HANGCHA

X *Series*

ELECTRIC FORKLIFT TRUCK

CPD60/70/80/90/100-XC4(-I)
CPD60/70/80/90/100-XC5(-I)
CPD60/70/80/90/100-XD3(-I)
CPD80-XLC4(-I)
CPD80-XLC5(-I)
CPD80-XLD3(-I)

OPERATION AND MAINTENANCE MANUAL



CE

Original Instruction

HANGCHA GROUP CO., LTD
03/2023

Foreword

Thanks for purchasing Hangcha J series four-wheel Electric Counterbalanced Forklift Truck

X series four-wheel electric forklift truck is a new product with a small turning radius, an attractive design, a small and compact structure, a low centre of gravity, good stability and superior performance.

This manual is brief introduction and correct use to X series four-wheel Electric Counterbalanced Forklift Truck, which guides you how to safely operate and right maintain. Relevant people should read and comprehend this manual well.

Due to the continuous updating and improvement of our products, there may be minor discrepancies between your forklift truck and this manual.

For any questions, please contact Hangcha or your nearest dealer.

Ⓒ 11/2022 HANGCHA GROUP CO., LTD

Content

1. Appearance and Main Components 1

2. Displays and controls 2

Multi-function display 3

Controls 9

Others 14

Seat 15

OPS system（optional） 17

3. Labels 19

4. Technical Specifications 20

5. Safety instructions 32

6. Truck Lifting, Carrying and Towing 38

Lifting 38

Carrying 39

Towing 40

7. The structure and stability of truck 41

8. During running-in 45

9. Routine Maintenance 46

10. Starting and Operation 52

Starting 52

Driving 52

Decelerating 52

Steering 52

Parking 53

Loading 53

Stacking 53

Unstacking 54

Post-operation checks 54

11. Storage 55

12. Battery 56

Battery maintenance 56

Specific gravity detection and conversion 56

Check the electrolyte level and add distilled water 58

Battery charging 59

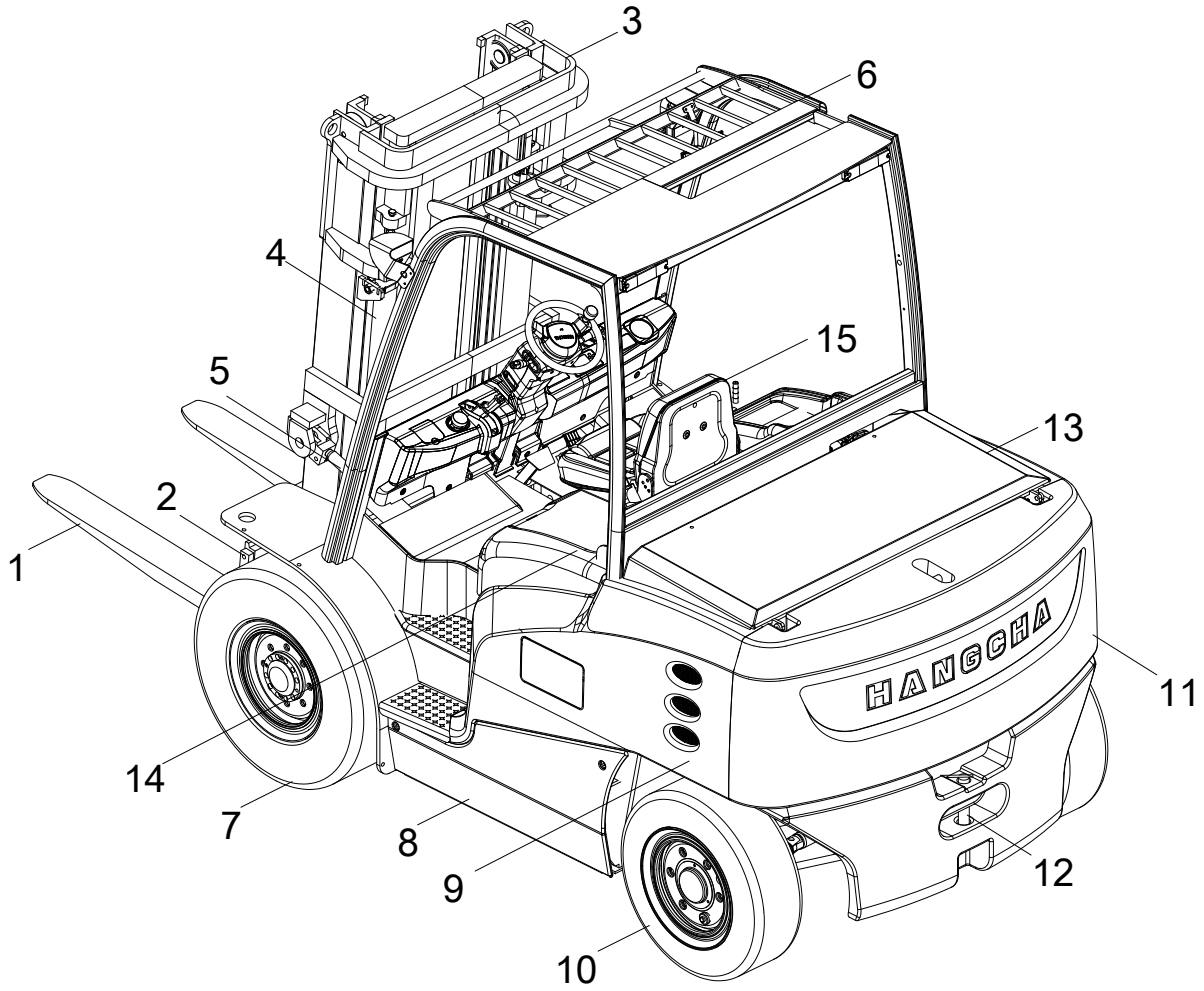
Battery specification 62

Battery charging 63

13. Lithium battery 68

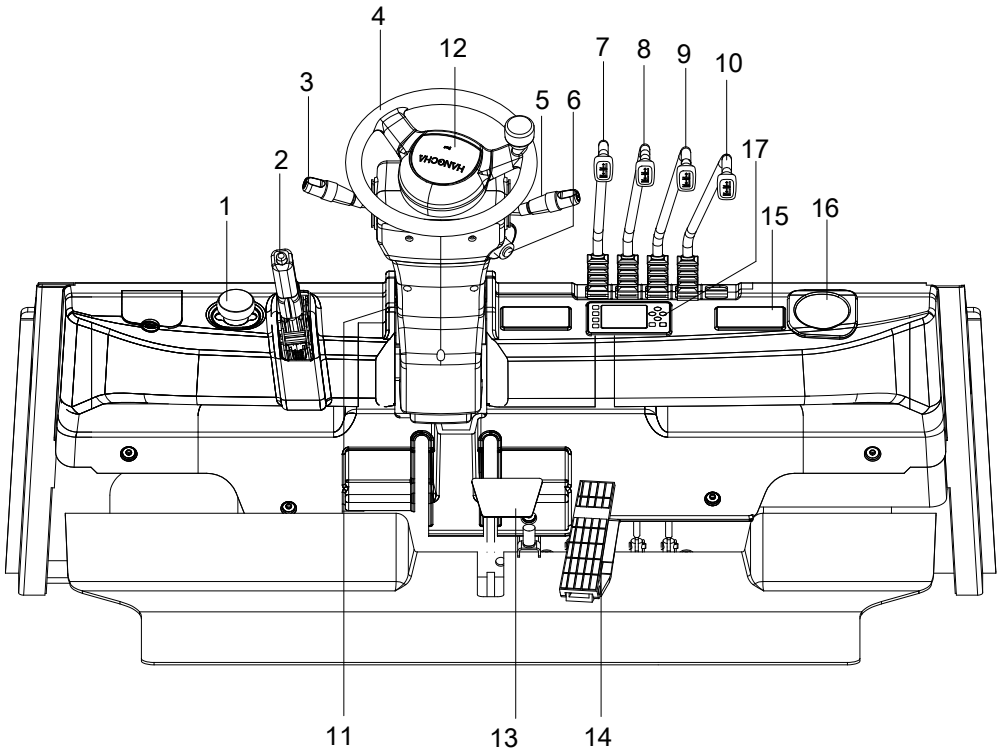
Lithium battery parameter （CATL） 68
Safety instructions 69
Installation instructions 69
Basic terms for lithium ion battery 69
Instructions for Use 70
Maintenance 71
Emergency plan 71
SLC-96250 Operation instructions for intelligent charger (CATL battery charger) 72
Lithium battery charging 79
Daily battery maintenance and care 80
Chapter VI Common failures of batteries and their Solutions 80
Chapter VIII Emergency Preparedness 81
14. Maintenance Summary 83
Periodic maintenance schedule 85
Forklift used oil and lubrication 92
Periodic replacement of safety-critical parts 94
Bolt tightening torque table 95
15. The use, install and safety rules of attachment 96
Attachment install 96
Attachment use 96
Attachment check and maintenance 98
16. Battery automatic filling water system(Option) 99

1. Appearance and Main Components



Item	Description	Item	Description
1	Fork	9	Left side plate
2	Load bracket	10	Rear wheel
3	Mast	11	Counterweight
4	Lift cylinder	12	Towing pin
5	Tilt cylinder	13	Rear cover
6	Overhead guard	14	Front cover
7	Front wheel	15	Seat
8	Left side door		

2. Displays and controls

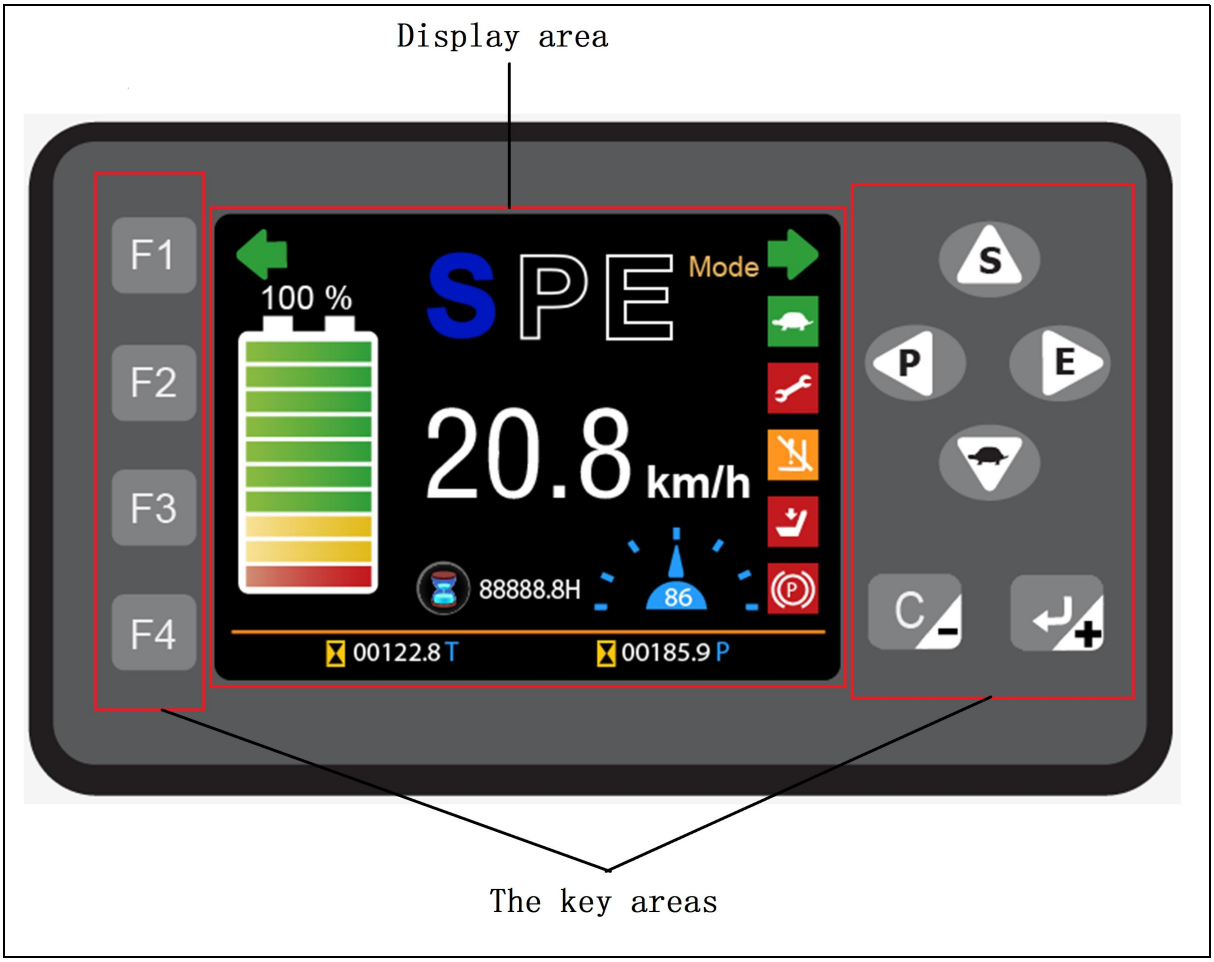


Item	Description	Item	Description
1	Emergency power off	10	Attachment lever
2	Parking brake	11	Steering column positioning device
3	Forward/Reverse selector switch	12	Horn
4	Steering wheel	13	Brake pedal
5	Combination light switch	14	Accelerator pedal
6	Key switch	15	Rocker switch
7	Lifting lever	16	Cup holder
8	Tilting lever	17	Multi-function display
9	Sideshift lever		

Multi-function display

Curtis electric-controlled model

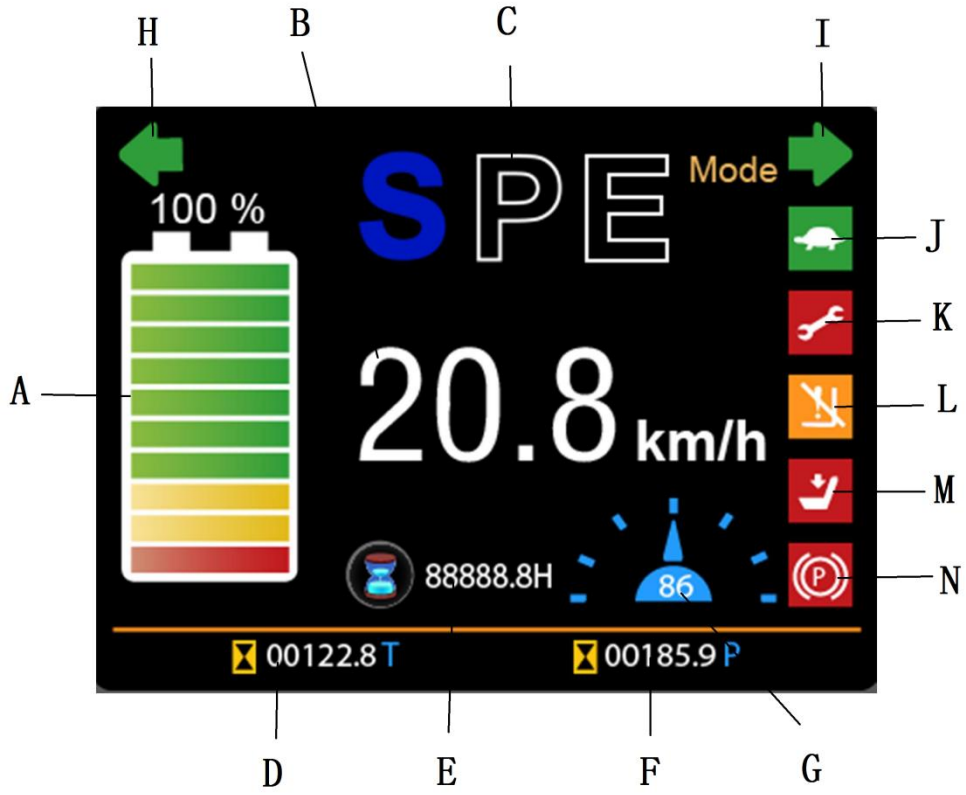
The multi-function display shows the battery capacity, the service hours, the operating mode, the travel speed and fault code information. Graphic illustrations on the multi-function display act as warning indicators. Through the multi-function display on the right button can also check fault code and parameter setting.



F1	Enter/exit the operation menu; when the meter is in the password input interface, press F1 to enter the number "1".
F2	Enter/exit the meter menu; when the meter is in the password input interface, press F2 to enter the number "2".
F3	Enter/exit the controller menu; when the meter is in the password input interface, press F3 to enter the number "3".
F4	Enter/exit the controller menu; when the meter is in the password input interface, press F4 to enter the number "4". When the meter is in the menu interface and the menu option is a modifiable parameter, press F4 to adjust the parameter change.The step size can be set to change the single digit, tens, hundred or thousand digits of the parameter.
S	The setting mode is super mode; when the meter is in the password interface, press ▲ to switch the user password or OEM password input setting; when the meter is in the menu

	interface, press ▲ to move the menu option up.
	The setting mode is slow mode; when the meter is in the password interface, press ▼ to switch the user password or OEM password input setting; when the meter is in the menu interface, press ▼ to move the menu option down.
	The setting mode is power mode; when the meter is in the password interface, press the key to switch the user password or OEM password input setting; when the meter is in the menu interface, press the key to return to the previous menu.
	The setting mode is economic mode; when the meter is in the password interface, press the key to switch the user password or OEM password input setting; when the meter is in the menu interface, press the key to enter the next level menu.
	When the meter is in the password interface, it is used to delete the entered password; when the meter is in the menu interface, it is used to reduce the parameter setting value or return to the previous menu.
	Enter the fault interface; when the meter is in the password interface, it is used to check the input password; when the meter is in the menu interface, it is used to increase the parameter setting value or enter the next level menu.

Main display interface



A	Battery level display	H	Left turn indication
B	Travel speed display	I	Right turn indication
C	Operating mode display	J	Turtle speed mode indication
D	Traction controller running hours display	K	Fault repair indication
E	Vehicle running hours display	L	Battery below 10%, lift lock indication
F	Pump controller operating hours display	M	Seat indication
G	Vehicle steering angle display	N	Park indication

Battery level display [A]



Shows the remaining capacity of the battery.

As shown in the above figure, when the battery power is less than 20%, the entire battery indicator will flash. At this time, please stop working and charge immediately. It is recommended to charge when two grids remain (the remaining battery is about 30%), otherwise the battery life will be greatly shortened.

CAUTION

- **Charging in time is very important, otherwise it will affect the lift-span of battery!**

Travel speed display [B]



Normal work, display the truck travel speed.

Operating mode display [C]



As the diagram shows

S mode is super mode, thus the truck's acceleration, deceleration rate, max climbing gradient and so on is much higher. It is applied for transporting mass of good in short time and climbing big gradient slop， but it costs more energy，so the mode will not be used in normal state except emergency.

P mode is power mode. All kinds of index are lower than that of super mode. It is applied for the case of long distance transporting and needing higher power or speed.

E mode is economical mode. All the parameters are optimized. Working in this mode can save power so it is applied for a long time work after charging, and it is suggested to work in this mode in normal work-time.

SPE mode: The truck is in Safety Mode. In this mode, maximum traveling speed is limited to 7km/h. it is very good for working in a crowd warehouse or other compact space. In this mode, the slow indicator[F] will be on.

CAUTION

- **The default mode is mode E. after power cutting every time, the work mode resets to mode E no matter which mode it is before power cutting, but the switch key is still in the mode before turn off.**

Traction controller running hours display [D]



The hourglass icon indicates the hour meter function.

Display the cumulative working time of the traction controller

Vehicle running hours display [E]



The hourglass icon indicates the hour meter function.

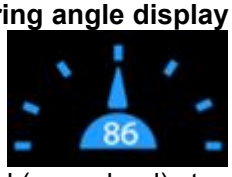
When the vehicle key switch is turned on, the hour meter starts counting, and the minimum resolution is 0.1 hour.

Pump controller operating hours display [F]

The hourglass icon indicates the hour meter function.

Display pump controller cumulative working time.

Vehicle steering angle display [G]



Steering wheel (rear wheel) steering angle and steering direction display.

As the steering wheel turns, the centered arrow symbol rotates around the center of the circle.

1.Steering direction display: the arrow is turned to the left around the center of the circle, then it is turned left; when it is deflected to the right, it is turned right.
2.Steering angle display: The larger the deflection angle, the larger the turning angle.

Left turn indication [H]



When the vehicle turns left, turn on the left turn signal and the indicator lights up.

Right turn indication [I]



When the vehicle turns right, turn on the right turn signal and the indicator lights up.

Crawl speed indicator[J]



When the truck in SPE mode, the crawl speed indicator light up.

Fault indicator[K]



The light up when the controller is wrong or operation mistake, and the fault code shows in the main display screen.

Lifting low speed indicator[L]



When there is 10% power, the indicator is on, and the mast lifting speed drops, to remind user to charge the battery as soon as possible.

Seat switch indicator[M]

When operator leaves the seat, the light will be on, and the truck will be unable to travel or lift. This function needs the seat to equip with seat switch.

Parking brake applied indicator[K]



When parking brake applied, the light up.

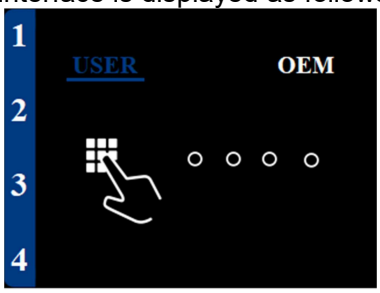
Battery low capacity indicator



This indicator lights up when the power is less than 20%.

Menu password interface

When the meter is in the main interface, press F2 or F3, the meter will enter the password interface before entering the corresponding meter or controller menu. Only when the user inputs the correct password, the meter will enter the corresponding menu interface. The password interface is displayed as follows:



OEM password

The meter sets menu options at different permission levels for the users. As shown in the figure above, when “User Password/USER” is selected and the corresponding user password is entered, the meter enters the user level menu; after “OEM password/ OEM is selected, enter the corresponding OEM password, the meter enters the OEM level menu. If the password is entered incorrectly, the meter will prompt the password error and you need to re-enter the correct password.

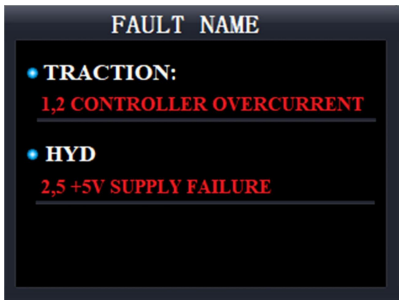
Password interface button function

When the meter is in the password input interface, the function of each button is as follows:

F1	Enter the number "1" for the password.
F2	Enter the number "2" for the password.
F3	Enter the number "3" for the password.
F4	Enter the number "4" for the password.
	Switch user password/OEM password.
	Switch user password/OEM password.
	Switch user password/OEM password.
	Switch user password/OEM password.
	Delete the entered password; if the password has been deleted, press the C/- button to return the meter to the main interface.
	When the 4-digit password is all entered, press  and the meter will automatically verify that the password is entered correctly. If the password is correct, the meter enters the corresponding menu. If the password is entered incorrectly, the meter prompts the password error. Note: When the password input is less than 4 digits,  is invalid pressed.

Fault interface

When the meter is in the main interface, press /+ to enter the fault interface. The fault code and the corresponding fault name are displayed according to the currently received controller fault code. The fault interface is displayed as follows:



When the meter is in the fault interface, press  again and the meter will return to the main interface display.

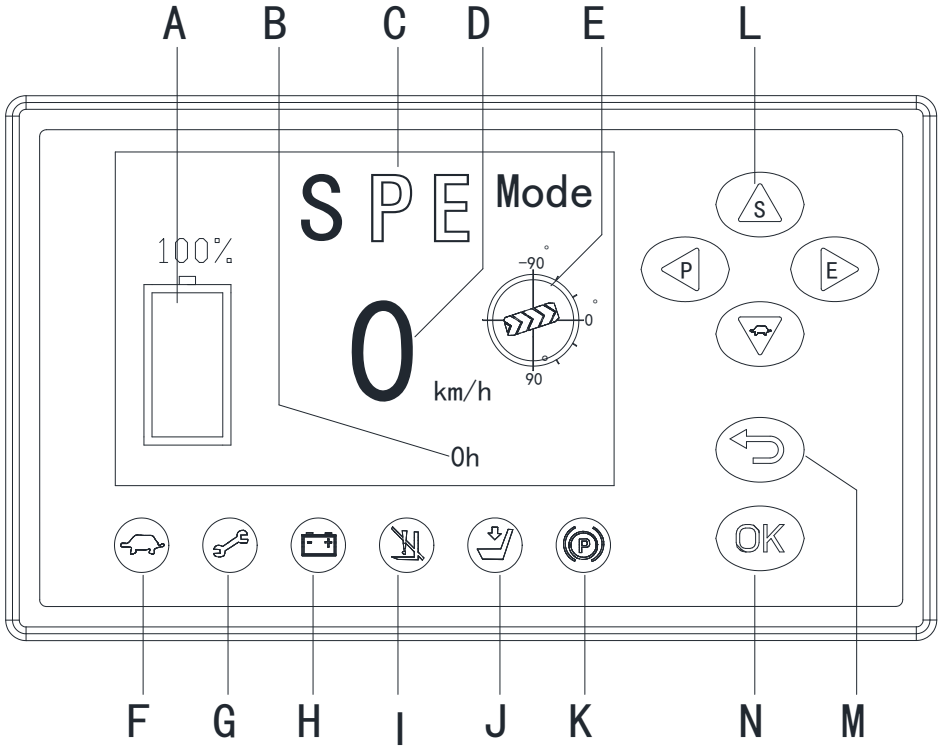
Key function

When the meter is in the main interface, you can enter the following 4 menu interfaces by pressing F1~F4.

F1	Enter/exit the operation menu.
F2	Enter/exit the meter menu.
F3	Enter/exit the controller menu.
F4	Enter/exit the controller monitoring menu; when the meter is in the meter menu or controller menu interface, if the current menu option is a modifiable parameter, press F4 to adjust the parameter change step size to set the single digit, tens, hundreds, or kilobyte value of the parameter separately.
	Move the menu option up.
	Move the menu option down.
	Return to the previous menu.
	Enter the next level menu.
	When the current menu option is a modifiable parameter, it is used to reduce the parameter setting value, otherwise it will be returned to the previous menu.
	When the current menu option is a modifiable parameter, it is used to increase the parameter setting value, otherwise it will enter the next level menu.

INMOTION electric-controlled model

The multi-function display shows the battery capacity, the service hours, the operating mode, the travel speed and fault code information. Graphic illustrations on the multi-function display act as warning indicators. Through the multi-function display on the right button can also check fault code and parameter setting.

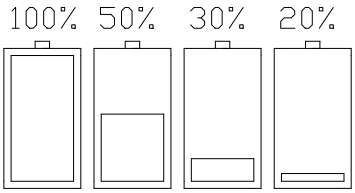


Item	Display		Item	Display
A	Battery capacity display		H	Battery low capacity indicator
B	Service hours display		I	Lifting low speed indicator
C	Operating mode display		J	Safety switch indicator
D	Travel speed or fault code display		K	Parking brake applied indicator
E	Steering wheel angle display		L	Mode settings or direction choosing button
F	Crawl speed indicator		M	return key
G	Fault indicator		N	Menu key

Main display interface



Battery capacity display[A]



Indicates the available residual capacity.

As the following diagram shows, from the left to the right, the battery decreases from full state to the only one case, which represents that the battery leaves only 20%. Thus the whole battery indicator bar will twinkle, and the state indicator lamp will be bright, now please stop working and charge immediately.

> **CAUTION**
>
> - **Charging in time is very important, otherwise it will affect the lift-span of battery!**

Service hours display[B]

0h

Hourglass icon indicates that timing function.

When you turn off the key switch, the hour meter will works and the minimum unit is 0.1 hour.

Operating mode display[C]

S P ES P ES P ESPE

As the diagram shows, the pictures from the left to the right represent the mode of **S** mode→ **P** mode → **E** mode → **SPE** mode.

S mode is super mode, thus the truck's acceleration, deceleration rate, max climbing gradient and so on is much higher. It is applied for transporting mass of good in short time and climbing big gradient slop， but it costs more energy，so the mode will not be used in normal state except emergency.

P mode is power mode. All kinds of index are lower than that of super mode. It is applied for the case of long distance transporting and needing higher power or speed.

E mode is economical mode. All the parameters are optimized. Working in this mode can save power so it is applied for a long time work after charging, and it is suggested to work in this mode in normal work-time.

SPE mode: The truck is in Safety Mode. In this mode, maximum traveling speed is limited to 7km/h. it is very good for working in a crowd warehouse or other compact space. In this mode, the slow indicator[F] will be on.

> **CAUTION**
>
> - **The default mode is mode E. after**

power cutting every time, the work mode resets to mode E no matter which mode it is before power cutting, but the switch key is still in the mode before turn off.

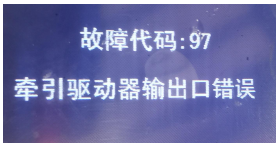
Travel speed or fault code display[D]

Travel speed display



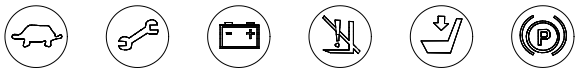
Normal work, display the truck travel speed.

Fault code display



Failure occurs, display the controller's fault code.

Indicator light



Crawl speed indicator[F](Green)



When the truck in SPE mode, the crawl speed indicator light up.

Fault indicator**[G](Red)**



The light up when the controller is wrong or operation mistake, and the fault code shows in the main display screen.

Battery low capacity indicator[H](Red)



When there is only one line for the power, the indicator will be on to remind the user to charge the battery.

Lifting low speed indicator[I](Red)



When there is 10% power, the indicator is on, and the mast lifting speed drops, to remind user to charge the battery as soon as possible.

Seat switch indicator[J](Red)



When operator leaves the seat, the light will be on, and the truck will be unable to travel or lift. This function needs the seat to equip with seat switch (optional).

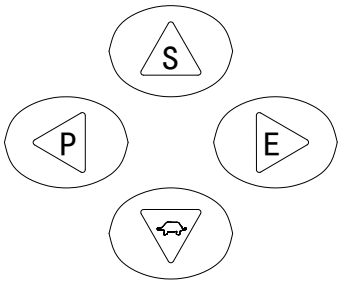
Parking brake applied indicator[K]



When parking brake applied, the light up.

Button

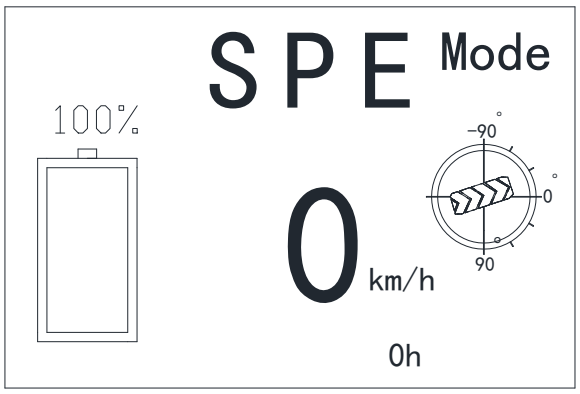
Mode settings or direction choosing button[L]



Mode settings

In the main display interface, the button 、、、, corresponding **S** mode、**P** mode、**E** mode、**SPE** mode.

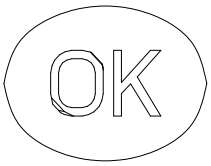
For example: In the main display interface, press the button , the screen shows as follows:



Direction choosing

In the menu interface, the button 、、、, corresponding up、left、right、down four direction choosing button keys.

Menu button[M]



（1）In the main interface, press the menu key [N], enter the password, and then press the menu key to enter the main menu page.



(2) Language switch setting: This instrument supports two languages, Chinese and English, which will be adjusted to the language you need when leaving the factory.If you need to switch the language,please refer to the following example for operation.

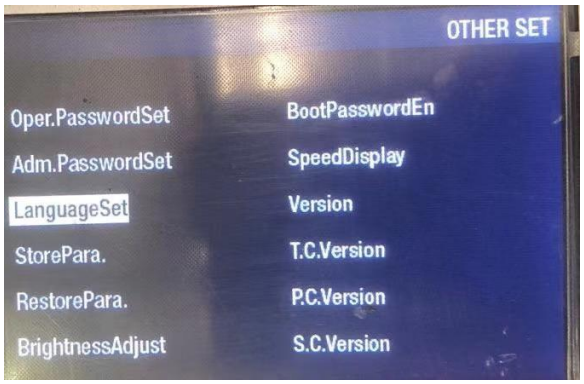
For example: The language from English switch to Chinese.

①On the main page, press the menu key () to enter the main menu. The main menu display is as follows:



②Use the up key () or down key () to select "other settings".

③ Press the menu key () to enter other setting menus.



④ Select the "Language" option by moving up () or down ().

Press the menu key () to enter the language setting state.

⑥ Use the up key () or down key () to select the Chinese language.

⑦Refer to steps ⑤ ④ ③ ② ①, press the return key () to return to the main interface.

Controls

Emergency power off [1]



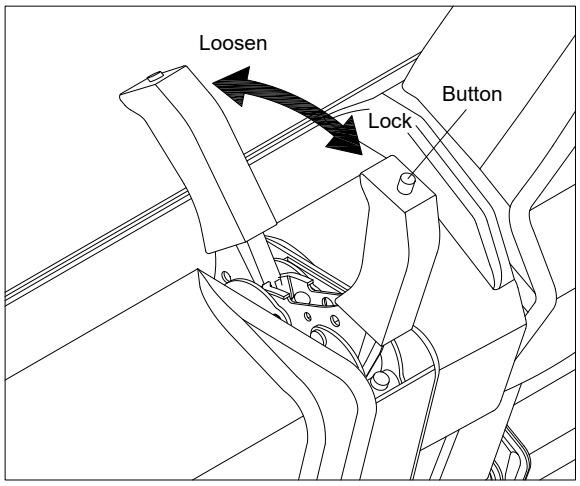
Turn on or off the power.

In an emergency, press the red mushroom head button to cut off the vehicle's main power supply. The vehicle will not be able to move, turn or lift.

CAUTION

- **Do not use the emergency power off switch to stop the truck under normal circumstances as the key switch.**

Parking brake [2]



Secure the stopping truck.

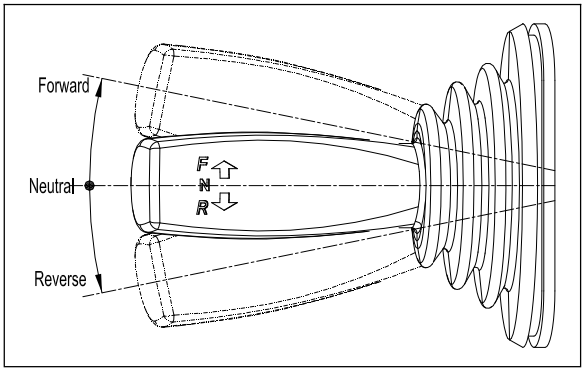
When braking, pulling on the brake lever generates a braking force on the front wheels. To release the brake, simply push the lever forward.

The hand brake is equipped with a micro-switch on the left side that stops the forklift from moving when the brake lever is engaged.

WARNING

- **If parking on the slope is unavoidable, block the wheels with solid wedge.**

Forward/Reverse selector switch [3]



Set truck moving direction according to need.

When the direction lever is pushed forward and the accelerator pedal is depressed, the forklift truck will travel forward. When the direction lever is pulled back and the accelerator pedal is depressed, the forklift will travel in reverse.

CAUTION

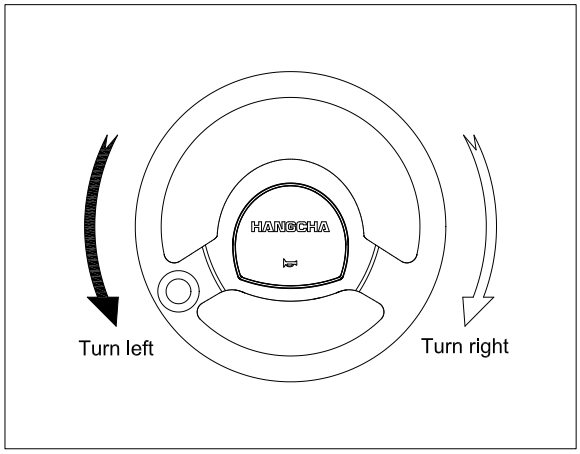
- **When the forklift is moving and the direction lever is operated, the electrical brake will be applied and the forklift will decelerate to a standstill before gradually moving off in the opposite direction.**

WARNING

- **If the direction lever is not in neutral or the accelerator pedal is depressed, the forklift will not start**

when the key switch is turned to ON. In this situation, return the direction lever to the neutral position and take your foot off the accelerator pedal before attempting to start the forklift.

Steering wheel [4]



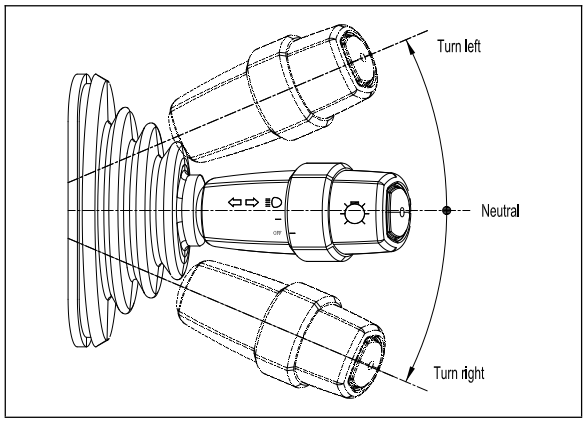
Control truck direction.

When the steering wheel is turned right, the forklift will turn to the right; when the steering wheel is turned left, the forklift will turn to the left. The rear end of the forklift swings out when turning.

WARNING

- **This forklift truck adopts a fully hydraulic steering system. Therefore, steering will be impaired when the oil pump motor stops running. Immediately restart the oil pump motor before turning again.**

Combination light switch [5]



Control turn light, headlight and front signal light.

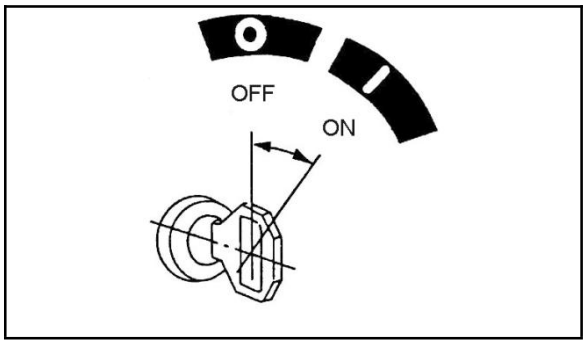
The turn signal light switch indicates the turning direction of the forklift. Push forward, left turn light flashes; push backward, right turn light flashes.

The head/signal light switch has two settings: signal light on; head light + signal light on.

CAUTION

- **The turn signal lever does not automatically return to the neutral position. Reset it by hand.**

Key switch[6]



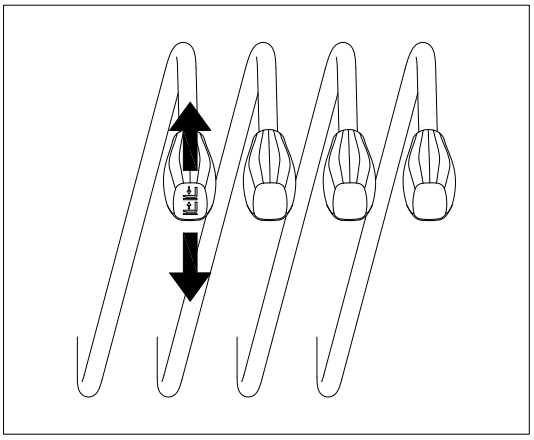
Connect and interrupt control current. Remove the key and make sure that the truck does not move suddenly.

The key switch has two positions: ON and OFF. First set the direction lever to the neutral position, take your foot off the accelerator pedal, then turn the key clockwise to the ON position.

CAUTION

- **If the direction lever is not in neutral or the accelerator pedal is depressed, the forklift will not start when the key switch is turned to ON.**
- **At this point a fault code will be displayed, which is perfectly normal.**
- **Return the direction lever to the neutral position and take your foot off the accelerator pedal before attempting to start the forklift**
- **The fault code will then disappear.**

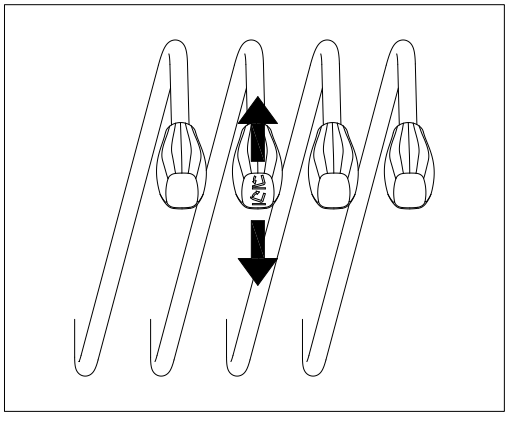
Lift lever [7]



Control the forks' up or down.

Pull back to raise the forks. Push forward to lower the forks. The lifting speed is controlled by the distance that the lever is moved backward. The lowering speed is controlled by the distance that the lever is moved forward.

Tilt lever [8]

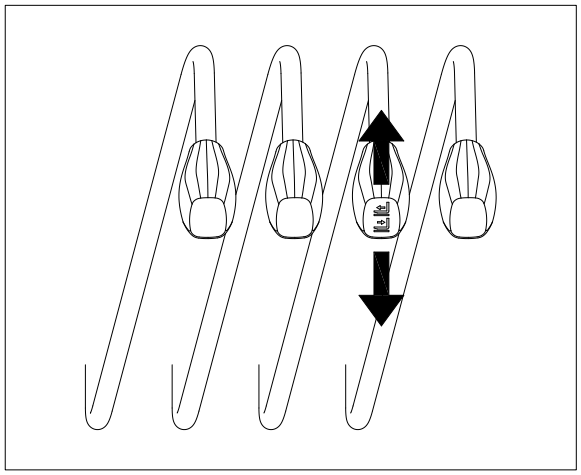


Control the forks' forward and backward tilting. The tilt lever is used to tilt the mast forward and backward. Push forward to tilt forward, pull backward to tilt back. The tilting speed is determined by the distance that the lever is moved.

CAUTION

- **The multi-way valve is equipped with a front tilt self-locking valve. When the circuit is cut off, the mast cannot tilt forward even if the lever is pushed forward.**

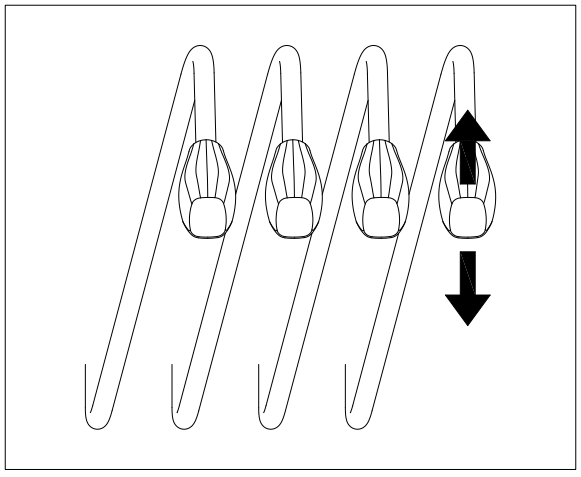
Sideshifter lever [9]



Control the fork to move to left or right.

Push or pull this lever can realize the left/right movement of the mast.

Attachment lever [10]

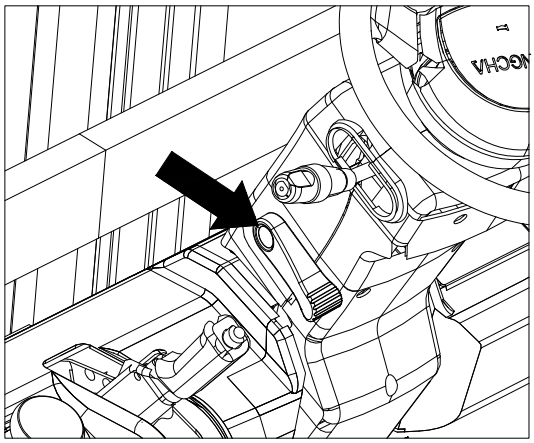


It is used when installing attachment like paper roll clamp or rotator.

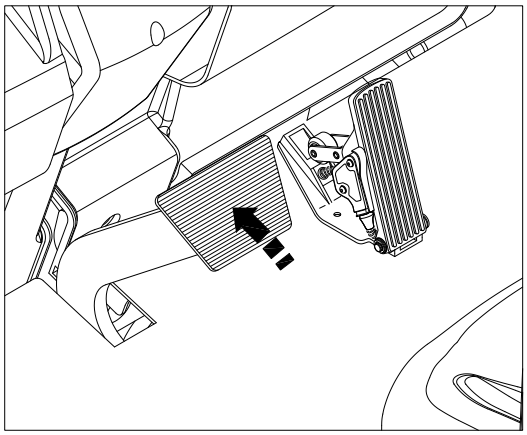
Steering column positioning device [11]

Adjust and fix steering column according to needed distance.

In order to meet operator's need, the tilting angle of steering column is adjustable. Pull the lever upward, the steering column is released; push downward and locked.



Brake pedal [13]

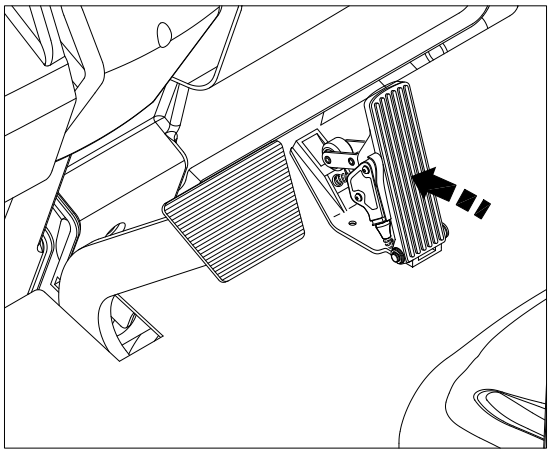


Carry out brake operation.

Depressing the brake pedal will slow down or stop the forklift and activate the brake lights.

> **CAUTION**
> - **Do not depress the accelerator and brake pedals at the same time, as this will damage the drive motor.**

Accelerator pedal [14]



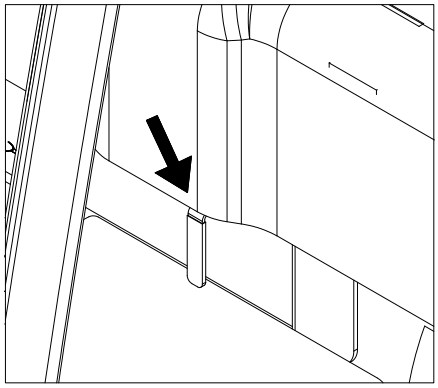
Stepless regulation of truck travelling speed.

Slowly depress the accelerator pedal, the drive motor will start running and the forklift will move off. The travel speed can be increased gradually based on the force applied to the pedal.

> **CAUTION**
> - **Release the accelerator pedal while driving to perform soft braking.**

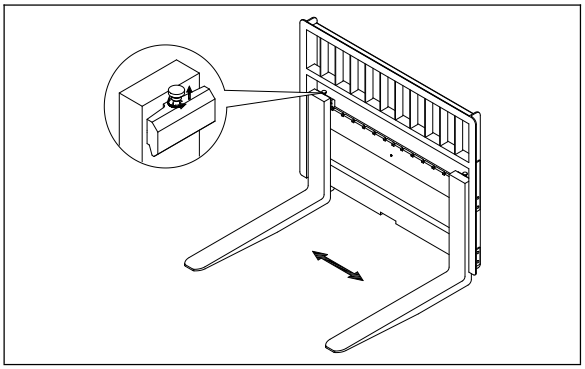
> **WARNING**
> - **Do not depress the accelerator pedal before turning on the key switch, otherwise the meter display will display a fault. Keep your foot off the accelerator pedal when turning the key switch on.**

Front cover lock catch[20]



Fix the front cover.

Fork stopper



Used when adjusting the spacing of the forks. Pull up the fork stopper and rotate it 90°, then adjust the forks to the desired positions according to the load to be handled.

WARNING

- **Fork spacing should be adjusted symmetrically to the truck centreline. After adjustment, make sure that the fork stoppers are securely locked.**
- **The lower crossbar of the fork carriage has an opening for fitting and removing the forks.**
- **Do not secure forks at the opening position, in order to prevent them falling through the opening.**
- **There installs one bolt in the middle of upper beam to avoid forks working here. If bolt damaged, replace new one.**

Replace forks

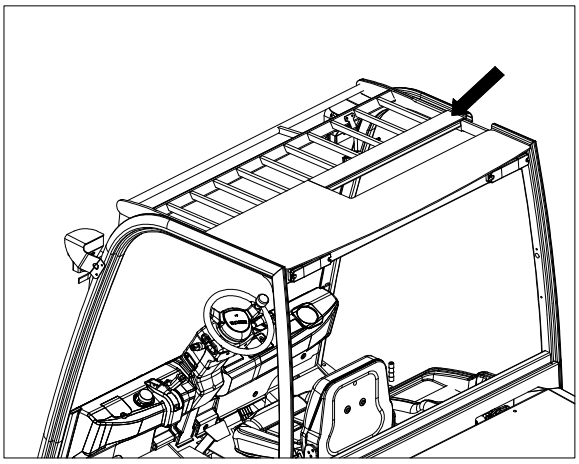
Remove old forks: place the forks in middle, drop to the ground, tilt forward the mast, then the forks are off the fork carriage and reverse the truck.

Assemble new forks: place forks on the ground facing the truck, lower the fork carriage to the lowest, truck travels slowly, aim the fork slot to the top-bottom beam and gag of fork carriage, then lift the fork carriage and adjust fork position.

Others

Overhead guard

The overhead guard protects the operator against injury from falling objects. It must have sufficient impact strength. Loose installation, dismantlement or remould of the overhead guard is dangerous, and may cause major accident. The gap on it is used to lift the battery.



WARNING

- **Do not use the forklift without the overhead guard.**

Front/rear cover

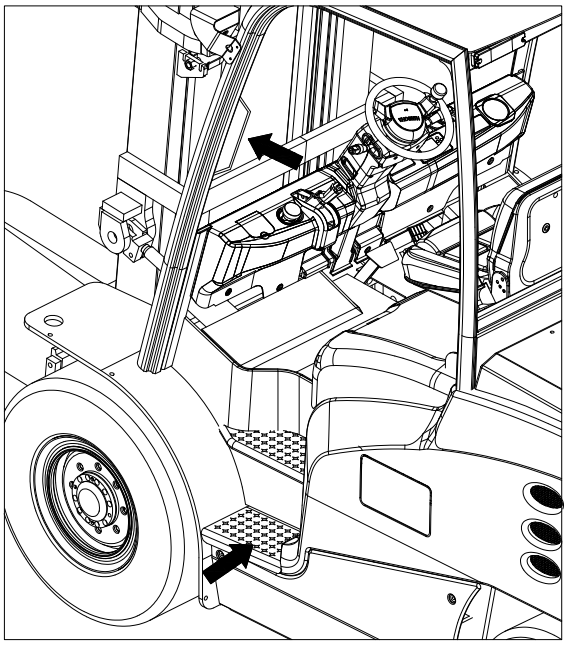
The wide-opening cover facilitates inspection and battery maintenance.

The gas spring on the inside enables the cover to be fully opened by lightly pulling it upwards. To close the cover, release the gas spring safety and push the cover head down.

CAUTION

- **To close the cover, press the gas spring safety and then press the hood head down.**
- **Prevent the cover from clamping your finger when closing the cover.**

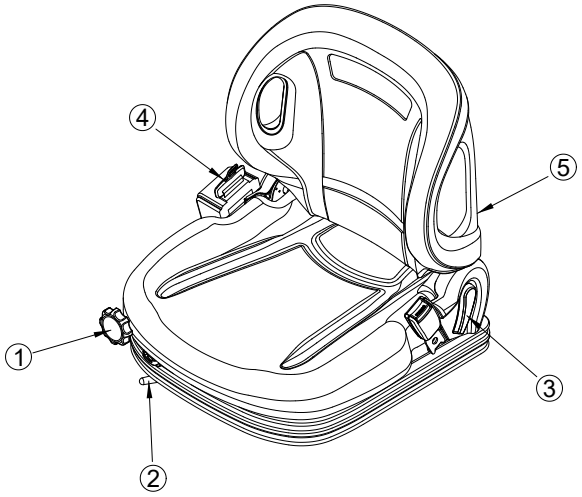
Safety step and handrail



A safety step is provided on both sides of the forklift body and a handrail is located on the left pillar of the overhead guard. Use the step and handrail to safely get on /off the forklift.

Seat

The seat design satisfies the maximum comfort, and can adjust as follows:



①Weight adjusting lever

②Seat forward-backward adjusting lever

③Backrest adjusting lever

④ Safety belt

⑤ Document box

Adjust driver seat according to weight：

In order to get ideal damping effect, adjust the seat according to driver's weight

- Driver sits on. If it is set correctly, seat adjusting lever① should match with driver weight mark. If the seat adjusting lever deviates to left or right too much, adjust the seat according to driver's weight.
- If driver is light, pull the seat adjusting lever① to left.
- If driver is heavy, pull the seat adjusting lever① to right.

Adjust seat position：

- Pull the driver seat forward-backward adjusting lever② upward, and move the seat forward or backward to proper position.
- Lock driver seat forward-backward adjusting lever②.

> ⚠ **WARNING**
>
> - **Lock the driver seat forward-backward adjusting lever on the set position. Never adjust seat when driving.**

Adjust seat back：

- Driver sits on.
- Press the seat back adjusting button③, and adjust back inclination.
- Release the seat back adjusting button③ and lock the seat back.

Safety belt

Fasten safety belt④ before driving. It protects driver when accidents happen. Regularly clean and check safety belt, avoid dirt.

Correctly use safety belt：

- Sit on the seat correctly.
- Check if the safety belt twisted.
- Place the safety belt on the hip.
- Fasten the safety belt and check safety belt lock.
- Adjust safety belt until it reaches the state that it does not squeeze hip or is unable to fix due to loosen too much.

Regular verification of seat belt related to:

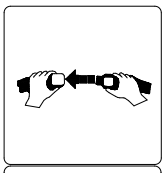
- Cut or frayed straps.
- Worn or damaged hardware, including anchor points.
- Buckle or retractor malfunction.
- Loose stitching.

WARNING

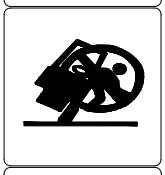
- **In any case, if there is damage or flaw(insecure lock, damage, wet light) on the safety bet, please repair or replace immediately.**
- **Never do any change to the safety belt. Replace new one after each accident.**

Adopted measure when special condition incurred：

- Fasten the safety belt and sit on.



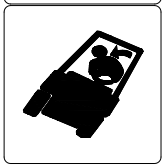
- Never jump from the truck.



- Lean forward, hold the steering wheel with both hands, and support with feet.



- Lean yourself in the opposite direction to truck tipping over.



WARNING

- **When there is danger of tipping over, do no unfasten the safety belt to escape. It may cause severe bodily injury.**

OPS system（optional）

OPS (Operator Presence Sensing) system is a safeguard system that installs a sensor in the driver seat to sense if the driver sits on the seat correctly. If the driver does not sit on the seat correctly, driving force is cut off, meanwhile, all loading and unloading operations will be stopped. It helps to reduce accident when the driver leaves. When the driver does not sit correctly, the driver cannot drive the truck or operate the loading and unloading, thus the accidents by maloperation will be reduced.

Driving protection function

When the vehicle is travelling, the driver leaves the seat or the safety belt is released (if equip with safety belt protection switch) over 1 second, truck stops automatically, and the instrument displayed seat indicator light  lights up, meanwhile the buzzer sends out continuous alarm signal. Only when pulling up the hand brake or the driver sits on the seat correctly and the direction switch returns to neutral, the seat indicator light goes out, travelling OPS status is released.

Working protection function

When the vehicle is under working condition, the driver leaves the seat or the safety belt is released (if equip with safety belt protection switch) over 1 second, working stops automatically, and the instrument displayed seat indicator light  lights up, meanwhile the buzzer sends out continuous alarm signal. OPS light comes on, buzzer sends out alarm signal, transportation operation stops automatically. When the driver sits down again, the seat indicator light goes out, working OPS status is released.

Warning function

Once the seat sensor detects the seat switch is turned off, within 1 second, the buzzer sends out continuous alarm signal, and the seat indicator light  lights up. If the seat indicator light keeps on when the seat switch is off, it means the OPS in the startup state.

Resume neutral function

If the direction switch does not return to neutral and the seat switch is turned on. The buzzer will send out continuous alarm signal to remind the driver that the OPS in the startup state.

OPS abnormal function handling

Park the truck in safe place and contact Hangcha agency to check if any below condition is occurred. a. after the driver leaves the seat, the seat indicator light does not light up; b. when the driver sits down, the seat indicator light does not go out.

⚠ **Caution**

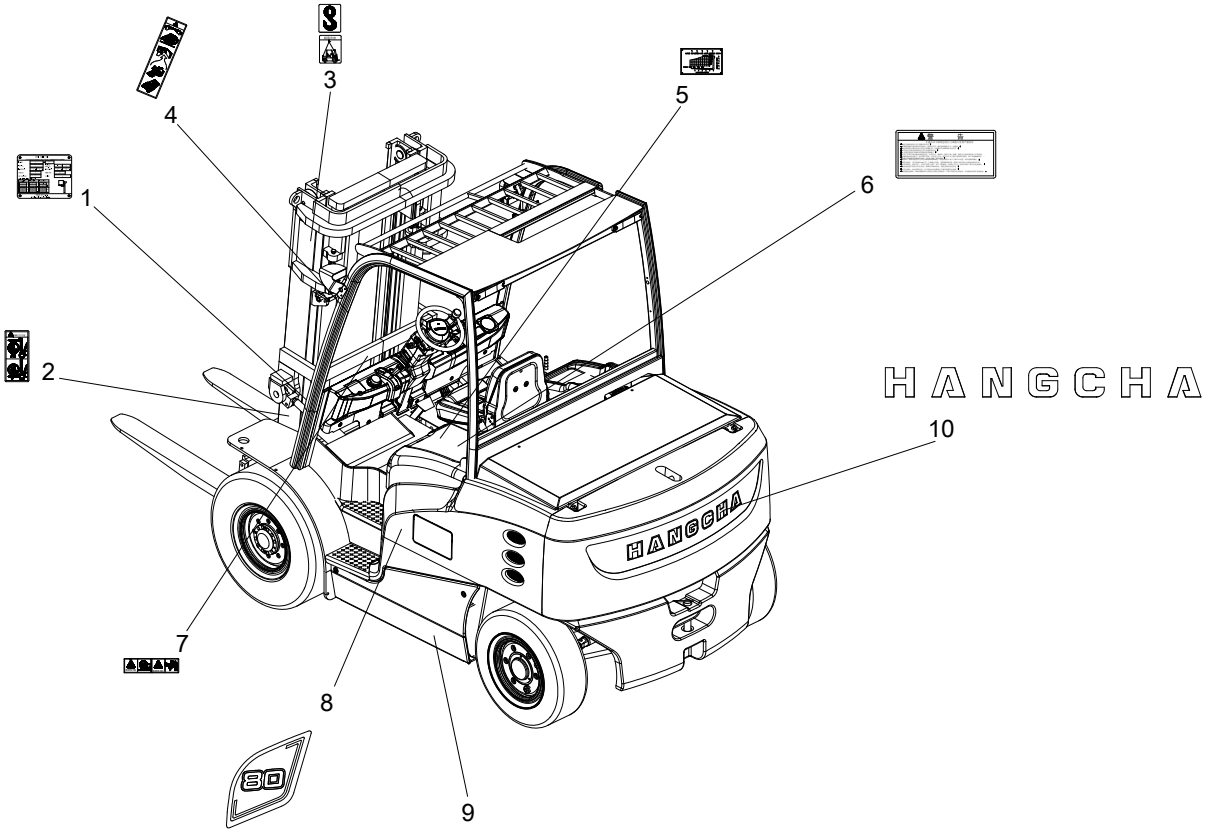
- **As to forklift equipped with safety belt protection switch, after driver sits on the seat correctly, it also needs fasten safety belt, then can operate the truck normally. When driving on the uphill, starting the OPS will cut off the drive power and make the truck slip. In order to avoid this accident, the driver must sit correctly when operating on the uphill.**

Fork locking function after power off

This function means: forks are locked when starting switch is closed or power failure, forks will not lower down even operate the control lever.

3. Labels

Labels, like warning label, load curve and nameplate, must be clear and readable. Replace when necessary.



No.	Description
1	Product nameplate
2	Danger label：Loading part is not allowed to carry people. Never stay under the loading part
3	Lifting label：The fixing point when using crane to load and unload.
4	Danger label：When the forklift rollover ,Don't jump forklift
5	Load curve label
6	Warning label：Obey safety regulation.
7	Danger label：Be careful when lifting the mast，No climbing
8	Tonnage label
9	Brand label
10	Brand label

4. Technical Specifications

序号	项 目			CPD60-XC4	CPD70-XC4
1	Rated lifting capacity		kg	6000	7000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	160	160
5	Mast Tilt angle (front/back)		(°)	5 / 10	5 / 10
6	Maximum travel speed(full load)		km/h	15	15
7	Maximum lifting speed (full load)		mm/s	340	320
8	Maximum grade ability (full load)		%	16	15
9	Minimum outside turning radius		mm	3050	3050
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	2.5	2.5
12	Dimensions	Length(to fork face)	mm	3195	3200
		Width	mm	1870	1870
		Height to overhead	mm	2565	2565
13	Service weight	Include battery box	kg	9600	10280
14	Battery	Model		9PZS720	9PZS810
		Standard	V/Ah	96 / 720	96 / 810
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	40	40
16	Tire	Front/number		355/65-15/2	355/65-15/2
		Rear/number		250-15/2	250-15/2

序号	项　目			CPD80-XC4	CPD90-XC4
1	Rated lifting capacity		kg	8000	9000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	175	200
5	Mast Tilt angle (front/back)		(°)	5 / 10	5 / 10
6	Maximum travel speed(full load)		km/h	14.5	13.5
7	Maximum lifting speed (full load)		mm/s	300	280
8	Maximum grade ability (full load)		%	14	12
9	Minimum outside turning radius		mm	3050	3350
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	2.5	2.5
12	Dimensions	Length(to fork face)	mm	3220	3755
		Width	mm	1945	1970
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	12180	12960
14	Battery	Model		9PZS945	12PZS1104
		Standard	V/Ah	96 / 945	96/1104
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	40	52
16	Tire	Front/number		355/50-20/2	8.25-15/4
		Rear/number		250-15/2	250-15/2

序号	项　目			CPD100-XC4	CPD100-XC4-I
1	Rated lifting capacity		kg	10000	10000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	175	175
5	Mast Tilt angle (front/back)		(°)	5 / 10	5 / 10
6	Maximum travel speed(full load)		km/h	13	13.5
7	Maximum lifting speed (full load)		mm/s	260	250
8	Maximum grade ability (full load)		%	12	12
9	Minimum outside turning radius		mm	3350	3350
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	2.5	2.5
12	Dimensions	Length(to fork face)	mm	3755	3755
		Width	mm	2038	2038
		Height to overhead	mm	2565	2565
13	Service weight	Include battery box	kg	13780	13180
14	Battery	Model		12PZS1260	CATL
		Standard	V/Ah	96 / 1260	96 / 606
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	52	52
16	Tire	Front/number		300-15/4	300-15/4
		Rear/number		250-15/2	250-15/2

序号	项　目		CPD90-XC4-I	CPD80-XC4-I
1	Rated lifting capacity kg		9000	8000
2	Load center distance mm		600	600
3	Standard mast lift height mm		3000	3000
4	Free lift height mm		200	175
5	Mast Tilt angle (front/back) (°)		5 / 10	5 / 10
6	Maximum travel speed(full load km/h		13.5	14.5
7	Maximum lifting speed (full load) mm/s		280	300
8	Maximum grade ability (full load) %		12	14
9	Minimum outside turning radius mm		3350	3050
10	Minimum ground clearance mm		183	183
11	Maximum braking distance m		2.5	2.5
12	Dimensions	Length(to fork face) mm	3755	3220
		Width mm	1970	1945
		Height to overhead guard mm	2565	2565
13	Service weight	Include battery box kg	11750	11230
14	Battery	Model	CATL	CATL
		Standard V/Ah	96/606	96/542
15	Motor	Driven Motor kW	35	35
		Pump Motor kW	52	40
16	Tire	Front/number	8.25-15/4	355/50-20SE/2
		Rear/number	250-15/2	250-15/2

序号	项　目			CPD70-XC4-I	CPD60-XC4-I
1	Rated lifting capacity		kg	7000	6000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	160	160
5	Mast Tilt angle (front/back)		(°)	5 / 10	5 / 10
6	Maximum travel speed(full load)		km/h	15	15
7	Maximum lifting speed (full load)		mm/s	320	340
8	Maximum grade ability (full load)		%	15	16
9	Minimum outside turning radius		mm	3050	3050
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	2.5	2.5
12	Dimensions	Length(to fork face)	mm	3200	3195
		Width	mm	1870	1870
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	9400	9030
14	Battery	Model		CATL	CATL
		Standard	V/Ah	96/542	96/542
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	40	40
16	Tire	Front/number		355/65-15/2	355/65-15/2
		Rear/number		250-15/2	250-15/2

序号	项　目			CPD80-XLC4	CPD80-XLC4-I
1	Rated lifting capacity		kg	8000	8000
2	Load center distance		mm	900	900
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	200	200
5	Mast Tilt angle (front/back)		(°)	5 / 10	5 / 10
6	Maximum travel speed(full load)		km/h	14.5	14.5
7	Maximum lifting speed (full load)		mm/s	300	300
8	Maximum grade ability (full load)		%	13	13
9	Minimum outside turning radius		mm	3350	3350
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	2.5	2.5
12	Dimensions	Length(to fork face)	mm	3745	3745
		Width	mm	1970	1970
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	13530	12480
14	Battery	Model		9PZS945	CATL
		Standard	V/Ah	96/945	96/606
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	52	52
16	Tire	Front/number		8.25-15/4	8.25-15/4
		Rear/number		250-15/2	250-15/2

序号	项　目			CPD60-XC5	CPD70-XC5
1	Rated lifting capacity		kg	6000	7000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	300
4	Free lift height		mm	600	160
5	Mast Tilt angle (front/back)		(°)	5/10	5/10
6	Maximum travel speed(full load)		km/h	15	15
7	Maximum lifting speed (full load)		mm/s	340	320
8	Maximum grade ability (full load)		%	16	15
9	Minimum outside turning radius		mm	3050	3050
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	5.8	5.8
12	Dimensions	Length(to fork face)	mm	3195	3200
		Width	mm	1870	1870
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	9600	10280
14	Battery	Model		9TTM435	9TTM500
		Standard	V/Ah	96/720	96/810
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	40	40
16	Tire	Front/number		355/65-15/2	355/65-15/2
		Rear/number		20-15/2	20-15/2

序号	项　目			CPD80-XC5	CPD90-XC5
1	Rated lifting capacity		kg	8000	9000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	175	200
5	Mast Tilt angle (front/back)		(°)	5/10	5/10
6	Maximum travel speed(full load)		km/h	14.5	13.5
7	Maximum lifting speed (full load)		mm/s	300	280
8	Maximum grade ability (full load)		%	14	12
9	Minimum outside turning radius		mm	3050	3350
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	5.8	6
12	Dimensions	Length(to fork face)	mm	3220	3695
		Width	mm	1945	1969
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	12180	12960
14	Battery	Model		9PZS945	12PZS1104
		Standard	V/Ah	96/985	96/1104
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	40	52
16	Tire	Front/number		355/50-20/2	8.25-15/4
		Rear/number		250-15/2	250-15/2

序号	项　目			CPD100-XC5	CPD60-XC5-I
1	Rated lifting capacity		kg	10000	6000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	200	160
5	Mast Tilt angle (front/back)		(°)	5/10	5/10
6	Maximum travel speed(full load)		km/h	13.5	15
7	Maximum lifting speed (full load)		mm/s	250	340
8	Maximum grade ability (full load)		%	12	16
9	Minimum outside turning radius		mm	3350	3050
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	6	2.5
12	Dimensions	Length(to fork face)	mm	3705	3195
		Width	mm	2038	1870
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	13780	9030
14	Battery	Model		12PZS1260	CATL
		Standard	V/Ah	96/1260	96/542
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	52	40
16	Tire	Front/number		300-15/4	355/65-15/2
		Rear/number		250-15/2	250-15/2

序号	项　目			CPD70-XC5-I	CPD80-XC5-I
1	Rated lifting capacity		kg	7000	8000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	160	175
5	Mast Tilt angle (front/back)		(°)	5/10	5/10
6	Maximum travel speed(full load)		km/h	15	14.5
7	Maximum lifting speed (full load)		mm/s	320	300
8	Maximum grade ability (full load)		%	15	14
9	Minimum outside turning radius		mm	3050	3050
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	2.5	2.5
12	Dimensions	Length(to fork face)	mm	3200	3220
		Width	mm	1870	1945
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	9400	11100
14	Battery	Model		CATL	CATL
		Standard	V/Ah	96/542	96/542
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	40	40
16	Tire	Front/number		355/65-15/2	355/50-20SE/2
		Rear/number		250-15/2	250-15/2

序号	项　目			CPD90-XC5-I	CPD100-XC5-I
1	Rated lifting capacity		kg	9000	10000
2	Load center distance		mm	600	600
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	200	200
5	Mast Tilt angle (front/back)		(°)	5/10	5/10
6	Maximum travel speed(full load)		km/h	13.5	13.5
7	Maximum lifting speed (full load)		mm/s	280	250
8	Maximum grade ability (full load)		%	12	12
9	Minimum outside turning radius		mm	3350	3350
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	6	6
12	Dimensions	Length(to fork face)	mm	3695	3705
		Width	mm	1969	2038
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	11750	13180
14	Battery	Model		CATL	CATL
		Standard	V/Ah	96/606	96/606
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	52	52
16	Tire	Front/number		8.75-15/4	300-15/4
		Rear/number		250-15/2	250-15/2

序号	项　目			CPD80-XLC5-I	CPD80-XLC5
1	Rated lifting capacity		kg	8000	8000
2	Load center distance		mm	900	900
3	Standard mast lift height		mm	3000	3000
4	Free lift height		mm	200	200
5	Mast Tilt angle (front/back)		(°)	5/10	5/10
6	Maximum travel speed(full load)		km/h	14.5	14.5
7	Maximum lifting speed (full load)		mm/s	300	300
8	Maximum grade ability (full load)		%	13	13
9	Minimum outside turning radius		mm	3350	3350
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	6	6
12	Dimensions	Length(to fork face)	mm	3705	3705
		Width	mm	1969	1969
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	12480	13530
14	Battery	Model		CATL	9PZS945
		Standard	V/Ah	96/606	96/945
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	52	52
16	Tire	Front/number		8.75-15/4	8.75-15/4
		Rear/number		250-15/2	250-15/2

序号	项　目		CPD60-XD3	CPD60-XD3-I
1	Rated lifting capacity kg		6000	6000
2	Load center distance mm		600	600
3	Mast maximum lift height mm		3000	3000
4	Free lift height mm		160	160
5	Mast Tilt angle (front/back) (°)		5/10	5/10
6	Maximum travel speed(full load) km/h		15	15
7	Maximum lifting speed (full load) mm/s		340	340
8	Maximum grade ability (full load) %		15	16
9	Minimum outside turning radius mm		3050	3050
10	Minimum ground clearance mm		183	183
11	Maximum braking distance m		2.5	2.5
12	Dimensions	Length(to fork face) mm	3195	3195
		Width mm	1870	1870
		Height to overhead guard mm	2565	2565
13	Service weight	Include battery box kg	9600	9030
14	Battery	Model	9PZS750	CATL
		Standard V/Ah	96/720	96/542
15	Motor	Driven Motor kW	35	35
		Pump Motor kW	40	40
16	Tire	Front/number	355/62-15/2	355/62-15/2
		Rear/number	250-15/2	250-15/2

序号	项　目			CPD70-XD3	CPD70-XD3-I
1	Rated lifting capacity		kg	7000	7000
2	Load center distance		mm	600	600
3	Mast maximum lift height		mm	3000	3000
4	Free lift height		mm	160	160
5	Mast Tilt angle (front/back)		(°)	5/10	5/10
6	Maximum travel speed(full load)		km/h	15	15
7	Maximum lifting speed (full load)		mm/s	320	320
8	Maximum grade ability (full load)		%	15	15
9	Minimum outside turning radius		mm	3050	3050
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	2.5	2.5
12	Dimensions	Length(to fork face)	mm	3200	3200
		Width	mm	1870	1870
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	10280	9400
14	Battery	Model		9PZS810	CATL
		Standard	V/Ah	96/810	96/542
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	40	40
16	Tire	Front/number		355/62-15/2	355/62-15/2
		Rear/number		250-15/2	250-15/2

序号	项　目		CPD80-XD3	CPD80-XD3-I
1	Rated lifting capacity kg		8000	8000
2	Load center distance mm		600	600
3	Mast maximum lift height mm		3000	3000
4	Free lift height mm		175	175
5	Mast Tilt angle (front/back) (°)		5/10	5/10
6	Maximum travel speed(full load) km/h		14.5	14.5
7	Maximum lifting speed (full load) mm/s		300	300
8	Maximum grade ability (full load) %		14	14
9	Minimum outside turning radius mm		3050	3050
10	Minimum ground clearance mm		183	183
11	Maximum braking distance m		2.5	2.5
12	Dimensions	Length(to fork face) mm	3220	3220
		Width mm	1945	1495
		Height to overhead guard mm	2565	2565
13	Service weight	Include battery box kg	12180	11230
14	Battery	Model	9PZS945	CATL
		Standard V/Ah	96/945	96/542
15	Motor	Driven Motor kW	35	35
		Pump Motor kW	40	40
16	Tire	Front/number	355/50-20/2	355/50-15SE/2
		Rear/number	250-15/2	250-15/2

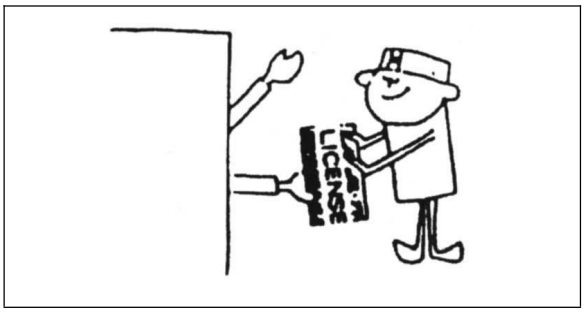
序号	项　目		CPD90-XD3	CPD90-XD3-I
1	Rated lifting capacity kg		9000	9000
2	Load center distance mm		600	600
3	Mast maximum lift height mm		3000	3000
4	Free lift height mm		200	200
5	Mast Tilt angle (front/back) (°)		5/10	5/10
6	Maximum travel speed(full load) km/h		13.5	13.5
7	Maximum lifting speed (full load) mm/s		280	280
8	Maximum grade ability (full load) %		12	12
9	Minimum outside turning radius mm		3350	3350
10	Minimum ground clearance mm		183	183
11	Maximum braking distance m		6	6
12	Dimensions	Length(to fork face) mm	3695	3695
		Width mm	1969	1969
		Height to overhead guard mm	2565	2565
13	Service weight	Include battery box kg	12960	11750
14	Battery	Model	12PZS1104	CATL
		Standard V/Ah	96/1104	96/606
15	Motor	Driven Motor kW	35	35
		Pump Motor kW	52	52
16	Tire	Front/number	8.25-15/4	8.25-15/4
		Rear/number	250-15/2	250-15/2

序号	项　目			CPD100-XD3	CPD100-XD3-I
1	Rated lifting capacity		kg	10000	10000
2	Load center distance		mm	600	600
3	Mast maximum lift height		mm	3000	3000
4	Free lift height		mm	200	200
5	Mast Tilt angle (front/back)		(°)	5/10	5/10
6	Maximum travel speed(full load)		km/h	13.5	13.5
7	Maximum lifting speed (full load)		mm/s	250	250
8	Maximum grade ability (full load)		%	12	12
9	Minimum outside turning radius		mm	3350	3350
10	Minimum ground clearance		mm	183	183
11	Maximum braking distance		m	6	6
12	Dimensions	Length(to fork face)	mm	3705	3705
		Width	mm	2038	2038
		Height to overhead guard	mm	2565	2565
13	Service weight	Include battery box	kg	13780	13180
14	Battery	Model		12PZS1260	CATL
		Standard	V/Ah	96/1260	96/606
15	Motor	Driven Motor	kW	35	35
		Pump Motor	kW	52	52
16	Tire	Front/number		300-15/4	300-15/4
		Rear/number		250-15/2	250-15/2

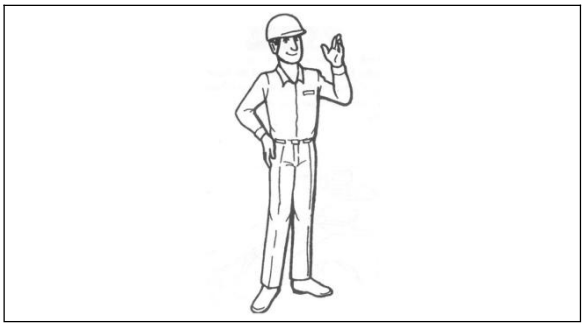
序号	项　目		CPD80-XLD3	CPD80-XLD3-I
1	Rated lifting capacity kg		8000	8000
2	Load center distance mm		900	900
3	Mast maximum lift height mm		3000	3000
4	Free lift height mm		200	200
5	Mast Tilt angle (front/back) (°)		5/10	5/10
6	Maximum travel speed(full load) km/h		14.5	14.5
7	Maximum lifting speed (full load) mm/s		300	300
8	Maximum grade ability (full load) %		13	13
9	Minimum outside turning radius mm		3350	3350
10	Minimum ground clearance mm		183	183
11	Maximum braking distance m		6	6
12	Dimensions	Length(to fork face) mm	3705	3705
		Width mm	1969	1969
		Height to overhead guard mm	2565	2565
13	Service weight	Include battery box kg	13530	12480
14	Battery	Model	9PZS945	CATL
		Standard V/Ah	96/945	96/606
15	Motor	Driven Motor kW	35	35
		Pump Motor kW	52	52
16	Tire	Front/number	8.25-15/4	8.25-15/4
		Rear/number	250-15/2	250-15/2

5. Safety instructions

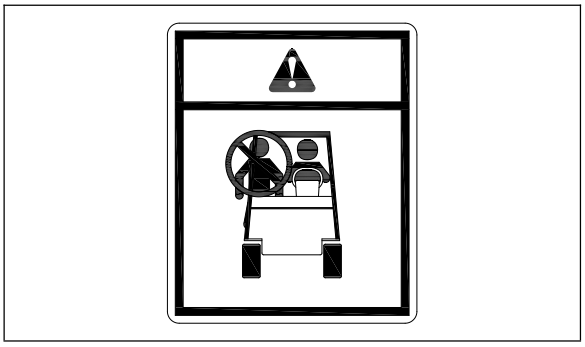
1. Only trained and accredited operators are permitted to operate the forklift truck.



2. Operators must wear a helmet, work shoes and overalls.



3. Never carry people.

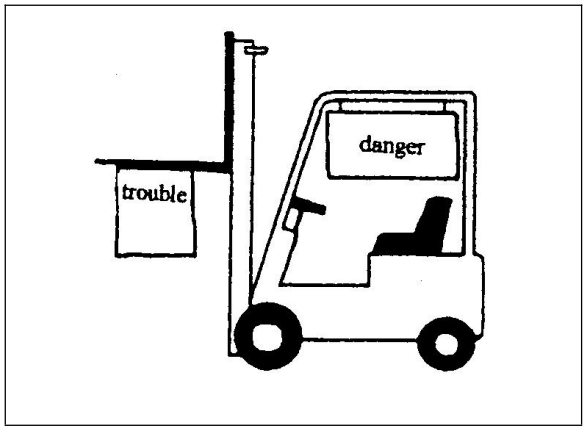


4. Inspect the truck at periodic intervals for leaks, deformation, defects, etc. the life of the truck will be shortened or an accident could occur.

- Make sure to replace the “key safety parts” during periodical inspection.
- Wipe off oil, grease or water from the floor board and foot and hand controls.
- Strictly prohibit smoking and spark near the storage battery when checking it.
- When performing maintenance on the mast, front and rear lights, or other high places, be safely secured and take care not to slip.
- Be careful do not be scalded when inspecting the motor, controller and etc.

5. Whenever you discover a fault, stop the forklift, hang a "DANGER" or "OUT OF ORDER" sign on it, remove the ignition key and notify a manager. The truck may only be used after the fault has been eliminated.

- Arrange for immediate repair in the event of a fault when lifting or driving uphill or downhill, or a leakage of battery electrolyte, hydraulic oil or brake fluid.



6. Batteries generate explosive gases. Keep sparks and open flames away from the battery.

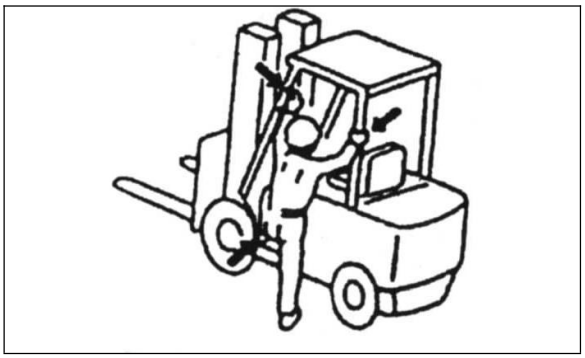
- Keep tools away from the battery terminals to prevent sparks or short-circuits.

7. The truck is designed to operate on solid and flat cement, asphalt or concrete surfaces. Check the road condition in advance.

- The truck is designed to operate in the following climatic conditions: temperature range -20 ℃ to 50 ℃; maximum wind speed 5 m/s; maximum relative air humidity 90% (at 20°C).
- The truck is not suitable for use in flammable or explosive working environments.

– Altitude not exceeds 2000m.

8. Never mount or dismount the forklift while it is in motion. Always use the safety step and safety handgrip when mounting and dismounting.



9. Never attempt to work the controls unless property seated.

– Before starting the vehicle, adjust the seat position to facilitate hand and foot control.

10. Before starting up, make sure that:

– The seat belt is fastened;

– The hand brake is released;

– The direction lever is in neutral;

– No person near the forklift.

– Before turning on the power, do not depress the accelerator pedal or operate the lift or tilt levers

– Operate the controls smoothly and do not jerk the steering wheel. Avoid sudden stops, starts or turns. Sudden braking may cause the vehicle to tip over.

11. Operate stably and correctly, no sudden brake or turn.

-- Emergency brake has the danger of tipping over.

12. Always look in the direction of travel and keep a clear view of the travel path.

– It is especially important to look in the direction of travel when reversing.

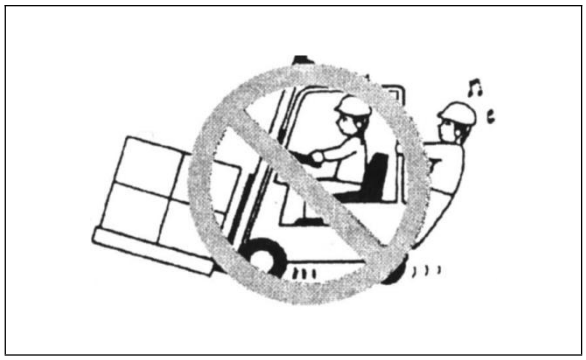
13. Other person is not allowed to sit on the fork, tray or forklift.

14. Select appropriate attachments and tools according to the shape and material of the loads to be handled.

– Do not lift loads by suspending ropes from the forks or attachment, as the ropes may slip off. If necessary, arrange for a lifting hook or jib to be attached by someone qualified to perform heavy lifting tasks.

– Be careful not to let the forks touch the floor, so as to avoid damaging the fork tips or driving surface.

15. Know the load capacity of the forklift and attachments, and never exceed it. Do not use people as an additional counterweight.



16. During driving, mobile phones and other electronic products cannot be used, and the focus is on work.

17. Keep your head, hands, arms, feet and legs within the confines of the forklift at all times.



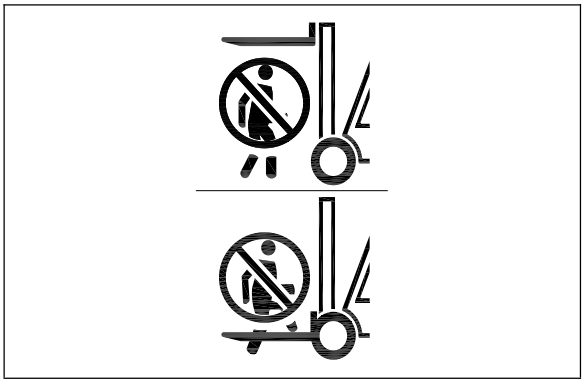
18. Pallets and skids should be strong enough to bear the weight of the load. Never use damaged or deformed pallets.

19. Hangcha can provide users with a variety of attachments including rotating clamps, flat

clamps, side-shift forks, jibs, etc. Such attachments are for special uses only. Modifications to attachments must be authorized by the manufacturer. Do not attempt to modify attachments yourself.

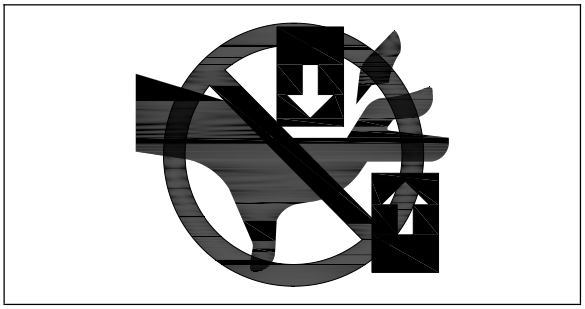
20. The overhead guard prevents cargo from falling onto the operator. The load backrest ensures the stability of loads. Do not use a forklift without the overhead guard and load backrest.

21. Never permit anyone to walk or stand under upraised forks or attachments. Do not allow anyone to stand on the forks.



22. Never place your head or body in between the mast and overhead guard. Risk of serious injury or death due to entrapment.

– Never place your hands in between the inner and outer masts.



23. Off-center loads may fall easily when turning corners or driving on uneven surfaces and increase the risk of the vehicle tipping over.

24. Do not stack loads on forks in such a way that the top of the load exceeds the backrest height. If unavoidable, make the load stable and secure. When handling bulky loads which restrict your vision, operate the forklift in reverse or have a guide. When using a guide, make sure you know and understand the meaning of all hand, flag, whistle or other signals being used. When transporting long loads such as lumber, piping and oversized cargo, or operating vehicles with elongated attachments, pay close attention to the front end when driving around corners or along narrow aisles and be aware of other people.

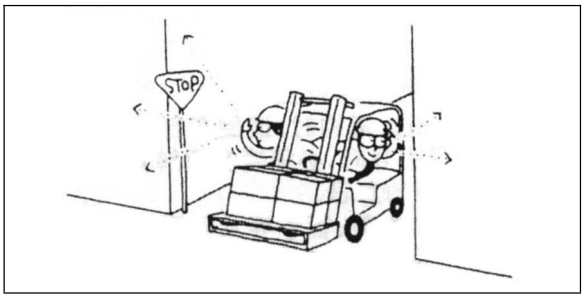
25. Use minimum forward and reverse tilt when stacking and unstacking loads. Never tilt forward unless the load is slightly above the stack or at low lift height.

– When stacking loads on a high place, make the mast vertical at a height of 15–20 cm above the ground and then lift the load. Never attempt to tilt the mast beyond vertical when the load is raised high.
– To remove loads from high places, insert forks into the pallet, lift slightly and drive backwards, then lower the load. Tilt the mast backwards after lowering. Never attempt to tilt the mast with the load elevated.

26. It is dangerous to travel with the forks elevated, regardless of whether loaded or not. When travelling, the forks should be 15–30 cm from the ground with the mast tilted backward. Do not operate a sideshift mechanism when the forks are raised and loaded. This will cause the forklift to be unbalanced.

27. When operating in congested areas, be aware of intersections, trailing ropes, entrances/exits and hanging objects.

– Slow down and sound the horn at cross aisles and other locations where vision is obstructed.
– Turning speed should be limited to 1/3 of the vehicle's top speed.

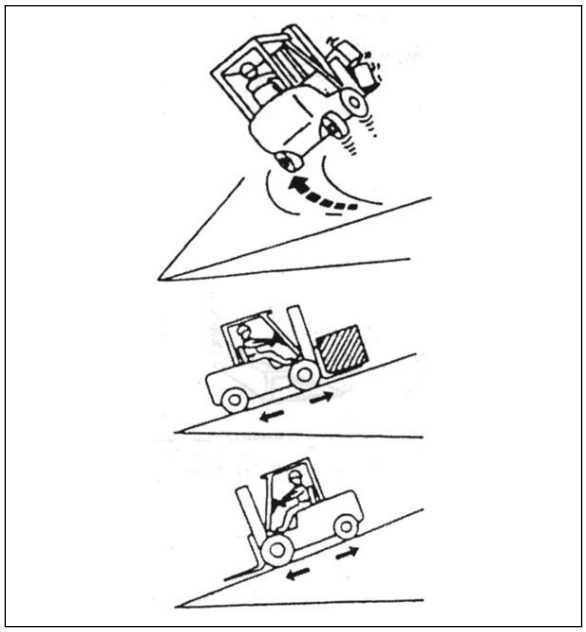


28. Make sure to keep your distance from the roadside or platform edge.

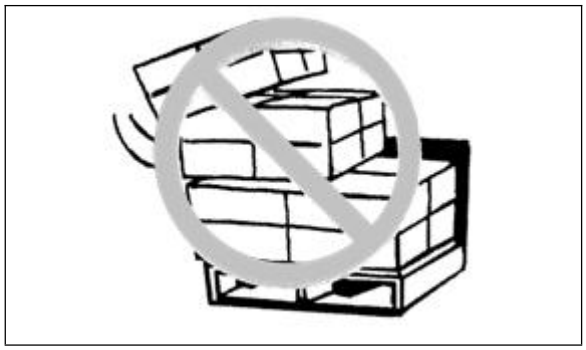
29. When driving over a ship's gangway or a bridge, make sure that it is properly secured and strong enough to withstand the weight of the forklift.

30. When operating a loaded forklift, climb inclines with the front end of the machine pointing uphill.

– When operating an unloaded forklift, descend inclines with the front end of the machine pointing downhill.
– Never turn sideways on an incline because of the danger of the forklift turning over.



31. Do not allow cargo to move away from the centre of the forks. Off-centre loads may fall easily when turning corners or driving on uneven surfaces and increase the risk of the vehicle tipping over.



32. Never lift loads with the truck inclined. Avoid loading and unloading work on a grade.

33. Never permit anyone to stand or walk under upraised forks or attachments. If unavoidable, choose a safe place and support forks with wooden blocks to prevent the possibility of them dropping or moving unexpectedly.

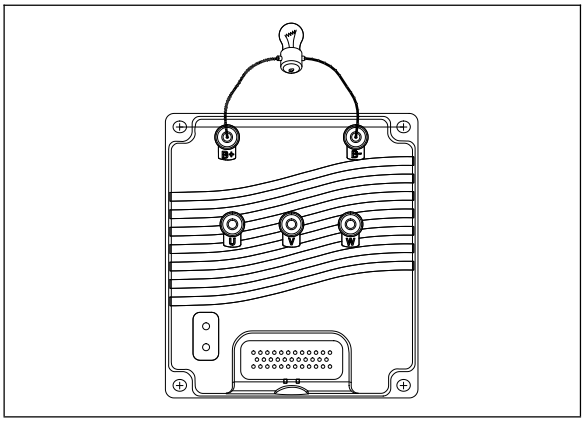
34. Inspect the surface over which you will run. Look for holes, drop-offs, obstacles, protrusions and anything that might cause loss of control or bumps.

– Clear away rubbish and debris and pick up items that might puncture a tire or

unbalance the load.

– Slow down on wet/slippery areas. Do not drive near the edge of the travel path; if unavoidable, be extra cautious.
– Do not use the forklift during sandstorms, snowfall, lightning, torrential rain, typhoons or other harsh weather conditions. Above all, avoid using the forklift where wind speeds are greater than 5 m/s.

35. Controller is equipped with accumulator. Forbid to touch within B+ and B- to prevent from wounding by electricity. Before checking or cleaning, please connect loads (contactor circuit or horn for example) between B+ and B- first to discharge for capacitor of controller.



36. Park the forklift on a level surface and apply the handbrake securely. If parking on an incline is unavoidable, be sure to block the wheels.

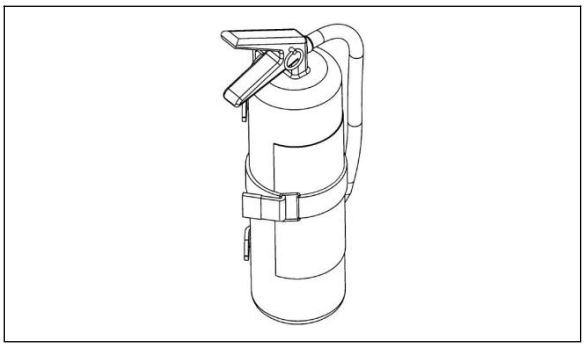
– Lower the forks to the floor and tilt slightly forward. Turn off the key switch and remove the key.
– Disconnect the battery plug.
– Park the forklift away from naked flames and sparks.

37. When the truck is unable to drive, drag the truck to safe place. Do not tow a truck whose steering system or braking system has been damaged.

38. The labels and signs on the vehicle provide warnings and operating instructions. During operation, adhere to the requirements of the manual as well as the labels and signs on the vehicle. Inspect the labels and signs, and replace any that are damaged or missing.

39. The workplace should be equipped with fire extinguishers. Users can also select a vehicle equipped with fire extinguisher. The fire extinguisher is generally installed on the rear leg of the safety frame and is easily accessible.

– Drivers and managers need to be familiar with the location and use of fire extinguishers.



40. Small loads should be carried on a pallet and not placed directly onto the forks.

41. Refrigerator type truck is not allowed to store in the refrigerator when power off

42. Never wash the forklift with water.

43. If fork arms/locking pins joint imperfectly，unexpected drop may occur.

44. Forklift operator to ensure compliance with the requirements of the scene illumination, forklift operation at night, you should open the truck lighting.

45. Only in the event that the truck manufacturer is no longer in business and there is no successor in the interest to the business, may the user arrange for a modification or alteration to a powered

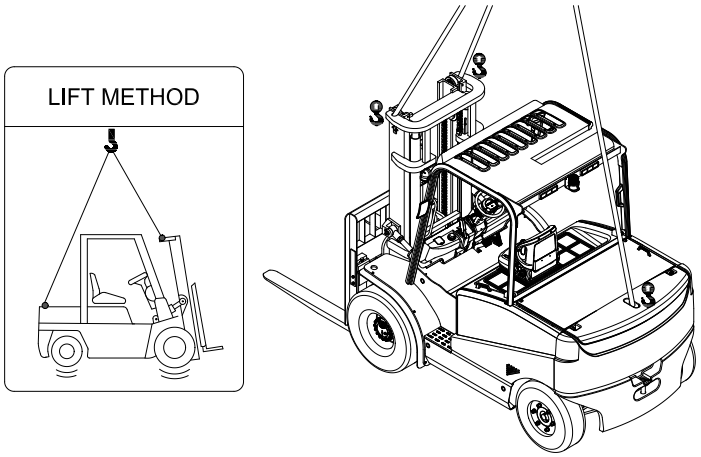
industrial truck, provided, however, that the user.

a) Arranges for the modification or alteration to be designed, tested and implemented by an engineer(s) expert in industrial trucks and their safety,
b) Maintains a permanent record of the design, test(s) and implementation of the modification or alteration,
c) Approves and makes appropriate changes to the capacity plate(s), decals, tags and instruction handbook, and
d) Affixes a permanent and readily visible label to the truck stating the manner in which the truck has been modified or altered, together with the date of the modification or alteration and the name and address of the organization that accomplished those tasks.

6. Truck Lifting, Carrying and Towing

Lifting

Securely fasten wire ropes to the lifting holes in both ends of the outer mast crossbar and to the counterweight hook, and then hoist the forklift with a lifting device. The wire rope fastened to the counterweight end must pass through the gap in the overhead guard, without putting stress on the overhead guard.



WARNING

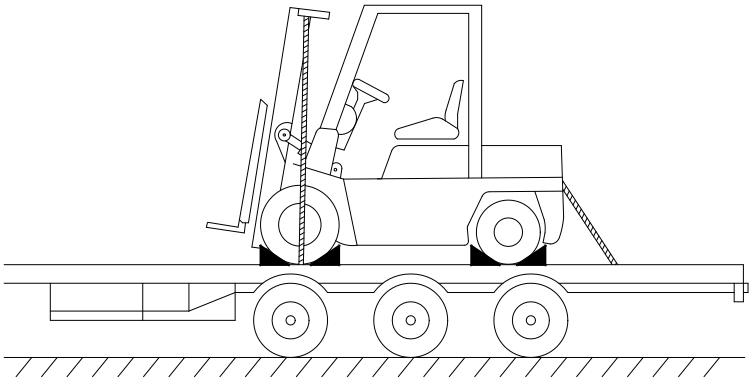
- **Only use the lifting tools with enough load.**
- **Fully tilt the mast backward when lifting.**
- **When assembling lifting tool, notice that the lifting tool will not touch forklift part or overhead guard when lifting.**
- **Do not lift a forklift by its cab frame (overhead guard).**
- **Never walk under a forklift when it is being lifted.**

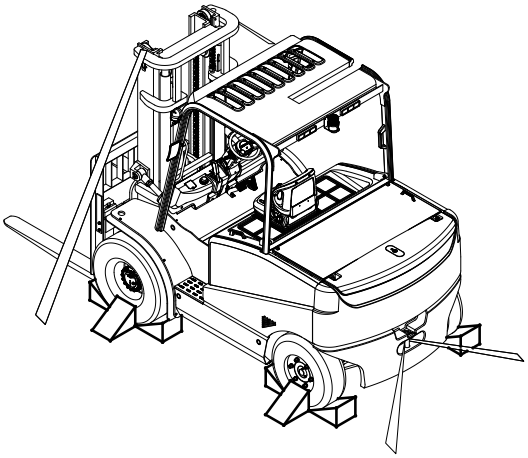
Carrying

Forklift trucks are generally used for loading, unloading and short-distance transportation. They are not designed to be a long-distance mode of transport. A forklift that needs to be transported over a long distance should be transported in a ship, train or a truck having a load capacity over 13T.

Procedures：

- Park the forklift on the lorry or trailer, and pull up the parking brake.
- Tie the tension belt on the mast upper beam and counterweight, and use clamping device to strain the tension belt.
- Block the front and rear wheel of the forklift with wedge wood.





WARNING

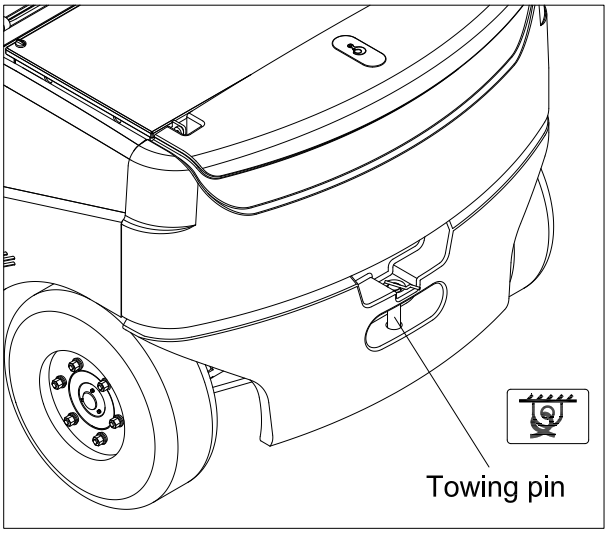
- **When fixing forklift, take effective measures according to specific condition to guarantee the safety of transportation.**
- **Correctly fix the forklift when transporting by lorry or trailer.**
- **Chock the forklift to avoid accident movement.**
- **Only use tension belt with big enough nominal strength or fasten the belt to fix the truck.**

Towing

Forklift is not permitted to use for daily traction or traction task

Towing pin in the lower counterweight is only used for the following occasions:

- Forklift malfunctions on the working road and move the truck urgently.
- Use when forklift gets into trouble and cannot drive(wheels get stuck in pits etc.)



Procedures：

- Turn off the key switch and disconnect the power plug.
- Release the parking brake.
- Put the direction lever in neutral.
- Fasten the wire rope for traction.

It can drag forklift.

WARNING

- **Don’t tie the steel wire ropes on the unfixed position.**
- **Don’t carry a load to steel wire ropes suddenly.**
- **The truck would be damaged if you tow it with the electric lock working.**

7. The structure and stability of truck

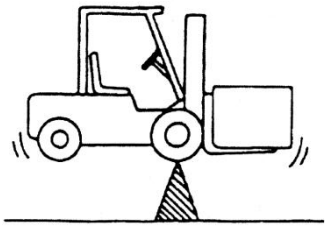
Prevent the forklift to turn over! It is very important for operator to know the truck's structure and relationship between load and stability.

CAUTION | **The structure of the truck**

The forklift truck essentially consists of the lifting device (forks and mast) and the truck itself (with tires).

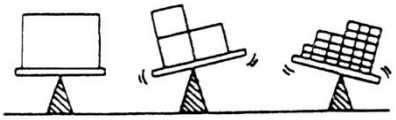
The front wheels are the fulcrum of the forklift and keep the centre of gravity of the forklift and load balanced.

The relationship between the forklift's centre of gravity and the load's centre of gravity is very important to maintaining the operation of the forklift.



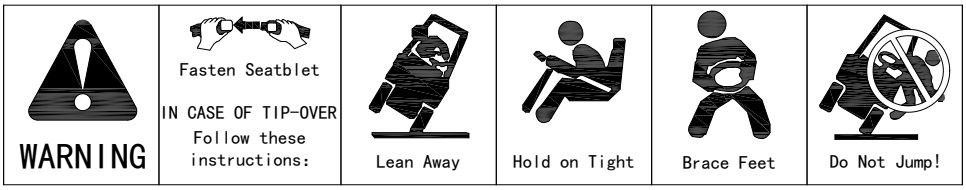
CAUTION | **Load center**

The forklift handles loads of different shapes, from crates to boards and elongated objects. In order to assess the forklift and its stability, it is very important to distinguish between the centres of gravity of different-shaped loads.



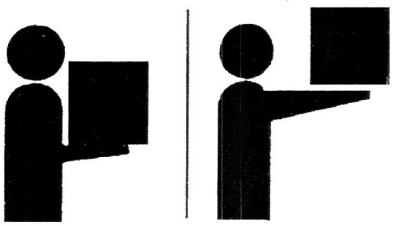
WARNING

If the forklift begins to tip over, do not attempt to jump off. The truck will tip much faster than you can jump. Spread your feet and grip the steering wheel with both hands to keep yourself within the confines of the forklift.



CAUTION | **the max load and load center**

The horizontal distance between the centre of gravity of the load on the forks and the backrest or the front face of the forks (whichever is shorter) is called the load centre distance. Maximum load is the maximum load that a forklift truck can carry at a standard load centre distance. The relationship between maximum load and load centre distance is stipulated in the forklift truck's load capacity graph. If the load centre distance moves towards the front of the forks, the overall centre of gravity shifts forward. Therefore, the load capacity decreases.



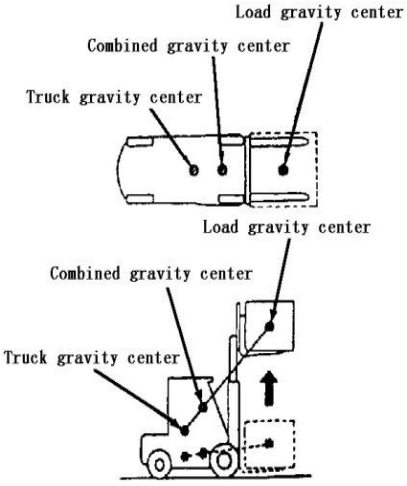
CAUTION | **Gravity and stability**

Forklift stability depends on the common centre of gravity of the forklift. When the forklift is unloaded, the centre of gravity (CoG) remains unchanged. When the forklift is loaded, the centre of gravity is formed by the combined centre of gravity of the forklift and load.

The load's centre of gravity depends on whether the mast is tilted forward or backward, raised or lowered, which means that the combined centre of gravity also changes accordingly.

The forklift's combined centre of gravity is determined by the following factors:

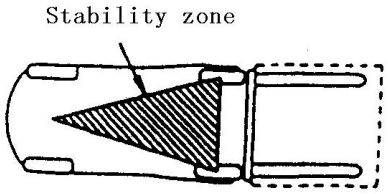
- Load size, weight and shape;
- Lifting height;
- Mast tilt angle;
- Tire inflation pressure;
- Acceleration, deceleration and turning radius;
- Driving surface conditions and inclination;
- Attachment type



CAUTION | **the stability zone of the center of gravity**

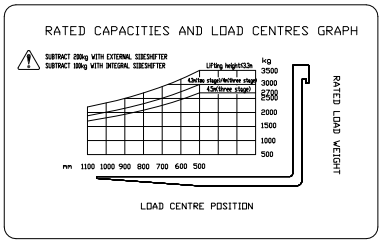
In order to stabilize the forklift, the combined centre of gravity must be located inside a triangle formed by the front wheels and the midpoint of the rear axle.

If the combined CoG is located on the front axle, the two front tires will form a fulcrum point on which the forklift will tip forward. If the combined CoG moves out of the stability triangle, the forklift will tip in the direction that the combined CoG has moved.



CAUTION | **the load capability chart**

This graph shows the relationship between the position of the load centre distance and the maximum load. Prior to loading, check whether the load and the load centre distance are within the limits of the load capacity graph. If a load has a complex shape, the heaviest part of the load should be centred over the forks and close to the load bracket.



CAUTION | **speed and acceleration**

A stationary object will remain stationary unless an external force acts on it. Similarly, in the absence of an external force, a moving object will continue moving at the same speed. This is inertia.

Due to inertia, a rearward force is exerted when the forklift starts moving, and a forward force is exerted when the forklift stops moving.

Sudden braking is dangerous because it generates a large forward force that will cause the forklift to tip over, or the load to slide off.

When the forklift turns a corner, a centrifugal force is exerted outward from the centre of the turn. This force pushes the forklift outward and makes it tip sideways.

The truck has narrow lateral stability, so cornering must performed slowly to prevent the forklift from tipping sideways. If the forklift is handling an elevated load, the overall centre of gravity is higher and therefore the forklift is more prone to forward or lateral tipover.

8. During running-in

New forklifts should initially be run under low-load conditions. In particular the following requirements should be met within the first 100 hours of operation:

- Battery over discharge must be prevented during initial use.
- In general, the battery should be recharged promptly when the charge level has decreased to 20% of its capacity.
- Required preventive maintenance must be carried out thoroughly.
- Avoid sudden braking, acceleration or cornering.
- Carry out oil changes or lubrication ahead of schedule in accordance with regulations.
- Limit the load weight to 70%～80% of the rated load.

9. Routine Maintenance

Careful, all-round maintenance will keep the forklift truck in good working condition. It guarantees the safety of the forklift and your personal safety at work.

WARNING

- **In addition to testing lights and checking operating performance, before checking the electrical system, turn off the key switch and disconnect the battery plug.**
- **Never use a forklift that has any kind of fault.**
- **Even a small fault can cause a serious accident.**

1. Check for leakage of hydraulic oil, electrolyte and brake fluid

Check for oil spills or leakage around the hydraulic fittings, battery, and brake systems by hand feeling or carrying out a visual inspection. Never use an open flame.

2. Check wheel fixation

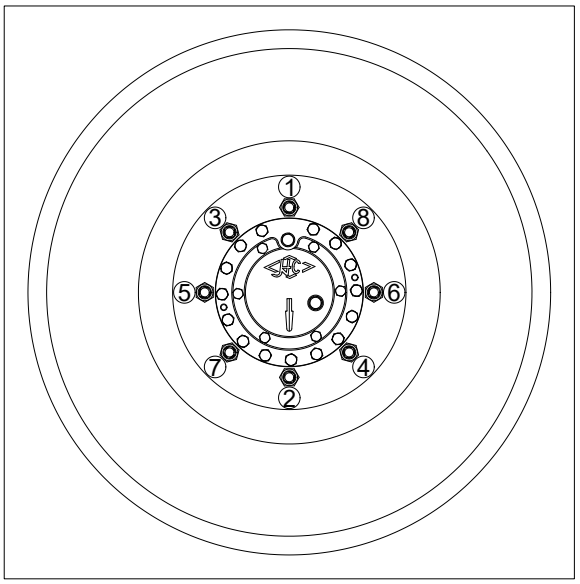
– Park the truck.

– Screw down wheel retaining nut with spanner crosswise.

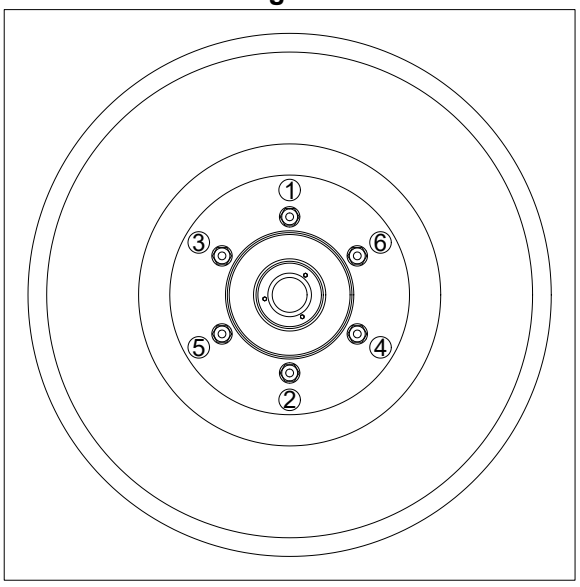
Bolt tightening torque：

Front wheel hub nut		Rear wheel hub nut
Single wheel	Dual wheel	
363～490 Nm	588～736 Nm	441～588 Nm

Front wheel（Driving wheel）



Rear wheel（steering wheel）

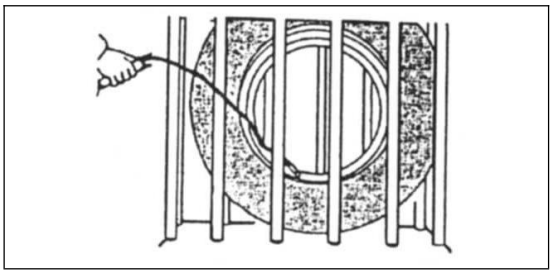


Change of tires

Warning

• When using an air compressor, first adjust the air pressure of the compressor. Failure to do so will cause a serious accident, since the compressor delivers the maximum pressure.

• To ensure safety, put the tire in a defend casing while inflating.



Front wheel

①Park forklift truck on level concrete;

② Start engine and raise mast about 100mm height.

③ Place chocks behind rear wheels to prevent movement of forklift;

④ Loosen wheel nuts 1-2 turns each by turning them counter-clockwise;

⑤ Tilt mast fully backward, and place a wooden block under each side of outer mast;

⑥ Tilt mast forward until front wheels are raised from surface;

Caution

Do not loose nuts before the front wheels leave the ground.

⑦Support truck by putting wooden blocks under both sides of the front truck frame. Stop the engine.

⑧ Take out the wheel nuts and replace the front wheel.

Caution

a. When removing tire from wheel rim, do not remove rim set bolts and nuts before releasing air;
b. Make sure that wooden blocks used to support lift truck are solid, one-piece units.
c. Never get under forklift while it is supported only by wooden blocks.

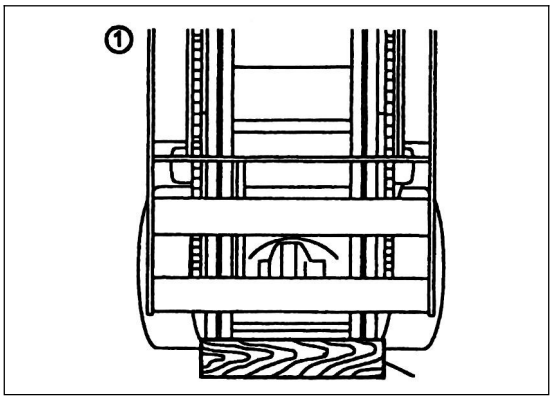
⑨ Retighten the wheel nut temporarily.

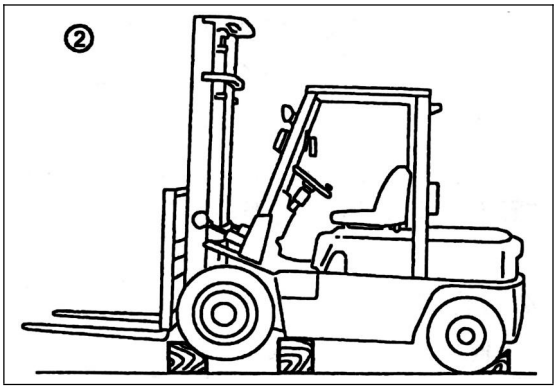
⑩ Start the engine, and take out the wooden block.

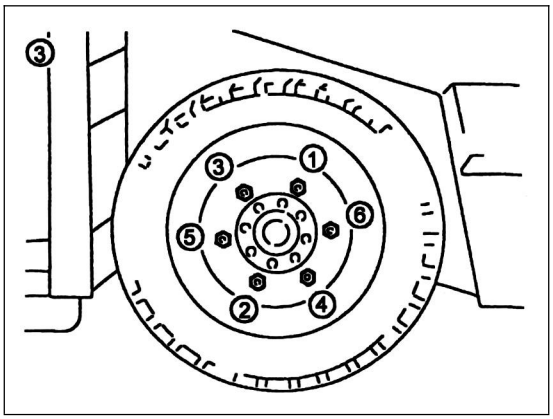
⑪ Tilt backward the mast and lower down the mast slowly, then take out the wooden block under the outer mast and rear wheel.

⑫ Retighten the wheel nut with correct torque.

⑬ Adjust tire pressure to specified value.







Rear wheel

① Park forklift trucks on level concrete.

② Pull the parking brake lever and place chocks before front wheels to prevent movement of forklift.

③Put the lifting jack under the counterweight.

Caution： Make sure the jack capacity is greater than 2/3 of service weight of forklift.

④ Loosen wheel nuts 1-2 turns by turning them counter-clockwise.

Warning

Do not remove wheel nuts until rear tires are raised from ground.

⑤ Raise the forklift with jack until rear wheels off the ground. Support forklift truck by putting additional wooden blocks under both sides of the front truck frame as shown below.

⑥ Take out the wheel nut of rear wheel, and then replace the wheel.

Warning

a. When removing tire from wheel rim, do not remove rim set bots and nuts before releasing air;

b. Make sure that wooden blocks used to support lift truck are solid, one-piece units;

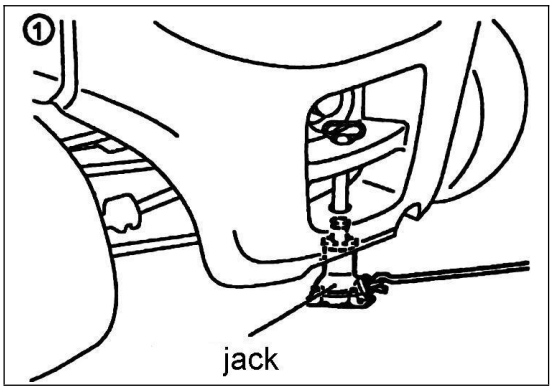
c. Never get under forklift while it is supported only by wooden blocks.

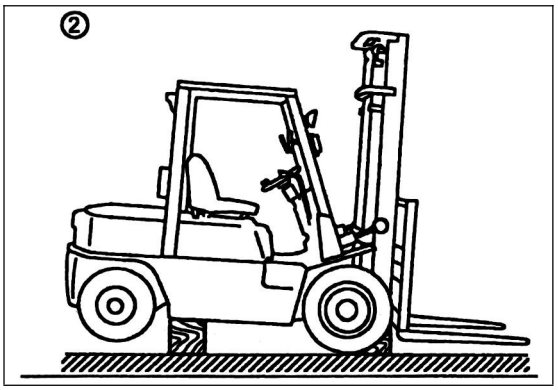
⑦ Retighten nuts as shown in figure below.

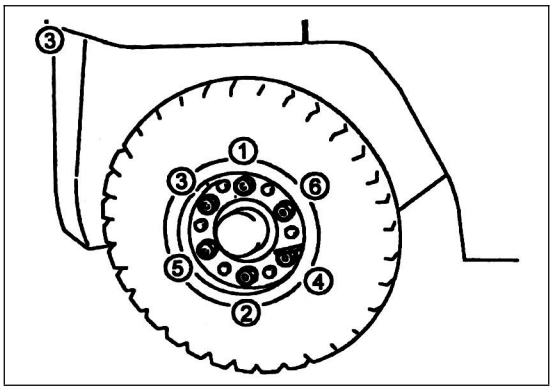
⑧ Remove the wooden block under chassis body. Let down the forklift slowly. Then take away the chocks and jack from the rear part of the front wheel.

⑨ Retighten the wheel nut with the correct torque. Please refer to *Tightening Torque Table*.

⑩Adjust tire pressure to specified value.







3. Brake pedal check

- Depress the brake pedal and check that it moves freely without jamming.
- The correct braking distance without a load is 2.5 metres.
- Adjust pedal height: regulate the limit bolt so that the midpoint of the upper face of the pedal pad is 115-125mm from the front baseplate.
- Adjust the length of the pushrod of the brake master cylinder so that the pedal free play is 1–3mm.
- The brake light switch should turn on fully when the brake pedal is gradually depressed 10–20mm.

4. Hand brake lever check

The operating force is regulated by means of an adjusting screw on the rod tip. Twist clockwise to increase the operating force; twist anti-clockwise to reduce it.

Make sure that when pulled tight and released,

the hand brake lever returns to its original position effectively.

CAUTION

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

5. Accelerator pedal check

As the accelerator pedal is depressed through its full stroke, there should be a clear change in the rate of acceleration, and the pedal should return freely to its original position when released.

6. Brake fluid check

Check whether the brake fluid level is between the scale marks. Top up if necessary. Also check for air trapped in the brake line.

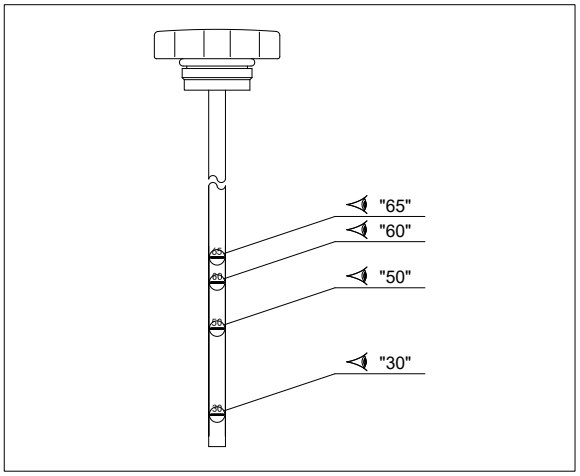


CAUTION

- **Use pure-grade brake fluid. Do not mix different grades of brake fluid.**
- **Do not spill brake fluid on painted surfaces, otherwise it will damage the paint.**
- **When adding brake fluid, avoid getting dust and water in the reservoir.**

7. Check hydraulic oil

Open the front cover, unscrew the hydraulic oil filler cap on the rear right side, pull out the dipstick and check whether the oil is between the marks. Add if necessary and then close the cover.



Working device movement make the pipeline full of oil, working device reset, and the oil level in the hydraulic oil tank reached the picture scale.

“30” means liquid level for mast with 3M lifting height or below

“50” means liquid level for mast with 5M lifting height or below

“60” means liquid level for mast with 6M lifting height or below

“65” means liquid level for mast with 6.5M lifting height or below.

Note: when installing with attachment, add proper hydraulic oil according to the attachment.

9. Seat adjustment

Move the seat adjustment lever to the right until the seat is comfortably positioned relative to the hand and foot controls, then lock in place. Adjust the weight setting.

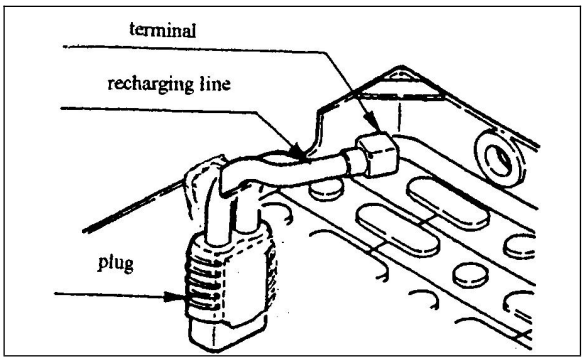
10. Battery check

Check that the lock pin is securely inserted and the battery is firmly fixed.

Check the specific gravity of the electrolyte. See Battery section.

Check where the wiring of both terminals is

loose or damaged. Adjust or replace the wiring if necessary.



Plug the battery plug and open the cover

Turn on the key switch

11. Instrument display check (power, faults)

See Instrument section.

12. Lift lever, tilt lever, and attachment lever

Check the lift lever, tilt lever and attachment lever for looseness. Make sure that they return freely to the original position when released.

13. Mast

Check the mast and forks to ensure that：

- Forks are not cracked or bent, and that they are firmly and correctly installed in the fork carriage;
- Check the oil cylinder and pipeline for leakage;
- Check that the rollers turn condition;
- Check the mast for cracks and deformation;
- Operate the lifting, tilting and attachment levers, check if the mast operates normally and no noise.

14. Mast lubrication

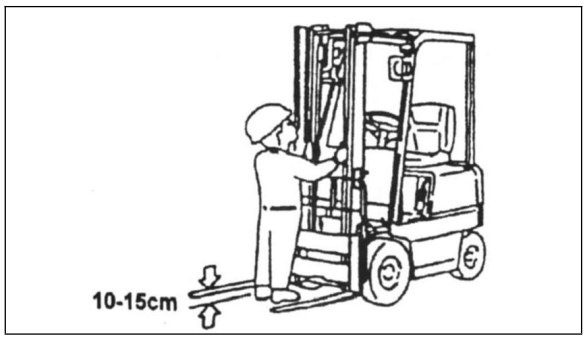
Apply grease to the inside and outside of the mast track regularly according to the periodic maintenance and lubrication table.

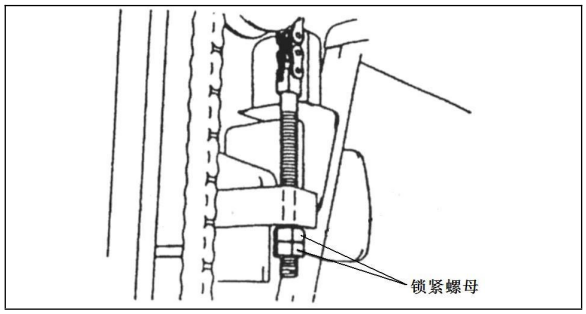
In heavy or severe operating conditions, adjust lubrication intervals accordingly. During busy months, increase the number of lubricated parts.

Depending on the operation of the forklift, coat the lift guide wheel and the contact surfaces on the inner and outer sides of the mast with a layer of grease.

15. Chain tension check

- Raise the forks to a height of 10–15cm with the mast vertical.
- Press the middle section of the chain with your thumb to check whether the tension between the left and right chains is identical.
- Tension adjustment: loose the lock nut and turn the adjuster nut to adjust the chains so that they both have the same tension, then tighten the lock nut.





16. Steering system check

Turn the steering wheel to the left and right to check the functionality of the steering system.

17. Turn signal lights, horn, other lights check

Push and pull the turn signal switch to check whether the turn signal lights are functioning

properly.

Press the horn button to check the sound of the horn.

Check all other lights and the reversing buzzer.

18. Battery maintenance

Refer to Battery section.

19. Others

Check for abnormal noise.

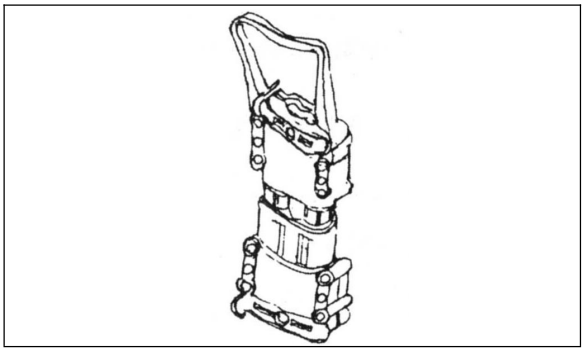
10. Starting and Operation

WARNING

- **Never start the truck before any damage or failure to the truck has been settled.**

Starting

– Open the cover, connect the battery plug, and then close the cover.



– Put the direction lever in the neutral position.
– Turn on key switch.
– Grip the steering wheel knob with your left hand and turn on the key switch with your right hand.
– Tilt mast backwards
– Operate the lifting lever to raise the forks 10 to 20cm off the ground. Operate the tilt lever to tilt the mast all the way back.
– Operate the direction lever
– To drive forward: push the direction lever forward;
– To reverse: pull the direction lever back.
– Release hand brake lever:
– Depress the brake pedal, push the hand brake lever all the way forward.
– Grip the steering wheel knob with your left hand and rest your right hand on the steering wheel.

Driving

Slowly depress the accelerator pedal until the forklift starts to travel forward or backward.

Decelerating

Slowly release the accelerator pedal, the forklift will slow down.

CAUTION

Always decelerate in the following situations:

- **When turning;**
- **When approaching cargo or pallets;**
- **When approaching stacked cargo areas;**
- **When entering narrow aisles;**
- **When ground or road is in poor condition.**

WARNING

- **Never depress the accelerator pedal and the brake pedal at the same time.**

Steering

A forklift is not like an ordinary vehicle in that it has rear-wheel steering, which means that the rear counterweight swings outward when cornering.

Decelerate, then rotate the steering wheel in the direction that you want to turn. The steering wheel needs to be turned slightly earlier than it would in a vehicle with front-wheel steering.

CAUTION

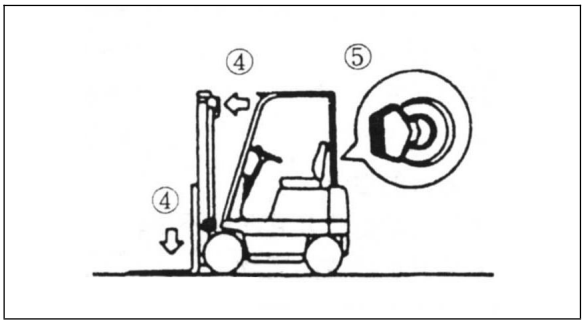
- **Drive slowly and operate the steering wheel carefully. Ensure that there is sufficient room for the rear end to swing out when making the turn.**

Parking

– Decelerate, then depress the brake pedal until the vehicle stops.
– Get the shift lever in neutral.
– Apply the hand brake.
– Lower the forks to the floor and tilt the mast all the way forward.
– Turn the key switch to the OFF position, disconnect the battery plug, remove the key and keep it in a secure place.

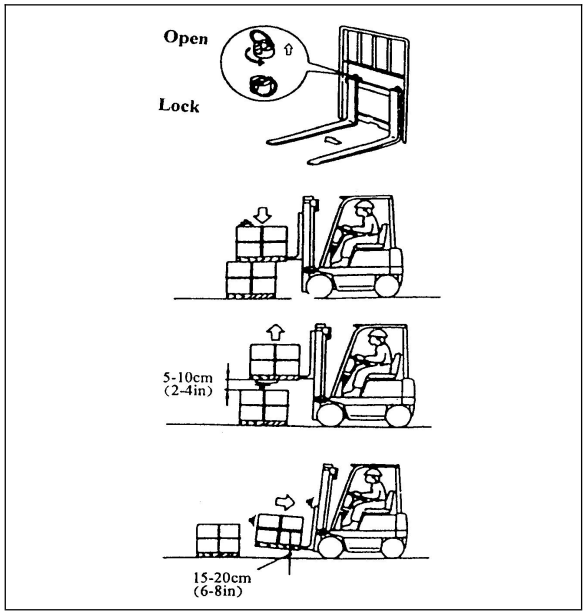
CAUTION

- **Dismount carefully — do not jump off.**
- **The vehicle must not be parked along driving routes.**



Loading

– Adjust the spacing between the forks to ensure a well-balanced load
– Position the forklift square to the load.
– Pallets should be placed symmetrically with respect to the forks.
– Insert the forks into the pallet as far as possible
– Lifting the load：
  - First raise the forks 5–10cm off the ground and make sure that the load is secure.
  - Tilt the mast all the way back, raise the load 5–10 cm off the ground, then move off.
– When a bulky load restricts vision, the forklift should be driven in reverse, except when driving up a gradient.



Stacking

– Slow down when approaching the deposit location.
– Stop the vehicle in front of the deposit location.
– Check the condition of the deposit location.
– Tilt the mast forward so the forks are parallel to the floor and raise them until they are slightly above the drop-off position.
– Inch forward until the load is over the drop-off position, then stop.
– After making sure that the load is squarely over the drop-off position, slowly lower the

forks and then check that the load is safely deposited.

– To perform necessary lifting and tilting operations, reverse the forklift to remove the forks from the loads.
– Make sure that the fork tips are clear of the load, then lower the forks to 15–20 cm off the ground.
– Tilt the mast all the way back

CAUTION

Slow down to the below condition:

- **When turn;**
- **Approach loads or tray;**
- **Approach stock area;**
- **Enter narrow aisle;**
- **Bad ground or road condition.**

WARNING

- **Do not tilt the mast when the load is raised above 2 m.**
- **Do not dismount or leave a vehicle unattended with a load elevated.**

Unstacking

– Slow down when approaching the pick-up location.
– Stop when the forklift is 30cm away from the load.
– Check the condition of the load.
– Tilt the mast forward until the forks are parallel to the floor, then raise the forks to the level of the pallet or rack.
– Make sure that the forks are aligned with the pallet, move forward slowly and insert the forks all the way into the pallet, then stop.

CAUTION

- **When it is difficult to insert the forks fully into the pallet, drive forward so that the forks are inserted to 3/4 of their length. Raise the forks by 5–10cm, back up 10–20cm, then lower the pallet or rack. Drive forward again until the forks are fully inserted.**

– Raise the forks 5–10cm off the stack.
– Look around the vehicle to make sure there are no obstacles in your path, then back up slowly.
– Lower the forks 15–20cm off the ground, tilt the mast all the way back, then carry the load to its destination.

Post-operation checks

After use, clean the forklift and carry out the following checks：

– Check for damage and oil leaks.
– Add lubricant if required.
– Check tires for damage and foreign bodies embedded in the treads.
– Check for loose wheel nuts.
– Check the electrolyte level.
– If the forks have not been elevated to their maximum height during the day, after finishing work, raise them to their maximum height 2 to 3 times.

CAUTION

- **If you discover any defects or faults, have them repaired immediately.**
- **Do not use the forklift until it has been fully repaired.**

11. Storage

Daily storage

- Park the forklift in a designated area and chock the wheels.
- Put the shift lever in neutral.
- Engage the hand brake.
- Turn off the key switch. Operate the multi-way valve lever several times to release the residual pressure in the cylinders and lines.
- Disconnect the power plug
- Remove the key and keep it in secure place.
- Refrigerator type forklift is not allowed to park in the refrigerator when off power.

Long-term storage

Pay attention to the following points, in addition to those for daily storage, when storing the forklift truck for extended periods：

- Disconnect the battery plug to prevent discharge and store the vehicle in a dark place.
- Apply anti-corrosion agent to shafts, rods and other exposed parts.
- Cover the breather and other openings where moisture may enter.
- Fully cover the vehicle with a sheet or similar.
- Lubricate with oil or grease where necessary.
- Support the underside of the body and counterweight with wooden blocks to reduce the weight on the rear wheel.
- Start the forklift at least once a week. Raise the forks to their maximum height several times.
- Measure the specific gravity and level of the battery electrolyte on a monthly basis.
- Apply one equalizing charging every month.

WARNING

- **The wooden blocks must be single pieces that are sturdy enough to support the weight of the forklift.**
- **Do not use wooden blocks that are more than 300mm (11.81 inches) in height.**
- **Raise the forklift just enough to allow it to be placed onto the wooden support blocks.**
- **Place wooden blocks of identical size under left and right sides of the frame.**
- **After supporting the forklift with the wooden blocks, rock the forklift back and forth from all four sides to make sure that it is safely secured.**

Forklift operation after long-term storage

- Remove anti-corrosion agent from exposed parts.
- Drain out the gear oil in the drive axle and reduction gearbox, then fill with fresh oil.
- Charge the battery, install it on the forklift and connect to the battery cables.
- Carry out a careful inspection before using the forklift, checking motor start-up, forward and reverse drive, steering and the lifting, lowering and forward/backward tilt functions.

12. Battery

Battery maintenance

It is important that the battery be properly charged in time, which will affect vehicle performance and battery life.

Over-discharge and over-charge will reduce battery life.

If there is abnormal situation such as odor, too fast electrolyte drop, high electrolyte temperature, please contact the agent or Hangcha after-sales service.

1.1 Maintenance precautions

（ 1 ） Maintenance personnel must undergo rigorous training.

（2）Never connect the battery's positive and negative terminals to each other, as this may cause a spark, fire or explosion. Fireworks, mobile phones and electronic products are strictly prohibited.

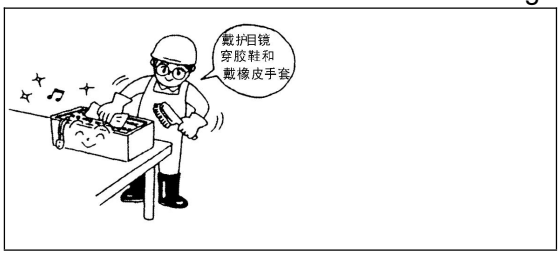


（3）Maintain and replace batteries and charge in designated well-ventilated areas, and place fire and power warning signs in conspicuous places.

（4）Check the electrolyte level daily. Do not use the truck when the electrolyte volume is low. Fill the distilled water (after charging) and always keep the electrolyte level at the specified height.

（5）The specific gravity of electrolyte was measured weekly.

（ 6 ） Make sure the battery surface is clean and dry. The connection terminals should be kept clean and dry. Surface area water and dirt can cause automatic discharge.



（7）Tighten the vent cap and clear the small holes to prevent dust from entering the electrolyte.

（8）Measures in winter: Maintain a good charging environment. Do not park the truck out in the cold or in the freezer for long time especially after the battery is used, it is forbidden to put it in a low temperature environment below 0 °C.

Warning

1. It is forbidden to place metal components and any other objects on it, and it is forbidden to connect the two poles of the battery to avoid short circuit, spark, or even explosion.
2. The electrolyte contains sulfuric acid, which is highly corrosive. If it comes into contact with the body, it may cause burns. Wear goggles, rubber shoes and rubber gloves when handling. Contact with clothing: take off immediately. Contact with skin or eyes: flush with running water for 15 to 20 minutes. Accidental ingestion: drink plenty of water and see a doctor immediately.
3. Explosive gases are generated inside the battery, smoking, flames and sparks are prohibited. Mobile phones and other electronic products are prohibited. Otherwise, the battery will explode.
4. Use a damp cloth when cleaning (no dry cloth or fabric) to prevent static electricity.

1.2 Daily, weekly, monthly, long-term storage maintenance

Time	Content
Daily	1. After the battery is discharged, it needs to be charged in time. 2. Check the electrolyte level. When the electrolyte level is low, add distilled water to the specified liquid level (after charging). If it is too high, it should be sucked out 3. Check if the vent cap is damaged. 4. Keep the battery surface clean and tidy. 5. Check whether the appearance is deformed, whether the surface is oxidized, stripped, whether the installation position is offset, whether the box is damaged or not.
Weekly	1. The specific gravity of the electrolyte is tested and recorded. 2. Check if the small hole of the vent cover is blocked and dredged to prevent dust from falling into the battery. 3. Check if the battery stud bolt connection is loose (use torque wrench, torque is 25Nm). 4. Check if there is any fluid in the box and handle it.
Monthly	1. Check whether the battery stud bolt is oxidized, whether the battery socket is damaged or deformed, or there is foreign matter. 2. Equalizing charge is performed once a month.
Long-term storage	The battery should be stored in a dry, ventilated place. Before storing the battery, fully charge it, and then charge it once every 30 days.

Specific gravity detection and conversion

The specific gravity of the electrolyte is tested at least once a week.

2.1 Specific gravity detection

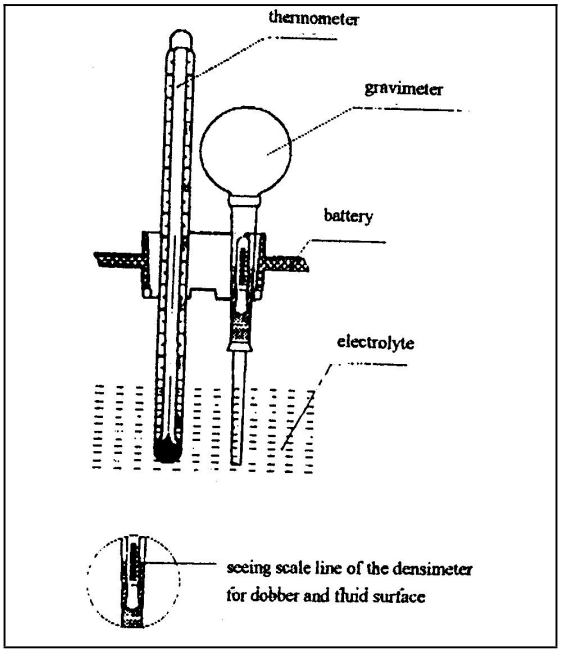
（1）Use a thermometer to measure the temperature of the electrolyte.

（2）Vertically insert the flexible tube of a pipette-type density meter into the electrolyte and squeeze the bulb. Electrolyte will enter the glass tube and the float will rise up.

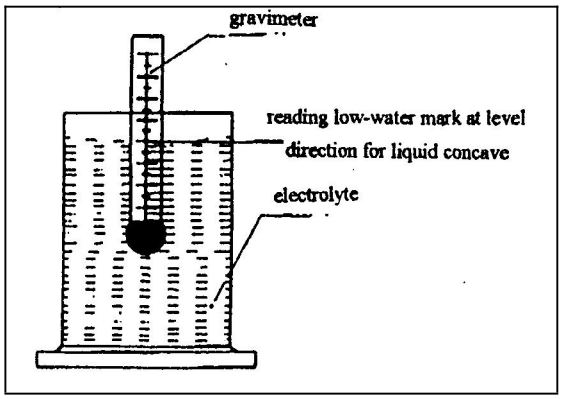
（3）Take the density reading.

Caution

Hold the density meter vertically so that the float does not touch the sides of the glass tube.



Use a hydrometer to measure the specific gravity of electrolyte.



2.2 Specific gravity conversion

Convert electrolyte density at the standard temperature of 30°C based on the following formula:

$D_{30}=D_t+0.0007(t-30)$

Wherein：D_{30}——electrolyte density at 30℃

D_t——measured electrolyte density at t℃.

t——electrolyte temperature during density measurement.

The specific gravity of the electrolyte mentioned in the manual refers to the specific gravity at 30 °C.

Specific gravity of the electrolyte varies with temperature.

Electrolyte after full charge: specific gravity 1.28 g/cm3

Electrolyte after 80% discharge: specific gravity 1.14g/cm3

Check the electrolyte level and add distilled water

Do not use the truck when the electrolyte is low.

Check the electrolyte level once a day. When the electrolyte level is low, add distilled water to the specified surface height (should be replenished after charging).

Warning

1. Using a battery when the electrolyte level is low may lead to overheating and shorten the life span of the battery.
2. When the amount of electrolyte is not correct, it will cause the battery to overheat and even burn the battery and electrical system components.

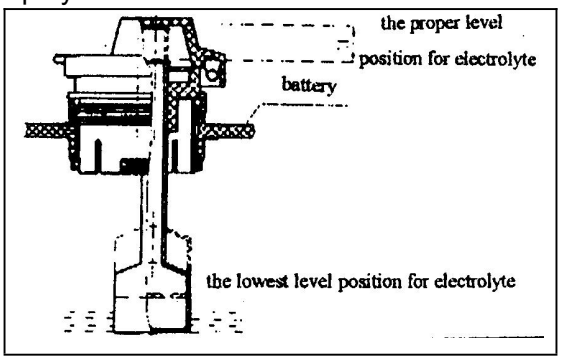
3.1 Check electrolyte level

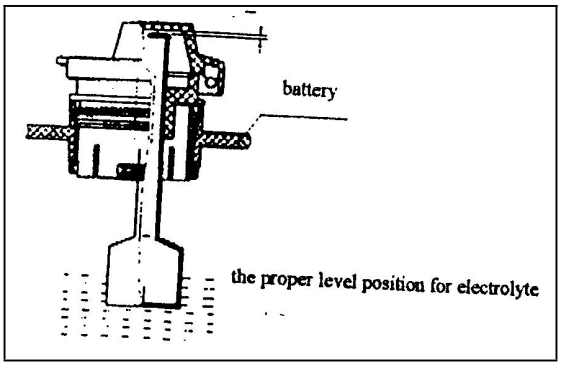
Battery without hydrometer

Electrolyte is 15 ～ 20mm higher than splashguard level.

Battery with hydrometer

Measure electrolyte level by reading the vent cap hydrometer.





3.2 Topping up distilled water

After the charging is completed, distilled water should be added, and the liquid level is 15-20mm higher than protective screening (that is, in the middle position of the screen). But don't overdo it.



Procedures：

（1）Wear protective eyewear, rubber boots and rubber gloves.

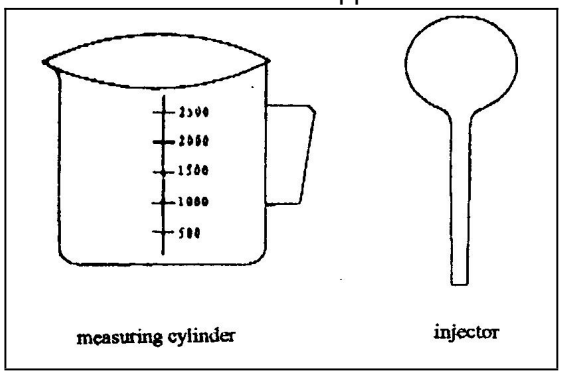
（2）Fill a squeeze bulb pipette with a certain amount of distilled water.

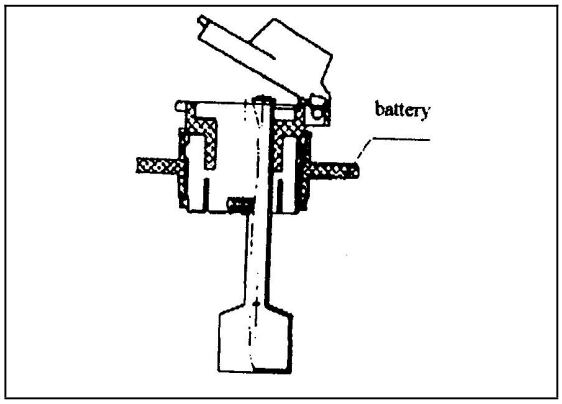
（3）Open all the vent or filler caps on the battery unit.

（4）Inject distilled water into battery cells using squeeze bulb pipette.

Battery with hydrometer

Stop adding water when the red hydrometer float rises and a white line appears.





Battery without hydrometer

Stop adding water when electrolyte is 15-20mm higher than splashguard level.

（5）After topping up, tightly fasten the vent or battery caps.

（6）Use a damp cloth to wipe clean the surface of each battery cell.

（7）Use a squeeze ball pipette to draw off any excess water.

Warning

1. When adding distilled water, do not exceed the specified maximum level. Adding too much water may cause electrolyte leakage and damage the forklift when charging or discharging the battery.
2. Do not use a dry cloth or fabric to wipe the surface of the battery to prevent static electricity from causing an explosion.

Battery charging

Warning

1. The forklift should be charged as soon as possible after use. It must be charged in time before the battery is 20% left. Excessive discharge will shorten battery life.

2. Charge in a designated well-ventilated place, away from inflammable and explosive materials, and place a fire and electric warning sign in conspicuous places.

3. Open the forklift hood and battery vent cover while charging to completely release hydrogen. When charging the battery, it is forbidden to use an open flame, mobile phone or other electronic products to prevent explosion. Do not charge when thunder.

4. During the charging process, it is forbidden to suddenly turn off the power switch or unplug the battery, otherwise it

will cause sparks and damage the plug and electrical components. Usually it is continuously and automatically filled.

5. After the charging is completed, distilled water should be added, and the liquid level is 15-20mm higher than protective screening (that is, in the middle position of the screen). But don't overdo it.

4.1 Charger requirement and selection

4.1.1 Charger

（1）When the charger is in use, its casing needs to be reliably grounded.

（2）Disconnect power when replacing fuse.

（3）Only qualified professionals are permitted to disassemble the charger casing for testing or maintenance.

（4）Do not rebuild or disassemble charger.

（5）Take measures to prevent damage caused by charger overheating in high temperature season. If necessary, suspend work temporarily.

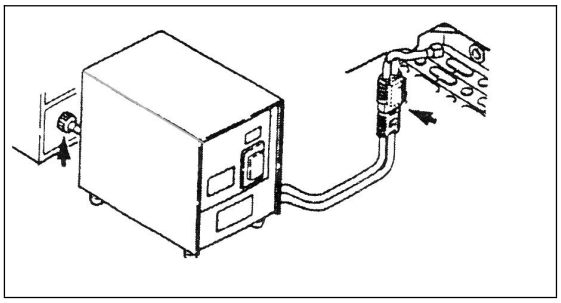
（6）Never continuously charge multiple batteries, which will overheat the charger and may even damage it. After charging, let the charger rest for an hour before re-using it.

4.1.2 Charger selection

Choose charger according to battery voltage and capacity (see parameter list). Generally, the charger current is selected according to the middle value of the battery capacity (1/10 to 1/7), that is, the current = (1/10 to 1/7) battery capacity. For example, the battery capacity is 630Ah, the charger current = (1/10 ~ 1 / 7) 630 = 63A ~ 90A, the choice of 70A-80A charger is most suitable.

Please use the Hangcha pure charger.

4.2 Daily charging procedures



（1）When the forklift meter shows 20% of the remaining power, it should be charged in time.

（2）Turn off the forklift key switch and press the red emergency stop button.

（3）Open the forklift cover and unplug the forklift cable from the battery socket.

（4）Open the battery venting cover to release the explosive gas, and measure the temperature of the electrolyte. If it exceeds 45 °C, it needs to be naturally cooled to below 45 °C, and then charged. The electrolyte temperature during charging should not exceed 55 °C.

（5）Check if the charger plug and the battery socket are damaged. After checking the error, plug the battery into the charger plug. It is strictly forbidden to misconnect positive and negative poles.

（6）Plug in the charger and press the charger's charging switch to charge.

（7）After the charging is completed, the charging device is automatically powered off. Now disconnect the power of the charger and then unplug the charger.

（8）Check the electrolyte level as required in the manual. If it is not enough, add distilled water (filled with Hangcha pure distilled water).

（9）For those equipped with automatic water filling system, distilled water should be added according to the relevant parts of Operation and Maintenance Manual

(Automatic Water Filling System of Battery (optional)).

（10）Close the vent cover, clean the battery surface, and close the battery cover. Plug the forklift cable plug into the battery socket and the charging is completed.

4.3 Equalizing charge

4.3.1 Reason of equalizing charge

With time, the voltage, density and capacity of a battery tend to become unbalanced. The voltage and specific gravity of some cells increase more slowly compared with other cells when charging, and decrease at a faster rate when discharging.

Equalizing charge should be applied when any of the following situations occur：

（1）The discharge voltage frequently falls below the cut-off voltage;

（2）The discharge current is frequently too high;

（3）The battery is not charged in a timely manner after discharge is complete;

（4）The battery frequently gets insufficient charge, or hasn't been used for a long time;

4.3.2 Equalizing charge method

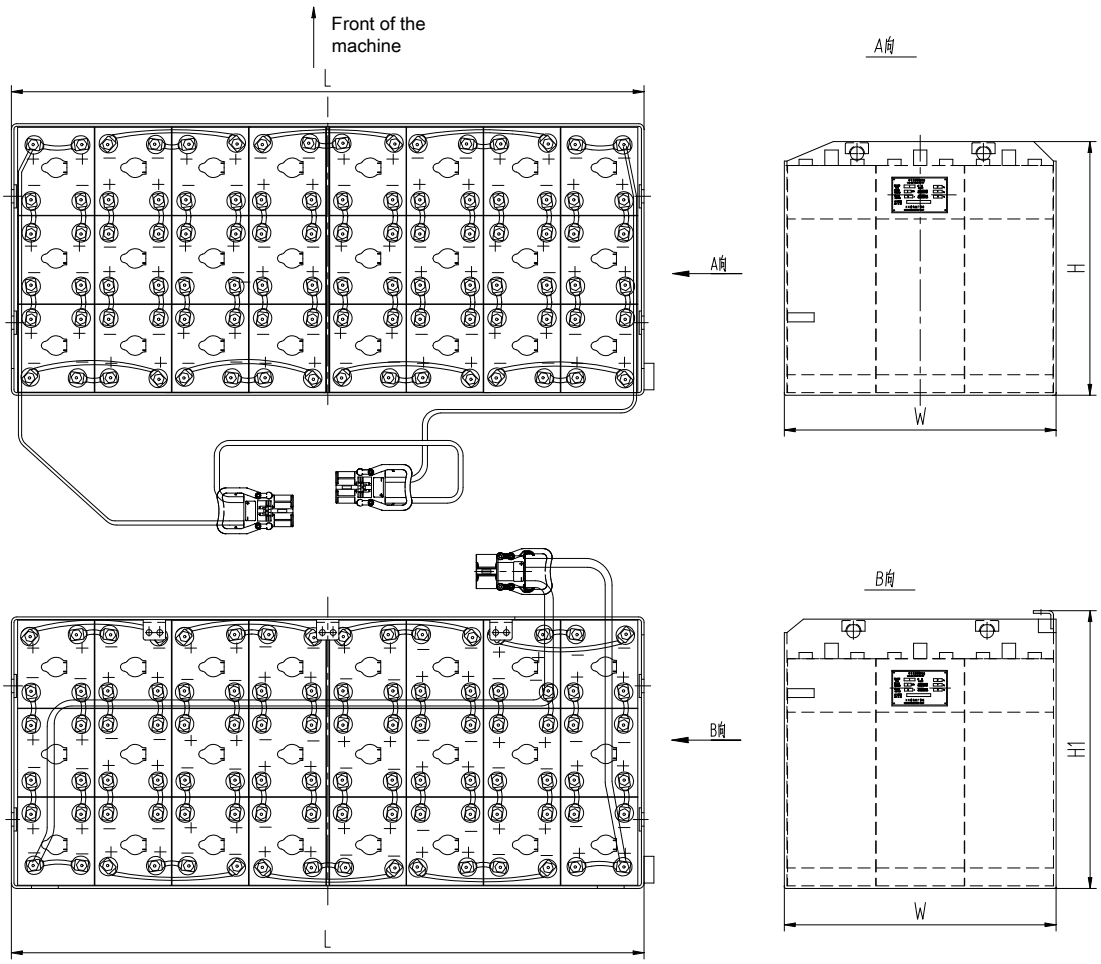
Please follow the instructions of the charger. Set to equalizing charge mode and charge.

Equalizing charge is performed once a month.

Battery specification

Battery of this truck is formed by front and rear batteries in series.

Item / Model			CPD60-XC4 CPD60-XC5	CPD70-XC4 CPD70-XC5	CPD80-XC4 CPD80-XC5	CPD90-XC4 CPD90-XC5	CPD100-XC4 CPD100-XC5	CPD80-XLC4 CPD80-XLC5
Battery box	Length [L]	mm	1420	1420	1420	1420	1420	1420
	Width [W]	mm	610	610	610	825	825	825
	Height [H]	mm	570	570	570	570	570	570
	Height [H1]	mm	624	624	624	624	624	624
Voltage		V	96	96	96	96	96	96
Capacity		A.h	720	810	945	1104	1260	945
Allowable lightest (Front Battery)		kg	1149	1251	1408	1717	1940	1476
Allowable lightest (Rear Battery)		kg	1161	1264	1420	1723	1946	1482

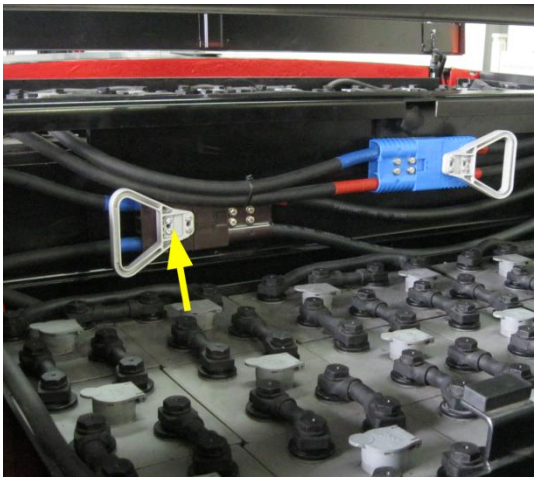


Battery charging

– Park the truck at the appointed charging area.
– Open the cover



– Take out the battery charging plug from the truck outlet



– Open each battery filling cap.



– Connect the battery charging plug to the charger plug



WARNING

- **Charging cable polarity must keep the same with the charger output terminal polarity.**
- **When the charging cable is connected to the battery plug, notice that the polarity keep the same. Otherwise it may damage battery.**

– Start the charger to charge.

After the battery is fully charged, take out battery charging plug, close each battery filling cap, and close the cover.



CAUTION

- **Charge in appointed and well ventilated place.**
- **Place No Flame signs when charging.**
- **Before charging, first check if wire or outlet damaged. Check if battery connector loosens and tighten.**
- **Electrolyte temperature during charging should not exceed 50℃, or try to cool, if the temperature does not drop, suspend charging, after the temperature drops, continue to charge.**

Battery replacement

CAUTION

- **Before replacing a battery, make sure that the voltage, capacity, weight and dimensions of the new battery match the forklift specifications.**
- **Do not use replacement batteries with a different voltage, weight or dimensions without the manufacturer's permission.**

– Park the truck at the appointed area.

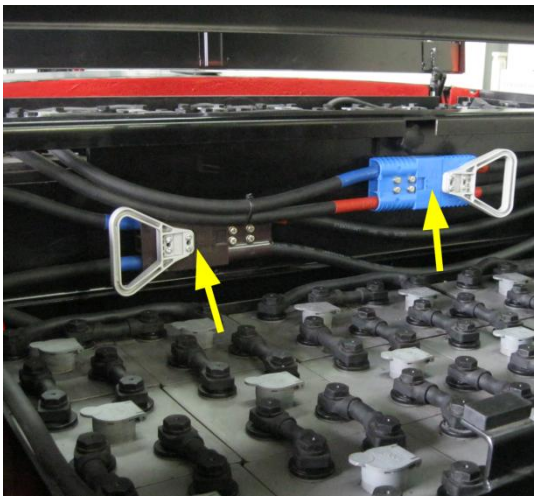
– Open the front/rear cover.



– Screw off the handle of left/right battery cover panels, and take out the left/right battery cover panels



– Dismantle the battery plug and place the battery cable in the battery box.



– Take down the front/rear battery box locating pins.





– Choose proper lifting appliance to hook up the four lifting holes of the battery box.



– Lift out the battery.

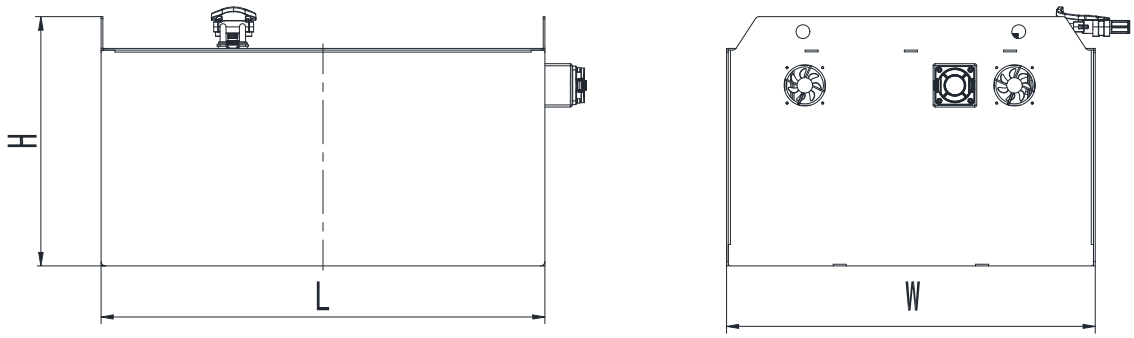


WARNING

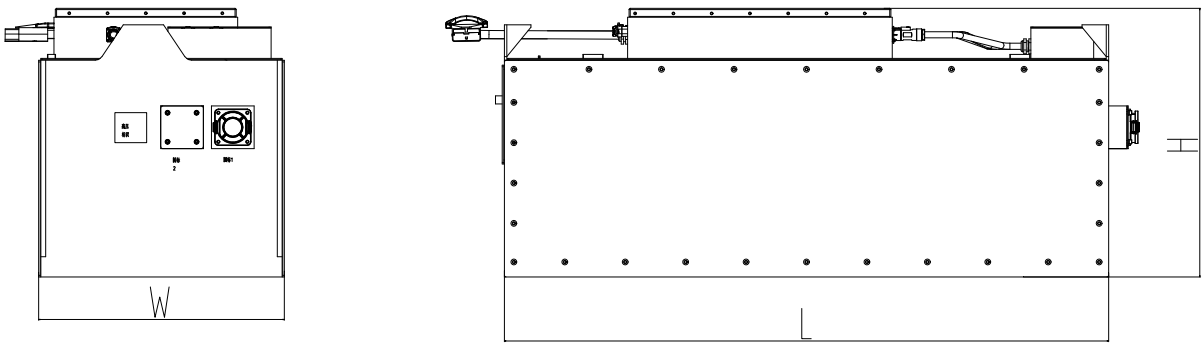
- **Lift the battery by attaching hooks to all 4 lifting holes. Do not lift with only 2 of the holes as this may subject the casing to uneven stress, causing the cells to rupture.**
- **Do not touch the steering wheel or other equipment when lifting the battery to avoid damage.**
- **When lifting up the battery box in lateral, keep stable and lift up slowly, avoid bumping against the forklift to cause damage.**
- **Do not discharge the battery liquid waste at will, but dispose it according to local environment protection law.**

13. Lithium battery

Lithium battery parameter （CATL）



Item		6t~8t
Length（L）	mm	1420
Width（W）	mm	610
Height（H）	mm	580
Heaviest weight	kg	609
Lightest weight	kg	580
Rated capacity	Ah	542
Rated voltage	V	96



Item		9t~10t	L8t
Length（L）	mm	1500	1500
Width（W）	mm	610	610
Height（H）	mm	666	666
Lightest weight	kg	638	638
Rated capacity	Ah	606	606
Rated voltage	V	96	96

Safety instructions

1.1.1 It is strictly forbidden to touch the positive and negative poles of the battery box with both hands at any time.



1.1.2 Maintenance personnel are required to hold the qualified electrician certificate and ENEROC maintenance authorization issued by the Safety Supervision Bureau in order to carry out maintenance operations

1.1.3When operating and maintaining the battery system, please wear insulting gloves and take off metal orraments.



1.1.4 When cleaning forklifts, high-voltage components should be avoided to adverse consequences after contact with water.



Installation instructions

1.2.1 Installation requirements : Installation personnel should be on duty with a certificate, wear labor insurance supplies, and pay attention to safety protection. Low voltage must be cut off before system installation. The high-voltage output interface should be protected to prevent the installation personnel from contacting during the installation process. When installing the system, mechanical hoisting should be adopted. When moving to the battery system warehouse, the speed should be slow and the position should be correct to prevent the extrusion deformation of the battery box. When the system is connected, the phenomena of negative and positive pole reverse connection and short circuit are avoided. In rainy and snowy weather, pay attention to the protection of connectors to prevent rainwater from entering.

1.2.2 Inspection after installation: After installation of the system, check the positioning pin/fixing bolt of the battery system to confirm that it meets the installation requirements. Check the connection of the low voltage connector is correct/reliable. Check the high voltage positive and negative cable connection is correct/reliable. Turn the key switch to ON gear and the relay should be able to suck in normally without battery alarm. If battery failure alarm occurs, the power supply should be cut off immediately and the after-sales service department of our company should be notified to solve the problem.

Basic terms for lithium ion battery

1.3.1. Battery system

Electric energy storage system, usually including one or more battery modules, battery management system, thermal management, high and low voltage lines, connectors and structural components.

1.3.2 SOC

Refers to the percentage of battery remaining electricity.

1.3.3 Nominal voltage

An appropriate approximate value used to represent the voltage of a battery.

1.3.4 Rated capacity

The capacity value specified by the manufacturer when the battery is fully charged under specified conditions.

1.3.5Overdischarge

When the battery voltage is lower than the discharge cut-off voltage, the state can usually be seen as that the battery enters the overdischarge state, generally referring to the state when the battery voltage reaches 0 V or even the voltage is negative.

1.3.6 Overcharging

When the battery voltage is higher than the maximum charging voltage, the state of the battery can usually be regarded as the state of overcharging.

1.3.7 Explosion:

The battery shell is broken and solid material rushes out of the battery and makes sound.

1.3.8 Fire

Open fire appears in the battery case.

1.3.9 Leakage

The internal components of the battery (electrolyte or other substances) leak from the battery.

1.3.10 CAN

Communication: Control Area Network, Controller Area Network.

Instructions for Use

1.4.1 Temperature Characteristics of Batteries：Working Environment Temperature : -25 ℃ ~55 ℃ ， Permissible Charging Temperature:0 ℃ ~55 ℃ ， Permissible Discharge Temperature : -28 ℃ ~55 ℃ ， Storage Environment Temperature: -28 ℃ ~55℃.

1.4.2 Pre-departure inspection：After the key switch is closed, confirm that the instrument panel has no battery system alarm information. Check the remaining power before leaving the car. It is recommended to charge up to 50%~100% before leaving the car. It can not overdischarge the power battery system. Overdischarge will cause irreversible permanent damage to lithium-ion power battery.

1.4.3 Charging instructions: Forklift truck in operation after stopping or battery system SOC less than 20%, please charge in time. Use the special charging equipment authorized by the manufacturer to charge. If there is a fault alarm during charging, the power battery system and charger will stop charging, and the charger will show the fault. Charging environment should be dry and ventilated without flammable and explosive materials. Cars should be fully charged once a week.

1.4.4 Long-term parking storage: Before parking, it is necessary to confirm the battery power of the vehicle: 50%-70%. Maintenance is carried out every three months.The electricity is filled by full charging, and then discharged to 50%~70% before parking. The vehicle has been parked for more than three months. Please make sure that the dashboard alarms before reusing. If so, please contact the vehicle manufacturer for maintenance. Forklift parking environment should be kept as dry and ventilated as possible, away from heat sources.

Maintenance

1.5.1 Outside appearance of inspection box: Check whether there are any debris, obvious deformation, rust and other abnormal conditions in the battery system outer box.

1.5.2 National Standard Charging Port: When the power is off, check whether there are any abnormal conditions such as debris and rust in the intPlug-in rface.

1.5.3 Plug-in: When the power is off, check whether the connector is loose or damaged.

1.5.4 Parameter Detection: Check the battery voltage and temperature on the display before charging and discharging to ensure that all values are in the normal range.

Emergency plan

1.6.1Scenarios,extreme anomalies

Users should establish a good sense of security in the use process, strictly prohibit illegal operation, avoid battery system abuse (overcharge, overdischarge, short circuit, extrusion, puncture, environmental overheating, high current discharge, etc.). In the process of charging and using, the abnormalities that may occur in the power battery system are as follows: Battery systems or local temperatures rise sharply. There is abnormal odor in any part of the battery system. Smoke and fire occur at any part of the battery system.

1.6.2Emergency plan

6.2.1Personnel leave the vehicle quickly and dial the alarm phone according to the situation on the spot.

6.2.2To ensure personal safety, the following operations are carried out conditionally:

a. Use carbon dioxide or dry powder fire extinguishers if the battery harness smokes and ignites.

b.If the battery is on fire, use a high-pressure water gun to extinguish the fire at a long distance.

c. If smoke is inhaled carelessly, please transfer it to the doctor as soon as possible.

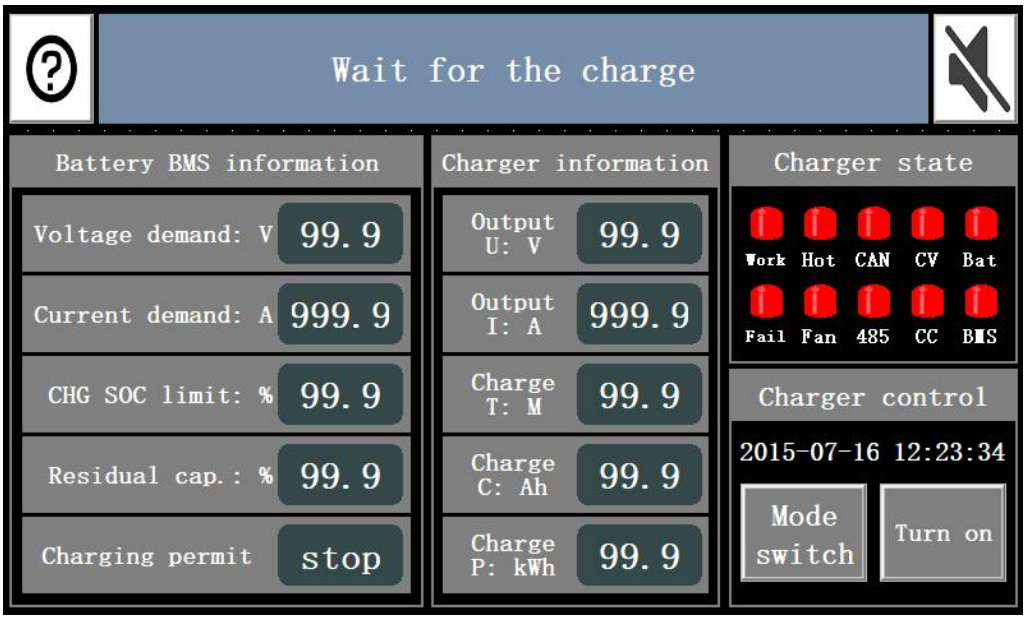
6.2.3 Contact forklift brand dealers to obtain professional treatment advice.

SLC-96250 Operation instructions for intelligent charger (CATL battery charger)

Start-up interface



Start-up interface



Click on the icon： , Enter the help description interface.

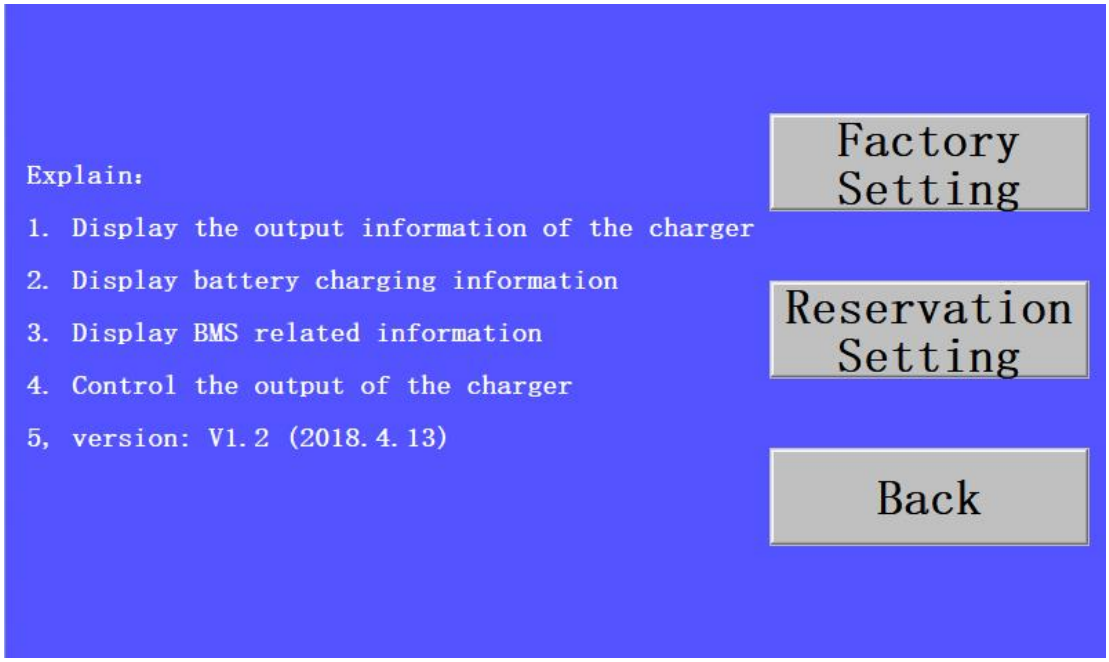
Click on the icon： or , on-off alarm sound, to turn on the alarm sound state, to

turn off the alarm sound state.

The control operation requires password permission. **The default password is: 123456**.

Click on the boot icon: toggle charging control to turn on or off.

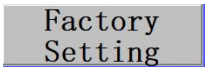
Click on the purple part of the charging status information bar, enter into the single charging module information display bar.



Click on the icon：

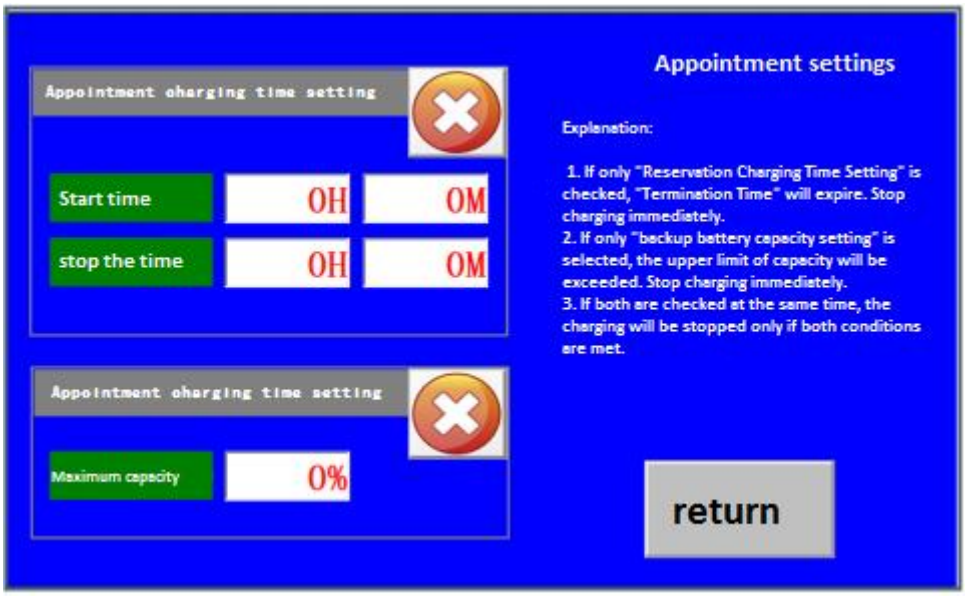
, return to main interface.

Click on the reservation icon to set the time for booking mode. **The default password is 123456.**

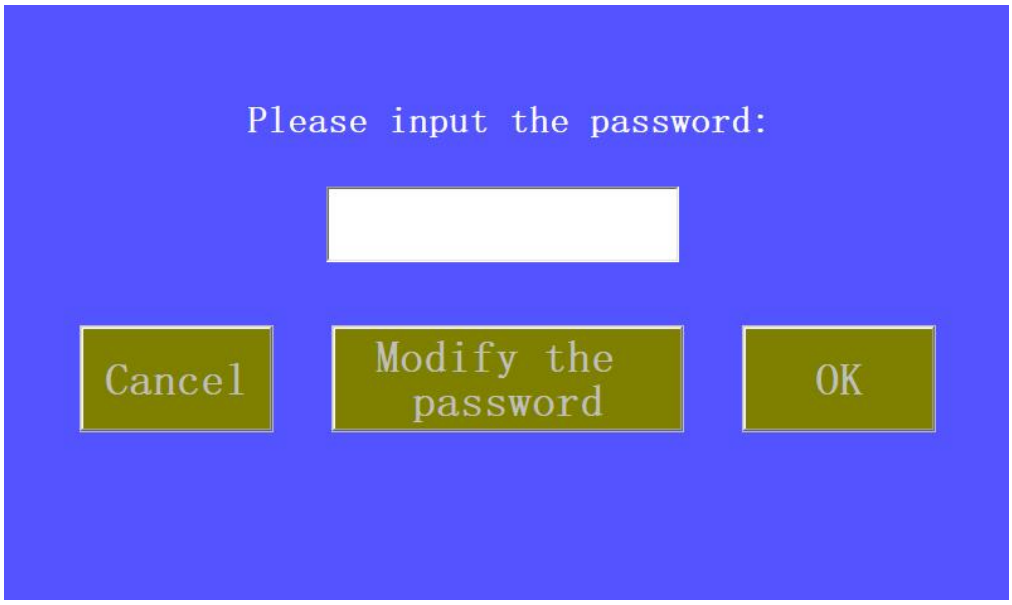
Click on the icon：

, enter the password input interface, enter the correct password into the factory parameter setting interface

Appointment setting instructions:



Password input interface:



Enter the correct password in the password entry box. **The default password is 888888.**

Click on the icon：

, return to help description interface.

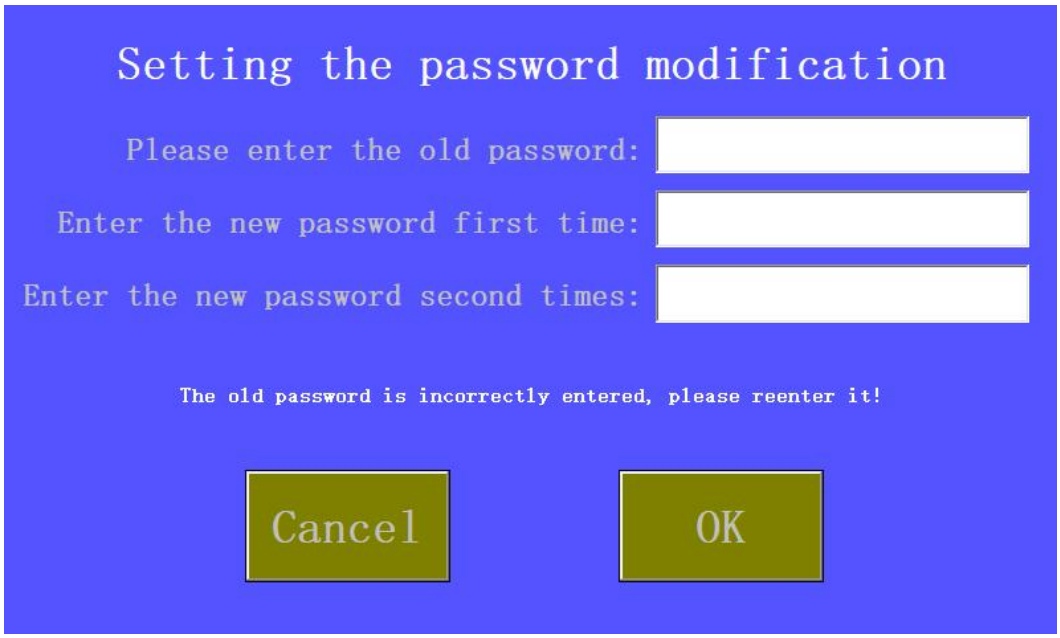
Click on the icon：,

enter the password modify interface.

Click on the icon：

, if the password is entered correctly, enter the parameter setting interface, otherwise the password input error is prompted. Please enter it again.

Password modification interface

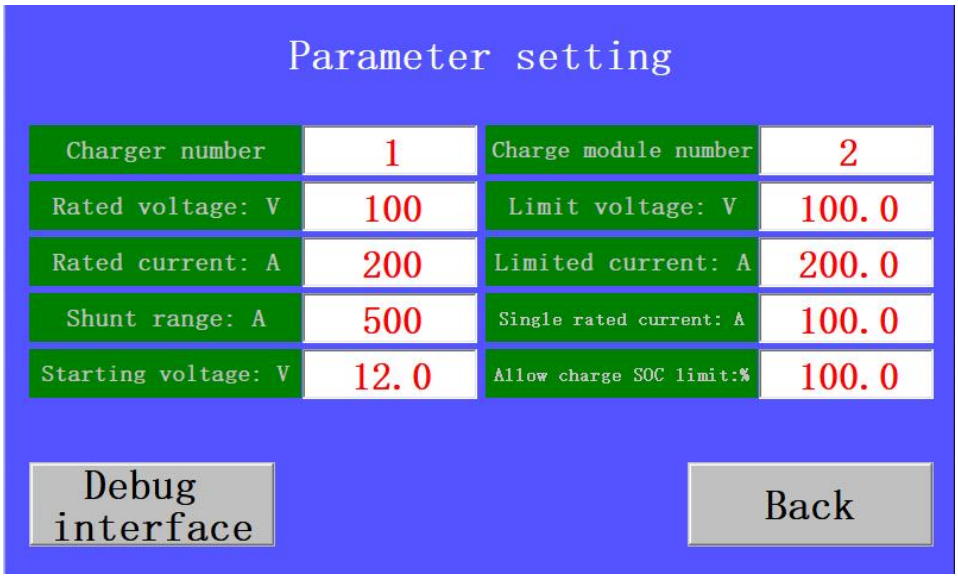


Enter in sequence according to the prompt: Enter the user's old password, enter the new password for the first time and enter the new password for the second time.

Click on the icon： OK , if the user's old password is entered correctly, the first time the new password is entered and the second time the new password is entered, the modification is successful. Otherwise, the prompt modification fails. Please re-enter.

Click on the icon： Cancel , Return to the password entry interface.

Parameter setting interface



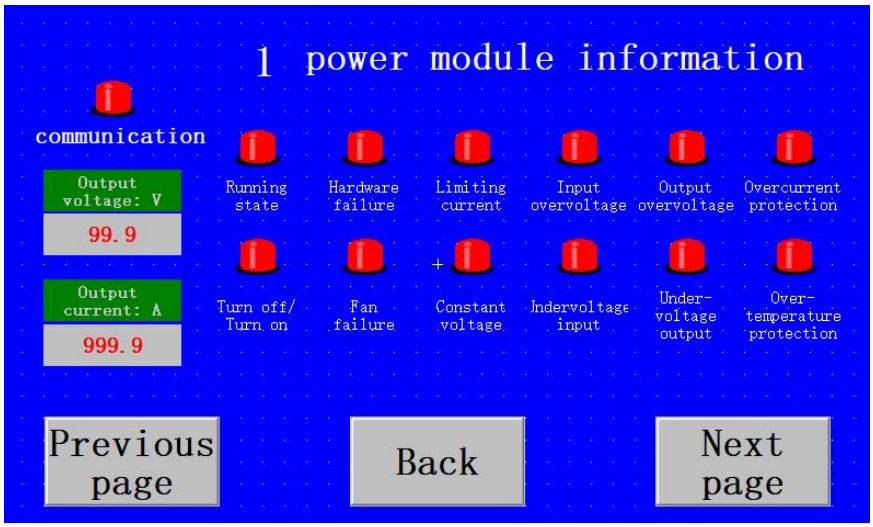
Click on the icon： Back , return to the help description interface.

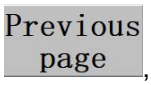
Parameter setting information: rated voltage, rated current and shunt range are related to machine hardware, and must not be arbitrarily modified after the factory.

Consult the manufacturer if the above parameters need to be modified. The charging machine

number is easy for the user to distinguish, and the user can set it at will.

Debug interface for the factory to adjust the test, users can not operate at will.

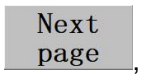


Click on the icon：

, switch module information backward.

Click on the icon：,

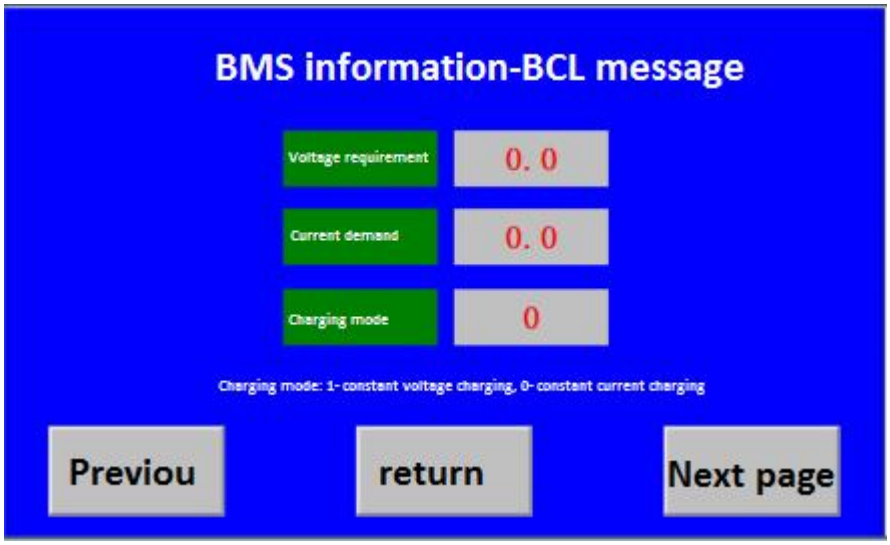
return to the main interface.

Click on the icon：

, switch module information forward.

Display single power module output voltage, output current, various operating conditions.

BMS information display interface:

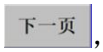


Click the icon: 

to switch the module information forward.

Click the icon: 

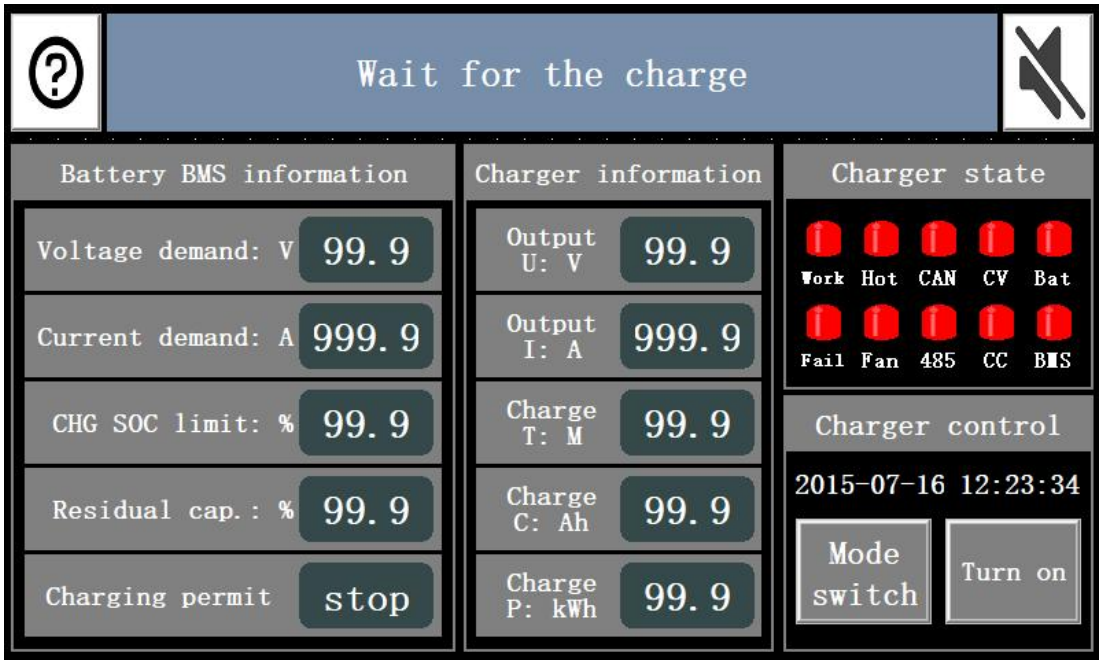
，to return to the main interface.。

Click the icon:：

，to switch back the module information.。

Following the national standard GBT20234-2015, the information transmitted by various BMSs is parsed and displayed.

Charging process explanation



The charging step：

1. Choose "turn on" charging control mode. The "CAN" and "485" indicator lights are bright green.

2. DC charging gun and battery connection is normal.

3. "Residual capacity" is less than "allowed to charge the SOC limit" to start charging.

4. "Battery" indicator light is bright green (charging machine detected the battery voltage, this light), "BMS" indicator light green.

5. The "working" light is bright green. When the "output voltage" is similar to the "battery voltage", the charging motor outputs the relay to absorb and the charging machine officially begins to charge the battery. At this point, "output current" and "output voltage" will be output according to "current demand" and "voltage demand".

6. BMS charging complete, send charging termination command, charging motor end charging.

7. During the charging process, charging motor failure ("overheated "and" abnormal "lights of charging motor information are all charging motor failures), BMS charging or" charging allowed "in a prohibited state, and artificial charging control in a" stop "state, all will terminate the charging.

The user's AC wiring part is located at the rear lower cabinet door. See the picture above for details.

AC input MCB power switch. PE is the earth, N is the neutral line, A is the A-phase power supply, B is the B-phase power supply, and C is the C-phase power supply.

Warning: PE protection earth must be connected, otherwise it may threaten life safety. The N line cannot be connected wrongly, otherwise it may burn the charging and connect the internal devices.

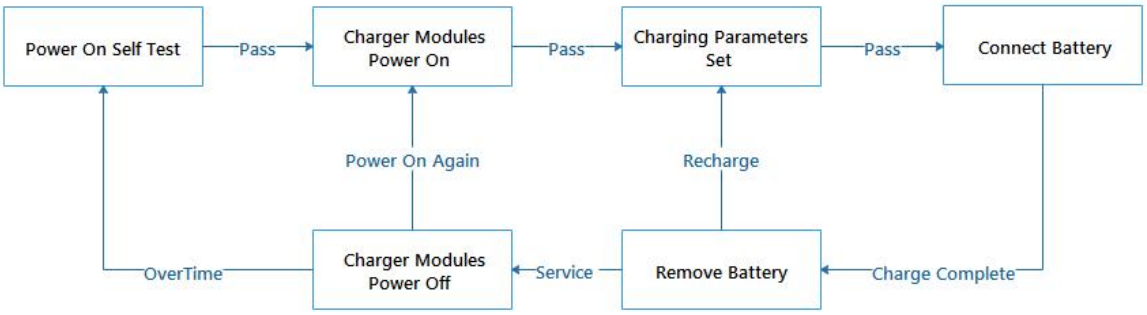
Cautions

a. Before the charger is turned on, it should be checked whether the battery box wiring is correct, whether there will be a short circuit or a positive and negative electrode connection. To avoid overloading the charging machine and burning components or lines.

b. It can be put into use only after the charger has no abnormal, overheating and other warning information.

c. For the safety of charging machines and equipment, it is forbidden to directly disconnect the battery switch under the condition of output current, except in case of emergency.

Operating instructions



Power check

Make sure that AC input zero wire and DC output positive and negative electrode wiring are correct, and that there is no short circuit in input and output; The input voltage and frequency are normal; At any time in the state of electricity.Offline online charging lines can not be connected at the same time.

Power on

Check whether the AC fan wind direction is correct after the power is on.The touch screen can be turned on normally, communication with the charging machine is normal.

Access to the battery

The battery voltage level and current level meet the requirements of the charging machine. Battery polarity is not reversed. Battery's fine. No abnormalities.

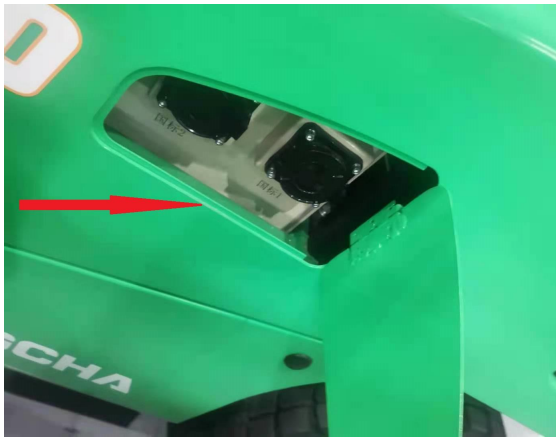
Power off

After the charging current and voltage drop to 0, exit the battery.Turn off the AC input air switch.

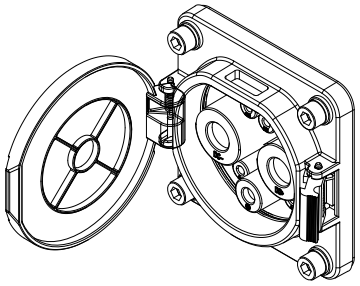
Lithium battery charging

Park the forklift safely.

Open the charging door cover



The charging port of the lithium battery is visible, and the charging port is covered with a cover. Open the cover, the charging port is visible

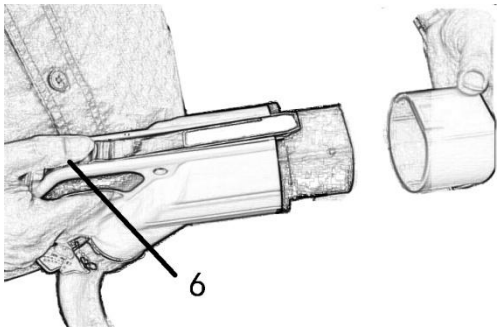


Lithium battery charging port structure

Note: There is a thin slot above the socket, which is used to buckle the lock when the charging gun is inserted into the charging.



Note: The flat side of the plug is equipped with a locking hook, which is used to buckle into the slot when inserted into the battery socket.



Only press the lock button (6) on the charging gun head to insert or pull out.

Daily battery maintenance and care

(1) Check before use

After the vehicle key switch is closed, confirm that the instrument panel has no battery system alarm information. Please check the remaining power before use. It is recommended to use SOC between 50% and 100%. If the SOC is lower than 30%, it is not recommended to continue to use it.

(2) Charging instructions

The battery system SOC is lower than 20%, please charge in time. Please use the special charging equipment specified by the manufacturer for charging. If a fault alarm occurs during charging, the battery system and the charger will stop charging, and the charger will display the fault information. The charging environment should be dry and ventilated, and there are no flammable and explosive materials around. The battery system should be fully charged once a week.

(3) Long-term storage

Before long-term storage, confirm that the battery system power is not less than 50%. The charging maintenance should be carried out every three months: the power is charged to 100%. Store for more than three months, please confirm whether there is a fault alarm in the power battery system before using it again. Keep the storage environment as dry and ventilated as possible, away from heat sources. Tip: When the ambient temperature is low, the charging time of the battery system will be extended, which is normal. To ensure the best performance of the battery system, the battery management system automatically adjusts the charging time as the temperature changes.

(4) Clean

①Clean the cabinet: Check the battery system for abnormalities such as foreign objects, obvious deformation, and corrosion.

② Charging port cleaning: In the power off state, check the interface for abnormalities such as damage, foreign objects, rust, etc.

③Plug cleaning: Check if the connector is loose or damaged under power failure.

④ Status detection: Observe the battery system voltage, temperature and other status information on the display screen of the charger during charging to ensure that all status information is within the normal range.

Chapter VI Common failures of batteries and their Solutions

The battery voltage is too low after filling

1、 The batteries have not been used for a long time and have not been maintained in accordance with the regulations. Solution: recharge the battery.

2、 The battery has been subjected to severe collisions characterized by damage to the outer surface of the cell case or the smell of electrolyte in the battery pack. Solution: this kind of situation is generally not within the scope of maintenance. If the maintenance needs to be determined, there is a problem in the output line or in the battery itself. First, disconnect the

battery case to see if the battery P+/C+ and P-/C- lines or solder joints are damaged. If there is any damage, they need to be replaced. Then the battery is odored by the method of incitement. If there is an exciting electrolyte odor, the battery has been leaked. It needs to test the battery of each battery. If a series of voltages is too large and very low, it is necessary to contact the manufacturer to change the battery.

3、Shortage of capacity. Solution: charge and discharge cycle for the battery, usually 3-5 cycles.

When the battery is fully charged (the charger shows full charge), the voltage is zero or on the low side.

1、Battery disconnection. Solution: take apart the battery, check whether the circuit is broken, check whether the solder joint has fallen off, repair the damaged place according to the situation.

2、The protective plate is not working. Solution: first of all, make sure whether the shield plate is in good contact with the shield board, and observe whether the solder joint falls off. If the above conditions are the same, test the voltage between B + B- and P + P-, if the difference between the two voltages is large, the protection board is broken and needs to be tested in detail. The test does not pass and needs to be replaced.

Battery voltage instability

1、Virtual welding .Solution: use the internal resistance tester to test the internal resistance of the battery. If the internal resistance exceeds the specified value, there may be false welding inside the battery, which needs to be disassembled and rewelded.

2、Abnormal protective plate. Solution: replace the protective plate

3、Poor contact between terminals or connectors. Solution: replace terminals or connectors

Normal charging, abnormal discharge or normal discharge, abnormal charging.

1、 The protective plate is broken.Solution: the protection plate needs to be replaced.

Chapter VIII Emergency Preparedness

Extreme anomalies that may occur during battery operation： In the process of use, users should establish a good sense of safety prevention, prohibit illegal operation strictly, avoid battery system abuse (overcharge, over-discharge, short-circuit, extrusion, puncture, environmental overheating, high-current discharge, etc.).Possible anomalies in the battery system during charging and use are as follows:

a. The battery system or the local temperature rises sharply.

b. The battery system has abnormal odor at any part of the system.

c. The battery system will smoke and fire at any part of the system.

Emergency measures in case of smoke and fire in battery system during operation In the event of smoke or open fire occurring in the battery system during the use of the battery, it is dealt with promptly in the following order:

a. Stop the car and turn off the electricity.

b. Personnel evacuate the vehicle quickly, call the police according to the situation of the scene.

c. In order to ensure their own safety, depending on the specific circumstances of the site, the following operations may be carried out:

Using carbon dioxide fire extinguishers or dry powder fire extinguishers to extinguish smoke or fire site under the condition of ensuring the safety of personnel.

d. Notify our company personnel as soon as possible to deal with.

14. Maintenance Summary

- The forklift must be regularly checked and maintained to keep it in good working order.
- Inspection and maintenance is often easily overlooked. Early detection enables problems to be addressed in a timely manner.
- Use original Hangcha Group spare parts.
- Do not use different types of oil when changing or topping up oil.
- Waste oil and battery fluid must not be poured away indiscriminately, but recycled or disposed of in accordance with local environmental laws and regulations.
- Establish and follow a comprehensive maintenance and service schedule.
- Maintain current and complete records of all maintenance and servicing activities.
- Untrained personnel must not attempt to carry out forklift repairs.

CAUTION

- **No Open flames！**
- **Turn off the key switch and disconnect the battery plug before carrying out any servicing or maintenance. (except when carrying out certain obstacle checks).**
- **Clean electrical parts with compressed air. Do not clean with water.**
- **Do not put your hands, feet or any part of your body between the mast and dashboard.**

Weight of counterweight：

Type	Counterweight weight（kg）	Type	Counterweight weight（kg）
CPD60-XC4(-I)(-IX) CPD60-XC5(-I) CPD60-XD3(-I)	1910	CPD100-XC4(-I) CPD100-XC5(-I) CPD100-XD3(-I)	2560
CPD70-XC4 CPD70-XC5 CPD70-XD3	2400	CPD100-XC4-IX	3070
CPD70-XC4-I CPD70-XC5-I CPD70-XD3-I	2560	CPD90-XC4 CPD90-XC5 CPD90-XD3	2580
CPD70-XC4-IX	3070	CPD90-XC4-I(-IX) CPD90-XC5-I CPD90-XD3-I	3070
CPD80-XC4 CPD80-XC5 CPD80-XD3	2560	CPD80-XLC4 CPD80-XLC5 CPD80-XLD3	2580
CPD80-XC4-I(-IX) CPD80-XC5-I CPD80-XD3-I	3070	CPD80-XLC4-I(-IX) CPD80-XLC5-I CPD80-XLD3-I	3070

Periodic maintenance schedule

○ —check, correct, adjust ×—replace

D—Daily; W—Weekly; M—Monthly; T—Trimonthly; S—Semiannually; Y—Yearly

Battery

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Battery	Electrolyte level	Visual inspection		○	○	○	○	○
	Electrolyte specific gravity	Hydrometer		○	○	○	○	○
	Battery power		○	○	○	○	○	○
	Check for loose connection terminals		○	○	○	○	○	○
	Check for loose connection cables		○	○	○	○	○	○
	Clean the battery surface		○	○	○	○	○	○
	Check for tools left on battery		○	○	○	○	○	○
	Check vent caps are tight, vents unobstructed			○	○	○	○	○
	Keep away from flames		○	○	○	○	○	○

Controller

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Controller	Check condition of contacts					○	○	○
	Check mechanical movement of contactors					○	○	○
	Check pedal microswitches are functioning properly					○	○	○
	Check condition of connections between motor, battery and power unit					○	○	○
	Check controller faults to determine whether system is functioning properly							2 years for first time

Motor

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Motor	Clear foreign bodies on motor housing				○	○	○	○
	Clean or replace bearings						○	○
	Check wear condition of carbon brushes, commutators, check spring force				○	○	○	○
	Wiring correct and secure				○	○	○	○
	Brush away carbon powder from grooves between commutator segments and on commutator surface					○	○	○

Transmission system

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Driving axle(front axle)	for abnormal noise		○	○	○	○	○	○
	Check for leakage		○	○	○	○	○	○
	Change oil						×	×
	Check for hub bearing looseness and noise			○	○	○	○	○
	Wipe and add lubricating oil					×	×	×
	Check for leakage		○	○	○	○	○	○
	Check axle deformation, crack or damage				○	○	○	○

Wheels (Front, Rear Wheels)

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Tires	Inflation pressure	Barometer	○	○	○	○	○	○
	Wear, cracks or damage		○	○	○	○	○	○
	Check for nails, stones or other foreign objects in the tread				○	○	○	○
	Check for damaged rims		○	○	○	○	○	○
	Split type rim bolt looseness	Test hammer	○	○	○	○	○	○

Steering System

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Steering wheel	Check play		○	○	○	○	○	○
	Check axial looseness		○	○	○	○	○	○
	Check radial looseness		○	○	○	○	○	○
	Check operation		○	○	○	○	○	○
Steering gear	Check for loose mounting bolts				○	○	○	○
Rear wheel knuckle	Check king pin for looseness or damage				○	○	○	○
	Check for deflection, deformation ,cracks or damage				○	○	○	○
	Check for installation	Test hammer			○	○	○	○
Steering cylinder	Check for operation		○	○	○	○	○	○
	Check for leakage		○	○	○	○	○	○
	Check for looseness when mounting and hinging.				○	○	○	○

Braking system

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Brake pedal	Free play	Ruler	○	○	○	○	○	○
	Pedal stroke		○	○	○	○	○	○
	Operation		○	○	○	○	○	○
	Check for air in brake lines		○	○	○	○	○	○
Parking brake operation	Check braking is safe and reliable, stroke is sufficient		○	○	○	○	○	○
	Operating performance		○	○	○	○	○	○
Rods, cables, etc.	Operating performance				○	○	○	○
	Loose connections				○	○	○	○
	Gear box connector wear					○	○	○
Pipelines	Damage, leakage, rupture				○	○	○	○
	Connection, clamping parts, looseness				○	○	○	○
Master brake cylinder	Leakage		○	○	○	○	○	○
	Check oil level, change oil		○	○	○		×	×
	Master cylinder, wheel cylinder action					○	○	○
	Master cylinder, wheel cylinder leakage and damage					○	○	○
	Inspect master and wheel cylinder piston cups and check-valves for wear and damage, replace						×	×

Hydraulic system

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Hydraulic oil reservoir	Check oil level, change oil		○	○	○	○	×	×
	Clean oil filter						○	○
	Clear foreign bodies						○	○
Control valve linkage	Loose connections		○	○	○	○	○	○
	Operation		○	○	○	○	○	○
Multi-way valve	Leakage		○	○	○	○	○	○
	Operation of safety valve and self-locking tilt valve				○	○	○	○
	Measure safety valve pressure	Oil pressure gauge					○	○
Line connectors	Leaks, looseness, rupture, deformation, damage				○	○	○	○
	Replace pipes							× 1-2 years
Hydraulic pump	Check pump for leaks and noise		○	○	○	○	○	○
	Check wear of pump drive gear				○	○	○	○

Lifting system

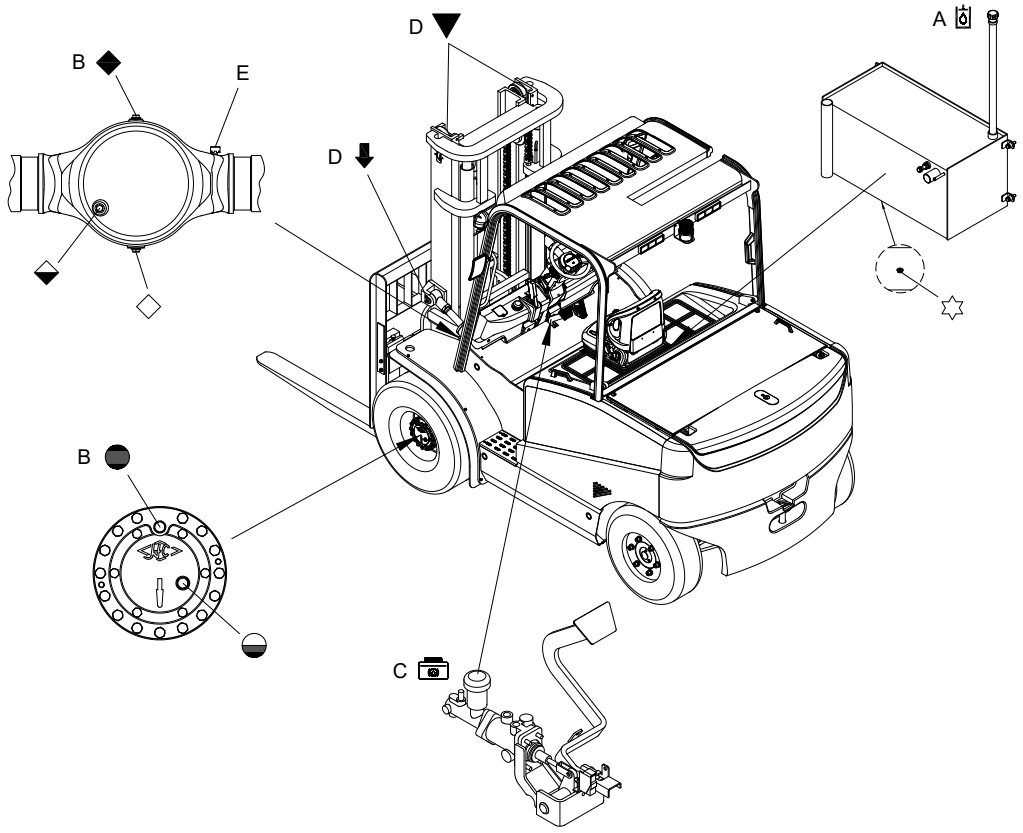
Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Chain sprocket	Check chain tension, check for deformation, damage and corrosion		○	○	○	○	○	○
	Lubricate chain				○	○	○	○
	Riveting pins and looseness				○	○	○	○
	Sprocket deformation and damage				○	○	○	○
	Looseness of sprocket bearings				○	○	○	○
Attachments	Check chain tension, check for deformation, damage and corrosion				○	○	○	○
Lift and tilt cylinders	Piston rod and piston rod threading, loose connections, deformation, damage	Testing hammer	○	○	○	○	○	○
	Operation		○	○	○	○	○	○
	Leakage		○	○	○	○	○	○
	Wear and damage of pins and cylinder steel-backed bearings				○	○	○	○
Forks	Fork damage, deformation, wear				○	○	○	○
	Damage and wear of fork stoppers					○	○	○
	Cracking and wear of welded part of fork heel coupling				○	○	○	○
Mast and fork carriage	Cracking and damage of welding on inner mast, outer mast and crossbars				○	○	○	○
	Wear, cracking and damage of welding on tilt cylinder brackets and mast				○	○	○	○
	Wear, cracking or damage of welding on inner and outer masts				○	○	○	○
	Wear, cracking and damage of welding on fork carriage				○	○	○	○
	Loose roller bearings				○	○	○	○
	Wear and damage of mast support bearing bushes						○	○
	Looseness of mast support cover bolts	Testing hammer			○ (first time only)		○	○
	Looseness of lift cylinder piston rod head bolts and plate bolts	Testing hammer			○ (first time only)		○	○

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
	Cracking and damage of welding on inner mast, outer mast and crossbars				○	○	○	○

Other

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Overhead guard and load backrest	Check mounting is secure	Testing hammer	○	○	○	○	○	○
	Check for deformation, cracking, damage		○	○	○	○	○	○
Turn signal lights	Operation and mounting		○	○	○	○	○	○
Horn	Operation and mounting		○	○	○	○	○	○
Lights and bulbs	Operation and mounting		○	○	○	○	○	○
Reversing buzzer	Operation and mounting		○	○	○	○	○	○
Instrument	Operation		○	○	○	○	○	○
Electrical cables	Harness damage, looseness			○	○	○	○	○
	Circuit connection looseness				○	○	○	○

Forklift used oil and lubrication



	Oil filler for hydraulic oil		Drain plug for hydraulic oil tank
	Oil filler plug for main axle housing of drive axle		Oil control plug for main axle housing of drive axle
	Oil filler/drain plug for hub reduction of drive axle		Drain plug for main axle housing of drive axle
	Lubricating surface		Oil control plug for hub reduction of drive axle
	Lubricating nozzle	E	Ventilation device
	Braking oiler		

Code	Description	Specification	Fuel charge	Remark
A	Hydraulic oil	Common environment：L-HM32 Cold environment：L-HV32	30～60L	Hydraulic oil tank
B	Gear oil for heavy load truck	GL-5 85W/90	4.5	Drive axle
C	Brake fluid	Choice HZY3 brake fluid（Add before delivery） or DOT3 brake fluid	1.5	Braking oiler
D	Lubricating grease	General purpose lithium lubricating grease for automobile		Lubricating part
	Industrial vaseline	2#		Battery terminal

Replace hydraulic oil

Hydraulic oil should be changed every half year：

- Park the truck on level ground;
- Turn the steering wheel right to the end, make the oil drain plug have enough space;
- Tilt the mast backward to the end and drop the forks on the ground;
- Apply the hand brake;
- Open the cover, screw off the oil filler cap of the fuel tank, and take out the dipstick;
- Put one container under the truck frame, remove oil plug, and drain oil;
- Take away the container, dispose waste oil according to local environmental law, and do not dump at will;
- Screw back the drain plug, add new hydraulic oil and check for leakage;
- Start forklift, raise forks for 3-5 times, and tilt the mast forward or backward for 3-5 times;
- Add oil to specified scale.

Periodic replacement of safety-critical parts

– Some parts are difficult to inspect during periodic maintenance. Therefore, in order to further improve safety, users should carry out periodic replacement of the parts listed in the following table.
– If any of these parts are found to be damaged or faulty before they are due for replacement, they should be replaced immediately.

Name of safety-critical part	Useful life (years)
Brake hose or rigid pipe	1～2
Lifting system hydraulic hoses	1～2
Lifting chain	2～4
Hydraulic system high-pressure hoses	2
Brake fluid cup	2～4
Brake master cylinder cover and dust cover	1
Hydraulic system inner seals and rubber parts	2
Rubber pad for steering axle	4

Bolt tightening torque table

Unit：N·m

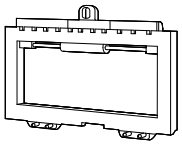
Bolt diameter	Grade			
	4.6	5.6	6.6	8.8
6	4～5	5～7	6～8	9～12
8	10～12	12～15	14～18	22～29
10	20～25	25～31	29～39	44～58
12	35～44	44～54	49～64	76～107
14	54～69	69～88	83～98	121～162
16	88～108	108～137	127～157	189～252
18	118～147	147～186	176～216	260～347
20	167～206	206～265	245～314	369～492
22	225～284	284～343	343～431	502～669
24	294～370	370～441	441～539	638～850
27	441～519	539～686	637～784	933～1244

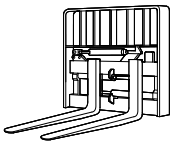
Note：

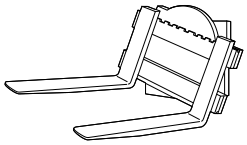
- Use entirely 8.8 grade bolt in the important joint position.
- Bolt’s grade can be found in the head of the bolt, if it can’t be found, the grade is 8.8.

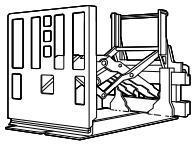
15. The use, install and safety rules of attachment

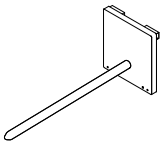
HANGCHA will choose attachment that in accordance with International standard ISO2328 *Forklift pothook fork and installation size of carriage*, such as sideshifters, fork positioner, rotator, push/pull and clamp ect.

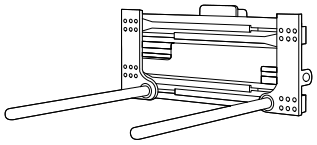

sideshifter

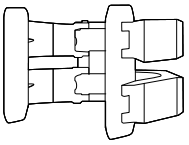

fork positioner

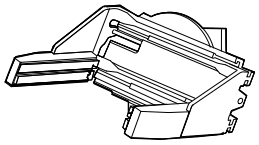

rotator

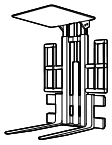

push/pull

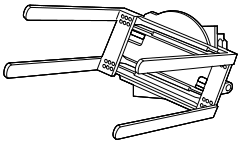

coil boom


bar arm clamp


paper roll clamp


block clamps


load Stabilizer


turnaload

Attachment install

- Untempered technology license of our company, any refit at safety and capability to attachment is strict prohibited.
- Actual rating load capacity should be the least of rating load capacity, the load capacity of attachment, combined load capacity of truck. Generally speaking, the combined load capacity of truck is the least. Attachment load capacity just a count value of attachment pressure.
- Installation goes to in reason, credibility, safety to avoid the attachment glide around carriage in using.
- After hang attachment, embed the rise catch block to the gap of top beam, let the offset of centre line of attachment and carriage is less than 50mm.Otherwise, it will affect the landscape orientation stability of forklift.
- To these attachment with rotating function, such as paper roll clamp, bale clamp, muti-purpose clamp, drum clamp, it needs to weld chock block in the joint of carriage beam and attachment to prevent move from side to side in the operation.
- Install the attachment of below catch orientation, it need to adjust the clearance between below catch and beam of carriage.

Attachment use

- Know well the content of nameplate on attachment, read the instruction manual before usage. (Especially the manual from attachment company) Before operate the attachment, the people should be trained and obtain the qualification.
- It should be understand the basic capability and operate methods of attachment. Especially the admit load, lift height, size of cargo and adapt range of attachment.
- Operate the multi-functional attachment, such as with side-shifter, clamp or rotator, it is not allowed that two action at one time. Operate one functional then do another one.

- Prohibit the cargo at a high position when truck moves with attachment. If the size of cargo is too big, prohibit the truck move on. Transport the cargo, make sure that the distance of bottom of cargo and ground is less than 300mm and mast incline back.
- The weight of cargo couldn't exceed the limited value of combination carrying capacity of forklift and attachment. It is not allowed that partial load at high position. It is a short time work for attachment with side-shifter. Partial load is around 100mm (Above 5 ton (including 5 ton), the side-shifter movable within 300mm.
- In the range of the projection forth 2m of the lower of attachment and cargo, prohibit standing to avoid the suddenness except the driver position under overhead.
- It is not allowed that an emergency brake in moving. Run slowly with load.
- Prohibit outside force when attachment working;
- It couldn't be use at malfeasance situation and overstep normal work range.
- When the attachment has trouble, prohibit using without check.

Attachment check and maintenance

- Check the clearance of carriage beam and below catch of attachment if meet the attachment manual.
- Check the rise catch is right on the flute of fork carriage.
- Use the auto general lithium-grease per 500 hours to bearing surface.
- If the tighten firmware become flexible.
- Check the tie-in of hydraulic pressure loop, if tube attaint. Prohibit use after repair.
- Check the drive of attachment or if the rotating elements fray or block, change in time.
- Check if each element and attachment working pressure is normal as well as attachment works normally under load. If not, check the hydraulic pressure loop, find out the broken part, change sealing element or whole loop element.

16. Battery automatic filling water system(Option)

Makeup of the automatic filling watering system：

- Automatic Watering Plug
- End Plug
- Floater
- T-piece & L-piece
- Flow Indicator（with filter）
- 6mm, 8mm ,10mm watering pipe
- Male & Female couplings (Kv10 and KV6, etc.)
- Water Tank







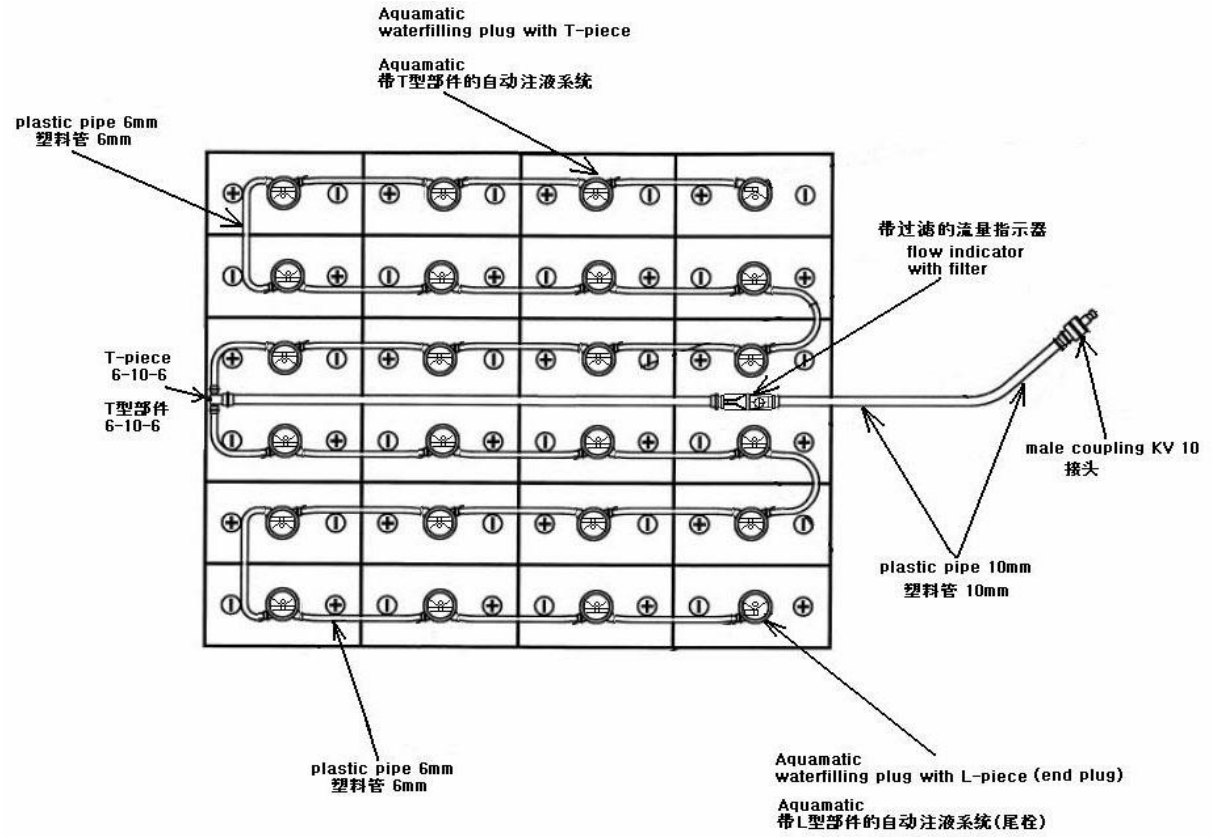
Application specification and installation

During the period of development and long-term practical usage, the leak tightness of FRÖTEK automatic watering system has received complete recognition. But when you use it, you need to keep the automatic watering system clean and there can't be any filth on the surface.

How to properly install the automatic watering system：Our automatic watering system is easy to operate, no need to finish watering the electrolyte in the storage battery by hand, time saving and labor saving, besides, it can extend the service life.

How to correctly install the water tank, choose proper floaters, how to confirm the specification & quantity of the installed accessories according to different types of battery, including correct application rules for automatic watering plug, watering pipe, T/L-pieces and male/female couplings as well as the cleaning of the flow indicator. We will give you a brief introduction for the above items as follows:

Battery spec.	Watering head / T-piece	T-piece（6-10-6）	Flow indicator（filter）	6mm Watering pipe	10mm Watering pipe	End plug	Male/female K10	Water tank Spec.
24V	12 pcs	1 pc	1 pc	3m	5m	2 pcs	1 pc	30L 1 pc
48V	24 pcs	1 pc	1 pc	5m	5m	2 pcs	1 pc	30L 1 pc
80V	40 pcs	1 pc	1 pc	10m	5m	2 pcs	1 pc	60L 1 pc

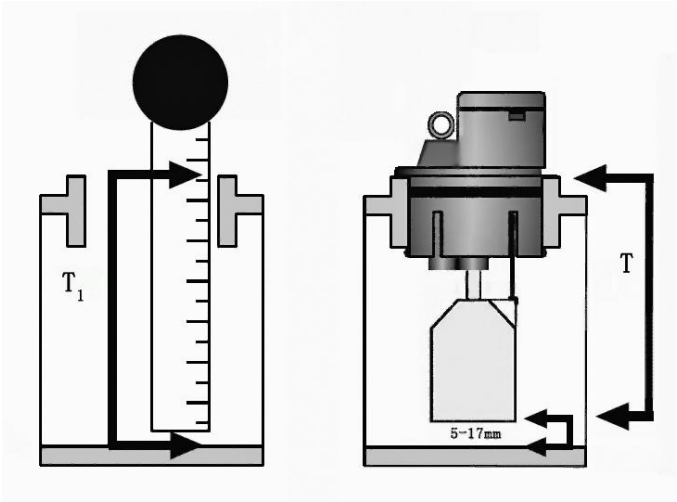


Automatic Watering System of Forklift Storage Battery-48V battery cells

Floater

How to choose proper floaters correctly：

- According to different storage battery, we have five kinds of floaters for you to choose. In order to achieve our expected standard and completely reflect the effectiveness of the automatic watering system, the most important thing is to choose proper floaters. At present our company can offer a rule for the client to make judgment and choose the type of floater. (see diagram)
- The diagram the installation way of the floaters:



$T=T_1$-(5～17mm)

T Length	47	50.5	58	61	72
Float	13	16.5	24	27	38

Watering pipe

Our company offers watering pipes of different types and the clients can choose what they need according to the specification of the battery. The watering pipe must be perfectly sealed with T-piece and L-piece.

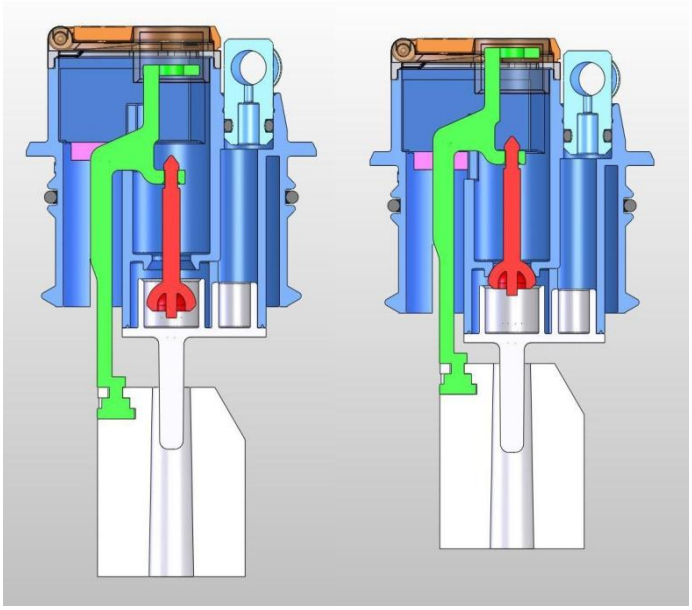
Notes during the filling process：

- In order to ensure a safe watering process, we hereby recommend you to use flow indicator (with filter), the flow indicator with filter can not only timely indicate whether it finishes watering, but also avoid unclean impurities entering the battery to result interruption.
- The watering pressure should be within the range of 0.02-0.06, no less than 20mMPa water tank is 2-5M higher than the battery surface.
- You'd better conduct watering within the specified periods, because frequent filling will lead to overflowing for too much water, which will do great damage to the storage battery.

Note：Filling after finishing charging is the best ideal state, besides, do not filling before charging.

Maintenance（Cleaning）

When you use it, you must pay much attention to keep the automatic watering system clean. No filth remaining on the surface. The users should regularly clean the watering plug for the plug is a kind of plastic good. Clean the surface directly with tap water and no need to use other detergent.



open close

Structure Diagram of the Watering Plug

Characteristics of the automatic filling watering system:

- No need to water by hand, labor saving.
- No malfunction factor leading to damage the battery.
- Easy operation, safe.
- Ensure a precise electrolyte level in every battery cell.
- Prevent leakage when watering.
- Effectively avoid the acid liquid to erode the storage battery and the electrolytic bath.
- Extend the service life of the battery.
- Environment protection.
- Save energy.

Function Introduction：

Function of the automatic watering system: the floater of the automatic watering plug can reach correct water level, when the level rises in the cell, the pressure closes the valves and prevents further water entering the cell.

When the system finishes watering, the flow indicator will stop running and you can see the water-level indicator clearly through the top of the watering system.

Besides, the material of FRÖTEK floater can avoid damage and ineffectiveness.

As for the structure of automatic watering system, there is a terraced step, when the electrolyte gas rises to the watering plug, the terraced part can prevent the leakage of the electrolyte gas as well as quickly cool the electrolyte gas to make them go back to the storage electrolyte gas as well as quickly cool the electrolyte gas to make them go back to the storage.

Related safety standards (for trucks exporting to Europe)

The TRUCKS covered are conform to the following European Directives and standards:

2006/42/EC	Machinery Directive
2014/30/EU	EMC Directive

EN ISO 12100:2010	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 3691-1:2015+A1:2020	Industrial trucks — Safety requirements and verification — Part 1: Self-propelled industrial trucks, other than driverless trucks, variable reach trucks and burden-carrier trucks
EN 1175:2020	Safety of industrial trucks – Electrical/electronic requirements
EN 16307-1:2020	Industrial trucks — Safety requirements and verification — Part 1: Supplementary requirements for self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks
EN 12053:2001+A1:2008	Safety of industrial trucks — Test methods for measuring noise emissions
EN 13059:2002+A1:2008	Safety of industrial trucks — Test methods for measuring vibration
EN 12895:2015+A1:2019	Industrial trucks — Electromagnetic compatibility
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

- The noise tests are according to EN 12053:2001+A1:2008.
- The vibration tests are according to EN 13059:2002+A1:2008.
- The static test coefficient used for lifting accessory is 1.33.
- Test results of noise and vibration:

Model	Noise pressure level in the operator's position dB(A)	Whole-body vibration m/s^2
CPD60-XC4 / CPD60-XC4-I CPD60-XC5 / CPD60-XC5-I CPD60-XD3 / CPD60-XD3-I	75	0.9
CPD70-XC4 / CPD70-XC4-I CPD70-XC5 / CPD70-XC5-I CPD70-XD3 / CPD70-XD3-I	75	0.9
CPD80-XC4 / CPD80-XC4-I CPD80-XC5 / CPD80-XC5-I CPD80-XD3 / CPD80-XD3-I	75	1.0
CPD80-XLC4 / CPD80-XLC4-I CPD80-XLC5 / CPD80-XLC5-I CPD80-XLD3 / CPD80-XLD3-I	75	1.0
CPD90-XC4 / CPD90-XC4-I CPD90-XC5 / CPD90-XC5-I CPD90-XD3 / CPD90-XD3-I	76	1.1
CPD100-XC4 / CPD100-XC4-I CPD100-XC5 / CPD100-XC5-I CPD100-XD3 / CPD100-XD3-I	76	1.1

Maintenance record

Date	Service content	Serviceman

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