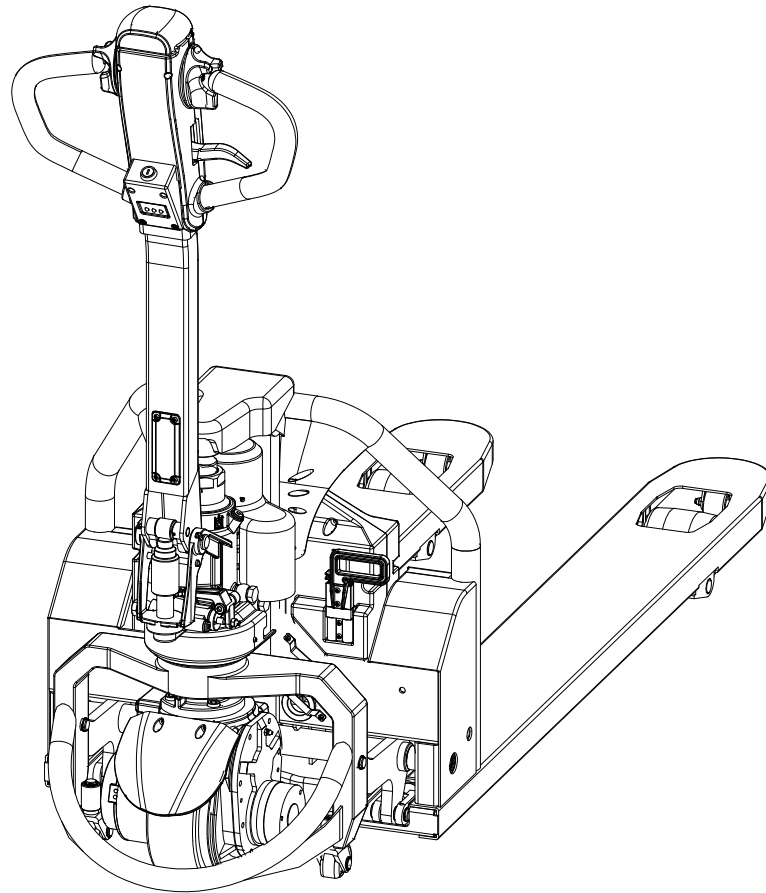


15EPML

Lithium Battery Pallet Truck

- Operation Manual
- Service Manual



Welcome to use “HYUNDAI” Electric Truck!

Wish our electric truck will bring greater convenience for your work!

- Please read this operation manual carefully before using the truck.
- This operation manual is universal, and we reserve right to make technical modifications on electric trucks. If this manual does not accord to the actual truck, please in kind prevail while this manual is only for reference.

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1. Safety regulations



Always wear safety shoes when using the truck.



In order to prevent injury, always wear protective glasses when assemble or disassemble the truck.



Caution!

Stop using the truck when it is damaged or faulted.



Attention!

The truck is designed for use on hard and flat ground only.

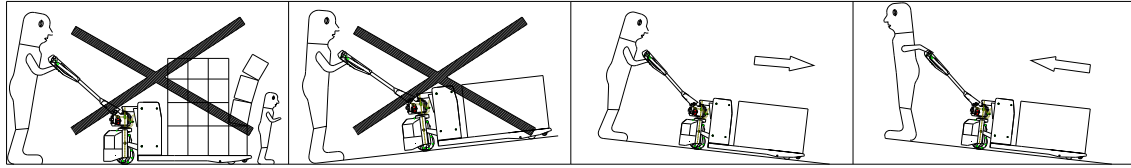
Never use the truck under the following conditions:

- There is dust or flammable/explosive gas in the air.
- In cold storage, low temperature, salty, or other corrosive environment.
- Outdoor rainy days.
- Operations on grid or grassland.
- Places with gradient greater than the designed grade ability.



Attention!

- When operating the truck, make good judgement with a responsible attitude.
- Never operate the truck with oily hands or shoes.
- Never wear loose clothes or jewelries while operating the truck.
- When operating the truck, make sure the ground has adequate load capacity. Herein the load capacity refers to the total weight of pallet truck and cargo.
- Be extremely careful if there is any extruding objects on/around the truck that may cause human injury or damage the truck.
- No person is allowed to appear around the operation area, because it may injure human body, for example, when cargo falls off.



Caution!

When transporting cargo on a slope, be extremely careful, and make sure the operator is operating on the upper end of the slope, as shown in the picture above. When the truck slides a slope, turn the drive wheels to the biggest angle to prevent further sliding. This method can only be adopted under emergency.



Warning!

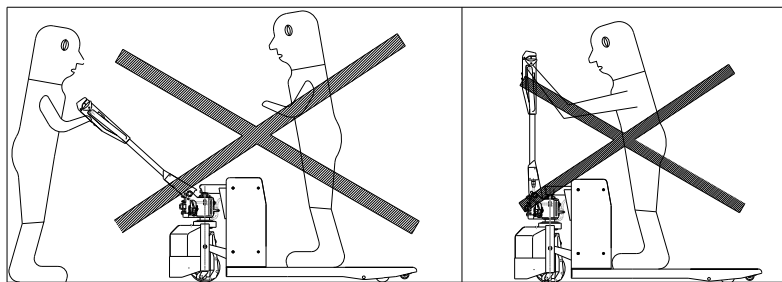
- Avoid fast operations during turning in order to prevent overturn.
- Cargo shall not be too high to block sight.
Brake lightly and cautiously to prevent cargo from falling off.
- Never make turns on a slope.

When pushing the truck into an elevator, make sure the elevator is capable of bearing total weight of the truck, cargo, operator and other persons in the elevator. When entering, make sure load enters first, rather than the operator. No person shall stays in the elevator when load/truck enters/exits the elevator.



Caution!

- Load weight shall not exceed rated load.
- When stacking, cargo shall not be too high, in order to prevent it from falling off.
- Never transport people by the truck. No person is allowed around the operation area to prevent human injury caused by truck faults.
- Operator is not allowed to sit or stand on the truck to operate.



Attention!

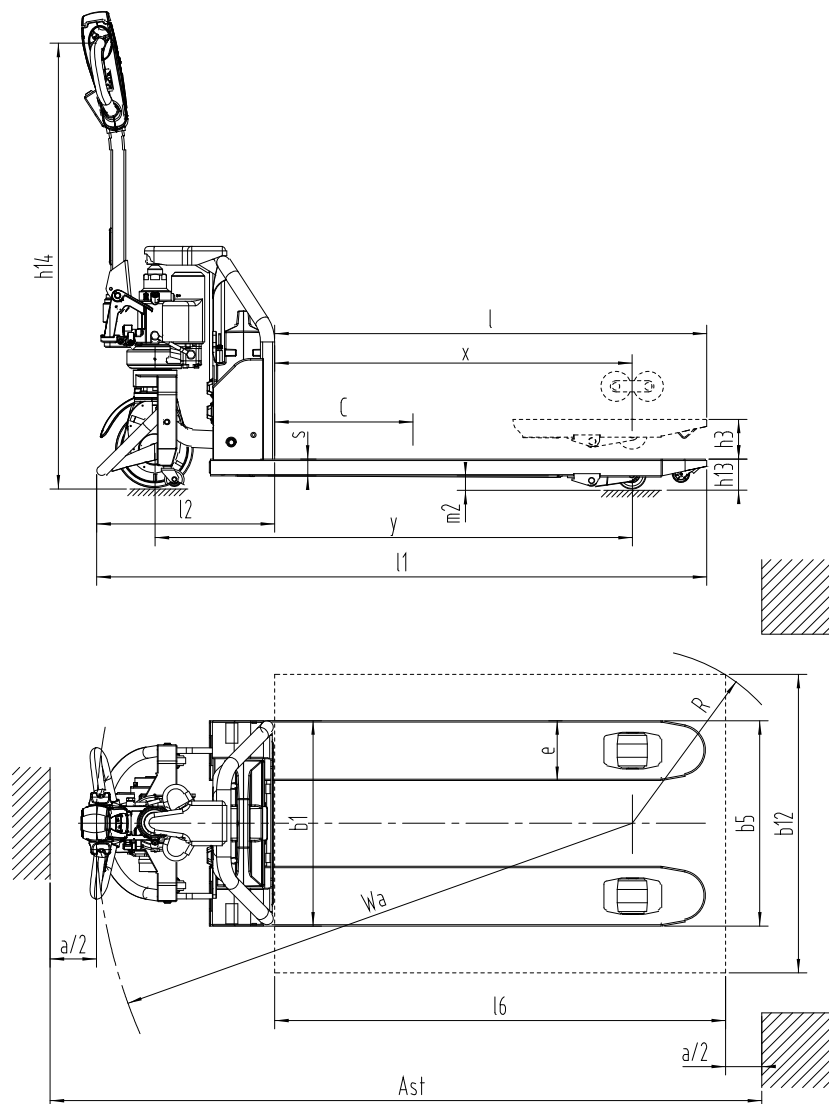
- Descend forks to the lowest position when parking.
- Never park the truck on a slope.
- Never park the truck at emergency exits.
- Never park the truck at places where it blocks traffic or influences work.
- Never use the truck in rains.
- When nobody guards the truck, turn off power supply.

2. Use conditions

This truck is designed for use on hard and flat indoor ground. Never use it in a unsuitable environment.

- Ambient temperature shall be between -10°C and $+40^{\circ}\text{C}$.
- For hard and flat ground;
- Never use the truck in flammable, explosive or other corrosive environment with acids or alkali.
- The maximum grade ability is 5%.

3. Truck parameter



Picture 1

Model		15EPML
Drive type		electric
Operation type		Walkie
Rated load	Q(kg)	1500
Load center	C (mm)	600
Fork lowest height	h ₁₃ (mm)	80
Tread	Y(mm)	1269/1339
Wheel		PU
Wheel dimension, front	mm	Φ 210
Wheel dimension, rear	mm	Φ 80
Wheel number (x=drive wheel)		1X-2/2 (4)
Lift height	h ₃ (mm)	110
Operation handle in driving position, min./max. height	h ₁₄ (mm)	635/1200
Overall length	l ₁ (mm)	1623/1693
Length of fork face	l ₂ (mm)	473
Truck body width	b ₁ (mm)	550/680
Fork dimension	s/e/l(mm)	45/160/1150(1220)
Fork outer width	b ₅ (mm)	550/685
Wheelbase center ground clearance	h ₁ (mm)	35
Aisle width for pallets 1000x1200 crossways	Ast(mm)	2226/2294
Aisle width for pallets 800x1200 lengthways	Ast(mm)	2095/2132
Turning radius	Wa(mm)	1424/1494
Travel speed, laden/unladen	Km/h	4.8/5
Max. grade ability, laden/unladen	%	5/20
Driving motor power	KW	0.65
Lifting motor power	KW	0.8
Battery voltage/rated capacity	V/Ah	48/20
Travelling brake		electric
Noise level at driver's ear according to DIN12053	dB(A)	70
Weight (including battery)	Kg	136

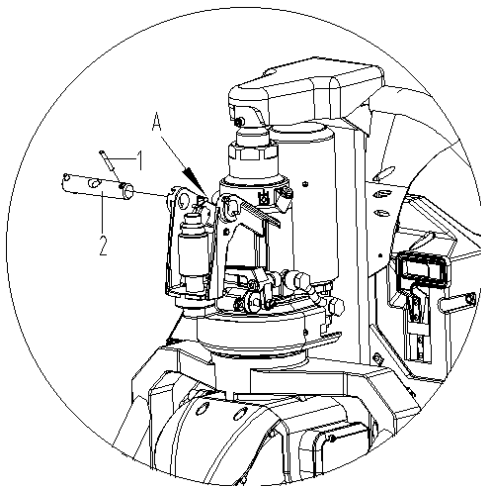
4. Handle assembly

For safe transportation and packaging, handles of the truck have been disassembled when ex-factory. Therefore, users should assemble handles before use. The assembly procedures are as follows:

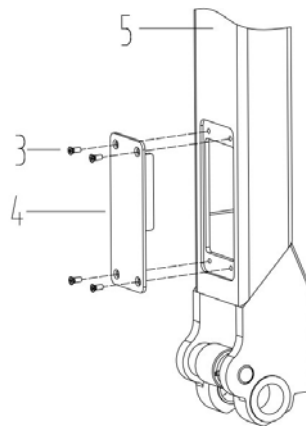
4.1 Refer to drawing 1, disassemble pin 1 from pin 2, and pull out pin 2.

4.2 Refer to drawing 2, take down screw 3 & remove cover plate 4 from handle assembly 5.

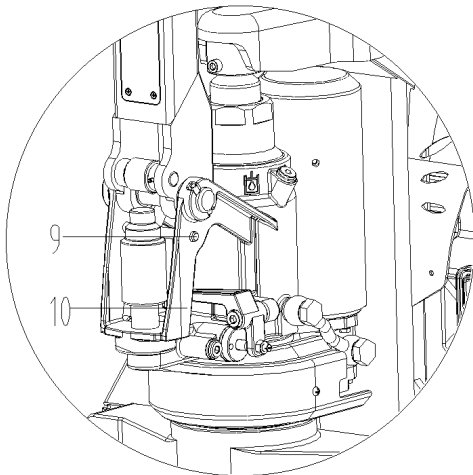
4.3 Refer to drawings 3 and 4, insert handle assembly 5 to A, connect handle assembly 5 and pump 10 with pin 2, then make chain 8 go through hole of pin 2. Rotate handle 5 to horizontal position and pull out pin 9, and keep pin 9 well for next use. Connect wiring harness in handle assembly 5 and wiring harness on truck body by connector 6, and fasten with belt to ensure reliable connection (refer to drawing 5). After connecting the wiring harness, fix wiring harness to handle assembly 5 through line card 7.



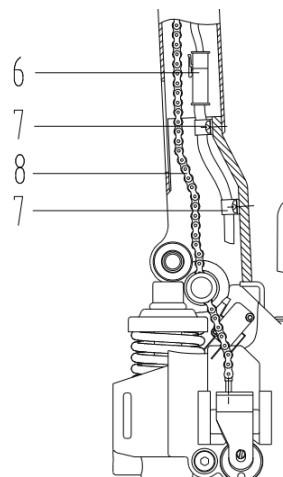
Drawing 1



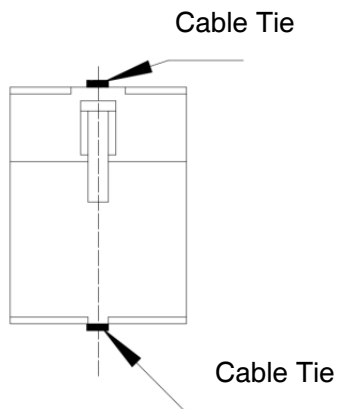
Drawing 2



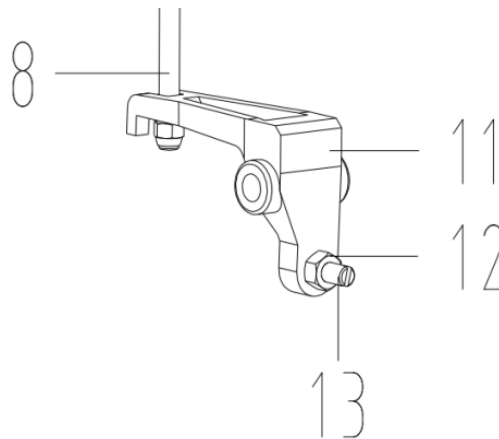
Drawing 3



Drawing 4



Drawing 5



Drawing 6

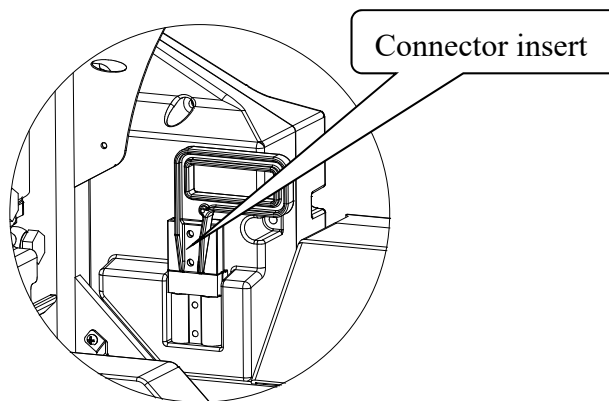
4.4 Refer to drawing 4 & 6, hook screw nut on the end of chain 8 into groove of lever plate 11.

4.5 Finally, fix pin 1 through pin 2, and install cover plate 4 back to handle assembly 5.

5. Truck operation

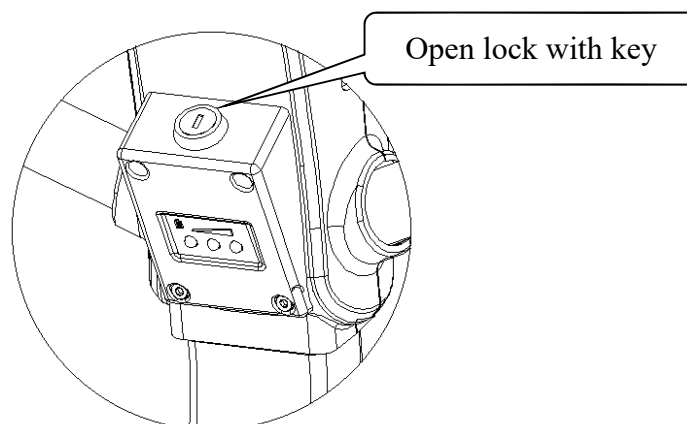
Truck powering on

- Plug in lithium battery interface.



Drawing 2

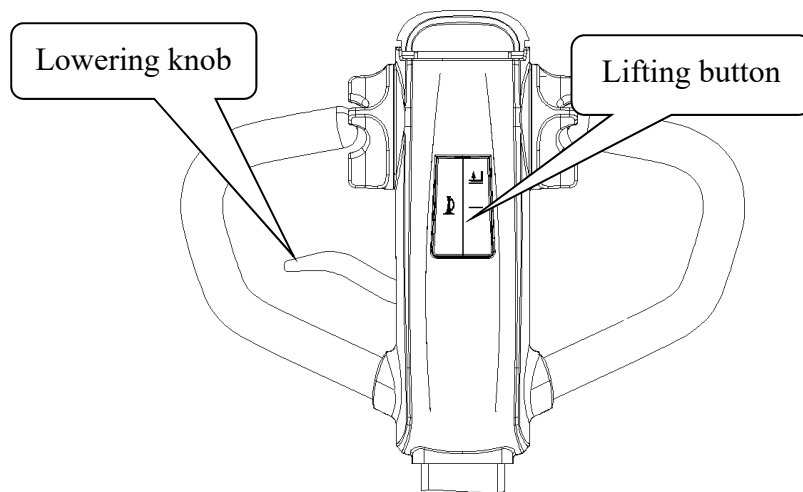
- Open lock



Drawing 3

Fork lifting/lowering

- Lifting: operate lifting button on operation handle.
- Lowering: hold knob to lower.

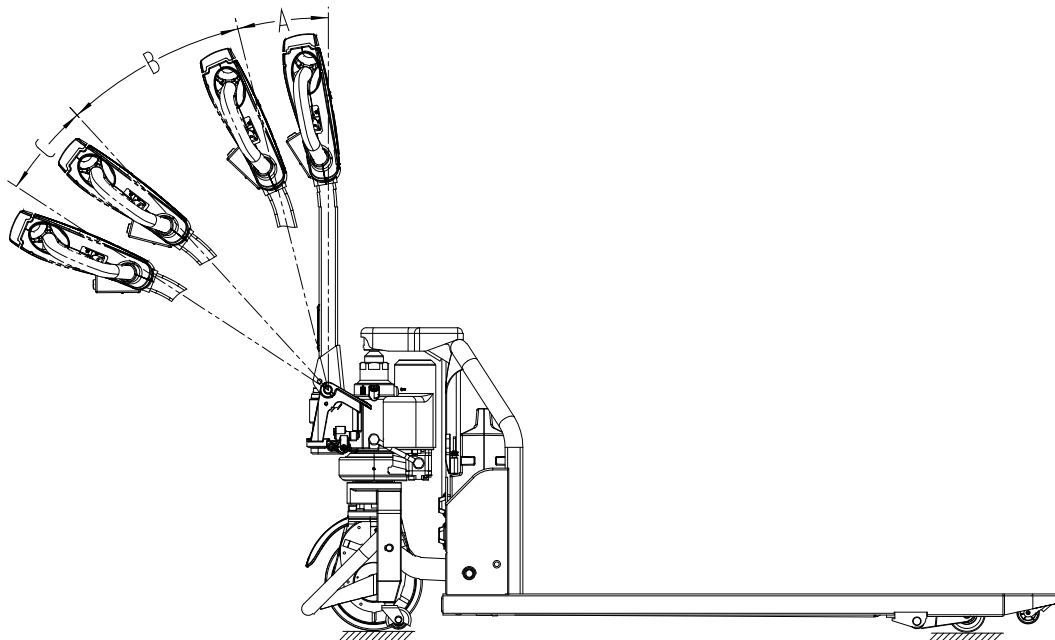


Drawing 4

Truck travelling

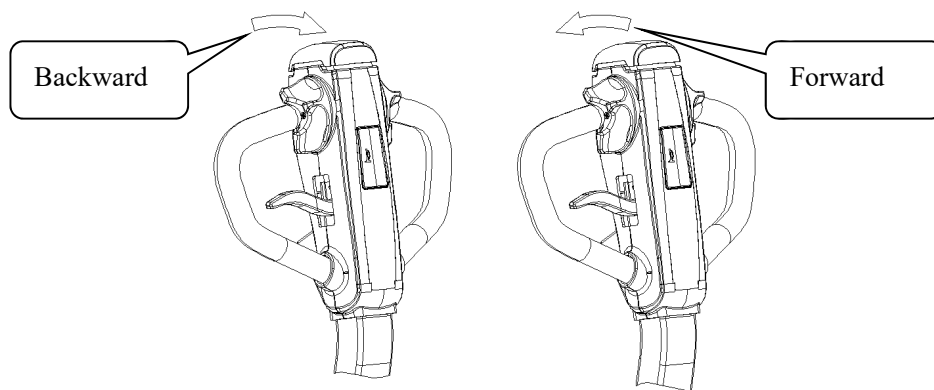
Rotate handle to travelling area

A and C are braking area, B is travelling area.



Drawing 5

- Rotate accelerator slowly to start truck (for safety reasons, fast acceleration is prohibited)



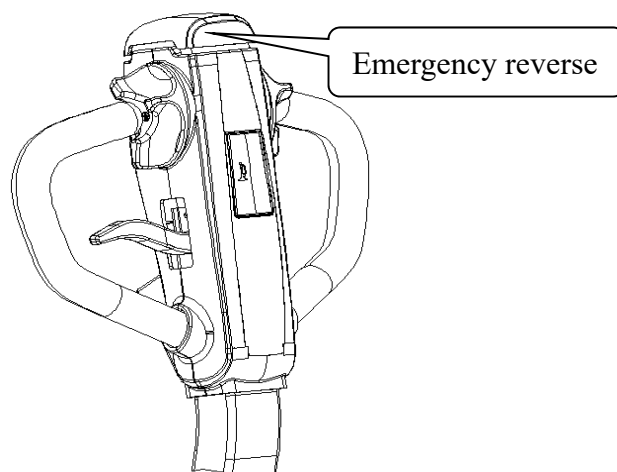
Drawing 6

Truck braking

- Release accelerator during normal travelling, and the truck will stop slowly through motor regenerative braking until brake locks.
- In emergency, rotate operation handle quickly to area A or C (drawing 5), and the brake will lock to release emergency braking.

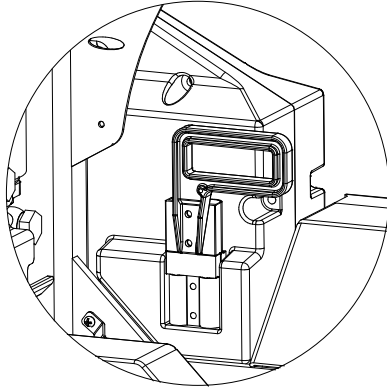
Emergency reverse function

- The red button at rear end of handle is the emergency reverse button. When human body touches the button, the truck will stop travelling forward immediately and will travel backward for some distance. This safety switch is designed to prevent human damage caused by truck squeezing when encountering obstacles.



Truck parking

- Release acceleration button to make the truck stop travelling. Then truck will decelerate slowly until brake closes.
- Descend forks to the lowest position.
- Turn off lock.
- For extended parking, separate power line and truck.



6. Use, maintenance and charging of storage battery

6.1 Type of storage battery and use precautions

6.1.1 Battery of this truck is lithium-ion battery; battery voltage 48V. This is environmentally friendly battery without mercury or cadmium.

6.1.2 Precautions

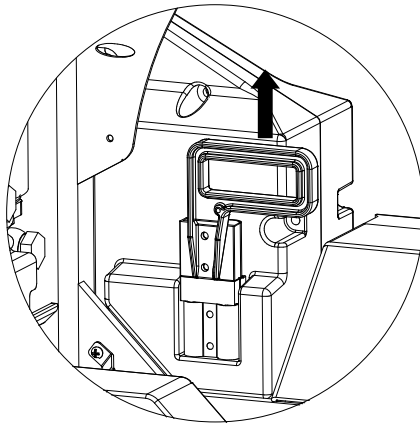
- a) Use temperature: -10 ~ 45;
- b) If the battery is to be placed for a long time, charge and discharge it every three months;
- c) Please fully charge the battery before use a new battery or use a battery that has been stored for a long time;
- d) Never short circuit the battery, which may damage it permanently;
- e) Never burn or damage the battery, which may cause release of toxic gases or explosion;
- f) Never weld the battery directly;
- g) Never place the battery in an unfavorable condition, such as extreme temperature, deep circulation, or frequent overcharging/over-discharging;
- h) If the battery becomes too hot, never touch it before it cools down;
- i) When remove battery pack, hold the plug rather than the wire;
- j) If the battery becomes too hot after use, please cool it down in a well-ventilated environment before charging again;
- k) Do not place the battery in water or sea water;
- l) Do not try separating, squeezing or striking the battery, because the battery may become hot or cause fire. Alkali liquid in battery is harmful to eyes and can damage clothes;
- m) Keep battery away from children.

6.2 Quick replacement of battery

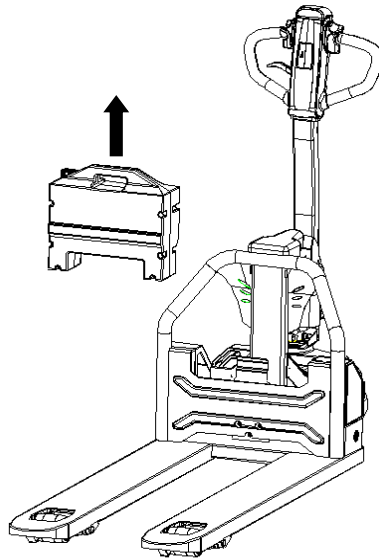
Step 1: turn off key

Step 2: hold knob of power supply connector, and pull out power supply connector.

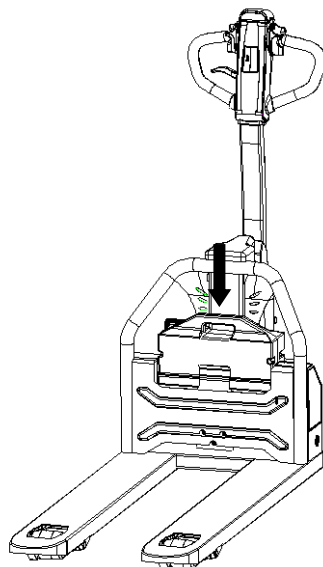
(Attention: you must hold the knob when pull out the connector; never pull wire directly)



Step 3: hold the battery knob forcefully to pull out the battery from truck.



Step 4: install new battery, insert it into mounting groove.



Step 5: insert power supply connector.

6.3 Precautions for battery charging

- a) **You must use our special Li-ion charger;** charger working voltage is 48V, the maximum charge voltage is 54.6V, charge current is 6-7A
- b) Do not conduct reverse charging
- c) If the battery becomes hot obviously during charging, please stop immediately, and charge again after it cools down
- d) When pulling the charger connector, hold the knob rather than pull the wire directly

6.4 Concerning power indicating

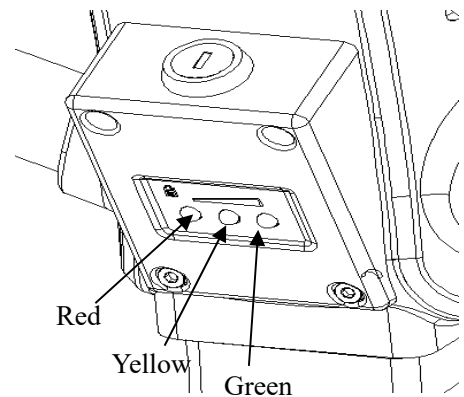
Green light on: 70%-100%

Yellow light on: 40%-70%

Red light on: 10%-40%

Red light flashes: null

If red light is on, please prepare to charge the truck; red light flashing is warning that the truck will stop working and please charge it. If you continue to use it, lithium battery will be disconnected, and truck will be unable to travel.



7. Keep and maintenance

Whether the truck can serve satisfactorily depends on careful maintenance. Neglect of maintenance may harm human body and damage cargo. Therefore, when you use the truck, please conduct inspections timely, exclude abnormal phenomenon, and never use a faulted truck in order to ensure safety and prolong service life.

Maintenance: maintenance of the truck is divided into three levels, i.e. daily maintenance, first level maintenance and second level maintenance.

Daily maintenance: conducted daily, mainly to keep truck surface clean and check whether power wire is damaged.

First level maintenance: conducted weekly, mainly to check whether each component functions normally, whether each fastener is fixed, whether there is leakage, whether the mechanical part has abnormal wearing and whether the electrical part has abnormal temperature rise or sparks. For any abnormal phenomena, adjust and exclude timely.

Second level maintenance: conducted periodically, and conduct full inspections for the following aspects:

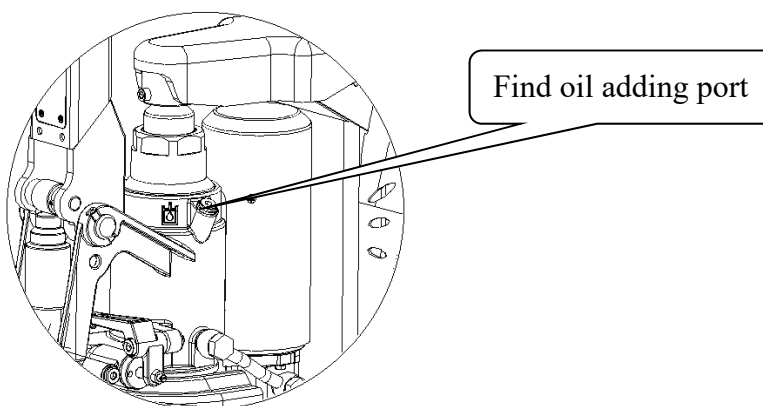
a. Mechanical maintenance: conducted half a year, mainly to check whether any fastener becomes loose, whether each wheel turns flexibly, and whether forks can lift and lower normally. After maintenance, the running noise shall not exceed 75dB.

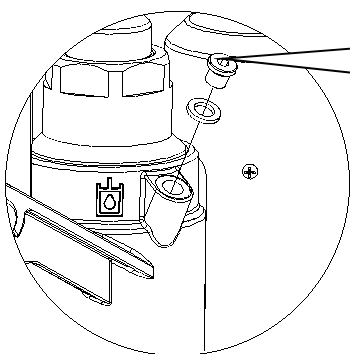
b. Hydraulic maintenance: conducted annually, mainly to check whether oil cylinders are normal, whether there is inner or outer leakage, whether hydraulic oil is clean, and replace hydraulic oil every 12 months generally. Adopt ISO oil quality for hydraulic oil.

When ambient temperature is $-5 \sim 40^{\circ}\text{C}$, adopt L-HV32; when ambient temperature is $-10 \sim -5^{\circ}\text{C}$, adopt L-HV15 low temperature hydraulic oil. The replaced wasted oil shall be disposed according to local laws and regulations. Check whether limit valve works normally.

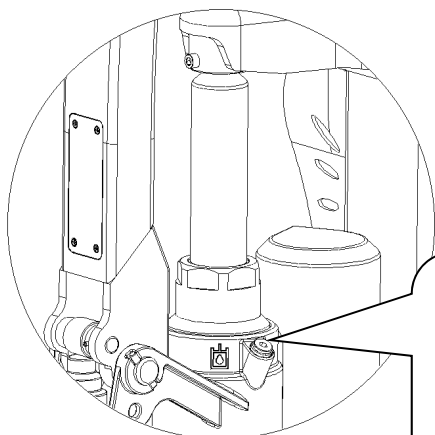
c. Electrical maintenance: conducted every three months, to check whether each joint is reliable, whether switches are normal, and whether insulation is normal (insulation resistance between electrical part and truck body shall be greater than $0.5\text{M}\Omega$).

7.1 Adding hydraulic oil



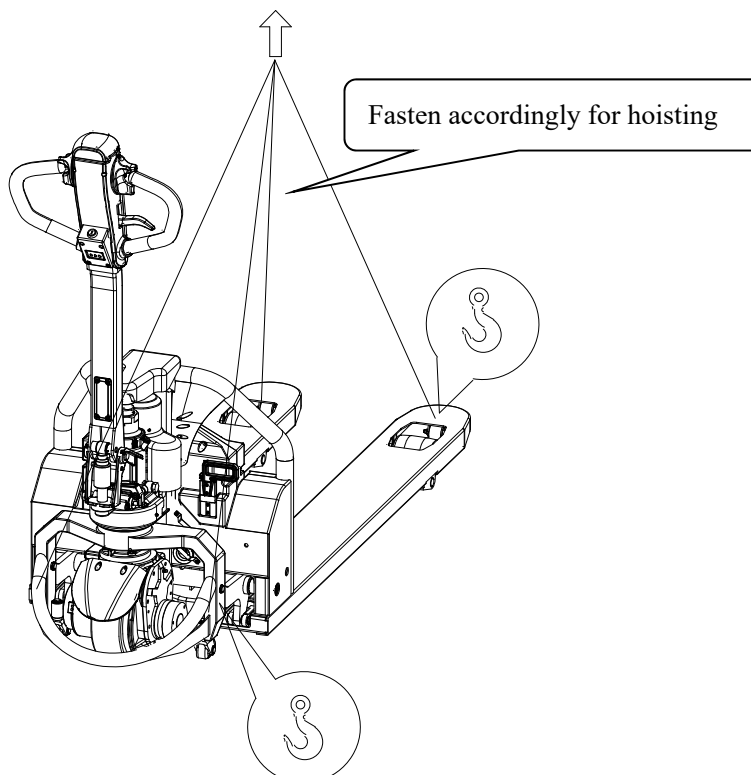


Use wrench No. 5 to remove screw at the adding port. The total required adding amount is 250ml.



After oil has been added, lift and lower for 2-3 times unladen, lift forks to the maximum height, then fasten the screw. If washer at the oil port is damaged, replace it with a new washer.

8. Truck hoisting



9. Common fault and troubleshooting

Some common faults and troubleshooting are listed in the table below:

No.	Fault	Cause analysis	Troubleshooting
1	Hydraulic oil leakage	1. Sealing failure; 2. Some spare parts have slight damage or wearing in surface. 3. Loose connection.	1. Replace sealing; 2. Replace damaged parts; 3. Fasten loose points again.
2	Forks not lifting	1. Work oil too viscous, or work oil not added; 2. Impurities in oil; 3. Hydraulic power unit damaged.	1. Replace work oil; 2. Clear impurities in oil line, replace work oil; 3. Replace hydraulic power unit.
3	Forks not lowering	1. Manual lowering valve not properly adjusted.	1. Adjust lowering valve screw position.
4	Motor cannot work	1. Power supply not turned on 2. Battery runs out of power 3. Brake not released 4. Fuse burnt	1. Insert key and start power supply 2. Charge 3. Check whether range switch on handle is pushed down by collision, and whether brake is damaged; 4. Replace fuse
5	Charger cannot charge	Charger damaged	Replace charger

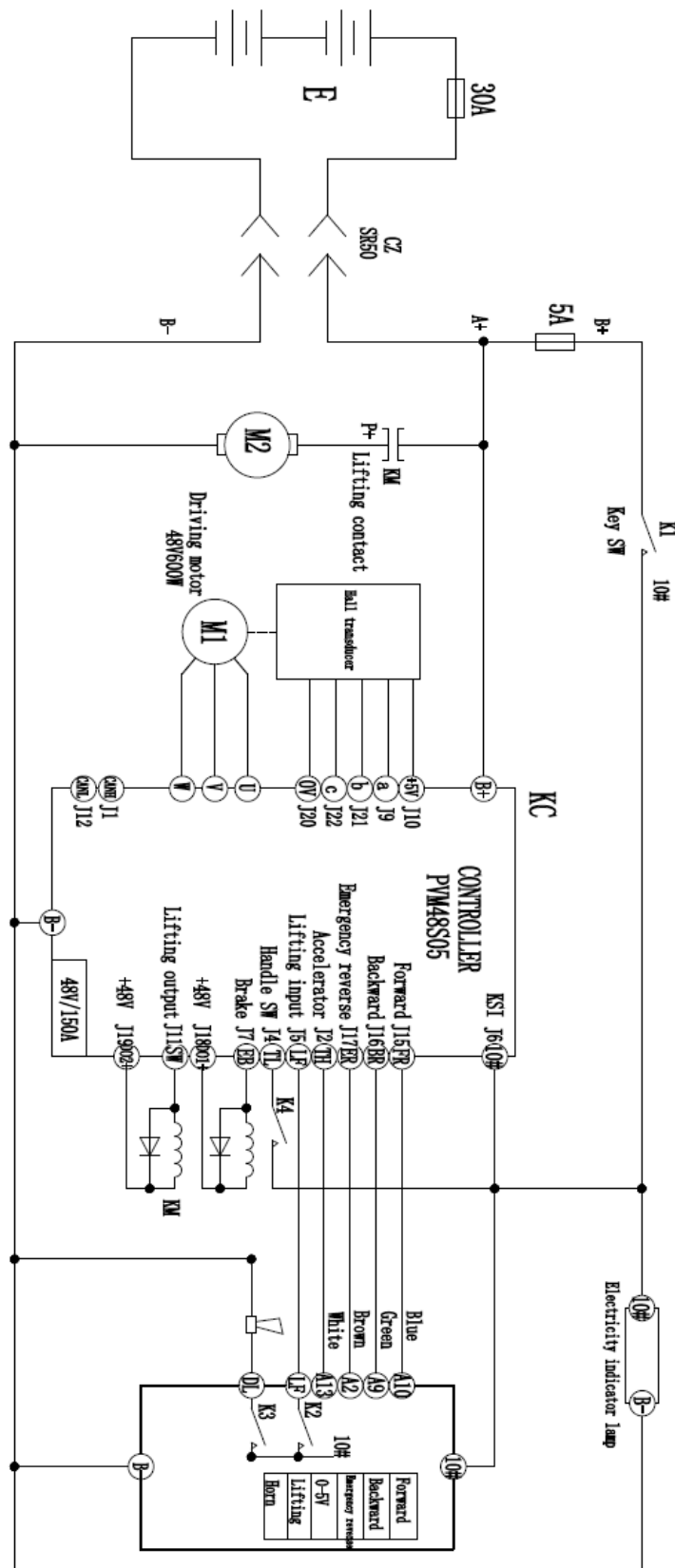
10. Waste disposal

For waste batteries and hydraulic oil, do not litter around; for environmental considerations, dispose them according to local laws and regulations.

11. Accessories and spare parts

No.	Name	Use position	Specification	Q'ty	Remarks
1	Key	Open lock		2	
2	Charger	Lithium battery		1	
3	Fuse 10A	Electric part		1	
4	Dust ring	Oil cylinder	DHS40	1	
5	Seal ring	Oil cylinder	UHS40	1	
6	O-ring	Oil cylinder	40X3.55	1	
7	O-ring	Oil cylinder	67X3.55	1	
8	O-ring	Oil cylinder	46.2X2.65	1	
9	Belt	Handle wiring harness connection	3X150	1	
10	Belt	Wiring harness fixing	4X150	2	
11	Screw	Wiring harness fixing	M4X6	2	

12. Electrical schematic drawing



13. Packing list

Packing List of 15EPML Pallet Truck

Consignee:

Manufacture No.:

Contract No.:

Manufacture date:

No.	Cargo	Q'ty	Net weight (kg)	Outline dimension (L x W x H)	Remarks
1	15EPML pallet truck	1			Whole truck
2	Accessory bag	1			Technical documents, accessories and spare parts within

Note: 1. The following files are included in the technical document bag:

- | | | |
|---|--------------------------------------|----------|
| ① | 15EPML pallet truck Operation Manual | 1 volume |
| ② | 15EPML pallet truck Parts Catalogue | 1 volume |
| ③ | Certificate of Quality | 1 copy |
| ④ | Packing list | 1 copy |

2. Accessories and spare parts

No.	Name	Use position	Specification	Q'ty	Remarks
1	Key	Open lock		2	
2	Charger	Lithium battery		1	
3	Fuse 10A	Electric part		1	
4	Dust ring	Oil cylinder	DHS40	1	
5	Seal ring	Oil cylinder	UHS40	1	
6	O-ring	Oil cylinder	40X3.55	1	
7	O-ring	Oil cylinder	67X3.55	1	
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9	Belt	Handle wiring harness connection	3X150	1	
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