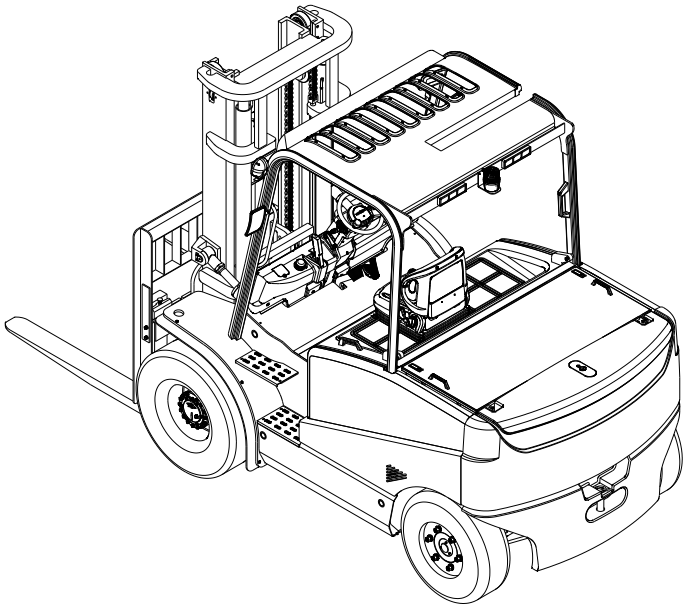
J *Series*

ELECTRIC FORKLIFT TRUCK

CPD80J-L/90J/100J
CPD80J-L-I/90J-I/100J-I

OPERATION AND MAINTENANCE MANUAL



Original Instruction

HANGCHA GROUP CO., LTD
09/2019

Foreword

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

J 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 J 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.

J series trucks have been passed CE certification

Ⓒ **09/2019 HANGCHA GROUP CO., LTD**

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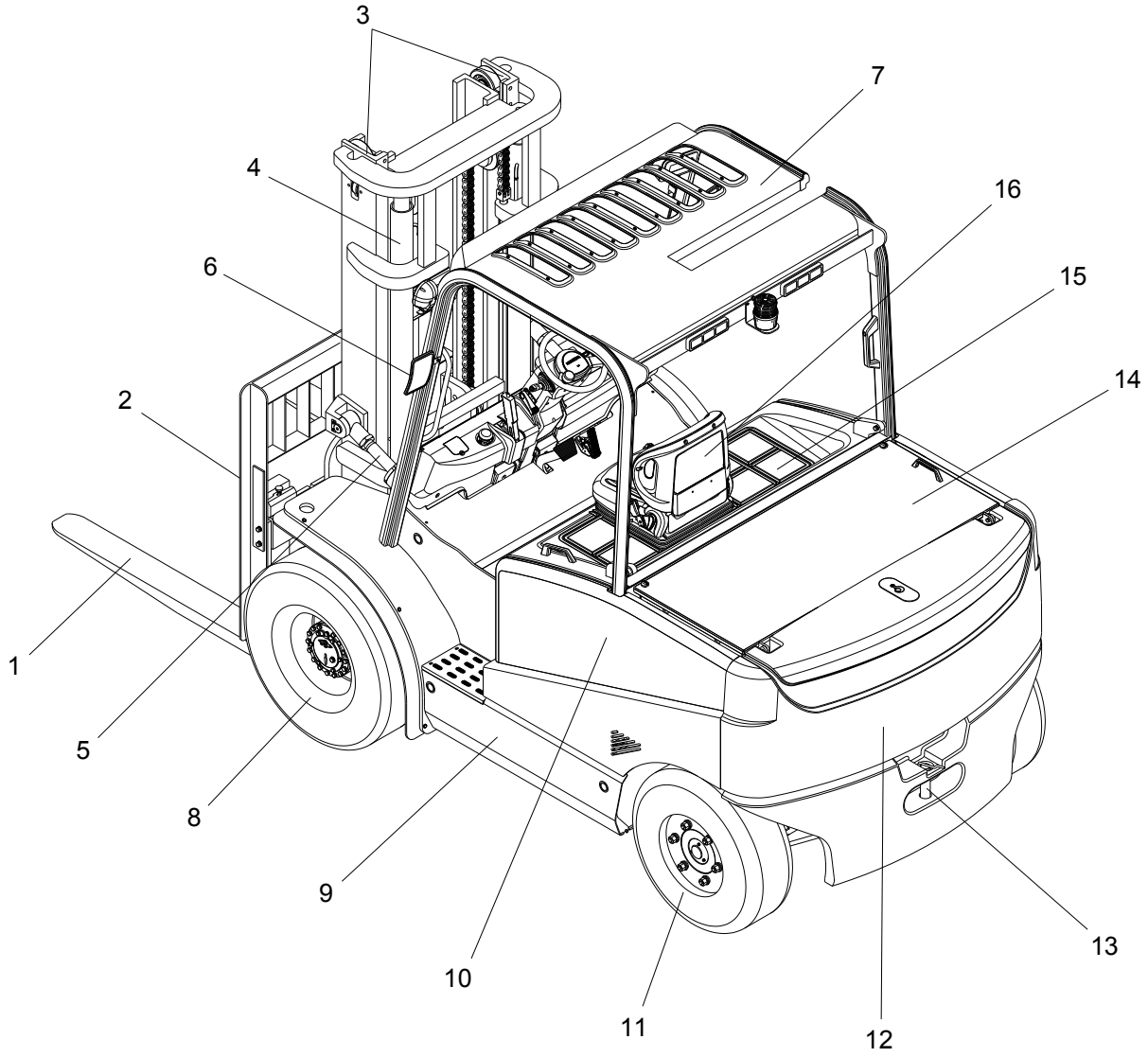
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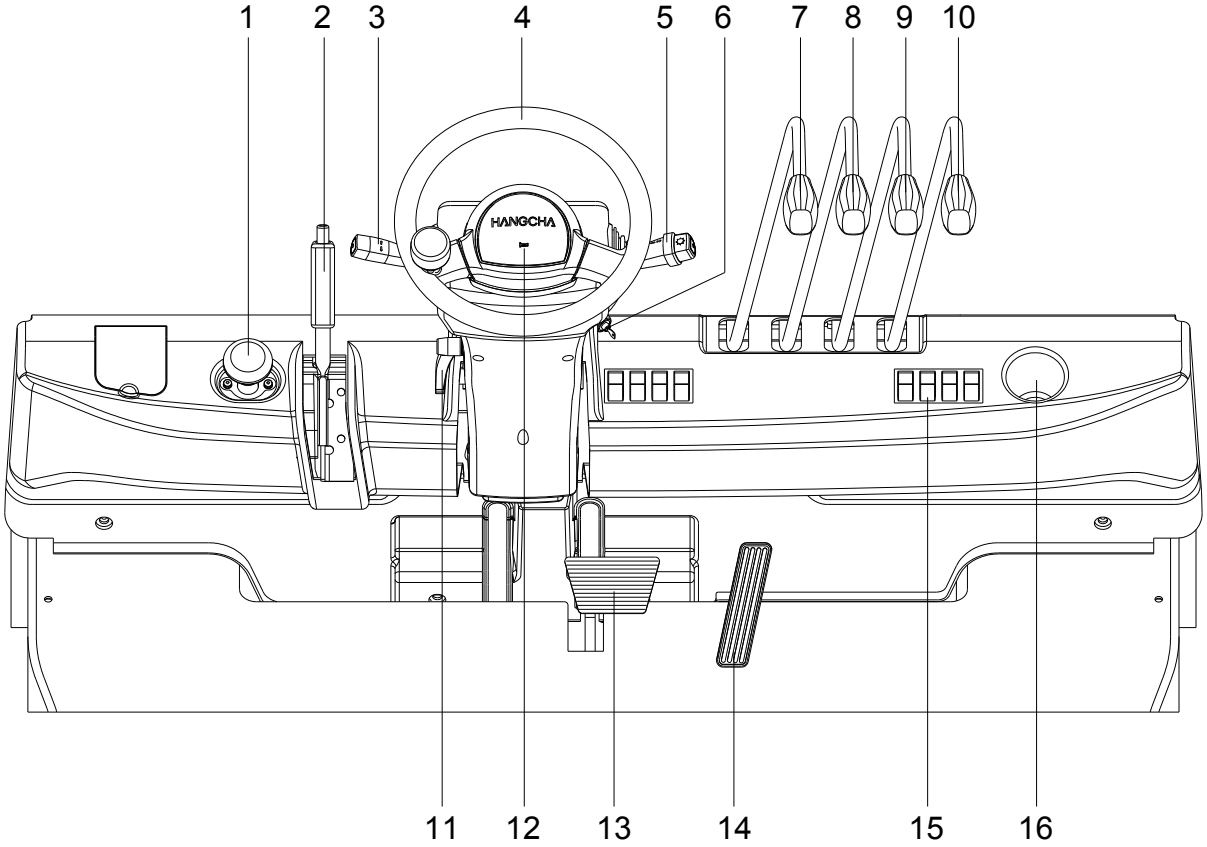
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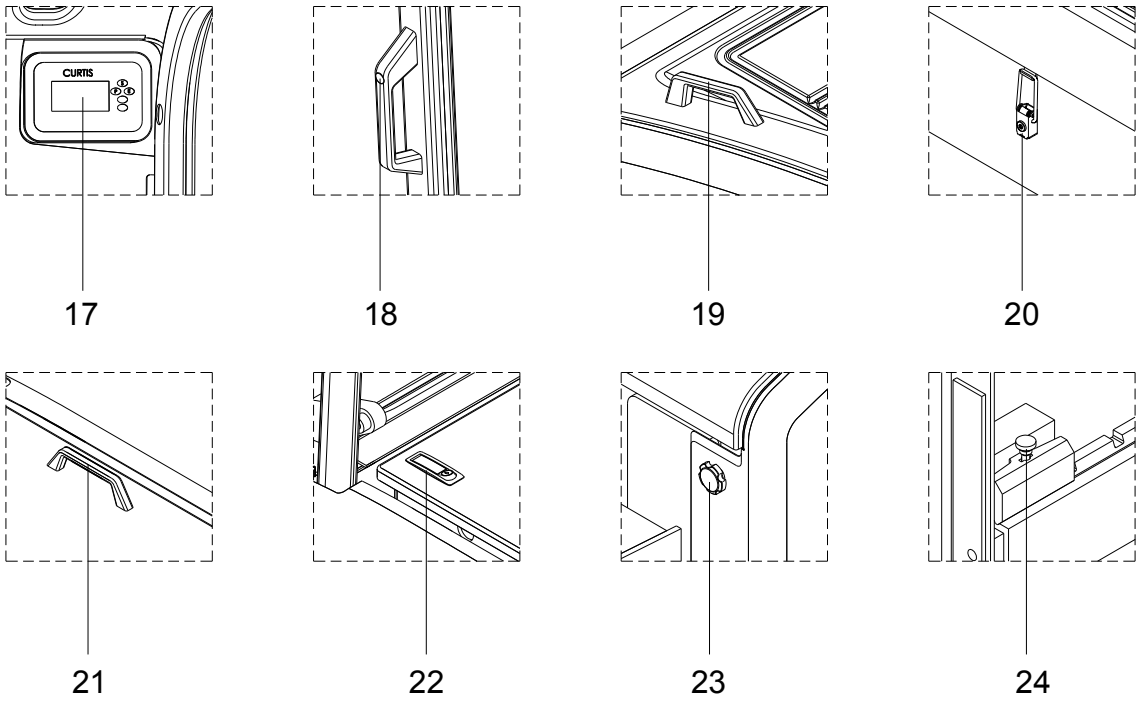
1. Appearance and Main Components



Item	Description	Item	Description
1	Fork	9	Left side door
2	Load bracket	10	Left side plate
3	Mast	11	Rear wheel
4	Lift cylinder	12	Counterweight
5	Tilt cylinder	13	Towing pin
6	Rearview mirror	14	Rear cover
7	Overhead guard	15	Front cover
8	Front wheel	16	Seat

2. Displays and controls



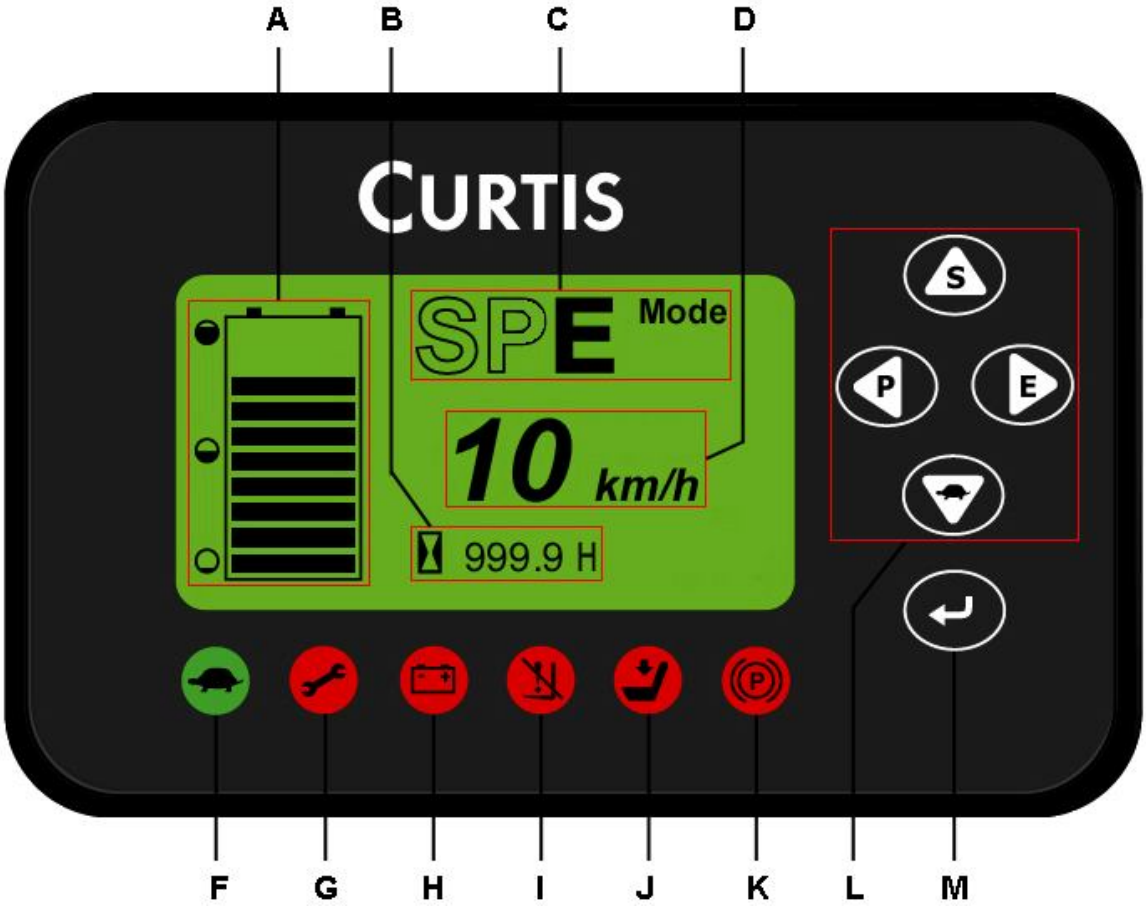


Item	Description	Item	Description
1	Emergency power off	13	Brake pedal
2	Parking brake	14	Accelerator pedal
3	Forward/Reverse selector switch	15	Rocker switch
4	Steering wheel	16	Cup holder
5	Combination light switch	17	Multi-function display
6	Key switch	18	Reversing handrail horn button(option)
7	Lifting lever	19	Front cover handrail
8	Tilting lever	20	Front cover lock catch
9	Sideshift lever	21	Rear cover handrail
10	Attachment lever	22	Rear cover lock catch
11	Steering column positioning device	23	Handle of left/right battery cover panels
12	Horn	24	Fork stopper

Multi-function display

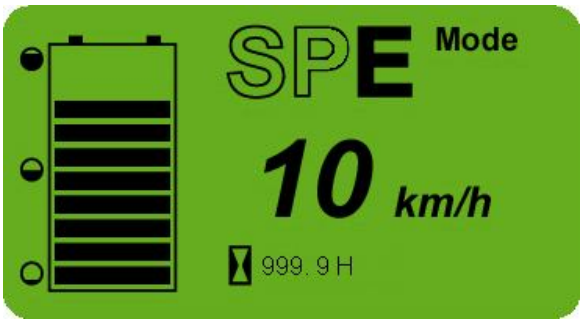
CPD80J-L\90J\100J	CPD80J-L-I\90J-I\100J-I

The multi-function display shows the battery capacity, the service hours, the operating mode, the travel speed, fault code information etc. 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, etc.

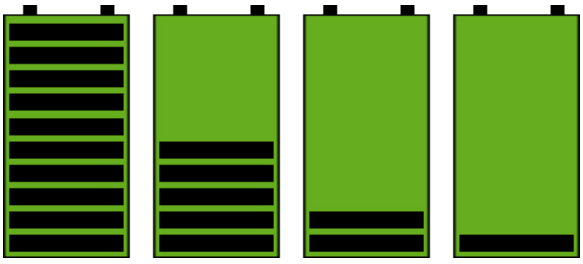


Item	Display
A	Battery indicator
B	Service hour meter
C	Mode indicator
D	Vehicle speed or fault code indicator
F	Slow speed indicator
G	Fault indicator
H	Low battery indicator
I	Lift speed indicator
J	Seat switch indicator
K	Parking brake applied indicator
L	Mode settings or direction choosing button
M	Menu button

Main display interface



Battery capacity display [A]



Indicates the available residual capacity.

As the figure shows below from left to right, the segments of the indicator bar gradually disappear as the battery charge is depleted. When only the last segment remains, the battery is at less than 20% of its capacity. At this point the entire indicator bar will blink; stop work and immediately charge the battery. We recommend charging the battery promptly when two segments remain (around 30% of capacity remaining), otherwise battery life may be significantly shortened.

> **CAUTION**
> - **Timely charging is essential to maintain the service life of the battery.**

Service hours display [B]



Hourglass icon indicates the timing function.

The hour meter starts counting when the vehicle key switch is turned on. Minimum resolution 0.1 hours.

Operating mode display [C]



As shown in the figure from left to right, this indicator respectively indicates

S mode→P mode→E mode→SPE mode.

S mode: Super mode allows for the fastest acceleration and deceleration and the maximum grade ability. It is used for climbing steep inclines and handling a large number of goods in a short period of time. However, it consumes the most power and should therefore be used sparingly.

P mode: Power mode offers slightly lower performance than Super mode and is used for long-distance transport situations that require greater power or speed.

E mode: Economy mode offers optimized all-round performance and energy saving. It is suitable for prolonged operation on a single charge and is recommended for normal work.

SPE mode: Safe mode limits the maximum travel speed to about 7 km/h. It is used for working in congested warehouses and confined spaces. In this mode, the **slow speed indicator lamp [F]** will be illuminated.

> **CAUTION**
> - **The system defaults to E mode. Whenever power is restored after a power failure, the system will revert to E mode regardless of which mode was selected before the power failure. However, when the key switch is turned off and on again, the system will revert to the same mode as was last selected.**

Travel speed or fault code display [D]

Travel speed display



This area displays the travel speed of the vehicle in real time.

Fault code display



Displays electronically controlled fault codes “TRA R” is the traction controller, and “HYD” is the pump controller.

Indicator light



Crawl speed indicator [F]



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

Fault indicator [G]



In the event of an electronic control failure or operating error, this lamp will illuminate and a fault code will be displayed on the instrument.

Battery low capacity indicator [H]



When only one segment remains, this lamp comes on to remind the user to charge the battery as soon as possible.

Lifting low speed indicator [I]



When the battery charge is only 10%, this lamp comes on and the mast lift speed slows down to remind the user to charge the battery as soon as possible.

Seat switch indicator [J]



This lamp illuminates whenever the driver leaves the seat, indicating that the seat switch is OFF. At this point, the vehicle cannot move or lift. This feature requires the seat to be fitted with a seat switch (option).

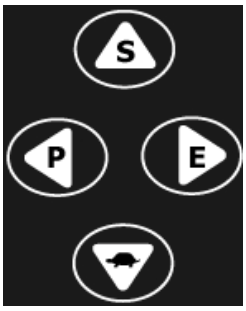
Parking brake applied indicator [K]



This lamp illuminates whenever the hand brake is applied.

Button

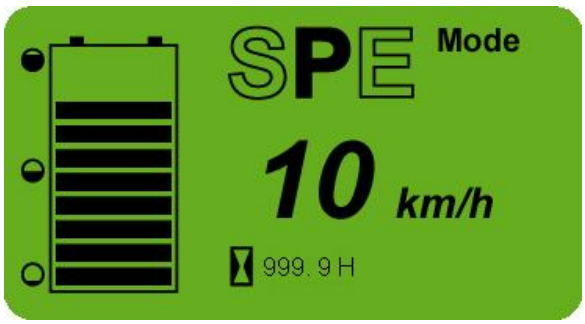
Mode settings or direction choosing button [L]



1）Mode settings

In the main display interface, button , , ,  represents four operation modes-- S, P, E, SPE respectively.

e.g.: In the main display interface, press button, it displays as follow:



2）Direction choosing

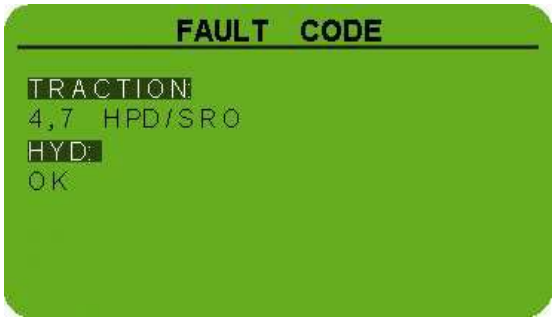
In the main display interface, button , , ,  represents four direction

choosing button—up, left, right, down respectively.

Menu button [M]

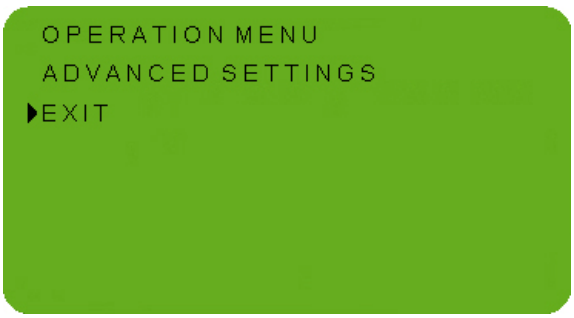


（1）In the main display interface, press the button **[M]** to enter the fault code interface. The fault code shows as follow：



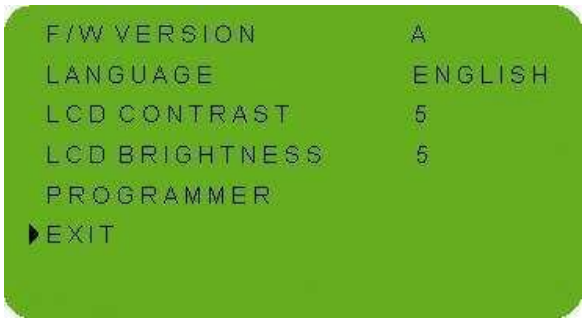
（2）In the main display interface, press the button  over 2 seconds, and then enter the main menu .

The main menu includes: operation menu, advanced settings and exit.



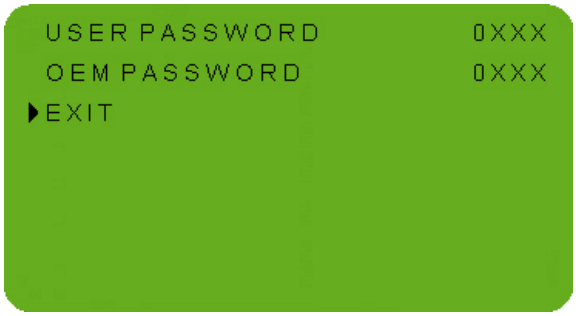
Operation Menu

The operation menu includes： Software version information, language settings, LCD contrast settings, LCD brightness settings, programmer settings and exit.



Advance Settings

This menu requires a password.

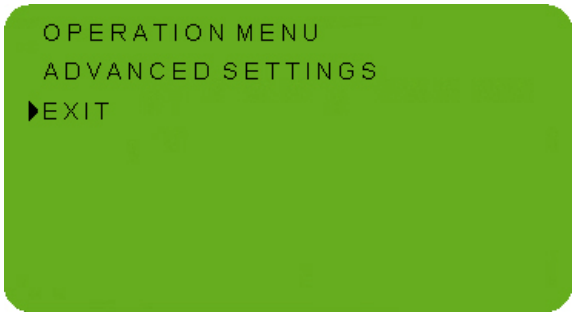


The following example indicates how to use button to set parameter.

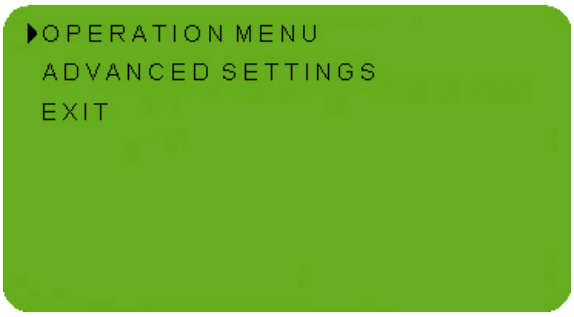
Note: this instrument supports two languages, Chinese and English. It will set to your desired language. If you want to switch the language, please refer to the above example for operation.

e.g.: change the language from English to Chinese.

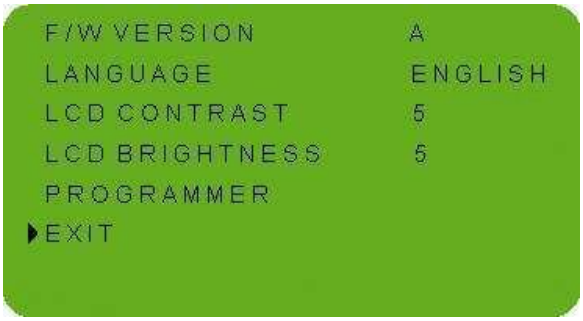
① In the main display interface, press the **menu button**  over 2 seconds, and then enter the main menu.



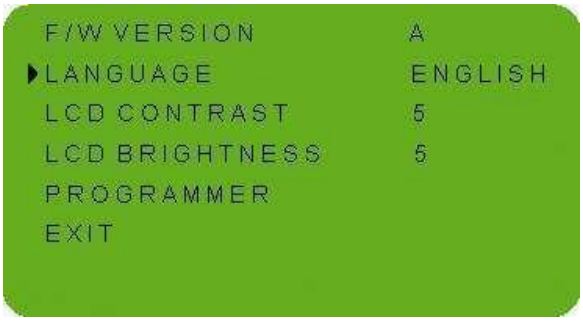
②Select the “OPERATION MENU” through **up button**() or **down button**() .



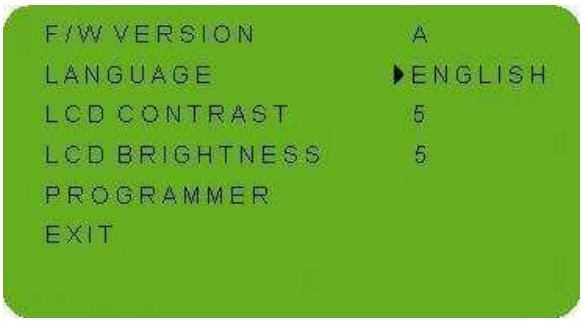
③ Press the **menu button** enter the operation menu.



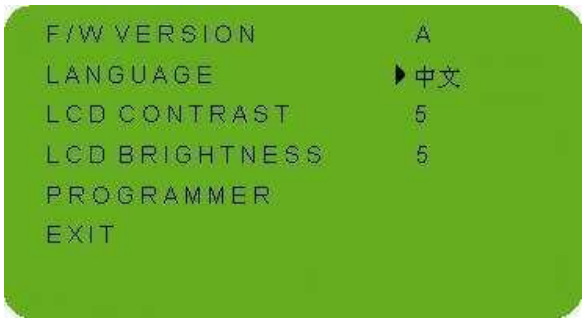
④ Select the "LANGUAGE" through **up button**( ) or **down button**( ) .



⑤Enter the language setting state through **left button**( ) or **right button**( ).



⑥ Through the **up button**( ) or **down button**( ), select the Chinese language.



⑦ Refer to steps ⑤ ④ ③ ② ①, return to the main display interface.

The language has been set up.

Controls

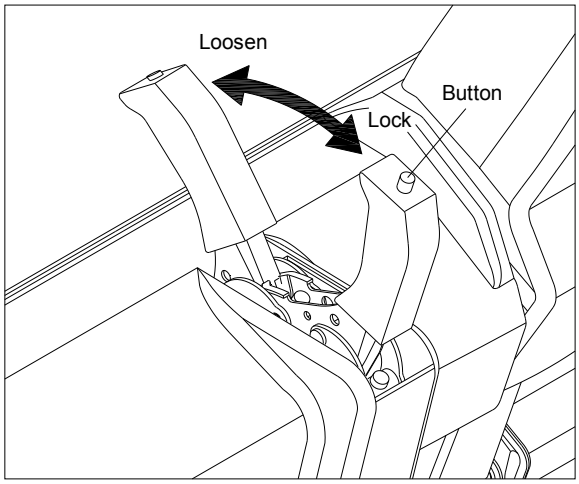
Emergency power off [1]

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]



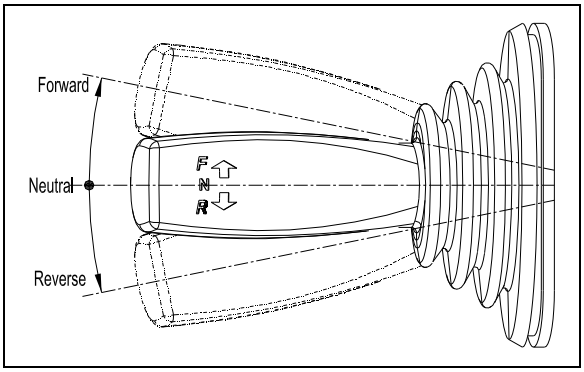
Secure the stopping truck.

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]



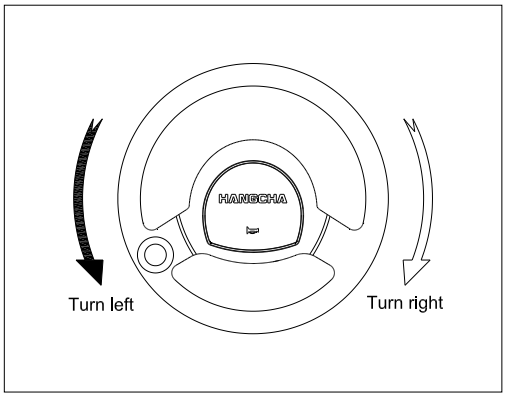
Set truck moving direction according to need.

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]



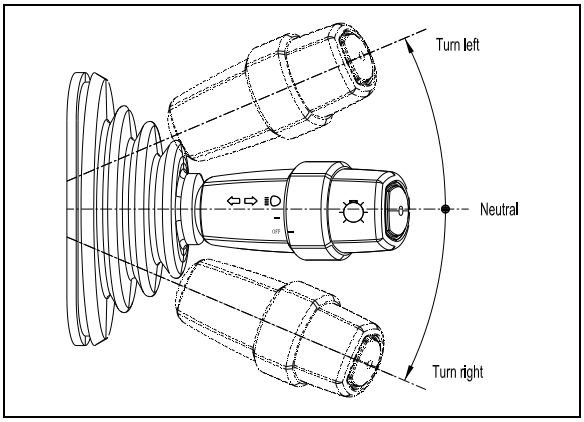
Control truck direction.

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.

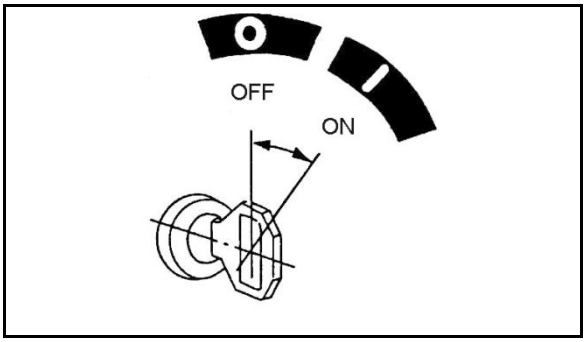
The turn signal light switch indicates the turning direction of the forklift. Push forward, left turn light flashes; push backward, right turn light flashes.

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]



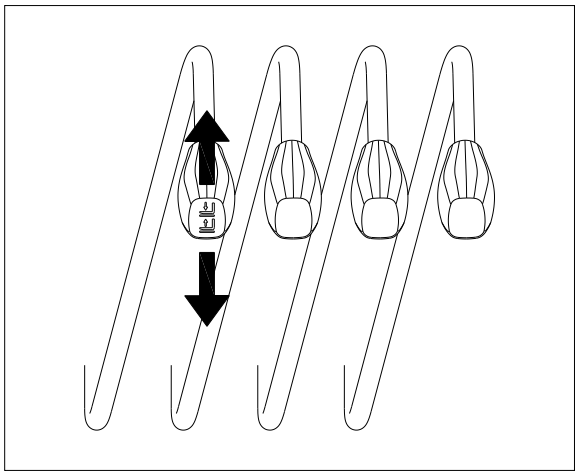
Connect and interrupt control current. Remove the key and make sure that the truck does not move suddenly.

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.**

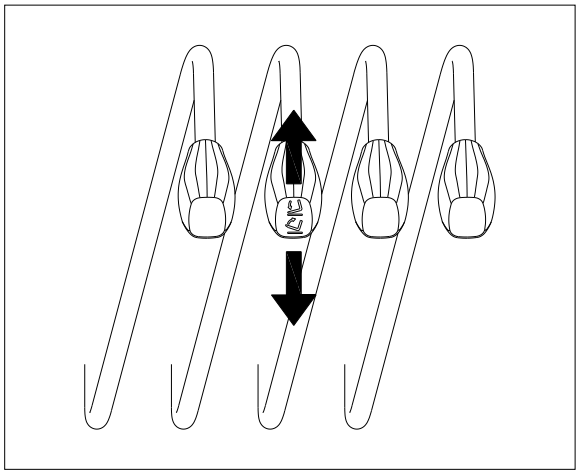
Lift lever [7]



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]

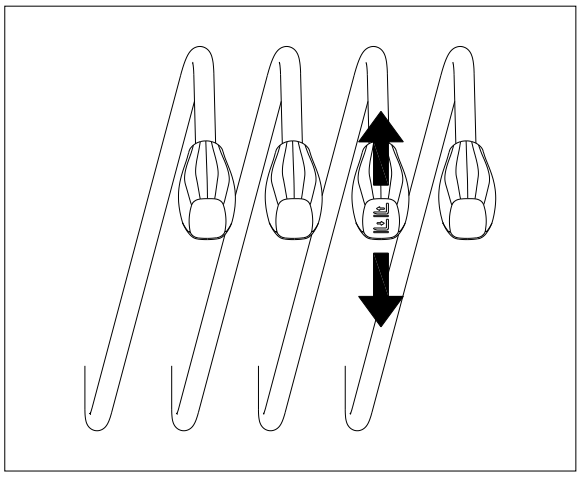


Control the forks' forward and backward tilting. The tilt lever is used to tilt the mast forward and backward. Push forward to tilt forward, pull backward to tilt back. The tilting speed is determined by the distance that the lever is moved.

⚠ 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.**

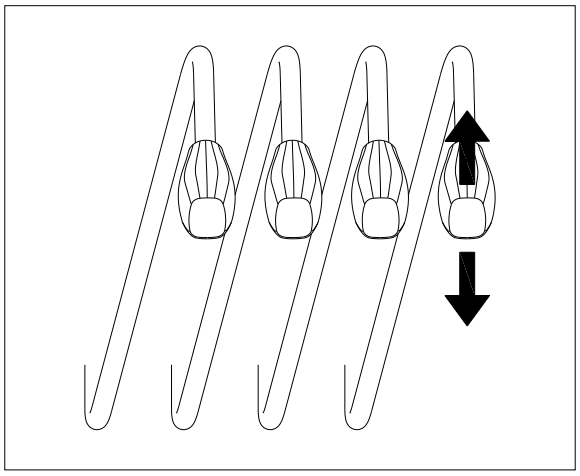
Sideshifter lever [9]



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]

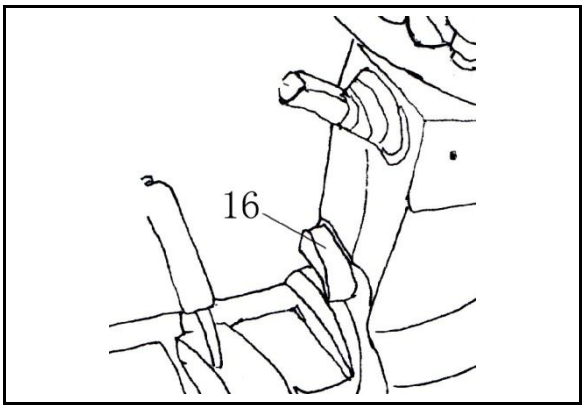


It is used when installing attachment like paper roll clamp or rotator.

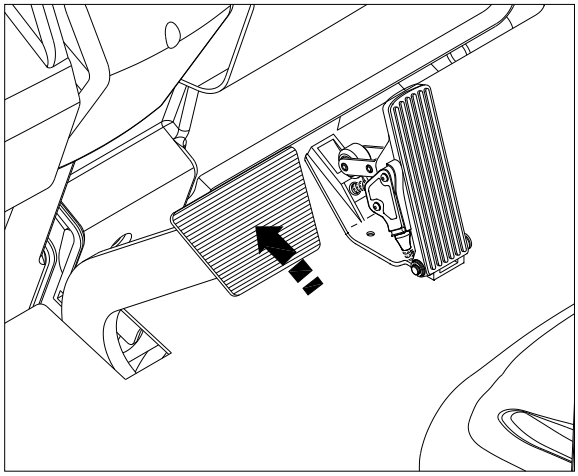
Steering column positioning device [11]

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]



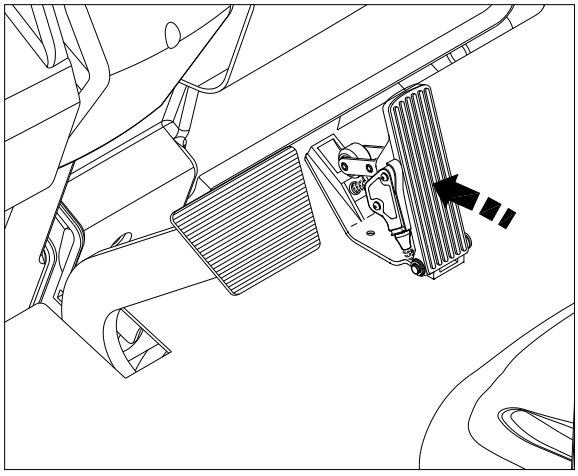
Carry out brake operation.

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.

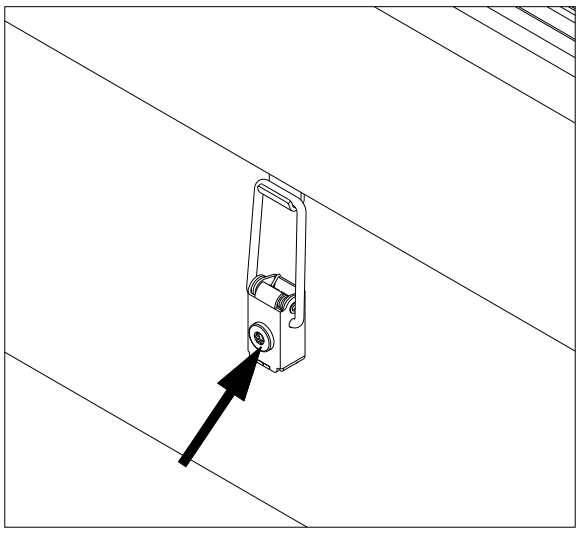
CAUTION

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

WARNING

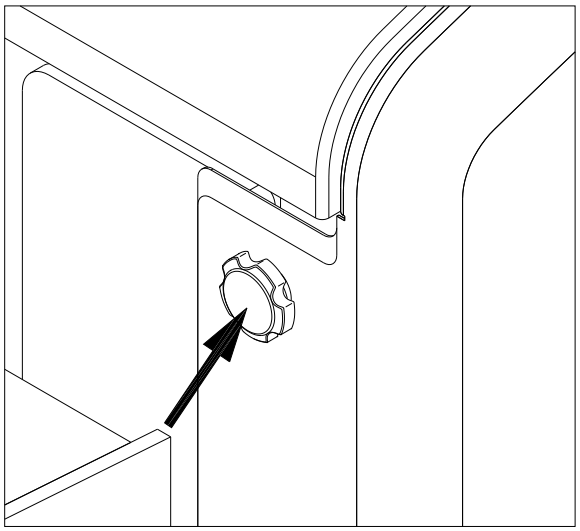
- **Do not depress the accelerator pedal before turning on the key switch, otherwise the meter display will display a fault. Keep your foot off the accelerator pedal when turning the key switch on.**

Front cover lock catch[20]



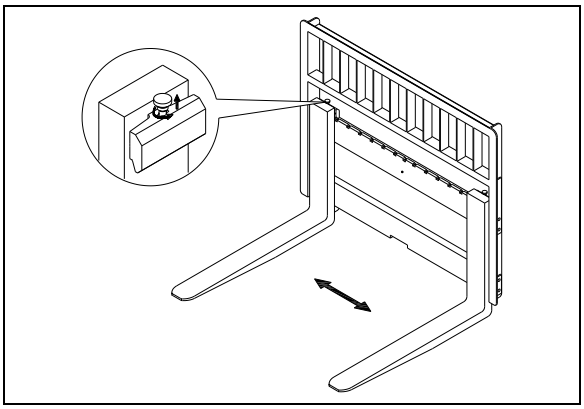
Fix the front cover.

Handle of left/right battery cover panels [23]



Fix the cover panels on both sides of the battery. When removing the battery panel, switch counterclockwise the handle.

Fork stopper [25]



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

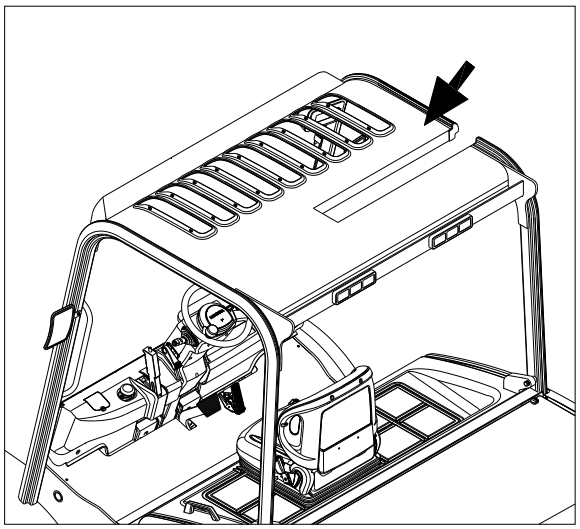
Remove old forks: place the forks in middle, drop to the ground, tilt forward the mast, then the forks are off the fork carriage and reverse the truck.

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

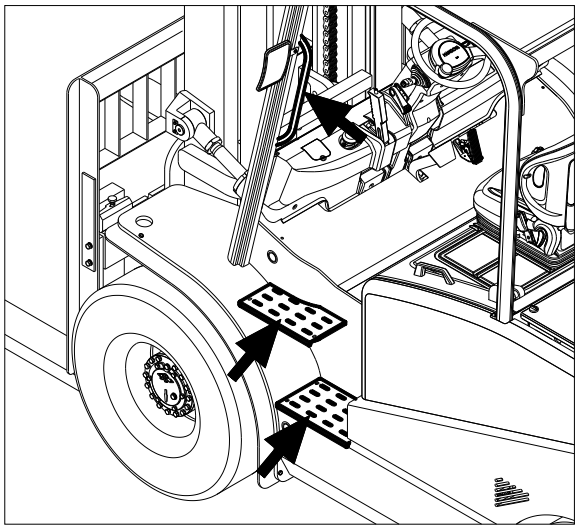
The wide-opening cover facilitates inspection and battery maintenance.

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

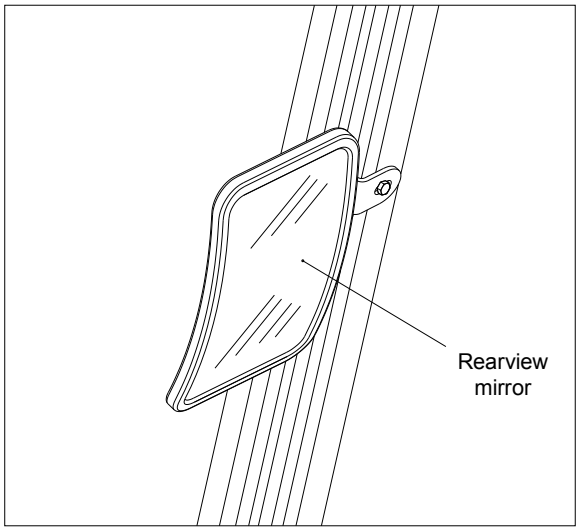
- **To close the cover, press the gas spring safety and then press the hood head down.**
- **Prevent the cover from clamping your finger when closing the cover.**

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.

Left/right rearview mirror



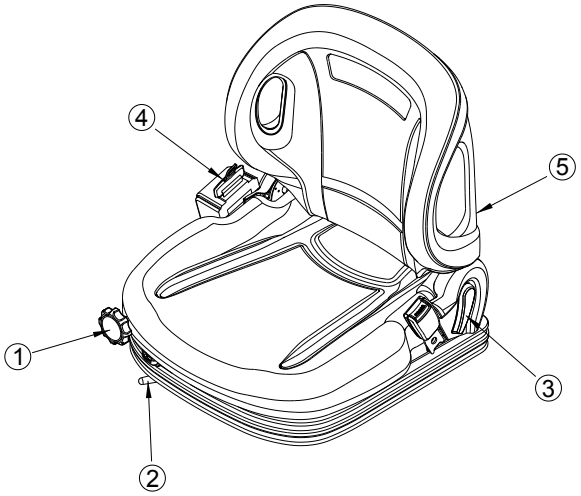
Adjust rearview mirror and make sure the rearview mirror vision in the best position.

WARNING

- **When the view is restricted, do not back up the forklift only by the rearview mirror. Often check the travelling direction before starting.**

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:

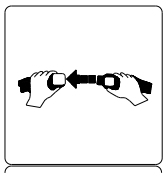
- Cut or frayed straps.
- Worn or damaged hardware, including anchor points.
- Buckle or retractor malfunction.
- Loose stitching.

WARNING

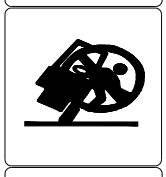
- **In any case, if there is damage or flaw(insecure lock, damage, wet light) on the safety bet, please repair or replace immediately.**
- **Never do any change to the safety belt. Replace new one after each accident.**

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**

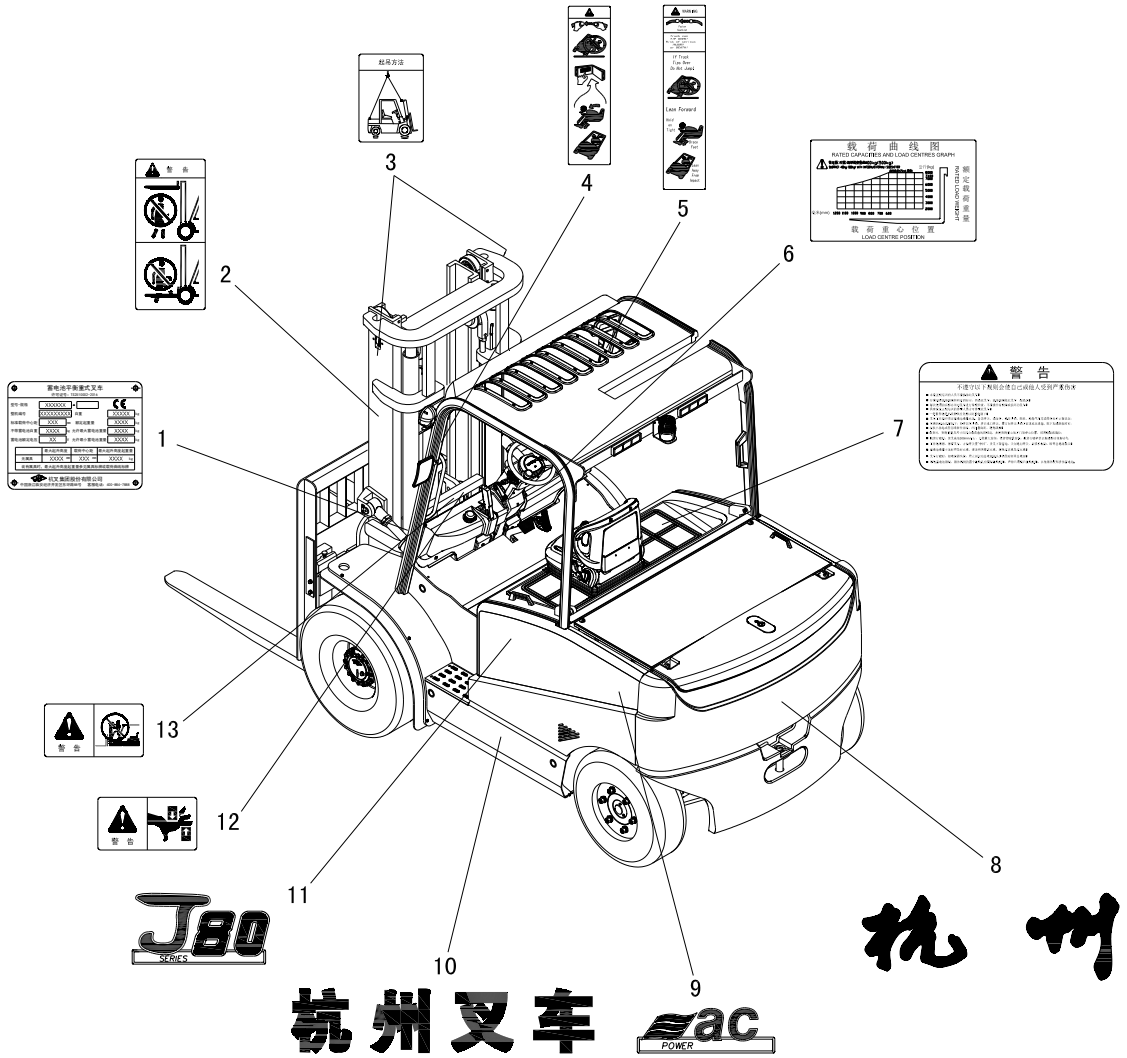
driving on the uphill, starting the OPS will cut off the drive power and make the truck slip. In order to avoid this accident, the driver must sit correctly when operating on the uphill.

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	Danger label：Don't jump forklift, when the forklift rollover
6	Load curve label
7	Warning label：Obey safety regulation.
8	Brand label
9	Ac label
10	Brand label
11	Series and tonnage label
12	Danger label：Be careful when lifting the mast
13	Danger label：No climbing

Main parameter

CPD80J-L/90/100J

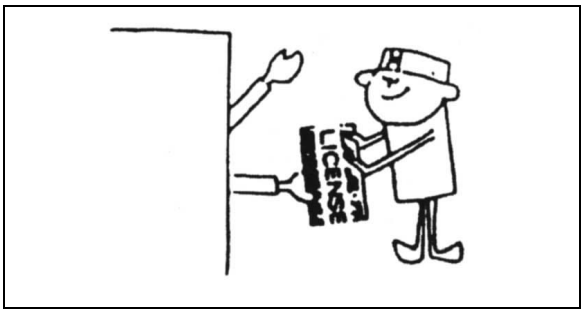
No.	project			CPD80J-L	CPD90J	CPD100J
1	Rated weight		kg	8000	9000	10000
2	Rated load center distance		mm	900	600	600
3	Standard gantry lifting height		mm	3000	3000	3000
4	Free rise height		mm	200	200	200
5	The maximum inclination of the gantry (front/back)		(°)	5/10	5/10	5 / 10
6	Maximum operating speed (full load)		km/h	13	13	13
7	Maximum lifting speed (full load)		mm/s	300	280	250
8	Maximum grade (full load/no load)		%	13/15	12/14	12 / 14
9	Minimum outside radius of turn		mm	3560	3560	3560
10	The minimum clearance from the center of the frame		mm	190	190	190
11	Maximum braking distance		m	2.5	2.5	2.5
12	Dimensions	Long (to fork back)	mm	3744	3744	3754
		width	mm	1970	1970	2040
		High (to top guard)	mm	2548	2548	2548
13	Weight	Including battery	kg	13950	13820	14500
14	Battery	standard	V/Ah	96/960	96/1104	96 / 1260
15	Motor	Drive motor	kW	35KW @3800rpm	35KW @3800rpm	35
		Pump motor	kW	52KW @2480rpm	52KW @2480rpm	52
		Steering motor	kW	3KW @1000rpm	3KW @1000rpm	3
16	Wheel	Front wheel×4		8.25-15/4	8.25-15/4	300-15/4
		Rear wheel×2		250-15/2	250-15/2	250-15/2

CPD80J-L-I/90J-I/100J-I

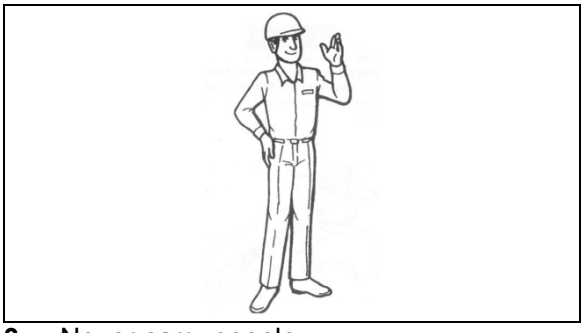
No.	project			CPD80J-L-I	CPD90J-I	CPD100J-I
1	Rated weight		kg	8000	9000	10000
2	Rated load center distance		mm	900	600	600
3	Standard gantry lifting height		mm	3000	3000	3000
4	Free rise height		mm	200	200	200
5	The maximum inclination of the gantry (front/back)		(°)	5/10	5/10	5 / 10
6	Maximum operating speed (full load)		km/h	13	13	13
7	Maximum lifting speed (full load)		mm/s	300	280	250
8	Maximum grade (full load/no load)		%	13	14	15
9	Minimum outside radius of turn		mm	3560	3560	3560
10	The minimum clearance from the center of the frame		mm	190	190	190
11	Maximum braking distance		m	2.5	2.5	2.5
12	Dimensions	Long (to fork back)	mm	3755	3755	3755
		width	mm	1970	1970	2040
		High (to top guard)	mm	2700	2700	2700
13	Weight	Including battery	kg	13380	13120	13700
14	Battery	standard	V/Ah	96/606	96/606	96/606
15	Motor	Drive motor	kW	35	35	35
		Pump motor	kW	52	52	52
		Steering motor	kW	3	3	3
16	Wheel	Front wheel×4		8.25-15	8.25-15	300-15
		Rear wheel×2		250-15	250-15	250-15

5. Safety instructions

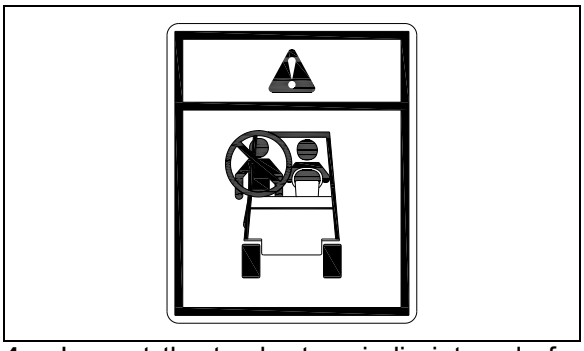
1. Only trained and accredited operators are permitted to operate the forklift truck.



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



3. Never carry people.

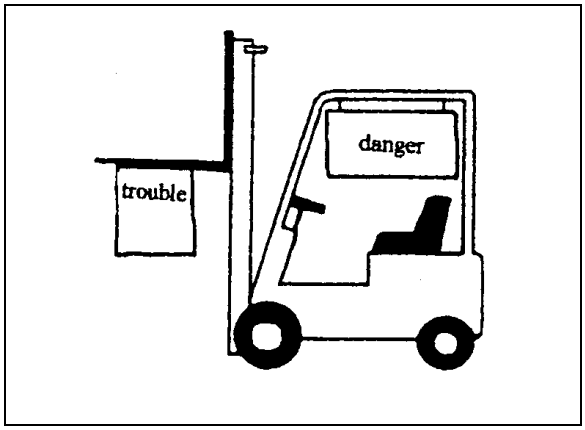


4. Inspect the truck at periodic intervals for leaks, deformation, defects, etc. the life of the truck will be shortened or an accident could occur.

- 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.

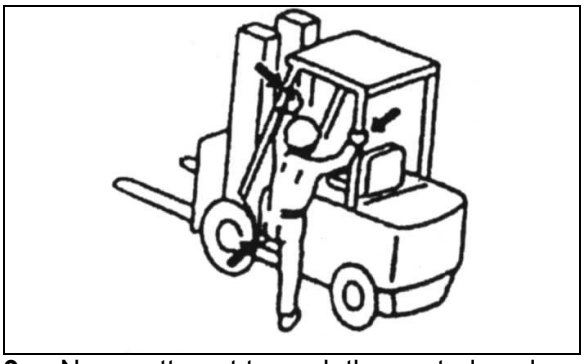
- Keep tools away from the battery terminals to prevent sparks or short-circuits.

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

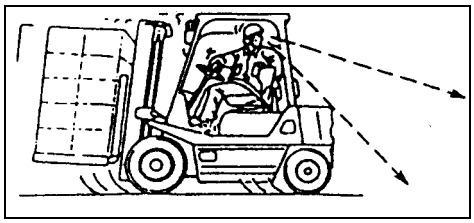
– Operate the controls smoothly and do not jerk the steering wheel. Avoid sudden stops, starts or turns. Sudden braking may cause the vehicle to tip over.

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.



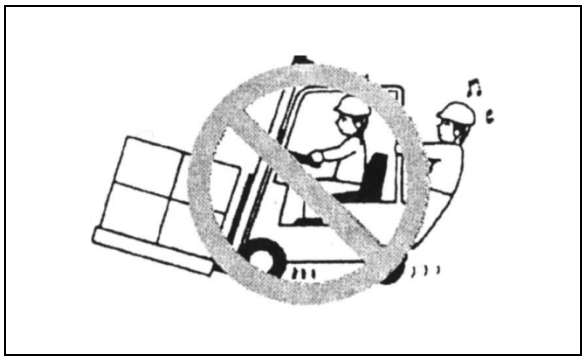
13. Other person is not allowed to sit on the fork, tray or forklift.

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.

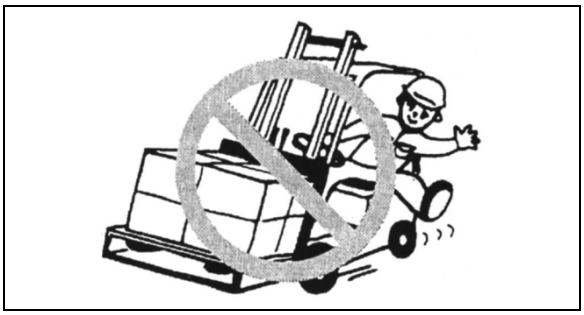
– Be careful not to let the forks touch the floor, so as to avoid damaging the fork tips or driving surface.

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



16. Do not use mobile phones or other electronic products while driving, and focus on work.

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

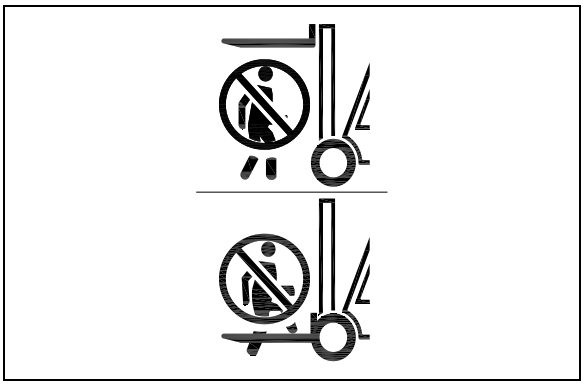


18. Pallets and skids should be strong enough to bear the weight of the load. Never use damaged or deformed pallets.

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.

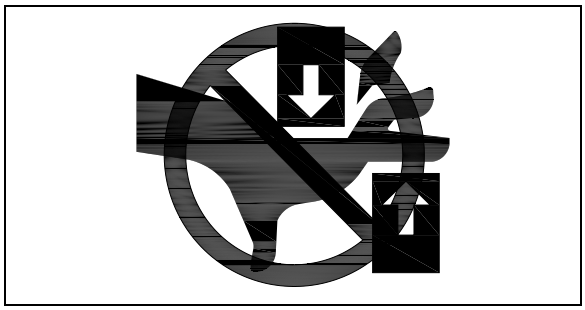
20. The overhead guard prevents cargo from falling onto the operator. The load backrest ensures the stability of loads. Do not use a forklift without the overhead guard and load backrest.

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



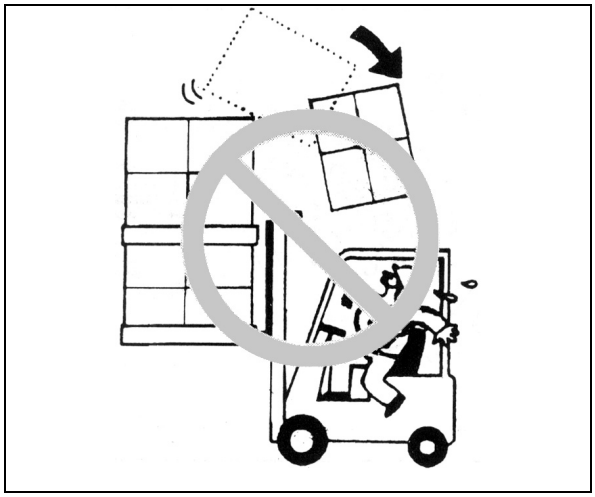
22. Never place your head or body in between the mast and overhead guard. Risk of serious injury or death due to entrapment.

– 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

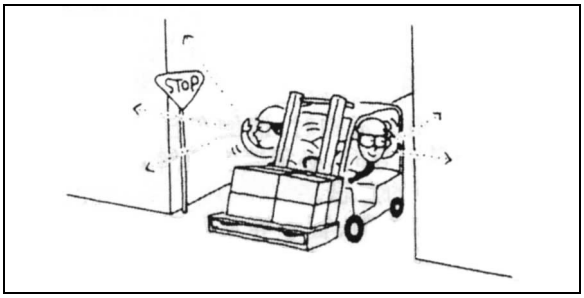
stack or at low lift height.

– 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.

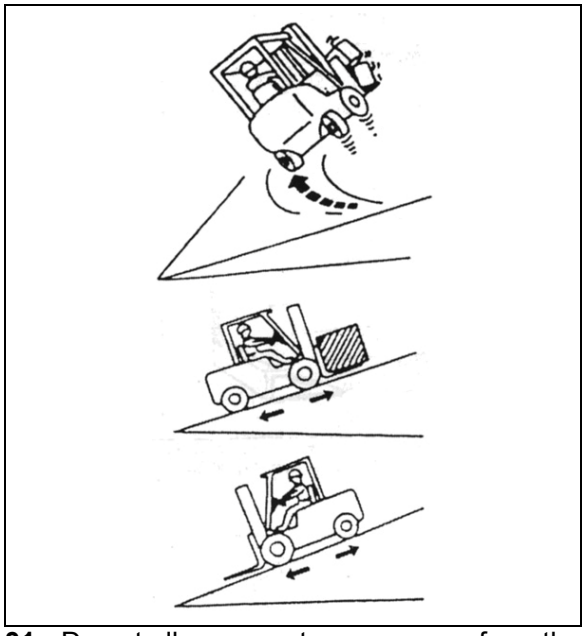


28. Make sure to keep your distance from the roadside or platform edge.

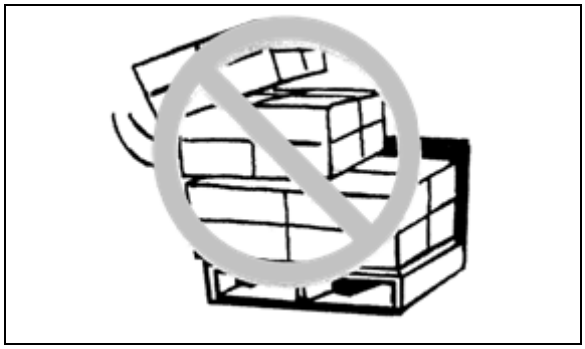
29. When driving over a ship's gangway or a bridge, make sure that it is properly secured and strong enough to withstand the weight of the forklift.

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.

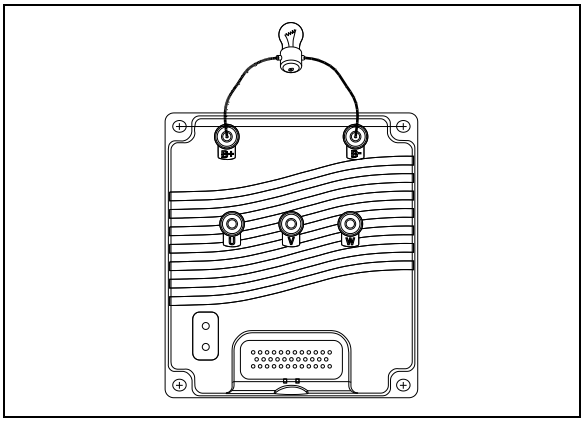
33. Never permit anyone to stand or walk

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.

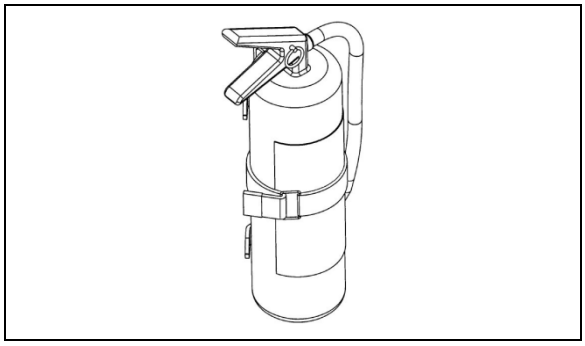
- Lower the forks to the floor and tilt slightly forward. Turn off the key switch and remove the key.
- Disconnect the battery plug.
- Park the forklift away from naked flames and sparks.

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.

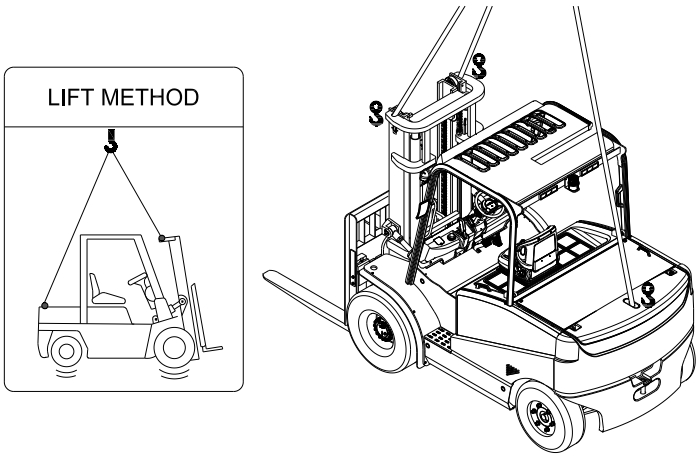
45. Only in the event that the truck manufacturer is no longer in business and there is no successor in the interest to the business, may the user arrange for a modification or alteration to a powered industrial truck, provided, however, that the user.

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

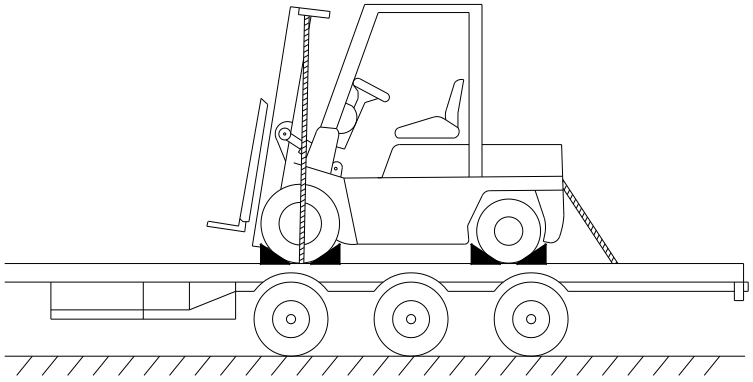
- **Only use the lifting tools with enough load.**
- **Fully tilt the mast backward when lifting.**
- **When assembling lifting tool, notice that the lifting tool will not touch forklift part or overhead guard when lifting.**
- **Do not lift a forklift by its cab frame (overhead guard).**
- **Never walk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

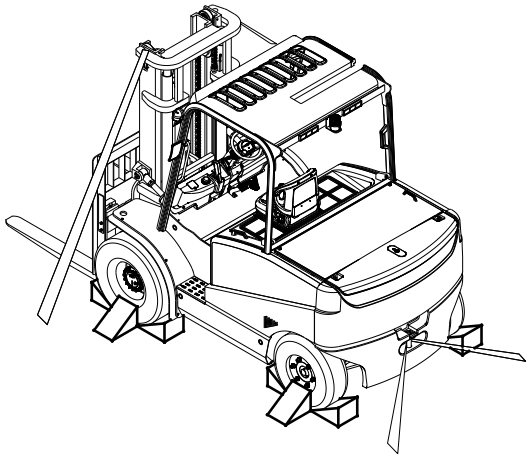
Carrying

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

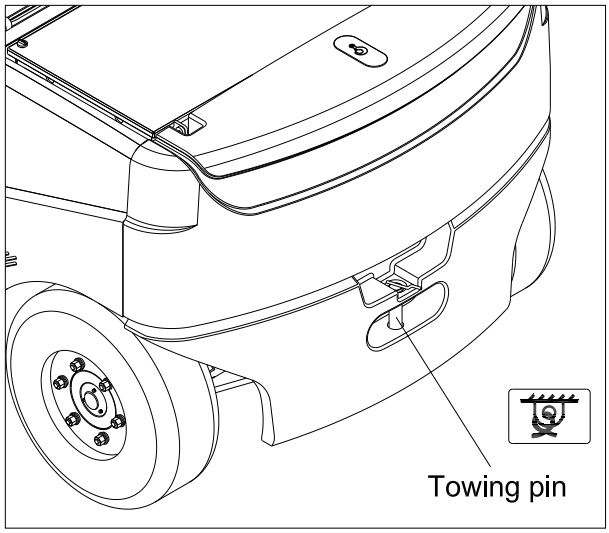
- **When fixing forklift, take effective measures according to specific condition to guarantee the safety of transportation.**
- **Correctly fix the forklift when transporting by lorry or trailer.**
- **Chock the forklift to avoid accident movement.**
- **Only use tension belt with big enough nominal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

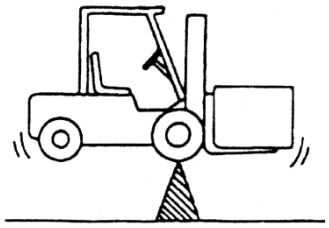
Prevent the forklift to turn over! It is very important for operator to know the truck's structure and relationship between load and stability.

CAUTION | **The structure of the truck**

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

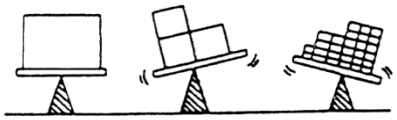
The front wheels are the fulcrum of the forklift and keep the centre of gravity of the forklift and load balanced.

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.



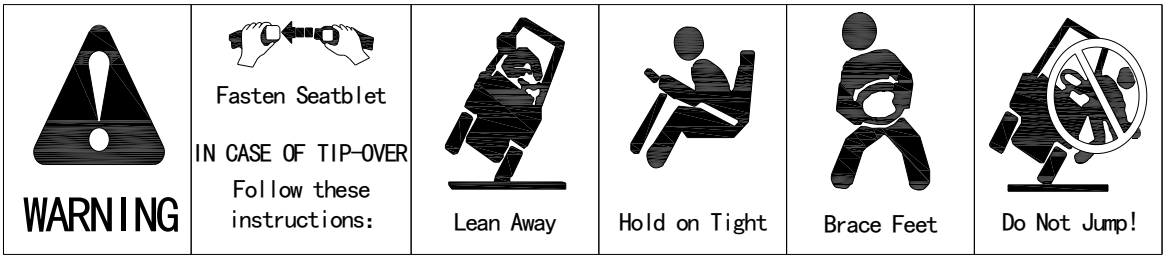
CAUTION | **Load center**

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.



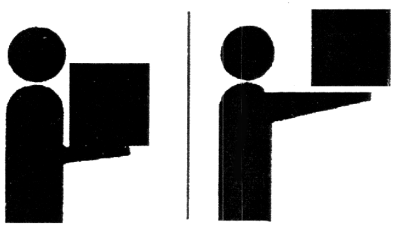
WARNING

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.



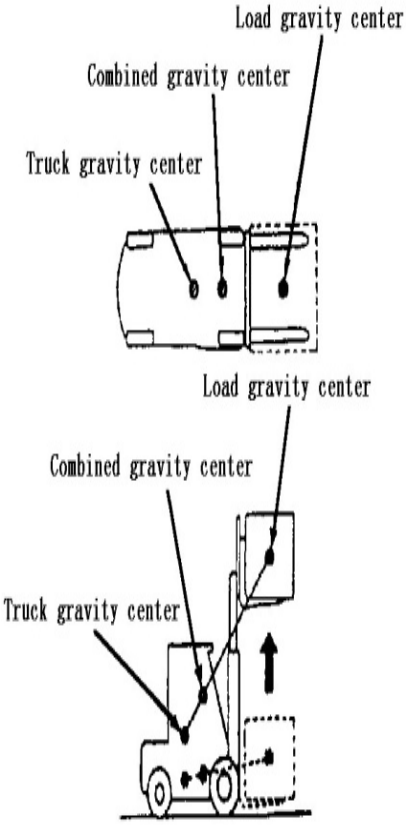
CAUTION | **Gravity and stability**

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:

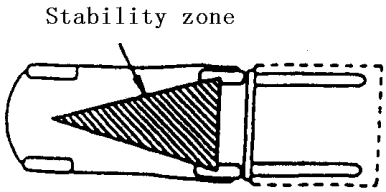
- Load size, weight and shape;
- Lifting height;
- Mast tilt angle;
- Tire inflation pressure;
- Acceleration, deceleration and turning radius;
- Driving surface conditions and inclination;
- Attachment type



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

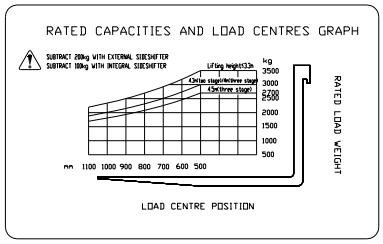
In order to stabilize the forklift, the combined centre of gravity must be located inside a triangle formed by the front wheels and the midpoint of the rear axle.

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.**
- **Maintenance of the machine at high altitudes is not allowed. If it is unavoidable, use seat belts. Maintenance personnel should be trained and there should be observers.**

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

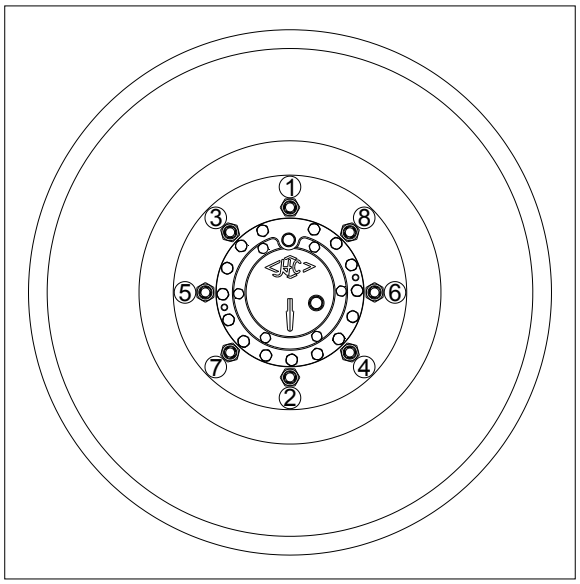
– Park the truck.

– Screw down wheel retaining nut with spanner crosswise.

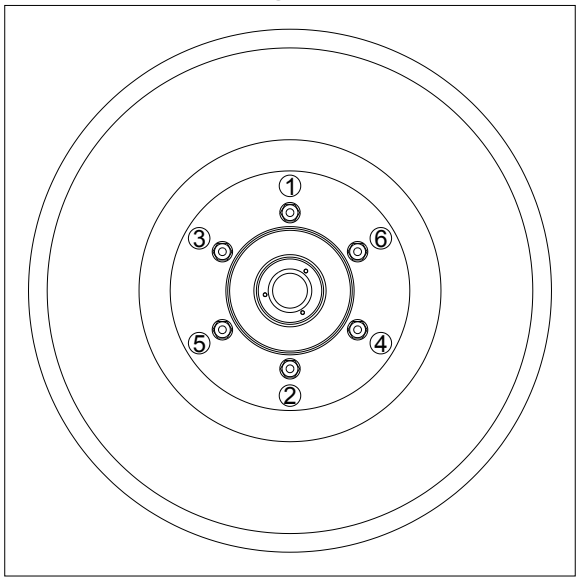
Bolt tightening torque：

Front wheel hub nut		Rear wheel hub nut
Single wheel	Dual wheel	
363～490 N.m	588～736 N.m	441～588 N.m

Front wheel（Driving wheel）



Rear wheel（steering wheel）



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 115mm -125mm from the front baseplate.

– Adjust the length of the pushrod of the brake master cylinder so that the pedal free play is 1㎜–3㎜.

– The brake light switch should turn on fully

when the brake pedal is gradually depressed 10mm–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

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

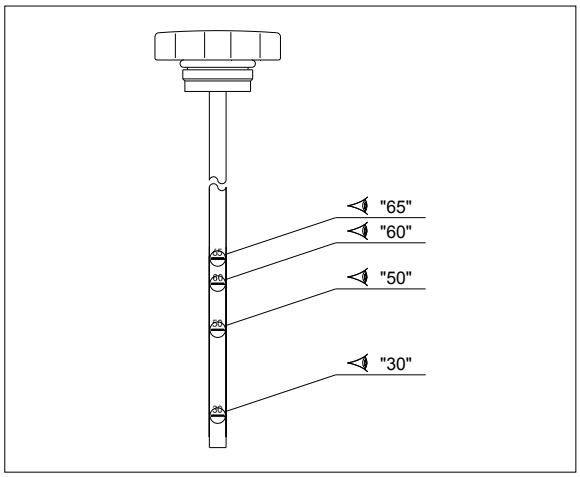


CAUTION

- **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.

8. Seat adjustment

Move the seat adjustment lever to the right

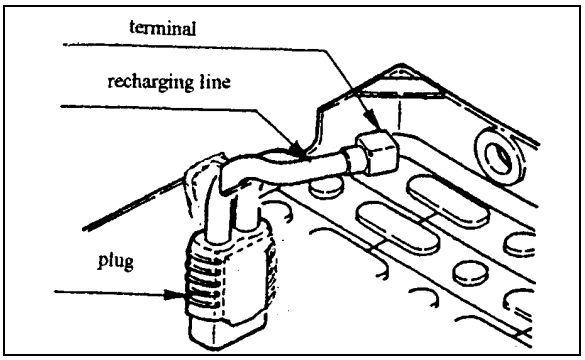
until the seat is comfortably positioned relative to the hand and foot controls, then lock in place. Adjust the weight setting.

9. 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

10. Instrument display check (power, faults)

See Instrument section.

11. 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.

12. 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.

13. Mast lubrication

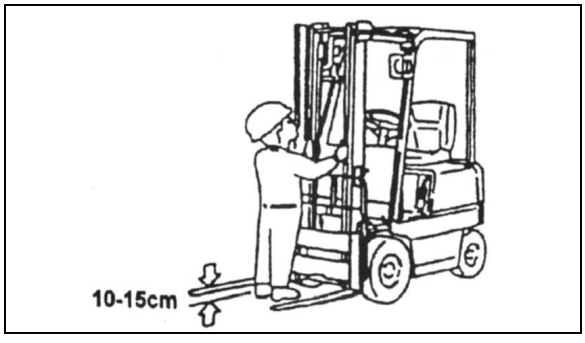
Apply grease to the inside and outside of the mast track regularly according to the periodic maintenance and lubrication table.

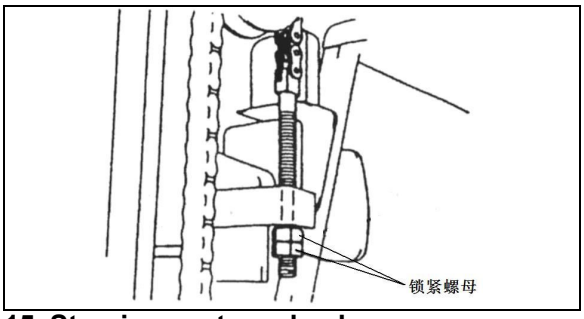
In heavy or severe operating conditions, adjust lubrication intervals accordingly. During busy months, increase the number of lubricated parts.

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.

14. Chain tension check

- Raise the forks to a height of 10cm–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.





15. Steering system check

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

16. 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.

17. Battery maintenance

Refer to Battery section.

18. Others

Check for abnormal noise.

It is strictly prohibited to climb to the height of portal frames and roof guards for maintenance and repair. If the door rack needs to be maintained or replaced at the height of the roller and other parts, the door rack should be removed according to the instructions of the maintenance manual for maintenance.

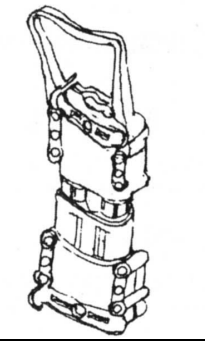
10. Starting and Operation

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

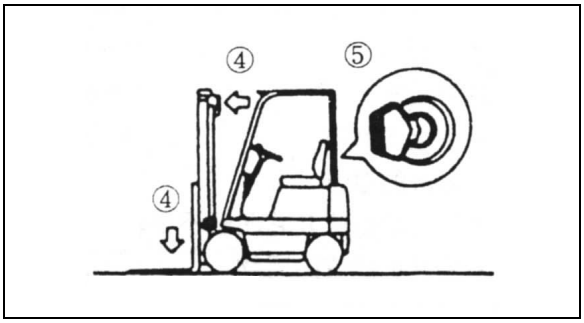
- **Drive slowly and operate the steering wheel carefully. Ensure that there is sufficient room for the rear end to swing out when making the turn.**

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.

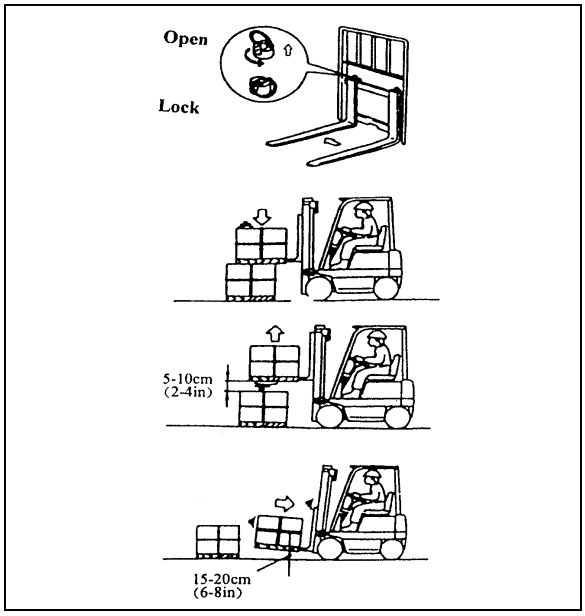
⚠ CAUTION

- **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 5cm～10cm off the ground and make sure that the load is secure.
  - Tilt the mast all the way back, raise the load 5cm～10cm 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 5cm～10cm 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 5cm～10cm, back up 10cm～20cm, then lower the pallet or rack. Drive forward again until the forks are fully inserted.**

– Raise the forks5cm～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 15cm～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.

2. Specific gravity detection and conversion

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

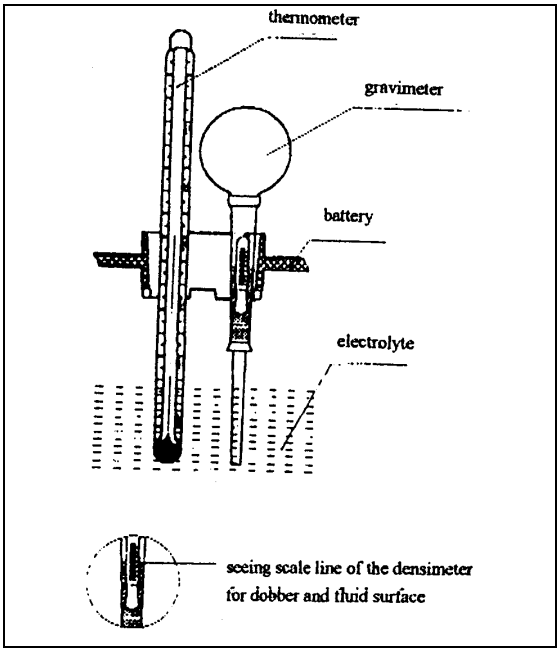
2.1 Specific gravity detection

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

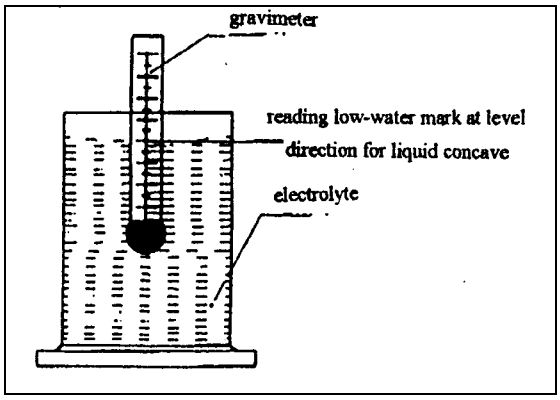
（2）Vertically insert the flexible tube of a pipette-type density meter into the electrolyte and squeeze the bulb. Electrolyte will enter the glass tube and the float will rise up.

（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

3. 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.

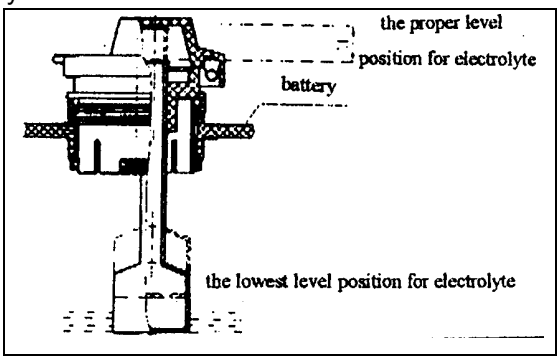
3.1 Check electrolyte level

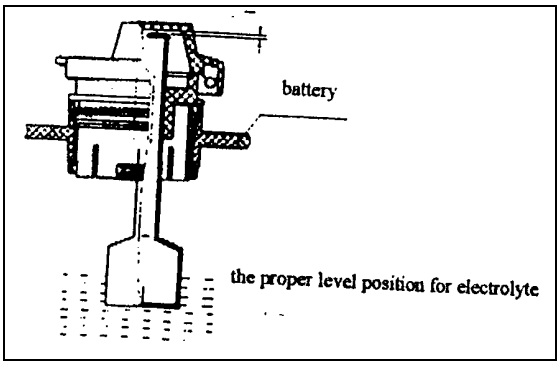
Battery without hydrometer

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.

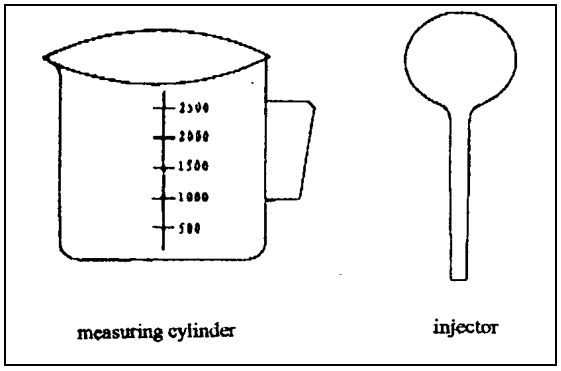
（2）Fill a squeeze bulb pipette with a certain amount of distilled water.

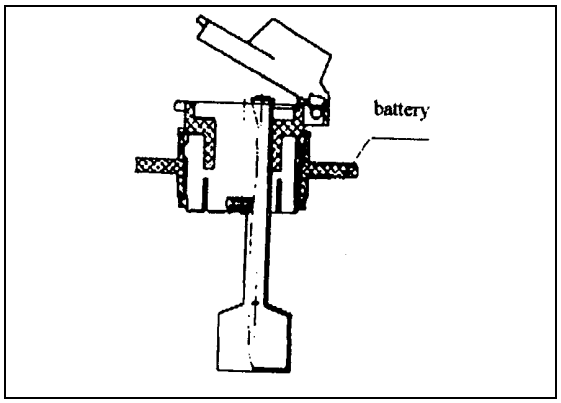
（3）Open all the vent or filler caps on the battery unit.

（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.

4. 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.

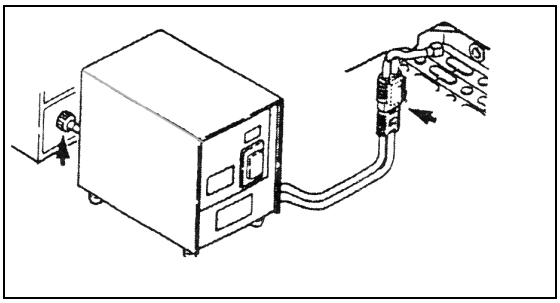
（6）Never continuously charge multiple batteries, which will overheat the charger and may even damage it. After charging, let the charger rest for an hour before re-using it.

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.

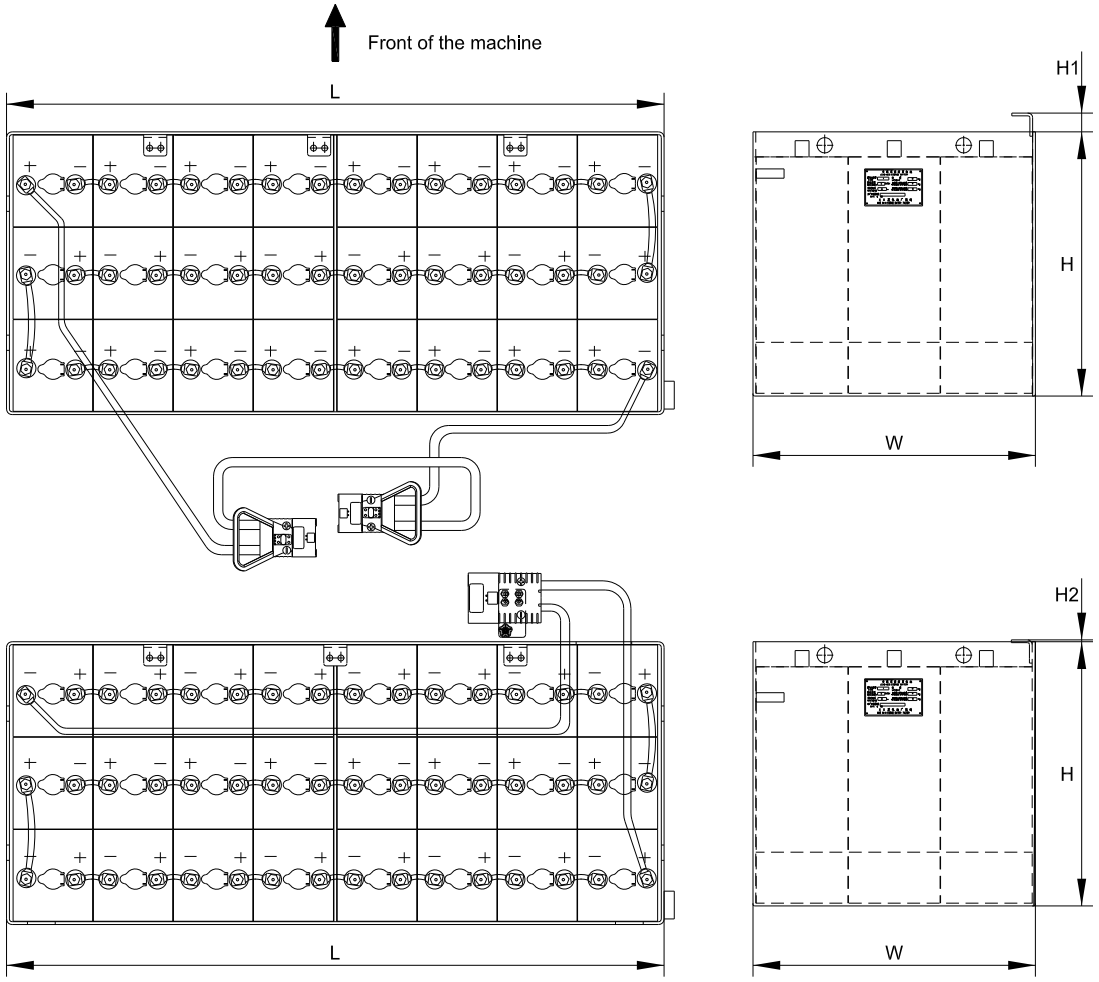
Set to equalizing charge mode and charge.

Equalizing charge is performed once a month.

Battery specification

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

Item / Model			80J-L	90J	100J	80J-L-I/90J-I/100J-I
Battery box	Length [L]	mm	1420	1420	1420	1450
	Width [W]	mm	825	825	825	825
	Height [H]	mm	580	580	580	580
	Height [H1]	mm	40.5	40.5	40.5	/
	Height [H2]	mm	4	4	4	3.5
Voltage		V	96	96	96	96
Capacity		A.h	960	1104	1260	606
Allowable lightest		kg	3174	3624	3960	680
Allowable heaviest		kg	3330	3880	4158	/

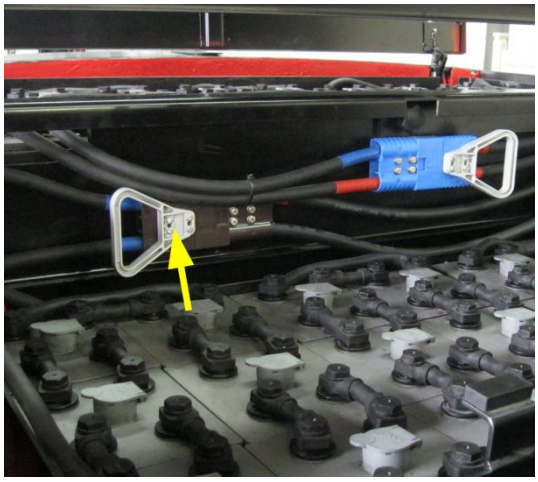


Battery charging

– 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.**

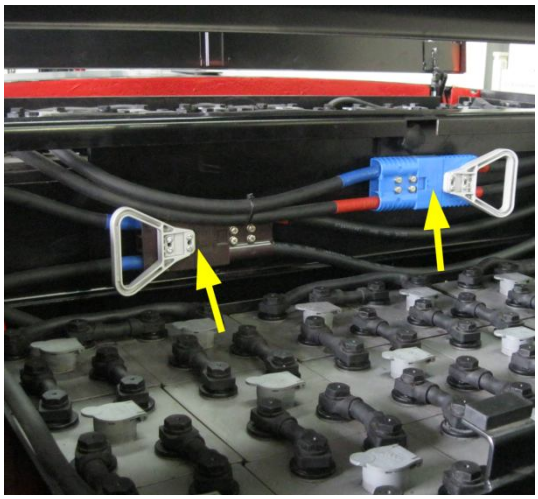
– Park the truck at the appointed area.
– Open the front/rear cover.



– 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.**

Lithium battery charging

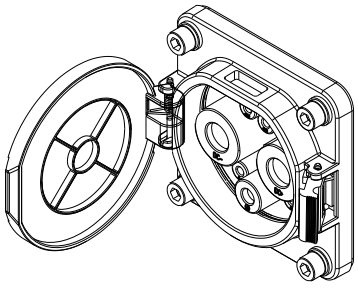
Park the truck securely as specified.



Open the charging door cover



The lithium battery charging port can be seen, and the charging port is covered with a cover. Open the lid and see the charging port

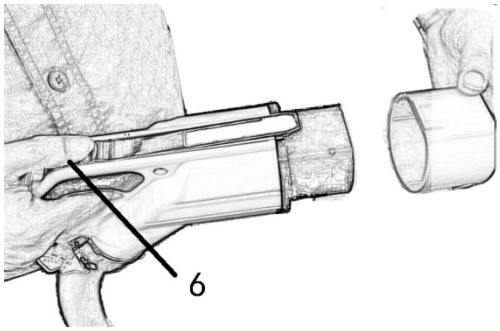


Lithium battery charging port structure

Note: There is a slot in the top of the socket for the buckle when the charging gun is inserted and charged.



Note: The flat side of the plug is equipped with a locking hook that snaps into the slot when it is inserted into the battery socket.



Press the lock button (6) on the charging gun head to insert or remove.

Battery daily maintenance and maintenance

（1）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 over discharge the power battery system. Over discharge will cause irreversible permanent damage to lithium- ion power battery.

（2）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.

（3）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.

（4）Clean

a. Cabinet cleaning: Check whether there are any debris, obvious deformation, rust and other abnormal conditions in the battery system outer box.

b. Charging port cleaning: When the power is off, check whether there are any abnormal conditions such as debris and rust in the intPlug-in rface.

c. Plug cleaning: When the power is off, check whether the connector is loose or damaged.

d. Status detection: When the power is off, check whether the connector is loose or damaged.

13. 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：

Tonnage	8.0t~10.0t
Counterweight weight（kg）	3000

Periodic maintenance schedule

○ —check, correct, adjust ×—replace

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

lithium battery

Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Battery	Lithium battery installation and fastening		○	○	○	○	○	○
	Lithium battery charging socket cleaning				○	○	○	○
	Lithium battery charging socket contacts are damaged or rusted		○	○	○	○	○	○
	Lithium battery charging socket contacts have water, clear		○	○	○	○	○	○
	Lithium battery charging socket dust cover is intact				○	○	○	○
	Is the lithium battery case damaged		○	○	○	○	○	○
	Battery power		○	○	○	○	○	○
	Keep away from flames		○	○	○	○	○	○

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

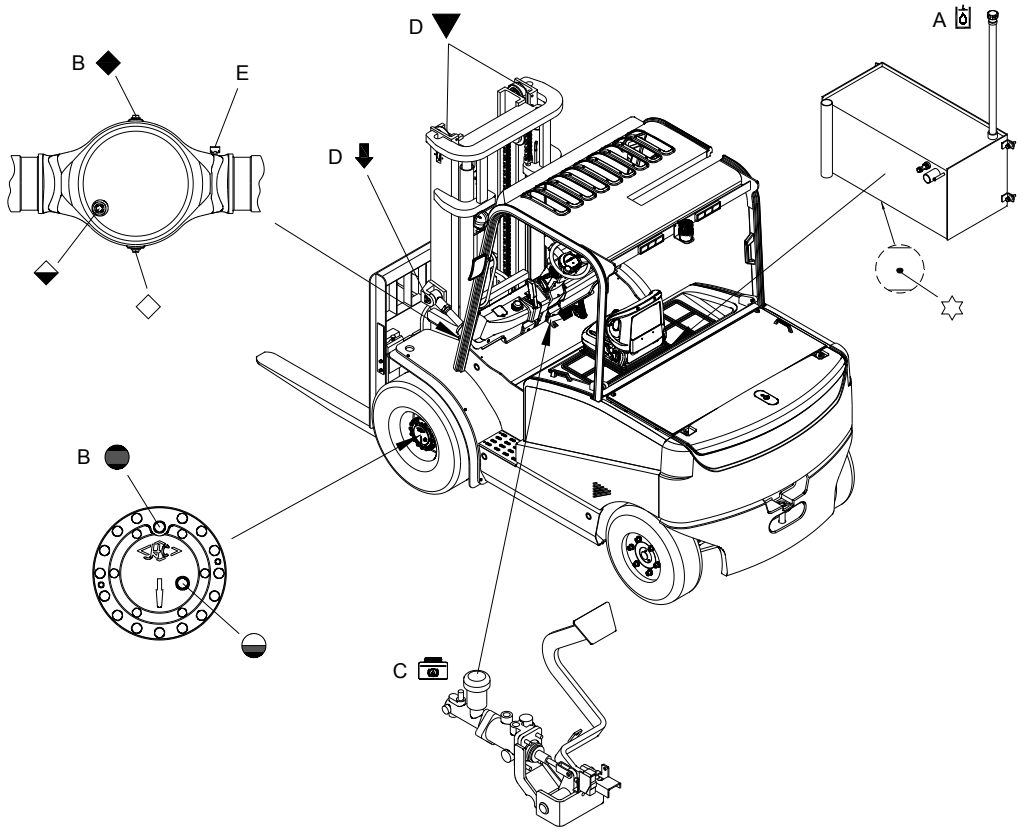
Item	Service required	Tool	D (8 h)	W (40 h)	M (166 h)	T (500 h)	S (1000h)	Y (2000h)
Chain sprocket	Check chain tension, check for deformation, damage and corrosion		○	○	○	○	○	○
	Lubricate chain				○	○	○	○
	Riveting pins and looseness				○	○	○	○
	Sprocket deformation and damage				○	○	○	○
	Looseness of 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.

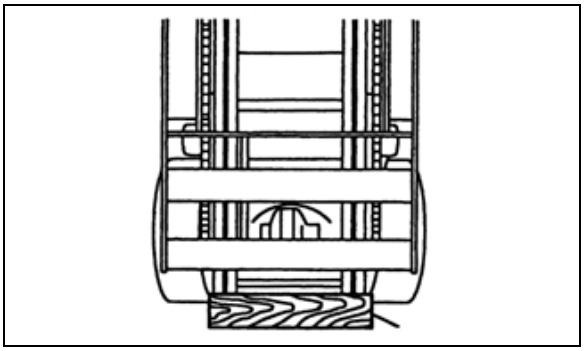
Replace wheel

Replace in time when tires are damaged.

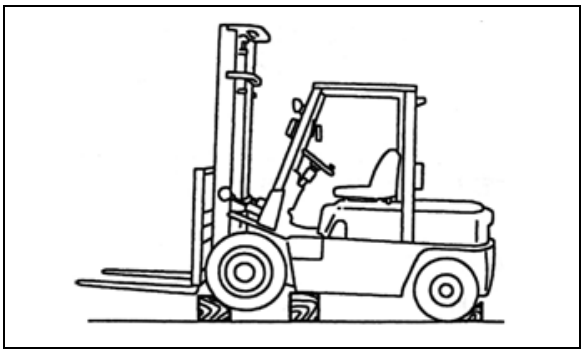
Replace front wheel

– Park forklift truck on level concrete. Place chocks behind rear wheels to prevent movement of forklift;

– Start the forklift, and lift the mast about 100mm. Tilt mast fully backward, and place a wooden block under each side of outer mast; Tilt mast forward until front wheels are raised from surface.



– Support truck by putting wooden blocks under both sides of the front truck frame, then turn off the key switch.



WARNING

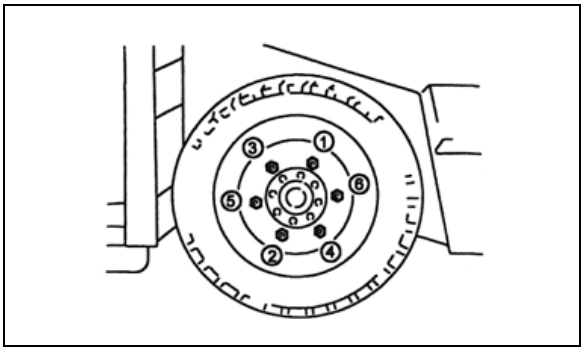
- **Make sure that wooden blocks used to support forklift truck are solid, one-piece units;**
- **Never get under forklift while it is supported only by wooden blocks.**

– Take out the wheel nuts and replace the new tires.

WARNING

- **Do not take out wheel nuts before the rear wheels leave the ground.**

Install the new tire on the hub, and screw down the hub nut symmetrically and crosswise （T=588～736N.m）.

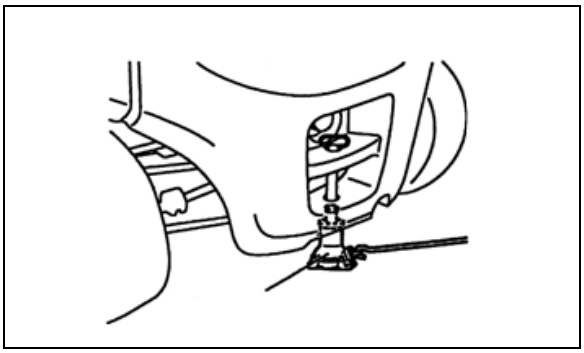


– Start the forklift, and take out wood block from the truck frame. Tilt the mast backward, slowly lower the truck, take out the wood blocks from the mast and rear wheel.

Replace rear wheel

– Park forklift truck on level concrete, pull up the hand brake, place chocks behind front wheels to prevent movement of forklift.

– Put the jack at the section of the bottom counterweight, and raise the forklift with jack slowly until rear wheels off the ground.

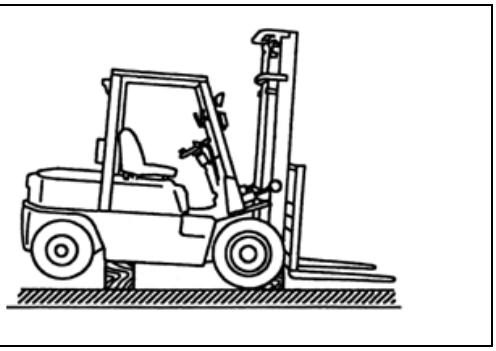


CAUTION

- **Make sure the minimum jack bearing**

weight is two thirds of the total truck weight.

– Place a solid wood block under the truck frame.



WARNING

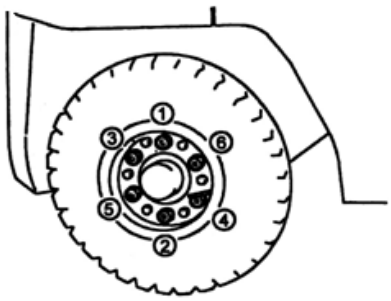
- **Make sure that wooden blocks used to support forklift truck are solid, one-piece units.**
- **Never get under the forklift when the forklift is only supported with wood block.**

– Release hub nut, remove the wheel and replace new tire.

WARNING

- **Do not take out wheel nuts before the rear wheels leave the ground.**

– Install the new tire on the hub, and screw down the hub nut symmetrically and crosswise（T=411～588N.m）.



– Remove the wood block from the truck frame, lower the forklift on ground slowly, and then take away wood block and jack from the front wheel.

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

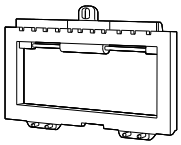
Bolt diameter	Grade			
	4.6	5.6	6.6	8.8
6	4～5	5～7	6～8	9～12
8	10～12	12～15	14～18	22～29
10	20～25	25～31	29～39	44～58
12	35～44	44～54	49～64	76～107
14	54～69	69～88	83～98	121～162
16	88～108	108～137	127～157	189～252
18	118～147	147～186	176～216	260～347
20	167～206	206～265	245～314	369～492
22	225～284	284～343	343～431	502～669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

Note：

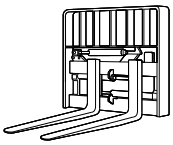
- Use entirely 8.8 grade bolt in the important joint position.
- Bolt’s grade can be found in the head of the bolt, if it can’t be found, the grade is 8.8.

14. The use, install and safety rules of attachment

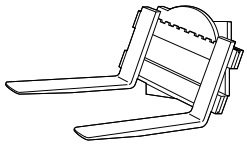
HANGCHA will choose attachment that in accordance with International standard ISO2328 *Forklift pothook fork and installation size of carriage*, such as sideshifters, fork positioner, rotator, push/pull and clamp ect.



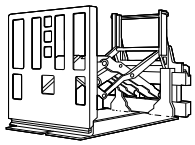
sideshifter



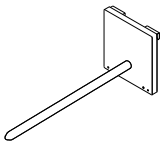
fork positioner



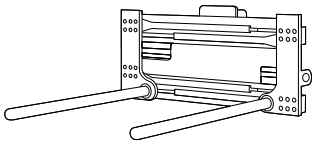
rotator



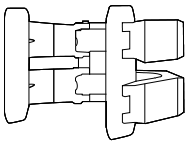
push/pull



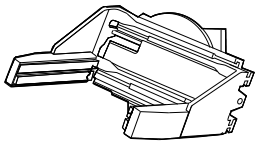
coil boom



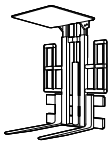
bar arm clamp



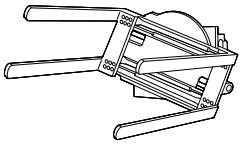
paper roll clamp



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.

15. 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







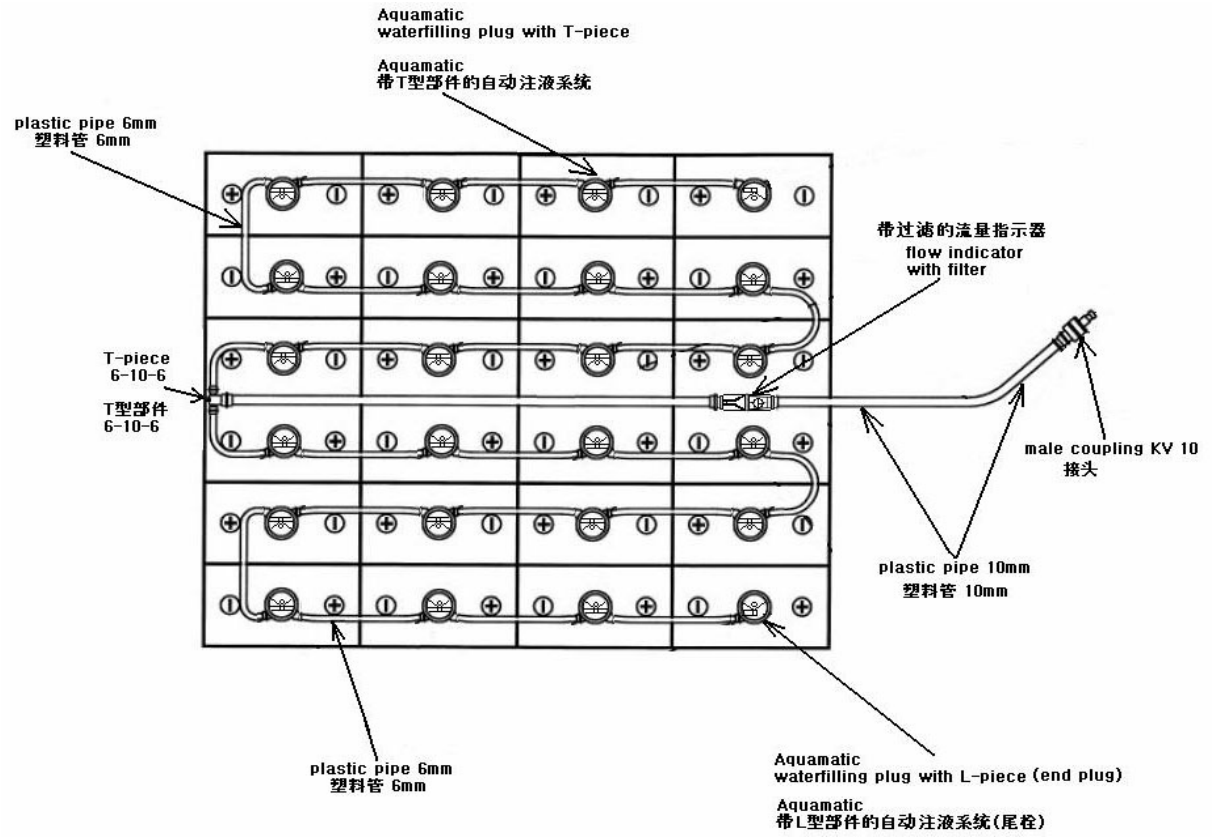
Application specification and installation

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

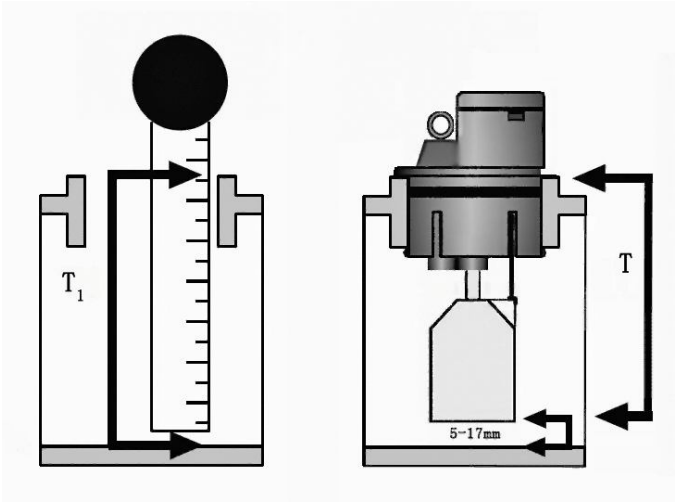


Automatic Watering System of Forklift Storage Battery-48V battery cells

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.

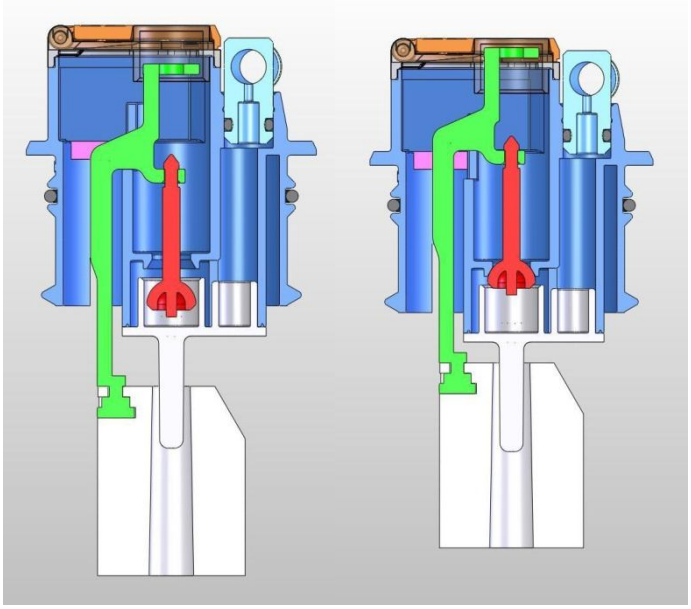
Notes during the filling process：

- 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.

16. Related Safety Instruction and Standard(For CE)

For trucks exporting to Europe or option.

The model by CE certification which according to the following instruction and standard:

- DIRECTIVE 2006/42/EC OF THE EUROPEAN PAMENT AND OF THE COUNCIL, DIRECTIVE 2000/14/EC OF THE EUROPEAN PAMENT AND OF THE COUNCIL, EN ISO 3691-1:2015, ISO/TS 3691-7:2011, EN 16307-1:2013+A1:2015, EN12053:2001+A1:2008, EN1175-1:1998+A1:2010, EN13059:2002+A1:2008 coordinate standard.
- Main safety factor will be according with DIRECTIVE 2006/42/EC OF THE EUROPEAN PAMENT AND OF THE COUNCIL and EN ISO 3691-1:2015, ISO/TS 3691-7:2011, EN 16307-1:2013+A1:2015，EN1175-1:1998+A1:2010 standard.
- The design and manufacture of electrical element comply with the low voltage standard 2014/35/EU.
- Noise will be according with EN12053:2001+A1:2008 and with 2000/14/EC amended by 2005/88/EC.

  Sound pressure level on the operator's position is lower than 75dB(A), measurement uncertainty is 1.5dB(A).

  Vibration parameters are measured according to standards of ISO5349-2:2001, EN13059:2002+A1:2008, ISO2631-1:1997, and the result meets the requirement of 2002/44/EC.

  Whole body vibration is lower than 1.1m/s^2.
- Electromagnetism compatibility is measured according to standard of EN12895:2015，and meets 2014/30/EU.

Maintenance record

Date	Service content	Serviceman

HANGCHA GROUP CO., LTD.

- Address For: OVERSEAS USERS
- Address: 666 Xiangfu Road, Iinan,Hangzhou, Zhejiang, China
- ZIP:311305
- Fax: 0086-571-88926789 0086-571-88132890
- Web: http://www.hcforklift.com ■ E-mail: sales@hcforklift.com