MATERIAL HANDLING EQUIPMENT

Operations & Maintenance Manual

Lithium Counterbalance

G33CBS-189LI

Introduction

In order to meet the needs of the national environmental protection request, To reduce industrial pollution and improve productivity, we design and produce new series of Counter Balanced Electric Stacker on the basis of absorption of the advantages of domestic & overseas Electric Counter Balanced Electric Stacker ,they are especially suitable for cargo loading and unloading, handling, stacking, etc. for food, bank, light textile, station, port, logistics and other enterprises. And it can apply widely if inter-grate with different fixture

The Counterbalanced Electric stacker adopts advanced structures such as wild field lifting system, EPS system, new AC controller. It is equipped high-quality Motors, Battery and high-power pumping stations. Therefor it is Convenient operation. With Good view, Flexible steering, Reliable braking, good power, Low noise, No pollution and Attractive appearance.

This manual describes the technical parameters of the Counterbalanced Electric stacker, working principle and operation, maintenance, and other aspects. It can help operators use the Counterbalanced Electric stacker more reasonable, make its maximum effect.

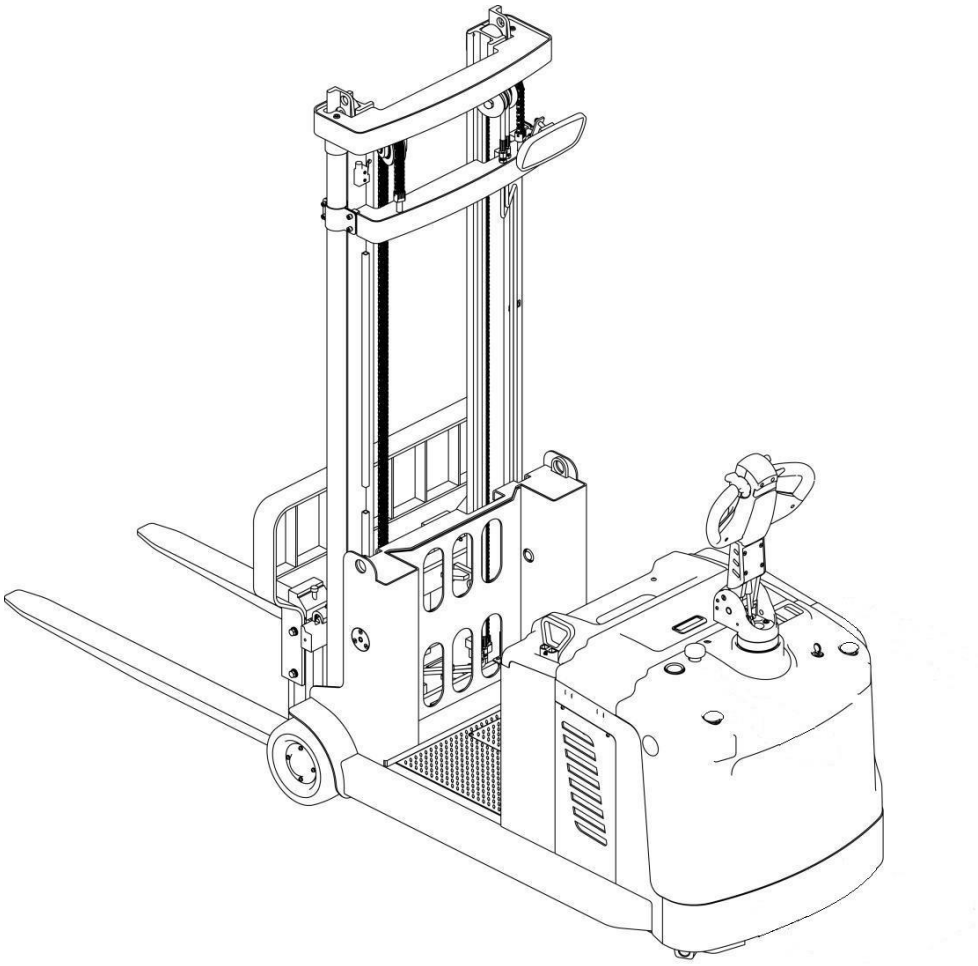
It is hoped that Operator strictly abides the regulations and the precautions in this manual when using the machine. Carefully use them so that your stacker can be in the best working condition for long period of time to maximize its effectiveness. And create better economic benefits.

The Statement

Our company production Counterbalanced Electric stacker is a special motor vehicle used in Factory, Tourist attractions, Amusement places which is specified by “special equipment safety supervision regulations”

13.1

1. General Introduction



Counterbalanced stackers use a battery as the power source. The rear end of the frame is provided with a counterweight. Under the condition of ensuring the rated lifting, there is sufficient overturning torque to keep the longitudinal stability of the stacker.

The characteristics of this stack are compact structure, simple, convenient maintenance, etc., and wide field of vision, no pollution, low noise and small vibration. The small turning radius makes it suitable for narrow passages and more complex areas. It can even perform flexible and efficient loading and unloading operations in containers, ships, and food depots. If it can be equipped with pallets and boxes, it can realize unitized transportation in the factory, which greatly improves production and reduces labor intensity.

The truck is suitable for stacking and handling c a r g o on hard, flat ground.

The service environment：

a. Altitude does not exceed 3937 ft.

b. Indoor room temperature at +5℃ to +40℃.

c. When environment temperature at +40℃, the relative humidity can't over 50%, at low temperature, allow bigger relative humidity

d. Firm, Flat ground.

e. It is forbidden to use this car in corrosive environment such as flammable and explosive or acid base.

2. Proper use

Please use the Counterbalanced electric stacker according to this specification.

The stacker described in this manual is a self-controlled series of Counterbalanced stackers. Lifting and lowering is controlled by the handle button.

Improper use can cause personal injury or machine damage. Operators or operating companies need to ensure proper use, make sure that the truck is operated only by personnel who are trained and authorized to use the truck.

The Truck needs to be used on a firm, flat, intact surface and suitable surface; the truck is designed for indoor use at room temperature from+5°C to +40°C

Use under light load without using permanent barriers or pits, it is forbidden to operate on the slope. During Operation, the goods must be placed approximately at the center of the truck's load center

Lifting or Carrying people is strictly prohibited, if carried goods. The goods must fall on the lifting point.

It is prohibited to use this truck on lifting or loading ramps。

The rated capacity is marked on the capacity label or nameplate. And the operator must pay attention to the warming signs and safety instructions

Operating lighting must be at least 50LUX Modification

Any modification that may affect the truck rated capacity, stability or safety operations must be approved in advance by the Truck's original manufacturer or Its authorized Manufacturer or its successor. This includes the effects of changes such as Braking, steering, Visibility, and the addition of removable accessories.

After the manufacturer or its successor approves the modification or change, the capacity name plate, Label, identification marks, operation and maintenance manual must be changed accordingly

Truck damage caused by not following Instruction will lose its warranty

3. Introduce of the product

a. Overview of main components

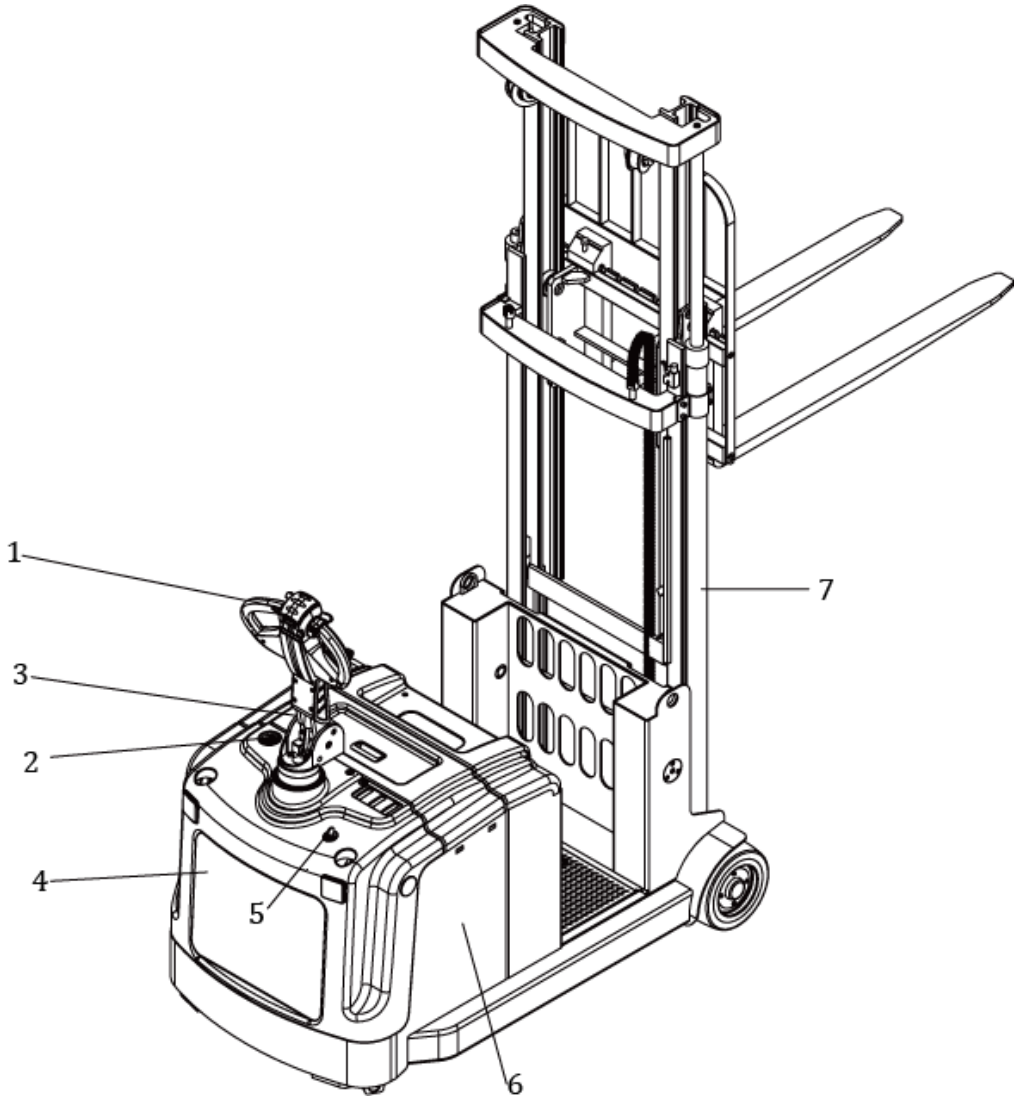
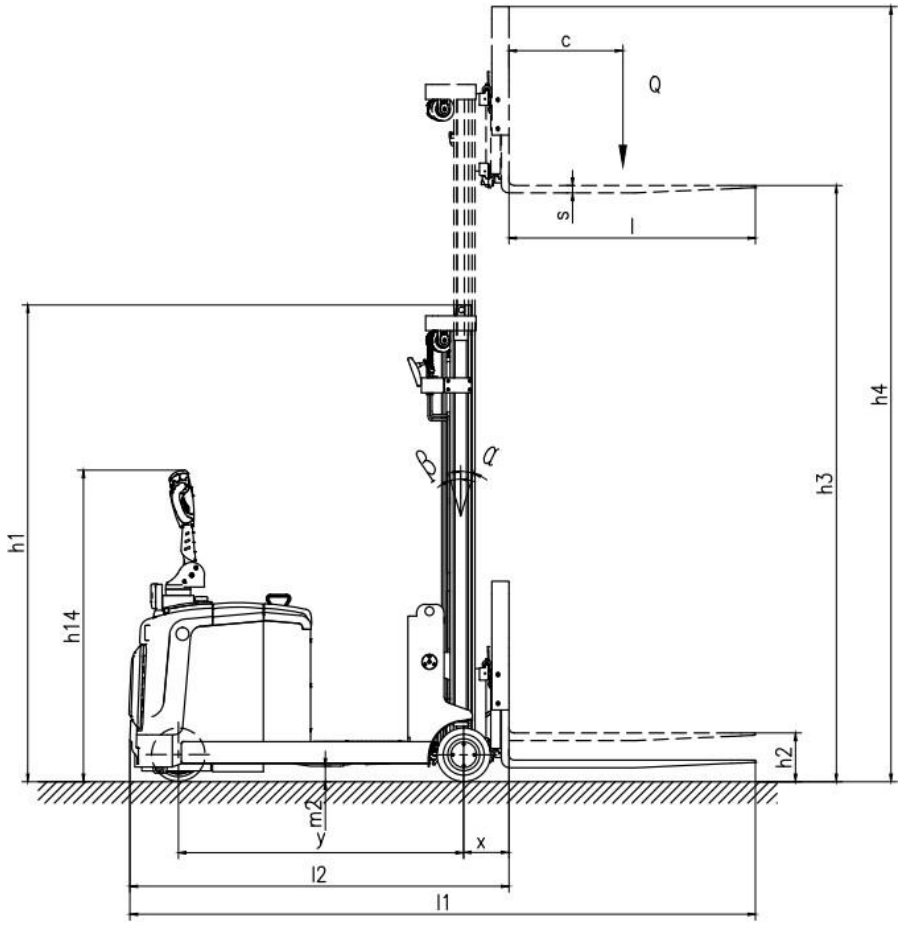


Figure 1 main components

No.	Description	No.	Description
1	Main frame assembly	5	Protection Arm
2	cover	6	Key switch
3	Operating handle	7	Emergency stop switch

4	Mast assembly	8	Electricity meter

b. Model parameters



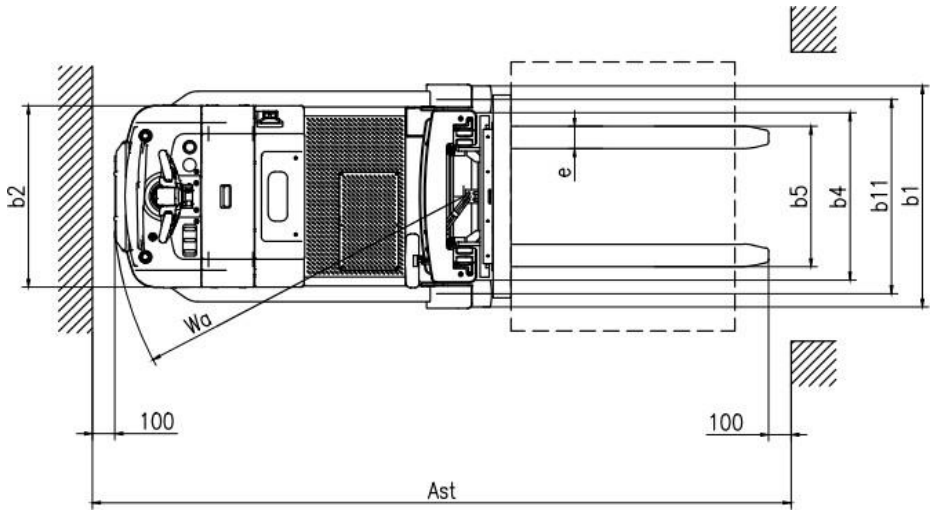


Fig 2 Schematic diagram of the stacker

Main technical parameter list

Mode		EK14S-130
Drive type		Electric
Type of operation		Stand on
Load Capacity	Q (lbs)	3300
Load Centre	c (inch)	23.6
Distance between fork backrest and front wheel	x (inch)	8.3
Wheelbase	y (inch)	52.36
Tire material		PU
Driving wheel size	Φ×w(inch)	Φ9.84×2.95
Bearing wheel size	Φ×w(inch)	Φ9.84×4.72
No of Driving wheel, Balance wheel/Bearing		2/1x
Front wheelbase	b11 (inch)	34.09
Mast/fork carriage tilt, forward/backward	α/β (°)	3°
Lowered mast height	h1 (inch)	87.52
Lift height	h3 (inch)	129.92
Extended mast height	h4 (inch)	165.67
The height of handle in the operation position	h14 (inch)	44.68/57.28
Overall Length	l1 (inch)	114.84
Body Length	l2 (inch)	69.57

Overall Width	b1/ b2 (inch)	31.8
Fork Size	s/e/l (inch)	1.38/3.94/45.3
Ground clearance under mast	m1 (inch)	3.54
Ground clearance at wheelbase center	m2 (inch)	2.87
Aisle width with pallet 39.37 x 47.24across forks）	Ast (inch)	122.8
Aisle width with pallet 31.5 x 47.24 along forks	Ast (inch)	127.36
Mi. Turning radius	Wa (inch)	61.8
Driving Speed load/unload	(km/h)	5.2/5.5
Maximum gradeability load/unload	(%)	5/8
Brake Type		Electromagnetic brake
Drive Motor	(kW)	2.5
Lift Motor	(kW)	3.0
Battery voltage/rate capacity	(V/Ah)	24/210
Battery Weight（±5%）	(lbs)	462
Type of drive control		AC
Noise level	(dB(A))	70
Steering type		EPS

4. Safety Caution

Please don't

- **When traveling outdoors, the stacking operation makes the lifting height of the cargo higher than the lifting point**
- **Place the foot or hand under or into the lifting mechanism**
- **Allow non-operators to stand in front of or behind the truck during moving or lifting / lowering**
- **Overload**
- **Putting your foot on the front of the wheel may cause injury**
- **When lifting person, they may fall and cause serious injury**
- **Push and pull cargo**
- **Use the car on the slope**
- **Use the car without Shielding panel**
- **Side load or tail load, the cargo must be evenly distributed on the fork**
- **Use this car to load unstable, unbalanced cargo**
- **Use this car without the manufacturer's written consent**

- **The uplifted cargo will become unstable because of wind. Don't lift the cargo in windy conditions**

Observing different ground conditions during driving. The cargo may fall, or the car may lose control, please check the loading situation frequently, If the cargo becomes unstable. Stop the operation of the truck immediately. When the cargo slide or slide off the truck, Stop the car by pressing emergency stop switch. Please refer to Chapter 6 for any truck Trouble. Maintain according to regular inspection. The Truck is not waterproof, please use it in dry environment. Continuous operation for a long time may damage the power box, please stop operating when Hydraulic oil temperature is too high.

- **The operator should put on safety shoes when operating the forklift**
- **The car is suitable for indoor use in temperature from +5°C to 40°C**
- **Operating lighting must be at least 50LUX**
- **Don't use the car on the slope**
- **In order to prevent sudden movement of the car when the car is not operated (such as caused by others), turn off the car power and remove the key when not operating**

5. Test run, Transportation, Outage

a. Test run

Table 3 test data

Model	EK14S-130
Packing weight（LBS）	See technical parameter table 2
Lifting height（INCH）	129.92
Size（INCH）	114.84*31.8*87.52

After receiving our new forklift or when it needs to be retest please with process with following steps before (the first) operation of the forklift :

i. Check if all parts are included .and there is no damage

ii. Battery installation and charging (refer to Chapter 7)

iii. Carry out daily inspection and machine function inspection

b. Transportation

Please pay attention to below point When shipping by container or car:

1. The front and rear wheels are fixed with wedges to prevent sliding during transportation.

2. When using a lasso, be careful not to place it on the fragile structure of the forklift.

3. When using a forklift to handle, keep the center of gravity of the forklift in the middle of the two forks.

c. Parking

When the forklift is not working, it should be parked in a dry and ventilated garage to prevent sun and rain. And please pay attention to the points below.

1. turn off the key. cut off the emergency stop switch, and plug off the power connector

2. Front and rear wheels are cushioned well

3. If it is stopped for a long time, the battery should be recharged every 15 days

6. Routine Inspection

This Chapter Describes checking the car before using

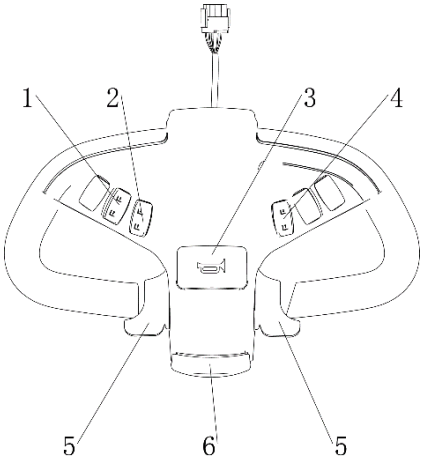
Routine inspection can effectively find out the defect or error of this car; The following points should be checked before operation.

Remove the cargo ,Lowered the fork. Please don't use the car if there is any Problem.

- Check the liquid level of the battery's electrolyte and add an appropriate amount of pure water. The liquid level will rise when charging.
- Check the condition of each pole, cable and protective cover of the battery.
- Check that the battery box is securely fastened
- Check the condition of the lifting chains, rollers, forks, tubing and horns.
- Check the oil leakage

- Press the emergency stop button to check the emergency brake function
- Check if the wheels can move smoothly
- Check the wear of the drive wheels, load wheels, etc.

7. The Schematic diagram of Operating Mechanism



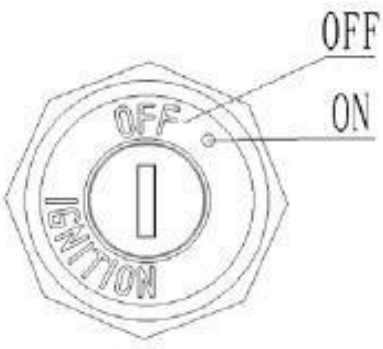


Fig 3 Operating console

Fig 4 Key Switch

No	Description
1	Side shifter switch
2	Tilt backward &forward switch
3	Horn
4	Lift up/ Lower down switch
5	Accelerator
6	Emergency revise switch

PS: Electricity meter and Emergency stop switch pls refer to FIG 1

8. Operating specification

Please familiarize yourself with the functions of the switches / buttons before operating the forklift.

a. Start, traveling and Parking:

1. Insert the key into Key switch (figure 4), Turn the key clockwise to “ON” position. Gently pull up the Emergency stop switch (Figure1-7).and the control circuit opens.
2. Lift the fork off the ground about 3.937 inches.
3. Slowly open the accelerator (Figure 3.3) until the required speed.
4. During the operation, if the forklift has an abnormal failure, it is necessary to quickly cut off the power. Press the emergency stop switch (Figure 1.7).
5. When the forklift is turning, the speed should be reduced. If possible, try not to make a sharp turn.
6. The full load climbing gradient of the forklift is 6%, so you need to know the gradient when climbing, and the forklift must press the accelerator as much as possible to obtain the maximum climbing force.
7. When the forklift stops, lower the fork to the lowest position, press the emergency stop switch (Figure 1.7), and pull out the key (Figure 4)

b. Use of emergency stop switch

The truck is out of control while driving, or it produces a scorching smell during use. Please press the emergency stop, switch on the forklift and cut off the main power. Check the cause and clear the fault before opening. The opening method is: pull the red button gently, the button pops up, and the opening is completed.

The emergency stop switch button is made of plastic. Do not use excessive force when pressing down or pulling up to avoid damaging the switch.

c. Use of horn

For driving safety, the vehicle is equipped with a driving horn (Figure 3.5). To remind others when driving, press the horn button in the middle of the operation handle, and the

horn will ring to remind pedestrians to pay attention.

d. Battery capacity display

The Electricity meter (Figure 1.8) has a capacity display function for the battery capacity of the forklift, and it can also use the power time statistics (calculated in cumulative hours) and undervoltage power-off functions.

e. Handling stacking operation

(1) How to carry heavy objects on a pile of goods

Slowly drive the forklift to the item to be transported, make the fork parallel to the ground, lift the fork to the height where it can be inserted, move the fork and slowly move forward, when the fork is fully inserted then parking, operate the lifting handle(figure 3.2) to raise the weight to a certain height, tilt the mast backwards, slowly reverse the forklift , do not touch the adjacent goods, Lowered the goods to a correct position when the heavy objects completely leave the cargo pile. and then carry it by walking.

(2) Putting heavy objects on the pile of goods

The weight is at a low position, the mast is tilted backward, and the stack is decelerated as it travels close to the cargo pile. When it is determined that the forklift is in a straight line with the stacking goods, the brake slowly adjust the title angle for the mast to a vertical state. lifting the goods slightly exceeds the height of the pile, and then the forklift slowly travels forward to stop above the pile. Slowly push and lower button, Once the heavy objects handled by the stack are dragged, lower the fork to the hollow position. When the fork is pulled out from the heavy object, ensure that the retracted position is unobstructed before it can be reversed. After the fork has completely left the heavy object, lower the fork and the mast is tilted backwards before carrying out a round of handling operations.

P.S.: Note: Please carry the goods according to the load Chart, any use beyond the requirements of the load curve diagram is not allowed

f. Steering

The truck equips EPS (Electric Power steering system) must be handled with care. Steer

the truck by turning the handle left or right

g. Braking system

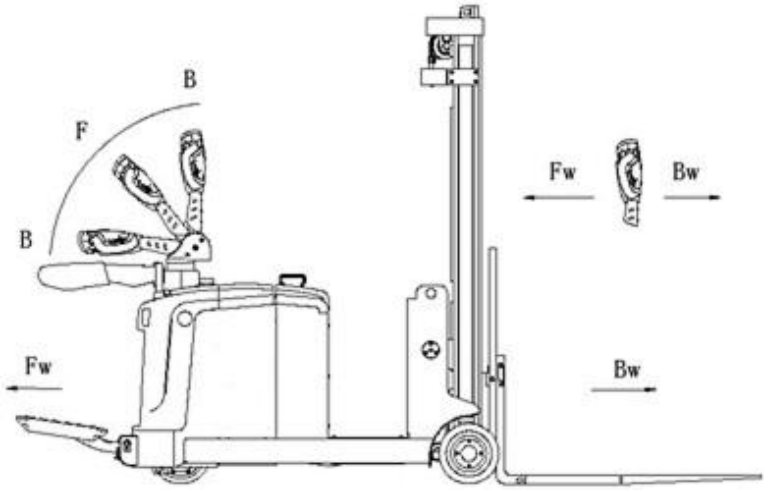


Figure 5 Location of the handle area

Braking performance depends on road conditions and the loading conditions of car

The brake function can be activated in the following ways:

i. By moving the accelerator (figure 3.3) to the “0) position or release the button, Regenerative braking is activated and the truck brakes until it stops.

ii. By moving the accelerator (figure3.3) directly from the drive direction to the opposite direction, the truck regenerates braking until it starts driving in the opposite direction

iii. The truck brakes if the handle moves up and down to the braking zone (‘B’). If releases the handle, it will automatically move to the upper braking zone (B) and the car brakes until it stops

Emergency reverse button(figure3.4) prevents the operator from being squeezed. And if this button is activated, the car slows down /or begins to travel backwards (‘Bw’) and then stops. If the handle is in the operating area and the truck is not moving. consider that this button still works for this situation

h. Brake structure & Brake Schematic

Braking principle: as figure12 shows including Brake by magnetic yoke assembly 6、Magnet exciting coil 7、Spring 2、 brake disc 5、Armature 1、Geared sleeve 4、Mounting screw

3. The brake is mounted on the end cap of the motor, and the mounting screw is adjusted to the specified air gap value. The gear sleeve is fixed on the shaft. The external teeth cooperate with the internal teeth of the brake disc. And the torque is transmitted during operation. Then the brake disc can move axially on the gear sleeve.

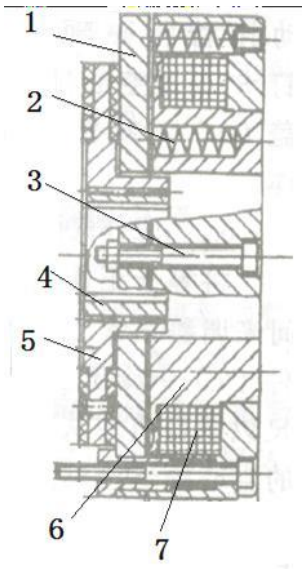


Figure 6 brake schematic

When Magnet exciting coil 7 of brake is energized. The coil produces a magnetic field that caused the armature 1 draw toward the magnetic yoke assembly 6. Armature 1 detached from the brake disc 5(Release). Then the motor drive shaft with brake disc 5 starts and operates normally. When Magnet exciting coil 7 is de-energized., The magnetic flux disappears. Armature 1 is released .and spring 2 process armature 1, then the friction plate on the brake disc is pressed to generate frictional force for braking purposes

i. Trouble

If there is any error or the car is not operate, Stop using and press the emergency stop switch(Figure 1.7).Parking the car in safe area if possible .Turn the key counterclockwise and remove the key(figure 4).Notify the manager or contact your after-sales service staff immediately .Use a special towing equipment /lifting equipment to pull the truck out of the operating area if necessary .

j. Emergency situations

Keep a safe distance in an emergency or the car is turned over. Press the emergency stop switch (Figure 1.7) and all electrical functions will stop.

9. Changing and Replacement for battery

- **Only Qualified personnel are allowed to repair or recharge the battery. Please be sure to follow this manual and battery manufacturer's instructions.**
- **The battery is Lead-Acid battery.**
- **Battery recycling is subject to national regulations. Please follow these rules.**
- **When handling batteries. Don't use open flame which my cause gas explosion.**

- **Don’t place flammable materials and work equipment that may generate sparks within a distance of at least 2M around the forklift that needs to be recharged**
- **It is forbidden to burn materials or burn liquid in the charging area of the battery. It is strictly forbidden to smoke. The area must be well ventilated.**
- **Parking the car safely before you start charging, installing /replacing the battery**
- **Before finishing the repair. Please make sure that all cables are connected and there is no interference with the other part of car.**

For standard batteries, this model is equipped with the following lead acid battery models:

1PC 2ZPS/24V/210AH/790X210X570(LXWXH)

Only lead-acid batteries are allowed

The battery weight has a certain influence on car operation. Please consider the max working temperature of the battery.

a. Replacement

Park the car safely, Move the Mast forward to the appropriate distance, Turn off the car by key(Figure 4) and press the emergency stop switch(Figure 1.7) to open the battery cover ,Remove the battery connector .Then lift the battery from the top of the frame directly .Caution: If the lifting equipment is not safe. The battery may tip over. Installation is the opposite procedure of remove, p l e a s e connect the positive terminal first. Otherwise, the car is easy to damage

Note: The used batteries must be recycled and stored in accordance with the relevant laws and regulations in the area where they are stored, or in the prescribed disposal area, and these tasks must be performed by a qualified professional company.

b. Battery display

Battery display table: The battery discharge situation is indicated on the battery display table by 10 display bars with an increase of 10% per cell.

As the battery capacity is consumed, the illuminated display bar will drop from the top.

The colors of the LEDs indicate the following different states:

name	LED color	Parameter value
Remaining power of standard battery	green	70-100%
	orange	30-60%
	Flashing red	0-20%

The battery is discharged up to 70%, and the red light flashes to issue a "charge storage" warning.

The battery is discharged up to 80%, and the two lights flashing to issue an "out of battery" alarm, the battery must be charged.

Sufficient battery

need to charge

low battery

c. Charging

i. **Only be charged with included charger**

ii. **Before using the charger, please fully understand the contents of the charger manual**

iii. **Ensure good ventilation in charging room**

iv. **Fully Charged situation can only be viewed from the display.to check this situation, you need to interrupt the charging and start the car.**

Park the car in a safe area that provides dedicated power. Lower fork and remove the cargo. Turn off the power of car, Open the battery cover, then connect the connector and Charger. The charger starts charging. Finishing charging. Remove the connector from the charger, Connect the connector to the car and cover the battery cover.

10. Maintain Introduction

- **Only Qualified and trained personnel are allowed to maintain the car.**
- **Remove the cargo from the fork and lower the fork to the lowest point before maintenance.**
- **Please use the designated binding equipment or lifting equipment in accordance with chapter 4, if it is necessary to lift the car. Before operation. Place safety device (such as lifting jacks, Wedges or Wooden blocks) under the car to prevent accidental falling, moving or sliding.**
- **Use approved and distributor 'S original accessories.**
- **Please consider the machine failure and accident that may be caused by the leakage of hydraulic oil.**
- **Only trained maintenance technicians are allowed to adjust the pressure Valve.**

If need to replace the wheel. Please follow the above instructions. Casters must be round and free of abnormal wear. Check the key points on the maintenance list.

a. Maintain list

Table 4 Maintain list		Time interval(Month)			
		1	3	6	12
No.	Hydraulic system				

1	Check if there is any damaged noise and leakage for hydraulic cylinder and piston		□		
2	Check if there any damage and leakage for Hydraulic connector and tubing .		□		
3	Check hydraulic oil level and refill if necessary.		□		
4	Refill hydraulic oil(12 months or 1500 working hours)				□
	Mechanical system.				
5	Check the fork for deformation and cracks		□		
6	Check the base for deformation and cracks		□		
7	Check all screws are fully fixed		□		
8	Check the mast & chain for corrosion. Deformation or damage ,And replace if necessary	□			
9	Check the gear box for noise and leakage		□		
10	Check the wheels for deformation and damage and		□		
11	Lubricated steering bearing				□
12	Check and lubricate the pivot point		□		
13	Grease fitting	□			
14	Protect, protective plates and replace it if they are	□			
	Electric system				
15	Check the wires for damage		□		
16	Check electrical connections and terminal conditions		□		
17	Check the function of Emergency stop switch		□		
18	Check the electric motor for noise and damage		□		
19	Check the display		□		
20	Check if the fuse is used correctly and replace if		□		
21	Detection buzzer		□		
22	Check the current contactor		□		
23	Check the frame for leaks (Insulation test)		□		
24	Check the function and wear of the accelerator		□		
25	Check the electrical system of the drive motor		□		
	Braking system				
26	Check the braking performance		□		
	battery				
27	Check the battery voltage		□		
28	Clean and grease the terminal ,Check for corrosion and		□		
29	Check if battery box damage		□		
	Charger				
30	Check if the main power cord is damage			□	
31	Check the start protection procedure during charging			□	
	Function				
32	Detection buzzer	□			
33	Check the air gap for electromagnetic braking	□			
34	Check emergency braking function	□			
35	Detect reverse braking and regenerative braking	□			
36	Check steering function	□			

37	Check lift up & lift down function	□			
38	Check key switch for damage and function	□			

39	Check speed limit switch(lifting height >~400mm)	□			
	Comprehensive				
40	Check if all labels are clear and complete	□			
41	Check if the shield panel and protection is not damaged	□			
42	Check the caster, to height adjust or replace it if worn		□		
43	Conduct a test run	□			

11. Trouble shooting

- If the car is still in trouble, please follow the instructions in chapter 6 Table6 Fault analysis

Effect of fault	Cause	Solution
The truck can't move	Battery connector is not connected	Check the battery connector and connect if necessary
	The electric lock switch is in the "OFF" position	The electric lock switch is placed at the "0" position
	Emergency stop switch did not open	Open Emergency stop switch
	Battery is exhausted	Check the battery charge and recharge if necessary
	Stacker is charging	Interrupting charging process
	Fuse damage	Check the fuse
Cargo can't lift up	The truck is not running	Operate as listed in the "Vehicles Cannot Move" fault
	Too little hydraulic Oil	Check Hydraulic Oil
	Fuse damage	Check the fuse
	Cargo overweight	Only lift up the max Load shown on the nameplate
	Lifting micro switches is not good or damaged	Check the fuse
Cargo Can't lower down	Oil dirty blockage control valve	Check hydraulic oil and purge control valve, replace hydraulic oil, if necessary,
	he drops solenoid valve is not open or damaged	Check the drop solenoid valve or replace it
Can't stop when lifting up	Lifting micro switch is damaged	Turn off the power and replace the lift micro switch
One direction moves	Micro switch and connection cable are not in good contact	Check the micro switch and connecting cable in the control handle

Move slowly	insufficient battery or poor cable contact	Check the battery level indicator and the corresponding cable
The truck start suddenly	Controller damaged	Change Controller
	Control forward and reverse handles are not reset	Repair to reset or replace

If the fault cannot be eliminated by Trouble shooting list, please inform the manufacturer's after-sales service team and let excluded by specially trained service personnel to Repair.

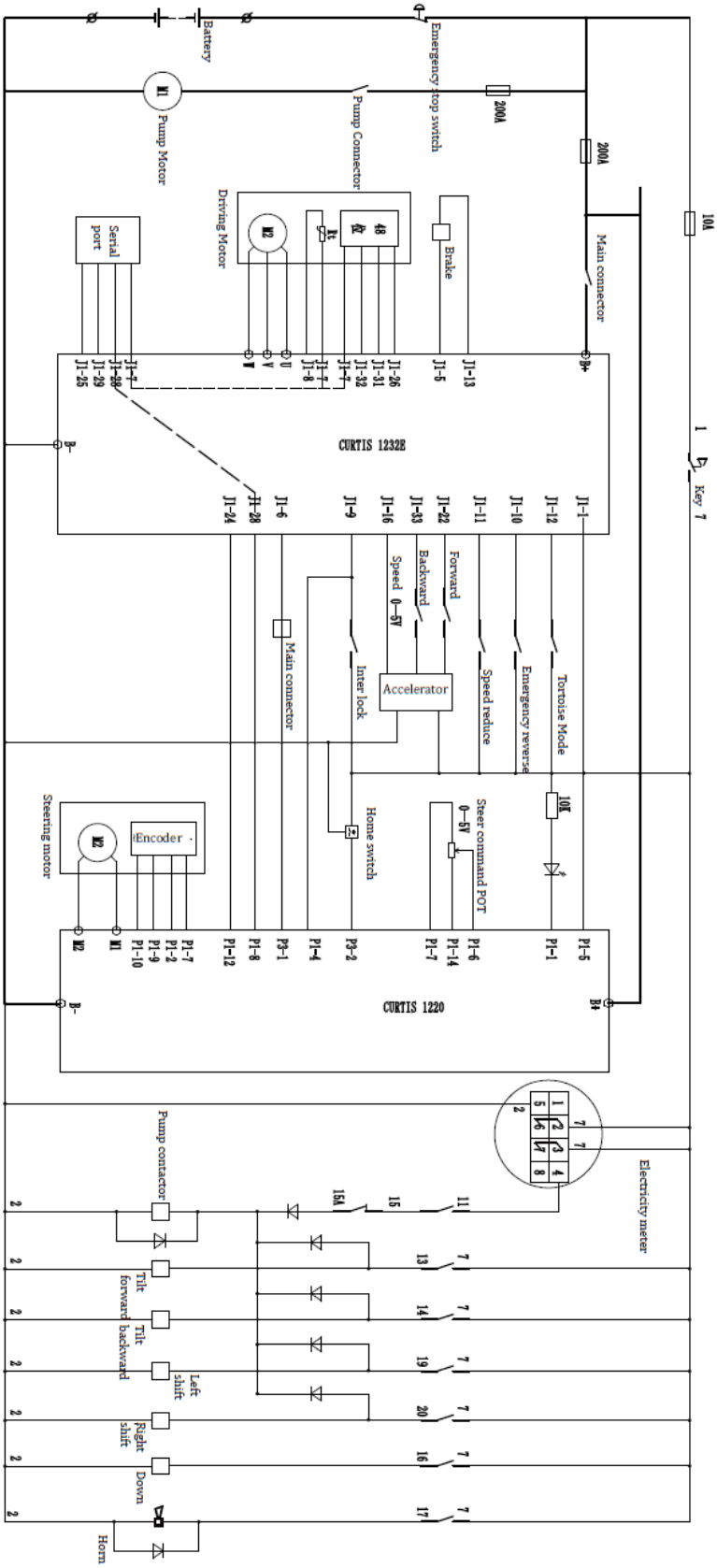
If the truck fails and cannot be operated outside the work area, lift the truck, place a load handling device under the truck and ensure the safety of the truck then remove the truck from the aisle.

12. After-sales service

If there is a fault that cannot be eliminated by professional service personnel, please contact our after-sales service personnel in timer.

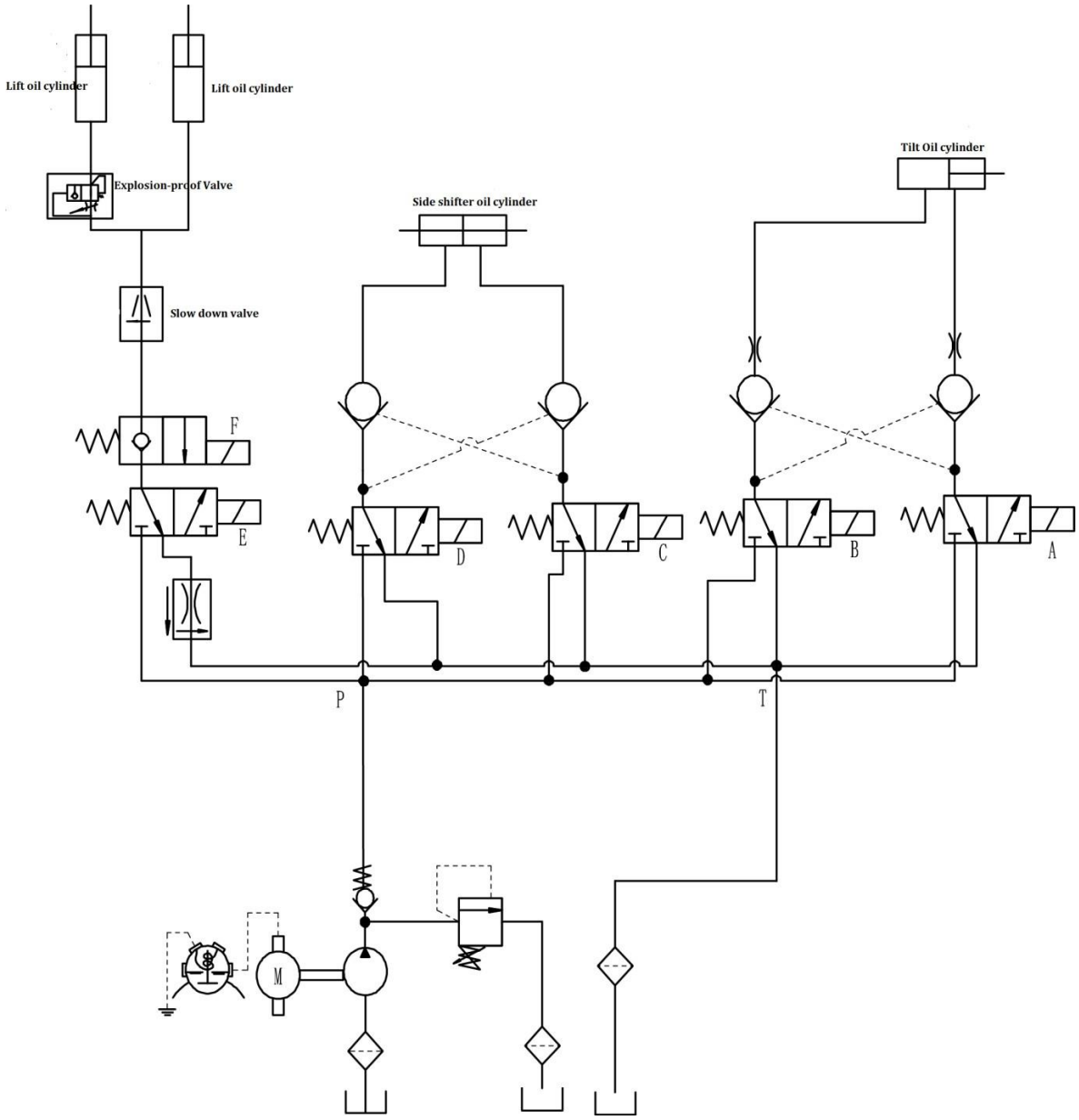
13.Electrical Schematic diagram

12.1 EK14S-130 Electrical Schematic diagram



14. Hydraulic Schematic diagram

13.1 EK14S-130 Hydraulic Schematic diagram



This manual final interpretation was retained by manufacturers.

1. Maintenance List

A. Overview of main components

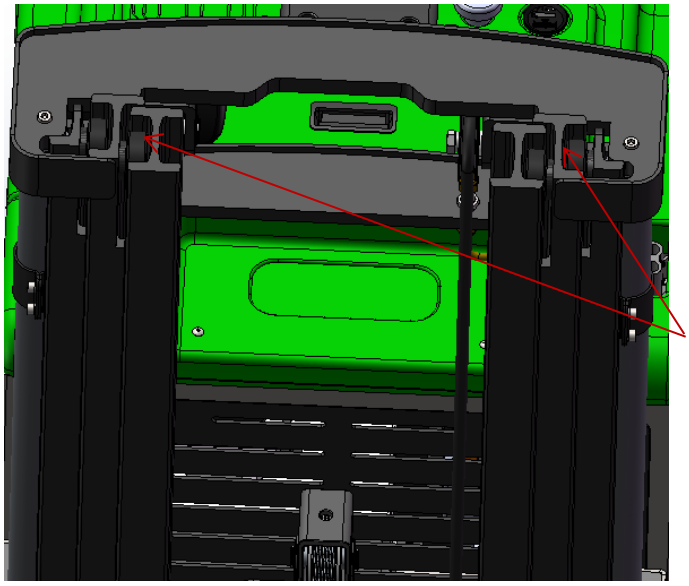
List 1: Maintenance List

		Interval (month)			
		1	3	6	12
The hydraulic system					
1	Check the hydraulic cylinder, piston for damage noise and leakage		•		
2	Check hydraulic fittings and tubing for damage and leakage		•		
3	Check hydraulic oil level and refill if necessary		•		
4	Refill with hydraulic fluid (12 months or 1500 working hours)				•
Mechanical systems					
5	Check the fork for deformation and cracks		•		
6	Check the base for deformation and cracks		•		
7	Check that all screws are properly fastened		•		
8	Inspect door frame and chain for corrosion, deformation or damage and replace if necessary.	•			
9	Check gear box for noise and leakage		•		
10	Check wheel for deformation and damage and replace if necessary		•		
11	Lubricated steering bearing				•
12	Check and lubricate the pivot points		•		
13	Lubricating grease nozzle	•			
14	If the protection and/or protection plate is damaged, replace it	•			
Electric System					
15	Check for damaged wires		•		
16	Check electrical connections and terminals		•		
17	Test emergency stop switch function		•		
18	Check the electric drive motor for noise and damage		•		
19	Detection display		•		
20	Check that the correct fuse is used and replace it if necessary		•		
21	Check the buzzer		•		
22	Check the current contactor		•		

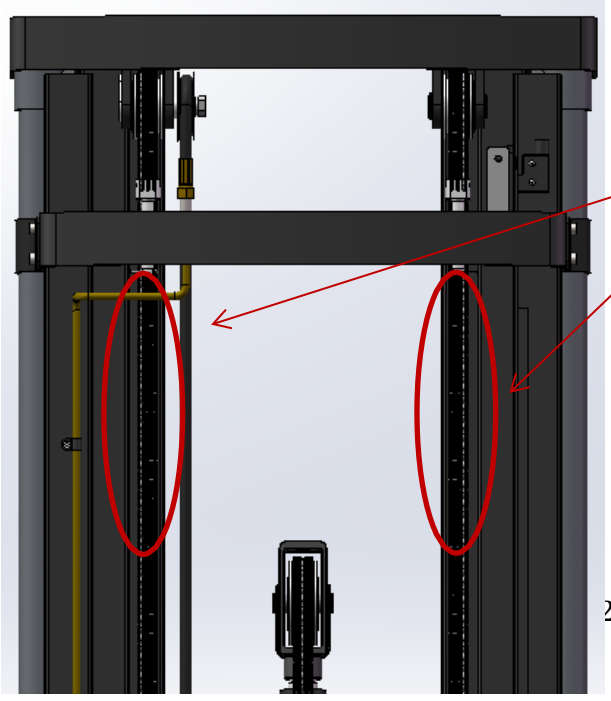
23	Check frame for leakage (insulation test)		•		
24	Check accelerator function and wear		•		
25	Check the electrical system driving the motor		•		
Driving system					
26	Check braking performance		•		
Storage Battery					
27	Checking the Battery voltage		•		
28	Clean and grease terminals and inspect for corrosion and damage		•		
29	Check whether the battery casing is damaged		•		
Charger					
30	Check whether the main power cable is damaged		•		
31	Check the startup protection program during charging		•		
Function					
32	Check the buzzer	•			
33	Check the air gap of the electromagnetic brake	•			
34	Test emergency brake function	•			
35	Test reverse braking and regenerative braking functions	•			
36	Check steering function	•			
37	Check lifting and descending functions	•			
38	Check whether the key switch is damaged and functional	•			
39	Detection speed limit switch (lifting height >~400mm)	•			
synthesize					
40	Check all labels for clarity and completeness	•			
41	Check that the guard plate and/or guard are not damaged	•			
42	Check casters, if worn height adjustment or replacement		•		
43	Run a trial run	•			

B. Lubrication points

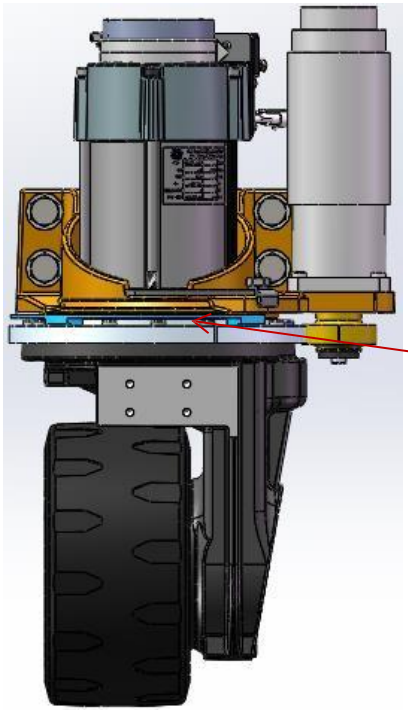
- **Lubricate marked points according to maintenance list.**
- **Required grease specification: DIN 51825 standard grease.**



Door frame track lubrication



Chain lubrication



A. Check and correct electrolytes

The electrolyte density is based on 25℃.Therefore, when measuring, if the temperature of the electrolyte is higher or lower than 25℃, every 1℃ higher, should be measured from the actual density value plus 0.0007; On the contrary, lower than 25℃, every 1℃, should be minus 0.0007; If the temperature difference is large.

Can be corrected by pressing the following formula:

Standard temperature of electrolyte (25℃) Density is converted according to the following formula: D25 = Dt + 0.0007(T-25)

D25 -- electrolyte density at 25℃

Dt -- T ℃ measured electrolyte density

T -- Temperature of electrolyte when measuring density

Under the condition of normal working of charging function, the density of 1.26±0.005(25℃) temperature below 30℃ sulfuric acid electrolyte into the battery, liquid level requirements higher than the protection plate 15 ~ 25㎜.

Leave the battery to rest for 3-4 hours, no more than 8 hours. Initial charging can be carried out

only when the liquid temperature drops below 35□.If the electrolyte level drops after standing, the electrolyte should be replenished.

The discarded batteries must be recovered and stored in the specified environmental protection area or the specified waste disposal area in accordance with the local laws and regulations, and the work must be carried out by qualified professional companies.

C. Check the fuse

200Afuse

List 2: Fuse specification

	Specification
Fuse 1	200A

2. Fault analysis

If the vehicle continues to malfunction, follow the instructions of the manual.

A. Common fault analysis

Hand and foot break common faults and troubleshooting methods

Fault	Cause	Maintenance
Vehicles cannot move	The battery connector is not connected	Check the battery connector and connect it if necessary
	The electric lock switch is in "OFF" position	The electric lock switch is placed in the "0" position
	The emergency stop switch is not on	Turn on the emergency stop switch
	Battery running out	Check the charging status of the battery and recharge it if necessary
	The forklift is charging	Interrupt charging process
	Fuse damage	Check fuse
Cargo cannot be lifted	The vehicle is not running	Follow the procedure listed in the "Vehicle cannot Move" fault
	There's too little hydraulic fluid	Check hydraulic oil
	Fuse damage	Check fuse
	Load overweight	Note rated load
	The lift micro switch is in bad contact or damaged	Check fuse
Goods cannot be lowered You can't stop when you go up	Dirty oil clogs the control valve	Check the hydraulic oil and clean control valve, replace the hydraulic if necessary
	The descent solenoid valve is not open or damaged	Check the drop solenoid or replace
Moving in one direction	The lifting micro switch is damaged	Cut off the power supply and replace the lifting micro switch
Traffic moves slowly	Contact between micro switch and connecting cable is not good	Check the micro switch and connecting cable in the control
The vehicle started suddenly	The battery power is low or the corresponding cable is in poor contact Controller damage	Check the battery indicator and corresponding cables Replacing a Controller
Goods cannot be lowered	Control forward and backward handle is not reset	To restore or replace

If the vehicle is malfunctioning and cannot be operated outside the work area, lift the vehicle up, handling device under the vehicle and secure the vehicle, then remove the vehicle out of

B. The fault code display

Table 4:1212P fault codes

Programmer display	code	The fault phenomenon	fault diagnosis
BATTERY DISCONNECT FAULT	**4.5**	Battery don't answer	1) The battery is not connected
BRAKE OFF FAULT	**3.4**	Brake closing fault	2) Poor contact of battery end
BRAKE ON FAULT	**3.2**	Break opening failure	1) Electromagnetic brake coil short circuit
CURRENTSENSE FAULT	**4.1**	Current detection fault	2) Electromagnetic brake drives open circuit
EEPROM CHECKSUM FAULT	**4.3**	EEPROM failure	1) Electromagnetic brake coil open
HARDWARE FAILSAFE	**4.2**	Motor voltage is out of range	2) Electromagnetic brake drives short circuit
HPD FAULT	**3.5**	HPD fault	1) Short circuit of motor or motor wiring
MAIN FAULT	**2.3**	The main contactor is faulty	2) The controller is faulty
MAIN OFF FAULT	**2.1**	Main contactor coil drive 'off' failure	1) EEPROM is faulty or invalid
MAIN ON FAULT	**2.4**	Main contactor coil drive 'on' failure	1) Motor voltage cannot match accelerator input
OVERVOLTAGE FAULT	**1.5**	Battery voltage is too high	2) Short circuit of motor or motor matching ring
PRECHARGE FAULT	**3.3**	Pre-charge failure	3) The controller is faulty
SPEED POT FAULT	**1.3**	The speed limiting potentiometer is faulty	1) Accelerator, key switch, promotion or prohibition
THERMAL FAULT	**1.1**	Over/under temperature cut-off	Input several actions out of order
THROTTLE FAULT	**1.2**	Potentiometer slip end or low	2) Wrong adjustment of accelerator

UNDERVOLTAGE FAULT	**1.4**	The terminal voltage is out of range	1) Main contactor adhesion or open

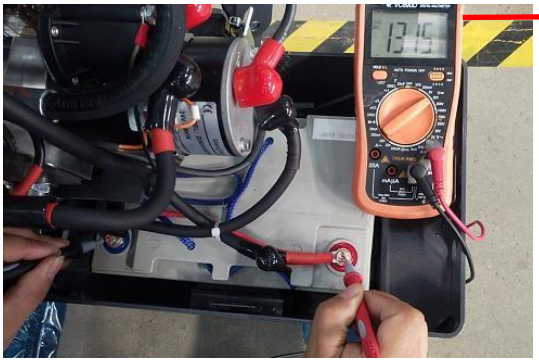
C. Methods for troubleshooting common faults

1、Code 4.5 Battery is not connected

Check whether the fastening of cable terminals of the car body is loose, as shown

Check whether the cable connection (including other secured parts) is loose

2. Use a multimeter to measure the monomer voltage of the battery with load. The specific operation is shown as follows:

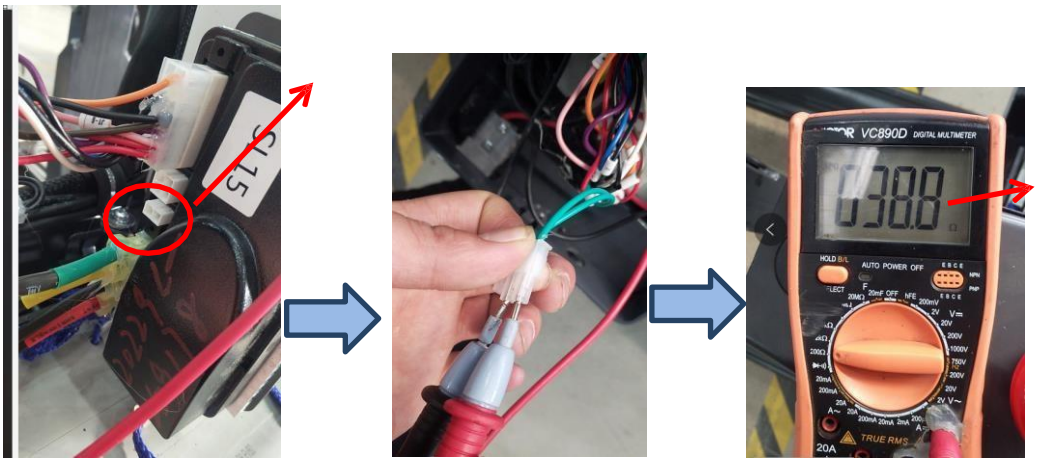


Cell with load measurement, cell voltage drop should be

When it's between 2 and 3V

1、Codes 3.4 and 3.2 Electromagnetic brake line problems, or electromagnetic brake failure

Use a multimeter to measure the resistance of the two cores on the controller to the plug-in. The specific operations are as follows:



Normally, it should be about 40 ω. If no resistance is displayed, there is a problem with

Code 4.1 Motor or motor line short circuit or controller failure

1. Remove the motor brake disc (the brake line is still connected), connect the motor M1 M2 directly to the positive and negative poles of the battery, observe whether the motor rotates normally, if not, the motor will fail.

2. If the motor turns normally, the controller should be replaced.

Operation sequence failure in 3.5 and 3.1

1, interlock switch under normal circumstances, use a multimeter to measure the controller 14 core plug-in between J1-6 and the negative pole, when the handle rod is in the switch working area, there is about 24V voltage. If not, check the interlock switch. For example, check whether the interlock switch is normal and whether the signal cable of the switch is connected to the controller.

4.2 Motor voltage cannot match accelerator input, motor or motor ring short circuit and controller fault, troubleshooting operations are shown as follows:

Switch the multimeter to 20V DC, insert the pen j1-1 (accelerator 0-5V speed signal) and 2 (negative pole) respectively, turn the accelerator after power on, and

If the voltage change of accelerator is normal, replace the controller

Six, determine the controller fault

Unplug the accelerator docking plug, if the controller is still reported fault after powering on (in addition to the above faults), the controller is faulty.

7. If the controller fault is steady on and there is no walking, the troubleshooting steps are as follows:

1. Measure whether there is voltage output of accelerator 0--5V (between J1-1 and negative electrode)

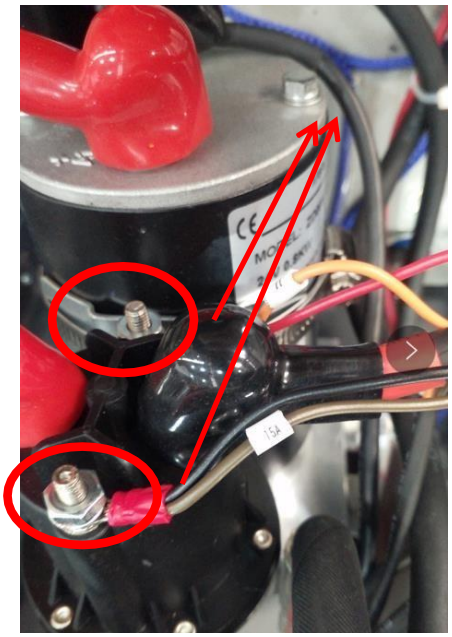
2. Short-circuit j1-6 on the 14-core plug of the controller with line 7 on the 5-pin. After restarting, turn the accelerator to see if there is a walk.

3. The brake is locked, remove the brake (the brake line is still connected), restart and turn the accelerator to check whether it is normal.

4, remove the motor brake disc (brake line is still connected), connect the motor M1 M2 directly to the battery positive and negative poles, observe whether the motor is normal rotation, if not, the motor failure.

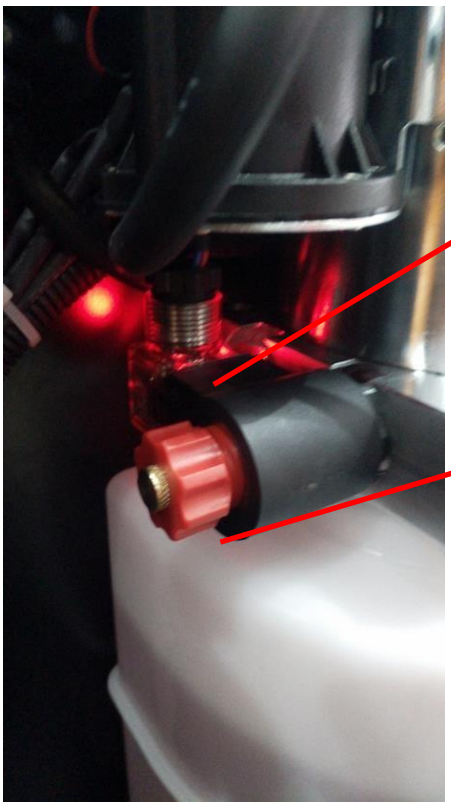
5. If all the above tests are normal, judge the controller problem.

1、



Here is the coil wiring of the lifting contactor (line numbers are 2 and 15). After powering on, press the lifting button to measure whether there is a voltage of about 24V at these two places. If so, and there is no sound of pulling on the contactor, then the contactor is faulty. If there is no 24V voltage, then line 15 at the measuring handle is connected to line 15 at this point.

Press down button, down solenoid valve signal red light should be steady on



The red light is the signal light of the descending solenoid valve. If the light is not on, measure whether line 16 is connected to the handle connection.

If the cylinder drops after lifting to the top, check whether the red mark of the drop solenoid valve is loose. If not, clean or replace it.

1. If the vehicle cannot be lifted normally, for example, the original 2800-3300lbs vehicle can only be lifted less than 2000lbs, then the oil pump

pressure can be adjusted, but this operation must be carefully, if the hydraulic pressure is adjusted so that the vehicle load exceeds the rated, it may make the frame deformation.

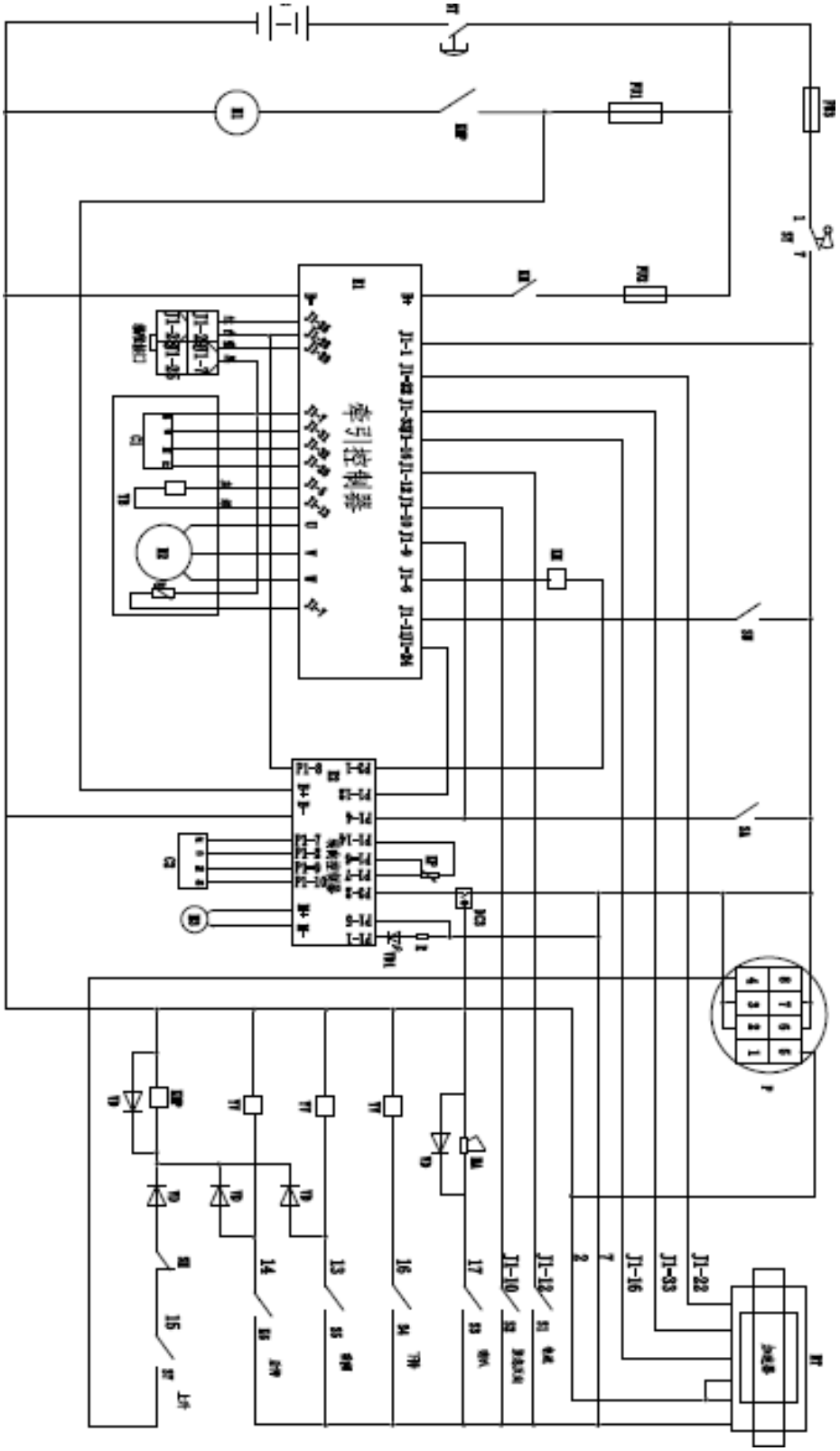
Specific operation are as follow:

The wrench unscrewed the pressure nut.

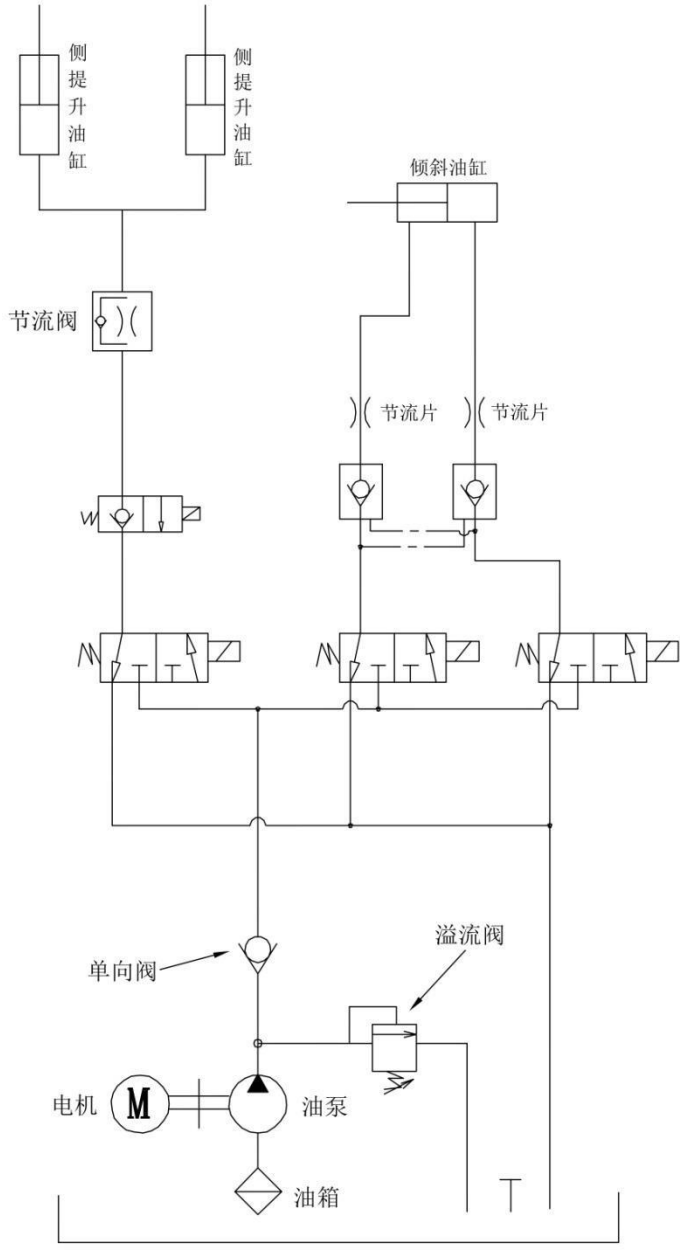
Using an inner hexagon wrench, adjust the pressure.

3. Wiring/circuit diagram

A. Schematic diagram and wiring diagram



B. Hydraulic circuit



Hydraulic circuit

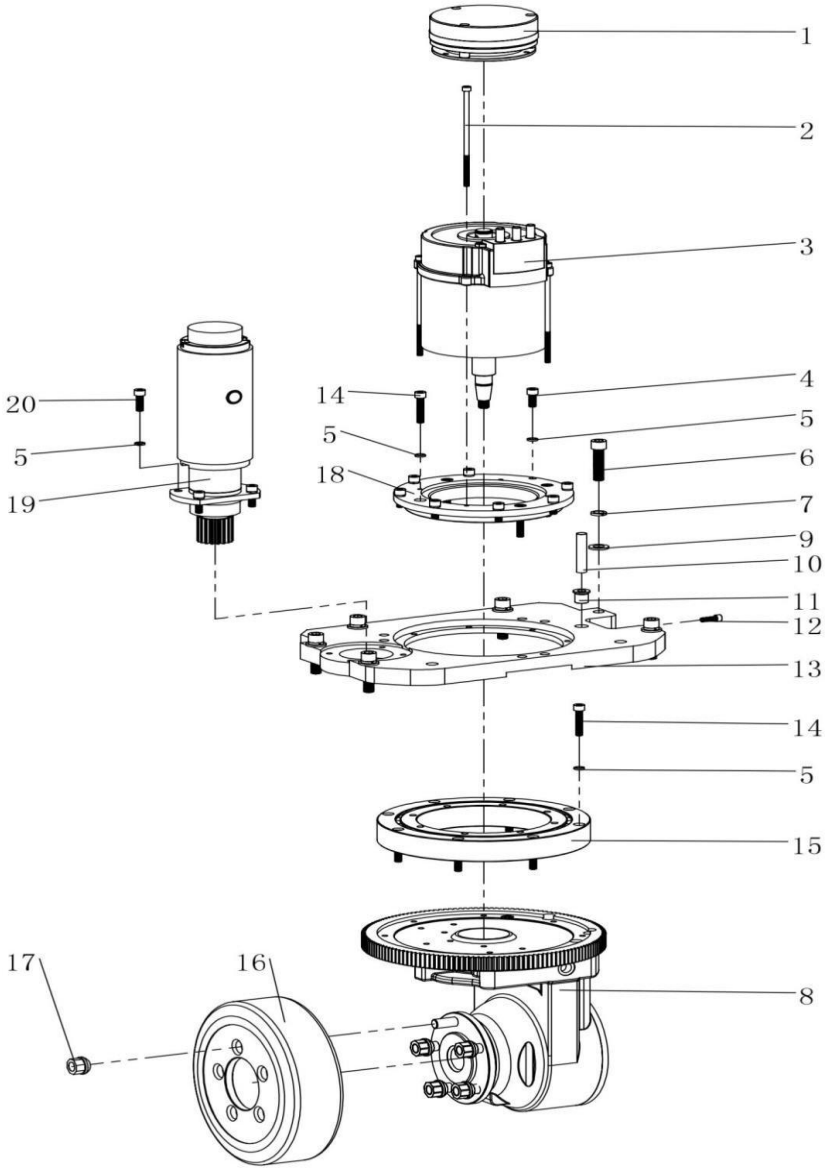
Hydraulic oil inspection

Appearance	Odor	Condition	Results
Clear not discoloration	good	good	can be used
color transparency	good	with other oil mix	check viscosity, if qualified can continue to use
Color changes like milk	well	mixed with air and water	to separate moisture or replace hydraulic fluid

The color becomes dark brown	not good	for oxidation	replacement of hydraulic oil
Clear color but small black spots	good	mix with other particles	can be used after filtering

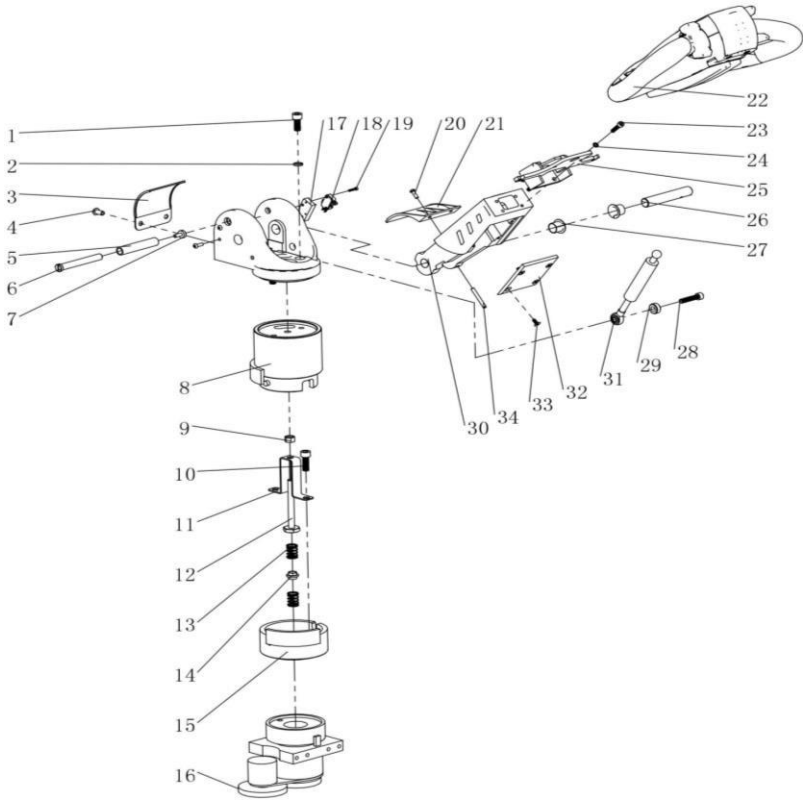
4. Disassembly of main parts

A. Removal of handle assembly



NO.	Code	Name		Quantity	Remark
1	SL20GA-01.6.3	Electromagnetic brake magnetic sensor assembly		1	
2	GB/T 70.1-2000	Hexagon socket head screws	M6×150	4	
3	SL20GA-01.6.7	Ac motor		1	
4	GB/T 70.1-2000	Hexagon socket head screws	M8×20	8	
5	GB/T 93-1987	Elastic washer	Φ8	24	
6	GB/T 70.1-2000	Hexagon socket head screws	M12×50	6	
7	GB/T 93-1987	Elastic washer	Φ12	6	
8	ZD-ZV21-500-001	reducer		1	
9	GB/T 95-2002	Flat washer	Φ12	6	
10	TY-01.40	Proximity switch PM12-04N		1	
11	SL20GA-01.6.6	The installation of		1	
12	GB/T 70.1-2000	Hexagon socket head screws	M6×20	1	
13	E10GL-01.9.1	Drive base plate (1)		1	
14	GB/T 70.1-2000	Hexagon socket head screws	M8×40	12	
15	SL20GA-01.6.4	Giant rotary bearing		1	
16	ZD-ZV21-BJL-001	Wheel drive	Φ248	1	
17		Big wheel nut		5	
18	E10GL-01.9.2	Drive base plate (2)		1	
19	TY-01.8	Steering motor	0.2KW	1	
20	GB/T 70.1-2000	Hexagon socket head screws	M8×25	4	

B. Removal of electric control component

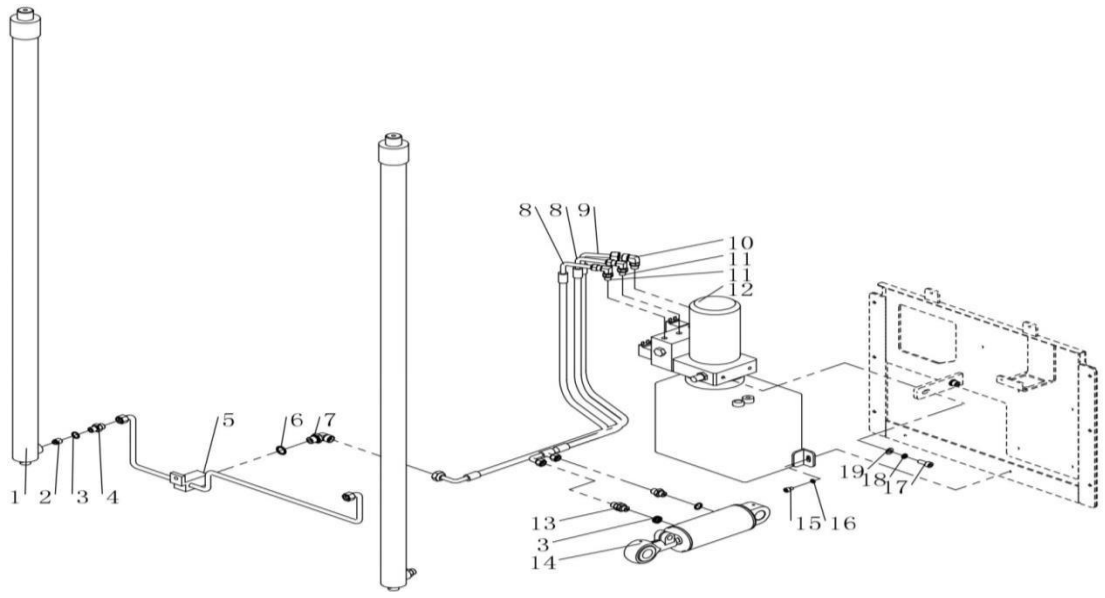


NO.	Code	Name	Specification	Quantity	REMARK
1	GB/T 70.1-2000	Hexagon socket head screws	M10×25	2	
2	GB/T 93-1987	Elastic washer	Φ10	2	
3	SL20GA-01.10.6	The cover plate		1	
4	GB/T 70.2-2000	Hexagon socket flat round head screws	M8×16	2	
5	SL20GA-01.10.1.4	The silicone tube		1	
6	SL20GA-01.10.1.2	pin		1	
7	SL20GA-01.10.1.3	screw		1	
8	E10GL-02.1	Upper casing welding		1	
9	GB/T 41-2000	Hexagonal nut	M10	1	
10	GB/T 70.1-2000	Hexagon socket screw	M10×30	2	

11	E10GL-02.2.2	Spring support		1	
12	E10GL-02.2.4	Adjust the screw		1	
13	CL10.10.3-3	spring		2	
14	E10GL-02.2.3	Spring seat		1	
15	E10GL-02.2.1	Casing welding		1	
16	SL20GA-01.10.3	Steering sensor		1	
17	SL20GA-01.10.1.7	Mounting plate		1	
18	TY-01.7	Micros witch RV-166-1C25		1	
19	GB/T 70.1-2000	Hexagon socket screw		2	
20	GB/T 70.2-2000	Hexagon socket flat round head screws	M5×16	2	
21	SL20GA-01.10.7	Outer cover plate		1	
22	TY-01.12	handle T606-1		1	
23	GB/T 70.1-2000	Hexagon socket head screws	M6×25	4	
24	GB/T 93-1987	Elastic washer	Φ6	4	
25	SL20GA-01.10.04	Mounting plate welded		1	
26	SL20GA-01.10.8	pin		1	
27	TY-02.2	Composite sleeve with shoulder φ 28 x φ 20 x φ 18 x 16		2	
28	GB/T 70.1-2000	Hexagon socket head screws	M8×40	1	
29	SL20GA-01.10.12	spacer		1	
30	SL20GA-01.10.5	The handle bar		1	
31	SL20GA-01.10.02	Air spring assembly		1	
32	SL20GA-01.10.11	Cover plate		1	
33	GB/T 70.3-2000	Hexagon socket countersunk head screws	M5×12	4	

34	GB/T 879.2-2000	Elastic cylindrical pin	Φ5×45	1	

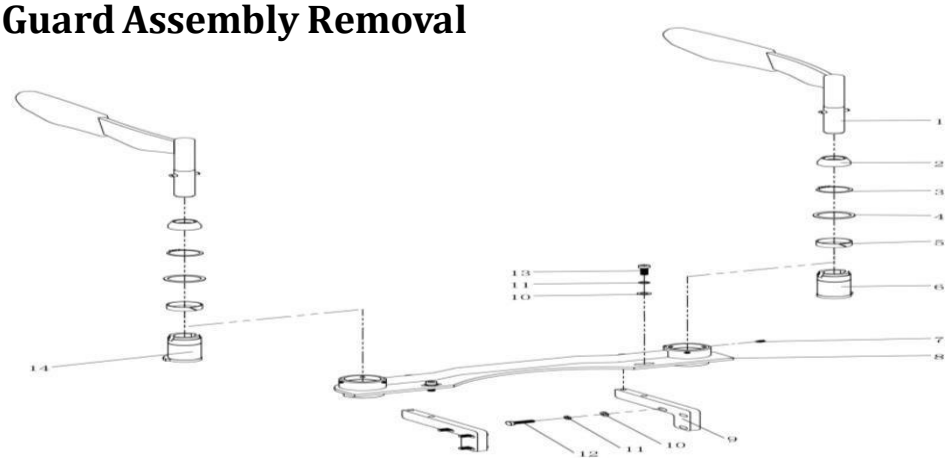
C. Hydraulic assembly removal



NO	Code	Name	Specification	Quantity
1	E10GS-03.4	Lift cylinder assembly		2
2	CL10.4.3	Anti-riot valve spool		1
3	GB982-77	Combination gasket	Φ16	4
4	E10GS-01.8.7	Directly to the head		2
5	E10GL-03.5	Steel pipe		1
6	GB892-77	Combination gasket	Φ20	1
7	E10GL-03.6	Right Angle adjustable joint		1
8	E10GL-01.6.5	Tilt hose		2
9	E10GL-01.6.4	Lifting hose		1
10	E10GS-01.7.1	Right Angle adjustable joint		1
11	E10GL-01.6.3	Right Angle adjustable joint		2
12	E10GL-01.6.2	Power unit		1
13	CG1646.05.1-4	Directly to the head		2
14	E10GL-03.4	Tilting cylinder assembly		1
15	GB/T 70.1-2000	Hexagon socket head screws	M8×12	2
16	GB/T 93-1987	Elastic washer	Φ8	2
17	GB/T 70.1-2000	Hexagon socket head screws	M10×25	2

18	GB/T 93-1987	Elastic washer	Φ10	2
19	GB/T 95-2002	Flat washer	Φ10	2

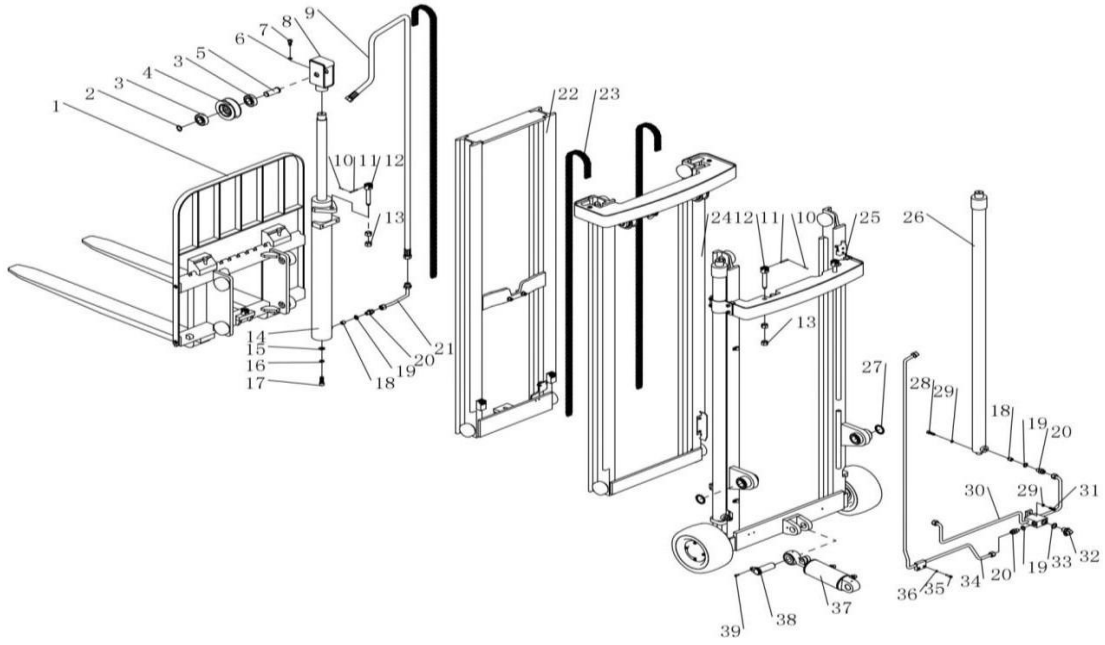
D. Arm Guard Assembly Removal



No.	Code	Name	Specification	Quantity	Remark
1	SL30GB-04.1	Boom guard welded		2	
2	SL30GB-04.2	shield		2	
3	GB 894.1-86	Shaft with elastic retainer	Φ48	2	
4	SL30GB-01.3.4	gasket		2	
5	SL30GB-01.3.5	bushing		2	
6	SL30GB-01.3.2	Shaft sleeve left		1	
7	GB/T 79-2000	Hexagon socket point set screws	M8×12	6	
8	SL30GB-01.3.1	Arm guard seat welded		1	
9	E10GL-04.2	Arm guard connecting plate		2	
10	GB/T 95-2002	Flat washer	Φ10	10	
11	GB/T 93-1987	Elastic washer	Φ10	10	
12	GB/T 5781-2000	Hexagon head bolt	M10×35	6	
13	GB/T 70.1-2000	Hexagon socket head screws	M10×35	4	

14	SL30GB-01.3.3	Shaft sleeve right		1	

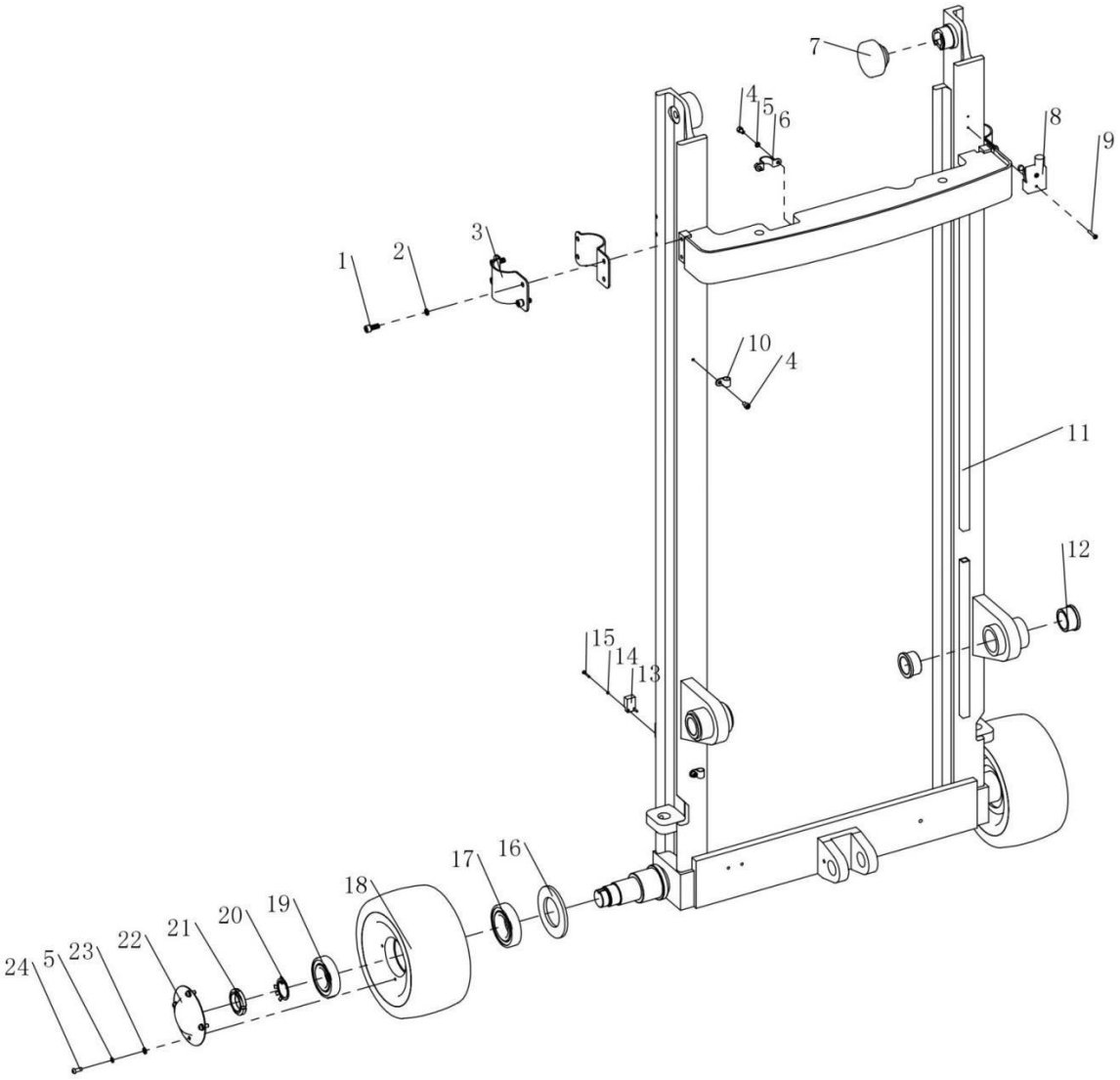
E. Mast Assembly



NO	Code	Name	Specification	Quantity
1	E10GL-06.4	Carriage components		1
2	GB 894.1-86	Shaft with elastic retainer	Φ25	1
3	GB/T 276-94	Deep groove ball bearing	6305-2Z	2
4	CG1646.03.3-5	Sprocket a.		1
5	CL1032C.02-09	Sprocket shaft		1
6	GB/T 93-1987	Elastic washer	Φ10	1
7	GB/T 70.1-2000	Hexagon socket head screws	M10×20	1
8	CL1555QD.02.07	Sprocket frame welding		1
9	E10GL-06.10	High pressure hose		1
10	GB/T 91-2000	Cotter pin	Φ1.2×18	2
11	GB 880-86	Perforated pin	Φ5×40	3
12	CG1646.02-4	Chain bolt		3
13	GB/T 41-2000	Hexagonal nut	M16	6
14	E10GL-06.5	Front lift cylinder assembly		1
15	GB/T 95-2002	Flat washer	Φ12	1
16	GB/T 93-1987	Elastic washer	Φ12	1
17	GB/T 70.1-2000	Hexagon socket head screws	M12×35	1

18	CL10.4.3	Anti-riot valve spool		3
19	GB982-77	Combination gasket	Φ16	4
20	E10GS-01.8.7	Directly to the head		4
21	E10GL-06.8	Steel Pipe (2)		1
22	E10GL-06.3	Internal door frame assembly		1
23	LH0866	Plate chain		3
24	E10GL-06.2	Middle gantry assembly		1
25	E10GL-03.1	External door frame assembly		1
26	E10GL-06.6	Rear lift cylinder assembly		2
27	E10GS-03.7	The door frame spacing		2
28	GB/T 70.1-2000	Hexagon socket head screws	M8×30	2
29	GB/T 93-1987	Elastic washer	Φ8	3
30	E10GL-06.7	Steel Pipe (1)		1
31	GB/T 70.1-2000	Hexagon socket head screws	M8×20	1
32	E10GS-01.7.1	Right Angle adjustable joint		1
33	GB892-77	Combination gasket	Φ20	1
34	E10GL-06.9	Steel Pipe (3)		1
35	GB/T 70.1-2000	Hexagon socket head screws	M6×25	2
36	GB/T 93-1987	Elastic washer	Φ6	2
37	E10GL-03.4	Tilting cylinder assembly		1
38	E10GS-01.6	Inclined cylinder pin shaft welding		1
39	GB/T 70.2-2000	Hexagon socket flat round head screws	M6×16	1

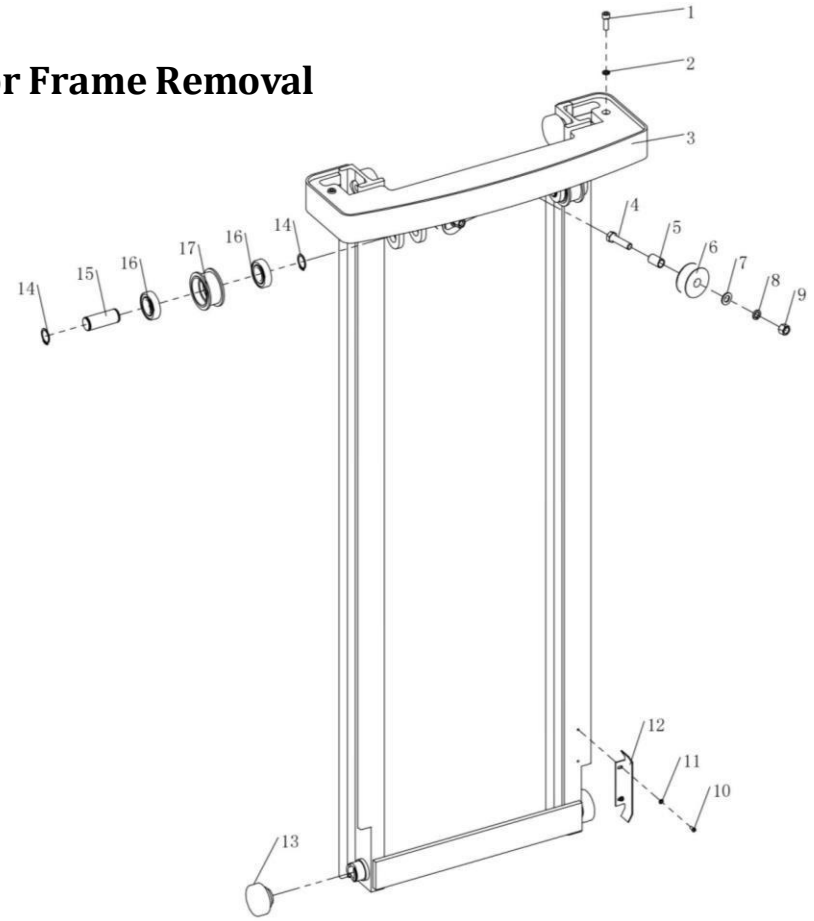
F. External door frame removed



No	Code	Name	Specification	Quantity	Remark
1	GB/T 70.1-2000	Hexagon socket head screws	M8×20	8	
2	GB/T 93-1987	Elastic washer	Φ8	8	
3	E10GS-03.1.4	Oil cylinder hoop		4	
4	GB/T 70.1-2000	Hexagon socket head screws	M6×10	4	
5	GB/T 93-1987	Elastic washer	Φ6	10	

6		the hoop	Φ21	1	
7	CRA70.4-4S	Composite roller		2	
8	TY-01.35	Micro switch RZ-15GW2S-B3		1	
9	GB/T 818-2000	Cross recessed pan head screws	M4×25	2	
10		R type hoop	Φ12	2	
11	E10GL-06.1.1	The outer door frame is welded		1	
12	E10GS-03.10	The door frame is connected with copper bushing		4	
13	TY-01.38	Proximity switch CLJF20-05FA		1	
14	GB/T 93-1987	Elastic washer	Φ3	2	
15	GB/T 818-2000	Cross recessed pan head screws	M3×20	2	
16	E10GL-03.1.3.1	Felt seal ring		2	
17	GB/T 276-94	Deep groove ball bearing	6209-2Z	2	
18	TY-02.56	The front wheel body		2	
19	GB/T 276-94	Deep groove ball bearing	6208-2Z	2	
20	GB 858-1988	Stop washers for round nuts	Φ35	2	
21	GB/T 812-1988	Round nut	M35×1.5	2	
22	E10GL-03.1.5	The front-end cover		2	
23	GB/T 95-2002	Flat washer	Φ6	8	
24	GB/T 70.2-2000	Hexagon socket flat round head screws	M6×16	8	

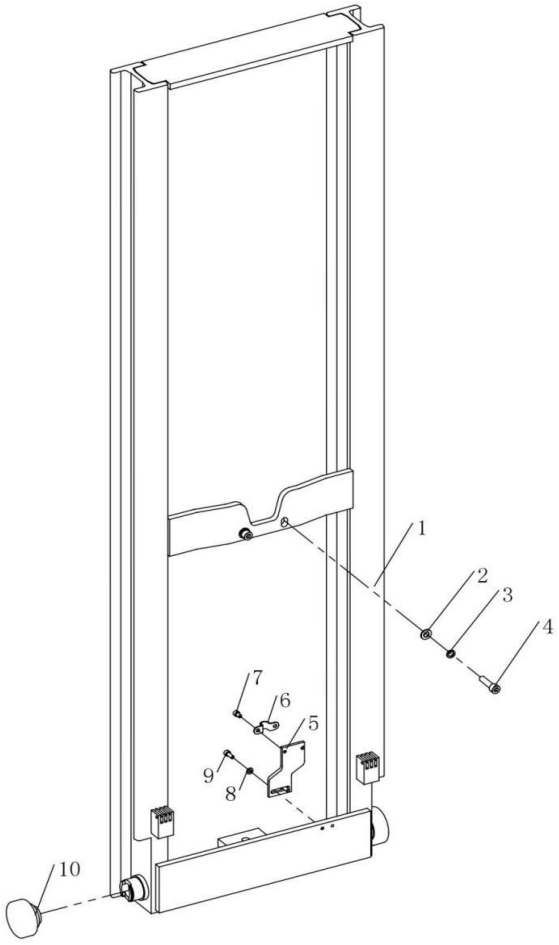
G. Middle Door Frame Removal



No	Code	Name	Specification	Quantity
1	GB/T 70.1-2000	Hexagon socket head screws	M10×30	2
2	GB/T 93-1987	Elastic washer	Φ10	2
3	E10GL-06.2.1	Middle frame welding		1
4	GB/T 5781-2000	Hexagon head bolt	M14×55	2
5	E10GS-07.2.3	Pulley casing		2
6	E10GS-07.2.2	The pulley		2
7	GB/T 95-2002	Flat washer	Φ14	2
8	GB/T 93-1987	Elastic washer	Φ14	2
9	GB/T 41-2000	Hexagonal nut	M14	2
10	GB/T 818-2000	Cross recessed pan head screws	M5×12	2
11	GB/T 95-2002	Flat washer	Φ5	2
12	E10GS-03.2.2	The limit board		1
13	CRA70.4-4S	Composite roller		4
14	GB 894.1-86	Shaft with elastic retainer	Φ30	4
15	CG1646.03.3-6	Sprocket shaft		2

16	GB/T 276-94	Deep groove ball bearing	6206-2Z	4
17	CG1646.03.2-7	Sprocket B		2

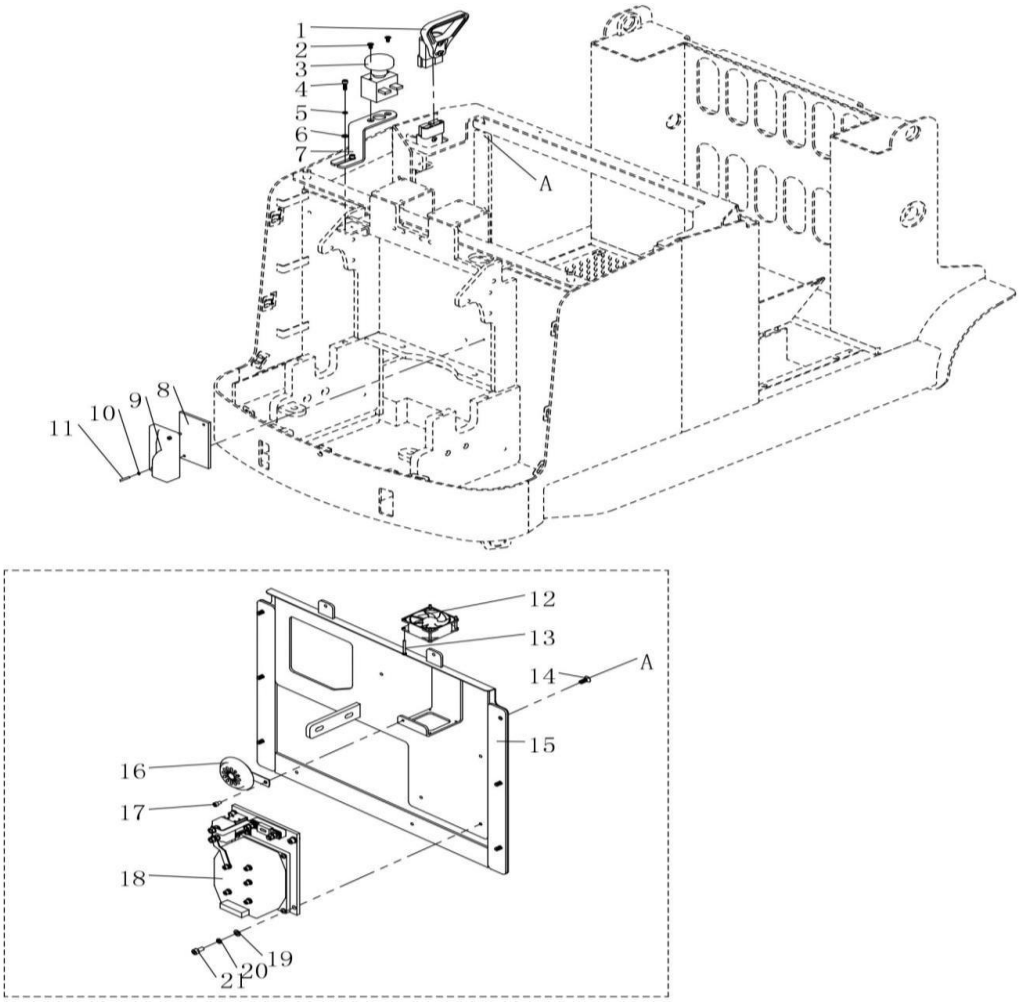
H. Inner Door Frame Removal



No	Code	Name	Specification	Quantity
1	E10GL-06.3.1	Inner door frame welded		1
2	GB/T 95-2002	Flat washer	Φ10	2
3	GB/T 93-1987	Elastic washer	Φ10	2
4	GB/T 70.1-2000	Hexagon socket head screws	M10×40	2
5	CL1555QD.02.03.01-1	Tubing fixing plate		1
6		The hoop	Φ12	1
7	GB/T 70.1-2000	Hexagon socket head screws	M6×10	2
8	GB/T 95-2002	Flat washer	Φ6	2

9	GB/T 70.1-2000	Hexagon socket head screws	M6×16	2
10	CRA70.4-4S	Composite roller		2

I. Electrical Assembly



No	Code	Name	Specification	Quantity	Remark
1	TY-02.57	Large power socket assembly		1	
2	GB 2673-86	Hexagon socket countersunk head screws	M6×12	2	
3	TY-01.14	Emergency stop switch ZDK31-250		1	
4	GB/T 70.1-2000	Hexagon socket head screws	M6×20	2	
5	GB/T 93-1987	Elastic washer	Φ6	2	
6	GB/T 95-2002	Flat washer	Φ6	2	

7	E10GL-01.15	Power off switch mounting bracket		1	
8	DK1220-01.1	Electric control mounting plate		1	
9	TY-01.49	Steering control 1212P-2502		1	
10	GB/T 859-1987	Spring washer	Φ4	2	
11	GB/T 70.1-2000	Hexagon socket head screws	M4×30	2	
12	TY-01.28	fan	80×80	1	
13	GB/T 818-2000	Cross recessed pan head screws	M4×40	4	
14	GB 2673-86	Hexagon socket countersunk head screws	M8×20	6	
15	E10GL-01.6.1	Neutral plate welding		1	
16	TY-01.18	The horn DC24 Φ - 125		1	
17	GB/T 70.1-2000	Hexagon socket head screws	M6×10	1	
18		Ac electric control module		1	
19	GB/T 95-2002	Flat washer	Φ8	4	
20	GB/T 93-1987	Elastic washer	Φ8	4	
21	GB/T 70.1-2000	Hexagon socket head screws	M8×16	4	

5. CURTIS Handheld unit

Precautions for operation:
The attention function of the hand-held unit is to facilitate vehicle inspection and maintenance. It is not allowed to adjust the controller parameters without the approval of the vehicle manufacturer, so as to avoid vehicle and personal safety accidents.
The hand-held unit will automatically save the modification parameters, just need to close the key switch, restart. The CURTIS handheld unit can be connected in the event of a controller power or power failure

Vehicle fault reading process:
1. After connecting the handheld unit with the controller, open the key
switch 2, From the menu list of CURTIS handheld units, find: Faults...
3. When the vehicle is running and the hand-held cursor flashes, there will be English fault content, which can be interpreted by referring to the fault code table

Vehicle signal detection:
1. After connecting the handheld unit with the controller, open the key
switch 2, According to the menu list of CURTIS handheld unit, find:
Monitor.....
3. According to requirements, open the corresponding sub-item of the detection menu, run the vehicle, and observe the change of the hand-held value.

CURTIS Contents of handheld unit menu:

The Curtis 1313 handheld programmer is used to configure the Curtis electric control system. Through this programmer, you can adjust and save the set parameters, real-time monitoring of controller data and fault diagnosis

Warning: The control system can affect the vehicle's acceleration rate, deceleration rate, hydraulic system and braking. A dangerous situation can occur if the vehicle control system is not programmed correctly or exceeds safety. Only the vehicle manufacturer or an authorized service agent can program the control system.

The programmer has two interfaces, one is used to communicate with the electric control, the other is used to communicate with the PC, the programmer has a battery box and a memory card slot

当编程器加载完控制器的信息后，编程器上会显示主菜单。

The programmer is powered on

The connection line of the handheld programmer can be connected to the controller by inserting the programming port of the controller. After connecting the controller, the handheld programmer will be powered on automatically and the control information will be displayed on the programmer.

The function keys

Since the function of the three keys is determined by the specified content, the three keys are blank. At any given time, the function of the button is displayed on the LCD screen above.

Direction arrow key

The displayed information can be selected up, down, or left by four directional buttons.

+ / - buttons

You can add and subtract parameters by using these two keys. In addition, "+" can mean "Yes" and "-" can mean "No". In some cases, it can also be used as a scrolling option.

Power key

When the programmer inserts a controller that has been powered on, the programmer does not have to press the power button to use it. The programmer will

Collect keys

There are two ways to enter the Favorites menu. You can enter Favorites from the main menu or press this key

The menu structures

The main menu consists of nine sub-menus, and each sub-menu is displayed with a specific icon. Each item in the sub- menu is arranged by hierarchy.

Some menus contain only one item of information, but most menus contain more than one item of information and open each item folder to access the next level of sub menus. Expand the table through the grid option, enter a group of execution commands through the dialog box option, and return to the upper menu regardless of the interface by pressing the left direction button.

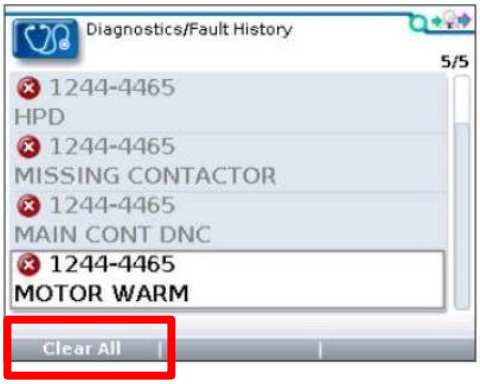
The names of all nine sub menus are shown in bold on the main menu and below the icon. When entering the stepped menu, the name of the sub menu or the path you are in is displayed at the top of the screen.

Fault Diagnosis menu

On the main menu, Select Diagnostics and press select to access the Fault diagnosis menu. The Fault diagnosis menu contains Present Errors current faults and Fault History historical faults

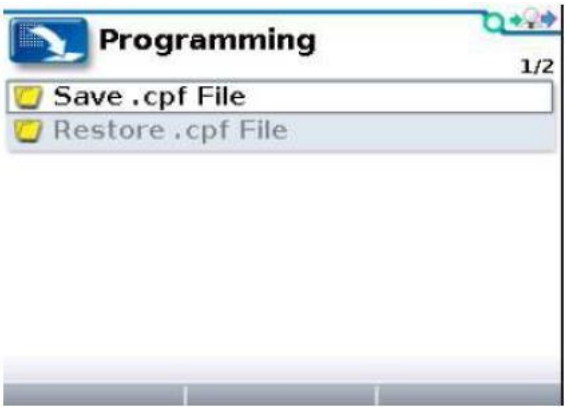
Note: Sometimes a fault caused by a temporary event captured in the circuit is not a system fault. You can determine whether the fault exists by restarting the system and observing whether the fault disappears automatically.

The historical faults folder lists all faults encountered after the last historical fault is cleared. By clearing the fault content in the entire folder, you can record the historical faults again.



Clear all is used to Clear historical fault folders. A function key is highlighted only when there are historical failures in the historical failures folder and grayed out when there are no historical failures.

Clear all is used to Clear historical fault folders. A function key is highlighted only when there are historical failures in the historical failures folder and grayed out when there



Save.cpf File (Save.cpf File)
Use the save. CPF file function in the programming menu to back up the currently set parameters. You can save as many.cpf files as you want, and you need to name each.cpf file differently
Restore. CPF File (Restore.cpf File)
Restore. CPF File The. CPF File saved earlier can be used to replace the CPF File of the current controller. When the data recovery is complete, a dialog box is displayed