

Product Model: MBD Series

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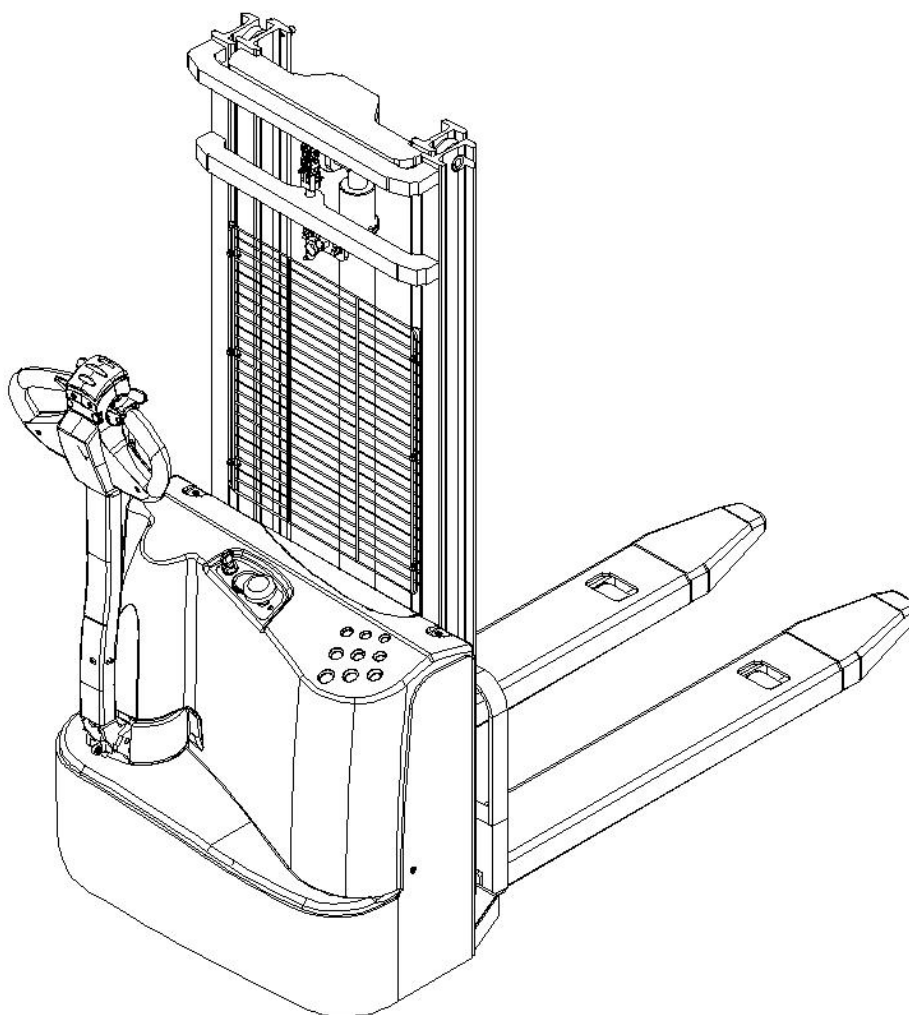
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Maintenance Instruction Manual

MBD Series Electric Pallet Stacker



Preface

Referring to the advanced technology at home and abroad, MBD electric stacker is our new product to meet the market needs. Due to its small and beautiful appearance and flexible operation, it is especially suitable for loading and unloading, stacking, handling and other work in the high-racking warehouse, freight yard, supermarket and so on.

This instruction clarifies the basic knowledge of the main components structure, working principles and maintenance of MBD electric pallet stacker. It can help the operator to use the forklift reasonably and make the forklift perform its maximum efficiency. We sincerely hope that operator and equipment manager will read this instruction carefully before operating the machine.

Through reading carefully of the original maintenance instruction, users can master the technical knowledge necessary for forklift safe operation. The information in the instructions is concise and clear.

This maintenance instruction manual is written for different types of forklifts. In the process of operation and maintenance, please pay attention to the specific provisions of each model.

Our company will continuously develop and optimize forklift equipments, so please understand that we have the right to amend the machine's appearance, equipment and technology. Out of this, the forklift users shall not derive any claims for any specific performance of our forklifts from the instruction manual content.

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Chapter 1 Safety

1 Safety regulation

The safety regulation is summed up as following.

- 1.1 Please check all the safety switches, equipment in advance everyday before using the forklift according to the requirement so as to ensure safety devices normal.
- 1.2 Check that all the cautions and design parameter on the forklift are not destroyed.
- 1.3 The batteries must be fixed safely in the battery case.
- 1.4 It's forbidden to use the forklift when it's damaged or out of order and cause unsafe use.
- 1.5 When maintaining or adjusting the forklift, only professionals can do that.

2 Operating the forklift

When the forklift is used in the place of cold storage, it must be made specially. When the forklift is in design and manufacture, it has certain restriction for using occasions.

- 2.1 Air with inflammable and explosive dust or gas.
- 2.2 Use as a tractor of other trucks

3 Responsibility of operators

- 3.1 People who have been trained and approved can operate the forklift.
- 3.2 Obey this instruction and local relevant security rules, regulations and traffic rules.
- 3.3 Check the forklift carefully before operating it and make sure it isn't out of order.
- 3.4 It's forbidden to operate the forklift when there's oil on your hands and feet.

4 Workplace

- 4.1 The forklift can only run on hard and flat roads such as concrete or pitch roads. Don't work in greasy and dirt area so as to skid.
- 4.2 Make sure the ground can bear the total weight of the forklift, that is the forklift weight, load weight and the operator's weight.

5 Driving and guiding in the course of transportation

- 5.1 Don't brake and turn suddenly under the condition of driving at high speed.
- 5.2 Slow down the speed on the slope and keep goods at the lowest position. Running should be straight up and down on the slope. It's forbidden to turn back on it.
- 5.3 If the road surface skids, the operator should slow down the speed in order to prevent the forklift

from spinning or overturning.

5.4 If your sight is obstructed, you can put goods behind you and drive. If necessary, ask others to guide in order to ensure security.

5.5 Keep a safe distance with the vehicle, persons, objects in front.

5.6 Ring the horn while you overtake.

5.7 It's forbidden to transport people.

5.8 Make sure the forklift can bear all the weight before it enter the lift.

6 Transporting goods

6.1 Only at the time of loading and unloading goods, you can lift the forks.

6.2 It's forbidden to transport when goods on the forks is unstable and unsafe.

6.3 Be more careful when transporting over high and over heavy goods.

7 Precaution of parking

7.1 After the forklift stop completely, you should lower the forks to the minimum position and brake it.

7.2 It's forbidden to park the forklift on the slope.

7.3 Park the forklift at the appointed place.

7.4 It's forbidden to park the forklift at the urgent exit.

7.5 Don't park it at the place to hinder work.

8 Fixing and removing the batteries

8.1 Be careful while fixing and removing the batteries and the plug, Read the instruction carefully firstly, see the chapter of the batteries in detail.

8.2 Please wear the protective glasses while changing or charging the batteries.

9 Maintenance

9.1 Maintenance can prevent mistakes and accidents. Please see the chapter of maintenance in detail.

9.2 All replacement parts and spare parts should be approved by our company.

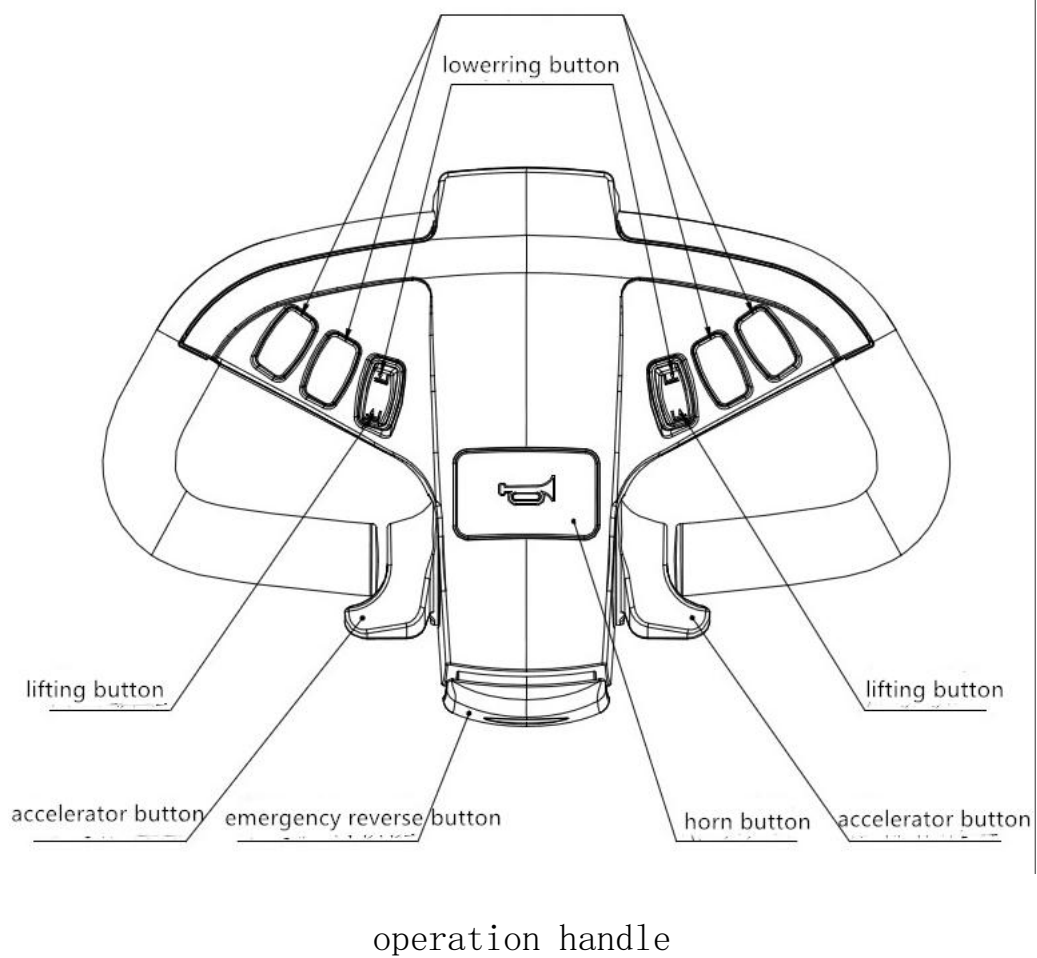
It's forbidden strictly to maintain or reequip the forklift, which can influence security or use function.

Chapter 2 Caution,trade mark and sign

The forklift has the following marks:

(Please read the signs on the forklift about relevant content)

- 1 Lifting and lowering the hydraulic handle
- 2 Control switch of driving direction and speed
- 3 Horn sign
- 4 Safety sign
- 5 Load curve sign



Chapter 3 Forklift introduction

The forklift drives with electric power, and walking is controlled by the switch on then operating handle, the operating arm controls steering.

The forklift adopts 24V electronic system, and adjust its speed steplessly by a set of integrated circuit controller to ensure steady speed and acceleration in the course of driving. The forks rise by the advanced electric hydraulic pump, lifting and lowering the forks by lifting and lowering button on the operating handle.

If the forklift works in the cold and moist environment, it should be equipped with low-temperature oil in order to adapt to the environment.

1 Suitable occasion of the forklift.

The forklift is suitable for loading and unloading and transporting goods on a pallet.

2 Forbidden occasion of the forklift.

It can't be used in the following situations:

- 2.1 The places can cause fire or explosion, such as oil districts.
- 2.2 The forklift is used as the tractor of other trucks.
- 2.3 It's used for transporting or lifting and lowering people.
- 2.4 It works on the meadow or the sand ground.

3 Forklift parameter

The following form is about the relevant parameters of the forklift.

Model No.	MBD1225	MBD1230	MBD1525	MBD1530
Rated capacity kg	1200	1200	1500	1500
Lift height mm	2500	3000	2500	3000
Travel speed –unload km/h	4	4	3.6	3.6
Travel speed –laden km/h	3.5	3.5	3.5	3.5
Max gradeability –laden %	3	3	3	3
Turning radius mm	1440	1440	1440	1440
Overall width mm	800	800	800	800
Service weight kg	560	600	560	600

Steering angle (°)	180	180	180	180
Material of drive wheel	PU	PU	PU	PU
Driving motor	0.75KW	0.75KW	0.75KW	0.75KW
Lifting motor	2.0KW	2.0KW	2.0KW	2.0KW

The relevant parameters of the forklift are marked on the plate of the forklift.

4 Main Component

4.1 Handle

During the driving process, the forklift is controlled to walk and turn by the handle, and the maximum steering angle of the joystick is 180° from left side to right side. When the Handle is at the highest and lowest place, the forklift will brake (turn off is automatically brake).

4.2 Pallet stacker nameplate

The nameplate is attached with the model number, rated capacity, maximum lifting height, self-weight, factory number.

4.3 Cover

Removable, with good visibility when in use.

4.4 Instrument

The Instrument displays the power value during normal operation, reflecting whether the battery power meets the requirements.

4.5 Hydraulic control

The up and down buttons on the handle of the vehicle control the rise and fall functions.

4.6 Hydraulic device

It consists of pumping station, piping system and lifting cylinder.

4.7 Power socket assembly

When charging the battery, plug the charger into the body socket.

4.8 Drive device with brake

It is equipped with an electromagnetic energizing brake, a traveling motor, a gear box and a driving wheel. A steering bearing is arranged between the driving motor and the gear box.

4.9 Speed control device

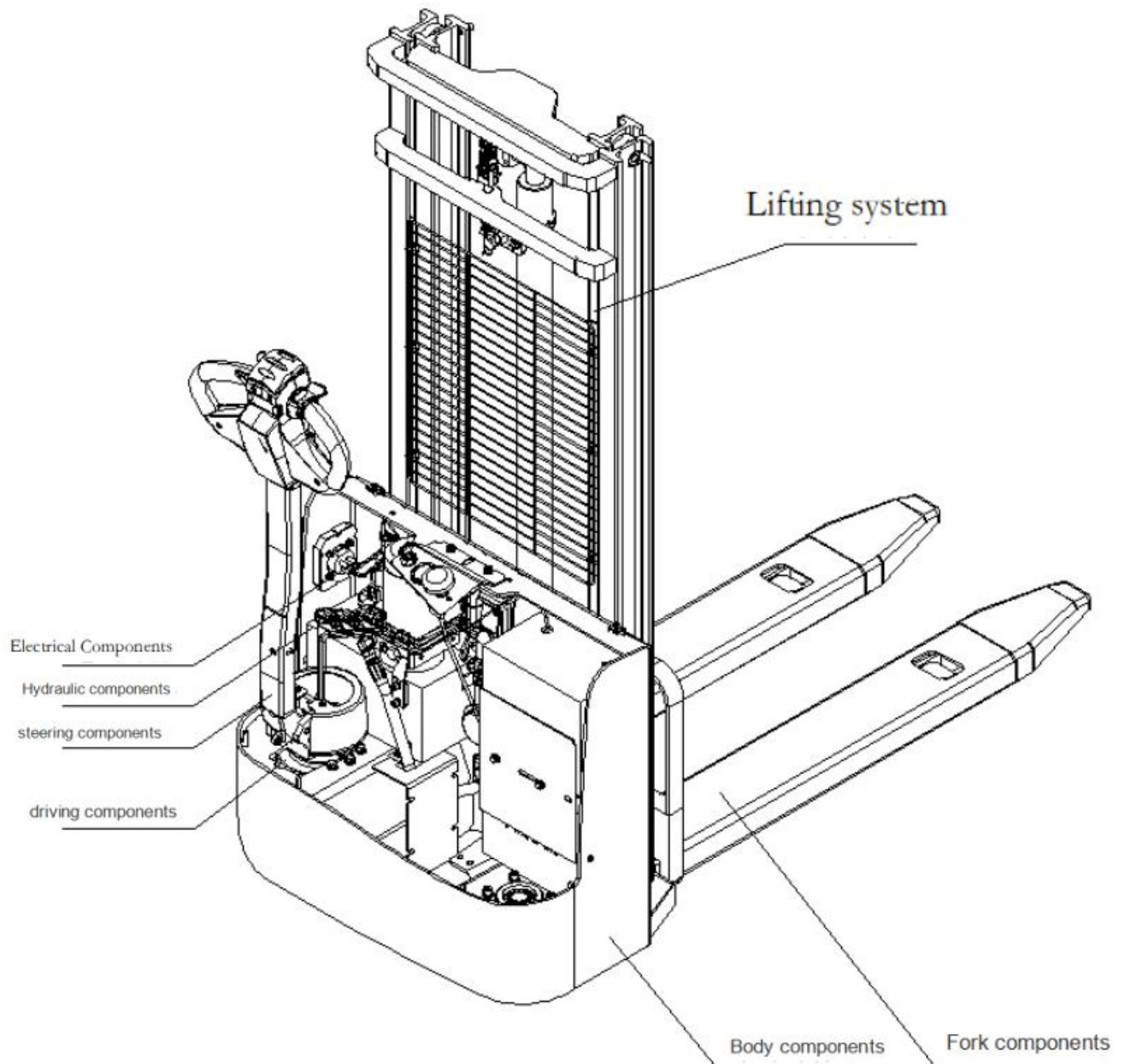
Normal operation at 24V, the speed is adjusted by electronic control.

4.10 Universal support wheel

One-side universal wheel support to ensure lateral stability of the car body.

4.12 Battery

The battery is fixed in the battery compartment and is connected in series by two 12V maintenance-free batteries with a standard capacity of 80Ah.



Vehicle assembly

Chapter 4 Control Devices

1 Lift control

Rotate the emergency stop switch, open the key switch, and operate the handle button in the direction indicated to control the fork to lift or lower.

2 Direction of travel and speed control

Turn the switch on the handle to control the direction of travel, through which you can adjust the speed and acceleration.

3 Anti-accident safety switch

The operator faces the fork and the cargo in the direction of operation. When the direction is reversed, the body can't avoid it, the handlebar is in contact with the body, the control switch is closed, the pallet stacker brakes, and then the emergency reverse runs a distance. To play a role in security protection.

4 Horn

Press the horn button to sound

5 Battery connector assembly

Remove the battery connector and disconnect the power supply under the following conditions.

5.1 Accident

5.2 Emergency, dangerous situation

5.3 Welding

Warning !

When welding around the vehicle body, the battery is easily damaged, and the welding current, such as breaking into the battery, may cause damage, and it is necessary to cut off the power supply.

6 Key switch

This switch function is to turn the control circuit on and off.

7 Voltmeter

When the key switch is turned on, the Instrument displays the battery remaining amount, a total of ten grids. When the leftmost two grid exchanges flash, it indicates that the battery is insufficient and the battery needs to be charged.

Chapter 5 Driving

1 Start up

Please proceed in the following order, otherwise the pallet stacker will not run:

- 1.1 Make sure the power outlet is securely plugged in.
- 1.2 Turn the key switch to the open position.
- 1.3 Make sure the battery pack has enough power.

Warning !

Long-term low-potential operation of the pallet stacker will damage the battery life. Before the battery is charged, the pallet stacker must not be started.

- ※ The handle should be between the uppermost and lowermost ends.
- ※ Choose the driving direction correctly, control the speed to the ideal state, and slowly accelerate to the ideal speed.

Warning !

Do not operate pallet stackers with serious functional defects that endanger safety. The following safety functions should be checked before working every day:

- ※ The speaker function is normal.
- ※ The handling function is intact.
- ※ The brake function is normal.
- ※ The hydraulic function is normal.

2 Brake

2.1 When the handle is rotated up and down to the uppermost or lowermost end, the pallet stacker achieves electromagnetic braking.

2.2 When the direction switch (accelerator knob) is turned to the reverse position during normal operation, the electric brake function can be performed. Controlling the running speed can control the magnitude of the power of the walking electric mechanism.

2.3 Parking: Stop the pallet stacker by releasing the direction switch (accelerator knob) and returning it to the neutral position.

3 Steering

3.1 Steering is controlled by the handle, and the steering angle can be anywhere within 90° of the left and right direction.

3.2 The pallet stacker encounters obstacles and should not be forced to pass. You can turn the handle forward or backward to bypass obstacles.

4 Waring

The wheels are not allowed to slip.

If the operator's hands or shoes are stained with oil, it is easy to operate and the pallet stacker is out of control, so dry hands or shoes should be used before driving.

5 Parking

5.1 Loosen the direction selector switch.

5.2 Lower the fork to the lowest position so that there is no system pressure in the hydraulic system.

5.3 Release the handle and the handle will automatically return to the parking brake position.

5.4 Turn the key switch to the off position.

Take Care !

Driving without permission is not allowed.

If you leave, please take the key with you.

Chapter 6 Transportation of Goods

1 The weight of the cargo shall be within the lifting capacity of the pallet stacker.

2 Decelerate when turning.

3 Irregular objects should be kept safe during transportation. When turning, pay attention to leaving room.

4 If the cargo affects the line of sight, drive back toward the cargo.

5 If the operator's front line of sight is affected, ask someone to direct directions.

6 Decelerate when going up and down the slope. It is forbidden to turn the head and lift the fork on the slope.

Warning !

Turning on the slope, the pallet stacker is in danger of overturning.

When going downhill, the brake distance of the pallet stacker is extended and the braking time is increased. Therefore, you should slow down and reduce the braking time. Do not force the upper and lower slopes.

7 Before the pallet stacker enters the elevator, it should be ensured that the elevator can withstand the entire load (the weight of the whole vehicle, the weight of the cargo, the weight of the operator). The pallet stacker should first enter the elevator and finally leave the elevator.

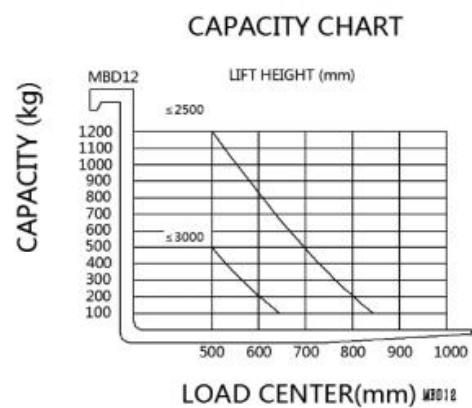
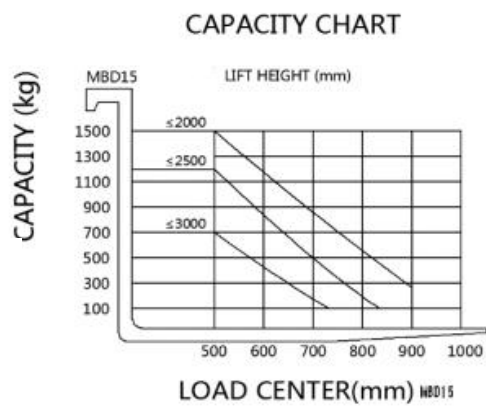
Warning !

Before starting the elevator, you should clearly understand the carrying capacity of the elevator and avoid accidents.

8 Before the pallet stacker drives to the bridge deck, it should be slowed down and kept at a certain distance from the edge of the platform.

Danger !

Check the load capacity of the bridge beforehand to verify its safety to avoid rollover and fall.



Note: The load capacity of the forklift must be strictly in accordance with the load curve! !

Chapter 7 Battery and Charger

1 Replace the battery

Only replace batteries that match the original battery model and have the same weight. (The weight of the battery affects the stability of the vehicle and its braking function.)

Warning !

Do not change the weight and size of the battery, otherwise it will affect the center of gravity of the body. Excessive or too light for battery weight will affect the stability and braking capacity of the pallet stacker. The weight must be the same as the value marked on the pallet truck battery label.

1.1 Remove the insufficient battery sequence:

1.1.1 Unplug the power cord.

1.1.2 Open the battery compartment cover.

1.1.3 Disconnect the battery terminal from the cable.

1.1.4 Remove the battery pack from the pallet stacker body with the appropriate battery box hooks.

1.2 The batteries are installed sequence:

1.2.1 Place the fully charged battery pack in the battery compartment of the forklift.

1.2.2 Connect the battery terminal to the cable and ensure that the positive and negative connections are correct.

1.2.3 Plug in the power outlet.

1.2.4 Close the battery cover.

1.2.5 The key switch is in the closed position.

2 Charging

2.1 Do not smoke or use an open flame while charging.

To charge the battery, use an automatic charger, taking care not to undercharge or overcharge, so as not to damage the battery.

The maximum charging current of the charger is:

Battery (Ah)	charger (A)
80	10~15

Dangerous!

The attendant vitriol in the electrolyte of the batteries has corrosion. If it spatters to skin, you should wash it with water and soap as soon as possible. If it enters eyes, please go to see the doctor and wash

your eyes with clear water. While checking the batteries, you should wear protective glasses and gloves.

2.2 Preparation for charging

The batteries must be charged as soon as possible after used, storage time should not exceed 24 hours.

2.2.1 Make the key switch to the off position after parking, pull out the key .

2.2.1 Connect the charger' plug with battery' socket;

2.2.3 Turn on the charger to charging.

Warning!

While charging, especially in a closed area, you should keep a good ventilation environment. Oxygen and hydrogen will emerge in the course of charging, so if it meets flame or electric spark, it can cause explosion.

So you should shut off the charge power before pulling out the outlet.

2.2.4 During charge

Charging method and using maintenance should consult the instruction of the batteries. Usually you can judge whether electricity is sufficient with the following methods.

※The proportion of the battery electrolyte keeps basic stability for over 2-3hours continuously.

※Charger display with full electricity

The above-mentioned situations indicate that the electric power of the batteries is sufficient.

2.2.5 After Charge

※Shut off the power and the charger.

※Pull out the charger plug from the battery plug.

3 Maintenance of the batteries

3.1 In order to ensure the life of the battery, the battery inputs should be fully charged before use, poorly charged battery can not be used.

3.2 Battery should avoid over-charge and over-discharge. Overcharge and over discharge will seriously affect battery performance and life.

3.3 After using, should be promptly charged storage period should not exceed 24 hours.

3.4 The charging should have good ventilation;

3.5 Battery needs equalization charging with following condition:

- a. Normal use of the battery (every three months to do a balancing charge).
- b. Stored battery unused for a long period of time.

c. Battery pack with disabled battery (disabled battery voltage is lower than the other battery or battery due to troubleshooting) charge-discharge process, equalizing charging disabled battery alone.

3.6 Equalizing charge method

a. First normal charge

b. Stop charging 1 hour after “full power” state ,then use charging 1 hour with $0.05C_5$ (C_5 is battery rated capacity).

c. Repeat the method “B” several times until charger switch on and batteries have boiling bubbles.

3.7 When the battery stored with one month, please charge it with normal charging method one time.

3.8 The battery need to avoid the sunshine directly, keep away the heat source don't less than 2m.

3.9 To avoid contact with any liquids and hazardous substances, any metal impurities can't drop into the batteries.

4 Maintenance of electromagnetic braking

4.1 Use it for a long time in an environment with high humidity. To prevent rust, rust will affect the use on the suction surface. Please remove the rust.

4.2 The friction surface should not be in direct contact with the hand, and there should be no oil stains. Otherwise, the maximum torque cannot be reached. Please clean and wipe the clean friction surface.

4.3 When the temperature in the environment is high, please install it in a place with ventilation and ventilation. Generally, the ambient temperature is $-10\text{ }^{\circ}\text{C}\sim 40\text{ }^{\circ}\text{C}$.

4.4 When the initial torque value is low, please use the running value for a period of time before the torque value will stabilize.

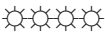
4.5 Please check regularly and check the items regularly: Is the switch action normal? Is there any noise? Is there abnormal fever? Is there any foreign matter, oil stains, etc. in the friction part and the swivel part? Is the clearance at the friction part appropriate? Is the voltage normal?

Chapter 8 Fault Diagnosis

(Programmer fault diagnosis list and Status display Fault diagnosis)

LED Display code	Programmer Display	Fault Phenomenon	Fault Reason
1,2	HW FAILSAFE	Hardware failure protection fault	1.controller failure
1,3	M-FAULT	M-output short circuit	1.M-output short circuit to ground 2.direction contactor don't closing 3.direction contactor' closing speed too slow;
1,4	SRO	SRO fault	1.key switch、brake and direction input sequence are not correct; 2.SRO type selection is wrong; 3.brake and direction switch are open circuit; 4.sequential delayed time is too short;
2,1	THROTTLE FAULT 1	Accelerator fault	1.the input line of accelerator is open circuit; 2.The input line of accelerator is to ground or B+ short circuit; 3.potentiometer' fault 4.chose the wrong accelerator type;
2,2	BB WIRING CHECK	Emergency reversing wiring fault	1.BB wiring is open circuit; 2.BB detection line is open circuit;
2,3	HPD	HPD sequence fault	1.KSI, brake and accelerator input sequence are wrong; 2.chose the wrong HPD type; 3.The adjusting of accelerator' potentionmeter is wrong;
2,4	THROTTLE FAULT 2	Low-end of potentiometer disconnection or short circuit	1.Low-end' wiring of accelerator is open circuit; 2.low-end of accelerator is short circuit; 3.choose the wrong accelerator type;
3,1	CONT DRVR OC	Driver output over-current	1.coil of reversing contactor is short circuit; 2.shunt field is short circuit;
3,2	DIR CONT WELDED	Reversing contactor blocking	1.contact closed;
3,4	MISSING ONTACTOR	Can't find contactor	1.coil of reversing contactor is open circuit; 2.coil of reversing contactor is lost; 3.shunt field is open circuit; 4.the line which connect with reversing contactor or shunt field are open circuit;
4,1	LOW BATTERY VOLTAGE	Low battery voltage	1.battery voltage<16V 2.battery'amphenol connector corroded or loosed 3.controller' amphenol connector loosed;

4,2	OVER VOLTAGE	Over battery voltage	1.battery voltage>33V 2.the charger still connect when driving;
4,3	THERMAL CUTBACK	Over work temperature range,low current	1.temperature>85 or<-25℃ 2.over load too much; 3.controller installation is wrong; 4.work in extreme condition;

LED display code example, (2,4):   is LED light flash 2 times first,then flash 4 times after a few seconds.

Customers can find fault based on above methods, please contact our after-sales personnel according to LED code.

Chapter 9 Maintenance

Please carry on a routine maintenance after the forklift works for 500 hours. The efficiency, life-span and security of the forklift depend on daily maintenance.

Maintaining the forklift, the spare part changed should be offered by our company to ensure the quality. We propose to get in touch with the agent of our products or the after sale service department of our company to make your forklift work safely and economically.

1 Safety regulation of maintenance

The people who study systemically can maintain the forklift.

1.1 Keep maintaining place clean.

1.2 Don't bring loose or valuable objects with you while maintaining.

Be careful!

When you maintain the electric system of the forklift, metal touches electrified electronic elements, which is easy to cause short circuit or burning, so please take off your watch, earrings or other ornaments.

1.3 Pull out the outlet and shut off the power first before maintaining the forklift.

1.4 Turn off the key switch of the forklift before opening the left and right case covers or the electric system.

1.5 Before checking the hydraulic system, you should lower the forks, release systematic pressure.

1.6 Check whether the forklift leaks oil or not, please wipe with paper or paper board, be sure not to touch it with your hands directly so as not to scald.

1.7 The oil may be higher in the driving device or hydraulic system, so you should make the forklift cool first, then change gear oil or hydraulic oil, so that the high temperature oil can't cause burning.

1.8 Hydraulic system should be added with new clean oil.

Attention!

If hydraulic oil is not clean, it will influence accurate hydraulic components, make ability of the whole hydraulic system reduce.

The used hydraulic oil with different brands is harmful to hydraulic components and influence ability of the system. So while adding or changing the hydraulic oil, pay attention to using the same brand.

1.9 Please obey relevant regulations, protect the environment, store and discharge the oil according to the regulations, don't discharge it into sewer.

1.10 When welding the forklift, please shut off the battery power. Because welding electric current may enter the batteries when you weld, in order to prevent it from taking place, please shut off the battery power.

1.11 When working below the forklift, you should fix the forklift with a supporting shelf.

Warning!

If it is improper to support the forklift, it will overturn and hurt people. If the forklift has no hoisting equipment or supporting shelf to protect, it's forbidden to work under it.

2 Maintenance which users can finish

2.1 Regular maintenance and safety inspection

2.1.1 Carrying on regular maintenance and checking the forklift is responsibility of operators.

2.1.2 If you don't carry on regular maintenance to the forklift, which will influence security and reliability of the forklift, it is easy to cause serious accidents.

2.1.3 While checking and finding out the trouble, you should repair it at once and stop using it.

2.2 You can finish the daily, weekly and monthly maintenance mentioned in the following chart.

Part name	Part name	Check content
1	Operation handle	Checking whether function is normal
2	Emergency reverse switch	Checking whether function is normal
3	Horn	Checking whether function is normal
4	Steering	Checking whether function is normal
5	Hydraulic device	Checking whether function is normal
6	Coulombmeter	Checking whether function is normal
7	Hydraulic system	Checking the oil level and leaks oil or not
8	Driving device	Checking whether it has unusual noise and oil leakage
9	Electromagnetic brake	Checking whether it works normally and keeps in touch or not
10	Transmission	Checking whether function is normal
11	Wheels	Checking whether they're damaged, getting rid of greasy dirt, metal scrap
12	Frame	Checking whether it's damaged, getting rid of dirt
13	Battery	Checking whether leak
13	Forks	Check whether they're out of shape or have crack
14	Lifting device	Checking whether it's damaged, getting rid of dirt
15	Hydraulic cylinder	Checking whether it's damaged and whether it leaks oil

Other maintaining parts in the maintenance form can only be finished by the maintenance men of our company or maintenance organization that our company approves.

3 Clean the forklift

3.1 Carrying on the routine cleaning every week is very important to guarantee its reliability. Please pull out the outlet before cleaning to avoid short circuit and damage the electric system.

3.2 External clean

3.2.1 Remove adherent objects on the wheels every day to keep them rotate flexibly.

3.2.2 After finishing cleaning, you should add the lubricating oil to the necessary lubricating position according to the lubricating position form.

3.3 Clean electrical components.

Blow off dust of the motor with compressed air.

Be careful!

The electric components can't be washed with the high pressure washing device. You can't destroy the electric components on the circuit board, and keep the position of them, avoid short circuit .

4 Maintenance table

Part No.	Running interval	1day	1week	1months	3months	6months	12months	36months
1	Body system							
1.1	Check cover plate(Left. Right)				★			
1.2	Check battery box fixture				★			
1.3	Check the frame for cracks				★			
1.4	Check that the body is securely				★			
2	Motor							
2.1	Check for loose joints			★				
2.2	Clean the motor			★				
2.3	Check installation bolts for firmness			★				
2.4	Check for abnormal bearing noise			★				
3	Drive system							
3.1	Check for leak					★		
3.2	Check for oil level				★			
3.3	Check for noise					★		

3.4	Oil change							★
4	Wheels							
4.1	Remove cords and debris from wheels	★						
4.2	Check drive wear and bolts				★			
4.3	Check whether the universal wheel and axle are Flexible and tight				★			
4.4	Check the wear condition of Universal wheel				★			
4.5	Check whether the support wheel can rotate and whether the joints is tight					★		
4.6	Check the wear of supporting wheels				★			
4.7	Remove and lubricate wheel body bearings					★		
5	Brake parts							
5.1	Clean brake				★			
5.2	Check the wear condition of brake friction disc				★			
5.3	Check brake condition under loose brake condition			★				
6	Electric controller board							

6.1	Cleaning and Installation inspection				★			
6.2	Secure tight cable connector				★			
6.3	Check the contactor contacts					★		
6.4	Check the action of contactor					★		
7	Storage battery							
7.1	Check the level of electrolyte (the level should be 10-15mm above the plate)		★					
7.2	Check whether the connection between the stacker and battery is tight		★					
7.3	Check each battery and its insulation sheath		★					
7.4	Check electrolyte specific gravity and temperature			★				
7.5	Clean accumulator	★						
8	Hydraulic System							
8.1	Check pipes and oints for leaks					★		
8.2	Check for line wear					★		
8.3	Check fuel tank for oil leakage					★		
8.4	Check the amount of					★		

	oil							
8.5	Oil change						★	
9	Oil cylinder							
9.1	Check the oil leak					★		
9.2	Check installation					★		
10	Control Handle							
10.1	Check the installation of fastening					★		
10.2	Check the brake switch				★			
10.3	Check whether the fastening screw falls					★		
10.4	Check the function of the safety switch					★		
10.5	Check and adjust damping spring					★		

5 Lubrication parts table

Part No.	Lubrication	Interval time (h)			Types of lubricating oil and grease
		500	1000	3000	
1	Wheel bearing (including steering)		L		A
2	Hydraulic system	H	O		B
3	Driving gearbox	H		O	C
4	Lifting chain	L			D
5	Lifting system bearing	L			G

L= lubricating H= inspect O= oil change

6 Lubricating Grease

Grease Category	Specification	Applicable parts
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		-20℃～0℃	0℃～40℃	
A	Lubricating grease	3#Drop point of lithium base grease170		Bearings and bushing
B	Hydraulic oil	L-HV 32 Arctic hydraulic fluids	L-HM 46 Antiwear hydraulic oil	Hydraulic system
C	Transmission oil	70W/75 (abroad SAE75W)	85W/90 (abroad SAE80W/90)	Gear case
D	Lubricating oil	CC15W (low temperature SAE10W)	CC30 (normal temperature SAE20W)	Chains and pipelines
G	Lubricating grease	3#Drop point of lithium base grease170		Lifting system bearing

Chapter 10 Transporting and preserving the forklift

1 Tow and transport the broken-down forklift

1.1 When towing or towing the pallet stacker with a rope , the towed pallet stacker must be steered by a driver to release the brakes .

1.2 When the brake function of the pallet stacker is intact,pull the pallet stacker by pulling the control handle to the operating position and ask others to help push the stacker (the pushing part is at the fork rack) to send the pallet stacker to the destination or the maintenance point of our company for repair.

1.3 If the drive wheel of the pallet stacker fails ,the pallet stacker can be towed by traveller or tractor.

Attention

The deicing wheel of pallet stacker must be lifted off the ground, otherwise the wheel and motor will be badly damaged.

1.4 If the pallet stacker electromagnetic brake fails and cannot hold the brake , the pallet stacker will move with the terrain after it is parked . At this time ,wedge blocks must be placed on the wheel in an appropriate way to prevent movement .

2 Preserve the forklift

If the pallet stacker needs to be stored for a long time, please take the following measures:

2.1 Storage battery

2.1.1 Recharge the battery ,and then maintain it according to the daily maintenance method.

2.1.2 Charge maintenance and check electrolyte level every 3 month.

2.2 Hydraulic system

Replace the hydraulic fluid in the hydraulic system when the pallet stacker has been stored for more than one year. Please refer to the maintenance list and lubrication part list.

2.3 Driving system

When the storage time exceed one week, the drive wheel should be fixed firmly and can be supported to prevent it from moving ,also, unload the cargo.

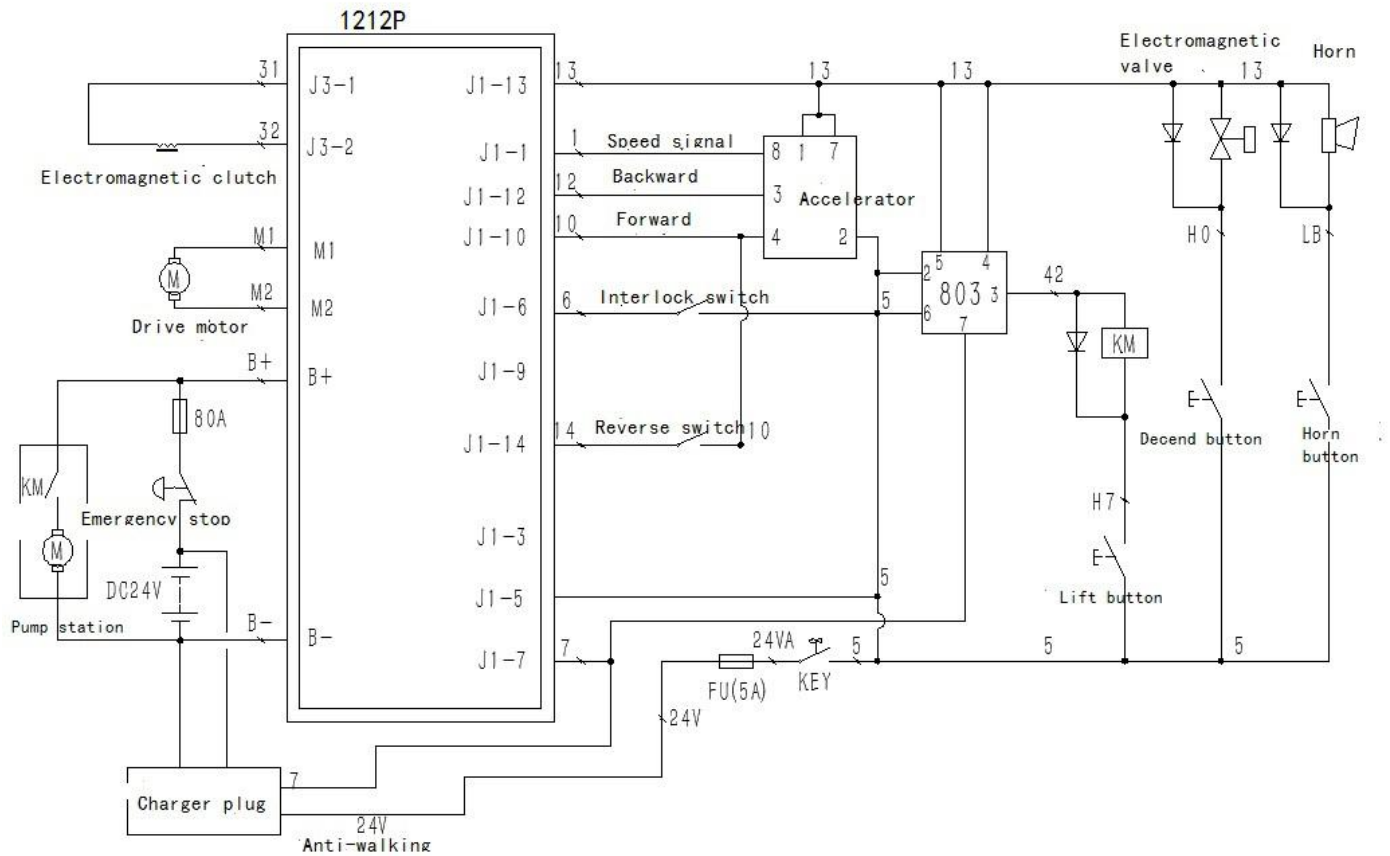
3 Caution of reusing the forklift after preservation

3.1 When storage for a period of time,please check the use function and safety of the pallet stacker like routine maintenance and safety inspection before re-use.

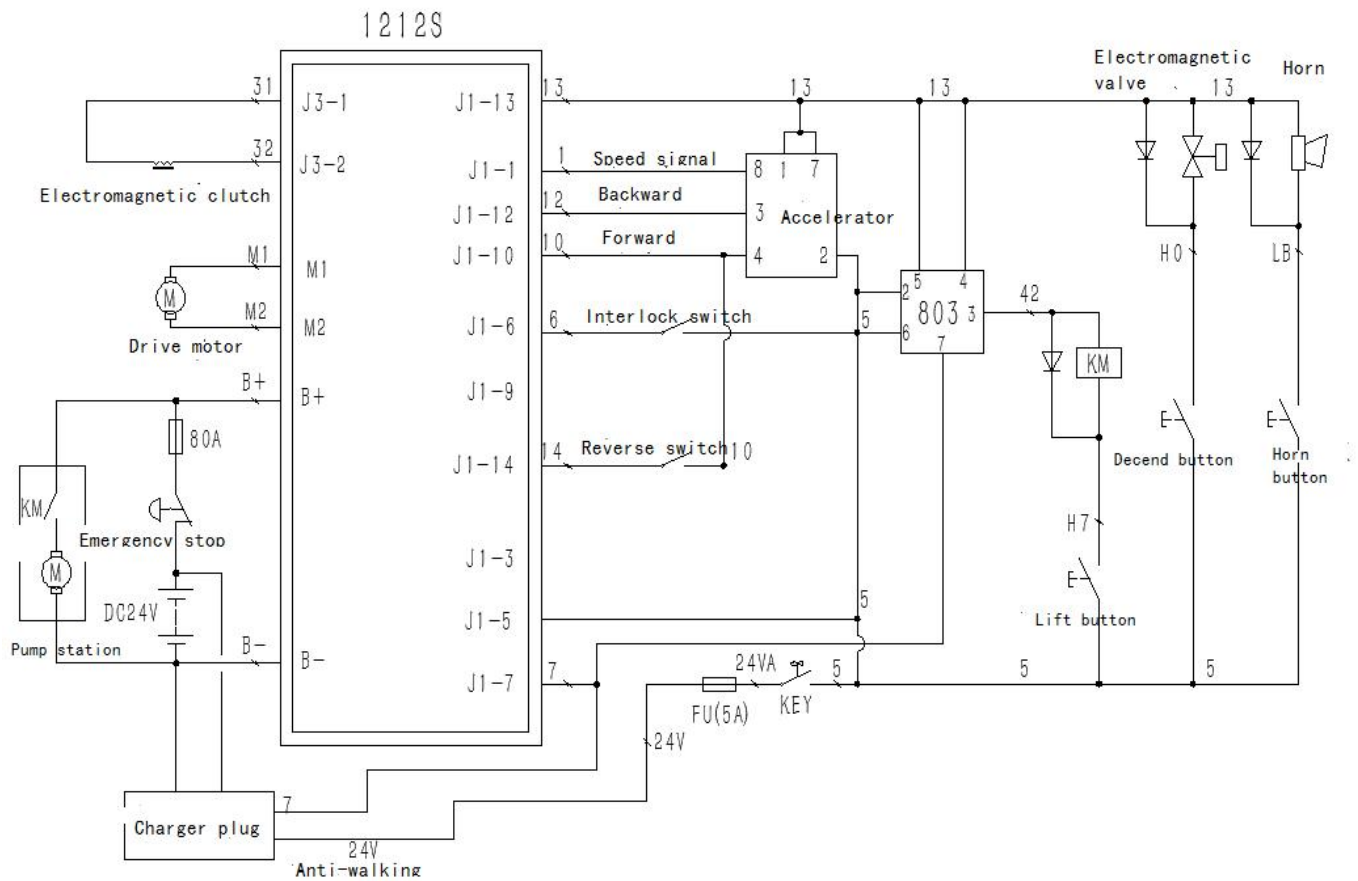
3.2 When the storage time exceed 3 months , prevent maintenance can be carried out according to the requirements of this manual (at intervals) of 500 hours.

Chapter 11 Schematic diagram

1 Electric schematic diagram

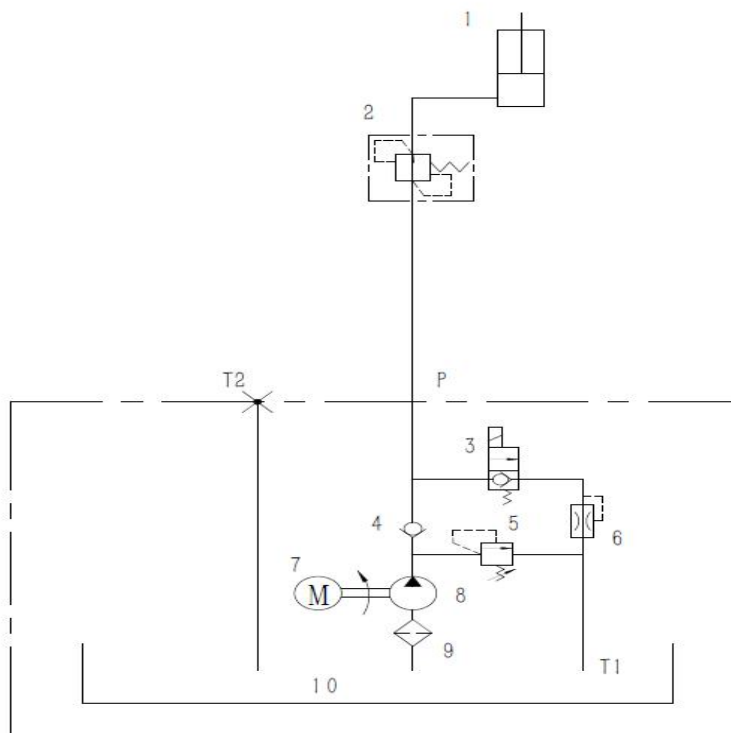


MBD12 SERIAL Electrical Schematic Diagram



MBD15 SERIES Electrical Schematic Diagram

2 Hydraulic Schematic Diagram



Hydraulic schematic diagram

Above picture shows :

1. Lift cylinder 2. Cut-off valve 3. Electromagnetic unloading valve 4. One -way valve
5. Safety valve 6. Trozzle valve 7. Motor 8. Gear pump 9. Filter element 10. Hydraulic drum