralizing reliably, but the wire way shall not be used as the protective line.

17.3.2 接线箱（接线盒）的安装应平整、牢固、不变形，其位置应符合设计要求

The installation of the junction box and case shall be even and straight, firm and ametabolic, and the position shall comply with the design requirements.

17.4 导线（电缆）要求 Wire (cable) requirements

17.4.1 导线（电缆）的敷设应符合下列规定：

Laying of wire (cable) shall comply with the following regulations:

a. 动力线和控制线应隔离敷设，有抗干扰要求的线路应符合产品要求。

a Power wire and control wire shall be laid isolated and circuit with the anti-interference requirement shall comply with product requirements.

b. 配线应绑扎整齐，并有清晰的接线编号，保护线端子和电压为 220V 及以上的端子应用明显的标记。

B Wire harnesses shall be bound in order with clear connecting line numbers, and terminals of protection lines and terminals with the voltages over 220V shall have obvious marks.

c. 接地保护线宜采用黄绿双色的绝缘导线。

c The grounding protection line shall adopt the yellow-green insulated wire.

d. 电线槽弯曲部分的导线、电缆受力处，应加绝缘衬垫，垂直部分应可靠固定。

d Wire and cable with stress on the bending parts of the wiring groove shall be equipped with insulating liners and the vertical parts shall be fixed reliably.

e. 敷设于电线管内的导线总截面积不应超过电线管内截面积的 40%，敷设于电线槽内的导线总截面积不应超过电线槽内截面积的 60%。

e The total cross sectional area of the guide line set inside the wiring tube shall not exceed 40% of the internal cross sectional area of the wiring tube, the total cross sectional area of the guide

line inside the wire way shall not exceed 60% of the internal cross sectional area of the wire way.

f. 线槽配线时，应减少中间接头，中间接头宜采用冷压端子，端子的规格应与导线匹配，压接可靠，绝缘处理良好。

f When wiring in the wire duct, the intermediate joints shall be reduced, and crimped terminals should be adopted for them. The specifications of the terminals shall be matched with the wires, the crimping shall be reliable, and the insulation treatment shall be good.

g. 配线应留有备用线，其长度应与箱、盒内最长的导线相同。

g The wiring shall leave some spare wire, whose length shall be the same as the longest guide line inside the box and the case.

17.4.2 随行电缆的安装应符合下列规定：

The traveling cable shall be installed according to the following regulations:

1. 随行电缆安装前，必须预先自由悬吊，消除扭曲。

1. Before installing the traveling cable, a pre-free hoisting shall be done to eliminate the tortuosity.

2. 随行电缆的敷设长度应使轿厢缓冲器完全压缩后略有余量，但不得拖地，多根并列时，长度应一致。

2. When the elevator car buffer is completely compressed, the length of the traveling cable shall be slightly residual, but it shall not be towed on the floor. When multiple cables are in parallel, the lengths shall be the same.

3. 随行电缆两端以及不运动部分应可靠固定。

3. Both ends of the traveling cable and the inactive part shall be fixed reliably.

随行电缆在运行中有可能与井道内其他部件碰撞时，必须采取防护措施。

When moving, the traveling cable might hang or bump into other assemblies inside the shaft, so protective measures shall be adopted.

18 安全保护装置 Safety protection devices

电梯的各种安全保护开关必须可靠固定，不得采用焊接固定，安装后不得因电梯正常运行时的碰撞和钢绳、钢带、皮带的正常摆动使开关产生位移、损坏和误动作。

All the safety protection switches of the elevator must be fixed reliably and shall not be fixed by welding. After installation, the switches shall not be moved, damaged or mis-operated due to the collision during normal operation of the elevator and the normal swing of steel ropes, steel belts and belts.

与机械相配合的各安全保护开关，在下列情况时应可靠断开，使电梯不能启动或立即停止运动：

Various safety protection switches matched with the machinery should be reliably disconnected under the following conditions, so that the elevator cannot start or immediately stop running:

- 限速器配重轮下落大于 50mm 时；
- When the speed governor counterweight wheel drops more than 50mm;
- 限速器速度接近其动作速度的 95%时，对额定速度 1m/s 及以下电梯最迟可在限速器打到其动作速度时；
- When the speed governor is close to 95% of its operating speed, for rated speeds of 1 m/s and below, the elevator reaches the speed of the speed governor at the latest;

- 安全钳拉杆动作时；
- When the safety gear lever action;
- 电梯载重量超过额定载重量的 10%时；
- When the elevator load exceeds the rated load of 10%;
- 任意的厅门、轿门未关闭或未锁紧时；
- When the door of any hall or car is not closed or locked;
- 安全窗开启时；
- When the security window is open;
- 液压缓冲器被压缩时。
- When the hydraulic buffer is compressed.

电气系统中的安全保护装置应进行下列检查：

Safety protection devices in electrical systems shall be inspected as follows:

- 错相、断相、欠电压、过电流、弱磁、超速等保护装置应按产品要求检验调整。
- Fault phase, phase loss, under voltage, over current, weak magnetic, over-speed and other protective devices, should be adjusted according to product requirements.
- 开、关门和运行方向接触器的机械或电气联锁应动作灵活可靠。
- Mechanical or electrical interlocks for door opening, door closing and contactor for running direction shall be flexible and reliable.
- 急停、检修、程序转换等按钮和开关，动作应灵活可靠。
- The actions of Buttons and switches of emergency stop, overhaul, program conversion should be flexible and reliable.

轿厢自动门的安全触板安装后应灵活可靠，其动作的碰撞力不应大于 5N，光电及其他防护装置功能必须可靠。

The safety edges for door of the elevator car's power operated door shall be flexible and reliable after installation. The collision force of its action shall not be more than 5N, and the function of optoelectronic and other protective devices shall be reliable.

19 安装质量检查 Installation quality inspection

本文件的随后几页包括并列出电梯安装要求的详细说明。当你无法确定部件是否符合要求时，参照本说明。

The subsequent pages of this document include and list a detailed instruction for the requirements of elevator installation. Please refer to the instructions, when you are not sure whether the parts meet the requirements.

乘坐质量

Quality of taking the elevator

电梯在加速或减速时不应该颤动

The elevator shall not quiver when it accelerates or decelerates

在驱动过程中，电梯不应该有突然的移动或意外的噪音

During driving, the elevator shall not make sudden movements or unexpected noise

平层

Leveling

两个方向最大平层误差为±5mm

The maximum leveling error in both directions is ±5mm

轿厢和信号装置

Elevator car and signal device

在轿厢和厅门外按下按钮时信号装置应该能进行正常工作

When pressing the button outside the elevator car and the hall, the signal device shall be able to work normally

轿厢照明正常

Elevator car lighting is normal

装潢应该整洁，无刮痕、凹痕

The decoration shall be clean and tidy without scratches or indentations

没必要留有安装时的保护层，如留有塑料保护膜

There is no need to leave a protective layer used for installation, such as a plastic protective film

轿厢标签已粘贴牢固

The elevator car label has been pasted firmly

轿厢风扇应该功能正常

Elevator car fan shall function normally

控制柜

Control cabinet

将保护装置放在正确的位置

Put the protective device in the right place

所有不寻常登记的故障应该解决并清零

All unusual recorded failures shall be resolved and reset

接触器等不应该发出不正常的噪音

The contactor and other devices shall not make abnormal noise

轿厢下行，当限速器动作时，安全钳能够使轿厢停下并保持在原来位置

For the descending elevator car, when the speed governor acts, the safety gear can stop the elevator car and keep the car in its original position

断电时，轿厢应急照明和报警铃必须可以工作

The emergency lighting and alarm bell in the elevator car must be able to work when the power is cut off

紧急救助驱动应该在两个方向均可运行

The emergency rescue drive shall operate in both directions

当操作制动器手柄可以将制动器完全打开

When operating the brake handle, the brake can be fully opened

上行轿厢在紧急停止时制动器可以制停轿厢，不应有不必要滑行

When the ascending elevator car stops in an emergency, the brake can stop the elevator car, and there shall be no unnecessary sliding

整个安装过程中所有的接地必须正确的接在接地端子上

All grounding must be properly connected to the grounding terminal throughout the installation

用于短接部分安全回路的装置必须拆除

The device used for short-circuiting part of the safety loop must be removed

制动器

Brake

制动器的最大间隙应该是 0.1mm

The maximum clearance of the brake shall be 0.1mm

中间螺母垫片可以手动移动

The middle nut washer can be moved manually

曳引机

Tractor

所有内部外部的扣紧装置应该紧紧固定

All internal and external fastening devices shall be firmly fixed

曳引机上的制动器的制动表面应该清洁且不会有灰尘

The brake surface of the brake of the tractor shall be clean and free from dust

曳引机体和固定装置不应该有机械接触

There shall be no mechanical contact between the tractor's body and the fixing device

钢丝绳

Wire rope

钢丝绳不能有生锈的迹象

The wire rope shall show no signs of rust

钢丝绳不能干燥或变脏且没有断丝、打结和扭曲

The wire rope shall not be dry or dirty and shall not break, knot or twist

绳头和弹簧

Rope head and spring

弹簧长度的最大偏差为 3mm

The maximum deviation of spring length is 3mm

绳头装置应该用两个螺母和一个开尾销正确固定

The rope socket device shall be properly fixed with two nuts and a split pin

确保绳头没有扭曲

Make sure the rope socket is not twisted

绳头装置之间不能有机械接触

There shall be no mechanical contact between the rope sockets

导轨

Guide rail

当使用滑动导靴时，整个导轨的工作面上应该有一层薄的油膜

When using a sliding guide shoe, the entire working surface of the guide rail shall have a thin oil film on it

安全钳划痕处应该平滑

The scratching part of the safety gear shall be smooth

所有的固定件已紧固

All fixed parts are fastened

对于速度在 1.6m/s 以内的电梯它的 DBG 最大偏差为±1mm，如果速度大于 1.6m/s 时偏差为±0.5mm

For an elevator with a speed less than 1.6m/s, the maximum DBG deviation is + / -1mm; if the speed is greater than 1.6m/s, the deviation is + / -0.5mm

电梯井道

Elevator shaft

导向轮的转动应该安静、平稳的

The rotation of the deflector sheave shall be quiet and smooth

所有井道照明应该正常工作

All shaft lighting should work normally

极限开关能动作，滚轮可转动且开关可以在上下端碰到撞弓，撞弓应该垂直安装正确

The limit switch can be operated, the roller can be rotated and the switch can hit against the shaft ramp at the upper and lower ends, and the shaft ramp shall be correctly installed vertically

顶部和底部安全空间符合土建图

Safety spaces at the top and bottom of the car conform to the construction layout drawing

轿厢减震装置应该安装

The elevator car's damping device shall be installed

导靴

Guide shoes

导靴应该正确调整，导轨和导靴之间的总间隙 2~3mm（如果使用滑动导靴）

The guide shoes shall be properly adjusted, and the total clearances between the guide rails and the guide shoes are 2~3mm (if sliding guide shoes are used)

油杯应该加满油的（如果使用滑动导靴）

The oil cup shall be full of oil (if using sliding guide shoes)

滚动导靴应该正确调整

The roller guide shoes shall be adjusted correctly

应该从导靴衬垫上拆除锁紧销

The locking pin shall be removed from the shoe pad

随行电缆

Traveling cable

当轿厢停在缓冲器上时，随行电缆的圆弧部分至少离底坑 150mm，确保当轿厢停在顶层平层位置时随行电缆不会过紧。当把对重驱动至缓冲器上时，轿厢会上跳（应该小心操作），

When the elevator car is parked on the buffer, the circular arc part of the traveling cable is at least 150 mm from the pit, ensuring that the traveling cable does not become too tight when the elevator car is parked at the top terminal landing. When the counterweight is driven to the buffer, the elevator car will jump up (it shall be handled carefully),

圆弧内电缆之间最短的距离应为 100mm

the shortest distance between cables in an arc shall be 100mm

随行电缆应该正确悬挂

The traveling cable shall be properly suspended

随行电缆应该状况良好且外部绝缘层无裂痕及划痕等

The traveling cable shall be in good condition and the outer insulation layer is free of cracks and scratches, etc.

有文字的一面应该在圆弧的外面

The side with the text shall be outside the arc

轿顶

Car roof

轿顶应该清洁、整洁且没有油污

The car roof shall be clean, tidy and free of oil

应急照明应正常

The emergency lighting shall be normal

轿顶接线盒

Car roof connection box

所有的电气装置和开关应该工作正常

All electrical devices and switches shall work properly

安全装置

Safety device

所有的安全开关应该工作正常

All safety switches shall work properly

对重

Counterweight

导靴导轨之间的间隙为 2~3mm（如果使用滑动导轨）

The tolerances between the guide shoes and guide rails are 2~3mm (if sliding guide rails are used)

正确调整滚动导靴

Correctly adjust the rolling guide shoes

油杯应该加满油（如果使用滑动导轨）

The oil cup shall be full of oil (if using sliding guide rail)

挡绳装置应该位置正确

The ward off rope device shall be in the correct position

对重块应该正确摆放且正确固定

The counterweight filler shall be correctly placed and properly fixed

层门机械

Landing door machinery

如果不需要的话，清除表面保护层

Clear the surface protective layer if not needed

必须调整到门扇不互相接触，门框、地坎和其它门扇之间的间隙最大为 6mm（一般为 5mm），对于玻璃门板门框和门板之间的最大间隙为 3mm

It must be adjusted that the door leaves do not touch each other. The maximum clearances among the door frame, the still and other door leaves are 6mm (usually 5mm), and the maximum clearance between the door frame and the door panel is 3mm

层门门锁和门触点

Landing door locks and door contacts

门触点必须干净且有轻微磨痕（可以看见表面金属）

The door contacts must be clean and slightly scratched (surface metal can be seen)

当触点接通时，锁钩的啮合长度最小为 7mm

When the contacts are contacted, the length of engagement of the hook is at least 7mm

门触头必须能压下触点界面 3mm

Door contact must be able to press the contact interface for 3mm

触点必须对准触点孔的中部，不会触及边缘

The contact must be aligned with the middle of the contact hole and do not touch the edge

电气端子必须紧固

The electrical terminals must be tightened

门应能灵活运动，且能自闭合

The door shall be flexible and self-closing

必须安装牢固

Shall be firmly installed

如果门打开时，安全回路必须切断

If the door is open, the safety circuit must be cut off

门顶胶应固定到位

The door header rubber shall be fixed in place

门锁滚轮应能转动

The roller of the door lock shall be able to rotate

紧急门开装置应有效，且门锁能恢复到自动锁住的位置

The emergency door opening device shall be effective and the door lock can be restored to the automatically locked position

检修活板门和检修门应该可以锁闭且和安全回路电气连接

The overhaul trap door and the access door shall be lockable and electrically connected to the safety circuit

轿门电气

Car door electric

不应有灰尘

There shall be no dust

门触头必须能压下触点界面 3mm

Door contact must be able to press the contact interface for 3mm

门按钮操作正常

Door buttons can be operated normally

当门保护装置动作时，应能重新开门

When the door protection device is activated, the door shall be able to be re-opened

轿门机械

Car door machinery

门滑块必须可靠固定

The door sliders must be securely fixed

在正常操作时，门滑块不应有异常声音

The door sliders shall not produce an abnormal sound during normal operation

门扇的底部到地坎之间的间隙为 6mm（一般为 5mm）

The clearance between the bottom of the door leaf and the still is 6mm (usually 5mm)

距同步滚轮 10cm 处，用手按压同步钢丝绳，钢丝绳应能与钢板接触

Press the synchronous wire rope by hand at10cm from the synchronous roller, the wire rope shall be in contact with the steel plate

当用拇指按下驱动带中部时，驱动带能够相互触碰

When the middle of the drive belt is pressed with the thumb, the two sides of the drive belt can touch each other

层门滚轮在门刀的中间，动作距离最小 5mm，一般是 10mm

The landing door's roller is in the middle of the cam, the action distance is at least 5mm, generally 10mm

门刀应该适当啮合，和滚轮啮合为 10mm±1mm

The cam shall be properly engaged, and the engagement length of it and the roller is 10mm ± 1mm

如果门打开，安全回路必须断开

If the door is open, the safety circuit must be cut off

必须调整到门扇不互相接触，门框、地坎和其它门扇之间的间隙为 5mm，一般为 4~6mm

It must be adjusted that the door leaves do not touch each other, and the clearances among the door frame, the still and other door leaves are 5mm, generally 4~6mm

门驱动时，不应有异常噪音

There shall be no abnormal noise when the door is driven

门运行平滑，从层门侧看也同样如此

The door runs smoothly, as seen from the side of the landing door.

门立柱必须正确对齐

The door pillars must be properly aligned

在轿顶上手动操作时，检查门操作应正确

The access door shall be operated correctly when manually operating on the car roof

滚轮必须转动平滑，且与门导轨对齐

The roller must rotate smoothly and align with the door guide rails.

门板必须平滑滑动，且与门导轨对齐

The door panel must slide smoothly and align with the door rails

滚轮及转向轮应可靠固定，且不会产生噪音

The roller and steering sheave shall be securely fixed without noise

偏心轮必须能阻止门离开运行轨道

The eccentric wheel must be able to prevent the door from leaving the running track

限速器及钢丝绳

Speed governor and wire rope

运行时应无声音

No sound when running

用手操作时，动作灵活

Flexible when operated by hand

电气触点有效

Electrical contacts are valid

铅封应完好

The lead seal shall be in good condition

钢丝绳必须干净，且无扭曲或缠绕

The wire rope must be clean and free of distortion or entanglement

安全钳

Safety clamp

必须正确对齐，楔块在导轨两侧间隙均匀

The safety gear must be properly aligned, the wedges are evenly spaced on both sides of the rail

所有螺栓和螺母正确固定到位

All bolts and nuts are properly seated in place

两边必须同步作用，同时夹紧

Both sides must be synchronized and clamped at the same time

在正常操作时，必须完全释放

It must be completely released during normal operation

当提升限速器钢丝绳时，应能自由移动，完全啮合

When lifting the wire rope of the speed governor, it shall be able to move freely and fully engaged

底坑

Pit

底坑内应无油，杂物和积水

There shall be no oil, debris and stagnant water in the pit

集油器在正确位置

The oil collector is in the correct position

缓冲器安装牢固且加满油

The buffer is securely mounted and filled with oil

限速器张紧装置

Tensioning device of speed governor

应能完全张紧限速器钢丝绳

It should be able to fully tension the speed governor's wire rope

安全开关触板在中间位置

The safety switch edge is in the middle position

应容易转动

It should be easy to rotate

- 拆去轿厢支撑架及井道脚手架

Remove the elevator car support frame and the shaft scaffold

重要说明 ：拆脚手架时要保护好井道内设备

Important explanation: Protect the devices in the shaft when removing the scaffolding

- 工地清理

Site clearance

注意：工地清理，消除不安全因素

Notes: ： Site clearance for eliminating unsafe factors

- 最终检查与试验

Final inspection and test

见电梯质量检验报告清单

See the inspection report list of elevator quality

- 移交 **Handover**

见用户移交清单

See the handover list of users

电 梯 安 装 改 造

Elevator Installation and Reconstruction

竣

工

移

交

书

Completion Hand-over Book

使用单位：

Using unit: 1

竣工日期：　　年　　月　　日

Completion date: DD MM YY

ZHEJIANG FUJICN ELEVATOR CO., LTD.

电梯主要参数 Main parameters of the elevator

电梯型号： Elevator model:	控制方式： Control method:
额定载重量： Rated load capacity:	额定速度： Rated speed:
层站门： Floor landing door:	开门方向：☐左☐右☐中分 Door opening direction: ☐Left ☐Right ☐Center opening
净开门：（宽×高） Net door opening: (Width × height)	开门方式： Door opening mode:
轿厢外尺寸：（宽×深×高） External dimension of elevator car (Width × depth × height)	轿厢内尺寸：（宽×深×高） Internal dimension of elevator car (Width × depth × height)
电机功率： Motor power:	额定电压： Rated voltage:
顶层高度： Top height:	底坑深度： Pit depth:
提升高度： Hoisting height:	合同编号： Contract No.:

一、电梯按 GB7588-2003（含 1 号修改单）、GB10058 制造安装，按 GB1006、GB50310-2002 验收合格。The elevator is manufactured and installed according to GB7588-2003 (including the No. 1 amendment) and GB10058, and is accepted and qualified according to GB1006 and GB50310-2002.

二、移交资料及专用件：Handover of information and special parts:

资料及专用名称 Information and special names		移交数量 Number of handovers
1、电梯随机文件 1. Elevator attached documents		
2、产品合格证 2. Product qualification certificate		
3、电梯井道图 3, The elevator shaft drawing		
4、电梯专用件 4. The elevator's special parts	4.1 控制屏前后门钥匙 4.1 Front and rear door keys for the control panel	
	4.2 厅外三角钥匙 4.2 Triangular key for hall doors	

	4.3 轿内操纵板钥匙 4.3 Key for the control panel in the car	
	4.4 厅外电门钥匙 4.4 Switch key for hall doors	

三、注意事项：该电梯已经主管部门检验合格，三角钥匙必须由经质量技术监督部门培训合格的人员保管，使用时请注意：Notes: The elevator has been inspected by the competent department, and the triangular key must be kept by qualified personnel trained by the Quality and Technical Supervision Department. Please pay attention when using it:

当您打开层门时，电梯不一定在此层，请务必当心！不要跌入井道！

Please be careful that the elevator is not necessarily on this floor when you open the landing door! Don't fall into the shaft!

四、质保期：　　年　月　日至　　年　月　日

The warranty period: From　　to