

NOBLELIFT

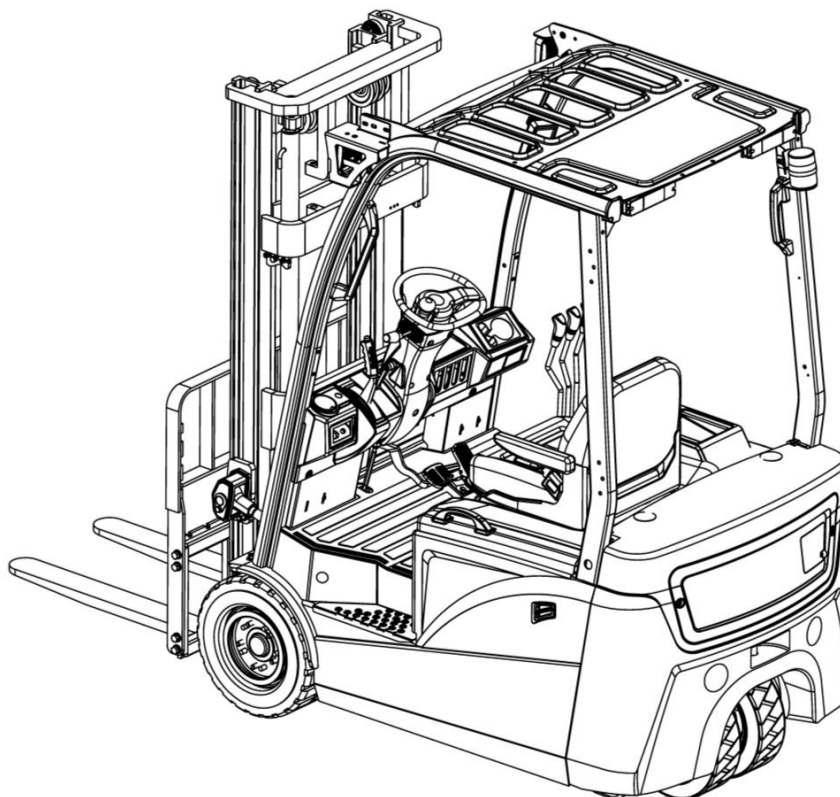


FE3D16-20N1-SMS-002



WARNING

Do not use the forklift before reading and understanding the operating instructions as well as the warning decals on the truck.
Keep for future reference.



Operation manual

FE3D16-20N1 series

battery counterbalanced forklift truck

NOBLELIFT INTELLIGENT EQUIPMENT CO., LTD.

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Introduction

This manual briefly describes the technical parameters of the counterbalanced accumulator forklift made by our company, and the structure of its main components, working principle and requirements on operation and maintenance. Please read this **ORIGINAL INSTRUCTION HANDBOOK** carefully before operation, so as to achieve proper driving and maintenance, and to ensure safe and effective material handling. Meanwhile, this manual aims to guide operators to use the forklift in an appropriate way and to maximize its performance! We hope that operators and equipment managers could read it carefully before use! Please strictly observe the provisions and cautions stipulated in this manual and operate the forklift with caution and care, so that the forklift can be maintained in its best status and optimal performance can be ensured. When you lease or transfer your forklift, always keep this manual with it.

For highlighting purpose, the following icons are used in this manual:

1.  ----Refers to a potential danger; if not avoided, it may cause serious human injury, vehicle damage or fire.
2.  ----Refers to a potential danger; if not avoided, it may cause minor human injury, or local damage to the vehicle.
3.  ----Refers to general cautions and instructions during use.

 Most parts of the product are made from recyclable steel. The recycling and disposal of cast-offs resulted during use, maintenance, cleaning and disassembling of the product has to comply with local regulations without pollution to the environment. The recycling and disposal of the cast-offs should only be operated by specialised personnel in the designated area. The cast-offs, such as hydraulic oil, battery and electronic units, if improperly disposed, may be hazardous to the environment and human health.

4. For truck operation, the following climatic conditions apply:

- average ambient temperature for continuous duty: + 25°C;
- maximum ambient temperature, short term (up to 1 h): +40°C;
- lowest ambient temperature for trucks intended for use in normal indoor conditions: +5°C;
- lowest ambient temperature for trucks intended for use in normal outdoor conditions: -20 °C;
- altitude: up to 2 000 m.

If the product needs to be used in a refrigerated warehouse or other special environmental conditions, specialized forklifts must be used. Please contact our technical engineers for support.

5. Vehicle safety monitoring device

The vehicle can be equipped with a driver authority information collector, through fingerprint, iris, facial features and other biological information or magnetic card and personal identity unique binding media price, verify the driver's operation authority, when the collector is invalid, removed or the driver information is incorrect, the vehicle cannot start.

6. nameplate

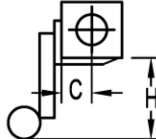
ELECTRIC FORKLIFT TRUCK

CE

Model		Specification No.	
Rated Capacity	kg	Nominal voltage	V
Load center	mm	Rated drive power	kW
Service weight	kg	Max. battery weight	kg
Weight without battery	kg	Min. battery weight	kg
Serial No.		Year of manufacture	

With attachment: Capacity at max. lifting height see attachment nameplate or load curve.

	Load center C	Max.lifting height H	Capacity at max. lifting height
Without attachment	mm	mm	kg
With attachment	mm	mm	kg



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Due to continuous product improvement, Noblelift reserves the right to make changes in product designs and specifications without prior notice. For the latest product parameters, please feel free to contact us. All parameters provided herein are as of the publication date of the Instruction Manual.

Chapter one Attentions when using the forklift truck

The operator must always keep in mind the principle of safety first. Conscientiously and cautiously read the maintenance manual. Undergo safe operation and canonical operation strictly following the demand in this manual

1. Transportation for forklift

Pay attention to the following particulars when using container or automobile to convey forklift truck

- (1) Enable parking brake
- (2) Fasten mast and counterweight with steel wire in both two sides; Chock with wedge the front and rear wheels at proper site
- (3) Hoist Lift the forklift according to indication on lifting plate

2. Deposit

- (1) Lower the mast to the lowest position
- (2) Switch off power; Push all the operating rod to vacancy; Pull out power plug
- (3) Stretch hand brake rod
- (4) Chock with wedge front and rear wheels
- (5) When truck is in long-term non-use. Wheels should be overhead. And battery should be boost charged once a month

3. Preparation before use

- (1) Check up all the meters
- (2) Check up tire pressure
- (3) Check up the state of each handle and pedal
- (4) Check up if the voltage of battery is in operating range; and whether the specific density of electrolyte and the altitude of liquid surface are in order
- (5) Check up if the contact of each connector and plug of electrical system is ok
- (6) Check up if the hydraulic liquid, electrolyte or brake fluid is leaking
- (7) Check up the condition of each main fastener
- (8) Check up if the illuminators, signal lamps are in order
- (9) Loosen parking brake
- (10) Try to lift and lower the mast, tilt forward and backward the mast, turn and brake the truck
- (11) Be sure that the polluting level of hydraulic oil is less than 12grade

4. Operation of truck

- (1) Only can the person operate the truck who has been trained and got driver's license
- (2) Operator should wear safe protective shoes, cap, costume in his operation
- (3) Pay attention to the performance and working conditions of mechanics, hydraulic, electrical and MOSFET governor when operating
- (4) Switch on the power, turn on the key, select the position of direction switch, roll the steering wheel to see if the truck is in order, step down the governor pedal slowly, keeping a

proper starting acceleration

- (5) Check the voltage meter when the truck is in working, if the value stated in the meter is less than 72V, stop working immediately, charge the battery or change another fully charged battery

- (6) When conveying, the load should not exceed the rated capacity. The separation and position of forks should be appropriate, insert the forks absolutely downside the load, make the

load uniformly distributed on the forks; to prevent load from deviation

(7) When the distance between the load' gravity center and yoke is equal or less than 500mm. The maximum load capacity should be the rated capacity, and when the distance between the load' gravity center and yoke is more than 500mm; the maximum load capacity should be less than the rated capacity

(8) When forks are bearing load, tilt backwards mast mostly, the yoke should always contact with load; lift forks upto 200mm high from ground before driving

(9) No standing under forks, no standing on forks when lifting

(10) The starting speed should not be too fast when starting to lift and lower the load

(11) No operation of truck and it' s additions without sitting on the driver's seat

(12) Push handle immediately to middle position when the mast has tilted forward or backward to the extreme position

(13) No driving or turning when the mast is lifting

(14) When travelling, pay attention to passers by, obstacles, irregular road and the clearance of upper side of forklift

(15) Be careful of travelling on slope, when the angle of slope is more than 10%, travel forward upslope and travel backward downslope. no turning on slope, no loading or unloading when travelling downslope

(16) Reduce speed when turning on the damp or slick road, take special care and drive slowly when travelling on dock or on temporary board

(17) Operating high lift range truck of which the lifting height is more than 3m, pay attention to the dropping of the load, and take measures to prevent it when necessary

(18) Don't convey unfastened or loosely stacked load, be careful when conveying large-size load

(19) When travelling with load, avoid emergency brake

(20) When leaving the truck, lower the forks to ground; push lever to free position, switch off power, when parking on the slope, pull tight the brake apparatus and plug the wheels with wedge if the parking time is long

(21) The protection valves on multiway valve and on steering device are already regulated, so the users shouldn't regulate randomly when using to prevent that the excessively high oil pressure leads to the damage of the whole hydraulic system and the burnout of the electric motor

(22) Charge the tyres according to the pressure value stated in "tire pressure" indication

(23) Treat the operation of non-load truck with additional apparatus as the operation load truck

5.The Use of Lithium Battery

Use the battery pack in strict accordance with the conditions specified in the battery pack instruction manual. Otherwise, the battery pack may not be covered by the warranty.

(1) Do not operate electric vehicles equipped with lithium batteries at temperatures above 55 °C or below -25 °C

(2) Under low temperature conditions below 0°C, please charge the vehicle immediately after use, please charge the vehicle immediately after use

(3) Do not flush the battery container directly to prevent water from entering the battery container

(4) Do not touch, remove, or disassemble the battery pack, high-voltage cables, or other components with high-voltage warning labels except Professional

(5) If the vehicle is involved in a strong collision, stop the vehicle in a safe area and check the battery pack area for damage

(6) When the vehicle or battery pack is on fire, leave the vehicle quickly to a safe distance and use a dry powder fire extinguisher to deal with the fire. Using water to extinguish the fire or putting out the fire with an incorrect fire extinguisher may lead to electric shock. According to the characteristics of the battery, the battery capacity attenuation range is 0% to 25% within the three-pack period

(7) The charging temperature ranges from 0°C to 40°C. Under low temperature conditions

below 0°C, charging at high rate may cause damage to the battery. Under low temperature conditions below 0°C, charge the vehicle immediately after use

- (8) Discharge temperature range: -20 ~ 50°C, the discharge capacity at (-20 ~ 0°C) may be lower than that at normal temperature. The battery can be used at 40 ~ 50 °C. However, if the battery temperature is too high, especially if the battery is in a high temperature environment for a long time, the aging of the materials inside the battery will be accelerated and the service life of the battery will be shortened
- (9) If the ambient temperature exceeds the temperature range, the battery performance may be adversely affected or damaged, and the service life of the battery may be shortened, so please avoid

6.The Use of Lead-acid Battery

- (1) When the battery pack is charged for the first time and replenishment, it must strictly comply with the provisions of the battery manual
- (2) When the voltage of the battery pack is reduced to 41V or the voltage of any single battery is lower than 1.7V, or the instrument gives an alarm, the forklift truck should stop working immediately and continue to use after charging or replacing the battery pack
- (3) When charging, check the specific gravity of the electrolyte, liquid level height and temperature at any time
- (4) After the forklift is used, the battery must be charged as soon as possible, and the placement time shall not exceed 24 hours. When charging, it is necessary to prevent insufficient and overcharging, so as not to damage the battery
- (5) In normal use, forklifts should be charged once a month in a balanced manner to adjust the proportion of each battery group.

Please refer to relevant sections of this manual for detailed charging method and operation and maintenance

Chapter two The main performance parameters of forklift truck

I . Overall size and performance parameters of the forklift

1. The truck's outline dimension see figure 1-1

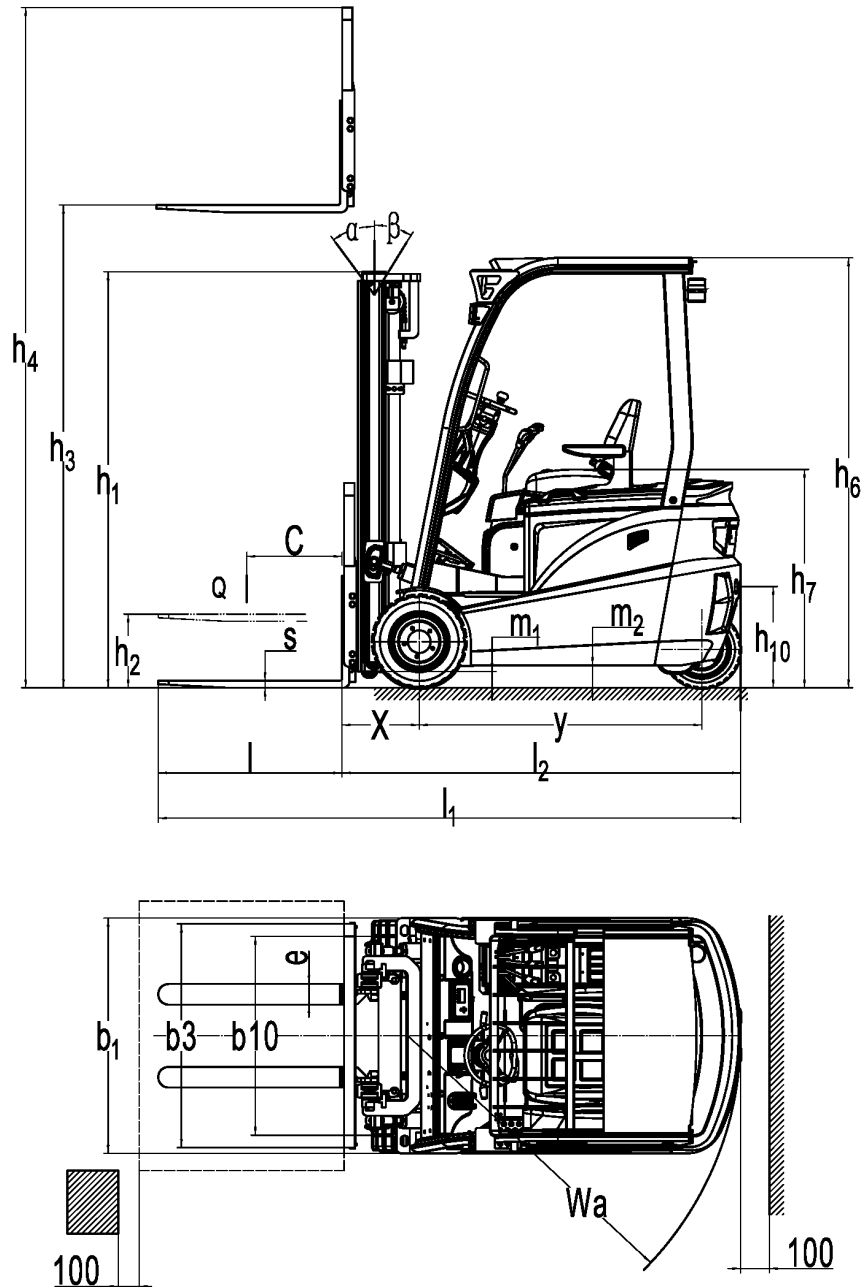


Figure 1-1 outline

2. Technical data

2.1FE3D16N1

E-M oto	Identification	1.1	Manufacture(abbreviation)		Noblelift
		1.2	Manufacturer's type designation		FE3D16N1
		1.3	Drive:electric(battery or mains),diesel,petrol gas,manual)		electric
		1.4	Type of operation(hand,pedestrian,standing,seated,order-picker)		seated
		1.5	Load capacity/rated load	Q (kg)	1600
		1.6	Load centre distance	C (mm)	500
		1.8	Load distance,centre of drive axle to fork	x (mm)	372
		1.9	wheelbase	y (mm)	1360
	Weights	2.1	Service weight incl. battery(see line 6.5)	kg	3080
		2.2	Axle loading ,laden front/rear	kg	4160/520
		2.3	Axle loading,unladen front/rear	kg	1470/1610
	Wheels、Chassis	3.1	Type:solid rubber, superelastic, pneumatic, polyurethane		solid rubber
		3.2	Tyres size, front		18×7-8
		3.3	Tyres size, rear		140/55-9
		3.5	Wheels, number front/rear(×=driven wheels)		2×/2
		3.6	Track width, front	b ₁₀ (mm)	902
		3.7	Track width, rear	b ₁₁ (mm)	210
	Basic Dimensions	4.1	Mast/fork carriage tilt forward/backward	$\alpha / \beta (^{\circ})$	5/7
		4.2	lowered mast height	h ₁ (mm)	2150
		4.3	Free lift	h ₂ (mm)	120
		4.4	Lift height	h ₃ (mm)	3000
		4.5	Extended mast height	h ₄ (mm)	3955
		4.7	Overhead load guardheight	h ₆ (mm)	2100
		4.8	Seat height/standing height	h ₇ (mm)	1005
		4.12	Coupling height	h ₁₀ (mm)	520
		4.19	Overall length	l ₁ (mm)	2925
		4.20	Length to face of forks	l ₂ (mm)	2005
		4.21	Overall width	b ₁ (mm)	1084
		4.22	Fork dimensions	s/e/l (mm)	35/100/920
		4.24	Fork carriage width	b ₃ (mm)	1040
		4.31	Ground clearance ,laden, under mast	m ₁ (mm)	115
		4.32	Ground clearance,centre of wheelbase	m ₂ (mm)	105
		4.33	Aisle width for pallets 1000×1200 crossways	Ast (mm)	3318
		4.34	Aisle width for pallets 800×1200 lengthways	Ast (mm)	3443
		4.35	Turning radius	Wa (mm)	1620
	Performance Data	5.1	Travel speed, laden/unladen	km/h	15/15
		5.2	Lift speed, laden/unladen	m/s	0.40/0.50
		5.3	lowering speed, laden/unladen	m/s	0.50/0.50
		5.5	Max. Drawbar pull, laden/unladen	N	11500/10500
		5.7	Max. Gradient performance, laden/unladen	%	15/20
		5.10	Service brake		hydraulic
		6.1	Drive motor rating S ₂ 60 min	kW	5.5*2

	6.2	Lift motor rating at S ₃ 15%	kW	12
	6.3	Battery standard		Lion
	6.4	Battery voltage,nominal capacity K _s	V/Ah	76.8/125 (150/277/412)
	6.5	Battery weight	kg	160/230/300
		Battery dimensions l/w/h	mm	819×400×605
Other Details	8.1	Type of drive control		AC
	8.2	Operating pressure for attachments	Mpa	17.5
	8.3	Oil volume for attachments	l/min	36
	8.4	Sound level at driver's ear according to EN 12 053	dB(A)	73

2.2 FE3D18N1

Identification	1.1	Manufacture(abbreviation)		Noblelift
	1.2	Manufacturer's type designation		FE3D18N1
	1.3	Drive:electric(battery or mains),diesel,petrol gas>manual)		electric
	1.4	Type of operation(hand,pedestrian,standing,seated,order-picker)		seated
	1.5	Load capacity/rated load	Q(kg)	1800
	1.6	Load centre distance	C(mm)	500
	1.8	Load distance,centre of drive axle to fork	x(mm)	377
	1.9	wheelbase	y(mm)	1360
Weights	2.1	Service weight incl. battery(see line 6.5)	kg	3200
	2.2	Axle loading ,laden front/rear	kg	4450/550
	2.3	Axle loading,unladen front/rear	kg	1530/1670
Wheels、Chassis	3.1	Type:solid rubber, superelastic, pneumatic, polyurethane		solid rubber
	3.2	Tyres size,front		18×7-8
	3.3	Tyres size,rear		140/55-9
	3.5	Wheels,number front/rear(×=driven wheels)		2×/2
	3.6	Track width,front	b ₁₀ (mm)	902
	3.7	Track width,rear	b ₁₁ (mm)	210
Basic Dimensions	4.1	Mast/fork carriage tilt forward/backward	$\alpha / \beta (^{\circ})$	5/7
	4.2	lowered mast height	h ₁ (mm)	2150
	4.3	Free lift	h ₂ (mm)	125
	4.4	Lift height	h ₃ (mm)	3000
	4.5	Extended mast height	h ₄ (mm)	3955
	4.7	Overhead load guardheight	h ₆ (mm)	2100
	4.8	Seat height/standing height	h ₇ (mm)	1005
	4.12	Coupling height	h ₁₀ (mm)	520
	4.19	Overall length	l ₁ (mm)	3080
	4.20	Length to face of forks	l ₂ (mm)	2010
	4.21	Overall width	b ₁ (mm)	1084
	4.22	Fork dimensions	s/e/l(mm)	40/100/1070
	4.24	Fork carriage width	b ₃ (mm)	1040
	4.31	Ground clearance ,laden,under mast	m ₁ (mm)	115
	4.32	Ground clearance,centre of wheelbase	m ₂ (mm)	105
	4.33	Aisle width for pallets 1000×1200 crossways	Ast(mm)	3323

	4.34	Aisle width for pallets 800×1200 lengthways	Ast (mm)	3447
	4.35	Turning radius	Wa (mm)	1620
Performance Data	5.1	Travel speed, laden/unladen	km/h	15/15
	5.2	Lift speed, laden/unladen	m/s	0.40/0.50
	5.3	lowering speed, laden/unladen	m/s	0.50/0.50
	5.5	Max. Drawbar pull, laden/unladen	N	12500/11500
	5.7	Max. Gradient performance, laden/unladen	%	15/20
	5.10	Service brake		hydraulic
E-Motor	6.1	Drive motor rating S ₂ 60 min	kW	5.5*2
	6.2	Lift motor rating at S ₃ 15%	kW	12
	6.3	Battery standard		Lion
	6.4	Battery voltage, nominal capacity K _s	V/Ah	76.8/125/ (150/277/412)
	6.5	Battery weight	kg	160/230/300
		Battery dimensions l/w/h	mm	819×400×605
Other Details	8.1	Type of drive control		AC
	8.2	Operating pressure for attachments	Mpa	17.5
	8.3	Oil volume for attachments	l/min	36
	8.4	Sound level at driver's ear according to EN 12 053	dB(A)	73

2.3FE3D20N1

	1.1	Manufacture (abbreviation)		Noblelift
	1.2	Manufacturer's type designation		FE3D20N1
	1.3	Drive: electric (battery or mains), diesel, petrol gas, manual)		electric
	1.4	Type of operation (hand, pedestrian, standing, seated, order-picker)		seated
	1.5	Load capacity/rated load	Q (kg)	2000
	1.6	Load centre distance	C (mm)	500
	1.8	Load distance, centre of drive axle to fork	x (mm)	377
	1.9	wheelbase	y (mm)	1360
Weights	2.1	Service weight incl. battery (see line 6.5)	kg	3400
	2.2	Axle loading, laden front/rear	kg	4790/610
	2.3	Axle loading, unladen front/rear	kg	1640/1760
Wheels, Chassis	3.1	Type: solid rubber, superelastic, pneumatic, polyurethane		solid rubber
	3.2	Tyres size, front		200/50-10
	3.3	Tyres size, rear		140/55-9
	3.5	Wheels, number front/rear (×=driven wheels)		2×/2
	3.6	Track width, front	b ₁₀ (mm)	940
	3.7	Track width, rear	b ₁₁ (mm)	210
Basic Dimensions	4.1	Mast/fork carriage tilt forward/backward	α / β (°)	5/7
	4.2	lowered mast height	h ₁ (mm)	2150
	4.3	Free lift	h ₂ (mm)	125
	4.4	Lift height	h ₃ (mm)	3000
	4.5	Extended mast height	h ₄ (mm)	3955
	4.7	Overhead load guard height	h ₆ (mm)	2100

	4.8	Seat height/standing height	h_7 (mm)	1005
	4.12	Coupling height	h_{10} (mm)	520
	4.19	Overall length	l_1 (mm)	3080
	4.20	Length to face of forks	l_2 (mm)	2010
	4.21	Overall width	b_1 (mm)	1145
	4.22	Fork dimensions	s/e/l (mm)	40/100/1070
	4.24	Fork carriage width	b_3 (mm)	1040
	4.31	Ground clearance , laden, under mast	m_1 (mm)	115
	4.32	Ground clearance, centre of wheelbase	m_2 (mm)	105
	4.33	Aisle width for pallets 1000×1200 crossways	A_{st} (mm)	3147
	4.34	Aisle width for pallets 800×1200 lengthways	A_{st} (mm)	3347
	4.35	Turning radius	W_a (mm)	1620
Performance Data	5.1	Travel speed, laden/unladen	km/h	15/15
	5.2	Lift speed, laden/unladen	m/s	0.40/0.50
	5.3	lowering speed, laden/unladen	m/s	0.50/0.50
	5.5	Max. Drawbar pull, laden/unladen	N	13500/12500
	5.7	Max. Gradient performance, laden/unladen	%	15/20
	5.10	Service brake		hydraulic
E-Motor	6.1	Drive motor rating S_2 60 min	kW	5.5*2
	6.2	Lift motor rating at S_3 15%	kW	12
	6.3	Battery standard		Lion
	6.4	Battery voltage, nominal capacity K_3	V/Ah	76.8/125 (150/277/412)
	6.5	Battery weight	kg	160/230/300
		Battery dimensions l/w/h	mm	819×400×605
Other Details	8.1	Type of drive control		AC
	8.2	Operating pressure for attachments	Mpa	17.5
	8.3	Oil volume for attachments	l/min	36
	8.4	Sound level at driver's ear according to EN 12 053	dB(A)	73

II. Structure, principle and adjustment of the main parts of forklift

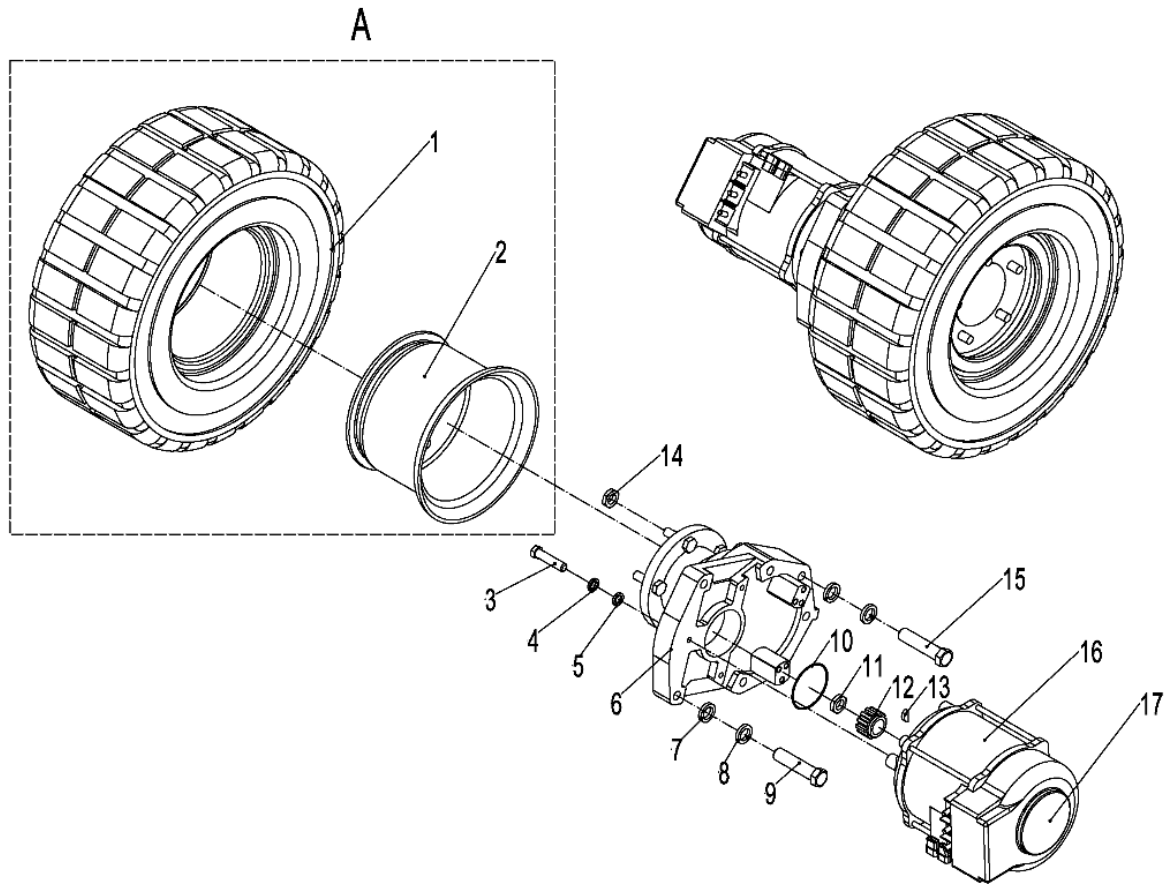
1. Transmission system

1.1 Overview

The transmission system of the forklift consists of two transmission assemblies and two drive motors. The driving gears of the transmission are directly connected to the drive motors. As the rotational speed of the motors increases, the speed of the forklift's movement also increases. The change in the direction of travel is achieved by changing the rotation direction of the motors.

1.2 Drive system

The gearbox is directly installed on the frame. One end is connected to the traveling motor, and the other end is equipped with the tires.. Figure 2-1.



- | | | | |
|-------------------|-------------|---------------------|------------------|
| 1-Tyre | 2-Rim | 3-Bolt | 4- Spring washer |
| 5-Washer | 6- Gearbox | 7-Washer | 8-Spring washer |
| 9-Bolt | 10-O-ring | 11-Self-locking nut | 12- Pinion |
| 13- Woodruff key | 14- Rim nut | 15-Bolt | 16-Motor |
| 17- Motor encoder | | | |

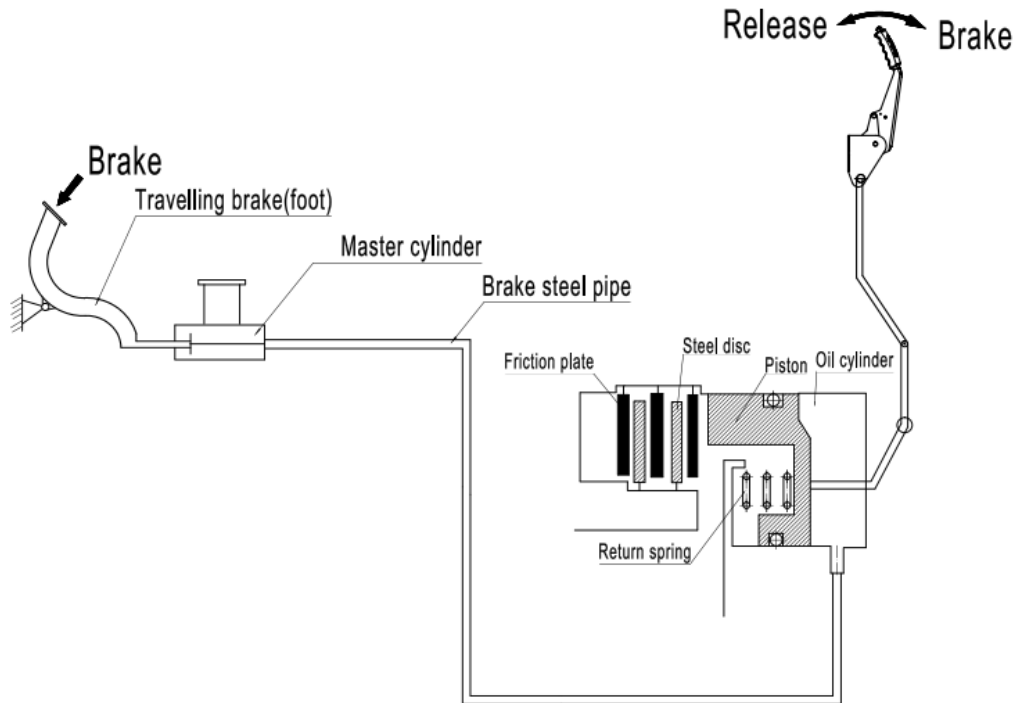
Figure 2-1 Reducer

2. Brake

3. System

3.1 Overview - Schematic diagram of braking system

The braking system is composed of brake pedal, brake master pump and wheel brake, which is the front wheel internal expansion hydraulic brake.

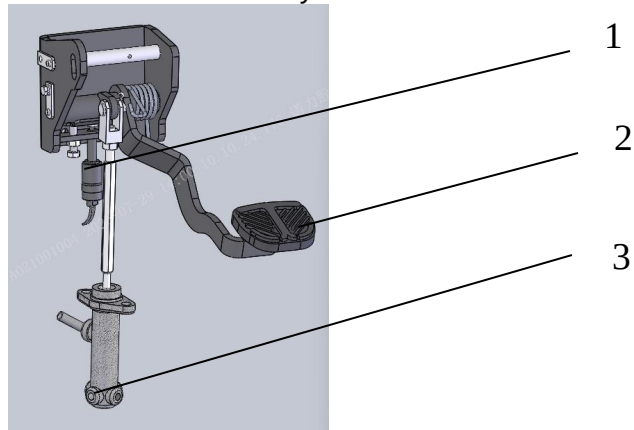


(Schematic diagram of braking system)

- (1) When driving, when the foot brake is pressed, the brake fluid in the brake master pump is pushed through the brake steel pipe to enter the brake sub-pump, and the brake shoes are pushed open to realize the service brake; Release the pedal to cancel the service brake.
- (2) When parking, when the rear handle brake, the brake shoe is pulled open by the brake to realize the parking brake; Release the pedal to cancel the parking brake.

3.2 Brake pedal

The structure of brake pedal is shown in Figure 2-2. The pedal would transfer the pedal force into brake oil pressure through the push rod on the brake master cylinder.



1. brake switch

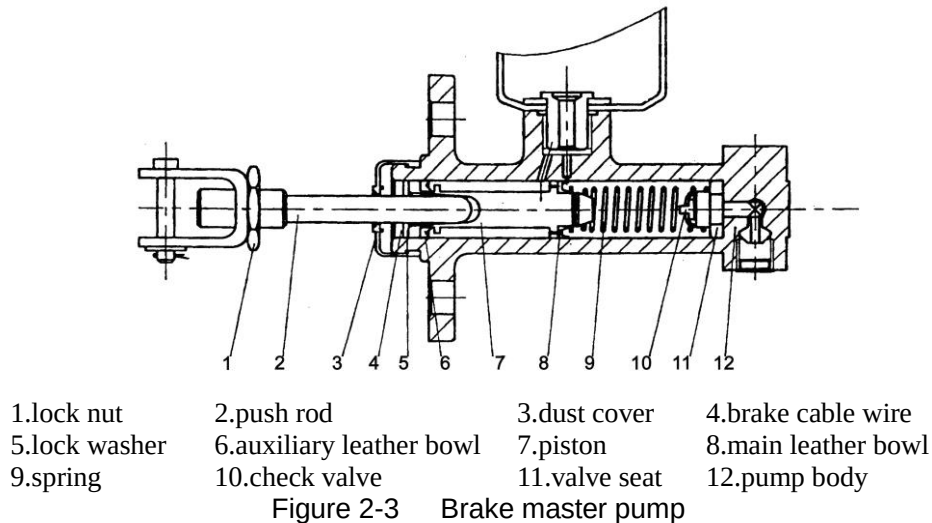
2. brake pedal

3. brake master cylinder

Figure 2-2 Brake pedal assembly

3.3 Brake master pump

The master pump includes a seat, a check valve, a return spring, and a main bowl, piston and auxiliary bowl. The end is fixed with stop washer and stop wire, and the exterior is protected by rubber dust cover. The piston of the master pump acts by operating the brake pedal through the push rod. When the brake pedal is stepped down, the push rod pushes the piston forward, and the brake fluid in the pump body flows back to the oil storage tank through the oil return port until the main leather bowl blocks the oil return hole. After the main bowl is pushed through the oil return port, the brake fluid in the front chamber of the main pump is compressed and the check valve is opened, which flows to the sub-pump through the brake line. In this way, the piston of each sub-pump extends outward, so that the brake shoe friction plate and the brake drum contact, to achieve the effect of slowing down or braking. At this time, the piston rear chamber is replenished by the brake fluid from the oil return and oil intake ports. When the brake pedal is released, the piston is pressed by the return spring, and the brake fluid in each brake pump is also compressed by the brake shoe return spring, so that the brake fluid returns to the main pump (piston front chamber) through the check valve, the piston returns to its original position, and the brake fluid in the main pump flows back to the oil storage tank through the return port. The pressure of the check valve is adjusted to a certain proportion of the remaining pressure in the brake line and brake pump, so that the leather bowl of the score pump is placed correctly to prevent oil leakage, and to eliminate the air resistance phenomenon that may occur when the emergency brake.



3.4 Parking brake control device

The parking brake handle is CAM type and the braking force can be adjusted by a regulator located at the end of the brake handle.

Adjustment of braking force: Turn the regulator clockwise to increase the braking force; Turning the regulator counterclockwise reduces the braking force.

Tension: 196N ~ 294N

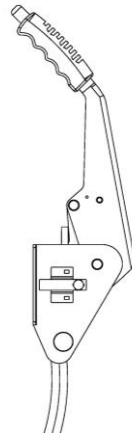


Figure 2-4 Parking brake pedal

3.5 Brake pedal adjustment

- (1) Shorten the putter;
- (2) Adjust the pedal limit bolt, as shown in Figure 2-5. (b) Adjust the pedal height;
- (3) Adjust the length of the push rod until the front end of the push rod contacts the piston of the main pump, and then retreat 1-2 turns to ensure that the free travel of the pedal is between 10mm-20mm;
- (4) Lock the push rod nut and pedal limit bolt nut.



limit bolt Push rod Brake pedal
(a)



The height of the pedal is generally controlled at around 90-100mm.

(b)

Figure 2-5

- (5) Adjust the brake switch as shown in Figure 2-6
- (a) Loosen the lock nut of the brake switch after the brake pedal height is adjusted;
- (b) Unplug the wire and let it separate;
- (c) Turn the switch so that the gap A=1mm;
- (d) Confirm that the brake light should be on when the brake pedal is down;
- (e) Finally lock the nut.

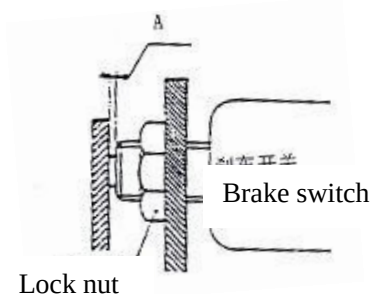


Figure 2-6 Brake light switch

3.6 Fault analysis and remove method

Table 2-1

Trouble	Analysis of genesis and origin	Remove method
Poor braking	1.Oil leakage of brake system	Repair
	2.Brake shoe clearance is not adjusted properly	Adjust regulator
	3.Brake overheat	Check for skid
	4.The brake drum is in poor contact with the friction plate	Readjust
	5.The impurities are attached to the friction plate	Repair or replace
	6.The impurities get mixed into the brake fluid	Check brake fluid
	7.Improper adjustment of brake pedal (micro valve)	Adjust
Brake noise	1.The surface of the friction plate is hardened or impurities are attached to it	Repair or rplace
	2.The bottom plate is deformed or the bolt is loose	Repair or rplace
	3.Brake shoes are deformed or improperly installed	Repair or rplace
	4.Friction plate wear	Replace
	5.Wheel bearing loose	Repair or rplace
Uneven braking	1.There is oil on the surface of the friction sheet	Repair or rplace
	2.Brake shoe clearance is adjusted at last	Adjust regulator
	3.Split pump failure	Repair or rplace
	4.Brake shoe return spring is damaged	Replace
	5.Brake drum deflection	Repair or rplace
Weak braking	1.Oil leakage of brake system	Repair or rplace
	2.Brake shoe clearance is not adjusted properly	Repair or rplace
	3.The braking system is mixed with air	Reliease air
	4.Improper adjustment of brake pedal	Readjust

3.7 Maintenance

- 1) Gear oil should be added before the new drive axle running test (gear oil should be selected in strict accordance with the instructions, please refer to Table 2-1 for specific models). When refueling, oil should be injected from the refueling hole in the upper part of the axle housing until oil is spilled from the oil level hole in the middle of the axle housing.
- 2) The thickness of the friction plate on the brake shoe is 8mm. The minimum allowable thickness is 2mm. These two parts are the key parts of the brake system, should be checked once a month, if found excessive wear and tear need to be replaced in time to avoid accidents.
- 3) Technical maintenance every 50h:
 - (1) The gear oil should be replaced after the new bridge works with the main engine for

50h. When changing the oil, the bridge should be cleaned and then added with new oil.

- (2) Check the fastening condition of each fastener, find loose, tighten immediately.
- (3) Check whether there is oil leakage at the connection between the half axle and the hub of the wheel. If there is leakage, reapply sealant.
- 4) Monthly technical maintenance:
 - (1) Check the wear condition of the brake drum for any destructive wear.
 - (2) Check the wear of brake shoes. When the wear does not meet the requirements of use, it should be replaced immediately.
 - (3) Check whether the oil level of the axle housing meets the requirements. If the oil level decreases, it should be made up in time.
- 5) Technical maintenance every six months: the gear oil in the bridge should be replaced every six months.
- 6) Annual technical maintenance: a year of work should be disintegrated inspection.
- 7) Requirements for inspection and commissioning projects in the installation process:

When the drive axle hub is re-installed, attention should be paid to adjusting the brake clearance regulator, so that the clearance between the brake drum and the friction plate is between 0.3mm ~ 0.5mm. The tapered roller bearing on the wheel hub should be filled with about 100ml of 3# lithium grease.

Wheel rim hub bearing clearance adjustment: tighten the inner nut until the hub brake drum can only barely rotate. Then reverse the inner lock nut 1/8 turn, at this time, the hub brake drum should be able to rotate freely, no stuck phenomenon, and no obvious axial clearance and yaw phenomenon, then assemble the lock washer, and finally lock with the outer lock nut.

4. Steering system

4.1 Overview

The steering system (Figure 2-7) is mainly composed of a steering wheel, steering shaft, steering device, steering oil pump and steering bridge. The steering shaft is connected to the steering gear through the universal joint, and the connecting shaft is connected to the steering wheel through the universal joint. The steering string can be tilted to the appropriate position through the handle (A). The steering axle is installed on the tail frame at the rear of the frame, and there is a steering joint on the left and right respectively. The steering joint is driven by the piston rod of the steering cylinder through the connecting rod to deflect the steering wheel and realize steering.

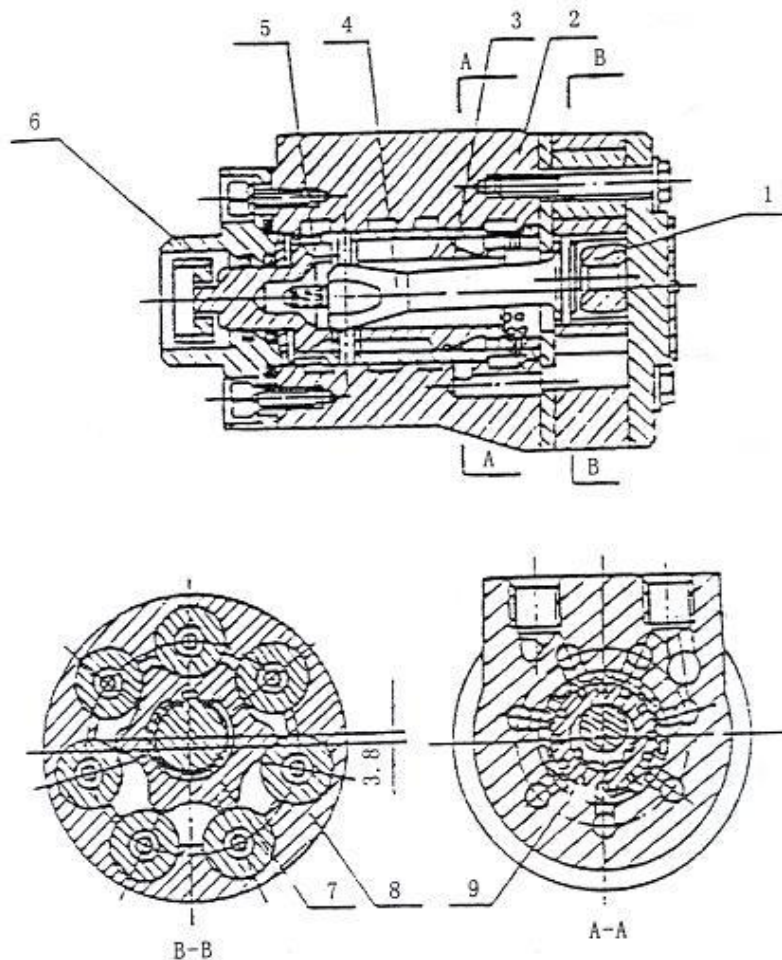


Figure 2-7 Steering control device

4.2 Full Hydraulic cycloid redirector

Full Hydraulic redirector (figure 2-8) can transfer pressure liquid from pump to oil cylinder according to rotatory angle of steering wheel. When hydraulic system failure, steering operation can be done by manpower.

The redirector consists of a normal redirector and an assembled valve, there is a safety valve which located in the hole of top cover of assembled valve, also there is a two-way overloading valve in valve body to be used to prevent damage on equipment when hydraulic pressure is too high produced by impact of outside force which is from ground to wheels during travelling. Both safety valve and two-way overloading valve are regulated in optimum by manufacturer, so, users shall not regulate it randomly.



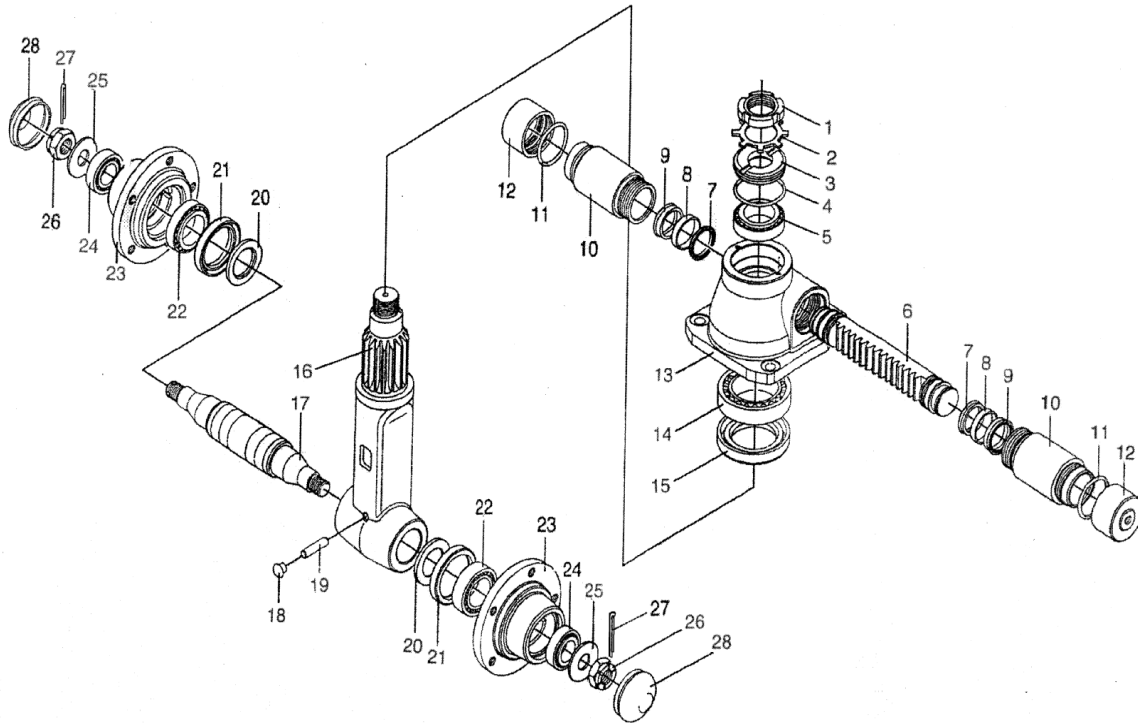
- | | | |
|--------------|---------------------------|----------------|
| 1 Limit pin | 4 Universal driving shaft | 7 Rotor |
| 2 Valve body | 5 Spring slice | 8 Stator |
| 3 valve core | 6 Joint piece | 9 Valve pocket |

Figure 2-8 Hydraulic cycloid redirector

4.3 Steering axle

The steering bridge is a welded structure with box cross-section (as shown in Figure 2-9), which is composed of steering bridge body, steering cylinder, connecting rod, steering knuckle, steering wheel and other components. The steering trapezoid adopts a crank slider mechanism, and the cylinder piston rod drives the steering knuckle through the connecting rod to make the

steering wheel offset, so as realize the steering. The steering bridge is bolted to the tail frame at the rear of the frame by the front and rear pins through the fixed plate that is the damping pad, so that the bridge can swing around the pin shaft. There is a steering knuckle on the left and right of the steering bridge, and the rear hub is mounted on the steering knuckle shaft with two tapered roller bearings. The wheel is fixed on the hub through the rim, and the inner side of the bearing is equipped with an oil seal to keep the grease in the hub and the steering knuckle cavity.



1.hexagonal head nut	2.spacer	3.retainer	4.seal ring
5.bearing	6.spline	7.seal ring	8.guide sleeve
9.seal ring	10.bush	11. seal ring	12.cover
13.cylinder	14.bearing	15. seal ring	16.gear shaft
17.main shaft	18.plug	19.pin	20.spacer
21. seal ring	22.bearing	23.wheel hub	24. bearing
25. washer	26.hexagon bolt	27.cotter pin	28.cover

Figure 2-9 Steering axle

4.4 Key points of adjustment and maintenance

- (1) Grease the hub, inner and outer bearings, and inner cavity of the hub cap. Grease the lip of the oil seal as well;
- (2) Fix the bearing outer ring on the hub and install the hub on the knuckle shaft;
- (3) Install the washer flat and tighten the grooved nut to a torque of 206-235N.m(21-24kgm), loosen the grooved nut and then screw the nut again to a torque of 9.8N.m(1kgm);
- (4) Gently knock the hub with a wooden hammer and turn the hub 3-4 turns to ensure that the hub is not loose;

- (5) Tighten the groove nut so that the groove is aligned with the cotter pin hole on the steering knuckle;
- (6) Gently beat the hub with a wooden hammer, turn the hub 3-4 turns by hand to ensure smooth rotation, and measure the rotational moment of the hub, the value of which is 2.94-7.8N.m (0.3-0.8kgm);
- (7) When the rotational torque is higher than the specified value, it can be returned 1/6 turn, and then measured the rotational torque;
- (8) When the specified torque is reached, the cotter pin is used to lock the groove nut.

4.5 Reinstallation checking of steering system

- (1) Turn the steering wheel around and play to see whether the force is uniform, whether the rotation is smooth;
- (2) Check whether the oil pressure pipeline layout is correct and whether the left and right steering is inverted;
- (3) Push up the rear wheel, slowly turn the steering wheel left and right, and repeat several times to remove air from the hydraulic line and cylinder.

4.6 Fault analysis

Table 2-2

Trouble	Cause analysis	Remove method
Failure of steering wheel	The oil pump is damaged or malfunctioning.	Replace
	The hose or joint is damaged or the pipe is blocked.	Replace or clean
Steering wheel overweight	The safety valve pressure is too low.	Adjust pressure
	There is air in the oil line.	Eliminate air
	Steering gear reset failure, positioning spring broken or insufficient elasticity.	Replace leaf spring
	There is too much leakage in the steering cylinder.	Check the piston seal
The forklift snake or swing	The spring is broken or unelastic.	Replace
Loud work noise	The oil level in the tank is low.	Add oil
	Suction tube or oil filter is blocked.	Clean or replace
Oil leak	The steering cylinder guide sleeve seal is damaged or the pipe or connector is damaged.	Replace

4. Electric system

The electric system of FE3D16-20N forklift truck is powered by 48V lead-acid/lithium battery pack and the traction power of the vehicle is provided by AC motor. The lifting power of goods is driven by the AC motor to generate oil pressure from the oil pump, and then the cargo fork is lifted, tilted and moved sideways by the hydraulic pipeline through the hydraulic cylinders on both sides of the mast. The sound optic system is powered by lead-acid/lithium battery at 48V to 24V.

4.1 Control system

AC controller, this type of controller integrates high safety, reliability, flexibility, convenient operation in one, through advanced control software to ensure that the motor in different modes, can run smoothly, including full speed and high torque state regenerative braking, zero speed and torque control, proprietary input/output port and software, The controller can ensure the economy and high efficiency of electromagnetic braking and hydraulic control system. The selected AC variable frequency motor is efficient, durable and basically maintenance-free.

The control system is mainly Curtis system, Inmotion system.



Figure 2-10Curtis controller



Figure 2-11 songzheng controller

4.2 Electrical schematic diagram

4.2.1 Electrical schematic diagram—Curtis(Figure2-12)

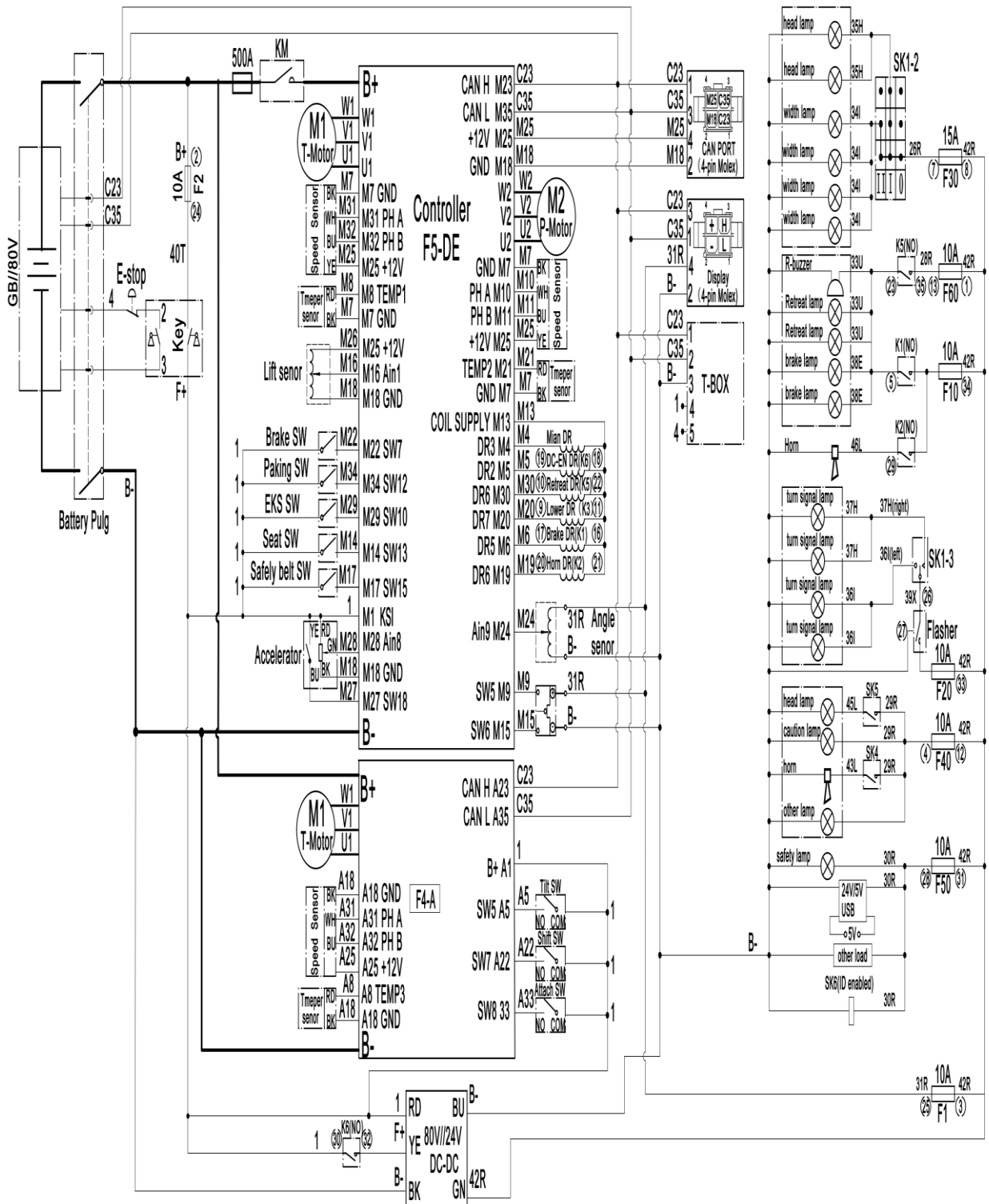


Figure 2-12 Electrical schematic diagram—Curtis

4.2.2 Electrical schematic diagram—Inmotion(Figure2-13)

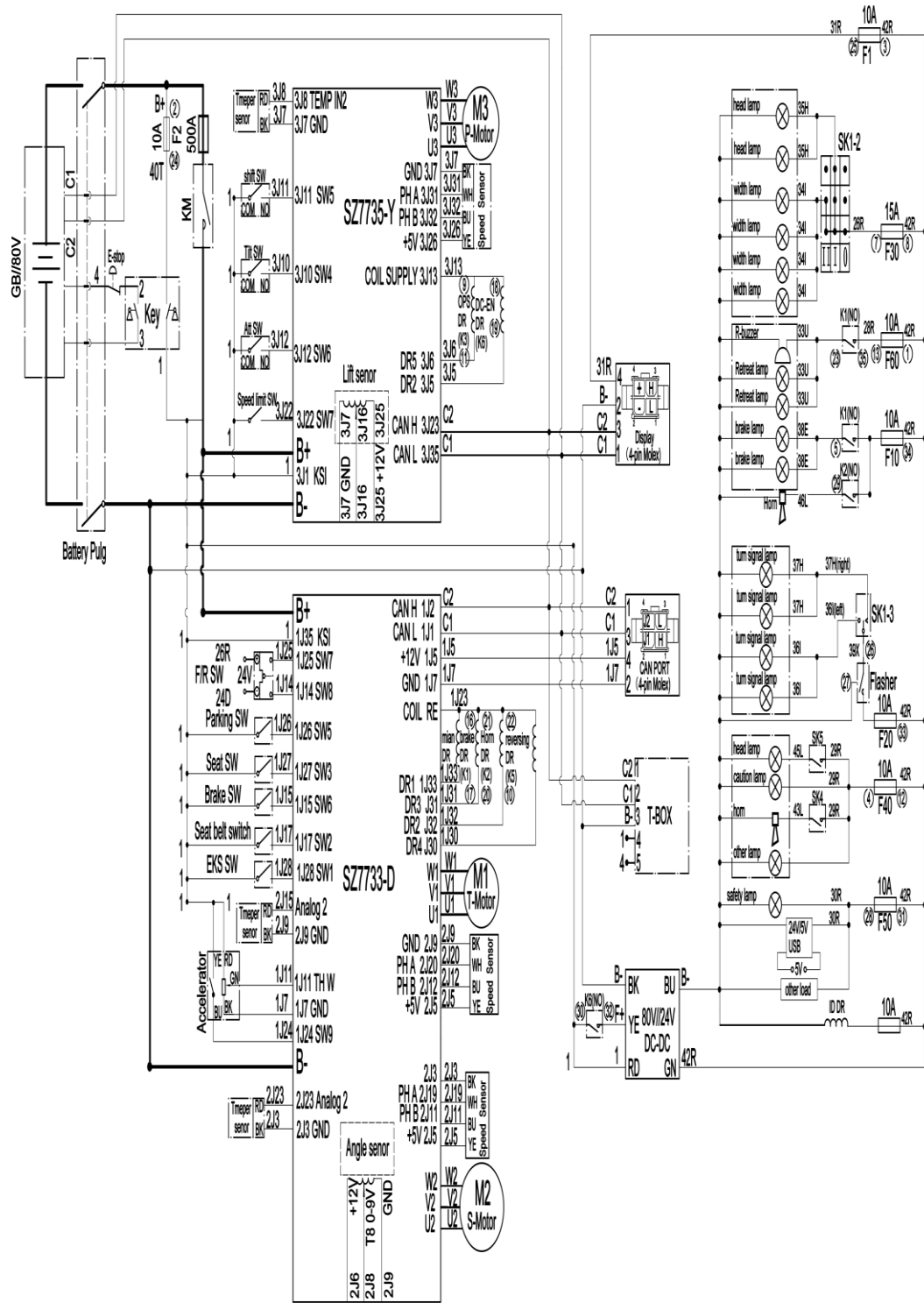
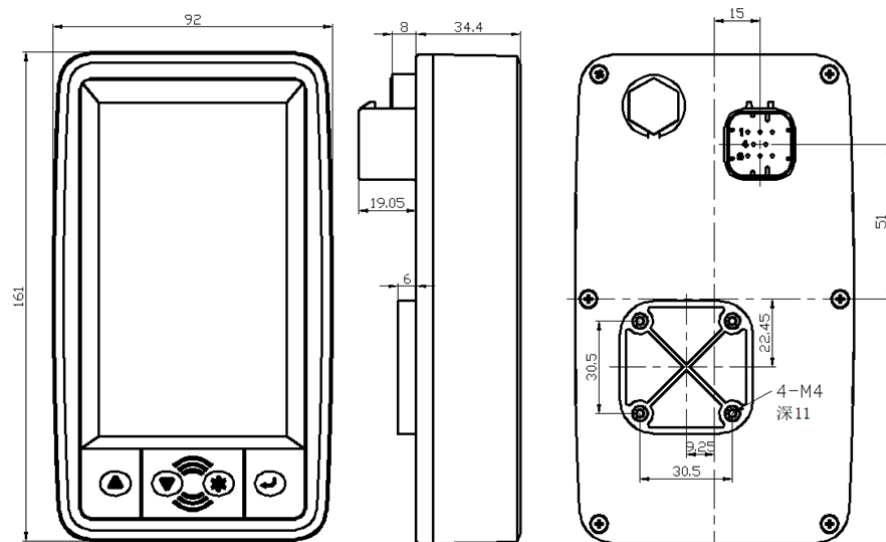


Figure2-13 Electrical schematic diagram—songzheng

4.3 Combination instrument

1. Instrument panel buttons



4.3 Combination instrument



1	Battery level alarm	13	Working hours
2	Parking brake sign	14	Function key (up)
3	Seat belt sign	15	Function key (down)
4	Seat sensing sign	16	Function key (Enter key)
5	Lift forbid sign	17	Function key (back)
6	Gear signal identification (Forward & backward)	18	Fault code
7	Travel speed	19	Fault prompt identifier
8	Driving authority mark	20	Fault explanation
9	Mileage		
10	Velocity mode		
11	Battery level		
12	Temperature and pressure (offload fork)		

Under the main interface, press 2 keys to switch between the three working modes: low-speed mode S, medium-speed mode E, and high-speed mode P, and the mode indicator icon changes accordingly.



The instrument contains the function of monitoring the vehicle system. Press the third button function key to enter the interface for query.

4.4 Failure analysis

Serial number	Fault code	Fault content	Alarm level	Eliminate the condition
1	01	Pedal High Failing	Level three alarm	If the accelerator pedal malfunctions or the analog quantity needs to be redefined or the accelerator replaced
2	02	Igbt Error Failing	Level three alarm	Replace the electronic control
3	03	MCU Undervoltage	Level one alarm	1. The battery voltage is too low. Check the battery 2. The battery parameters of the program inside the controller are set incorrectly
4	04	MCU Overvoltage	Level one alarm	1. The battery parameters of the program inside the controller are set incorrectly 2. The battery is not matched properly 3. Replace the controller
5	05	Pedal Fault	Level three alarm	If the accelerator pedal malfunctions or the analog quantity needs to be redefined or the accelerator replaced
6	06	Resolver fault	Level three alarm	1. Fault of the resolver encoder of the permanent magnet motor 2. Loose wiring or loose connectors 3. Internal fault of the controller
7	07	Hardware Overcurrent	Level three alarm	The controller is faulty. Replace the controller
8	08	MCU Over-temperature	Level two alarm	1. Situations caused by normal operation, wait for the controller to cool down

				2. The electronic control temperature sensor is faulty. Replace the controller
9	09	Motor Over-temperature	Level two alarm	1. Situations caused by normal operation, wait for the motor to cool down 2. The motor temperature sensor is faulty. Replace the drive motor
10	0A	Motor Overspeed	Level three alarm	Special setting fault
11	0B	Motor Stall	Level three alarm	1. Check the magnitude of the operating current of the controller 2. Replace the motor encoder 3. Replace the motor
12	0C	Motor Temperature Sensor Error	Level three alarm	1. The connection lines or plugs are loose 2. The temperature sensor inside the motor is faulty and needs to be replaced
13	0D	Bus Off Error	Level three alarm	1. Program issue. Re-flash the correct program 2. Controller failure: Replace the controller
14	0E	Operation sequence error	Level three alarm	1. After all the devices related to the operation sequence have been reset, operate in the correct sequence 2. If the components related to the operation sequence are damaged or have no signal output, replace the components 3. Wiring issues, inspect the wiring
15	0F	BMS CAN Open	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Replace the lithium battery BMS
16	10	Traction controller communication lost	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Replace the traction controller
17	11	Steering controller communication lost	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Replace the steering controller
18	12	Oil pump controller communication lost	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Replace the oil pump controller

19	13	Valve controller communication lost	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Replace the valve controller
20	14	Instrument cluster communication lost	Level two alarm	1. Check the CAN communication connection line and plug-in 2. Replace the instrument
21	15	T-BOX communication lost	Level two alarm	1. Check the CAN communication connection line and plug-in 2. Replace the T-BOX
22	16	Handle communication lost	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Replace the handle
23	17	ControllerOvercurrent	Level three alarm	Replace the controller
24	18	PrechargeFailed	Level three alarm	1. Replace the pre-charge resistor 2. Check the battery voltage 3. Replace the controller 4. Check the wiring
25	19	SevereKSIUndervoltage	Level three alarm	1. The battery is severely low. Charge it immediately 2. Replace the battery 3. The charger is damaged, resulting in the battery not being fully charged
26	1A	SevereKSIOvervoltage	Level three alarm	1. The battery is not matched properly 2. Replace the controller
27	1B	Speed Limit Supervision	Level three alarm	The controller detects abnormal speed
28	1C	Motor_Short	Level three alarm	1. Check the type and parameters of the motor 2. If the motor insulation is abnormal or there is a short circuit, replace the motor 3. Short circuit of the motor wires around the motor. Check the circuit
29	1D	Ext5VSupplyFailure	Level three alarm	1. The external 5V load is too small 2. Incorrect parameter Settings
30	1E	Ext12VSupplyFailure	Level three alarm	1. The external 12V load is too small 2. Incorrect parameter Settings
31	1F	Seat Belt logic Alarm	Level one alarm	1. Replace the lock of the electronic seat belt 2. Logic program for replacing seat belts

32	20	Lifting Analog Value Out Of Range	Level three alarm	1. Check the circuits and plugins 2. Check the lifting voltage parameter value of the controller 3. Replace the lifting potentiometer
33	21	Accumulator Low Pressure	Level one alarm	1. Check the circuits and plugins 2. Replace the accumulator
34	22	Angle Analog Value Out Of Range	Level three alarm	1. Check the circuits and plugins 2. Check the angular voltage parameter value of the controller 3. Replace the Angle potentiometer
35	23	CAN Communication Error	Level three alarm	1. Check the circuits and plugins 2. Before checking the CAN, the resistance value should be 120 or 60Ω 3. Software program issues, such as baud rate Settings, excessive error frames, and overly high load rates 4. Replace the controller
36	24	Main Contactor Welded	Level three alarm	1. The main contactor is faulty. Replace the contactor 2. The controller drive port is faulty. Replace the controller
37	25	Main Contactor Did Not Close	Level three alarm	1. Check the contactor coil connection wire 2. Check the battery voltage 3. Replace the contactor
38	26	MotorOpen	Level three alarm	1. Motor phase open circuit 2. Incorrect crimping or wiring
39	27	BrakeInput	Reserved	The corresponding fault triggered by the brake input source (assigned analog input)
40	28	1222 shutdown Fault	Level three alarm	The steering motor is blocked, there is a problem with the motor or the circuit
41	29	1222 Limit Fault	Level three alarm	The steering motor is blocked, there is a problem with the motor or the circuit
42	2A	Battery type mismatch	Level three alarm	Solve communication issues with the controller (such as matching, protocols, lines, etc.)
43	2B	Battery unlock	Level three alarm	1. Detect the sensory switch 2. Whether the installation is in place
44	2C	PumpOvercurrent	Level three alarm	1. The motor wire is short-circuited 2. Misadjustment of motor parameters 3. Controller failure 4. The oil circuit pressure has not been adjusted

45	2D	Lifting drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
46	2E	Lowering drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
47	2F	Forward tilt drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
48	30	Backward tilt drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
49	31	Left shift drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
50	32	Right shift drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent

51	33	Forward travel drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
52	34	Backward travel drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
53	35	Left rotation drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
54	36	Right rotation drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
55	37	Fork forward drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
56	38	Fork backward drive fault	Level two alarm	1. The driver load is open circuit or short-circuited 2. The pins of the connectors or the coils of the contactors are dirty 3. Incorrect crimping or wiring of the connector 4. Drive overcurrent
57	39	Accelerator analog input 1 out of range	Level three alarm	1. The analog input is higher than the set value

				2. The analog input is lower than the set value
58	3A	Lifting analog input 2 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
59	3B	Lowering analog input 3 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
60	3C	Forward tilt analog input 4 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
61	3D	Backward tilt analog input 5 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
62	3E	Left shift analog input 6 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
63	3F	Right shift analog input 7 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
64	40	Left rotation analog input 8 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
65	41	Right rotation analog input 9 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
66	42	Forward travel analog input 14 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
67	43	Backward travel analog input 18 out of range	Level two alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value

68	44	Dual Arm Analog supervision	Level three alarm	1.The analog input is higher than the set value 2. The analog input is lower than the set value
69	45	Interlock Switch Supervision	Level three alarm	The operation sequence is incorrect, or the switch is faulty
70	46	Home Switch Supervision	Level three alarm	The return switch is faulty
71	47	Steer Command Supervision	Level three alarm	The analog input of the command device is out of range
72	48	Wheel Position Supervision	Level three alarm	The analog input of the position feedback device is out of range
73	49	5V Current Out of Range 5V	Level three alarm	1. The steering motor is blocked 2. Encoder failure 3. Cable curling or incorrect wiring 4. Encoder power supply failure
74	4A	Software Fault1	Level three alarm	1. Software malfunction 2. Controller failure
75	4B	Following Error	Level three alarm	1. Malfunction of the position feedback device 2. The steering motor is locked 3. The encoder of the steering motor has failed
76	4C	EMR Rev HPD	Level three alarm	The emergency reverse operation has ended, but the accelerator input, direction switch and interlock have not returned to their original positions
77	4D	EMR Switch Redundancy	Level three alarm	1.One or both of the two emergency reverse switches are not functioning, resulting in an ineffective state 2. The switch is damp or foreign objects have entered it
78	4E	Low battery warning	Level one alarm	Charge now
79	4F	Lithium battery fault	Level two alarm	Charge now
80	50	Motor polarity fault	Level three alarm	1. The motor parameters are set incorrectly 2. Motor failure
81	51	Motor polarity fault	Level two alarm	This vehicle has been restricted. Please contact the service provider as soon as possible. Thank you
82	52	Motor polarity fault	Level three alarm	This vehicle has been restricted. Please contact the service provider as soon as possible. Thank you

83	53	MCU Seriousness Over-temperature	Level three alarm	1. Situations caused by normal operation, wait for the controller to cool down 2. The electronic control temperature sensor is faulty. Replace the controller
84	54	Motor Seriousness Over-temperature	Level three alarm	1. Situations caused by normal operation, wait for the motor to cool down 2. The electronic control temperature sensor is faulty. Replace the controller
85	55	Unmatched Display Fault	Level one alarm	1. The type of instrument was improperly selected 2. The instrument program is incorrect 3. The type setting of the controller instrument is incorrect
86	56	Controller Severe Undertemp	Level three alarm	1. Harsh environments cause the operating temperature of the controller to exceed it 2. The electronic control temperature sensor is faulty. Replace the controller
87	57	Motor Characterizati on Error	Level three alarm	1. Issues during the software matching process: Motor matching failed during the motor matching process 2. The motor type is incorrect or the motor is faulty 3. Controller failure
88	58	Lithium battery failure	Level three alarm	1. Check the software of the lithium battery 2. Hardware failure of the lithium battery. Replace the lithium battery
89	59	Module 1 Communication loss	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Check whether the software in Module 1 is correct 3. Hardware issue: Replace the component of Module 1
90	5A	Module 2 Communication loss	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Check whether the software in Module 2 is correct 3. Hardware issue: Replace the component of Module 2
91	5B	Module 3 Communication loss	Level three alarm	1. Check the CAN communication connection line and plug-in 2. Check whether the software in Module 3 is correct 3. Hardware issue: Replace module 3 components
92	5C	Accelerator redundancy failure	Level three alarm	1. Wiring error 2. Hardware failure of the accelerator
93	5D	The handbrake is not pulled	Level one alarm	1. Check if the handbrake is tightened; 2. Check whether the handbrake is damaged or if the internal fit is good.
94	5E	EEPROM data out of range	Level three alarm	1. The parameter Settings exceed the preset range. Modify the parameters that are out of range to bring them back within the preset range
95	5F	Parameter modification fault	Level three alarm	To modify important parameters, a restart is required before resetting

96	60	Main contactor drive port short circuit or short circuit	Level three alarm	1. Check whether the wiring of the main contactor coil is correct 2. Whether the main contactor coil is in good condition
97	61	Reverse drive port shorted or shorted	Level one alarm	1. Check whether the wiring of the reversing relay coil is correct 2. Check whether the coil of the reversing relay contact is in good condition
98	62	Brake drive port short circuit or short circuit	Level one alarm	1. Check whether the wiring of the brake relay coil is correct 2. Whether the coil of the brake relay contact is in good condition
99	63	Alarm drive port short circuit or short circuit	Level one alarm	1. Check whether the wiring of the alarm relay coil is correct 2. Whether the coil of the alarm relay contact is in good condition
100	64	Short circuit or short circuit the solenoid valve driving port	Level three alarm	1. Check whether the wiring of the descending solenoid valve coil is correct 2. Check whether the coil of the solenoid valve contact is in good condition
101	65	DC enable drive port short or shorted	Level three alarm	1. Check whether the wiring of the DC enable relay coil is correct 2. Whether the coil of the DC enable relay contact is in good condition
102	66	Short circuit or short of fan drive port	Level one alarm	1. Check whether the wiring of the DC enable relay coil is correct 2. Whether the coil of the DC enable relay contact is in good condition

2. 5. Battery and Charger

5.1 Lead-acid battery

5.1.1 Lead-acid battery instructions

- Battery life is generally about 2 to 3 years, if used and maintained properly, can be used for more than 4 years. If not used and maintained properly, it will be damaged early within a few months.

- The height of the electrolyte should be checked regularly in the use of the battery, and the storage status of the battery should be checked and supplemented in time. Battery maintenance is simple, but requires patience and care. Do a good job of electrolyte supplement and density control, battery and pole pile cleaning work, can effectively extend the battery life.

- Check whether there is water in the battery box. Drain the water immediately.

- In addition, the battery should not be with electrolyte storage, if you want to short-term storage has been used and fully charged battery, in the storage period every other month to charge once, in order to compensate the battery self-discharge and prevent the battery plate vulcanization or eliminate the battery plate slight vulcanization, and often to check the status of the battery.

- Battery in use, if not full charge full discharge, every month to carry out a full discharge full charge. This preserves the battery's capacity and avoids plate acidification.

- The outside of the battery should be kept clean

- Check the fixing of the accumulator and the collet of the leading wire. There should be no loosening.

- Check the battery shell should not be cracked and damaged, pole and lead collet should not be burned.

- Wipe the dust outside the battery with a cloth. If there is electrolyte overflow on the surface, the cloth can be used to wipe away the dirt or wash with hot water, and then dry with a cloth. Clean the dirt and oxide on the pole pile head, wipe the outside of the connecting line and the lead chuck, remove the dirt. Dredge the vent hole of the liquid filling cover and clean it. Apply a thin layer of industrial petroleum jelly to the pole and lead collet during installation.



Charge the battery according to the charger instructions.

5.1.2 Lead-acid battery recovery and disposal

- In order to avoid environmental damage, shall not handle the used machine oil, battery, filter. Dispose of such waste products in accordance with local laws or contact Noli distributor or authorized waste disposal agency.

- Oil and gas, chemicals, batteries, tires and other combustible materials must be stored in a safe place to prevent fire and damage to the environment. Illegal disposal of these materials can lead to environmental damage. Please contact Nori Sales or professional waste disposal agency to properly dispose of these materials.

- As part of routine pre-operation inspection, check the entire forklift to ensure there are no oil leaks or fluid leakage.

Leakage can contaminate the environment and may indicate mechanical failure of the forklift.

- When the battery is replaced with a new one or the whole forklift is scrapped, the battery should be processed and recycled

Consider environmental hazards. For example, some battery forklifts use lead-acid and lithium batteries.

- Batteries contain materials that are harmful to the environment and humans, so batteries should be returned or sent to manufacturing

Trade or waste disposal agency for better recycling.

a) Lithium battery

5.2.1 Lithium battery instructions

- Lithium phosphate lithium ion battery refers to the lithium ion battery with lithium phosphate as the cathode material. The main application direction is the power battery. Compared with lead-acid battery, this type of battery has the characteristics of small volume, light weight, long cycle life, high safety, green pollution and so on.

- The charging of lithium battery should be carried out in strict accordance with the requirements on the lithium charger. The charging temperature range is: 0 ~ 40°C. Under the low temperature environment below 0° C, high rate charging will cause damage to the battery.

- Discharge temperature range: The discharge capacity at -25 ~ 50°C (-25 ~ 0) may be lower than that at normal temperature. The battery can be used at 40 ~ 50°C. However, if the battery temperature is too high, especially if the battery is in a high temperature environment for a long time, the aging of the materials inside the battery will be accelerated and the service life of the battery will be shortened

If the ambient temperature exceeds the temperature range, the battery performance may be adversely affected or damaged, and the battery life may be shortened.



Warning: Please use the battery pack in strict accordance with the conditions specified in the battery pack instruction manual, otherwise it may not be included in the warranty scope:

Do not operate electric vehicles equipped with lithium batteries at temperatures above 55 ° C or below -25 ° C

- Low temperature environment below 0° C, please charge the vehicle immediately after use.

- Do not flush the battery container directly to prevent water from entering the battery container

- For non-professionals, do not touch, move, or disassemble the battery pack, the corresponding high-voltage cable, or other parts with high-voltage warning labels

Note:

- In order to achieve a better use effect, extend the battery life, contact the manufacturer every year, and by the manufacturer's technical personnel for a battery performance test and balanced charging

- Stop the vehicle in a safe area and check the battery pack area for damage if the vehicle is subjected to a strong collision while driving

- When the vehicle or battery pack is on fire, quickly leave the vehicle to a safe distance, use a dry powder fire extinguisher for treatment, using water or incorrect fire extinguisher may lead to electric shock

- According to the characteristics of the battery, the battery capacity attenuation range is 0% ~ 25% in the three-pack life

Do not immerse the battery pack in water or make it wet.

- Do not put the battery pack into the fire or expose it to the high temperature environment beyond the temperature conditions specified in the instructions of the lithium battery for a long time, otherwise it may lead to fire. Do not use or store battery packs near heat sources;

- Do not short-circuit the positive and negative electrodes of the battery pack;

- Connect the positive and negative terminals of the battery pack in strict accordance with the signs and instructions, do not reverse charge;

- Do not use nails or other sharp objects to Pierce the battery pack housing, do not hammer or foot the battery pack;

- It is forbidden to decompose the battery pack and battery in any way;

- Do not put the battery pack in the microwave oven or pressure vessel.

- When electrolyte leaks, avoid skin and eyes contact with electrolyte. If exposed, wash the area with plenty of water and seek medical help. No person or animal is allowed to ingest any part

of the battery or any substance contained in the battery;

- Try to protect the battery from mechanical shock, collision and pressure impact, otherwise the battery pack may short circuit, high temperature and fire;

- Do not use the battery pack in extremely hot environment, such as direct sunlight or hot days in the car. Otherwise, the battery pack will overheat, which will affect the performance and shorten the service life of the battery pack.

- The battery pack in the process of charging and discharging, if there is a peculiar smell, abnormal sound, please stop charging or discharging immediately;

- If the above phenomenon, please contact the manufacturer, do not disassemble without permission

5.2.2 Storage of lithium batteries

If the battery string is stored for a long period of time (more than six months), the lithium battery must be completely powered off. It is recommended that the battery string be stored at a capacity of at least 60% and the ambient humidity not higher than 95%RH.

A full - load store is performed within the specified time as required.

Storage Temperature	Storage relative humidity	Storage time
-10~0° C	5%~95%	≤6 months 60%SOC
0~40° C	5%~95%	≤6 months 60%SOC
40~45° C	5%~95%	≤2 months 60%SOC

5.2.3 Lithium battery recovery and disposal

- In order to avoid environmental damage, shall not handle the used machine oil, battery, filter. Dispose of such waste products in accordance with local laws or contact Noli distributor or authorized waste disposal agency.

- Oil and gas, chemicals, batteries, tires and other combustible materials must be stored in a safe place to prevent fire and damage to the environment. Illegal disposal of these materials can lead to environmental damage. Please contact Nori Sales or professional waste disposal agency to properly dispose of these materials.



- When the battery is replaced with a new one or the whole forklift is scrapped, the battery should be processed and recycled, consider environmental hazards. For example, some battery forklifts use lead-acid and lithium batteries.

- Batteries contain materials that are harmful to the environment and humans, so batteries should be returned or sent to manufacturing, trade or waste disposal agency for better recycling.

5.3 Charger

5.3.1 Charger specification

Input voltage range	Input current	Input connector	Output voltage range	output current	Output power	Output connector
Single-phase 220VAC(176-256V)	15A	16A Three-core industrial plug	80V(10-100V)	35A	3KW	REMA320 Male
Three-phase four-wire 380VAC(304-520V)	17A	32A industrial five-pin plug	80V(30-110V)	100A	10KW	REMA320 Male
Three-phase four-wire 380VAC(304-520V)	25A	industrial five-pin plug	80V(20-100V)	150A	15KW	REMA320 Male
Three-phase four-wire	33A	32A industrial five-pin plug	80V(20-100V)	200A	20KW	REMA320 Male

380VAC(304-520V)						
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5.3.2 Forklift Charging Instruction Manual

Step 1 - Open the loading door located on the side of the forklift.



Step 2 - Plug in the power



5.3.3 Single-phase charger

(1) Status description

The charger is equipped with an LED display, which can monitor and operate the state of the charger through the display

Charger status display		State description
LED	error code	
Voltage is too high	E01	The output voltage of the charger is higher than the preset value
Current is too high	E02	The output current of the charger is higher than the preset value
Module communication is abnormal	E03	Abnormal communication between charger modules
Module over temperature	E04	The temperature of the charger module is higher than the preset value
Output short circuit	E09	Short circuit of charger module output/BMS detects battery abnormality and sends overvoltage command
Battery overvoltage	EB1	BMS detects abnormal battery and sends over-current command
Battery overcurrent	EB2	BMS detects abnormal battery and sends over-current command
BMS communication is abnormal	EB3	Abnormal communication between BMS and charger
Battery over temperature	EB4	BMS detects battery abnormality and issues an over-temperature command
Remarks: 1. Part of the status display needs to be issued with BMS to display. If the battery		

has no BMS, part of the fault code will not be displayed.

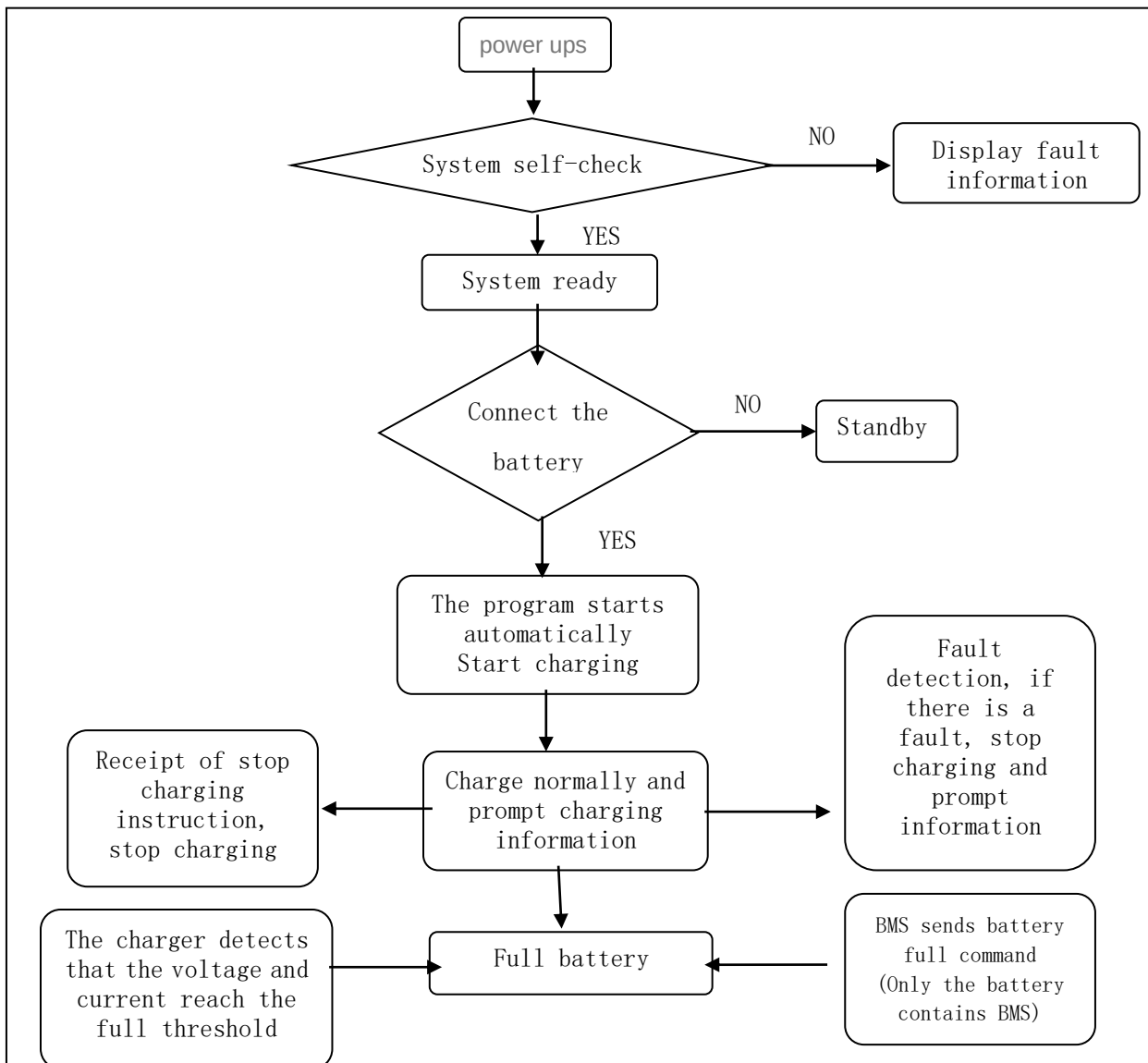
2. Due to the low pixel density of the LED screen, some statuses are replaced by fault codes.

(2) Program logic

Charging with LED display charger:

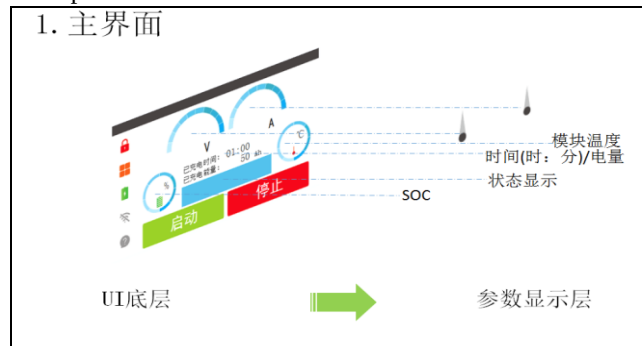
1. After power on, the standby light of the charger is always green;
2. When the charger is connected to the battery, there is no abnormality in the self-check, and the communication with the battery is normal and there is no alarm, the program starts to charge, at this time the charging indicator light (yellow light) flashes, and the LED screen displays the voltage and power status during charging;
3. If a failure occurs during charging, the charging indicator light (yellow light) will go out, and the fault light (red light) will turn on;
4. When the battery is full, the charger cuts off the output, the charging indicator light (yellow light) goes out, and the standby light (green light) turns on to enter the standby state;

(3) Charging process



5.3.4 Three-phase charger

(1) Main interface description



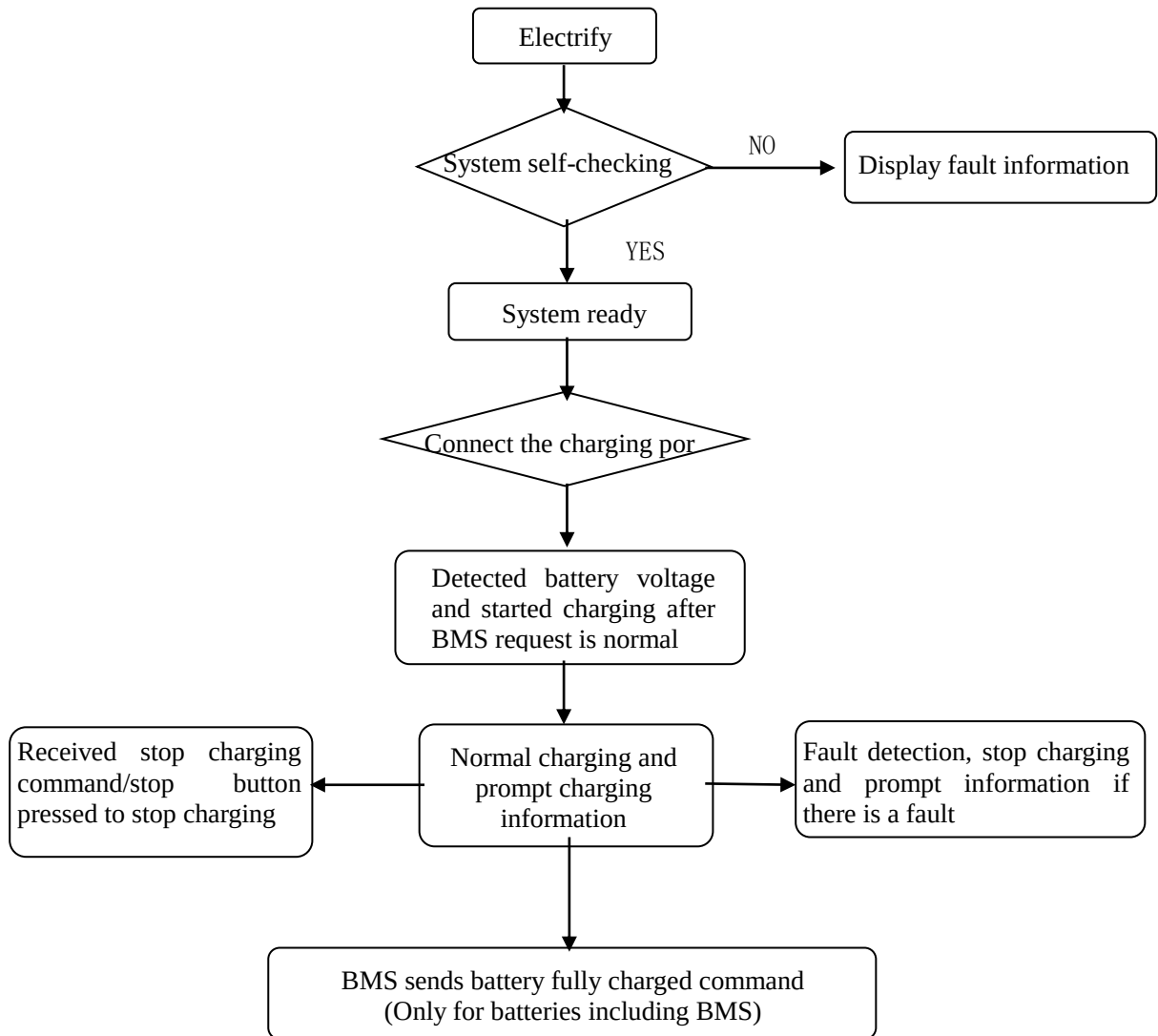
The above is the basic settings interface. For more detailed operation instructions, please refer to: Display UI Design.

(2) Display status description

Charger status display	Status Description
Touch screen display	
Self checking in progress	Check whether the battery is faulty, whether charging is allowed, and whether the charger itself is faulty, etc
Ready to go	The external environment is normal and can be charged
Charging	Charging
Stop charging	Manually stop, at this time the main switch can be turned off
Abnormal power grid	The input voltage of the charger is higher or lower than the input voltage range
Voltage too high	The output voltage of the charger is higher than the preset value
Current too high	The temperature of the charger is higher than the preset value
The temperature is too high	The temperature of the charger is higher than the preset value
Fan failure	Fan malfunction of charger
Output short circuit	Short circuit in the output of the charger
Module communication abnormality	Abnormal communication between charging machine modules
Please connect the battery	Please connect the battery
Charge Complete	Charge Complete
Battery overvoltage	BMS detects battery abnormality and sends overvoltage command

Battery overcurrent	BMS detects battery abnormality and sends overcurrent command
Battery overheating	BMS detects battery abnormality and issues over temperature command
BMS communication abnormality	Abnormal communication between BMS and charger

(3) Charging process

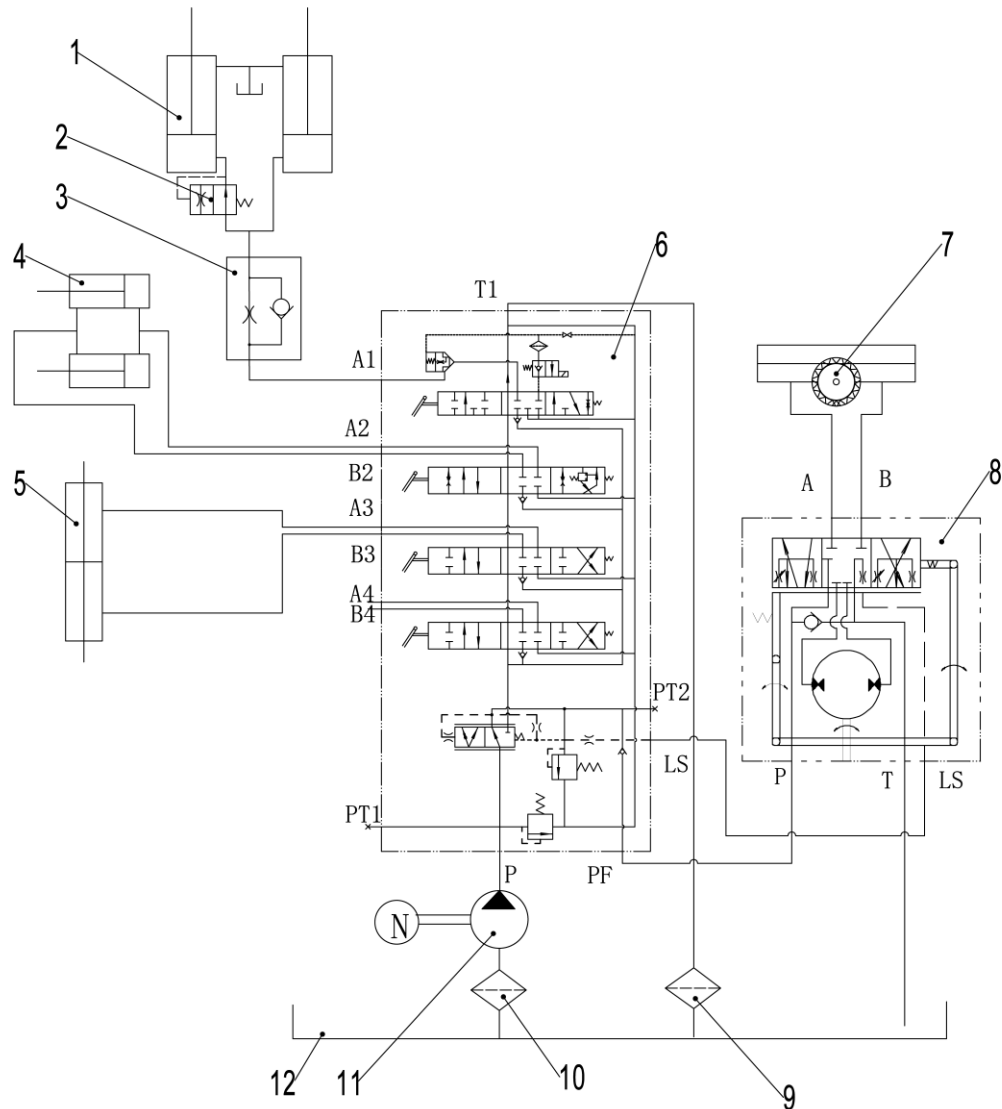


6. Hydraulic system

6.1 Overview- Hydraulic system schematic diagram

The hydraulic system consists of oil pump, multi-way valve, lifting cylinder, tilt cylinder and pipeline components. As shown in Figure 2-16

The hydraulic oil is supplied by a hydraulic pump connected to the motor and then distributed to the cylinders by a multi-way valve.



- | | | | |
|------------------------|--------------------------|----------------------|---------------------------------|
| 1. Lifting cylinder | 2. Explosion-proof valve | 3. Speed Limit Valve | 4. Tilt cylinder |
| 5. Side shift cylinder | 6. Multiway valve | 7. Steering cylinder | 8. Full hydraulic steering gear |
| 9. Return oil filter | 10. Oil-absorbing filter | 11. Gear pump | 12. Hydraulic oil tank |

Figure 2-16 Hydraulic system schematic diagram

6.2 Oil pump

The oil pump is a hydraulic gear pump.

6.3 Multiway valve

Oil pump for hydraulic gear pump multi-way valve adopts two-piece four-type, hydraulic oil from the working oil pump through the multi-way valve stem control, the high-pressure oil distribution to the lifting cylinder or tilt cylinder. Multi - way valve has a safety valve and self - locking valve. The safety valve is located on the upper side of the oil inlet of the multi-way valve to control the system pressure; The self-locking valve is located on the tilt valve disc, which is mainly

used to prevent the tilt cylinder from misoperating the joystick under the condition of no pressure source and causing serious consequences. A one-way valve is arranged between the oil inlet and the oil inlet of the lifting valve disc and between the oil inlet of the lifting valve disc and the oil inlet of the tilt valve disc.

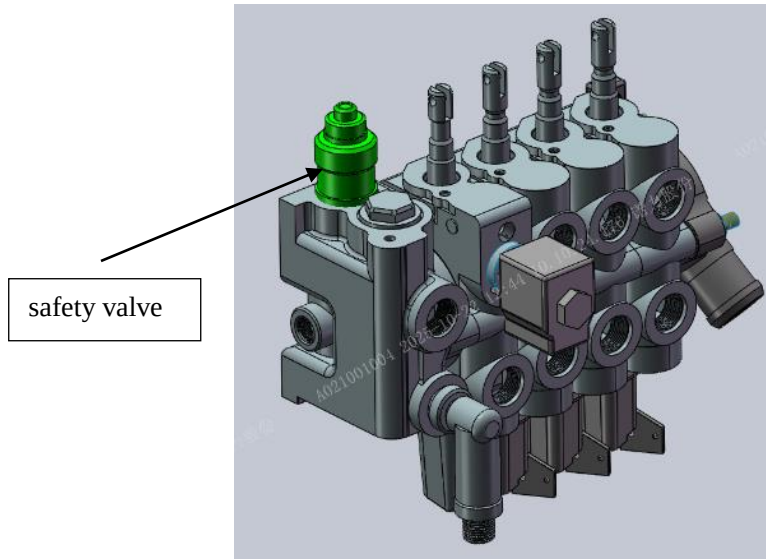
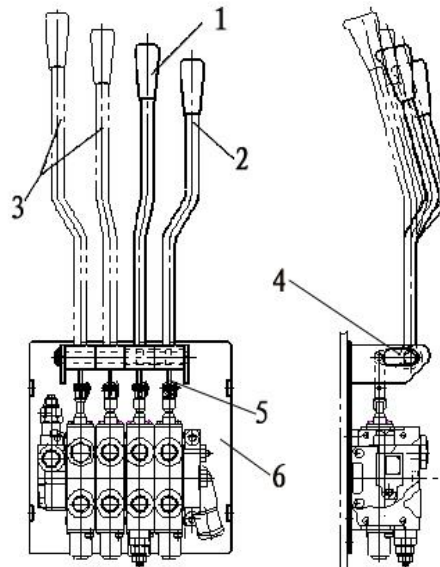


Figure 2-17 Multiway valve outline diagram

(1) Multi-way valve operation Figure 2-18

Multiway valves are operated by joysticks, all of which are mounted on a connecting shaft, which is fixed to the body via a bracket, and the joystick operates the spool valve through a connecting rod.



- | | | |
|--------------------------|-------------------|--------------------------|
| 1. lifting joystick | 2. tilt joystick | 3. attachment joystick 1 |
| 4. attachment joystick 2 | 5. connecting rod | 6. bracket |

Figure 2-18 Multi-way valve operation

(2) Relief valve pressure adjustment

 The safety valve pressure has been set by the manufacturer, the user is not allowed to adjust.

6.4 Hydraulic pipeline

The hydraulic pipeline of the hydraulic system is shown in Figure 2-19.

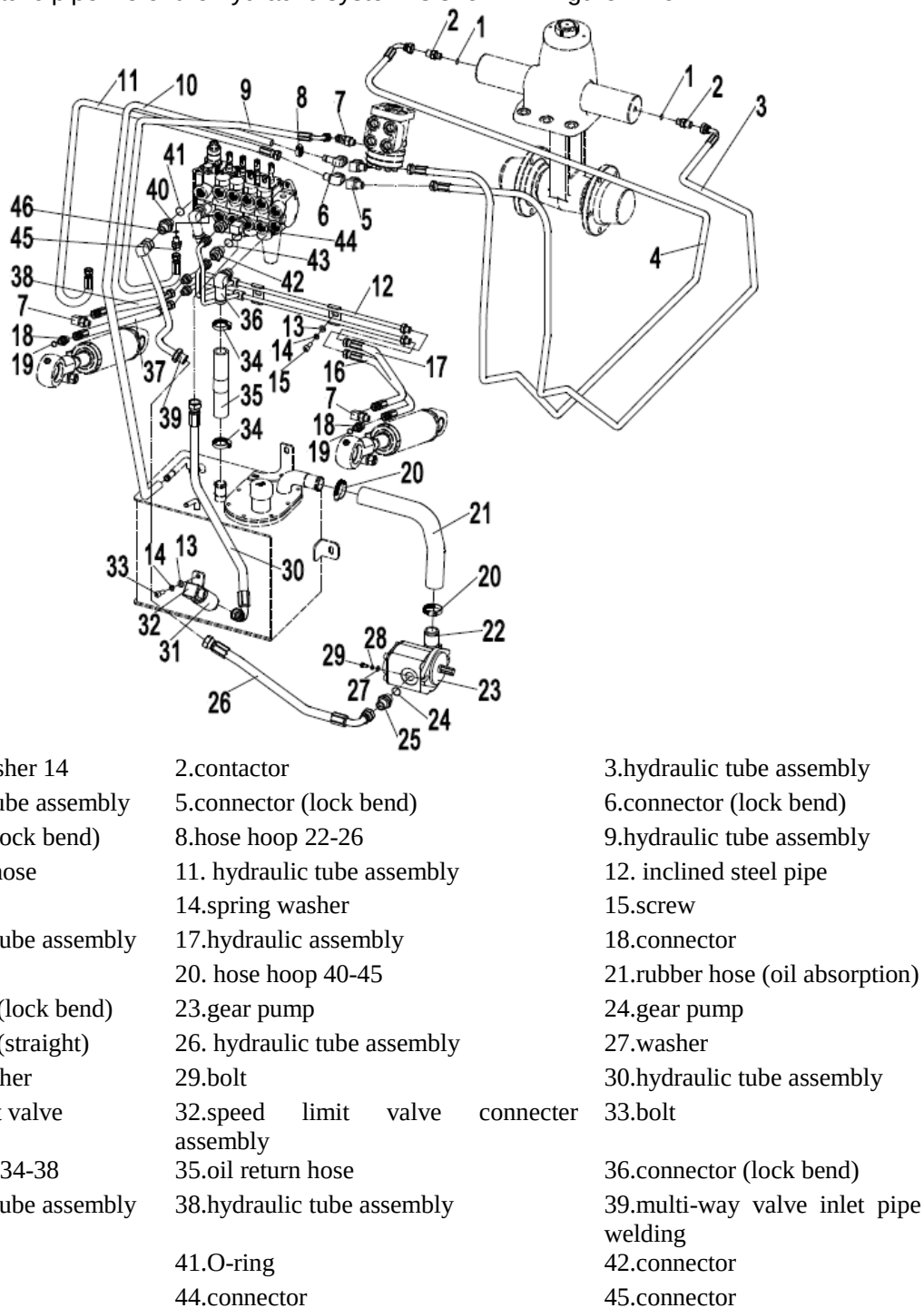


Figure 2-19 Hydraulic pipeline

6.5 Fault analysis

If the hydraulic system fails, find out the cause according to the table below and make the necessary repairs.

(1) Multi-way valve fault analysis (Table 2-3)

Table 2-3

Fault	Cause	Repair method
The lifting oil pressure is not high	Slide valve stuck	Wash after decomposition
	Oil hole blockage	Wash after decomposition
Vibration Slow pressure rises	Slide valve stuck	Wash after decomposition
	Insufficient exhaust gas	Exhaust gas fully
The steering oil pressure is greater than the specified value	Slide valve stuck	Wash after decomposition
	Oil hole blockage	Wash after decomposition
Not up to the required amount of oil	The pressure relief valve is improperly adjusted	Adjust
Noise	The pressure relief valve is improperly adjusted	Adjust
	Sliding surface wear	Replace the pressure relief valve
Oil spill (external)	The O-ring is aged or damaged	Replace O-ring
Set pressure low	Spring damaged	Replace spring
	Valve seat surface broken	Adjust or replace the pressure relief valve
Oil spill (internal)	Valve seat surface damaged	Corrected seat surface
Set pressure high	Stuck valve	Wash after decomposition

(2) Pump fault analysis (Table 2-4)

Table 2-4

Fault	Cause	Repair method
Less oil discharge	The tank level is low	Add to specified
	Clogged tubing or oil filter	Clean or replace on request
Pump pressure is low	●Liner plate damage ●Failure of support ●Bad seal ring, liner or check ring	Replace
	The pressure relief valve is improperly adjusted	Adjust the relief valve pressure to the specified value with the pressure gauge.
	There's air in the system	●Re-tighten the suction side tubing ●Add oil ●replace the oil seal of the oil pump
Noise during operation	The suction pipe is damaged or the oil filter is blocked	Check pipes or repair oil filters
	The oil suction side is loose and leaking	Tighten loose particles
	Oil viscosity is too high	Replace the viscosity oil suitable for the pump operating temperature
	There are bubbles in the oil	Find out the cause of the bubbles and take actions
Oil leakage of pump	Pump oil seal or part seal ring is damaged	Replace
	Pump damage	Replace

7. Lifting system

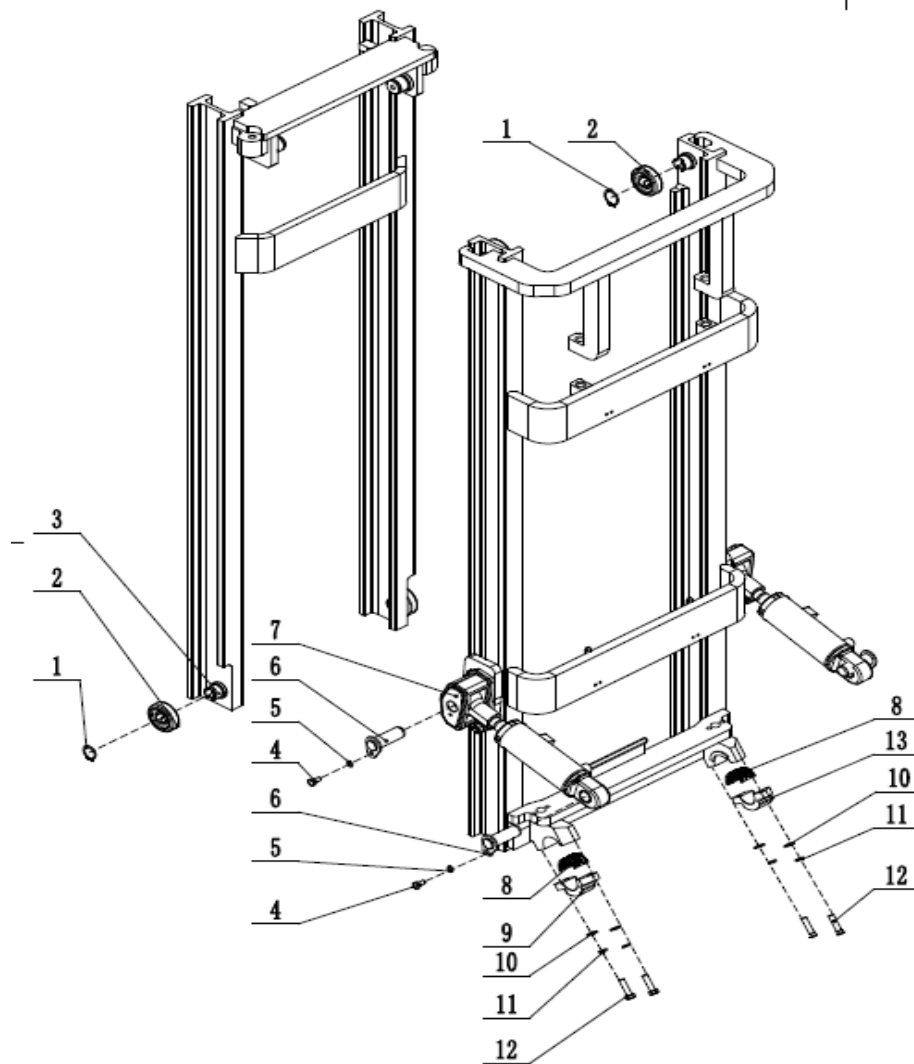
7.1 Overview

The lifting system is a two-stage roller type vertical lifting and shrinking, which is composed of inner and outer masts and fork arm carrier.

7.2 Inner and outer mast

The inner and outer masts are welded parts. The bottom of the outer mast is mounted on the drive axle with a support.

The middle part of the outer mast is connected to the frame through the tilt cylinder, and can tilt forward and backward under the action of the tilt cylinder.



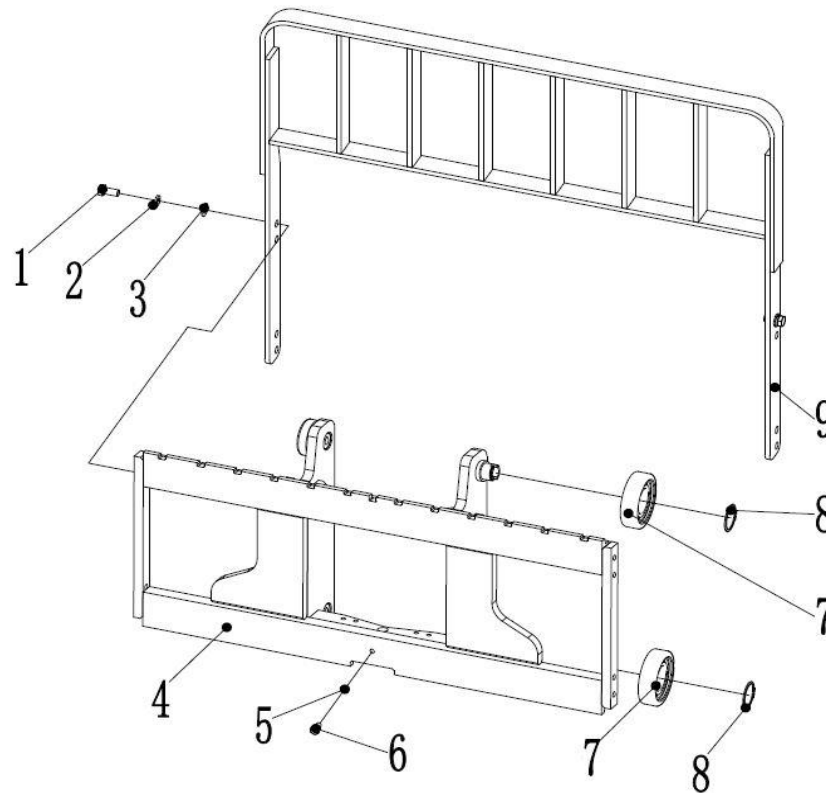
- | | | | | |
|---------------------|--------------------|-------------------|-----------------|------------------|
| 1.external circlips | 2.composite roller | 3. inner mast | 4. bolt | 5. spring washer |
| 6.trunnion | 7. outer mast | 8. bearing bush | 9.bearing(left) | 10.washer |
| 11.bearing cover | 12. bolt | 13.bearing(right) | | |

Figure 2-20 Inner and outer mast

7.3 Fork carrier

The fork arm carrier rolls in the inner mast through the main roller, the main roller is mounted on the main roller shaft and stuck with an elastic retaining ring. The main roller shaft is welded to the fork arm carrier, and the side roller is integrated on the composite roller, rolling along the inner mast wing plate, which can be adjusted. To prevent rolling clearance, 2 fixed side rollers are used to roll along the outside of the inner gantry wing panel. The longitudinal load is borne by the main roller, which emerges from the top of the gantry when the fork is raised to the top. Lateral loads are

supported by side rollers.

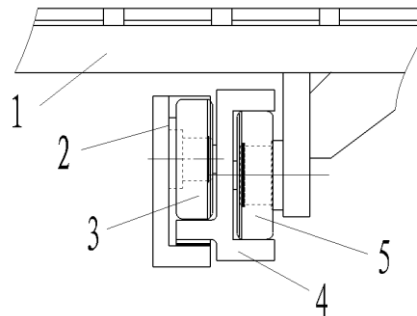


- | | | | | |
|------------|---------------------|----------------------|--------------------------|------------------|
| 1. bolt | 2. spring washer | 3. washer | 4. fork carrier welding | 5. spring washer |
| 6. circlip | 7. composite roller | 8. external circlips | 9. load backrest welding | |

Figure 2-21 Fork arm carrier

7.4 Position of roller

There are two kinds of rollers: outer mast composite roller and inner mast and fork arm carrier composite roller. Install the outer mast, the inner mast and the fork arm carrier respectively. The composite roller is composed of a main roller and a measuring roller. The main roller bears the load in the front and rear direction, and the side roller bears the side load, so that the inner mast and the fork arm carrier can move freely.



- | | | |
|---------------------|---|--------------------------------|
| 1. fork arm carrier | 2. outer mast | 3. outer mast composite roller |
| 4. inner mast | 5. inner mast and fork arm carrier composite roller | |

Figure 2-22 Position of roller

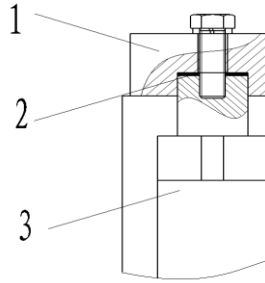
Note: (a) Adjust the clearance of side rollers to 0.5mm;
(b) Butter main roller surface and mast contact surface.

7.5 Maintenance

7.5.1 Lifting cylinder adjustment (figuer 2-23)

When the lifting cylinder, inner mast or outer mast is removed and replaced, the lifting cylinder stroke needs to be adjusted again. The adjustment method is as follows:

- (1) Insert the piston rod head into the inner mast beam without adjustment pad.
- (2) Slowly rise the mast to the maximum extension of the oil cylinder, and check whether the two oil cylinders are synchronized.
- (3) Add an adjustment pad between the piston rod head of the cylinder and the beam of the inner mast. Adjust pad thickness 0.2mm and 0.5mm.
- (4) Adjust the tension degree of the chain.



1.inner mast beam 2. lifting cylinder adjustable pad 3. lifting cylinder

Figure 2-23 Lifting cylinder adjustment

7.5.2 Fork arm carrier height adjustment

- (1) Park the car on a level surface and make the mast vertical.
- (2) Make the bottom surface of the fork arm carrier contact the ground, and adjust the adjusting nut of the upper end joint of the chain so that there is A certain distance A ($A=24 \sim 29$) between the main roller and the lower end face of the inner mast.

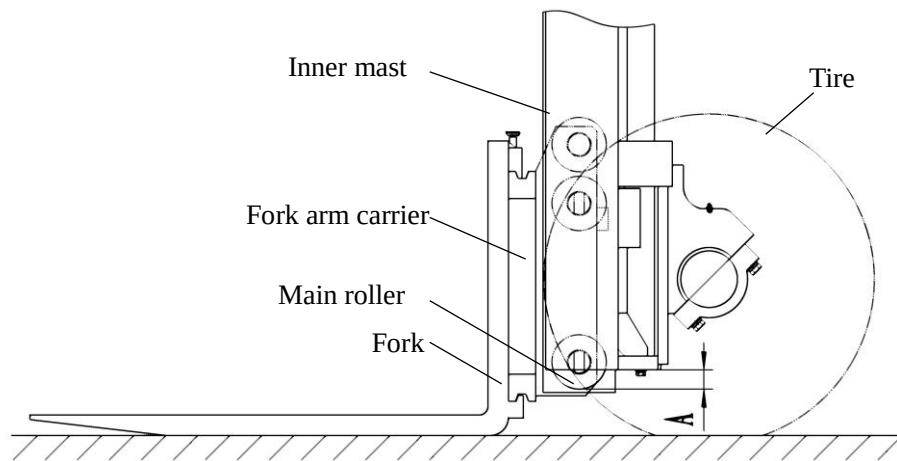


Figure 2-24 Fork arm carrier height adjustment

- (3) Land the fork and lean back into position. Adjust the upper end connector of the chain and adjust the nut to make both chains tensioned to the same degree.

7.5.3 Replacement of fork arm carrier roller

- (1) Fork a pallet and park the car on a level ground.
- (2) Drop the fork and pallet to the ground.
- (3) Remove the upper end connector of the chain and remove the chain from the sprocket
- (4) Lift the inner mast (① in Figure 2-25).
- (5) After confirming that the fork is removed from the outer mast, reverse the forklift (② in

Figure 2-26).

- (6) Replace the main roller
 - (a) Remove all spring retainers and remove the main roller with the drawing tool, taking care to keep the adjusting pad.
 - (b) Confirm that the new roller is the same as the replaced roller, install the new roller into the cargo fork rack and clamp it with the elastic retainer.

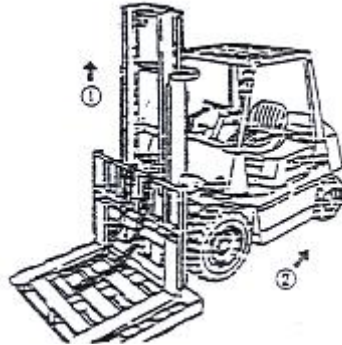


Figure 2-25

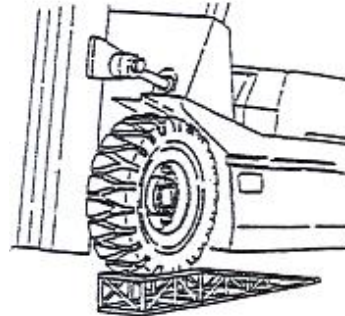


Figure 2-26

7.5.4 Replacement of mast roller

- (1) Remove the fork rack from the inner mast in the same way as described in 9.5.3 replacement fork Rack Roller.
- (2) Drive the forklift to the level ground, and put the front wheel up 250-300mm.
- (3) Pull the overhand brake and pad the rear wheel with the wedge.
- (4) Remove the lifting cylinder and the fixing bolts of the inner mast. Lift the inner mast, taking care not to lose the adjustment pad for the piston rod head.
- (5) Remove the connection bolt between the lifting cylinder and the bottom of the outer mast, remove the lifting cylinder and the oil pipe between the two cylinders, do not loosen the oil pipe joint.
- (6) Put down the inner mast and remove the main roller at the bottom of the inner mast. The main roller of the outer gantry will also be exposed from the top of the inner mast.
- (7) Replace the main roller.
 - a) Remove the upper main roller with the drawing tool without losing the adjustment pad.
 - b) Install the new roller with the adjustment pad removed in step (a).
- (8) Lift the inner mast until all rollers enter the mast.
- (9) Install the lifting cylinder and fork rack according to the opposite steps of disassembly.

7.6 Installation instructions for attachments



If you need to install attachments, please contact our sales department, do not install by yourself.

8. Removal and installation

8.1 Notice

- (1) Only qualified operators can disassemble or repair the parts on the vehicle.
- (2) Stop the vehicle on the flat ground and wedge the wheel before starting the disassembly and detection operation, otherwise it will cause the vehicle to move accidentally. Meanwhile, place the main switch in the off position and disconnect the battery plug.
- (3) Remove all rings, watches and other metal items from your body before starting the disassembly and detection operation to avoid accidental short circuit.
- (4) Please use the correct tools in the disassembly process, if required, please use the special tools marked.
- (5) Please choose the appropriate spreader according to the size and weight of the parts to be removed to avoid danger.
- (6) Before lifting, please be sure to install the sling securely to avoid slipping. Keep the sling tensioned during lifting.
- (7) When removing a heavy part from the car, be careful not to lose its balance and break it.

8.2 Description of lifting points of each disassembled component

- (1) Figure 2-27 shows the lifting system

Maximum weight (excluding accessories) is not more than 1500Kg

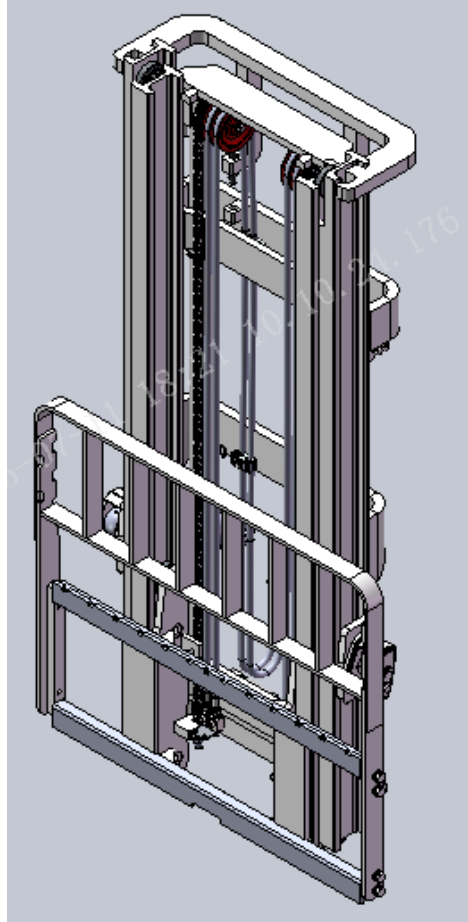


Figure 2-27

(2) Figure 2-28 shows how to lift the top shelf
The maximum weight is not more than 120Kg



Figure 2-28

(3) Figure 2-29 shows the balanced lifting
The maximum weight is not more than 1200Kg.

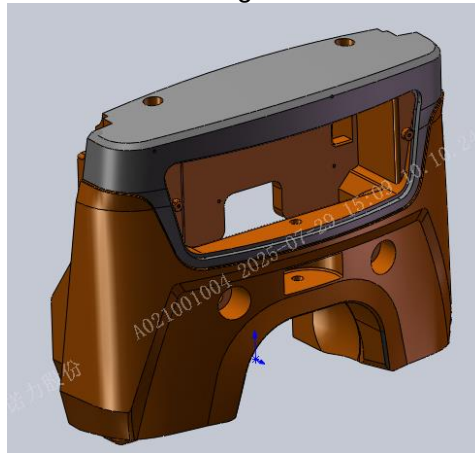


Figure 2-29



The lifting ring on the balance weight is only allowed to lift the balance weight, not the whole vehicle.

(4) Figure 2-30 shows how to lift a battery box.
For battery weight, see battery nameplat

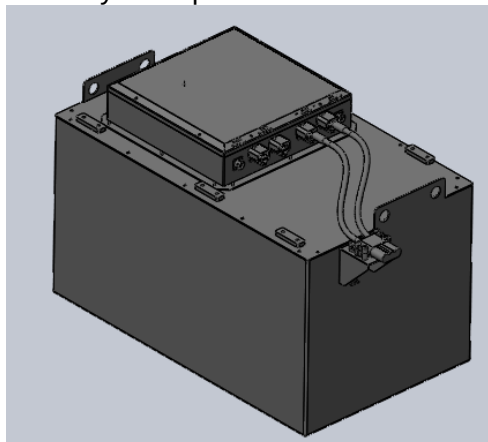


Figure 2-30

 The battery also has the performance of balancing weight. Users are not allowed to replace the battery at will, otherwise it will affect the balance of the whole machine and other performance.

- (5) Figure 2-31 shows the lifting of the walking motor.
The maximum weight is not more than 100Kg

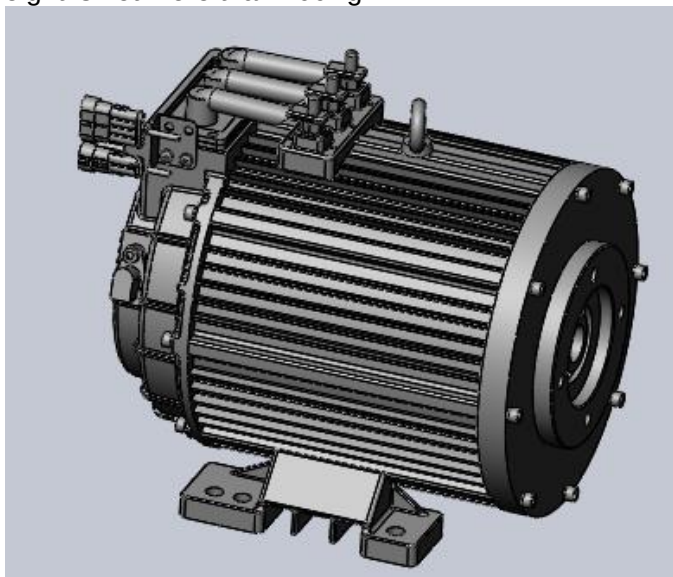


Figure 2-31

Chapter Three Operation, use and safety for forklift

I . Driving and operation

There is some information for operating normally as below and it favor you about good running performance, using safely, running economically.

1. Usage of new vehicle



·All the parking parts from the new vehicle should be reclaimed according to the establishment of local government.

·In order to insure the new vehicle can work normally, Make a trial run of it before use it.

The life-span of vehicle depends on how you begin to use your new forklift. At initial 200 hours running, please to notice as follow.



·Whatever season, you must run machine warmly before operating.

·Do maintenance better in normally.

·Do not abuse machine and unreason using.

2. Connection between load and stability

Under load curve, forklift take front wheel for pivot to keep balance of vehicle and load on fork, please pay attention to load centre and load capacity to keep vehicle stable.



· If exceed load curve, rear wheel should be uplifted and be in danger, forklift should be overturned to lead severe injury. Saying as below figure, load close to fork prong is the same effect as increase weight. As in such condition, load shall be decrease.

3. Load center and load curve

Load centre means the distance between front end surface of fork and cargo cg. Said figure of load curve show you relation of 2t forklift load centre and permitted load. figure of load curve is adhibited on vehicle, if figure damaged, to renew it in time.



·If forklift is equipped disposal accessories such as side-move device, scraper bucket or rotating fork, its permitted load is less than normal truck (without any accessories), the reason as follow:

(1) Subtract load from rated load, its weight equal to weight of accessories.

(2) Because accessories length lead load centre to move forward, rated load is also decrease.

Accessories equipped lead load centre moving forward, this phenomenon is called “Load centre loss”.

Do not load exceeding the rated load shown by figure of load curve pasted on vehicle or accessories.

4. Forklift stability

There are regulations in ISO or other standard about forklift stability, but said regulation is not applicable for all running condition, forklift stability vary on different running condition.

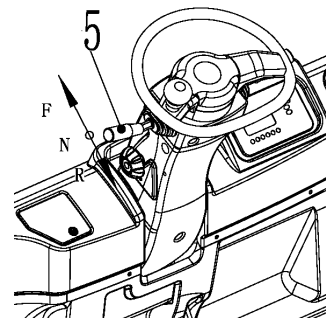
Maximum stability is assured under below condition:

(1) Level and firm ground.

(2) Running under standard load or unloaded condition.

Standard no-load state: Fork or other bearing accessories lie 30cm upto ground, tilting mast backward enough without load.

Standard load condition: Fork or other loading accessories lift up about 30cm from ground, rated load on standard load centre, mast tilting backward to max angle.



⊘ When loading, keep min. tilting angle forward or backward as can as possible, do not tilting forward unless load fixed on load backrest or rigidity loading goods frame, or low lift height.

5. Transporting and loading for forklift

(1) Transportation of forklift



Transporting with truck, Wedge forklift wheel or tighten forklift by rope to prevent it moving during transportation.

Pay attention to obey regulation of full-length, full-width, full-height of forklift during transportation on traffic road.

(2) Loading and unloading for forklift



Please use gangplank with enough length, width and intensity.

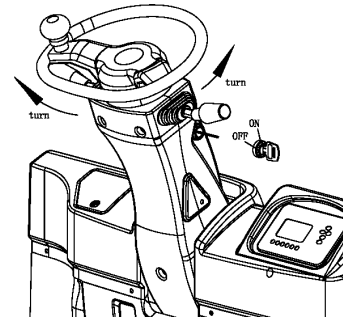
Brake lorry firmly and wedge wheel.

Gangplank shall be fixed on middle of carriage firmly, no greese on gangplank.

Both height of left and right gangplank shall be same.

Do not turn or transverse move during operating on gangplank.

When loading on lorry, in order to let forklift board on simultaneously, please backing lorry slowly.



6. Preparation before driving

(1) Check position of direction switch handle⑤, and push it to neutral position(N).

(2) Turn on ignition key

Catch hold of handle of steering wheel, then turn on ignition key and keep it at "ON" position.



Even after ignition key is turned to "ON" position, 1 second is needed between brake circuit starting to work and starting to move.

If gear shift lever is in forwardposition "F" or backwardposition "R", before turn ignition key to "on" position, push gear shift lever to neutral position "N"

Do notice that if step down accelerating paddle suddenly, vehicle will probably accelerate suddenly.

(3) Tilting backward of mast

Pull backward lifting handle to lift fork

150-200mm upto ground, and pull backward tilting handle to tilt mast backward.

(4) Operation of direction switch handle⑤.Direction switch handle decide travelling direction(forward-backward)

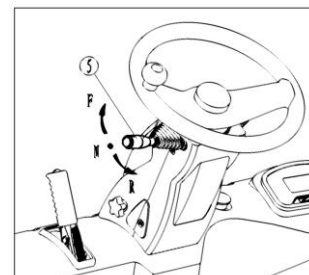
Forward F: push forward direction switch handle

Backward R: pull backward direction switch handle

(5) Loosen parking brake handle

Step down brake paddle

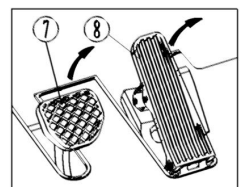
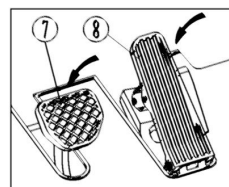
Let go parking brake handle forward entirely, catch hold of steering wheel with left hand, put right hand lightly on steering wheel too.



7. Steer

(1) Starting up

Move food away from brake paddle and step down accelerating paddle slowly, then, the vehicle will start to



move.

Acceleration rate is decided by how much accelerating paddle is stepped down.



· **Do not startup or brake suddenly to prevent cargo falling down.**

(2) Speed slow down

Release accelerator slowly. If necessary, step brake pedal down. Except emergency brake, release accelerator to make slow down slowly until parking. If even release accelerator suddenly, emergency brake is also impossible. When emergency situation, step brake pedal down to make emergency brake.



· **Please slow down if situation as follow:**

- (a) turning at crossing.
- (b) Closing to cargo or pallet.
- (c) Closing to goods pile.
- (d) Traveling through narrow channel.
- (e) Ground/Road surface is bad.

· **When backing forklift you have to look at rear direction to be sure condition is safe.**

It is dangerous when backing forklift depending only on rearview mirror.

(3) Turning

It is not same as car, forklift depend on rear wheel to turn. When turning you shall be slow down and be careful for tail swing of forklift when operating steering wheel.



· **During turning, when turning radius is small, the fast speed the forklift is, the more possibility the forklift overturn. Be careful for this situation.**

(4) Traveling and lifting simultaneously (Inching operation)

- (a) Traveling first, let fork prong be close to goods about 3—5m distance.
- (b) Step brake pedal down perfectly (standstill).
- (c) Step accelerator down to be in optimum speed.
- (d) Operating lift and lowering handle to operate fork

to be lifting operation.



· **Traveling and lifting simultaneously (Inching operation) is a professional work to ask for skilled operator. Be definite to know well the shape and cg of goods to identify the vehicle stability, make a slow lifting and lowering performance of the vehicle, and please be careful in operation.**

· **Tilting fork to operate when fork is at a much height is very dangerous, except for fork's in and out operation, please do not operate the vehicle on the load stage.**

· **In order to reduce the danger of tilting fork to operate when fork is at a much height, make lifting operation when the vehicle is very close to load stage.**



8. Parking and temporary parking



· **Parking safely**

· **Parking place shall be broad and level as much as possible.**

· **When unladed forklift need to park on ramp, please make mast face downward and block wheel by wedge.**

· **Parking vehicle outside workplace or qualified place.**

· **If necessary, to use signs or signal light.**

· **Parking on firm and level ground.**



- If fork can not lower because of fault, hang cloth on fork prong forward dead corner.
- Pay attention for road surface slide or cave in.
- To lower fork after parking perfectly, it is very dangerous to lower fork during traveling.

- Do not jump off vehicle.
- When get off forklift, you must face vehicle and take favour of footboard.
- Slow down first and step brake pedal down and standstill and put gearshift on "N".
- Parking vehicle at place where is convenient to other vehicles and operating as follow:

(a) Pull backward the parking brake handle enough to its position, actuate the parking brake.

(b) Let fork lower to make it touch ground.

(c) Turn ignition key to "off" position.

(d) Take off key and keep it carefully.

(e) Be careful to get on or get off vehicle.

(f) Parking forklift



- When get off forklift, pull brake handle up and to tilt mast forward. Lower fork on ground. When parking on ramp, block forklift by wedge.

- When leaving forklift, take ignition key

9. Usage of battery

(1) Charging battery

To choose right charger according to instruction of operating manual.

(a) Keep liquid on normal level.



- Keep liquid level on normal situation to prevent battery from being over-hot or being burn out.

- If electrolyte is not enough, the life-span of battery will be shorted

(b) Infuse distill water.

(c) Do not overcharge.

(d) Charging place shall be ventilated enough.



- Battery charging shall be at ventilated and dry place.

(e) Open battery cover.



- There is hydrogen to be generated when charging, so and please open battery cover.

(f) Check terminal, cable and connector.



- Before charging, check connector and cable to ensure there is no injury

- Not charging under the situations as follow:

- Connector terminal has been injured.

- There are rust and abrasion in Terminal and cable.

These situations will lead spark to burn and to explode.

(g) Charge after turning off ignition key.

(h) Check proportion

Before charging, check each cell for electrolyte proportion to detect for abnormal condition to prevent certain accident happen.

(i) When pulling out or insert power connector, hold connector or handle not the cable.



- Do not pull out cable.

- If cable and connector failure, please inform manufacturer to replace by new one.

(j) Break up charging procedure



·According to 《operation and maintenance manual》 of the used charger to break charging procedure.

·Do not pull out charger plug during charging, otherwise there will be spark take place to lead to danger.

(2) Replace battery

When forklift has been used continuously for a working period and the battery has entirely excharged, replace the battery with another fully charged one and charge the battery been replaced.



·In replacing, to be sure that new battery mates with forklift well, otherwise there will be dangerous to shorten lifespan of forklift or overturn during traveling.

·Replacement of battery shall be done on level table.

According to the steps as below to replace battery:



·When using another forklift as hoisting equipment to lift battery, you shall choose a proper lifting tool(accessary).

·Only qualified person can operate battery.

(a) Pull out plug of battery.

(b) Open upper cover of battery.

Use gas spring or other methods to ensure block upper cover of battery to avoid cover fall down to injure human or bodywork.

(c) When hoisting battery out forklift, be careful for touching steering wheel or other forklift parts.

(d) After finish installation of battery, connect and fasten the battery pin.

(e) Close upper cover of battery.



· When close upper cover of battery, be careful to injure your finger.

·During hoisting battery, be careful to prevent swing of battery box to injure bodywork.

10. Stacking



·Check the following items before operation:

(a) Be sure that there are no falling of load and damaging of load in loading region.

(b) Be sure that there is no goods or pile possible leading to unsafety

Stack as follows:

(1) Slow down when getting close to goods.

(2) Parking in front of goods.

(3) Check the safety of goods area.

(4) Adjust the position of vehicle until it lies in front of goods

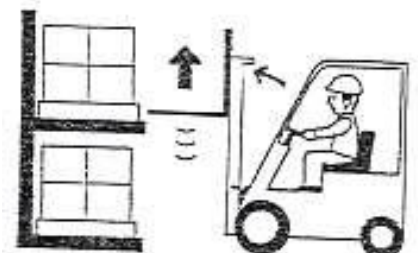
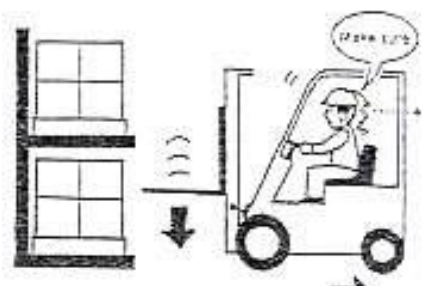
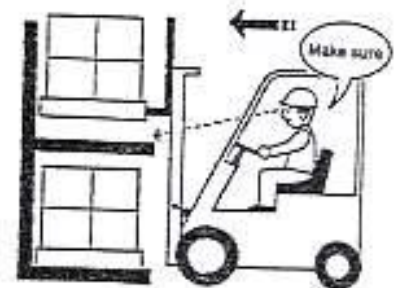
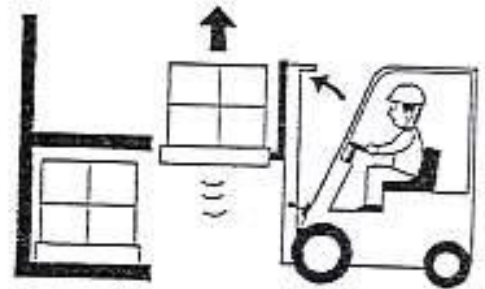
(5) Make Mast vertically, lift fork up more than the height of goods.

(6) Check goods'location and park the vehicle to optimum position.

(7) Ensure that the load higher than the stacked goods and lower fork slowly and place load correctly and safely.



·Before load placed on shelves or bracket:



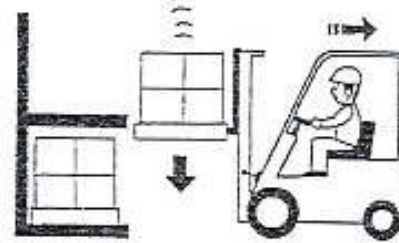
(a) Lower load until the fork no longer carries any load.

(b) Backing forklift for distance of 1 / 4 length of fork.

(c) Lift fork 50—100mm up and drive forklift forward for stacking to be optimum.

(8) Look at rear space, backing forklift in order to avoid impact between fork and pallet or goods.

(9) Ensure fork prong to be off goods or pallet, lower fork to avail driving (from ground 150—200mm).



11. Unstacking

Unstack referring to the procedure as below

(1) Slow down when close to goods.

(2) Park in front of goods (30cm between goods and fork prong)

(3) Adjust the vehicle position in front of goods

(4) Be sure that there is no overloading.

(5) Adjust the Mast upright to ground.

(6) Observe the vehicle position and move it forward until the fork inserts the pallet completely



•When it is difficult to insert the fork completely into pallet:

(a) Inserting 3 / 4 length of fork and lift pallet little more (50—100mm), then pull fork out pallet 100-200mm, then lower pallet.

(b) Insert fork into pallet completely.

(7) After fork insert pallet, lift pallet (50-100mm) up.

(8) Look at ambient space to move forklift backward to lower load.

(9) Lower load at the height of 150-200mm from ground.

(10) Tilt backward the mast to ensure the stability of goods.

(11) Transport the goods to destination



12 Deposit

(1) Before deposit

Before forklift deposits, clean it thoroughly, check up as following:

(a) If necessary, clean grease and oil of bodywork by cloth and water.

(b) When cleaning, check the vehicle entirely especially for hollow or damage of bodywork, if tires punctured, and if there is any nail or stone in tire surface groove.

(c) Check for leakage.

(d) If necessary, infuse grease.

(e) Check wheel hub nut and joint face between piston rod and piston for loose, check piston rod surface for injury.

(f) Check mast roller for rotation stability.

(g) Actuate lift cylinder to its max. height to let cylinder be full of liquid.



•As long as there is any failure or malfunction or unsafe factor of forklift to be known, report to related person and stop using forklift until repaired.

(2) Daily deposit

(a) Parking forklift on appointed place and block wheel by wedge.

(b) Put shift gear on neutral and actuate parking brake.

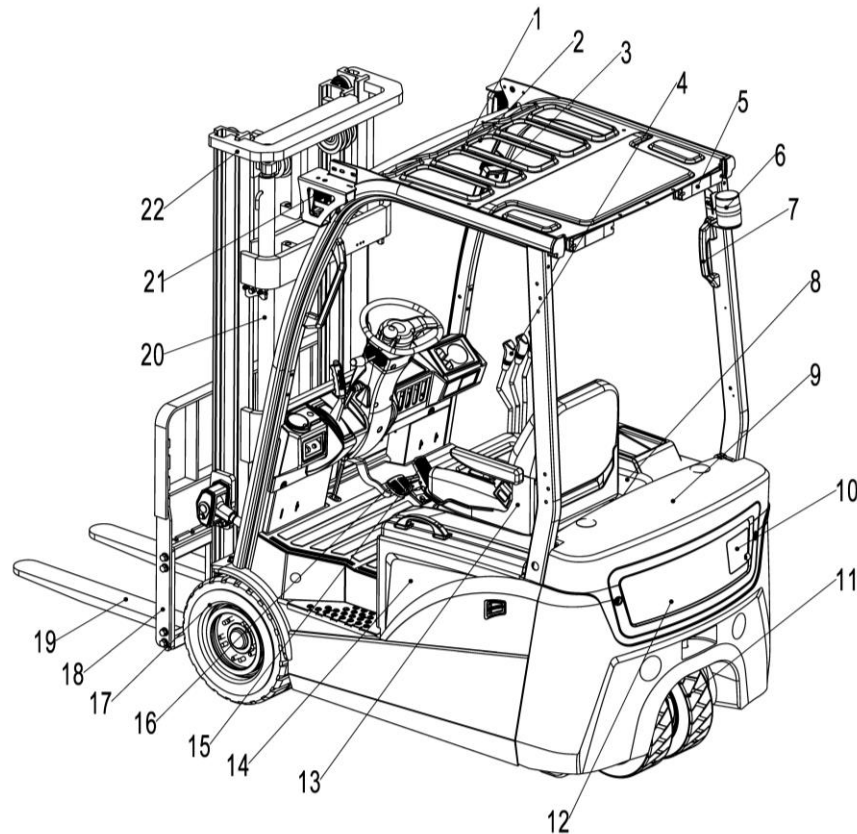
(c) Take off ignition key and keep it in safe area.

(3) Long time deposit.

- Based on daily deposit, please make check and maintenance according to the follow items.
- (a) Considering the raining season, park the vehicle on high and rigid ground.
 - (b) Unload battery from forklift, even indoor parking, if the place is muggy, dry and shade-cool are necessary fo the battery depositing. Charge the battery once a month.
 - (c) Rub anticonosive oil on bared surface of piston rod and shaft ect.
 - (d) Cover parts prevent raining and wet.
 - (e) Startup vehicle at least once a month, install battery, clean the grease on piston and shaft, startup engine and preheating, make vehicle move forward and backward slowly, meanwhile operating hydraulic control for several times.
 - (f) In summer, do not park forklift on floppy surface such as asphalt ground.
- (4) Operation after long time deposit.
- (a) Take off dampproof cover.
 - (b) Cleaning pickling oil from bared parts.
 - (c) Cleaning impurity and water of hydraulic tank.
 - (d) Install full charged battery on forklift andconnect it.
 - (e) Check carefully before startup.

II.Using instruction of operating devices

1. Components, schematic diagram for operating devices(see following figure)



- | | | | |
|----------------------------|--------------------|-----------------|----------------------------------|
| 1.overhead guard | 2. rearview mirror | 3. instrument | 4. Multi-way valve control lever |
| 5. rear combination lamp | 6. caution light | 7. Rear armrest | 8. Battery box cover |
| 9. counterweight | 10. Charging gate | 11. rear-wheel | 12. back shroud |
| 13.Seat | 14. side door | 15. accelerator | 16. brake pedal |
| 17. front wheel | 18. load backrest | 19.Fork | 20. Lifting cylinder |
| 21. front combination lamp | 22.Mast | | |

2. Instrument unit

see Electrical system .

3. Switches

(1) Emergency stop button

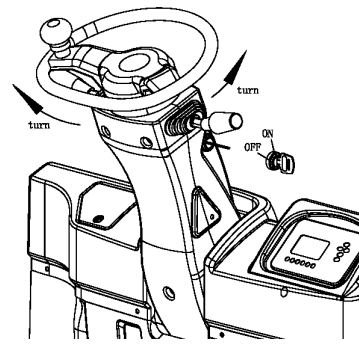
When emergency, press red mushroom-head button down to cut off power to stop function of traveling, turning, lifting. To resume the function, rotate the button according to the arrowhead indication.

(2) Key switch

key can turn on or turn off controlling power

Turn off (OFF): In this position, power is cut off and key can be inserted and pulled out

Turn on (ON): Turn forward from off position, switch is turned on, forklift starts up.



Emergency switch



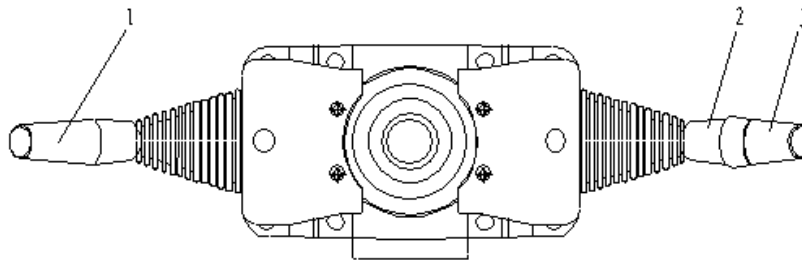
Do not turn on ignition key and step accelerator down simultaneously.

Take off key to prevent unqualified operating when get off forklift.

Take off key when charging or parking to prevent unqualified operating.

(3) Switch unit

Switch unit is combined by direction switch, steering switch and big and small light switch.



1- direction switch

2- steering switch

3- big and small light switch

Direction switch controls travelling direction and delivers signal to instrument to display. Push handle forward, vehicle travel forward, and pull handle backward, vehicle travel backward. Neutral position is vacancy. When handle is on backward, back-up light and caution light will open, back buzzer has sound.

Steering light shows rotation direction of forklift, when handle is on turning position, steering light will blink.

push forward	left steering light is bright
middle	neutral
pull backward	right steering light is bright

Big and small lights switch control relevant lights. Small light will open when rotate to the first gear, both big and small lights will open when rotate to the second gear.

light \ gear	OFF	first gear	second gear
width light	×	○	○
tail light	×	○	○
fore light	×	×	○

○: lightening ×: blanking

(4) Rear big light switch

Tail light switch is a single gear which controls on&off of the light. Pull switch up, light open;

push down, light off.

4. Control

(1) Steering wheel①and steering wheel handlebar②

Steering wheel operation is traditional: steering wheel turn right, vehicle move right; steering wheel turn left, vehicle move left. There is steering wheel at backside of forklift to make backside of forklift swing toward outside when turning.

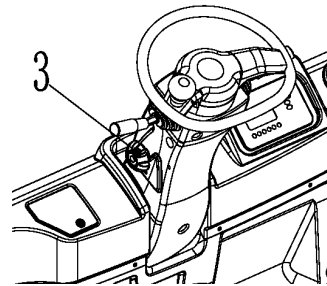
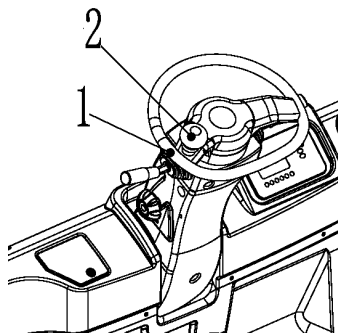
When turning, catch steering wheel by left hand and right hand on steering wheel or control handle of multiway valve.

Both hydraulic steering system and steering wheel tilting device are standard equipment of forklift.



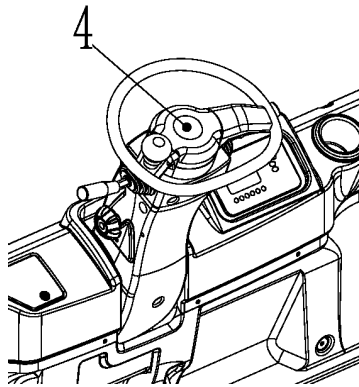
According to driver seat to adjust steering wheel to optimum angle.

·Lock steering pipe by tilting handle after adjusting steering wheel tilting angle.



(2) Horn button④

Push down rubber cover located in the center of steering wheel to make a buzzing sound. Even when ignition key is turned off, the horn can also sound.



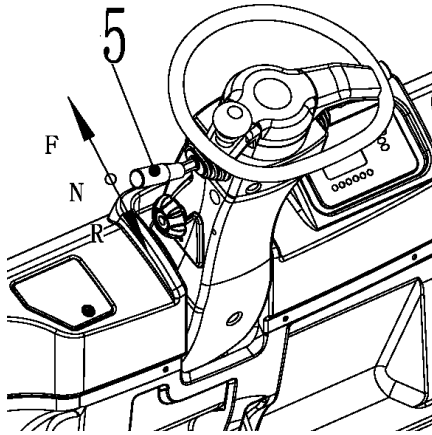
(3) Direction switch handle⑤

Indicate travelling direction

Travel forward (F): Push forward handle and step down accelerating paddle

Travel backward (R): Pull backward handle and step down accelerating paddle

When parking forklift, direction switch handle should be put in neutral position(N).



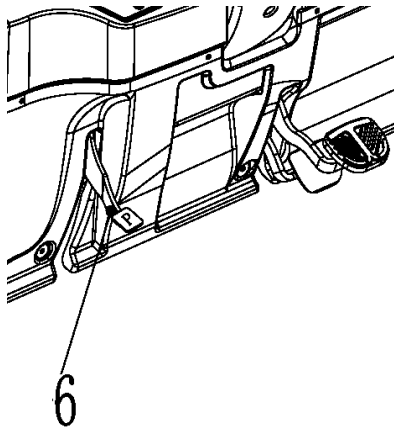
(4) Parking brake handle⑥

In order to prevent forklift from moving, when park forklift, pull up entirely parking brake handle.

It is necessary to push parking brake handle to end before driving.



·When operating the parking barke handle, step down the parking paddle.



(5) Brake paddle⑦and accelerating paddle⑧

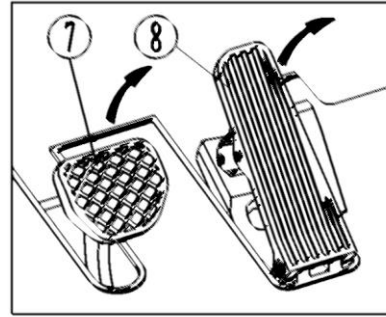
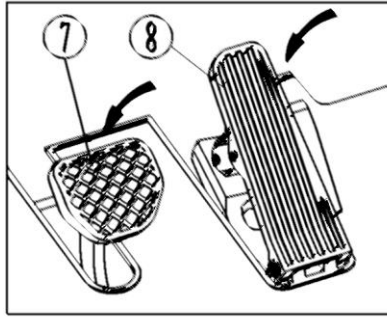


·Do not step accelerator pedal suddenly to prevent the vehicle from starting or accelerating suddenly.

·Ensure your foot remove from accelerator pedal when step brake pedal down.

From left to right, there are brake paddle⑦ and accelerating paddle⑧ in turn.

Step down accelerating paddle slowly, forklift speed is decided by stepped angle of accelerating paddle.



(6) Lifting handle⑨

Pull backward lifting handle, fork lifts, and push forward lifting handle, fork lowers. Lifting and lowering speed depend on tilting angle of handle, the larger the angle, the faster the speed is.



·Lifting operation can't be made, if push or pull lifting handle when turn on ignition key.

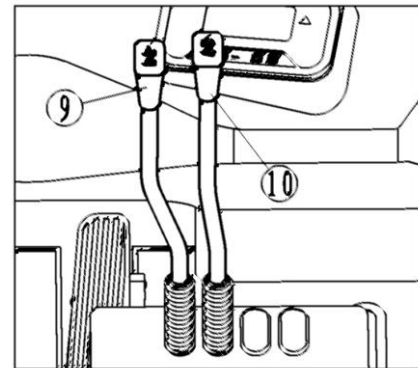
·Don't lower fork suddenly or stop suddenly when lowering fork.

(7) Tilting handle⑩

Pull backward tilting handle, mast tilts backward; push forward tilting handle, mast tilts forward. Tilting speed is decided by tilting angle of handle, the larger the angle is, the faster the speed is



·When turn ignition key on, push or pull tilting handle, you can not tilt mast.



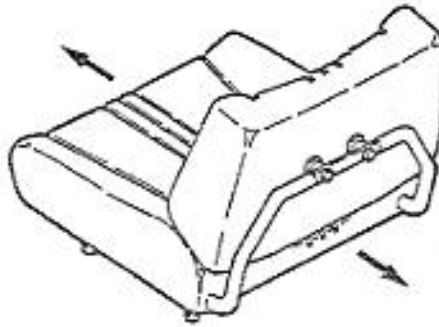
5. Truck body

(1) Seat

Make you fit to drive seat by adjust operating handle.

Lock will be released after pull the handle up. you can move seat to and fro gently. To be sure seat locked after adjusting.

Seat adjusting range To and fro is 120mm. When traveling on dry cement road, driver is given a perpendicular acceleration is 2.130m/s²-2.237m/s², integrative acceleration is 2.252m/s-2.356m/s.



(2) Roof guard

! ·Roof guard protect you from falling down goods. Its top is a fence-type shape, the space between two bars is 150mm, so, if goods size is less than 150×150mm, you must adopt another measure to protect yourself from danger of falling down of weights. Abnormal installation of roof guard or no roof guard or changing roof guard shall lead terrible accident.

(3) Goods rest

! ·Goods rest is an important device to protect operator from being impacted when cargo slides toward operator. Loose installation, usage after dismantling and usage after modification are all dangerous.

(4) Traction rod

Only in the following situation shall be possible to use traction rod.

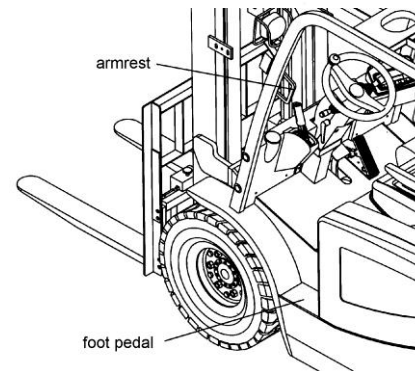
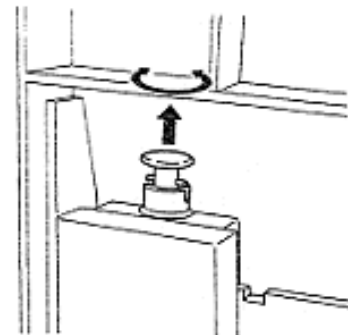
- To escape from the trouble of being not able to travel (for example wheel trapped in ditch)
- Forklift need to be loaded on or be unloaded from lorry.

! ·No using for towing or to be towed operation absolutely.

(5) Fitting pin for fork

Fork fitting pin lock fork on certain position. When need to regulate clearance of fork, pull pin out up, rotate pin 1 / 4 circle to make fork at position required. Regulation of clearance of fork depend on goods need to be loaded.

! ·According to principle of goods gravity centre shall be on centre of vehicle, we must regulate space of forks for equal distance either left and right. After regulated, to fixup fork



by fitting pin firmly.

- When adjust space of fork, lean against your body on goods rest, after standing stably, push fork by your foot. Do not regulate by your hands absolutely.

(6) Foot pedal and armrest

There is foot pedal on each side of forklift, armrest located on left front brace of roof guard, when get on or get off, please use foot pedal and armrest to ensure your safety.

(7) Lamps

There are head light and front light assembled on the head of vehicle direction indicator lamp, parking light, width light). There also are back light assembled on backside of vehicle which consists of tail light, turning light, brake light, parking light, back light and flasher.



- Identify the working status of lamps, Replace and repair lamps immediately if lamp burning out, lamp shield injury or dirty.

(8) Rear view mirror

Rear view mirror locates in right of roofguard front beam.



- Keep rearview mirror surface cleanness.
- Regulate rearview mirror for good position in favor of good sight of driver.

(9) Battery plug

Battery plug is used to join or cut off power, in normal situation, it should always be connected.



- If checking electrical parts of inside location, please cut off power to prevent danger.

- Even if ignition key on "OFF", main circuit Still has voltage. if you want to switch off power, it is necessary to pull out this connector.

- Do not pull out plug of battery during Driving unless emergency, because it can lead steering malfunction.



III. Safety issues

Safety is your business and responsibility. This section describes the typical forklift often used in the basic safety regulations and warnings, but also applies to the door frame with special specifications.

1 Operation place and working environment

(1) Ground conditions

The operation place of forklift should be ground with flat and firm surface, a good ventilation is needed.

Forklift's performance depends on the ground situation; running speed should be adjusted appropriately in ramps or rough pavement to be especially careful when driving. Driving on a ramp or rough roads will speed up the forklift tire wear and increased noise.

(2) Work environment

Forklift use ambient temperature should be -20 ° C ~ 40 ° C, the ambient humidity should less than 80%.

(3) Weather condition

When it's rainy, snowy, foggy or windy, to assess the safety before use forklift, the best is not to use for out door work, if must, driving and operation should be more carefully.

2. Safety rules



Only qualified people who has been trained and has driver license can operate the forklift!



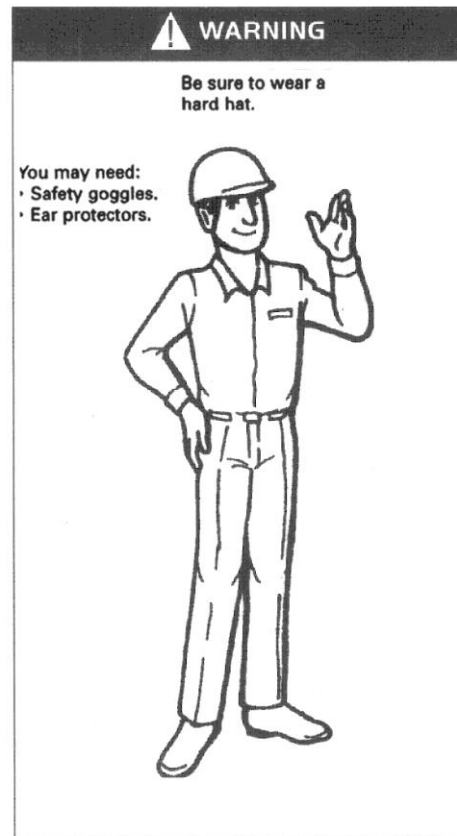
Forbid to drive on the highway!



Vigilant: injuries, the ambulance!



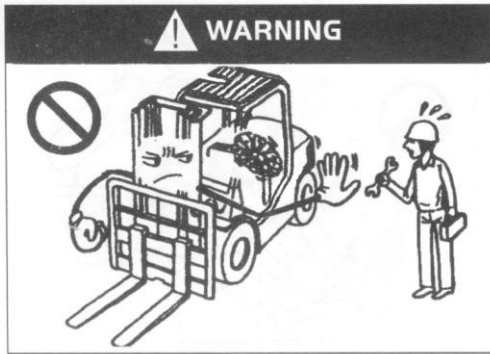
Do not change parts on forklift arbitrary without permission.



Put fatigue dress on before driving!



Read the instruction manual carefully before driving!



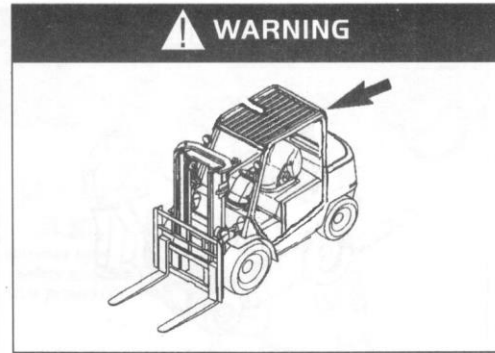
Turn off the engine before maintenance!



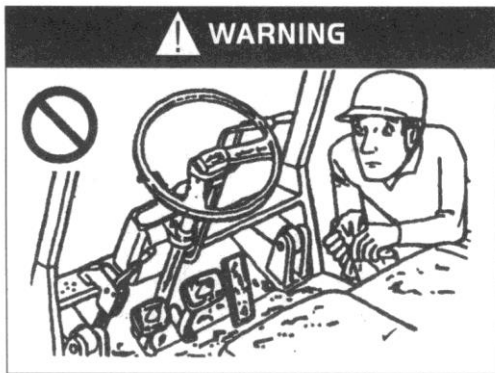
Understand traffic regulations



Before use, please check on the truck!



Do not move the overhead guard!



To keep driver's cap clean!



Do not drive an unsafe forklift!



Drivers should have a healthy body!



Be sure your truck is safe!



Work in specified area



Do not drive a damaged truck!



Hold tightly when get on the truck!



Start forklift correctly!



Adjust seat before driving!



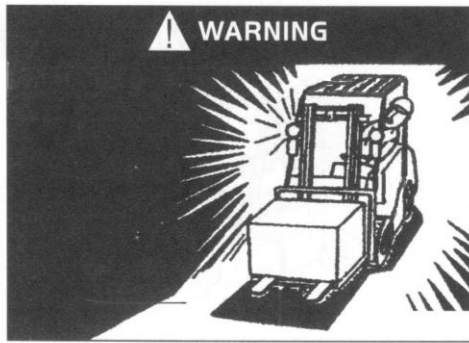
Make sure your forklift is in safe operating condition!



Appropriate fasten seat belts!



Always pay attention to the height of work place!



Turn on lights in dark area!



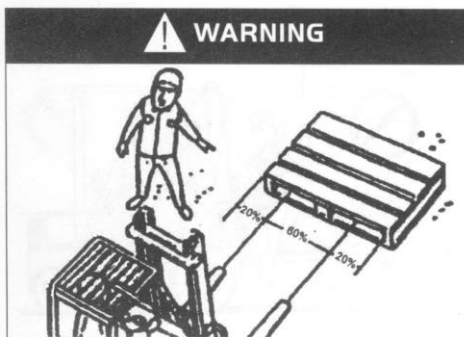
Do not put arm and body outside of the overhead guard during work!



Avoid driving on soft ground, only allowed to run on solid and flat ground.



Keep body under the guards!



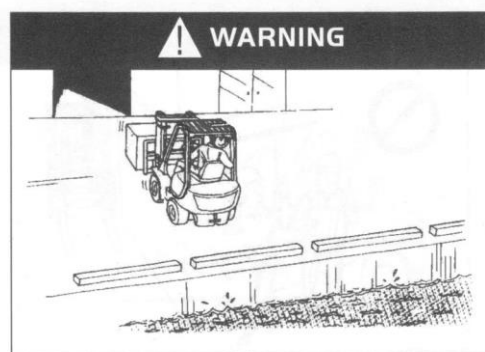
Avoid eccentric loading!



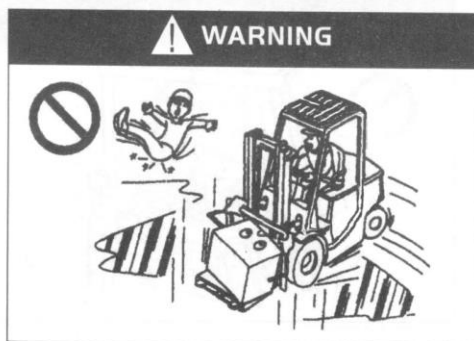
Pay attention to encounter item by front fork when loading!



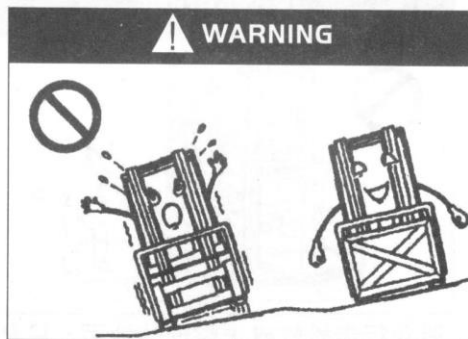
Check fork pin position!



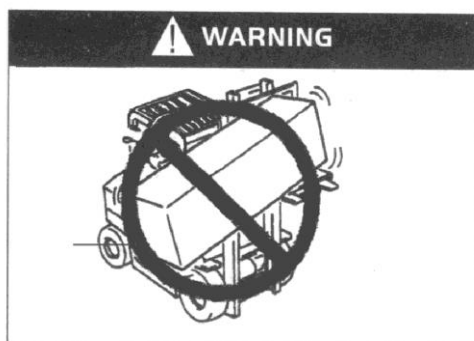
Note the security of the work region!



Do not run on smooth or slippery ground!



Note the horizontal driving stability of the truck when it is un-load!



Be especially careful when handling long or wide cargo!



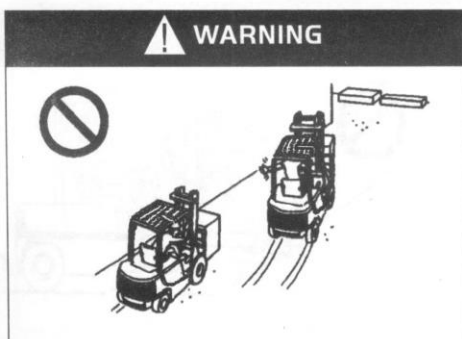
Forbid handling people!



If can not see the front when turning, please whistle and drive slowly.



Use appropriate pallets or sleeper when handling small objects!



Do not chase each other through the traffic!



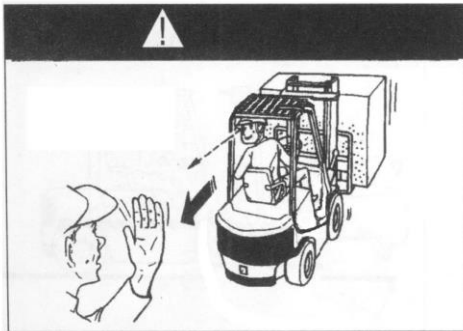
Not allowed to stand on the goods!



Not allowed to gaze around while driving!



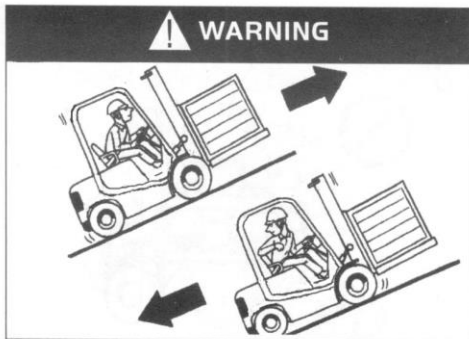
Do not use the forklift to do stunt!



when goods are so high to keep out line of sight, drive backward or forward under direction of others



Should obey the traffic rules and all warnings and signs!



when loading, travel forward in upgrade and backward in downgrade



Pay attention to the steep uphill slopes and goods lifting height!



When no-load, travel backward in upgrade and travel forward in downgrade!



Note using brake when start truck on the slopes!



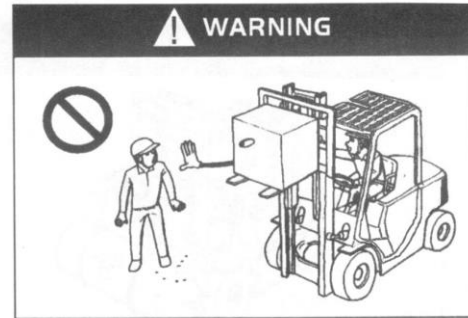
Not turn when driving on a slope!



People or things moving on road should be warned by whistle!



Be careful to crush people or goods when turning!



Operators are not allowed to close when the truck is working!



While turning a high speed can cause accident because of unstable center of gravity!



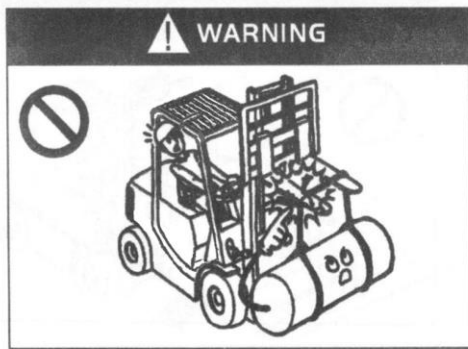
People are not allowed to start in work place!



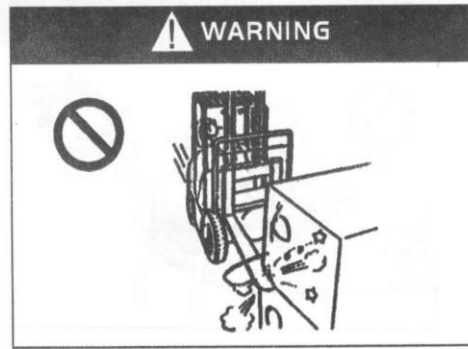
Notice the change of rated load weight before use forklift.



Pay attention to the area where forklift is driven!



Use the fork correctly when loading!



Slow down when loading!



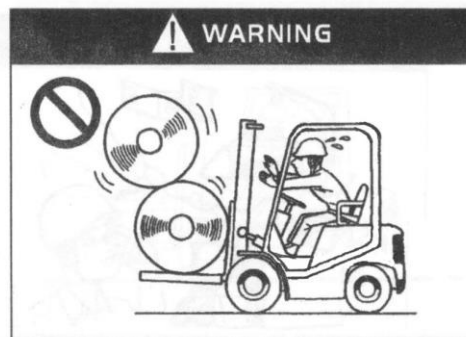
Do not move the truck when there is someone in front of the truck!



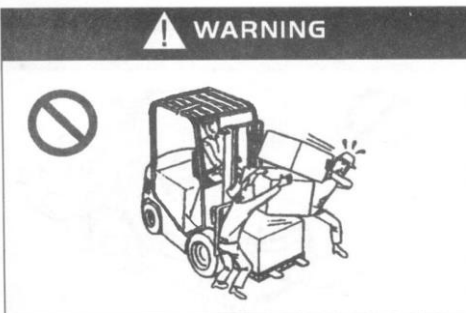
It is forbidden to stand or walk under the elevatory fork!



Do not load the goods which is higher than the goods rest.



Please bind the goods which is difficult to fix before load!



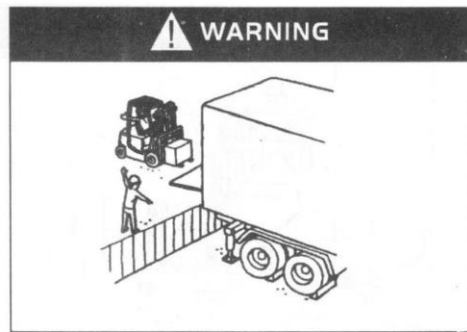
Do not carry the goods from forklift by manpower!



Do not let people to carry the goods have been damaged!



Do not misuse the fork!



Be careful when load the container!



Do not pick up people!



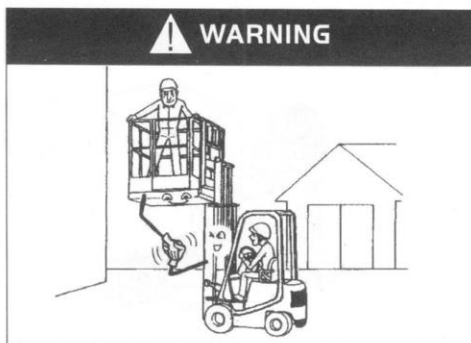
Do not misuse forklift!



Do not extend any part of body outside when driving!



Drive the truck smoothly to avoid sudden acceleration and deceleration!



Must use special equipment to lift people safely to work at height!



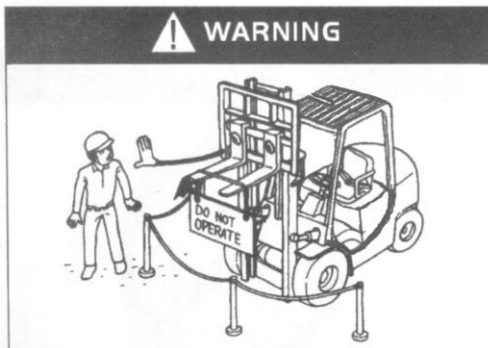
Do not overload!



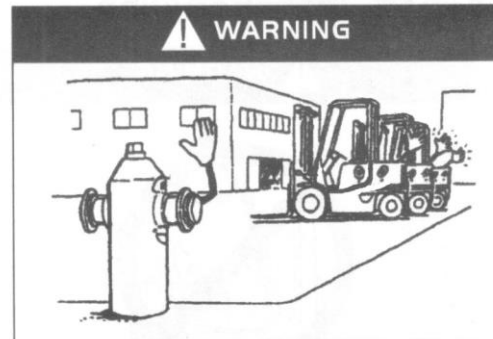
Do not lift when there is excessive wind!



Not allowed to work in explosive environments!



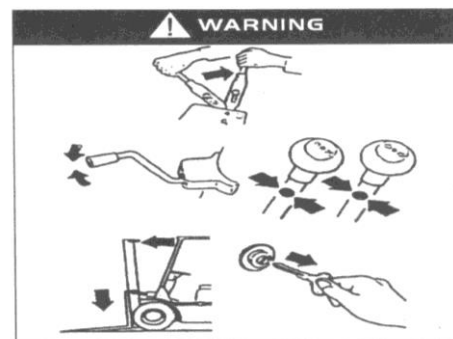
The faulty trucks should be put into the indicated area!



park the forklift to the indicated area!



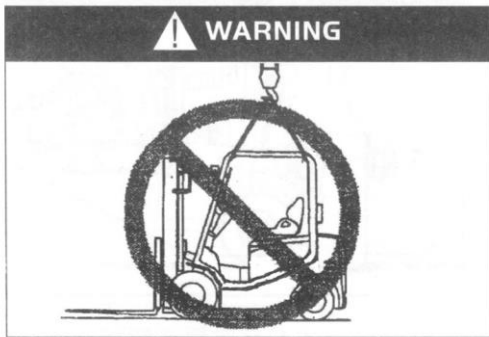
Do not park the forklift on the slope!



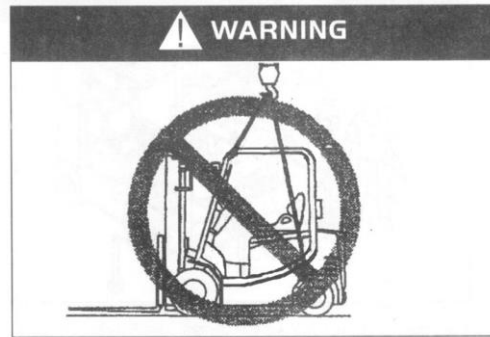
When the forklift is not in use, please do the follow.

- Brake
- Put direction pole in neutral position.
- Lower the fork to the ground
- Frame forward tilt.
- Take off the key

3. Move the truck



Forbid hoisting from the top!



Forbid hoisting on the frame!



Hoisting the forklift correctly!

Hoisting the forklift

·Tie firmly steel cable on two terminal holes of outer mast beam and on counterweight hoisting hook, then, hoist forklift with hoisting device.the side of steel cable connecting to counterweight should go through notch of roofguard without exerting pressure on roofguard.

- ⚠ ·When lifting the truck, be sure not to wire rope and overhead guard around together.
- Wire rope and lifting equipment to be very strong, enough to secure bearing fork lift, because the truck is extremely heavy.
- Do not use the cab (overhead guard) to hoist the forklift.
- Forklift upgrade, do not enter the truck underneath.

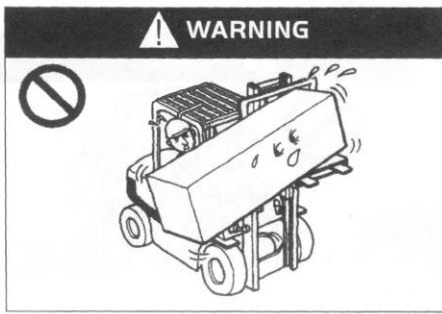
4. How to avoid overturning, how to protect yourself



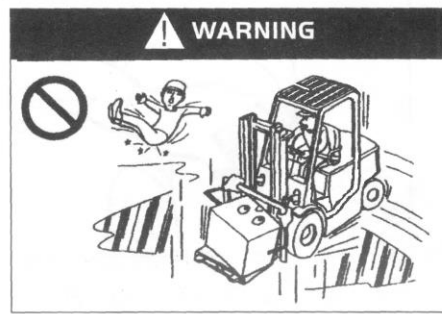
Prohibit forward tilt to enhance loading, so as avoid tipping!



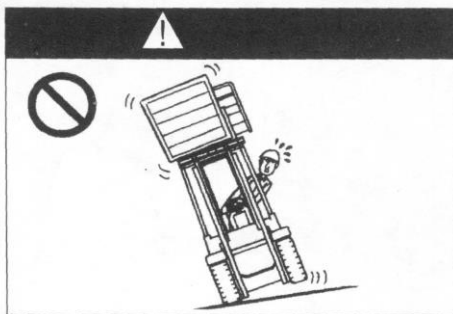
Prohibit lifting goods tipsily!



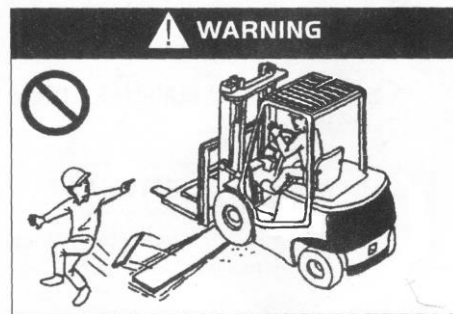
Prohibit eccentric loading of goods!



To avoid driving on slippery roads!



When the truck is not in the horizontal position, do not load or unload!



Prohibit crossing the obstacle such as a trench, mound and railway!



When moving, the distance between fork and ground should be less than 150mm to 200mm!



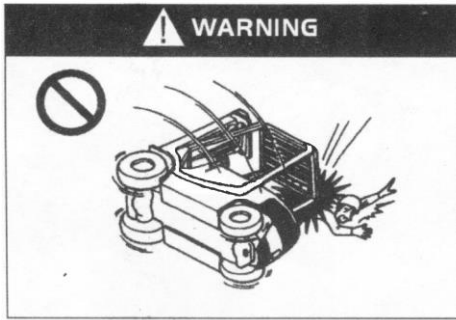
Whether load or no-load, don't turn in a high speed or in a large radius!



when no-load fork is lifted, please turn with a narrow range.



Be sure to fasten seat belts!



Do not jump in the event of forklift rollover!



Please wear helmets when driving!

! It is safer to stay under the protection of seat belt than jump down the truck. If the forklift began to tip over:

1. Tap foot and clench the steering wheel tightly.
2. Do not jump.
3. The body bend to the opposite direction of the rollover.
4. Forward the body.

5. Safety problem in Maintenance

(1) Maintenance location

! Designated areas should be available to service providers and adequate equipment and security facilities.

- The site should be level ground.
- The site should be well ventilated.
- The site should have fire-fighting equipment.

(2) Precautions before maintenance

! No smoking
 • Wear all protective equipment (helmets, shoes, glasses, gloves and boots), and suitable clothing.

• Wipe out the oil in time.
 • When add lubricating oil, you should clean out dirty oil or dust with a brush or cloth, then add oil.

• In addition to the needs of some cases, should turn off the key switch and pull the battery plug out.

- Lower the fork to ground when maintaining.
- Clean the electrical components with compressed air.

(3) Matters need attention.

! You should be careful not to put your feet under the descensive fork, do not be tripped over by fork.

• When fork is lifted, place cushion block or other object under inner mast to prevent fork and mast from falling down suddenly.

• You should be careful when you open and close the noseplate and cover plate of battery.

• When you can not finish your work in one time, please make mark and go on next time.

• Use the right tools, do not use makeshift tools.

• Because of high pressure hydraulic circuit, do not carry out maintenance work before reducing the internal pressure oil-way.

• When shocked by high-voltage, search for medical treatment immediately.

- Do not use the door frame assembly as a ladder.
- Strictly forbidden to put your hands, feet and body between frame and door frame assembly.

(4) Inspect and replace tires.



·Assembly and disassembly of tires must be operated by professionals.

- High-pressure air should be carried by professional.
- Wear goggles when using the compressed air.
- When disassemble tires, do not loose rim junction bolts and nuts, there is high-pressure gas inside the tire, bolts, nuts and rims loose cause very dangerous situation.

·Junction disassembly rim bolts and nuts, the tire must be exhausted within the high-pressure gas, and carried out special tools.

(5) Use jack (replacement of tyres)



·When lift the forklift truck with a jack, do not bore into the bottom of forklift.
 ·Before lift the forklift truck with a jack, ensure there is no person or load on the truck.
 ·When forklift is of ground, stop using jack and put pad under it to prevent it from falling.

·Before lift forklift with jack, affirm there is nobody and no load on it

(6) Emission (electrolytic liquid, oil, etc.) requirement.



·Forklift scrapped parts (plastic parts, electrical components, etc.), liquid (hydraulic oil, brake fluid, etc.) should be recycled according to local government stipulation, do not dispose them at will.

6. Safety problem in battery usage

(1) No smoking



·Batteries produce hydrogen gas. Short circuit will produce sparks when lit cigarette near the battery, it will cause an explosion and fire.



(2) Avoid electrical attack



·Battery with high voltage, when the installation and maintenance, do not touch the battery conductor, which can cause serious burns.

(3) Correct link



·When the battery charging, the positive and negative can not be reversed, otherwise it will cause heat, fire, smoke or explosion.

(4) Do not put metal objects on the battery

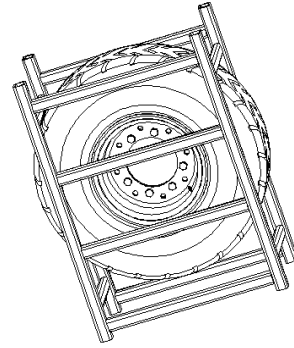


·Do not let positive and negative contacts cause a short circuit by bolts or tools, which will result in injuries and explosions.

(5) Against excessive discharge



·Do not use forklift until it can not move, otherwise the battery life will be shortened.



The batteries need charging up when the battery capacity warning light flashes continuously.

(6) Keep clean



- Keep the battery surface clean.
- Do not use dry cloth, chemical fiber cloth to clean the battery surface. Do not use polyethylene film covered battery.
- Static electricity can cause an explosion.
- Clean the top of the battery not covered with a moist cloth.

(7) Wear protective clothing



- When maintain the batteries, you should wear goggles, rubber gloves and rubber boots.



(8) Battery electrolyte is harmful



- Battery electrolyte is made of diluted sulfuric acid, be careful when handling.
- When electrolyte adhesion conglytination on eyes, skin and clothing, it will result in vision loss and burns.

(9) Emergency dealing methods



- When the accident occurred, deal according to the following methods of emergency treatment and contact a doctor immediately.
- Splash on the skin: wash with water for 10-15 minutes.
- Splash into the eyes: wash with water for 10-15 minutes.
- Contaminated for a large area: counteract (baking soda) electrolyte with dry soda or clean it out with water
- Swallowed: to drink plenty of water or milk.
- Spilled on clothing, immediately take off clothes.

(10) Close battery cover tightly.



- Cloth battery upper cover tightly to prevent electrolyte from leaking.
- Do not add too much electrolyte, electrolyte overflow will cause leakage.

(11) Waterproof



- Batteries can not be wet with rain or sea water, this will damage the battery or cause fire.

(12) Battery anomaly



- When the battery has the following situations, please contact our sales department:
- Battery stinks.
- Dirty of electrolyte.

- Electrolyte temperature becomes higher.
- Electrolyte reduces too quickly.

(13) Prohibit disassemble



- Do not drain the electrolyte from the battery.
- Do not split the battery.
- Do not repair the battery.

(14) Stored



·When the battery is not in use for a long time, it should be stored in well-ventilated place and difficult to fire.

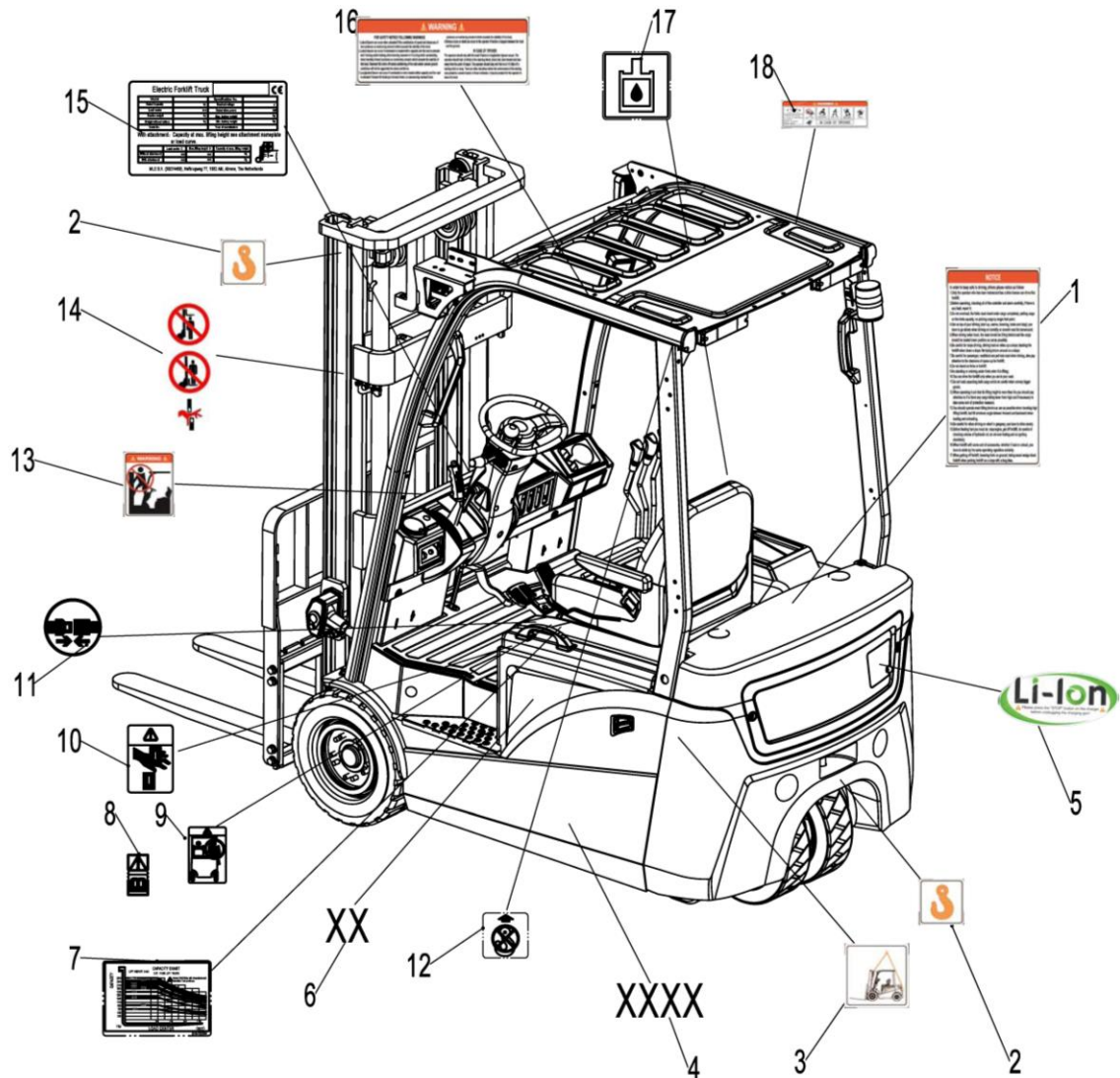
(15) Disposal of waste batteries



- Disposal of waste batteries should contact our sales department.

7. Labels

Labels posted on the forklift are used to illustrate the use and precautions of it. They are for the benefits of both you and the forklift. Immediately re-paste the labels if they fall off.



1- Operating Instructions for Forklift Trucks
4-LOGO
7- load curve
10- Hand-shake sign
13- No Climbing
16- Anti-side-overmark 1

2- Lifting point
5- Charging indicator
8- Reading sign
11- safety belt
14- warning sign
17- Hydraulic oil identification

3- Whole vehicle hoisting
6- vehicle model identification
9- Prohibition of seating people
12- Prohibition of lifting
15- nameplate
18- Anti-side-over Marking 2

Chapter four Truck's regular check and maintenance

Conduct a comprehensive pre-inspection of forklift trucks and forklifts to avoid failure and fail to produce the life it deserves. Maintenance program is based on the number of hours listed in forklift work 8 hours a day, working 200 hours a month the case may be, in order to maintain safe operation and maintenance procedures should be maintained on the forklift.

Routine maintenance and repair work carried out by the truck drivers, and other inspection and maintenance by professional maintenance personnel.

I .The check before operation

For safe operation and to make sure the truck in good condition, a comprehensive inspection of truck should be conduct before operation, which is a statutory duty. If find problems you should contact our sales department.



A small mistake will cause a major accident, do not operate or move the forklift truck before the completion of repair work and inspections.

- The forklift should be checked on the platform.
- When checking on electrical system of the truck, the key switch should be switched off and the battery plug should be unplugged before the test.
- Replacement of inappropriate handling of waste oil down (into the water pipe under the soil, burning, etc.) will pollute the water, soil, atmosphere, etc., which is prohibited by law.

1. Checking point and checking content

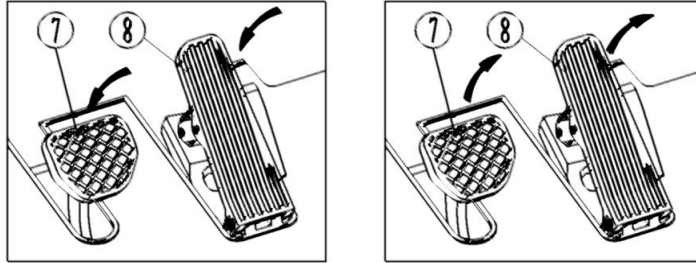
	No.	Checking points	Checking contents
Brake system	1	Brake pedal	Foot brake pedal travel and braking force
	2	Brake oil	Quantity and cleanliness
	3	Parking brake	Parking brake handle travel and the size of operation force
Steering system	4	Steering wheel control	Elastic, rotation and movement before and after
	5	Hydraulic steering operation	Operation of all components
Hydraulic system and the frame	6	Function	Function, it has cracks, lubrication condition
	7	Pipe	Whether the pipe is leakage
	8	Hydraulic fuel	The appropriate fuel
	9	Lifting chain	Left and right should be consistent with two chain tightness
Tyre	10	Tyre	Pressure size, whether abnormal breakage.
	11	Wheel nut	Tighten firmly
Battery	12	Charging	Determine the battery capacity display status, the proportion of the plug should be firmly connected.
Lights, horn and switch	13	Headlights, taillights, reversing lights, horn turn signals, and emergency power off switch	To see if the light off, listening to speakers if sound, emergency power off switch is abnormal.
Detection and display	14	Function	When connected to key switch should display "test state normal"
Others	15	Owerhead guard, load backrest	Bolts, nuts are tightened
	16	Nameplate and marks	Integrity
	16	Other parts	Normal or not

2. Checking procedure

(1) Check the brake pedal

(1) Check the foot brake pedal ⑦

Check the braking status. Ensure that if the brake pedal is fully depressed, the travel distance of the brake pedal should be more than 50mm, and the braking distance of no-load forklift shall be about 2.5m.



(2) Check brake fluid



• Open the oil cup cover and check the quantity of brake oil and other conditions.

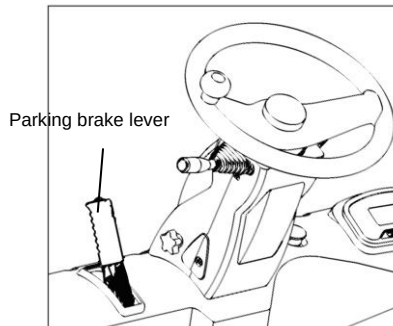


(3) Check the parking brake lever

Push forward the parking brake lever and check the following items:

- If the pull distance is appropriate.
- Degree of braking force.
- If the parts are broken.

If the operator finds the manipulation force of the lever (standard force is 17-22kg) appropriate. Operators can adjust the screw at the top of the lever.

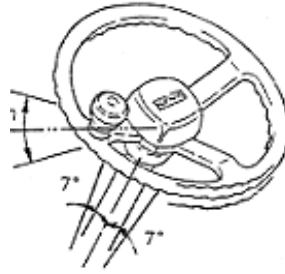


(4) Check the rotation of the steering wheel

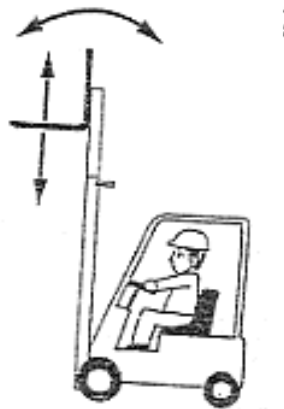
Gently rotate the steering wheel clockwise and counterclockwise to check if rebound occurs. The suitable travel length for rebound shall be 50-100mm. The travel length of steering wheel when moving forwards and backwards are

about 7°. If the actual travel length falls within the scope, rotation of the steering wheel can be deemed as Normal.

Rebound stroke
50—100mm



- (5) Check the power steering feature
Rotate the steering wheel clockwise and counter-clockwise, and check the working condition of the power steering.
- (6) Check the hydraulic system and the function of main frame
Check if the operations of lifting, tilting forward and backward are normal and smooth.



- (7) Check the oil pipe
Check the lifting cylinder, tilting cylinder and all the piping for oil leakage.
- (8) Check hydraulic oil
Lower the fork to the ground and check the oil level of hydraulic oil with a gauge. If the oil level is within the range of H to L, the hydraulic oil volume is appropriate.

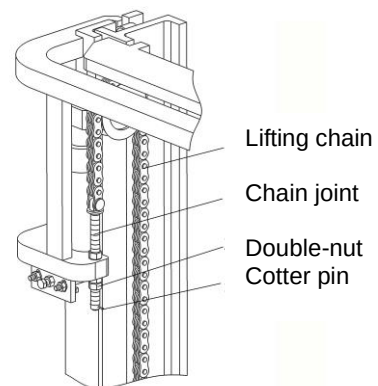
Type	H	L
FE3D16-20N1	20L	24L

- (9) Check the lifting chain
Lift the fork to 200-300mm away from the ground and ensure that the tightness of left and right chains are the same. Check whether the finger lever is in the neutral position. Adjust the chain joints in case of difference in tightness.



• Double-nut should be tightened after this adjustment.

- (10) Check the tires (solid tire)
Check tires and the side surfaces for damage or cracking, and then check the wheel rim and the lock ring for deformation or damage.



(11) Check the rim nuts

! • Looseness of rim nuts could be very dangerous as it may lead to falling off of wheels and overturning of the forklift. Check all the rim nuts for looseness. Make sure they have been tightened to the specified torque to avoid danger.

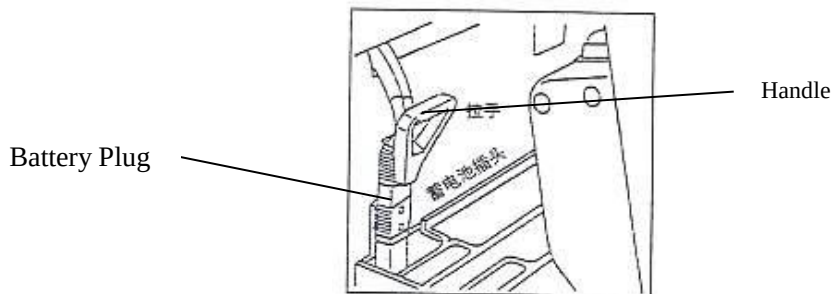
Tightening torque of the rim nuts:

Front wheel: 18×7-8 280-320N. m

Rear wheel: 15×4 1/2-8 130-150N. m

(12) Check the charging status

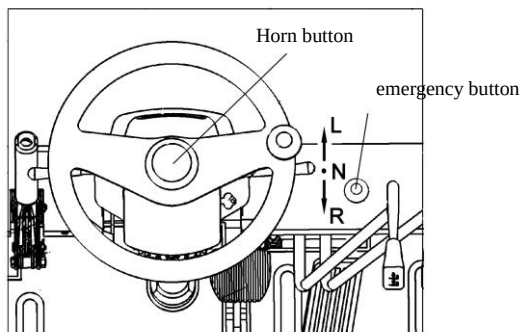
Measure the specific gravity of the battery. If the specific gravity of the accumulator is 1.275 to 1.285 when the accumulator is switched to 30 °C, indicating that the accumulator is fully charged. Check for loosening of terminals and check cables damage.



(13) Check the front headlight, steering lamp and the horn

Check if these lamps could light up normally and if the horn can sound normally (checking by pressing the horn button).

Check the emergency stop switch.



L	Left steering lamp lights up
N	Neutral position
R	Right steering lamp lights up

(14) Check instrument panel

Under normal circumstances, the instrument panel will display as below within a few seconds after turning on the key switch.

15) Check the overhead guard and backrest

Check the bolts or nuts for looseness.

16) Check the integrity of the labels

17) Others

Check for abnormalities on other components.

! • In addition to checking of the lights and operating conditions, turn off key switch and unplug the accumulator before check the electric system.

II. Checking after operations

After work, remove dirt from the forklift and check the following items:

(1) Inspect all parts and components for damage or leakages.

(2) Check for deformation, distortion, damage or breakage.

- (3) Add grease if necessary.
- (4) Lift the fork to the maximum height for several times after operations are finished. (After you do not lift the fork to its maximum height in daily work, this allows the oil flow through the cylinder to prevent rusting).
- (5) Replace abnormal components that cause failures during work.



• **A small fault will cause a major accident. Do not operate or move the forklift before completion of repair and inspection.**

III. Clean the forklift



- **Park the forklift at the specified location.**
- **Pull the parking brake lever.**
- **Press the emergency stop switch.**
- **Turn off the key switch and remove the key.**
- **Disconnect the accumulator plug.**

1. Clean the forklift surface



Do not use flammable liquids to clean the forklift and take safety measures to prevent short circuits.

- Use water and soluble detergent to clean the forklift.
- Carefully clean the oil filler and the periphery of the lubricating port.



Please conduct lubrication timely if you clean the forklift frequently.

2. Clean the chain



Do not use chemical detergents, acid and other corrosive liquids to clean the chain.

- Place a container under the main frame.
- Use gasoline and other petrochemical derivatives to clean the chain.
- Do not use any additives when cleaning with a steam nozzle.
- Wipe the chain pin and water on chain surface immediately after cleaning.

3. Clean the electric system



Do not use water to clean the pump control and the connectors, so as avoid damage to the electrical system.

Use non-metallic brush or low-power dryer to clean the electric system according to the manufacturer's instructions. Do not move the protective cover.

4. After cleaning

- Thoroughly wipe off water stains on the forklift (compressed air could be used.)
- Start the forklift according to the procedures.



If moisture penetrates gets into the motor, you should first remove the moisture to prevent short circuits.



Moisture will reduce brake performance, so you shall conduct braking to dry the brake.

IV. Regular maintenance

- Regular inspection and maintenance of the forklift shall be conducted to keep it in good performance status.
- Use spare parts made by Noblift Machinery.
- Do not use different types of oil when replacing or refilling oil.

- The oil and accumulator being replaced shall be disposed according to local environmental protection laws and regulations rather than being dumped and abandoned.
- Develop comprehensive maintenance and repair program.
- Keep detailed record of each maintenance and repair.
- Forklift repairing without training is prohibited.



- **No smoking.**
- **Turn off the key switch and disconnect the accumulator plug before maintenance.**
(Except for conducting some of the troubleshooting checks)
- **Clean electrical parts with compressed air and do not use water for cleaning.**
- **Never stretch your hands, feet or any part of the body into the place between the main frame and instrument rack.**
- **The charged capacitor within the controller may cause electrical injury even if the key switch is off. Be careful when contacting the controller.**

1. Regular maintenance schedule

√ - Inspection, calibration, adjustment × - Replacement

(1) Accumulator

Maintenance Item	Maintenance content	Tools	Per day (8h)	Per week (50h)	per month (200h)	Per 3 months (600h)	Per 6 months (1200h)
	Accumulator power		√	√	√	√	√
	Looseness of terminals		√	√	√	√	√
	Looseness of the connection lines		√	√	√	√	√
	Cleanness of accumulator surface		√	√	√	√	√
	If there is any tool placed on accumulator surface		√	√	√	√	√
	Keep away from fireworks		√	√	√	√	√

(2) Controller

Maintenance Item	Maintenance content	Tools	Per day (8h)	Per week (50h)	Per month (200h)	Per 3 months (600h)	Per 6 months (1200h)
Controller	Check wear status of contacts					√	√
	Check if the mechanical movement of the contactors is good					√	√
	Check if the operation of micro switch pedal is normal					√	√
	Check the connection between the motor, accumulator and the power units					√	√
	Check if the troubleshooting system of controller is normal						For the first 2 years

(3) Motor

Maintenance Item	Maintenance content	Tools	Per day (8h)	per week (50h)	per month (200h)	Every 3 months (600h)	Every 6 months (1200h)
Motor	Remove foreign body on the motor shell				√	√	√
	Replace or clean the bearing						√
	Check for wear of carbon brushes and commutator. Also check if the spring force is normal				√	√	√
	Check if the wiring is correct and reliable				√	√	√
	Clean up the groove on changeover plate and add carbon powder on the changeover					√	√

(4) Transmission system

Maintenance Item	Maintenance content	Tools	Per day (8h)	per week (50h)	per month (200h)	Every 3 months (600h)	Every 6 months (1200h)
Gearbox and wheel reduction mechanism	If any noise		√	√	√	√	√
	Check for leakage		√	√	√	√	√
	Replace the oil						×
	Check the working status of brake		√	√	√	√	√
	Check the gear operation					√	√
	Check looseness of the bolts at the connection with the main frame				√	√	√
	Check the tightening torque of wheel hub bolt	Torque Wrench	√	√	√	√	√

(5) Wheels (front and rear)

Maintenance Item	Maintenance content	Tools	Per day (8h)	per week (50h)	per month (200h)	Every 3 months (600h)	Every 6 months (1200h)
Tires	Wear, cracks or damage		√	√	√	√	√
	nails, stones or other foreign body on the tire				√	√	√
	Damage of wheel rim		√	√	√	√	√

(6) Steering system

Maintenance Item	Maintenance content	Tools	Per day (8h)	per week (50h)	per month (200h)	Every 3 months (600h)	Every 6 months (1200h)
Steering Wheel	Check the clearance		√	√	√	√	√
	Check the axial looseness		√	√	√	√	√
	Check the radial looseness		√	√	√	√	√
	Check the operating status		√	√	√	√	√
Steering gear and Vavle block	Check for looseness of the mounting bolts				√	√	√
	Check the leakage on contact surface of valve block and steering gear		√	√	√	√	√
	Check the sealing condition of the interface connectors		√	√	√	√	√
Rear axle	Check for looseness of the mounting bolts on rear axle				√	√	√
	Check bending, deformation, cracking and damage				√	√	√
	Check or replace the lubrication on axle supporting bearing					√	√
	Check or replace the lubrication on bearing of the steering wheel hub					√	√
	Check the operating conditions of steering cylinder		√	√	√	√	√
	Check for leakage of the steering cylinder		√	√	√	√	√
	Check the meshing of gear and rack					√	√
	Sensor wiring and working status					√	√

(7) Braking system

Maintenance Item	Maintenance content	Tools	Per day (8h)	per week (50h)	per month (200h)	Every 3 months (600h)	Every 6 months (1200h)
Brake pedal	Free travel	Graduated scale	√	√	√	√	√
	Pedal travel		√	√	√	√	√
	Operating conditions		√	√	√	√	√

	If there is air within the brake lines		√	√	√	√	√
Manipulation of parking brake	If the brake control is safe and reliable and with enough travel		√	√	√	√	√
	control performance		√	√	√	√	√
Rod, cable and etc	control performance				√	√	√
	Looseness of the connection				√	√	√
	Wear of the joints with gearbox					√	√
Pipelines	Damage, leakage, rupture				√	√	√
	Connection, clamping parts and looseness status				√	√	√
Braking Master cylinder and Wheel Cylinders	Leakage		√	√	√	√	√
	Check the oil level and replace oil		√	√	√		×
	Action of master cylinder and wheel cylinders					√	√
	Leakage and damage of master cylinder and wheel cylinders					√	√
	Check wear and damage of master cylinder, wheel cylinder piston cups and check valve. Replace if necessary.						×

(8) Hydraulic system

Maintenance Item	Maintenance content	Tools	Per day (8h)	Per week (50h)	Per month (200h)	Per 3 months (600h)	Per 6 months (1200h)
Hydraulic cylinder	Oil volume check and replacement of oil		√	√	√	√	×
	Clean the oil absorption filter						√
	Exclude foreign body						√
The control valve rod	Looseness of the connection		√	√	√	√	√
	Operating conditions		√	√	√	√	√
Multiple unit valve	Oil leakage		√	√	√	√	√
	Operating conditions of the safety valve and self-locking tilt valve				√	√	√

	Measure the pressure of the safety valve	Oil pressure gauge					√
Pipe line joints	Leakage, looseness, crack, deformation and damage				√	√	√
	Replace the tube						× 1-2 years
Hydraulic Pump Cylinders	Oil leaks or noise of hydraulic pump		√	√	√	√	√
	Wear of the driving gear of hydraulic pump				√	√	√

(9) Lifting system

Maintenance Item	Maintenance content	Tools	Per day (8h)	Per week (50h)	Per month (200h)	Per 3 months (600h)	Per 6 months (1200h)
Chain sprocket	Check the tightness of the chain and see if there is any deformation, damage and corrosion		√	√	√	√	√
	Lubricate the chain				√	√	√
	Riveting pin and its looseness				√	√	√
	Deformation and damage of chain wheel				√	√	√
	If the sprocket of bearings are loose				√	√	√
Accessories	Check if it is in normal state				√	√	√
Lifting cylinder and tilt cylinder	Looseness, deformation, damage of piston rod, threaded rod and their connection parts		√	√	√	√	√
	Operating conditions		√	√	√	√	√
	Leakage		√	√	√	√	√
	Wear and damage of pins and steel backed bearing				√	√	√
Fork	Damage, deformation and wear of the fork				√	√	√
	Damage, wear of the location pin					√	√
	Cracking and wear on the welding parts at the root of the fork				√	√	√
Main Frame Fork frame	Crack or damage on the inner main frame, outer main frame and welded parts on the beam				√	√	√
	Bad welding, cracking, damage on the welded parts between tilt cylinder bracket and the main frame				√	√	√
	Bad welding, cracking or damage of the inner and outer main frame				√	√	√
	Bad welding, cracking or damage of the fork frame				√	√	√
	Looseness of rollers				√	√	√

	Wear and damage of the support bearing of the main frame						√
	Looseness of bolts on the main frame bearing cap	Test hammer			√ (Only for the first time)		√
	Looseness of bolts on the piston rod head of the lifting cylinder and the plate bending bolts	Test hammer			√ (Only for the first time)		√
	Cracking and damage of roller, roller axle and welding parts				√	√	√

(10) Others

Maintenance Item	Maintenance content	Tools	Per day (8h)	Per week (50h)	Per month (200h)	Per 3 months (600h)	Per 6 months (1200h)
Overhead guard and backrest	are firmly installed	Test hammer	√	√	√	√	√
	Check the deformation, cracking and damage		√	√	√	√	√
Steering lamp	Working and installation status		√	√	√	√	√
Horn	Working and installation status		√	√	√	√	√
Lamps and light bulbs	Working and installation status		√	√	√	√	√
Back-up buzzer	Working and installation status		√	√	√	√	√
Instrument	Working status of instrument		√	√	√	√	√
Wiring	Damage and loosening of harness			√	√	√	√
	Loosening of circuit connection				√	√	√

2. Replace critical safety components periodically

If injury or damage of some parts is difficult to find through regular maintenance, users shall conduct periodic replacement of parts given in the following table to further improve security.

If these parts are abnormal before the due replacement time, replace them immediately.

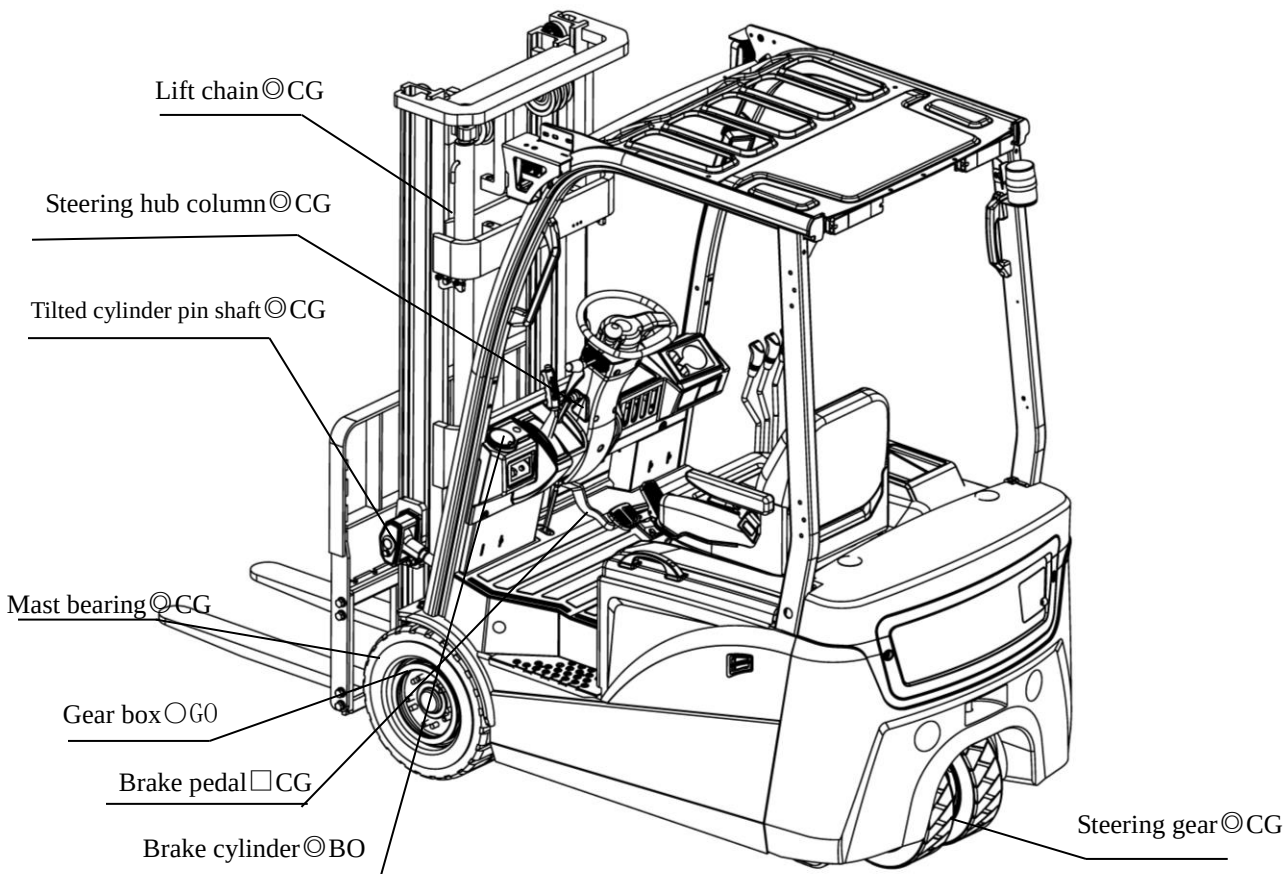
Name of key safety components	Service life (years)
Brake hose or tube	1~2
Hydraulic hose for the lifting system	1~2
Lifting chain	2~4
High pressure hose and tube for the hydraulic system	2
Oil cup of the brake fluid	2~4
Brake master cylinder cover and dust proof cover	1
Internal seals and rubber parts of the hydraulic system	2

V. Lubricating parts and recommended oil

1. Lubricating parts

○: Replacement
 ◎: adding
 □: Check and adjustment
 BO: Brake oil

FO: Hydraulic oil
 GO: Gear oil
 CG: Lubricant grease
 W: Distilled water



2. Recommended oil

Name	Trademark	Capability(L)	Remark
Hydraulic oil	L-HM32	Max.24	≥-5° C
	L-HV32		≥-20° C
Gear oil	ATF220	0.45x2	
Brake fluid	Caltex DOT4	0.2	
Industrial Vaseline	2#	Moderate	Battery electrode column
Grease	3# Lithium Grease	Moderate	

Chapter five DECLARATION OF CONFORMITY

[GB] Original CE Declaration of conformity

The signatory hereby declares that the specified machine conforms to the EC Directive 2006/42/EC (Machine Directive), and 2014/30/EU (Electro-Magnetic Compatibility, EMC) including their amendments as translated into national legislation of the member countries. The signatory is individually authorized to compile the technical documents and declares that the following standards, including the normative procedures contained therein, have been applied:

[D] Original EG- Konformitätserklärung

Der Unterzeichner erklärt hiermit, dass die angegebene Maschine den EG-Richtlinien 2006/42/EG (Maschinenrichtlinie) und 2014/30/EU (Elektromagnetische Verträglichkeit, EMV) einschließlich ihrer Änderungen in der Umsetzung in die nationale Gesetzgebung der Mitgliedsänder entspricht. Der Unterzeichner ist zur Zusammenstellung der technischen Unterlagen einzeln befugt und erklärt, dass folgende Normen, einschließlich der darin enthaltenen normativen Verfahren, angewendet wurden:

[E] Original DECLARACIÓN DE CONFORMIDAD CE

El signatario declara por la presente que la máquina especificada cumple con la Directiva CE 2006/42/EC (Directiva de Máquinas) y 2014/30/EU (Compatibilidad Electromagnética, EMC) incluidas sus enmiendas traducidas a la legislación nacional de los países miembros. El firmante está autorizado individualmente para compilar los documentos técnicos y declara que se han aplicado los siguientes estándares, incluidos los procedimientos normativos contenidos en ellos:

[F] Originale DECLARATION DE CONFORMITE CE

Le signataire déclare par la présente que la machine spécifiée est conforme à la directive CE 2006/42/CE (directive machine) et 2014/30/UE (compatibilité électromagnétique, CEM), y compris leurs modifications telles que traduites dans la législation nationale des pays membres. Le signataire est individuellement autorisé à compiler les documents techniques et déclare que les normes suivantes, y compris les procédures normatives qu'elles contiennent, ont été appliquées:

[NL] Origineel EG-CONFORMITEITSVERKLARING

De ondertekenaar verklaart hierbij dat de gespecificeerde machine voldoet aan de EG-richtlijnen 2006/42/EG (machinerichtlijn) en 2014/30/EU (elektromagnetische compatibiliteit, EMC) inclusief hun amendementen zoals vertaald in de nationale wetgeving van de aangesloten landen. De ondertekenaar is individueel gemachtigd om de technische documenten samen te stellen en verklaart dat de volgende normen, inclusief de normatieve procedures die daarin zijn opgenomen, zijn toegepast:

[P] Original DECLARAÇÃO DE CONFORMIDADE CE

O signatário declara que a máquina especificada está em conformidade com a Diretiva EC 2006/42/EC (Diretiva de Máquinas) e 2014/30/EU (Compatibilidade Eletromagnética, EMC), incluindo suas emendas traduzidas para a legislação nacional dos países membros. O signatário está individualmente autorizado a compilar os documentos técnicos e declara que as seguintes normas, incluindo os procedimentos normativos neles contidos, foram aplicadas:

[I] Originale DICHIARAZIONE DI CONFORMITÀ CE

Il firmatario dichiara che la macchina specificata è conforme alla Direttiva CE 2006/42/CE (Direttiva macchine) e 2014/30/UE (Compatibilità elettromagnetica, EMC) compresi i relativi emendamenti tradotti nella legislazione nazionale dei paesi membri. Il firmatario è autorizzato individualmente alla compilazione dei documenti tecnici e dichiara che sono state applicate le seguenti norme, comprese le procedure normative ivi contenute:

[BG] Оригинал ЕВРОПЕЙСКА ОБЩНОСТ - ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

С настоящото подписалото лице декларира, че посочената машина отговаря на Директива на ЕО 2006/42/EC (Директива за машини) и 2014/30/EU (Електромагнитна съвместимост, EMC), включително техните изменения, преведени в националното законодателство на страните-членки. Подписалото лице е лично упълномощено да съставя техническите документи и декларира, че са приложени следните стандарти, включително съдържащите се в тях нормативни процедури:

[CZ] Originál EG - PROHLÁŠENÍ SHODĚ

Signatář tímto prohlašuje, že uvedený stroj je ve shodě se směrnicí ES 2006/42/ES (Směrnice o strojích) a 2014/30/EU (Elektromagnetická kompatibilita, EMC) včetně jejich změn ve znění předloženého národního legislativního členských zemí. Podepisující osoba je samostatně oprávněna sestavit technické dokumenty a prohlašuje, že byly použity následující normy, včetně normativních postupů v nich obsažených:

[DK] Original EF-OVERENSSTEMMELSESESKLÆRING

Underskrivoren erklærer hermed, at den specificerede maskine er i overensstemmelse med EF-direktivet 2006/42/EC (maskindirektivet) og 2014/30/EU (elektro-magnetisk kompatibilitet, EMC) inklusive deres ændringer som oversat til national lovgivning i medlemslandene. Underskrivoren er individuelt bemyndiget til at udarbejde de tekniske dokumenter og erklærer, at følgende standarder, inklusive de normative procedurer indeholdt deri, er blevet anvendt:

[EST] Originaal EL vastavusavaldus

Allakirjutanu kinnitab k ässolevaga, et nimetatud masin vastab EÜ direktiivile 2006/42/EÜ (masinadirektiiv) ja 2014/30/EL (elektromagnetiline ühilduvus, EMC), sealhulgas nende muudatustele, nagu on t ägitud liikmesriikide siseriiklikesse ägusaktidesse. Allakirjutanut on individuaalselt ägus koostada tehnilisi dokumente ja ta kinnitab, et on kohaldatud j ärgmisi standardeid, sealhulgas neis sisalduvaid normatiivprotseduure:

[FIN] Alkuper änen EU-YHDENMUKAISUUSSELOSTUS

Allekirjoittaja vakuuttaa t äten, ett äm ääritetty kone on EY-direktiivin 2006/42/EY (konedirektiivi) ja 2014/30/EU (s ähk ämagneettinen yhteensopivuus, EMC) mukainen, mukaan lukien niiden muutokset, sellaisina kuin ne on k äännetty j äsenmaiden kansalliseen lains ääd änt ään. Allekirjoittaja on henkil äkohtaisesti valtuutettu kokoamaan tekniset asiakirjat ja vakuuttaa, ett äseuraavia standardeja, mukaan lukien niihin sis ätyv ä normatiiviset menettelyt, on sovellettu:

[GR] Πρωτότυπο ΔΗΛΩΣΗΣΥΜΜΟΡΦΩΣΗΣΕΟΚ

Ο υπογράφοντας δηλώνει με το παρόν ότι το συγκεκριμένο μηχανήμα συμμορφώνεται με την Οδηγία 2006/42/EK (Οδηγία Μηχανών) και 2014/30/EE (Ηλεκτρομαγνητική Συμβατότητα, EMC) συμπεριλαμβανομένων των τροποποιήσεων τους όπως έχουν μεταφραστεί στην εθνική νομοθεσία των χωρών μελών. Ο υπογράφοντας είναι ατομικά εξουσιοδοτημένος να συντάξει τα τεχνικά έγγραφα και δηλώνει ότι έχουν εφαρμοστεί τα ακόλουθα πρότυπα, συμπεριλαμβανομένων των κανονιστικών διαδικασιών που περιέχονται σε αυτά:

[H] Eredeti EU KONFORMITÁSI NYILATKOZAT

Az al áf őezennel kijelenti, hogy a megadott g ép megfelel a 2006/42/EC (g épír ányelv) és a 2014/30/EU (elektrom ágneses ősszef érhetőség, EMC) ir ányelveknek, bele ártve azok m ődos í áit a tagorsz ágok nemzeti jogszabályaiba lefordítva. Az aláíró egyénileg jogosult a műszaki dokumentumok ősszeállítására, és kijelenti, hogy a következő szabványokat, beleértve az abban foglalt normatív eljárásokat, alkalmazt ák:

[LT] Originalus ES atitikim ų deklaracija

Pasirašęs asmuo pareiškia, kad nurodyta mašina atitinka EB direktyvą 2006/42/EB (mašinų direktyvą) ir 2014/30/ES (elektromagnetinį suderinamumą, EMC), įskaitant jų pakeitimus, išverstus į šalių narių nacionalinius teisės aktus. Pasirašęs asmuo yra individualiai įgaliotas rengti techninius dokumentus ir pareiškia, kad buvo taikomi šie standartai, įskaitant juose nurodytas normines procedūras:

[LV] Oriģināls ES atbilstības deklarācija

Parakstītājs ar šo apliecina, ka norādītā iekārta atbilst EK Direktīvai 2006/42/EK (Mašīnu direktīva) un 2014/30/ES (Elektromagnētiskā saderība, EMC), ieskaitot to grozījumus, kas ir tulkoti dalībvalstu nacionālajos tiesību aktos. Parakstītājs ir individuāli pilnvarots sastādīt tehniskos dokumentus un apliecina, ka ir piemēroti šādi standarti, tostarp tajos ietvertās normatīvās procedūras:

[N] Opprinnelig EU-KONFORMITETSERKLÆ RING

Underskrivøren erklærer herved at den spesifiserte maskinen er i samsvar med EC-direktivet 2006/42/EC (maskindirektivet), og 2014/30/EU (elektromagnetisk kompatibilitet, EMC) inkludert deres endringer som oversatt til nasjonal lovgivning i medlemslandene. Underskrivøren er individuelt autorisert til å sammenstille de tekniske dokumentene og erklærer at følgende standarder, inkludert de normative prosedyrene som finnes deri, er brukt:

[PL] Oryginalny DEKLARACJA ZGODNOŚCI WE

Sygnatariusz niniejszym oświadcza, że określona maszyna jest zgodna z dyrektywą WE 2006/42/WE (dyrektywa maszynowa) i 2014/30/UE (kompatybilność elektromagnetyczna, EMC) wraz z ich poprawkami w tłumaczeniu na ustawodawstwo krajowe krajów członkowskich. Sygnatariusz jest indywidualnie upoważniony do sporządzania dokumentacji technicznej i oświadcza, że zastosowano następujące normy, w tym zawarte w nich procedury normatywne:

[RO] Original DECLARATIE DE CONFORMITATE CE

Semnatarul declară prin prezenta că mașina specificată este conformă cu Directiva CE 2006/42/CE (Directiva Mașini) și 2014/30/UE (Compatibilitate electro-magnetică, EMC), inclusiv amendamentele acestora, astfel cum au fost traduse în legislația națională a țărilor membre. Semnatarul este autorizat individual să întocmească documentele tehnice și declară că au fost aplicate următoarele standarde, inclusiv procedurile normative cuprinse în acestea:

[RUS] Оригинал Декларация соответствия стандартам ЕС

Настоящим подписывающая сторона заявляет, что указанная машина соответствует Директиве ЕС 2006/42/EC (Директива по машинам) и 2014/30/EC (Электромагнитная совместимость, ЭМС), включая их поправки, переведенные в национальное законодательство стран-членов. Подписавшаяся сторона имеет индивидуальное право на составление технических документов и заявляет, что были применены следующие стандарты, включая содержащиеся в них нормативные процедуры:

[S] Original EG-KONFORMITETSFÖRKLARING

Undertecknaren intygar härmed att den specificerade maskinen överensst ämmer med EG-direktivet 2006/42/EC (maskindirektivet) och 2014/30/EU (elektromagnetisk kompatibilitet, EMC) inklusive deras till ägg som översatts till nationell lagstiftning i medlemsl änderna. Undertecknaren ä r individuellt beh örig att sammanst älla de tekniska dokumenten och förklarar att följande standarder, inklusive de normativa procedurerna som finns d äri, har till änpats:

[SK] Origin á vyhl ásenie o zhode

Signatár týmto vyhlasuje, že špecifikovaný stroj je v súlade so Smernicou ES 2006/42/EC (Smernica o strojoch) a 2014/30/EU (Elektromagnetická kompatibilita, EMC) vrátane ich dodatkov preložených do národnej legislatívy členských krajín. Signatár je individuálne oprávnený zostavovať technické dokumenty a vyhlasuje, že boli aplikované nasledujúce normy vrátane normatívnych postupov v nich obsiahnutých:

[SLO] Original EU IZJAVA O SKLADNOSTI

Podpisník s tým izjavlja, da je navedeni stroj v skladu z Direktivo ES 2006/42/ES (Direktiva o strojih) in 2014/30/EU (Electro-Magnetic Compatibility, EMC), vključno z njunimi spremembami, kot so prevedene v nacionalno zakonodajo držav članic. Podpisník je posamično pooblaščen za sestavo tehnične dokumentacije in izjavlja, da so bili uporabljeni naslednji standardi, vključno z normativnimi postopki, ki jih vsebuje:

[TR] Orijinal AB Uygunluk Açıklaması

İmza sahibi, belirtilen makinenin AB Direktifi 2006/42/EC (Makine Direktifi) ve 2014/30/EU (Elektro-Manyetik Uyumluluk, EMC) ve bunların üye ülkelerin ulusal mevzuatına tercüme edilen değişiklikleri ile uyumlu olduğunu beyan eder. İmza sahibi, teknik belgeleri derlemeye bireysel olarak yetkilidir ve burada yer alan normatif prosedürler dahil olmak üzere aşağıdaki standartların uygulandığını beyan eder:

<the applied standards have to be shown here>

- (1) Type: **XX XX– Self-propelled industrial truck**
- (2) Serial No: **XXXXXXXX**
- (3) Year of constr.: **YYYY**
- (4) Manufacturer: Noblelift Intelligent Equipment Co., Ltd.
528 Changzhou Road, Taihu Sub-district, Changxing, 313100, PR China
- (5) Responsible for compiling the technical documentation: <Company name>,
<Company Address>
- (6) Date: <Place>, **YYYY.MM.DD**
- (7) Authorized signatory: <Position> **Mr. Sample**

In this case ask for
a copy

- (1) Type/ Typ/ Tipo/ Modello/ Τυππι/ Tipo / ΤΥΠΟΣ/ Τίπος/ Tip/ Тип/ Tips/ Tipas/ Tüüp:
- (2) Serial No./ Serien-Nr./ N° de série/ Seriennummer/ N°de serie/ Numero di serie/ Serienr./ Sarjanro/ [αριθμός](#)/ Seriové číslo/ Szériaszám/ Nr.Seryjny/ Serijska številka/ Výrobné číslo/ Серийныйномер/ Seri No./ Seerianr./ Sērijas Nr./ Serijos numeris:
- (3) Year of constr./ Baujahr/ Année de constr./ Bouwjaar/ Año de constr./ Anno di costruzione/ Produktionsår/ Byggeår/ Tillverkningsår/ Valmistusvuosi / Ano de fabrico / [έτοςκατασκευής](#)/ Rokvýroby/ Gyártásiév/ Rokprodukcji / Letnik / Годизготовления / Üretim yılı / V äljalaskeasta / Izgatavošanas gads / Gamybosmetai
- (4) Manufacturer/ Hersteller/ Fabricante/ Fabricant/ Fabrikant/ Fabricante/ Produttore/ производител/ Výrobce/ Fabrikant/ Tootja/ Valmistaja/ Κατασκευαστής/ Gyártó/ Gamintojas/ Ražotājs/ Produsent/ Producent/ Producător/ Производитель/ Tillverkare/ Výrobca/ Proizvajalec/ Üretici firma
- (5) Responsible for compiling the technical documentiton/ Verantwortlich für die Zusammenstellung der technischen Dokumentation/ Responsable de compiler la documentaci ón t écnica/ Responsable de la compilation de la documentation technique/ Verantwoordelijk voor het samenstellen van de technische documentatie/ Respons ável pela compila ção da documenta ção t écnica/ Responsabile della compilazione della documentazione tecnica/ Отговаря за съставянето на техническата документация/ Zodpovídá za sestavení technické dokumentace/ Ansvarlig for udarbejdelse af den tekniske dokumentation/ Vastutab tehnilise dokumentatsiooni koostamise eest/ Vastaa teknisen dokumentaation laatimisesta/ Υπεύθυνος για τη σύνταξη της τεχνικής τεκμηρίωσης/ Felelős a műszaki dokumentáció összeállításáért/ Atsakingas už techninės dokumentacijos sudarymą/ Atbildīgs par tehniskās dokumentācijas sastādīšanu/ Ansvarlig for sammenstilling av teknisk dokumentasjon/ Odpowiedzialny za kompletowanie dokumentacji technicznej/ Responsabil cu întocmirea documentatiei tehnice/ Ответственный за составление технической документации/ Ansvarig för att sammanställa den tekniska dokumentationen/ Zodpovedá za zostavenie technickej dokumentácie/ Odgovoren za pripravo tehnične dokumentacije/ Teknik dokümantasyonun derlenmesinden sorumlu
- (6) Date/ Datum/ Data/ Fecha/ datum/ Dato/ p äv ärs/ Kuup äev/ Datums/ [дата](#)/ D áum/ d áum/ tarih/ [ημερομηνία](#)
- (7) Authorised signatory/ ImAuftrag/ pour ordre/ Incaricato/ Por orden de/ por procura ção/ op last van/ p ävegneaf/ p äppdrag/ Etteroppdrag/ psta./ Ülesandel/ pavadus / v.i. / Попоручению / megbízásból/ длѣжностнолице / z pověření / z poverenia / po nalogu / napolecenie / din sarcina / adina / θαη' εληνύ

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NOBLELIFT

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