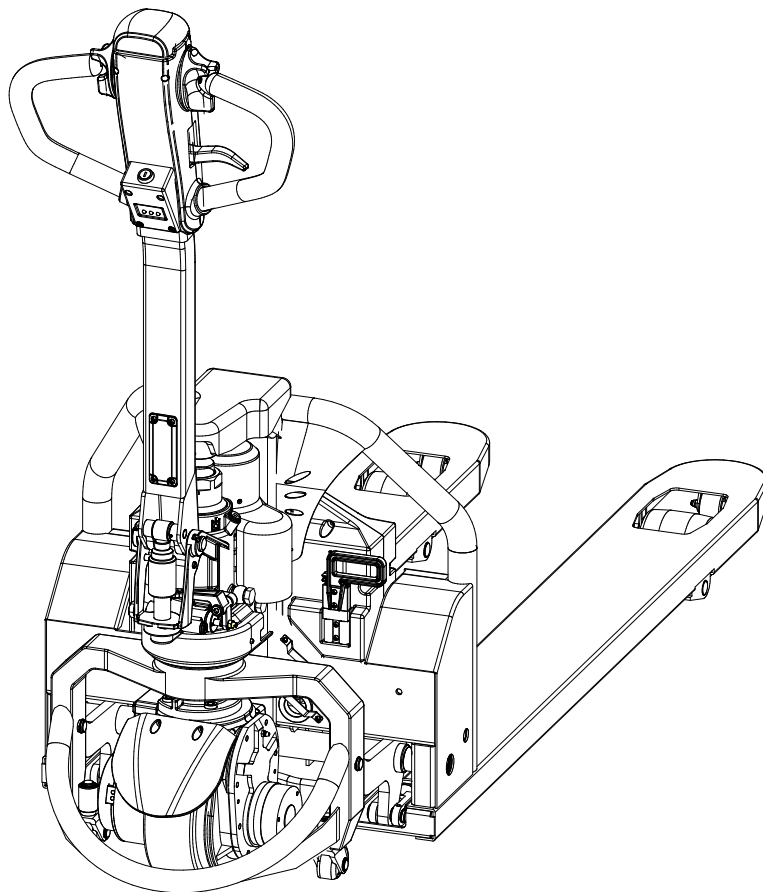


CBD15W-LiX

Li-ion Powered Pallet Truck

- Operation Manual
- Parts Catalogue



**Thank you for choosing CBD15W-LiX
Li-ion powered pallet truck!**

Hope it will provide great convenience for your work!

- Please read the manual carefully before starting the truck.
 - This operation manual is general, and the right to make any technical modifications to the tractors is reserved. Contents provided in this manual for reference only and if wrong in real, prevail in kind.
-

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1. Safety regulations



Safety shoes are always required to handle the pallet truck.



Safety glasses are recommended to avoid personal accidents while assembling or disassembling the pallet truck.



CAUTION

When the truck is damaged or has safety problems, stop using it immediately.



CAUTION

The pallet truck is designed for hard and flat floor only.

It's forbidden to use the truck when :

- the air contains dust or flammable and explosive gases that can cause fire or explosion.
- in freezer or some low temperature, salty or other corrosive environment.
- Rainy outdoor.
- Operate on gravel or grassland.
- the gradient of the ground is greater than the gradient of product design.



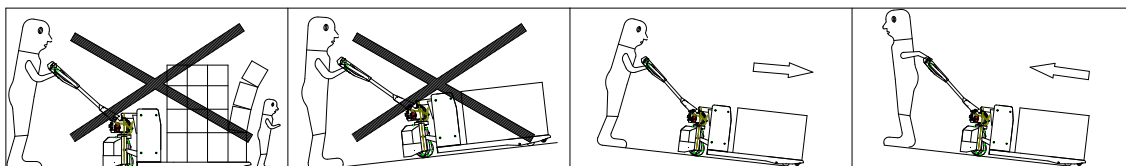
CAUTION

- Careful judgment and responsible attitude should be taken in the operation of pallet trucks.
- The pallet truck is not able to be operated with oily hands or shoes
- Operators shall not wear loose clothes or jewelry



CAUTION

- When operating the pallet truck, it is necessary to ensure that the ground has sufficient load bearing capacity, where the load is the sum of the weight of the pallet truck and the load.
- Special care should be taken if there are prominent objects that can cause personal injury
- Personnel are prohibited around the operating area of the pallet truck, which may cause personal injury, for example, when the goods fall.



CAUTION

Operators must be very carefully when handling the pallet truck on a slope. See the drawing, the operator should stand ahead of the truck. Operators must be very carefully

when handling the pallet truck on a slope. See the drawing, the operator should stand ahead of the truck. When a vehicle runs on a ramp, the driving wheel can be quickly turned to the maximum angle to avoid the risk that the vehicle will continue to slide. This method allows operation only in emergencies.



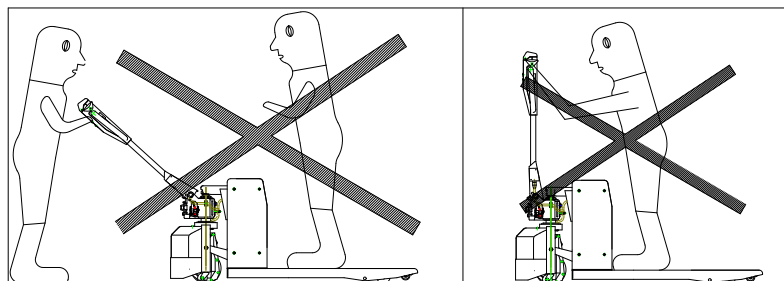
WARNING!

- Avoid high-speed operation when turning to avoid the danger of overturning.
- The goods should not be too high to block sight.
- Brake gently and carefully to avoid cargo slipping off the pallet and causing material damage.
- The pallet truck is not allowed to turn on the slope.
- Before pushing the pallet into the elevator, the operator must ensure that the elevator can withstand the total load of the pallet and cargo, the total weight of the operator and other personnel on the elevator. Make sure the load goes into the elevator first, then the operator. The elevator should keep empty when the pallet truck with load is about to go in/out of it.



CAUTION!

- The load shall not exceed the rated load of the vehicle.
- When stacking goods, the goods should not be too high to avoid the danger of falling down or overturning the pallet truck during handling.
- It's forbidden to ride people with the pallet truck.
- Keep clear of the pallet truck's working area, avoiding personal injuries due to sudden accidents happened over its working.
- Standing and sitting on the pallet truck is strictly forbidden.



CAUTION!

- Keep the fork at the lowest position while it's parked.
- Don't leave the truck on a slope.
- Don't leave the truck at the emergency access.
- Don't leave the pallet truck to block the traffic or affect work.
- Don't use the pallet truck in rain.
- Turn off the power when the pallet truck is unattended.

2. Allowed environment for using

-This truck is suitable for use on hard and flat indoor ground. It is not allowed to use it for non-adaptive applications.

-The altitude shall not exceed 1000 meters;

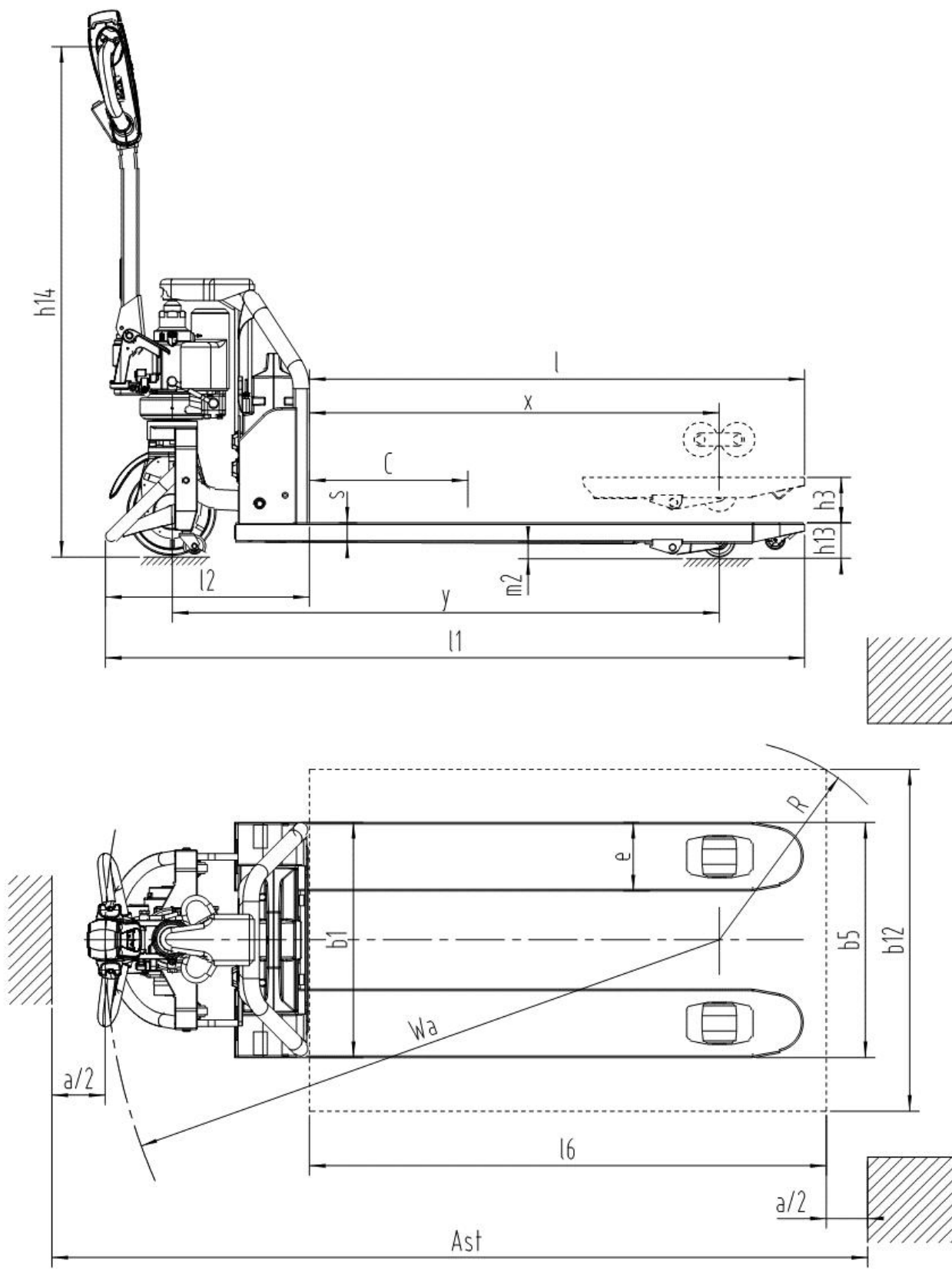
-The ambient air temperature shall not exceed +40 °C and not be lower than - 10 °C;

-When the ambient temperature is +40 °C, the relative humidity shall not exceed 50%, and at a lower temperature, a larger relative humidity is allowed;

-Hard and flat ground;

-It is prohibited to use this vehicle in flammable, explosive or corrosive environment such as acid and alkali.

3. Technical parameters



Model		CBD15W-LiX
Operator type		Electric

Drive type		Pedestrian
Load capacity	Q(kg)	1500
Load center distance	C(mm)	600
Fork height, lowered	h_{13} (mm)	80
Tread	Y(mm)	1269/1339
Wheel		PU
Tire size, front	mm	$\Phi 210$
Tire size, rear	mm	$\Phi 80$
Wheel number, front/rear (x = driving wheel)		1X-2/2 (4)
Lift height	h_3 (mm)	110
Height of tiller in drive position min./max.	h_{14} (mm)	635/1200
Overall length	l_1 (mm)	1623/1693
Length to face of forks	l_2 (mm)	473
Overall width	b_1 (mm)	550/680
Fork dimensions	s/e/l(mm)	45/160/1150(1220)
Width overall forks	b_5 (mm)	550/685
Wheelbase ground distance	h_1 (mm)	35
Aisle width for pallets 1000x1200 crossways	A_{st} (mm)	2226/2294
Aisle width for pallets 800x1200 lengthways	A_{st} (mm)	2095/2132
Turning radius	W_a (mm)	1424/1494
Travel speed, laden/unladen	km/h	4.8/5
Max. gradeability, laden/unladen	%	5/20
Driving motor power	kW	0.65
Lifting motor power	kW	0.8
Battery voltage/rated capacity	V/Ah	48/20
Traveling brake		EM brake
Noise level at operator's ear, according to DIN12053	dB(A)	70
Service weight(with battery)	kg	135

4. Handle installment

The handle is removed before shipment in the consideration of the requirement of packing and the safety over transportation, and the steps to install the hand are list as following:

- 4.1 Refer to Figure 1, remove the pin 1 from pin 2, then pull out the pin 2.
- 4.2 Refer to Figure 2, loose the screw 3; remove the cover plate 4 from handle assembly 5.
- 4.3 Refer to Figure 3, 4, insert handle assembly 5 (Fig. 2) into A (Fig. 1), connect handle assembly 5 to pump body 10 by pin 2. Thread the rod chain 8 through the hole of pin 2. Pull the handle to horizontal position, take out pin 9 and save it for next time use. Connect the wire of handle assembly 5 to the truck body through connector 6; tighten it with a harness for a reliable connection (see Fig.5). After that, fix it to handle assembly 5 by line card 7 according to Fig. 4.

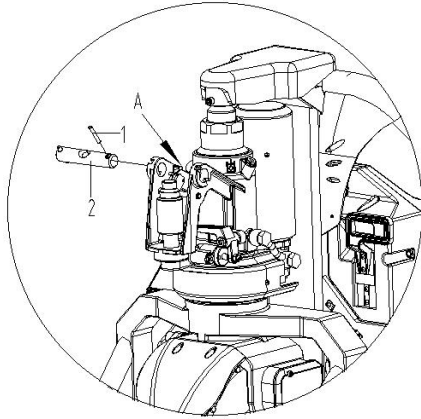


Figure 1

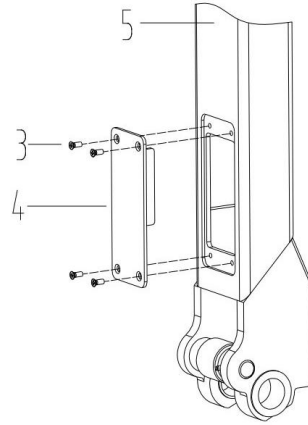


Figure 2

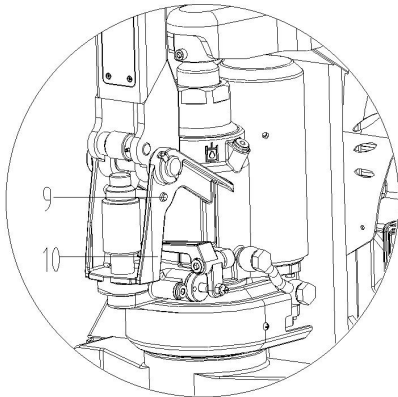


Figure 3

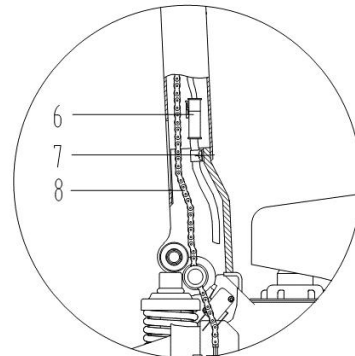


Figure 4

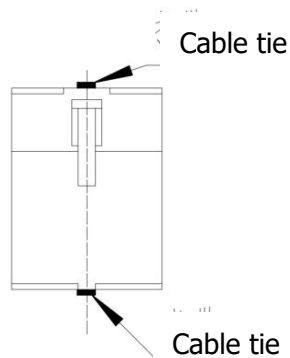


Figure 5

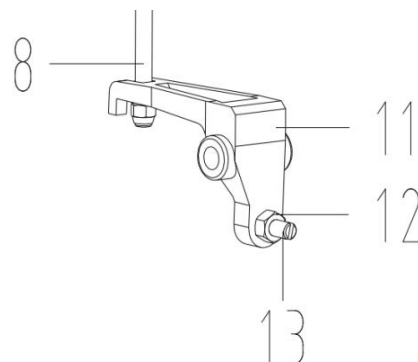


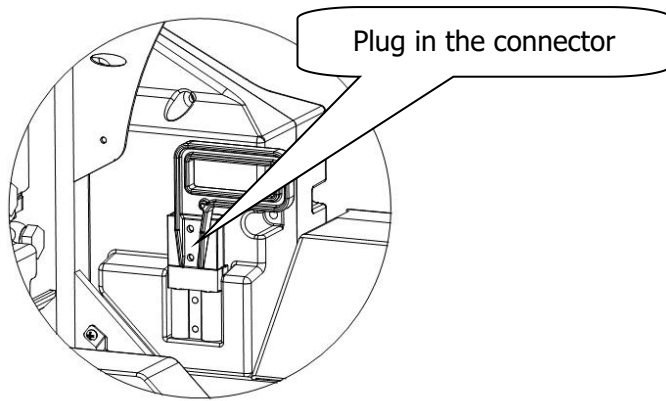
Figure 6

- 4.4 Refer to Figure 4, 6, fix the screw and nut at the end of chain 8 into the groove of lever plate 11
- 4.5 Pass the pin 2 through pin 2 and fix, install the cover plate 4 onto handle assembly 5.

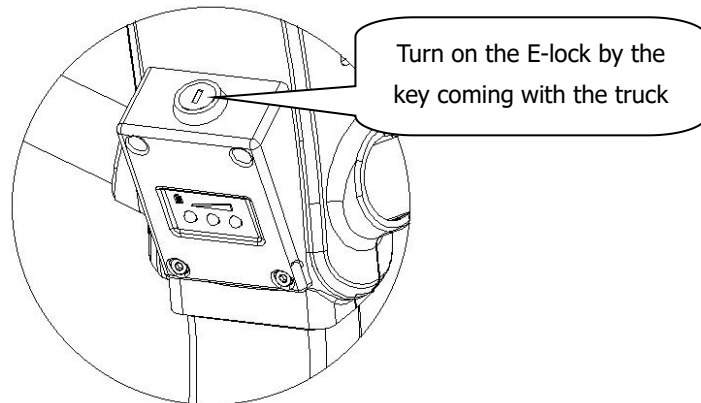
5. Operation

Truck electrified

- Plug in the connector of the Li-ion battery.

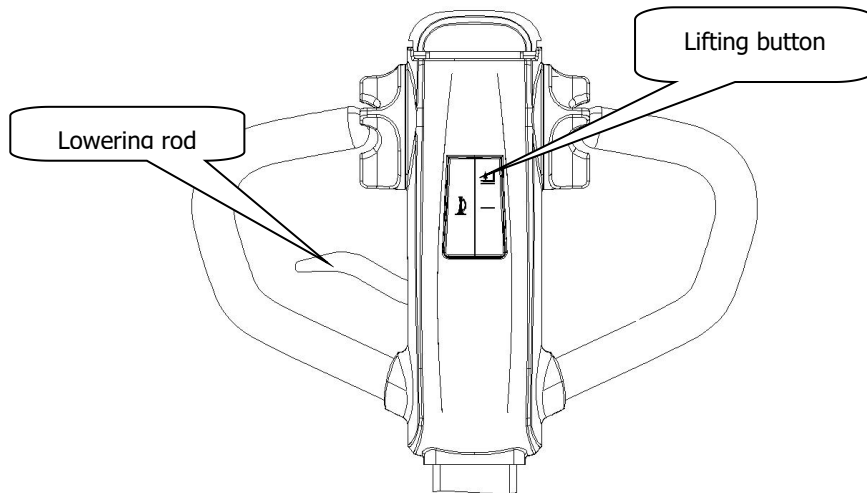


-Turn on the E-lock



Fork lifting and lowering

- Lifting: Press the lifting button to lift
- Lowering: Press the lowering rod to lower.



Traveling of the pallet truck

- Rotate the handle to the traveling section:
A and C are the braking sections;
B is the traveling section;

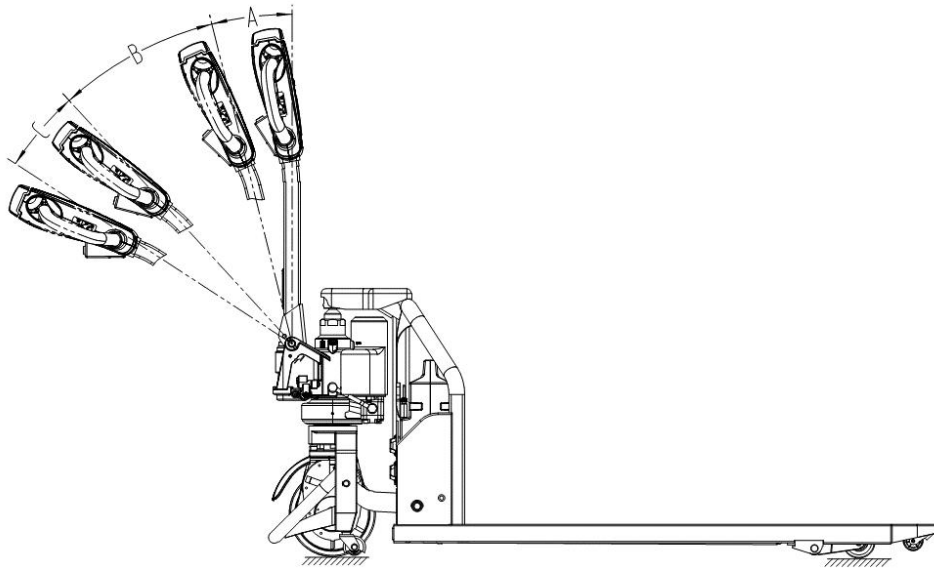


Figure 10

- Rotate the accelerator to start the truck slowly (for safety's sake, it's prohibited to accelerate rapidly).

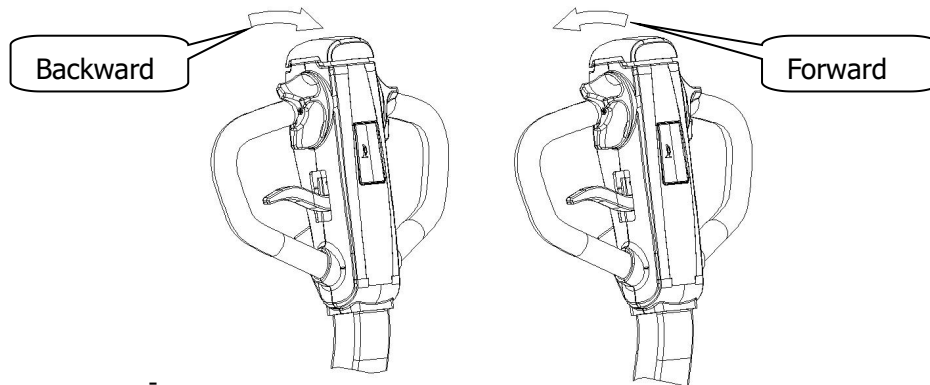


Figure 11

Braking

- Release the accelerator for normal braking; the truck stops slowly by the regenerative brake of the motor until the brake lock the wheels.
- Turn the handle to A or C quickly for emergency braking (Figure 5); the brake will lock the wheel to achieve an emergency braking.

Emergency reverse button

The emergency reverse button is at the end of the hand. When it's touched by operator's body, the truck will stop traveling immediately, and then travel backwards for a distance. The function is set to minimize possible squeeze injuries when the truck encounters into obstacles over its traveling.

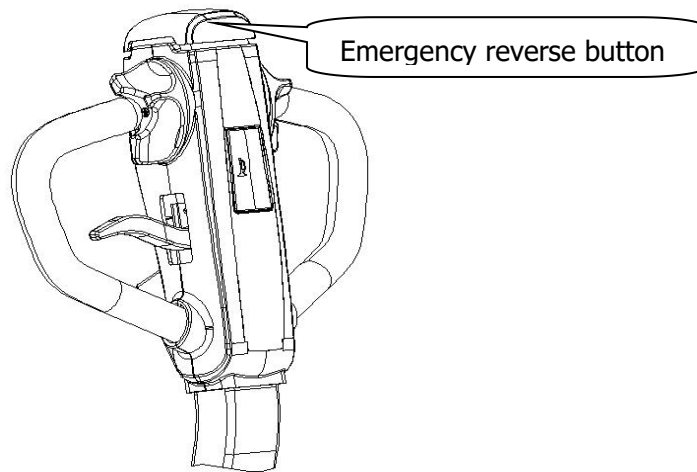
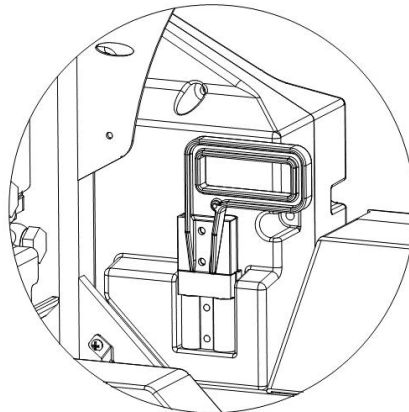


Figure 12

Parking

- Release the accelerator to stop the truck. The truck stops slowly until the brake engages and parks
- Lower the fork to the lowest position.
- Turn off the key switch.
- Disconnect the battery harness in order to park for a long time .



6. Charge and battery replacement

6.1 Types of battery and use precautions

6.1.1 The battery used in this pallet truck is 48V lithium-ion, which is environmental friendly, without chemical mercury and cadmium.

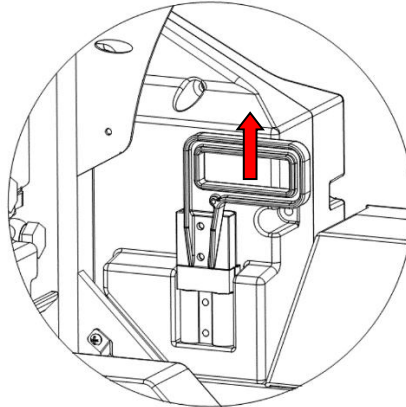
6.1.2 Precautions

- ◆ Working ambient temperature of lithium battery is -10°C ~ 40°C.
- ◆ Charge and discharge the battery every 3 months when it's stored for a long time.
- ◆ Fully charge the battery before the first use or re-use after long-term idleness.
- ◆ Do not short circuit the battery, which may permanently damage it.
- ◆ Do not weld the battery by yourself.
- ◆ Do not keep the battery in an unfavorable environment, such as extreme temperature, deep cycle, or often overcharge or over-discharge.
- ◆ Do not touch the hot battery until it cools down.
- ◆ Taking down the battery by holding the plug, instead of pulling the charging line.
- ◆ The battery may be hot after charging, cool it down in a ventilated environment.

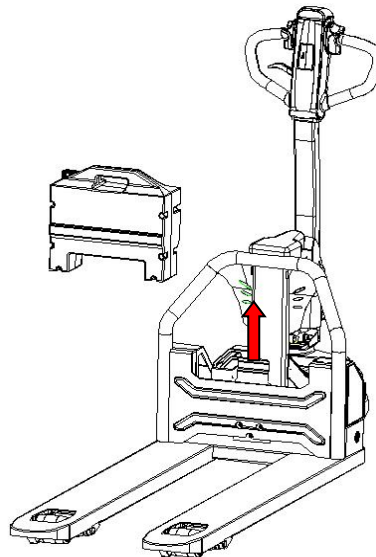
- ◆ Do not put batteries in water or sea water;
- ◆ Do not try to separate, squeeze, or hit the battery. Battery lye is harmful to skin and eyes, and will corrode clothes.
- ◆ Keep the battery out of children's reach.

6.2 Fast battery replacement

- ◆ Shut off the truck
- ◆ Open the rear cover plate
- ◆ Separate the power connector properly (**Note: Must hold the puller, but not the wiring while doing this.**)



- ◆ Hold the battery puller tight and pull it out from the truck.



- ◆ Place a charged battery into the truck

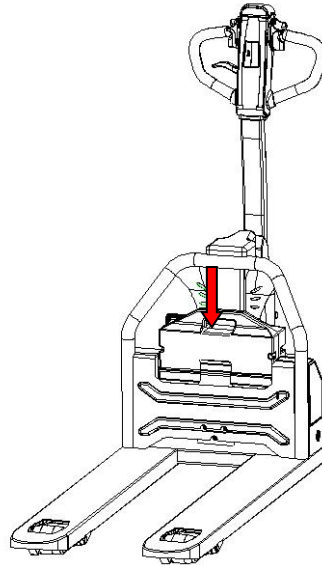


Figure 16

- ◆ Plug in the connector

6.3 Precautions on battery charging

- A special charger from our company must be used;** Charge voltage is 48V, max limited charge is 54.6V, charge current is 6-7A.
- Do not reverse charge the battery;
- If the battery is found to have obvious heat during charging, please stop charging immediately and charge it after natural cooling;
- When pulling the charger connector, must hold the handle. It is not allowed to pull the wire directly.
- Do not charge in flammable and explosive environment;
- Do not charge in the environment below 0 °C.

6.4 Power indicator

Green light always on: 70%-100% power

Yellow light always on: 40%-70% power

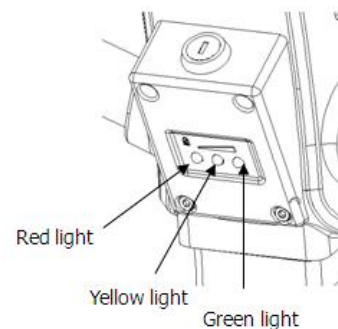
Red light always on: 10%-40% power

Red lamp flashes: the battery is empty

When the red light is on, indicating low battery needs to recharge.

Red light flashes as a warning, indicating the truck is about to stop,

charging is in need. If continue to use, the power disconnect protection will automatically carry out to stop the truck.



7. Maintenance

Whether a vehicle can be used satisfactorily depends on careful maintenance. Neglect of maintenance, which may endanger personal safety and damage property. Therefore, checks should be made regularly, abnormal phenomena should be eliminated in time, and faulty cars should not be used to ensure safety and prolong the service life of cars.

Maintenance of this pallet truck is generally divided into three levels: daily maintenance, weekly maintenance and Periodic Maintenance.

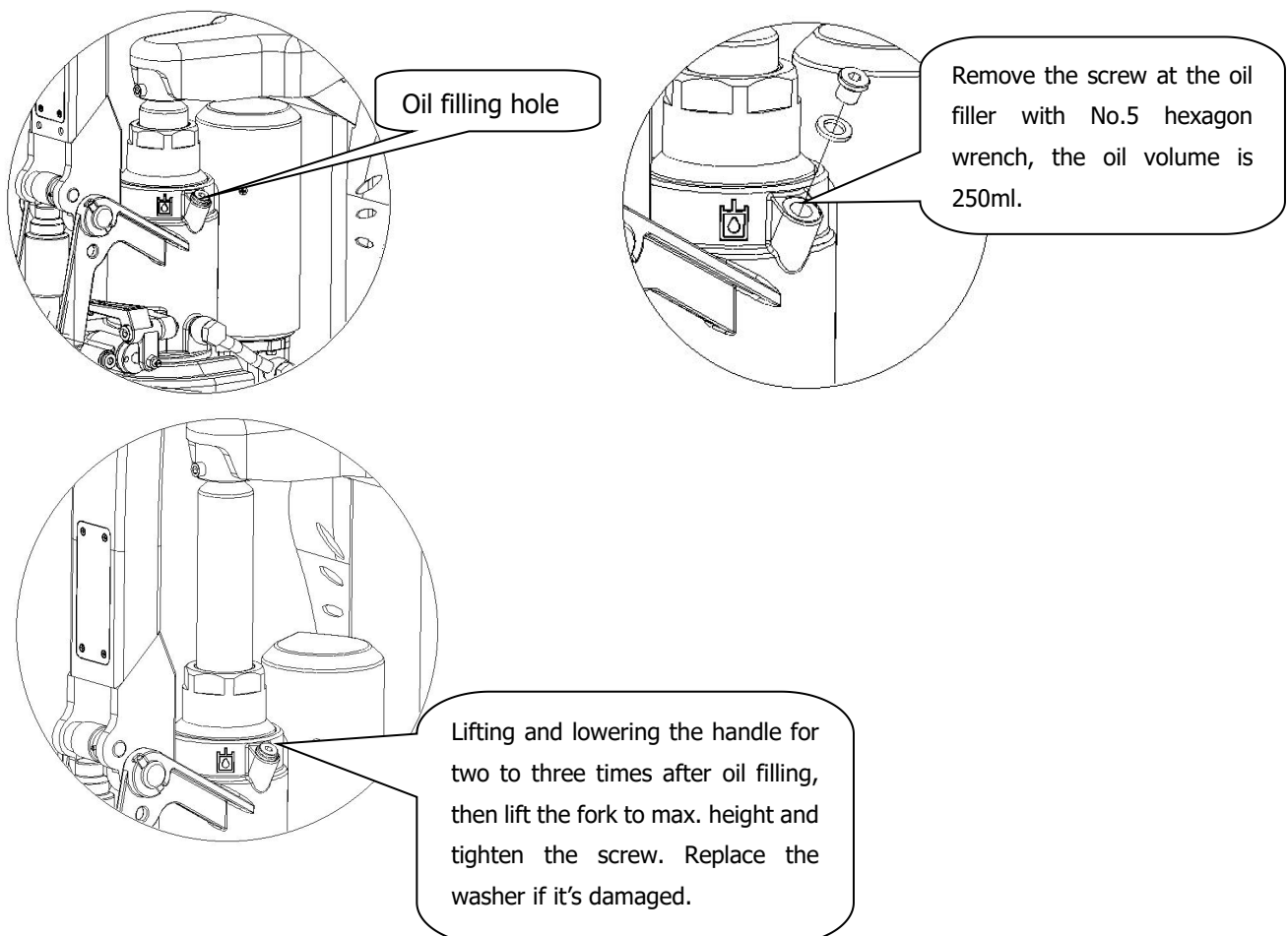
Daily maintenance : To keep the surface clean and examine if the power supply cable is damaged.

Weekly Maintenance: To check the condition of the operational components, all-fastening items, if oil leakage, if abnormal wearing in mechanical components exists, if abnormal temperature rises or sparks in electric equipment, etc.

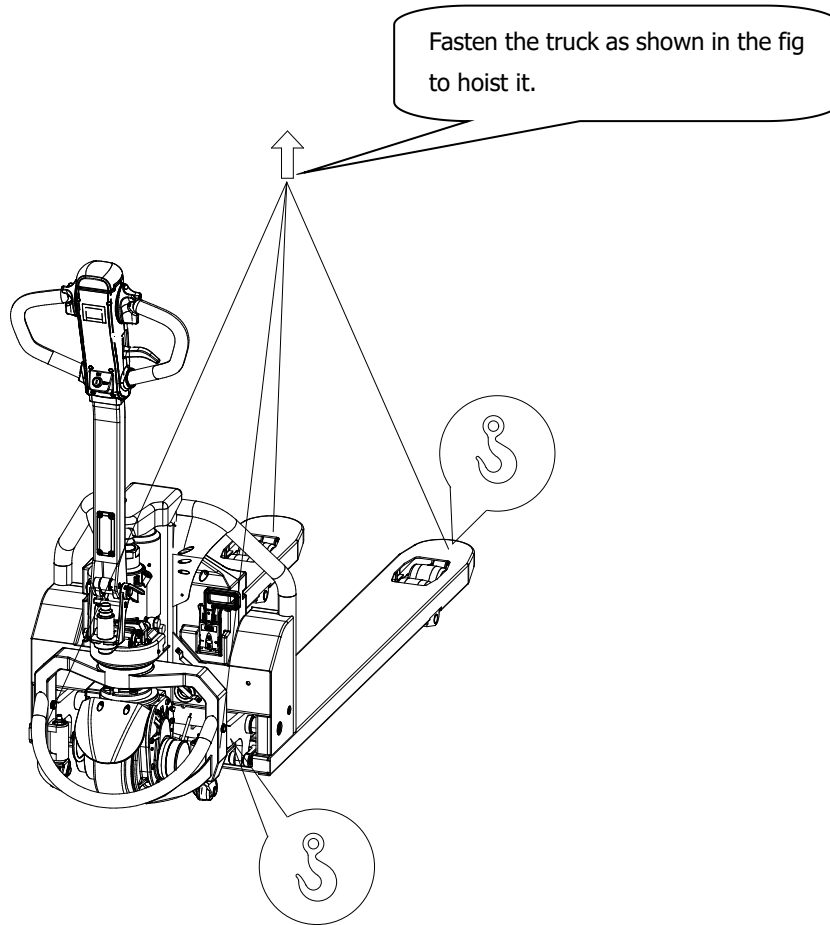
Periodic Maintenance

- a. Mechanical maintenance: do it every 6 months. Main content is to check whether the fasteners are loose, whether the wheels work flexibly and whether the fork lifts normally. The running noise of the vehicle after maintenance is not more than 75 dB.
- b. Hydraulic maintenance: do it yearly to Check whether the cylinder is in normal condition, whether there are internal and external leakage. Whether the hydraulic oil is clean or not, which is usually replaced once in 12 months. Hydraulic oil adopts ISO standard. L-HV32 and L-HV15 cryogenic hydraulic oils are used when the ambient temperature is $-5-40^{\circ}\text{C}$ and $-10-5^{\circ}\text{C}$ respectively. The waste oil replaced shall be treated in accordance with the relevant local laws and regulations. Check whether the limit valve is working properly
- c. Electrical Maintenance: do it every 3 month to Check whether the electrical connectors are reliable, whether the switches are normal, and Check whether the electrical insulation is normal (the insulation resistance between the electrical part and the car body should be greater than $0.5\text{M}\Omega$).

7.1 Adding hydraulic oil



8. Truck hoisting



9. Trouble shooting

The table below provides some common failures of the truck in operation and the trouble shooting

No.	Faults	Analysis of cause	Trouble shooting
1	Hydraulic oil leakage	<ol style="list-style-type: none"> 1. Failed oil seal 2. Slight damage or wear on the surface of one or two components 3. Loose connection 	<ol style="list-style-type: none"> 1. Replace the oil seal 2. Replace the damaged components 3. Re-tighten the connection
2	Lifting failure	<ol style="list-style-type: none"> 1. Too great viscosity of hydraulic oil or hydraulic oil has not been injected 2. Foreign matters in the oil 3. The hydraulic power unit is damaged 	<ol style="list-style-type: none"> 1. Replace hydraulic oil 2. Remove the foreign matter in oil or replace hydraulic oil 3. Replace the hydraulic power unit
3	Lower failure	Manual lowering valve is not adjusted well	Adjust the position of lowering valve screw
4	Motor failure	<ol style="list-style-type: none"> 1. Power supply switch has not been turned on 2. Battery has completely discharged 3. Brake has not been released 4. Burnt fuse 	<ol style="list-style-type: none"> 1. Insert key and turn on power 2. Charge 3. Examine the stroke switch on the lever if it is pressed because of collision and if the braking switch has been reset.

			4.Replace the fuse
5	Charge failure	Damaged charger	Replace the charger

10. Waste treatment

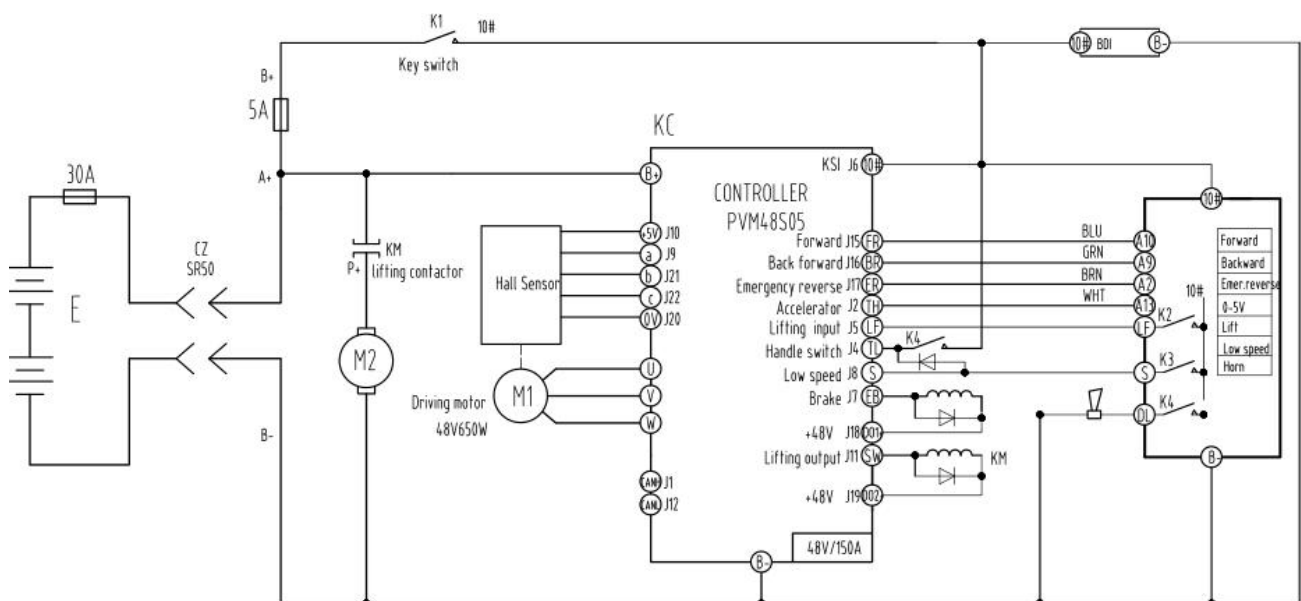
The abandoned batteries and hydraulic oil should not be placed carelessly and must be treated according to the relevant local regulations and laws. Attention must be paid to environmental protection.

11. Accessories and spare parts

No.	Name	Application site	Specification	Qty(pc)	Remarks
1	Key	Turn on the E-lock		2	
2	Charger	Charge the battery		1	
3	Fuse 5A	Electric parts		1	
4	Dust ring	Cylinder	DHS40	1	
5	Seal ring	Cylinder	UHS40	1	
6	O-ring	Cylinder	40X3.55	1	
7	O-ring	Cylinder	67X3.55	1	
8	O-ring	Cylinder	46.2X2.65	1	
9	Cable tie	Handle harness connection	3X150	1	
10	Fix buckle	Fix harness	ACC-2-B	1	
11	Screw	Fix harness	M4X6	1	

12. Electrical schematic diagram and error code

● Electrical schematic diagram



● Fault code table

Code	Description	Possible causes and trouble shooting
------	-------------	--------------------------------------

1	Feedback overspeed	Controller fails, contact the manufacturer.
2	Kernel running error	Controller fails, contact the manufacturer.
8	Speed sensor missing	No speed feedback detected. To solve the problem as following: 1. Check the connection between speed sensor and controller; 2. Check whether the signal of speed sensor is normal; 3. Check the detection circuit of the controller.
9	Direction of speed sensor is wrong.	The direction or phase of Hall sensor ABC and motor UVW are inconsistent. To solve the problem as following: 1. Adjust the Hall phase through the controller parameter P47; increase by 300 each time until the motor rotates normally. Then adjust 50 every time to find out the normal rotation range of the motor. Finally, the midpoint of the range is set as the parameter value. 2. If the method of 1 cannot solve the problem, repeat step 1 after changing parameter P3.0 (feedback commutation).
11	2-minute maximum current protection of motor	The motor current lasts for more than 2 minutes and the maximum current lasts for more than 2 minutes. 1. The motor is locked; check whether the brake is open and whether there is any foreign matter stuck in the driving mechanism. 2. The controller parameters are not set properly, see motor parameter adjustment for details.
12	Over current of controller	Possible causes: 1. The motor is short circuited. 2. The direction or phase of Hall sensor ABC and motor UVW are inconsistent. 3. Motor parameter p15 weak magnetic base speed setting error. 4. In case of controller failure, contact the manufacturer.
13	BUS charging fault	Solve the problem as following: 1. Check whether there is short circuit between u, V and W phases of motor. 2. Check whether the battery voltage supply is too low. 3. Check whether the drive coil is short circuited (do circuit and battery B -). 4. Check whether do + terminal supplies power to equipment other than do.
14	Main contactor connection failure	The contactor inside the controller is abnormal.
15	DRIVER1 connection failure	Check whether the Driver1 connection is normal.
16	Battery voltage is too low	Check the battery level; or the controller battery voltage level is set incorrectly.
17	Battery voltage is too high	Check the battery voltage; or the controller battery voltage level is set incorrectly.

18	Severe over temperature of power board	Controller protection, out of service.
20	Abnormal accelerator / braking pedal input	The input signal of accelerator pedal or brake pedal is abnormal. Solve the problem as following: 1. Check the connection between pedal and controller for short circuit and open circuit. 2. Check whether the pedal is damaged; 3. Check the parameter settings of the controller related to the pedal, especially the pedal type. (P91, P101) .
22	5V output failure	1. motor encoder short circuit; 2. Other 5V external equipment is short circuited; 3. In case of controller failure, contact the manufacturer.
23	MACID detection failure	The controller can network ID number is set repeatedly. Solve the problem by resting it.
24	Main contactor drive failure	The contactor inside the controller is abnormal.
25	Power module failure	Controller failure.
26	Can node lost	1. The controller is configured in parameter P1, and the interlock check is enabled in parameter P2Check. In actual operation, no corresponding module is found. 2. Check the connection between each module and the working status of the module.
29	The temperature measuring circuit inside the controller is abnormal.	Controller fails, contact the manufacturer.
31	Battery voltage is slightly low	The battery is low. Charge it as soon as possible.
32	Power board slightly over temperature	The controller reduces the load due to slight over temperature.
33	Power board low temperature	When the ambient temperature is too low, the controller reduces the load.
34	Slight over temperature of motor	The controller reduces the load.
36	Drive2 connection failure	Check connection of Drive 2.
37	Drive3 connection failure	Check connection of Drive 3.
38	EEPROM reading and writing parameter error	Controller fails, contact the manufacturer.
39	Parameter overrun error	If the parameter setting fails, contact the manufacturer.
40	Operation timing error	After reset, the key signal is not in the original position (throttle switch, direction switch, lifting / lowering, safety switch, emergency switch). The signal returns to its original position and the alarm is automatically eliminated.
41	Alarm for 20% remaining power	Charge
42	Alarm for 15% remaining power	Charge
43	Alarm not matched	The match enable parameter is set, but the match is not complete. See the automatic matching instructions for details.

13. Packing list

Packing list of CBD15W-LiX Li-ion powered pallet truck

Consignee:

Ex-work No:

Contract No.:

Ex-work Date:

No.	Product Name	QTY	Weight (kg)	Dimension (L×W×H)	Remarks
1	CBD15W-LiX pallet truck	1			A complete set
2	Accessory box	1			Technical documents, accessories and spare parts.

Note: 1. The following documents are in the file bag:

- | | |
|--------------------------------|----------|
| 1) CBD15W-LiX operation manual | 1 volume |
| 2) Qualification certificate | 1 copy |
| 3) Packing list | 1 copy |

2. Accessories and spare parts

No.	Name	Application site	Specification	Qty(pc)	Remarks
1	Key	Turn on the E-lock		2	
2	Charger	Charge the battery		1	
3	Fuse 5A	Electric parts		1	
4	Dust ring	Cylinder	DHS40	1	
5	Seal ring	Cylinder	UHS40	1	
6	O-ring	Cylinder	40X3.55	1	
7	O-ring	Cylinder	67X3.55	1	
8	O-ring	Cylinder	46.2X2.65	1	
9	Cable tie	Handle harness connection	3X150	1	
10	Fix buckle	Fix harness	ACC-2-B	1	
11	Screw	Fix harness	M4X6	1	

Consignee: