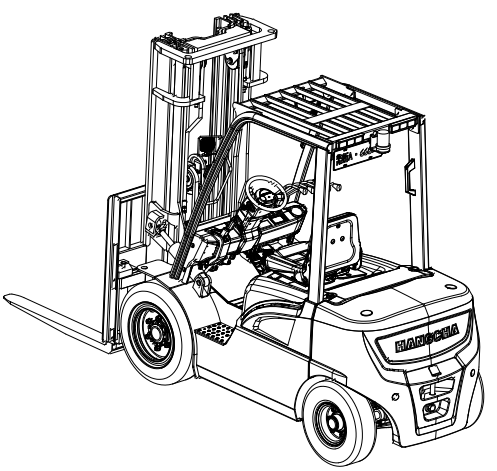
XE *Series*

XE Series Four-wheel Lithium-ion Battery Forklift Truck

CPD15/18/20/25/30/35/38-XEY2-SI
CPD20/40-XEXY2-SI
CPD30/35/38-XEY2H1-SI
CPD20/25/30/35/38-XEY2H-SI
CPD20/25/30/35/38-XEY2H2-SI
CPD40/45/50-XEY2-SI(GW)
CPD50-XEXY2-SI(GW)
CPD15/18/20/25/27/30/35/38-XEY2HA-SI
CPD20-XEXY2HA-SI

OPERATION AND MAINTENANCE MANUAL



Original Instruction

HANGCHA GROUP CO., LTD.

03/2025

Preface

Thank you for purchasing this XE series four-wheel lithium-ion battery forklift truck manufactured by HANGCHA GROUP CO., LTD.

Please read this manual thoroughly to understand how to use and maintain the forklift truck safely.

The XE series lithium-ion battery forklift trucks are cost effective products developed based on HANGCHA's "lithium-ion battery dedicated architecture" and "permanent magnet synchronous technology". While continuing the lithium-ion battery forklift family design style, proven internal combustion vehicle parts are adopted. The overall vehicle performance, ergonomics, reliability, maintenance, outdoor operation capability, load capacity, etc. are optimized to meet customers' usage scenarios for internal combustion forklift trucks. New high-performance models have been added to meet the usage needs of different users under heavy load conditions.

This manual provides instructions on how to use the 1.5 t to 5.0 t XE series four-wheel battery forklift truck correctly, instructing you on how to perform the safety operation and preventive maintenance. Relevant operators and maintenance personnel must read this manual thoroughly before using it.

Due to the constant updating and improvement of our products, the functions of your forklift may be slightly different from the instructions in this manual.

For any queries, please contact the sales company or agent of HANGCHA GROUP CO., LTD.

In order to ensure the safety of people and the truck, there are 3 levels of alarm icons including “Danger”, “Warning” and “Caution”, which provide different information.

a) Danger: To warn the operators of an extremely dangerous situation which may lead to personal injuries or even death if ignored. For example:

 Danger

Do not use two forklift trucks to carry the same object because it could lead to a rollover or tip-over, which will cause personal injuries or even death.

b) Warning: To warn the operators to be aware of potential hazards to prevent property damage, personal injuries or death. For example:

Warning

Do not use the forklift truck in sandstorms, snow, lightning, rain, wind and other bad weather conditions.

c) Caution: To alert the operators to potential hazards that may cause damage to the vehicle or affect performance. For example:

Caution

Stop operation immediately when the liquid-crystal display is in the red area and reduce engine speed to cool down the engine and then shut it down. Check the coolant level is sufficient and whether the fan belt is tight.

Vehicle model	Traction motor controller	Oil pump motor controller	Rated Lift Capacity (kg) / Load Center Distance (mm)
CPD15-XEY2-SI	MC138NH-11-8035	MC138NH-11-8035	1500/500
CPD18-XEY2-SI	MC138NH-11-8035	MC138NH-11-8035	1800/500
CPD20-XEY2-SI	MC138NH-11-8035	MC138NH-11-8035	2000/500
CPD25-XEY2-SI	MC138NH-11-8035	MC138NH-11-8035	2500/500
CPD30-XEY2-SI	MC138NH-11-8045	MC138NH-11-8035	3000/500
CPD35-XEY2-SI	MC138NH-11-8045	MC138NH-11-8035	3500/500
CPD38-XEY2-SI	MC138NH-11-8045	MC138NH-11-8035	3800/500
CPD20-XEXY2-SI	MC138NH-11-8035	MC138NH-11-8035	2000/500
CPD40-XEXY2-SI	MC130NH-11-8055	MC138NH-11-8045	4000/500
CPD40-XEY2-SI	MC130NH-11-8055	MC138NH-11-8045	4000/500
CPD45-XEY2-SI	MC130NH-11-8055	MC138NH-11-8045	4500/500
CPD50-XEY2-SI	MC130NH-11-8055	MC138NH-11-8045	5000/600
CPD50-XEXY2-SI	MC130NH-11-8055	MC138NH-11-8045	5000/500
CPD30-XEY2H1-SI	MC138NH-11-8045	MC138NH-11-8045	3000/500

Vehicle model	Traction motor controller	Oil pump motor controller	Rated Lift Capacity (kg) / Load Center Distance (mm)
CPD35-XEY2H1-SI	MC138NH-11-8045	MC138NH-11-8045	3500/500
CPD38-XEY2H1-SI	MC138NH-11-8045	MC138NH-11-8045	3800/500
CPD20-XEY2H-SI	MC138NH-11-8035	MC138NH-11-8035	2000/500
CPD25-XEY2H-SI	MC138NH-11-8035	MC138NH-11-8035	2500/500
CPD30-XEY2H-SI	MC138NH-11-8045	MC138NH-11-8035	3000/500
CPD35-XEY2H-SI	MC138NH-11-8045	MC138NH-11-8035	3500/500
CPD38-XEY2H-SI	MC138NH-11-8045	MC138NH-11-8035	3800/500
CPD20-XEY2H2-SI	MC138NH-11-8045	MC138NH-11-8035	2000/500
CPD25-XEY2H2-SI	MC138NH-11-8045	MC138NH-11-8035	2500/500
CPD30-XEY2H2-SI	MC130NH-11-8055	MC138NH-11-8045	3000/500
CPD35-XEY2H2-SI	MC130NH-11-8055	MC138NH-11-8045	3500/500
CPD38-XEY2H2-SI	MC130NH-11-8055	MC138NH-11-8045	3800/500
CPD40-XEY2-SIGW	MC130NH-11-8055	MC138NH-11-8045	4000/500
CPD45-XEY2-SIGW	MC130NH-11-8055	MC138NH-11-8045	4500/500
CPD50-XEY2-SIGW	MC130NH-11-8055	MC138NH-11-8045	5000/600
CPD50-XEXY2-SIGW	MC130NH-11-8055	MC138NH-11-8045	5000/500
CPD15-XEY2HA-SI	MC138NH-11-8035	MC138NH-11-8035	1500/500
CPD18-XEY2HA-SI	MC138NH-11-8035	MC138NH-11-8035	1800/500
CPD20-XEXY2HA-SI	MC138NH-11-8035	MC138NH-11-8035	2000/500
CPD20-XEY2HA-SI	MC138NH-11-8035	MC138NH-11-8035	2000/500
CPD25-XEY2HA-SI	MC138NH-11-8035	MC138NH-11-8035	2500/500
CPD30-XEY2HA-SI	MC138NH-11-8045	MC138NH-11-8035	3000/500

Vehicle model	Traction motor controller	Oil pump motor controller	Rated Lift Capacity (kg) / Load Center Distance (mm)
CPD35-XEY2HA-SI	MC138NH-11-8045	MC138NH-11-8035	3500/500
CPD38-XEY2HA-SI	MC138NH-11-8045	MC138NH-11-8035	3800/500
CPD27-XEY2HA-SI	MC138NH-11-8035	MC138NH-11-8035	2700/500

Ⓒ 03/2025, HANGCHA GROUP CO., LTD.

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1 Overview

The forklift truck in this manual is only intended for lifting/lowering or handling cargo.

Users must operate and maintain the forklift truck according to this manual. Do not use the forklift truck for purposes not mentioned in this manual as it may cause personal injury or even death or cause damage to the forklift truck and other property.

2 Application Environments

Application environments:

– The truck can be used at ambient temperatures of -20℃ to 40℃.

– The air humidity should not exceed 90% at 20°C.

– The wind speed should not be greater than 12m/s.

– The truck can only be used on solid and flat ground with sufficient load-bearing capacity.

– The truck can only be used on driving roads with good visibility and the permission of the operator.

– When carrying a load uphill, it is necessary to keep the forks facing forward, do not travel sideways or diagonally. When going downhill, it is recommended to drive in reverse.

– The forklift truck is only to be used in specific areas such as factory plants, tourist attractions and amusement parks, etc.

Warning

- **When this truck is used in extreme environments, especially in places with a large amount of dust or where corrosion and rust are easily caused, additional special equipment must be installed with the permission of the manufacturer.**
- **Do not use this truck in explosion-proof places.**
- **Do not operate the truck outdoors or in hazardous areas during severe weather conditions such as storms or lightning.**

3 Application scope

Application scope:

– Lift and lower the cargo.

– Transport the cargo over short distances.

– Do not drive the forklift truck when cargo is raised.

– Do not carry people.

– Do not push or pull the goods.

– Fasten the cargo onto the truck when it is being towed.

– Do not carry cargo exceeding the load capacity.

Warning

- **The maximum towing load is indicated on the product nameplate and the load should not exceed this value.**
- **The cargo must be placed against the back of the fork arm carrier and in the middle of the two forks.**
- **Do not use non-explosion-proof forklift trucks in flammable and explosive environments.**
- **Do not use forklift trucks not specially designed for cold storage warehouses in cold storage warehouses.**

4 Obligations and responsibilities of the truck user

In this manual, the User refers to any natural or legal person who directly uses or appoints another person to use the forklift. In special cases such as leasing or renting, the User refers to the party who assumes the specified operational obligations according to the terms of the contract between the forklift owner and the user.

The User must ensure that the forklift is used only for the specified purpose and that any danger that may risk the life and health of the user or a third party is eliminated in a timely manner. In addition, the User must strictly observe accident prevention regulations, other technical safety regulations, and guidelines for the operation, maintenance and repair of the forklift.

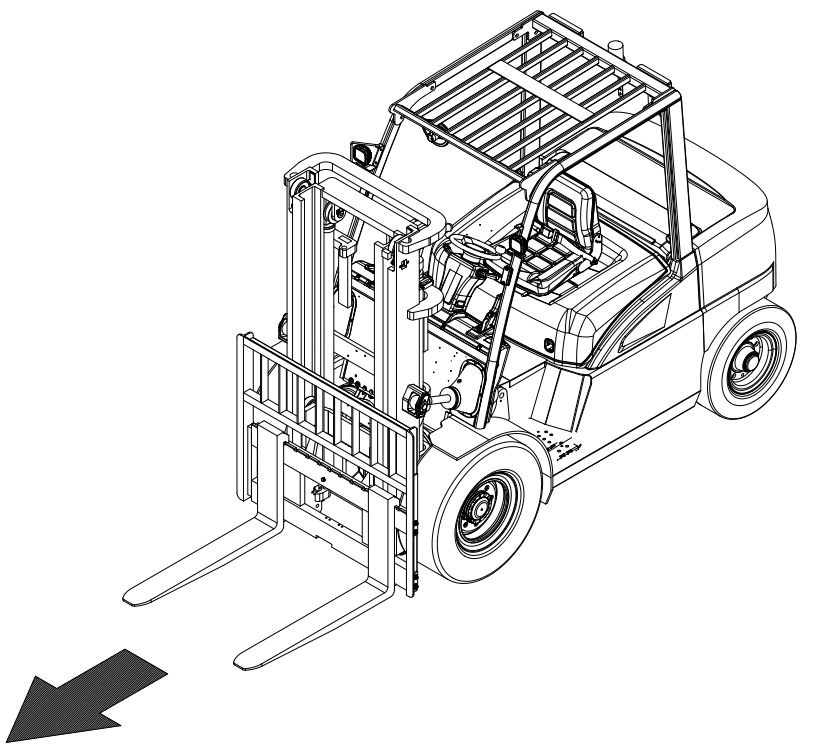
The truck can only be operated by specially trained personnel. The forklift user must ensure that all operators read and fully understand the content in this manual.

5 Attachment/accessory installation

If it is necessary to install or add additional devices that may affect or supplement the functions of the forklift, you must obtain prior written consent from our company. Depending on the actual situation, the approval and consent of the local authorities may also be required. Please note that the approval result does not represent the opinion of our company.

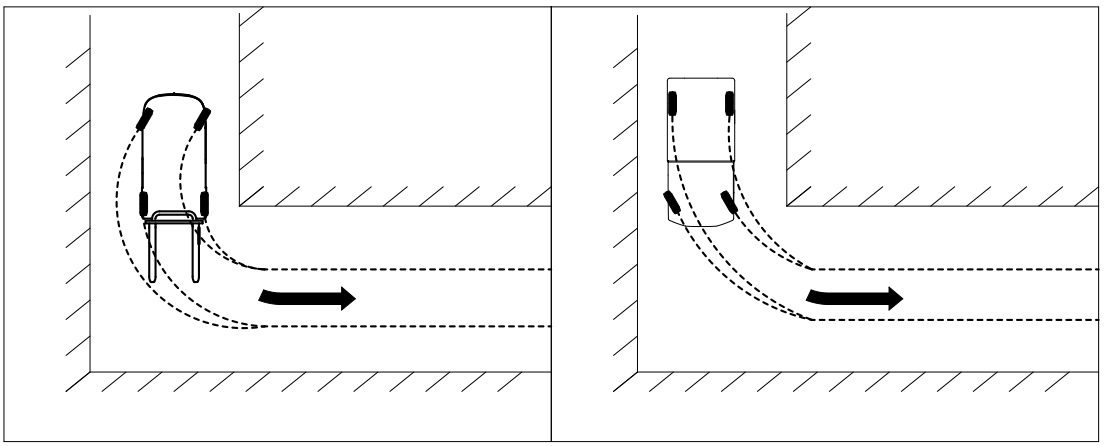
6 Traveling direction and wheel trajectory

When the forklift truck is traveling, the driver should ensure that the forks are facing the traveling direction, as shown in the following figure.



In this Manual, on the premise that the driver is sitting on the seat correctly, the left side of the driver refers to the truck's left side, while the right side of the driver refers to the truck's right side.

The forklift truck turns in a rear-wheel steering mode, with its rear wheels moving the rear outward, which is different to front steered vehicles with the rear wheels following the front wheels.

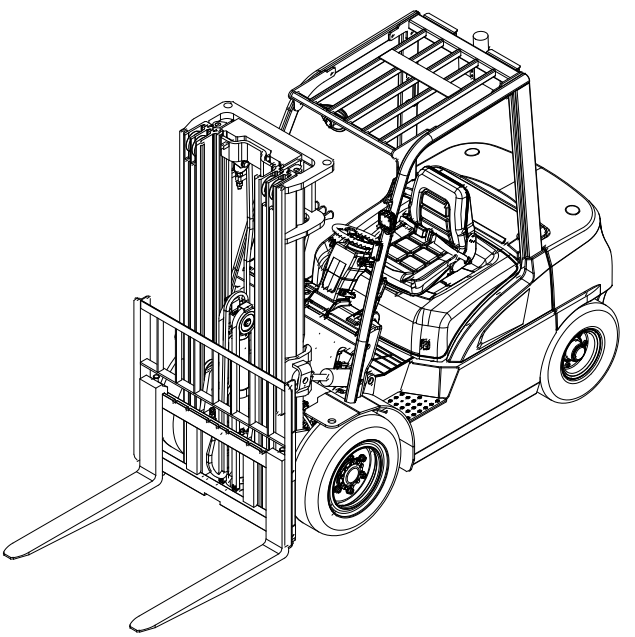


Forklift trucks (steering trajectory of the rear wheels) Cars (steering trajectory of the front wheels)

7 Forklift introduction

7.1 Appearance

XE Series Four-wheel Electric Forklift Truck



(1) The overall vehicle continues the XC series style with a unified design.

(2) The reinforced drive axle and reduction gearbox match the internal combustion vehicle mast, steering axle, and tires.

(3) The smart dashboard has a graphical interface that is simple and intuitive. It has three speed mode options to suit different work environments.

(4) Safety, comfort, and reliability have been comprehensively improved, with the overall vehicle performance significantly higher than the original models.

(5) The high-torque permanent magnet synchronous motor and high-ratio reduction gearbox significantly improve driving speed, climbing gradient, and lifting speed.

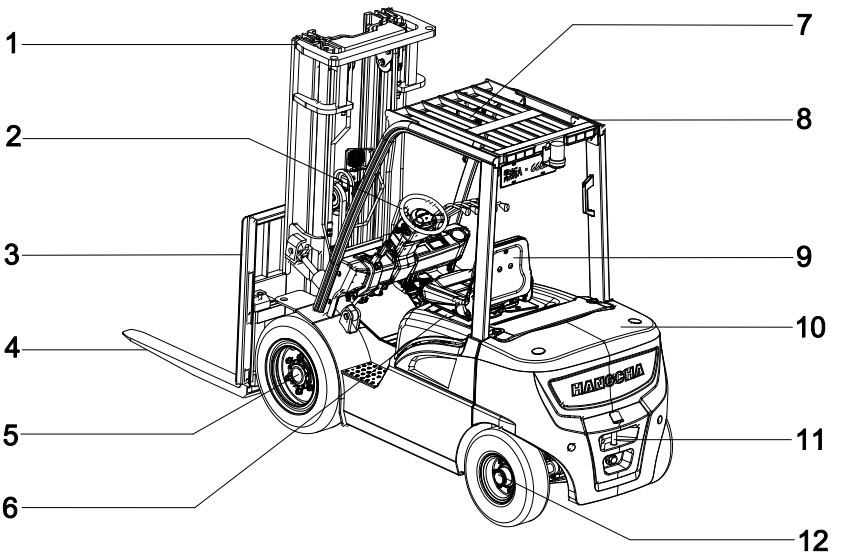
(6) The traction and lifting motors have built-in air cooling for better heat dissipation and better overall performance. A gear reducer is introduced for the oil pump for the first time, making the

lifting motor more efficient.

(7) The 80 V double permanent magnet synchronous motor system has higher power density. Through in-depth matching of the reduction gearbox, motor, and motor controller, energy consumption is reduced by 15-20% under the same conditions compared to traditional asynchronous motor models.

(8) The low center of gravity provides more stable operation.

7.2 Appearance and main parts



No.	Name	No.	Name	No.	Name
1	Mast	2	Steering wheel	3	Load backrest
4	Fork	5	Drive axle	6	Hood
7	Rearview mirror	8	Overhead guard	9	Driver's seat
10	Counterweight	11	Tow pin	12	Steering axle

7.3 Systems

The XE series four-wheel electric forklift truck has seven systems including the transmission system, steering system, body system, operation system, hydraulic system, electrical system and lifting system with their functions described below:

(1)Transmission system: It is composed of the motor, gearbox, drive axle, brakes and tires, etc. and is used to drive the truck.

(2)Steering system: It is composed of the steering device and steering axle and is used to make the truck turn.

(3)Body system: It is composed of the frame, dashboard, hood and other covers, overhead guard and counterweight, etc. Main functions: To provide a solid support platform for the forklift and protect the personal safety of the driver.

(4)Operation system: It includes the handbrake and foot brake. The handbrake is also called the parking brake, which achieves mechanical braking when it is pulled up by the hand; the foot brake is also called the service brake which achieves braking when the brake pedal is pressed; the two braking methods both act on the left and right brakes of the drive axle.

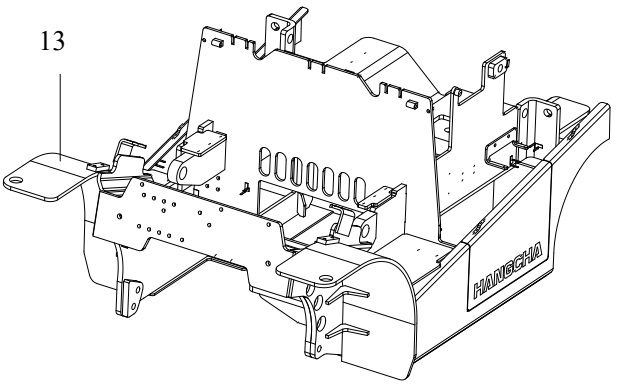
(5)Hydraulic system: It is composed of the hydraulic oil reservoir, oil pump, multi-way valve assembly and hydraulic pipe assembly and is used to control the truck's steering and mast's lifting/lowering with the hydraulic oil.

(6)Electrical system: It is composed of the dashboard, lighting system, lithium-ion battery and key switch, etc.

(7)Lifting system: It is composed of the masts, fork arm carrier, forks, load backrest, lifting chain, rollers, lift cylinder and tilt cylinder, etc., which constitutes the working device of the forklift truck together with the oil circuit and hydraulic system, and it is the actuator for handling operations.

7.4 Chassis Steel Stamp Number Position

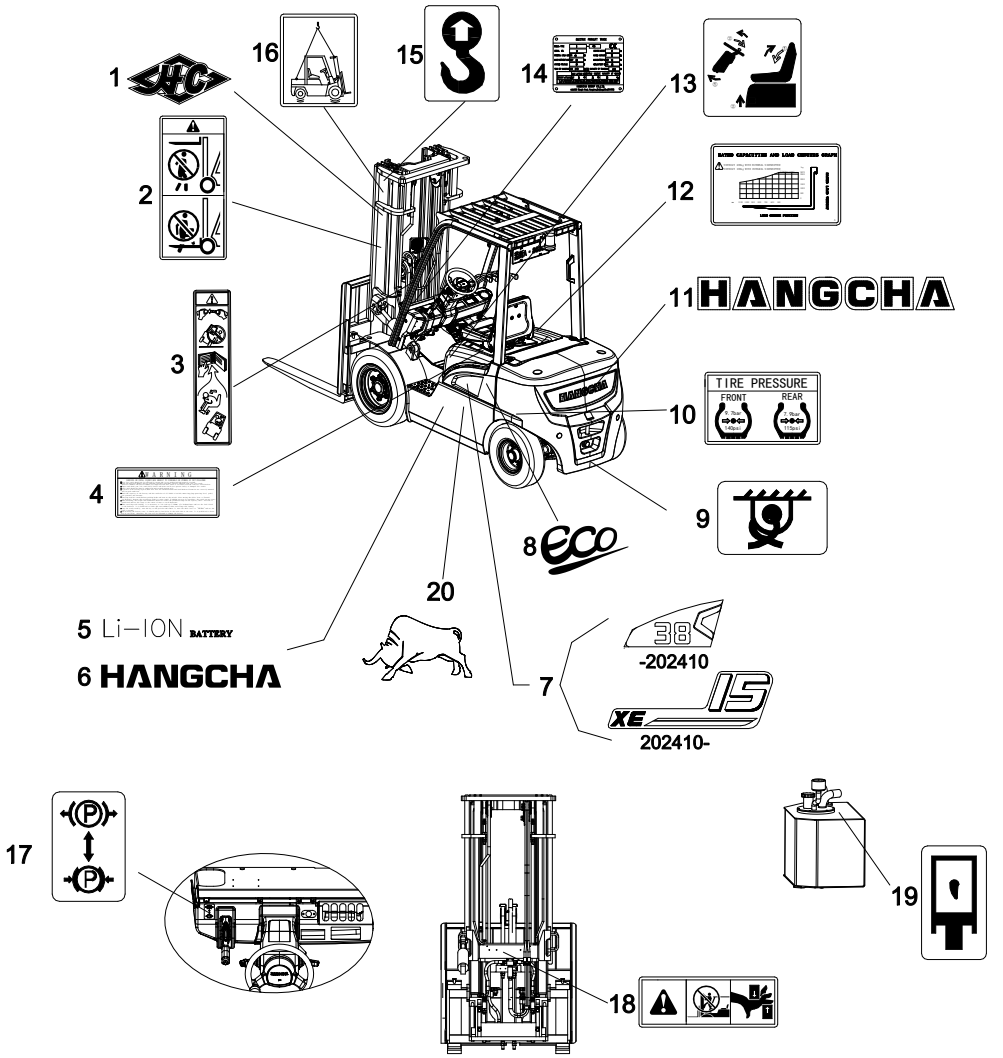
Each vehicle has a unique steel-stamped chassis number at the time of factory production, and the specific location is shown in the figure below:



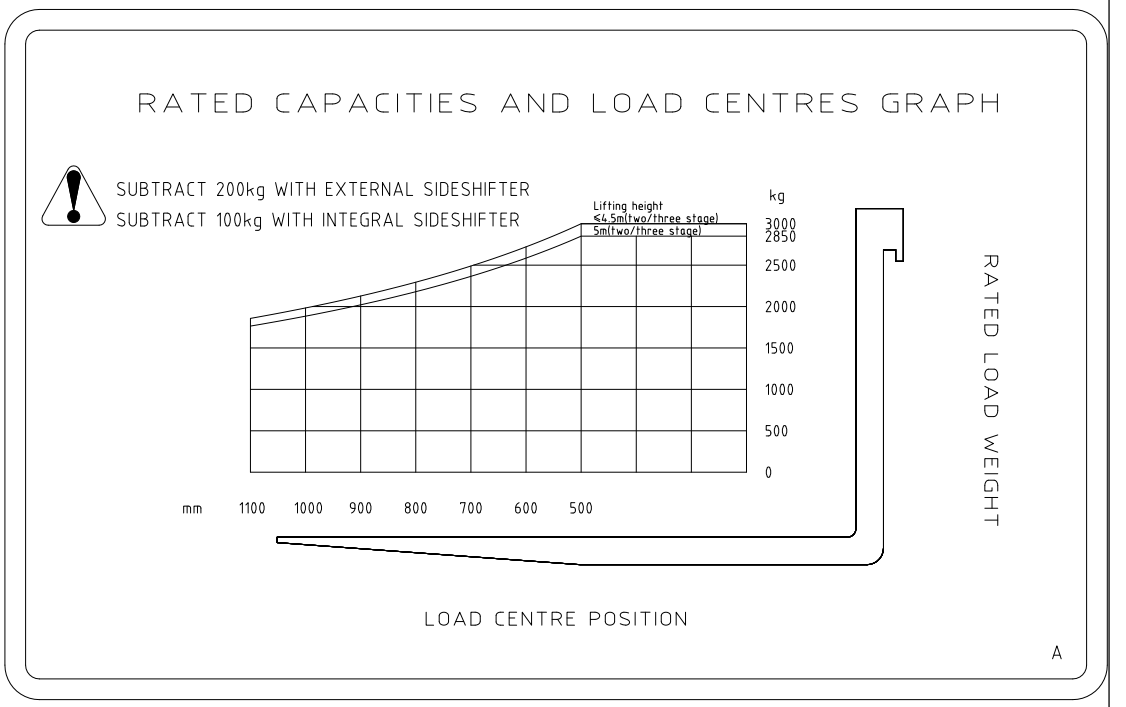
13	Marking positions for frame S/N

8 Signs

Warning and indication nameplates, load curve nameplates, lifting points and model identification must be clearly readable and replaced if necessary.



No.	Name
1	HC label
2	Mast warning label (one for each mast): Do not stand on forks or stand under raised forks.
3	Safety belt label
4	Warning label:serious or tatal injury may result to yourself or others if not followed.
5	Lithium-ion battery label
6	Typeface label
7	Tonnage label
8	Left, right labels(-202410)

9	Tie-down point label
10	Tire pressure label
11	Typeface label
12	Load curve label:It shows the relationship between the location of the load center distance and the maximum load or maximum lift height. The load capacity of trucks with a sideshifter and attachments is reduced. When the lift height is increased, the load capacity will decrease. Check whether the load and the load center distance are within the allowable range of the Loading Capacity Chart before loading. If the load shape is complicated, the heaviest part should be placed in the center of the fork and close to the load backrest.  Taking a counterbalanced forklift with a rated lifting capacity of 3 tons and a standard load center distance of 500mm as an example: when the maximum mast lift height is 4.5m or less, the maximum allowable load weight is 3000kg (with integral sideshifter:2900kg, with extegral sideshifter:2800kg), meaning cargo weighing up to 3000kg (with integral sideshifter:2900kg, with extegral sideshifter:2800kg) can be lifted to a height of 4.5m. When the maximum mast lift height is 5m, the maximum allowable load weight for a three-stage mast is 2850kg (with integral sideshifter:2750kg , with extegral sideshifter:2650kg); meaning cargo weighing up to 2850kg (with integral sideshifter:2750kg , with extegral sideshifter:2650kg) can be lifted to a height of 5m.
13	Engine hood opening label
14	Product nameplate: Located on the front-left of the instrument frame.
15	Lifting label (one for each mast): Tie-down points for handling the forklift truck with a crane.
16	Lifting label: tie-down points for handling the truck with a crane.
17	Hand brake label

18	Hazard label: Beware of hand trapping when the lifting mast is moving.
19	Hydraulic oil label
20	Taurus label: One on each side, for CPD20/25/30/35/38-XEY2H2-SI and CPD40-XEXY2-SI models.

9 Performance parameters in standard configuration

No.	Item			CPD38-XEY2H1-SI	CPD35-XEY2H1-SI	CPD30-XEY2H1-SI
1	Rated load capacity		kg	3800	3500	3000
2	Load center distance		mm	500	500	500
3	Lifting height		mm	3000	3000	3000
4	Free lift height		mm	170	170	165
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	17/18	17/18	17/18
7	Max. lifting speed （Laden/Unladed）		mm/s	350/440	350/440	400/500
8	Max. descent speed （Laden/Unladed）		mm/s	500/390	500/390	500/390
9	Max. gradeability （Laden/Unladed） %		%	17/25	18/25	20/25
10	Min. outside turning radius mm		mm	2420	2420	2420
11	Min. ground clearance		mm	155	155	155
12	Max. braking distance		m	4.5	4.5	4
13	Dimension	Length(to fork face) mm	mm	2670	2670	2665
		Width	mm	1225	1225	1225
		Height (to overhead	mm	2180	2180	2180
14	Service weight	Including lithium battery	kg	5050	4820	4440
15	Battery	standard	V/Ah	80/460	80/460	80/460
16	Motor	Drive motor	kW	16	16	16
		Pump motor	kW	24	24	24
17	Tires	Front tire×2		28×9-15-14PR/2	28×9-15-14PR/2	28×9-15-14PR/2
		Rear tire×2		6.50-10-10PR/2	6.50-10-10PR/2	6.50-10-10PR/2

No.	Item			CPD15-XEY2-SI	CPD18-XEY2-SI	CPD20-XEXY2-SI	CPD20-XEY2-SI
1	Rated load capacity		kg	1500	1800	2000	2000
2	Load center distance		mm	500	500	500	500
3	Lifting height		mm	3000	3000	3000	3000
4	Free lift height		mm	155	155	160	160
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	14/15	14/15	14/15	14/15
7	Max. lifting speed （Laden/Unladed）		mm/s	290/430	290/430	290/430	290/400
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed）		%	15/25	15/25	15/25	15/25
10	Min. outside turning radius mm		mm	2035	2035	2035	2200
11	Min. ground clearance		mm	130	130	130	140
12	Max. braking distance		m	4	4	4	4
13	Dimension	Length(to fork face) mm	mm	2230	2235	2230	2500
		Width	mm	1126	1126	1126	1176
		Height (to overhead guard) mm	mm	2155	2155	2155	2165
14	Service weight	Including lithium battery kg	kg	2690	2930	2980	3450
15	Battery	standard	V/Ah	80/160	80/160	80/160	80/230
16	Motor	Drive motor	kW	10	10	10	15
		Pump motor	kW	13	13	13	24
17	Tires	Front tire×2		6.50-10-10PR/2	6.50-10-10PR/2	6.50-10-10PR/2	7.00-12-12PR/2
		Rear tire×2		5.00-8-10PR/2	5.00-8-10PR/2	5.00-8-10PR/2	6.00-9-10PR/2

No.	Item			CPD25-XEY2-SI	CPD30-XEY2-SI	CPD35-XEY2-SI	CPD38-XEY2-SI
1	Rated load capacity		kg	2500	3000	3500	3800
2	Load center distance		mm	500	500	500	500
3	Lifting height		mm	3000	3000	3000	3000
4	Free lift height		mm	160	165	170	170
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	14/15	14/15	14/15	14/15
7	Max. lifting speed （Laden/Unladed）		mm/s	290/400	290/400	290/350	290/350
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed） %		%	15/25	15/25	15/25	15/25
10	Min. outside turning radius mm		mm	2200	2350	2350	2350
11	Min. ground clearance		mm	140	155	155	155
12	Max. braking distance		m	4	4	4.5	4.5
13	Dimension	Length(to fork face) mm	mm	2500	2665	2670	2670
		Width	mm	1176	1225	1225	1225
		Height (to overhead guard) mm	mm	2165	2180	2180	2180
14	Service weight	Including lithium battery kg	kg	3840	4250	4630	4860
15	Battery	standard	V/Ah	80/230	80/230	80/230	80/230
16	Motor	Drive motor	kW	15	15	15	15
		Pump motor	kW	24	24	24	24
17	Tires	Front tire×2		7.00-12-12PR/2	28×9-15-14PR/2	28×9-15-14PR/2	28×9-15-14PR/2
		Rear tire×2		6.00-9-10PR/2	6.50-10-10PR/2	6.50-10-10PR/2	6.50-10-10PR/2

No.	Item			CPD20-XEY2H-SI	CPD25-XEY2H-SI
1	Rated load capacity		kg	2000	2500
2	Load center distance		mm	500	500
3	Lifting height		mm	3000	3000
4	Free lift height		mm	160	160
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	16/17	16/17
7	Max. lifting speed （Laden/Unladed）		mm/s	400/500	400/500
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed） %		%	15/25	15/25
10	Min. outside turning radius mm		mm	2200	2200
11	Min. ground clearance		mm	140	140
12	Max. braking distance		m	4	4
13	Dimension	Length(to fork face) mm	mm	2500	2500
		Width	mm	1176	1176
		Height (to overhead guard) mm	mm	2165	2165
14	Service weight	Including lithium battery kg	kg	3495	3885
15	Battery	standard	V/Ah	80/304	80/304
16	Motor	Drive motor	kW	16	16
		Pump motor	kW	24	24
17	Tires	Front tire×2		7.00-12-12PR/2	7.00-12-12PR/2
		Rear tire×2		6.00-9-10PR/2	6.00-9-10PR/2

No.	Item			CPD38-XEY2H-SI	CPD35-XEY2H-SI	CPD30-XEY2H-SI
1	Rated load capacity		kg	3800	3500	3000
2	Load center distance		mm	500	500	500
3	Lifting height		mm	3000	3000	3000
4	Free lift height		mm	150	150	165
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	16/17	16/17	17/18
7	Max. lifting speed （Laden/Unladed）		mm/s	350/440	350/440	400/500
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed） %		%	15/25	15/25	15/25
10	Min. outside turning radius mm		mm	2420	2420	2420
11	Min. ground clearance		mm	155	155	155
12	Max. braking distance		m	4.5	4.5	4
13	Dimension	Length(to fork face) mm	mm	2670	2670	2665
		Width	mm	1225	1225	1225
		Height (to overhead guard) mm	mm	2180	2180	2180
14	Service weight	Including lithium battery kg	kg	5030	4690	4310
15	Battery	standard	V/Ah	80/460	80/304	80/304
16	Motor	Drive motor	kW	13	13	16
		Pump motor	kW	18	18	24
17	Tires	Front tire×2		28×9-15-14PR/2	28×9-15-14PR/2	28×9-15-14PR/2
		Rear tire×2		6.50-10-10PR/2	6.50-10-10PR/2	6.50-10-10PR/2

No.	Item			CPD40-XEY2-SI	CPD45-XEY2-SI	CPD50-XEY2-SI	CPD50-XEXY2-SI
1	Rated load capacity		kg	4000	4500	5000	5000
2	Load center distance		mm	500	500	600	500
3	Lifting height		mm	3000	3000	3000	3000
4	Free lift height		mm	150	150	150	150
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	19/19	19/19	19/19	19/19
7	Max. lifting speed （Laden/Unladed）		mm/s	430/550	430/550	390/500	390/500
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed） %		%	17/20	17/20	16/20	16/20
10	Min. outside turning radius mm		mm	2700	2700	2740	2740
11	Min. ground clearance		mm	200	200	200	200
12	Max. braking distance		m	6.0	6.0	6.0	6.0
13	Dimension	Length(to fork face) mm	mm	3050	3050	3100	3090
		Width	mm	1420	1490	1490	1490
		Height (to overhead guard) mm	mm	2350	2350	2350	2740
14	Service weight	Including lithium battery kg	kg	6240	6630	7230	6930
15	Battery	standard	V/Ah	80/460	80/460	80/460	80/460
16	Motor	Drive motor	kW	23	23	23	23
		Pump motor	kW	28	28	28	28
17	Tires	Front tire×2		8.25-15-14PR/2	300-15-18PR/2	300-15-18PR/2	300-15-18PR/2
		Rear tire×2		7.00-12-12PR/2	7.00-12-12PR/2	7.00-12-12PR/2	7.00-12-12PR/2

No.	Item			CPD40-XEY2-SIGW	CPD45-XEY2-SIGW	CPD50-XEY2-SIGW	CPD50-XEXY2-SIGW
1	Rated load capacity		kg	4000	4500	5000	5000
2	Load center distance		mm	500	500	600	500
3	Lifting height		mm	3000	3000	3000	3000
4	Free lift height		mm	150	150	150	150
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	19/19	19/19	19/19	19/19
7	Max. lifting speed （Laden/Unladed）		mm/s	430/550	430/550	390/500	390/500
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed）		%	17/20	17/20	16/20	16/20
10	Min. outside turning radius mm		mm	2700	2700	2740	2740
11	Min. ground clearance		mm	200	200	200	200
12	Max. braking distance		m	6.0	6.0	6.0	6.0
13	Dimension	Length(to fork face) mm	mm	3050	3050	3100	3090
		Width	mm	1420	1490	1490	1490
		Height (to overhead guard) mm	mm	2856	2856	2856	2856
14	Service weight	Including lithium battery kg	kg	6240	6630	7230	6930
15	Battery	standard	V/Ah	80/460	80/460	80/460	80/460
16	Motor	Drive motor	kW	23	23	23	23
		Pump motor	kW	28	28	28	28
17	Tires	Front tire×2		8.25-15-14PR/2	300-15-18PR/2	300-15-18PR/2	300-15-18PR/2
		Rear tire×2		7.00-12-12PR/2	7.00-12-12PR/2	7.00-12-12PR/2	7.00-12-12PR/2

No.	Item			CPD20-XEY2H2-SI	CPD25-XEY2H2-SI	CPD30-XEY2H2-SI
1	Rated load capacity		kg	2000	2500	3000
2	Load center distance		mm	500	500	500
3	Lifting height		mm	3000	3000	3000
4	Free lift height		mm	160	160	160
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	20/20	20/20	20/20
7	Max. lifting speed （Laden/Unladed）		mm/s	500/600	500/600	480/575
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed）		%	20/25	20/25	/
10	Min. outside turning radius mm		mm	2200	2200	2420
11	Min. ground clearance		mm	/	/	/
12	Max. braking distance		m	4.5	4.5	4.5
13	Dimension	Length(to fork face) mm	mm	2500	2500	2665
		Width	mm	1176	1176	1225
		Height (to overhead guard) mm	mm	2165	2165	2180
14	Service weight	Including lithium battery kg	kg	3525	3915	4470
15	Battery	standard	V/Ah	80/304	80/304	80/460
16	Motor	Drive motor	kW	20	20	20
		Pump motor	kW	28	28	28
17	Tires	Front tire×2		7.00-12-12PR/2	7.00-12-12PR/2	28×9-15-14PR/2
		Rear tire×2		6.00-9-10PR/2	6.00-9-10PR/2	6.50-10-10PR/2

No.	Item			CPD35-XEY2H2-SI	CPD38-XEY2H2-SI
1	Rated load capacity		kg	3500	3800
2	Load center distance		mm	500	500
3	Lifting height		mm	3000	3000
4	Free lift height		mm	170	170
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	20/20	19.5/19.5
7	Max. lifting speed （Laden/Unladed）		mm/s	430/525	430/525
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed）		%	/	/
10	Min. outside turning radius mm		mm	2420	2420
11	Min. ground clearance		mm	/	/
12	Max. braking distance		m	4.5	4.5
13	Dimension	Length(to fork face) mm	mm	2670	2670
		Width	mm	1225	1225
		Height (to overhead guard) mm	mm	2180	2180
14	Service weight	Including lithium battery kg	kg	4850	5080
15	Battery	standard	V/Ah	80/460	80/460
16	Motor	Drive motor	kW	20	20
		Pump motor	kW	28	28
17	Tires	Front tire×2		28×9-15-14PR/2	28×9-15-14PR/2
		Rear tire×2		6.50-10-10PR/2	6.50-10-10PR/2

No.	Item			CPD40-XEXY2-SI
1	Rated load capacity		kg	4000
2	Load center distance		mm	500
3	Lifting height		mm	3000
4	Free lift height		mm	160
5	Mast max. tilting angle(F/R) (°)		(°)	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	18/18
7	Max. lifting speed （Laden/Unladed）		mm/s	410/500
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard
9	Max. gradeability （Laden/Unladed） %		%	/
10	Min. outside turning radius mm		mm	2505
11	Min. ground clearance		mm	/
12	Max. braking distance		m	≤6.0
13	Dimension	Length(to fork face) mm	mm	2825
		Width	mm	1285
		Height (to overhead guard) mm	mm	2190
14	Service weight	Including lithium battery kg	kg	5360
15	Battery	standard	V/Ah	80/460
16	Motor	Drive motor	kW	20
		Pump motor	kW	28
17	Tires	Front tire×2		250-15-18PR/2
		Rear tire×2		6.50-10-10PR/2

No.	Item			CPD15-XEY2HA-SI	CPD18-XEY2HA-SI	CPD20-XEXY2HA-SI
1	Rated load capacity		kg	1500	1800	2000
2	Load center distance		mm	500	500	500
3	Lifting height		mm	3000	3000	3000
4	Free lift height		mm	155	155	160
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	15/15	15/15	15/15
7	Max. lifting speed （Laden/Unladed）		mm/s	300/430	300/430	300/430
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed）		%	18/25	16/25	15/25
10	Min. outside turning radius mm		mm	2035	2035	2035
11	Min. ground clearance		mm	/	/	/
12	Max. braking distance		m	≤4	≤4	≤4
13	Dimension	Length(to fork face) mm	mm	2230	2235	2230
		Width	mm	1126	1126	1126
		Height (to overhead guard) mm	mm	2155	2155	2155
14	Service weight	Including lithium battery kg	kg	2880	3130	3230
15	Battery	standard	V/Ah	80/150	80/150	80/150
16	Motor	Drive motor	kW	10	10	10
		Pump motor	kW	13	13	13
17	Tires	Front tire×2		6.50-10-10PR/2	6.50-10-10PR/2	6.50-10-10PR/2
		Rear tire×2		5.00-8-10PR/2	5.00-8-10PR/2	5.00-8-10PR/2

No.	Item			CPD20-XEY2HA-SI	CPD25-XEY2HA-SI	CPD30-XEY2HA-SI
1	Rated load capacity		kg	2000	2500	3000
2	Load center distance		mm	500	500	500
3	Lifting height		mm	3000	3000	3000
4	Free lift height		mm	160	160	165
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	16/17	16/17	17/18
7	Max. lifting speed （Laden/Unladed）		mm/s	400/500	400/500	400/500
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed）		%	/	/	/
10	Min. outside turning radius mm		mm	2200	2200	2350
11	Min. ground clearance		mm	/	/	/
12	Max. braking distance		m	≤4	≤4	≤4
13	Dimension	Length(to fork face) mm	mm	2500	2500	2665
		Width	mm	1176	1176	1225
		Height (to overhead guard) mm	mm	2165	2165	2180
14	Service weight	Including lithium battery kg	kg	3470	3860	4310
15	Battery	standard	V/Ah	80/230	80/230	80/230
16	Motor	Drive motor	kW	16	16	16
		Pump motor	kW	24	24	24
17	Tires	Front tire×2		7.00-12-12PR/2	7.00-12-12PR/2	28×9-15-14PR/2
		Rear tire×2		6.00-9-10PR/2	6.00-9-10PR/2	6.50-10-10PR/2

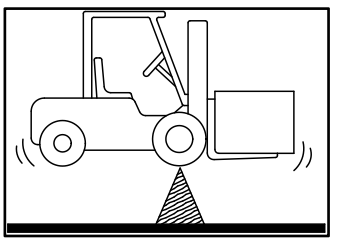
No.	Item			CPD35-XEY2HA-SI	CPD38-XEY2HA-SI	CPD27-XEY2HA-SI
1	Rated load capacity		kg	3500	3800	2700
2	Load center distance		mm	500	500	500
3	Lifting height		mm	3000	3000	3000
4	Free lift height		mm	170	170	165
5	Mast max. tilting angle(F/R) (°)		(°)	6/12	6/12	6/12
6	Max. travelling speed （Laden/Unladed）		km/h	17/18	17/18	14/15
7	Max. lifting speed （Laden/Unladed）		mm/s	350/440	350/440	400/500
8	Max. descent speed （Laden/Unladed）		mm/s	According to the standard	According to the standard	According to the standard
9	Max. gradeability （Laden/Unladed）		%	/	/	/
10	Min. outside turning radius mm		mm	2350	2350	2200
11	Min. ground clearance		mm	/	/	/
12	Max. braking distance		m	≤4.5	≤4.5	≤4
13	Dimension	Length(to fork face) mm	mm	2670	2670	2515
		Width	mm	1225	1225	1200
		Height (to overhead guard) mm	mm	2180	2180	2165
14	Service weight	Including lithium battery kg	kg	4690	4920	4210
15	Battery	standard	V/Ah	80/230	80/230	80/230
16	Motor	Drive motor	kW	16	16	15
		Pump motor	kW	24	24	24
17	Tires	Front tire×2		28×9-15-14PR/2	28×9-15-14PR/2	7.00-12-12PR/2
		Rear tire×2		6.50-10-10PR/2	6.50-10-10PR/2	6.00-9-10PR/2

10 Forklift truck structure and stability

Be aware that the structure and stability of the forklift are very important to safe operation.

Caution | **Forklift truck structure**

The basic components of the forklift truck are the lifting device (forks and mast) and the forklift truck itself at the rear (with tires).

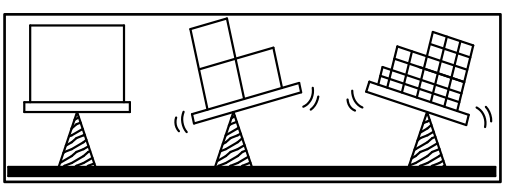


The front wheels of the forklift truck can be used as fulcra to keep balance between the center of gravity of the forklift truck and that of the load.

The relationship between the center of gravity of the forklift truck and that of the load is critical to the operation of the forklift truck.

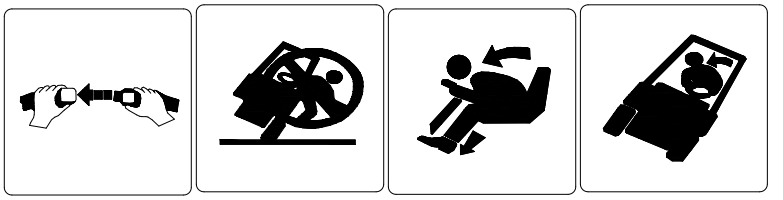
Caution | **Load center of gravity**

The load profiles handled with the forklift truck vary; in order to evaluate the forklift truck and its stability, it is very important to identify the center of gravity for loads in different shapes from boxes to boards and rectangular objects.



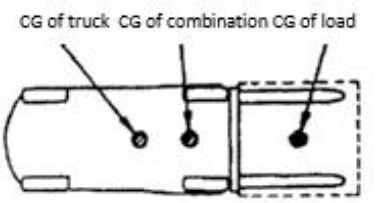
Warning

Do not jump out of the truck if the forklift truck starts to roll over. The forklift truck will roll over much faster than you can jump out of the truck; you should stretch your feet and keep your hands on the steering wheel firmly to hold you in the cab. Please fasten the safety belt tightly.

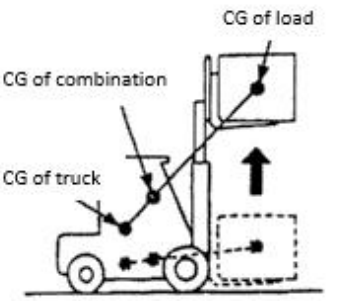


Caution | **Center of gravity and stability**

The center of gravity of the forklift truck depends on the combined center of gravity of the forklift truck. When the forklift truck is unloaded, the center of gravity remains unchanged; when it is loaded, the center of gravity is formed by the combined center of gravity of the forklift truck and the load. The center of gravity of the load is determined by whether the mast is tilted forward or backward or whether it is lifted or lowered, thus the combined center of gravity can change.



The combined center of gravity of the forklift truck is determined by the following factors:



a) Load magnitude, weight and shape;

b) Lift height;

c) Tilt angle of the mast;

d) Tire inflation pressure;

e) Acceleration, deceleration and turning radius;

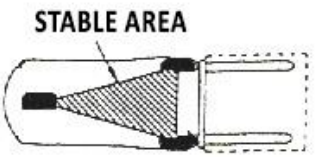
f) Road conditions and road tilt angle;

g) Attachment type.

Caution | **Stable center of gravity region**

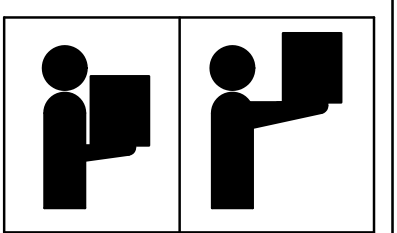
In order to make the forklift truck stable, the combined center of gravity has to be within the triangle formed by the contact point of the front left and right tires and the midpoint of the rear axle.

If the combined center of gravity is on the rear axle, the two front tires will form a fulcrum and the forklift truck will tilt forward. If the combined center of gravity moves out of the stable center of gravity triangle, the forklift truck will roll over in the direction towards the combined center of gravity.



Caution | **Maximum load (weight and load center distance)**

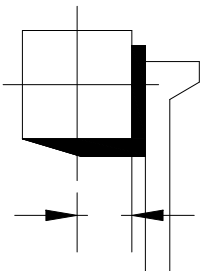
The horizontal distance between the center of gravity of the load on a fork and the load backrest of the fork or the front surface of the fork (whichever is smaller) is called the load center distance. The maximum load refers to the maximum load that the fork can bear at the standard load center distance. The relationship between the maximum load and the load center distance is shown on the Loading Capacity Chart of the forklift truck. If the load center distance moves towards the front fork, the overall center of gravity will move forward, thus the load has to be reduced.



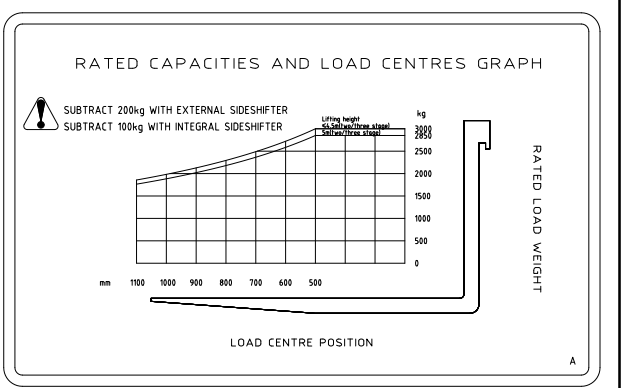
Caution | **Bearing Capacity Chart**

The chart shows the relationship between the location of the load center distance and the maximum load.

Check whether the load and the load center distance are within the allowable range of the Bearing Capacity Chart before loading. If the load shape is complicated, the heaviest part should be placed in the center of the fork and close to the load backrest.



Load center distance



Caution | **Speed and acceleration**

A static object should remain static without an external force. Similarly, a moving object continues to move at the same speed without an external force, which is referred to as inertia.

Due to inertia, when the forklift truck starts to move forward, a force acts backwards; when the truck stops, a force acts forward. It is dangerous to suddenly apply the brake, because the forklift truck will roll over or the load will slide when a large force acts forward.

When the truck turns, a centrifugal force will be applied outwards from the turning center. The truck can be pulled out and rolled over by the force. The left and right stability regions are small; thus, the truck should slow down to avoid rolling over when turning. If the truck carries a high load and the overall center of gravity is high, the truck may easily tilt forward, to the left or to the right.

11 Safety Rules

11.1 Safety rules for driving the truck

Driving permit:

The truck can only be operated and driven by specially trained technicians. The operator must be tested by the truck user, be proficient in driving and load handling operations, and be duly authorized by the truck user or its representative.

Driver's rights, obligations and code of conduct:

The operator must be familiar with his/her rights and obligations, be trained in the truck operation procedures, and be familiar with this Manual. The user must grant the operator the rights as required.

Unauthorized personnel are prohibited from using the truck:

During the operation, the operator is solely responsible for the truck safety. It is the operator’s responsibility to prohibit unauthorized personnel from driving or operating the truck. Do not use the truck to carry and transport people.

Truck damage and defects:

If any damage or defects are found on the truck or its attachments, the operator must report to the director. Trucks with any faults (e.g. worn tires or faulty brakes, etc.) must not be used before proper maintenance.

Truck maintenance:

The operator must not repair or modify the truck without special training and permission. The operator must not disable or adjust safety devices and switches without permission.

Hazardous places:

Hazardous places refer to places where there is a risk of personal injury. These risks arise primarily from the truck itself, its carrying device (e.g. Trailer) and traveling with cargo. Hazardous places also include places where there is a risk of falling loads or separation from the trailer. Unauthorized personnel must stay away from the hazardous places. Warning signs must be provided in the hazardous places.

11.2 Safety devices and warning signs

The operator must comply with all provisions of this manual regarding safety

devices, warning signs and warning instructions.

Dismounting or disabling safety devices (such as the emergency stop switch, emergency brake pedal, alarms, warning lights, safety guards, protective glass, covers, etc.) may result in accidents and personal injury.。

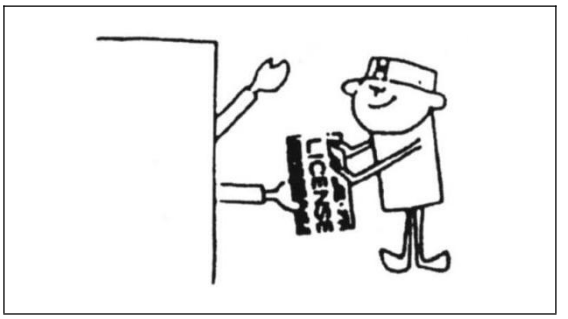
– Immediately report the identified defects to your superior.

– Mark and stop the truck if it is damaged.

– Restart the truck only after the fault has been identified and cleared.。

Remarks:

1. Only trained and approved operators can operate the truck.



2. Oil/water leakage, deformation and looseness should be regularly checked; otherwise, the service life of forklift truck will be shortened; in severe cases, it may cause an accident.

– Ensure that “safety critical parts” are replaced in regular checks.

– Wipe off oil, grease and water on the baseplate, footboard and control handle.

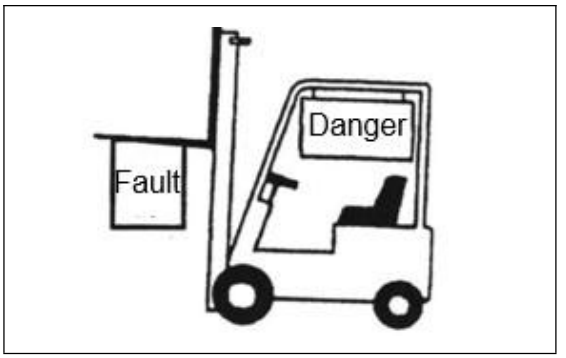
– No smoking, sparks or flames near to the lithium-ion battery during inspection.

– During maintenance at height (such as the mast, front light and back light), take care to avoid getting trapped and slipping.

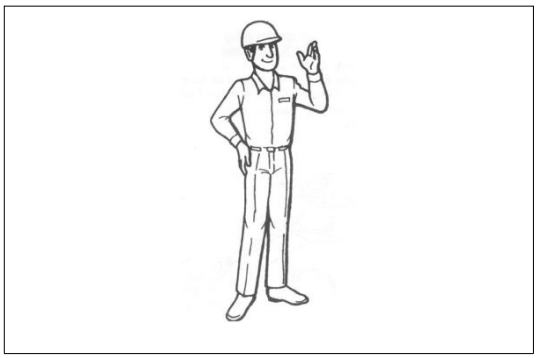
– Take care to avoid burning yourself when checking the motor or controller.

3. In the event of any faults, the operator should stop the truck immediately, hang the "Danger" or "Fault" sign, pull out the key and report to the management. The truck should not be used until all faults are eliminated.

– In case of a sudden fault when lifting cargo or driving on gradients, causing leakage of storage battery electrolyte or hydraulic oil and brake fluid, personnel should be organized for repair immediately.



4. Operators must wear helmets, work shoes and clothes.



5. Explosive gas will be generated in the lithium battery, so no flames should be close to the battery.

– Keep tools away from the poles of the lithium-ion battery, to prevent sparks or short circuits.

6. The driving route must be a solid and flat concrete road or similar roads suitable for operation. Lay flat boards on rough ground to ensure that the truck can travel as smoothly as possible. Pre-inspect the ground conditions of the work site.

Adequate distance should be reserved between the truck/cargo and the surrounding objects so the passage through the aisle is not obstructed. When the cargo size is not within the specified range, the user should check whether a larger aisle is required.

– Climate conditions the forklift truck is designed for: temperature: -20℃ to 50℃; wind speed: no more than 5m/s; relative air humidity: no more than 90% (temperature: 20℃).

– The forklift truck is not suitable for use in flammable and explosive working environments.

– The altitude for using the forklift truck should not be greater than 2,000 m.

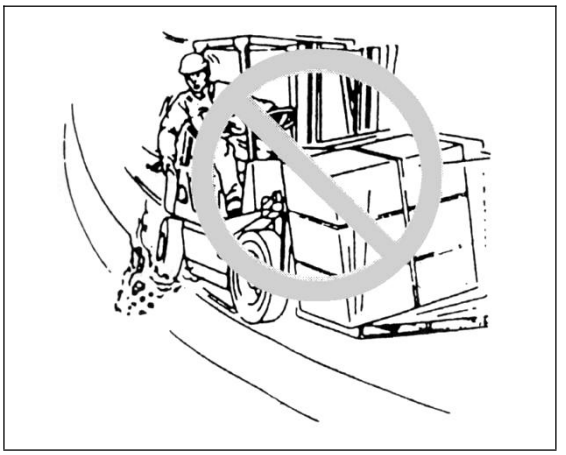
Caution

- **Check the road to be driven for holes, abrupt slopes, barriers, bumps, and road conditions that may cause loss of control and vibration.**
- **Remove rubbish, debris and foreign matter that may puncture tires and throw cargo out of balance.**
- **Slow down on slippery roads, do not drive on the edge of the road, and take extra care when it cannot be avoided.**
- **Uneven ground will cause vehicle**

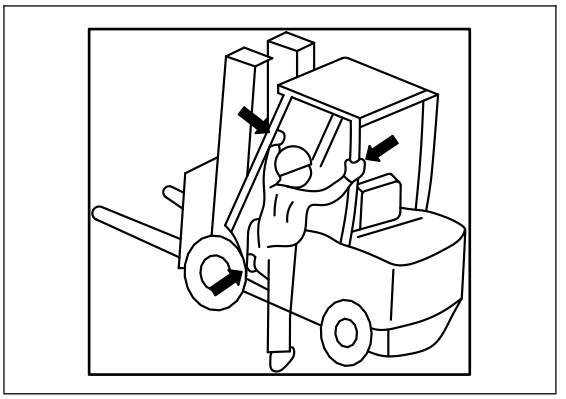
vibration and noise. High tire pressure will cause vehicle vibration and noise.

Warning

- **Do not use the forklift truck in sandstorms, snow, lightning, rain, wind and other bad weather conditions.**



7. Do not get on or off the forklift truck when it is in use; please use the safety pedal and safety handrail when getting on or off.

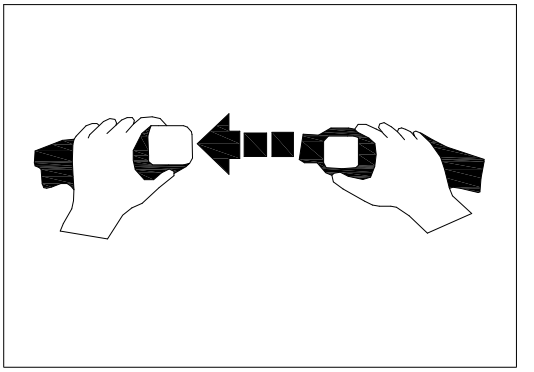


8. Operate the forklift truck only when sitting properly.

– Adjust the seat position for good hand and foot control before starting.

9. Before starting:

– Please fasten the safety belt tightly.



– Release the hand brake.

– Place the direction lever in the neutral position.

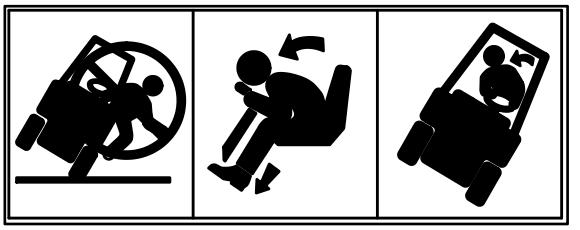
– No people should be around the forklift truck.

– Do not depress the accelerator pedal or operate the lift control lever or tilt control lever before powering on.

10. Keep a stable and accurate operation; sudden stops and sharp turns should be avoided.

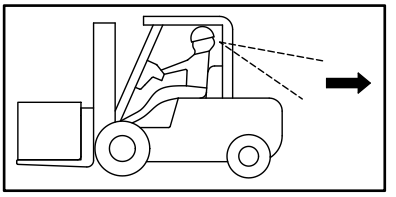
– Truck rollover may occur during emergency braking.If the forklift truck rolls over, it will roll over much faster than you can jump out. Open your legs, firmly step on the front base plate with your feet, grip the steering wheel with

both hands, tilt your body in the opposite direction of the rollover direction, and keep your body fixed on the driver's seat.



11. Pay attention to the driving direction and keep a good lookout.

– Pay special attention to the driving direction when reversing.



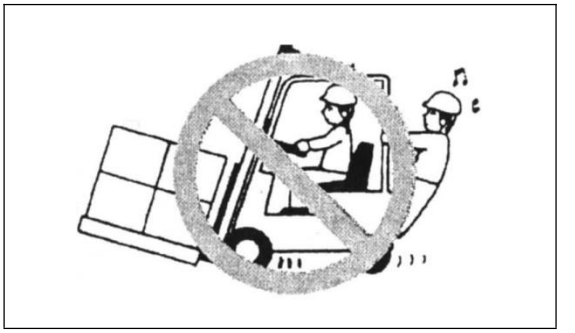
12. Other people must not sit on the fork, pallet or forklift truck.

13. Select proper attachments and tools according to the shapes and materials of the cargo to be loaded.

– Do not hang ropes on the forks or attachments to lift cargo, because the rope may slip; if necessary, a person with lifting operation qualifications should lift the cargo with a lifting hook or a boom.

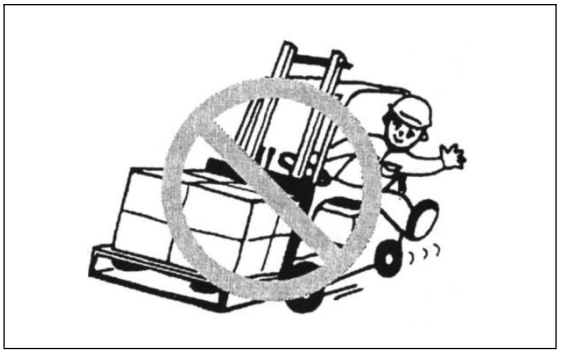
– Be careful not to let the forks touch the road surface, to avoid damaging the fork tip and road surface.

14. Know the load curves of the forklift truck and attachments. Do not use people as additional counterweight.



15. Do not use a mobile phone or other electronic products while driving. Focus on the work.

16. Keep your head, arms, legs and feet in the cab and do not stretch them out of the cab for any reason.

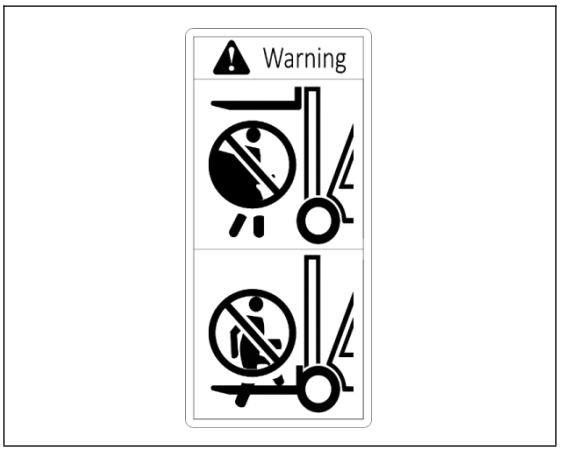


17. The pallet or wooden wedges should be strong enough to bear the cargo weight, do not use damaged or deformed pallets.

18. Various attachments are provided from HANGCHA for the user, such as rotating clamps, flat holding clamps, side shift forks, and booms, which are to be used exclusively. If attachments are required to be refitted, the permission of the manufacturer must be obtained. Do not refit your attachments without permission.

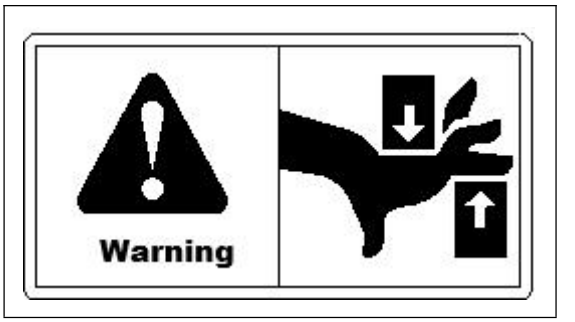
19. The overhead guard can protect you from being hit by falling cargo. The load backrest ensures the stable loading of cargo. Forklifts should not be used without overhead guards and load backrests.

20. Do not stand or walk under the forks or attachments. Do not stand on the fork.

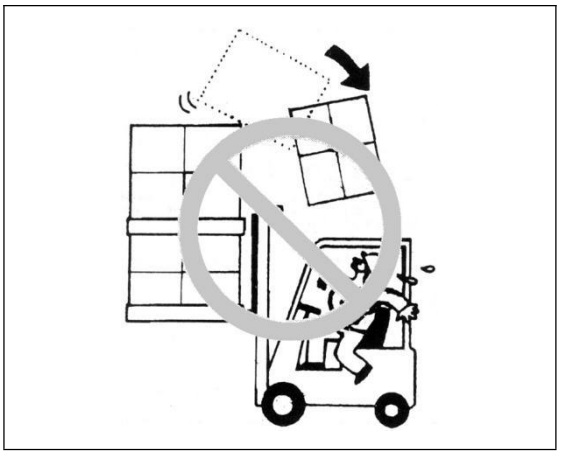


21. Do not stretch your head or body between the mast and the overhead guard. You may be injured if your head or body is trapped.

– Do not stretch your hands between the inner mast and the outer mast.



22. The stacking height of cargo should not exceed that of the load-backrest; if this cannot be avoided, the cargo should be fixed securely. Please drive in reverse or under guidance when handling large cargo obstructing visibility. When there is a guide for forklift operations, the operator must be familiar with the meaning of his hands, flags, whistles or other signals. When the forklift truck is used for carrying cargo in large lengths such as wood, pipes and oversized items, or the attachments of the forklift truck can be extended, the operator must pay full attention to the front and keep an eye on other people when turning or driving in narrow passages.



23. Reduce the forward tilt angle as much as possible when stacking for unloading; when the height of cargo is slightly higher or lower than that of the stacking layer, cargo can tilt forward.

– When stacking at height and the distance to the ground is 15cm-20cm, the mast should be vertical and then lifted; be careful to not tilt the mast when the cargo is lifted.

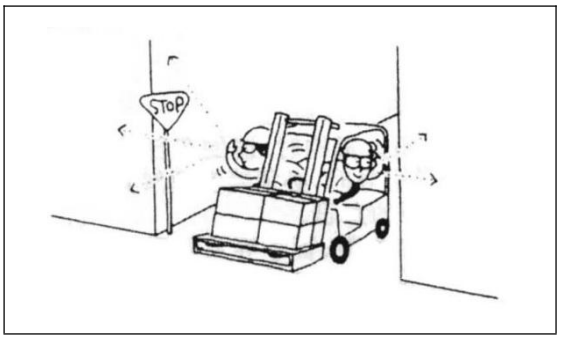
– When picking up goods at height, insert the fork into the pallet, slowly lift, back up and then descend, lower the rear mast and tilt it backward. Never tilt the mast when the goods are at height.

24. It is dangerous to lift the forks when driving with or without load; the distance between the forks and the ground should be 15cm-30cm; and truck should be driven with the mast tilting backward. Do not conduct side shift operations when the forks are raised to protect the forklift truck from losing balance.

25. Pay attention to intersections, ropes, exit/entrances and hanging objects when operating in a crowded space.

– Slow down and sound the horn when passing through crossroads or other sections with poor visibility.

– Reduce the driving speed to 1/3 of maximum speed when turning.



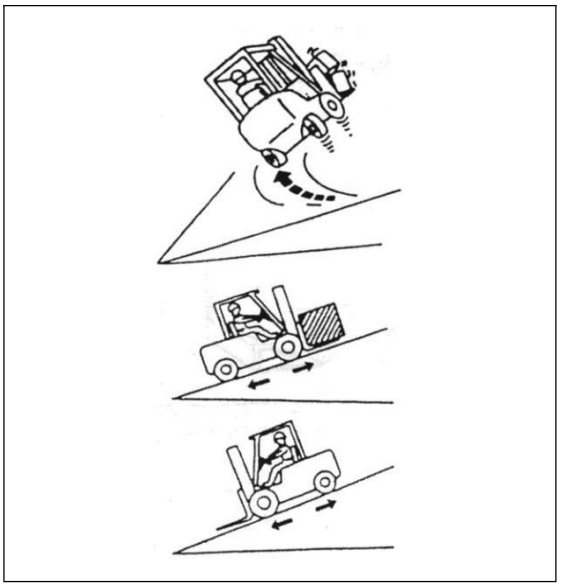
26. Keep the truck away from the road edges or platform edges.

27. When crossing a ship deck or bridge, confirm that it is fixed correctly and has enough strength to bear the weight of the forklift.

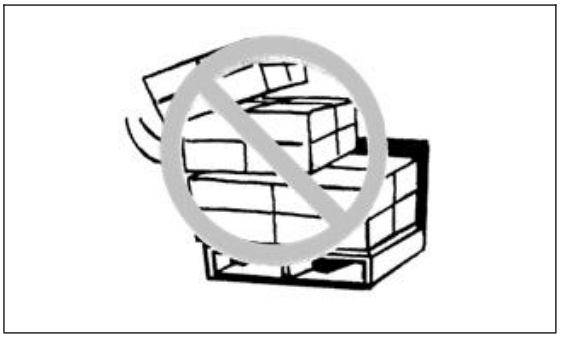
28. Reverse downhill and climb facing forward when loaded.

– Reverse uphill and drive downhill when loaded.

– Do not turn on ramps to avoid rolling over.



29. Cargo must be aligned with the center of the forks; when cargo is not aligned, or when the forklift truck turns or crosses uneven surfaces, the cargo may easily fall off. The possibility of rollover is also increased.



30. Do not lift cargo when the forklift truck is on a slope and avoid loading and unloading operations on ramps.

31. Do not stand or walk under the lifted forks or attachments. If it is unavoidable, the user should choose a safe place and hold the forks or attachments with wooden blocks to prevent accidents.

32. Check the road to be driven for holes, abrupt slopes, barriers, bumps, and road conditions that may cause loss of control and vibration.

– Remove rubbish, debris and foreign matter that may puncture tires and throw cargo out of balance.

– Slow down on slippery roads, do not drive on the edge of the road, and take extra care when it cannot be avoided.

– Do not use the forklift truck in sandstorms, snow, lightning, rain, wind and other bad weather conditions. In particular, when the wind speed is more than 5m/s, it is better not to use the truck.

33. The controller is equipped with an accumulator. Do not touch the position between B+ and B- to prevent an electric shock. In order to check or clean the controller, a load device (such as contactor coil or horn) should be installed between B+ and B- to discharge the capacitor inside the controller.

34. Pull up the hand brake when parking on a flat road; if the truck has to be stopped on a ramp, a wedge must be placed under the

wheel.

– Turn off the key switch and take out the key when the forks are lowered to the ground and slightly tilted forward.

– Pull the battery plug out.

– Stop the truck away from smoke or flames.

35. When the forklift truck cannot be driven, it can be towed to a safe place using the tow pin. Do not tow trucks with defective steering systems or damaged brake systems.

36. There are warnings and operation methods on the truck labels or signs. Please operate according to the directions of the manual and truck labels and signs. Check labels, signs and marks, and replace them if they are damaged or missing.

37. The workplace should be provided with fire extinguishers. The user can choose to provide a fire extinguisher for the truck, which is generally installed on the rear leg of the safety frame for easy access.

– Drivers and managers should be familiar with the position and usage method of the fire extinguishers.。

38. Use a pallet when handling small objects and do not place them on the forks directly.

39. Forklift trucks specially designed for cold storage warehouses should not be turned off and parked inside the warehouse.

40. When there are any corrosive chemicals on the corrosion resistant forklift truck, such as acid, alkali and salty fluid, clear them away promptly them to avoid corrosion.

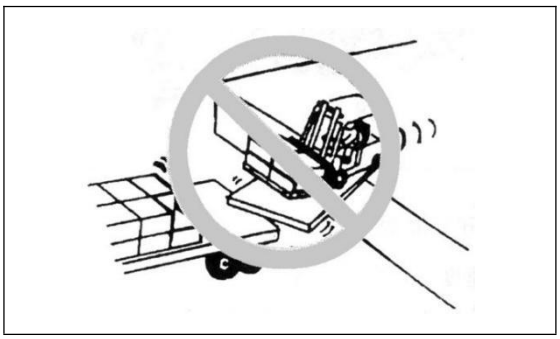
41. In corrosive environments, especially severely corrosive environments with corrosive chemicals such as acid, alkali and salt, or severe environments such as high temperature, moisture and dust, the corrosion resistant forklift truck should not work or be parked there for too long.

42. Pay attention to the driving direction and keep a good lookout.



43. When crossing a ship deck or bridge, confirm that it is fixed correctly and has enough strength to bear the weight of the forklift, and check the ground conditions of the work site in

advance.



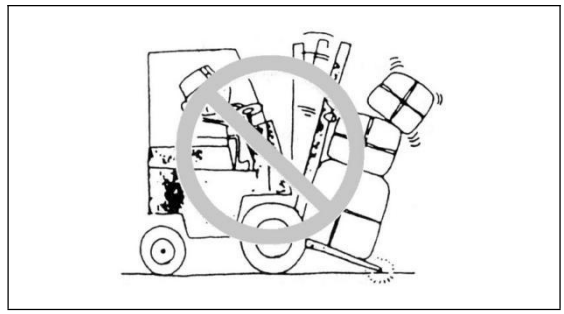
44. It is dangerous to lift the forks when driving with or without load; the standard driving condition (the distance between the forks and the ground is 15cm-30cm) should be maintained.

Do not conduct side shift operations when the forks are raised to protect the forklift from losing balance.

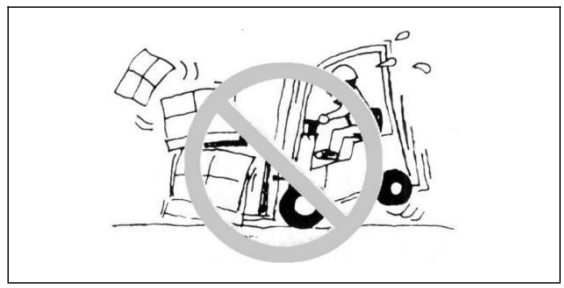
Forklifts with attachments should be considered vehicle loads.



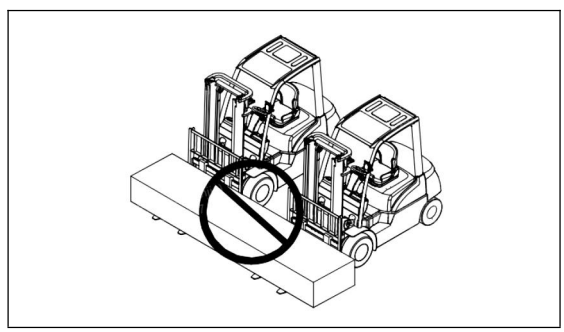
45. The mast should tilt backward and the height of cargo should be lowered as much as possible when the truck is operated under load.



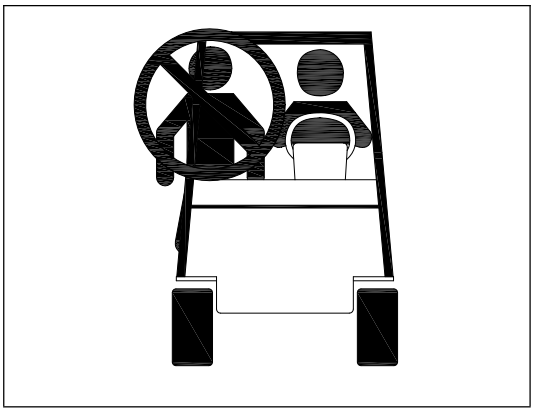
46. Know the load curves of the forklift truck and attachments, and do not overload. It is very dangerous to use artificial additional counterweights.



47. Do not use two forklift trucks to carry the same object because it may lead to a rollover or tip-over, which could cause personal injuries or even death.



48. Do not carry people!



49. Explosive gas will be generated in the lithium battery, so no flames should be close to the battery. Do not touch the positive and negative terminals of the battery with your hands at the same time to prevent an electric shock or short circuit.



50. Improper maintenance can cause serious accidents and shorten the service life of forklift trucks. For safe operation, please contact Hangcha dealers or agents for maintenance matters.

51. The power switch can be started only after checking the circuit before working every day. After the work, the power switch should be turned off.

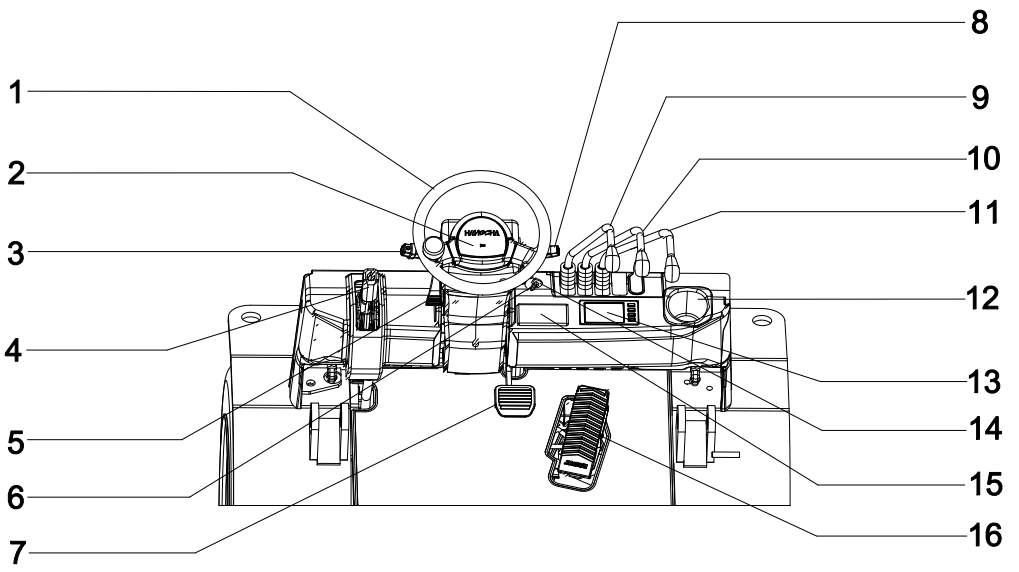
52. Oil/water leakage, deformation and looseness should be regularly checked; otherwise, the service life of forklift truck will be shortened; in severe cases, it may cause an accident.

- Ensure that “safety critical parts” are replaced in regular checks.
- Wipe off oil, grease and water on the baseplate, pedal and control lever.
- No smoking, sparks or flames near to the lithium-ion battery during inspection.
- During maintenance at height (such as the mast, front light and back light), take care to avoid getting trapped and slipping
- Take care to avoid burning yourself when checking the motor or controller.

53. Use a pallet when handling small objects and do not place them on the forks directly.

12 Display and control parts

12.1 Position of each part



1. Steering wheel	5. Steering column adjustment switch	9. Lift control lever	13. Multi-functional display screen
2. Horn button	6. Ignition key switch	10. Tilt lever	14. Emergency stop switch
3. Direction lever	7. Brake pedal	11. Side shift control lever	15. Rocker switch
4. Hand brake	8. Combination light switch	12. Cup holder	16. Accelerator pedal

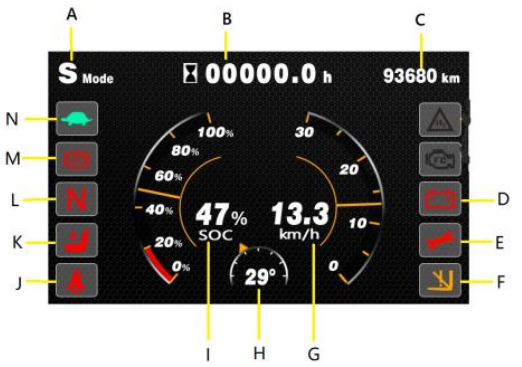
12.2 Dashboard

12.2.1 HY40D-HC Dashboard

12.2.1.1 An introduction to the instrumentation functions

The XE series forklift truck's smart dashboard is an on-board color screen dashboard integrated with the CAN bus. It can display vehicle speed, battery level, working hours, total mileage, Chinese/English display, password protection, fault codes, drive and lithium-ion battery monitoring information, etc. At the same time, users can change the driver parameters through the dashboard to meet individual customization needs.

12.2.1.2 Main interface display



A. Running mode	H. Steering angle
B. Running hours	I. Battery level
C. Odometers	J. Safety belt
D. Low battery display	K. Driver's seat switch
E. Fault indicator light	L. Gear indicator light
F. Working device restriction	M. Parking indicator light
G. Speed display	N. Slow mode

Running mode [A]

There are three running modes, respectively: Mode S, mode P, and mode E (slow mode).

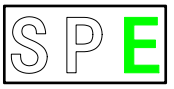
Mode S refers to the fast mode. In this mode, the forklift truck's acceleration, maximum gradeability and other values are high, and the forklift truck is suitable for carrying a large amount of cargo in a short time and climbing a slope. The power consumption of the forklift truck is highest in this mode.



Mode P refers to the normal mode. In this mode, all indexes are slightly lower than the fast mode, and the forklift truck is suitable for normal operating environments. This is the default mode.



Mode E refers to the slow mode. In this mode, the maximum speed is limited, and the forklift truck is suitable for working in crowded warehouses and narrow spaces.



Running hours [B]



When the key switch is turned on, the forklift truck running time starts counting. When the key switch is turned off, the forklift truck running time stops counting.

Low battery display [D]



When the battery level is less than 20% of the battery capacity, this indicator light will light up; When the battery level is higher than 20% of the battery capacity, this indicator light goes off.

Fault indicator light [E]



When an electrical system fault occurs, this indicator light stays on constantly. After the fault is cleared, this indicator light goes off.

Working device restriction indicator light [F]



When only 10% battery capacity remains, this icon will light up; at the same time, the lifting speed of mast will be reduced, prompting the user to charge the battery immediately.

Vehicle speed [G]



Range is 0-30 km/h, displayed to 1 decimal place.

Steering angle [H]



Display the vehicle's left/right steering angle, unit: °

Battery level [I]



Display remaining battery capacity with a display range of 0-100% and accuracy of 1%.

It is recommended that the battery should be charged when only 30% capacity remains, otherwise its service life will be greatly shortened.

Caution

- **It is important to charge the battery on time, otherwise the battery life will be shortened!**

Safety belt [J]



Fasten the safety belt. If the safety belt is not fastened properly, the safety belt alarm indicator light will turn on.

Driver's seat switch [K]



When the driver leaves the seat, this icon will light up. It indicates that the seat switch is turned off, and the truck cannot move or lift. This function applies to driver’s seats fitted with a switch.

Gear indicator light [L]

The forklift has three gear positions, namely “N” , “D” , and “R” .

Neutral gear



When the gear is in neutral, the dashboard displays “N”.

Forward gear



When the forward gear switch is closed, the dashboard displays “D”.

Reverse gear



When the reverse gear switch is closed, the dashboard displays “R”.

Parking indicator light [M]



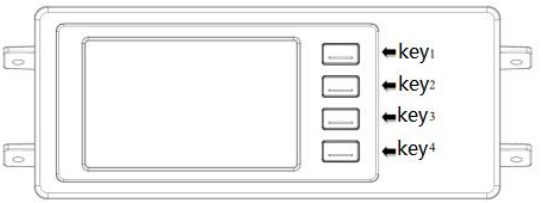
When the hand brake is engaged, this icon will light up.

Tortoise speed mode [N]



When the forklift truck is running in low-speed mode (Mode SPE), this indicator light will light up.

12.2.1.3 Instrument buttons

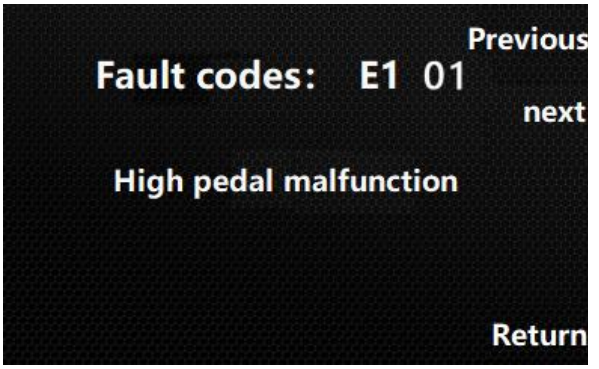


12.2.1.4 Power on interface



12.2.1.5 Main menu

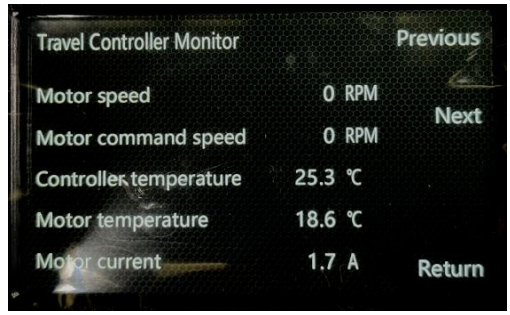
(1)Press button 1 on the main interface to view fault information. Press button 1 and button 2 to page up/down to view multiple fault messages. Press button 4 to return to the main interface.

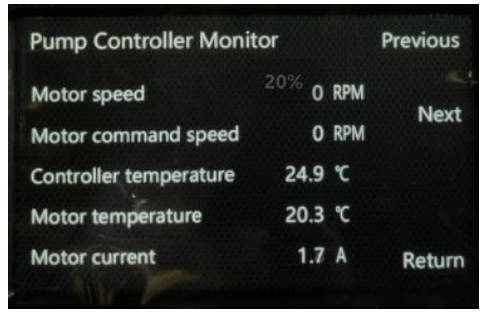


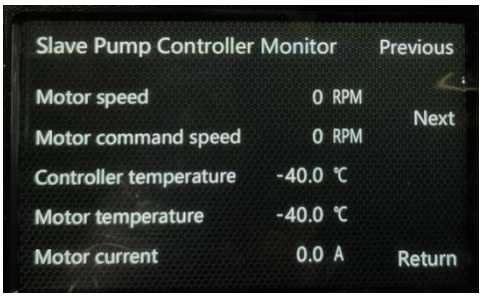
(2)Press button 2 on the main interface to switch between the three running modes: Speed mode S, Normal mode P, and Slow mode E. The mode indicator icon will change accordingly.

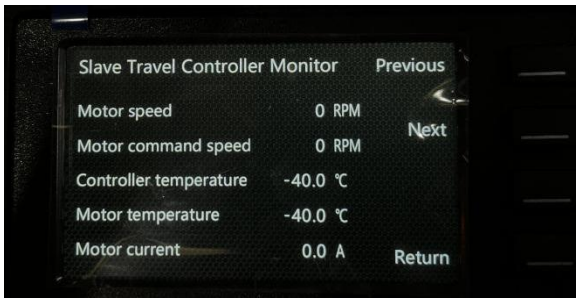


(3)Press button 3 on the main interface to view monitoring information. Press button 1 and button 2 to page up/down to view traction controller, auxiliary traction controller (reserved), oil pump controller, auxiliary oil pump controller (reserved), and lithium-ion battery monitoring information. Press button 4 to return to the main interface.

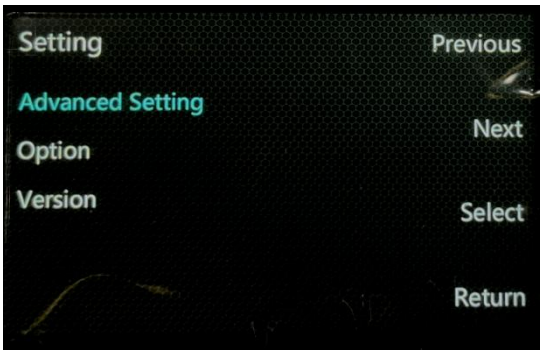








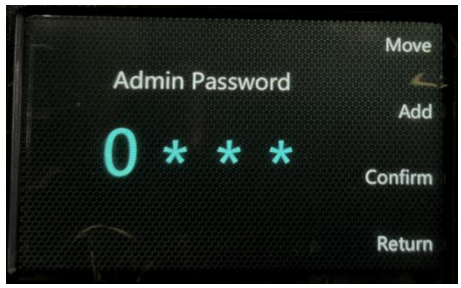
(4)Press button 4 on the main interface to enter the setting page. Press button 1 and button 2 to switch between different sub-page options. Press button 3 to enter the selected sub-page, and press button 4 again to return to the main interface.

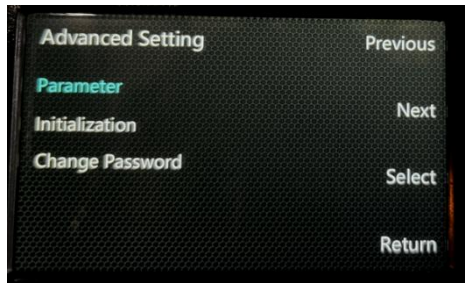


12.2.1.6 Advanced setting page

Entering the advanced setting page requires inputting a four-digit password first. The password input method is as follows: Use button 1 to move the cursor to the digit to be modified, use button 2 to change the value, after all four digits are entered press button 3 to confirm.

If the password is correct, the advanced settings interface can be entered.



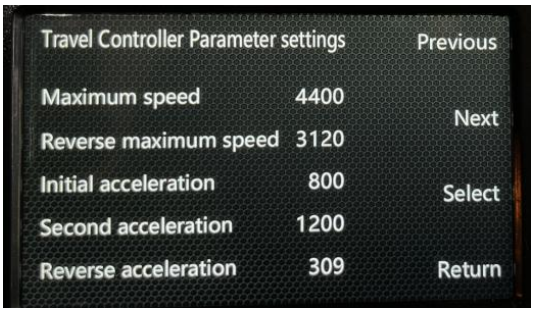


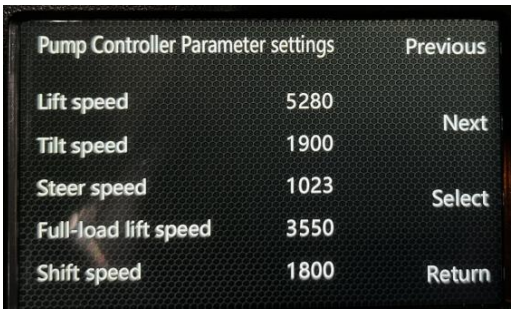
(1)Parameter settings interface

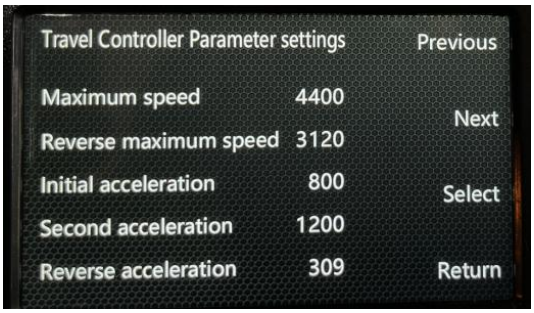
The parameter settings interface has 6 pages in total. 3 pages for traction controller parameter settings, with 13 setup items. Among them, auxiliary traction 1, auxiliary traction 2,auxiliary traction 3 are reserved items with no function. There are 3 pages for oil pump controller parameter settings, with 12 setup items.

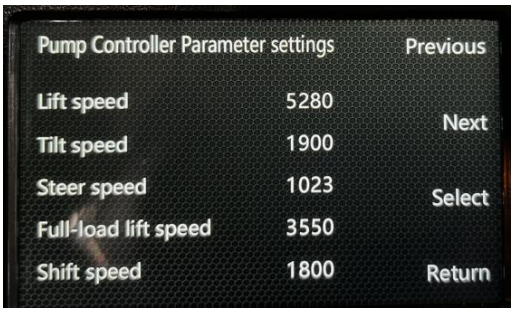
Among them, auxiliary oil pump 1, auxiliary oil pump 2, auxiliary oil pump 3 are reserved items

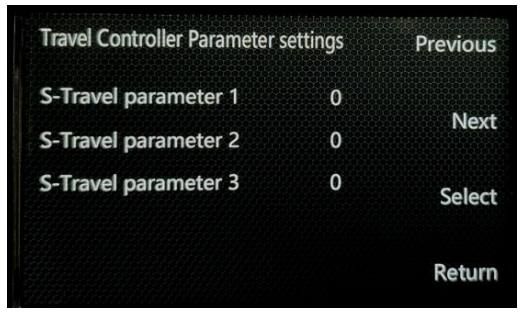
with no function.

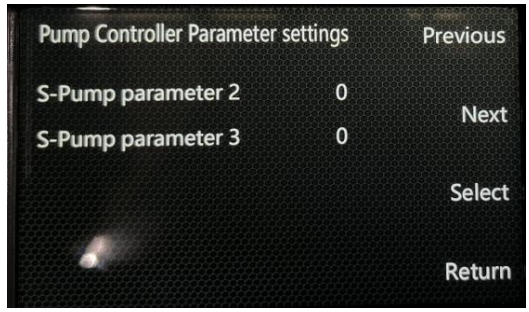




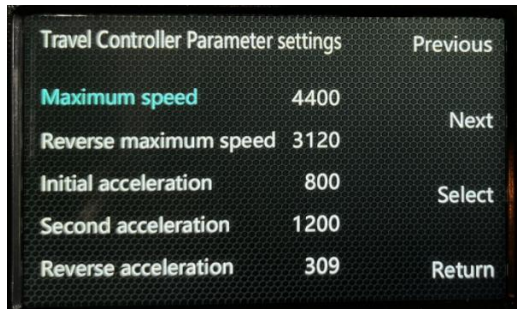








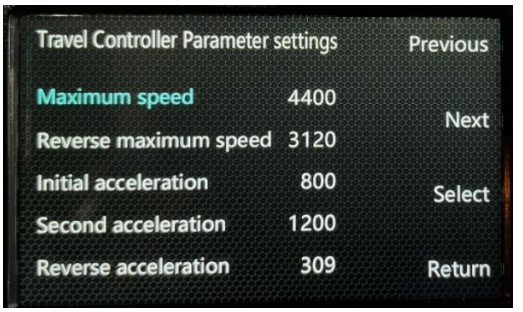
The first press of button 3 selects the current page, and the right button prompt information changes automatically. Press button 1 and button 2 to select the setting item under the current sub-page;



The second press of button 3 selects the current setting item, and the right button prompt information changes automatically. Press button 1 to move the cursor to the digit to be

modified,and press button 2 to change the value;

The third press of button 3 confirms the modified value, completing the parameter modification. The interface automatically jumps back to the previous step; press button 4 to cancel and return to the previous interface.



(2)Initialization settings interface

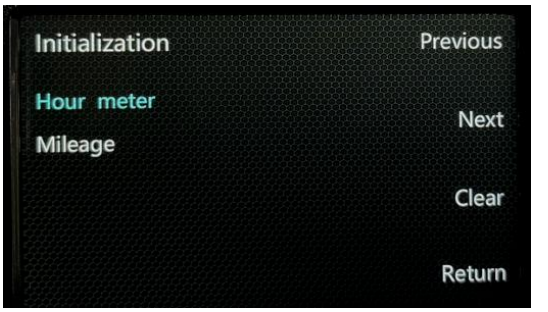
Press button 1 and button 2 to select the working hours and mileage options;

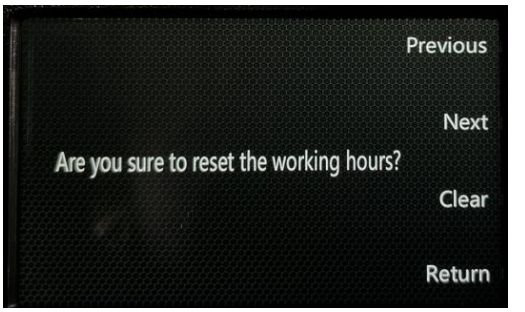
Press button 3 to confirm, and the interface will automatically jump and prompt to reset;

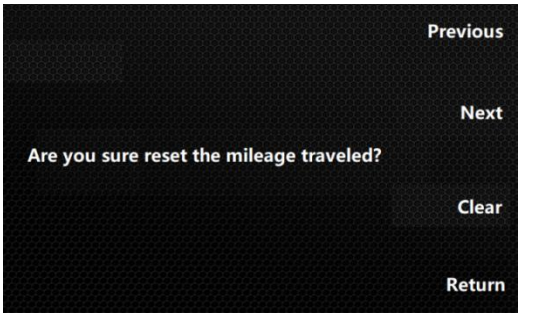
Press button 3 again to confirm, and the interface will automatically jump back to the previous interface, and the stored hours/mileage data is reset;

Press button 4 to cancel and return to the previous interface.

Note: The working hours on the current main interface are controller forwarded data and cannot be reset through the dashboard. It is a reserved function.

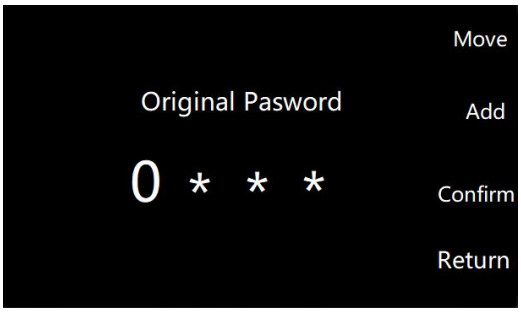


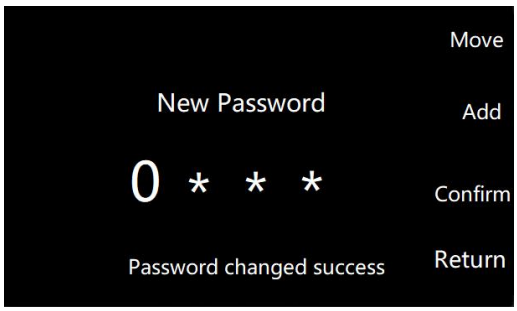




(3)User password settings interface

To change the password, the original password must be entered first, then enter the new password. After confirmation it will prompt "Password changed successfully".

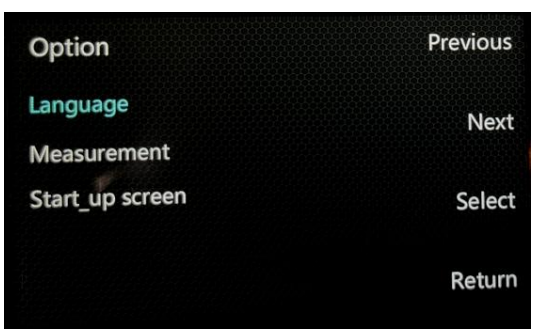




12.2.1.7 Options page

(1)Language settings

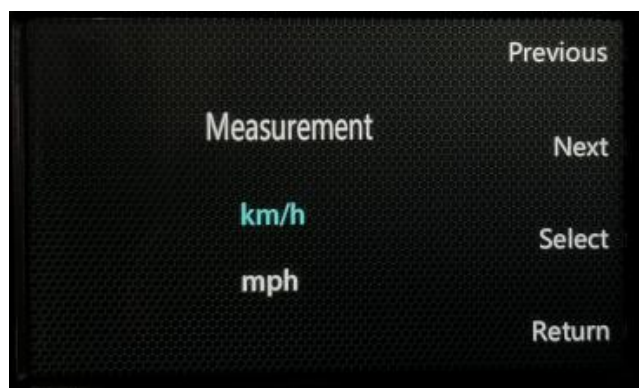
Press button 1 and button 2 to select between Chinese/English; press button 3 to confirm, and the interface will automatically jump back and the language will change accordingly; press button 4 to cancel and return to the previous interface.





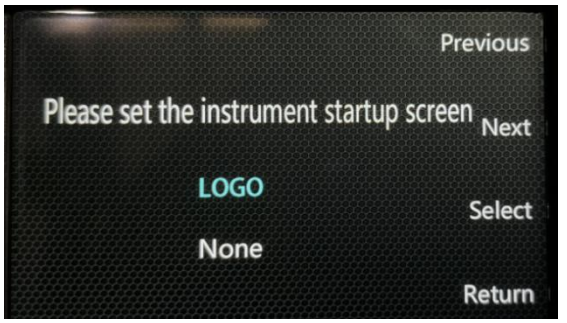
(2)Unit settings

Press button 1 and button 2 to select between Imperial/Metric; press button 3 to confirm, and the interface will automatically jump back and the main interface units will change accordingly; press button 4 to cancel and return to the previous interface.



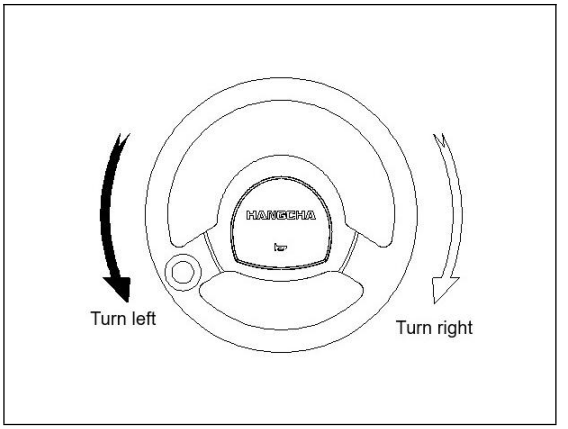
(3)Start-up interface settings

Press button 1 and button 2 to select HANGCHA Logo/No Power On Screen options; press button 3 to confirm, and the interface will automatically jump back and the power on screen will change accordingly; press button 4 to cancel and return to the previous interface.


Previous
Please set the instrument startup screen
Next
LOGO
Select
None
Return

12.3 Control devices

Steering wheel [1]



To control the driving direction of the forklift.

When the steering wheel is rotated to the right, the truck will turn right; when the steering wheel is rotated to the left, the truck will turn left. The rear of the truck can swing outward.

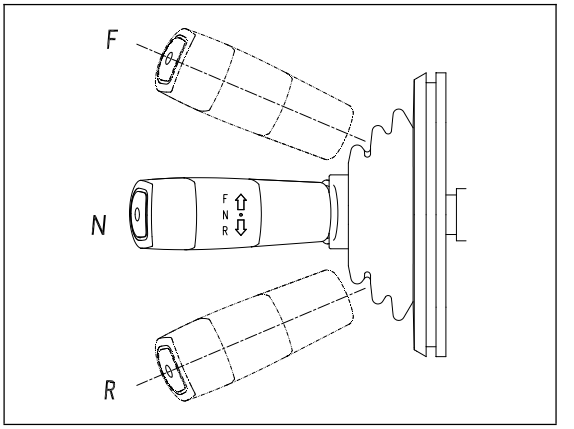
Warning

- **The forklift truck is equipped with a hydraulic steering mechanism. When the oil pump motor shuts down, the steering will become very heavy. Before turning again, the oil pump motor must be restarted immediately.**
- **The rear wheels of the forklift truck are used for steering. When steering, the user must ensure that there are no pedestrians or barriers in the rear swing area.**

Horn button [2]

The horn button is used to warn nearby pedestrians and is located in the center of the steering wheel. The user can sound the horn by pressing the edge of the horn button with his or her finger or pressing the center of the horn button with his or her palm.

Direction lever [3]



The direction control lever is used to change the driving direction of the forklift truck and is located on the left side of the steering hub column. Its operation method is as follows:

Moving forward: When the forklift truck is stationary, the user moves the direction control lever forward to the "F" position and presses the accelerator pedal to make the forklift truck move forward.

Moving backward: When the forklift truck is stationary, the user moves the direction control lever back to the "R" position, the reversing

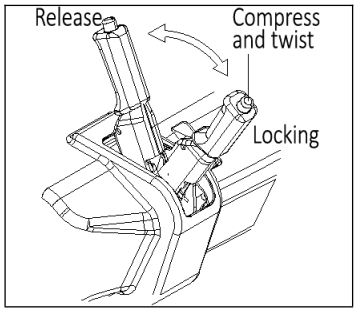
buzzer will sound, and the user then presses the accelerator pedal to make the forklift truck move backward.

Parking: When the forklift truck is stationary for a long time, the user moves the direction control lever to the "N" position, and engages the parking brake to park.

Caution

- **The forklift truck can only be started when the direction control lever is in the "N" position.**
- **The lever can only be shifted when the forklift truck is stationary.**

Parking brake [4]



The parking brake is used for forklift truck parking and is located to the left of the center console. Its operation method is as follows:

Parking state: After the forklift truck has stopped, the lever is in the "N" position, and the user pulls the parking brake to the "locked" position as shown in the figure, and the parking brake will be automatically locked for parking.

Releasing the parking brake: The user keeps the parking brake button pressed, first pulls the parking brake back forcibly, and then pushes it forward to the "release" position as shown in the figure to complete the release of the parking brake.

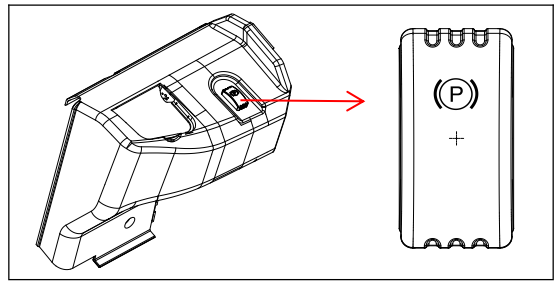
Caution

Engage the parking brake before leaving the forklift truck.

In the event of braking system failure or an emergency, the parking brake can be engaged for emergency braking.

Do not use the parking brake for service braking.

EPB (optional)



The electronic parking brake (EPB) is also called the electronic parking brake system. It integrates the temporary braking function when driving with the long-term braking function for parking. The parking brake function is

controlled electronically.

After the truck is started, the electromagnetic brake is locked in its initial state; when the operator ove the direction switchand presses the EPB button down and then depresses the accelerator pedal, the EPB will be released; when the operator releases the accelerator pedal and the motor speed is lower than 100rpm for 2s, or enables the EPB button and the motor speed is lower than 100rpm for 2s, the EPB is engaged (locked).

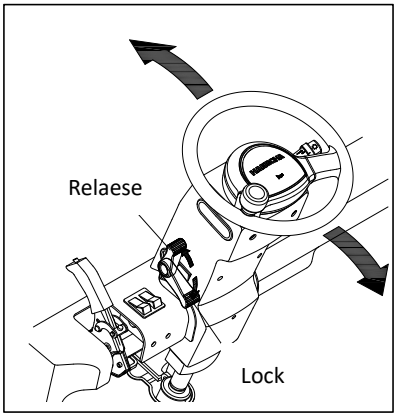
In an emergency (the truck cannot move due to a fault), the EPB can be released by powering it from an external source (45V).

Warning

In an emergency (the truck cannot move due to a fault),Towing of the truck is not allowed

In special circumstances, to drag the vehicle, the front wheel should be towed off the ground.

Steering column adjustment switch [5]



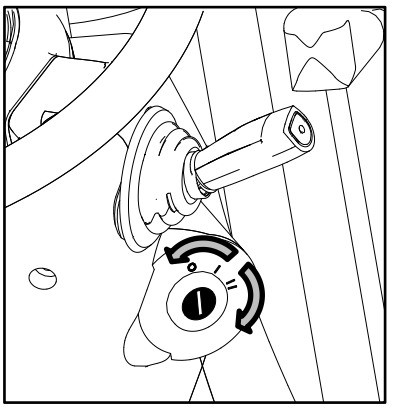
The steering column adjustment switch is used to adjust the front and rear positions of the steering wheel and is located below the left side of the steering column.

Operating steps:

- The forklift truck is in the parking state.
- The user grips the steering wheel in his or her right hand.
- The user rotates the adjustment switch up by 90° with his or her left hand, at which point the steering column is released and can be adjusted forward and backward.
- The user should adjust the position of the steering wheel, keep the right hand still, and turn the adjustment switch down by 90° with the left hand to lock it.
- The user should firmly pull the steering wheel backward and forward to ensure that the steering column is locked tightly.

- The adjustments of direction and position are completed.

Ignition key switch[6]



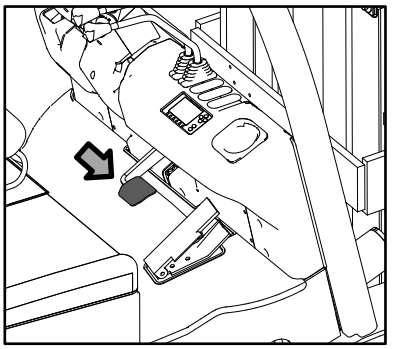
The ignition key switch is used to start or turn off the electrical system of the forklift truck and is located on the right side of the steering hub column. Pull the key out of the lock switch to ensure that the truck cannot be started accidentally.

The key switch has two functional positions: on/off; first, set the shift lever to neutral, release the accelerator pedal, and then turn the key clockwise to the "**ON**" position.

Caution

- The forklift truck will not start if the direction lever is not in neutral or the accelerator pedal is pressed down when the key switch is turned to the "ON" position.
- In this instance, there will be a fault code.
- The user should restore the direction lever to the neutral position and move their foot away from the accelerator pedal to start the truck. At this time, the fault code will disappear.

Brake pedal [7]



The brake pedal is used for braking control when driving the forklift truck.

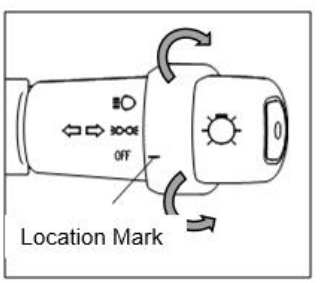
Caution

Emergency braking can easily cause the truck to tilt or cargo to fall, resulting in accidents.

Combination light switch [8]

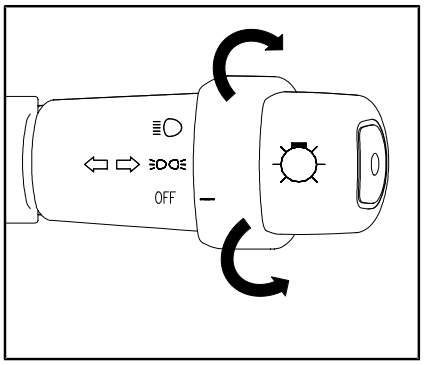
The combination light switch is used to control headlights and indicator lights. It is located to the right of the steering column.

Operation of the indicator light:



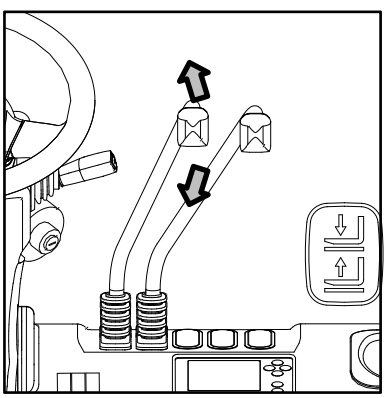
Push forward	⇦	Left turn signal light flashing
Neutral		Off
Toggle backward	⇨	Right turn signal light flashing

Operation of the headlight: "√" means the switch is on.



Location mark	Lighting Sign	Front signal light	Head light	Width light
—	≡D		√	√
	≡DOE	√		√

Lift control lever [9]

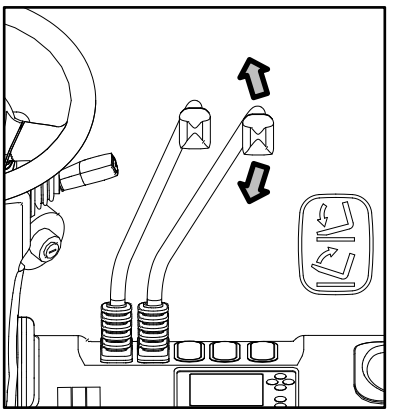


This lever is located in the right side of the center console and is used to lift or lower the forks. The lifting or lowering speed is controlled by the angle of the control lever.

Operating steps:

- **Lifting**: Pull the control lever backward.
- **Lowering:** Push the control lever forward.

Tilt lever [10]



This lever is used to tilt the mast forward and backward. It is located to the right of the lift control lever. The speed is controlled by the angle of the lever.

Operating steps:

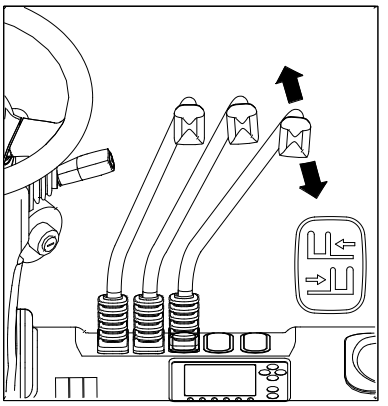
- **Tilt forward:** Push the control lever forward.
- **Tilt backward:** Pull the control lever backward.

⚠ **Caution**

The multi-way valve is equipped with a forward tilt self-locking valve. Therefore when the power is off, the mast cannot tilt forward even if the tilt lever is pushed forward.

Side shift control lever [11](as required by

attachments)



This side shift control lever is used to move the side shift frame to the left or right. It is located to the right of the tilt lever. The speed is controlled by the angle of the lever.

Operating steps:

- **Move left**: Push the control lever forward.
- **Move right:** Pull the control lever backward.

Attachment control lever (as required by attachments)

The attachment control lever refers to side shift control lever, turning control lever or other attachment control levers, depending on the specific attachments fitted.

Cup holder [12]

A cup holder is located on the right side of the center console for holding the operator's cup.

Emergency stop switch [14]

Turns the power on or off.

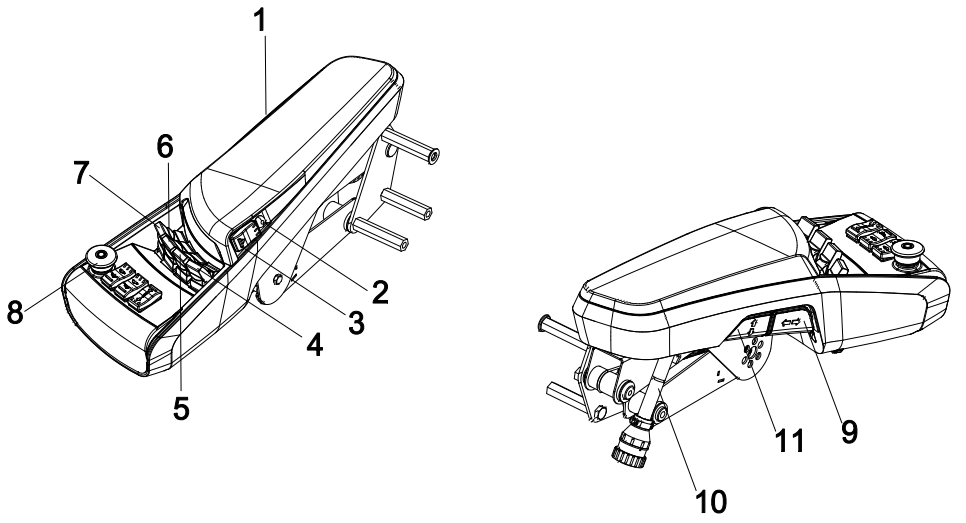
In an emergency, press the red mushroom-shaped button to cut off the main vehicle power. Traveling, steering and lifting actions will be disabled.

Accelerator pedal [16]

The accelerator pedal is used to control the driving speed. Press the pedal to start the forklift truck. Controls the speed according to the angle at which the pedal is pressed. Release the accelerator pedal to slow down the forklift truck until it stops.

Thumb switch（Optional）

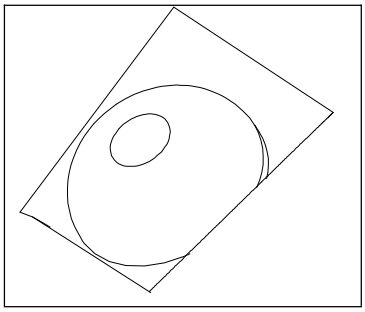
Function



No.	Name	Function
1	Handrail	The installation and operation platform of the control elements, and the placement platform of the driver's right arm.
2	Horn button	Trigger warning sound signal.
3	Travel direction switch	Select driving direction or zero position.
4	Lift thumb switch	Control the lifting and lowering of the host.
5	Tilt thumb switch	Control the front and back tilt of the host.
6	Side shift thumb switch	Control the left and right movement of the fork.
7	Attachments thumb switch	Control the work of the fourth attachments
8	Emergency stop button	Cut off the main power supply and stop all operation of the forklift.
9	Handrail front and rear adjustment button	Adjust the front/back position of the armrest.(travel:110mm)
10	Handrail adjusting handle	Adjust the tilt Angle of the handrail.(0-85°)。
11	Handrail up and down adjustment buttons	Adjust the upper/lower position of the handrail.(travel:100mm)

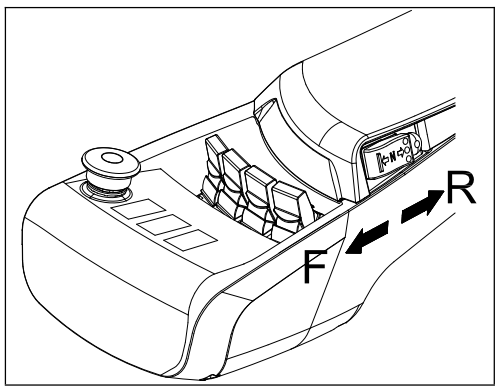
Control element

Horn button[2]



Press this button when an alert or warning sound signal is required.

Travel direction switch[3]



The driving direction of the forklift can be set as required.

The travel direction switch is used to switch the forward and backward directions of the forklift truck.

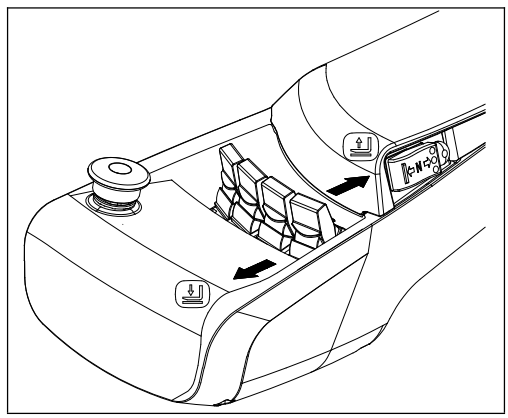
When the travel direction switch is pressed forward and the accelerator pedal is pressed, the forklift truck runs forward;

When the travel direction switch is pushed back, the forklift moves backward.

Caution

- When the forklift is in operation, the driving direction switch is pressed to the opposite direction, the electrical brake acts to slow down the forklift. After stopping, the forklift will slowly move in the other direction.
- When the travel direction switch is not in neutral, start the key switch, the instrument shows the fault, put the travel direction switch in neutral, and the instrument fault disappears.

Lift thumb switch [4]



Control fork rise and fall.

Press the thumb switch forward to lower the fork;

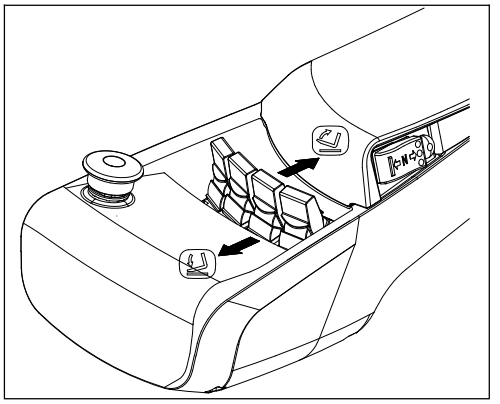
Flip the thumb switch backwards，Fork rise.

Release the thumb switch and the thumb switch will automatically return to zero position.

Lifting and descending speed is controlled by thumb switch tilt Angle, the greater the Angle,

the faster the speed.

Tilt thumb switch [5]



Control the front and back tilt of the host.

Press the thumb switch forward, the fork leans forward;

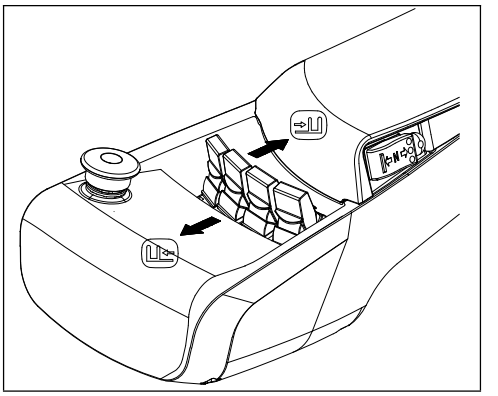
Flip the thumb switch backwards，the fork tilted to the rear.

Release the thumb switch and the thumb switch will automatically return to zero position.

Fork tilt forward or backward speed, depending on thumb switch tilt Angle.

> **Caution**
>
> ● The multiway valve itself has a forward-tilting self-locking valve. When the circuit is cut, even if the tilt handle is pushed forward, the host will not lean forward.

Side shift thumb switch **[6]**



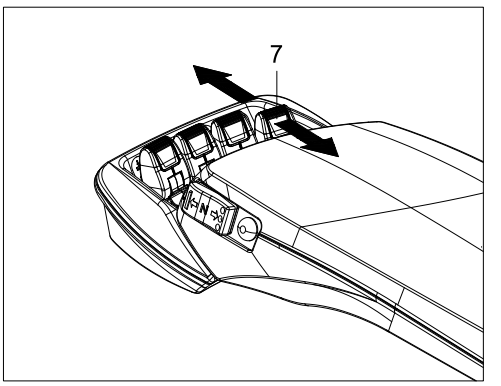
Control the left and right side movement of the fork.

Flip the thumb switch forward and move the fork to the left (as viewed from the driver's position).

Flip the thumb switch backwards and the fork moves to the right (as viewed from the driver's position).

Release the thumb switch and the thumb switch will automatically return to zero position.

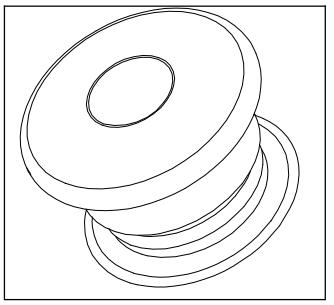
Attachments thumb switch [7]



Use when installing the fourth Attachments.Flip the thumb switch forward and backward, and

the function that can be achieved depends on the selected attachments.

Emergency stop button [8]



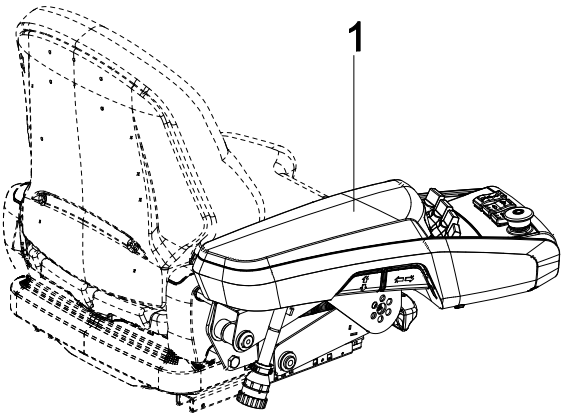
In case of emergency, press this button to cut off the main power supply of the vehicle.

Caution

- Do not use the emergency stop button as the key switch.

Adjusting handrail

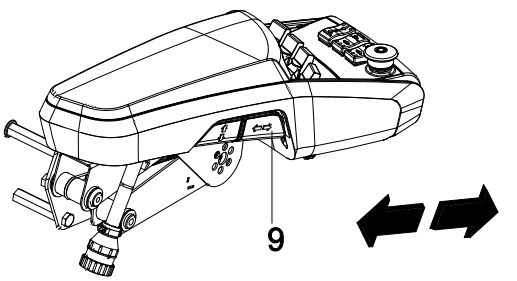
Armrests (1) are fixed on the right side of the driver's seat. When adjusting the position of the driver's seat, the armrest (1) moves forward and backward with the seat, so the position of the seat should be adjusted before adjusting the position of the armrest (1).



Adjust the front/back position of the armrest

Operation steps:

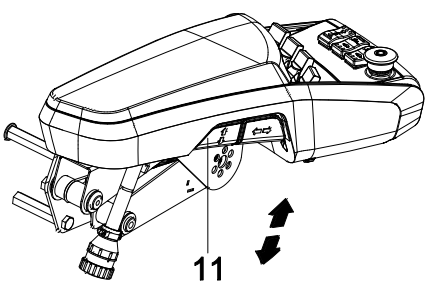
- Press the adjustment button (9) in front of the armrest to move the armrest forward. (View from the driver's position)
- Press the adjustment button (9) behind the armrest to move the armrest backward. (View from the driver's position)



Adjust the upper/lower position of the handrail

Operation steps:

- Press the adjustment button (11) above the armrest to move the armrest upward.
- Press the front and rear adjustment button (11) below the armrest to move the armrest downward.



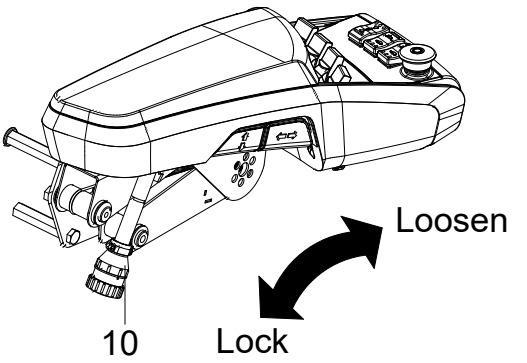
Angle the handrail

Operation steps:

– Turn the armrest adjusting handle (10) clockwise to release the lock.

– Adjust the tilt of the handrail.

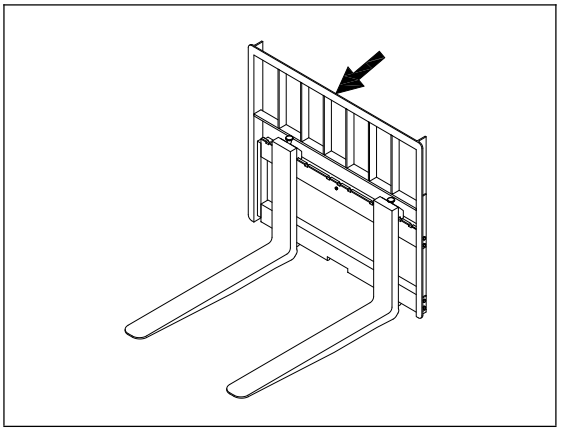
– Turn the armrest adjusting handle (10) counterclockwise to lock the armrest.



12.4 Body and others

Load backrest

The load backrest ensures the stable loading of cargo. The forklift truck must not be operated without a load backrest. Do not dismantle or modify the load backrest.



Switch lock

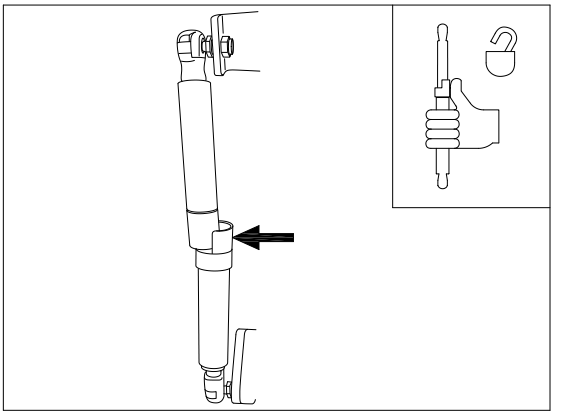
To connect or disconnect the electric circuit. Pull the key out of the lock switch to ensure that the truck cannot be started accidentally.

The key switch has two functional positions: on/off; first, set the shift lever to neutral, release the accelerator pedal, and then turn the key clockwise to the "**ON**" position.

Caution

- **The forklift truck will not start if the direction lever is not in neutral or the accelerator pedal is pressed down when the key switch is turned to the "ON" position.**
- **In this instance, there will be a fault code.**
- **The user should restore the direction lever to the neutral position and move their foot away from the accelerator pedal to start the truck. At this time, the fault code will disappear.**

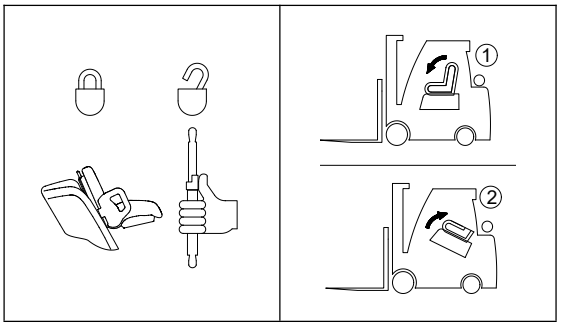
Gas strut



It is used to support the machine hood when it is opened. To close the machine hood, press the red button in the direction of the arrow shown, and press down firmly on the cover.

Hood

The hood with a large opening is convenient for service and maintenance. With the help of the inner gas spring, the user can fully open the machine hood with very little force.



Press the red button on the gas spring when

closing; then, release the lock catch; press down the head of the hood to close it; a click indicates that the hood has locked.

Caution

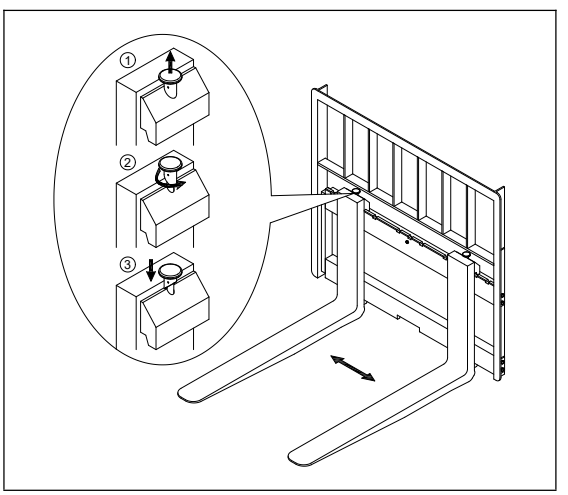
- **Take care to prevent your fingers from being trapped by the hood when closing.**

Warning

- **When performing maintenance under the hood, be sure to turn the key switch off to prevent an electrical shock. However, provided the hands, feet, head, and body do not touch the components, it is permissible to open the hood without turning off the key switch in order to diagnose the fault by listening for abnormal noises.**

Fork positioner

Used for adjusting the fork spacing. Pull out the fork positioner, rotate by 180°, and adjust the forks to the required position for the cargo to be unloaded.



Warning

- **The fork spacing adjustment should be based on the center line of the forklift truck and symmetrical on the left and right sides; the fork positioner should be tight after adjusting.**
- **There is an opening on the lower beam of the fork arm carrier for loading and unloading forks.**
- **Do not use the fork in the open position to prevent the fork from falling off from the open position. Regularly check the bolt in the middle of the fork arm, which prevents the fork from being used in the open position.**

Fork replacement

Disassemble the old forks: put the forks in the middle, lower the forks to the ground, tilt the mast forward, remove the forks from the fork arm, and back up the forklift.

Install new forks: place the forks on the ground against the forklift, lower the fork arm to the bottom, drive the forklift slowly, align the upper and lower slots of the forks with the upper and lower beams and gaps of the fork arm, lift the fork arm slowly, and adjust the position of the forks.

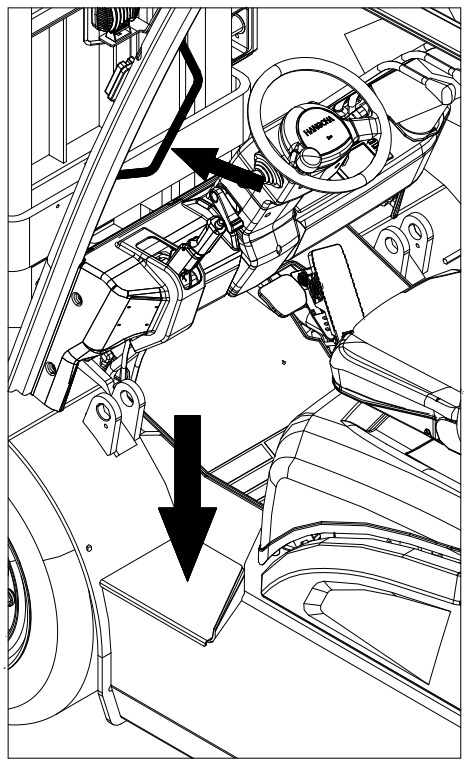
Overhead guard

The overhead guard protects the operator from falling objects. It must have sufficient impact

strength. The notch is used to lift the battery. The forklift truck must not be used without an overhead guard.

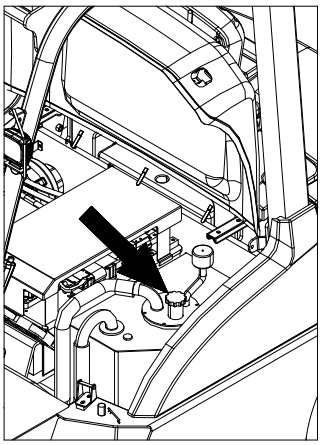
Step and handrail for getting on and off the forklift truck

The body is provided with a step for getting on and off the truck on both sides; an on/off handrail is provided on the left leg of the overhead guard. Face the forklift when getting on and off the vehicle. Please use the handrails for safety when getting on and off the forklift truck.



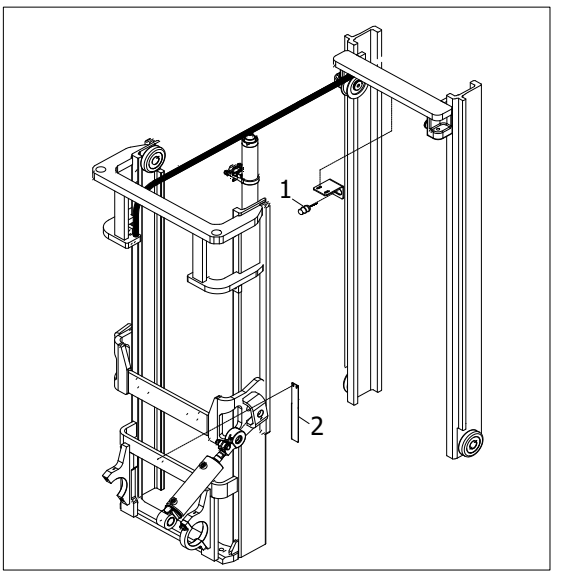
Hydraulic oil filling port lid

The hydraulic oil tank is located in the middle of the vehicle, and the hood must be opened first to supplement hydraulic oil.



Replenish with clean hydraulic oil through the oil filling port and screw down the lid after refilling.

Mast Top Buffer Device[Optional]



1.Proximity switch 2.Detection plate

This vehicle can be optionally equipped with a mast top buffer function. The main functional

components are the proximity switch and the detection plate. The proximity switch is installed on the upper crossbeam of the outer mast, while the detection plate is installed on the middle crossbeam of the inner mast. During the mast lifting process, when the proximity switch detects the detection plate, the mast lifting begins to decelerate.

The rate of deceleration during the buffering process can be adjusted through the dashboard or the handheld unit of the controller.

Headlight and front combination light

The two headlights and the front combination light (turn signal light and width light) are mounted on the front support of the overhead guard. Pay attention to protecting the lights; if there is any dust, they should be wiped clean; if there is any damage, they should be replaced.

Rear combination light

The rear combination lights include the turn signal light, width light, brake light and reversing light. Pay attention to protecting the lights; if there is any dust, they should be wiped clean; if there is any damage, they should be replaced.

Tail light [optional]

Tail lights are mounted on the top of the overhead guard at the rear. If there is any damage, replace them immediately.

Tail light switch [optional]

It is a push-pull switch. "×" means the switch is on.

Connection / Gear	Power supply	AHB
0	×	
Gear 1	×	×

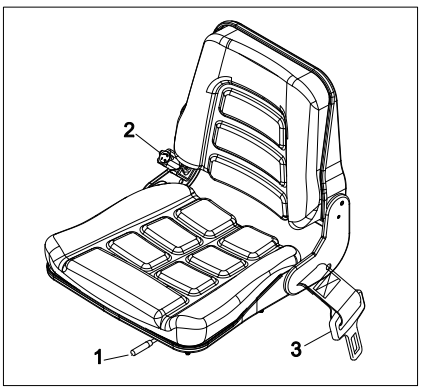
Caution

- **This light can be turned on or off independent of the key switch position, so remember to turn it off.**

Operator's seat

Adjust the driver's seat before starting the truck to ensure that the driver can reach all operating parts; adjust the rearview mirror to ensure that the driver can observe the rear operating environment.

Seat（standard）

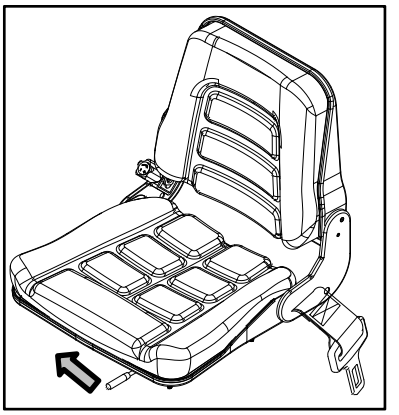


1.Forward and backward adjustment handle for the driver's seat 2.Backrest angle adjustment handle 3.Safety belt

Adjustment of the position of driver's seat

Operating steps:

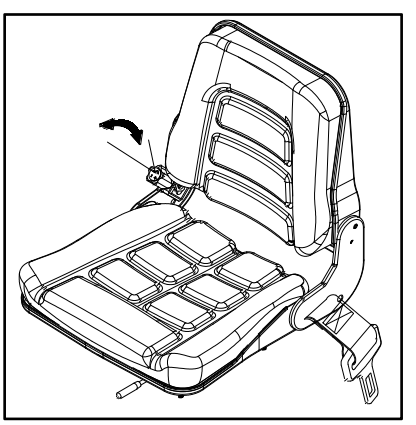
- The driver sits on the seat.
- Pull the driver's seat position adjustment lever in the direction of the arrow to adjust the driver's seat position.
- The driver slides the seat to the desired position.
- The driver releases the driver's seat position adjustment lever and ensures the position is locked.
- The position is adjusted.



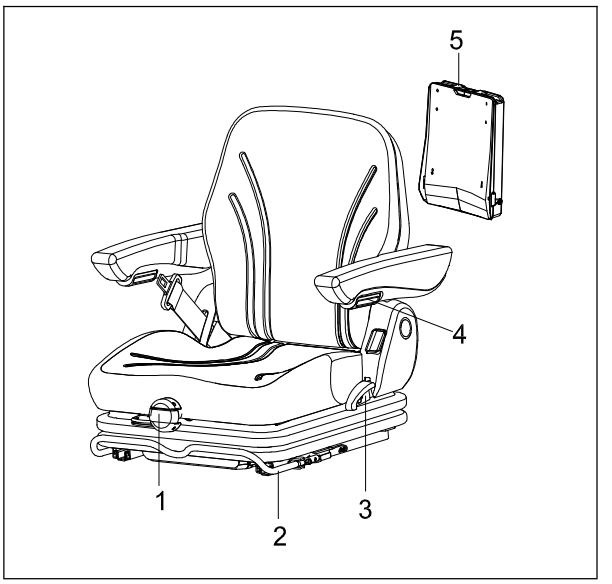
Adjustment of the driver's seat backrest

Operating steps:

- The driver sits on the seat.
- Turn the driver's seat back angle adjustment handle clockwise/counterclockwise with your right hand.
- Tilt back or forward with your body.
- Release the driver's seat back angle adjustment handle.
- The backrest is adjusted.



Seat (Optional)(MSG65 seat)



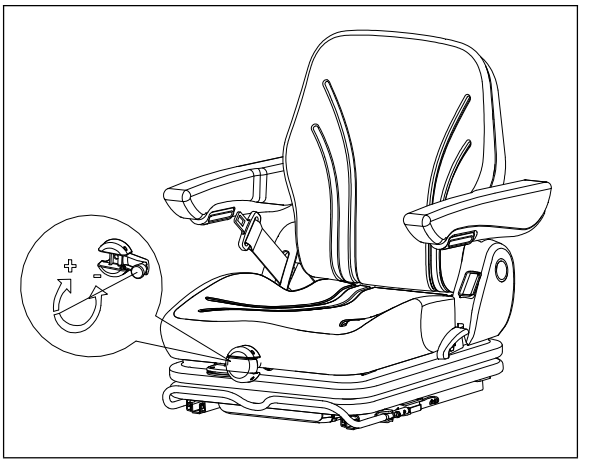
1.Adjust the weight adjustment handle 2.Seat front and rear adjustment handle 3.Backrest angle adjustment handle 4.Armrest adjustment knob

Seat weight adjustment

In order to obtain the ideal shock absorption effect, the seat must be adjusted according to the driver's weight.

Operating steps:

- Rotate the weight adjustment handle;
- Turn the handle clockwise (+) to increase the weight adjustment scale value, and turn the handle counterclockwise (-) to decrease the weight adjustment scale value;
- After reaching the weight scale for the individual count, release the adjustment handle.



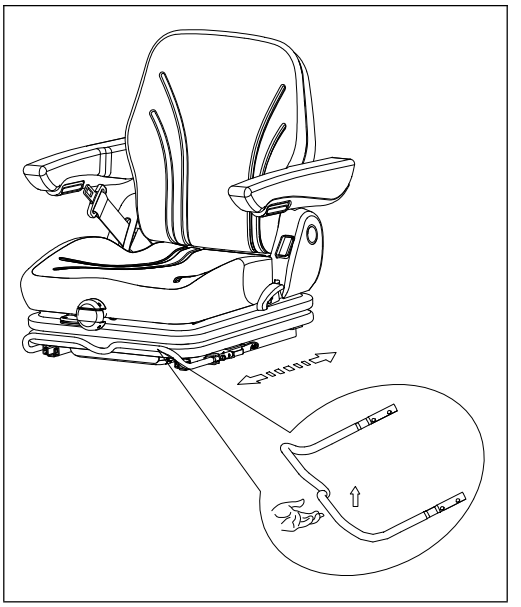
Caution

- **Driver seat’s positioning device lock lever must be locked in the position.**
- **Never adjust driver seat during driving.**

Seat front and rear adjustment

Operating steps:

- Pull up the slide adjustment handle;
- The forward and backward close-up shots are unfolded;
- After adjusting to a personally comfortable position, release the slide control handle to sort.



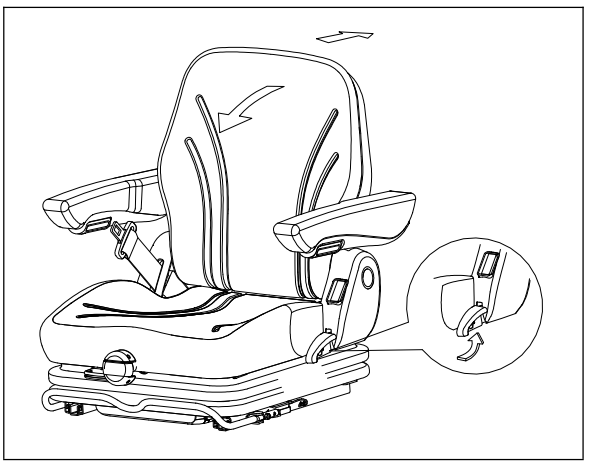
Warning

- **Driver seat's positioning device lock lever must be locked in the position.**
- **Never adjust driver seat during driving.**

Backrest angle adjustment

Operating steps:

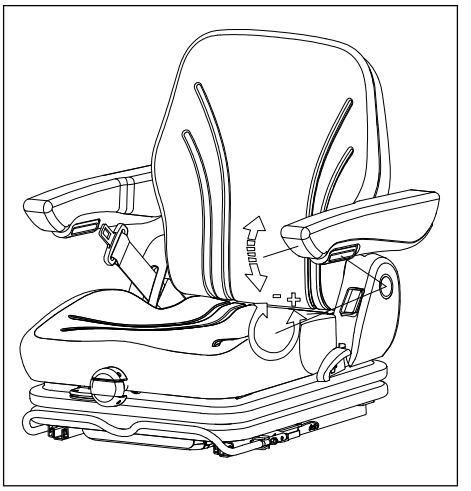
- Pull the backrest adjustment handle on the left side of the seat;
- After pulling the handle, lean forward or backward to adjust the angle of the backrest;
- After reaching a personally comfortable angle, release the backrest adjustment handle.



Armrest adjustment

Operating steps:

- Rotate the hand wheel at the bottom of the armrest to adjust the angle of the armrest; during the adjustment, the hand cannot be pressed on it, and the armrest should be slightly lifted up before adjustment.
- When the handwheel rotates to the outside (+), the front section of the armrest rises; when the handwheel rotates to the inside (-), the front section of the armrest lowers.



Warning

- Before adjusting the seat, the key switch must be turned off.
- When the forklift must be stopped, pull up the parking brake switch to adjust the position of the seat.
- It is not allowed to adjust the seat during driving to avoid accidents.
- For front and back adjustment and backrest angle adjustment, the handle should be pulled in place to ensure that the structure is completely separated before adjustment.
- After adjustment, the handles should be in place when returning. Before using the forklift, ensure that all parts are reliably locked.

Safety belt

Fasten the safety belt securely before driving the truck. The seat belt can protect the driver in the event of an accident. Clean and inspect the seat belt regularly to avoid build up of dirt.

Use the safety belt properly:

- The driver sits on the seat properly.
- Check the safety belt for any twisting or knots.
- Pull the safety belt to the hips.
- Fasten the safety belt and check the buckle.
- Adjust the safety belt to avoid extreme tension or looseness (which leads to a failure to hold the driver in place).

Check the safety belt regularly:

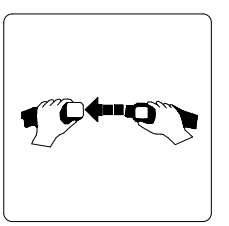
- Check the safety belt for any damage, breakage, or cracks.
- Check the metal attachments of the safety belt (including the tie-down point) for any wear or damage.
- Check the safety belt buckle and tensioning device.

Warning

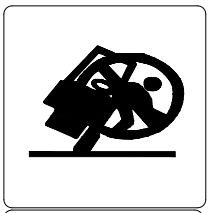
- **In any event, if the safety belt has any damage or defects (insecure, broken or slippery safety belt), please repair or replace it immediately.**
- **Do not modify or refit the seat belt. Replace the seat belt after an accident.**
- **The ignition key switch must be turned off before adjusting the driver's seat.**
- **The seat position can be adjusted only when the forklift truck has stopped.**

Measures to be taken in special circumstances:

– Fasten the seat belt and sit on the seat.



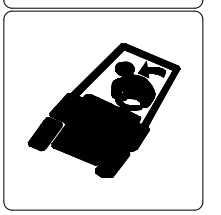
– Do not jump out of the forklift.



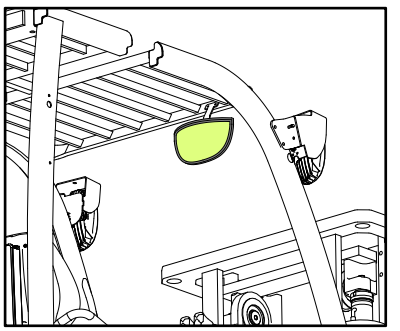
– Lean your body forward, grip the steering wheel with both hands and support your body with both feet.



– Tilt your body in the opposite direction of the rollover.



Rearview mirror



The rearview mirror can help the driver observe the driving environment at the rear of the forklift truck, and the wide-angle mirror increases the visual range.

Adjustment of the rearview mirror

Operating steps:

- The operator adjusts the driver's seat and sitting position.
- Manually adjust the up and down positions of the rearview mirror so that the distant horizon is centered in the horizontal direction of the mirror.
- Manually adjust the left and right positions of the rearview mirror so that the body or overhead guard is centered in the vertical direction of the mirror.
- The rearview mirror is adjusted.

12.5 OPS system(OPT)

The OPS (Operator Presence Sensing) system is a safety protection system that senses whether the driver is sitting in the seat correctly with a sensor mounted in the driver's seat. If the driver is not sitting in the driver's seat correctly, the driving force will be cut off and all handling operations will be stopped. It is used to prevent accidents when the driver leaves the seat. If the driver is not sitting in the driver's seat correctly, he/she will not be able to conduct driving or handling operations, to reduce the risk of accidents.

Driving protection function

While driving the truck, if the driver leaves the seat or releases the safety belt for more than 1s (on the premise that it is mounted with a safety belt protection switch), the truck will automatically stop, the seat switch indicator light "" will turn on and the buzzer will sound a continuous alarm. Only when the hand brake is engaged or the driver is sitting on the seat correctly, and the direction lever returns to the neutral position, will the seat switch indicator light "" turn off and the OPS driving state be released.

Working protection function

When the truck is working, if the driver leaves the seat or releases the safety belt for more than 1s (on the premise that it is mounted with a safety belt protection switch), the truck will automatically stop working, the seat switch indicator light "" will turn on and the buzzer will sound a continuous alarm. The OPS indicator light will automatically turn on, the buzzer will sound an alarm and the handling operations will automatically stop. Only when the driver is sitting on the seat correctly, and the seat switch indicator light "" turns off, will the OPS working state be released.

Alarm function

Once the seat sensor detects that the seat switch is off, within about 1s, the buzzer will sound a continuous alarm and the seat switch indicator light "" will turn on. If the seat switch indicator light

“” is on when the seat switch is off, it indicates that the OPS is in the “ON” state.。

Neutral reset function

If the direction lever has not been restored to the neutral position and the seat switch is on, the buzzer will sound a continuous alarm to remind the driver that the OPS driving function is activated.

OPS function exception handling

In the event of the following conditions, the forklift truck should be stopped in a safe place and Hangcha agency should be contacted for inspection. a. After the driver leaves the seat, the seat switch indicator light “” does not turn on; b. After the driver sits back in the seat, the seat switch indicator light “” does not turn off.

Caution

- **For forklift trucks with seats provided with a safety belt protection switch, after the driver first sits back on the driver's seat properly and fastens his/her safety belt, normal operation can be conducted. If the OPS system is started by accident when driving uphill, it will disconnect the driving power, making the forklift truck roll backwards. In order to avoid accidents, the driver must sit on the driver's seat properly when driving uphill.**

Fork lock function after power failure

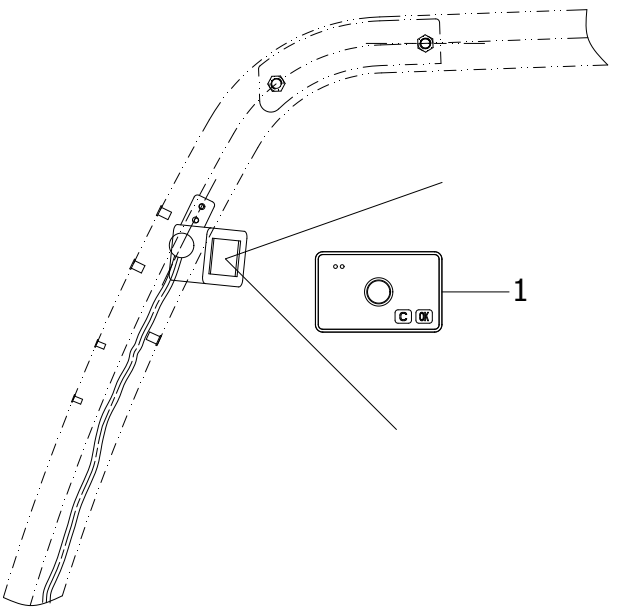
In the event of turning off the start switch or power failure, the forks are locked and cannot be lowered even if the lowering lever is used.

12.6 TSG81 fingerprint lock (optional)

Some types of forklift trucks have fingerprint locks instead of the previous slot cards. There are two kinds of fingerprint locks, i.e. EPS310 and FKS. Check the truck for the specific fingerprint lock model.

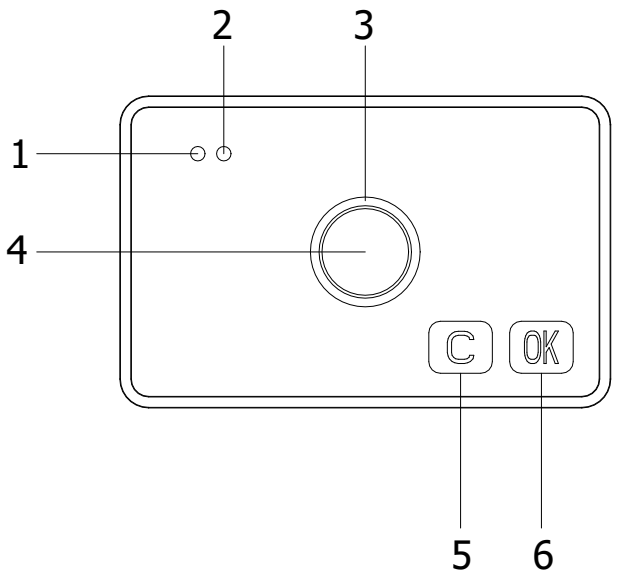
12.6.1 EPS310 fingerprint lock

EPS310 fingerprint lock is installed onto the right front leg of the overhead guard.



Installation position of the fingerprint lock

1-Fingerprint lock



Fingerprint lock

1 - Green indicator light	2 - Red indicator light	3 - Circular indicator light	4 - Fingerprint identification
5 - “C” key	6 - “OK” key		

12.6.1.1 Factory setting status of the fingerprint lock

When the user receives a new forklift truck, the fingerprint lock is in the factory setting status. Turn on the switch key to power on the forklift truck, the green indicator light will flash, the red indicator light will go out, the circular indicator light will flash in blue and green, and then the buzzer will sound (for 1s).

Indicator light	Status
Green indicator light	Flash
Red indicator light	Off
Circular indicator light	Flash in blue and green

Caution

- **Make sure the emergency power-off switch is pulled upward before powering on the forklift truck equipped with an emergency power-off switch.**

At this time, put your finger onto the fingerprint identification area for unlocking, then the green indicator light will turn on, the red indicator light will turn on, the circular indicator light will flash in

blue and green, the buzzer will sound (for 3s), then turn the key to its limit position to start the forklift truck.

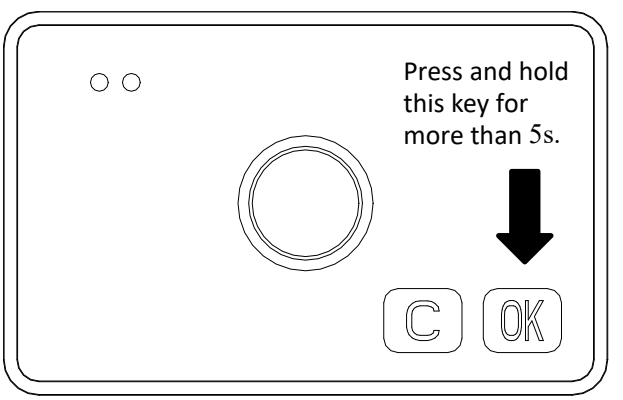
Indicator light	Status
Green indicator light	On
Red indicator light	On
Circular indicator light	Flash in blue and green

Caution

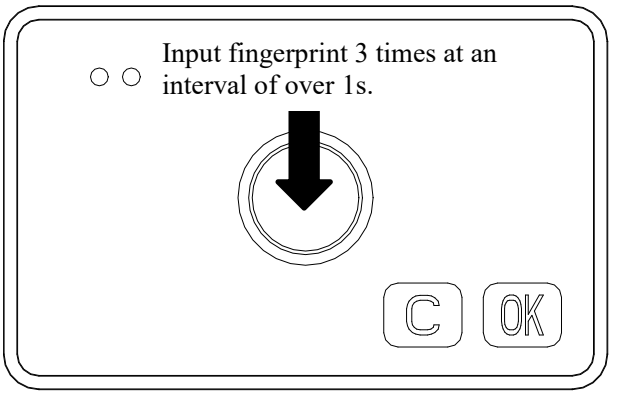
- **For the sake of security, the administrator should input his/her fingerprint as soon as possible.**

12.6.1.2 Administrator's fingerprint inputting

1)Put one of your fingers on the identification area to unlock the truck, press and hold the "OK" key for more than 5s, the buzzer will sound 3 times (1s each time), the red and green indicator lights will go out, the circular indicator light will flash in blue and green.



2)Put one of your fingers (the same finger) onto the fingerprint identification area to input your fingerprint 3 times (inputting interval: more than 1s), after the third inputting,the buzzer will sound for 1s, the green and red indicator lights will turn on and the circular indicator light will turn blue, indicating that the administrator's fingerprint has been input successfully.。

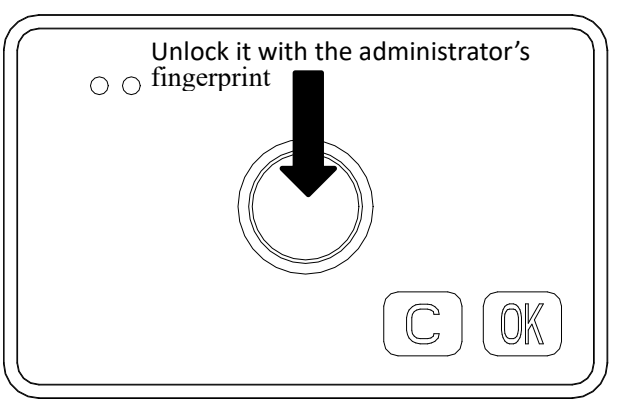


Caution

- **For the EPS fingerprint lock, only 1 administrator’s fingerprint can be inputted.**
- **If the administrator fails to input the fingerprint within 5s after he/she has entered the fingerprint inputting program after pressing the “OK” key, the fingerprint lock will be in an error status indicating input time limit reached, and the red indicator light and green indicator light will flash, the buzzer will sound for 3s, then the fingerprint lock will return to the previous “To be unlocked” status, at this time, the administrator can input his/her fingerprint again.**

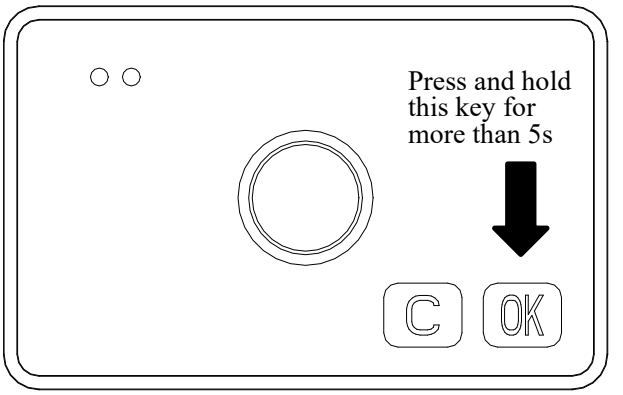
12.6.1.3 Operator’s fingerprint inputting

1)Power on the fingerprint lock when the administrator’s fingerprint has been inputted, then unlock it with the administrator’s fingerprint, the green and red indicator lights will turn on, the circular indicator light will turn blue, and the buzzer will sound for 3s.

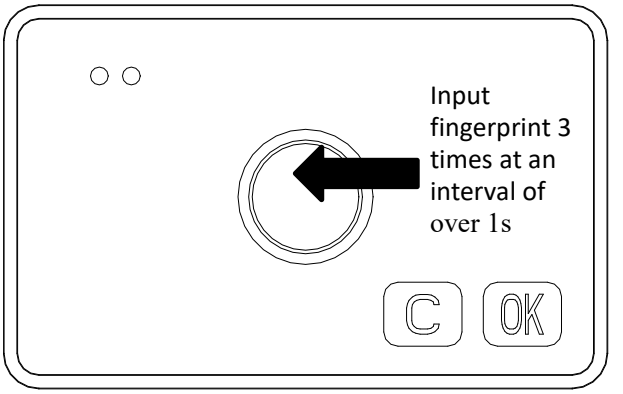


2)In the unlocked status, press the “OK” key for more than 5s to enter the operator’s fingerprint inputting program, and at this time, the green and red indicator lights will go out, the circular indicator

light will flash in blue and green, and the buzzer will sound 3 times.



3)Put one of your fingers (the same finger) onto the fingerprint identification area to input your fingerprint 3 times (inputting interval: more than 1s), after the third inputting, the buzzer will sound for 1s, the green and red indicator lights will turn on and the circular indicator light will turn blue, indicating that the operator's fingerprint has been input successfully.



Caution

- **For our fingerprint lock, 50 operators' fingerprints can be inputted.**
- **Make sure the administrator's fingerprint has been inputted before inputting any operators' fingerprints.**
- **If the operator fails to input the fingerprint, the fingerprint lock will be in an error status, and the red indicator light and green indicator light will flash, the circular indicator light will turn red, and the buzzer will sound for 3s, then the fingerprint lock will return to the previous "To be**

unlocked” status, at this time, the operator can input his/her fingerprint again after unlocking it with the administrator’s fingerprint.

- **If the administrator fails to input the fingerprint within 5s after he/she has entered the fingerprint inputting program after pressing the “OK” key, the fingerprint lock will be in an error status indicating input time limit reached, the red indicator light and green indicator light will flash, the buzzer will sound for 3s, then the fingerprint lock will return to the previous “To be unlocked” status, at this time, the administrator can input his/her fingerprint again.**

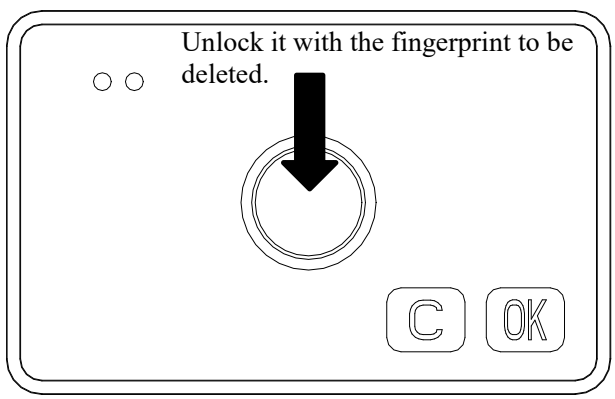
12.6.1.4 Fingerprint lock unlocking

Power on the fingerprint lock, put your finger (administrator/operator) onto the fingerprint identification area for unlocking, then the green and red indicator lights will turn on, the circular indicator light will flash in blue and green, the buzzer will sound (for 3s) indicating that the fingerprint lock is unlocked successfully; and then turn the key to its limit position to start the forklift truck.

Indicator light	Status
Green indicator light	On
Red indicator light	On
Circular indicator light	Flash in blue and green

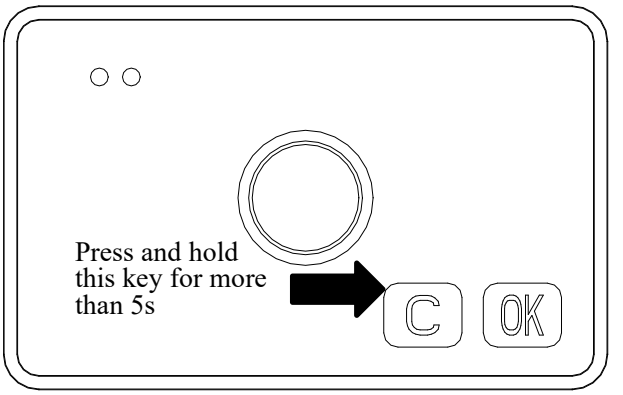
12.6.1.5 Operator’s fingerprint deleting

1)Power on the fingerprint lock where the fingerprints have been inputted, and then unlock it with the fingerprint to be deleted. At this time, the green and red indicator lights will turn on, the circular indicator light will turn blue, and the buzzer will sound for 3s.

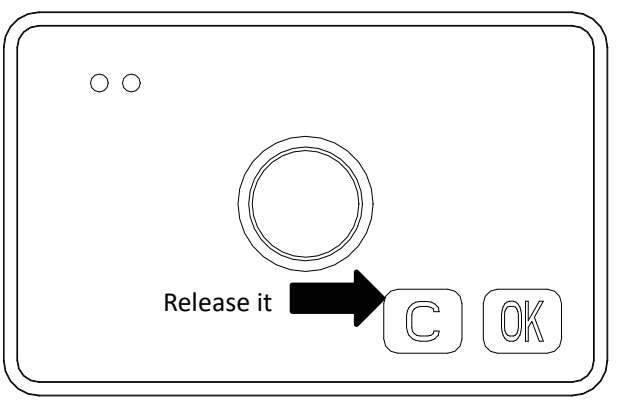


2)Press and hold the “C” key for more than 5s, the green indicator light will turn on for 3s and off

for 1s, the red indicator light will turn on, and the circular indicator light will turn blue.



3)Release the “C” key, the green and red indicator lights will go out and the circular indicator light will turn green and then go out. After 2s, the fingerprint lock returns to the “To be unlocked” status, i.e. the green indicator light will flash, the red indicator light will go out, the circular indicator light will flash blue and green, and the buzzer will sound for 1s indicating that the operator’s fingerprint has been deleted successfully.



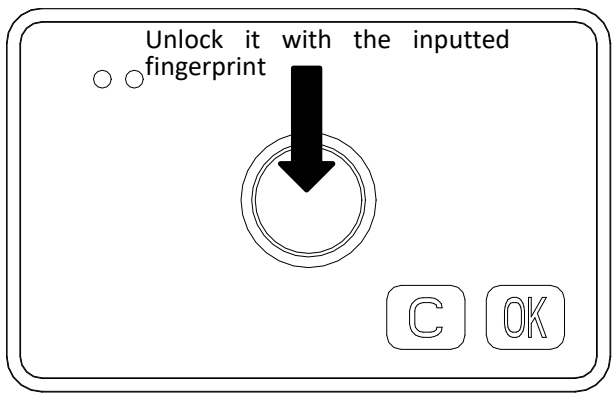
Caution

- **If the red indicator light and green indicator light flash alternately and the circular indicator light flashes in blue and green after the key is released, it indicates that the deletion failed. The fingerprint lock will return to the “To be unlocked” status, i.e. the green indicator light will flash, the red indicator light will go out, the circular indicator light will flash in blue and green, and then the buzzer will sound for 1s. At this time, the user can delete the fingerprint again with the**

fingerprint to be deleted.

12.6.1.6 Initialization

1)Power on the fingerprint lock and then unlock it with the fingerprint which has been inputted already (any fingerprints are OK if no fingerprints have been inputted). At this time, the green and red indicator lights will turn on, the circular indicator light will turn blue, and the buzzer will sound for 3s.



2)Press and hold the “C” key and “OK” key at the same time for more than 5s, the green and red indicator lights will go out and the circular indicator light will turn red. Release the keys, the green and red indicator lights will go out and the circular indicator light will turn green and then go out.

3)After a few moments, the fingerprint lock returns to the “To be unlocked” status, i.e. the green indicator light will flash, the red indicator light will go out, the circular indicator light will flash blue and green, and the buzzer will sound for 1s indicating that the initialization was successful.

Caution

- **Note that all inputted fingerprints will be deleted after the initialization, thus extra care and caution should be taken for the initialization.**

12.6.2 FKS Fingerprint lock

The FKS fingerprint lock is installed onto the right cover of the dashboard stand.



Fingerprint lock

12.6.2.1 Factory setting status of the fingerprint lock

When the user receives a new forklift truck, the fingerprint lock is in the factory setting status. Turn on the switch key to power on the forklift truck and the fingerprint lock can be unlocked with any fingerprints.

Caution

- **Make sure the emergency power-off switch is pulled upward before powering on the forklift truck equipped with an emergency power-off switch.**
- **For the sake of security, the administrator should input his/her fingerprint as soon as possible.**

12.6.2.2 Administrator's fingerprint inputting

1）Press and hold the fingerprint identification area (for 5s) with any finger, and then release your finger after the circular indicator light turns yellow; at this time, the circular indicator light is yellow and flashing slowly, indicating that it has entered the administrator's fingerprint inputting program.

2）Put your finger on the fingerprint identification area and the circular indicator light turns blue, then release your finger and the circular indicator light turns yellow and flashes, repeat the above steps 4-6 times until the circular indicator light turns green (for 1s), indicating that the fingerprint has been inputted successfully; if the circular indicator light turns red, it indicates that the fingerprint inputting failed.

3）After the circular indicator light turns green (inputting successful) or red (inputting failed), the circular indicator light will be yellow and flash slowly, and at this time, other administrators can input their fingerprints; if you want to terminate the inputting program, you just need to stop operation for 10s and the fingerprint lock will automatically exit the inputting program.

The inputted fingerprints cannot be inputted again, otherwise the circular indicator light will turn red and the fingerprint lock will automatically exit the inputting program. In the fingerprint inputting process, press the same finger onto the fingerprint identification area several times with different parts of the finger, so that the fingerprint identification rate is improved. If the circular indicator light flashes red in the inputting process, it indicates that the user has repeatedly put the same part of the finger part on the identification area, rather than different finger parts.



Caution

- **For the FKS fingerprint lock, 10 administrators' fingerprints can be inputted at most.**
- **The user can decide whether to input more than one administrators' fingerprints for the first time based on the specific circumstances.**
- **The inputted fingerprints cannot be inputted again, otherwise the circular indicator light will turn red and the fingerprint lock will automatically exit the inputting program.**
- **In the fingerprint inputting process, press the same finger onto the fingerprint identification area several times with different parts of the finger, so that the fingerprint identification rate is improved. If the circular indicator light flashes red in the inputting process, it indicates that the user has repeatedly put the same part of the finger part on the identification area, rather than different finger parts.**

12.6.2.3 Operator's fingerprint inputting

1）Press and hold the fingerprint identification area (for about 10s) with the administrator's finger, the circular indicator light will turn yellow and then pink; then release the finger after the circular indicator light turns pink; at this time, the circular indicator light is pink and flashing, indicating that it has entered the operator's fingerprint inputting program.

2）The operator's fingerprint inputting program is the same as the administrator's fingerprint inputting program.

12.6.2.4 Fingerprint lock unlocking

After inputting the administrator's/operator's fingerprint, the user puts their finger on the fingerprint identification area, and if the circular indicator light turns blue, it indicates that it is unlocked successfully, and the user can start the truck. If the circular indicator light turns red, it indicates that it is not unlocked and the user should put his/her finger on the fingerprint identification area to unlock it.

12.6.2.5 Fingerprint deleting

1）Press and hold the fingerprint identification area (for about 15s) with the administrator's finger, the circular indicator light turns yellow, pink and yellow in sequence and then flashes; release the finger when the circular indicator light turns yellow for the second time and flashes; and at this time, the circular indicator light is yellow (but not flashing), it indicates that it has entered the fingerprint deleting program.

2）Press any finger on the fingerprint identification area and the circular indicator light turns green (for about 1s), and at this time, it indicates that all inputted fingerprints have been deleted, the fingerprint lock returns to the factory setting status, and the user can unlock the fingerprint lock with any fingerprint.

12.6.2.6 Operator's fingerprint deleting

1）Press and hold the fingerprint identification area (for about 20s) with the administrator's finger, the circular indicator light turns yellow, pink and yellow in sequence and then flashes; release

the finger when the circular indicator light turns yellow for the second time and flashes; and at this time, the circular indicator light is pink (but not flashing), it indicates that it has entered the operator's fingerprint deleting program.

2）Press any finger on the fingerprint identification area and the circular indicator light turns green (for about 1s), indicating that all inputted operators' fingerprints have been deleted, but the administrator's fingerprint is still valid; and before inputting any new fingerprints, the fingerprint lock can be only unlocked with the administrator's fingerprint.

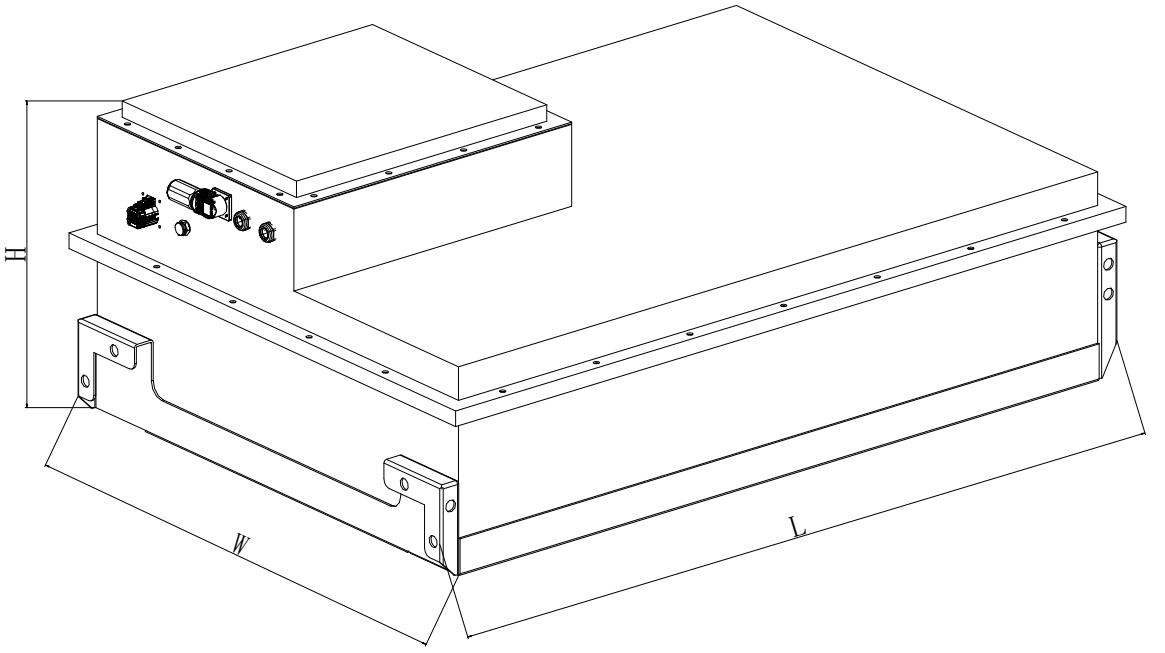
12.6.2.7 Designated operator's fingerprint deleting

1）Press and hold the fingerprint identification area (for about 25s) with the administrator's finger, the circular indicator light turns yellow, pink and yellow in sequence and then flashes, then turns pink and flashes, then turns white and flashes; release the finger when the circular indicator light turns white and flashes; and at this time, the circular indicator light is white (but not flashing), indicating that it has entered the designated operator's fingerprint deleting program.

Press the finger with the fingerprint to be deleted on the fingerprint identification area, and if the circular indicator light turns green, it indicates that this fingerprint has been deleted successfully, but if it turns red, it indicates that this fingerprint has not been inputted in the system before. At this time, the user can continue to delete other operators' fingerprints and if the user stops operation for about 10s, the fingerprint lock will automatically exit the deleting program.

13 Lithium-ion Battery

13.1 Size/Weight



Truck model		CPD15-XEY2-SI CPD18-XEY2-SI CPD20-XEXY2-SI	CPD20-XEY2-SI CPD25-XEY2-SI CPD27-XEY2HA-SI	CPD38-XEY2-SI CPD35-XEY2-SI CPD30-XEY2-SI	CPD38-XEY2H1-SI CPD38-XEY2H2-SI CPD35-XEY2H1-SI CPD35-XEY2H2-SI CPD30-XEY2H1-SI CPD30-XEY2H2-SI CPD40-XEXY2-SI
		STD			
Length (L)	mm	1014	1084	1084	1084
Width (W)	mm	520	620	761	761
Height (H)	mm	281	415	415	415
Rated capacity	Ah	-20240805 160 20240805- 150	230	230	460
Rated voltage	V	77.28	76.8	76.8	76.8
Allowable min. weight	Kg	150	180	200	310

Truck model		CPD20-XEY2H-SI CPD20-XEY2H2-SI CPD25-XEY2H-SI CPD25-XEY2H2-SI	CPD38-XEY2H-SI CPD35-XEY2H-SI CPD30-XEY2H-SI	CPD40-XEY2-SI CPD45-XEY2-SI CPD50-XEY2-SI CPD50-XEXY2-SI	CPD40-XEY2-SIGW CPD45-XEY2-SIGW CPD50-XEY2-SIGW CPD50-XEXY2-SIGW
Length (L)	mm	1084	1084	1170	1170
Width (W)	mm	620	761	820	820
Height (H)	mm	415	415	533.5	533.5
Rated capacity	Ah	304	304	460	460
Rated voltage	V	76.8	76.8	76.8	76.8
Allowable min. weight	Kg	225	240	350	350

Truck model		CPD15-XEY2HA-SI CPD18-XEY2HA-SI CPD20-XEXY2HA-SI	CPD20-XEY2HA-SI CPD25-XEY2HA-SI	CPD38-XEY2HA-SI CPD35-XEY2HA-SI CPD30-XEY2HA-SI
Length (L)	mm	1014	1084	1084
Width (W)	mm	520	620	761
Height (H)	mm	281	415	415
Rated capacity	Ah	150	230	230
Rated voltage	V	77.28	76.8	76.8
Allowable min. weight	Kg	150±5%	180	200

13.2 Instructions for safety

1.Do not touch the positive and negative terminals of the battery case with your hands at the same time at any time to prevent an electric shock.



2.Maintenance personnel must have a electrician license issued by the State Administration of Work Safety and should not conduct maintenance without maintenance authorization.



3.Wear insulated gloves when operating and maintaining the battery system, metal jewelry such as watches are strictly prohibited.



4.When cleaning the truck, do not directly flush the battery system to prevent malfunctions caused by water ingress.



13.3 Instructions for installation

1.Installation personnel should have a relevant license for installation, be provided with labor protection, and pay attention to safety. Before installing the battery system, make sure that the low-voltage plug-in of the battery system is disconnected from the truck. When connecting the high-voltage system, pay attention to safety protection to prevent an electric shock during installation. During the installation of the battery system, the battery should be mechanically lifted and slowly installed into the battery compartment of the truck, do not crush or damage the battery case and external cables. During the installation of the battery system, avoid high-voltage reverse connection or short circuits, etc. To remove the battery system from the vehicle, make sure that the key for the whole vehicle is turned off and the high-voltage cable and low-voltage plug-in are disconnected from the vehicle.

2.Post-installation inspection: after the battery system is installed, check the battery system stop pins and fixing bolts to confirm that they meet the battery system installation requirements. Check that the high-voltage cable and low-voltage plug-in are connected correctly and securely. Turn the key switch to the “ON” position, the relay should engage normally with no battery alarm. If there is a battery fault alarm, cut off the power immediately and notify our after-sales service center for a solution.

13.4 Common terms for lithium-ion power batteries

1.Battery system

The battery system is an energy storage device that typically includes one or more battery modules, battery management systems, thermal management systems, high/low voltage wires, connectors, and structural components.

2.SOC

The "State Of Charge" (SOC) of a battery is a measurement of how much energy is remaining (percent).

3.Rated voltage

It is an approximate value used to indicate the battery voltage.

4.Rated capacity

Under the specified conditions, the electric capacity provided by the fully charged battery, which is indicated by the manufacturer.

5.Over-discharge

The state when the battery voltage is below the discharge cutoff voltage, and it usually refers to the discharge state after the battery is fully discharged.

6.Overcharge

It can be usually regarded as the overcharge state when the battery voltage is higher than the maximum charging voltage.

7.Explosion

The battery case is broken and solid material is forced out of the battery with an explosive sound.

8.Fire

Open fire comes out of the battery case.

9.Leakage

The internal composition of the battery (electrolyte or other substances) leaks out of the battery.

10.CAN communication

Control Area Network.

13.5 Instructions for use

1.Battery working temperature: -28℃ to 55℃; allowable charging temperature: 0℃ to 55℃; allowable discharging temperature: -28 ℃ to 55℃; storage temperature: -28℃ to 55℃.

2.Check before use and make sure there is no battery system alarm message on the dashboard after the key switch is turned off. Please check the remaining battery capacity before use. It is recommended to use the truck when the battery SOC is within the range of 50% - 100%. It is recommended not to use the truck when the battery SOC is below 30%. Please charge the battery as soon as possible**.**

3.Charge the battery promptly when the battery SOC is below 20%. Please use the special charging device designated by the manufacturer. In the event of a fault alarm during charging, both the battery system and charger will stop charging and the fault information will be displayed on the charger. The charging place should be dry and ventilated, with no flammable and explosive materials. The battery system should be fully charged once a week.

4.Before long-term storage, confirm that the battery level is not less than 50% of the rated capacity. Charge the battery every three months for maintenance, i.e. fully charge the battery. When the battery has been stored for more than three months, before using, please confirm whether there is a fault alarm in the power battery system. If so, please contact our after-sales service center for maintenance. Keep the storage place dry and well-ventilated and away from heat sources.

Caution

- **When the ambient temperature is low, the charging time of the battery system will be extended, which is a normal phenomenon. The battery management system will automatically adjust the charging time with the temperature change to ensure the best performance of the battery system.**

13.6 Daily maintenance

1.Battery case maintenance: Check the outer case of the battery system for foreign objects, obvious deformation, rust and corrosion and other abnormalities.

2.Charging port maintenance: In the power-off state, check whether there is any damage, foreign objects, rust and corrosion and other abnormalities in the charging port.

3.Plug-in maintenance: In the power-off state, check for looseness, damage and other abnormalities in the plug-in components.

4.State detection: Observe the battery system voltage, temperature and other state information on the charger display while charging to ensure that all state information is in the normal range.

13.7 Emergency plan

1.Severe abnormalities: During use, users should be familiar with safety precautions and should not carry out inappropriate operations to avoid improper use of the battery (e.g. overcharge, over-discharge, short circuit, extrusion, puncture, overheating and high current discharge, etc.). In the charging and use process, the power battery system may develop abnormalities: the temperature of battery system or parts rises sharply; or abnormal smell or smoke from the battery system.

Emergency plan:

1.All personnel at the site should quickly leave the forklift truck and call the fire station.

2.Carry out the following operations, if possible, provided that personal safety can be guaranteed:

a.If there is any smoke or burning in the external wiring harness, use a carbon dioxide or dry powder fire extinguisher for fire-fighting.

b.If there is any smoke from the battery, use a high-pressure water gun for fire-fighting at a distance.

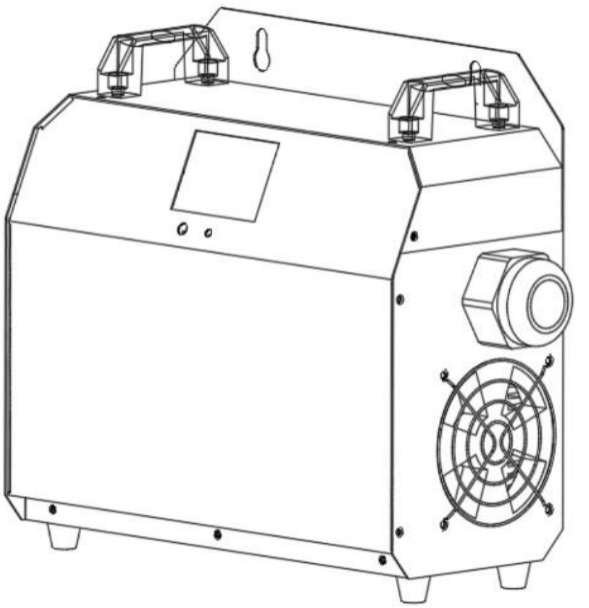
c.If the user inadvertently inhales smoke, please leave the area and seek medical attention as soon as possible.

3.Contact the truck dealer for professional advice.

13.8 Charging the lithium-ion battery

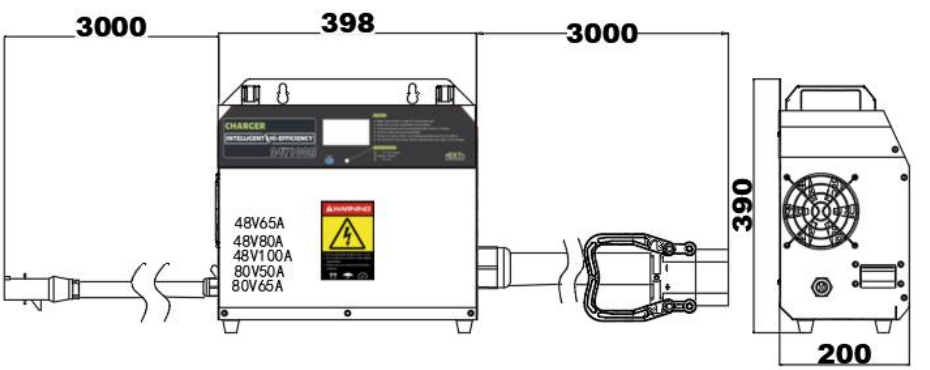
13.8.1 YLCHD-80V65A-00 charger

13.8.1.1 Appearance and structure



The product dimensions and weight are shown in the table below

Model	Weight (kg)	L×W×H (mm)	Cooling method	Installation position
48V100A	17	525×455×260	Forced air cooling	Indoor
80V65A	17	525×455×260	Forced air cooling	Indoor



13.8.1.2 Electrical parameters

Model	48 V 100 A	80 V 65 A
Rated input voltage	AC380 V ± 15% Three-phase four-wire voltage	AC380 V ± 15% Three-phase four-wire voltage
Input grid frequency	50/60 Hz	50/60 Hz
Power factor	≥ 0.99	≥ 0.99
Input power	≤ 5.2 KW	≤ 5.2 KW
Efficiency	≥ 0.92	≥ 0.92
Rated output voltage	48 V	80V
Rated output current	100 A	65A
Rated output power	4.8 KW	4.8 KW
DC output range	18VDC-65VDC	18VDC-65VDC
Output connector	GB125 A or Rema160 A Male or female connector available	GB125 A or Rema160 A Male or female connector available
Cooling method	Forced air cooling	Forced air cooling
Working temperature	-20° C - 50° C	-20° C - 50° C
Working humidity	0% - 95%	0% - 95%
IP class	IP20	IP20
Noise	65dB	65dB
Altitude	< 2000 m	< 2000 m

13.8.1.3 Charger wiring installation and minimum AC input power requirements

Model	Input circuit sectional area (mm)	Air-break switch model
48 V 100 A	3 × 2.5 mm2 + 1 × 2.5 mm2 3P + PE	32A - 3P
80 V 65 A	3 × 2.5 mm2 + 1 × 2.5 mm2 3P + PE	32A - 3P

13.8.1.4 Charging steps:

The charger's input and output power should be connected by qualified professionals. Connect after unplugging the input socket or disconnecting the circuit breaker.

1)Move the truck near the charger. Make sure the plug and hands are dry before operating.

2)Inspect the charger before charging to ensure correct wiring and no faults or abnormalities.

3)Confirm the battery voltage and capacity match the charger. (Refer to charger specs and battery specs).

4)Before charging, connect the charger output plug to the truck battery socket, and then connect the charger input plug to the power socket.

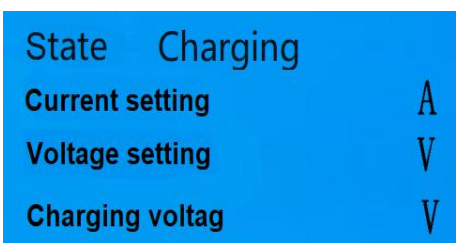
5)If there are no faults, the charger will receive the charging command (including charging voltage, charging current, start-up instructions, etc.) from the truck battery BMS and automatically start charging the battery, and the indicator light will blink.

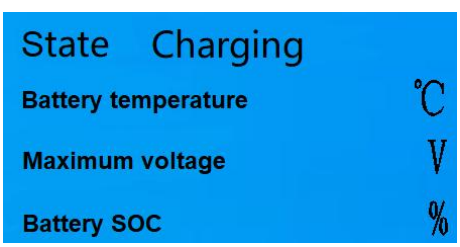
6)If an error occurs during charging, press "Pause" to stop charging until the fault is resolved.

7)After the battery is fully charged, the charger will automatically stop charging and the indicator light will be on.

8)If the truck needs to be used before charging is complete, press "Pause" to stop charging and then disconnect the plugs.

9)During charging, the indicator light blinks. The display sequentially shows the following 4 screens:





Current settings:Current set value sent by battery BMS to charger.

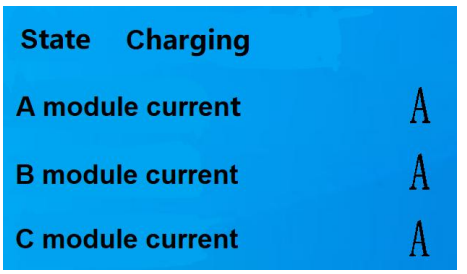
Voltage settings: Voltage set value sent by battery BMS to charger.

Voltage during charging: Battery current voltage value.

Battery temperature:Battery temperature during charging.

Max. voltage:Highest single cell voltage in battery pack.

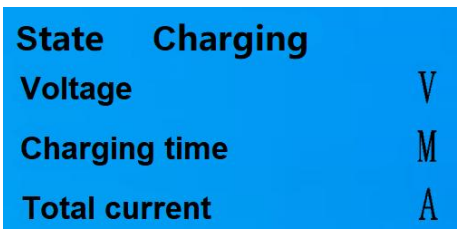
Battery SOC: Battery's current SOC value.



Module A current: Charger module A output current value.

Module B current: Charger module B output current value.

Module C current: Charger module C output current value



Voltage: Battery current voltage value

Charging time: Accumulated charging time

Total current: Charger max output current value when operating

10)After charging is complete the indicator light stays on and the screen displays charging completed. Disconnect the charger's AC circuit breaker, unplug the AC input connector, and then unplug the battery connector.

Caution: Improper operation can damage the battery or charger, or lead to other risks.

13.8.1.5 Regular inspection instructions

- Check for damage on the input and output cables (inspect before charging or use);
- Check for damage on the charger output plug (inspect before charging or use);
- Promptly replace the relevant parts if damage is found. (Inspect before charging or use);
- Clean dust and other foreign objects from the charger air inlet and outlet. (Inspect monthly);
- Confirm the charger input circuit breaker is working normally. Contact the store or manufacturer promptly if any faults are found;
- Disconnect input power before finding out the cause of a fault, and unplug the charging AC input connector to avoid an electric shock.

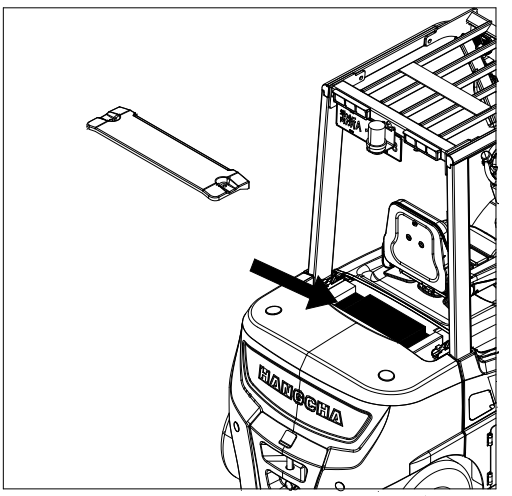
13.8.1.6 Codes and information

Code	Information corresponding to codes	Code	Information corresponding to codes
F4	Insulation fault	F14	Stop for unauthorized shutdown

F5	Over-temperature of output connector	F15	Overvoltage of battery cell
F6	BMS over-temperature	F16	Undervoltage of battery cell
F7	Charging connector fault	F17	Charging overcurrent
F8	Over-temperature of battery pack	F18	Battery over-temperature
F9	High-voltage relay fault	F19	Abnormal insulation
F10	Check point 2 detection fault	F20	Connector fault
F11	Other faults		
F12	Abnormal current		
F13	Abnormal voltage		

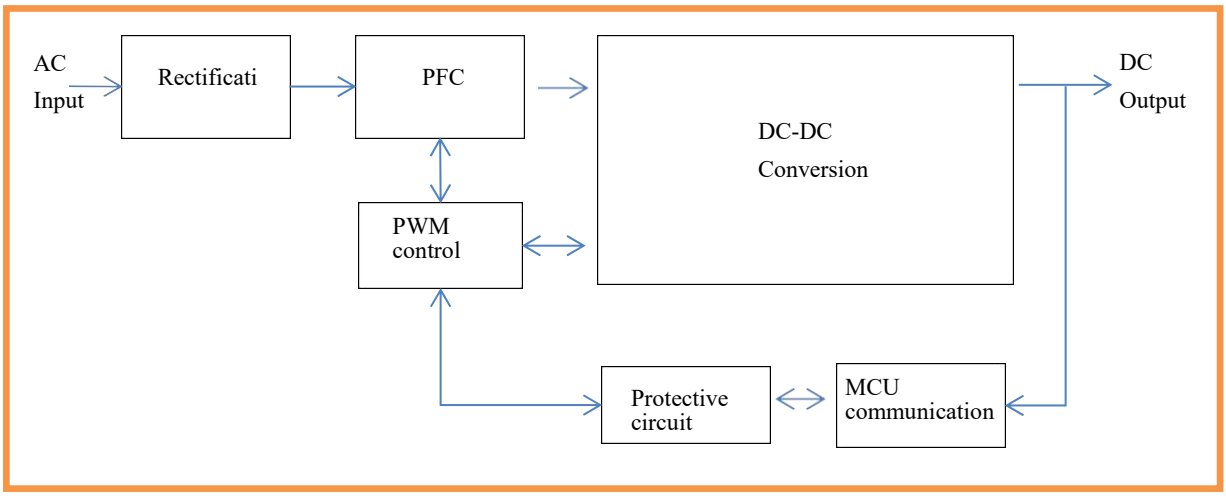
13.8.2 FST truck-mounted charger (optional)

The truck-mounted charger for the XE series modified truck is placed in the counterweight at the rear of truck and is visible when the upper cover of the counterweight is removed, as shown in the following figure.



13.8.2.1 Overview

Following the concept of modularized and standardized design, this HF charger incorporates the latest phase-shifted PWM zero-voltage & zero-current soft-switching technology and features stable system operation and high conversion efficiency. A three-phase 380VAC/single-phase 220V voltage input is suitable for this charger which has protection functions for input over-voltage & under-voltage, output over-voltage & under-voltage, over-current, output short circuit and faults, etc.



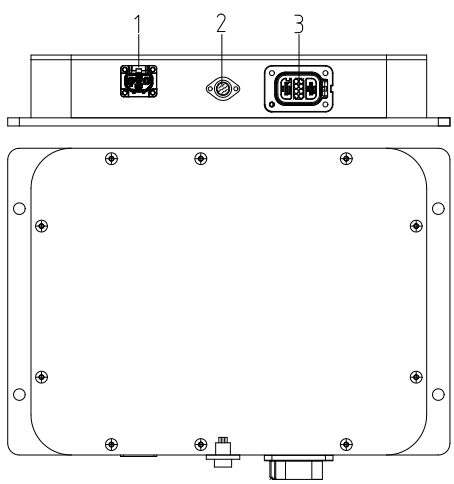
Schematic diagram for the charger modules

13.8.2.2 Working principle

This charger is composed of modules including the PFC power factor correction circuit, LLC resonant network, rectification and filtering module, APS module and CAN communication circuit.

13.8.2.3 Specifications

Truck Model	Charger Model	Rated output voltage (V)	Rated output current (A)
1.5t-1.8t	FST-C-8035-B	80V	35A
2t-3.8t	FST-C-8065-B	80V	65A



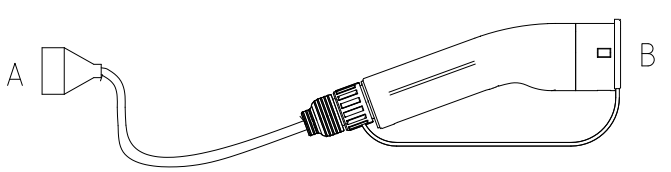
1. Input port	2. Signal port	3. Output port

13.8.2.4 Technical parameters

Model	FST-C-8035-B	FST-C-8065-B
Rated input voltage	3-Phase 380VAC±15%	3-Phase 380VAC±15%
Rated output frequency	45-65Hz	45-65Hz
Input power	≤3KVA	≤6KVA
Max. input current	5A	11A
Max. conversion efficiency	≥93%	≥93%
Rated output voltage	80V	80V
Rated output current	35A	65A
Rated output power	3KW	6KW
Output & input plug model	Customized	Customized
Communication mode	CAN communication	CAN communication
APS output voltage	12V	12V
APS output current	3A	3A
Cooling method	Extra cooling method	Extra cooling method
Working temperature	-40℃ to 55℃ for full-power output Radiator fin 75℃ for reduced-power output	-40℃ to 55℃ for full-power output Radiator fin 75℃ for reduced-power output
Relative humidity	10% to 90%, no icing	10% to 90%, no icing
IP class	IP67	IP67
Noise	≤20dB	≤20dB
Altitude	Below 2,000m	Below 2,000m
Weight	10KG (only for reference, the actual measured value shall prevail).	10KG (only for reference, the actual measured value shall prevail).

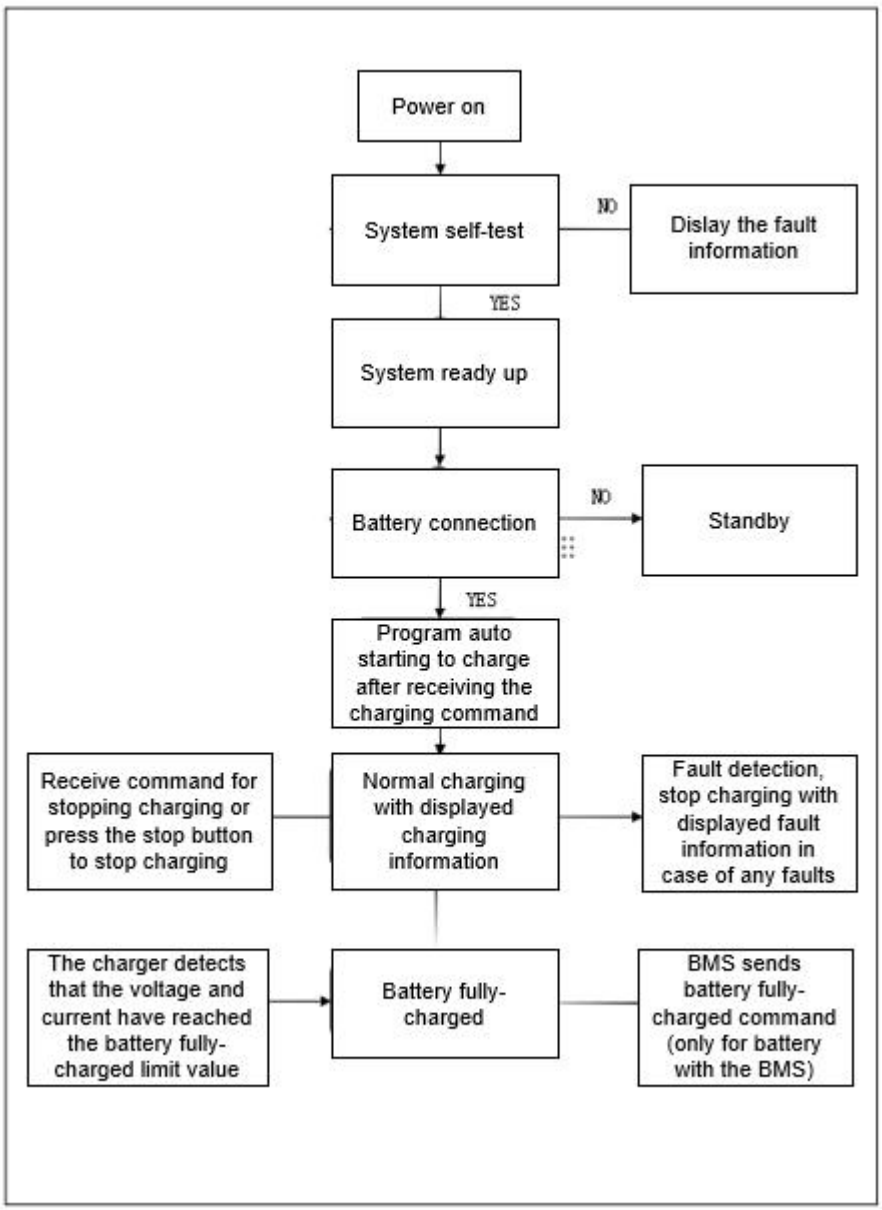
13.8.2.5 Charging process

For trucks equipped with this type of charger, a charging cable is provided with the truck for further charging, with one end connecting to the truck's charging port and the other end connecting to the power supply.



A. Industrial 5-pin connector for connecting to the power supply.
B.7-pin connector for connecting to the truck’s charging port.

The charging process for the truck-mounted charger is described as follows:



13.8.2.6 Charging steps

1. Park the truck near the power socket and turn off the key switch, i.e., power off the truck.

2. Open the charging cover. For trucks with a built-in charger, there is a charging cover on the left side of truck body (No. 1 as shown in the following figure).



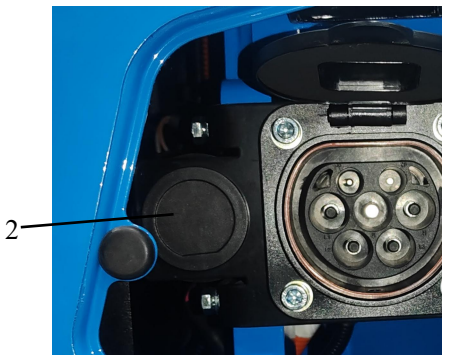
1

3.Open the charging cap inside it. Check the charger socket to ensure that there is no water or foreign matter in each port and that the metal terminals are not damaged or affected by rust or corrosion.



4.Take out the charging cable with one end of it connecting to the charger socket and the other end connecting to the power socket.

5.Check the lithium-ion battery level from the little display screen (No. 2 as shown in the following figure) by the charger socket.



6.The charger will automatically stop charging when the lithium-ion battery is fully charged. At this time, the operator should disconnect the cable from the external power supply and then unplug the charging gun.

7.Replace the charging cap and charging cover on the truck body in sequence.

13.8.2.7 Precautions for use

(1) Prevent children from touching the charger and cables, it is recommended that the charger should be only used by personnel with relevant electrical qualifications.

(2) Do not connect the charger to an unstable power supply to avoid current fluctuations or over-voltage.

(3) Do not place flammable or explosive materials around the charger socket.

(4) Make sure that the charger has been securely connected to the power socket during operation.

Do not operate the charger in the event of any AC power failure.

(5) Only authorized personnel can modify or repair the charger, and the charger must be mounted onto the truck by qualified personnel.

(6) Do not touch the charger surface during charging, and disconnect the AC power supply before connecting or disconnecting from the battery.

(7) If the charger has been knocked, dropped or damaged in any way, only professional personnel can carry out repairs or maintenance on the charger.

(8) The charger is only suitable for charging lithium-ion batteries, and the operator should read the instruction manual before use.

(9) Do not disassemble the charger.

13.8.2.8 Table of common faults

Fault Code	Item	Description	Troubleshooting
1	BMS hardware fault	BMS fault	Stop charging and check the BMS hardware for any faults
2	BMS communication fault	Communication abnormality between the BMS and charger	Check the CAN wire connection between the BMS and charger
3	Battery over-voltage	The battery voltage is higher than the limit value.	Stop charging and check the battery for over-voltage
4	Battery under-voltage	The battery voltage is lower than the limit value.	Stop charging and check the battery for under-voltage
5	Battery over-temperature	The battery temperature is higher than the limit value.	Stop charging and wait for the battery to cool down

Fault Code	Item	Description	Troubleshooting
6	Battery under-temperature	The battery temperature is lower than the limit value.	Stop charging and wait for the battery to heat up
7	BMS insulation fault	BMS insulation failure	Stop charging and check the BMS for any wire disconnection
8	Extremely large BMS voltage difference	Extremely large BMS voltage difference	Stop charging and contact the BMS manufacturer
9	Extremely large BMS temperature difference	Extremely large BMS temperature difference	Stop charging and wait until the battery temperature difference falls below the max. value.
10	Other BMS faults	Other unknown BMS faults	Stop charging and contact the BMS manufacturer for troubleshooting
11	Charging gun fault	Output charging gun fault	Stop charging and replace the output charging gun
12	Charging gun over-temperature	Output charging gun over-temperature	Stop charging and wait for the output charging gun to cool down
13	AC input over-voltage	The input voltage is higher than the limit value.	Stop charging
14	AC input under-voltage	The input voltage is lower than the limit value.	Stop charging
15	AC input phase loss (Only applicable to three-phase input)	Charger AC input phase loss	Stop charging, check the charger input wiring for any looseness and check the voltage of the three phases.
16	Output over-voltage	The charger output voltage is higher than the limit value.	Stop charging and limit the charger output voltage.
17	Output over-current	The charger output current is higher than the limit value.	Stop charging and limit the charger output current.
18	Output short-circuit	Charger output short-circuit	Stop charging and check the conductivity between the output positive and negative terminals.
19	Battery reverse connection	Reverse connection of the battery positive and negative terminals	Stop charging and contact the BMS manufacturer for help
20	Charger over-temperature	Charger over-temperature	Stop charging and wait for the charger to cool down
21	Insulation fault	Charger insulation failure	Stop charging and check the charger for any wire disconnection
22	Hardware fault	Charger hardware fault	Stop charging and contact the charger manufacturer
23	Fan fault	Fan starting failure	Stop charging and check whether the fan is running normally

Fault Code	Item	Description	Troubleshooting
24	Relay fault	Relay failure	Stop charging and replace the relay
25	Other hardware faults	Other unknown hardware faults	Stop charging and contact the charger manufacturer

13.8.3 Charging steps

Charging Method 1 (Standard):

1.Park the truck at the charging pile according to regulations and turn off the key switch, i.e., power off the truck.

2.Inspect the appearance of the charger and charging cable. Check if there is any severe damage or deformation on the charger housing, and if there are any signs of wear, cracking, or exposed wires on the charging cable. If any abnormalities are found, do not use them and contact the relevant staff for repair or replacement in a timely manner.Turn off the charger input master switch, make sure the emergency stop switch is disconnected, the charger starts automatically, the power indicator light turns on and the display interface shows automatically.

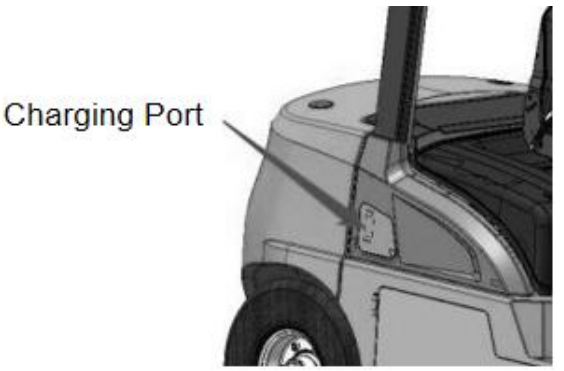
	Input master switch

	Emergency stop switch
	Display interface

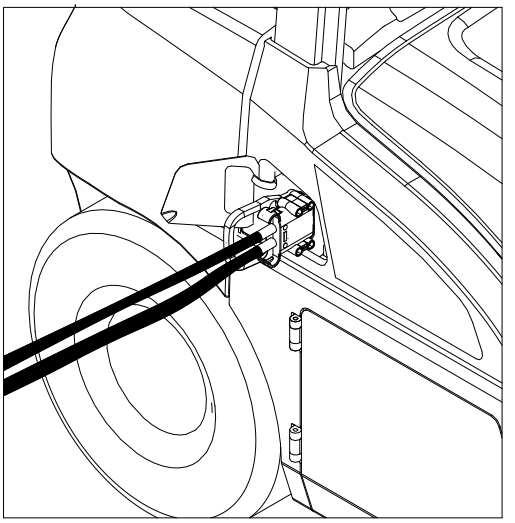
3. Check the charger to ensure that there is no water or foreign objects in each port and that the metal terminals are not damaged or affected by rust or corrosion.



4.Open the charging ports on the forklift truck and the charging cover of batteries respectively. Check the lithium-ion battery charging socket to ensure that there is no water or foreign objects in each port and that the metal terminals are not damaged or affected by rust or corrosion.



5.Connect the charger to the charging socket of the lithium-ion battery, the charger will check automatically and communicate with the lithium-ion battery; when the whole system is fault-free, after about 15 s, the internal relay of the charger will be activated and charging will start, at this time, the charging indicator light will be on, and the charging voltage, charging current, charging time and charging fault information will be displayed on the touch screen.



6.When the lithium-ion battery is fully charged, the charger will automatically stop charging, and at this time, the output voltage and output current on the touch screen is 0. Press the pause key, and then unlock the charging gun and pull it out at the same time. If it is necessary to stop charging the lithium-ion battery when it is not fully charged, please press the pause key on the screen first, wait for the charging current to drop to 0 A and then press and release the button buckle to take out the charger.

Note:When pulling out the charging gun, hold the handle part and do not pull the cable!



7.Put the charging covers of the lithium-ion battery and forklift truck back in place.

8.In low-temperature environments below zero degrees, charge the vehicle immediately after use.

Charging Method 2 (optional):

1.Park the truck at the charging pile according to regulations and turn off the key switch, i.e., power off the truck.

2.Inspect the appearance of the charger and charging cable. Check if there is any severe damage or deformation on the charger housing, and if there are any signs of wear, cracking, or exposed wires on the charging cable. If any abnormalities are found, do not use them and contact the relevant staff for repair or replacement in a timely manner.Turn off the charger input master switch, make sure the emergency stop switch is disconnected, the charger starts automatically, the power indicator light turns on and the display interface shows automatically.

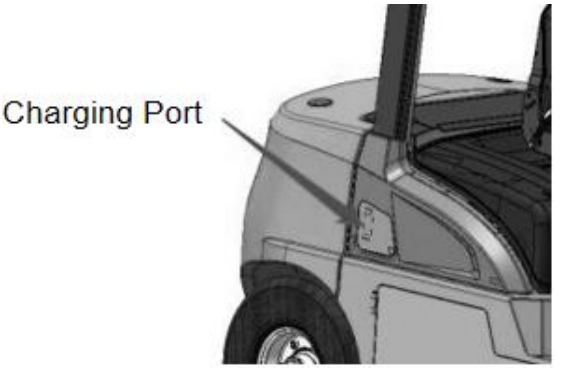
	Input master switch
	Emergency stop switch

	Display interface

3.Press and release the button buckle to take out the charger. Check the charger to ensure that there is no water or foreign objects in each port and that the metal terminals are not damaged or affected by rust or corrosion.



4.Open the charging ports on the forklift truck and the charging cover of batteries respectively. Check the lithium-ion battery charging socket to ensure that there is no water or foreign objects in each port and that the metal terminals are not damaged or affected by rust or corrosion.



5.Connect the charger to the charging socket of the lithium-ion battery, the charger will check

automatically and communicate with the lithium-ion battery; when the whole system is fault-free, after about 15 s, the internal relay of the charger will be activated and charging will start, at this time, the charging indicator light will be on, and the charging voltage, charging current, charging time and charging fault information will be displayed on the touch screen.



6.When the lithium-ion battery is fully charged, the charger will automatically stop charging, and at this time, the output voltage and output current on the touch screen is 0. Press the pause key, and then unlock the charging gun and pull it out at the same time. If it is necessary to stop charging the lithium-ion battery when it is not fully charged, please press the pause key on the screen first, wait for the charging current to drop to 0 A and then press and release the button buckle to take out the charger.

Note:When pulling out the charging gun, hold the handle part and do not pull the cable!

7.Replace the charging gun on the charger and turn off the charger input master switch.

8.Put the charging covers of the lithium-ion battery and forklift truck back in place.

9.In low-temperature environments below zero degrees, charge the vehicle immediately after use.

13.8.6 Precautions for Charging

(1) Safe Disconnection: After charging is completed, first end the charging operation on the charger. Wait until the charger displays "charging complete" and the current returns to zero before unplugging the charging gun. After unplugging the charging gun, cover the forklift's charging protection cover and compartment door. Place the charging gun properly in the designated position on the charger to avoid damage from dropping or external impacts. Turn off the charger's power supply.

(2) Vehicle Inspection: Do not start the vehicle immediately after charging. First, check if the vehicle's charging interface is normal and look for any signs of overheating or unusual odors.

(3) Prohibition of Use under Equipment Failure: Never use the charger if there is a device malfunction. In case of charging abnormalities, in addition to pressing the emergency stop button, do not operate it arbitrarily. Please contact the staff or call the customer service hotline in a timely manner.

(4) Before connecting to the vehicle, ensure that the vehicle's charging port is compatible with the charging plug on the charger. Check if the charger has been soaked in rainwater and if there is any water or debris inside the charging gun. If water or debris is found inside the charging gun, clean it before use.

(5) In case of rainy weather, avoid charging outdoors to prevent the risk of electric leakage. If charging is necessary, when unplugging the charging gun from the charger, be cautious to prevent rainwater from splashing into the gun head. When moving the gun, ensure that the nozzle is pointing downward.

(6) After use, return the charging gun to its place to prevent it from falling to the ground and getting contaminated with water or sand. This helps to avoid water or sand entering the vehicle's charging socket during the next charging session.

13.9 Common faults and troubleshooting

13.9.1 Undervoltage when fully charged

(1) The battery has been idle for a long time and has not been maintained in accordance with the provisions. Troubleshooting: Charge the battery.

(2) The battery has suffered a severe impact, which caused damage to the battery case or a smell of electrolyte in the battery pack. Troubleshooting: Generally, this fault is not covered by the maintenance scope. It is necessary to figure out whether the fault is in the output circuit or the battery prior to any maintenance. First of all, disassemble the battery case, check the P+/C+ and P-/C- wires or solder joints of the battery pack for any damage, and if so, please replace them. Check the battery smell. If there is an irritating electrolyte smell, it indicates that there is a leakage in the battery and a voltage test for each battery pack should be performed. If the voltage of one battery pack is very low and very different to that of the other battery packs, please contact the battery manufacturer for replacement.

(3) Insufficient battery capacity. Troubleshooting: Carry out 3-5 charge-discharge cycles for the battery.

13.9.2 The battery is fully charged (as shown on the charger), but the voltage is zero or low

(1) The battery is disconnected. Troubleshooting: Disassemble the battery and check for wire disconnection or missing solder joints. Clear the fault if necessary.

(2) The protection board does not work. Troubleshooting: Check the wiring of the protection board for any missing solder joints; otherwise, check the voltage between B+ and B- and the voltage between P+ and P-, if there is a great difference between them, it means that the protection board is damaged. It is necessary to thoroughly test the protection board, and if it fails to pass the test, please replace it.

13.9.3 Battery voltage instability

(1) Defective soldering. Troubleshooting: Test the internal resistance of the battery with an internal resistance tester. If the value exceeds the specified value, there may be incorrectly soldered joints in

the battery, please carry out correct soldering after disassembling the battery.

(2) The protection board is abnormal. Troubleshooting: Replace the protection board.

(3) Poor contact with terminals or connectors. Troubleshooting: Replace the terminals or connectors.

13.9.4 The battery can be charged normally but cannot be discharged normally, or can be discharged normally but not be charged normally.

1.The protection board is damaged.

Troubleshooting: Replace the protection board.

13.10 Emergency response

(1) **Severe abnormalities:** During use, users should be familiar with safety precautions and should not carry out improper operations to avoid improper use of the battery (e.g. overcharge, over-discharge, short circuit, extrusion, puncture, overheating and high current discharge, etc.). During charging and use, the following abnormalities may occur in the battery system:

a. The battery system or parts temperature rises sharply.

b. Abnormal smell from any part of the battery system.

c. Smoke and fire in any part of the battery system.

(2) **Emergency measures in the event of smoke and fire in the battery system:** In the process of use, in the event of any smoke or fire in the battery system, the following emergency measures should be taken immediately:

a. Stop the truck and power off.

b. All personnel at site should quickly leave the truck and call the fire station.

c. Use carbon dioxide fire extinguishers or dry powder fire extinguishers to put out the smoke or fire provided that personal safety is not put at risk.

d. Notify our company as soon as possible to get further support.

13.11 Lithium-ion battery replacement

See the lithium-ion battery maintenance section in the Maintenance Manual for the replacement

steps.

14 Operations

14.1 Breaking-in of a new truck

The forklift truck should be operated under low load in the initial stages after it is put into use, especially within the first 100h, and the following requirements should be met:

- Over-discharge of the new battery in the initial application stage must be prevented.
- Promptly charge the battery when the battery level drops to 20% of its capacity.
- The prescribed preventive maintenance should be made.
- Fast running, sudden stops and sharp turns should be avoided.
- Oil change or lubrication should be done in advance according to the requirements.
- The actual load capacity should be 70% to 80% of the rated load capacity.

14.2 Checks and adjustment before operation



– When carrying out a visual check of the forklift truck, the operator should pay special attention to whether the wheels, wheel bolts and load parts are damaged or loose.

– Check whether the tire pressures are normal with an air pressure gauge.

– Check the fork positioner.

– Perform a visual inspection of the visible areas of the hydraulic system for any damage or leaks.

– Check whether the driver's seat is properly locked.

– Check whether the alarms (including the reverse buzzer) function properly.

– Check whether the Load Curve Sign and warning labels are clearly visible.

– Check the function of the operating and display parts.

– Check whether the steering system is functioning properly.

– Check whether the mast lifting chains are evenly tensioned.

– Check that the seat belt is functioning properly (the seat belt must lock when pulled out quickly).

– Check the seat switch function: if the driver is not properly seated, the hydraulic functions should be disabled.

– Check lifting/lowering, tilting hydraulic functions and, if necessary, check the attachments.

– Depress the pedal when the parking brake control lever is engaged.

Check whether the lights are working properly.

– Check whether the accelerator pedal is normal.

– Check the battery fastening and wiring by visual inspection.

Warning

In addition to inspecting the lights and checking operational performance, before examining the electrical system, it is necessary to turn off the key switch and disconnect the battery plug.

If there is any damage or other defects found on the forklift truck or attachments in the subsequent check, the forklift truck should not be used again until it is repaired in accordance with the regulations. In addition, the following measures must be taken:

1. Immediately report the identified defects to your superior.

2. Mark and stop the truck if it is damaged.

3. Restart the truck only after the fault has been identified and cleared.

14.3 Starting the truck

14.3.1 Starting truck without the card

Prerequisite: Checks and adjustment before operation has been performed on the forklift truck.

Warning

- **If the forklift truck has any damage or faults, it should not be started before repairing.**

Operating steps:

– Release the emergency stop switch. Rotate it clockwise, the emergency stop switch button will pop up automatically.

– Place the direction lever in the neutral

position.

– Insert the key into the switch lock and rotate it right to the “I” position.

– Enter the user password through the electronic password switch keyboard. (for optional combination lock)

– The forklift will automatically enter the self-test program (about 3 to 4 seconds). The display shows the welcome interface and all 6 indicator lights are on.

Caution

- **The forklift truck cannot be driven or lift during this time. If the direction switch or accelerator pedal or lift switch, etc. is operated during this time, a malfunction message appears in the display and the fault indicator “ " lights up.**

– Hold the steering wheel with the left hand and turn the key switch on with the right hand.

– Tilt the mast backward.

– Operate the lift control lever to lift the forks by 150mm-200mm from the ground. Operate the tilt control lever to make the mast tilt back to its limit.

– Operating the direction control lever

– To drive forward: push the direction control lever forward.

– To drive backward: push the direction control lever backward.

– Release the hand brake lever.

– Press the brake pedal and push the handbrake lever to the forward position.

Hold the steering wheel handle with your left hand and gently put your right hand on the steering wheel.

14.3.2 Starting the truck with the card and steps (to be initiated by an optional card)

Card reader

1. Starting the truck with the card

①Power on the truck (pull up the emergency stop switch and put the gearshift handle in the “N” position).

Caution

- **The forklift truck will not start if the emergency stop switch is not pulled up or the gearshift handle is not placed in the “N” position.**

②Turn the key switch to the “ON” position (the dashboard will light up); and at this time, the card indicator or icon will flash.

Card indicator and icon:

Item / Name	Color	Icon*
Card icon	Green	

Note*: Some devices, e.g. card readers, have no icons to be displayed, and only indicators are provided.

③ Put the IC card close to the sensing area of the card reader (within 10mm), and then remove the IC card after about 1s. If the card indicator or icon turns on, it indicates that the card was read successfully, if not, the user should repeat these steps.

Caution

- **This forklift truck is equipped with an integrated card reader and there is a sign for the card sensing area on the dashboard.**
- **Do not place the IC card in the sensing area of the card reader for a long time.**



Front view of the IC card



Card reading icon

④On the premise that the emergency stop switch is pulled up and the gearshift handle is placed in the “N” position, the electric forklift truck will start after the card is read successfully.

2. Binding a new IC card

①Power on the forklift truck (pull up the emergency stop switch and put the gearshift handle in the “N” position).

②Turn the key switch to the “ON” position (the dashboard will light up); and at this time, the card indicator or icon will flash.

Card indicator and icon:

Item / Name	Indicator	Icon*
Card icon	Green	

Note*: Some devices, e.g. card readers, have no icons to be displayed, and only indicators are provided.

③ Put the new IC card close to the card sensing area 3 times within 15s, and at this time, the card indicator or icon will turn off.

④Put the new IC card close to the card sensing area again for more than 5s, and at this time, the card indicator or icon will turn on, indicating that the new IC card was bound and read successfully.

Caution

- **If the user doses not finish this step within 2min and then proceeds to the next step, the system will give a timeout prompt, indicating that the card was not read successfully and the truck is in a locked state.**

3. Deleting the bound IC card

①Power on the forklift truck (pull up the emergency stop switch and put the gearshift handle in the "N" position).

② Turn the key switch to the "ON" position (the dashboard will light up); and at this time, the card indicator or icon will flash.

Card indicator and icon:

Item / Name	Indicator	Icon*
Card icon	Green	
Note*: Some devices, e.g. card readers, have no icons to be displayed, and only indicators are provided.		

③Put the IC card to be deleted close to the card sensing area for about 15s (do not remove the card during this period), and at this time, the card indicator or icon will turn on for 3s and then turn off for 1s in a cycle.

④Remove the IC card and put it close to the sensing area again, and if the card indicator or icon turns off, it indicates that the IC card has been deleted successfully; if the card indicator or icon turns on for 3s and then turns off for 1s in a cycle, it indicates that it has not been deleted successfully.

⑤Power on the forklift truck and then put the card close to the sensing area to start the truck.

Caution

- **If the user doses not finish this step within 2min and then proceeds to the next step, the system will give a timeout prompt, indicating that the card was not read successfully and the truck is in a locked state.**

Safety monitoring device (to be initiated by an optional card)

For forklift trucks equipped with a safety monitoring device, if the operator is not in the proper operating position, the truck cannot travel forward or backward, the mast cannot be lifted, lowered or tilted and the fork arm carrier will not work when the operator uses the mast control handle, the operator should sit in the right operating position, put the gearshift handle and the mast control handle in the "N" position, and then carry out these operations as

described above.

14.3.3 Equipped with fingerprint lock start(Optional)

See the previous section on the TSG fingerprint lock.

14.4 Driving

Operating steps:

– Start the forklift truck.Disengage the parking brake lever to release the parking brake (the corresponding parking brake indicator light "" is off).

– Use the direction switch to select the driving direction.

– Lift the forks 150mm to 200 mm above the ground.

– Tilt the mast backward.

– Depress the accelerator pedal slowly and adjust the driving speed according to the road conditions.

The truck will travel in the selected direction.

Caution

- **During driving, if the direction switch is switched to the opposite driving direction, the forklift truck will be braked until the forklift starts to move in the opposite direction.**

14.5 Steering

The forklift truck is different from ordinary vehicles, because its rear wheels are used for steering; the rear counterweight is rotated outwards when steering.

Slow down and rotate the steering wheel towards the side to turn; the steering wheel needs to be rotated a little bit earlier than front steered vehicles.

Caution

- **Slow down the forklift truck before turning.**
- **Do not turn the steering wheel in the stationary position when turning.**
- **The forklift truck is steered through rear wheels, and the counterweight will swing outward during steering. Therefore, the operator should ensure that there is enough space behind the forklift before turning.**

14.6 Braking

Braking can be performed in the following three ways:**:**

– Handbrake;

– Reverse brake;

– Roll brake.

Safe parking:

– Parking brake

Warning

The braking performance of the truck mainly depends on the condition of the road

surface.

- **The driver must be aware of the driving surface conditions and consider the braking performance.**
- **Extra caution and care should be taken when braking to avoid cargo falling.**
- **Be aware that braking distances will be extended when towing cargo.**
- **In an emergency, only use the driving brake to brake the forklift.**

Foot brake:

– Depress the brake pedal until enough braking pressure is generated to make the truck slow down or stop.

Reverse brake:

– Switch the travel switch to the reverse direction during driving.

The truck will be braked until it drives in the reverse direction.

Roll brake:

– Release the accelerator pedal.

Brake the truck.

Parking brake

– Pull up the parking brake lever after it has stopped.

Park it in a safe place.

Emergency stop

Operating steps:

– Press the emergency stop switch in an emergency. All electric functions will be cut off at this time and the truck will be braked until it comes to a standstill.

Pull up the emergency stop switch again when starting next time.

Warning

- **The emergency stop switch should only be used in dangerous situations during driving.**
- **The emergency stop switch must not be used for service braking.**

14.7 Cargo picking, transportation and storage

Cargo picking

Drive the truck slowly to the pallet. (Check the fork spacing and adjust if necessary.)

– Vertically lift the mast and adjust the fork height so that the forks are facing the pallet.

– Slowly put the forks into the pallet until the pallet reaches the back of the forks.

– Operate the lifting control lever to lift the goods to 50mm～100mm from the ground or the lower goods.

– Operate the tilt switch to make the mast tilt backward to its limit.

– Travel backward carefully and slowly so that the load is completely out of the stacking area. Check for any obstacles when traveling in reverse.

– Operate the lifting control lever to lower the cargo to the position approximately 150mm - 200mm above the ground.

 Caution

– Use pallets to carry goods as required.

– Ensure the cargo weight meets the rated load of the forklift.

Cargo transportation

– Pick the cargo according to rules and regulations.

– Accelerate and brake the truck gradually.

– Control the vehicle speed according to the driving route and the transported cargo.

– Pay attention to other people or vehicles at intersections and aisles.

– Guidance from other operators should be provided if the view is obstructed.

– When driving uphill with goods, the forklift truck must move forward; when going downhill, it must reverse. Do not drive across slopes or turn around on slopes.

Cargo unloading

– Vertically lift the mast.

– Carefully drive the forklift truck into the rack.

– Lower the load-bearing parts as much as possible and separate the forks from the cargo.

– Lower the load-carrying parts.

– Withdraw the forks carefully from the pallet.

Cargo placement is complete.

 Caution

- **Do not stack cargo on driving routes and by emergency exits that may be used at any time or in front of safety devices and operating devices.**
- **Do not operate too aggressively when lowering the load to ensure that the load and load carrying components are not damaged.**

Warning

Before cargo picking, the driver must make sure the cargo has been stacked properly and the cargo weight does not exceed the rated load capacity.

– Only cargo placed and secured according to rules and regulations should be transported. If the cargo is in danger of tipping over or falling during handling, suitable protection devices must be installed.

– Do not transport any goods out of the scope of allowable transported goods.

– Do not transport damaged cargo.

– If the loaded cargo blocks the driver's front sight line, the driver should drive in reverse (except uphill).

– Pay attention to the clarity of your view when traveling in reverse.

– Never exceed the maximum load capacity indicated on the load curve sign.

– Do not allow personnel to go underneath the load carrying components.

– Do not use the truck to lift people.

– Do not put your hands into the lifted mast.

– Check the fork spacing before carrying the cargo and make adjustments if necessary.

– Never stand under raised load-bearing parts.

– Do not tilt the mast when the load is lifted above 2 m.

– Do not get off or leave the forklift truck when the load is at a high level.

14.8 Safe parking

Operating steps:

– Engage the parking brake control lever.

– Turn the key to the "0" position.

– Remove the key from the switch lock.

– Press the emergency power-off switch down.

This completes the parking steps.

Warning

- **The truck must be parked on flat ground. If the ground is not level, the truck must be secured with wedges or other objects.**
- **Never Park or leave the truck on a slope.**
- **Never Park the truck with a raised load.**
- **The truck must be parked in the designated safe parking area, not on travel**

routes.

14.9 Adjustment and replacement of the forks

1.Adjustment of the forks:

— In order to ensure safe operation in the picking process, before the picking operation, it is necessary to adjust the distance of the fork to the appropriate position according to the size of the load pallet.

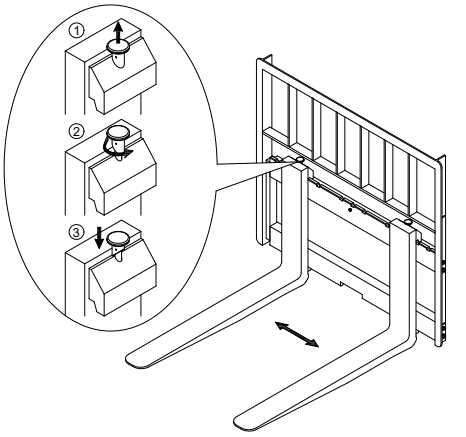
— Operating steps:

– Pull up the fork stop dowel and rotate it by 180° in any direction to release the lock of the fork.

– Adjust the position of the fork symmetrically to both ends based on the center line of the fork arm carrier.

– After the fork clearance is adjusted, pull up the fork stop dowel, and rotate it back to the initial position, and then slightly move the fork left and right to ensure that the fork stop dowel is in the card slot of the fork arm carrier.

— The fork clearance is adjusted.



Caution

- **The fork stop dowel must be locked (in the card slot of the fork arm carrier), if it is not locked, the fork can easily move while driving the forklift truck, and the cargo may fall.**
- **Be careful to prevent fingers from being clamped when adjusting a fork.**
- **In order to ensure safe operation in the picking process, the distance between the forks should be as large as possible, and the position of the forks must be symmetrical with the center line of the fork arm carrier. The center of load must be located in the middle of the fork clearance.**

2. Disassembly of forks:

Caution

- **There is an opening on the lower beam of the fork arm carrier for loading and unloading forks.**
- **Do not fasten the fork in the open position of the fork arm carrier to prevent the fork from falling off from the open position.**

- **There is a bolt in the middle of the upper beam to prevent the fork from working there. If the bolt is damaged, it should be replaced as soon as possible.**

When the fork needs to be replaced, the operator should unscrew the fixing bolt in the middle of the fork arm carrier, move the fork to the opening in the middle of the cross-beam of the fork arm carrier, and then tilt forward and lower the fork until the fork is free from the fork arm carrier, then move the vehicle back.

3. Installation of the fork:

Place the forks on the ground against the forklift, lower the fork arm to the bottom, drive the forklift slowly, align the upper and lower slots of the forks with the upper and lower beams and gaps of the fork arm, lift the fork arm slowly, and adjust the position of the forks.

14.10 Checks after operation

Clean the truck after operation and conduct the following checks:

– Check for any damage or leakage.

– Refill with lubricating oil as appropriate.

– Check the tires for any damage or foreign objects.

– Check the wheel nuts for any looseness.

– Check the electrolyte level.

– If the truck did not lift to the maximum height during the operation on that day, the forks should be raised to the maximum height 2 or 3 times after the operation is completed.。

Caution

- **In the event of any faults, prompt maintenance should be made.**
- **Do not use the truck before it is repaired.**

15 Transportation, lifting and towing

15.1 Transportation

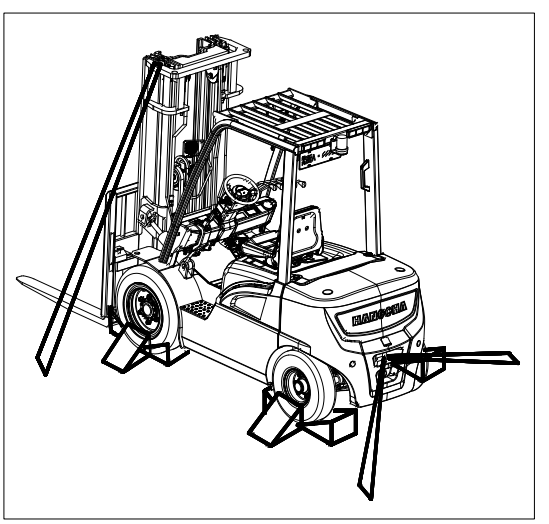
The forklift truck is a short-distance handling truck and not suitable for long-distance transportation. If the forklift truck is transported over a long distance, it should be handled with a ship, train or vehicle with load capacity of more than 6t. The forklift truck should be handled with a loading platform or lifting device.

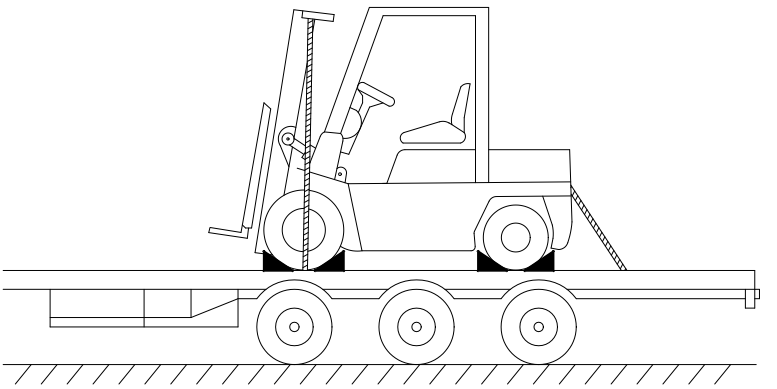
Operating steps:

– Park the forklift safely on the truck or trailer and apply the parking brake.

– Bolt the tension belt to the upper crossbeam of the mast and the counterweight towing pin and pull the tension belt with the tightening device.

– Pad the front and rear wheels of the forklift firmly with wedge-shaped wooden blocks.



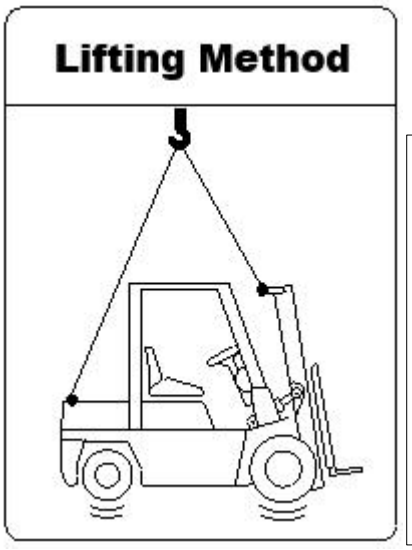


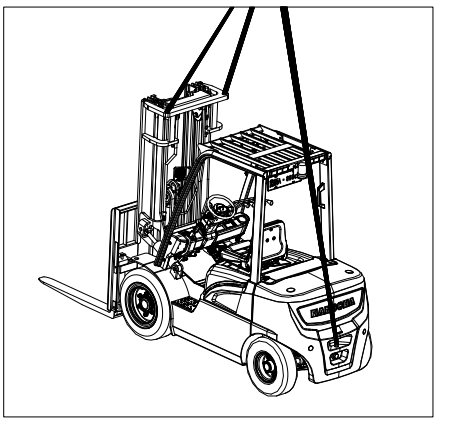
Warning

- **When the forklift is fastened, effective measures must be taken for the specific situation to ensure the safety of transportation.**
- **The forklift must be securely fixed when it is transported with a crane or trailer.**
- **Use wedges to secure the truck to prevent accidental movement.**
- **Only tensioned or tethered belts of sufficient nominal strength should be used to secure the forklift.**

15.2 Lifting

Tie the steel rope on the lifting hole and counterweight lifting hole at both ends of the beam of outer mast firmly and lift the forklift truck with the lifting device. The wire rope connected with one end of counterweight should be passed through the gap in the overhead guard, to avoid placing any strain on it.





Warning

- **Only lifting tools with sufficient loading capacity can be used.**
- **Tilt the mast backward completely when lifting.**
- **When installing the lifting tools, you must be careful to ensure that the tools will not touch the components or overhead guard of the forklift truck during the lifting process.**
- **Do not lift the forklift truck from the cab frame (overhead guard).**
- **Do not stand under the forklift truck when lifting it.**
- **Do not wind the steel rope around the overhead guard when lifting the forklift truck.**
- **The steel rope and the lifting device must be strong enough to safely support the pallet forklift truck**
- **Prevent the lifting hook from slipping off. Do not tie the lifting hook on other points. Otherwise, there is a risk of major accidents.**

When lifting the forklift truck, hang the hooks in three places (see the lifting signs "Lift here"): the left and right lifting holes on the lower part of the front body; and the rear towing hooks. Take care to prevent the hook from slipping off, then slowly lift the vehicle with the lifting device.

15.3 Towing

Do not routinely use the forklift truck for towing or being towed.

The tow pin under the counterweight is only to be used in the following situations:

– To urgently move the forklift truck if it suddenly breaks down on the working road.

– To be used for getting out of trouble if the forklift gets stuck (e.g. its wheels are trapped in potholes) and cannot be driven.



Operating steps:

– Turn off the key switch and unplug the battery power supply.

– Release the parking brake.

– Put the direction lever in the neutral position.

– Firmly tie the steel tow rope on the tow pin.

The forklift truck can then be towed.

Warning

- **Do not tow forklift trucks with defective steering systems or damaged brake systems.**
- **Do not suddenly apply load to the steel wire rope.**
- **The controller will be damaged if the forklift truck is towed when it is powered on.**
- **Lift the front wheels when towing, otherwise the motor may be damaged.**

16 Repair and maintenance

16.1 Rules for maintenance and repair

Carry out all checks and maintenance based on the schedule as stated in the maintenance checklist.

Warning

Do not modify or refit the truck, especially the safety devices. Do not change the working speed of the truck.

Caution

Only the original spare parts comply with the quality management requirements of our company. Only the spare parts supplied by our company can guarantee that the truck can achieve reliable and stable operating performance. Worn parts and waste fluids should be disposed of according to the current environmental protection directives.

Carry out all checks and maintenance based on the schedule as stated in the maintenance checklist.

Do not modify or refit the truck, especially the safety devices. Do not change the working speed of the truck.

It is necessary to perform regular checks and maintenance to keep the forklift truck performance at optimum.

Checks and maintenance are often neglected, so it is better to find the problems early and solve them in time.

Use the spare parts from HANGCHA GROUP CO., LTD.

When changing or adding oil, do not use oil which is not the same as the original.

The waste battery, oil and fluid from the lithium-ion battery should be disposed of in accordance with the local environmental protection laws and regulations, rather than dumped at will.

Develop a comprehensive maintenance and repair plan.

Complete records should be made after each maintenance and repair.

Do not repair trucks without training.

Caution

- **Smoke and fire are strictly prohibited.**
- **Turn off the emergency stop switch and unplug the battery before maintenance. (Except for fault diagnosis).**

- **Use compressed air to clean the electrical parts, rather than water.**
- **Do not put your hands, feet or any part of your body under the mast and display frame.**
- **In addition to testing the lights and checking the operational performance, the key switch must be turned off and the battery must be unplugged before checking the electrical system.**
- **Do not use a forklift with any faults.Small faults can cause big accidents.**
- **Do not put your hands, feet or any part of your body under the mast and display frame.**
- **Wear insulating gloves when operating and maintaining the battery system, and accessories that may cause short circuit or electric shock are strictly prohibited.**

16.2 Daily maintenance (8 hours)

It also serves as a pre-operation check.

To ensure the safe operation of the forklift truck, the operator must check and adjust the forklift truck before driving it.

> **Warning**
> - **If there is damage or a safety hazard on the forklift truck or attachment found in the check, the forklift truck should not be used again until it is repaired in accordance with the regulations.**
> - **In addition to testing the lights and checking the operational performance, the key switch must be turned off and the battery must be unplugged before checking the electrical system.**

16.2.1 Leakage check: hydraulic oil, brake fluid, cooling liquid and gear oil

Check whether there is any fuel leak or water leak in the drive axle, hydraulic system, braking system and lithium-ion battery by hand and visual inspection. Do not use naked flames.

> **Warning**
> **Do not drive the truck if a Oil leakage is found before work; start the engine after eliminating the leakage.**

16.2.2 Visual inspection

– When carrying out a visual check of the forklift truck, the operator should pay special attention to whether the wheels, wheel bolts and load parts are damaged or loose.

– Check whether lights and instruments work normally.

– Check tires, air pressure and ensure bolts are tight.

– Check whether the tires are damaged and whether tire pressures are normal.

– Check whether the battery case is locked tightly.

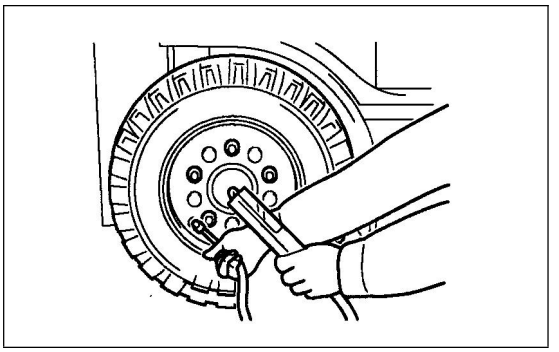
– Adjust the front, back and up and down positions of the hand-guard control device to suit the driver.

– Adjust the field of vision in the rearview mirror.

– Check whether the lifting chains are evenly tensioned.

16.2.3 Tire check and tire pressure check (pneumatic tires)

Screw the cap back on after confirming that there is no air leakage; check whether there is damage on the tire surfaces and sides and whether the rims are deformed.

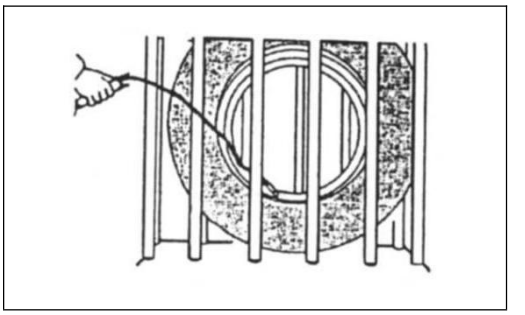


Unscrew the cap anticlockwise and measure the tire pressure with an air pressure gauge. Increase the pressure to the specified value if it is insufficient.

	Pressure bar(psi)	
Tonnage	Rear wheel	Front wheel
1.5t-x2t	7.9(115)	10.0(145)
2.0t-2.7t	8.6(125)	8.6(125)
3.0t-3.8t	9.7(140)	7.9(115)
x4t	10.3(150)	7.9(115)
4t	8.3(120)	8.6(125)
4.5t-5t	8.3(120)	8.6(125)

Warning

(1)The forklift truck tires require very high pressure to bear loads; tiny deformation of the rim or surface damage to the tire may cause an accident.
(2)When using an air compressor, as the maximum output pressure of the air compressor is higher than the specified pressure of tire, the pressure setting should be adjusted first, see the following table for pressure values; over pressurizing may cause a serious accident.
(3)In order to ensure safety, the tire should be placed in a protective frame during air inflation.



16.2.4 Brake pedal check

– Depress the brake pedal and check for sluggishness or jamming.

– The correct braking distance at no load is 2.5m.

– Adjust the pedal height: Adjust the stop bolts so that the distance between the middle point of the upper surface of the pedal and the front bottom base is 115mm-125mm.

– Adjust the length of the brake master cylinder push rod so that the idle stroke of the pedal is 1mm-3mm.

– Gradually depress the brake pedal by 10mm-20mm, the brake light switch should be turned on.

16.2.5 Accelerator pedal check

When the accelerator pedal is depressed, the acceleration should increase and the pedal should return when released.

16.2.6 Brake fluid check

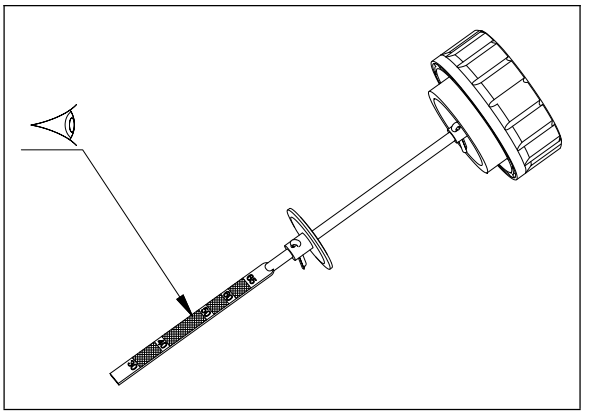
Open the brake fluid cup cover, check whether the brake fluid quantity is within the scale; if the liquid quantity is insufficient, please top it up and check whether there is air in the brake line.

Caution

- **Use the original brake fluid and do not add brake fluid of another type.**
- **Do not spill brake fluid on any painted surface, as this will damage the paint.**
- **Prevent dust and water from mixing with the brake fluid when adding it.**

16.2.7 Hydraulic oil check

Open the rear base plate, unscrew the hydraulic oil filling cover at right rear part, pull out the dipstick, check whether the fuel level is between the scale lines. If the fuel level is insufficient, add more into the reservoir.



The height of the liquid level on the dipstick corresponding to the different mast lifting heights:

"L" refers to the hydraulic level when the lifting height (H) ≤ 4.0 m

"M" refers to the hydraulic level when the lifting height 5.0m≤(H)＜4.0m

"H" refers to: When the lifting height is 5.0m ⩽ H < 7.0m, the hydraulic oil level should be between "M" and "H"

16.2.8 Driver's seat adjustment and seat belt check

Pull the seat adjusting lever to the right, adjust the driver's seat to a comfortable position for your hands and feet, and lock it. Adjust the weight.

Check whether the seat belt works normally.

16.2.9 Dashboard display check (power, faults)

See the Dashboard section.

16.2.10 Lift lever, tilt lever and attachment lever check

Check whether the lift lever, tilt lever and attachment lever are secure and return properly.

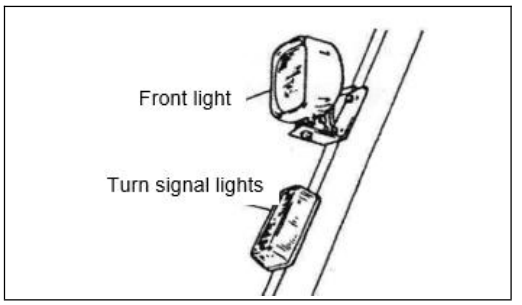
16.2.11 Steering system check

①The truck should be driven slowly.

②Turn the steering wheel three turns clockwise and anticlockwise, respectively. Check whether the left and right steering force are the same.

16.2.12 Turn indicator light, horn and other lights

Push and pull the turn indicator light to check whether it works normally.



Press the horn button to check its sound.

Check the other lights and the reversing buzzer

16.2.13 Battery maintenance

See the Battery section.

16.2.14 Others

Check for abnormal noises.

16.3 Weekly maintenance (40 hours)

Add the following maintenance items in addition to the daily maintenance:

16.3.1 Wheel check

– Park the forklift truck according to rules and regulations.

– Tighten the wheel nuts with a torque wrench in a crosswise way.

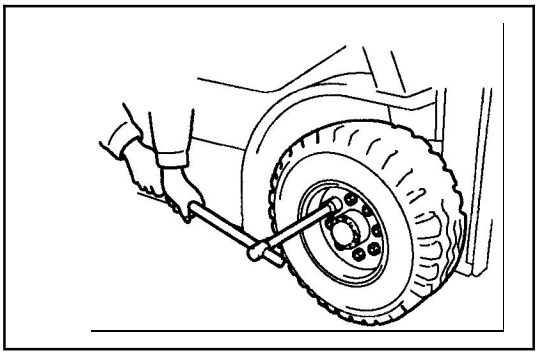
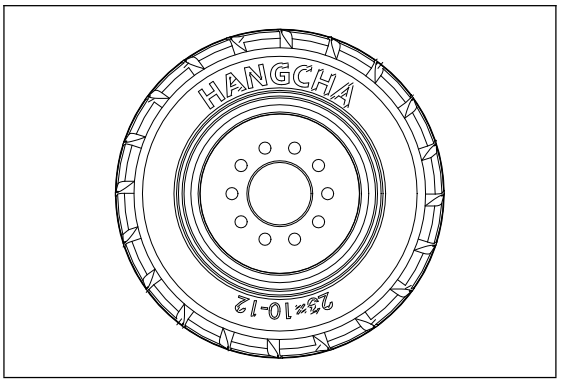


Table of Bolt Tightening Torque

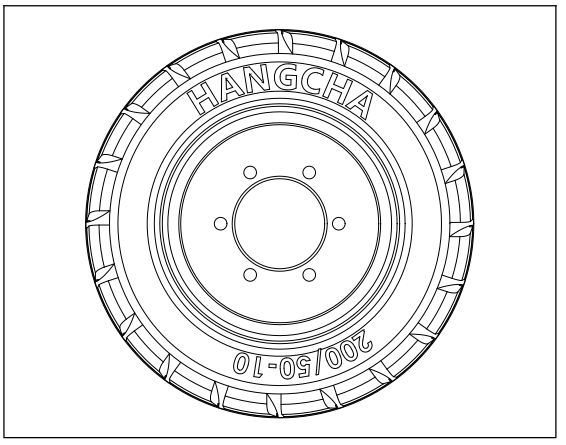
Model	Front wheel nuts (N·m)	Rear wheel nuts; (N·m)
1.5t~x2t	157~176	78～98
2.0t~x4t	363~490	157～176

4.0t~5.0t	363~490	363～490

Front wheel (driving wheel)



Rear wheel (steering wheel)



16.3.2 Hand brake lever check

The operating force is adjusted by the top lever screw. Screw it clockwise to increase the operating force; screw it anticlockwise to decrease the force.

Make sure the hand brake handle acts normally after it is tightened and then loosened to its original position.

⚠ **Caution**

● **Depressing the brake pedal helps to tighten or loosen the hand brake lever.**

16.3.3 Mast check

Check the mast and forks to ensure that:

– The fork is not cracked or bent and firmly and correctly mounted on the fork arm.

– Check the oil cylinder and oil pipe for any oil leakage.

– Check the rotation of the rollers.

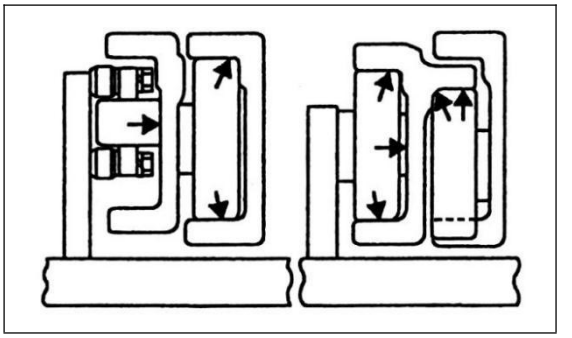
– Check whether there are cracks or deformation in the mast.

– Manipulate the lifting, tilting, and attachment lever to check whether the mast works normally and whether there is any abnormal noise.

16.3.4 Lubrication

16.3.4.1 Mast lubrication

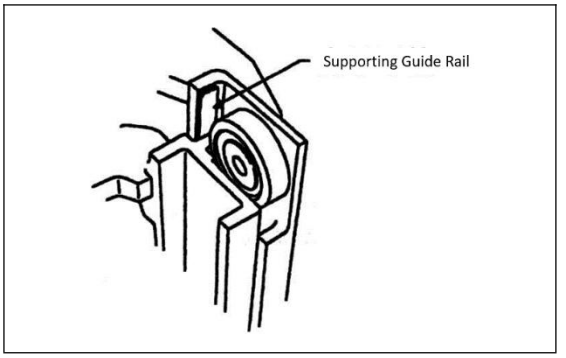
According to the requirements of the regular maintenance and lubrication cycle, the following parts should be lubricated regularly.



Caution:

a）The lubrication cycle should be

adjusted according to the operating conditions. In the busy months of operation, the lubrication cycle should be shortened.



b)In order to ease the forklift truck operation, apply a layer of grease to the contact surface of the lifting guide wheel and the inner & outer mast.

Warning

- **When applying grease, park the forklift on a flat road, turn off the engine and engage the hand brake. Prevent your hands and body from being caught when applying grease, and take care to avoid falling when lubricating at height. Be careful**

16.3.4.2 Chain lubrication

Spray the chain spray directly on the chain or take a brush and apply the lubricating oil to both sides of the chain.

16.3.4.3 Lubricating grease on the following parts

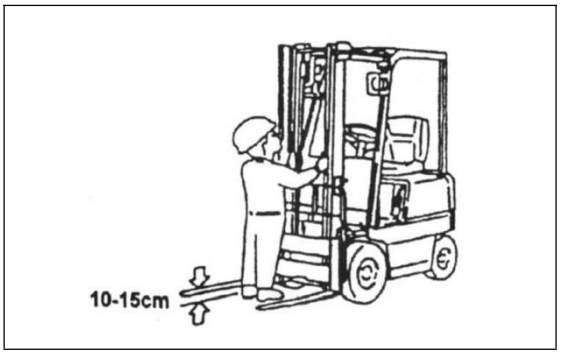
1) Lubrication of mast seat bearing;
2) Lubrication of brake pedal (clutch);
3) Lubrication of steering axle support shaft;
4) Lubrication of steering knuckle spindle;
5) Lubrication of steering linkage pin;
6) Lubrication of steering cylinder pin.

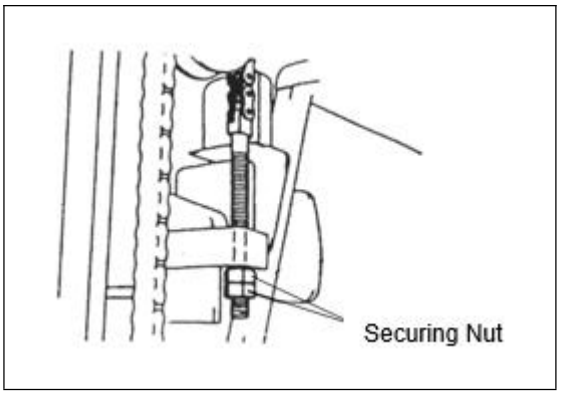
16.3.5 Chain tension check

– Raise the forks by 10cm-15cm with the mast vertical.

– Press the middle of the chain with your thumb to check whether the tension of the left and right chains is the same.

– Tension adjustment: loosen the locknut, screw the nut to adjust the chains so that the tension of the two chains is the same, and then tighten the locknut.





16.3.6 The routine inspection and maintenance of the electrical cable and wiring harness connections

Check for the first 40 hours and every 250 hours thereafter.

Regular inspections on the connections of electrical wiring harness such as the motor AC input terminals (U, V, W), controller DC input (B+, B-, fuse), AC output (U, V, W), main contact of DC contactor (positive input, positive output), terminal (charge +, discharge +/-), disconnect switch contact etc. are required during using the forklifts, which needs to be tightened if loose.

Caution

- **If the fasteners at the connection end of the cable and wiring harness become loose, electric leakage may occur and cause fires with serious consequences!**
- **During the check, the vehicle must be powered off and the battery cables must be disconnected to prevent electric shock!**
- **Operation in humid environments is strictly prohibited!**

16.4 Daily maintenance (200 hours)

Add the following maintenance items in addition to weekly maintenance.

16.4.1 Lubricating grease on the front and rear pins of the tilt cylinder

Wipe the filling point clean and then squeeze out the old grease.

16.4.2 Chain check

(1) Use a caliper and measuring tape to measure chain elongation and replace it when the elongation exceeds 3% of the initial length.

(2) Use a caliper to measure the height of the chain plate, replace it when its wear exceeds 3% of the initial height, and replace other chains on the same mast, do not replace them individually.

(3) Clean and lubricate the chains, when they work in an environment that is severely cold or with any corrosive substances, the cleaning and lubrication cycle should be

reduced to 100 hours.

16.4.3 Drive axle gear oil change

The gear oil should be changed after 200 hours of use for the first time, and then changed once every 2,000 hours.

Park the forklift on horizontal ground.

1) Remove the oil drain plug and drain the oil into a container. Clean the oil drain plug.
2) Install the oil drain plug.
3) Remove the air vent plug and oil level plug. Add oil into the drive axle housing from the curved plug seat hole until the oil overflows from the horizontal plug hole. See the “Refilling Amount”.
4) Install the horizontal plug and curved plug holder.
5) Start the forklift truck. Put the direction control handle into the neutral position.
6) Remove the horizontal plug. Maintain the oil level until the oil overflows.

16.5 Every three month maintenance (500 hours)

Add the following maintenance items in addition to those for every one month and a half.

16.5.1 Clean the oil absorption filter

Park the forklift truck on a horizontal road, lower the forks to the ground, tilt the mast back, pull up the hand brake handle firmly to stop the forklift truck.

①Loosen the bolts on the upper cover assembly of the hydraulic oil reservoir.

②Remove the oil absorption filter from the upper cover.

③Clean the oil absorption filter.

④Fit the oil absorption filter by hand.

⑤Install the upper cover of the oil reservoir and tighten the bolts.

16.5.2 Check the braking master cylinder and wheel cylinder for any leaks or damage.

16.6 Semi-annual maintenance (1000 hours)

Add the following maintenance items in addition to those for the three-monthly maintenance.

16.6.1 Lubrication of the steering wheel locking device

Apply lubricating grease to the steering wheel locking device.

16.6.2 Brake fluid change

(1) Park the forklift truck on a horizontal road in the designated maintenance area, lower the forks to the ground, engage the handbrake handle securely to stop the forklift truck.

(2) Take off the rubber dust cap on the drain port, put the two ends of the prepared transparent hose in the drain port and the waste oil collection bottle respectively, and then use a wrench to loosen the drain port screw counterclockwise while another person on the vehicle repeatedly presses the brake pedal. The brake fluid will be sprayed from the drain port, pay attention to the level of the brake fluid reservoir, and add new brake fluid as the fluid level drops. Tighten the drain port screws after clear brake fluid flows out.

(3) Repeatedly press the brake pedal to the bottom and hold it, while the person under the forklift loosens the screws of the drain port, tighten the screws after clear brake fluid comes out and then asks the person on the forklift to release the brake pedal. Repeat the above operation several times until there are no air bubbles in the released brake fluid. Pay attention to the fluid level in the brake fluid reservoir and add new brake fluid as the level drops.



Caution

- **Prevent dust and water from mixing when adding brake fluid.**
- **Brake fluid is toxic and corrosive and should be rinsed off if you are exposed to it.**

16.6.3 Check the built-in friction block in the side shifter

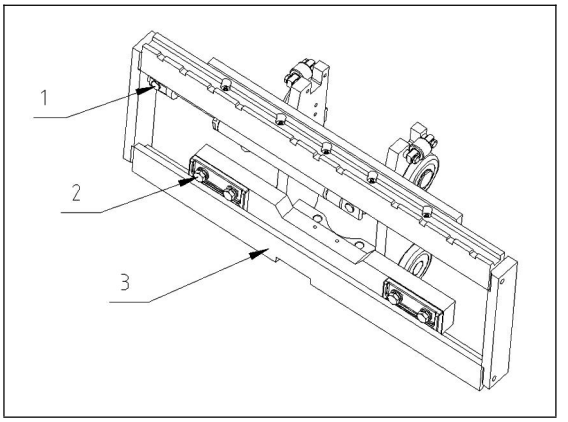
(1) Remove the pin at the piston rod end of the side-shifting cylinder.

(2) Remove the four bolts of the left, right and down friction blocks, and remove the down friction block (pay attention to the adjustment pad inside).

(3) Push the beam under the side-shifting frame forward slightly and lift the side-shifting frame upwards.

(4) Check the thickness of the friction block and replace the friction block with a new

one when the wear relative to the initial size is greater than 2 mm.



16.7 Annual maintenance (2,000 hours)

16.7.1 Hydraulic oil change

– Stop the truck on a flat road.

– Turn the steering wheel right to its limit to leave enough room for the drain plug.

– Tilt the mast to its limit and lower the forks to the ground.

– Pull up the handbrake handle.

– Open the hood, unscrew the hydraulic oil filling cover and pull out the dipstick.

– Place an oil container under the frame, remove the drain plug, and drain out the old oil.

– Take away the oil container, handle the waste oil according to local environmental regulations, do not dump it arbitrarily;

– Screw in the drain screw plug, add new hydraulic fluid and check for leaks.

– Start the truck, lift the forks 3-5 times, and tilt the mast forward/backward 3-5 times.

– Refill it with hydraulic oil to the specified line.

16.7.2 Change the lubricating grease for the entire forklift truck

16.8 Tire replacement

If the tire is damaged, it should be replaced as soon as possible. Jack up the forklift so that the tire is just off the ground, then put a solid wooden block under the frame. Unscrew the wheel nuts and replace the tire with a new one. Tighten the wheel nuts in a symmetrical and crosswise way.

Check the wheel nuts for any looseness after the replacement tire has run for ten hours.

Front wheels

① Park the forklift on level and solid ground.

② Turn the switch on and raise the mast by approximately 100 mm.

③ Place wooden blocks behind the rear wheels to prevent the forklift from moving.

④ Loosen each wheel nut 1-2 turns counterclockwise.

⑤ Tilt the mast backward and place wooden blocks at the sides of the outer mast.

⑥ Tilt the mast forward until the front wheels are lifted off the ground.



Caution

- **Do not loosen the nuts until the front wheels have been lifted off the ground.**

⑦ Place wooden blocks on each front side of the forklift frame to support the forklift and then turn off the switch.

⑧ Remove the wheel nuts and replace the front wheels.

Caution

- **When removing the tire from the hub, the rim bolts and nuts should not be removed until deflating.**
- **The wooden blocks should be solid and strong enough.**
- **When the forklift is only supported with wooden blocks do not lay under it.**

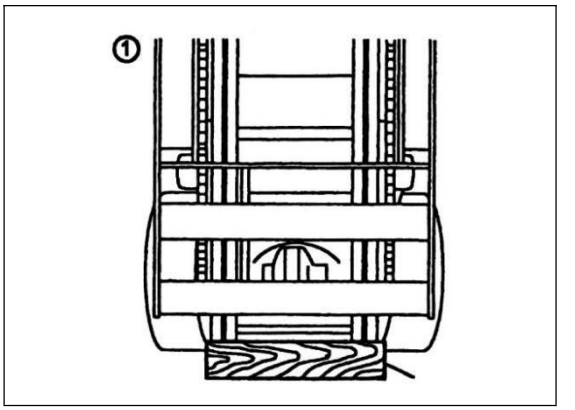
⑨ Put on the nuts in sequence as shown in the diagram and lock them temporarily.

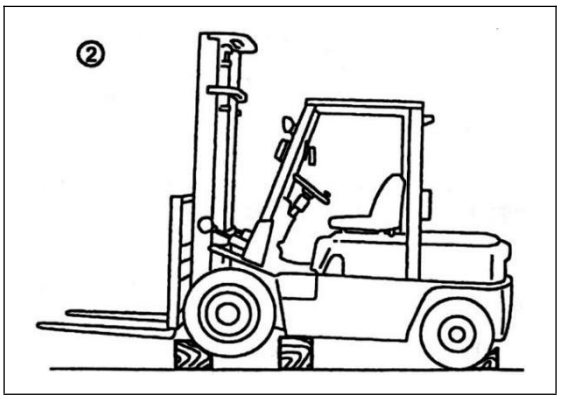
⑩ Turn on the switch and remove the wooden blocks from the forklift frame.

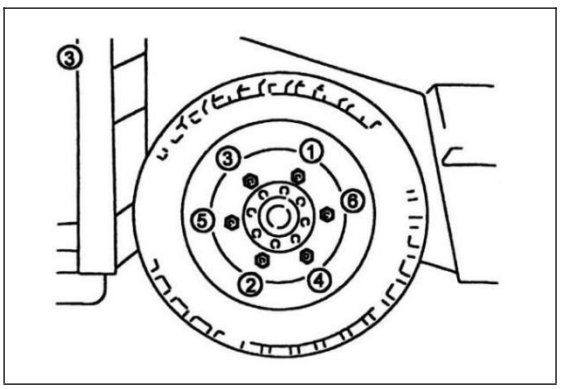
⑪ Tilt the forklift frame backward so that the forklift is slowly lowered, and then take out the wooden blocks under the forklift frame and at the rear wheels.

⑫ Tighten the tire bolts symmetrically and crosswise in sequence.

⑬ Adjust the tire pressure to the specified value.







Rear wheel tires

① Park the forklift on level and solid ground.

② Engage the handbrake and place wooden blocks behind the front wheels to

prevent the forklift from moving.

③ Place the jack at the bottom cut of the counterweight as shown in the diagram.

Note: Make sure the minimum bearing weight of the jack is 2/3 of the total weight of the forklift truck.

④ Loosen the nuts on the wheel 1-2 turns counterclockwise.

Warning

- **Do not remove the nuts until the rear wheels are lifted off the ground.**

⑤ Slowly lift the forklift with a jack until the rear wheels are completely off the ground. Place wooden blocks on each rear side of the forklift frame to support the forklift as shown in the diagram.

⑥ Remove the wheel nuts and replace the rear tires.

Warning

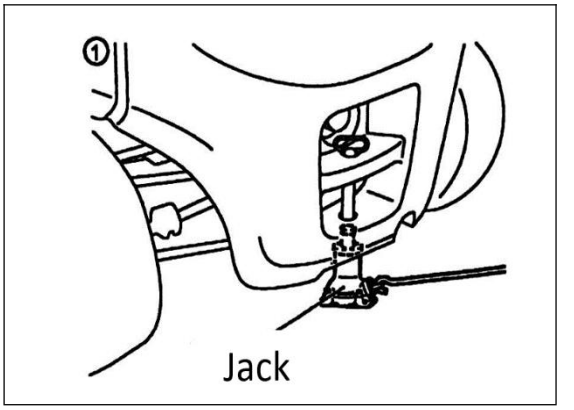
- **When removing the tire from the hub, the rim bolts and nuts should not be removed until deflating.**
- **Make sure that the wooden blocks used to support the forklift are solid and strong enough.**
- **When the forklift is only supported with wooden blocks, do not lay under it.**

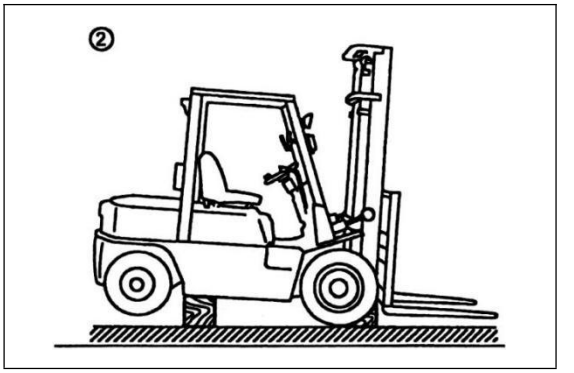
⑦ Put on the nuts in sequence as shown in the diagram and lock them temporarily.

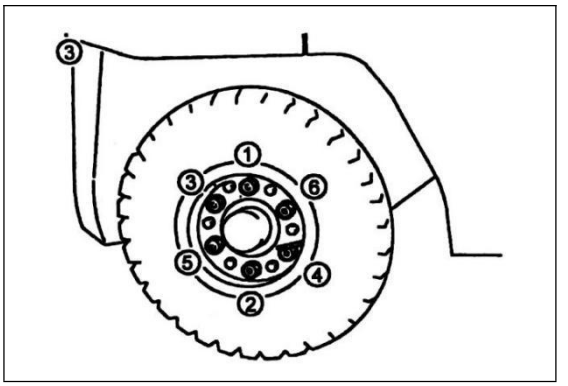
⑧ Remove the wooden blocks under the frame, lower the forklift slowly to the ground and remove the wooden blocks and jack behind the front wheels.

⑨ Tighten the nuts to the specified torque in a crosswise manner. See the "Tightening Torque Table".

⑩ Adjust the tire pressure to meet the specified parameters.






3
1
3
6
5
4
2

16.9 Fuse

(1)Before replacing any defective fuse or relay, please investigate the cause of failure.

(2)Replace the fuse with a new one of the correct specification.

Check and replace the fuse

Operating steps:

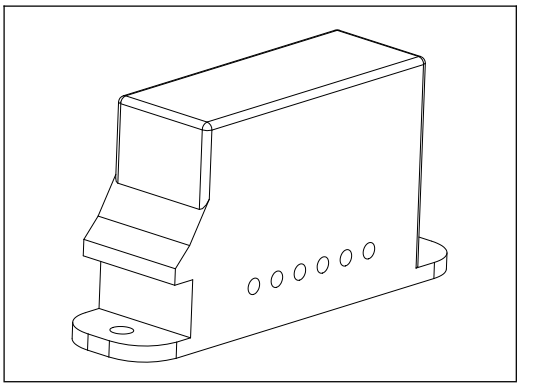
– Park the forklift according to rules and regulations,Power off the entire vehicle.

– Open the right door and unplug the battery.

– Open the fuse box cover.

– Check the fuses for any damage, and replace the damaged fuse promptly.

– Close the fuse box cover.



Caution

- **Unplug the battery before any operations on the electrical system of the forklift truck.**
- **Take off the metal trim before any operations on the electrical system of the forklift truck.**
- **When replacing a fuse, please select a new fuse of the same rating as the original.**

16.10 Others

16.10.1 Oil tank check

Warning

- **All work must be done by an authorized professional during the inspection. Ensure adequate ventilation if cleaning the oil tank indoors.**
- **Do not use tools that may cause sparks, heat or static electricity.**

1.Visually inspect all sides of the hydraulic tank to ensure that there is no deformation or scratching.

2.Remove the retaining bolts and rubber gaskets on the tank cover, check the tank flange surface,

and use a file or other tools to polish the surface if there are any bumps.

3.Remove the retaining bolts and rubber gaskets on the tank cover, check the inner cavity with a flashlight to ensure that there are no iron chips, dust or other solid impurities in the oil tank.

4.Check the oil drain screw plug and replace it promptly if there is any damage.

5.Repair or replace the hydraulic oil tank if it is broken or leaking.

Checks, cleaning and replacement of the return oil filter and oil suction filter

Park the forklift truck on a flat surface, lower the forks to the ground, tilt the mast back and power off.

1) Loosen the bolts on the upper cover assembly of the hydraulic oil tank.
2) Remove the return oil filter from the upper cover.
3) Mount the new return oil filter by hand.
4) Remove the filter screen from the oil tank.
5) Mount a new filter screen by hand.
6) Mount the upper cover of the oil tank and tighten the bolts.
7) Power on and operate the hydraulic system so that the entire system is primed with hydraulic oil. Check for any leakage.
8) Power off and check the oil level. Retract all cylinder rods so that the oil level remains between the scales of the dipstick.

16.10.2 Truck cleaning

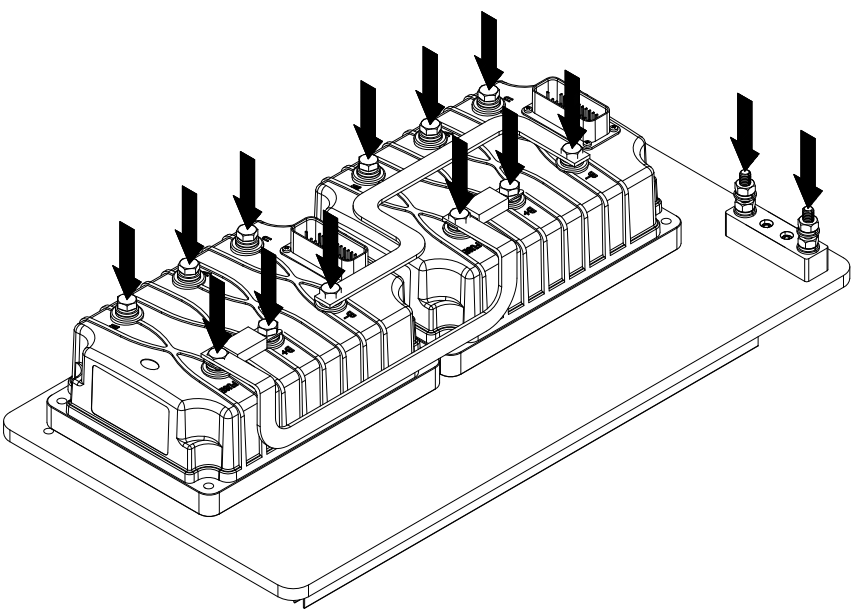
Warning

- **Do not clean the truck with flammable liquids!**
- **Power off the forklift truck and unplug the power supply before cleaning the truck.**
- **Before cleaning operations, all necessary safety measures must be taken!**
- **Do not directly clean the electrical components with water!**
- **Do not directly clean the pedal pad, hood assembly, dashboard assembly or other parts containing electrical components with a high-pressure water gun.**
- **Make sure to cover the electrical components in advance before cleaning the truck with a high-pressure water gun, otherwise, the electrical system will be damaged.**

16.10.3 The routine inspection and maintenance of the electrical cable and wiring harness connections

16.10.3.1 Controller contact

Cables, fuses, contactors, copper busbars, terminals and other electrical components are all connected by threads to realize a closed loop of the circuit, If the connection loosens, it is prone to leakage and cause serious accidents like fire etc., so it is necessary to check the fasteners of these parts. The following are some models' controller for reference, the arrow indicates the controller terminals, and the controller appearance is subject to the actual object.

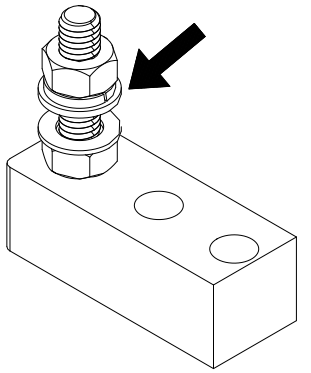


Check the controller for loose threaded part

Power off the forklift and unplug the battery discharge cable for check. Check the connection for looseness by a visual check or wearing gloves (wear insulating gloves for high voltage), and tighten it if loose. The tightening torque is shown in Table 1 Tightening Torque Table for Threaded Connections at Electrical Component End.

16.10.3.2 Terminal

Forklifts are sometimes installed with a separate terminal for wiring and the threads must be checked regularly for looseness.



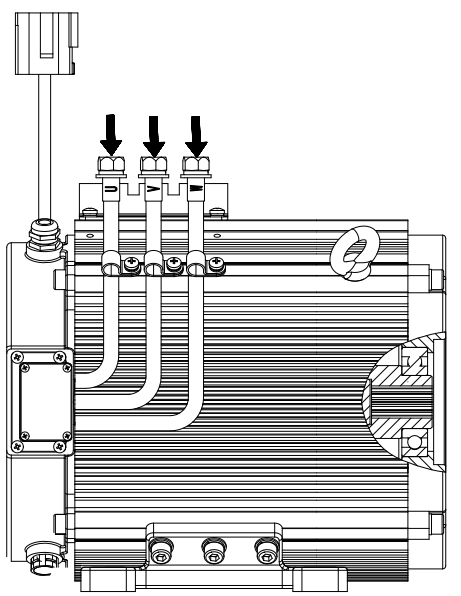
Check the terminal for loose threaded part

The inspection process is performed as follows:

Power off the forklift and unplug the battery discharge cable for check. Check the connection for looseness by a visual check or wearing gloves (wear insulating gloves for high voltage), and tighten it if loose. The tightening torque is shown in Table 1 Tightening Torque Table for Threaded Connections at Electrical Component End.

16.10.3.3 Motor U, V, W terminals

Usually there are U, V, W terminals on the motor to connect the cables, which should be regularly checked for loose threads. The following are some models' motor for reference, the arrows indicate the motor U, V, W terminals, and it is subject to the actual object.

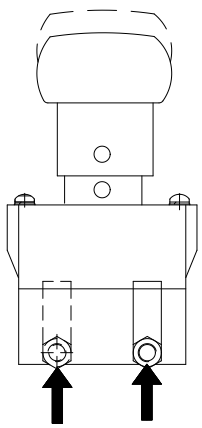


Check the motor terminals for loose threaded part

Power off the forklift and unplug the battery discharge cable for check. Check the connection for loose by a visual check or wearing gloves (wear insulating gloves for high voltage), and tighten it if loose. The tightening torque is shown in Table 1 Tightening Torque Table for Threaded Connections at Electrical Component End.

16.10.3.4 Disconnect switch

Forklifts installed with disconnect switches are sometimes connected with thread, which should be checked regularly for loose threads.



Check the disconnect switch for loose threaded part

16.10.3.5 Electrical wiring harness connector

Wiring harness connectors, cable connections, and battery connectors of the forklift must be checked regularly for looseness. If it is loose, adjust it to ensure a reliable connection.

16.10.3.6 Socket, cable connector, charging socket

Some of the charging socket, socket and cable connector are mounted on the body or lithium-ion battery by bolts or screws, which should be checked regularly and tightened if loose. See Table 3 for Bolt Tightening Torque Table.

16.10.3.7 Tightening Torque Table for Threaded Connections at Electrical Component End

Name of check part	Bolt diameter	Recommended tightening torque（Nm）	Bolt grade	Base
Controller bolt	M6	10（9–11）	8.8	Aluminum

Torque				alloy
	M8	15（13–17）	8.8	Aluminum alloy
Terminal	M8	11（10–12）	/	Composite insulating material
Fuse assembly	M8	11（10–12）	/	Composite insulating material
Contactor	M8	11（10–12）	/	Composite insulating material
Contactor	M10	14（13–15）	/	Composite insulating material
Fuse	M6	10（9–11）	/	/
Fuse	M8	15（13–17）	/	/
Motor terminal block bolts (U, V, W)	M6	6（5–6）	/	Composite insulating material
	M8	11（10–12）	/	Ceramics
	M10	23 (21–25)	/	Ceramics
	M12	26 (22–30)	/	/
	M16	55 (50–60)	/	/
Unite motor (U, V, W)	M8	20（18–22）	/	Ceramics
ZAPI (U, V, W)	M10	11（10–12）	/	
Liaoyuan motor (U, V, W)	M4	11（10–12）	/	

16.11 Regular maintenance schedule

16.11.1 Lithium-ion battery

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Lithium-ion battery	Installation and fastening of lithium-ion batteries		○	○	○	○	○	○
	Cleaning of lithium-ion battery charging sockets				○	○	○	○
	Check whether the contact of the lithium-ion battery charging socket is damaged or corroded		○	○	○	○	○	○
	Check if there is water on the contacts of the lithium-ion battery charging socket		○	○	○	○	○	○
	Check whether the dust cover of the lithium-ion battery charging socket is in good condition				○	○	○	○
	Check whether the lithium-ion battery casing is damaged		○	○	○	○	○	○
	Battery level		○	○	○	○	○	○
	Check whether it is kept safe from smoke and flames		○	○	○	○	○	○
	Loose connection between battery charge/discharge cable and socket			○(for the first time)	○	○	○	○

16.11.2 Controller

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Controller	Check the contacts for any wear					○	○	○
	Check whether the mechanical motion of the contactor is abnormal					○	○	○
	Check whether the micro switch works normally					○	○	○
	Check whether the connections between the motor, battery and power unit are in good condition					○	○	○
	Check whether the fault diagnosis system of the controller is normal						First time (4,000h)	
Controller contact	Tightness of thread installation	Torque wrench		○（for the first time）	○	○	○	○
	There is no risk of touch short circuit between the copper plate and each pole column.			○（for the first time）	○	○	○	○
	Whether the cable sheath of each pole column and terminal column is complete and suitable.			○（for the first time）	○	○	○	○

16.11.3 Motor

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Motor	Clean the motor enclosure				○	○	○	○
	Clean and replace the bearings						○	○
	Check the carbon brushes and rectifiers for any wear; check whether the spring force is normal				○	○	○	○
	Check whether the wiring is correct and secure				○	○	○	○
	Clear away the carbon powder in the commutator slot and on its surface					○	○	○
	Check for any abnormal vibration or noises and check whether the base is fixed securely				○	○	○	○
Motor U, V, W terminals	Tightness of thread installation	Torque wrench		○(for the first time)	○	○	○	○

16.11.4 Transmission system

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Transmission drive axle (front axle)	Check for any noise from the transmission		○	○	○	○	○	○
	Check for any leakage		○	○	○	○	○	○
	Change the gear oil				×(for the first time)	○	○	×
	Check the hub bearing for looseness and noise.			○	○	○	○	○
	Change the front wheel bearing lubricating grease						×	×
	Check for any leakage		○	○	○	○	○	○
	Check the axle for any deformation, cracks or damage				○	○	○	○
	Check all fasteners for any looseness		○	○	○	○	○	○
	Clean and dust the exterior		○	○	○	○	○	○
	Check the tightening torque of the hub bolts	Torque wrench	○	○	○	○	○	○
	Check the tightness of the bolts in the joints of the vehicle frame				○	○	○	○

16.11.5 Wheels (front/rear)

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Tires	Inflation pressure	Air pressure gauge	○	○	○	○	○	○
	Wear, cracks or damage		○	○	○	○	○	○
	Check the tires for any nails, gravel or other foreign objects.				○	○	○	○
	Check the rim for any damage		○	○	○	○	○	○
	Check the split rim bolts for any looseness	Inspection hammer	○	○	○	○	○	○

16.11.6 Steering system

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Steering wheel	Check the clearance		○	○	○	○	○	○
	Check for looseness in the axial direction		○	○	○	○	○	○
	Check for looseness in the radial direction		○	○	○	○	○	○
	Check the operating condition		○	○	○	○	○	○
Commutator	Check the bolts for looseness				○	○	○	○
	Check for oil leakage at the interface				○	○	○	○
Rear axle steering knuckle	Check the pin for looseness				○	○	○	○
	Check for bends, deformations, cracks or damage				○	○	○	○
	Check the installation condition	Inspection hammer			○	○	○	○
Steering cylinder	Check the operating condition		○	○	○	○	○	○
	Check for any leakage		○	○	○	○	○	○
	Check for any looseness in the assembly and joints				○	○	○	○

Rear wheel bearing	Replace the lubricating grease						×	×
Angle sensor (if applicable)	Check the tightening of bolts				○	○	○	○
	Check the wiring harness for looseness or damage.		○	○	○	○	○	○

16.11.7 Braking system

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Brake pedal	Idle running	Calibrated scale	○	○	○	○	○	○
	Pedal travel		○	○	○	○	○	○
	Check the operating condition		○	○	○	○	○	○
	Check the brake line for air		○	○	○	○	○	○
Braking	Check whether the brake is safe and reliable, and has enough travel		○	○	○	○	○	○
	Operating performance		○	○	○	○	○	○
Rod or dragline	Operating performance				○	○	○	○
	Check the joints for looseness				○	○	○	○
	Check for any wear in the transmission joints					○	○	○
Pipe	Check for any damage, leaks or cracks				○	○	○	○
	Check the joints and clamping parts for any looseness				○	○	○	○
Brake master cylinder and wheel cylinder	Check for any leakage		○	○	○	○	○	○
	Check the oil level, change it if necessary		○	○	○		×	×
	Operating condition of brake master cylinder and wheel cylinder					○	○	○
	Check the brake master cylinder and wheel cylinder for any leaks or damage					○	○	○
	Check the brake master cylinder and wheel cylinder piston cup and non-return valve for any wear or damage and replace if necessary.						×	×
Brake drum and brake shoe	Are the brake drum mounting parts loose?	Detection hammer	○	○	○	○	○	○
	Friction plate wear	vernier calipers					○	○
	Brake shoe action situation		○	○	○	○	○	○
	Corrosion of fixing pin						○	○

	Damage of return spring	dividing rule					○	○
	Check whether the clearance is appropriate when the self-adjusting device is operated.						○	○
	Wear and damage of brake drum						○	○
Brake base plate	Floor deformation						○	○
	crack	Flaw detection					○	○
	Loose during installation	Detection hammer					○	○

16.11.8 Hydraulic system

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Hydraulic oil tank	Check the oil level or change it and replace the oil filter		○	○	○	○	○	×
	Clean the oil absorption filter						○	○
	Clear away any foreign objects						○	○
Control valve stem	Check the joints for looseness		○	○	○	○	○	○
	Check the operating condition		○	○	○	○	○	○
Multi-way valve	Check for any oil leakage		○	○	○	○	○	○
	Check the operating condition of the safety valve and tilt self-locking valve				○	○	○	○
	Measure the safety valve pressure	Oil pressure gauge	○	○	○	○	○	○
Pipe joint	Check for any leakage, looseness, fracture, deformation or damage				○	○	○	○
	Replace the pipe							× 1000h-2000h
Hydraulic pump	Check the hydraulic pump for any leakage or noise		○	○	○	○	○	○
	Check the driving gear of the hydraulic pump for any wear and tear				○	○	○	○
Hydraulic oil pump gearbox (if fitted)	Check for any leakage				○	○	○	○
	Add more gear oil				○	○	× (First time)	×

16.11.9 Lifting system

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Chain	Check the chain tension and check for any deformation, damage or rust		○	○	○	○	○	○
	Lubricate the chain				○	○	○	○
	Check the riveted pin for any looseness				○	○	○	○
	Check the chain wheel for any deformation or damage				○	○	○	○
	Check the chain wheel gear for any looseness				○	○	○	○
Attachments	Check the operating status				○	○	○	○
Lifting cylinder and tilting cylinder	Check the piston rod, the thread and joint for any looseness, deformation or damage	Inspection hammer	○	○	○	○	○	○
	Check the operating condition		○	○	○	○	○	○
	Check for any leakage		○	○	○	○	○	○
	Check the pin and steel-backed bearing of the cylinder for any wear or damage				○	○	○	○
Forks	Check the forks for any damage, deformation or wear				○	○	○	○
	Check fork positioner for any damage or wear					○	○	○
	Check the welded part of the hook at the root of the forks for any cracks or wear				○	○	○	○
Mast and fork arm	Check the welded part between the inner/outer mast and beam for any cracks or damage				○	○	○	○
	Check the welded part between the tilt cylinder frame and mast for any poor welding, cracks or damage				○	○	○	○

	Check the inner/outer mast for any poor welding, cracks or damage				○	○	○	○
	Check the fork arm for any poor welding, cracks or damage				○	○	○	○
	Check the roller for any looseness				○	○	○	○
	Check the bearing shaft bush of the mast for any wear or damage						○	○
	Check the bearing cap bolts of the mast for any looseness	Inspection hammer			○ (Only for the first time)		○	○
	Check the bolts at the top of the lifting cylinder piston rod and on the link plate for any looseness	Inspection hammer			○ (Only for the first time)		○	○
	Check the roller, roller shaft and welded part for any cracks or damage				○	○	○	○

16.11.10 Others

Check Item	Method & Content	Tools	Cycle					
			8h	40h	200h	500h	1000h	2000h
Overhead guard and load-backrest	Check whether they are secured		○	○	○	○	○	○
	Check for any deformation, cracks or damage		○	○	○	○	○	○
Steering indicator light	Check the operating and installation condition		○	○	○	○	○	○
Horn	Check the operating and installation condition		○	○	○	○	○	○
Lights and bulbs	Check the operating and installation condition		○	○	○	○	○	○
Reverse buzzer	Check the operating and installation condition		○	○	○	○	○	○
Dashboard	Check whether it works normally		○	○	○	○	○	○
Wires	Check the wire harness for any damage or looseness			○	○	○	○	○
	Check for any looseness in circuit connections				○	○	○	○

Rearview mirror	Check for any dirt or damage		○	○	○	○	○	○
	Check the rear visibility		○	○	○	○	○	○
Driver's seat	Check the bolts for looseness or damage					○	○	○
	Check the safety belt for any looseness, damage or breakage		○	○	○	○	○	○
Forklift body	Check the frame and beam for any damage or cracks						○	○
	Check the rivets and bolts for any looseness						○	○
Apply lubricating grease or change the oil	Check the lubrication of the chassis after cleaning			○	○	○	○	○
	Check the rivets and bolts for any looseness		○	○	○	○	○	○
Counterweight	Check the tightness of the bolts in the joints of the vehicle frame					○	○	○
Controller contact	Tightness of thread installation	Torque wrench		○(for the first time)	○	○	○	○
	There is no risk of touch short circuit between the copper plate and each pole column.			○(for the first time)	○	○	○	○
	Whether the cable sheath of each pole column and terminal column is complete and suitable.			○(for the first time)	○	○	○	○
Disconnect switch	Tightness of thread installation	Torque wrench		○(for the first time)	○	○	○	○
Vehicle wiring harness	Damaged wiring harness, loose connection			○(for the first time)	○	○	○	○
	Loose circuit connection			○(for the first time)	○	○	○	○
Socket, cable connector, charging socket	Loose fasteners				○	○	○	○

Seat Sensing System (Optional)	working situation		○	○	○	○	○	○
	Loose connection of seat harness		○	○	○	○	○	○

16.12 Replace the key safe parts termly

- **Some parts are difficult to find damage or damage through regular maintenance. In order to fully improve the safety, users should regularly replace the parts according to the following table.**
- **If these parts are abnormal before the replacing time, they should be replaced immediately.**

Key safe part's description	Service life (year)
Brake hose or tube	1～2
Lifting system hydraulic hose	1～2
Lifting chain	2～4
Hydraulic system high-pressure rubber hose	2
Brake fluid cup	2～4
Brake master cylinder head and dust cover	1
Hydraulic system internal seal, rubber part	2
Steering axle rubber pad	4

16.13 Bolts tightening torque table

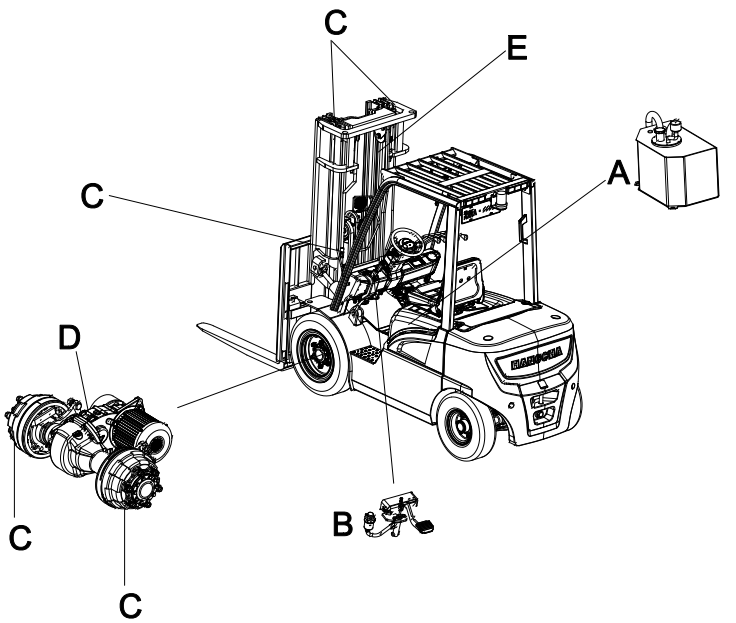
Unit:N·m

Nominal Diameter	Grade			
	4.6	5.6	6.6	8.8
6	4～5	5～7	6～8	9～12
8	10～12	12～15	14～18	22～29
10	20～25	25～31	29～39	44～58
12	35～44	44～54	49～64	76～107
14	54～69	69～88	83～98	121～162
16	88～108	108～137	127～157	189～252
18	118～147	147～186	176～216	260～347
20	167～206	206～265	245～314	369～492
22	225～284	284～343	343～431	502～669
24	294～370	370～441	441～539	638～850
27	441～519	539～686	637～784	933～1244

Note: Grade 8.8 bolts are used for all key joints.

The bolt grade can be found in the head, if not it is Grade 8.8.

16.14 Forklift used oil and lubrication



Code	Name	Specifications	Fuel quantity（L）	remarks
A	Hydraulic oil	Common environment：L-HM32 Cold storage/alpine environment：L-HV32	26	Hydraulic oil tank
B	Brake fluid	Choice HZY3 brake fluid（Add before delivery） or DOT3 brake fluid	0.6	Braking oiler
C	Lubricating grease	Automotive general purpose lithium-based grease		Lubricating part and lubricating nozzle
D	Gear oil	85W/90（GL-5）		Drive axle and gearbox
E	Anti-rust oil	Chain spray or engine oil		Chain
F	Industrial vaseline	2#		Battery terminal
G	Gear oil	75W/90 or 85W/90	45-60mm	Hydraulic deceleration box

16.15 Checks and maintenance of the control system assemblies

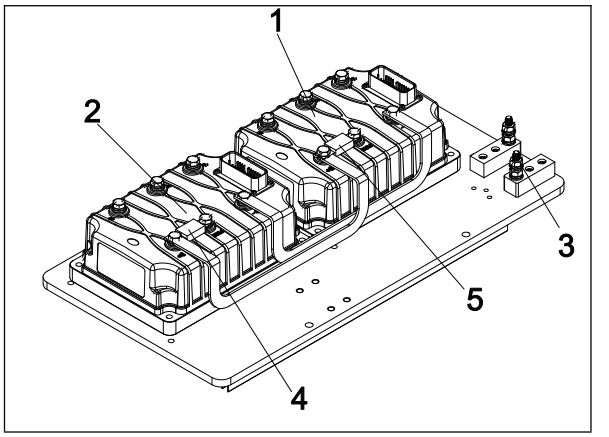
Operating steps:

– Park the forklift truck according to rules and regulations.

– Open the right door and unplug the battery.

– Open the cover of the counterweight.

Check, replace and adjust components of the control system assemblies when they are exposed.



S/N	Name	Control Circuit	Specifications
1	Oil pump controller	Control the oil pump motor	350A
2	Traction Controller	Control the driving motor	450A
3	Binding post	/	
4	Fuse	Traction Controller	350A
5	Fuse	Oil pump controller	250A

Caution

- **Unplug the battery before any operations on the electrical system of the forklift truck.**
- **The controller is equipped with an accumulator. Do not touch the position between B+ and B- to prevent an electric shock. In order to check or clean the controller, please power off first, and then a load device (such as resistance and bulb) should be installed between B+ and B- to discharge the capacitor inside the controller.**
- **Take off the metal trim before any operations on the electrical system of the forklift truck.**
- **When replacing a fuse, please select a new fuse of the same rating as the original.**

17 Parking and storage

17.1 Daily storage

– Park the forklift at the designated place and use wedge blocks to support the wheels.

– Place the gearshift lever in the neutral position.

– Engage the handbrake lever.

– Turn off the key switch and operate the multi-valve handle several times to release the remaining pressure in the oil cylinder and pipeline.

– Unplug the power supply.

– Remove the key and keep it in a safe place.

– Forklift trucks specially designed for cold storage warehouses should not be turned off and parked inside the warehouse.

17.2 Long-term storage

Make the following maintenance and checks in addition to maintenance as required in Daily Storage.

– Unplug the battery to prevent discharge and store it in a dark place.

– Apply anti-rust oil to exposed parts such as the piston rod and shafts that may rust.

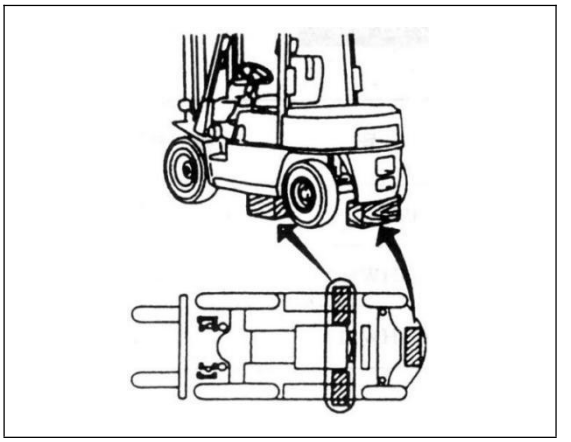
– Cover the ventilation holes and other places where water can enter.

– Cover the whole forklift.

– Fill all lubrication points with oil (grease).

– Use wooden blocks for support under the vehicle body and counterweight to reduce the loading on the rear wheels.

– Cover the truck if it is parked outside.



– Run the forklift truck once a week. Lift the forks to maximum height several times.

– Check the specific gravity and level of electrolyte once a month.

– Consistent charging should be done once a month.

Warning

- **The wooden block must be solid and should be strong enough to support the weight of the forklift truck.**
- **Do not use blocks higher than 300 mm.**
- **Raise the forklift just enough to place it on the supports**
- **Place blocks of the same size under the left and right sides of the forklift.**

● **After supporting the forklift with the blocks, push the forklift back and forth & left and right to check whether it is stable.**

17.3 Operation after long-term storage

– Remove the anti-rust oil on exposed parts.

– Drain the gear oil from the drive axle and transmission, clean the inside and add new oil.

– Charge the battery, mount it on the truck and connect the battery leads.

Carefully carry out the pre-start inspection to check the starting, forward, reverse, steering, lifting, lowering, front and rear tilting functions of the forklift truck.

18 Use, installation and safety rules for attachments

Hangcha selects attachments, such as the flat clamp, rotating clamp, roll clamp, string rod, side shifter and others in accordance with ISO2328: Fork Lift Trucks-Hook-on Type Fork Arms and Fork Carriers-Mounting Dimensions.

18.1 Installation of attachments

– Without the technical permission of the company, it is strictly prohibited to modify the safety and performance of the forklift truck attachments.

– The actual load-carrying capacity shall be subject to the rated load-carrying capacity of the forklift truck, the load-carrying capacity of attachments, or the overall load-carrying capacity of the whole truck, whichever is the smaller. Generally speaking, the overall bearing capacity of the complete truck is the lowest of the three. “Bearing capacity of accessories” is a calculated value for the force applied on accessories.

– The installation and positioning should be reasonable, reliable and safe, to avoid attachments sliding from side to side along the fork arm carrier of the forklift truck during use.

– After the attachments are mounted, if there is a upper hook block, it should be embedded in the notch of the upper beam, so that the offset between the center line of attachments and that of the fork arm carrier is less than 50 mm; otherwise, it will affect the lateral stability of the forklift truck.

– For accessories with a rotation function, (roll clamp, soft clamp, multi-purpose rigid arm clamp, bucket clamp) after hanging and installation, stop blocks should be welded on both sides of the joint between the upper beam

of the fork arm carrier and the accessories to prevent sliding when operating them.

– When accessories with lower hook positioning are installed, the joint spacing between the lower hook and the lower beam of the fork arm carrier should be adjusted appropriately.

18.2 Use of attachments

– Become familiar with the relevant content on the nameplate of the forklift truck, read the relevant operation manual carefully before use (especially the user manual and installation manual of the professional attachment company), and be trained and qualified to operate the forklift truck attachments.

– Fully understand the basic performance and operation methods of the forklift attachments, especially the allowable load, lift height, cargo size and the fitting range of attachments.

– When operating forklift truck attachments with multiple functions, such as side shift, clamping or rotation, do not perform multiple operations at the same time. One action can be carried out only after the other one is completed.

– Forklift trucks provided with accessories must not be driven when the cargo is at a high level; when the cargo volume is too large do not drive the forklift truck forwards; when transporting cargo, ensure that cargo is 300 mm above the ground, and the mast is tilted backward;

– The weight of the cargo should not exceed the limit of the combined bearing capacity of the forklift truck and attachments. Try not to load eccentrically at high cargo positions. Attachments with side shift function can only be operated for a short time. Eccentric load is strictly limited to 100 mm on the left and right (the side shift amount of the side shifter above 5 tons (including 5 tons)) is within the range of ±150 mm).

– Except for the driver's position which is protected by the overhead guard, it is strictly prohibited to stand within 2 meters of the projection area under attachments and cargo to avoid injury.

– It is strictly prohibited to engage the emergency brake when the forklift truck with attachments is running and it is required to

drive slowly with a load.

– Do not allow external forces to act on the truck when the attachment is working; do not use the attachment for unsuitable purposes, the normal working range of the attachment must not be exceeded.

– Do not use attachments for unsuitable purposes, do not exceed the normal scope of work of attachments.

– When attachments are faulty, they should not be used until the fault has been eliminated.

18.3 Checks and maintenance of the attachments

– Check whether the spacing between the lower beams of the forks of the forklift truck and the lower hooks of attachments conform to the requirements of the attachment manual.

– Check whether the upper hook is properly embedded in the groove of the fork arm carrier of the forklift truck.

– The upper and lower sliding support surfaces should be lubricated with general automotive lithium-based grease every 500 hours.

– Check fasteners for tightness.

– Regularly check whether hydraulic circuit connections are loose and whether the hose is damaged. If it is damaged, it must not be used before repair.

– Regularly check whether the transmission or rotating elements of attachments are worn or stuck, and replace them promptly if any damage or defect is found.

– In the case of dynamic loads, check whether the working elements of the attachments are normal, whether the working pressure of the attachments is normal, and whether the attachments work normally. If not, it is necessary to check the hydraulic circuit, find any leaking elements, and replace the seals or the whole circuit.

19 Relevant safety command and standard (CE models)

The model with CE certification which accords to the following directive and standard: Machinery Directive 2006/42/EC *(The European Council of the Laws of the Member States concerning Machinery)*, Noise Directive 2000/14/EC *(Directive of the Laws of the Member States concerning Outdoor Equipment Noise Radiation),* EN ISO 12100:2010 *(Safety of machinery — General principles for design — Risk assessment and risk reduction),* , EN ISO 3691-1:2015+A1:2020, EN 16307-1:2020,

EN 1175:2020, EN 12053:2001+A1:2008, EN 13059:2002+A1:2008, etc.

coordinative standards.

- Main safety factors accord with Machinery Directive 2006/42/EC, EN ISO 12100:2010,

EN ISO 3691-1:2015+A1:2020, EN1175:2020, EN 16307-1:2020.

- Noise is measured according to EN 12053:2001+A1:2008.
- Vibration parameter is measured according to EN 13059:2002+A1:2008.
- Electromagnetism compatibility is measured according to EN 12895:2015+A1:2019, and meet with 2014/30/EU Directive.

Static test coefficient for lifting attachment is 1.33.

Model	Whole-body Vibration m/s^2	Sound pressure level at the operator's position dB(A)	Sound power level dB(A)
CPD15-XEY2-SI CPD18-XEY2-SI CPD20-XEY2-SI CPD20-XEXY2-SI	0.68	65	85
CPD25-XEY2-SI CPD30-XEY2-SI CPD35-XEY2-SI CPD30-XEY2H1-SI CPD35-XEY2H1-SI	0.70	66	86
CPD38-XEY2-SI CPD38-XEY2H1-SI	0.72	66	86
CPD40/45-XEY2-SI	0.74	72	89
CPD50-XEY2-SI CPD50-XEXY2-SI	0.75	72	89
CPD40/45-XEY2-SIGW	0.74	72	89
CPD50-XEY2-SIGW CPD50-XEXY2-SIGW	0.75	72	89
CPD20-XEY2H-SI CPD25-XEY2H-SI	0.67	64	84
CPD30-XEY2H-SI CPD35-XEY2H-SI	0.69	65	85
CPD38-XEY2H-SI	0.69	66	86
CPD20-XEY2H2-SI	0.67	68	88
CPD25-XEY2H2-SI	0.67	68	88
CPD30-XEY2H2-SI	0.70	68	88
CPD35-XEY2H2-SI	0.70	68	88
CPD38-XEY2H2-SI	0.70	68	88
CPD15-XEY2HA-SI	0.68	66	85
CPD18-XEY2HA-SI			
CPD20-XEY2HA-SI			
CPD20-XEXY2HA-SI	0.70	63	85
CPD25-XEY2HA-SI			
CPD30-XEY2HA-SI			
CPD35-XEY2HA-SI		68	84
CPD38-XEY2HA-SI			

EC DECLARATION OF CONFORMITY

Original Declaration

MANUFACTURER:

Name: HANGCHA GROUP CO., LTD.

Address: 666 Xiangfu Road, Lin'an District, Hangzhou City, Zhejiang Province 311305, P.R. China

TECHNICAL DOCUMENT WAS COMPILED BY:

Name: Andy Yang

Address: Die das technische Datenblatt erstellt hat Mariechen-Graulich-Straße 12a,
65439 Flörsheim am main Germany Tel: 0049-61453769188

HEREBY DECLARES THAT THE PRODUCT DESCRIBED BELLOW:

Name: Electric Forklift Truck

Model: CPD15/18/20/25/30/35/38/40/45/50-XEY2-SI,CPD20//40/50-XEXY2-SI CPD20/25/30/35/38-XEY2H-SI,CPD30/35/38-XEY2H1-SI,CPD20/25/3-/35/38-XEY2H2-SI,CPD15/18/20/25/30/35/38-XEY2HA-SI,CPD20-XEXY2HA-SI,CPD27-XEY2HA-SI

Serial No.

COMPLIES WITH THE PROVISIONS OF THE FOLLOWING EUROPEAN DIRECTIVES

2006/42/EC Machinery Directive
2014/30/EU EMC Directive
2014/35/EU LVD Directive

COMPLIES WITH THE PROVISIONS OF THE FOLLOWING STANDARDS

EN ISO 12100:2010
EN 1175:2020
EN 12053:2001+A1:2008
EN 12895:2015+A1:2019
EN ISO 3691-1:2015+A1:2020
EN 16307-1:2020
EN 13059:2002+A1:2008

Place: Hangzhou, Zhejiang, P.R. China
Date:
Signature and stamp:
Name:
Position:

According to Annex II 1.A of the Directive 2006/42/EC

Maintenance Record Sheet

Date	Maintenance Content	Serviceman

HANGCHA GROUP CO., LTD.

■ Address For: OVERSEAS USERS
■ Address: 666 Xiangfu Road, Lin'an Economic Development Zone,Zhejiang, China
■ Fax: 0086-571-88926789 0086-571-88132890 ■ ZIP:311305
■ Web: http://www.hcforklift.com ■ E-mail: sales@hcforklift.com