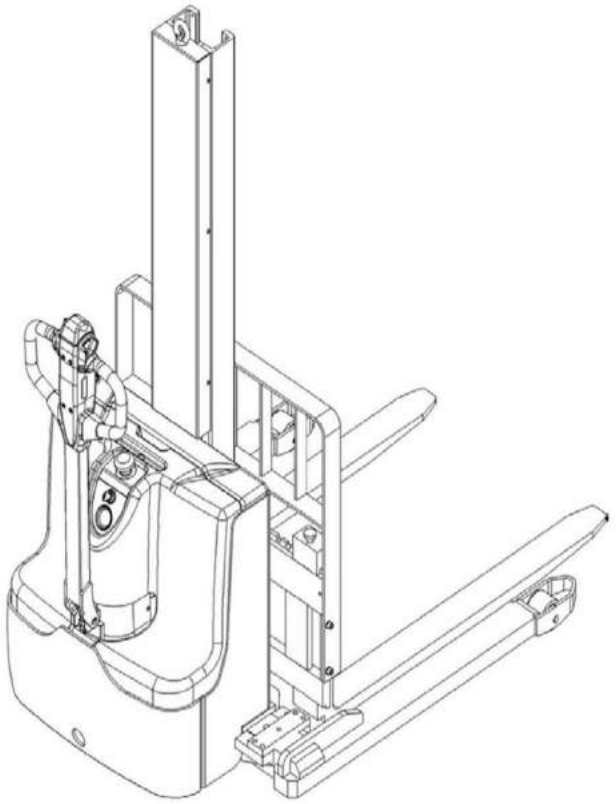
NOBLELIFT

Service & Maintenance Manual
PSE22 SL (PSE22M SL)



Version 2021/4/24

CONTENT

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Foreword

This specification briefly introduces the technical parameters of our pallet, the structure of the main components, working principle and operation, maintenance, maintenance and other requirements and contents. Please read this manual carefully before operation to ensure safe and effective material handling through proper driving and maintenance. At the same time, it can help operators to use battery vehicles reasonably, so that pallet play the maximum efficiency! It is hoped that operators and equipment managers will read carefully before operating battery vehicles! Please strictly abide by the regulations and matters needing attention in this specification, drive carefully, operate carefully and use carefully, so that your pallet can be in the best working condition for a long time and play its best role. When you rent or transfer a vehicle, please rent or transfer this manual with the car.

To highlight, the following icons are used in this manual:

1. ⃠---- Indicates a potentially dangerous state, if not avoided, may cause serious personal injury, serious damage to the pallet or fire, etc.
2. ---- Indicates a potentially dangerous state, if not avoided, that may cause minor injury to the person, ⚠ or local damage to the pallet, etc.
3. 🏭---- General considerations and instructions when using

⚠ Most of this product is made of recyclable steel, and the waste produced in the process of use, maintenance, cleaning and disassembly must be recovered and disposed of without pollution according to local regulations. The recycling of such waste must be done by professionals in designated areas, such as hydraulic fluids, batteries and electronic equipment, which, if not handled properly, may be hazardous to the environment and human health.

Special statement:

1) this product is strictly prohibited from being used in potentially explosive dangerous environments.
2) the noise level of the normal use of this product is in accordance with the international standard EN 12053.
3) the normal vibration level of this product conforms to the international standard EN13059.
4) the environmental requirements for the normal use of this product are as follows: altitude is not more than 2000 meters, temperature range is-5 °C-40 °C, humidity is not more than 90%, wind speed is not more than 5 m / s.

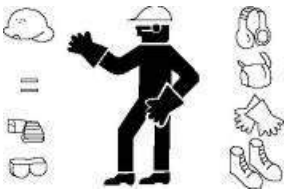
If you need to use it in cold storage or special environment for a long time, please contact our technical staff if you need to install special accessories.

5) implement product recall service in the event of batch problem

Due to the requirement of continuous product improvement, manufacturers reserve the right to change their product design and specifications without prior notice. If you want to know the latest product parameters, please contact us. All parameters of this manual shall be subject to the date of publication of the specification.

1.GENERAL

1.1 INTRODUCTION – MAINTENANCE SAFETY PRECAUTIONS



Maintenance work may cause injuries. Always take care to perform work safe, at least observing the following. It is of utmost importance that maintenance personnel pay strict attention to these warnings. and precautions to avoid possible injury to themselves, others or damage equipment. A maintenance program must be followed to ensure that the machine is safe to operate. The specific precautions to be observed during maintenance are inserted at the appropriate point in the manual. These precautions are, for the most parts, those that apply when servicing hydraulic and larger. truck component parts.

MODIFICATION OF THE TRUCK WITHOUT CERTIFICATION BY A RESPONSIBLE AUTHORITY THAT THE TRUCK IS AT LEAST AS SAFE AS ORIGINALLY MANUFACTURED, IS A SAFETY VIOLATION.

SINCE THE TRUCK MANUFACTURER HAS NO DIRECT CONTROL OVER THE FIELD INSPECTION AND MAINTENANCE, SAFETY IN THIS AREA RESPONSIBIUTY OF THE OWNER OR OPERATOR.

FAILURE TO COMPLY WITH SAFETY PRECAUTIONS, LISTED IN THIS SECTION MAY RESULT

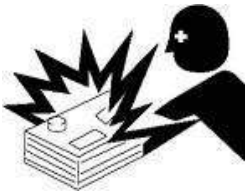
- When carrying out any operation or maintenance, have trained and experienced personnel to carry out the work.
- When carrying out any operation or maintenance, carefully read operation and maintenance handbook.
- Read all the precautions given on the decals which are fixed to the truck.
- Be sure you fully understand the content of the operation. It is important to prepare necessary tools and parts for maintain the truck.
- Your safety, and that of others, is the first consideration when engaging in the maintenance of equipment. Always be conscious of weight. Never attempt to move heavy parts without the aid of a mechanical device. Do not allow heavy objects to rest in an unstable position. When raising a portion of the equipment, ensure that adequate support is provided.
- It should be noted that the machines hydraulic systems operate at extremely high potentially dangerous pressures. Every effort should be made to relieve any system pressure prior to disconnecting or removing any portion of the system. Relieve system pressure by cycling the applicable control several times with the engine(motor) stopped and ignition on, to direct any line pressure back into the reservoir. Pressure feed lines to system components can then be disconnected with minimal fluid loss.

- Remove all rings, watches and jewelry when performing any maintenance.
- Wear well-fitting helmet, safety shoes and working Clothes When drilling grinding or hammering always. Wear protective goggles. Always do up safety clothes properly so that they do. Not catch on protruding parts of machines. Do not wear oily clothes. When checking, always release battery plug. DO NOT WEAR LONG HAIR UNRESTRAINED, OR LOOSE-FITTING CLOTHING AND NECKTIES WHICH ARE APT TO BECOME CAUGHT ON OR ENTANGLED IN EQUIPMENT.
- During maintenance do not allow any unauthorized person, to stand near the machine.
- Flames should never be used instead of lamps. Never use a naked flame to check leaks or the level of oil

or electrolyte.

- Immediately remove any oil or grease on the floor of the operator's compartment or on the handrail. It is very dangerous if someone slips while on the machine.
- Always use pure oil or grease and be sure to use clean containers.

- Oil is a dangerous substance. Never handle oil, grease or oily clothes in places where there is any fire or flame. As preparation for use of fire extinguishers and other fire- fighting equipment.
- Keep the battery away from fire hazards. The generated gases are explosive.
- Store all the oils in a specified place.



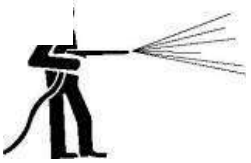
- Keep the flammable things away from the machine. Do not smoke at the working place.
- Battery should always be disconnected during replacement of electrical components.
- Always use the grades of grease and oil recommended by NOBLELIFT choose the viscosity specified for the ambient temperature.
- Exhaust gas is dangerous provide ventilation when working in a closed space.
- Avoid breathing dust that may be generated when handling components containing asbestos fibers. Wear a gas mask if necessary.
- When working on top of the machine, be careful not to lose your balance and fall.

- Hand a caution sign in the operator's compartment (for example "Do not start" of "Maintenance in progress"). This will prevent anyone from starting or moving the machine by mistake.
- When welding on the machine or working on the electrical system, ALWAYS turn the key switch OFF and remove the battery plug from the battery. Park the machine on firm, flat ground. Lower the fork to the min. height and stop the motor.

- Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin and eat holes in clothing. If you spill acid on your clothes or skin, immediately flush with large quantities or water.

- When working on the battery, wear goggles or safety glasses. If splashed into the eyes, flush with water and get medical attention immediately.
- Battery terminals touched by metal objects can cause short circuit and burn you. Keep tools away from the terminals.
- Keep sparks, lighted matches, and open flame away from the top of battery. Battery (hydrogen) gas can explode.
- When disassembling and assembling the battery, make sure that the battery terminals (+, –) are correctly connected.

- If water gets into the electrical system, abnormal operation or failure can result. Do not use water or steam on sensors, connectors and instruments in the cab.
- Do not handle electrical equipment while wearing wet gloves, or in wet places, as this can cause electric shock.
- When working with other, choose a group leader and work according to his instructions. Do not perform any maintenance beyond the agreed work.



- Unless you have special instructions to the contrary, maintenance should always be carried out with the motor stopped. If maintenance is carried out with the motor running, there must be two technicians present: One operating the stacker and the other one performing the maintenance. In such a case, never touch any moving part.
- Before making adjustment, lubricating or performing any other maintenance, shut off all power controls.
- When removing parts containing O-ring Gaskets or seal clean the mounting surface and replace with new sealing parts.

- Thoroughly clean the machine. In particular, be careful to clean the grease fittings and the area around the dipsticks. Be careful not to let any dirt or dust into the system.
- Use only approved nonflammable cleaning solvents.
- When changing the oil or fitter, check the drained oil and filter for any signs of excessive metal particles or other foreign materials.
- Always use NOBLELIFT genuine parts for replacement. ENSURE REPLACEMENT PARTS OR COMPONENTS ARE IDENTICAL OR EQUIVALENT TO ORIGINAL PARTS OR COMPONENTS.
- When checking an open gear case, there is a risk of dripping things in. Before removing the covers to inspect such cases, empty everything from your pockets. Be particularly careful to remove wrenches and nuts.

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1.2 MEASUREMENT CONVERSIONS

Length

Unit	cm	m	km	in	ft	yd	mile
cm	1	0.01	0.00001	0.3937	0.03281	0.01094	0.000006
m	100	1	0.001	39.37	3.2808	1.0936	0.00062
km	100000	1000	1	39370.7	3280.8	1093.6	0.62137
in	2.54	0.0254	0.000025	1	0.08333	0.02777	0.000015
ft	30.48	0.3048	0.000304	12	1	0.3333	0.000189
yd	91.44	0.9144	0.000914	36	3	1	0.000568
mile	160930	1609.3	1.6093	63360	5280	1760	1

1mm=0.1cm, 1μm=0.001mm

Area

Unit	cm2	m2	km2	a	ft2	yd2	in2
cm2	1	0.0001	–	0.000001	0.001076	0.000012	0.155000
m2	10000	1	0.000001	0.01	10.764	1.1958	1550.000
km2	–	1000000	1	10000	1076400	1195800	–
a	0.01	100	0.0001	1	1076.4	119.58	–
ft2	–	0.092903	–	0.000929	1	0.1111	144.000
yd2	–	0.83613	–	0.008361	9	1	1296.00
in2	6.4516	0.000645	–	–	0.006943	0.000771	1

1ha=100a, 1mile2=259ha=2.59km2

Volume

Unit	cm3 = cc	m3	l	in3	ft3	yd3
cm3 = m l	1	0.000001	0.001	0.061024	0.000035	0.000001
m3	1000000	1	1000	61024	35.315	1.30796
l	1000	0.001	1	61.024	0.035315	0.001308
in3	16.387	0.000016	0.01638	1	0.000578	0.000021
ft3	28316.8	0.028317	28.317	1728	1	0.03704
yd3	764529.8	0.76453	764.53	46656	27	1

1gal(US)=3785.41 cm3=231 in3=0.83267gal(US)

Weight

Unit	g	kg	t	oz	lb
g	1	0.001	0.000001	0.03527	0.0022
kg	1000	10	0.001	35.273	2.20459
t	1000000	1000	1	35273	2204.59
oz	28.3495	0.02835	0.000028	1	0.0625
lb	453.592	0.45359	0.000454	16	1

1 tone (metric)= 1.1023 ton(US)=0.9842 ton(UK)

Pressure

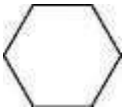
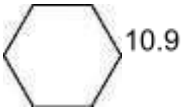
Unit	kgf/cm2	bar	Pa=N/m2	kPa	lbf/in2	lbf/ft2
kgf/cm2	1	0.98067	98066.5	98.0665	14.2233	2048.16
bar	1.01972	1	100000	100	14.5037	2088.6
Pa=N/m2	0.00001	0.001	1	0.001	0.00015	0.02086

kPa	0.01020	0.01	1000	1	0.14504	20.886
lbf/in2	0.07032	0.0689	6894.76	6.89476	1	144
lbf/ft2	0.00047	0.00047	47.88028	0.04788	0.00694	1

kgf/cm2=735.56 Torr(mmHg)=0.96784atm

Standard tightening torque
The following charts give the standard tightening torques of bolts and nuts.
Exceptions are given in sections of “Disassembly and Assembly”

METER TABLE

Classification	4T, 5T	10T
Bolt type		
Bolt size	Torque kgf · m (lbf · ft)	Torque kgf · m (lbf · ft)
M4	0.2 ± 0.02	0.4 ± 0.04
M5	0.3 ± 0.03	0.8 ± 0.08
M6	0.5 ± 0.05	1.4 ± 0.14
M8	1.2 ± 0.12	3.3 ± 0.3
M10	2.3 ± 0.23	6.5 ± 0.7
M12	4.0 ± 0.4	11.3 ± 1.1
M14	6.4 ± 0.6	17.9 ± 1.8
M16	9.5 ± 0.9	26.7 ± 2.7
M18	13.5 ± 1.4	38.0 ± 3.8
M20	18.6 ± 1.9	52.2 ± 5.2
M22	24.7 ± 2.5	69.4 ± 6.9
M24	32.1 ± 3.2	90.2 ± 9.0
M30	62.6 ± 6.3	176.1 ± 17.6
M36	108.2 ± 10.8	304.3 ± 30.4
M42	171.8 ± 17.2	483.2 ± 48.3
M45	211.3 ± 21.1	594.3 ± 50.4

INCH TABLE

4T, 5T 10T

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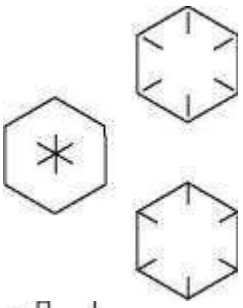
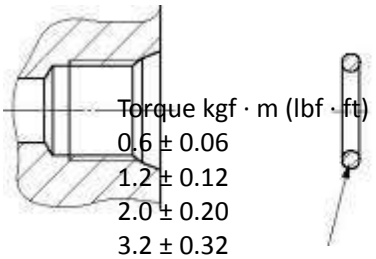
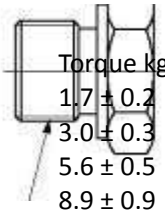
Classification Bolt type







Bolt size	Torque kgf · m (lbf · ft)	Torque kgf · m (lbf · ft)
1/4	0.6 ± 0.06	1.7 ± 0.2
5/16	1.2 ± 0.12	3.0 ± 0.3
3/8	2.0 ± 0.20	5.6 ± 0.5
7/16	3.2 ± 0.32	8.9 ± 0.9
1/2	4.7 ± 0.47	13.4 ± 1.3
9/16	6.8 ± 0.68	19.0 ± 1.9
5/8	9.3 ± 0.93	26.1 ± 2.6
3/4	16.0 ± 1.60	45.1 ± 4.5
7/8	25.5 ± 2.55	71.6 ± 7.2
1	38.0 ± 3.80	106.9 ± 10.7
1-1/8	54.1 ± 5.41	152.2 ± 15.2
1-1/4	74.2 ± 7.42	208.9 ± 20.9
1-3/4	98.8 ± 9.88	277.8 ± 27.8
1-1/2	128.2 ± 12.82	360.7 ± 36.1

The torque in above table shall not be applied to nylon or nonferrous bolts or washer. The same is valid for not standardized ones.
H Newton meter : 1 Nm = 0.1kgfm

TIGHTENING TORQUE OF SPLIT FLANGE BOLTS
The following torque shall be applied to the split flange bolts.

Diameter (mm)	Flat width (mm)	Torque	
		kgf·m	N·m
10	14	6.7 ± 0.7	66.7 ± 6.8
12	17	11.5 ± 1	112 ± 9.8
16	22	28.5 ± 3	279 ± 29

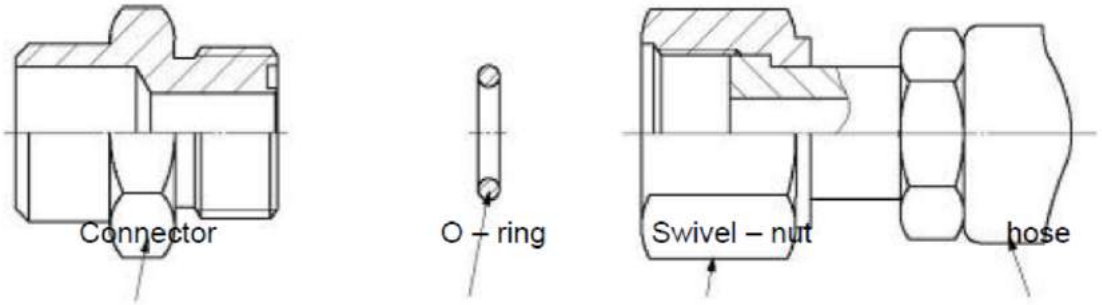
.

PF THREAD

Thread	Torque (kgf·m)

1/8	1.1 ± 0.1
1/4	2.6 ± 0.2
3/8	4.6 ± 0.3
1/2	8.5 ± 0.4
3/4	19 ± 1.0
1	33 ± 2.0

TORQUE FOR SWIVEL NUT WITH O-RING



Tube O.D (inch)	Thread (in)	Torque (kgf·m)
1/2	UN 13/16 - 16	9.5 ± 0.95
3/4	UN 1 3/16 - 12	18 ± 1.8
1	UN 1 7/16 - 12	21 ± 2.1

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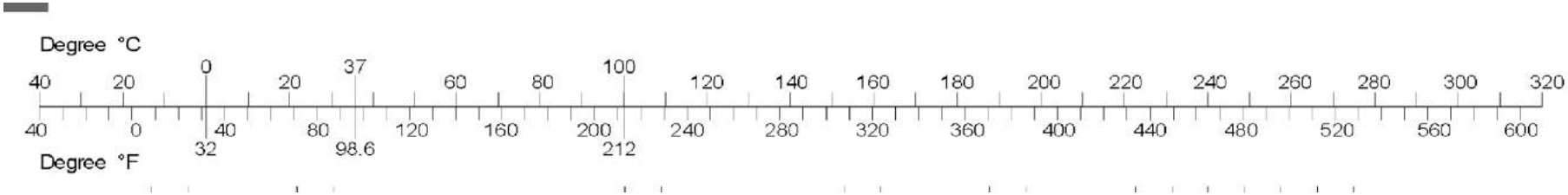
Degree °C
40 20 0 20 37 60 80 100 120 140 160 180 200 220 240 260 280 300 320
40 0 32 40 80 98.6 120 160 200 212 240 280 320 360 400 440 480 520 560 600
Degree °F

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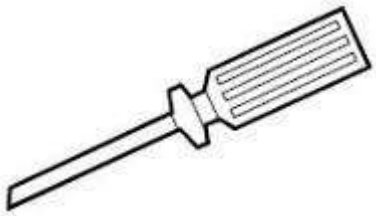
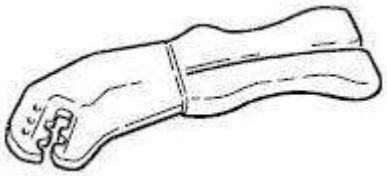
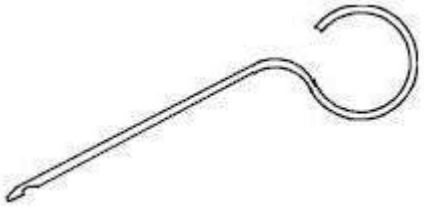
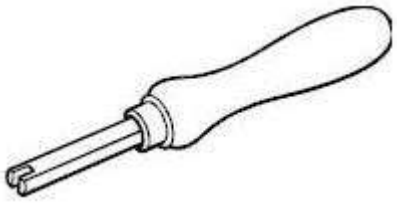
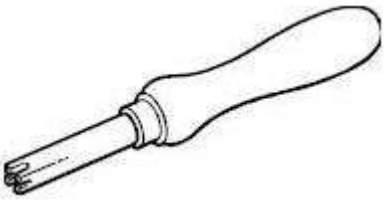
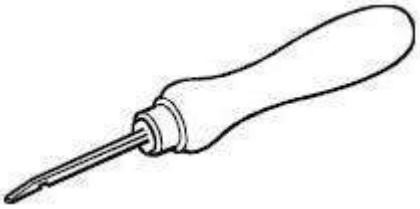
APPROXIMATE CONVERSIONS

SI Unit	Conv Factor	Non–SI Unit	Conv Factor	SI Unit
Torque				
Newton meter (N·m)	× 8.9	= ln·in	× 0.113	= N·m
Newton meter (N·m)	× 0.74	= lb·ft.	× 1.36	= N·m
Newton meter (N·m)	× 0.102	= kg·m	× 7.22	= lb·ft.*
Pressure (Pa = N/m^2)				
kiloPascal (kPa)	× 4.0	= in. H_2O	× 0.249	= kPa
kiloPascal (kPa)	× 0.30	= in. Hg	× 3.38	= kPa
kiloPascal (kPa)	× 0.145	= psi	× 6.89	= kPa
(bar)	× 14.5	= psi	× 0.069	= bar*
(kg/cm^2)	× 14.22	= psi	× 0.070	= kgf/cm^{2}*
$Newton/mm^2$	× 145.04	= psi	× 0.069	= bar*
MegaPascal (MPa) ($Pa=N·m^2$)	× 145	= psi	× 0.00689	= MPa
Power r (W = J/s)				
kiloWatt (kW)	× 1.36	= PS (cv)	× 0.736	= kW
kiloWatt (kW)	× 1.34	= HP	× 0.746	= kW
kiloWatt (kW)	× 0.948	= Btu/s	× 1.055	= kW
Watt (W) (W=J/s)	× 0.74	= ft·lb/s	× 1.36	= W
Energy (J = N·m)				
kiloJoule (kJ)	× 0.948	= Btu	× 1.055	= kJ
Joule (J) (J=N·m)	× 0.239	= calorie	× 4.19	= J
Velocity and acceleration				
meter per sec^2 (m/s^2)	×3.28	= ft/s^2	× 0.305	= m/s^2
meter per sec (m/s)	× 3.28	= ft/s	× 0.305	= m/s
kilometer per hour (km/h)	× 0.62	= mph	× 1.61	= km/h
Horse Power/Torque				
BHP × 5252 R.P.M. = TQ (lb·ft)		TQ Z R.P.M. 5252 = B.H.P.		
Temperature				
°C = (°F–32) ÷ 1.8		°F= (°C Z 1.8) + 32		
Flow Rate				
liter/min (dm^3/min)	× 0.264	= US gal/minZ3.785		= l/min

Note : ( ) Non–SI Unit

Replacement tool for electrical plug-in connection

No.	Pic	Application
1		Remove pin
2		Install pin
3		Loose lock
4		Two-hole lock
5		Four-hole lock
6		Remove pin

2.Sepcification

2.1 Overview of the main components

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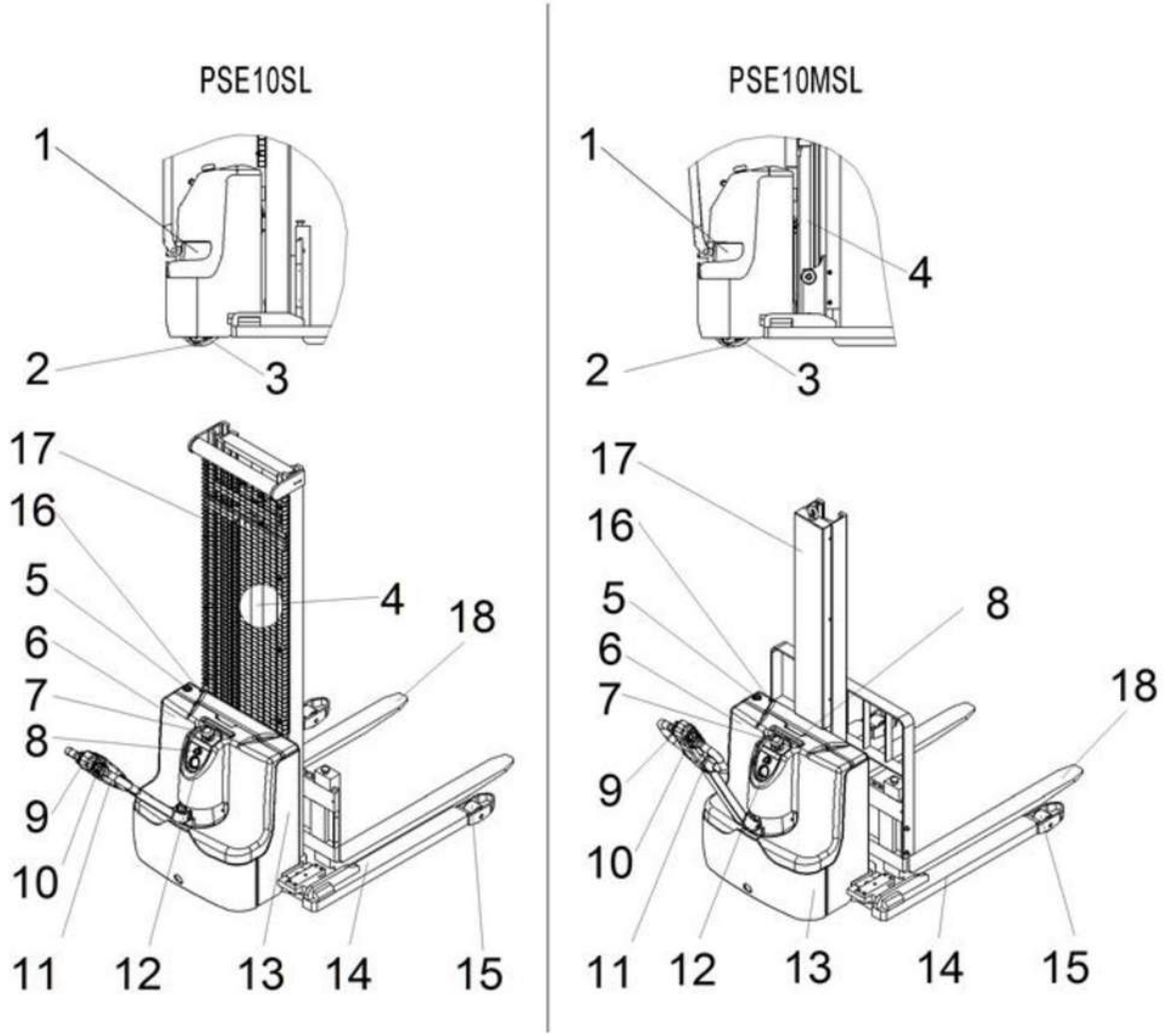
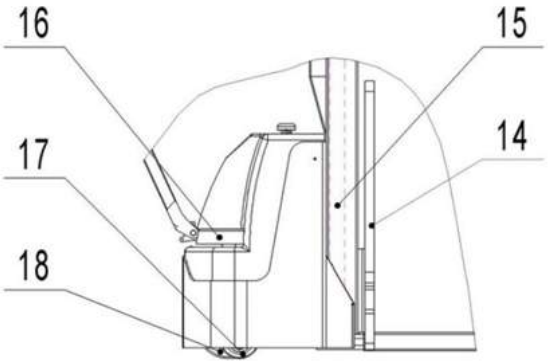
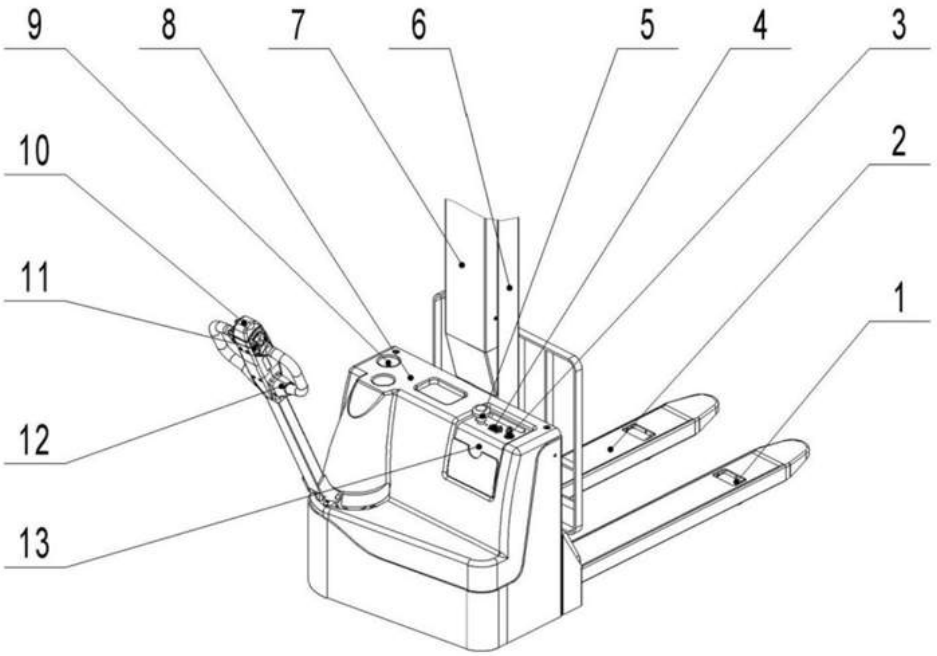


1	Drive motor cover	10	Accelerator (butterfly- switch)
2	Balance wheel	11	Multifunction tiller
3	Drive wheel	12	Electricity meter
4	Hydraulic cylinder	13	Chassis with mast
5	Charging cable	14	Leg
6	Main cover	15	Load wheel
7	Emergency button	16	Charging indicating LED
8	Key switch	17	Protective screen
9	Safety (belly) button	18	Forks

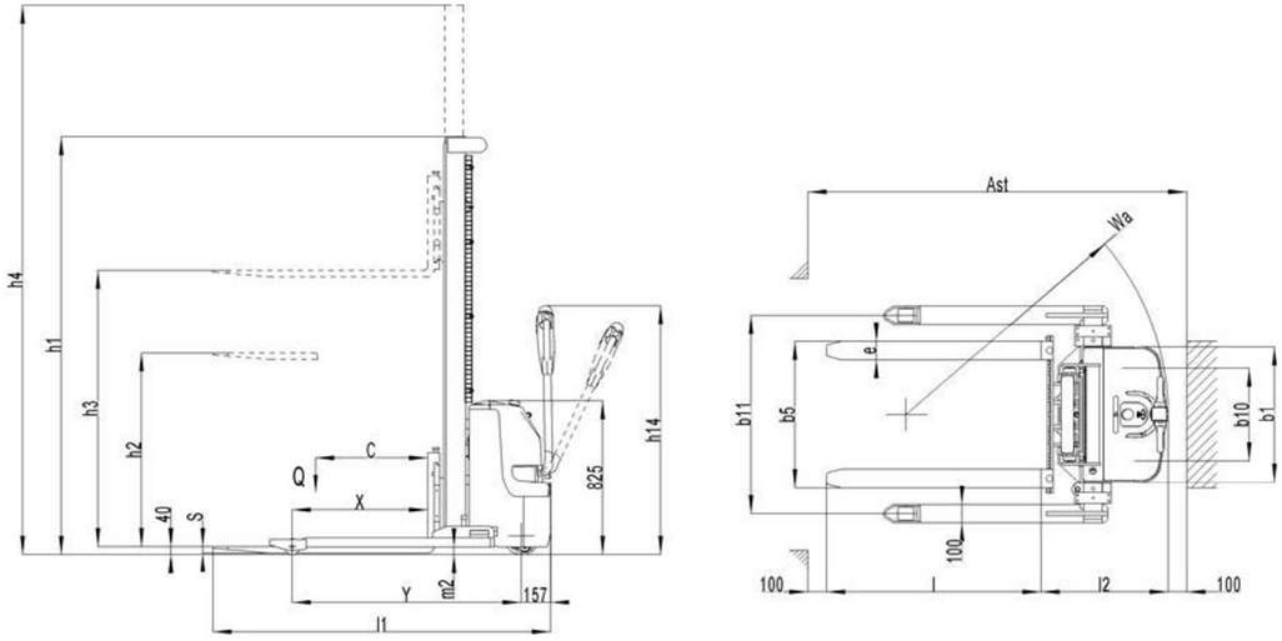




PSE10M

1 2 3.	Bearing wheel Fork arm Key switch	11. 12. 13.	Accelerator (butterfly switch Multi-function handle The front panel
4.	Electricity meter and charging indicator LED lamp	14	Load Backrest
5.	Emergency stop button	15.	Hydraulic oil cylinder
6 .	Chassis and door frame	16.	Drive motor housing
7 .	Protective Cover	17.	Balance wheel
8.	Electrical box enclosure	18.	Driving wheel
9.	Charging spring wire		
10 .	Belly switch		

2.2 Specification



Technical data (PSE10SL)

1.Main technical data

Type sheet for industrial truck acc. to VDI 2198						
Distinguishing mark	1.2	Manufacturer`s type designation		PSE10SL(2900)	PSE10SL(3200)	PSE10SL(3500)
	1.3	Drive		Battery		
	1.4	Operator type		Pedestrian		
	1.5	Load capacity / rated load	Q(t)	1000		
	1.6	Load centre distance	C(mm)	600		
	1.8	Load distance ,centre of drive axle to fork	X(mm)	725		
	1.9	Wheelbase	Y(mm)	1228		
Weight	2.1	Service weight	kg	722	737	752
	2.2	Axle loading, laden front/rear	kg	577/1138	582/1148	587/1158
	2.3	Axle loading, unladen front/rear	kg	513/219	523/214	533/219
Tyres, Chassis	3.1	Tires		Polyurethane (PU)		
	3.2	Tire size, front	⌀ x w (mm)	⌀200×73		
	3.3	Tire size, rear	⌀ x w (mm)	⌀84×70		
	3.4	Additional wheels(dimensions) ⌀ x w (mm)		⌀80×30		
	3.5	Wheels, number front/rear(x=driven wheels)		1x+2/2		
	3.6	Tread, front	b_{10}(mm)	498		

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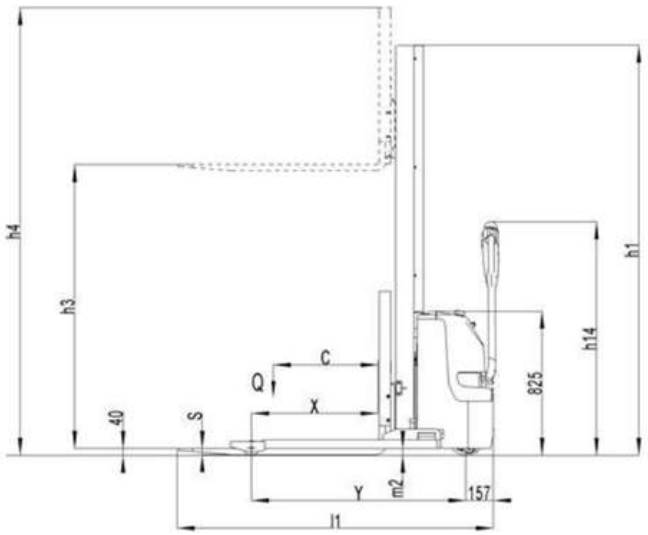
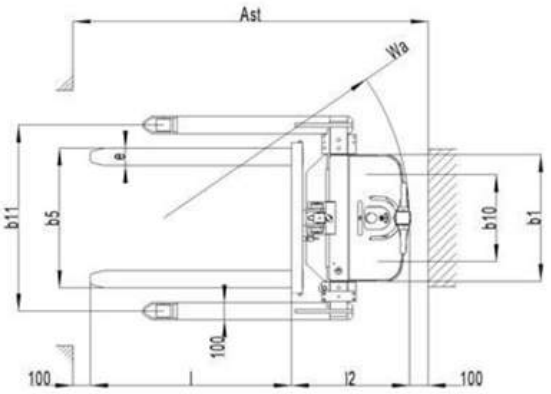
	3.7	Tread, rear	b_{11} (mm)	1070-1370		
Dimensions	4.2	Lowered mast height	h_1 (mm)	1945	2095	2245
	4.3	Free Lift height	h_2 (mm)	70		
	4.4	Lift	h_3 (mm)	2840	3140	3440
	4.5	Extended mast height	h_4 (mm)	3420	3720	4020
	4.9	Height of tiller in drive position min./ max.	h_{14} mm	825/1250		
	4.15	Height, lowered	h_{13} mm	40		
	4.19	Overall length	l_1 (mm)	1810		
	4.20	Length to face of forks	l_2 (mm)	660		
	4.21	Overall width	b_1 (mm)	726		
	4.22	Fork dimensions	s/ e/ l(mm)	35/100/1150		
	4.25	Width across forks	b_5 (mm)	252-800		
	4.32	Ground clearance, centre of wheelbase	m2(mm)	40		
	4.33	Aisle width for pallets 1000X1200 crossways	Ast (mm)	2251		
	4.34	Aisle width for pallets 800X1200 lengthways	Ast (mm)	2200		
	4.35	Turning radius	Wa (mm)	1405		
Performance data	5.1	Travel speed, laden/ unladen	km/h	3.9/4.1		
	5.2	Lift speed, laden/ unladen	m/s	0.105/0.145		
	5.9	Lowering speed, laden/ unladen	m/s	0.103/0.102		
	5.8	Max. gradeability, laden/ unladen	%	5/10		
	5.10	Service brake		Electromagnetic		
Electric- motor	6.1	Drive motor rating S2 60min	kW	0.45		
	6.2	Lift motor rating at S3 7.5%	kW	2.2		
	6.3	Battery acc. to DIN 43531/ 35/ 36 A, B, C, no		no		
	6.4	Battery voltage, nominal capacity K5	V/Ah	2x12/85		
	6.5	Battery weight	kg	2x25		
	6.6	Energy consumption acc. to VDI cycle	kWh/h	0.62		
Addi- tional data	8.1	Type of drive control		DC- Speed Control		
	8.4	Sound level at driver's ear acc. to EN 12053	db(A)	<70		





Technical data (PSE10MSL)

Type sheet for industrial truck acc. to VDI 2198					
Distinguishing mark	1.2	Manufacturer`s type designation		PSE 10MSL(1600)	PSE 10MSL(2000)
	1.3	Drive		Battery	
	1.4	Operator type		Pedestrian	
	1.5	Load capacity / rated load	Q(t)	1000	
	1.6	Load centre distance	C(mm)	600	
	1.8	Load distance ,centre of drive axle to fork	X(mm)	732	
	1.9	Wheelbase	Y(mm)	1228	
Weight	2.1	Service weight	kg	637	650
	2.2	Axle loading, laden front/rear	kg	518/1111	522/1120
	2.3	Axle loading, unladen front/rear	kg	452/185	461/189
Tyres, Chassis	3.1	Tires		Polyurethane (PU)	
	3.2	Tire size, front	∅ x w (mm)	∅200×73	
	3.3	Tire size, rear	∅ x w (mm)	∅84×70	
	3.4	Additional wheels(dimensions)	∅ x w (mm)	∅80 × 30	
	3.5	Wheels, number front/rear(x=driven wheels)		1x+2/2	
	3.6	Tread, front	b_{10}(mm)	498	
	3.7	Tread, rear	b_{11} (mm)	1070-1370	
Dimensions	4.2	Lowered mast height	h_1 (mm)	1950	2350
	4.3	Free Lift height	h_2 (mm)	1530	1930
	4.4	Lift	h_3 (mm)	1530	1930
	4.5	Extended mast height	h_4 (mm)	2470	2870

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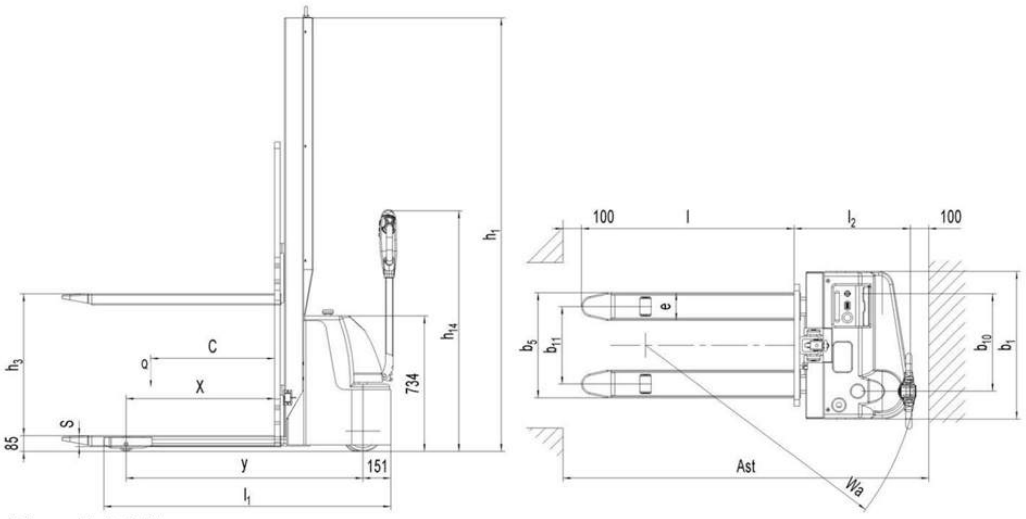
	4.9	Height of tiller in drive position min./ max.	h_{14} mm	825/1250
	4.15	Height, lowered	h_{13} mm	40
	4.19	Overall length	l_1 (mm)	1810
	4.20	Length to face of forks	l_2 (mm)	660
	4.21	Overall width	b_1 (mm)	726
	4.22	Fork dimensions	s/ e/ l(mm)	35/100/1150
	4.25	Width across forks	b_5 (mm)	252-800
	4.32	Ground clearance, centre of wheelbase	m2(mm)	40
	4.33	Aisle width for pallets 1000X1200 crossways	Ast (mm)	2262
	4.34	Aisle width for pallets 800X1200 lengthways	Ast (mm)	2221
	4.35	Turning radius	Wa (mm)	1405
Performance data	5.1	Travel speed, laden/ unladen	km/h	3.7/4.0
	5.2	Lift speed, laden/ unladen	m/s	0.12/0.18
	5.3	Lowering speed, laden/ unladen	m/s	0.16/0.12
	5.8	Max. gradeability, laden/ unladen	%	5/10
	5.10	Service brake		Electromagnetic
Electric- motor	6.1	Drive motor rating S2 60min	kW	0.45
	6.2	Lift motor rating at S3 7.5%	kW	2.2
	6.3	Battery acc. to DIN 43531/ 35/ 36 A, B, C, no		no
	6.4	Battery voltage, nominal capacity K5	V/Ah	2x12/85
	6.5	Battery weight	kg	2x25
	6.6	Energy consumption acc. to VDI cycle	kWh/h	0.62
Addi - tiona l data	8.1	Type of drive control		DC- Speed Control
	8.4	Sound level at driver`s ear acc. to EN 12053	db(A)	<70



Technical data (PSE10M)

Type sheet for industrial truck acc. to VDI 2198				
General data	1.2	Manufacturer`s type designation		PSE10M

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	1.3	Power (battery, diesel, petrol, gas, manual)		电动		
	1.4	Operator type		步行式		
	1.5	Load Capacity / rated load	Q (t)	1.0		
	1.6	Load center distance	C (mm)	600		
	1.8	Load distance, center of drive axle to fork	X (mm)	800		
	1.9	Wheelbase	Y (mm)	1281		
Weight	2.1	Service weight	kg	444		
	2.2	Axle loading, laden front/rear	kg	477/957		
	2.3	Axle loading, unladen front/rear	kg	335/119		
Tires, chassis	3.1	Tires		聚氨酯(PU)		
	3.2	Tire size, front	x w (mm)	220 × 70		
	3.3	Tire size, rear	x w (mm)	80 × 93		
	3.4	Additional wheels(dimensions)	x w (mm)	124 × 60		
	3.5	Wheels, number front/rear(x=driven wheels)		1x+1 / 2		
	3.6	Track, front	b10 (mm)	529		
	3.7	Track, rear	b (mm)	390		
Dimensions	4.2	Lowered mast height	h (mm)	2349	1949	1570
	4.4	Lift height	h (mm)	1915	1515	715
	4.9	Extended mast height	h (mm)	785/ 1300		
	4.15	Height of tiller in drive position min./ max.	h (mm)	85		
	4.19	Height, lowered	l (mm)	1778		
	4.20	Length to face of forks	l (mm)	628		
	4.21	Overall width	b (mm)	800		
	4.22	Fork dimensions	s/e/l (mm)	60/150/1150		
	4.25	Distance between fork-arms	b (mm)	540		
	4.32	Ground clearance, center of wheelbase	m (mm)	35		
	4.33	Aisle width for pallets 1000X1200 crossways	Ast (mm)	2316		
	4.34	Aisle width for pallets 800X1200 lengthways	Ast (mm)	2248		
	4.35	Turning radius	Wa (mm)	1485		
Performance	5.1	Travel speed, laden/ unladen	km/h	4.3 / 4.5		
	5.2	Lift speed, laden/ unladen	m/s	0,11/ 0,16		
	5.3	Lowering speed, laden/ unladen	m/s	0,13/ 0,11		
	5.8	Max. gradeability, laden/ unladen	%	5/ 10		
	5.10	Service brake		电磁制动		
Electric	6.1	Drive motor rating S2 60min	kW	0.45		
	6.2	Lift motor rating at S3 10%	kW	2.2		
	6.3	Battery acc. to DIN 43531/35/36 A, B, C, no		NO		
	6.4	Battery voltage, nominal capacity K5	V/ Ah	2X 12/ 85		
	6.5	Battery weight	KG	2X 55		
	6.6	Energy consumption acc: to VDI cycle	kWh/h	0.73		
Other	8.1	Type of drive control		直流速度控制		
	8.4	Sound level at driver's ear acc. to EN 12053	dB(A)	< 70		

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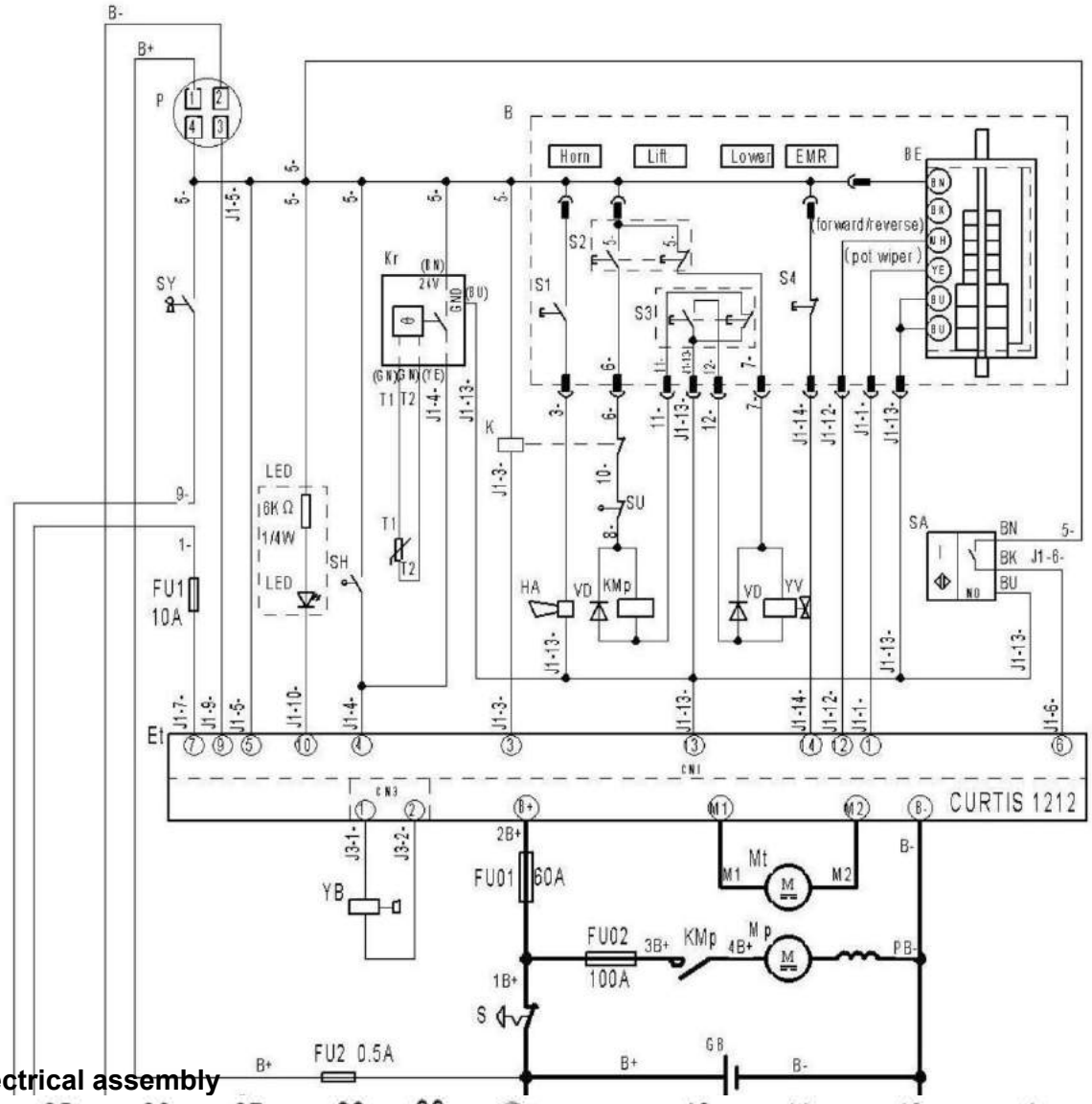
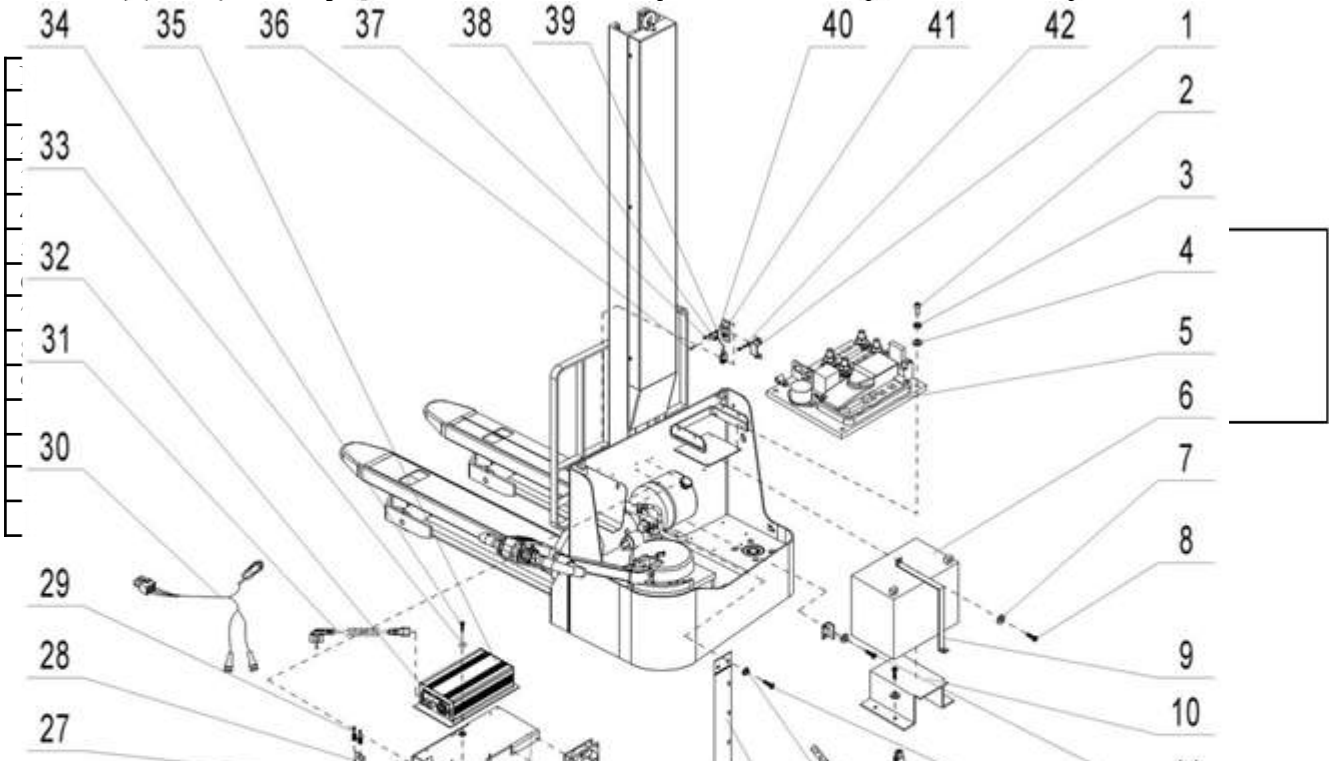
3. Electrical system

3.1 Electrical circuit diagram

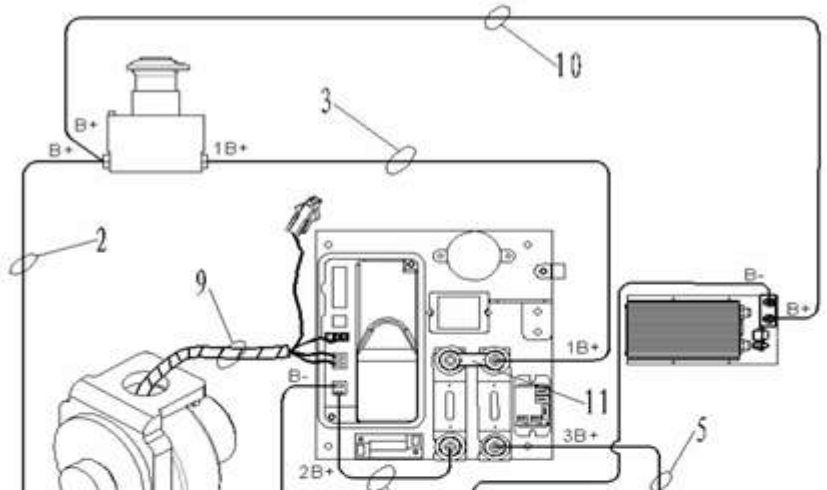


3.2 Electrical assembly



14	The fuse tube	1	
15	Limit switch short wiring	1	
16	The fixed frame	1	
17	LED fault display component	1	
18	Cross recessed pan head screws	2	
19	fan	1	
20	Connector mounting frame	1	
21	Charger holder	1	
22	A car fuse holder	1	
23	Plug-in type fuse	1	
24	Cross recessed pan head screws	2	
25	The fuse holder	1	
26	Cross recessed pan head screws	2	
27	Connector mounting frame	1	
28	Connector mounting frame	1	
29	Cross recessed pan head screws	6	
30	Fan cable	1	
31	Double end spring cord plug	1	
32	Rubber gasket	4	
33	Flat mat	4	
34	Hexagon socket socket head screws	1	
35	charger	2	
36	Hexagon socket screw	2	
37	Hexagon socket screw	4	
38	Elastic washer	4	
39	Flat mat	4	
40	Proximity switch	1	
41	Mounting plate 2	1	
42	Hexagon socket screw	2	

3.3 Main circuit harness



Note

6	Cable -4B+-16-8-8-120	1	
7	Cable -PB--16-6-8-950	1	
8	Cable -B--6-6-6.3-810	1	
9	Drive wheel harness assembly	1	
10	Cable -B+-2.5-6-8-1050	1	
11	Copper platoon	1	
12	Cable -B--2.5-6-8-1130	1	

4. Battery (maintenance-free battery)

Charging of the battery

The storage battery shall be charged with the original charger, and the operation shall be carried out strictly in accordance with the maintenance instruction. a) Never overcharging

b) The charging place shall be well ventilated

 ·The battery charging process should be carried out in a well-ventilated place and should avoid moisture.

 ·Check the connector and cable before charging to ensure that there is no damage.

·Do not charge

--when the connector electrode is damaged.

--The terminal and cable line are corroded.

These conditions can lead to sparks, burning items and fires and explosions and other accidents.

d) Turn off the key switch and charge it

e) Link Charger AC power supply, the vehicle for the built-in Charger.

 ·Do not unplug the cable.

·When the cable and power connector are damaged, you should contact our after-sale department to replace the damaged cable and power connector.

f) disconnect charging process

 ·The steps of disconnecting the charging process must be operated in strict accordance with the maintenance instructions .

·Do not unplug the charger when charging, otherwise there will be electric sparks causing danger

4.1 Battery replacement

When the Pallet uses a working cycle continuously and the battery is completely used up, the battery on the original vehicle should be replaced with another group of fully charged batteries in time, and the replaced batteries should be charged.

 ·When replacing a battery, ensure that the battery matches the pallet. Using a battery that doesn't match the pallet will shorten the working hours or cause the pallet to tip over as it travels.

Replacement batteries shall be carried out on a designated working platform.

 ·When using another forklift as lifting equipment for replacing batteries, appropriate cranes should be used.

·Hoisting batteries should be operated by professionals.

1) Park the vehicle safely, turn off the key switch, and press the power switch to turn off the vehicle.

2) Open the chassis. Loosen the battery holder and remove the holder.

3) First unscrew the screw at the negative end (display '-'), then unscrew the screw at the positive end (display '+') and place the wire harness beside it. Then remove the two batteries one by one.

4) Installation is the opposite procedure of removal. Please connect the positive terminal first, otherwise the vehicle is vulnerable to damage.

This vehicle is equipped with the following sealed liquid acid batteries:

2 battery of 12V/ 85Ah

optional: 2 battery of 12V/ 106Ah

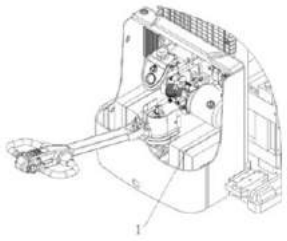


Fig. 13 Battery replacement

4.2 Maintenance of batteries

the vehicle is powered by a maintenance-free battery and no maintenance is required for the battery during use

4.3 Battery test

A. Battery status check

Weak batteries can cause or cause problems with the controller and power circuits. Please make sure the battery is in good condition before troubleshooting other areas.

Verify that the polarity on the battery connectors and control panel is correct. The positive cable shall be located at the line fuse (fuse) and the negative cable shall be located at the negative terminal of the control panel.

When the pallet is working

Battery load test

Turn the range switch on the multimeter to read the battery voltage.

connection battery

connects the multimeter lead between b + (1) and b-(2) of the controller.

In the safety area, operate the hydraulic system (load) and read the voltage indicated on the multimeter at the same time.

If the indication is less than the limit value (19.0v), the battery needs to be charged or repaired before continuing to troubleshoot.

When the pallet is not working, and the battery faulty.

A battery pressure drop test

1. Measure the voltage of each unit cell when the pallet is energized, and the pump motor is running.
2. Normal voltage should be between 1.7 v and 2.1 v per unit cell. If the voltage on each of the individual cells is less than 1.7 v, the electrical pool must be charged or repaired before continuing the troubleshooting.
3. The index between the batteries should not exceed 0.15 volts. If so, the battery must be charged or serviced.

C Battery shell insulation inspection

The resistance between the pallet wiring and any point in the pallet body shall be at least 10,000 Ω or higher. The short-circuit of the battery case results in several faults. A short circuit in the chassis in the pallet wiring may cause a problem as the battery may have a chassis leak. to prevent problems due to a short circuit

Do as following:

1. Disconnect the battery and discharge the controller.
2. Random measurement of any component connections or wiring connections to the pallet chassis with a minimum resistance of 10,000 Ω. Any test point with low resistance must remove the chassis short.
3. Always keep the battery clean to minimize current leakage to the chassis.
4. Ensure that all accessories, such as the horn and the lamp, are designed to have no chassis connection (two-wire system)

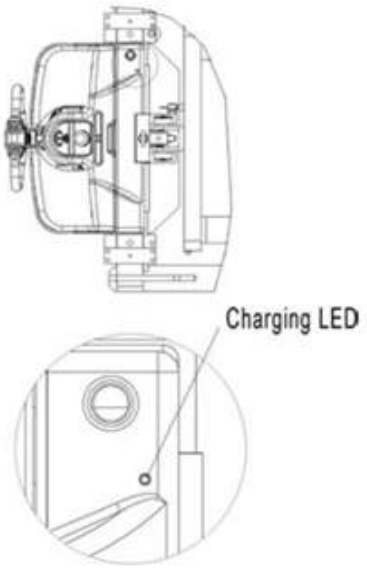
5. The charger

5.1 Overview

This model adopts the built-in charger, the specification is 24V/10A
Input voltage: 100~240V 50~60Hz
Input current: 4.0A (maximum)
Work efficiency: above 220V 90%
Operation mode: single chip control on/off micro computer
Output voltage: 24V
Output current: 10A
Applicable battery: 24V 50~120Ah lead-acid battery
The ambient temperature and humidity: 0℃~40℃ and 20%~85%5.2

5.2 Instructions

Charging status display light
Charging: Red light flashes
Full saturation wait: green light is always on
Battery abnormal: yellow light is always on
Charger abnormal: yellow light flashing
First connect the power supply, then the charging status indicator light is always on, a few seconds later, the charger will enter the charging mode.



The vehicle is not electrified when charging, and the electric meter does not show the electric quantity. When the AC power is disconnected, turn on the key switch. When the vehicle does not show the electric quantity, please check the charging protection link line of the charger. When charging is normally open, not charging is normally closed state.

5.3 Common faults of charger

When the charger is connected to the power supply, check the status indicator:
1. If the status indicator light is always on, the power supply is turned on
A. Is the output connector properly connected or polarity reversed? (Please connect it before charging it)
B. Is the battery fully charged? (Please charge after use)
C. Is the battery worn out? (Please replace it with a new battery)
2. If the status indicator light is not on, it means the charger is not energized or damaged
A. Please make sure that the power plug is in good contact? (Please plug it in and charge it again)
B. Please confirm whether the power switch is on or not. (Please turn it on and then charge it)
C. Is the charger damaged? (Please send it to the factory for maintenance)

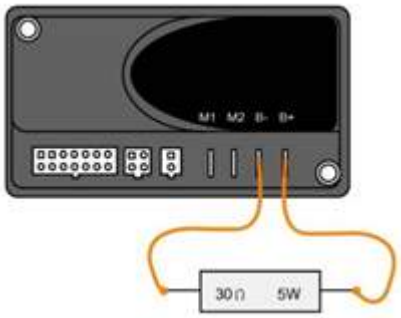
6.Controllor

6.1 Appearance

· M1 and M2 can change the running direction of the vehicle.

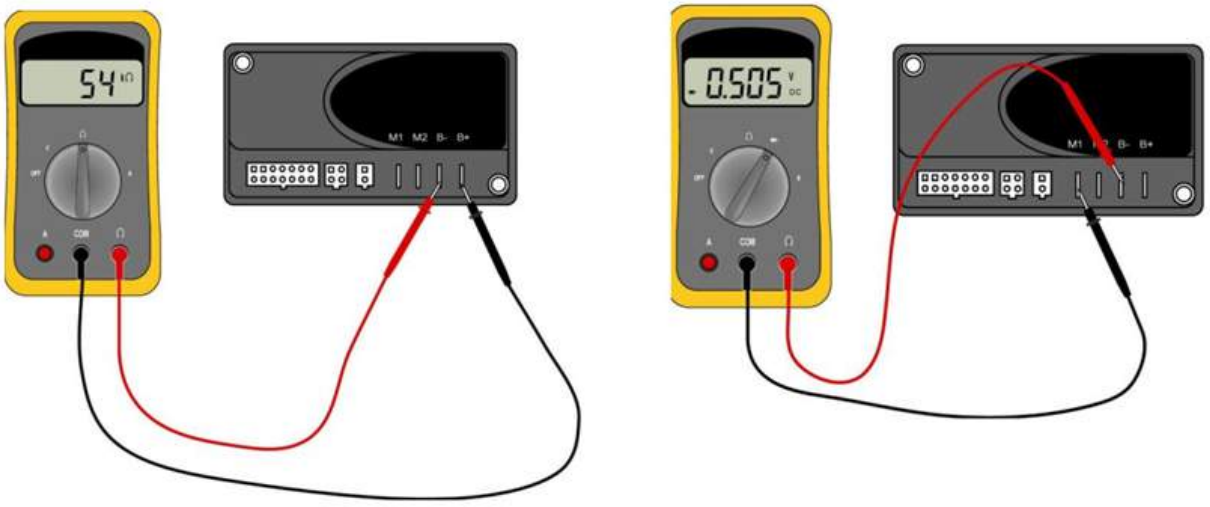
:kly to represent the number of fault codes, and there is an interval

sistor to B +, B – terminal discharge



			range of data	
		tro	Voltage	Resistance
				40KΩ以上
				80KΩ以上
				80KΩ以上
				60KΩ以上
			0.3～0.6 V	
6	B-	M1	0.3～0.6 V	

All values should be measured more than 3 times.



Multimeter to Ω file (resistance) Dial the multimeter to diode (polarity value determination)

6.2 Electronically controlled fault code

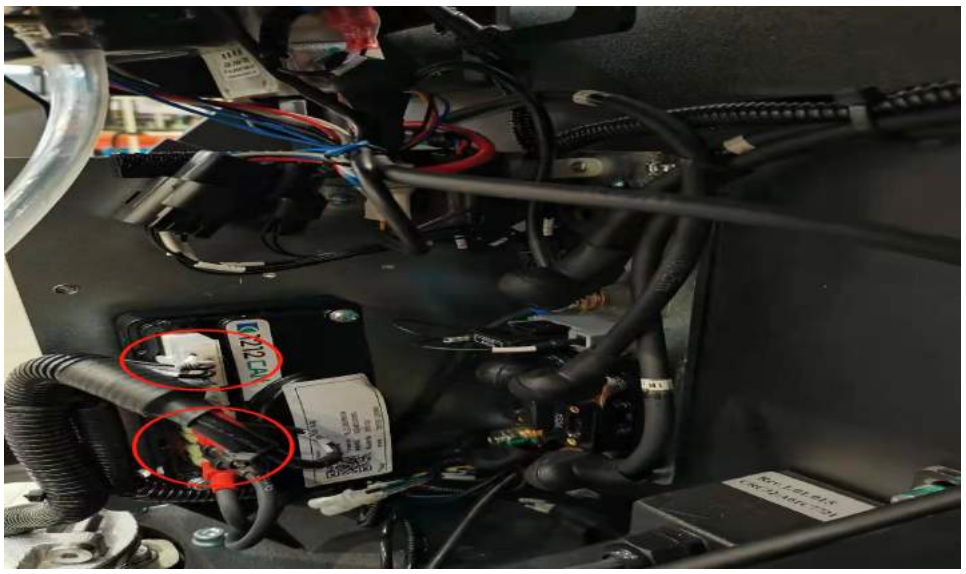
Fault code table

NO	Fault	No.	Checking items	reasons
1	BATTERY DISCONNECT FAULT	4.5	The batteries not connected	1, the battery is not connected 2. Bad battery contact
2	BRAKE OFF FAULT	3.4	Brake shutdown fault	1, electromagnetic brake coil short circuit

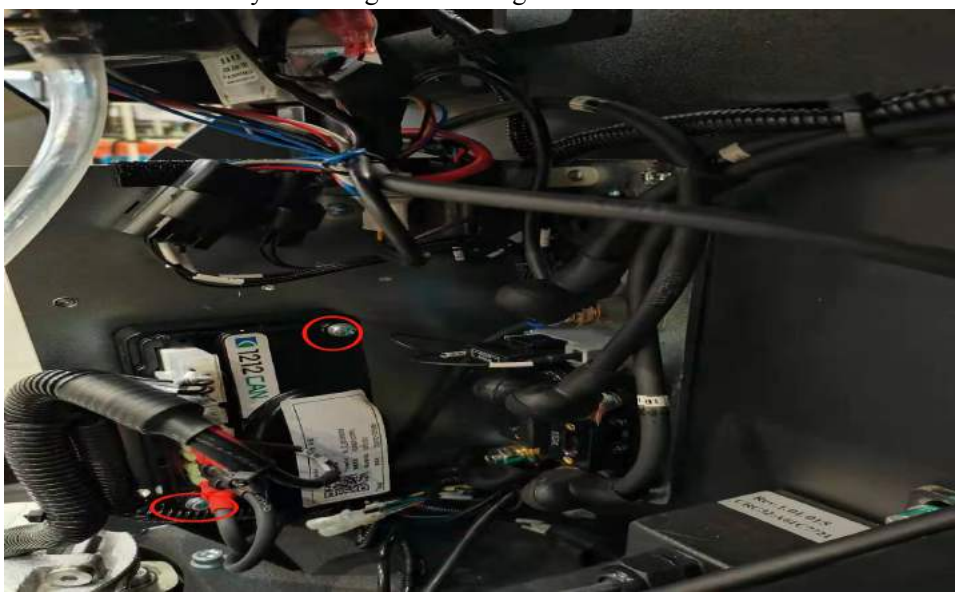
				2, electromagnetic brake drive open circuit
3	BRAKE ON FAULT	3.2	Brake opening fault	1. Open the electromagnetic brake coil 2. Electromagnetic brake drive short circuit
4	CURRENTSENSE FAULT	4.1	Current detection fault	1, motor or motor wiring short circuit 2. Controller failure
5	EEPROM CHECKSUM FAULT	4.3	EEPROM error	EEPROM malfunction or failure
6	HARDWARE FAILSAFE	4.2	Motor voltage out of range	1. Motor voltage does not match accelerator input 2, motor or motor wiring short circuit 3. Controller failure
7	HPD FAULT	3.5	HPD error	1, accelerator, key switch, push or forbid input several action operation sequence error 2. The accelerator was incorrectly tuned
8	MAIN FAULT	2.3	Main contactor failure	1. Adhesive or open main contactor 2. Main contactor coil drive error
9	MAIN OFF FAULT	2.1	Main contactor coil drive "off" fault	Incorrect opening of main contactor coil
10	MAIN ON FAULT	2.4	Main contactor coil drive "on" fault	Main contactor coil closed incorrectly
11	OVERVOL TAGE FAULT	1.5	Battery voltage is too high	1. Battery voltage >31V 2. Connect the charger when the vehicle is running 3. Bad battery contact
12	PRECHARGE FAULT	3.3	Recharge fault	1. Controller failure 2. Low battery power
13	SPEED POT FAULT	1.3	Speed limiting potentiometer malfunction	1, speed limit potentiometer wire open circuit or short circuit 2, speed limit potentiometer open circuit
14	THERMAL FAULT	1.1	Cut off over/under temperature	1, the temperature BBB 0 80℃ or <-10℃ 2. Vehicle overload 3. Operating in extremely harsh environments 4. The electromagnetic brake is not released normally
15	THROTTLE FAULT	1.2	Potentiometer sliding end or low voltage out of range	1. Open circuit or short circuit at the accelerator input end 2, accelerator potentiometer failure 3. Wrong selection of accelerator type
16	UNDERVOL TAGE FAULT	1.4	Battery voltage is too low	1. Battery voltage <17V 2. Bad wiring of battery or controller
17	WIRING FAULT	3.1	HPD failure time exceeds 10 seconds	1. Improper operation of the accelerator 2. The accelerator port or mechanical part of the accelerator is malfunctioning

6.3 Switch the controller.

1. Turn off the power and unplug the battery plug-in
2. Wait 30 seconds before removing
3. Remove plugins and motor wires



4. It can be removed by removing the retaining bolt



5. Installation is the reverse process

7. Curtis handheld unit

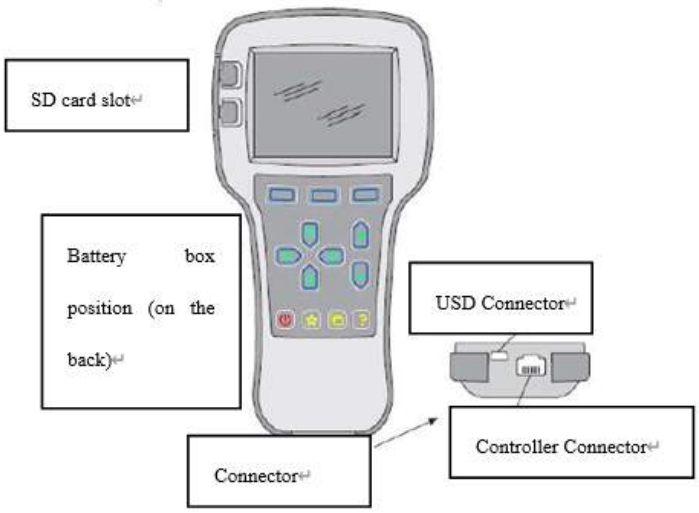
Note：
Handheld unit attention function is for the convenience of vehicle inspection and maintenance, without the approval of the vehicle manufacturer, the controller parameters are not allowed to adjust, in order to avoid vehicle and personal safety accidents.
After modifying the parameters of the handheld unit, it will be saved automatically. You only need to turn off the key switch and restart it.
The Curtis handheld unit can be connected when the controller is live or power off.
Vehicle trouble reading process.
After connecting the hand-held unit with the controller, the key switch is opened.

According to Curtis's hand-held unit menu list, find: Faults.
Running vehicles, hand-held cursor flashing will appear in English fault content, refer to the fault code table interpretation.
Vehicle signal detection
After connecting the handheld unit to the controller, turn on the key switch.

From the Curtis handheld unit menu list, find: Monitor...
According to the need, open the corresponding detection menu sub-item, run the vehicle, observe the handheld value changes.
Curtis handheld unit menu contents
The Curtis 1313 handheld programmer is used to configure the Curtis electronic control system. Through this programmer, you can adjust and save 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 brakes. Dangerous conditions can occur if the vehicle control system is programmed incorrectly or beyond safety. Only the vehicle manufacturer or authorized service agent can program the control system.

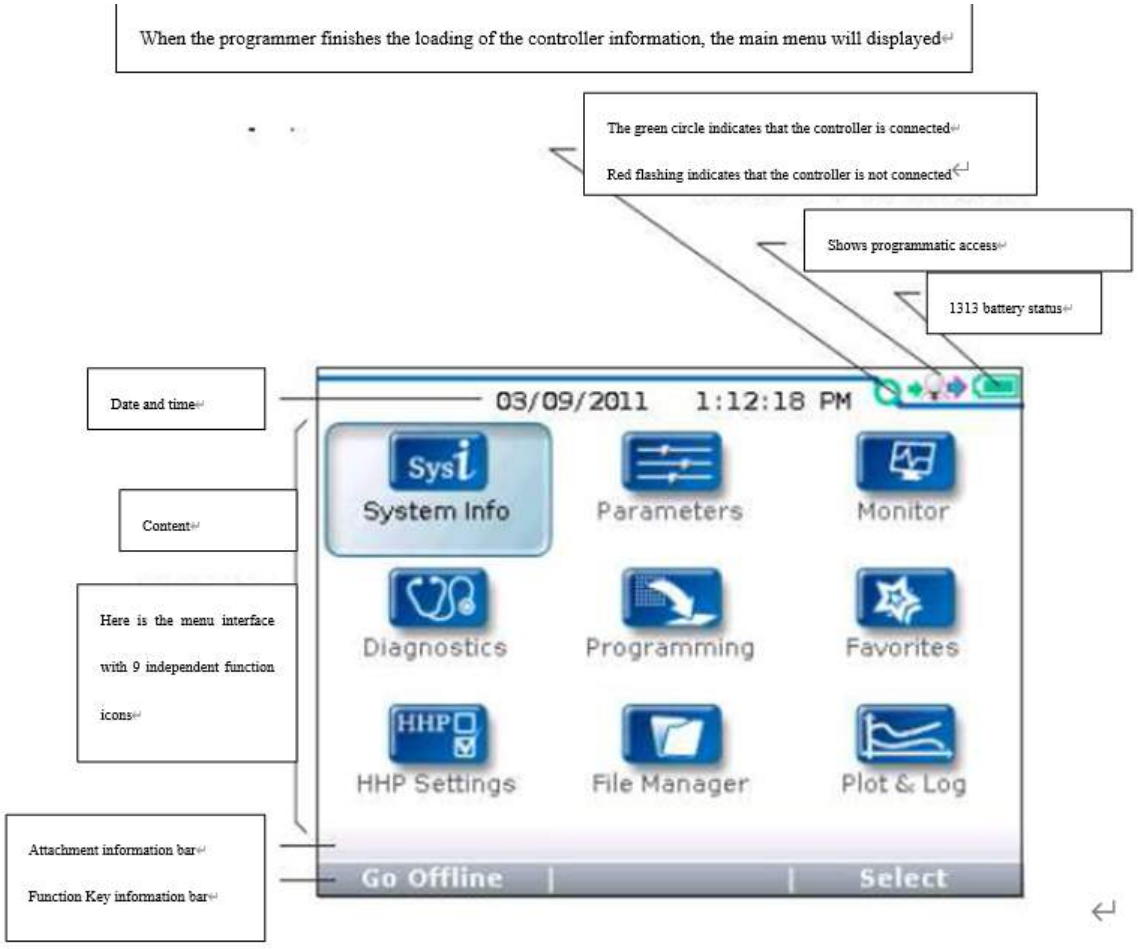
The programmer has two interfaces, one is used to communicate with the electronic control, the other is used to communicate with the PC, the programmer has a battery box and a memory card.

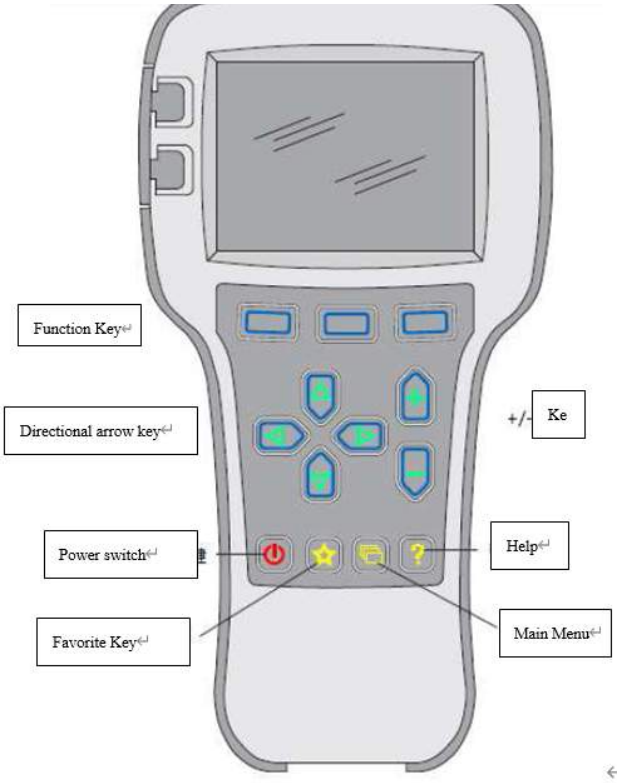


当编程器加载完控制器的信息后，编程器上会显示主菜单。

Power up the programmer

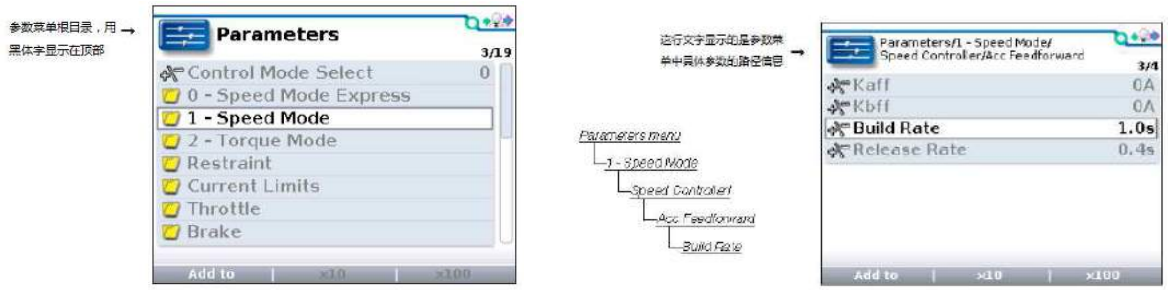
By inserting the connector of the hand-held programmer into the programming port of the controller, the hand-held programmer will automatically power up and display the control information on the controller.



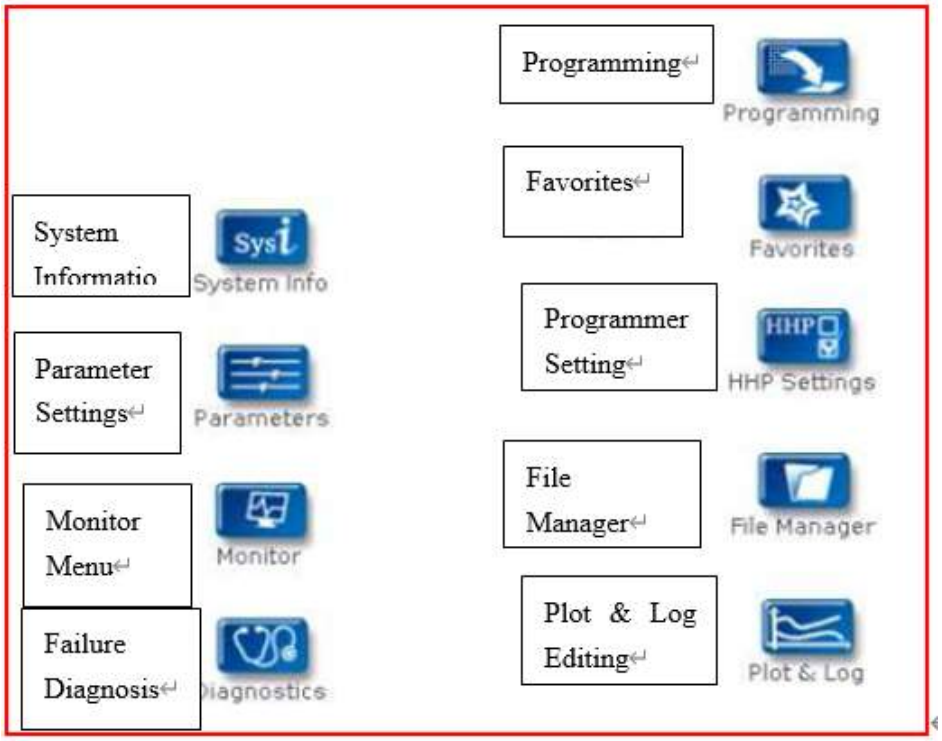


Function Key
Since the function of the three keys is determined by the content specified, the three keys are blank. At any given time, the function of the buttons will be displayed on the LCD screen above.
Arrow keys for direction
Through the 4 direction keys can be displayed on the information about the top and bottom of the selection.
+/-button
These two buttons allow you to add and subtract parameters. At the same time," can mean "Yes" in the operation,"-"can mean "No". In some cases, it can also be used as a scrolling option.
Power Key
When a programmer inserts an energized controller, the programmer does not have to press the power button to use it, the programmer turns on automatically. After holding it down for a few seconds, the programmer prompts if it needs to be turned off and decides whether to turn it off by selecting

The menu structure.
The main menu consists of nine submenus, each of which is displayed with a specific icon, and each item in the submenu is arranged in a hierarchy. Some menus contain only one item of information, but most contain multiple items, and you can go to the next level of submenus by opening each item folder. Expand the table through the grid option, enter a group of execution commands through the dialog box option, no matter in which interface, use the left direction key, can return to the previous level of menu.
The names of all nine submenus are shown in bold on the main menu and below the icon. When you enter a hierarchical menu, the name of the submenu or the path you are in is displayed at the top of the screen.



Nine menu

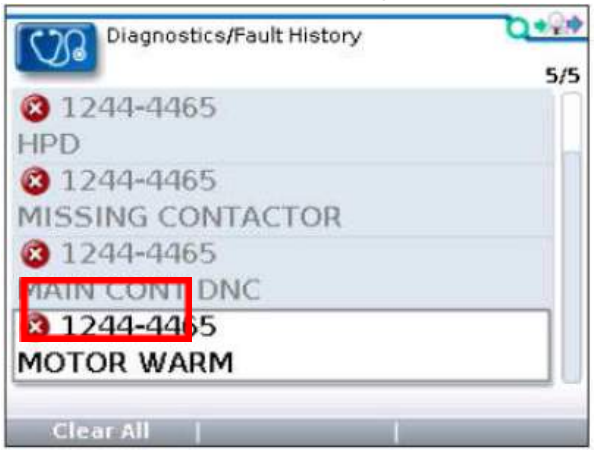


Troubleshooting menu

In the main menu, Select the "Diagnostics" icon and press the function key corresponding to Select to enter the Fault diagnosis menu, which contains two folders: "Present Errors" and "Fault History."

Note: Sometimes the fault caused by a temporary event caught in the circuit is not a system fault. It can be determined by rebooting the system and seeing if the fault disappears automatically.

In the historical fault folder, the faults listed are all the that have been encountered since the last historical fault cleared. By clearing the contents of the entire folder, you restart the historical fault recording.

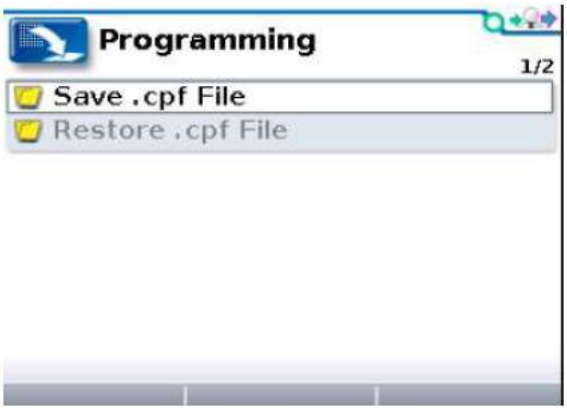


"Clear All" is used to Clear the historical failure folder. A function key will only be highlighted if there is a history fault in the history fault folder and will be grayed out if there is no history fault.

faults was can

Programming menu

In the main menu, Select the “Programming” icon, press the “Select” corresponding function key to enter the menu. The parameter settings file (. CPF file) can be stored and restored from the programming menu

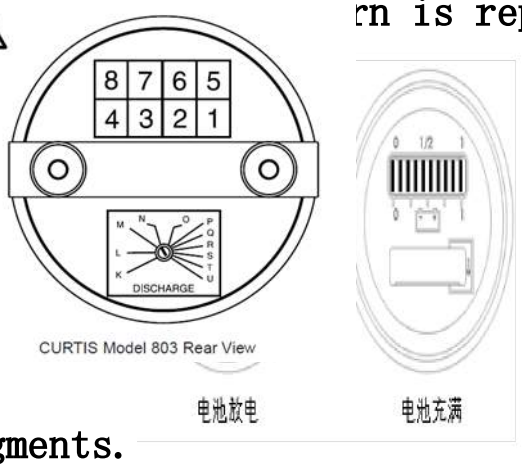


Save the .cpf File.
Use the Save. CPF file function in the programming menu to back up the currently set parameters. You can save as many .cpf files as you want, and you need to give each .cpf file a different name.
Restore .cpf File ()
Restore .cpf File can select the previously saved .cpf File instead of the .cpf File of the current controller. When the whole data recovery process is completed, the screen will pop up a dialog box asking to restart the system.

8. Instruments

8.1 overview of electric meters

⚠ rn is represented by 10 LED display



segments.

The LED light on the far right lights up only when the battery is properly charged. As the battery's charge dropped, the LEDs turned on one at a time, but only one at a time.

A second LED light to the left flashes, indicating "energy reserve" (70% discharge depth).

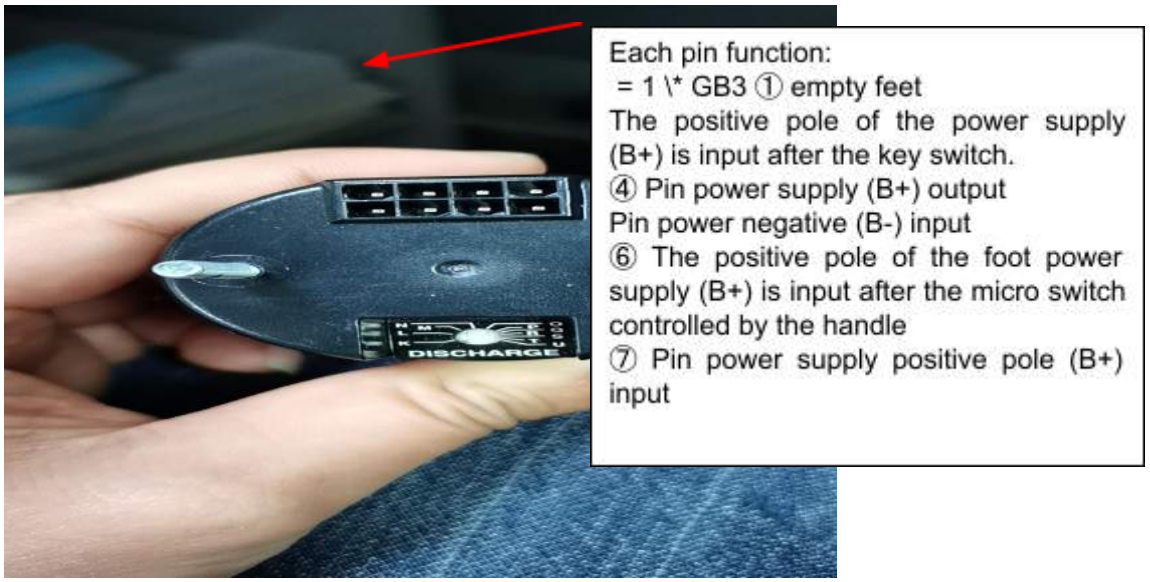
B The two LED lights on the far-left flicker alternately, indicating "empty battery" (80% discharge depth).

Common faults of electric meter

A meter wire harness B +, and b-has 24V voltage, the meter does not show.

B power meter pin4 pin without 24V voltage output.

C no hours Please replace the meter for the above two fault phenomena



Common faults of power switch

When the power switch is closed, there is no conduction phenomenon or no 24V voltage at both ends of the emergency switch. Please change the power switch.

Common faults of key switch

Key switch to ON, with multimeter measurement no conduction phenomenon please replace the key switch.

8.2 Replace the electric meter

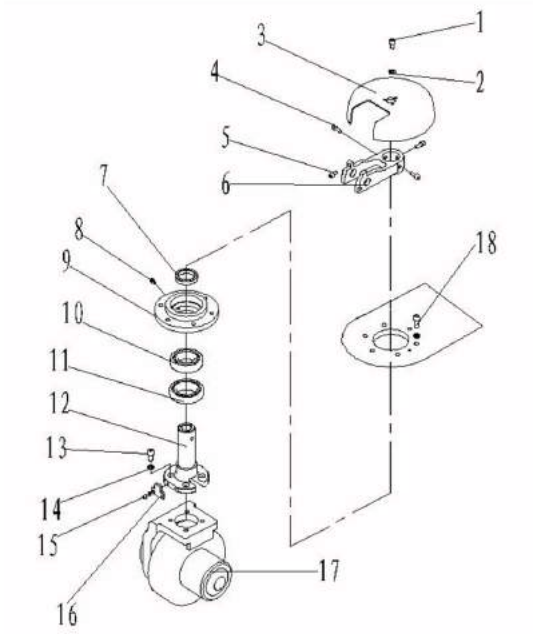
1. Unscrew the two fixed nuts of the meter by hand

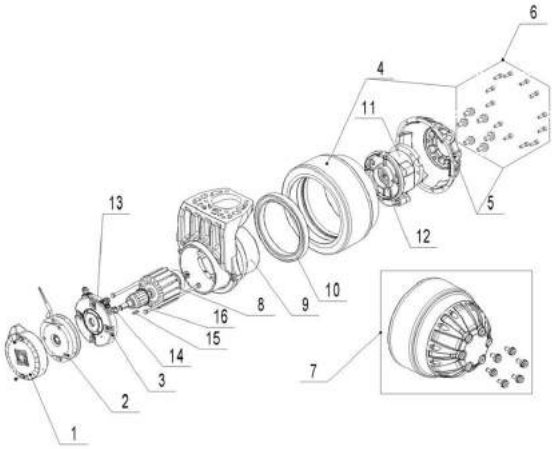
2. Remove metal ring

3. Replace the electric meter immediately

9. Driving wheel

9.1 Drive wheel overview





Large drive assembly ARMA Drive Assembly

See part manual for part name. On the electric side, drive motors turn their drive wheels, allowing the vehicle to move forward/backward.

Controlled by a controller.

The drive motor is connected to the controller via MI and M2 wires. The controller runs the drive motor based on input from multiple switches and sensors as well as internal parameter Settings.

When the following conditions are met, the driving motor runs:

1. The key switch turns on to supply power to the controller.
2 Handle down (proximity switch in induction area),
3 Determine the driving direction (accelerator button),
4 Twist accelerator buttons (accelerator)

9.2 Drive motor disassembly/assembly

1.After removing the electromagnetic brake, loosen the screws and remove the cover.

.

ol.

end cover.

semble the drive motor.

ts components as follows

9.3 Stator testing

1.Carefully wipe contaminants on the stator surface using a clean cloth dipped in alcohol
Notes: Contaminants in the stator may cause damage to the coil and therefore to the stator itself.
2.Measurement of resistance per phase (uv,vw,wu) using multimeter
Rated resistance:0.4Ω

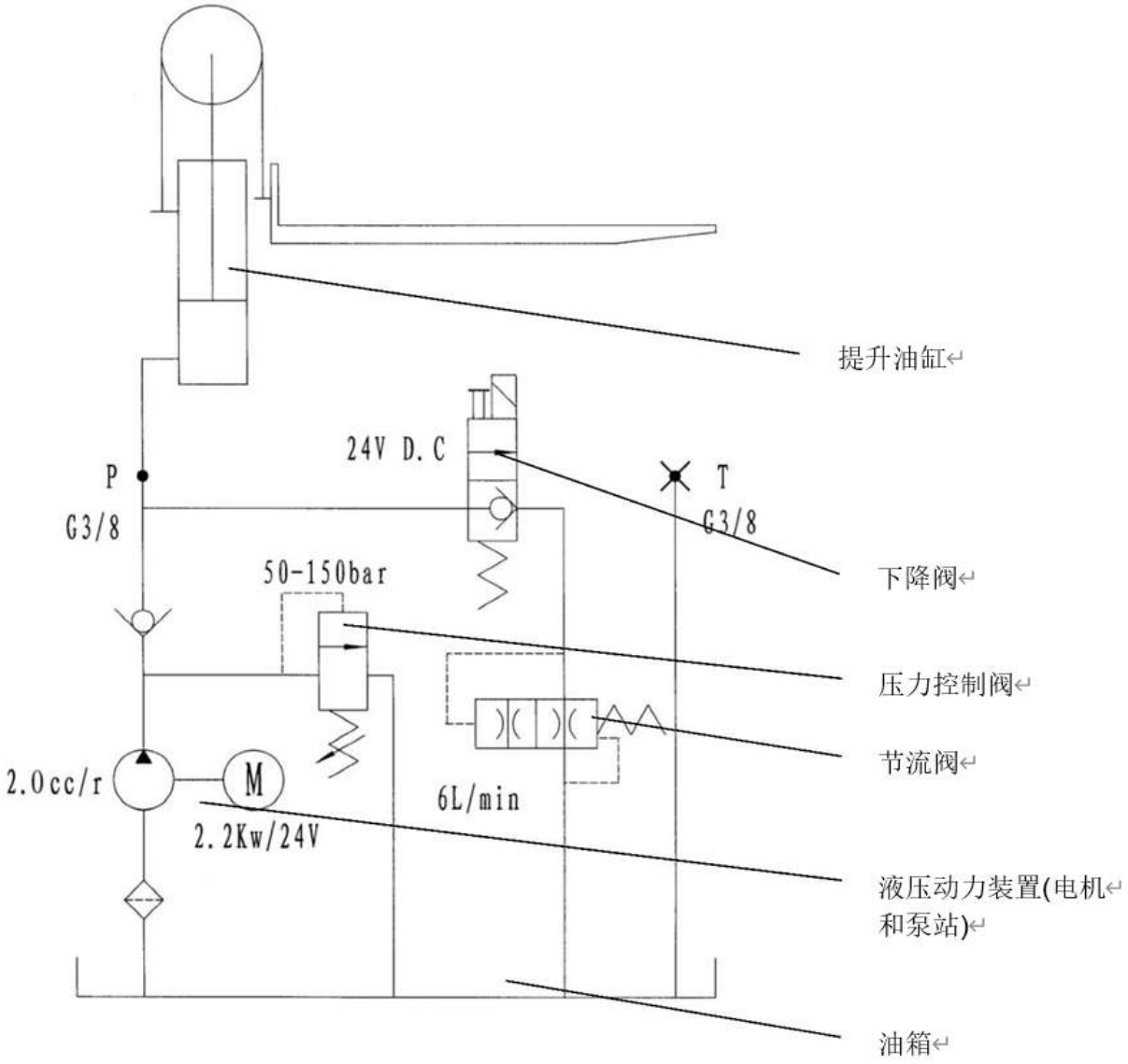
0 MΩ using insulation tester.
replace the new stator.

	Reason
	Switch is not off (battery connector, key switch, proximity switch): Turn off switch. If still not running, use a voltmeter to test the power of the control panel and the current of each switch.
	Bad signal. fuse burned: check battery connection. Check the connection of the battery Check fuse, driver, and logic. Replace fuse if burned. Check the drive motor and control panel which possible cause fuse breakage. Some of the reasons are operating under excessive load, the current limit is too high.
	Battery voltage low: Check the battery terminal voltage. Charge the battery if too low. Check if there is one or more defective cell cells.
	Incorrect operate
Drive motor doesn't work	Speed sensor fault
	The brake is defective, resulting in excessive resistance. The heat increases, causing the motor to stop. Check braking adjustment
Traction does not work during normal operation	Too much heat in the control panel for the following reasons:
	Overweight traction load: Reduced duty cycle load. Heat sensor failure:
	These may cause malfunction of the drive motor, failure of the control handle or opening of the drive fuse
	The pallet is equipped with too small batteries
	Battery not charged fully during battery charging: Check if battery charges
	Check if battery charger is malfunction.
Battery positive (+) or negative (-) is in direct contact with the vehicle frame (body) or drive motor	Battery replacement interval is too long, or battery replacement cooling time is too short.
	The battery has one or more defective single batteries, causing the rated capacity and capacity of the battery to be below normal:
	Due to the failure of the drive system, the drive system consumes too much battery power. Check the brake adjustment. Check the wheel bearings, axles and other mechanical parts for correction to eliminate the failure. Replace the smaller friction tire.
	After a work shift, the pallet capacity exceeds its designed capacity without the power available:

The vehicle did not reach its maximum speed.	The battery is dirty, the electrolyte is on top of the battery. The current flows through the battery box, which applies voltage on the forklift frame: clean the battery with baking soda

10. Hydraulic system

10.1 Overview



液压原理图

The hydraulic system operates other hydraulic parts through hydraulic force from pump.

1. The main hydraulic pump is driven by the pump motor controlled by the controller.
2. The main hydraulic pump uses the rotating force output from the motor to pressure the oil in the hydraulic tank and conveys the oil to the lifting cylinder.
3. The hydraulic tank stores the hydraulic oil returned from the cylinder. The stored oil is synced by the main hydraulic pump for reuse.

The pump motor transmits the power to the main hydraulic pump by electric mode to pump the hydraulic oil to operate the hydraulic system.

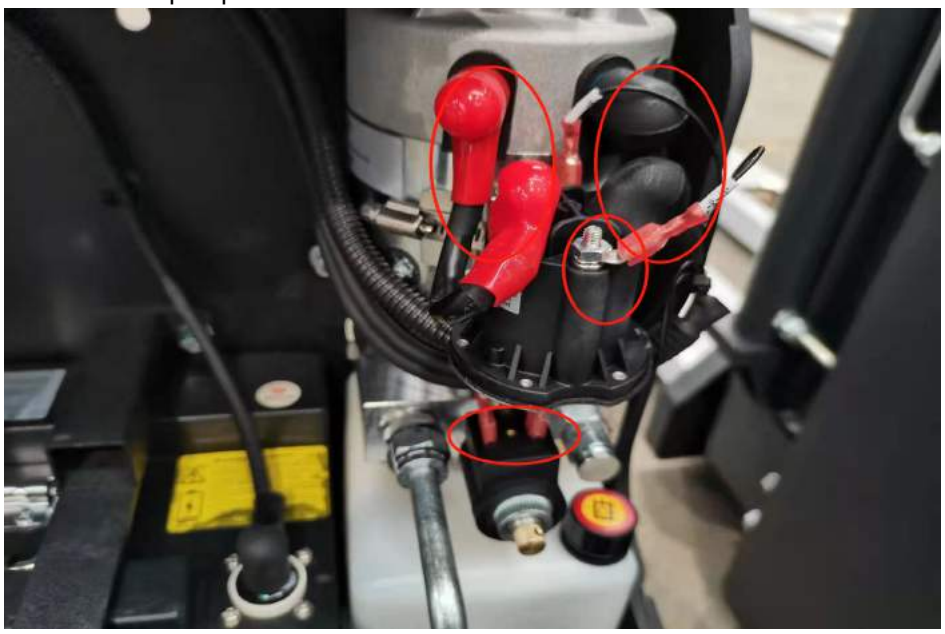
The pump motor is connected to the pump motor controller through the pump contactor and (B-)line. The controller runs the pump motor according to the input of the lifting switch and sensor.

When the following conditions are met, the pump motor runs:

the key switch is turned on.
Upper limit switch closing
handle rising switch closed
pump contactor suction

10.2 Disassembly of pump motor

1. Disconnect pump motor B+ /B- terminal cable.



2. Disconnect hose from hydraulic pump.

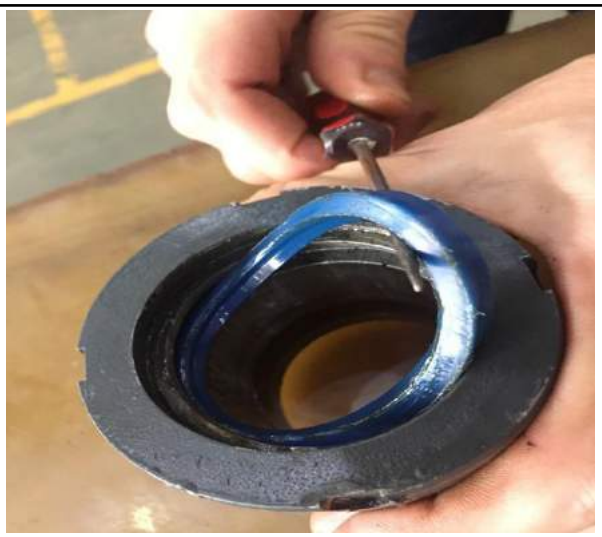
3.Remove fixing bolt between pump motor and pump, then remove motor.

Installation torque:55±10n.m (40±7lb.ft).
4. Install pump motor in reverse order.
5. Add hydraulic oil to tank according to specifications given in manual.

10.3 Replace oil seal of lifting cylinder.

1. Remove the cylinder head with a crescent wrench

2.Remove piston, then remove retaining ring




2. Remove dustproof seal and shield ring and Y-type seal


3. **Remove o-seal and shield ring, then repair hose. Installation way is in reverse sequence**

10.4 Hydraulic motor fault

Breakdown	Reason
Hydraulic motor doesn't work	Bad connection or fuse burning. Check the battery connection. Check the key fuse. Check if hydraulic pump motor is likely to cause fuse burning.
	The key switch or pump station contactor is not turned off. Turn off the key switch. Check the power of pump station contact coil and pump station contactor with multimeter. Check the voltage output and upper limit switch of pin-4 in the meter. The key switch must be turned off, the rising button and the pump station connector, then make the power steering function run.
	Insufficient voltage. Charge or replace batteries. Check for one or more defective battery cells in battery. Check cable terminals are tightly aligned with battery terminals and control panel connectors. Check cable internal wires are broken.
	The lift and drive system is not operating correctly.
The battery will not continue to work properly.	The battery installed on the vehicle is too small. According to the working hours, choose the appropriate battery capacity.
	The battery is not fully charged during the battery charging operation. Check if battery is balance-charging (charging makes the proportion of all batteries is the same). Check if battery charger defects
	The battery charging interval is too long or the rechargeable battery cooling time is too short. Reduce battery duration. Please extend the cooling time of the battery before it can be put into use.
	Batteries have one or more defective battery cells, which may result in lower rated capacity and battery capacity. Test and identify defective cells. Replace defective cells. Battery units are connected in series. A bad battery causes high resistance in series with other batteries. This reduces the speed of the motor. This may occur when other batteries are almost fully charged.
	The hydraulic pump motor is overheated.

10.5 Hydraulic pump fault

Breakdown	Reason
Pump noise	Low oil level
	oil thick
	limit to the inlet line of the pump
	Worn parts in the pump.

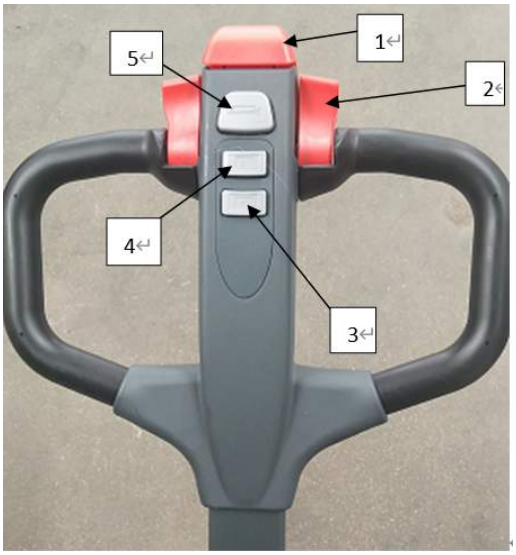
	Oil dirty
	Air leaks into the inlet line
High temperature	Low oil level
	oil channel limited
	Safety valve settings are too low
	Oil thin
	Air leakage in the system
	Pump wear is too high
	The system operates at too high a pressure. The safety valve is too high. Restrictions in flow control valves, check valves and oil routes.
Pump seal oil leakage	Seal is worn
	Pump inside worn
	Too low an oil level in the tank causes the seal to be sucked
	During installation, seal is cut on the shoulder of the pump or keyway.
	Sealed lips dry and hardened by heat.
Pump can't convey hydraulic	Low oil in tank
	Restrictions on the pump inlet pipeline
	air leakage in the inlet pipe. Loose bolts. Defects in the inlet pipe.
	viscosity of the oil is wrong
	Pump worn too much
	pump shaft fault
	The bolts of the pump do not have the correct torque

The main safety valve pressure has been adjusted before leaving the factory, and the user is not allowed to adjust and disassemble at will.

11.Tiller

11.1 Overview

1. Control handle button function



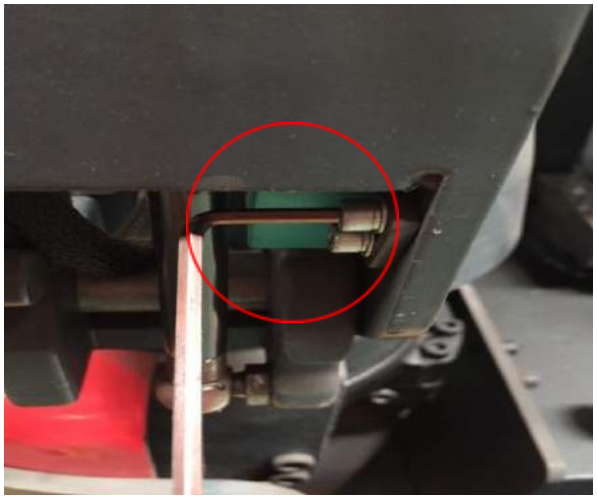
1: Emergency reverse switch (belly switch)
2: Acceleration knob switch

3: Down switch
4: Lifting switch
5: horn switch

2 Operation Instructions

Emergency reverse switch: when the vehicle is running forward, the driver's body touches the button to make it close, the vehicle will run along the direction of the fork for 3 seconds, and then stop running. (Note: If the key is closed in advance before opening the key switch, the vehicle will not be able to operate)
Acceleration knob switch: control the running direction and speed of the vehicle. (Note: rotate the switch slowly during operation to avoid rapid acceleration. When the vehicle is turning, it needs to release the knob properly and slow down to pass)
Drop switch: press this button when you need to drop goods.
Lifting switch: press this button, goods rise. (Note: After the goods are lifted to the limited position, the lifting button fails, which is normal protection, not fault.)
Horn switch: press this button, horn work. (Note: Do not press this button for a long time to avoid burning the horn)

11.2 Replace handle proximity switch.

	
1. Unscrew the bolt with 2mm inner hexagon wrench	2. Unscrew the outer cover screw with 6mm inner hexagon wrench

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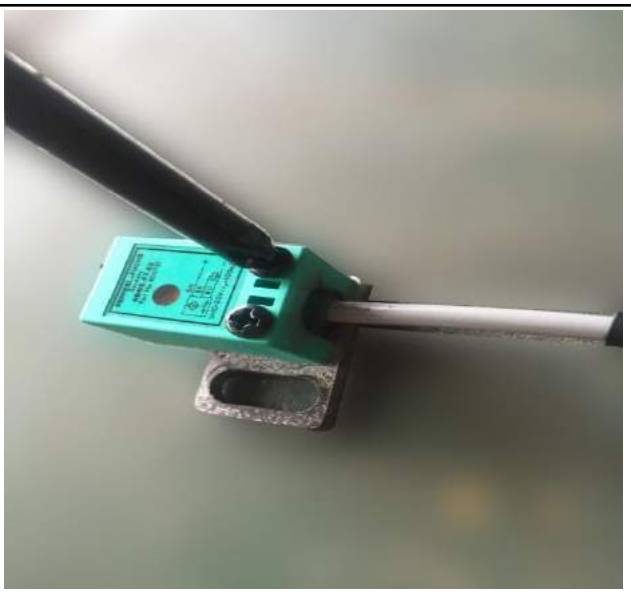
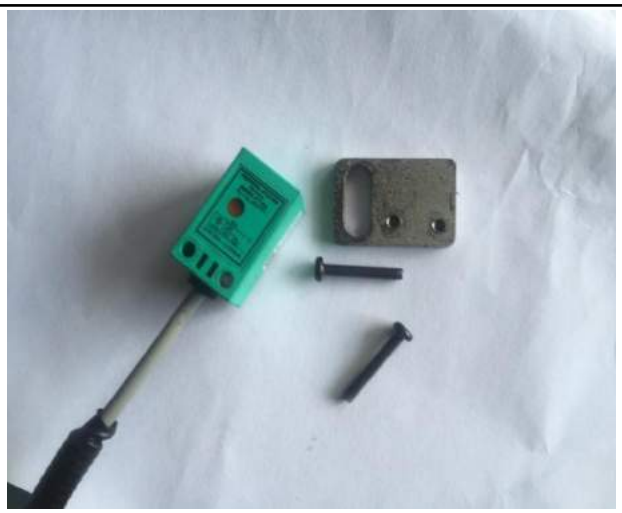
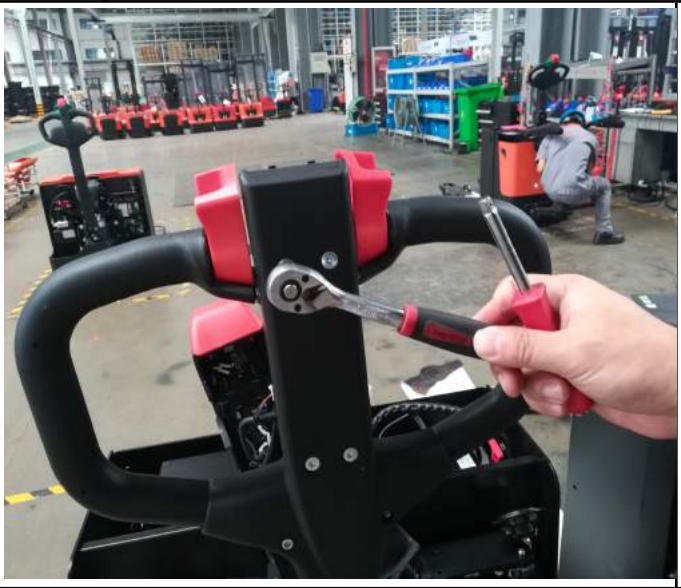
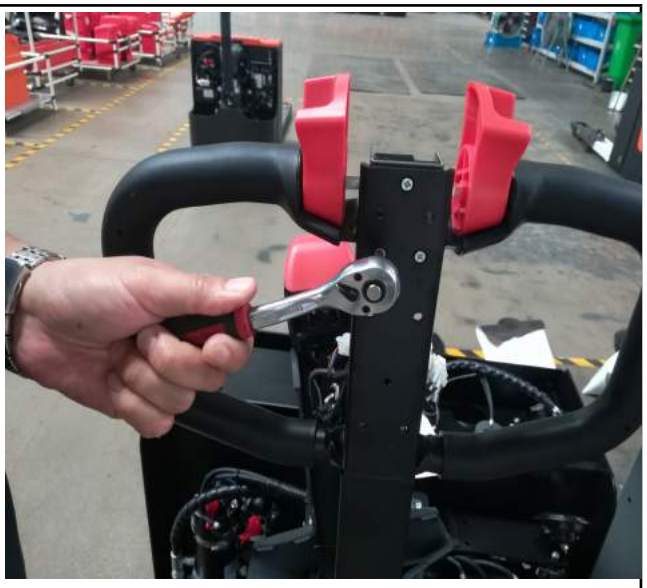
3. Open the handle cover	4. Unplug the connector (note the wire harness number)

	
5. Remove the entire switch	6. Unscrew the screw with a cross screwdriver



7. The interlock switch can be replaced

11.3 Replace the handle accelerator

	
5. Remove handle back cover screw and remove back cover	6. Unscrew the fixing screw of the accelerator with a cross screwdriver to replace it

12. Regular maintenance

- Only qualified and trained personnel can perform maintenance work on this vehicle

• Remove the cargo from the forks and lower the forks to the lowest position prior to maintenance
• If lifting the vehicle, use the specified lashing device or lifting device in accordance with Section 4. Before operation, place safety devices (such as specified lifting jacks, wedges or wooden blocks) under the vehicle to prevent them from accidentally falling, moving or sliding.
• Please pay attention to the maintenance of handle lever. Through compression, a gas pressure spring has been preinstalled. Carelessness is apt to injure.
• Please use original spare parts approved and issued by the Distributor
• Please consider possible machine failures and accidents caused by leakage of hydraulic oil
• Only trained maintenance technicians can adjust the pressure valve
If you need to replace wheels, please follow the instructions above. Casters must be round and free of abnormal wear.
Check the key items on the maintenance list.

Maintenance list

		Intervals（Month）			
		1	3	6	12
Hydraulic system					
1	Check hydraulic cylinder if there is noise and leakage of piston		·		
2	Check hydraulic connectors and tubing if there is damage and leakage		·		

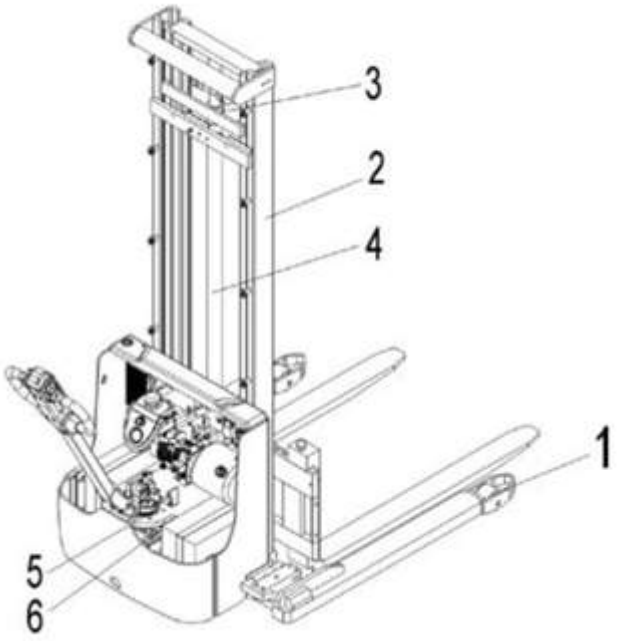
NOBLELIFT

3	Check hydraulic oil level and recharge if necessary		·		
4	Add hydraulic oil after 12 months or 1500 hours of work				·
5	Check and adjust the function of hydraulic valve (1600/2000/2500kg +0/+10%)				·
Mechanical system					
6	Check if there is deformation and damaged on fork		·		
7	Check if there is deformation and damaged in chassis		·		
8	Check if all bolts are tightened		·		
9	Check if push rod is deformation and damaged		·		
10	Check if there is noise and leakage in transmission		·		
11	Check if there is deformation and damaged for tire		·		
12	Steering bearing				·
13	Check and lubricate spindle center points		·		
14	Lubricating grease nozzle	·			
Electrical system					
15	Check if there is wire damaged		·		
16	Check wire connecting		·		
17	Check emergency switch		·		
18	Check if there is noise and damaged in driving system		·		
19	Check monitor		·		
20	Check if correct fuse is used		·		
21	Check warning signal		·		
22	Check contactor		·		
23	Check if frame is leakage (insulation test)		·		
24	Check the function and wear of the drive controller		·		
25	Check the electrical system		·		
Brake system					
26	Check brake function, replace brake shoe or adjust if necessary		·		
Battery					
27	Check battery volatge		·		
28	Check if wiring end is corrosion and damage, lubricate the wiring end		·		
29	Check if battery cover is damaged		·		
Charger					
30	Check if main cable is damage			·	
31	Check startup protection procedures during charging			·	
Function					
32	Check Horn	·			
33	Check electromagnetic valve	·			
34	Check emergency brake	·			
35	Check reverse braking and regenerated braking	·			
36	Check belly button	·			
37	Check steering	·			

38	Check Lift up and down	·			
39	Check proximity switch of tiller	·			
Summary					
40	Check label	·			
41	Check bearing wheel and adjust height, replace if worn out		·		
42	Test one more time	·			

Lubrication points

Lubricate marked points according to maintenance list. Required grease specification: DIN 51825 standard grease.
1 load wheel bearing
2 the door frame
3 the chain
4 Hydraulic system
5 Steering bearing
6 gear box



Check and add hydraulic.
Spec of hydraulic:

- H-LP 46, DIN 51524
- Viscosity: 41.4 - 47

The amount of oil is 1.5-2.0L

Waste materials such as waste oil, batteries or other materials must be treated and recycled in accordance with national regulations and, if necessary, submitted to the recycling company for recovery. The oil level should not be lower than the minimum amount of fuel required to start the vehicle. Add oil to the filling point if necessary.

Check fuse.

Remove the main cover and the fuse is in the position shown below. Fuse specifications are shown below

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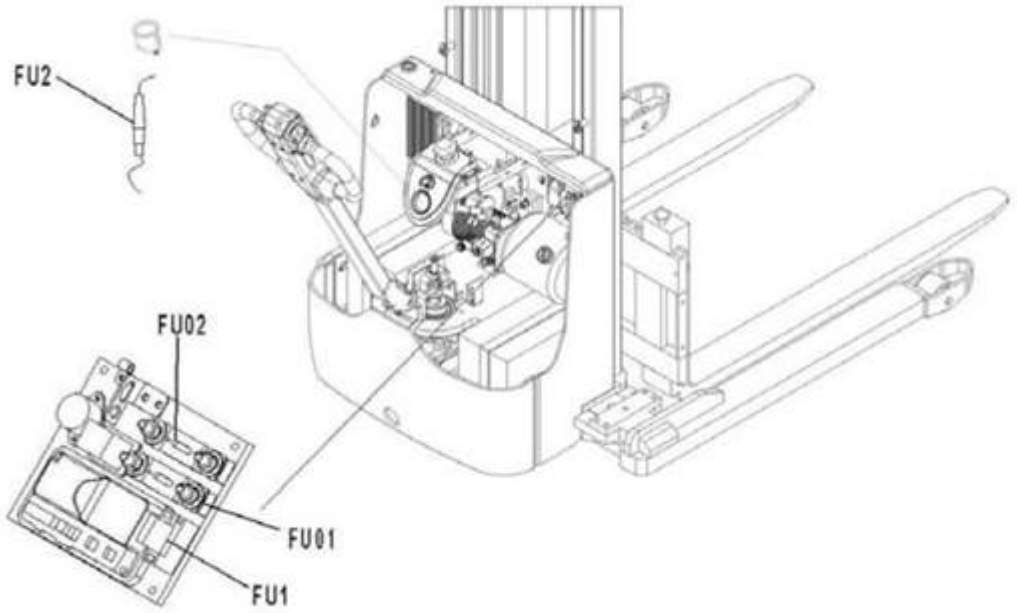

FU1 10A
FU2 0.5A
FU01 60A
FU02 100A