X series 20t-35t Counterbalance Internal Combustion Forklift Truck Operation and maintenance manual

CPCD200/250/280/300/320/350-XRW83G

CPCD200/250/280/300/320/350-XRH10G

CPCD200/250/280/300/320/350-XRH19G

HANGCHA GROUP CO. , LTD.
05/2025

Preface

Thank you very much for purchasing the product of Hangcha Group.

20t-35t Counterbalance Internal Combustion Forklift Fruck is the latest development product of us. This manual is about the brief introduction and correct operation of 20t-35t Counterbalance Internal Combustion Forklift Truck, which will tell you how to operate safely and maintain correctly, relative persons who will use the forklift truck must read and understand the manual.

Our product design will be improved continusly, so the content of this manual may be a little different from the forklift truck.

If you have any problem please contact sales company of HANGCHA GROUP CO. , LTD. or our agent without any hesitation.

Ⓒ 02/2025 HANGCHA GROUP CO. , LTD.

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I. General rules

To keep the truck and you safe, obey these rules below:

1. Only trained and authorized operators shall be permitted to operate the truck.

2. Before starting truck you should check all control and alarm devices; if any are damaged, DO NOT operate until it is repaired.

3. When carrying a load, do not overload. The forks should insert in the load completely and evenly. It is not permitted use only one fork to load.

4. You should operate the truck smoothly when starting, turning, traveling, braking and parking. On a slick or wet road, decrease speed when turning.

5. Lower the forks and tilt the mast backwards when traveling with a load.

6. If the slope angle is bigger than 10%, travel forward up slope and backward down slope. Never turn sideways or stack load on an incline.

7. Be aware of bystanders, barriers, potholes and overhead clearances.

8. DO NOT allow passengers or persons to stand on the fork.

9. DO NOT stand or walk under the fork.

10. DO NOT operate the truck or attachment from any position except the operator’s seat.

11. DO NOT carry the load unpackaged. Be careful when carrying large loads.

12. Take care not to lose load when lift height is higher than 3 meters, take protective measures if necessary.

13. Travel with load as low as possible and tilt back the mast.

14. When driving over a dock-board or bridge-plate, be careful and drive slowly.

15. Make sure that there is no naked flame near the area, never smoke. The driver should not remain seated when adding fuel.

16. Treat the truck with attachments as a loaded truck

17. When leave the truck, you should put the forks down, make the shift lever in neutral, shut down the engine and cut the power. When parking on a grade, make sure to tighten the brake lever. If necessary, use a block when parking on a grade for a long time.

18. If the truck suddenly gets out of order, or for leakage of electrolyte, hydraulic oil or brake oil when lifting goods or grade climbing, leave truck in safe state and contact service technician immediately.

19. During installation and assembly, there will be noise and vibration. Please choose the right tool and assembly method. Minimize the noise and vibration as soon as possible to reduce noise pollution.

20. The trucks arefor in-plant use only, The work road surface for forklift should be stable and free of litter, preferably cement, blacktop or concrete. If there is snow, ice, water or other eye irritants,

protect against these and resume work.

21. Move the truck to the place where respects traffic when it anchors. If the reason is brake or turn system, move it by a suitable truck (Refer to the part of truck carrying); other reasons, use a suitable truck to move, tie the cord outside of truck. Please abide by the traffic regulations when moving the truck on roads.

22.DO NOT operate the truck or load cargo after removing the hood, water tank cover board, overhead guard, or load backrest of mast.

23. Make sure there is enough light around the work area. At night, use the head lamps.

24. Handle with automatic pitch fork of the forklift when the load must not make lateral operation, so as not to lose balance and forklift components of the damage caused.

25. Trucks equipped with energy accumulator, which offers at least one time emergency braking after engine off. In order to ensure your safety, please carefully read and strictly carry out relevant accumulator operation.

26.Before hydraulic oil temperature rises, do not tilt the mast forward, backward or lift the mast to the limit when in idling.

27.No modifications or alterations to a powered industrial truck, which could affect, for example, capacity, stability or safety requirements of the truck, shall be made without the prior written approval of the original truck manufacturer, its authorized representative, or a successor thereof. This includes changes affecting, for example, braking, steering, visibility and the addition of removable attachments. When the manufacturer or his successor approves a modification or alteration, the manufacturer or successor shall also make and approve appropriate changes to the capacity plate, decals, tags and operation and maintenance handbooks.

28.In the event the truck manufacturer is no longer in business and there is no successor in the interest to the business, the user may arrange for a modification or alteration to a powered industrial truck manufacturer and the user shall:

(1) Arrange for the modification or alteration to be designed, tested and implemented by an engineer(s) expert in industrial trucks and their safety;

(2) Maintain a permanent record of the design, test(s) and implementation of the modification or alteration;

(3) Approve and make appropriate changes to the capacity plate(s),decals, tags and instruction handbook;

(4) Affix 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 made the modification or alteration.

II. Apperance and name of main parts

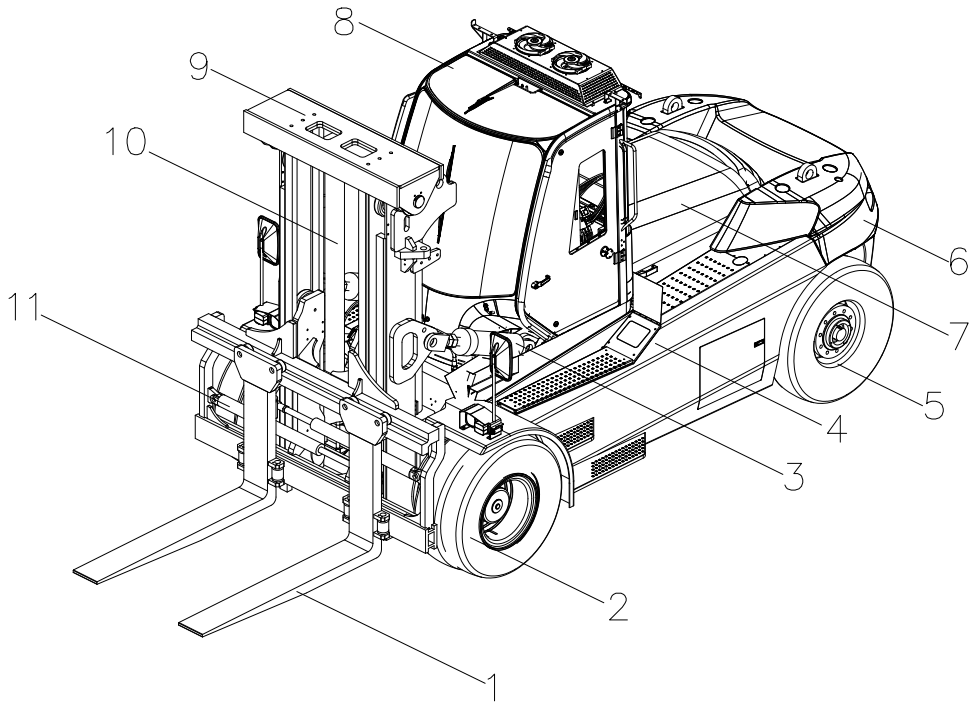
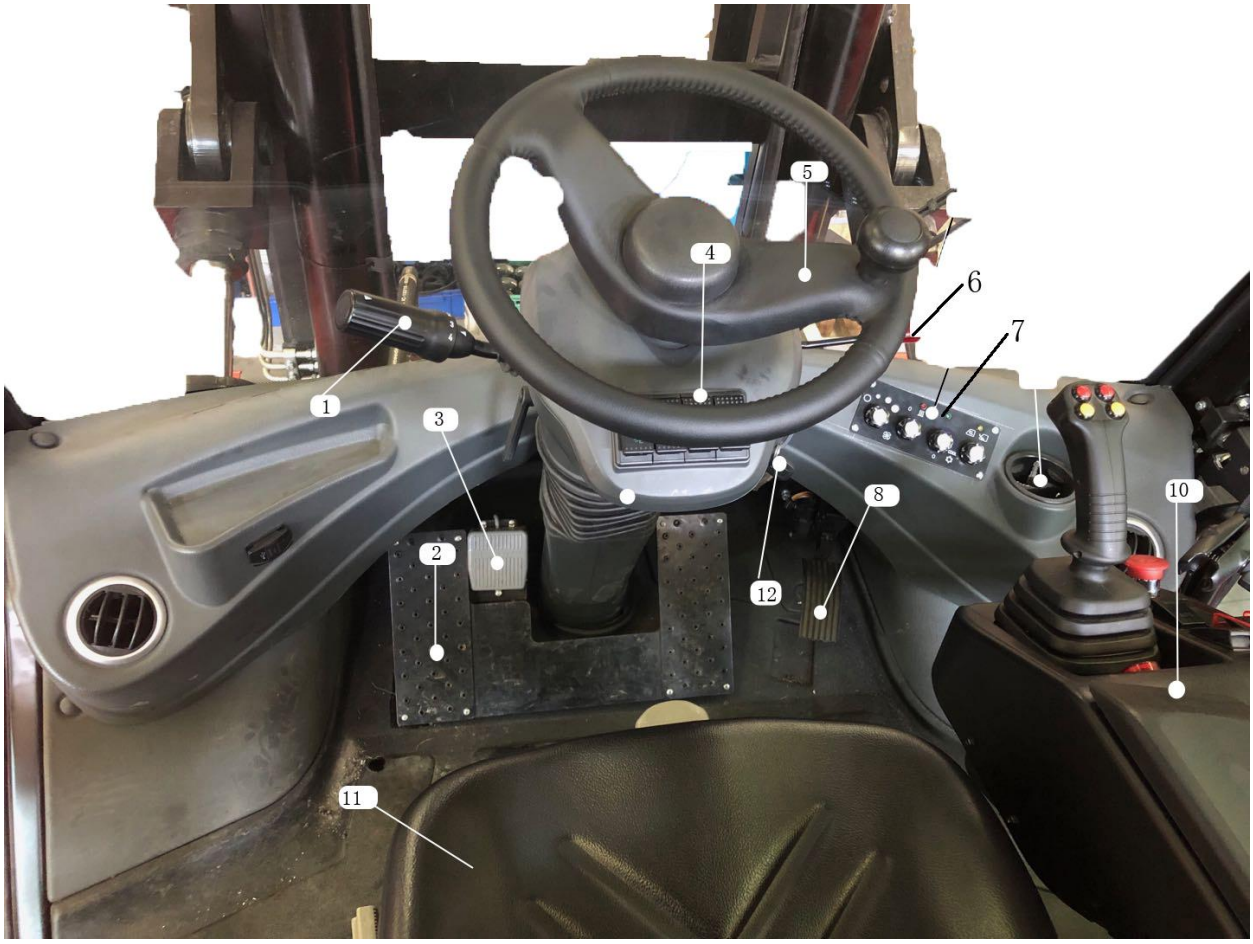
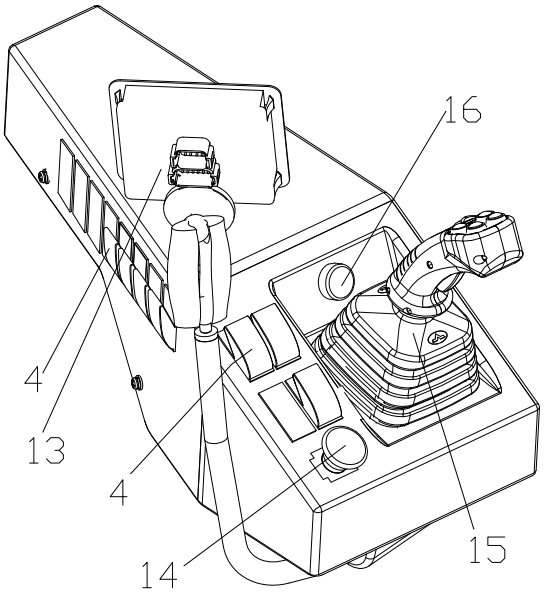


Fig.2-1Forklift

1.Fork	2.Front wheel (driving wheel)		3.Tilting cylinder
4.Frame	5.Rear wheel (steering wheel)		6. Counter balance
7.Fuel reservoir cap	8.Cabin	9. Mast	10.Lifting cylinder
11.Side shifting cylinder			

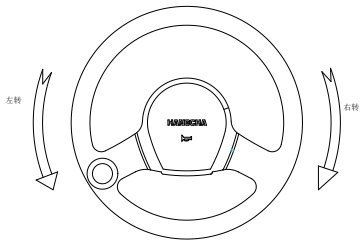
2.1 Control





1.Shift switch	2.Brake pedal	3.Power cut-off switch	4.Rocker switch
5.Steering wheel	6.Steering lamp switch	7.Cold and warm air heating radiator control	
8.Accelerator pedal	9.Cup holder	10.Handhold assy	11.Seat assy
12.Key switch	13.field bus instrument	14.tight stop button	15.Pilot control handle
16.buzzer alarm			

Steering wheel



Turn steering wheel to the right, forklift will turn right. Turn steering wheel to the left, forklift will turn left. Rear part of forklift can swing to the outside.

Attention： The truck adopts hydraulic sttering, so when the engine stops, steering will be difficult. You must start the engine for re-steering.

Horn button

Press the horn button in the center of steering wheel, the horn will sound, though the key switch is at “OFF”.

Key switch

OFF—where the key in and out

DRIVE—after have lined up the electric electrocircuit and started up the engine, remain the key at this position.

START--- As the key is placed in the “start” position that it means that the fuel is the starter motor is engaged. When removing hand off key, it is automatically returned to the “ON” position by spring force.

Caution:

1. Don’t keep the key at the “DRIVE” position when the engine has been shut down. Otherwise it will result in discharge of battery.

2. While the engine is running, don’t switch the key at the “START” position, otherwise it may cause damages to the start motor.

3. Don’t keep the motor running for more than 5 seconds when starting the engine up, and wait at least 2 minutes for another start-up.

4. When the gear lever is not at the neutral position, the engine can not get started.

Steering lamp switch

Steering lamp switch is installed on the right steering column. When the indicator rod is at the turning point, the steering lamp flashes.

Move forward-left steering lamp lights;

Middle-close

Move backward-right steering lamp lights;

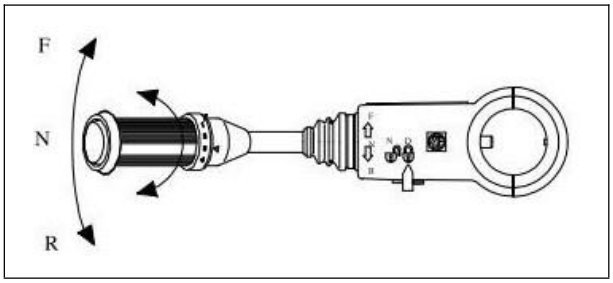
The light combination switch handle end is equipped with LED light, when the turn signal switch turns on, the LED works accordingly.

Indicator rod cannot return neutral automatically, move by the hand for reset.

Gear shift switch

The truck adopts electric reversing, owns 3 forward gears and 3 backward gears.

Before changing move direction, please step the brake pedal for complete stop, then move the handle to the forward gear, rotate to the forward gear 1, 2, 3 or move the handle to the backward gear, and rotate to the backward gear 1, 2, 3.



	1	2	3
Move forward	Forward gear 1	Forward gear 2	Forward gear 3
Move backward	Backward gear 1	Backward gear2	Backward gear 3

Attention:

Only when the handle is in neutral position can you start the truck.

Rotate to 1 position when the truck starts and climbs.

Disconnect switch

Stepping the disconnect switch, the signal transfers to transmission control unit, and the transmission cut off the power from the engine.

Stepping the brake pedal to make the pedal power reach 1/3 of general pedal power. Under such condition, pressure sensor transmits the signal to transmission control unit, and the power from the engine can be cut too.

Brake pedal

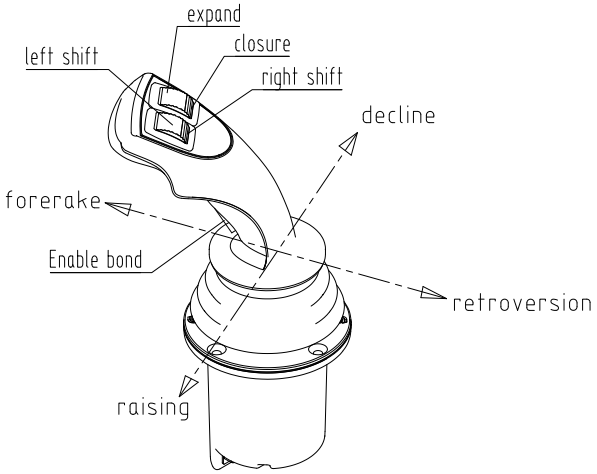
Step the brake pedal, the forklift will slow down or stop and the brake lamp lights.

Accelerator pedal

Step the accelerator pedal, the engine speed will boost; release the accelerator pedal, the engine speed will slow down.

Pilot handle control

The handle controls the lift, tilt, side shift and position adjustment of the fork.



During operation, the operation is only effective by holding down the safety switch.

Attention

Always gently use the control handle.

The speed of the hydraulic action depends on the magnitude of the control handle being pushed.

When you release the control handle, it automatically returns to its original position.

Tight stop button

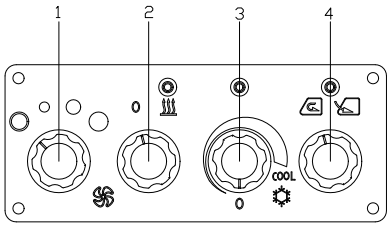
Pressing this button will cut off the connection between the electrical apparatus and the battery.

To start the forklift again, you need to rotate and unplug this button.

LED warning lamp

When the truck is faulty, or the operator performs a dangerous operation, the LED warning lamp is on. If the truck is faulty, check the instrument to confirm which system is faulty, and the truck can be reoperated again after the fault is solved, otherwise the truck may be damaged or personal injury may occur. If it is a dangerous operation, the operator should operate and drive the truck correctly.

Cold and warm air heating radiator control



It is used to control the opening of the chiller in the cab.

1 is the gear switch to adjust the wind speed,

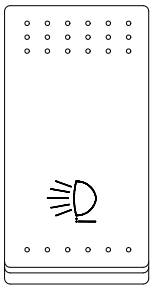
2 is the heating switch to turn on the heater, and when turned on, the corresponding red light is lit.

3 is the refrigeration switch is used to turn on the chiller, the corresponding green indicator is lit when it is turned on.

4 is the inner and outer cycle, which is used to adjust the inner and outer circulation, when the outside cycle is in, the yellow light is lit.

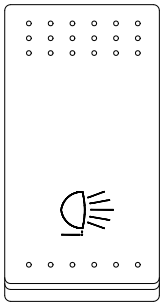
Rocker switch

Front work light rocker switch



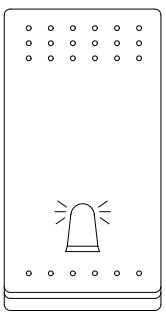
It is used to control the open and close of front work light.

Rear work light rocker switch



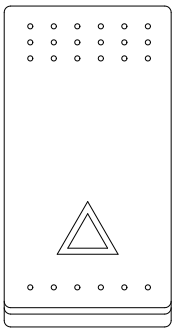
It is used to control the open and close of rear work light.

Alarm light rocker switch

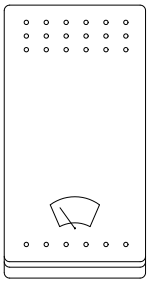


It controls the open&close of the alarm light.

Alarm warp switch

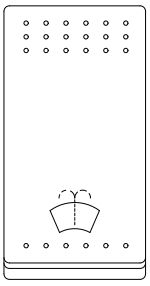


Front wiper rocker switch



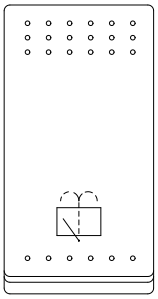
It is used to control the open and close of front wiper.

Front wiper washing rocker switch



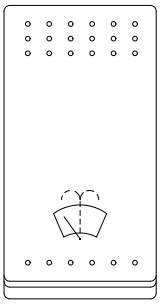
It is used to control the open and close of front wiper washing.

Rear wiper rocker switch



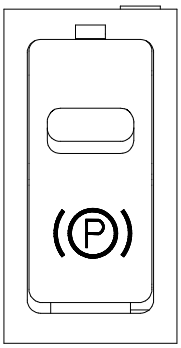
It is used to control the open and close of rear wiper.

Top wiper rocker switch



It is used to control the open and close of top wiper.

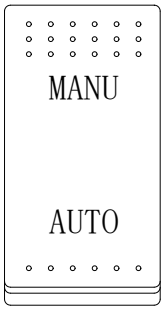
Parking brake rocker switch



Open this switch when parking brake. Close it when cancel the parking brake.

After the engine flameout, close the switch and there is an alarm. Only the driver sit on the chair open this switch the alert can be canceled.

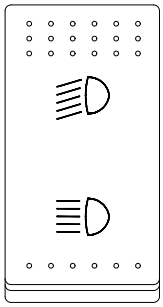
Manual/Automatic rocker switch



When the gear shift switch rotates left to the end (automatic shift), the truck stays in gear

automatic switching status, when the gearshift switch is in position 1, the gearbox will remain in that gear until the operator selects another gear, when the gearshift switch is in position 2, the gearbox will automatically switch between the first gear and the second gear according to the speed of the gearshift switch, and when the gearshift switch is in position 3, the gearbox will automatically switch between the first gear, the second gear and the third gear according to the speed of the gearshift switch.. When the gear shift switch rotates right to the end (manual shift), the truck traveling speed can realize 1, 2, 3 gear shift by adjusting gear shift switch.

Lamp rocker switch



When the rocker switch is pressed in the“”， the high beam opened；

When the rocker switch is pressed in the“”， the dipped headlight opened.

2.2 Bus instrument

Bus instrument by 32-bit high-performance ARM chip, combined with advanced control technology, CAN communication technology.

Easy to install and use; strong anti-interference ability; multi-level password authority protection; vibration resistance, high temperature, humidity, salt fog and other harsh environment, control screen IP65 grade; CPU uses 32-bit high-performance ARM chip, safe and reliable.

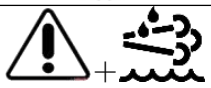
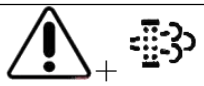
Main technical indicators:

Working environment temperature:-30 ℃ ~ 70 ℃, relative humidity: ≤ 98%, anti-vibration > 4 g.

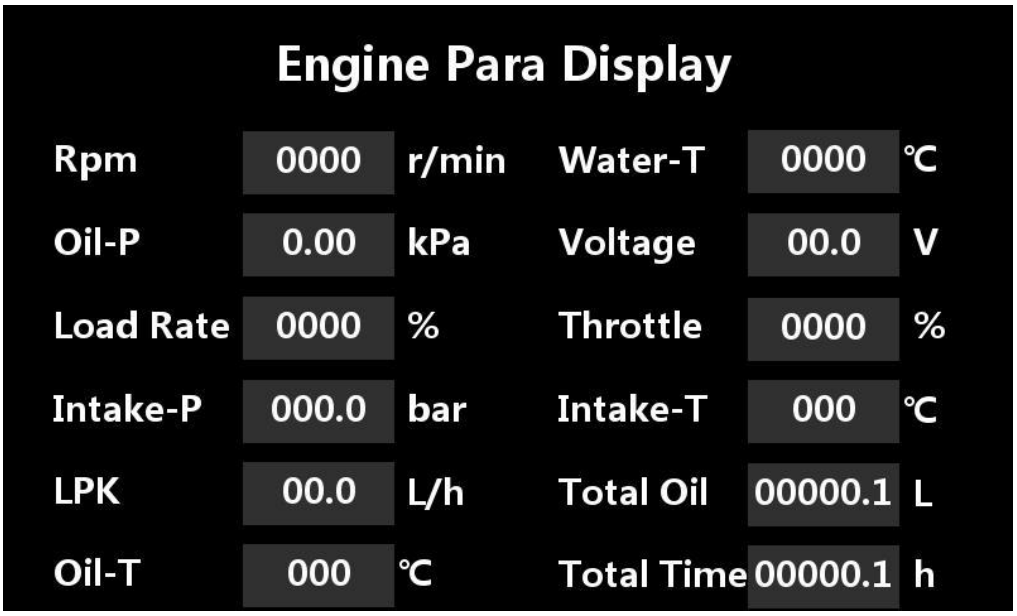
Display mode: 4.3 inch LCD color display, analog tachometer, oil meter and other dynamic graphics.

System Power: DC24V

1.The main interface can display engine running time, alarm icon, gearbox actual and hanging shields, engine speed, fuel quantity, water temperature, oil temperature, fork weight and battery voltage, etc.

Identifying	Colour	Explain
	Red	Safety belt indicator
	Blue	Engine temperature
	Yellow	Fuel level
	Blue	Charging indicator
	Red	Accumulator alarm indicator
	Red	Seat signal indicator
	Red	Gearbox oil temperature alarm indicator
	Red	Parking braking indicator
	Red	Air filter alarm indicator
	Red	Oil-water separator alarm indicator
	Red	Engine oil pressure indicator
	Red	Oil filter alarm indicator
	Yellow	Maintenance tips
	Yellow/Red	Engine fault indicator
	Red	Engine preheating indicator
	Blue	Urea level indicator
	Red	National IV module alarm
	Red	Gearbox fault indicator
	Yellow/Red ＋Yellow	Driver Performance Limit Warning Light＋NCD fault lamp
	Yellow/Red ＋Yellow	Driver Performance Limit Warning Light＋PCD fault lamp
	Yellow/Red	DPF Regeneration Indicator Light

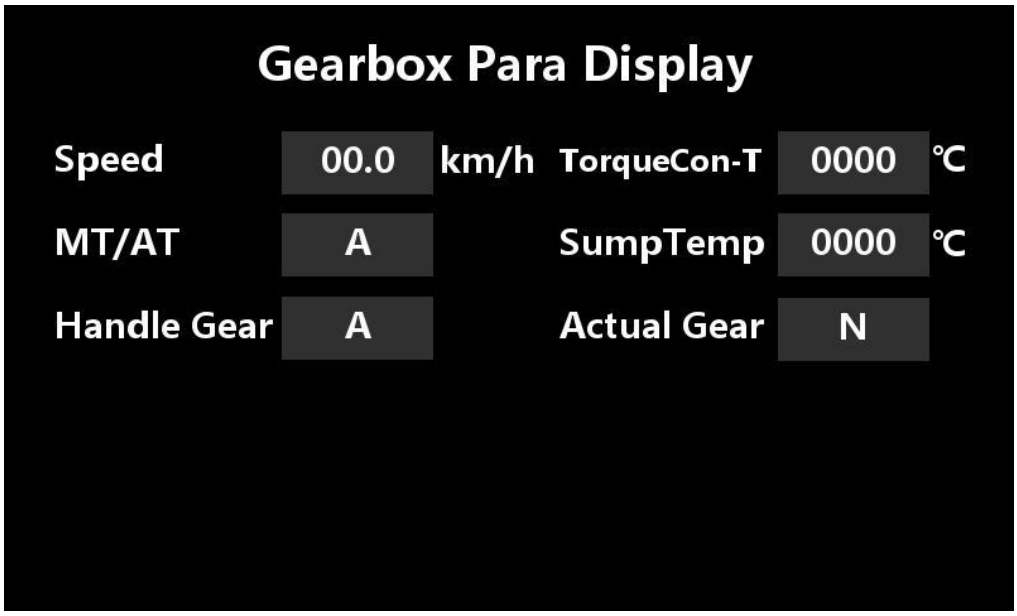
2. Engine parameters display as shown: show the real-time operating parameters of the engine.



The parameters of the real-time operation of the engine can be displayed. If a data is 0 after start-up, ECU does not send the message information for that data.

Parameter name	Numerical range	Unit	Explain
Rotate speed	0~9999	r/min	Engine present rotate speed
Water temperature	-40~150	℃	Cooling liquid temperature
Voltage	0~40.0	V	Battery voltage
Oil pressure	0~1.2	kPa	Machine oil pressure
Intake temperature	-40~150	℃	Intake-tube temperature
Intake pressure	0~1.2	kPa	Intake-tube pressure
Accelerator	0~100	%	Engine accelerator aperture
Load rate	0~100	%	Engine load rate
Machine oil temperature	-40~150	℃	Engine machine oil temperature
Instantaneous fuel consumption	0~999.0	L/h	Engine instantaneous fuel consumption
Total fuel consumption	0~9999999.9	L	Engine total fuel consumption
Total time	0~9999999.9	h	Engine operation total time

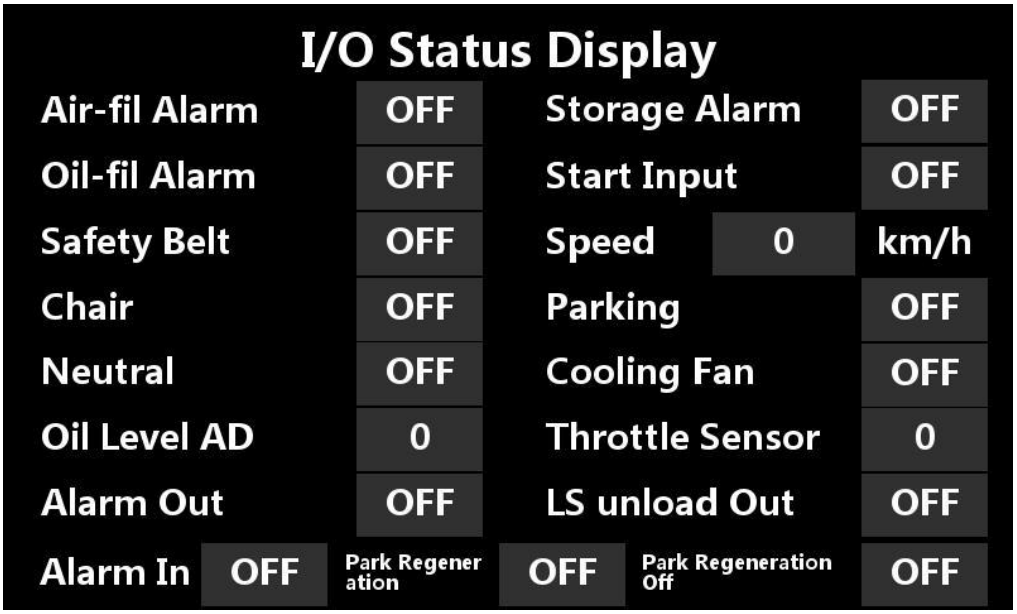
3. Gearbox parameters: show gearbox operating parameters.



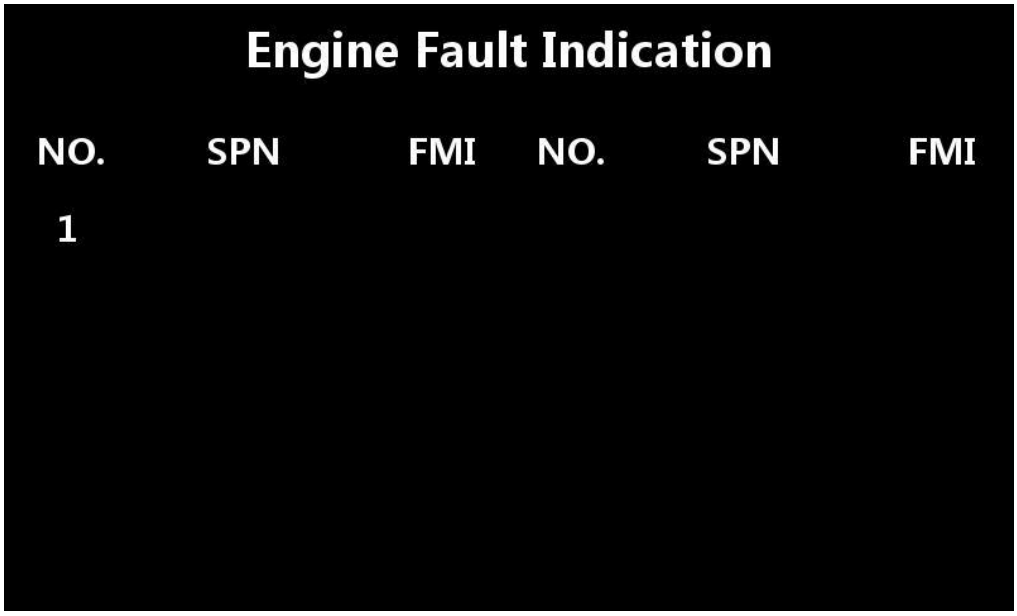
Displays data information for the gearbox. If a data is 0 after startup, TCU does not send the message information for that data.

Parameter name	Numerical range	Unit	Explain
Forklift speed	0~999.9	Km/h	Forklift operating speed
Manual/Automatic	M/A		Manual/Automatic cut
Handle gears	F1/F2/F3/F4/LF R1/R2/R3/R4/LR		Handle gears position
Torque converter temperature	-40~150	℃	Torque converter oil-out temperature
Oil sump oil temperature	-40~150	℃	Oil sump oil temperature
Practical gears	F1/F2/F3/F4/LF R1/R2/R3/R4/LR		Gearbox present practical gears

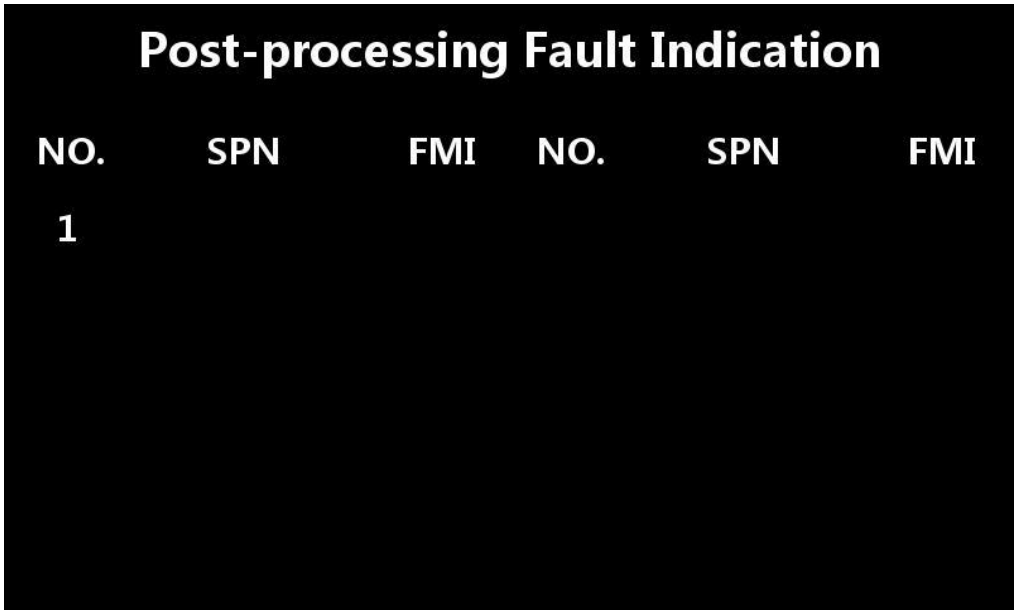
4.I/O status display:displays input and output signals for the I/O board



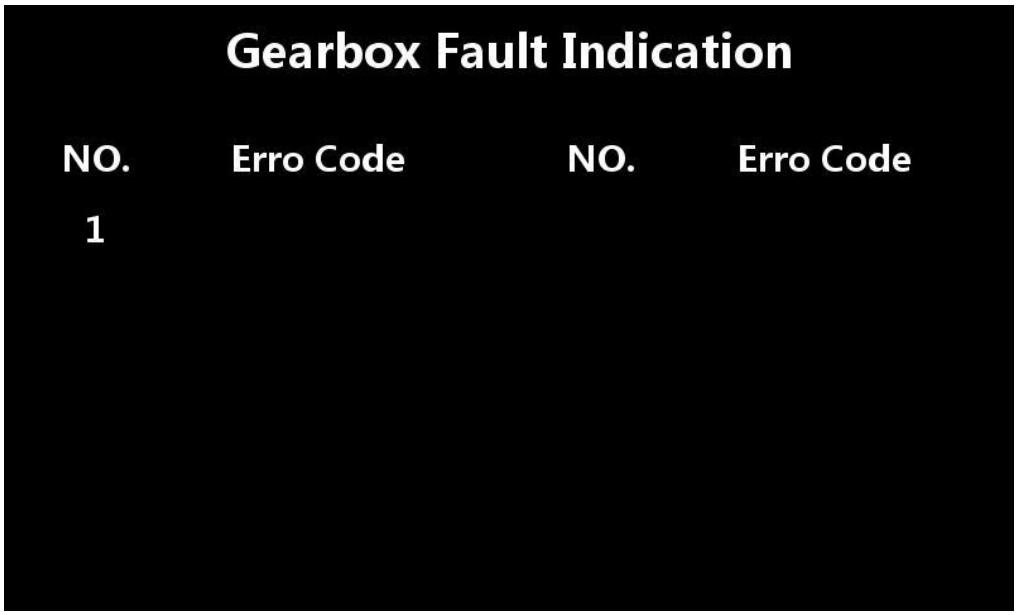
5. Engine fault display:displays real-time engine fault SPN-FMI information. You can press the button to refresh the display. Please refer to engine manufacturer information for trouble code table.



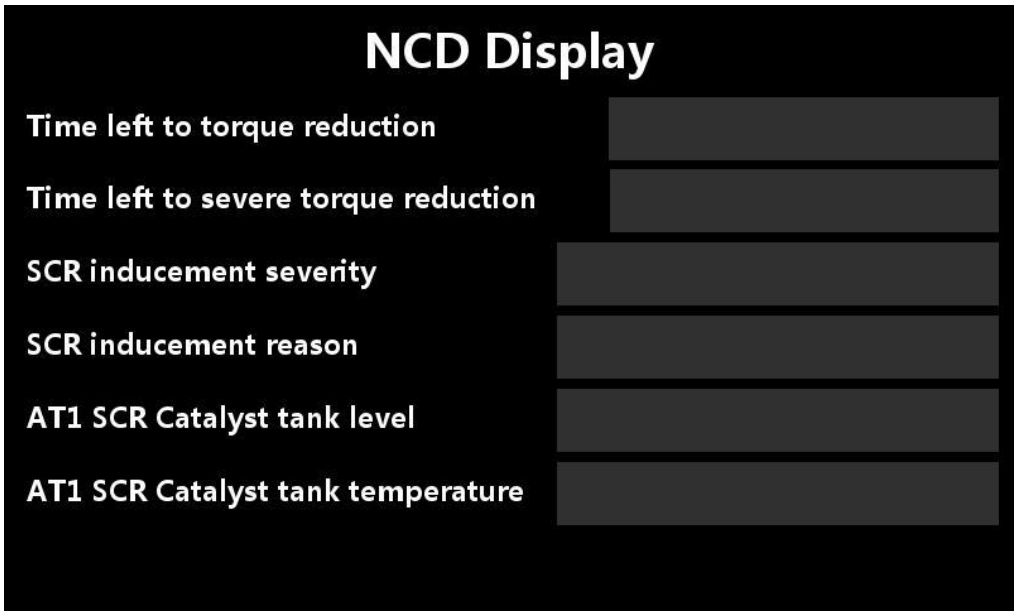
6.Post-treatment fault display:displays real-time post-treatment fault SPN-FMI information. You can press the button to refresh the display. Please refer to engine manufacturer information for trouble code table.



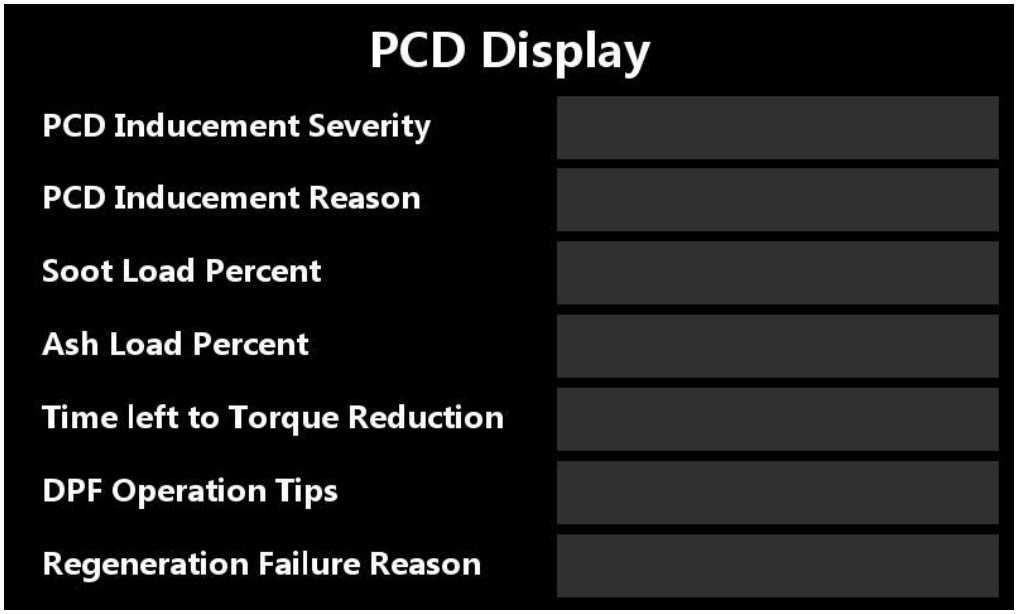
7. Gearbox fault display: display gearbox real-time fault code information. You can press the button to refresh the display. Trouble code list please refer to gearbox manufacturer information.



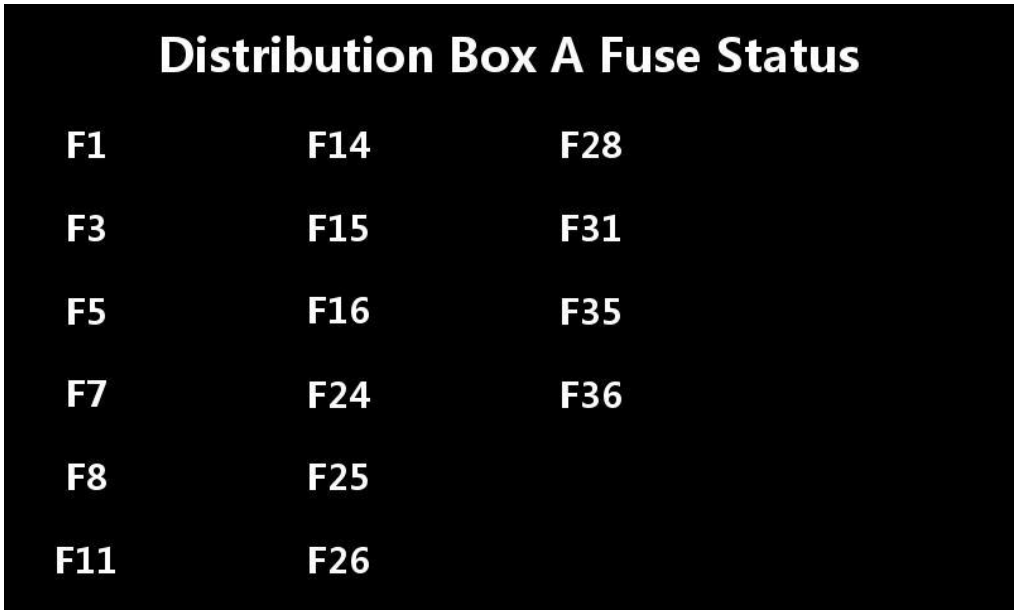
8.NCD parameter display: NCD related parameters



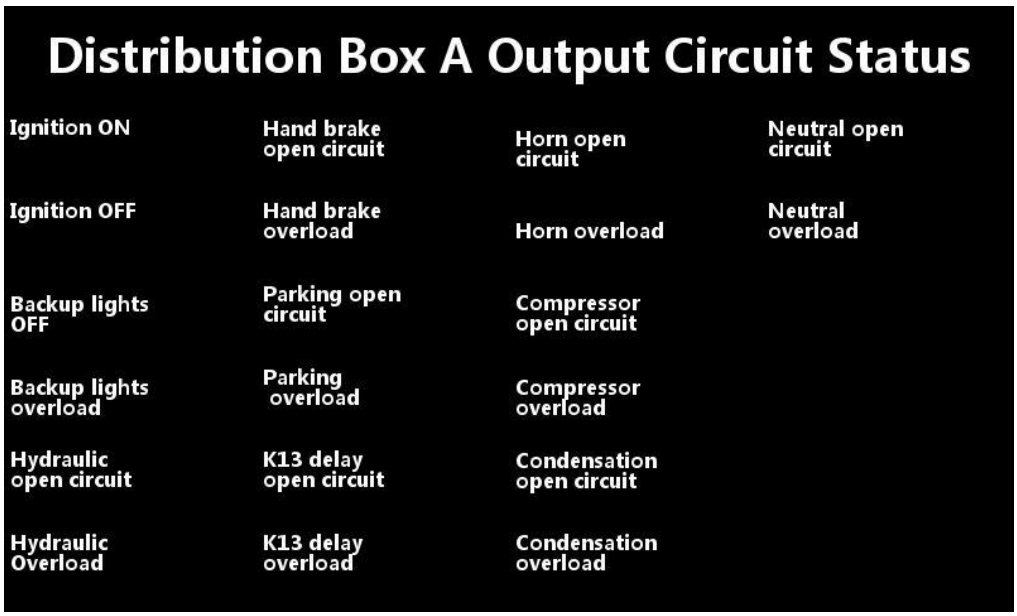
9. PCD parameter display: PCD related parameters



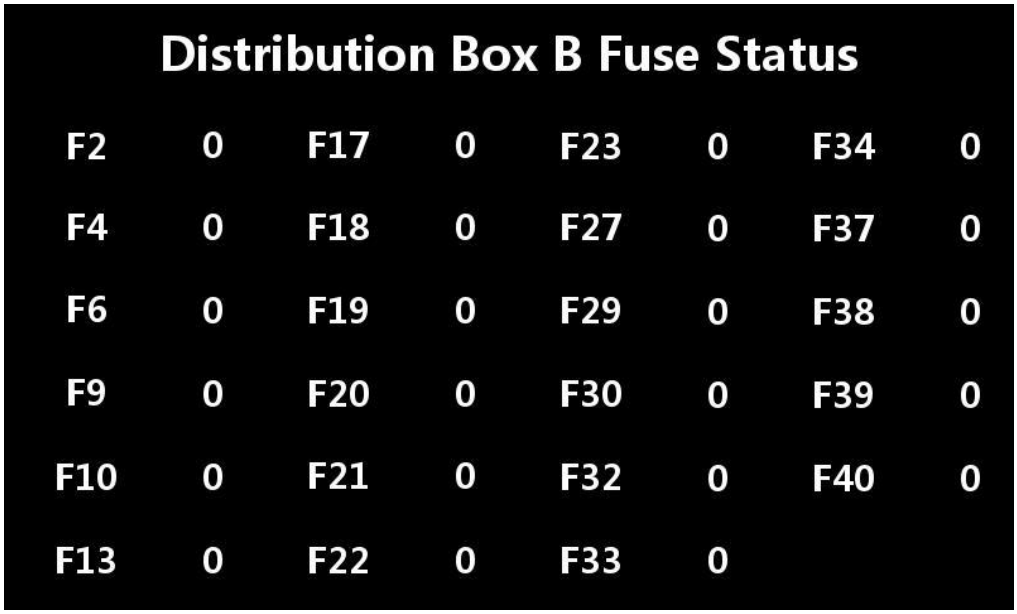
10.Bus distribution box A fuse information display



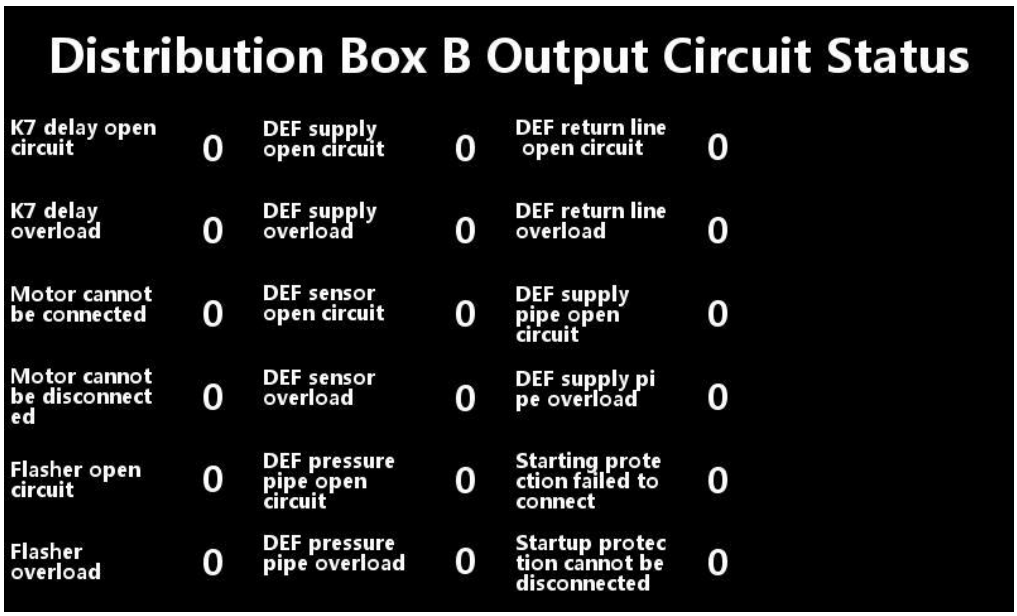
11.Bus distribution box A output circuit information display



12.Bus distribution box B fuse information display

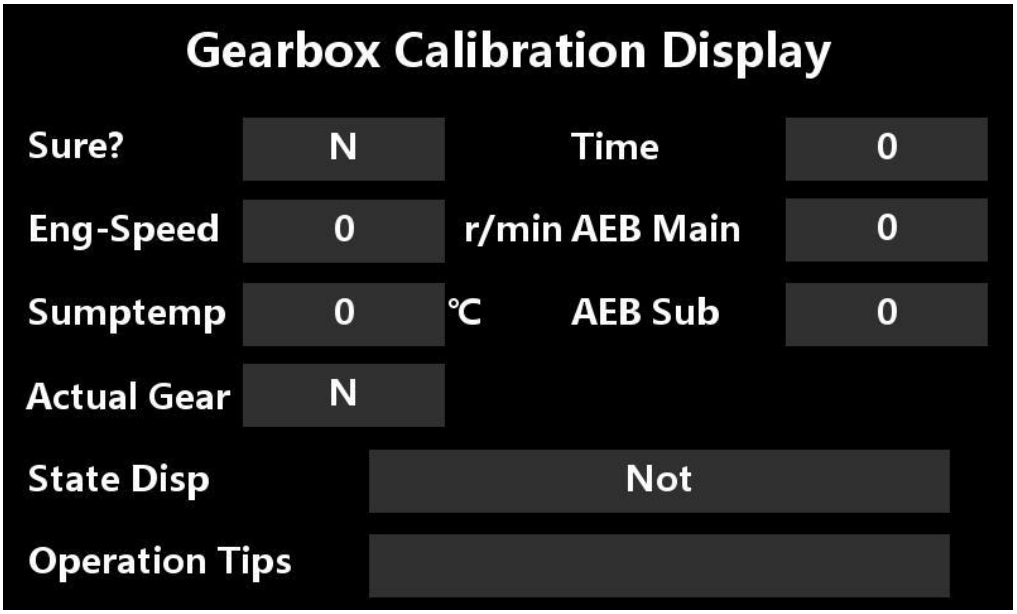


13.Bus distribution box B output circuit information display



14. Gearbox calibration:password input. Loop press numerical digit can be inputted into a shift password,press"↑"and "↓"can change the number of the numerical digit， after typing the password in turn，press can confirm the password input, if the input is correct, automatically jump into the gearbox calibration display interface.

15. Gearbox calibration display:



Function description: In this interface press "↑"change to "Y",press change to =.then calibration time running, system automatic calibration start. Status display calibration result: OK means calibration succeed ,NOT means calibration failure. AEB primary key and AEB subcode detail see gearbox material.Operation instruction：

when the operation instruction E↑，please promote engine rotate speed.

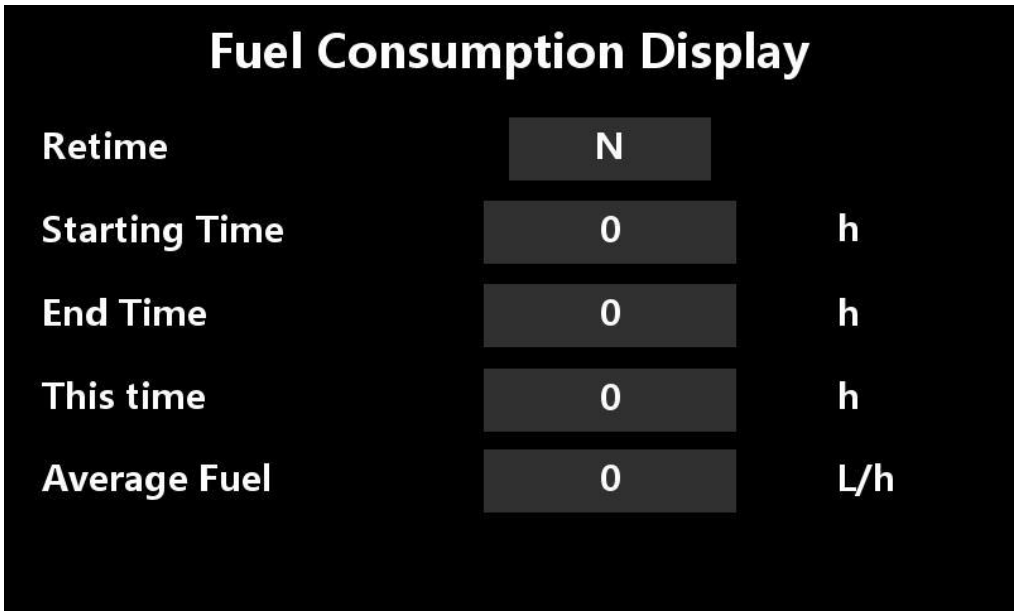
when the operation instruction E↓，please reduce engine rotate speed.

when the operation instruction T↑，please promote torque converter temperature.

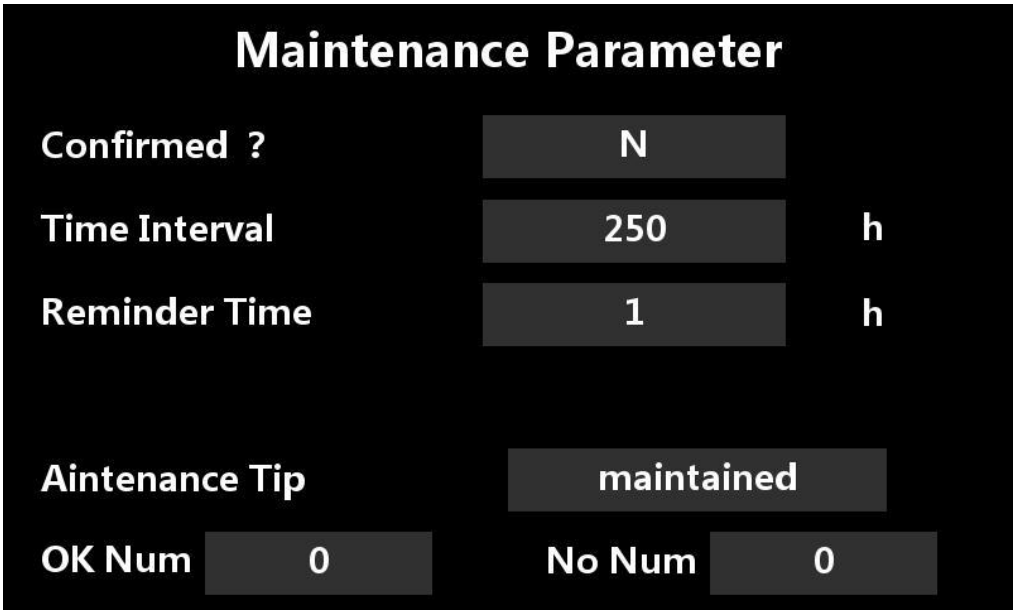
when the operation instruction T↓，please reduce torque converter temperature..

16. Administrator password input：Loop press numerical digit can be inputted into a shift password,press“↑”and “↓”can change the number of the numerical digit，after typing the password in turn， press can confirm the password input, if the input is correct, automatically jump into the working oil wear display interface.

17.working oil wear display：In this interface press “↑”change to “Y”,long press ， automatic calculation of fuel consumption in the system.

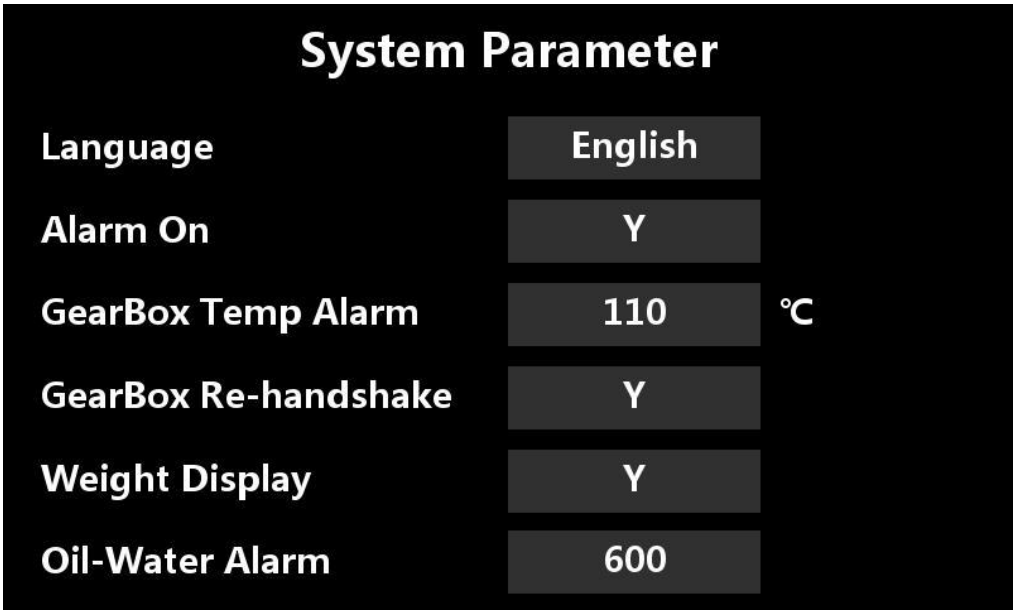


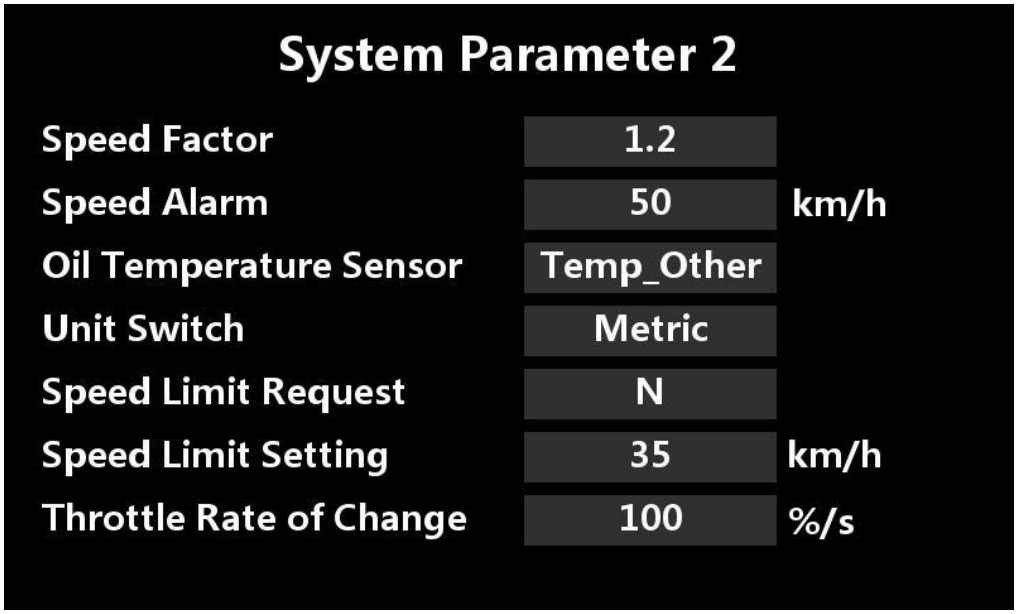
18. maintenance parameter setting：



Function declaration :when main interface appears,means the truck need to maintenance. Confirm on this interface after maintenance, and start timing the next maintenance.

19. System parameter setting：



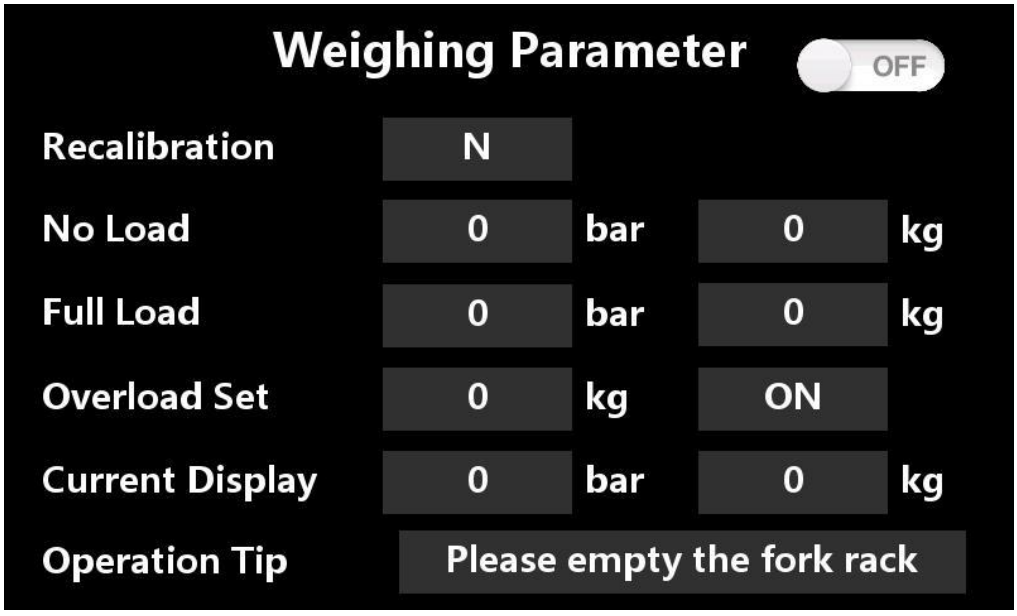


Cycle through the switchable setting options by pressing . Press "↑" and "↓" to modify the selected corresponding data.

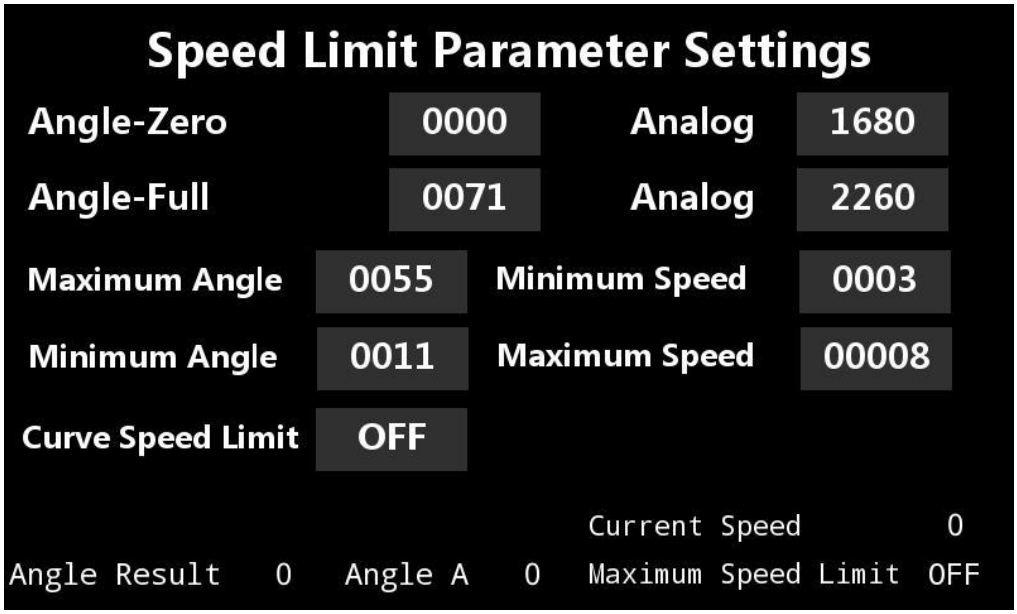
Gearbox afresh handshake： When set to Y, the instrument automatically sends a handshake signal on the next power-up, and when the transmission is complete, the value becomes N.

20.Weighing parameter setting

Long press on this interface to enter the weighing parameter settings, and cycle through the switchable setting options. According to the "Operation Prompts" on the instrument, the weighing system can be set up, and the zero and full position data can be saved, and the weighing can be recalculated.



21.Curve Speed Limit Parameter Setting

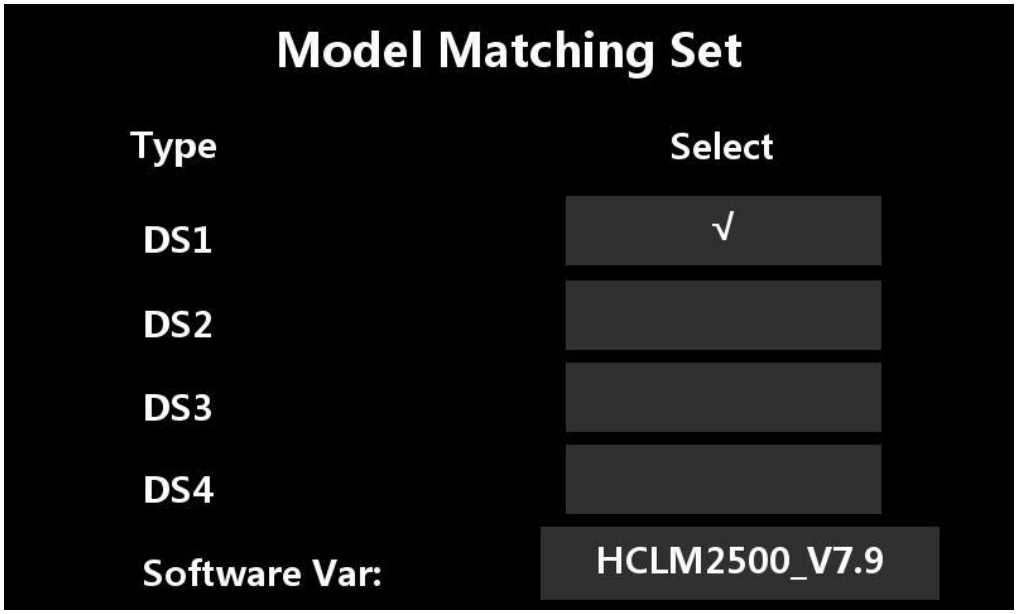


Press to switch the data content to be modified, press "↑" to switch the specific position of the data to be modified at this location (thousands, hundreds, tens, ones cycle switching), press "↓" to increment the data at the parameter position by 1 each time within the range of 0 to 9.

Note: The curve speed limit has only two states, OFF and ON. Pressing "↑" modifies it to the ON state, and pressing "↓" modifies it to the OFF state. After the modification is complete, long press to save the data.

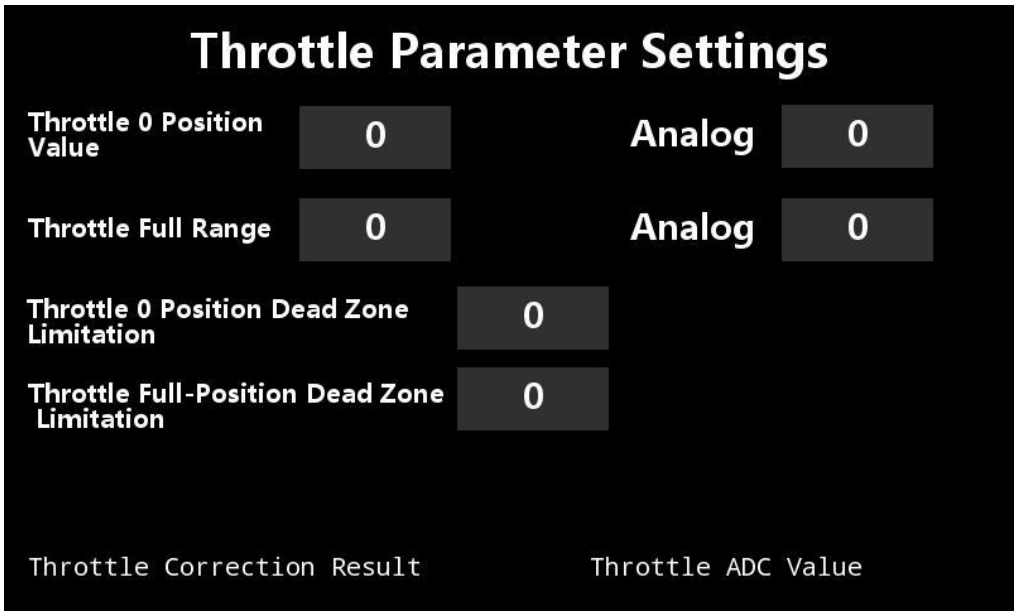
22.Model Matching Setting

On this interface, press "↑" or "↓" to select the model, and then press Confirm.



Note: On the model matching interface, long press the "↑" button. When the interface displays the prompt "K4", long press the "↓" button. When the interface displays the prompt "K3" again, long press the "↑" button to switch to the throttle parameter setting interface.

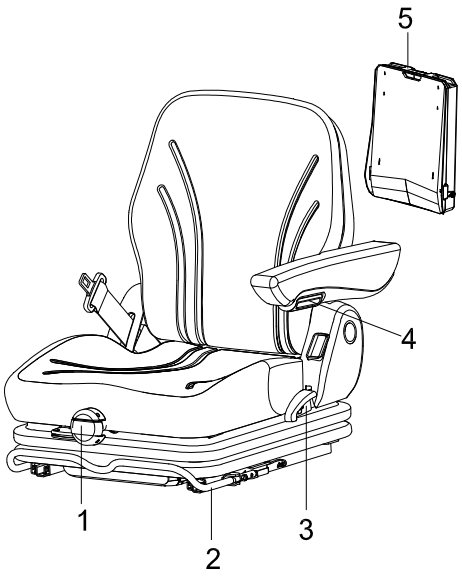
23.Throttle parameter setting



Press to switch the data content to be modified, press "↑" to switch the specific position of the data to be modified at this location (thousands, hundreds, tens, ones cycle switching), press "↓" to increment the data at the parameter position by 1 each time within the range of 0 to 9.

2.3 Others

Seat and seat adjustment lever



1.weight adjustment lever

2.seat front and rear adjustment lever

3.backrest adjustment lever

4.armrest adjustment lever

5.storage box

Technical feature：

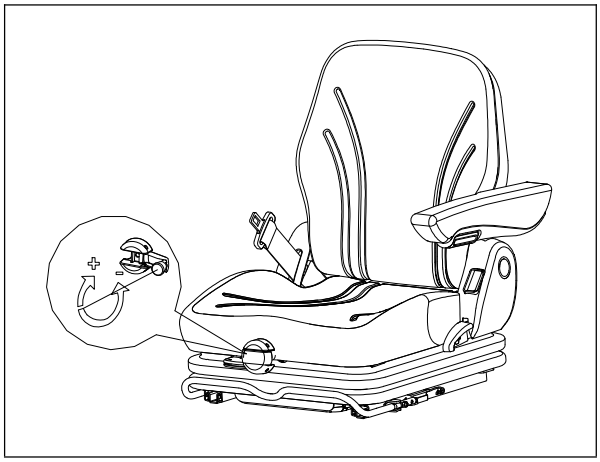
1.The MAX suspension stroke of shock absorption is 70mm；

2. Stepless adjusted between 50kg and 130kg according to the weight of human body；

3.backrest adjusting range is 113°，Design Angle 10° as the baseline,forward 85°, backward 28°；

4.The adjustable range of the front and rear seats is 180mm, 90mm and 90mm, and the adjustable spacing is 15mm。

Weight adjustment lever

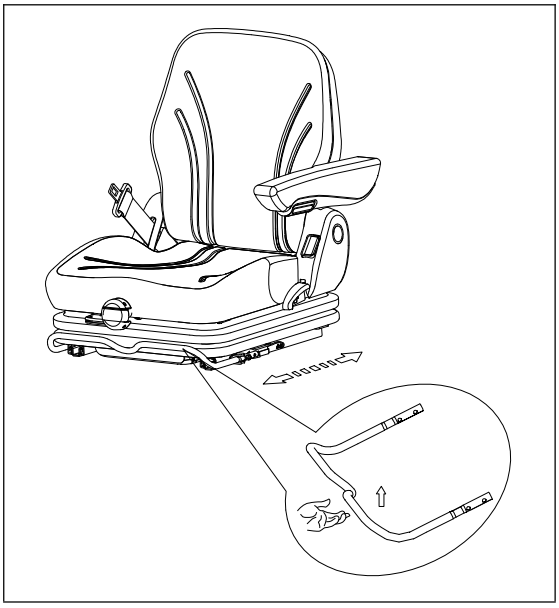


1.Rotating weight adjustment lever；

2.Clockwise (+) rotates the weight adjustment scale increases, and decreases when counterclockwise (-)；

3.when reaching the individual weight scale, release the adjustment handle。

Seat front and rear adjustment lever

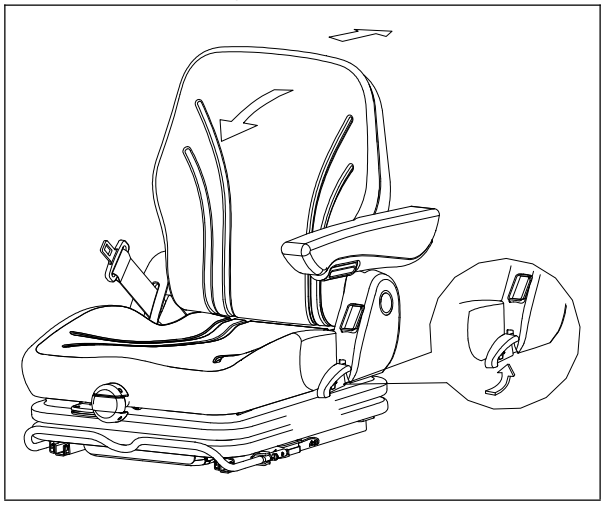


1.pull the seat front and rear adjustment lever；

2.Drag the seat forward or back for front and rear sliding；

3.After adjusting to a personally comfortable position, release the slide adjustment handle.

Backrest adjustment lever

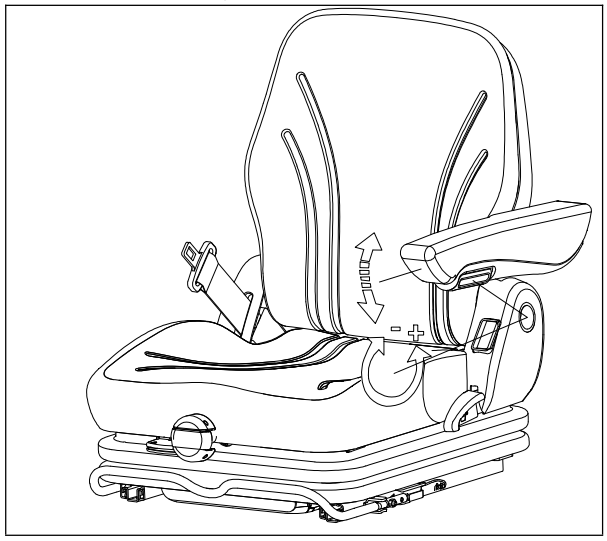


1.Pull the back control handle on the left side of the seat；

2.After pulling the handle, lean forward or back to adjust the back rest angle；

3.After reaching the personal comfort Angle, release the backrest adjustment handle。

Armrest adjustment lever



1.The hand wheel at the bottom of the rotating armrest can adjust the angle of the armrest; during mediation, the hand cannot be pressed on it, and it should be lifted slightly up and then adjusted.

2.When the wheel rotates to the outside (+) and the inside (-) of the wheel.

Warning

The key switch must be switched off before adjusting the seat.

When the forklift must stop, the seat position can be adjusted after pulling up the parking brake switch.

The seat is not allowed to be adjusted during driving to avoid accidents.

For front and rear adjustment and back rest angle adjustment, the handle should be pulled in place to ensure that the structure is completely detached and then adjusted.

After the adjustment, each handle return position shall be in place.Ensure reliable locking at all parts before using the forklift.

Safety belt

Put on the safety belt each time before starting the truck. The belt protects against serious injury.Protect the belt from contamination and clean it regularly.

Correct use the safe belt:

1.Sit correctly on the seat.

2.Check that seat belt is not twisted.

3.Place the seat belt at hip level.

4.Attach the seat belt and check that it locks.

5.Adjust the seat belt to your body shape without squeezing your hip and without over-slack.

Regular verification of seat belt related to:

1.Cut or frayed straps.

2.Worn or damaged hardware, including anchor points.

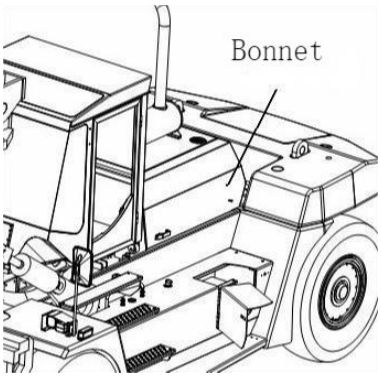
3.Buckle or retractor malfunction.

⚠ WARNING

In no event should the lift truck be used if the seat belt is defective (fixing, locking, cuts, tears, etc.). Repair or replace the seat belt immediately.

Do not alter the belt setting. Always replace the seat belt after an accident.

Engine cover and its key switch



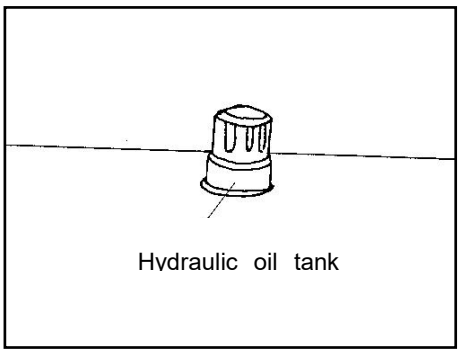
Large opening engine cover is easy for maintenance. With the help of gas spring in the engine cover, you can fully open the cover upwards. Pull downward the engine cover, it is closed. When hearing “Ka”, the cover is locked.

You need key when opening the engine cover. Insert the key in vertical position and swivel 180°in clockwise, press key hole inward and open the cover upward.

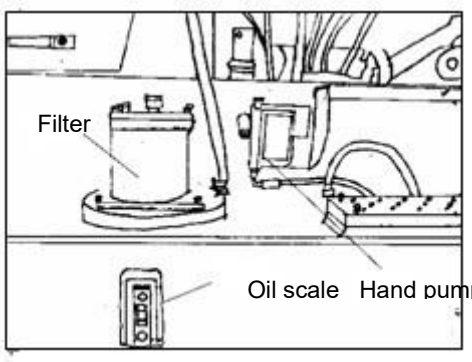
Attention：

When closing the engine cover, prevent the cover clamping your finger and body.

Hydraulic oil tank cap and oil scale



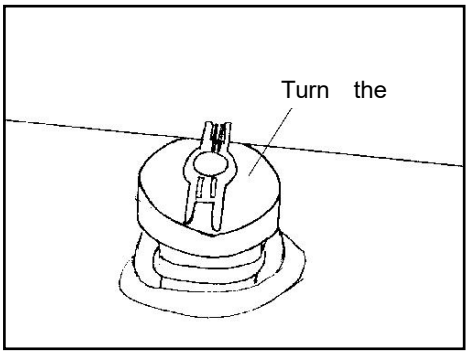
Hydraulic oil tank cap should be in the right of the carriage, and open the cap when adding oil. Out of the hydraulic oil tank sets oil mass gauge, and the hydraulic oil should be between up and down scale. When the oil level is below the scale, you should add hydraulic oil.



The added hydraulic oil should filter through 10μfilter screen, make sure its cleanness and screw the cover after adding oil.

Fuel tank cap

Fuel tank cap is on the left of the chassis. There are air vent in the fuel tank cap, check for its smooth when adding oil.



When adding fuel, the truck must stop and the engine turn off, press the parking brake rocker switch, and make sure there is no fire and the driver is out of the car.

·After adding fuel, make sure screw the cover, otherwise the fuel may leak and cause fires.

·Wipe the exceeded fuel, then you can start the engine.

·It is forbidden to use fire when checking oil level.

·If the fuel splashes into eye, wash it with water for 15-20 minutes, and go to hospital if necessary.

Radiator antifreeze fluid adding hole

Radiator antifreeze fluid adding hole lies under the cover of antifreeze fluid adding hole. When adding antifreeze fluid, only when screwing off the screw above the cover can you open the cover, then unscrew antifreeze fluid cover to add antifreeze fluid.

Attention:

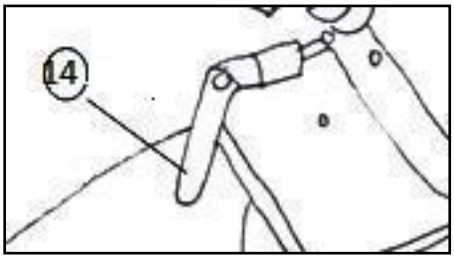
·When the temperature of engine antifreeze fluid is above 70^0C, please do not open the cover. Press the cover and turn left slightly can reduce the pressure of the antifreeze fluid box.

·Do not wear glove to open the box.

Warning

After moving a certain time, the outer of the muffer stays in high-temperature status. When adding antifreeze fluid at this time, do not touch the muffer by hand and the body to avoid burn.

Adjusting rod of steering wheel tilting angle



In order for operator's need, the steering column tilting angle is adjustable.

Pull downward the adjusting handle on the left of the steering column, the steering column will be released; pull the handle upwards, the steering column is locked.

Caution

a.Adjust the steering wheel when the truck is still. Do not attempt to adjust steering wheel when the truck is moving.

b.After adjusting, push the steering wheel upwards and downwards to make sure it is safely locked.

Front headlamp and steering signal light

Two front headlamp and steering signal light are installed at both side of the front chassis. Pay attention to protect the lamp, wipe the dust if there is any, replace when damage occurs.

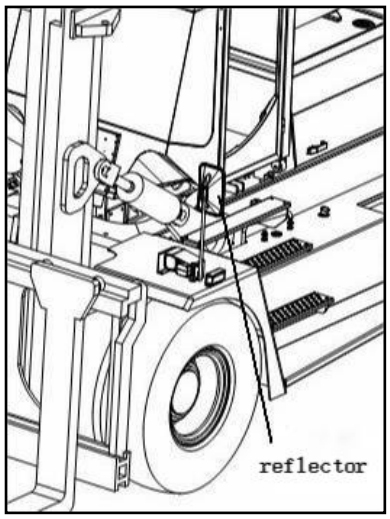
Rear combination lamp

Rear combination lamp includes steering signal light, taillight brake lamp, back-up light, wipe the dust if there is any, replace when damage occurs.

Brake light

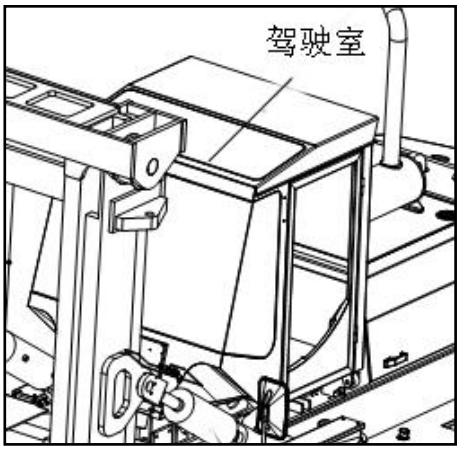
Install back-up light in the middle of the counterbalance weight. When the truck is braking, the light is on.

Reflector



Both sides of the front cab install reflectors, which are used for inspecting vehicle rear condition and back-up.

Cab

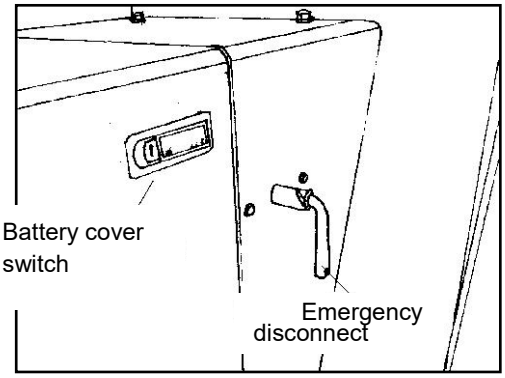


The truck is equipped with suspension cab, can tip-over manually, and is easy for daily maintenance. Before the driver, the glass is large, no frame connected on the corner, and the view is wide. Standard option for the cab is air conditioner and heater. It equips with doors both sides and locks. Make sure the door is closed before driving. Lock the door when leaving the truck. The left and right window glass are adjustable, when the air quality in the truck is not good, please open the window glass to keep the good air condition.

Air conditioner

The truck is equipped with air conditioner, when the temperature is not proper, open it.

Emergency disconnect switch



The emergency disconnects switch lies on the side wall of left cab. The fig shows the power is connected, rotate 90°of the emergency disconnect switch in counterclockwise then the power is off. When the power is on again, you need rotate 90°in clockwise to the fig position. When the emergency disconnect switch handle is free, place in the battery cover to avoid missing.

Battery cover and key switch

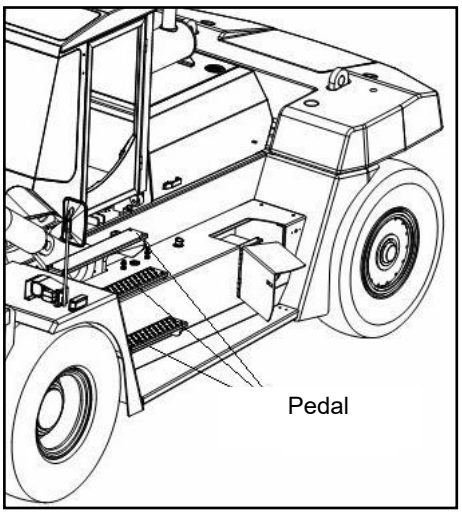
In order to observer the battery condition easily, it is equipped with battery cover switch. Battery cover and key switch lies on the side wall of left cab, and the key is needed when opening the battery cover. When the key hole keeps in level, it is closed, open when in vertical. When opening the battery cover, insert the key in level to the key hole and swivel 90°in clockwise, then press the key hole with thumb, pull outwards and you can open the battery cover.

Battery

The truck equips with 2 maintenance free lead-acid battery. When you see the ball is in green through the electrical eye, the battery capacity is normal and electrolyte density reaches standard; if it is in black, the battery capacity is insufficient, electrolyte density drops; if in white, the battery capacity is severe insufficient, you should check carefully whether the shell fracture, leak or battery fault.

Usage and maintenance refer to Maintenance Free Lead-acid Battery Use and Maintenance Way.

Pedal and armrest



Both sides of the truck equips with pedal, both in 4 layers, on the left of the cab, right of 2nd and 3rd pedal install armrest. When stepping on and off the truck, please use armrest for safe.

Muffer

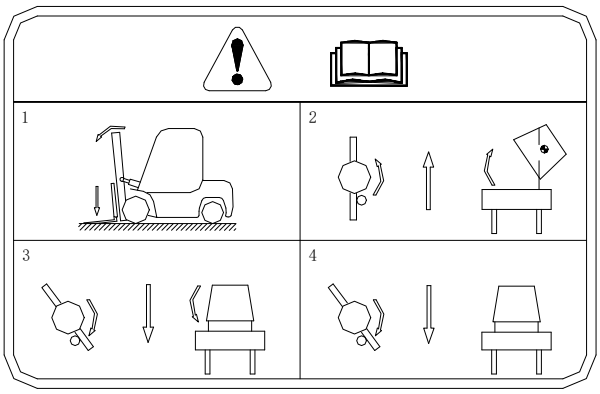
In order to reduce displacement and noise pollution, it is fitted with muffer. Muffer smoke exhaust faces upwards.

Warning

After traveling for a certain period, the outer of the muffer keeps in high temperature status. At this time, each part of the body should never touch the muffer or it will cause damage.

Operating instructions for cab tipping

1.Standard



1.Park the truck on flat ground, set the shift lever at neutral position, land the forks, tilt the mast fully, pull up the parking brake lever, power off the engine and cut off the electrical supply(1);

2.The articles unfixed must be taken out before tipping the cab,make sure that keep no one in the cab,and no one is on the near left when tipping;

3.Open the locking device at the bottom of buffer seat on the right of the cab. Turn the reversing handle of the hand pump to the position"\↑"（2）;

4.Sway the lever to overturn the cab. Slow down the speed of swaying the lever when the cab's gravity approaches overturning safety lines. Stop swaying the lever when the gravity passed the safety lines, the cab will freely turn to its position;

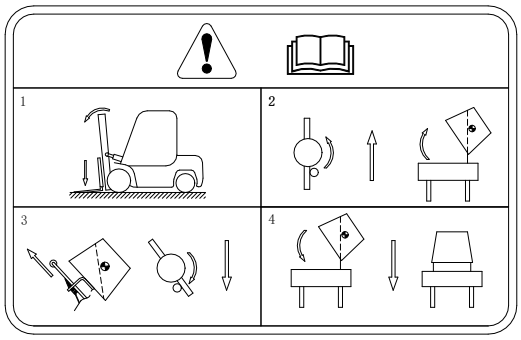
5.Before the cab's gravity crossed the safety line, it is forbidden to maintain and operate into the cab and confirm the manual pump shift handle turning to the"\↑"position（2）;

6.Make sure there's no one in the cab before repositioning the cab.Turn the reversing handle of the hand pump to the position"↓"（3）;

7.Swaying the lever to make the cabin turn over and come down. When the cab approaches to it original position it will descend smoothly by its weight until to absolute position.

8.Before running the truck make sure the lock device is locked and reversing handle is on the position of "\↓"（4）.

2.Add cab protection device



1.Park the truck on flat ground, set the shift lever at neutral position, land the forks, tilt the mast fully, pull up the parking brake lever, power off the engine and cut off the electrical supply(1);

2.The articles unfixed must be taken out before tipping the cab,make sure that keep no one in the cab,and no one is on the near left when tipping;

3.Open the locking device at the bottom of buffer seat on the right of the cab. Turn the reversing handle of the hand pump to the position"\↑"（2）;

4.Sway the lever to overturn the cab. Slow down the speed of swaying the lever when the cab's gravity approaches overturning safety lines. Stop swaying the lever when the gravity passed the safety lines, the cab will freely turn to its position;

5.Before the cab's gravity crossed the safety line, it is forbidden to maintain and operate into the cab and confirm the manual pump shift handle turning to the"\↑"position （2）;

6.Make sure there's no one in the cab before repositioning the cab.Turn the reversing handle of the hand pump to the position"↓"， at the same time, the operator should pull the guard handle under the cab bracket outward to the card site lock（3）;

⚠ **caution：**

If this device is not pulled, the cab will no longer drop when it to about 40 degrees, and the action of the roll pump will be blocked accordingly. If the cab wants to continue to drop after the descent limit lock, it is necessary to reverse the cab over some, and then put the protective device handle to the card site and the cab can normally descend to the end.

7.Swaying the lever to make the cabin turn over and come down. When the cab approaches to it original position it will descend smoothly by its weight until to absolute position.

8.Before running the truck make sure the lock device is locked and reversing handle is on the position of "\↓"（4）.

III. Safety rules

Compared to small tonnage forklift, this one is larger and much heavier, with high operation position, higher requirement of loading and unloading，working environment and must operate very carefully. For the security of life&wealth, you must put safety on the first position and not have fluke mind.

1. only trained and authorized operator shall be permitted to operate the forklift. Despite get the authorization, if you haven't operation experience of 16 ton or more heavy forklift, you shall still learn the operation and then operate when become proficient.

2. Check the oil, water leakage, deformation, flexibility in certain time. If neglected, the longevity of forklift will be shorter and in serious condition there will be accident.

Make sure to change the "key safety component"during the schedule maintenance.

Wipe of the oil, grease or water on the soleplate and control stick.

Turn off the engine when checking the engine and its component, especially the fan and strap.

Be careful to scald when checking the water tank, muffle and oil level.

3. Whenever you find the forklift abnormal, stop and tell to the managing person at once.

Be catious of safety and prevent clipping or sliding when during the high position maintenance (like mast, front&rear light).

You shall drive to a safe place then check and solve the fault when the emergency light is on or other fault comes out.

If there are leakages of oil, water,air and fault when lifting mast and driving in the street, you shall organize people rush to repair.

Prevent to be hurt by the edges that may touched by people when during the maintenance.

Put on the defect sign on the defected forklift.

4. Do not use fire to check the fuel level, electrolyte, cooling water and leakage.

Do not smoke when checking the battery and adding fuel or checking fuel system.

Fire extinguisher shall be equipped at the work site.

Do not add fuel when the engine is running.

5. Before operation, preheating the water temperature to 50℃.

Do not open the water tank when the temperature is over 70℃.

6. Waste gas is harmful to person, make sure there is enough ventilation when operating in a closed space, adding a ventilation fan if nessary.

The forklift is forbidden to use in the flammable and explosive environment.

7. Do not get on or off the running forklift. Please use the safety pedal and armrest.

This is the big tonnage forklift with high

body, so be careful when get on and off the forklift, preventing to slide or drop from it.

8. You can only operate the truck after steady seating.

Before starting, adjust the seat to proper control.

9. Before starting, make sure that:

①Nobody is around

②The fordward-reverse lever is in neutral.

10. Open the parking brake switch when parking on the ground. It's forbidden to park on the ramp. If parking on the ramp as the fault, be sure to fix a wedge on the wheel.

Slow the fork to the ground and tilt a little forewardly, then turn off the engine and take the key.

11. Keep mooth and accurate operation. Be avoid to sudden stop, start or turning.

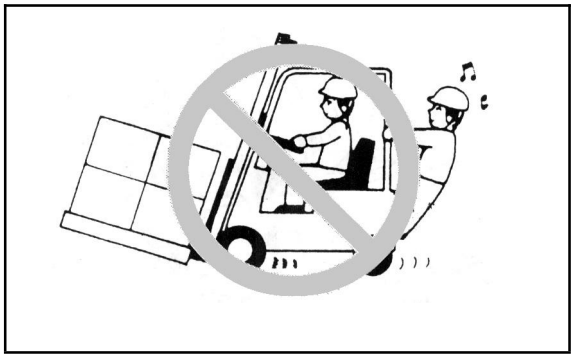
12. Control the speed and obey the traffic lights.

⚠Please obey the traffic rules when driving in the street.

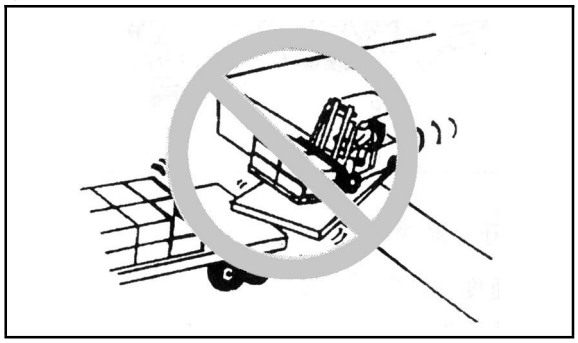
13. Notice the driving direction and keep good vision.

Warn
Be caution of the traveling direction when backing-up

14. It's forbidden to sit on fork or truck for other person.



15. Be sure the correct fixing and there is enough strength to bear the weight when driving over a dock-board or bridge-plate. Prechecking the ground condition and consider the overal weight of truck and goods.

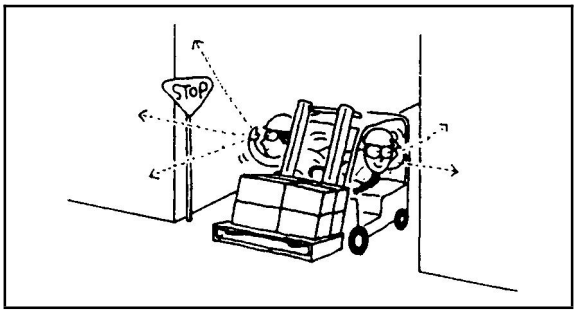


16. Be focus on working.

17. Never hold your head, arm, leg out of the cabin.

18. Please drive in reverse or be guided when lifting large goods that obstract your vision.

19. Please slow down the speed and press loudspeaker when pass the crossroad, keeping the speed at the 1/3 of the maximum.



20. Keep fluid cans, wood, paper and chemicals away from the running truck. The exhaust gas from muffler may cause fire or exploding.

21. Please use head light and side light and control the speed at night.

22. The work ground of forklift shall be the cement one, bituminous macadam or concrete one.

For truck operation, the following climatic conditions apply:

average ambient temperature for continuous duty: + 25℃;

maximum ambient temperature, short term (up to 1 h): + 40℃;

lowest ambient temperature for trucks intended for use in normal indoor conditions: + 5℃;

lowest ambient temperature for trucks intended for use in normal outdoor conditions: -20℃;

altitude: up to 2 000 m.

Check the ground, hole, slope, obstacle, rough spots and any condition cause you to lose control and jounce.

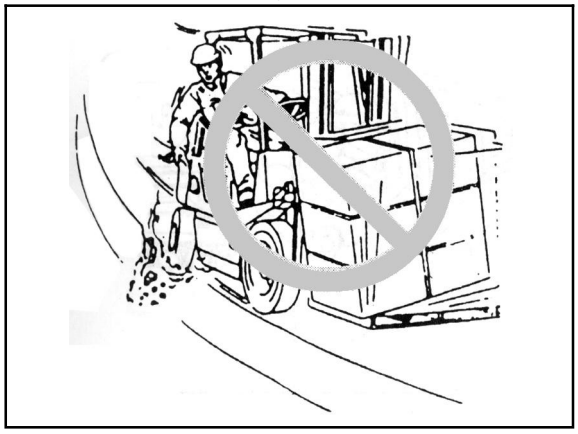
·Clear the rubbish and patch and anything can puncture tyre or let the load lose balance.

·Slow down the speed on wet and slide roads. Do not drive on the side of road, and if inevitable be more careful.

·There will be vibration and noise when the ground is not flat and over pressure of tyre.

·Do not use truck under the weather of sand, snow, thunder, storm, gale, etc.

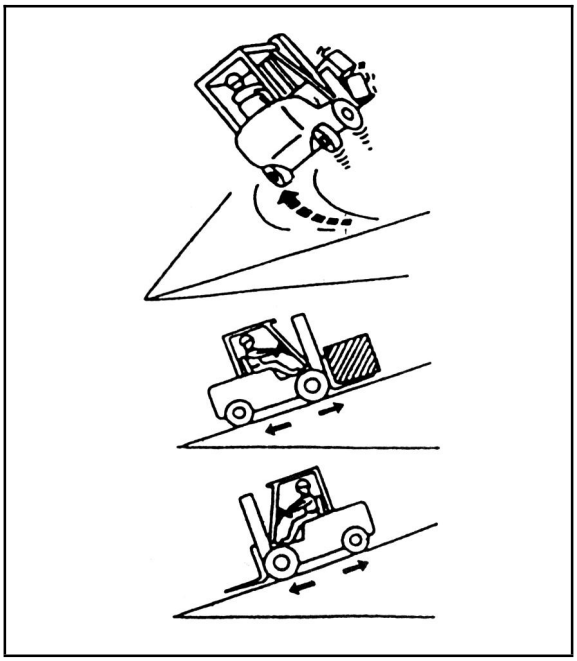
Do not load goods when wind speed is quick, or the truck may be overturned.



23. Reverse when downgrade and

forward when upgrade. Condition of unloading is the opposite of loading.

Do not turn on the ramp in order to avoid overturn.



24. Please use engine brake and brake pedal continuely when downgrade.

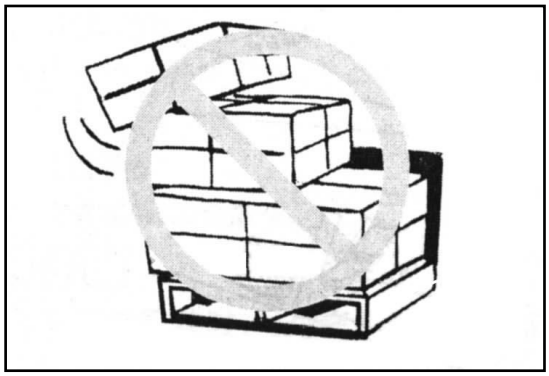
25. No matter noload or load, it's dangous to drive with the fork lifting, please keep standard condition.

You shall adjust the fork position according to the goods. In any cases, you shall keep the two forks symmetrical.

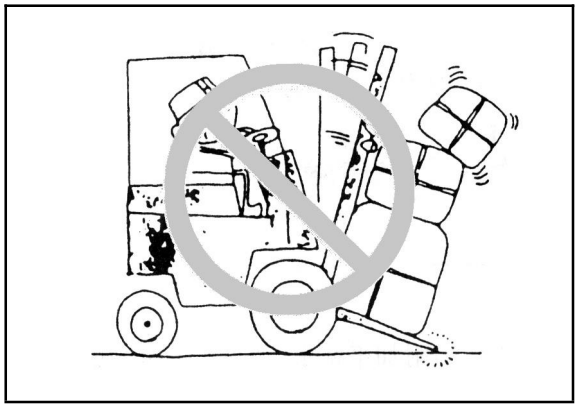
Never operate the fork positioner's hand shank or adjust the L/R position of goods, otherwise, otherwise the fork positioned will be damaged and the truck will lose balance.

The forklift with attachment shall be as the loaded one.

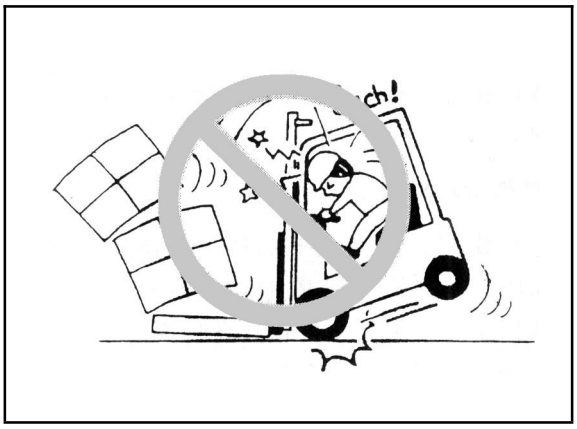
26. ⚠ It's forbidden to deviate from the fork center. It's easy to fall when the goods deviates from the fork center, turning, or passing by unsmooth road.



27. Try to tip back the mast and slow down the height of goods when loading.



28. Avoid hard brake or quick downgrade. Enmergency brake is dangerous.



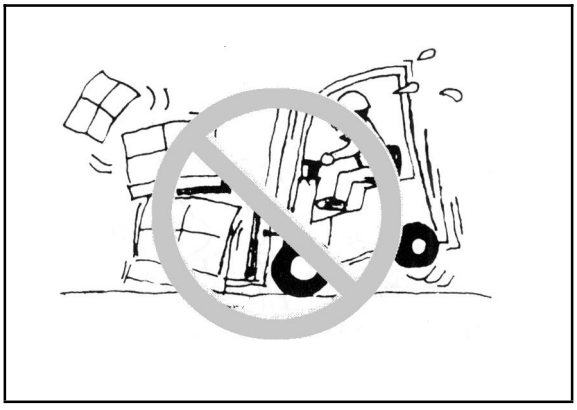
29. You can reverse drive only after the truck has stopped compeletely, vice verse.

30. Choose proper attachment and tools according to the shape and material of goods.

Never use rope to hang on the fork or attachment to lift goods, as the rope may slide off, if necessary, letting a qualified hanging worker to operate with hook or crane.

⚠ Do not make the fork touch the ground lest damaging prong and ground.

31. Make a clear understanding of load diagram of truck and attachment. It's forbidden to overlaod.



It's forbidden to add counterweight factitiously.

32. HANGCHA provide various attachments to clients, such as rotating clamp, flat clamp, sideshifter fork, cargo boom, etc. These are all special use and not allowed to change freely, and if needed must under the permission of factory.

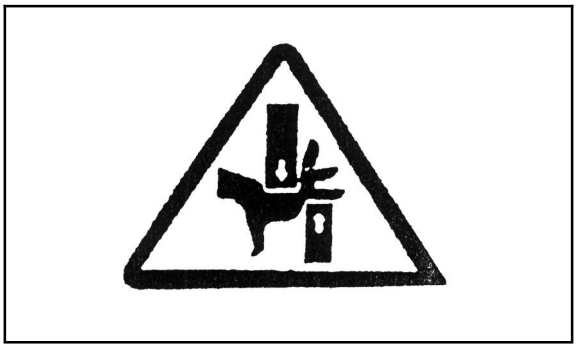
33. You shall prevent the safeguard from hitting by goods at high position. Keeping stable of the backrest' load. It's forbidden to use the truck that hasn't safeguard or backrest or cabin.

34. It's forbidden to stand or walk under the fork or attachment. It's forbidden to stand on the fork.

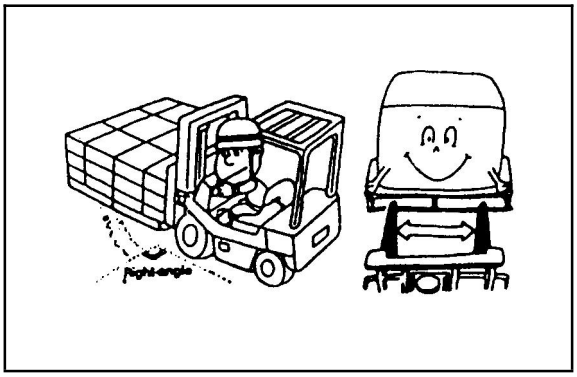
35. It's forbidden to put the head or body into the space between the mast and safeguard, once clipped, is dangous to your life.

It's forbidden to put the hands into the

space between the inside and outside mast.

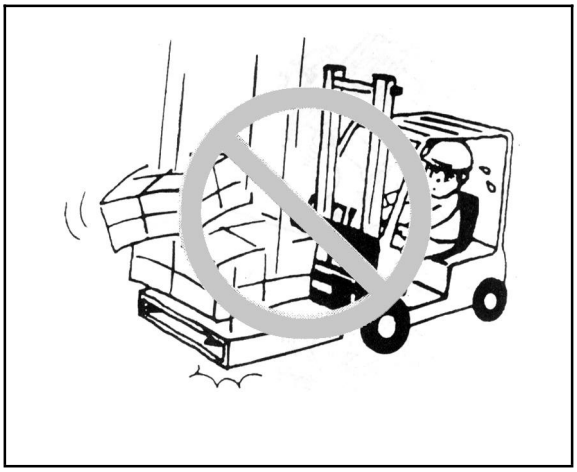


36. When fenching the goods from the stacking, please enter the zone in front, then insert the fork to pallet carefully.



37.It's forbidden to drive with high speed. You shall confirm the goods stable before lifting the fork.

You shall stop for a while before lifting the goods.

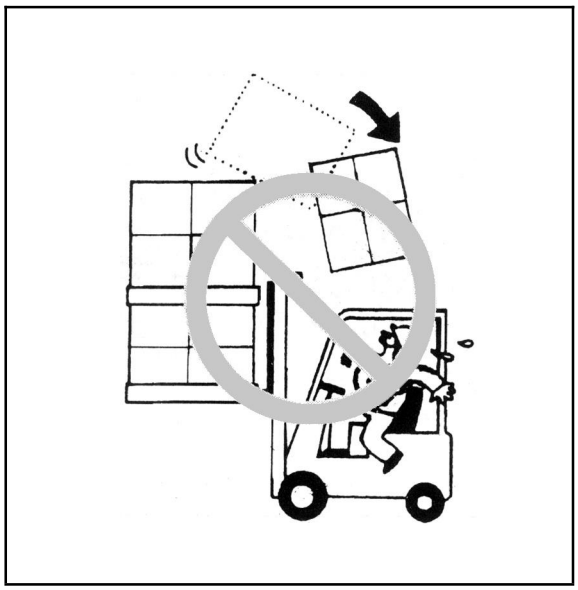


38. You shall confirm the goode are fixed and laid on two forks not on one fork. It's forbidden to use two or more forklifts to lift the same goods.

If there are attachments, confirm the goods are fixed and tightened, and then pull the multi-valve lever in place.

39. It's forbidden to lift goods on tilting roads. Do not load on downgrade.

40. Height of goods shall not exceed the one of backrest, if unavoidable; you shall fix the goods tightly. When the large goods obstract the vision, please reverse drive or be guided.



41. Try to reduce the front tilting angle when stacking goods, you can only tilt foreward when the goods are higher than the stacking floor or at a low position.

When stacking in high position, making mast vertical at the ground clearance of 15~20cm， then lift. Do not have the mast

tilted when lifting.

When fentching goods from a high position, insert fork into pallet, lift slowly and reverse then godown, make mast tilted backward. Do not tilt the mast when the goods are at high position.

42. Forklift with abnormal steering system and brake system can not tow.

Driving the tow truck shall obey the traffic rules.

43.You shall wear uniform and other personal security guards, such as ear cap, safety helmet, protective glasses, anti-dust mask, safety shoes, and antistatic clothes.

44.You shall stop the truck and step the brake 5～10 times in order to release the energy before repairing brake system and hydraulic system.

45.Use safety belt correctly, don't twist it and it's better to tie the belt at the hip not waist.

If there is overturn accident, firstly stop the truck and then open your feet, grasp the steering wheel to fix you in the cabin or safeguard, being convenient to take off the safety belt.

46.There are warning sign and operation menthod on the reuck. Please follow the rules when operating.

Checking and changing damaged &lost signs, labels and tags.

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

48. The static test coefficient used for the lifting accessory is 1.33.

Attention: the pictures in the Safety Rules are to be described as the safe operation of truck and may a little different from the actuality.

IV. Maintenance

More detailed maintenance information please see “scheduled maintenance and lubrication periodic chart”.

4.1 （Ⅰ）Daily maintenance(8 hours)

Daily maintenance also includes inspecting before starting the truck.

1. Leakage inspection: Hydraulic oil, cooling liquid and transmission oil.

Warning

Do not start the truck when there is fuel leakage until solving the problem.

Inspecting if there is leakage of engine, hydraulic pipe connector, water tank and driving system by touching and vision. Never use open fire.

2. Appearance inspection

Inspect if the lights and instruments work normally.

Inspect if the bolts of tyre loosen

Inspect if the tyre is damaged and if the pressure is normal.

3. Fuel quantity inspection

You shall install the fuel gaugue on the instrument panel and inspect the fuel level before work everyday. Add fuel fully everyday after work. The fuel filler is on the left of the cabin.

4. Fuel quantity inspection

Attention:

·Inspect the fuel quantity of the truck which should be located at smooth ground.

·You can inspect the fuel level accurately when the machine is cool down.

First take out the oil scale, clean its head and insert again and pull out. The level must be between the sign of “MIN”and “MAX”. The measurement must be done at least five minutes after power off.

5. Engine cooling liquid inspection

Inspect the level of cooling liquid under the cooling comdition of the engine. Please add cooling liquid if the quantity is not enough.

warning

Please don’t open the cap of water tank when the water temperature is higher than 50℃. press the cap and spin to the left in order to overflow the steam, with a thin cloth and twist.

Do not twist the cap of water tank with glove.

Attention:

Do not only take water as cooling liquid, which can cause corrosion and is harmful to the engine.

Use 50% water and 50% HF-C or propylene glycol antifreeze to fill into the cooling system.

Do not add water or antifreeze when the water temperature is high than 50℃.

Pay special attention to the water tank and cooling system in hot season.

Warning

·Antifreeze is harmful to human, if swallows carelessly, spit it out and go to the hospital at once.

·Let antifreeze far away from children.

Warning

After a certain time of driving, the appearance of muffle become very hot, if adding antifreeze at this time, hands must avoid to touch the muffle orelse there will be hurt.

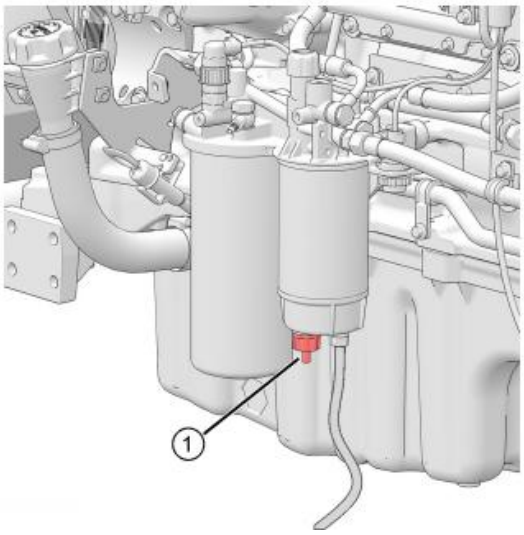
6. Intake inspection

Use version method to inspect the intake if there is wear point, pipe damaging, hoop looseness or broken that can damage the engine.

If nessary, change the damaged pipe, tighten the loose hoop in order to avoid the leakage of air system

Inspect the hoop and hose of the intake if there is corrosion which can cause corrosive and dirt go into air intake system.

7. Drain of oil-water separator



Please drain the water and sediment in the separator everyday.

①Close the engine.

②Put a container under the filter.

③Open the drain valve. Turn the valve 3.5 circles anticlockwise until the valve descend to 25.4mm and then begin to drain.

④Drain the water in the separator until see the clean fuel.

Attention：

Do not tighten the valve too much when closing the drain valve. Too much tighteness will damage thread. When close the valve, pull up the valve and turn clockwise until tightening by hands.

8. Oil level of oil tank inspection

Inspect the oil quantity in the hydraulic oil tank.

Hydraulic oil quantity should be on the red line of oil scale.

9. Lamp inspection

Ensure the key switch is on, and then the light is on.

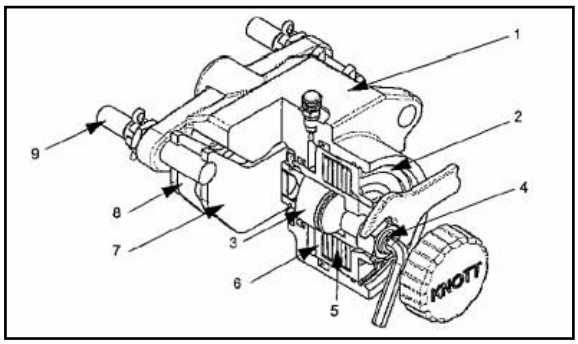
10. Steering lamp inspection

Press the control shank of steering lamp to see if the lights work normally.

11. Parking brake inspection

①Slow down the speed.

②Press the rockerswitch of parking brake, truck is stopped. It's required that the truck cann't be deviated.



Inspecting the parking brake and the gap between the friction plate（7）.（8）and brake

12. Reverse lamp and reversing buzzer inspection

Operate shift lever to R, reverse lamp is on, reversing buzzer sounds.

13. Steering

①Slow down the speed.

②Turn the steering wheel to left&right three circles each.

See if the steering power of left&right is the approximate same.

14. Loudspeaker

Press the loudspeaker button to see if it is noemal.

15. Seat adjustment and safety belt inspection.

Inspect the front&rear adjustment lever, seat weight adjustment and tilting adjustment to see if they are normal.

Inspect the safety belt if it is normal.

16. Gear shift switch

This truck uses electric shift with three forward shifts and three reverse shifts.

Inspect the switch gear to see if the shift is clear or not and if the shift change is smooth.

17. Lifting, tilting, sideshifting, adjusting hand shank

Inspect the lifting, tilting, sideshifting and adjusting hand shank if there is loosened and if the return is good.

Increase engine speed, respectively operate lifting, tilting, sideshifting and adjusting hand shank to ensure fully upgrade, down fork, front&rear tilting mast and left&right moving fork and so on

18. Instrument and sensor

Inspect the timer, water temperature gauge, oil temperature gauge, transmission oil temperature sensor, fuel sensor and engine water temperature sensor if they are normal.

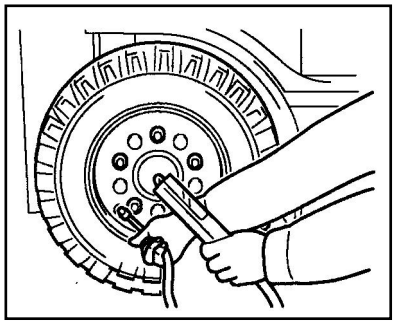
19. Brake pedal inspection

Slow down the speed, step on brake pedal then the brake light is on.

20. Tyre and tyre pressure inspection

Tighten the cap after confirming there is no leakage. Inspect the ground plane and

side if damaged, if the rim is deformed.



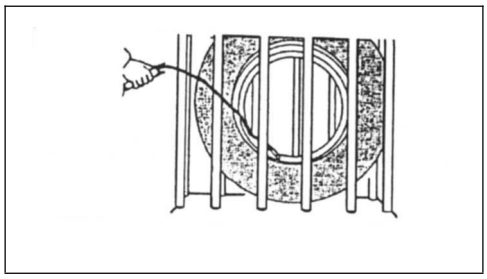
Take off the cap and use pressure gaugue to measure the tyre pressure. Add pressure to the standard level when there is not enough.

Warning

Forklift tyre needs high pressure to bear the load, too small rim or damaged tyre ground plane may cause accident.

• When use the air compressor, firstly adjust the pressure, as the air compressor can output much more pressure than the tyre's regulation value, orelse there will be serious accident.

• Being considered the safety, put the tyre into a protective frame when charging.



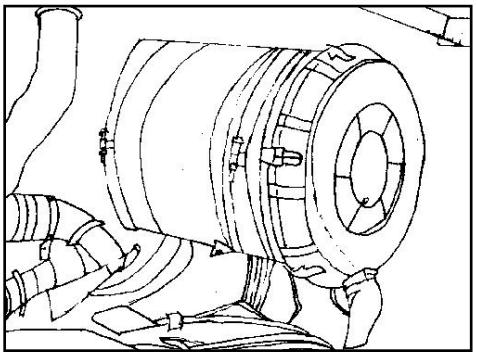
New standard of tyre pressure GB/T2982-2001:

model	driving wheel(front wheel)	steering tyre(rear wheel)
20t-35t	1.0MPa	1.0MPa

4.2 （II） Weekly maintenance (40 hours)

Add following content on the base of daily maintenance:

Air filter maintenance



Usually,

Maintenance the filter elememt every 50～250 hours.

Change the filter after six times of maintenance.

Attention： The maintenance period shall be more if the condition for the truck is not good.

Under dusty environment, you shall shorten maintenance and change filter element in accordance with actual information. We suggest maintenance per 8 hours to 50 hours, and change filter element per 100 hours to 300 hours.

Methods:

1.Break the six buckles with thumb.

2.Hold the buckle and pull out the cap.

3.Shake main filter element softly, and then take it out slowly.

4.Safety filter element needn't maintain. If needed to change, do the same way as main filter element.

5.Clean the inside of the container lest effect the installation and sealing.

6.Inspect filter element and install it into the container.

7.Inspect main filter element and install it into the container.

8.Cover the cap and keep the anti-dust bag downward.

9.Lock the buckle and finish the installation.

Warning

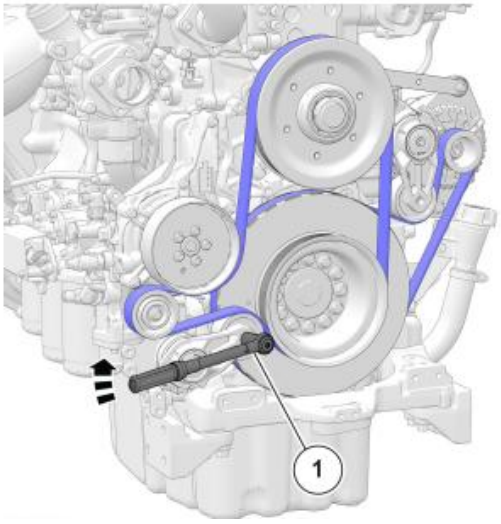
Not timely maintenance or change filter will cause the engine damage in advance.

2. Fan belt

Between the pulleys you should be able to press about 3-4 mm. AC engine belt and drive belt

Belt with belt tensioner, no need to adjust.

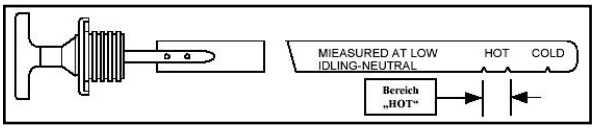
Check the status of the belt and replace it if necessary.

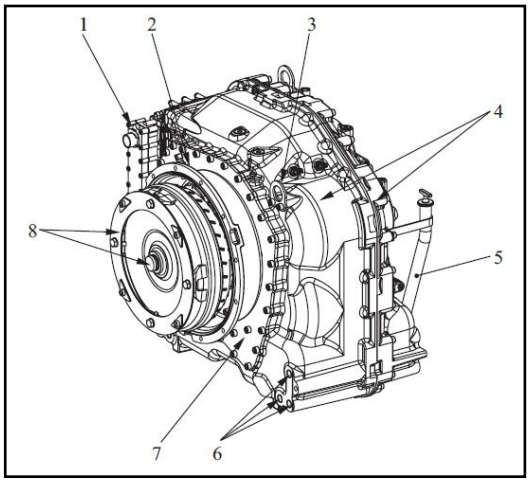


3. Transmission oil level

Tip over the cabin exactly as the requirement.

Loosen the oil scale and pull it out, inspect if the oil level is within the scale. No.5 in the picture is the oil scale.





1）Inspect the transmission oil quantity weekly.

2）Truck should be stopped on smooth ground.

3）Trransmission locates in the middle.

4）Inspect under the cold start: idling for 2-3 minutes after starting the engine, the oil level should be within “COLD”.

5）Oil temperature: 80℃-90℃

6）Idling running

7）Loosen oil scale counterclockwise, pull out and clean.

8）Insert the oil scale slowly in place and then pull it out.

9）The oil level should be at “HOT”position.

10）Insert the oil scale and tighten it clockwise.

Attention： After running, if the oil level is lower than “hot”position, you shall add oil. If the oil level is higher than “hot”position, that means overheat.

Time for changing oil and filter

First changing oil time is after running 100 hours, then change per 1000 hours, no later than one year; the filter must be changed when changing the oil.

Start with AEB after every oil change.

4. Mast and fork inspection

To be confirmed:

①No gap or bend of the fork, installed on the fork carrier firmly and correctly.

②To inspect if there is any leakage.

③To inspect the turning of rollers.

④No gap or bend of the mast.

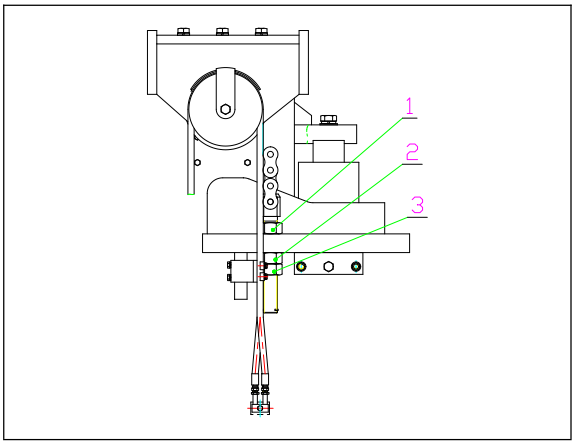
⑤To inspect if the lifting, tilting, adjusting hand shank and mast are normal and abnormal sound.

5. Chain tensity inspection

1.lift fork up 10～15cm, mast becomes vertical.

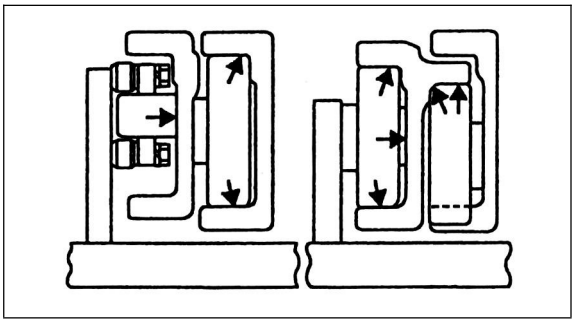
Press the middle of the chain to see if the left&right tensity is the same.

2.Tensity adjustment: loosen the nut 1 and 3, adjust nut 2 to keep the same tensity of the two chains, and then tighten the nut 1 and 3.



6. Mast lubrication

Lubrice the following parts periodically according to the requirements of lubrication sheet.

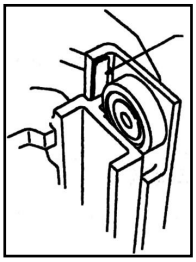


Mast

Lubricate the supporting guide rail.

Attention：

a）The interval cycle of lubrication should be made according to the actual work conditions. Add the time of lubrication when in busy months.



b）To match with the forklift, lubricate the lifting guide wheel and the surface of inside&outside mast.

Warning

You must stop the truck on smooth ground when add lubricating grease, power off the engine and close the emergency power switch.

Be aware of nipping hands and body. Be cautious of falling down when doing high lubrication.

7. Chain lubrication.

Brush the left&right sides of chain with engine oil.

Pay attention to the safety when lubricating the chain. Be cautious of falling down when in high position.

8. Add lubrication grease th the following parts, detailed parts please see the "Lubrication System Sheet".

1.Mast bering lubrication

2.Fork sideshift cylinder pin lubrication

3.steering axle supporting lubrication

4.steering knot main axle lubrication

5.steering link rod pin lubrication

6.Steering cylinder pin lubrication

9. Tightening of bolt and nut

please see the maintenance periodic sheet.

10. Tightening torque of tyre nut inspection

Inspect if the tightening torque of tyre nut meets the requirement.

Driving wheel(front wheel)

Tightening torque of front rim nut N.m

Rim nut	331-397

Steering wheel(rear wheel)

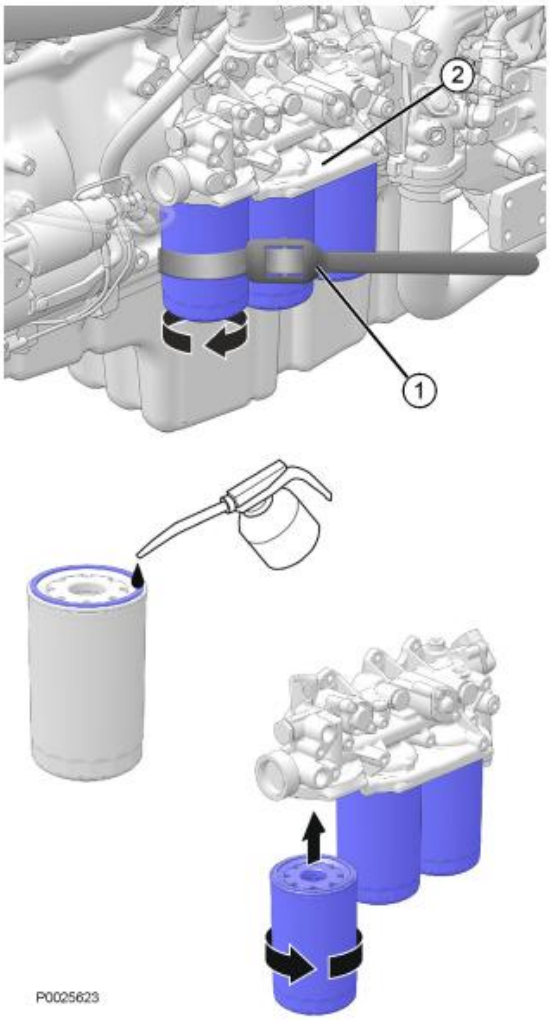
Tightening torque of rear rim nut N.m

	20t-25t	28t-35t
Rim nut	331-397	594-714

4.3 （ III ） one and half months maintenance(250 hours)

Add following maintenance under the base of weekly maintenance.

1. Change engine oil and oil filter （Only for the first time, later on, change 500 hours）.



1.Start the engine fully then power off.

2.take off the oil cap and oil pan drain plug, releasing the oil.

Warning

Be cautious of burning because the engine oil may be very hot.

Milky oil means the cooling liquid mixed together. You should look for the reason and solve it.

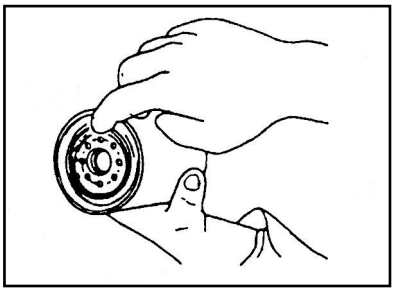
1.Clean and install the oil drain plug and gasket.

tightening torque of oil drain plug:：29～39 N·m；

Remove the oil filter by tools.

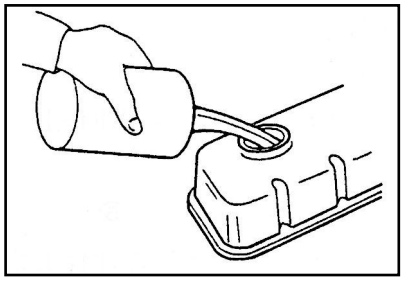
Clean the surface of oil filter.

Put on some oil on the rubber gasket of the new oil filter.



1.Instal the new oil filter only by hands not spanner.

2.Add recommended oil according to the oil sheet of forklift.



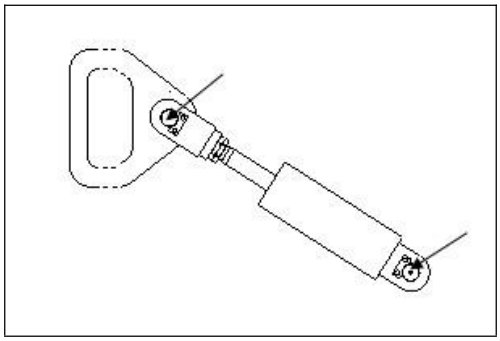
3.Start the engine, inspect the oil drain plug and oil filter if there is leakage around.

If there is clear leakage, the part has not been installed correctly.

4.Start the engine fully and then power off, inspecting the oil level. If necessary, add some oil.

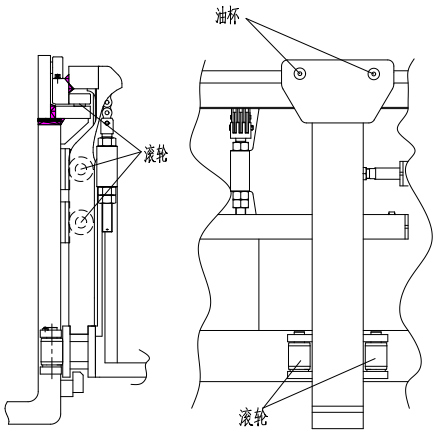
Stop the forklift on smooth ground when inspecting the oil level.

2. Front&rear pin roll of tilting cylinder.



Clean the filler and add lubrication until the old oil flows out.

3. Cylinder head pin roll of fork sideshift



Add lubrication

4. Roller wheel and obit of fork

At roller wheel oil cup 8（4×2）of fork, clean the filling point and add lubrication until the old oil flows out.

Add lubrication on the obit.

5. Inspect the gear oil of driving axle-housing, if necessary add some.

If there is too much dust, change the gear oil in the driving axle-housing for the first time after using for 166～200 hours.

6. Change transmission oil filter (Only for the first time, later on, change half a year)

Inspect the transmission oil according to the actual environment, if there is too much dust, change the hydraulic for the first time.

Stop the truck on smooth ground, slow the fork to ground, tilt the mast backward, open parking brake switch, hang the transmission to the neutral position, power off the engine.

1.Remove the rubber gasket and front underplate.

2.Remove the filter according to the local regulation.

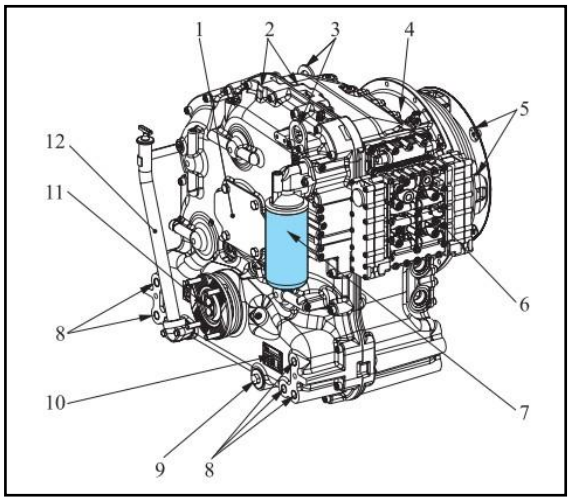
3.Clean the underplate of filter and ensure that the old gasket has been cleaned.

4.Add a little hydraulic oil on the new gasket of filter.

5.Instal the filter by hands. Tighten the 1/2-3/4 circle when the filter reaches the underplate.

7. Change hydraulic oil of transmission.(Only for the first time, later on, change half a year)

Stop the truck on smooth ground, slow the fork to ground, tilt the mast backward, open parking brake switch, hang the transmission to the neutral position, power off the engine.



1.Put a container under the transmission

2.Remove the screw of oil drain (9), and then put oil into the container.

3.Clean and install the plug of oil drain.

4.Remove the oil scale. Add hydraulic oil. Please see the “Oil Sheet for Forklift”. Then replace the oil scale.

5.Start the engine.

6.Step the brake pedal, meanwhile let engine idle and transmission in forward&backward status.

7.Hang the transmission to neutral position, start the parking brake switch.

8.Remove the oil scale and observe the level.

9.If there is not enough oil, please add hydraulic oil to keep the oil level between “hot” and “cold”.

10.Inspect the leakage of filter and oil drain plug.

11.Power off the engine and install the front underplate.

8. Exhaust of fuel system

Clear off the air from the fuel system after adding fuel or draining the water in the oil-water separator.

① Loosen the bolt

②Press the manual pump until no air flows out from the exhaust bolt.

③Tighten the exhaust bolt.

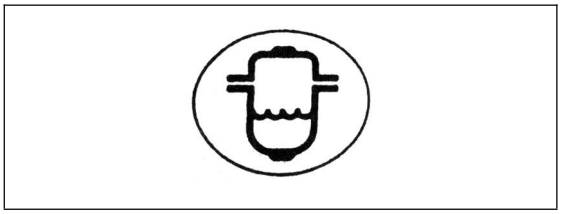
9. Battery and electrolyte inspection

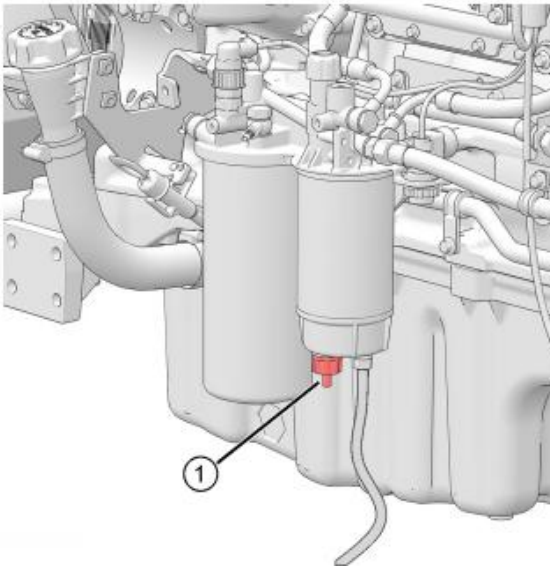
Please see “Maintenance-free lead-acid battery maintenance methods”.

⚠Warn
Hot hydraulic oul and part may burn the body. It is forbidden to touch the skin with hot hydraulic and part.

10. Drain from the oil-water separator

During the running of the engine, please drain the water if the emergency light of filter is on.





①Close the engine

②Put a container under the fuel filter.

③Open the drain valve by hands. Turn the valve 3.5 circles counterclockwise until the valve slows down to the 25.4mm and then begin to drain.

④Drain the water in the separator until see the clean fuel.

11. Exhaust inspection

No color	burn totally—normal
black	Not burn totally—abnormal
blue	Burn motor oil —abnormal
white	Water in the burning house—abnormal

Warning

Do not run the engine in an unventilated place. There is Carbon monoxide which can cause poision.

12. Inspect, clean and change the fuel filter

In dusty or dirty environment, clean the fuel filter per month and change it per six months.

1.Take off the filter components.

2.Take off the sensor from the upper place.

3.Install the sensor component before install the new. Add a little clean fuel on the sealing point of filter.

Attention：

Never add fuel to the filter before the installation, orelse will increase the attrition of fuel system component.

1.Install new filter component.

2.Turn new filter until the sealing gasket is sticked on the sealing surface.

3.Then tighten 2/3 circle.

4.4（ IV ）Semiannually maintenance(1000 hours)

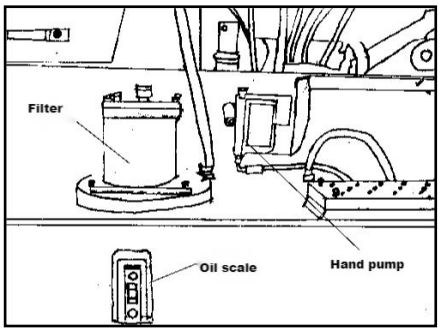
Add following maintenance under the base of the monthly maintenance.

1. Lubrication of steering wheel lockup

Add lubrication grease at the locked position of steering wheel.

2. Inspection, cleaning and changing of hydraulic return Oil filter, oil tank respirator and filter.

Stop the truck on smooth ground, slow the fork to ground, tilt the mast backward, open parking brake switch, hang the transmission to the neutral position, power off the engine.



1.Loosen the bolts on the filter's gap components of return oil filter.

2.Take off the return oil filter.

3.Inspect the filter of reture oil and change if it is damaged.

4.Take off the oil filter from the oil tank.

5.Remove the gap of hydraulic oil tank

6.Install the new filter.

7.Install the gap of hydraulic oil tank

8.Take off the respirator.

9.Use noninflammable ablunt to clean and dry.

10.Install the respirator.

11.Start the engine and operate the hydraulic system, making hydraulic oil be full in the whole system. Inspect if there is leakage.

12.Close the engine and inspect the oil level. Retract all the cylinder rob and keep the oil level between the oil scales.

3. Change hydraulic oil of transmission.

Please see the "change hydraulic oil of transmission" of the "weekly maintenance".

4.5 (V)Yearly maintenance (2000hours)

Add the following maintenance on the basis of half-year maintenance.

1.Change hydraulic oil

Stop the truck on smooth ground, slow the fork to ground, tilt the mast backward, open parking brake switch, hang the transmission to the neutral position, power off the engine.

.⚠Warning
Never touch the hot hydraulic oil and parts.

1.Put a container under the hydraulic oil tank, remove the drain oil plug and drain the hydraulic oil to the container.

2.Remove the hydraulic oil scale and fuel tank components.

3.Take out the megnat and clean it, using hydraulic oil to wash the oil filler of the

4.Clean and install the oil plug.

5.Add hydraulic oil fully. Please see the “oil sheet for forklift”. Install hydraulic oil gap and oil scale. Start the engine and operate the multitandem valve to control the pilot lever and steering system, making the hydraulic oil be full of whole system.

6.Inspect if there is any leakage of the hydraulic parts and pipes.

7.Close the engine, return all the cylinder rod and inspect the oil level of hydraulic oil tank.

2. Replace lubricating grease for front wheel bearing

Refer to the drive axle in Maintenance Manual

3.Replace lubricating grease for rear wheel bearing

Refer to the steering axle in Maintenance Manual.

4. Replace drive axle gear oil

Park the truck on the road, better in warm condition, in neutral gear and the engine is off.

1.Dry all oil filter and oil outlet, open the oil filter of hub, main, axle differential and autotransformer. Drain plug of wheel assembly should face downward;

2.Oil drainage;

3.Replace new drain plug and sealing gasket;

4.Open the oil level plug or oil filling plug of hub, main, axle differential and autotransformer;

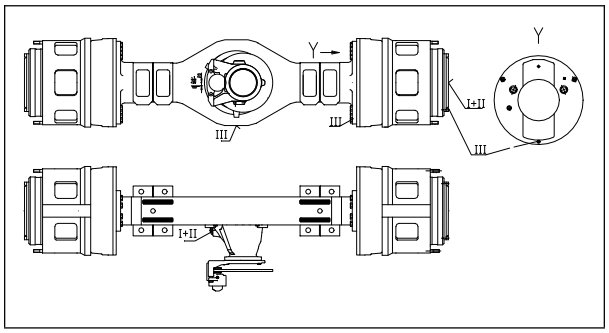
5.Add oil;

6.Check oil level at the oil filter(overflow), wait several minutes to add when the oil level drops, repeat it until it does not change.

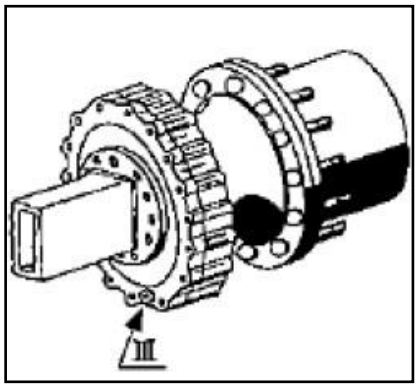
Notice: Wipe grease nipple before adding glycerol.

The axle with self-locking differential may cause noise if using normal grease oil. In order to prevent causing noise on the bumpy road, you need to use anti-lubricant added EP gear oil, like M2C—104A.

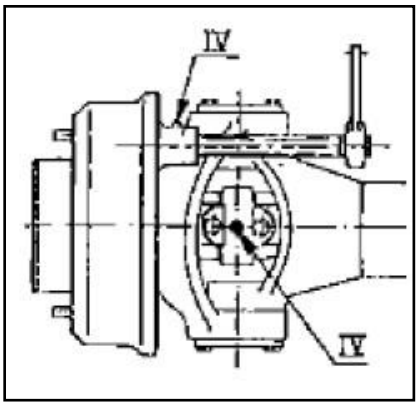
Each oil port and lubricating point show as follows:



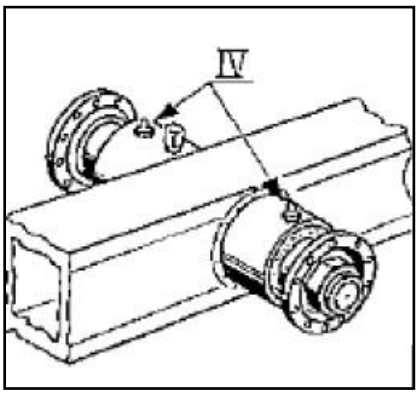
Driving axle oil port



Lubricating point of hub reduction assembly



Lubricating point of cardan shaft



Lubricating point of inner drive axle bearing

I-Oil filling plug II- Drainage plug
III-Oil level plug IV Glycerol nozzle

Drive axle lubricating circle and oil filling condition refer to Drive Axle Lubricating and Lubricating Periodical Chart

5. Engine turbocharger check

Dismantle intake tube from turbocharger.

Check the turbocharger compressor impeller blade for damage. If damage, please replace turbocharger.

If the compressor impeller damages, check whether the intake tube and filter slug damage. Repair all the damage parts before running the engine.

Dismantle exhaust pipe from turbocharger.

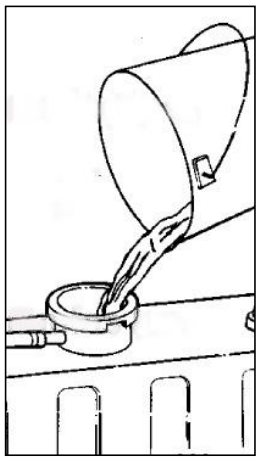
Check impeller blade for damage. If damage, please replace turbocharger.

Install intake tube and screw clamp.

Install exhaust pipe and screw clamp. Torque value: 8Nm.

4.6 (Ⅵ)Two years maintenance (2000hours)

1. Replace engine coolant



1.Open tank cover and liquor drainage cock, drain coolant, and then wash cooling system;

2.Screw liquor drainage cock;

3.Add coolant to the tank until to the filling mouth;

4.Make the engine fully rotate;

5.Stop the engine, add coolant to the filling mouth after complete cooling, and fill coolant to the fluid reservoir to “MAX” position;

6.Check the liquor drainage cock for leakage.

> ⚠ **Warning**
>
> **In order to avoid burn, you are not allow to replace coolant when the engine coolant temperature is higher than 50℃.**

The added engine coolant is antirust antifreeze coolant; refer to Table for Oil Used for Forklift.

4.7 Others

1. Fuse

The fuse box is installed on the left rear of cab seat. Before replacing any incorrect fuse, you should find out the reason.

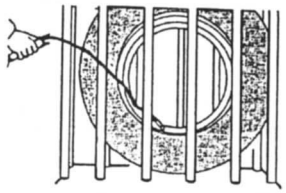
Replace the specified fuse.

2. Tyre replacing

Warning

• When using the air compressor, you should firstly adjust the press, cause the max. output pressure of the air compressor is higher than the specified pressure of tyre, otherwise, it may cause severe accidents.

• To ensure safety, you should place the tyre in a protective frame when filling air.



Front tyre

1.Place the car on smooth and solid ground;

2.Start the engine and lift the mast about 100mm;

3.Place block at the rear of the rear wheel to avoid forklift moving;

4.Unscrew every nut of the wheel 1-2 rings in counterclockwise;

5.Tilt the mast backwards, place the block over the outer mast;

6.Tilt the mast forwards until the front wheel is over the ground;

Attention：

Do not release the nut until the front wheel is off the ground.

7.Place block in the front part of the truck body to support the truck, then turn off then engine;

8.Take out the wheel nut and replace front tyre;

Attention：

When taking off the tyre from hub, only after air bleeding can you take out the hub bolt and nut;

Block should be a whole one and firm.

When supporting the truck with block, people are not allowed to enter the bottom of the truck.

9.Install nut in opposite angle and lock the nut temporarily;

10.Start the engine and take out the block;

11.Tilting the mast backwards to slow down the truck, then take out the block from the mast and rear wheel;

12.Keep the bolt in symmetrical and cross and screw in turn.

13.Adjust the tyre pressure to specified value.

Rear tyre

1.Place the car on smooth and solid ground;

2.Turn on parking brake switch, place block at the back of front wheel to avoid truck moving;

3.Place the jack at the section of bottom counterweight;

Attention：
Make sure the min. capacity of the jack is 2/3 of the truck.

4.Unscrew the nuts of the wheel 1-2 rings in counterclockwise;

Warning
Do not take out the nut until the rear wheel is off the ground

Uplift the truck slowly with jack until the rear wheel is off the ground. Place block at the back of the truck in both sides to support the truck;

Take out wheel nut and replace rear tyre;

Warning
When taking off the tyre from hub, only after air bleeding can you take out the hub bolt and nut;
Block should be a whole one and firm;
When supporting the truck with block, people are not allowed to enter the bottom of the truck.

1.Install nut in opposite angle and lock the nut temporarily;

2.Move the block under the truck and low down the truck to the ground, then take out the block and jack at the rear part of front wheel;

3.Fasten the nut to specified torque in cross matching way. Refer to Fastening Torque Table;

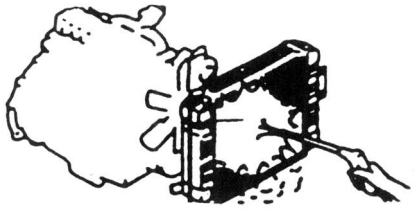
4.Adjust the tyre pressure to specified parameter.

3. Wash radiator fin

Warning
·Dust will splash into your eyes, so you should wear protective glass or dustproof glass.

If the fin is blocked, it will cause overheat, thus you should use compressed air, vapour and water to blow pin.

Attention：
When washing pin with compressed air or vapour, place the nozzle face radiator in right angle.



4. Operation for the overheated engine

If the engine is overheated, do not stop the engine immediately, but do the following”

① Start the engine in low speed;

② Open the engine cover to improve ventilation of the engine chamber; stop the engine when the water temperature drops;

③ Check coolant and add when needed.

V. During brake in

We recommended operating the machine under light load conditions for the first stage of operation to get the most from it. Especially the requirements given below should be observed while the machine is in a stage of 100 hours of operation.

1.Before usage, the forklift should be pre-heated no matter what season.

2.Perform specified preventive maintenance services carefully and completely.

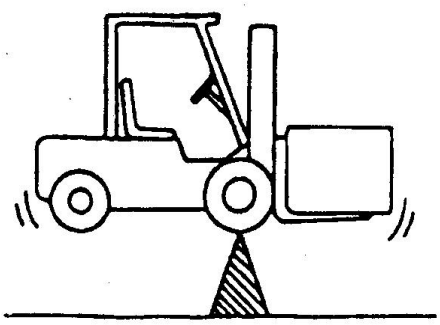
3.Avoid sudden stop, starts or turns.

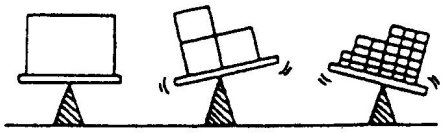
4.Replace oil or lubricate in advance according to regulation.

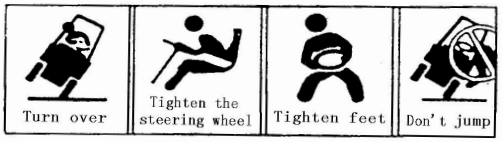
5.Do not let the engine run rapidly at idle.

VI. Structure and stability of truck

It is very important for operator to clarify the function of truck's structure and stability to safe operation.

Caution	Structure of the truck	
The basic structure of the truck is lifting device (including mast and forks) and body (including tire). The lift truck keeps the balance of weight between the truck body and the load on the forks with the center of the front wheels as a fulcrum when the rated capacity load is placed in position. Relationship between the center of gravity of forklift and the center of gravity of loads is very important to maintain the stability of the truck.		

Caution	Load center	
The loads' shape is quite different, such as box, board and large roller. It is very important to distinguish the difference and the gravity center of loads for evaluating forklift and its stability.		

Caution	Load center	
If the truck will turn over, do not attempt to get out of the truck. The speed of overturn is much fast than yours. You should hold the steering wheel handle, and this practice will let you in the seats. Please tie belt.		

Caution	Center of gravity and stability

The combined center that is composed of the barycenter and the load center determine the stability of lift trucks.

When unloaded, the barycenter does not change; when loaded, the barycenter is determined by the truck and the load's center.

The barycenter is also determined by the tilting and lifting of the mast.

The combined center is determined by the following factors:

Load's size, weight and shape;

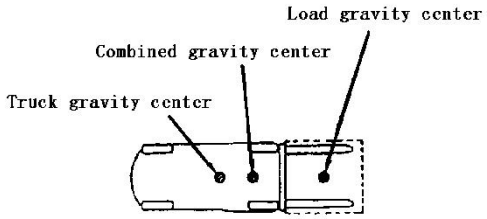
The lifting height;

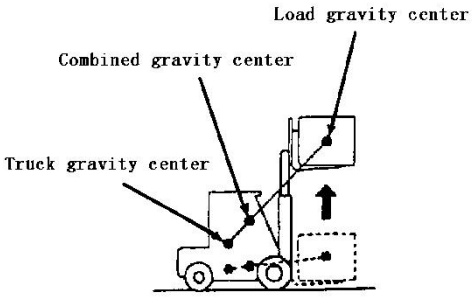
The tilting angle;

Acceleration, reducing speed and radius of turning;

The road condition and angle;

The attachments.

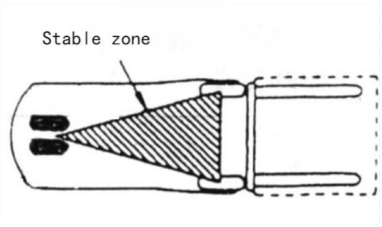


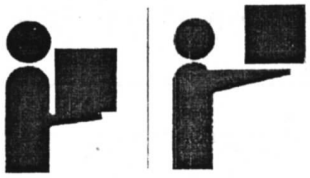


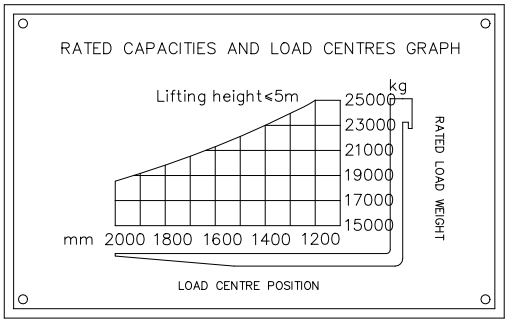
Caution	Stable zone of gravity center

In order to make the truck stable, the combined gravity center must be in the triangle which is made up of two points that the two front wheels attach ground and the midpoint of the back driving axle.

If the combined gravity center is in the front driving axle, the two front wheels become two fulcrums, the truck will overturn. If the combined gravity center departures the triangle, the trucks shall overturn in the corresponding direction.



Caution	Maximum load (weight and load center)	
The load center distance is defined that: the distance between the load center and the fork carriage or the front of the fork carriage. The max.load means the maximum load the truck can charge at the normal load center distance. The relation between the max.load and load center distance shows on the capacity chart. You should reduce the weight of load if the load center distance inclines to the fork carriage.		

Caution	Capacity chart	
The chart given shows the relation between the load center and the weight of loads. Before loading, make sure that the load and the load center distance in the range of capacity chart. If the load's shape is complex, put the most weightily part on the middle of the forks, and close to the fork carriage		

Caution	Velocity and acceleration
One object will keep quiescence until force works on it. Also, a moving object will keep moving until force works on it .This is just inertia. According to inertia, when truck starts moving, one force works backwards, and when truck stops moving, one force works forwards. So, it's dangerous to brake suddenly, because it causes one large force works forwards, and it's easy to cause truck overturn or load slide off. When the forklift makes a turn, will exert a centrifugal force outward from the curve center. This strength pushes forklift outwards and causes it to turn over. About stabile region is very small, so decelerate when turning. If the cargo transported at the high position, it's easy to turn over left or right.	

VII. Operation

Warning!

If any damage or fault is found, don't operate truck until being repaired.

7.1 Starting

1.Set the direction switch to neutral position

2.Screw the starting switch" ⇄ "to position, after starting, the key rebound to "|"position automatically.

Notice

If it does not work within 5 seconds, screw to "o" position and restart after 2 minutes.

Notice

When the temperature is lower than -50C, you should switch the key to end for preheating, and start

Notice

Stating time should not exceed 5 seconds, and the interval should be less than 2 minutes.

After engine starting

①Preheat the engine for 5 minutes.

②Check engine running condition

Notice

After engine running, accelerate to keep it in intermediate speed(1800 ～ 2000r/min), empty warming up.

Check the compression(misfire) noise.

Check exhaust condition.

Make sure all indicators turn off.

After complete preheating of engine, operate control valve lever in whole course for 2-3 times, and check mast working condition.

7.2 Moving

1.Hold the handle of steering wheel. Touch the steering wheel slightly with right hand and prepare for loading and unloading operation.

2.When the fork is 15-20cm away from the ground, the mast tilts backwards.

3.Check whether there are persons around the forklift and press the horn.

Step the brake pedal and operate F-R shift lever.

Start parking brake switch

Release brake pedal, step the accelerator pedal, and then the vehicle moves.

Gear shift

Stop the truck before gear shifting.

Stir the gear shifting rod.

Decrease speed

Loosen the accelerate pedal slowly

and step the brake pedal when necessary.

Steering

Unlike general passenger-cars, the turning wheels are located at the rear of the truck. This cause the counterbalance swing out when turning.

Slow down the truck and turn the steering wheel toward the side which you are turning. The steering wheel should be turned a bit earlier than as with the front wheel steering car.

Stopping or parking

1.Slow down and press the brake pedal to stop the truck.

2.Place the shift lever in neutral.

3.Pull up the parking brake lever.

4.Down the forks on the ground, tilt mast forwards fully.

5.Place the key switch in “O” to shut off the engine. Remove the key and keep it.

Caution

Don’t dismount from the moving truck.

Never jump from the truck.

Don’t parking the truck on the working road.

7.3 Loading

·The forks should be adjusted properly to maintain the balance of load.

·Place the truck right in front of the load to be handled.

·The pallet should be evenly positioned across both forks.

·Insert forks into the pallet as far as possible.

·To raise loads from the ground：

① Firstly, lift the forks 5 to 10cm off the ground or floor and make sure loads lay stably.

②Then, tilt the mast backwards fully and lift forks up to 5 to 10 cm off ground then start running.

·When handling bulky loads which restrict your vision, operate the truck in reverse except when climbing grades.

7.4 Stacking

·When approaching the deposit area slow down your truck.

·Stop the truck right in front of the area where your load is to be deposited.

·Check the condition of the deposit area.

·Tilt the mast forward until forks become to horizontal. Raise forks until they are a little higher than the deposit position.

·Move forward to place the load directly over the desired area and stop the truck.

·Make sure your load is just over the desired area. Slowly lower the load into position. Make sure the load is securely stacked.

·Do necessary lift-tilt operations and then back away to make the forks leave

loads.

After making sure the forks leave the load, lower the forks to the basic position (15 to 20 cm off the ground).

Tilt the mast backwards.

Warning!

Never tilt the mast with loads upraised 2m or more.

Don't leave or dismount from the truck when the load is raised high.

7.5 Un-stacking

·When approaching the area where the load is to be retrieved, slow down your truck.

·Stop the truck 30 cm far from the load.

·Check the condition of the load.

·Tilt the mast forward until forks become horizontal. Elevate forks up to the position of the pallet.

·Make sure forks are positioned properly to the pallet. Move forward slowly to insert forks into the pallet as far as possible.

Caution

If the forks are hard to be fully inserted, use the following procedure: Move forward and insert 3/4 of the forks. Raise the forks 5 to 10 cm and move backward 10 to 20 cm with the pallet on the forks, and then fall the pallet to the stack.

Move forward again to insert the forks fully.

·Raise the forks 5 to 10cm off the stack

·Check all around the truck to insure that the path of travel is unobstructed and back away slowly.

·Lower forks to a height of 15 to 20 cm above the ground. Tilt the mast backward fully and move to the desired area.

7.6 Maintenance of air filter

General condition:

Please maintain the filter element after working 50-250 hours(the truck has travelled for 4000-20000km);

Replace main filter element after maintenance for 6 times.

Notice:

When use condition of your truck is severe, it should be maintained and

When working under severe environment of much dust, it should shorten filter element maintenance and replace interval. It is suggested to maintain between every 8 hours to 50 hours and replace new filter element every 100-300 hours correspondingly.

Maintenance way:

① Tear the 6 clips with thumb;

②Hold the clip with hand and pull out the cover outwards;

③Shake main filter element right and

left slightly with hands, and extract the main filter element slowly;

④Safety filter element does not need maintenance, if safety filter element replacement is needed, shake filter element slightly and extract the filter element slowly;

⑤Wipe clearly the inner of cylinder with cloth to avoid influencing installation and seal effect;

⑥Check safety filter element and install into the cylinder;

⑦Check main filter element and install into the cylinder;

⑧Cover the cover and keep the dust exhaust bag downwards;

⑨Lock the clip and installation is completed.

Warn

If you do not maintain or replace filter element in time according to the requirement, you will damage the engine ahead of time.

VIII. Deposit

Daily Depositing

1.Park your truck at the area appointed, and block the wheels to prevent accidental roll.

2.Make sure the shift lever on neutral position.

3.Pull up the hand brake lever.

4.Shut off key switch and operate the lift and tilt lever several times so that the inner pressure in the hydraulic tube will decrease.

5.Take out the key and deposit it in a safe position.

Warn

Once you find the truck is in malfunction, you should report to manager and repair it.

Do the following maintenance:

1.Clean grease on the truck with cloth and water.

2.Check the overall condition of the truck, especially whether the tyre is damaged or imbedded foreign material like piton.

3.Fill the oil tank with appointed fuel.

4.Check leakage of hydraulic oil, engine oil, fuel oil and coolant.

5.Fill lubricating grease.

6.Check the looseness of faying surface of tyre bolt, cylinder piston rod and damage of piston rod surface.

7.Check whether the mast roller runs stable.

8.Lift the lift cylinder to fill the cylinder with oil.

9.Long-acting coolant does not need to discharge in winter or cold environment, but cooling water should be drained.

Deposit the truck for a long time

If the truck parks for a long time, you should block the body and bottom balance weight to reduce real wheels burden.

Warning

a. The stow-wood must be single and hard enough to support the truck.

b. Lift the truck to the height of placing on the stow-wood.

c. Place two same size stow-woods under the left and right sides of the truck.

d. After supporting the truck with stow-wood, swing the truck forward, backward, left, right, and check its safety.

On the basic maintenance of the “daily depositing”, you should do the following maintenance and checks:

1.Take out plug to prevent discharge and place in shade and charge once per month.

2.Brush antirust oil on those parts which is exposed such as piston rod and axle easy-rusted.

3.Cover breather hole and so on which humidity easy to enter.

4.Operate the forklift once a week. Add cooling water when being discharged. Install battery. Get rid of antirust oil on piston rod and axle. Start the engine and fully pre-heat, slowly travel, operate mast lift, down, forward and backward for several times.

5.The truck should not park on the bituminous pavement in summer.

Working after long deposit

Get rid of antirust oil of the exposed part.

①Discharge the engine oil from crankcase, gear oil from driving axle, hub reduction mechanism and hydraulic transmission box or hydraulic drive oil, and clean up the internal of them then add new oil.

②Clean foreign body and water on the hydraulic oil tank and fuel tank.

③Dismantle cylinder cover, valve, rockshaft of the engine and check the clearance of each valve.

④Add coolant to specified mark.

⑤Charge the battery then install it to truck, and do not forget to connect the down-lead.

⑥Check carefully before starting.

⑦Preheat forklift

⑧Check forklift function, conduct travelling, steering, lifting, falling, tilting and stacking according to regulations.

IX. Maintenance

The forklift truck needs inspection and maintenance periodically, to make it in good working condition.

· Inspection and maintenance are usually ignored, you'd better find the problems early and solve it in time.

· Use the pure service parts of ZHEJIANG HANGCHA ENGINEERING MACHINERY CO., LTD.

· Draw up completer maintenance plan.

· Don't rave about oil and electrolyte used at will, and carry on handling according to the local environmental protection laws and regulations.

· If you'll maintain the control system, you should discharge the energy by the following ways:

Park the truck on the flat road, place the mast lowest, start parking brake switch, the engine misses and open the accumulator valve to release hydraulic oil in the system. Shut it after maintenance check.

Notice: when oil drainage valve (ball valve) between accumulator and oil tank is in upright condition, it is closed, while in level, it is opened.

Don't use different oil when changing or adding oil.

After you make maintenance, you'd better make a record.

Forbid to repair the forklift truck if you haven't been trained.

9.1 Preventive maintenance schedule

○ — Check, revise, adjust

× — Replace

9.1.1 Engine

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Engine	Eyeballing the engine running condition(including noise, exhaust color)		○	○	○	○	○
	Clean or replace filter element		○	○	○	×	×
	Check crankcase and clean dirt			○	○	○	○
	Check and adjust valve clearance	Plug gauge		○(first)	○	○	○
	Screw down cylinder cover bolt	Torque converter		○(first)	○	○	○
	Check cylinder compression pressure	Pressure gage					○
Crankshaft ventilation device	Check valve and pipe blocking or damage condition					○	○
Governor or injection pump	Check no-load max. speed	Speed meter					○
Lubricating system	Whether the engine leaks oil		○	○	○	○	○
	Check oil mass and cleanness		○	○	○	○	○
	Replace engine oil			×（first）	×	×	×
	Replace engine oil filter element			×（first）	×	×	×

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Fuel system	Eyeballing whether pipeline, pump or oil tanks leaks oil		○	○	○	○	○
	Check whether the fuel filter blocks				○	○	○
	Replace fuel filter			×（first）	×	×	×
	Check nozzle and adjust pressure status	Injection test bench				○	○
	Injection moment						○
	Fuel tank drainage				○	○	○
	Clean fuel tank					○	○
	Oil-water separator drainage		○	○	○	○	○
	Check fuel volume		○	○	○	○	○
Cooling system	Coolant volume		○	○	○	○	○
	Leakage condition		○	○	○	○	○
	Clean and replace coolant						× Use of anti-freeze solution is 2～4 years.
	Check tension and damage condition of fan belt		○	○	○	○	○
	Clean outer water tank				○	○	○
	Water tank cover performance and installation condition			○	○	○	○
	Aging of in and out tube					○	○
	Looseness of in and out water hose connector				○	○	○

9.1.2 Drive system

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Transmission box	Check for noise					○	○
	Check for oil leakage		○	○	○	○	○
	Check oil volume or replace			× first	○	×	×
	Brake pedal running idle or moving condition		○	○	○	○	○
	Control valve performance		○	○	○	○	○
	Inching valve performance		○	○	○	○	○
	Check gear moving condition				○	○	○
	Operation and looseness of shift lever			○	○	○	○
	Hydraulics filter			× first	○	×	×
Drive axle (front axle)	Hub bearing adjustment			○ （first 100h)			○
	Whether the rim, driving flange nut loose	Torque spanner		○	○	○	○
	Check the wet brake wear						○
	Check brake spring					○	○
	Whether drive assembly connecting bolt is loose					○	×
	Whether gear ring supporting bolt of drive assembly is loose				○	○	○
	Check seal ring						○
	Differential lock function and self-return check		○	○	○	○	○

9.1.3 Wheels (Front, Rear Wheels)

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Tyre	Inflation pressure	Barometer	○	○	○	○	○
	Check for abrasion, cracks or damage		○	○	○	○	○
	Check for spikes, stones or foreign matter			○	○	○	○
	Check the wheel hub for damage		○	○	○	○	○
	Divide-body rim nut looseness	Test hammer	○	○	○	○	○

9.1.4 Steering system

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Steering wheel	Check for clearance		○	○	○	○	○
	Check for axial looseness		○	○	○	○	○
	Check for radial looseness		○	○	○	○	○
	Check for operation		○	○	○	○	○
Steering gear	Check mounting bolts for looseness			○	○	○	○
Rear axle Knuckle	Check for looseness or damage of king pin			○	○	○	○
	Check for deflection, deformation, cracks or damage			○	○	○	○
	Check for mounting status	Test hamme		○	○	○	○
Steering cylinder	Check operation condition		○	○	○	○	○
	Check for leakage		○	○	○	○	○

9.1.5 Brake system

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Brake pedal	Check for free travel	Scale	○	○	○	○	○
	Check for pedal travel		○	○	○	○	○
	Check for operation		○	○	○	○	○
	Check for air mixed in brake piping		○	○	○	○	○
Pipeline	Check for damage, leakage or collapse			○	○	○	○
	Check connection or clamping parts for looseness			○	○	○	○
Brake and friction plate assembly	Check brake installation for looseness				○	○	○
	Friction plate assembly wear condition	slide caliper					○
	Check oil level, change oil		○	○	○	×	×
	Friction plate assembly movement condition						○
	Cotter looseness condition				○	○	○
	Wear and damage condition of distance rod				○	○	○
	Butterfly spring working condition						○
Accumulator	Work and installation condition			○	○	○	○
Guild pump	Check for leakage			○	○	○	○
Ball valve	Whether the working performance is normal					○	○

9.1.6 Hydraulic system

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Hydraulic reservoir	Check for oil level, change oil		○	○	○	○	×
	Clean suction strainer					○	×
	Replace oil return oil filter					○	×
	Clean foreign matter					○	○
	Claen or replace air filter			○	○	○	×
Control lever	Check levers for looseness		○	○	○	○	○
	Check for operation		○	○	○	○	○
Control valve	Check for oil leakage		○	○	○	○	○
	Check relief valve and tilt lock valve for operation			○	○	○	○
	Measure relief pressure	Oil press gauge				○	○
Hose Swivel Joint	Check for oil leak, looseness, collapse, deformation and damage			○	○	○	○
	Replace hoses.						× 1～2years
Double pump	Check double pump for oil leak or noise		○	○	○	○	○
	Check double pump drive gear for wear			○	○	○	○
Oil return fine filter	Work and installation condition			○	○	○	○
Indicating display	Work and installation condition			○	○	○	○
fluid level gauge	Work and installation condition			○	○	○	○
Guild oil source solenoid valve	Work and installation condition				○	○	○

9.1.7 Electrical system

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Starting motor	Pinion engagement condition				○	○	○
Generator	Clean the foreign body on the generator housing			○	○	○	○
	Clean or replace bearing					○	○
	Check the carbon brush and commutater for worn, whether spring is normal			○	○	○	○
	Whether the connection is correct and firm.			○	○	○	○
	Brush carbon powder on shift plate and shift device.				○	○	○
Battery	Battery quantity			○	○	○	○
	Whether the connection is firm				○	○	○
	Whether the battery surface is clean			○	○	○	○
Each alarm device	Work and installation condition				○	○	○
Wire	Check wire harness for damage or looseness		○	○	○	○	○
	Looseness of electric circuit Joint		○	○	○	○	○
Central block terminal	Work and installation condition		○	○	○	○	○

9.1.8 Lifting system

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Chains & Sheave	Check chain for tension, damage or rust		○	○	○	○	○
	Add lubrication for chains			○	○	○	○
	Riveting pin and looseness			○	○	○	○
	Check sheaves for deformation or damage			○	○	○	○
	Check sheave bearings for looseness			○	○	○	○
Lifting cylinder, tilting cylinder and sideshifte rcylinder	Check piston rod, rod screw and connection for looseness deformation or damage	Test hammer		○	○	○	○
	Operation condition		○	○	○	○	○
	Leakage condition		○	○	○	○	○
	U-type bolt down condition of sideshifter cylinder		○	○	○	○	○
	Each cylinder piston rod axis pin lubrication			○	○	○	○
	Check pins and cylinder bushings for wear or damage			○	○	○	○
Fork	Check forks for damage, deformation or wear			○	○	○	○
	Whether the fork distance adjustment is flexible		○	○	○	○	○
	Add lubricate grease to fork roller			○	○	○	○
	Check fork base and hook welding for defective cracks or wear			○	○	○	○
Mast & Lift Bracket	Check weld between cross members with outer and inner masts for defective, cracks or damage			○	○	○	○
	Check tilt cylinder bracket and mast for defective weld, cracks or damage			○	○	○	○
	Check outer and inner masts for defective weld, cracks or damage			○	○	○	○
	Check for defective weld, cracks or damage of lift bracket			○	○	○	○
	Check roller bearings for looseness			○	○	○	○

	Check mast support bushings for wear or damage						○
	Check mast support cap bolts for looseness	Test hammer		○（Only for the 1st time）	○	○	○
	Check lift cylinder tall bolts, piston rod head bolts, U-bolts, and piston head guide bolts for looseness	Test hammer		○（Only for the 1st time）	○	○	○
	Check rollers, roller pins and welded parts for cracks or damage			○	○	○	○

9.1.9 Others

Checking item	Service required	Tools	Daily (8 hrs)	1.5months (250hrs)	3months (500hrs)	6 Months (1000hrs)	Yearly (2000 hrs)
Cabin	Whether the installation is firm	Test hammer	○	○	○	○	○
	Check the axis pin of the support on the right side of cab is installed in place		○	○	○	○	○
	Check for deformation, cracks or damage		○	○	○	○	○
	Check wiper working condition		○	○	○	○	○
	Check door open/close condition		○	○	○	○	○
	Check hand pump working condition		○	○	○	○	○
	Whether tilting cylinder connector is loose			○	○	○	○
	Whether tilting cylinder connector leaks oil			○	○	○	○
	Whether connecting oil pipe of tilting cylinder cracks			○	○	○	○
Turn signal	Work and installation condition		○	○	○	○	○
Horn	Work and installation condition		○	○	○	○	○
Light & Lamps	Work and installation condition		○	○	○	○	○

Buck-up Buzzer	Work and installation condition		○	○	○	○	○
Meters	Instrumentation condition		○	○	○	○	○
Air condition compressor	Work and installation condition		○	○	○	○	○
Radiator	Work and installation condition		○	○	○	○	○

9.2 Table for bolt's tight torque

Unit N·m

Bolt's diameter（mm）	Grade			
	4.6	5.6	6.8	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
30	529～666	666～833	784～980	1267～1689
36	882～1078	1098～1372	1323～1677	2214～2952
47				4000～4300

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.

·Spanner type for special nut type and specification is listed as follows:

9.3 Replace the key safe parts periodically

Some parts was unable to detect the damage through periodical maintenance, for further improving the safety, users should replace the parts periodically according to the following table.

If the part is abnormal before the replacing time, it should be replaced immediately.

Key safe part's description	Term of using (year)
Brake hose or tube	1～2
Hydraulic hose for lifting system	1～2
Lifting chain	2～4
High-pressure hose, hose for hydraulic system	2
Fuel horse	2
Inner sealing element, rubber matter	2

9.4 Oil used for forklift

Name	Mark, code	Volume（L）		Remark
		20t-25t	32t	
Diesel oil	0#（summer -10#～-35#（winter）	350	440	Fuel tank
Diesel engine oil	General season：CF-4 level15W／40，winter：CF-4 level 10W／30 or according to maintenance manual	32	32	Transmission box
	General season：CJ-4 level15W／40，winter：CJ-4 level 10W／30 or according to maintenance manual	27	27	Diesel engine
Hydraulic oil	THF1000 or L-HM46+LZ9990A(5%)	500		Hydraulic oil tank
	L-HM46		500	
	THF1000 or L-HM46+LZ9990A(5%)		85	
Vehicle gear oil	GL-5 ，85 W／90	32		Drive axle and hub reduction device
Caltex antifreeze	ASTMD3306，50／50	40		
Industrial Vaseline	2#			Electrode of storage battery
Lubrication grease	Automobile general lithium base lubricant			

Note:

1. The listed oil in the table is the main oil used in normal environment; oil used in special environment is otherwise specified;

2. Oil used for each part should be based on the oil level plug or oil gauge(liquid indicator) of corresponding part; the above oil mass is rough total fuel charge; including:

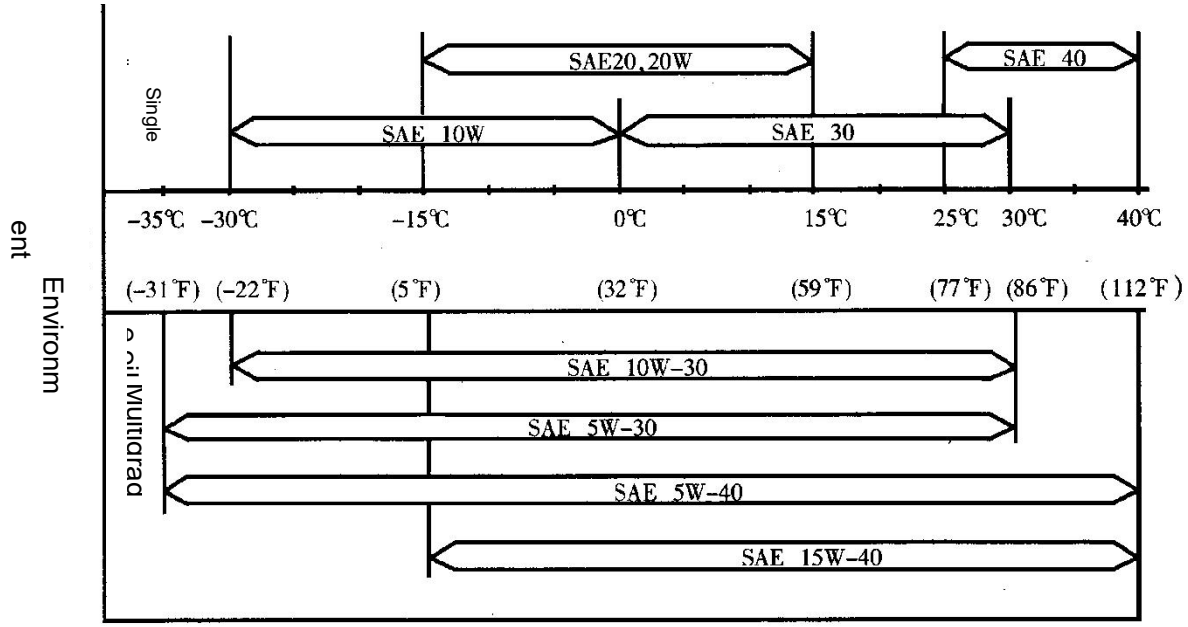
1) When the transmission box is in neutral position, engine runs idle and the vehicle in cold condition, its oil level should be above “cold” scale; finally it should be based on the transmission box oil temperature of 80℃～90℃ and oil level in “HOT” scale;

2) Hydraulic oil added into the hydraulic oil tank and variable pump housing will filter through the filter, whose precision is no lower than 10μm, and the cleanness should no lower than level 9 of NAS1638(or 18/15 to ISO/DIS 4406) provision; hydraulic oil tank

level can be checked when the pipeline and cylinder are full of oil, working device is in reset state, oil tank level should be added to the marked scope in the liquid indicator; variable pump should fill oil through housing leakage mouth before running;

3) Brake oil tank level should be stopped to check after low-tension alarm lamp turning off and indicating normal status, and reduce the level to oil gauge marked scope.

Recommended diesel engine oil viscosity under different temperature

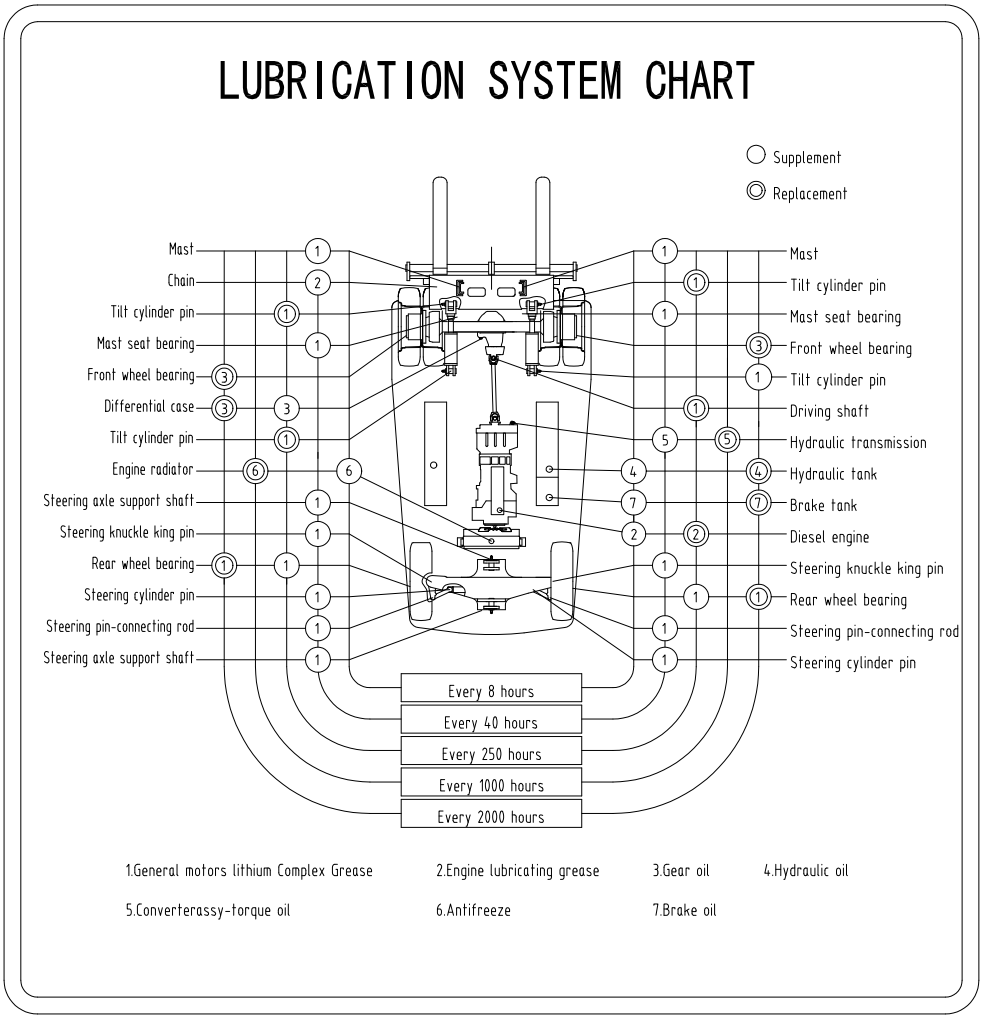


Notice:

1. Performance and quality of diesel engine oil should be in accordance with API classification or SAE J183 **CJ-4** level or above **CJ-4** level and GB11122-2006 **CJ-4** level or above **CJ-4** level.

2. Leaving factory oil added: **CJ-4** level SAE 15W / 40.

9.5 Lubricating system drawing



Notice:

1. Please add oil according to specified truck with detailed lubricating oil.

2. Lubricating of mast track and chain please refer to weekly maintenance (40hours) for mast lubricating.

Environmental protection

1. Clean, maintain and repair the truck at appointed place;

2. Before dismantling pipeline, connector and relevant spare parts, you should use specified container to receive used oil(including coolant, engine oil, hydraulic oil, transmission oil and lubricating grease etc.) and used battery;

3. According to local environmental protection laws, the replaced above oil, liquid waste should carry out recovery processing and should not dump or discard at will to prevent the environment pollution.

Safety awareness: Temperature of coolant, engine oil, hydraulic oil, transmission oil, hydraulic transmission oil is very hot after long-time running, so it is required to replace when below 50℃; do not touch the skin, otherwise it may scald or corrode the skin.

9.6 Drive axle lubricating and lubricating periodic table

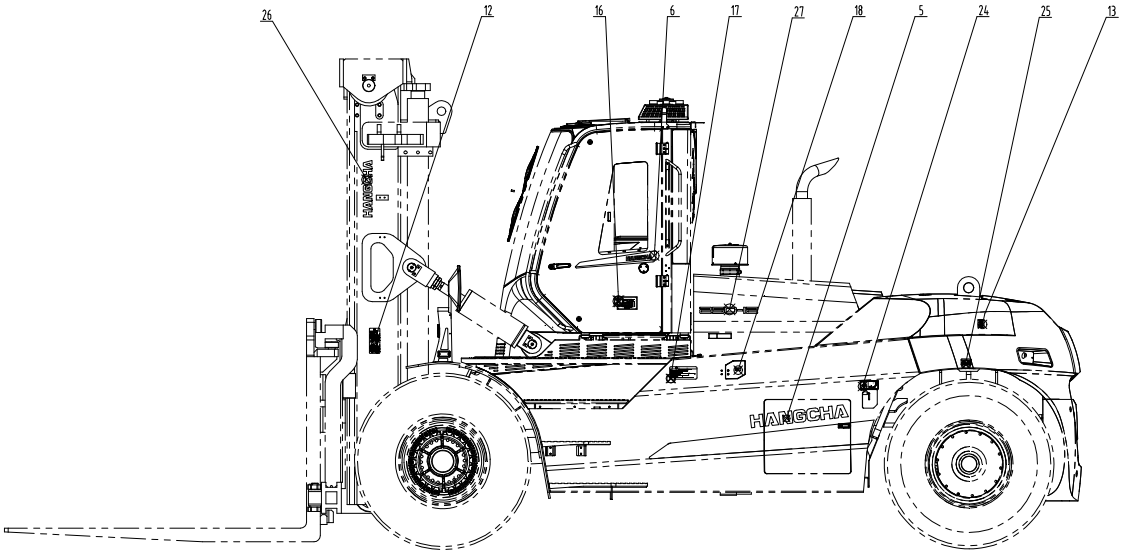
Lubricating point	Lubricating	Remark	Lubricating interval				
			100 hours	Every other 500hours	Every other 1000 hours	At least 1year	At least 2 years
Main reduction gear	The following standard gear oil MIL-L-2105B/API GL 5 MIL-L-2105C/D/API GL 5 SAE 90：normal weather condition SAE 75 W-90：below-10℃ SAE 75 W-85 SAE 140：over+30℃	Change oil	Y		Y	Y	
Hub planetary drive		Check oil level monthly	Y		Y	Y	
Axle differential			Y		Y	Y	
Distance fall tank			Y		Y	Y	
Hub bearing			Y		Y	Y	
Disc parking brake	Hydraulic oil ISO VG 32		Y		Y	Y	
Knuckle bearing	In accordance with NLGI 2 glycerol Fuchs MP 150		Y	Y			
Knuckle bearing		Maintenance			Y	Y	
Drive axle		If supply	Y	Y			
Pull rod		If supply	Y	Y			
Steering cylinder bulb and oscillating bearing		If supply	Y	Y			
Drive axle bearing		If supply			Y	Y	
Pinion bearing		If glycerol lubricating	Y		Y	Y	
Brake shaft bearing		Notice	Y	Y			
Brake shoe bearing		Notice	New, add little glycerol over the brake shoe.				
Hub bearing		If glycerol lubricating	Dismantle hub and change oil				Y
Wet-type brake	Medium environment：ISO VG22-32 Icy environment：ISO VG15 Extremely hot environment：ISO VG46	With extra cooling	According to different volume / operating environment / cooling system of the oil tank				
		Without extra cooling	Y		Y	Y	

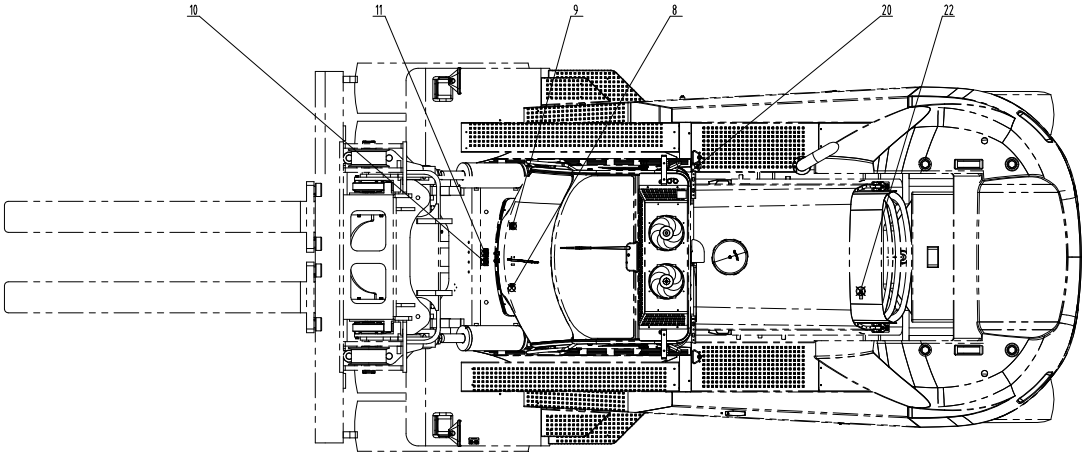
Notice:

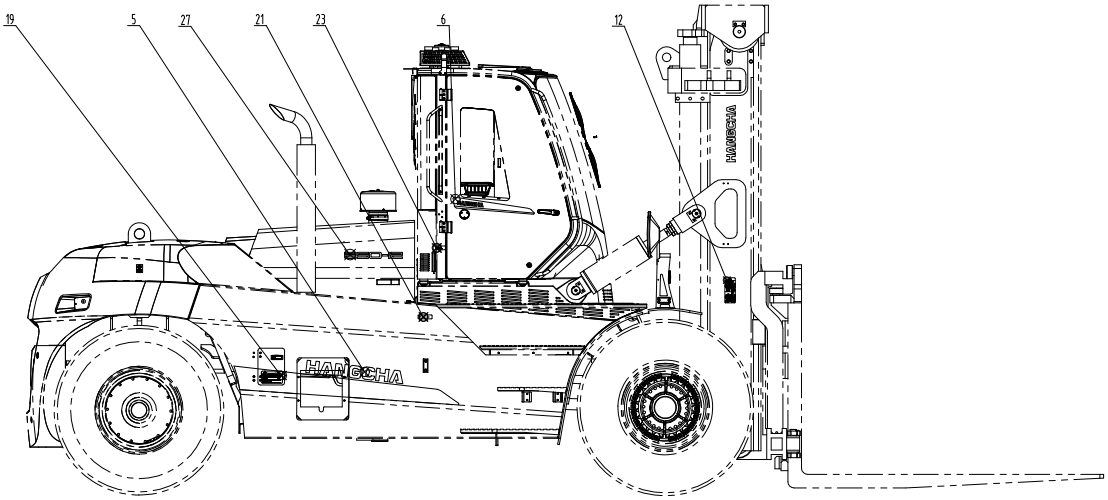
1. Depend on the first coming.

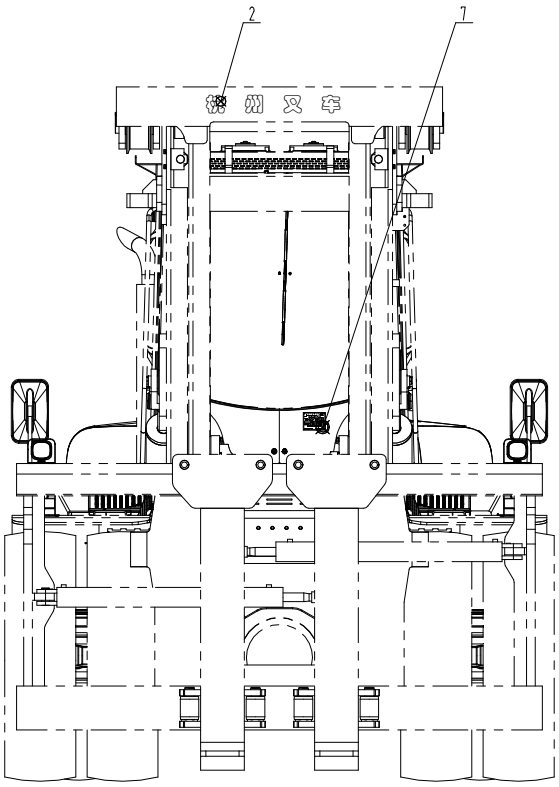
2. Lubricating point belongs to mild lubricating, and it should avoid the glycerol entering the drum brake(It should only use manual oil gun and wipe the emitting glycerol). Check brake periodically and lubricate correctly(Overheating is dangerous).

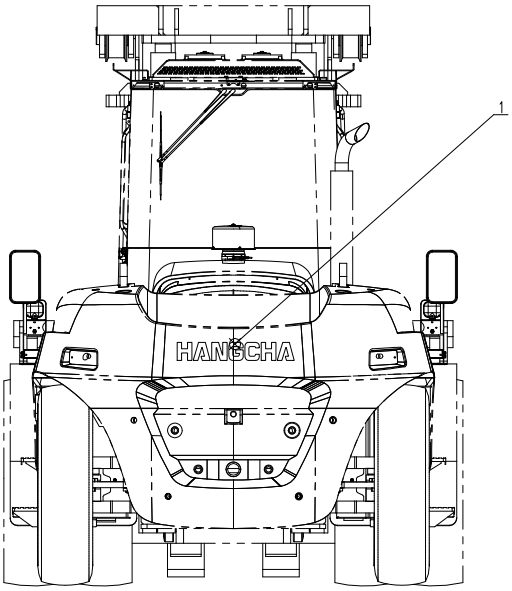
9.7 Various plate: control lever various plate and labels to different position of the vehicle

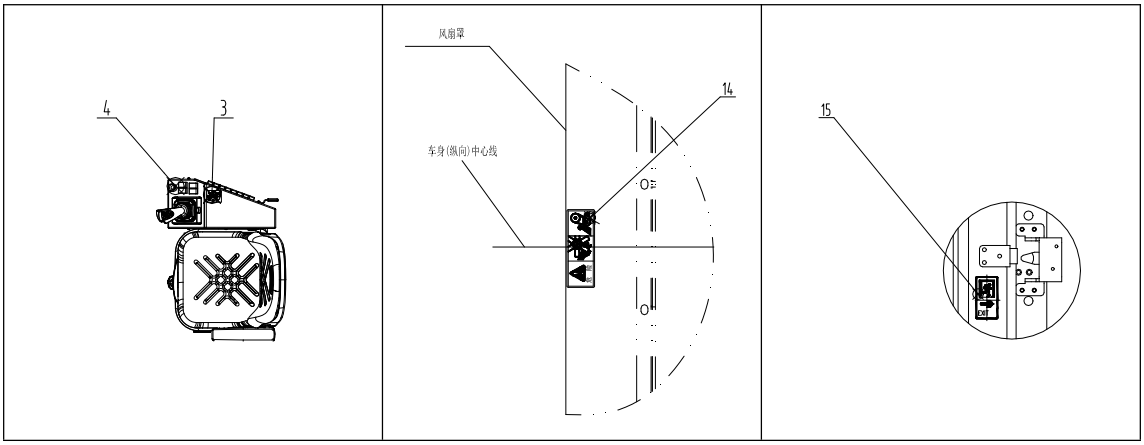







2
7
HANGCHA

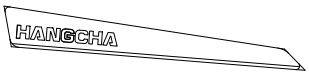

1
HANGCHA


4
3
风扇罩
14
车身(纵向)中心线
15

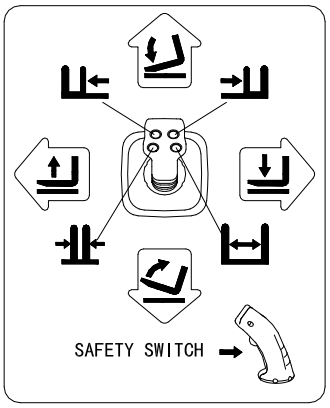
1.2.5.6.26.Label of written character

HANGCHA

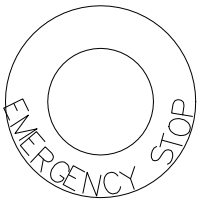
HANGCHA



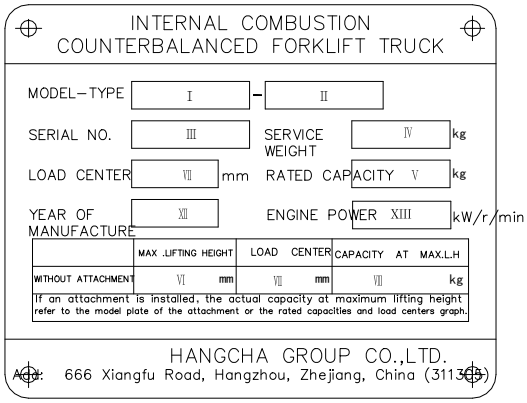
3.Guild handle control label



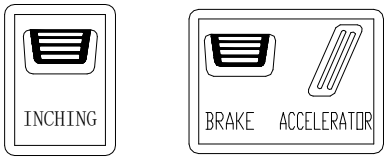
4.Emergency stop label



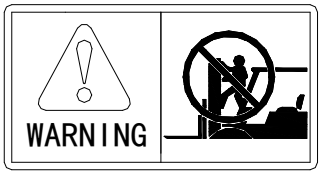
7.Product nameplate



8.9.Control label

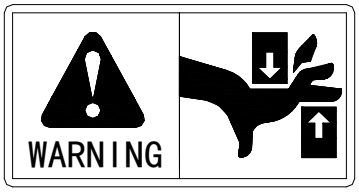


10.Danger label: it is forbidden to enter mast.



Warn: It is in relation with your life, once the body is blocked among mast, instrument stand and overhead safeguard, you'll be in danger. Check and repair are only allowed after engine stops. There should be no other person in the truck, and the person out of the truck is also not allowed to operate vehicle in case of operating mast handle by mistake to cause accident.

11.Danger label



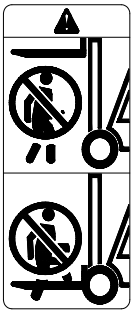
Warn: Inner and outer mast, fork carriage are all slippage articles for lifting and lowing. It is forbidden to reach the hand between inner and outer mast.

Check and repair are only allowed after engine stops. There should be no other person in the truck, and the person out of the truck is also not allowed to operate vehicle in case of operating mast handle by mistake to cause accident.

12.Dangerous label:

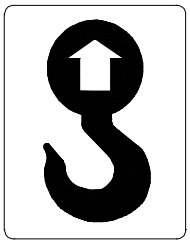
stick to the outer mast

It is forbidden to stand on or under the fork carriage, otherwise it is dangerous.

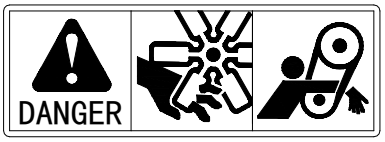


13.Hoisting label

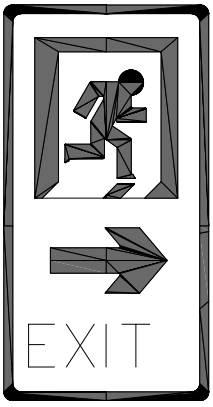
Indicate the vehicle hoist position and method. Prevent the rope from friction and damaging the lamp.



14.Hand cut label



15.Emergency exit label

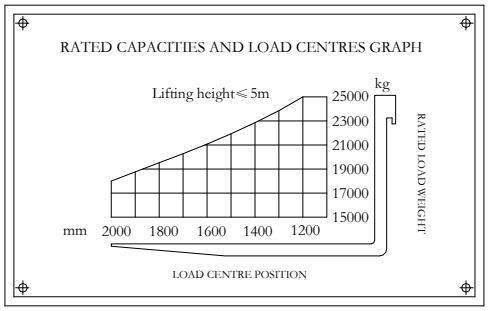


16.Load curve plate

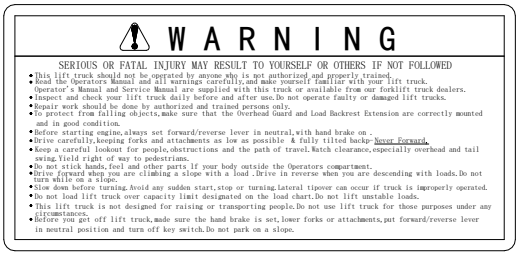
Indicate relationship between load center position and max. load, max. lifting height.

Load capacity decreases when equipping with sideshifter and attachment. Load capacity decreases while lifting height increases. Before loading, you should check whether load and load center is within the allowed range of load capacity chart. If the load shape is complex, place the heaviest part in the center of the fork and close to the

backrest.



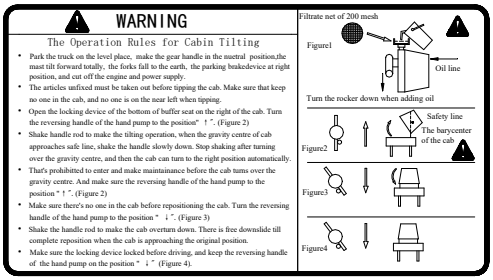
17.Warning nameplate



18.Fuel label:

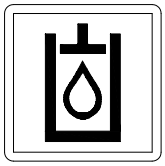
Indicate oil filter position

19.Operation rules for cabin tilting



20.Hydraulic oil refuel label:

Indicate oil filter position

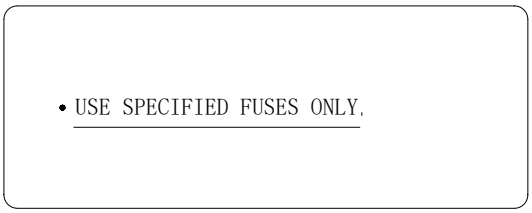


21.Transmission oil level check label

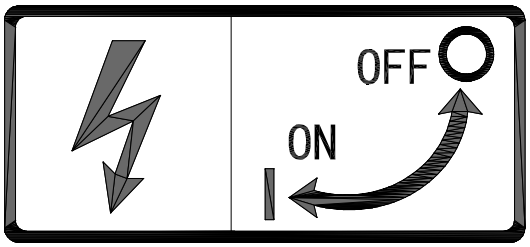
⚠ The transmission oil level check must be carried out at engine idling speed.

22.Anti-freeze label

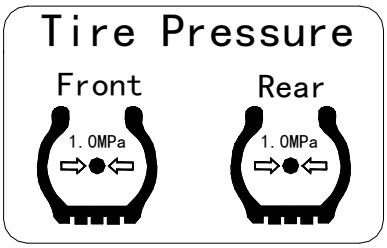
23.Fuse label



24.Power label



25.Tyre pressure label

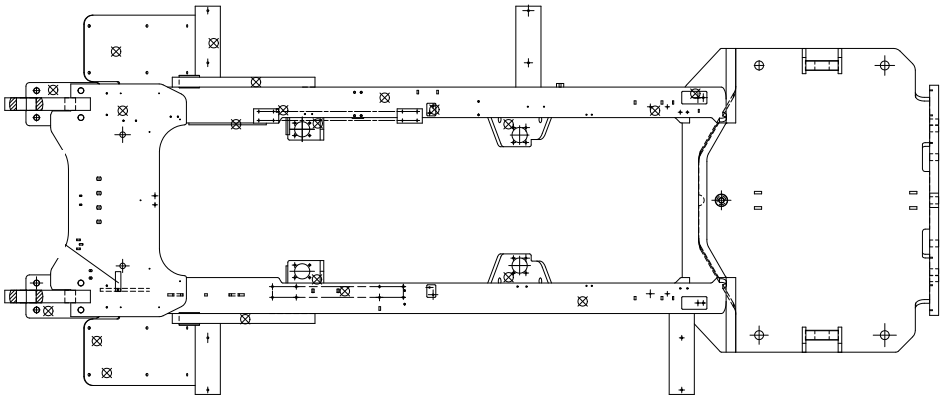


27.Tonnage label

9.8 Printing Position of Carriage Serial No.

Each truck refers to a carriage serial no., and the printing position is at the right front side of the carriage.

Printing Position of Carriage Serial No. #



X. Conveying, lifting and drawing of forklift

Convey

·The Fork Lift Truck is designed for material handling only and is inappropriate for long-distance transportation. If needed, the Fork Lift Truck must be transported by ship, train or lorry, of above 40T loading. Use a lifting pallet or hoist device to hoist the truck.

• To avoid truck slip, please press parking brake switch, block tires with solid chocks, use enough intensity ropes to bind body firmly.

Hoist the truck

·Use the steel wire ropes to tie the holes in the two side of the outside mast's beam and the hook of the balance weight, and then use the lifting device to hoist the truck.

⚠Warning

·When hoist the truck, don't coil the overhead guard with the steel wire.

·The steel wire ropes and the lifting device must be very firm to support the truck because the truck is very heavy.

·Don't lift the truck by hoist the overhead guard.

·When lifting the truck, don't take yourself below the truck.

Towing

The towing pin at the back of the balance weight is used to pull and drag the truck. Pull out the pin when pulling, then mount steel wire and return the towing pin.

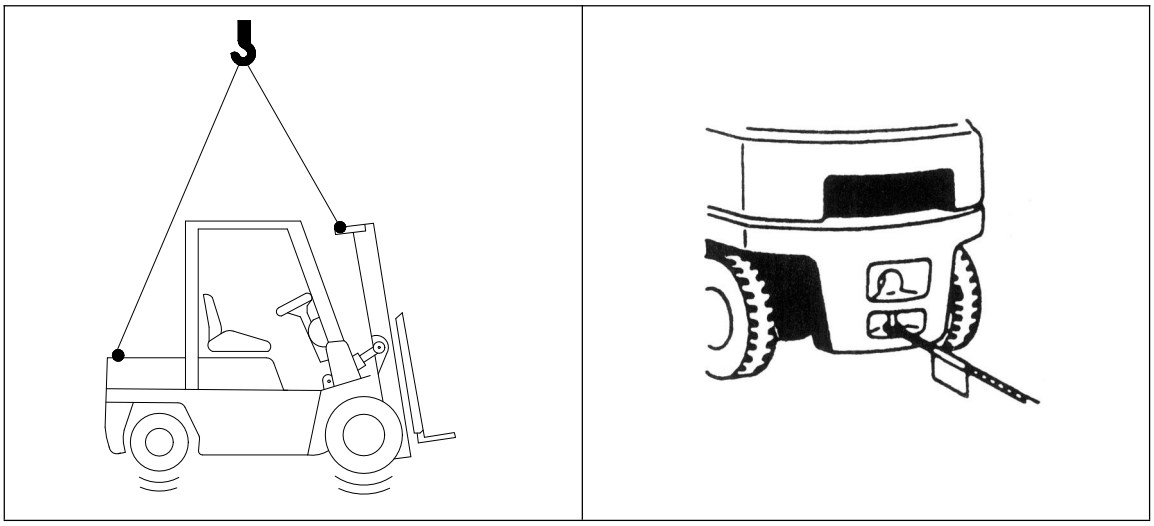
Stop parking brake switch.

Set switch lever to neutral position.

⚠Warning

Don't tie the steel wire ropes on the unfixed position.

Don't carry a load to steel wire ropes suddenly.



XI. Technical performance parameter table

Item		Unit	Technical parameter and specification code	
Model			CPCD200-XRW83G	CPCD250-XRW83G
Power type			Diesel	Diesel
Rated capacity		kg	20000	25000
Load center		mm	1200	1200
Lifting height		mm	4000	4000
Free lift height		mm	110	110
Fork gap(outside)		mm	900-2600	900-2600
Mast tilt angle		deg	6/10	6/10
Dimension	Overall length	mm	6250（Excluded fork）	6250（Excluded fork）
			8690（Including fork）	8690（Including fork）
	Overall width	mm	3050	3050
	Overall height	mm	3580（overhead guard height）	3580（overhead guard height）
			3900（mast height）	3900（mast height）
Min. turning radius（Outside）		mm	5800	5800
Min.ground clearance,mast lower		mm	300	300
Lifting speed, laden		mm/s	340	340
Max. travel speed		km/h	28	28
Max gradeability, laded, ≥2km/h		%	25	25
Max. drawbar pull		kN	160	160
Service weight		t	33.5	35.5
Tyre	Front /No.	piece	14.00-24-28PR/4	14.00-24-28PR/4
	Rear/ No.	piece	14.00-24-28PR/2	14.00-24-28PR/2
Battery	Model		N150	N150
	Voltage /Capacity	V/Ah	2×12/150	2×12/150
Engine	Model		VOLVO TAD851VE	VOLVO TAD851VE
	Rated capacity/rotating speed	kw/rpm	185/2200	185/2200
	Max. torque/ rotating speed	Nm/rpm	1160/1350	1160/1350
	No. of cylinder		6	6
	Bore×stroke	mm	110×135	110×135
	Displacement	l	7.7	7.7
Brake distance	Unladed，20km/h	m	≤7	≤7

Item		Unit	Technical parameter and specification code	
Model			CPCD280-XRW83G	CPCD300-XRW83G
Power type			Diesel	Diesel
Rated capacity		kg	28000	30000
Load center		mm	1200	1200
Lifting height		mm	4000	4000
Free lift height		mm	110	110
Max.lifting speed, laden/unload		mm/s	300/350	270/340
Mast tilt angle		（°）	6/10	6/10
Max.travel speed,laden/unload		km/h	22/25	22/25
Max gradeability, laded, ≥2km/h		%	20	20
Min. turning radius（Outside）		mm	6600	6600
Min.ground clearance,mast lower		mm	300	300
Max. drawbar pull		kN	240	240
Dimension	Overall length	mm	6910（Excluded fork）	6910（Excluded fork）
			9350（Including fork）	9350（Including fork）
	Overall width	mm	3420	3420
	Overall height（CAB height）	mm	3710	3710
Service weight		t	40	42
Tyre	Front /No.	piece	16.00-25-32PR/4	16.00-25-32PR/4
	Rear/ No.	piece	16.00-25-32PR/2	16.00-25-32PR/2
Battery	Model		N150	N150
	Voltage /Capacity	V/Ah	2×12/150	2×12/150
Engine	Model		VOLVO TAD851VE	
	Rated capacity/rotating speed	kw/rpm	185/2200	
	Max. torque/ rotating speed	Nm/rpm	1160/1350	
	No. of cylinder		6	
	Bore×stroke	mm	110×135	
	Displacement	l	7.7	
Brake distance	Unladed，20km/h	m	≤7	

Item		Unit	Technical parameter and specification code	
Model			CPCD320-XRW83G	CPCD350-XRW83G
Power type			Diesel	Diesel
Rated capacity		kg	32000	35000
Load center		mm	1200	1200
Lifting height		mm	4000	4000
Free lift height		mm	110	110
Max.lifting speed, laden/unload		mm/s	280/330	250/330
Mast tilt angle		（°）	6/10	6/10
Max.travel speed,laden/unload		km/h	22/25	22/25
Max gradeability, laded, ≥2km/h		%	20	20
Min. turning radius（Outside）		mm	6600	6600
Min.ground clearance,mast lower		mm	300	300
Max. drawbar pull		kN	240	240
Dimension	Overall length	mm	6910（Excluded fork）	6910（Excluded fork）
			9350（Including fork）	9350（Including fork）
	Overall width	mm	3420	3420
	Overall height（CAB height）	mm	3710	3710
Service weight		t	42.5	46.5
Tyre	Front /No.	piece	16.00-25-32PR/4	16.00-25-36PR/4
	Rear/ No.	piece	16.00-25-32PR/2	16.00-25-36PR/2
Battery	Model		N150	N150
	Voltage /Capacity	V/Ah	2×12/150	2×12/150
Engine	Model		VOLVO TAD851VE	
	Rated capacity/rotating speed	kw/rpm	185/2200	
	Max. torque/ rotating speed	Nm/rpm	1160/1350	
	No. of cylinder		6	
	Bore×stroke	mm	110×135	
	Displacement	l	7.7	
Brake distance	Unladed，20km/h	m	≤7	

Item		Unit	Technical parameter and specification code	
Model			CPCD200-XRH10G CPCD200-XRH19G	CPCD250-XRH10G CPCD250-XRH19G
Power type			Diesel	Diesel
Rated capacity		kg	20000	25000
Load center		mm	1200	1200
Lifting height		mm	4000	4000
Free lift height		mm	110	110
Fork gap(outside)		mm	900-2600	900-2600
Mast tilt angle		deg	6/10	6/10
Dimension	Overall length	mm	6250（Excluded fork）	6250（Excluded fork）
			8690（Including fork）	8690（Including fork）
	Overall width	mm	3050	3050
	Overall height（CAB height）	mm	3580	3580
Min. turning radius（Outside）		mm	5800	5800
Min.ground clearance,mast lower		mm	300	300
Lifting speed, laden		mm/s	340	340
Max. travel speed		km/h	28	28
Max gradeability, laded, ≥2km/h		%	25	25
Max. drawbar pull		kN	160	160
Service weight		t	33.5	35.5
Tyre	Front /No.	piece	14.00-24-28PR/4	14.00-24-28PR/4
	Rear/ No.	piece	14.00-24-28PR/2	14.00-24-28PR/2
Battery	Model		N150	N150
	Voltage /Capacity	V/Ah	2×12/150	2×12/150
Engine	Model		VOLVO TAD881VE	VOLVO TAD881VE
	Rated capacity/rotating speed	kw/rpm	185/2210	185/2210
	Max. torque/ rotating speed	Nm/rpm	1175/1400	1175/1400
	No. of cylinder		6	6
	Bore×stroke	mm	110×135	110×135
	Displacement	l	7.7	7.7

Item		Unit	Technical parameter and specification code	
Model			CPCD280-XRH10G CPCD280-XRH19G	CPCD300-XRH10G CPCD300-XRH19G
Power type			Diesel	Diesel
Rated capacity		kg	28000	30000
Load center		mm	1200	1200
Lifting height		mm	4000	4000
Free lift height		mm	110	110
Max.lifting speed, laden/unload		mm/s	300/350	270/340
Mast tilt angle		（°）	6/10	6/10
Max.travel speed,laden/unload		km/h	22/25	22/25
Max gradeability, laded, ≥2km/h		%	20	20
Min. turning radius（Outside）		mm	6600	6600
Min.ground clearance,mast lower		mm	300	300
Max. drawbar pull		kN	240	240
Dimension	Overall length	mm	6910（Excluded fork）	6910（Excluded fork）
			9350（Including fork）	9350（Including fork）
	Overall width	mm	3420	3420
	Overall height（CAB height）	mm	3710	3710
Service weight		t	40	42
Tyre	Front /No.	piece	16.00-25-32PR/4	16.00-25-32PR/4
	Rear/ No.	piece	16.00-25-32PR/2	16.00-25-32PR/2
Battery	Model		N150	N150
	Voltage /Capacity	V/Ah	2×12/150	2×12/150
Engine	Model		VOLVO TAD881VE	
	Rated capacity/rotating speed	kw/rpm	185/2210	
	Max. torque/ rotating speed	Nm/rpm	1175/1400	
	No. of cylinder		6	
	Bore×stroke	mm	110×135	
	Displacement	l	7.7	

Item		Unit	Technical parameter and specification code	
Model			CPCD320-XRH10G CPCD320-XRH19G	CPCD350-XRH10G CPCD350-XRH19G
Power type			Diesel	Diesel
Rated capacity		kg	32000	35000
Load center		mm	1200	1200
Lifting height		mm	4000	4000
Free lift height		mm	110	110
Max.lifting speed, laden/unload		mm/s	280/330	250/330
Mast tilt angle		（°）	6/10	6/10
Max.travel speed,laden/unload		km/h	22/25	22/25
Max gradeability, laded, ≥2km/h		%	20	20
Min. turning radius（Outside）		mm	6600	6600
Min.ground clearance,mast lower		mm	300	300
Max. drawbar pull		kN	240	240
Dimension	Overall length	mm	6910（Excluded fork）	6910（Excluded fork）
			9350（Including fork）	9350（Including fork）
	Overall width	mm	3420	3420
	Overall height （CAB height）	mm	3710	3710
Service weight		t	42.5	46.5
Tyre	Front /No.	piece	16.00-25-32PR/4	16.00-25-36PR/4
	Rear/ No.	piece	16.00-25-32PR/2	16.00-25-36PR/2
Battery	Model		N150	N150
	Voltage /Capacity	V/Ah	2×12/150	2×12/150
Engine	Model		VOLVO TAD881VE	
	Rated capacity/rotating speed	kw/rpm	185/2210	
	Max. torque/ rotating speed	Nm/rpm	1175/1400	
	No. of cylinder		6	
	Bore×stroke	mm	110×135	
	Displacement	l	7.7	

XII. Use and Maintenance of Lead-acid Battery

12.1 Lead acid battery and its application

Lead acid battery is used for power start engine, and it can be for voltage regulation and overload generator substitute power, it has following strengths: low internal resistance, stable end voltage, large support current, low water cost, huge capacity, nice starting performance at low temperature, light pole corrosion, light mass, low fault rate, convenient maintenance. The Maintenance-free batteries are all sealed besides 2 vent holes (for overflowing a little air from battery) at the side of Maintenance-free battery. Low-maintenance lead-acid batteries plus liquid left in the battery cover mouth.

12.2 Storage and maintenance

12.2.1 Storage

The place for storing battery should be clean, dry, airy, and the battery should be charged every 3 months.

12.2.2 Maintenance

If truck will be stored over 30 days, the following should be done:

Maintenance-free battery

1) Insure the green status visual in inner indicator;

2) Disconnecting negative earth wire to avoid discharging by additional current release;

3) Keep the battery charge completely if the battery can not be removed down from truck;

4) Make a general schedule, charge every 30-45 days;

5) Check battery when the green status of indicator at battery are invisible, then charge or replace battery;

Low-Maintenance battery

1) Ensure that the battery electrolyte fluid level in the UPPER LEVEL.

2) Disconnecting negative earth wire to avoid discharging by additional current release;

3) Keep the battery charge completely if the battery can not be removed down from truck;

4) Make a general schedule, charge every 30-45 days;

5) When the liquid level below the LOWER LEVEL, please add water to the UPPER LEVEL, do not add, no measure will overflow corrode your vehicle!

12.2.3 Notice for usage

Battery can produce explosive gas, electrolyte has corrosive, and the current can burn skin from battery producing, please flush immediately when electrolyte touch skin or eyes, then go to hospital if serious.

1.Human body, especially the head should be far away from battery, and the protected glass must be wearing.

Forbid battery emerging in naked fire or spark.

Connect active and negative pole with electrical equipment correctly to avoid burning battery or electrical equipment.

To avoid short circuit of battery, the electric things are forbidden to cover at battery.

12.2.4 Check the battery

Check the Maintenance-free battery

The indicator of the electric eye will be green when the capacity is normal, density of electrolyte reaches the standard; it will be white when capacity is not enough, density of electrolyte does not reach the standard; it will be red when the electrolyte is acute shortage, the shell should be carefully examined whether there is rupture, leakage or battery failure.

The indicator of battery see particularly the prompt of the battery label.

Check the Low-Maintenance battery

As the forklift is used in a high temperature ambient ,and the battery easily consumes water, you should do pay attention to the liquid level when using the forklift. There is an aperture for adding liquid in the cover of the battery. Please add enough water up to the UPPER LEVEL when the liquid level is below the LOWER LEVEL and be sure the water is not so much that can spill out to erode your forklift.

When lacking of the electrolyte, please check whether the surface is damaged or leaky, or the battery is conking out.

XIII. Maintenance Record

Date	Maintenance content	Signature	Remark

Date	Maintenance content	Signature	Remark

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