

Enforcer series
OPERATION MANUAL

1-10T Enforcer series Internal Combustion
Counterbalanced Forklift Truck

Operational and Maintenance Manual



Original Instruction

Foreword

1-10T Enforcer series internal combustion forklift is a new developed forklift of Fork Force Australia, it owns characteristics as energy conservation and environment protection, novel structure and superior performance. This manual introduces safety, operation, transportation, lubrication, brief structure and maintenance method of trucks. Driver, maintenance personnel and equipment manager must read and comprehend this manual before use.

Because of the update and improvements of our products, there may be some differences between this operation manual contents and your forklift truck.

Illustration adopted by this manual may vary from your truck structure.

This manual is also available for container forklift and forklift equipped with attachment.

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I. General rules

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

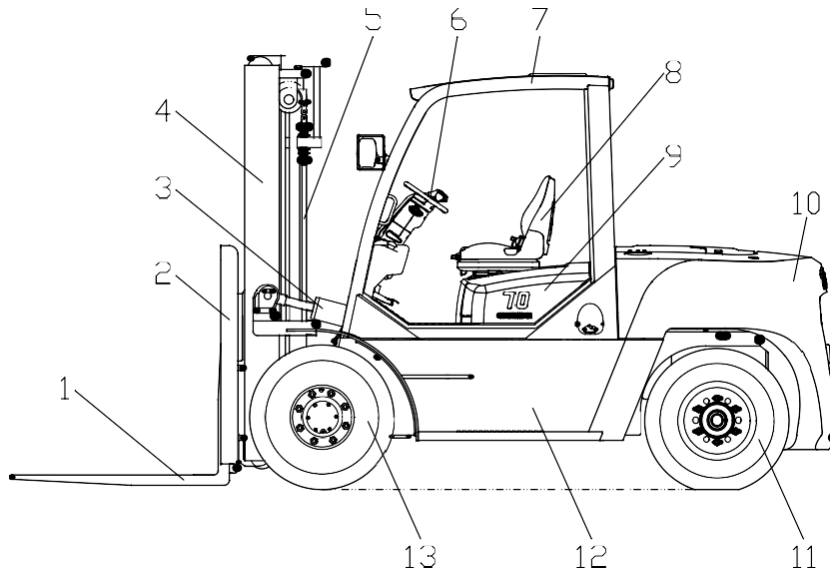
- 1.** Only trained and authorized operators shall be permitted to operate the truck.
- 2.** Before starting truck you should check all control and alarm devices; if any are damaged, DO NOT operate until it is repaired.
- 3.** When carrying a load, do not overload. The forks should insert in the load 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 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.** 5-10 t trucks are 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:

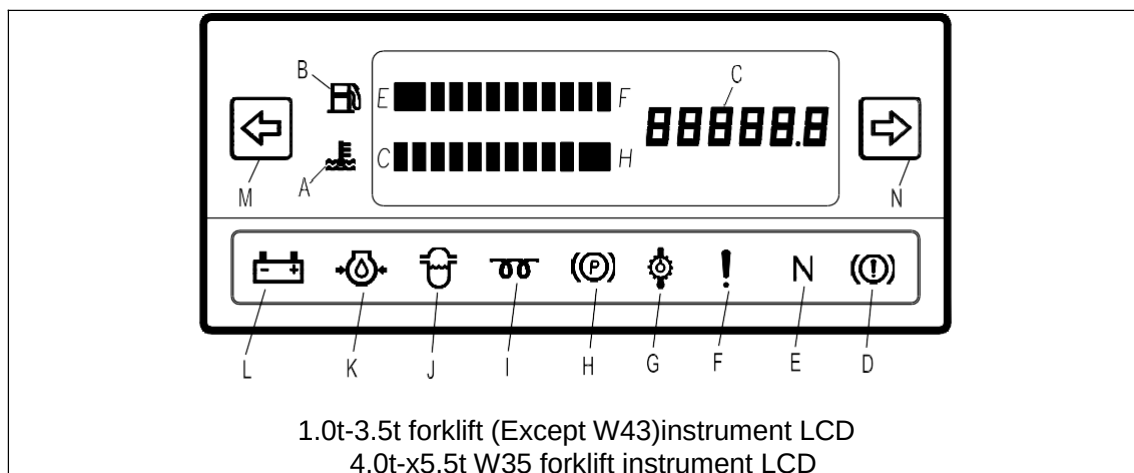
- (1) Arrange for the modification or alteration to be designed, tested and implemented by an engineer(s) expert in industrial trucks and their safety;
- (2) Maintain a permanent record of the design, test(s) and implementation of the modification or alteration;
- (3) Approve and make appropriate changes 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. Name of main parts or component

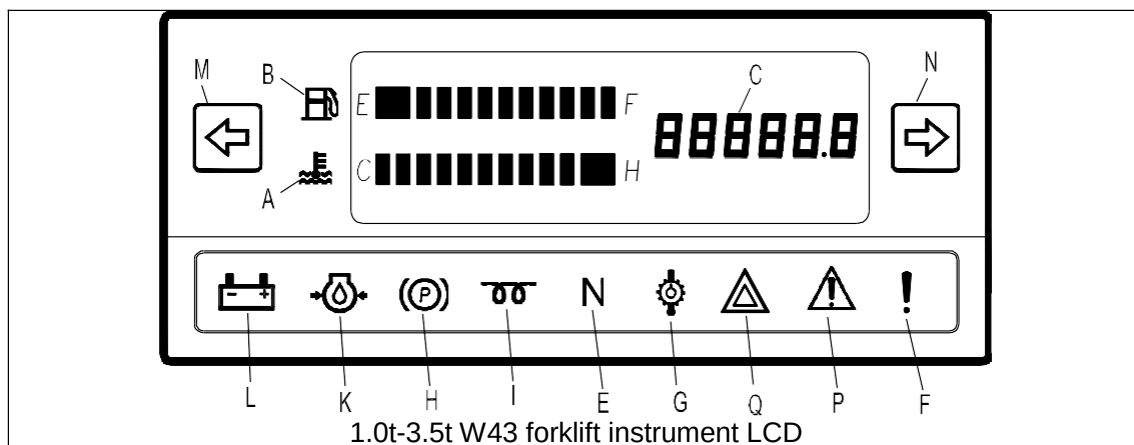


- | | | | |
|------------------|---------------------------|-------------------|----------------|
| 1. Fork | 2. Load backrest | 3. Tilt cylinder | 4. Mast |
| 5. Lift cylinder | 6. Steering wheel | 7. Overhead guard | 8. Seat |
| 9. Cover hood | 10. Counterbalance weight | | 11. Rear wheel |
| 12. Truck frame | 13. Front wheel | | |

1. Instruments



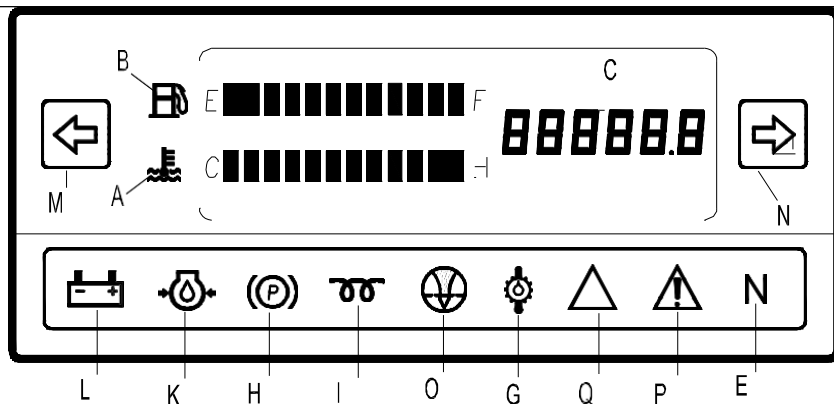
- | | | |
|---|--|-----------------------------|
| A. Water temperature gauge | B. Fuel gauge | C. Timer |
| D. Accumulator warning indicator | E. Neutral position start-up indicator | F. OPS indicator |
| G. Transmission oil temperature warning light | H. Parking indicator | I. Preheat indicator light |
| J. Oil water separator Indicator light | K. Engine oil pressure warning light | L. Charging indicator light |
| M. Left turning indicator | N. Right turning indicator | |



- | | | |
|--|----------------------------|---|
| A. Water temperature gauge | B. Fuel gauge | C. Timer |
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| H. Parking indicator | I. Preheat indicator light | K. Engine oil pressure warning light |
| L. Charging indicator light | M. Left turning indicator | N. Right turning indicator |

P. Engine fault indicator

Q. Severe warning indicator



5.0t-10.0t forklift instrument LCD
 4.0t-x5.5t W57 forklift instrument LCD
 4.0t-x5.5t W58 forklift instrument LCD

A. Water temperature gauge

B. Fuel gauge

C. Timer

E. Neutral position start-up indicator

G. Transmission oil temperature warning light

H. Parking indicator

I. Preheat indicator light

K. Engine oil pressure warning light

L. Charging indicator light

M. Left turning indicator

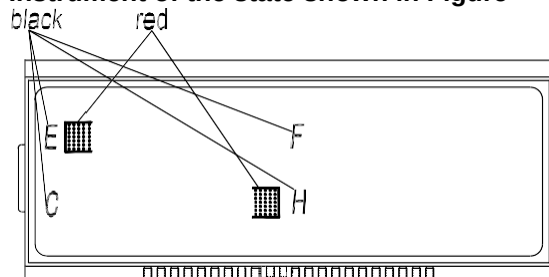
N. Right turning indicator

O. Air filter indicator

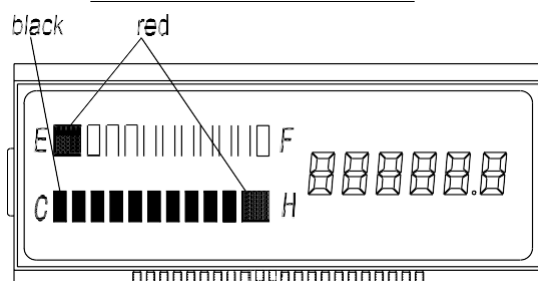
P. Engine fault indicator

Q. Severe warning indicator

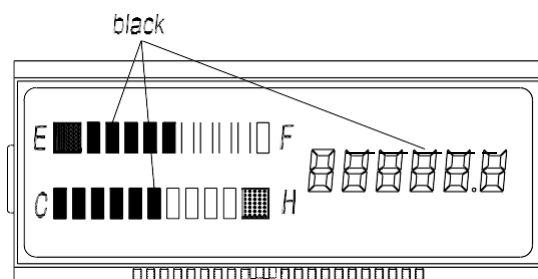
Instrument of the state shown in Figure



Display at non-working condition



Display when it is at working condition which water temperature is too high, oil level is too low



Display at normal working condition

Water temperature gauge [A]



This gauge indicates the oil temperature in the torque converter transmission box when the key is at **I** (ON) position. In normal status, LED Displayed in the range of 40 °C -110 °C



Caution

If LCD display in the red zone, please stop the truck at once. Decrease the engine speed to make the engine cool. Check the cooling fluid if enough and the fan belt's elasticity if fit.

R_{25} R_t	$100K \Omega$ 3950	LCD display effect
50	3.588	C ■■■■■■■■■■ H
60	2.476	C ■■■■■■■■■■ H
70	1.743	C ■■■■■■■■■■ H
80	1.250	C ■■■■■■■■■■ H
85	1.065	C ■■■■■■■■■■ H
90	0.911	C ■■■■■■■■■■ H
95	0.7824	C ■■■■■■■■■■ H
100	0.6744	E ■■■■■■■■■■ H
105	0.5836	E ■■■■■■■■■■ H
110	0.5066	E ■■■■■■■■■■ H
120	0.40708	C ■■■■■■■■■■ H

Fuel gauge [B]



The gauge indicates the fuel level in the tank when the key is at **I** (ON) position.

Suggest filling up the fuel tank after work every day.

Fuel tank capacity	LCD display effect	Resistance (Ω)
Lowest C	E ■■■■■■■■■■ F	11K
Warm Level	E ■■■■■■■■■■ F	11K
1/10	E ■■■■■■■■■■ F	10K
2/10	E ■■■■■■■■■■ F	9K
3/10	E ■■■■■■■■■■ F	8K
4/10	E ■■■■■■■■■■ F	7K
1/2	E ■■■■■■■■■■ F	6K
6/10	E ■■■■■■■■■■ F	5K
7/10	E ■■■■■■■■■■ F	4K
8/10	E ■■■■■■■■■■ F	3K
9/10	E ■■■■■■■■■■ F	2K
Highest I	E ■■■■■■■■■■ F	1K

Hour meter [C]



This meter measures working time of engine when the key is at **I** (ON) position. The meter increase one number every working hour. Use meter to schedule lubrication and maintenance periods.

Accumulator warning indicator [D]



This indicator light does not work on the forklift.

Neutral position start-up indicator [E]



Put the steering handle in the neutral position when truck on the temporarily stop, the light will indicated on

The truck can be started up only in the neutral position.

It's prohibited for truck in the neutral position slipping when it's on the slope.

OPS indicator [F]



When this light is on, it means driver leave the seats or not sitting on the seat correctly.

Transmission oil temperature warning light [G] (Hydraulic Forklift)



In normal state, once the starter is set to "ON" position, this lamp lights up. After the engine is started up, it goes out.

During work time if the oil temperature exceed the normal rang(60~120° C) the indicator light on.

pointer goes into the green range, and have a check then.

Parking indicator [H]



Parking indicator shows on means brake is affected, Please loosen the parking handle (hand brake handle), the parking indicator will shows off.



Warning

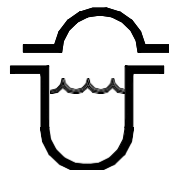
It will damage the engine and transmission, etc. when indicated.

Glow indicator (I) [Diesel truck]



Turn the key to "ON" position and the indicator lights up for a moment. After the indicator goes out, turn the key to **II** "Start" position

Sedimentor indicator (J) [W10,W55,W56 diesel truck]



In normal state, once the starter is set to "ON" position, this lamp lights up. After the engine is started up, it goes out.

This lamp lights up when water in sedimentor reaches to a certain level, while the engine is running.

If this lamp continues to stay lit or lights up during the engine running, stopping the engine and discharge water immediately.



Caution

If continue working when the lamp is light. The fuel injection pump may be damaged.

**Caution**

If the pointer enters the red range, stop the operation instantly and slow down engine speed to cool the coolant and wait until the

Engine oil pressure alert lamp (K)



This lamp indicates the pressure condition of engine lube oil. Although it lights up when the engine switch is set at "ON", once the engine starts up and the accelerator pedal is pressed, this lamp goes out.



Caution

If this light continues to stay lit or lights up during operation, the pressure is lower than 0.05Mpa and should be checked immediately.

Charging indicator (L)



This lamp indicates the battery condition of charge. The lamp comes on when the ignition switch is set at "ON", but it goes out as the engine starts and accelerator pedal is pressed.



Caution

If the light continues to stay lit or lights up during operation, the charging rate is low and should be checked immediately.

Left turning indicator [M] Right turning indicator [N]



When the truck turns left, the indicator is set forward, the lamp lights up.
When the truck turns right, the indicator is set backward, the lamp lights up.

Air filter indicator [O]



When the light is on, it indicates the air inlet system is blocked, stop the truck and clean the

Engine fault indicator [P] [Electronic-controlled engine]

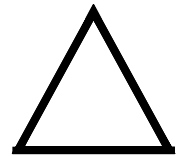
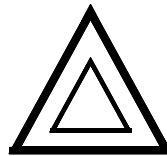


1.0t-3.5t(Except W43 Cummins engine): This indicator does not work.

4.0t-7.0t: W57 PSI engine forklift truck: When the engine gets out of order, this Indicator will be on. Please stop and eliminate the failure.

Only Cummins engine forklift truck :
When this light is on, it means one important engine working is beyond the prescribed limits of engine protection calibration, engine power can be reduced, you must stop and check.

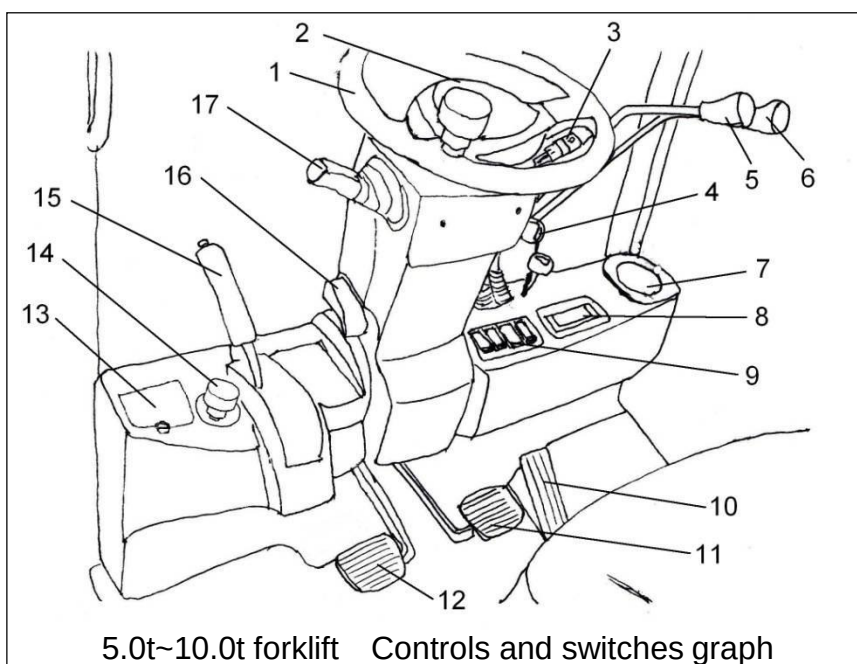
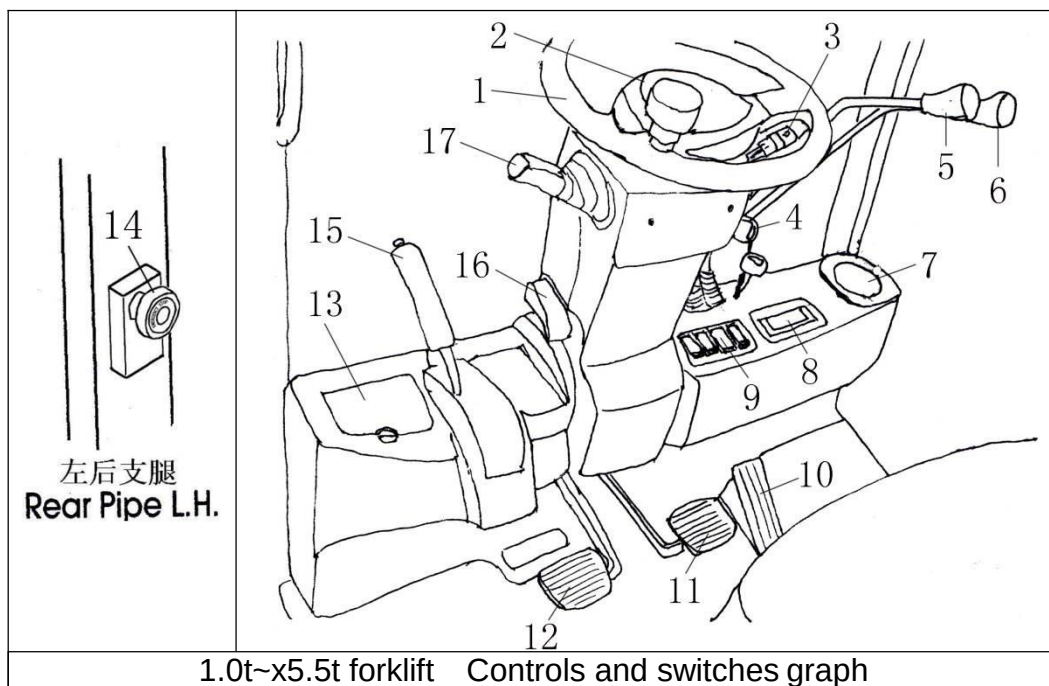
Severe warning indicator [Q] [Electronic-controlled engine]



Only Cummins engine forklift truck:
When this light is on, it indicates the engine is in severe work condition and the engine power reduced severely. If condition stays and starts engine protection shut-down, then this indicator will flash 30 seconds before engine shut down to warn the impending shut-down.

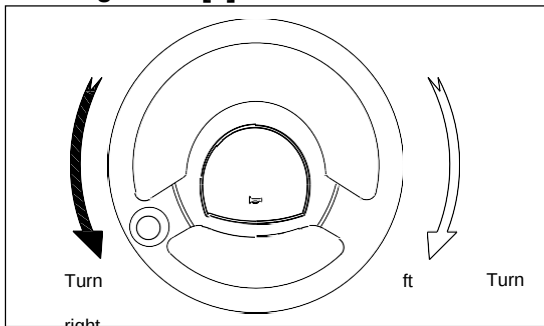
air filter.

2. Controls and switches



1.Steering wheel	2.Horn	3.Combination switch
4.Key switch	5. Lift control lever	6. Tilt control lever
7. Cup holder	8.Instrument	9. Rocker switch
10. Accelerator pedal	11. Brake pedal	12. Inching pedal
13. Wiper spray lid	14.Emergency disconnect switch	15. Parking brake lever
16. Steering wheel adjustment switch		17.Reversing lever

Steering wheel [1]



It controls the movement direction of truck. Rotate counterclockwise, the truck moves to the left; rotate clockwise, then moves to the right



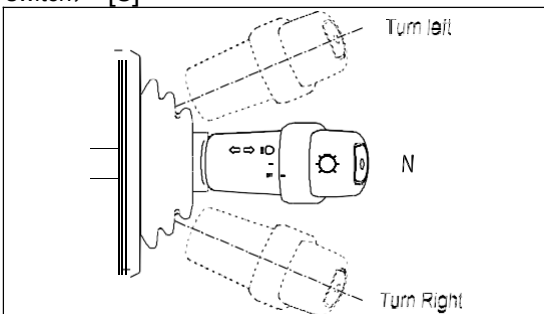
Warning

This truck is provided with the power steering, so heavy hand-wheel operation is caused when the engine comes to a stall. To put the power steering in operation again, restart the engine without delay.

Horn button[2]

Press the button in the center of steering wheel, the horn will sound.

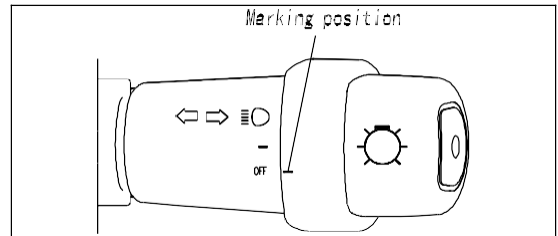
Combination switch (Turn signal switch/light switch) [3]



Use this lever which is at the right side of steering column to indicate the turning direction of the truck.

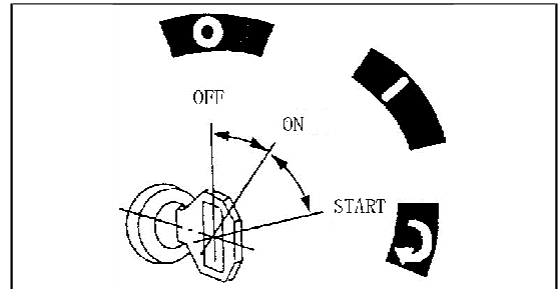
Forward-left turn light, **N**-neutral, **Backward**-right turn light

The turn signal lever does not automatically return to the neutral position unlike general passenger cars. It must be returned to the neutral position manually.



Turn on the headlamp and small lamp, turn this switch, and aim the position line on the switch knob to the relevant marking on the switch subject.

Key switch[4]



O (OFF): This is the position at which the key may be inserted or removed

| (ON): The electric circuit is closed with the starter switch at “ | ” (ON). After the engine starts, the key remains in.

↻ START: When the key is turned to the ↻ position, the starter motor is engaged. Switch returns to the “ | ” position automatically after starting.

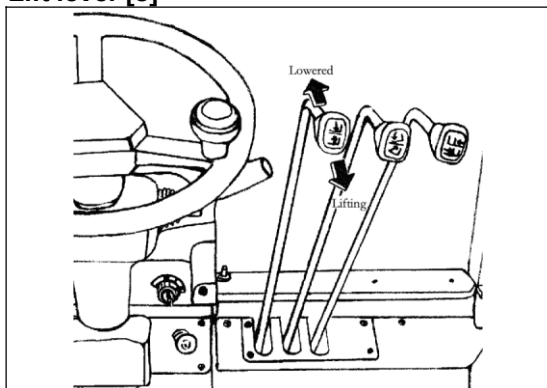
Turn the key to “ | ” position, the indicator light[I] will come on momentarily. After the indicator light goes out, turn the key to “↻” position.



Caution

1. Do not leave the key in the “ | ” position when engine is off. Doing so will discharge battery.
2. Do not turn key to the “↻” position when the engine is running. Doing so may damage the starter motor.
3. Do not keep key in the “START” position for more than 5 seconds at a time. Wait about 2 minutes between attempts.

Lift lever [5]



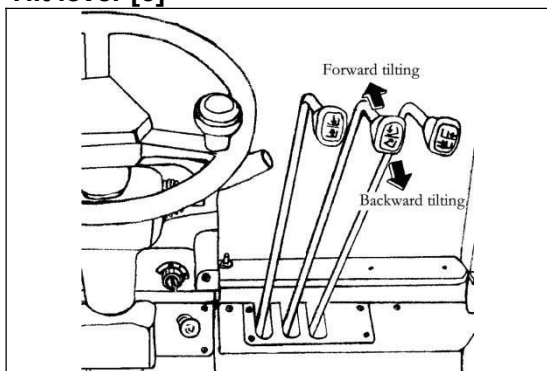
Controls the forks' up or down.

Push forward—lowered

Pull backward—lifting

Lifting speed is controlled by tilting backwards angle of lever and accelerator pedal. The lowering speed can be controlled by tilting forwards angle of the lever.

Tilt lever [6]



It is used for forward and backward tilting of mast.

Push—tilt forward

Pull---tilt backward

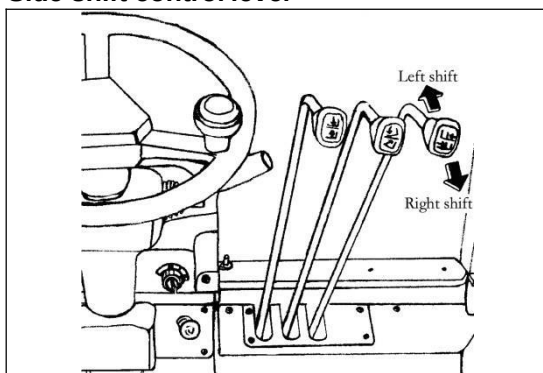
The tilting speed is controlled by tilting angle of the lever and accelerator pedal effort.



Caution

The tilt lock mechanism in the hydraulic control valve will not allow the mast to tilt forward while the engine is being shut down, even if the tilt lever is pushed forward.

Side shift control lever



Used for left shifting and right shifting of the side shift bracket.

Push forward-move to the left

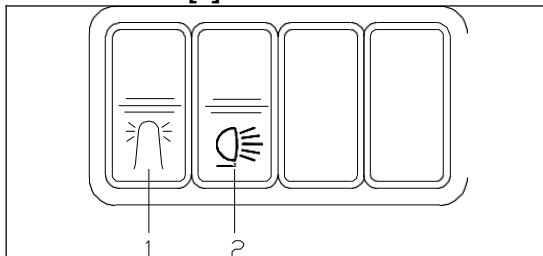
Pull backward-move to the right

Side shifting speed depends on the tilting angle of the handle and accelerator control. Different attachment type has different working way, so the operator must be familiar with the operation.

Cup holder[7]

It is in the right side of the instrument. It's designed for the operator to put the cup.

Rocker switch[9]



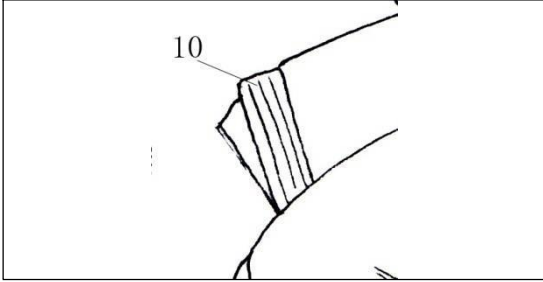
1 Warning light.: Press backward, the warning light is on; press forward, the warning light is off.

2 Rear headlamp switch: Press backward, the rear headlamp is on; press forward, the rear headlamp is off.

There may be some difference with the rocker switch if with cab. Add ventilation, anti-fog or other functions.

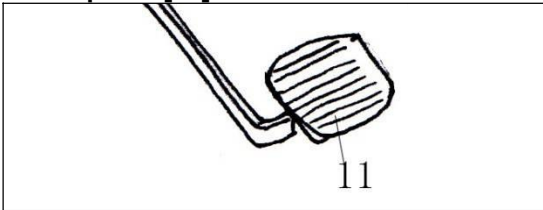
Pedal

Accelerator pedal [10]



Depress accelerator pedal to increase speed.
Release pedal to decrease speed.

Brake pedal [11]



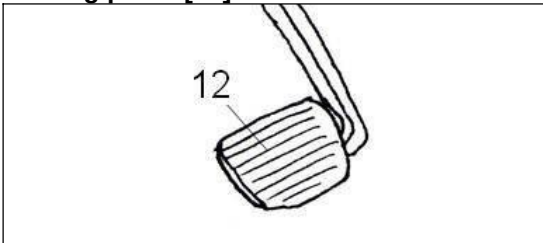
Depress the pedal partially to slow vehicle motion. Depress it fully to bring vehicle to a stop. Release the pedal to resume vehicle motion.



Caution

Avoid sudden braking which can cause vehicle rolling over or cargo falling, and lead to accidents.

Inching pedal [12]



Depress the pedal partially to decrease hydraulic oil pressure. Use inching pedal for forklift loading and unloading, and when slow speed is required. When pedal is depressed all the way, forklift will slow to a stop.



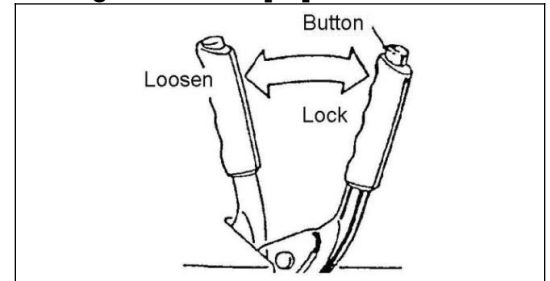
Caution

Do not use the inching pedal too much, as it will cause transmission oil temperature to rise and the clutch to slip.

Emergency disconnect switch [14]

Press the emergency disconnect switch, disconnect electrical appliance with battery. Re-start the truck, pull up the switch. After shut down, turn off the switch in 30 seconds.

Parking brake lever [15]



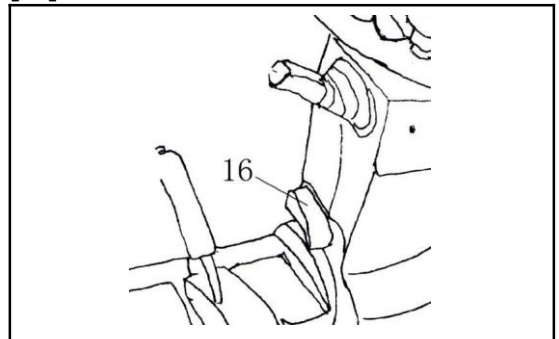
Pull lever backward to set the parking brake, push lever forward to release the parking brake. Always set parking brake before leaving the truck.



Caution

In case of brake system doesn't work or there is an emergency, you can tighten this lever to stop the truck in urgency. Normally it is prohibited to use parking brake as service brake.

Steering column tilting angle adjustment [16]



The tilting angle of the steering wheel is adjustable to suit individual operators. The steering column is unlocked by pushing down the lever at the left side of turning rod, then adjust the angle suit to the driver, and pull up the lever to lock.



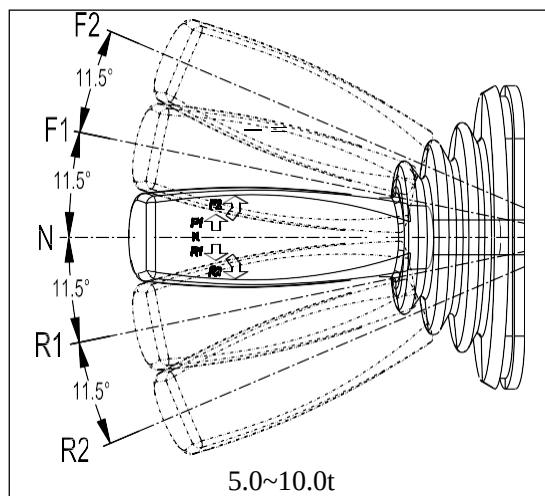
Caution

- After stop the truck and pulled up the hand brake, then adjust steering wheel angle.
- After adjustment, pull the steering wheel to make sure if locked.

Reversing lever [17]

It's installed on the left of the steering column. These series forklift trucks are electronic reversing, push or pull this lever to realize the following functions:

1.5~3.5t	F	Forward
	N	Neutral
	R	Reverse
4.0~X5.5t	F2	Forward 2 gear
	F1	Forward 1 gear
	N	Neutral
	R	Reverse
5.0~10.0t	F2	Forward 2 gear
	F1	Forward 1 gear
	N	Neutral
	R1	Reverse 1 gear
	R2	Reverse 2 gear

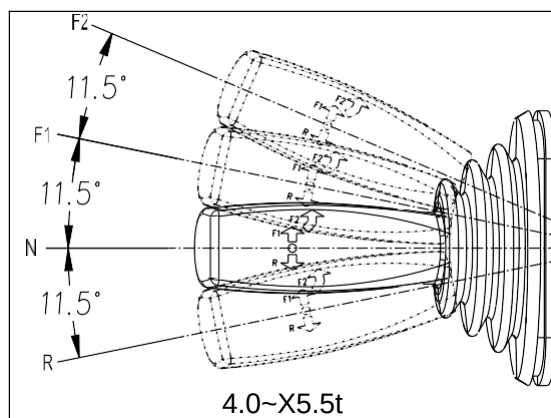
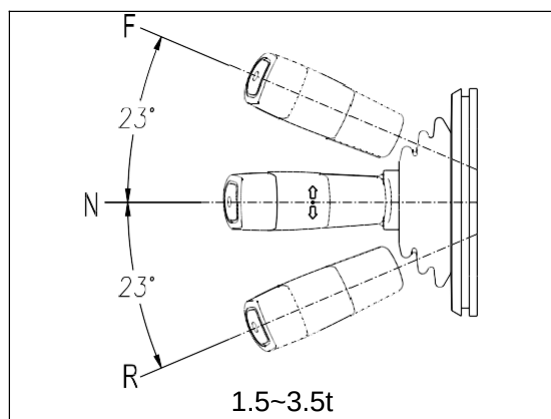


Before changing travelling direction, step the brake pedal until the truck completely stops, then move the lever forward to F1, and move to F2 through F1; if retreat needed, step the brake pedal to slow down the truck, move backward to R1, and then move to R2 through R1.



Caution

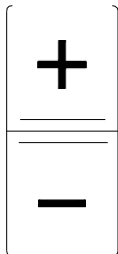
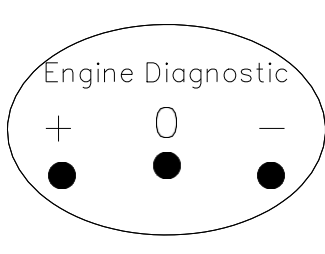
Only place the lever in neutral can you start the engine



Engine malfunction detect switch (Only for CUMMINS engine)

2.0t-3.5t: W43	5-10t: W38, W46, W28, W48
4.0t-X5.5t: W58	

Engine detect page turning switch (Only for CUMMINS engine)

2.0t-3.5t: W43 4.0t-X5.5t: W58	5-10t:W38,W46,W28,W48
	

When the engine has something wrong, put the Key Switch at the position **I** (ON) ,

“Engine detect”switch at “Fn” or “ON”, ,

Indicator is always on,  or  Indicator display fault code by various frequency, remove the trouble according to fault code.If there are multi-malfunction,you can watch other malfunctions by using “Engine detect page turning”.After remove the malfunctions,

,  or  indicator go out.Put

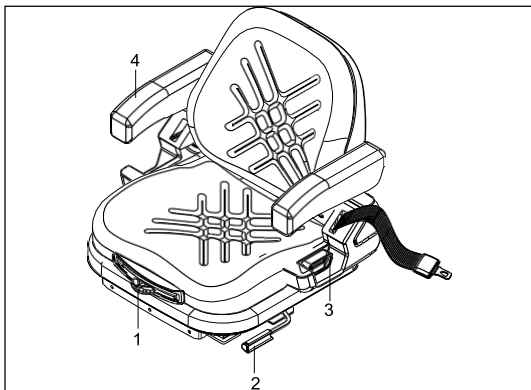
“Engine detect”switch at “OFF”,Key switch **O** (OFF) , start the engine only after 30seconds can.

3. Truck body and others

Load backrest

The load backrest improves stabilization when loading goods. Never use forklift truck without the load backrest.

seat



- 1: Weight adjustment lever
- 2: Forward and rearward adjustment lever
- 3: Backrest angle adjustment lever
- 4: Armrest adjustment knob

•Weight adjustment on the seat

Pull up the weight adjustment lever and then move the lever to left or right side horizontally to adjust the seat to the driver's weight where it's comfortable for driving and working.

•Forward and rearward adjustment of the seat

Move the lever to inner side with hands, and then move the seat assembly forward or rearward to adjust the seat to a proper position. When the handle is released, the seat will be locked automatically.

• Angle adjustment of foldable seat backrest

When seated on a seat, lay the back on the seat backrest and pull the backrest angle adjustment lever upward with left hand. Do not release the lever until a proper position is fitted to the seat by moving the body forward or backward.

•Armrest Adjustment

The inclination of the armrests can be modified by turning the adjustment knob. When turning the knob to the outside the front part of the armrest will be lifting, when turning the knob to inside it will be lowered.

⚠ Warning

- Turn off the key before adjusting the seat.
- It's prohibited to adjust the position of the seat only when the truck stops.
- In case of accident, no seat adjustment is allowed in the process of travelling
- Make sure the lever is moved completely to separate the seat structure before the forward and rearward adjustment of the seat and angle adjustment of seatbackrest.
- After adjustment, each lever should be back in place. Before using the truck, make sure the lock of every part is reliable.

Safety belt

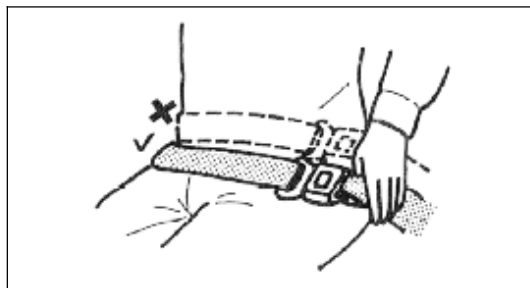
- Fasten safety belt

Belt was huddled up in the box. There is a secondary action to draw out the belt. So you may meet some trouble due to not be familiar with it.

One kind of seat: this needs to press the white circular button (with the words: press to release) by one hand, then the belt can be pulled out by the other hand and inserted into the socket.

You may also meet another seat: the belt box is adjustable. Rotate the belt box forward, the belt can not be drawn out. Rotate the belt box backward, the belt is drawn out. Insert the belt into the socket of the other side. Rotate the belt box forward again and then the belt is in normal working position.

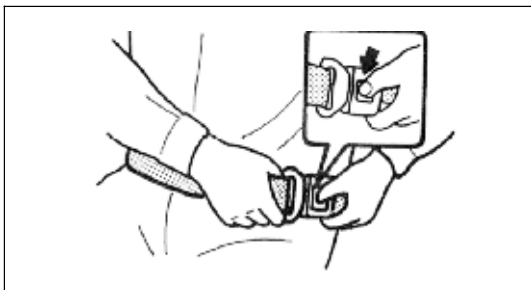
Please fasten the belt when get on the truck. Meanwhile, let the back and waist close to the seat. Don't tie the seat in the abdomen.



Please don't have the seat backrest tilted excessively. Otherwise, the belt can not be

extended correctly.
Prohibit use the belt knotted or twisted.
To tie the belt in the daily operation will protect you when the truck turn over and reduce the harm.

• Unfasten the belt



Use left pollex to press the red button (with the word PRESS) in the socket, it's untied.

• Check the belt

Regularly check the bolt of the fixed belt if it becomes loosened. Don't put the belt in the hard or frangible objects and prevent from grinding with the sharp blade to avoid any damage. It is prohibited to remove any parts of the belt. The belt, used frequently, often needs to be checked.

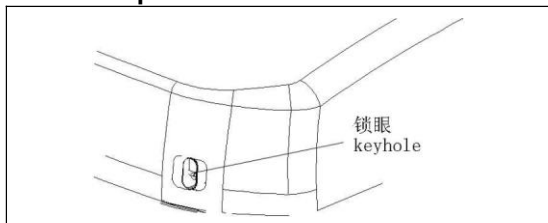
- cut or frayed straps.
- worn or damaged hardware, including anchor points.
- buckle or retractor malfunction.
- loose stitching.

If find it abnormal, please change the new belt immediately. The service life of the belt is three years, so reject it in advance if it's abnormal.

Overhead guard

DO NOT operate forklift without the overhead guard. It is designed to protect the operator from falling objects and meets the safety standard.

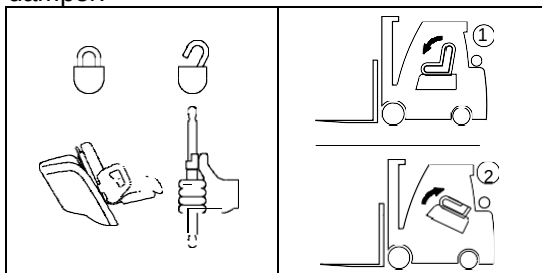
Lock components



To avoid opening the hood at discretion, the truck is equipped with lock. Use the key to open the hood.

Hood

The hood can be swung up fully to provide easy maintenance service. You can lift up the hood with little effort with an aid of hood damper.



To lock the hood, press the red button on the air spring pipe. The lock button is unstuck this time, then push down the button on the front of hood until you hear a rattling sound. It means the hood is locked.



Caution

The hood needs key to open of CE truck. Turn the key to horizontal position, and then press the key forward to open hood.

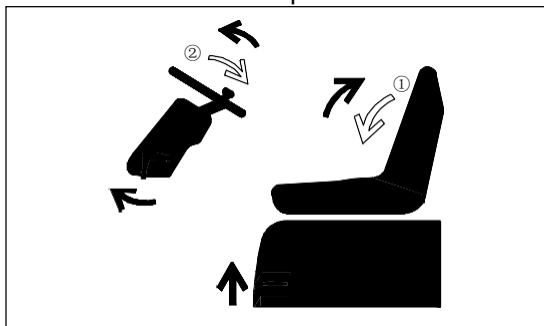
Use caution not to catch your fingers in the hood while closing it.



Warning

While performing maintenance under the hood, the engine must be off to avoid injury to hands or other body parts. The engine can be running in order to troubleshoot some problems, however, DO NOT place body under hood while it is running.

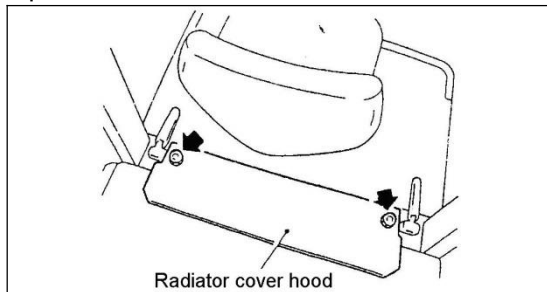
Before opening hood, please move steering wheel forward, tilt seat back forward. After closing hood, reset steering wheel and seat back to their initial position.



Radiator cover hood

When the engine cover is closed, this radiator

cover hood can be removed to check cooling liquid.



Caution

Reinstall the radiator cover hood and tighten the bolt by hand.

Fix up this part by inner hexagon bolts for truck exported to Europe. Use socket spanner to loose before remove; reinstall and tighten the bolt by socket spanner.

Radiator cap and coolant reservoir

The reservoir is located inside the hood. The radiator cap is located under the cover plate at the rear of the hood.

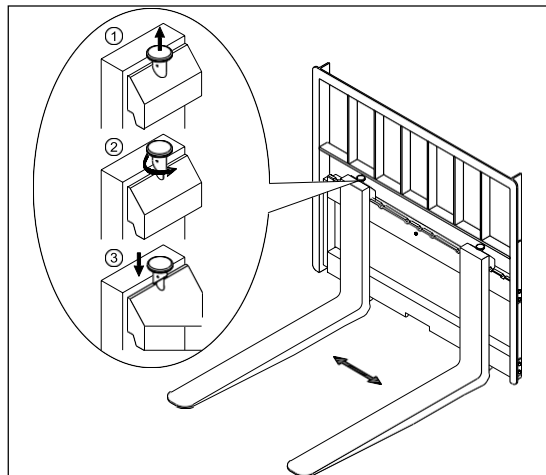


Warning

- When the water temperature of the engine is higher than 70 degrees Celsius, do not open the pressure cap of the radiator. Loosen cap slowly to allow steam to escape. After that, tighten cap securely. It is good practice to use a thick waste cloth or the like when removing the cap.
- Do not wear gloves when removing radiator cap.
- Antifreeze is harmful to a person, if swallowed, seek medical advice immediately. Keep antifreeze away from children.

Fork stopper

Use it to adjust fork spacing. Pull up fork stopper, turn 180°, adjust fork spacing depending on the load to handle.



Warning

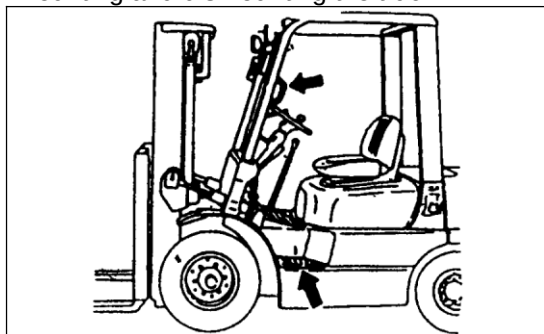
The forks should be set symmetrically to machine centerline and fork stoppers should always be set

The lower beams of the fork have an opening section to load or unload forks.

DO NOT set the forks over the opening. Check the bolt at the middle of the fork bracket used to prevent fork load at the opening.

Safety step and safety grip

Safety steps are provided on both sides of the truck body. The safety grip is located on the left and right sides of the overhead guard. Use both the safety step and safety grip when mounting and dismounting the truck.



Hydraulic fluid reservoir cap

The hydraulic fluid reservoir cap is located on the right side of the hood. Open the engine hood when adding oil. Fill hydraulic fluid through this filler port and lock the cap after filling hydraulic fluid.

Fuel reservoir cap



Fuel reservoir cap without lock



Fuel reservoir cap with lock

The fuel reservoir cap is located on the rear left side of the truck body. The fuel reservoir cap has a breather inside it to allow air to enter the reservoir. Check to see that the breather is in good condition every time fuel is added.



Caution

1. Stop the truck, shut down the engine and apply the parking brake securely. Make sure there is no naked flame near the area. DO NOT smoke while handling fuel. DO NOT remain seated when adding fuel.
2. After adding fuel, securely close the reservoir cap. A loose cap could cause a fuel leak or lead to a fire hazard.
3. Before starting the engine, make sure no fuel has spilled on or around the truck.
4. NEVER use light flame to check the fuel level.

Cab rear window

When ventilating or opening the hood, you need open the rear window.



Caution

For 1-3.5t LPG truck, you may touch the

cylinder when opening the rear window, so you need to turn over the cylinder, after pushing away the rear window, resume the cylinder to original position.



Cylinder bracket (LPG truck)

Cylinder bracket is back-rotated (Only for 1.0t-3.5t).

Under the following condition, you need turn the cylinder over:

1. Open the rear window and ventilate.
2. Open the hood and do not touch the rear window.

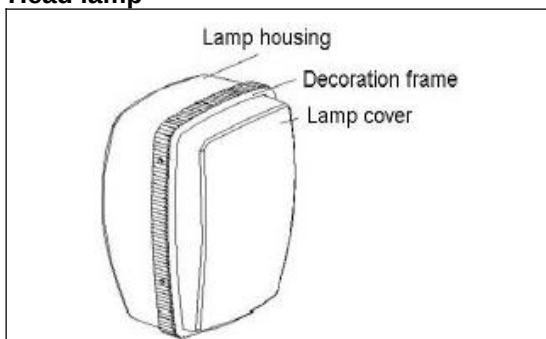


Rearview mirror



There are rearview mirrors on the upper right of overhead guard for operator to see behind the truck.

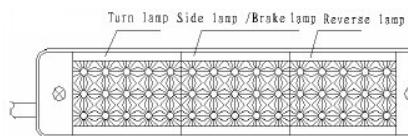
Head lamp



Disassembly and assembly of the head lamp

1. Dismantle the decorative frame;
2. Screw the four bolts at the back of the lamp housing and open the lamp housing;
3. Cut the lead wire, loosen the lock button, remove the lamp, change a new lamp and install;
4. Loosen the two fixed bolts of the width lamp, take out the lamp, check if the lamp is damaged. If it is, then, cut the lead-out wire close to the welding spot, change the new plate, weld again in the original place and install;
5. Rotate the turn light according to the arrowhead in the back of lamp holder in opposite direction. Take out the light, change a new one and install;
6. Close the lamp housing, screw the bolt and fasten up the decorative frame.

Rear combination lamp



Take apart the rear combination lamp from the overhead guard, pay attention to the safety

1. Take the whole rear combination lamp to the service place, take off the lamp housing, and screw off the four bolts at the back of the lamp housing
2. Take off LED plate, loosen two bolts fixed the connector, cut the connector, and change a new LED plate.
3. The installation procedure is contrary to the disassembly.

Accumulator (only for 5-10t)

The truck is equipped with accumulator. Only after the engine started, completely depressed the brake or changed direction, the braking pressure was established. Depress the brake pedal for 10s after the engine started. If brake pressure does not establish, alarm will keep sound.



Warning

1. After start the engine, step down the pedal a few times so that the pressure is established.
2. After engine flameout, there are limited times for brake(3-5 times for different model). Release the accumulator power, the truck is without any brake. In case of danger, don't jump from truck, strain hand brake, and have the truck slow stop.
3. Never allow that the truck coast on the ramp in flameout. Strain the hand brake, and then start the engine. If the engine couldn't start normally, don't start by slide. It relates to your safely.



Warning

Before maintaining brake system or hydraulic system, first shut off the engine, then step the brake pedal for 5-10 times continuously to release the power in accumulator. Otherwise there may be severe accident and endanger personal safety.



Caution

When turn the key to "ON" position, if the pressure switch gives an alarm, operator should start engine and step the brake pedal the limit position over 10s. The alarm will be released after the accumulator established the pressure.

III. Safety rules

1. Only trained and authorized operators should operate the truck.

2. Inspect the truck at periodic intervals for oil or water leaks, deformation, defects, etc. If neglected, the life of the truck will be shortened and in the worst, case a fatal accident could occur.

Make sure to replace the “key safety parts” during periodical inspection.

Wipe off any oil, grease or water from the floor board and foot and hand controls.

Shut down the engine before inspecting the engine and its allied components. Use extra caution when near the engine fan.

When inspecting the radiator or muffler, exercise caution to avoid being burned.

3. Any time you find that the truck is not functioning properly, stop the truck and report the condition to your supervisor.

When performing maintenance on the mast, front and rear lights, or other high places, be safely secured and take care not to slip

If any warning lamp comes on, move to a safe place and check or repair the trouble.

When performing maintenance, take care not to cut hands, head or other parts of body on truck edges.

Place a sign/label on a truck found to be defective.

4. DO NOT use open flame to check fuel, electrolyte or coolant levels.

DO NOT smoke while inspecting the battery, handling fuel or working on the fuel system. There is a danger of explosion.

Always have a fire extinguisher available when working on the truck.

Never fill the fuel tank while the engine is running.

5. Warm water temperature to 70°C before operation.

If the temperature of the water is above 70°C, DO NOT open the tank cap.

6. When using the truck in an enclosed space, make sure there is enough ventilation. If needed, use a ventilation fan.

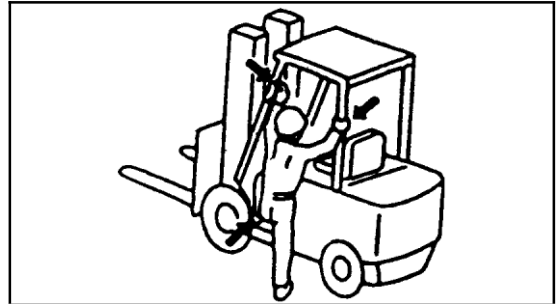
DO NOT work in a closed working space because exhaust gases are harmful.



Caution

Not allowed to used in underground.
It's forbidden to use truck under a circumstance of flammability and easy to blast.

7. Never mount or dismount a moving truck. Use the safety step(s) and safety grip when mounting or dismounting the truck.



8. DO NOT operate truck controls unless properly seated.

Before starting and operating the truck, adjust the seat so you have easy access to all hands and foot controls.

9. Make sure before starting:

①no one is under, on or close to the truck.

②the forward-reverse lever is in neutral.

10. Park the truck on a level surface and apply the parking brake securely. If the truck cannot be parked on a level surface, be sure to block the wheels.

Put the forks on the ground or floor and tilt them forward a little. Shut down the engine and remove the key.

11. Operate the controls smoothly, DO NOT jerk the steering wheel. Avoid sudden stops, starts or turns.

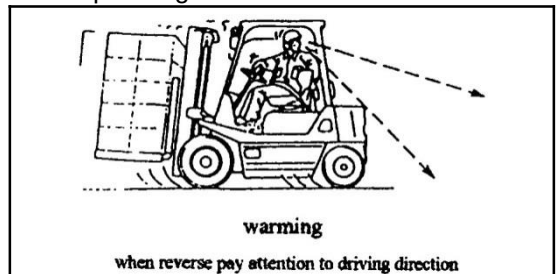
12. Control speed and observe traffic signs.



Caution

When traveling on public roads or streets, obey all local traffic regulations.

13. Be aware of your surroundings at all times while operating truck.



14. DO NOT allow passengers to ride on the truck, or allow people to sit on the forks or pallets.



15. Before driving over a dock-board or bridge-plate, be sure that it is properly secured and strong enough to sustain the weight of the truck/load. Check the ground or floor condition of working area in advance.



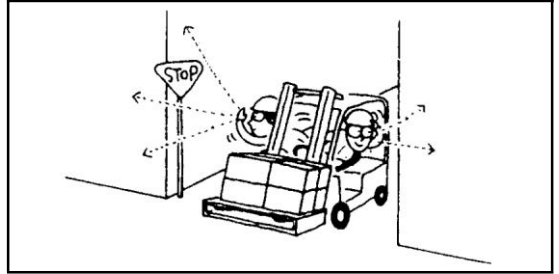
16. Keep your mind on your work.

17. Keep your head, hands, arms, feet and legs within the cab. Never place them out of the cab for any reason.



18. When handling bulky loads which restrict your vision, operate the truck in reverse or have a guide.

19. Slow down and sound horn at cross aisles and other locations where vision is restricted. The speed should be kept slower than 1/3 of max speed.



20. Keep fluid cans, row cotton, paper or chemicals away from the truck during operation since they may catch fire or explode due to exhaust gas from the muffler.

21. Use head lights and required work light and clearance lights at night. Travel at a slower speeds at night.

22. The work surface should be solid and level such as a cement road, asphalt or concrete road surface.

For truck operation, the following climatic conditions apply:

average ambient temperature for continuous duty: + 25 ° C;

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

lowest ambient temperature for trucks intended for use in normal indoor conditions:

+ 5 ° C;

lowest ambient temperature for trucks intended for use in normal outdoor conditions:

20 ° C;

altitude: up to 2 000 m.



Caution

Inspect the surface over which truck will operate. Inspect for holes, drop-offs, obstacles, and rough spots. Look for anything that might cause you to lose control of the truck, or cause the truck to bog down or turn over.

·Clear away trash and debris. Pick up anything that might puncture the tires or cause the load to become unbalanced

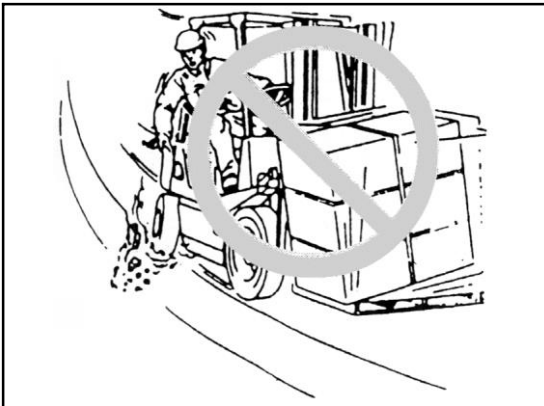
·Slow down when driving on wet and slippery roads. Stay away from the shoulder of the road. If you have to drive on the shoulder, use extreme caution

·Rugged surfaces cause truck vibration and noise. The high air pressure of the tires will cause vibration and noise as well.

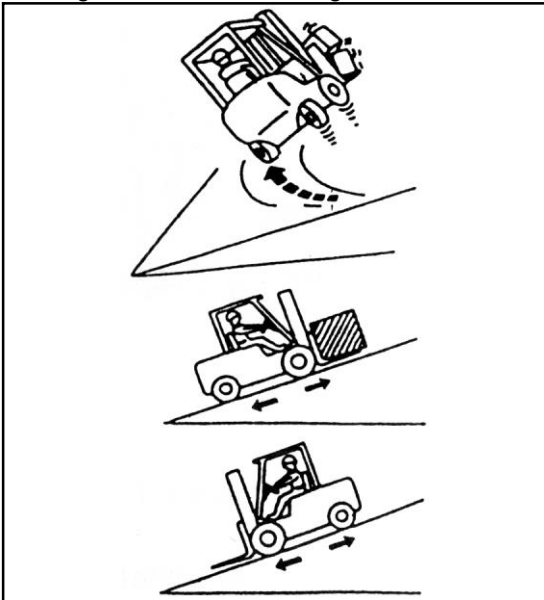


Warning

DO NOT operate the truck when the weather is inclement, such as wind storms, thunder storms, snow and etc.



23. When operating a loaded truck, have the rear end of the truck pointed downhill. When operating an unloaded truck, have the rear end of your machine pointed uphill. Never turn truck sideways on an incline. There is danger of the truck turning over.



24. When operating truck down on a grade, use engine idle speed. At the same time use the brake pedal intermittently.

25. It is dangerous to travel with forks higher than the appropriate position regardless of whether they are loaded or not. Maintain a good traveling posture. (When traveling, the forks should be 15 to 30 cm above the ground or floor.)

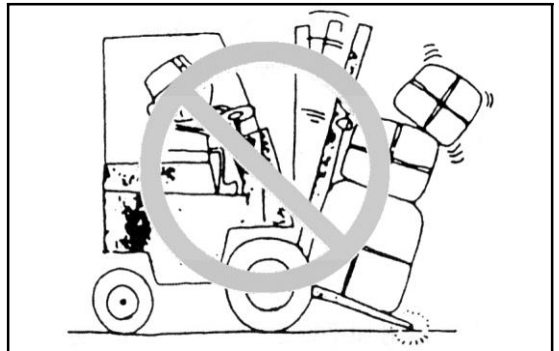
DO NOT operate the side shift mechanism, if equipped, when the forks are raised and

loaded, since this will cause the truck to become unbalanced.

A truck with attachments should be considered the same as a loaded truck.



26. Travel with load as low as possible and tilted back the mast.



27. Avoid braking too sharply or descending on a grade at a high speed. There is danger of loads falling down or the truck turning over.



28. Always brake to a full stop before reversing direction of travel; vice versa.

29. Take the shape and material of the loads to be handled into account when selecting the proper attachment and tools.

Avoid hoisting the load with wire rope hung from the forks or the attachment, since wire rope may slide off. If needed, qualified personnel should perform a sling operation, making use of a hook or crane arm attachment.



Caution

Make sure the fork does not protrude from under load. The protruding fork tips may damage or turn over an adjacent load.

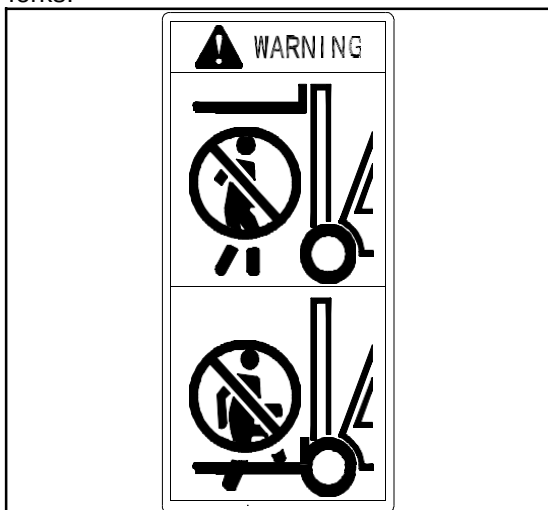
30. Know the rated capacity of your lift truck and its attachment, if any, and never exceed it. **DO NOT** use people as additional counterweights. It is quite dangerous.



31. Load back rest is in place to prevent hitting the higher goods. A load backrest is used to ensure stable loading. **DO NOT** use forklift truck without overhead guard and load bracket.

32. Never permit anyone to stand or walk under upraised forks or other attachments if machine is so equipped.

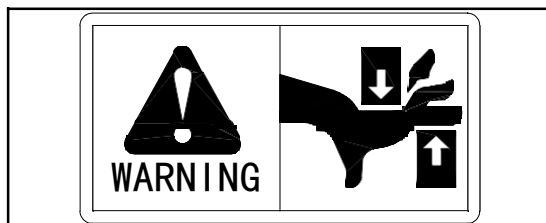
Never permit anyone to stand on the forks.



33. **DO NOT** put head or body into the interspace of mast and overhead guard which may cause loss of life.



DO NOT place hands into the interspace of inner mast and outer mast.



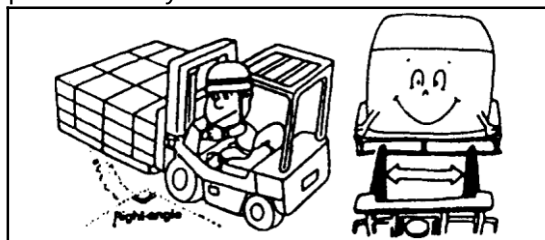
34. When driver's ear noise is bigger than 80dB, please adopt hearing protective measures.



Caution

Rough or uneven road surface and tyre deformation may largen noise value.

35. When load is to be retrieved from a pile, enter the area squarely. Engage forks into the pallet carefully

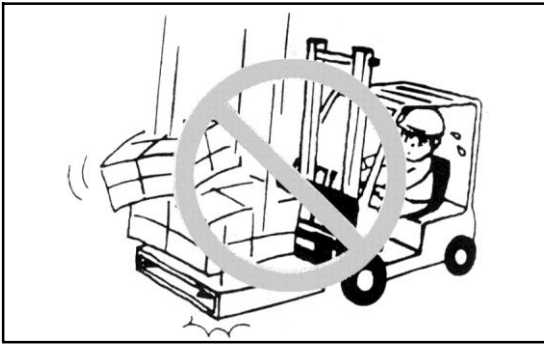


36. When traveling on rough roads or turning, stay to the center of the road to avoid losing the load or turning over.



37. **DO NOT** engage forks into loads at high speeds. Always make certain the load is stable before lifting the forks.

Be sure to stop in front of the load before engaging the forks, and make certain there are no obstacles, then engage the load by driving forwards.

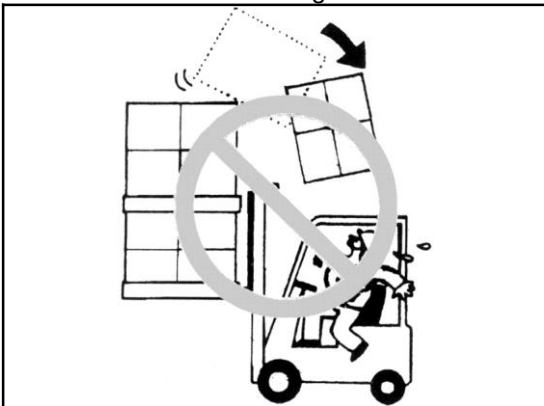


38. Make certain the load is well stacked and evenly positioned across both forks. **DO NOT** attempt to lift a load with only one fork.

On the truck with an attachment such as a load grab, make certain the load is securely and correctly grabbed, and pull the loading control level to the full (increase to relieve pressure).

39. Never lift loads when the truck is on an incline. Avoid loading work on a grade.

40. **DO NOT** stack loads on forks in such a way that the top of the load exceeds the load backrest height. If this is unavoidable, make the load as secure as possible. When handling bulky loads that restrict vision, operate the truck in reverse or have a guide



41. Use minimum forward and reverse tilt when stacking and unloading loads. Never tilt forward unless the load is over stack or at a low lift height.

When stacking loads on a high place, make the mast vertical when load is 15 to 20 cm above the ground before lifting the load further. Never attempt to tilt the mast beyond vertical when the load is raised high.

To unload loads from a high place, insert forks into the pallet and drive backwards, then lower the load. Tilt the mast back after lowering. Never attempt to tilt the mast with the load raised high.

42. **DO NOT** tow a truck that has engine problems, or whose steering system doesn't work properly, or if its braking system has been disabled.

Obey all traffic rules when towing the truck.

43. Dress appropriately for operating the truck (overalls or other protective uniforms, safety helmet, safety shoes etc.). Avoid wearing neckties or other articles of clothing which may present a hazard if they come into contact with truck components.

44. The workplace should be equipped with a fire extinguisher. In order to provide easy access to it, the fire extinguisher is usually installed on the safety frame rear supporting leg. The operator should be familiar with position of the fire extinguisher and its use.

45. Use a pallet when carrying small goods instead of the forks.

46. There are labels on the machine that display warnings and describe methods for operating the lift truck. When operating the machine, observe and follow all markings on the machine in addition to this operator's manual.

Replace damaged or missing decals and name plate.

47. Fork Force provides various attachments to the user, like rotating clamp, side shifter, jib and so on, which are for special use. If attachment configuration needed, it must be admitted by the factory. It is forbidden to configure attachment by yourself.

Replace damaged or missing decals and name plate.

IV. Maintenance

See *Preventive maintenance schedule* for further information.

1. Daily maintenance (8hours)

It is also used as check before operation.

1. Check leaks: electrolyte, hydraulic oil, brake fluid, coolant, and oil in hydraulic transmission gear box.



Warning

DO NOT operate truck if leaked fuel is found following pre-operational checks. Correct the leak before starting engine.

Check the engine, hydraulic pipe connector, radiator and driving system for leaks by touching and visual inspection. DO NOT use an open flame to check levels.

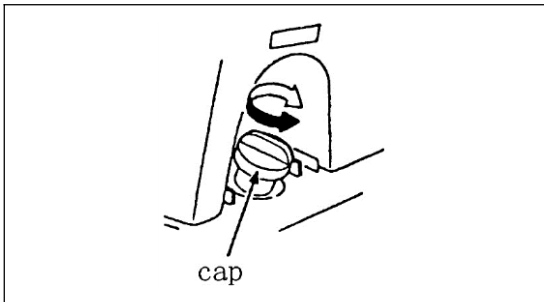
2. Check appearance

Visually check the lamps and meters for problems.

Check the tires, tire pressure and the entire truck for loose bolts

Check if the tyre is damaged, tyre pressure is normal.

3. Check fuel mass



A fuel level gauge is provided on the indicator panel. Make sure the fuel level is sufficient for the day's work. The fuel filler port is located at the rear left pillar of the overhead guard.

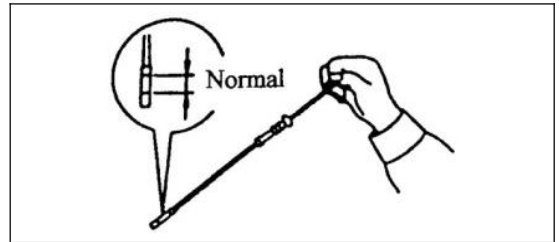
4. Engine oil level check



Caution

- When checking the engine oil, place forklift truck on level ground.
- Check engine oil when the engine is cool.

Remove the dipstick, clean the rod and reinstall. Pull it out again and check the oil level. The level should be within the marks on the dipstick



5. Check engine coolant

Inspect the small reservoir tank to see if the coolant level is between Min and Max position when the engine is cool. If is lower than "MIN", add to "MAX". If there is no coolant in the reservoir tank, check radiator coolant level. If insufficient, add coolant to radiator until to the radiator cap, its freezing point is -36.5°C, and fill reservoir tank with coolant to "MAX" position.



Caution

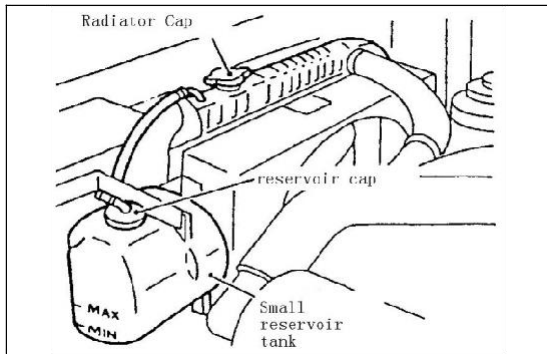
Add clean water to radiator. If you use antifreeze, make sure you use the same brand of antifreeze.

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



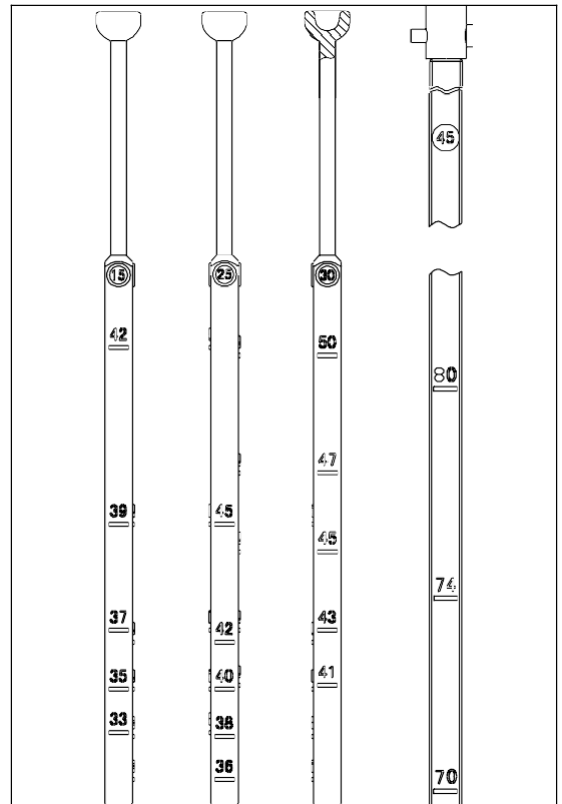
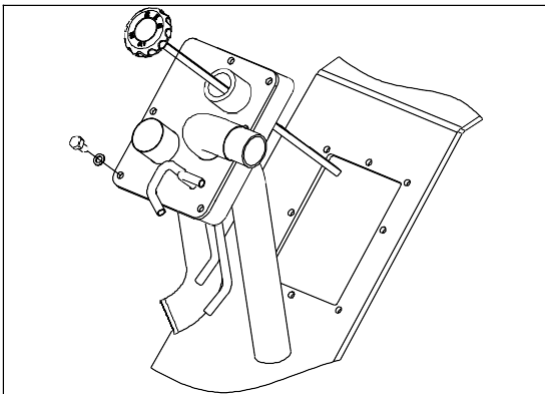
Warning

- When the water temperature of the engine is higher than 70 degrees Celsius, do not open the pressure cap of the radiator. Loosen cap slowly to allow steam to escape. After that, tighten cap securely. It is good practice to use a thick waste cloth or the like when removing the cap.
- Do not wear glove when removing radiator cap. You may get burnt on your hand if hot water splashes on it.
- Antifreeze is harmful to a person, if swallowed, disgorge at once and go to hospital.
- Keep antifreeze away from children.



6. Hydraulic oil level check

Check the oil level in the hydraulic oil tank.
The oil level should be in the place between two limits.



The 1-3.5t square oil dipstick has three surfaces with marks, and the figure inside the round at the top of dipstick means the truck model applied for (see figure):

symbol 15 means its value of mark can be applied for 1t~1.8t truck;

symbol 25 means its value of mark can be applied for 2t~2.5t truck;

symbol 30 means its value of mark can be applied for 3t~3.5t truck;

When the mast is in the lowest place:

For 1t~1.8t: the truck with standard mast demands filling the hydraulic oil above the mark of "39"; the truck with triplex mast demands filling the hydraulic oil above the mark of "42".

For 2t ~ 2.5t: the truck with standard mast demands filling the hydraulic oil above the mark of "42"; the truck with triplex mast demands filling the hydraulic oil above the mark of "45".

For 3t ~ 3.5t: the truck with standard mast demands filling the hydraulic oil above the mark of "47"; the truck with triplex mast demands filling the hydraulic oil above the mark of "50".

4.0t~5.5t W35、W57 Forklift Truck:

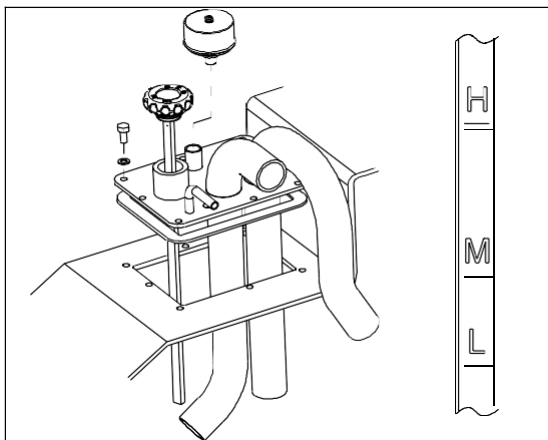
symbol $\textcircled{45}$ means its value of mark can

be applied for 4t~x5t truck(except W58);

When the mast is in the lowest place:

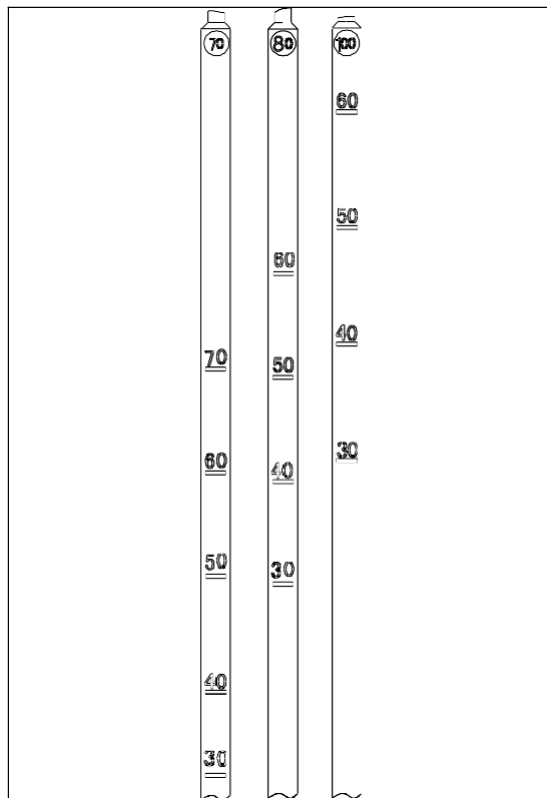
The truck with standard mast demands filling the hydraulic oil above the mark of "70"; the truck with triplex mast demands filling the hydraulic oil above the mark of "74".

4.0t~5.5t W58 Forklift Truck:



1. L scale indicates the liquid level lower limit. The level of truck with mast lower than 4M (including 4M)(including full free mast) should be higher than this scale.
2. M scale indicates high mast lower limit. The liquid level of truck with mast over than 4M(including duplex, free lift or triplex mast) or with attachment should be higher than this scale.
3. H scale indicates the hydraulic oil upper limit, but truck with attachment is allowed to over this limitation.

5.0t~10.0t



symbol $\textcircled{70}$ means its value of mark can be applied for 5t~7t truck;

symbol $\textcircled{80}$ means its value of mark can be applied for 8t truck;

symbol $\textcircled{100}$ means its value of mark can be applied for 10t truck;

When the mast is in the lowest place:
Fuel charge for 5t~10t as follows:

"30" means liquid level for mast with 3M lifting height or below(including duplex full free mast)

"40" means liquid level for mast with 4M lifting height or below(including duplex full free mast)

"50" means liquid level for mast with 5M lifting height or below(including duplex and triplex full free mast)

"60" means liquid level for mast with 6M lifting height or below(including duplex and triplex full free mast)

"70" means liquid level for mast with 7M lifting height or below(including duplex and triplex full free mast)

7. Brake fluid level check (1.0-X5.5t)

Check the fluid level in the brake fluid

reservoir. The level should be between the two seams of the reservoir. When adding fluid, due care should be taken to prevent air from entering the brake tube.



Caution

When adding fluid, due care should be taken to prevent dirt or water from entering the reservoir.

Brake fluid is dangerous to health, you should avoid skin contact.

Brake oil fluid change

See “ Every half year maintenance (1000 hours)”

7. Head lamp check

Make sure that the head lamp is lighting when the key is at “ON” position.

8. Turn signal check

Make sure that the turn signal operates properly by moving the turn signal lever

9. Hand brake check

① Drive truck slowly

② Pull hand brake lever, stop the truck,

and truck has no deviation.

10. Back-up lamp and buzzer check

The back-up lamp comes on and buzzer sounds when the shift lever is placed in reverse position.

11. Turning

① Operate the truck running slowly.

② Turn the steering wheel to left and

right 3 times respectively.

Check that the steering forces are equal in right and left.

12. Horn

Press the horn button to make certain the horn sound is normal or not.

13. Driver's seat adjustment and safety belt check

Make sure the driver's seat is properly positioned. If not properly, shift the adjusting lever and move the driver's seat to a position which provides easy access to all foot and hand controls.

Check if safety belt is normal.

14. Shift lever check

Inspect the shift lever to see if loose and shift change is smooth.

15. Lifting lever, tilting lever and attachment lever check

Check the loading levers (for lift, tilt and

optional attachment) for looseness and smooth operation.

Increase the rotate speed of engine, make certain that the lifting lever, tilting lever and attachment lever is in good work condition.

16. Instruments and sensors

Make sure that hour meter, water temperature indicator, oil temperature indicator, transmission fluid sensor, fuel sensor and engine coolant temperature sensor, oil pressure sensor etc., function properly.

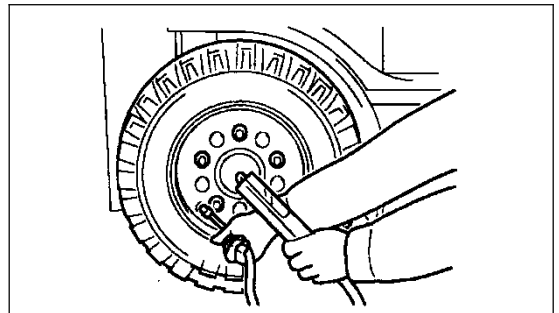
17. Brake pedal and inching pedal check

Drive truck slowly, step down brake pedal, and brake lamp lights.

Drive truck slowly, step down inching pedal, and check the inching pedal condition.

18. Tire inspection and Tire pressure

Check the tires for damage, and whether the rims are deformation.



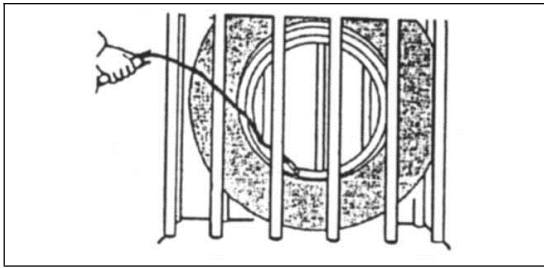
Turn tire valve cap counter clock-wise and remove it. Using a tire pressure gauge, measure the inflation pressure, and adjust it to the specified pressure, if needed.



Warning

Since the forklift truck needs tires that have a high inflation pressure to carry heavy loads, even a small bending of rims or damage at the tread surface could cause an accident.

When using an air compressor, first adjust the air pressure of the compressor. Failure to do so will cause a serious accident, since the compressor delivers the maximum pressure. To ensure safety, you should place the tires in a protective frame when inflation.



**Tire pressure adopts new standard
GB/T2982-2001:**

Truck type	Driving wheel (Front wheel)	Steering wheel (Rear wheel)
1t-1.8t	790kPa	1000kPa
2t-2.5t	860kPa	860kPa
3t-3.5t	830kPa	790kPa
4t-X5t	830kPa	860kPa
5t-7t	830kPa	830kPa
8t-10t	760kPa	760kPa

2. Weekly maintenance (40hours)

Increase the following content based on daily maintenance.

1. Air cleaner maintenance

General condition:

Perform maintenance on the air cleaner after 50-250 hours of operation.

Replace air cleaner after maintaining for six times.

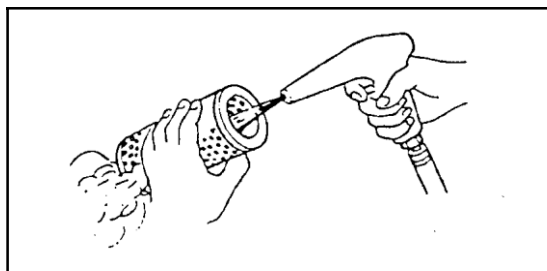


Caution

If the working condition is bad, air cleaner needs to be serviced/replaced more frequently.

Under dusty work conditions, the cycle of maintaining and changing air cleaner will be shortened. It is advised to perform maintenance between 8-50 hours; replace it between 100-300 hours.

1-x5.5t Maintenance method :



- ① Dismantle filter end cap;
- ② Take out the filter element;
- ③ Blow off the dust inner and outer of the filter element with dry compressed air.



Warning

1. Dust will blow into your eyes, so please wear protective glasses.
2. Do not maintain and replace element filter in time according to the requirement

will lead to the damage of engine in advance.

With air filter Service indicator models:



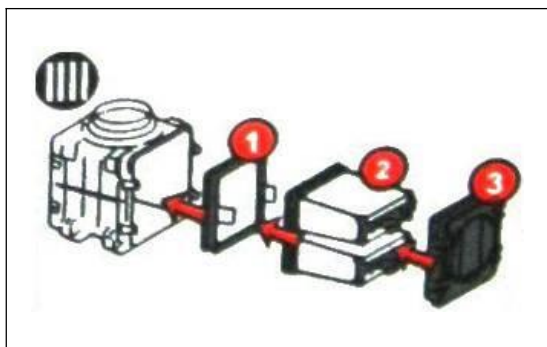
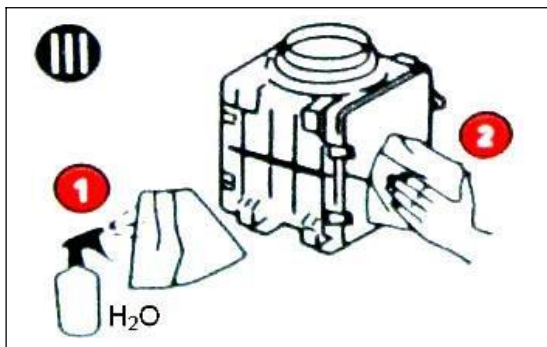
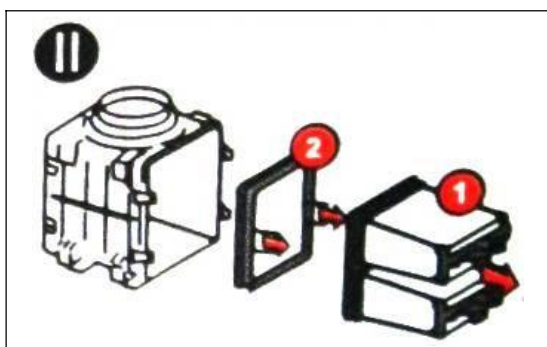
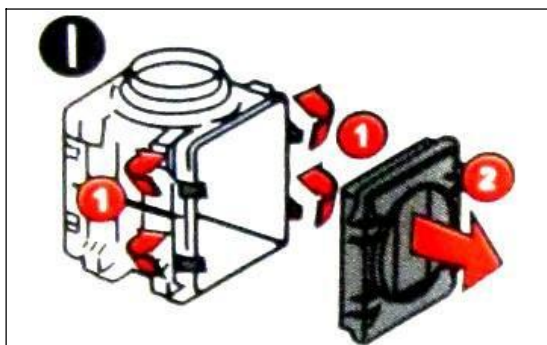
scale mark: Engine intake resistance.



Indicator window	The engine intake patency
Yellow	The inlet fluid, temporarily without maintenance
Yellow+red	Intake slightly hindered, need maintenance
Red Or Scale mark $\geq 6.2\text{kPa}$	The air inlet is blocked seriously, must maintain or replacement of the main filter element;

- ① Maintenance of the main filter element, do not have to remove all the filter, security filter does not need maintenance;
- ② Main filter element has maintenance three times or Service after the indicator window is still displayed in red, the need to also replace the main filter element and security filter element.
- ③ After the maintenance or replacement of the filter element, press the reset button on the top of the air filter Service indicator so that the indicator window is reset.

4.0t-x5.5t W58 engine Truck Maintenance method :



5-10t Maintenance method :



①When alarm lamp of air cleaner shows red, it needs maintain and change the main filter element.

②When maintaining the main filter element, it does not need to take out all filter elements and the safety filter elements need no maintenance.

③If the main filter element has maintained for three times or the alarm lamp is still on, it also needs change main filter element and safety filter element.

Maintenance method:

①Loosen 4 fasteners with thumb;

②Hold the fasteners, and open the cap outward.

③Shake the main filter left and right lightly, and then take out the main filter element.

④Safety element does not need maintenance. If need change new one, shake the main filter left and right lightly, and then take out the filter element.

⑤Clean the inner body with cloth in case influence installation and seal effect.

⑥Check safety filter and install into the cylinder;

⑦Check main filter and install into the cylinder;

⑧Close the cap, and downward the dust exhaust cover;

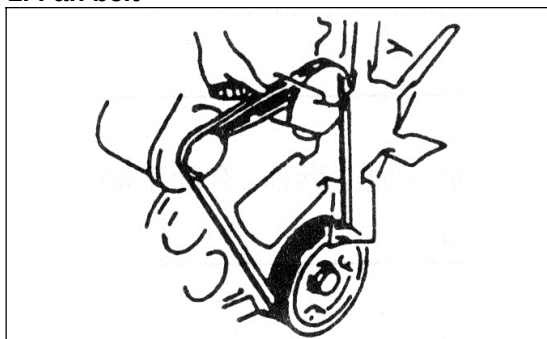
⑨Lock the snap and finish assembly.



Warning

Do not maintain and replace element filter in time according to the requirement will lead to the damage of engine in advance.

2. Fan belt



Stop the engine.

Use finger to press the belt at the midway point between the water pump pulley and the generator pulley by 10kg press, and check the drop distance if it is up to standard.

Engine	Drop distance (mm)
K21, K25	11-13
4TNE92 4TNE98	New 8-12(<5min) old 10-14(≥5min)
4TNV94L	New 5-8(<5min) old 7-10(≥5min)
C240PKJ-30	8-12
S4S	12

Use finger to press the belt at the midway point between the water pump pulley and the

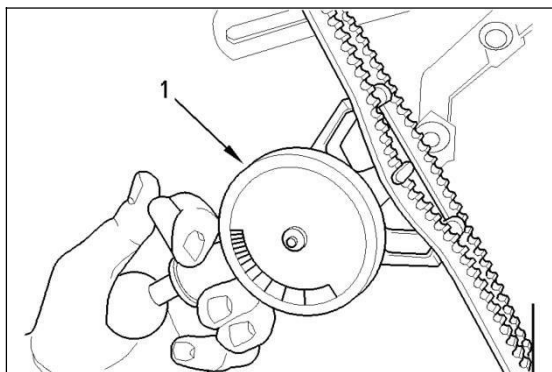
generator pulley by 3-5kg press, and check the drop distance if it is up to standard.

Engine	Drop distance (mm)
A498BT1	10-15

Make a 6kg force in the middle of two belts with finger to check if the drooping quantity meets the specified value.

Engine	Drooping quantity (mm)
GM4.3L	≤13

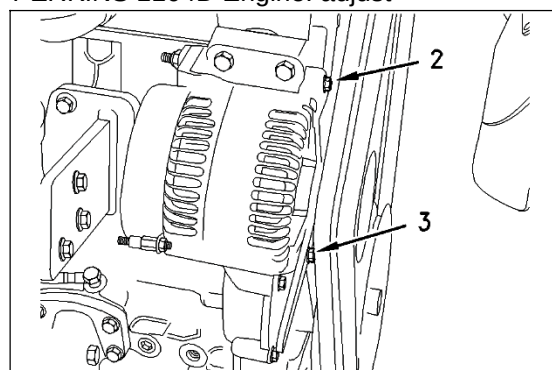
PERKINS 1104D Engine: check



Install belt tensionmeter(1) to the center of the longest free length and check tension. Correct tension of new belt is 535N. If the tension is lower than 250N, adjust the belt to 535N.

If install two belts, check both belt's tension and adjust the tighter belt.

PERKINS 1104D Engine: adjust



1. Loosen AC motor pivot bolt(2) and bolt (3).

2. Move AC motor to increase or reduce

Use proper gauge to measure belt tension.

belt tension. Tighten AC motor pivot bolt and connecting rod bolt to 22N.m.

QSB3.3,QSB4.5,QSF2.8 engines equip with automatic tensioning pulley, and their fan belt tension do not need adjust.



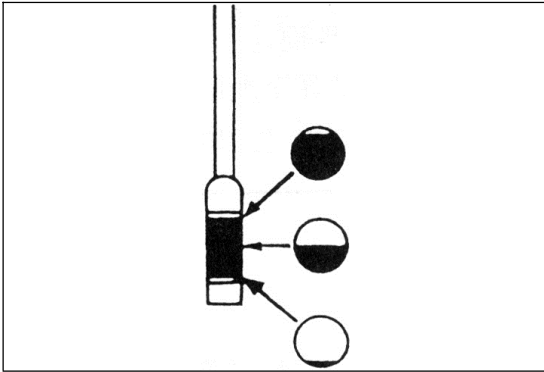
Caution

If the belt is loose, cut out, or has no surplus it should be changed.

DO NOT perform this check with the engine running to avoid personal injury.

3. Hydraulic transmission fluid level

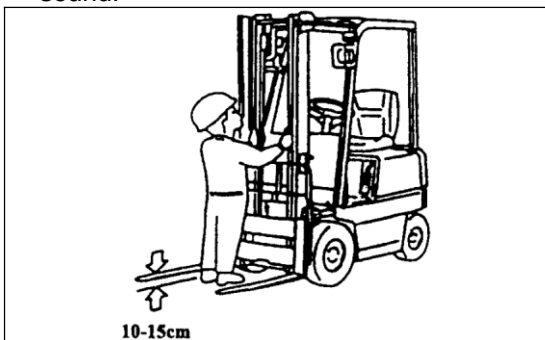
Open the inspections cover and pull out the oil scale. Inspect if the fluid level is within the mark of the gauge.



4. Mast and forks

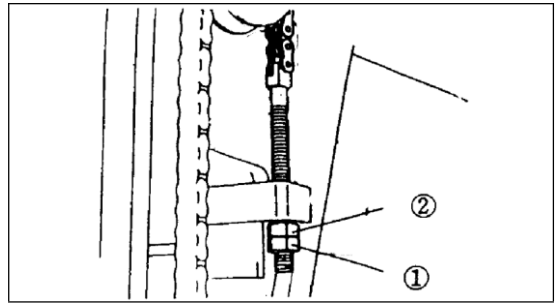
Check the mast and forks to make sure:

- ① There is no crack and bend on the forks, and the forks are installed on the fork bracket strongly;
- ② Check if there is oil leakage on the cylinder and tubing;
- ③ Check the rollers' rotation;
- ④ Check the mast if there are cracks or bends;
- ⑤ Operate the lifting, tilting and attachment lever, check the mast if it's in good condition, and pay attention to system operating sound.



5. Lift chain tension check

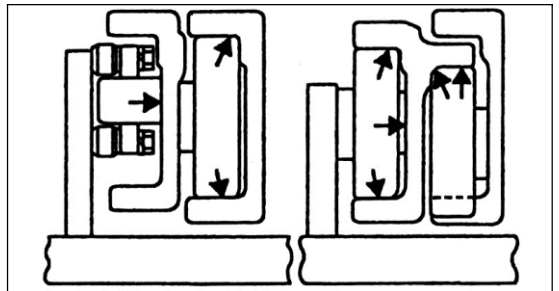
- ① Raise the fork about 10-15 cm above the ground and make it vertical.
- ② Press middle of the chain by thumb. Make certain the tension for the right and left chains are even.
- ③ Adjust the tension: Loosen the lock nut 1, screw the nut 2 and adjust the chain to make the equal tension, and then screw down the lock nut 1.



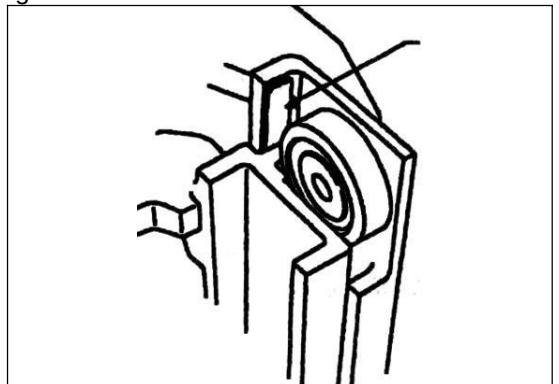
6. Lubrication of mast

Lubricate the following parts periodically according to the requirements of lubrication sheet

- ① The periods of paint lubrication grease depend on the truck's work condition. If work is heavy, please paint much more grease on mast.
- ② To assist with the truck's operation, paint some lubrication grease on the surface where the idler pulley and inside and outside masts touch.



Paint some lubrication grease on bearing guide rail.





Warning

When painting lubrication grease; stop the truck on a smooth road, engine off and pull hand brake. Avoid injury to hand or body, and avoid falling off from high place. Keep safe.

7. Chain Lubrication

Take one brush with engine oil paint both sides on chain

8. Lubrication grease to below parts, the detail please see *Lubrication system drawing*

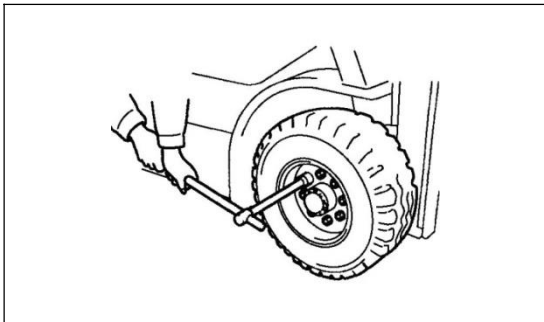
- ① Mast bearing lubricate;
- ② Inching pedal lubricate;
- ③ Steering axle shaft lubricate;
- ④ Steering knuckle main bearing lubricate;
- ⑤ Steering rod bar pin lubricate;
- ⑥ Steering cylinder pin lubricate.

9. Bolt, nut tighten

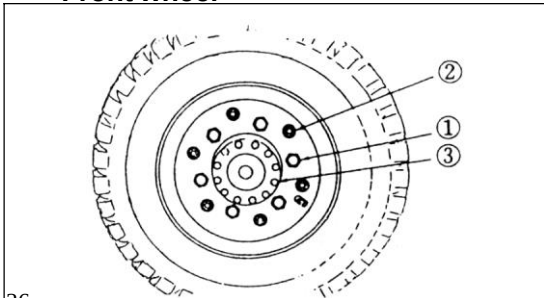
Refer to the *Maintain periodic chart*.

10. Hub nut torque check

Check if tightening torque of hub nut meets standard.



Front wheel



① Hub nut

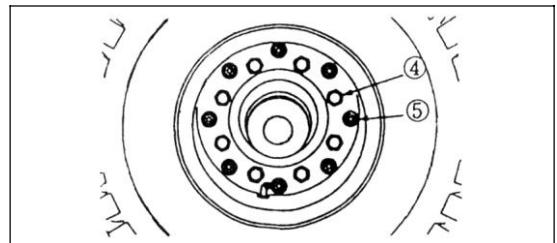
② Split-type rim bolt (only 1-1.8t) ;

③ Half axle bolt

Tightening torque N.m:

	1.0t-1.8t	2.0t-3.5t
Hub nut	157-176	363-490
	4.0t-7.0t	8.0t-10.0t
	441~558	500~585

Rear wheel



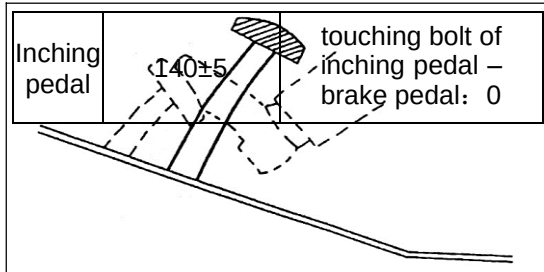
④ Rear hub nut;

Tightening torque N.m:

	1.0t-1.8t	2.0t-3.5t
Hub nut	78-98	157-176
	4.0t-X5.5t	5.0t-10.0t
	363-490	441~588

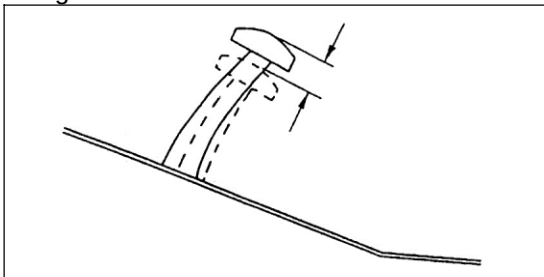
⑤ Split-type rear rim bolt (some truck model without)

11. Brake pedal, inching pedal and clutch pedal check



Step the brake pedal fully when the engine is running, the distance between brake pedal and front soleplate should be more than 60mm.

Check the inching pedal and clutch pedal using the same method



1.0t-1.8t Height and the free clearance

	Height mm	Free clearance mm
Brake pedal	135±5	1-3
Inching pedal	135±5	touching bolt of inching pedal – brake pedal: 0 mm

2.0t-3.5t Height and the free clearance

	Height mm	Free clearance mm
Brake pedal	135±5	1-3
Inching pedal	135±5	touching bolt of inching pedal – brake pedal, Chinese trans.: 6 Nissan trans.: 2.9-3.4 Okamura trans.: 7.1-7.6

4.0-X5.0t Height and the free clearance: mm

	Height mm	Free clearance mm
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5.0t-10.0t Height and the free clearance: mm

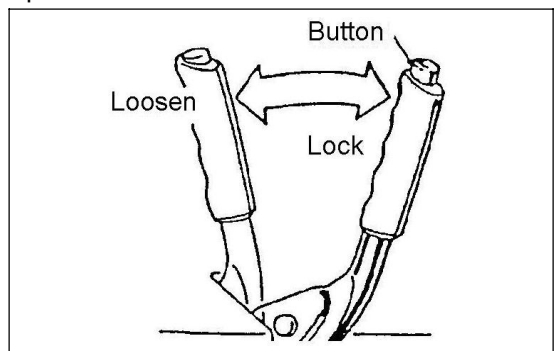
	Height mm	Free clearance mm
Brake pedal	142±5	1-3
Inching pedal	142±5	touching bolt of inching pedal – brake pedal: 7mm-9 mm

12. Hand brake

Make sure that the hand brake lever, after pulled up, still has good function when return.

1.0t~X5.0t the required tension when pulled up: 245N-295N

5.0t~10.0t the required tension when pulled up: 100N-300N



13. Cylinder bracket check (only for LPG truck)

Pull the cylinder, check if the bracket is firm, restore the normal position and check if stable.



Brake pedal	140±5	1-3
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3.Monthly maintenance (166hours)

Increase the below content based upon weekly maintenance

1. Change engine oil and oil filter(only for the first time, then per 500hours)

①Start the engine, warm-up enough, then shut off.

②Remove oil cover and bottom shell to plug, release the oil.



Warning

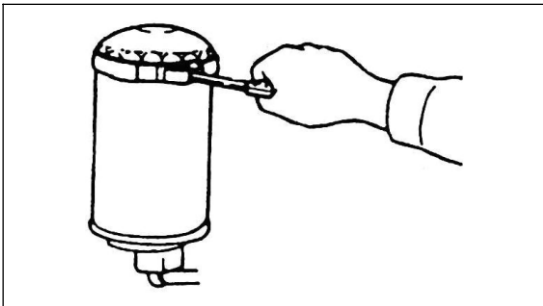
Be careful with the hot oil.

Milky oil shows there is some cooling fluid in it, find out the reason and correct.

Thin oil shows that the oil contains gasoline.

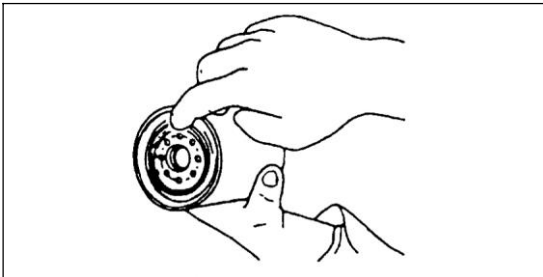
③ Wipe up and fit drain plug and gasket. Tightening torque of drain plug: 29 ~39 N·m

④ Dismantle the oil filter by tool.



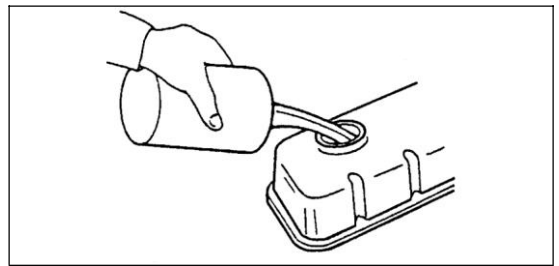
⑤Use cloth to clean the surface of oil filter.

⑥Lay on little oil on the rubber ring of new oil filter.



⑦Install new oil filter by hand, not spanner.

⑧Reference *Table for the oil used in the*



⑨Start the engine, check for oil leaks around drain plug and filter. If the leak is excessive, the part has not been installed correctly.

⑩Warm-up engine, then shut-off and check oil level, fill if needed.

To check the oil fluid level, place truck on level ground.

2. Apply lubricate to front and rear of pin roll of tilt cylinder

Clean the area, and remove used oil.

3. Check the gear oil of drive axle housing

Change the oil after 200 hours if operating truck in dusty environment.

4. Change transmission oil filter (first time, then semiannually)

Check the hydraulic transmission oil fluid, if more dust, change the hydraulic oil of transmission. Change only for the first time.

①Park the truck on level ground, lay-down the fork to the floor, incline the mast back, apply parking brake, put transmission in neutral position, shut off engine.



Warning

Hot hydraulic oil and parts will cause injury. DO NOT touch the hot hydraulic oil and parts.

②Dismantle rubber mat and front soleplate.

③Dismantle filter and deal with local regulation.

④Clean pedestal of filter, confirm that the old gasket of pedestal is clean.

⑤Apply small amount hydraulic oil on the new filter gasket.

⑥Install filter by hand. When the filter get to pedestal, screw down an additional 1/2-3/4 turn.

5. Change hydraulic transmission oil (first time, then semiannually)

Park truck on level ground, lay-down the fork to the floor, incline the mast back, apply parking brake, put transmission in neutral position, and shut off engine.



Warning

Hot hydraulic oil and parts will cause injury. DO NOT touch the hot hydraulic oil and parts

- ① Put one case (volume is over 20 liters)

under the transmission.

- ② Remove oil plug and drain oil.

- ③ Clean oil plug then install.

- ④ Take out the dipstick. Add hydraulic oil.

See *Table for the oil used in the truck*, and then install dipstick.

⑤ Startup engine. Step the brake pedal, get the engine idle running, place the transmission in forward and backward so that the oil enters the clutch.

⑥ Place transmission in neutral, apply parking brake.

⑦ Take out the dipstick, inspect fluid position. If oil is not enough, add oil to keep it between max and mix marks.

- ⑧ Check the filter and oil plug for leaks.

- ⑨ Shut off engine, install front soleplate.

6. Air-bleeding fuel system [Diesel]

During fueling or draining water from separator, it's also necessary to bleed air in the fuel system.

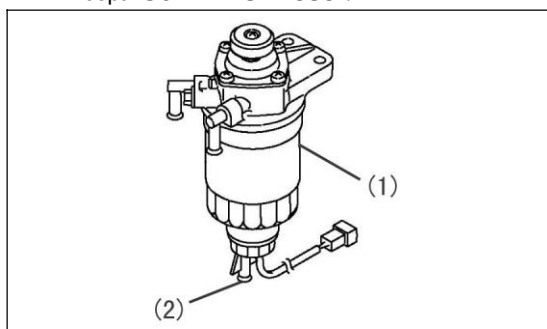
- ① Loosen the bleed plug;

- ② Press the priming pump until fuel comes through the bleed plug without any bubbles;

- ③ Fasten the bleed plug;

7. Oil-water separator draining [Diesel]

Except Cummins Diesel:



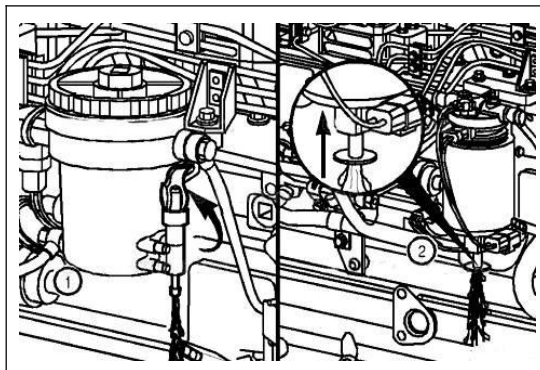
- ① Position an approved container under the fuel filter to collect the contaminants.

- ② Loosen the drain cock (2) at the bottom of the fuel filter. Drain any water collected inside.

- ③ Hand tighten the drain cock.

- ④ Be sure to prime the diesel fuel system when you are done.

Cummins Diesel:



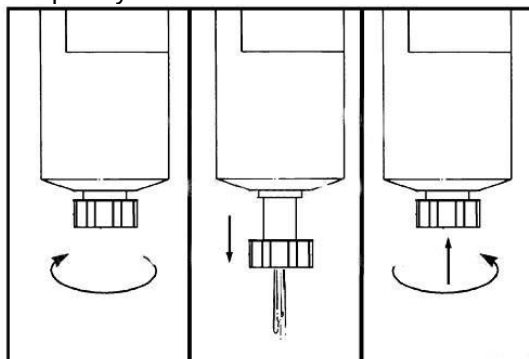
Can type:

- ① Shut the engine;

- ② Place a container under the fuel filter;

③ Uplift the drain valve control rod until the liquid is completely drained and see clean fuel;

④ Push up drain rod until the liquid is completely drained.



Rotary type:

- ① Shut the engine;

- ② Place a container under the fuel filter;

③ Open the drain valve. Turn the valve 3.5 rings counterclockwise, until the valve drop 25.4mm and start to drain;

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



Caution

Do not screw the valve too tight when shutting the drain valve. Over tightening will damage thread. When shutting the valve, uplift the valve and rotate in clockwise until screw

down.

8. Exhaust gas check

Colorless	Normal: complete combustion
Black	Abnormal: incomplete combustion
Blue	Abnormal: oil burns
White	Abnormal: water in combustion chamber



Warning

Don't start the lift truck in bad ventilation space. There is carbon monoxide in the exhaust gas, it is very dangerous

9. Check battery and electrolyte

Refer to *Operational method of lead acid battery*.

4. Every half year maintenance (1000 hours)

Increase the following content based on monthly maintenance.

1. Brake oil fluid change(1.0t-X5.5t)

- ① Let the truck at level ground, play-down the fork to floor, tilt back the mast, strain brake handle. Transmission at neutral, engine flameout.
- ② Pick off the rubber dustproof cap of oil orifice, install the both side of preliminary clarity tube to oil orifice and waste oil collect bottle, then use spanner loosen oil orifice bolt counterclockwise. The other people step on the brake pedal repeat on the truck at same time. Here the brake oil will burst forth from oil orifice, note the fluid lever of brake oil tank. Append new brake fluid when the lever falls. Screw down the bolt of oil orifice when oil clear.
- ③ the people step on brake pedal repeat at culmination, not loose, the other people loose oil orifice bolt, screw down it after brake oil gush completely. Then inform the first people loose. Repeat upwards operation till brake oil without air bladder. Note the fluid lever of brake oil tank. Append new brake fluid when the lever falls.



Caution

Prevent dust, water into oil when add brake fluid.
The brake fluid is venomous ness, causticity, touch in case, please wash clean.



Caution

Transmission system forklift from Korea: add brake fluid (Brake oil pot) is mobile Delvac Hydraulic SAE10W.
Other model: Caltex DOT3 or Choice HZY3 brake liquid (note add after factory)

2. Steering wheel locked device lubrication

Apply lubricating grease to the steering wheel locked device.

3. Hydraulic oil change

Park the truck on level ground, lay-down the forks on the floor, incline the mast back, and apply parking brake. Put transmission in neutral position, shut off the engine.



Warning

Hot hydraulic oil and parts will hurt body. Do not touch the hot hydraulic oil and parts.

- ① Put one case (volume is over 60 liters) under the hydraulic oil box. Dismantle the drain plug of oil tank, let the hydraulic oil flow to case.
- ② Dismantle hydraulic dipstick and oil box cover.
- ③ Take out the magnet from oil box to clean and rinse the oil orifice of box bottom by hydraulic oil.
- ④ Clean and install the oil plug.
- ⑤ Fill hydraulic oil box. Refer to *Table for the oil used in the truck*.
- ⑥ Startup the engine and operate multiple valve joystick and turn system, fill hydraulic oil in all system. .
- ⑦ Check each hydraulic component and pipeline for leaks.
- ⑧ Close the engine, retract all cylinder pole, check the oil level of hydraulic oil box. Add oil at fill mark.

4. Check clean and change hydraulic return oil filter, respirator and strainer

Park the truck on level ground, lay-down the fork on floor, incline the mast back, and apply parking brake. Put transmission is in neutral position, shut off engine.

- ① Loosen the bolt of hydraulic oil box cover board.
- ② Remove return oil filter from top cover board.
- ③ Install new filter by hand.
- ④ Take out the strainer from oil box.
- ⑤ Install new filter by hand.
- ⑥ Install oil box top cover board and screw down bolt.
- ⑦ Take out respirator. Clean by lotion and dry.
- ⑧ Install respirator.
- ⑨ Start the engine and operate hydraulic system, let hydraulic oil in all system. Check for leaks.
- ⑩ Close the engine, retract all cylinder pole,

check the oil level of hydraulic oil box. Add oil at fill mark.

5. Change hydraulic transmission oil

Refer to 'Change hydraulic transmission oil' from 'Monthly Maintenance'.

6. Check, clean, change fuel filter



Caution

In the dust and dirty work condition, clean fuel filters per one month and replace every six months.

- ① Remove out the fuel filter.
- ② Remove transducer.
- ③ Before installing new one, install transducer existing, put a little fuel on the filter airproof.



Caution

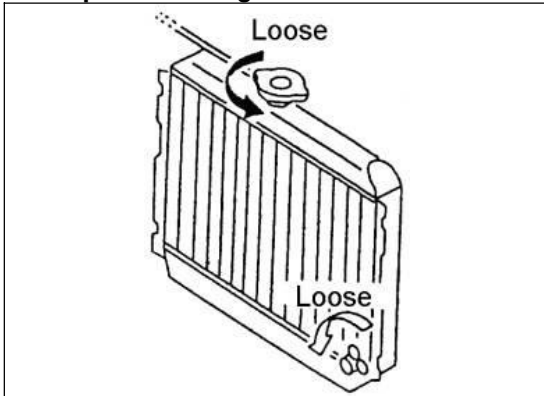
Before installation, do not add fuel to filter, as this may accelerate the wear of fuel system parts.

- ④ Install new filter.
- ⑤ Turn the new filter till the airproof mat adheres to surface.
- ⑥ Screw down 2/3 loops.

5. Annual maintenance (2000 hours)

Increase the following content based on semiannual maintenance.

1. Replace the engine coolant



- ① Open the radiator cover and loosen the drain cover, let the coolant drain, then wash the cooling system.
- ② Screw down the drain cover.
- ③ Add coolant to radiator up to the top
- ④ Let the engine run fully.
- ⑤ Stop the engine, after cooling down fully, still add coolant to radiator up to the top, and add coolant to coolant reservoir to "MAX" position.
- ⑥ Check the drain cover for leaks.



Warning

When the water temperature of the engine is higher than 70 degrees Celsius, do not change coolant to prevent scalding.

The engine coolant fluid is designed to prevent rust and frost bite. See *Table for the oil used in the truck*

2. Front-wheel bearing change lubricating grease

Refer to steering axle content in *Maintenance Manual*, remove hub bearing and then replace lubrication grease.

3. Rear-wheel bearing change lubricating grease

Refer to steering axle in *Service Manual*

4. Change steering axle gear oil

Park the truck on level ground. Put transmission in neutral, shut off engine.

- ① Remove the oil plug, put oil to a container. Clean oil plug.

- ② Install oil plug.

- ③ Remove breather plug and oil fluid position plug. Put the oil from orifice bend to steering axle housing until oil overflows from level plug. See "Re-add amount".

- ④ Install level plug and curved-shaped plug adapter

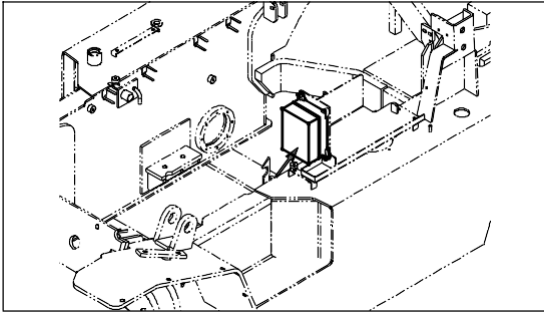
- ⑤ Start-up forklift. Run engine at idle and place the steering wheel control handle at neutral.

- ⑥ Take out level plug. Keep oil level until overflow.

6.Others

1. Fuse, relay

- ① Please first find out the reason before replace damaged fuse or relay.
 - ② Replace with regulated standard fuse
- The Control box of forklifts are placed on left side of truck frame.

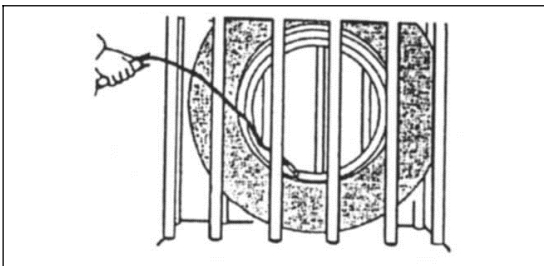


2. Change of tires



Warning

- When using an air compressor, first adjust the air pressure of the compressor. Failure to do so will cause a serious accident, since the compressor delivers the maximum pressure.
- To ensure safety, put the tire in a defend casing while inflating.



Front wheel

- ① Park forklift truck on level concrete;
- ② Start engine and raise mast about 100mm height.
- ③ Place chocks behind rear wheels to prevent movement of forklift;
- ④ Loosen wheel nuts 1-2 turns each by turning them counter-clockwise;
- ⑤ Tilt mast fully backward, and place a wooden block under each side of outer mast;
- ⑥ Tilt mast forward until front wheels are raised from surface;



Caution

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

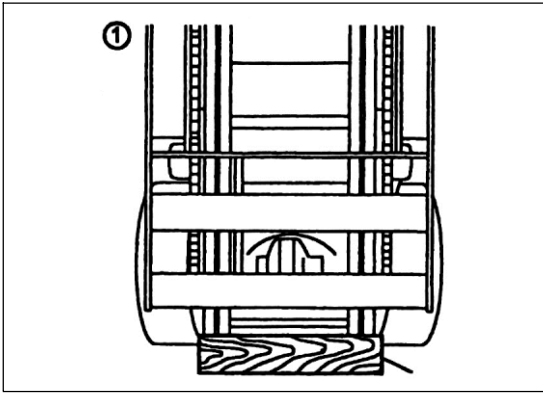
- ⑦ Support truck by putting wooden blocks under both sides of the front truck frame. Stop the engine.
- ⑧ Take out the wheel nuts and replace the front wheel.



Caution

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

- ⑨ Retighten the wheel nut temporarily.
- ⑩ Start the engine, and take out the wooden block.
- ⑪ Tilt backward the mast and lower down the mast slowly, then take out the wooden block under the outer mast and rear wheel.
- ⑫ Retighten the wheel nut with correct torque.
- ⑬ Adjust tire pressure to specified value.

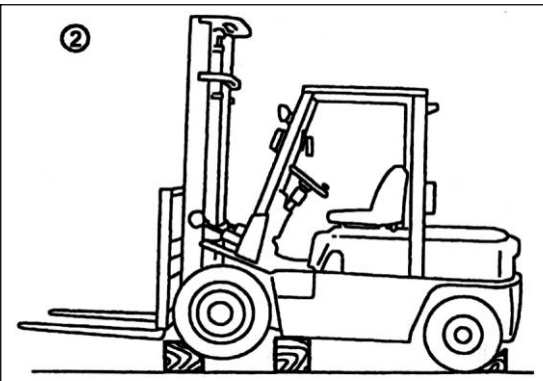


- ④ Loosen wheel nuts 1-2 turns by turning them counter-clockwise.



Warning

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



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

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

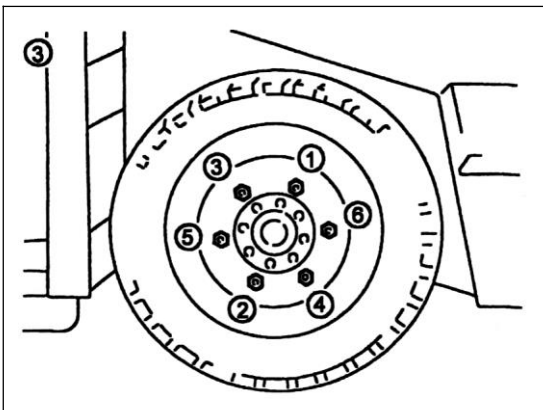


Warning

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

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

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



- ⑦ Retighten nuts as shown in figure below.

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

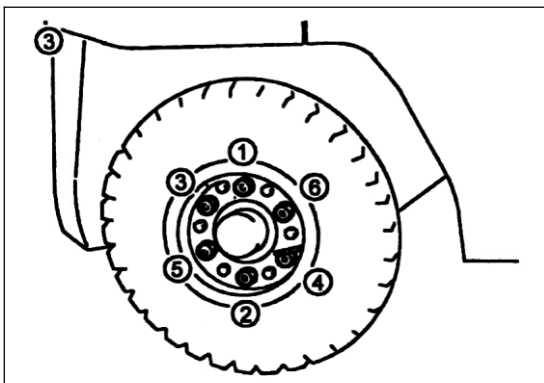
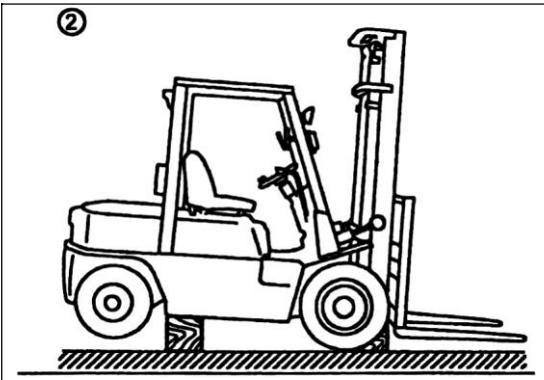
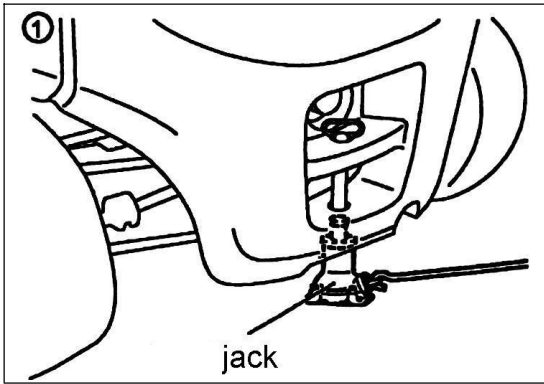
- ⑨ Retighten the wheel nut with the correct torque. Please refer to *Tightening Torque Table*.

- ⑩ Adjust tire pressure to specified value.

Rear wheel

- ① Park forklift trucks on level concrete.
- ② Pull the parking brake lever and place chocks before front wheels to prevent movement of forklift.
- ③ Put the lifting jack under the counterweight.

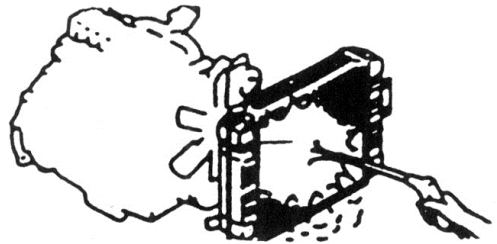
Caution : Make sure the jack capacity is greater than 2/3 of service weight of forklift.



- 3. Measures against cold and hot weather**
According to environment temperature, choose proper viscosity oil.
- 4. Clean the radiator and radiator fins**

water to clear.

! Caution
Clean the radiator fins by using compressed air or vapor, place the muzzle to radiator a right angle.



- 5. The operation of too hot engine**
If the engine is too hot, DO NOT stop it at once, do as follows:
- ① Reduce speed;
 - ② Open the engine cover;
 - ③ Stop engine when water temperature drops;
 - ④ Check coolant, add water, if need.

! Warning
Dust may fly into your eyes, so make sure to wear safety glasses.

If the radiator fins are clogged, it will lead to overheating. Use compressed air, vapor or

V. Structure and stability of truck

It is very important for operator to know the truck's structure and relationship between load and stability.



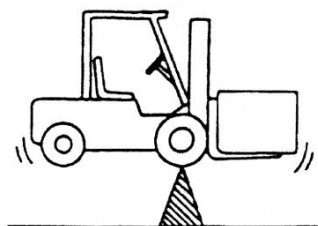
Caution

The structure of the truck

The basic structure of the truck is mast (include mast and forks) and body (include 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.

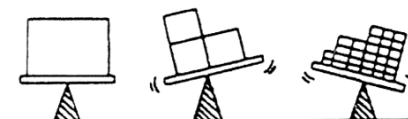
Due care should be paid to the weight and the center of gravity of loads to maintain the stability of the truck.



Caution

Load center

There is difference because of the loads' shape, gravity, such as box, board and large roller. It is very important to distinguish the difference and the gravity center of loads.



Warning

If the truck is going to turn over, do not attempt to get out of the truck, because the speed of overturn is much fast than you. You should hold the steering wheel handle, and this practice will let you in the seats.

Please tie safety belt



Truck can
TIP OVER!
Risk of serious
INJURY
or DEATH!



WARNING

Fasten Seatbelt

Do Not Jump!

Lean Forward
Hold on
Tight
Brace
Feet

Lean Away
From Impact



Caution

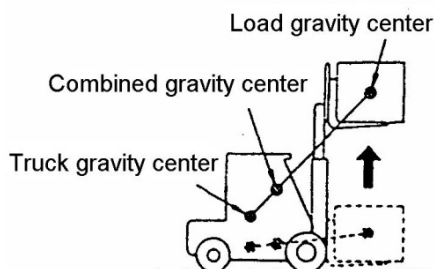
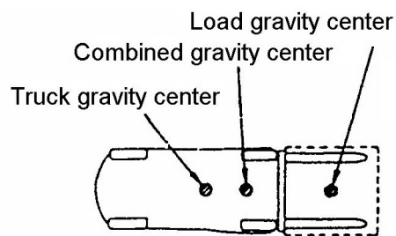
Gravity and stability

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

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

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

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





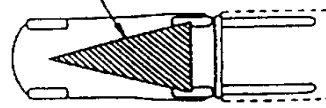
Caution

the stability zone of the barycenter

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

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

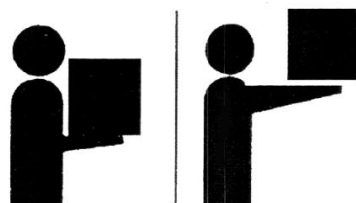
Stability zone



Caution

the max load

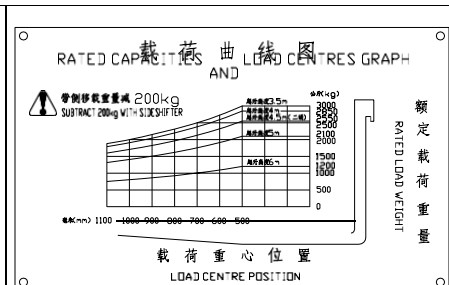
The distance between the load center and the front surface of forklift or load backrest (select the min) on the forklift is called LOAD CENTER DISTANCE. The max gravity that the truck can load is called MAX LOAD on condition that the load is on the load center distance. The relationship of MAX LOAD and LOAD CENTER DISTANCE is specified on the load capability chart. If the load center is moved near the front of forklift, the load should be reduced.



Caution

the load capability chart

This chart shows the relationship of MAX LOAD and the location of LOAD CENTER DISTANCE. Check whether the load and load center distance is in the range referred by the chart. Put the most important parts near the load backrest if the shape of goods is asymmetrical.



Caution

speed and acceleration

A static object keeps its static station which is not affected by outside force, one dynamic object moves with the same speed which is not affected by outside force, this is inertia.

Because of inertia, one force affected backward when the truck is moving, one force affected forward when the truck is stopping.

It is very dangerous to press the brake suddenly. It may result in capsizing or sliding down of the load because of huge force to the front.

Centrifugal force is present during turning and its direction is from the turning center to the outer. If the force is strong enough, it may result in the capsizing of the truck. The right-and-left stable zones are very small, so the truck's speed must be reduced when turning to prevent capsizing. If the truck is carrying a load with the forks raised high, the possibility of capsizing is very great.

VI. Operation



Warning

Before operating the truck, check all controls and warning devices for proper operation. If any damage of fault is found, don't operate truck until corrected.

1. Start-up

Starting diesel engine truck

① Shift levers in neutral position.

② Screw the starting switch to  position, after start, the key rebound to  position.



Caution

· If it does not work within 5 seconds, screw to "O" position and restart after 2 minutes.
· If you can't start for three times, please check the reason.



Caution

When the temperature is lower than -5°C , you should switch the key to "I" for preheating, and start when the preheat indicator turns off.

Starting gasoline engine

① Shift levers in neutral position

② Cold engine

Pull out the choke button fully. Depress the accelerator pedal to the floor two or three times and release it. With your foot OFF the pedal, crank the engine by turning the ignition key to "START". Release key when engine starts.

③ Warm engine

Do not pull out the choke button. Press down the accelerator pedal halfway and cold crank the engine by turning the ignition key to "START". Release key when engine starts.



Caution

When the heat engine starts, do not step the accelerator pedal to the end, cause it may cause start trouble, even step the pedal for several times.



Caution

The time to start should be less than 5 seconds each attempt, and the interval between attempts should be at least 2 minutes.

After engine has started

① Warm-up the engine for 5 minutes

② Check engine running condition



Caution

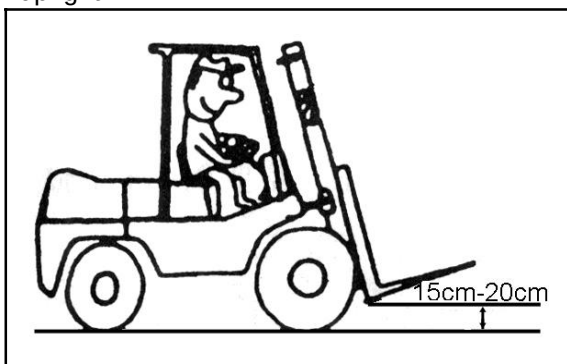
After starting the diesel engine, accelerate its speed to the range of 1800-2000r/min, and warm it without work.

- Check the compression (misfire) noise.
- Check exhaust condition.
- Make sure all indicators turn off.
- After complete warming up of engine, operate control valve lever in whole course for 2-3 times, and check mast working condition.

2. Travel

① Hold the knob on the steering wheel with your left hand and get the right hand ready for the controls, lightly putting it on the wheel.

② Set the bottom of the fork 15 to 20 cm above the ground and fully tilt back the upright.



③ Check the safety around the machine and give a signal when starting the engine.

Hydraulic drive forklift

· Step the brake pedal and operate F-R Reversing switch.

- Release hand brake

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

Gear shift

Hydraulic drive forklift

- Stop the truck before reversing the direction of travel.

- Shift the gear shifting lever.

Slow down

Hydraulic drive forklift

Release accelerator pedal a little, and step the brake pedal, if necessary.

Steering

Unlike general passenger-cars, the steer wheels are located at the rear of the truck. These cause the rear of the truck to swing out when a turn is made.

Slow down and move toward the side to which you are turning. The steer hand wheel should be turned a bit earlier than when turning the front wheels of a car.

Stopping or parking the truck

① Slow down and step the brake pedal to stop the truck (in the case of clutch type machine, the clutch pedal is used).

② Place the shift lever in neutral.

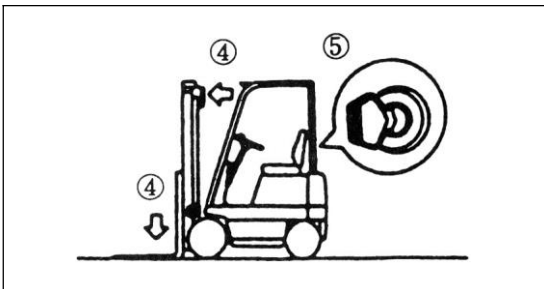
③ Apply the parking brake.

④ Lower the forks on the ground, and tilt the mast all the way forward.

⑤ Place the key switch in “O” position to shut down the engine. For diesel trucks, pull out the engine stop button. Remove the key and take it with you.

Caution:

- Be careful to get off, Never jump off the truck.
- Do not park the truck on travelling route.



3. Pick up

- The forks should be adjusted sideways to maintain proper balance of load.

- Place the truck in front of the load to be

handled.

- The pallet should be evenly positioned across both forks

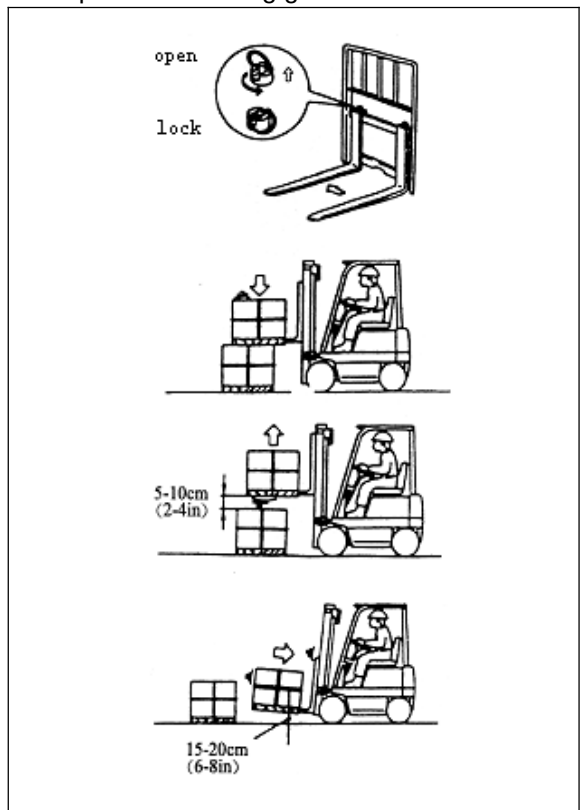
- Insert forks into the pallet as far as possible.

- To raise loads from the ground:

① First lift the forks 5 to 10 cm off the ground or floor and make sure loads rest stable.

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

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



4. Stacking load

- Slow down when approaching the load deposit area.

- 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 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.

- Disengage forks from the load by using necessary lift-tilt operation and then back away.

- After making sure the fork tips 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.

5. Remove load

- Slow down when approaching the area where the load is to be retrieved.

- Stop the truck about 30cm away from the loads.

- Check the condition of the loads.

- Tilt the mast forward until forks become horizontal. Elevate forks up to the position of the pallet or skid.

- Make sure forks are positioned properly for the pallet. Move forward slowly to insert forks into the pallet as far as possible and then stop the truck.



Caution

If the forks cannot be fully inserted, use the following procedure: move forward and insert the forks 3/4 of the way. Raise the forks 5 to 10 cm and move backward 10 to 20 cm with the pallet or skid on the forks, then lower the pallet or skid on the stack. Move forward again to insert the forks fully.

- Raise the forks 5 to 10 cm 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.

VII. Parking

1. Parking daily

- ① Park your truck to desired place and block the wheels.
- ② Make sure the shift level is in the neutral position.
- ③ Apply the parking brake.
- ④ Shut the engine down and move the lift and tilt levers several times so that the inner pressure in the hydraulic tubes will be released.
- ⑤ Remove the key and take it with you.



Warning

You should tell the manager if you find any problems with the truck, and have them repaired immediately.

Do the following things :

- ① Clean oil and grease stains with a cloth and water on the truck body.
- ② Check the whole truck, especially the tires.
- ③ Fill the fuel tank with the proper fuel.
- ④ Check for leaks of hydraulic oil, engine oil, LPG and coolant.
- ⑤ Apply lubricate grease
- ⑥ Check whether the junction plane between the nuts of wheel boss and the piston of hydro cylinder are loose, and whether the surface of piston has been pulled.
- ⑦ Check mast rollers operate smoothly.
- ⑧ Lift the lifting cylinder to the top and fill it with oil.
- ⑨ In cold weather, it is not necessary to drain the antifreeze, but the water should be completely drained from the radiator.

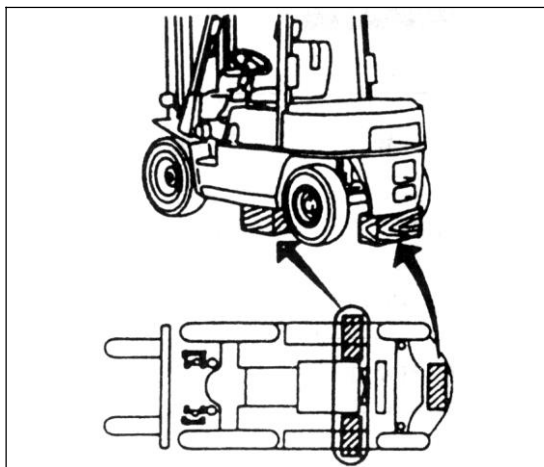
2. Park the truck for a long time

When parking the truck for a long period, place blocks under the truck body and counterweight to reduce the load on two rear wheels.



Warning

- a. The block must be single and hard enough to support the truck.
- b. Don't use blocks higher than 300 mm (11.81 inch) .
- c. Lift the truck to place it on the blocks.
- d. Use the same size blocks under the left and right sides of the truck.
- e. While the truck is supported by the blocks, swing the truck forward, backward, left and right, check its safety.



Perform the following maintenance for long term truck storage:

- ① Remove the battery and recharge it once a month, keep it in a shady place.
- ② Brush antirust oil on those parts that are exposed to the air, such as piston rods and axles.
- ③ Put a cloth on vent-plug and air-cleaner.
- ④ Start the engine once a week. If the water has already been removed, add water in the radiator. Then run the engine at low speed and operate the mast several times.
- ⑤ In summer, it is not recommended to park the fork on asphalt road.

3. Running after storing for a long time

- ① Remove the antirust oil from the exposed parts.
- ② Drain the gear oil of the crankcase, driving axle, hydraulic transmission box (torque converter type) clear it and add with new gear oil.
- ③ Clean the hydraulic oil reservoir and fuel reservoir (removing any dirt or water) and add with new hydraulic oil/fuel.
- ④ Check the clearance of the valve, gas valve cap and other parts on the engine.
- ⑤ Add antifreeze to required level.
- ⑥ Charge the battery, install on the truck and connect battery lead.
- ⑦ Check basic truck functions like starting, running, turning, lifting etc.

- ⑧ Warm-up your truck.

VIII. Maintenance

Caution:

- ① Only repair the fork lift truck if you have been properly trained.
- ② It is important to do timely inspections and maintenance to keep the truck in good working condition.
- ③ If the work place has a lot of dirt or other pollutants, time between maintenance intervals should be decreased.
- ④ Do not ignore routine inspection and maintenance, and resolve problem in time.
- ⑤ Don't use different oil when changing or adding oil.
- ⑥ If problems like loss of engine power, sudden increase in truck noise, or black smoke occur, check the truck immediately. The problems may be corrected by adjusting the diesel nozzle pressure and fuel atomization.
- ⑦ Dispose of waste oil or electrolyte liquid according to local environmental protection laws and regulations.
- ⑧ Follow the maintenance schedule.
- ⑨ After performing maintenance, keep a record.
- ⑩ Only use Hangcha parts

1. Preventive maintenance schedule

○——Check, revise, adjust

×——Replace

Caution : (1) If the work place has a lot of dirt or other pollutants, time between maintenance intervals should be decreased.

(2) If problems like loss of engine power, sudden increase in truck noise, or black smoke occur, check the truck immediately. The problems may be corrected by adjusting the diesel nozzle pressure and fuel atomization.

Engine periodical maintenance schedule

Check Item	Service required	Tool	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Engine	Visual check engine run condition(including noise, exhaust color)		○	○	○	○	○
	Clean or replace filter element		○	○	○	×	×
	Drain the water of oil water separator (diesel engine)			○	○	○	○

Check Item	Service required	Tool	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
	Check crankcase and clean dirt				○	○	○
	Check the valve clearance is correct	Plug gauge		First time ○	○	○	○
	Tighten cylinder head bolt	Torque wrench		First time ○	○	○	○
	Check cylinder compression pressure	Pressure gauge					○
	Sparking plug (Gasoline engine)			○	○	○	○
	Check distributor point, cover and rotor(Gasoline engine) (1)				○	○	○
	Distributor inner(IC ignition system)(1)						○
LPG Engine	1.Piping or pipe connector portion for gas leakage (1)		○	○	○	○	○
	2.Tar in vaporizer, Discharge		○	○	○	○	○
	3.Piping or pipe connector portion for damage		○	○	○	○	○
	4.Mounting bracket of LPG cylinder for looseness or damage		○	○	○	○	○
	5.Filter for LPG				○	○	×
Crank case ventilator	Check P. C.V valve and pipe blockage or damage					○	○
Governor	Check max. idling speed	Tachometer					○

Check Item	Service required	Tool	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Lubricating system	Check for the oil leakage of engine		○	○	○	○	○
	Check oil capacity and cleanness		○	○	○	○	○
	Replace engine oil (1)			First time ×	×	×	×
	Replace engine oil filter(1)			First time ×	×	×	×
Fuel system	Visual check if oil leakage at pipeline, pump or oil tank		○	○	○	○	○
	Replace fuel filter			First time ×	×	×	×
	Check nozzle and adjust pressure(diesel engine) (2)	Injection test				○	○
	Ignition timing(Gasoline engine)			○	○	○	○
	Injection moment(Diesel engine)						○
	Fuel tank drainage				○	○	○
	Clean fuel tank					○	○
	Check fuel		○	○	○	○	○
Cooling system	Cooling liquid quantity		○	○	○	○	○
	Leakage condition		○	○	○	○	○
	Replace cooling liquid						×
	Check fan belt tension and damage condition		○	○	○	○	○
	Clean outer water tank			Per month in summer	○	○	○
	Water tank cover performance and installation condition			○	○	○	○
	Tube aging condition					○	○

Drive system periodical maintenance schedule

Check item	Service required	Tools	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Hydraulic transmission gear box	Replace oil absorption filter			× First time (200h)		×	×
	Leakage condition		○	○	○	○	○
	Check oil quantity and change oil			× First time (200h)	○	×	×
	Inching pedal idle stroke and run condition		○	○	○	○	○
	Control valve and hydraulic clutch performance		○	○	○	○	○
	Inching valve performance		○	○	○	○	○
	Shift lever operation and loosen condition			○	○	○	○
	Hydraulic oil filter					×	×
Drive axle(Front axle)	Check hub bearing looseness and noise			○	○	○	○
	Wipe and re-add lubrication oil					×	×
	Leakage check		○	○	○	○	○
	Check axle deformation, crack or damage				○	○	○
	Check chassis connected bolt looseness				○	○	○
	Check hub bolt tightening torque	Torque wrench	○	○	○	○	○

Wheel (front, rear wheel) periodical maintenance schedule

Check item	Service required	Tools	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Tire	Charge pressure	Barometer	○	○	○	○	○
	Abrasion, crack or damage		○	○	○	○	○
	If there is nail, stone or other foreign body on the tyre			○	○	○	○
	Rim damage condition		○	○	○	○	○
	Split-type rim bolt looseness	Test hammer	○	○	○	○	○

Steering system periodical maintenance schedule

Check item	Service required	Tools	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Steering wheel	Check clearance		○	○	○	○	○
	Check axial looseness		○	○	○	○	○
	Check radial looseness		○	○	○	○	○
	Check operation condition		○	○	○	○	○
Steering pin	Check if erection bolt loosen			○	○	○	○
Rear axle knuckle	Check if master pin loosen or damage			○	○	○	○
	Check bend, deformation crack or damage condition			○	○	○	○
	Check installation condition	Test hammer		○	○	○	○
Steering cylinder	Check operation condition		○	○	○	○	○
	Check for leakage		○	○	○	○	○
	Check if loosen when installing and hinging			○	○	○	○

Brake system periodical maintenance schedule

Check item	Service required	Tools	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Brake pedal	Idle stroke	Dividing scale	○	○	○	○	○
	Pedal travel		○	○	○	○	○
	Operation condition		○	○	○	○	○
	Check if there is air in the brake pipeline		○	○	○	○	○
Parking brake control	If brake is safe and reliable and owns enough travel		○	○	○	○	○
	Control performance		○	○	○	○	○
Stick and dragline	Control performance			○	○	○	○
	If connection loosen			○	○	○	○
Pipeline	Damage, leakage, fracture			○	○	○	○
	Connection, clamp part, looseness condition			○	○	○	○
Brake master cylinder, brake cylinder	Leakage condition			○	○	○	○
	Check oil level, change oil		○	○	○	×	×
	Master cylinder and cylinder action condition						○
	Cylinder leakage, damage condition						○
	master cylinder, piston cup, check valve abrasion damage condition, replace						×
Brake drum and brake shoe	If brake drum parts loosen	Test hammer		○	○	○	○
	Friction plate abrasion condition	Slide caliper					○
	Brake shoe action condition						○
	If fixed pin rusts						○
	Return spring damage condition	Dividing rule					○
	Check if self-adjusting device operation time is proper						○

	Brake drum abrasion, damage condition						○
Brake baseboard	Check if baseboard deforms						○
	Check if crack	Flaw detection					○
	Check if loosen during installation	Test hammer					○

Hydraulic system periodical maintenance schedule

Check item	Service required	Tools	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Hydraulic oil tank	Check Hydraulic oil and replace		○	○	○	×	×
	Clear oil absorption filter element					○	○
	Replace oil return suction strainer (1)					×	×
	Eliminate foreign body					○	○
Control valve rod	If connection loosens		○	○	○	○	○
	Operation condition		○	○	○	○	○
Filter	Check oil leakage			○	○	○	○
Multi-way valve	Oil leak		○	○	○	○	○
	Relief valve and tilt latching valve operation condition			○	○	○	○
	Measure relief valve pressure	Oil gauge				○	○
Pipe joint	Leakage, loosen, fracture, deformation and damage condition			○	○	○	○
	Replace pipe						×

Electrical system periodical maintenance schedule

Check item	Service required	Tools	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Starting motor	Pinion engagement condition				○	○	○
Battery	Electrolyte fluid level and clean			○	○	○	○
	Check electrolyte proportion	Areometer			○	○	○
Wire	Wire harness damage and fix loosen condition			○	○	○	○

	Circuit joint looseness condition				○	○	○
Steering indicator light	Work and installation condition		○	○	○	○	○
Horn	Work and installation condition		○	○	○	○	○
Light and bulb	Work and installation condition		○	○	○	○	○
Reversing buzzer	Work and installation condition		○	○	○	○	○
Instrument	Instrument working condition		○	○	○	○	○

Lifting system periodical maintenance schedule

Check item	Service required	Tools	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Chain, chain wheel	Check chain tensy, if transform, damage or rust.		○	○	○	○	○
	Add oil to the chain			○	○	○	○
	Riveting pin and looseness			○	○	○	○
	Chain deformation and damage.			○	○	○	○
	If chain bearing loosen.			○	○	○	○
Attachm ent	Check if conditon is normal			○	○	○	○
Lifting cylinder	Check if piston rod, piston rod thread and connection deform, loosen or damage.	Test hammer	○	○	○	○	○
	Operation condition		○	○	○	○	○
	Leakage condition		○	○	○	○	○
	Pin and cylinder steel-backed bearing wear or damage condition.			○	○	○	○
Hydraulic pump	If hydraulic pump leaks or has noise.		○	○	○	○	○
	Hydraulic pump drive gear wear condition			○	○	○	○
Fork	Fork damage, deformation and wear condition.		○	○	○	○	○
	Positioning pin wear and damage condition.				○	○	○

	Fork root hook welded part crack or wear condition.			○	○	○	○
Mast, fork carriage	If the welded part between inner and outer mast and beam has crack or damage.			○	○	○	○
	If the welded part between mast and tilting cylinder has bad welding, crack or damage.			○	○	○	○
	If inner or outer masts have bad welding, crack or damage.			○	○	○	○
	If fork carriage bad welding, crack or damage.			○	○	○	○
	If roller loosens.			○	○	○	○
	Mast supporting bear wear or damage.						○
	If mast supporting bolts loosen.	Test hammer		○ (first time)	○	○	○
	If lifting cylinder bottom bolt, piston head bolt, U-type bolt and walking beam guide bolt loosen.	Test hammer		○ (first time)	○	○	○
	Roller, roller shaft and its welded part crack or damage condition.			○	○	○	○

Safety device and attachment periodical maintenance schedule

Check item	Service required	Tools	Daily (8 hrs)	Monthly (166hrs)	3months (300hrs)	Semi-annual (1000hrs)	Annual (2000hrs)
Overhead guard and load bracket	If firmly installed	Test hammer	○	○	○	○	○
	Check deformation, crack and damage.		○	○	○	○	○
Rearview mirror	Dirt and damage condition		○	○	○	○	○
	Rear-view condition		○	○	○	○	○
Seat	Check if bolt or damage loosen					○	○

Truck body	If chassis and beam damage or crack						○
	If rivet or bolt loosen						○
Add lubricate grease or change oil	Check chassis lubrication condition after clean			○	○	○	○
	Check oil in the oil tank						○
Operator presence system	Working condition		○	○	○	○	○

2. Torque Specifications

Unit :

N·m

Bolt's diameter mm	Grade			
	4.6	5.6	6.8	8.8
6	4~5	5~7	7~9	9~12
8	10~12	12~15	17~23	22~30
10	20~25	25~32	33~45	45~59
12	36~45	45~55	58~78	78~104
14	55~70	70~90	93~124	124~165
16	90~110	110~140	145~193	193~257
18	120~150	150~190	199~264	264~354
20	170~210	210~270	282~376	376~502
22	230~290	290~350	384~512	512~683
24	300~377	370~450	488~650	651~868
27	450~530	550~700	714~952	952~1269
30	540~680	680~850	969~1293	1293~1723
33	670~880	825~1100	1319~1759	1759~2345
36	900~1100	1120~1400	1694~2259	2259~3012
39	928~1237	1160~1546	1559~2079	2923~3898

Note : ・Use entirely 8.8 grade bolt in the important joint position.

・Bolt's grade can be found in the head, if it can't be found, the grade is 8.8.

3. Periodic replacement of key safe parts

Some parts are not checked during routine maintenance. Please refer to the table below for the average service life of these parts

Replace them when their service life has expired, sooner if they damaged.

Name of key safe part	service life (years)
Brake hose or hard tube	1~2
Hydraulic rubber hose for lifting system	1~2
Lifting chain	2~4
High pressure rubber hose or tube for hydraulic system	2
Grease cup for brake fluid	2~4
Fuel tube	2
Sealing member, rubber articles inside of hydraulic system	2

4. Table for the oil used in the truck

1.0t~3.5t Forklift used oil

Description	Shop sign, Code name	Capacity(L)	Remark
Gasoline	93# or 97#	45	1t~1.8t
		60	2t~3.5t
Diesel	0# (Summer) -10#~-35# (Winter)	45	1t~1.8t
		60	2t~3.5t
LPG		40	仅 W57
Diesel engine oil	General season: CH-4 grade 15W / 40 winter: CH-4 grade 10W / 30 (arctic-alpine: CF-4 grade 5W/30, Cummins engine CH-4 grade) or refer to engine manual	5.2~7.5	Diesel engine
Gasoline Engine Oil	General season: SF grade 15W/40 winter: SF grade 10W/30 (arctic-alpine: Caltex API SAE 5W-30) or refer to engine manual	3.5~4	K21、K25
Hydraulic oil	L—HM32 (arctic-alpine: L—HV32)	36~41	1.0t~1.8t
		45~51	2.0t~2.5t
		49~55	3.0t~3.5t
Hydrodynamic Power Transmission Oil	DEXRON—III (Caltex) (1t-3.5t)	10	M truck model (South Korea MS)
		11	F truck model (Domestic) exported truck
		4	B truck model (Okamura) exported truck
Gear oil (Drive axle)	85W/90 (GL-5)	5-5.8	1t~1.8t: F, B truck model
		6.5	2t~3.5t: F, B truck model
	South Korean drive axle: Mobil 424 hydraulic drive oil SAE 85W/90	4.5	1t~1.8t, M truck model
		5.6	2t~3.5t, M truck model
Brake Liquid (Add to brake oiler)	Choice HZY3 brake liquid (add when leaving factory) or DOT3.	1.5	F, B truck model

Description	Shop sign, Code name	Capacity(L)	Remark
	SAE10W Delvac advanced hydraulic oil	1	Only for South Korean drive axle(M truck model)
Antirust antifreeze liquid (Radiator)	-35# motor antifreeze liquid (add when leaving factory) or FD-2 antifreeze	10~11	1t~3.5t
Industrial vaseline	2#		Battery terminal
Lubrication grease (each lubricating point)	3# Automobile general lithium base lubrication grease		Each lubricating point
	HP-R lubrication grease (POLYREX)		Relatively need lubricating point with high temperature resistance

4.0t~x5.5t Forklift used oil

Description	Shop sign , Code name	Capacity	Remark
Gasoline	93# or 97#	100L	4.0t~4.5t
		116L	5.0~5.5t
Diesel	0# (winter) (w58 sulphur content<15pmm) -10#~-35# (winter)	100L	4.0t~4.5t
		116L	5.0~5.5t
Diesel engine oil	General season: CH-4 grade 15W / 40(add when leaving factory)winter: CH-4 grade 10W / 30 or refer to engine manual(arctic-alpine: CH-4 grade 5W/30, or refer to engine manual	9	W35B
		6.2	W58B
Gasoline engine oil	SF grade 15W/40(add when leaving factory) or refer to engine manual (arctic-alpine: Caltex API SAE 5W-30)	9	W57B
Hydraulic oil	L—HM46 (arctic-alpine: L—HV32)	70~74	
Hydraulic transmission oil (Gearbox)	ATF DEXRON II	13	
Gear oil (Driving axle)	GL—5 85W/90 or equivalent	10	
Brake liquid (Brake oil box)	DOT3 brake liquid or equivalent	1	
Antirust antifreeze solution(water tank)	-35# motor vehicle antifreeze fluid (add after leaving factory) or FD-2 antifreeze	20L	W35B
		18~20L	W57B
		11~12L	W58B
Industrial Vaseline	2#		Electrode of storage battery
Lubrication grease (each lubricating point)	Automobile general lithium base lubricant		

Note: • The trucks have been added antirust antifreeze liquid, you need not discharge the liquid even at cold winter. Add the liquid according to original requirement if need. Replace the liquid every 2-4 years normally.

- If the truck has not been added antirust antifreeze liquid, users can add the liquid according to requirement. The cooling water must be discharged at winter if the truck has not been added antirust antifreeze liquid.

• F truck model: truck with the last letter F; B truck model: truck with the last letter B; M truck model: truck with the last letter M

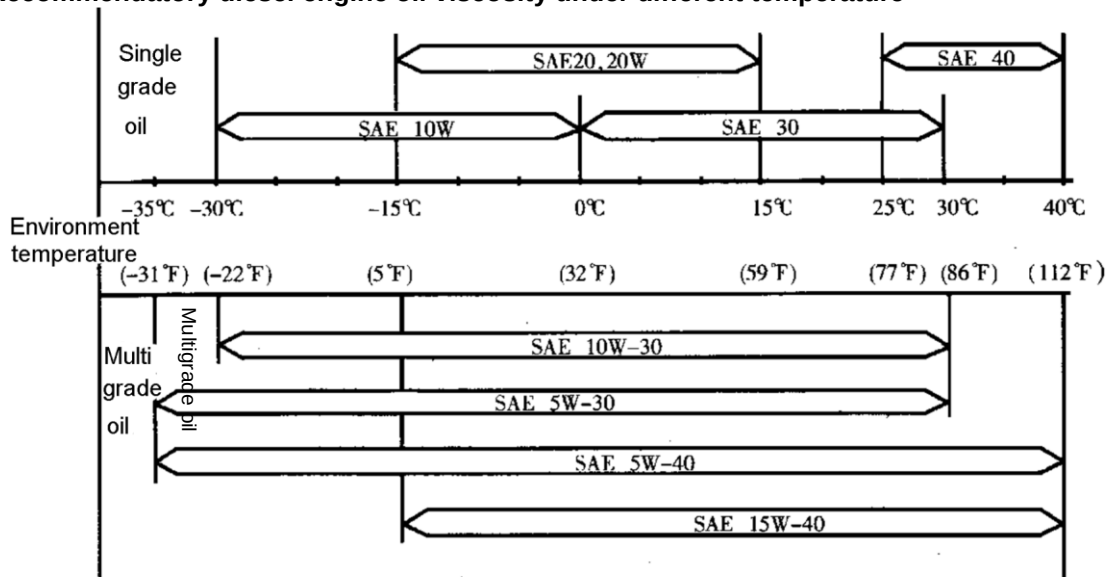
5.0t~10.0t Forklift used oil

Description	Shop sign, Code name	Capacity(L)	Remark	
LPG		40	Only W57truck	
Diesel	0#（Summer） -10#～-35#（Winter）	110	5t-7t	Only for diesel truck
		120	8t-10t	
Diesel engine oil	General season: CH-4 grade 15W / 40 Winter: CH-4 grade 10W / 30 arctic-alpine: CH-4 grade 5W/30 or 5W/40	Filling amount refer to engine manual or oil scale mark	Only for diesel truck	
Hydraulic oil	General season: L—HM32 arctic-alpine: L—HV32	110～120	Hydraulic oil tank	
Hydrodynamic Power Transmission Oil	6#or 8# Hydrodynamic Power Transmission Oil	25	Transmission	
Gear oil	85W/90（GL-5） (arctic-alpine: 80W/90（GL-5）)	13	5t-7t	Drive axle, hub reduction gear
		15	8t-10t	
Antirust antifreeze	FD-2（Great Wall Brand）Mutiple-effect antifreeze	23	5t-7t	Radiator, ratio1: 1（Engine coolant liquid 4.6L）
		28	8t-10t	
Lubrication grease	3# Automobile general lithium base lubrication grease		Each lubricating point	
	HP-R lubrication grease（POLYREX）		Relatively need lubricating point with high temperature resistance	

Note: The trucks have been added antirust antifreeze liquid, you need not discharge the liquid even at cold winter. Add the liquid according to original requirement if need. Replace the liquid every 2-4 years normally. The cooling water must be discharged at winter if the truck has not been added antirust antifreeze liquid.

Different oil brand cannot mix.

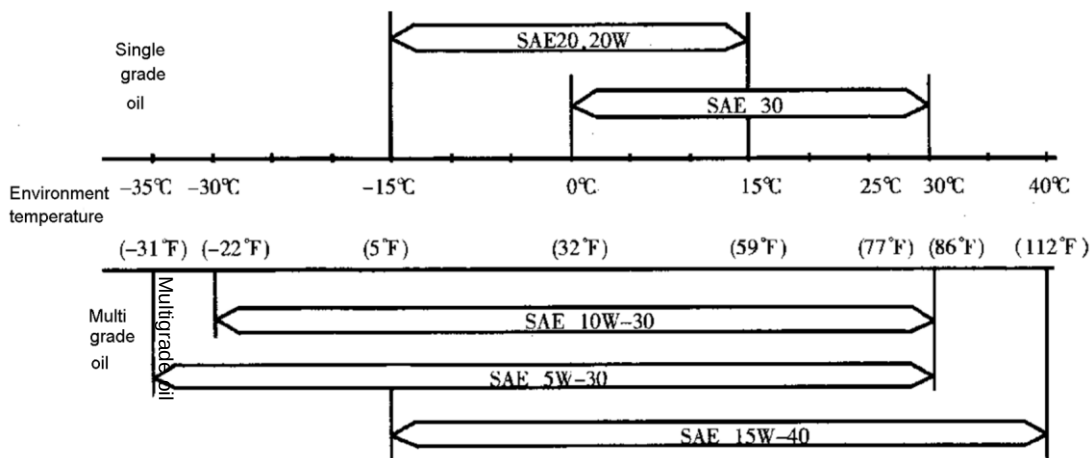
Recommendatory diesel engine oil viscosity under different temperature



Note:

1. The capability and quality of diesel engine oil should be in accordance with API class or SAE J183 CD grade or above CD grade, GB11122-1997 CD grade and above CD-grade.
2. Fill oil to diesel engine before leaving factory: CD grade SAE 15W / 40.

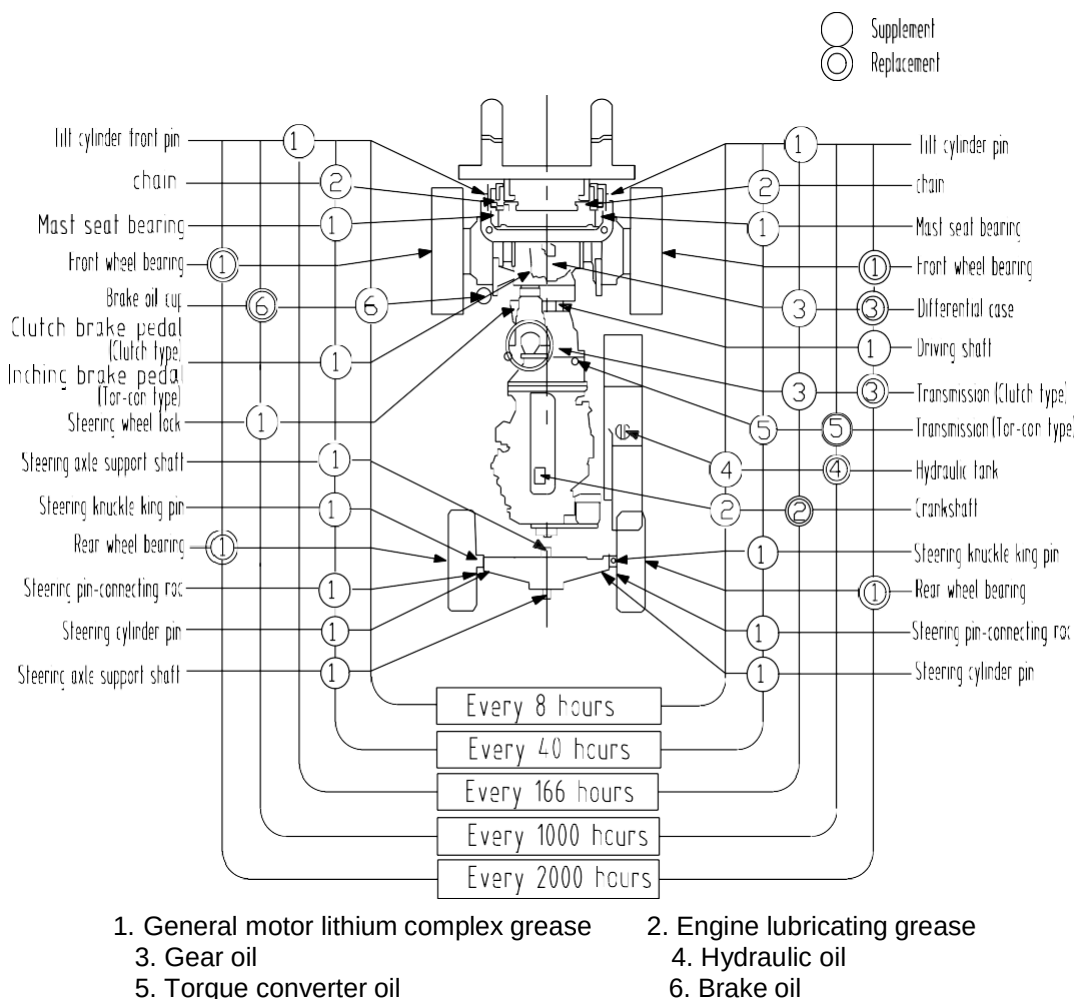
Recommendatory gasoline engine oil viscosity under different temperature



Note:

1. The capability and quality of gasoline engine oil should be in accordance with API class or SAE J183 SE grade and above SE grade, GB11121-1995 SE and above SE grade.
2. Fill oil to Gasoline engine before leaving factory: SF grade SAE 15W / 40

5. Lubrication system drawing



Note : 1. The details of lubricating oil for different trucks are listed in the *Table for the oil used in the truck*.

2. Lubrication for mast, please refer to *Weekly Maintenance (40hrs)*

Environment protection :

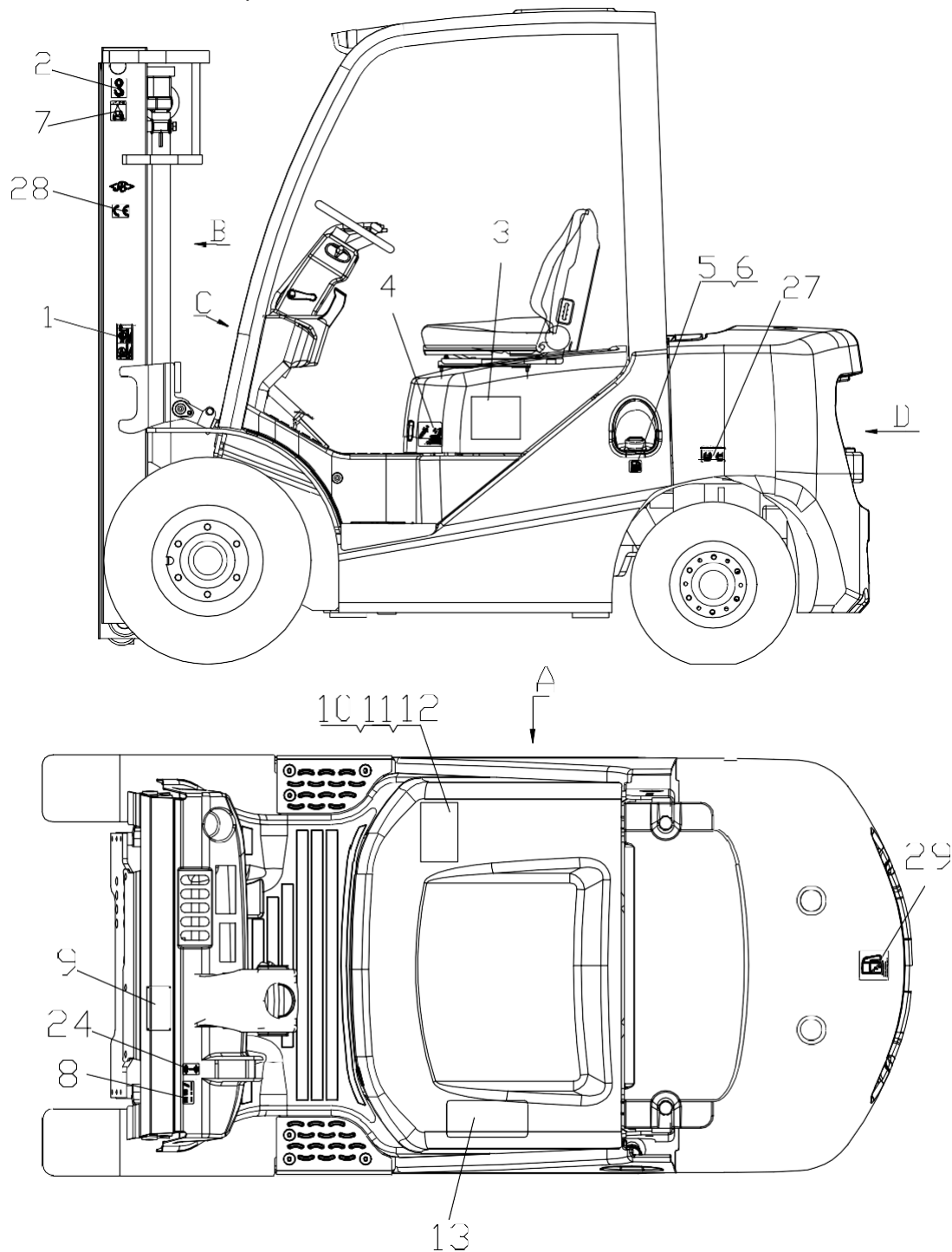
1. Please perform truck cleaning and maintenance at specified locations.
2. Before removing the pipe, connector and related parts, please use the specified container for the used liquid (include antifreeze liquid, engine oil, hydraulic oil, hydrodynamic power transmission oil, gear oil, brake liquid, lubrication grease) and used battery.
3. The used liquid referred above should only be disposed of according to local environment protection laws and regulations.

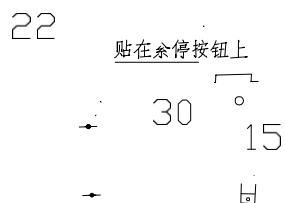
Safety awareness :

The antifreeze liquid, engine oil, hydraulic oil, hydrodynamic power transmission oil and gear oil should be replaced when it is below 70°C to avoid personal injury.

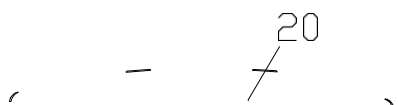
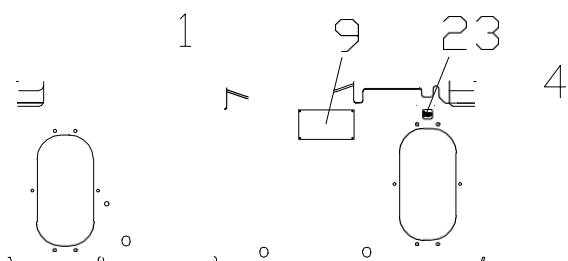
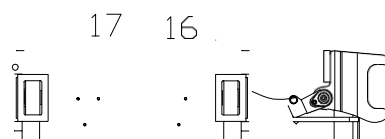
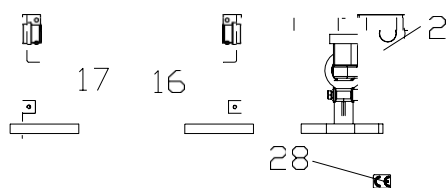
IX. Labels : Stick various nameplate and mark at different position of the truck

Take 1-3.5t truck for example, and 4-10t truck is similar:





内侧

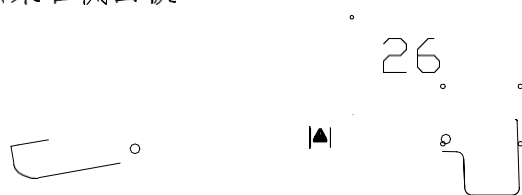


右箱体(去掉机罩)

21

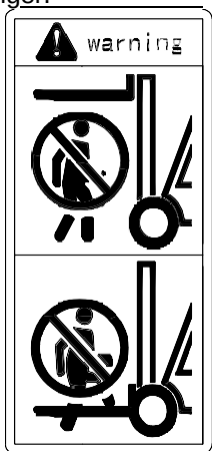


顶架右侧面板

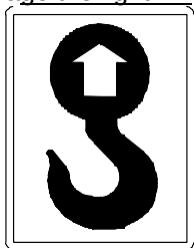


- | | | | |
|-------------------------|----------------------|-------------------------|------------------------------|
| 5. Diesel label | 6. Gasoline label | 7. Hang label | 8. Operate label |
| 9. Nameplate label | 10. Load curve label | 13. Warning label | 14. Lubrication system label |
| 15. No washing label | 16. Danger label | 17. Danger label | 18. Hand injury risk label |
| 19. Antifreeze label | 20. Character label | 21. Hydraulic oil label | 22. Noise label |
| 23. Horn label | 24. Hand brake label | 25. Tie down label | 26. Safety belt label |
| 27. Tire pressure label | 28. CE Label | 29. LPG label | 30. Emergency Stop Label |

1.Danger Label: on the outside of mast
 Don't stand on or under fork, otherwise the life may be in danger.



2.Hang Label: it shows the hoisting position and method of truck lifting. Avoid the cord touch and damage the light when hoisting.

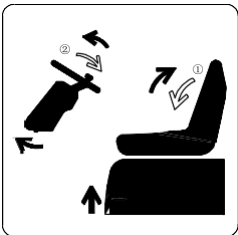


3. Tonnage label



For example, “30” means the rated capacity is 3ton, but if lift highly or with attachment, then the capacity reduces.

4. Hood open label



Before opening the hood, move forward the steering wheel, and tilt forward the seat back.
After closing the hood, steering wheel and seat back return to original position.

5. Diesel label: it shows that oil filter position, which on the rear left outrigger of overhead guard.
 (Gasoline, LPG truck without)

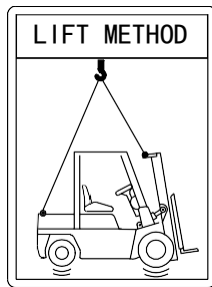


6. Gasoline label : it shows that oil filter position, which on the rear left outrigger of overhead guard.
 (Diesel, single fuel LPG truck without)

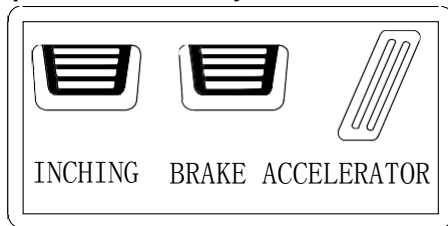


7. Hang Label: it shows the hoisting position

and method of truck lifting. Avoid the cord touch and damage the light when hoisting.



8. Operate label 1 Hydraulic truck



9. Nameplate label

INTERNAL COMBUSTION COUNTERBALANCED FORKLIFT TRUCK

MODEL TYPE: I II

SERIES NO. III SERVICE WEIGHT IV kg

NOMINAL LOAD CENTER VI mm RATED CAPACITY V kg

YEAR OF MANUFACTURE XI

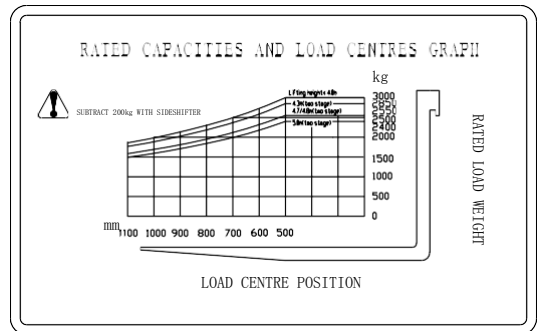
	MAX. LIFT HEIGHT	LOAD CENTER	CAPACITY AT MAX. L.H.
WITHOUT ATTACHMENT	VI mm	VI mm	VI kg
WITH ATTACHMENT	IX mm	X mm	XI kg

ZHEJIANG HANGCHA ENGINEERING MACHINERY CO., LTD.
License No.: TS2410418-2012 Add: 398 Shi'ao Road, Hangzhou, China

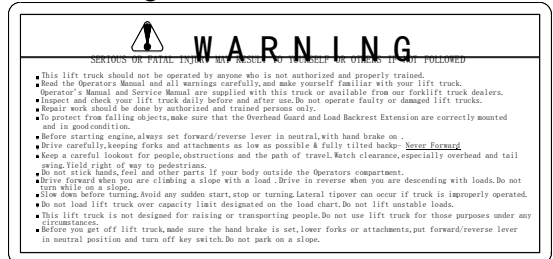
10,11,12: Load curve label

It shows the connection among load center position and max load, max lifting height. Load capacity decreases if truck equips with sideshifter and attachment, or lifting height increases.

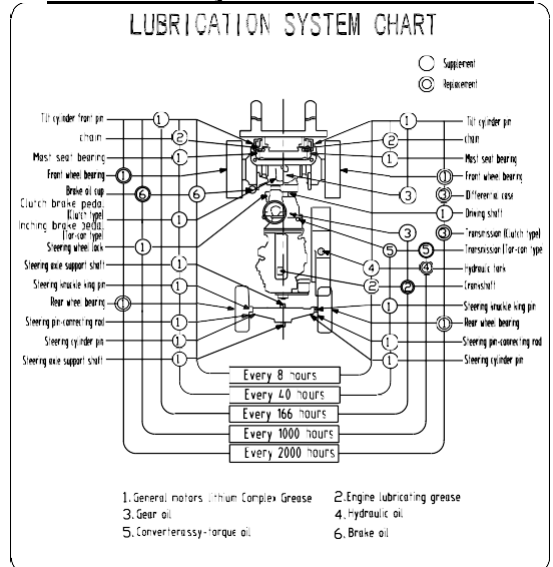
Before loading, please check whether the load and load centre in the range of load capacity chart. If the figure of load is complex, please make sure the heaviest part of load is in the centre of fork and close to backrest.



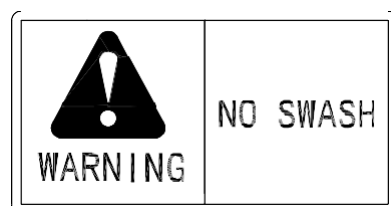
13. Warning label



14. Lubrication system label

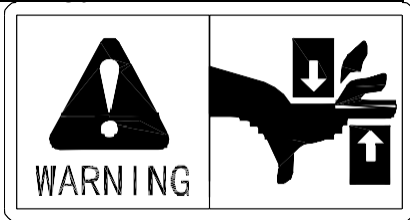


15. No washing label On the right overhead guard, it's the air inlet passage of the engine. It is strictly prohibited to let water enter airshaft and avoid water during washing the truck.



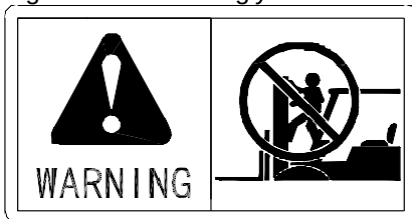
16. Danger label

The inner and outer mast, fork frame are all lifting slip parts. The hands are not allowed to reach in between the inner and outer masts. If a part needs to be check or repaired, the inspection and repair should be carried out after shutting down the engine. There should not be person on the truck or others to operate the truck to avoid accidents by handling mast lever wrongly.

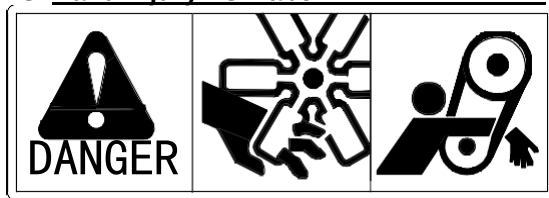


17. Danger label (No entering mast label)

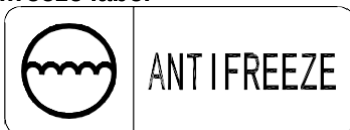
Warning: It is dangerous of your life. If the body is crushed between the mast, instrument frame and shield cab, it can be fatal. If the part needs to be checked or repaired, the inspection and repair should be carried out after shutting down the engine. There should not be person on the truck or others to operate the truck to avoid accidents by handling mast lever wrongly.



18. Hand injury risk label



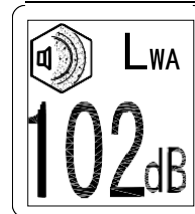
19. Antifreeze label



21. Hydraulic oil label



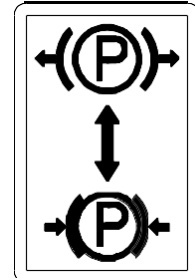
22. Noise label



23. Horn label



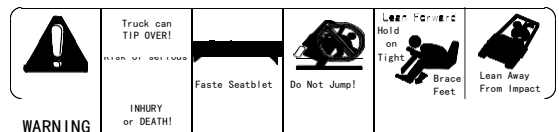
24. Hand brake label



25. Tie down label

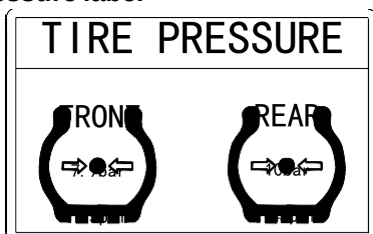


26. Safety belt label and Anti-tilting Warning Label

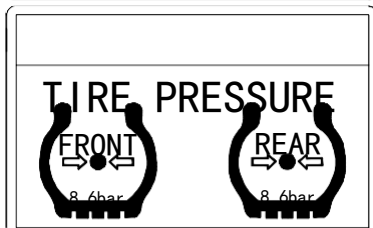


27. Tire pressure label

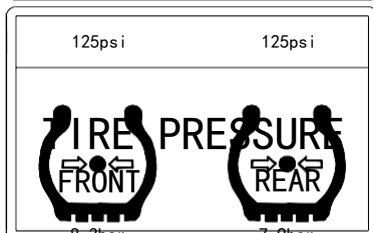
1.5t~1.8t



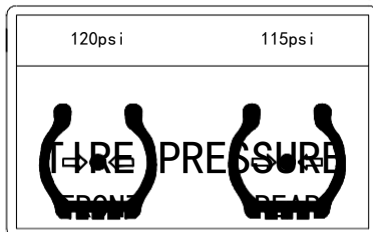
2.0t~2.5t



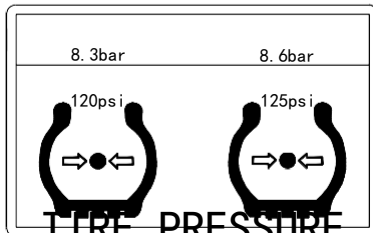
3.0t~3.5t



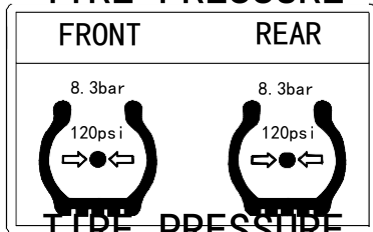
4.0t~X5t



5t~7t



8t~10t



FRONT

REAR

7.6bar

7.6bar

110psi

110psi

28. CE Label



29. LPG Label (Only for LPG truck or dual fuel truck)



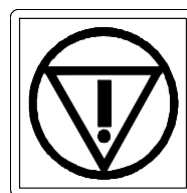
Stick this label on the cylinder :

Marked: Max. LPG weight is 52kg.

Max. LPG pressure 2.2MPa

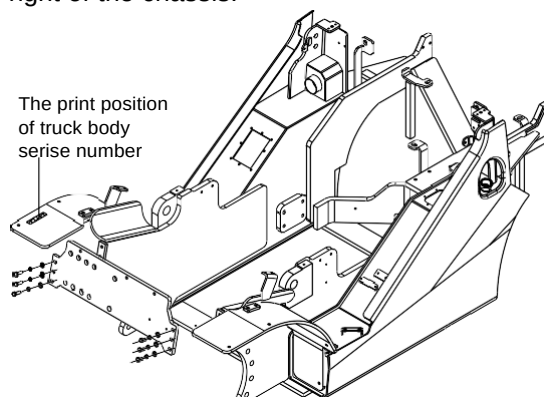
Max. support bearing weight 105kg

30. Emergency stop label



Serial number printing position

Each truck has one unique chassis serial number and the printing position is at the front right of the chassis.



X. Truck transporting, lifting, towing

Hoist the truck

Use steel wire ropes through the holes in the two sides of the outside mast's beam and the hook of the counter balance, then use the lifting device to hoist the truck.



Warning

- When hoisting the truck, do not 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.
- Do not lift the truck by the overhead guard.
- When lifting the truck, do not get under the truck.

Transporting

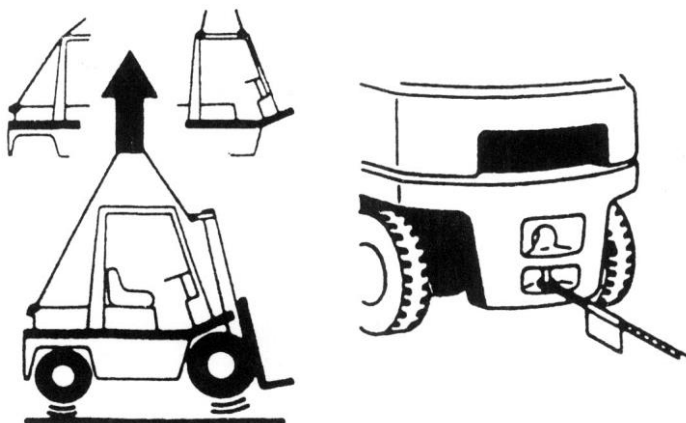
The forklift truck is designed for material handling and short-distance transportation only. It is not designed for long-distance transportation. The Fork Lift Truck must be transported by ship, train or lorry, of over 5T loading. Tighten the brake lever, place wood blocks to the front and rear wheels and bind the truck body with enough rope, to avoid slippage during transportation.

Towing

The towing rod on the bottom of the counter balance is used to pull and drag the truck, for installing the rod, first remove the towing rod and then install the ropes. After that, replace the rod

Towing method for damaged truck:

Release hand brake lever. Place shift in neutral. Be careful to the traffic safety and hang being towed label.



Caution

- Never tow the truck with abnormal steering system and damaged brake system.
- Obey traffic rules when towing truck on road,



Warning

- ONLY connect the wire ropes to the towing rod.
- DO NOT pull a load secured by steel wire ropes suddenly.

XI. Model meaning

1t-1.8t

Model	Engine	Hydraulic transmission	Rated capacity(t)/ Load center(mm)
FD10/15/18-XW10F	C240PKJ-30 Diesel engine	XF150-120000-G00	1/500、1.5/500、 1.75/500
FG10/15/18-XW21F	K21 Gasoline engine GCT(NISSAN)	XF150-120000-G00	1/500、1.5/500 1.75/500 Gasoline
FG10/15/18-XW21B		Y43160X / Y48130X	
FG10/15/18-XW21M		XM150-130000-G00	
FG5/18-XW21F	K21 Gasoline engine GCT(NISSAN)	XF150-120000-G00	1.5/500、1.75/500, IMPCO LPG single fuel system
FG15/18-XW21B		Y43160X / Y48130X	
FG15/18-XW21M		XM150-130000-G00	
FG15/18-XW21F	K21 Gasoline/LPG engine GCT(NISSAN)	XF150-120000-G00	1.5/500、1.75/500, IMPCO LPG dual fuel system
FG15/18-XW21B		Y43160X / Y48130X	
FG15/18-XW21M		XM150-130000-G00	
FG15/18-XW51F	K21 LPG GCT(NISSAN)	XF150-120000-G00	1.5/500、1.75/500, NIKKI LPG single fuel system
FG15/18-XW51B		Y43160X / Y48130X	
FG15/18-XW51M		XM150-130000-G00	
FD10/15/18-XW32F	4TNE92-HRJ Diesel engine	XF150-120000-G00	1/500、1.5/500、 1.75/500
FD10/15/18-XW32B		Y43160X / Y48130X	
FD10/15/18-XW32M		XM150-130000-G00	

2t-2.5t

Model	Engine	Hydraulic transmission	Rated capacity(t)/ Load center(mm)
FD20/25-XW10F	C240PKJ-30 Diesel engine	XF250-130000-G00	2/500、2.5/500
FD25-XW10B		Y43160X / Y48140X	2.5/500
FG20/25-XW21F	K21 gasoline engine GCT(NISSAN)	XF250-130000-G00	2/500、2.5/500 Gasoline
FG20/25-XW21F			2/500、2.5/500, IMPCO LPG single fuel system
FG20/25-XW21F			2/500、2.5/500, IMPCO LPG dual fuel system
FG20/25-XW22F	K25 gasoline engine GCT(NISSAN)	XF250-130000-G00	2/500、2.5/500 Gasoline
FG20/25-XW22B		Y43160X / Y48140X	
FG20/25-XW22M		RM322-130000-G00	
FG20/25-XW22F	K25 gasoline engine GCT(NISSAN)	XF250-130000-G00	2/500、2.5/500, IMPCO LPG single fuel system
FG20/25-XW22B		Y43160X / Y48140X	
FG20/25-XW22M		RM322-130000-G00	
FG20/25-XW22F	K25 gasoline engine GCT(NISSAN)	XF250-130000-G00	2/500、2.5/500, IMPCO LPG dual fuel system
FG20/25-XW22B		Y43160X / Y48140X	
FG20/25-XW22M		RM322-130000-G00	
FG20/25-XW51F	K21 LPG GCT(NISSAN)	XF250-130000-G00	2/500、2.5/500, NIKKI LPG single fuel system
FG20/25-XW52F	K25 LPG GCT(NISSAN)	XF250-130000-G00	
FG20/25-XW52B		Y43160X / Y48140X	
FG20/25-XW52M		RM322-130000-G00	
FD20/25-XW27F	A498BT1-20 Diesel engine	XF250-130000-G00	2/500、2.5/500
FD20/25-XW32F	4TNE92-HRJ Diesel engine	XF250-130000-G00	2/500、2.5/500
FD25-XW32B		Y43160X / Y48140X	2.5/500
FD25-XW32M		RM322-130000-G00	2.5/500

Model	Engine	Hydraulic transmission	Rated capacity(t)/ Load center(mm)
FD20/25-XW33F	4TNE98-BQFLC Diesel engine	XF250-130000-G00	2/500、2.5/500
FD20/25-XW33B		Y43160X / Y48140X	
FD20/25-XW33M		RM322-130000-G00	
FD20/25-XW43F	Cummins QSF2.8T3NA49 Diesel engine	XF250-130000-G00	2/500、2.5/500
FD20/25-XW43B		Y43160X / Y48140X	
FD20/25-XW55F	Mitsubishi Motors S4S-Z362CSFL(OLD) S4S-DPEU2(NEW) Diesel engine	XF250-130000-G00	2/500、2.5/500
FD20/25-XW55B		Y43160X / Y48140X	
FD20/25-XW56F	Yanmar 4TNV94L-BXPHZ Diesel engine	XF250-130000-G00	2/500、2.5/500
FD20/25-XW56B		Y43160X / Y48140X	
FD20/25-XW56M		RM322-130000-G00	

3t-3.5t

Model	Engine	Hydraulic transmission	Rated capacity(t)/
FD30/35-XW10F	C240PKJ-30 Diesel engine	XF300-120000-G00	3/500、3.5/500
FG30/35-XW22F	K25 gasoline engine GCT(NISSAN)	XF300-120000-G00	3/500、3.5/500 Gasoline
FG30/35-XW22B		Y43160X / Y48150X	
FG30/35-XW22M		RM622-130000-G00	
FG30/35-XW22F	K25 gasoline engine GCT(NISSAN)	XF300-120000-G00	3/500、3.5/500 IMPCO single fuel system
FG30/35-XW22B		Y43160X / Y48150X	
FG30/35-XW22M		RM622-130000-G00	
FG30/35-XW22F	K25 gasoline engine GCT(NISSAN)	XF300-120000-G00	3/500、3.5/500 IMPCO dual fuel system
FG30/35-XW22B		Y43160X / Y48150X	
FG30/35-XW22M		RM622-130000-G00	
FG30/35-XW52F	K25 LPG GCT(NISSAN)	XF300-120000-G00	3/500、3.5/500 NIKKI single fuel system
FG30/35-XW52B		Y43160X / Y48150X	
FG30/35-XW52M		RM622-130000-G00	
FD30/35-XW33F	4TNE98-BQFLC Diesel engine	XF300-120000-G00	3/500、3.5/500
FD30/35-XW33B		Y43160X / Y48150X	3/500、3.5/500
FD30/35-XW33M		RM622-130000-G00	3/500、3.5/500
FD30/35-XW43F	Cummins QSF2.8T3NA49 Diesel engine	XF300-120000-G00	3/500、3.5/500
FD30/35-XW43B		Y43160X / Y48150X	
FD30/35-XW55F	Mitsubishi Motors S4S-Z362CSFL(OLD) S4S-DPEU2(NEW) Diesel engine	XF300-120000-G00	3/500、3.5/500
FD30/35-XW55B		Y43160X / Y48150X	
FD30/35-XW56F	Yanmar 4TNV94L-BXPHZ Diesel engine	XF300-120000-G00	3/500、3.5/500
FD30/35-XW56B		Y43160X / Y48150X	
FD30/35-XW56M		RM622-130000-G00	

4t-5t

Model	Engine	Hydraulic transmission	Rated capacity(t)/ Load center(mm)
FD40/45-XW35B	1104D-44 (PERKINS)	XB450-130000-G02	4.0/500, 4.5/500
FD50/55-XXW35B			5.0/500,5.5/500
FD40/45-XW58B	QSF2.8 T4F (CUMMINS)	XB450-130000-G01	4.0/500, 4.5/500
FD50/55-XXW58B			5.0/500,5.5/500
FG40/45-XW57B	GM4.3L LX Dual fule engine	XB450-130000-G01	4/500、4.5/500
FG50/55-XXW57B			5.0/500, 5.5/500
FG40/45-XW57B			4/500、4.5/500
FG50/55-XXW57B			5.0/500 ,5.5/500

5t-10t

Model	Engine	Hydraulic transmission	Rated capacity(t)/ Load center(mm)
FD50/60/70-XW38	QSB3.3 (CUMMINS)	YQXD100H21	5/600, 6/600, 7/600
FD50/60/70-XW46	QSB3.3 100 (CUMMINS)	YQXD100H21	5/600, 6/600, 7/600
FD50/60/70-XW57	GM4.3L LX (LPG dual fuel)	YQXD100H13A	5/600, 6/600, 7/600
FD80/100-XW28	QSB4.5 (CUMMINS)	YQXD100H20	8/600, 10/600
FD80/100-XW48	QSB4.5 110 (CUMMINS)	YQXD100H20	8/600, 10/600

XII. Main technical performance parameter

1t—1.8t

Model		CPCD10-XW10F	CPCD15-XW10F	CPCD18-XW10F
Rated capacity	kg	1000	1500	1750
Load centre distance	mm	500	500	500
Overall maximum lift height	mm	3000	3000	3000
Free lift height	mm	155	155	155
Maximum lift speed (with load)	mm/s	610	610	610
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	21	21	21
Ground clearance	mm	115	115	115
Min outside turning radius	mm	1965	1990	2015
Max. Grade ability (Full load)	%	20	20	20
Wheel-base	mm	1475	1475	1475
Track (F/R)	mm	900/920	900/920	900/920
Service mass	kg	2510	2650	2765
Overall dimension (L×W×H)(include forks)		3175×1080×2105	3205×1080×2105	3230×1080×2105
Tyre (F/R)		6.5-10-10PR/2 5.00-8-10PR/2	6.5-10-10PR/2 5.00-8-10PR/2	6.5-10-10PR/2 5.00-8-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h	12/60/20h
Diesel engine	Model	ISUZU C240PKJ-30		
	Rated capacity/rpm	34.5kW/2500 r/min		
	Max torque/rpm	137.7N • m/1800 r/min		
	Displacement L	2.4		

Model		CPQD10-XW21	CPQD15-XW21	CPQD18-XW21
Rated capacity	kg	1000	1500	1750
Load centre distance	mm	500	500	500
Overall maximum lift height	mm	3000	3000	3000
Free lift height	mm	155	155	155
Maximum lift speed (with load)	mm/s	580	510	510
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	19	18	18
Ground clearance	mm	115	115	115
Min outside turning radius	mm	1965	1990	2015
Max. Grade ability (Full load)	%	20	20	20
Wheel-base	mm	1475	1475	1475
Track (F/R)	mm	900/920	900/920	900/920
Service mass	kg	2510	2650	2765
Overall dimension (L×W×H)(include forks)		3175×1080×2105	3205×1080×2105	3230×1080×2105
Tyre (F/R)		6.5-10-10PR/2 5.00-8-10PR/2	6.5-10-10PR/2 5.00-8-10PR/2	6.5-10-10PR/2 5.00-8-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h	12/60/20h
Gasoline engine	Model	GCT(NISSAN) K21		
	Rated capacity/rpm	31.5kW/2300 r/min		
	Max torque/rpm	144N • m/1600 r/min		
	Displacement L	2.065		

	Power	Gasoline
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Model		FG15-XW21	FG18-XW21
Rated capacity	kg	1500	1750
Load centre distance	mm	500	500
Overall maximum lift height	mm	3000	3000
Free lift height	mm	155	155
Maximum lift speed (with load)	mm/s	510	510
Tilt of the mast	F/B	6° /12°	6° /12°
Max travel speed (without load)	km/h	18	18
Ground clearance	mm	115	115
Min outside turning radius	mm	1990	2015
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	1475	1475
Track (F/R)	mm	900/920	900/920
Service mass	kg	2650	2765
Overall dimension (L×W×H)(include forks)		3205×1080×2105	3230×1080×2105
Tyre (F/R)		6.5-10-10PR/2 5.00-8-10PR/2	6.5-10-10PR/2 5.00-8-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h
Gasoline engine	Model	GCT(NISSAN) K21	
	Rated capacity/rpm	31.5kW/2300 r/min	
	Max torque/rpm	144N • m/1600 r/min	

	Displacement L	2.065
	Power	LPG

Model		FG15-XW21	FG18-XW21
Rated capacity	kg	1500	1750
Load centre distance	mm	500	500
Overall maximum lift height	mm	3000	3000
Free lift height	mm	155	155
Maximum lift speed (with load)	mm/s	510	510
Tilt of the mast	F/B	6° /12°	6° /12°
Max travel speed (without load)	km/h	18	18
Ground clearance	mm	115	115
Min outside turning radius	mm	1990	2015
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	1475	1475
Track (F/R)	mm	900/920	900/920
Service mass	kg	2650	2765
Overall dimension (L×W×H)(include forks)		3205×1080×2105	3230×1080×2105
Tyre (F/R)		6.50-10-10PR/2 5.00-8-10PR/2	6.50-10-10PR/2 5.00-8-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h
Gasoline engine	Model	GCT(NISSAN) K21	
	Rated capacity/rpm	31.5kW/2300 r/min	
	Max torque/rpm	144N • m/1600 r/min	

	Displacement L	2.065
	Power	Gasoline/LPG

Model		FG15-XW51	FG18-XW51
Rated capacity	kg	1500	1750
Load centre distance	mm	500	500
Overall maximum lift height	mm	3000	3000
Free lift height	mm	155	155
Maximum lift speed (with load)	mm/s	510	510
Tilt of the mast	F/B	6°/12°	6°/12°
Max travel speed (without load)	km/h	18	18
Ground clearance	mm	115	115
Min outside turning radius	mm	1990	2015
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	1475	1475
Track (F/R)	mm	900/920	900/920
Service mass	kg	2650	2765
Overall dimension (L×W×H)(include forks)		3205×1080×2105	3230×1080×2105
Tyre (F/R)		6.5-10-10PR/2 5.00-8-10PR/2	6.5-10-10PR/2 5.00-8-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h
LPG engine	Model	GCT(NISSAN) K21 LPG	
	Rated apacity/rpm	29kW/2250 r/min	
	Max torque/rpm	140N·m/1600 r/min	
	Displacement L	2.065	

Model		FD10-XW32F FD10-XW32B FD10-XW32M	FD15-XW32F FD15-XW32B FD15-XW32M	FD18-XW32F FD18-XW32B FD18-XW32M
Rated capacity	kg	1000	1500	1750
Load centre distance	mm	500	500	500
Overall maximum lift height	mm	3000	3000	3000
Free lift height	mm	155	155	155
Maximum lift speed (with load)	mm/s	580	580	580
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	19/19.3/19	19/19.3/19	19/19.3/19
Ground clearance	mm	115	115	115
Min outside turning radius	mm	1965	1990	2015
Max. Grade ability (Full load)	%	20	20	20
Wheel-base	mm	1475	1475	1475
Track (F/R)	mm	900/920	900/920	900/920
Service mass	kg	2510	2650	2765
Overall dimension (L×W×H)(include forks)		3175×1080×2105	3205×1080×2105	3230×1080×2105
Tyre (F/R)		6.5-10-10PR/2 5.00-8-10PR/2	6.5-10-10PR/2 5.00-8-10PR/2	6.5-10-10PR/2 5.00-8-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h	12/60/20h
Diesel engine	Model	YANMAR 4TNE92-HRJ		
	Rated capacity/rpm	32.8kW/2450 r/min		

	Max torque/rpm	142N • m/1600 r/min
	Displacement L	2.659

2-3.5t

Model		FD20-XW10F	FD25-XW10F FD25-XW10B	FD30-XW10F	FD35-XW10F
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	650	650/620	520	455
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	19.7	19.7/18.6	18.6	18.6
Ground clearance	mm	115	115	130	130
Min outside turning radius	mm	2180	2250	2355	2415
Max. Grade ability (Full load)	%	20	20	15	15
Wheel-base	mm	1650	1650	1700	1700
Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2
Battery V/ capacity Ah		12/90/20h	12/90/20h	12/90/20h	12/90/20h
Diesel engine	Model	ISUZU C240PKJ-30			
	Rated capacity/rpm	34.5kW/2500 r/min			

	Max torque/rpm	137.7N • m/1800 r/min
	Displacement L	2.4

Model		FG20-XW21F	FG25-XW21F
Rated capacity	kg	2000	2500
Load centre distance	mm	500	500
Overall maximum lift height	mm	3000	3000
Free lift height	mm	140	140
Maximum lift speed (with load)	mm/s	490	490
Tilt of the mast	F/B	6° /12°	6° /12°
Max travel speed (without load)	km/h	18.2	18.2
Ground clearance	mm	115	115
Min outside turning radius	mm	2180	2250
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	1650	1650
Track (F/R)	mm	965/973	965/973
Service mass	kg	3405	3765
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR
Battery V/ capacity Ah		12/60/20h	12/60/20h
Gasoline engine	Model	GCT(NISSAN) K21	
	Rated capacity/rpm	31.5kW/2300 r/min	

	Max torque/rpm	144N • m/1600 r/min
	Displacement L	2.065
	Power	Gasoline

Model		FG20-XW21F	FG25-XW21F
Rated capacity	kg	2000	2500
Load centre distance	mm	500	500
Overall maximum lift height	mm	3000	3000
Free lift height	mm	140	140
Maximum lift speed (with load)	mm/s	490	490
Tilt of the mast	F/B	6° /12°	6° /12°
Max travel speed (without load)	km/h	18.2	18.2
Ground clearance	mm	115	115
Min outside turning radius	mm	2180	2250
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	1650	1650
Track (F/R)	mm	965/973	965/973
Service mass	kg	3405	3765
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR
Battery V/ capacity Ah		12/60/20h	12/60/20h
Gasoline engine	Model	GCT(NISSAN) K21	
	Rated capacity/rpm	31.5kW/2300 r/min	

	Max torque/rpm	144N • m/1600 r/min
	Displacement L	2.065
	Power	LPG

Model		FG20-XW21F	FG25-XW21F
Rated capacity	kg	2000	2500
Load centre distance	mm	500	500
Overall maximum lift height	mm	3000	3000
Free lift height	mm	140	140
Maximum lift speed (with load)	mm/s	490	490
Tilt of the mast	F/B	6° /12°	6° /12°
Max travel speed (without load)	km/h	18.2	18.2
Ground clearance	mm	115	115
Min outside turning radius	mm	2180	2250
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	1650	1650
Track (F/R)	mm	965/973	965/973
Service mass	kg	3405	3765
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR
Battery V/ capacity Ah		12/60/20h	12/60/20h
Gasoline engine	Model	GCT(NISSAN) K21	
	Rated capacity/rpm	31.5kW/2300 r/min	

	Max torque/rpm	144N • m/1600 r/min
	Displacement L	2.065
	Power	Gasoline/LPG

Model		FG20-XW22F FG20-XW22M	FG25-XW22F FG25-XW22B FG25-XW22M	FG30-XW22F FG30-XW22M	FG35-XW22F FG35-XW22M
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	560	560	450	385
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	19/18.7	19/19.4/18.7	17.9/18.3	17.9/18.3
Ground clearance	mm	115	115	130	130
Min outside turning radius	mm	2180	2250	2340	2415
Max. Grade ability (Full load)	%	20	20	20	20
Wheel-base	mm	1650	1650	1700	1700
Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h	12/60/20h	12/60/20h
	Model	GCT(NISSAN) K25			

	Rated capacity/rpm	38kW/2400 r/min
	Max torque/rpm	185N • m/1600 r/min
	Displacement L	2488
	Power	Gasoline

Model		FG20-XW22F FG20-XW22B FG20-XW22M	FG25-XW22F FG25-XW22B FG25-XW22M	FG30-XW22F FG30-XW22B FG30-XW22M	FG35-XW22F FG35-XW22B FG35-XW22M
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	560	560	450	385
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	19/19.4/18.7	19/19.4/18.7	17.9/18.4/18.3	17.9/18.4/18.3
Ground clearance	mm	115	115	130	130
Min outside turning radius	mm	2180	2250	2340	2415
Max. Grade ability (Full load)	%	20	20	20	20
Wheel-base	mm	1650	1650	1700	1700
Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h	12/60/20h	12/60/20h

Gasoline engine	Model	GCT(NISSAN) K25
	Rated capacity/rpm	38kW/2400 r/min
	Max torque/rpm	185N • m/1600 r/min
	Displacement L	2.488
	Power	LPG

Model					
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	560	560	450	385
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	19/19.4/18.7	19/19.4/18.7	17.9/18.4/18.3	17.9/18.4/18.3
Ground clearance	mm	115	115	130	130
Min outside turning radius	mm	2180	2250	2340	2415
Max. Grade ability (Full load)	%	20	20	20	20
Wheel-base	mm	1650	1650	1700	1700
Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2

Battery V/ capacity Ah		12/60/20h	12/60/20h	12/60/20h	12/60/20h
Gasoline engine	Model	GCT(NISSAN) K25			
	Rated capacity/rpm	38kW/2400 r/min			
	Max torque/rpm	185N • m/1600 r/min			
	Displacement L	2.488			
	Power	Gasoline/LPG			

Model		FG20-XW51F	FG25-XW51F
Rated capacity	kg	2000	2500
Load centre distance	mm	500	500
Overall maximum lift height	mm	3000	3000
Free lift height	mm	140	140
Maximum lift speed (with load)	mm/s	490	490
Tilt of the mast	F/B	6° /12°	6° /12°
Max travel speed (without load)	km/h	18.2	18.2
Ground clearance	mm	115	115
Min outside turning radius	mm	2180	2250
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	1650	1650
Track (F/R)	mm	965/973	965/973
Service mass	kg	3405	3765
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115

Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR
Battery V/ capacity Ah		12/60/20h	12/60/20h
LPG engine	Model	GCT(NISSAN) K21 LPG	
	Rated capacity/rpm	29kW/2250 r/min	
	Max torque/rpm	140N • m/1600 r/min	
	Displacement L	2.065	

Model		FG20-XW52	FG25-XW52	FG30-XW52	FG35-XW52
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	560	560	450	385
Tilt of the mast	F/B	6°/12°	6°/12°	6°/12°	6°/12°
Max travel speed (without load)	km/h	19/19.4/18.7	19/19.4/18.7	17.9/18.4/18.3	17.9/18.4/18.3
Ground clearance	mm	115	115	130	130
Min outside turning radius	mm	2180	2250	2340	2415
Max. Grade ability (Full load)	%	20	20	20	20
Wheel-base	mm	1650	1650	1700	1700
Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h	12/60/20h	12/60/20h

LPG engine	Model	GCT(NISSAN) K25 LPG
	Rated capacity/rpm	35kW/2400 r/min
	Max torque/rpm	170N·m/1600 r/min
	Displacement L	2.488

Model		FD20-XW32F	FD25-XW32F FD25-XW32B FD25-XW32M
Rated capacity	kg	2000	2500
Load centre distance	mm	500	500
Overall maximum lift height	mm	3000	3000
Free lift height	mm	140	140
Maximum lift speed (with load)	mm/s	600	600 /620/620
Tilt of the mast	F/B	6° /12°	6° /12°
Max travel speed (without load)	km/h	19.4	19.4/18.6/17.9
Ground clearance	mm	115	115
Min outside turning radius	mm	2180	2250
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	1650	1650
Track (F/R)	mm	965/973	965/973

Service mass kg		3405	3765
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR
Battery V/ capacity Ah		12/90/20h	12/90/20h
Diesel engine	Model	YANMAR 4TNE92-HRJ	
	Rated capacity/rpm	32.8kW/2450 r/min	
	Max torque/rpm	142N • m/1600 r/min	
	Displacement L	2.659	

Model		FD20-XW33	FD25-XW33	FD30-XW33	FD35-XW33
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	620	620	490	430
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	18.2/18.6/17.9	18.2/18.6/17.9	17.2/17.6/17.6	17.2/17.6/17.6
Ground clearance	mm	115	115	130	130
Min outside turning radius	mm	2180	2250	2340	2415
Max. Grade ability (Full load)	%	20	20	20	20
Wheel-base	mm	1650	1650	1700	1700

Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2
Battery V/ capacity Ah		12/90/20h	12/90/20h	12/90/20h	12/90/20h
Diesel engine	Model	YANMAR 4TNE98			
	Rated capacity/rpm	42.1kW/2300 r/min			
	Max torque/rpm	186N • m/1700 r/min			
	Displacement L	3.319			

Model		FD20-XW43	FD25-XW43	FD30-XW43	FD35-XW43
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	620	620	490	430
Tilt of the mast	F/B	6° /12°	6° /12°	6° /12°	6° /12°
Max travel speed (without load)	km/h	17.5/18	17.5/18	18.6/19	18.6/19
Ground clearance	mm	115	115	130	130
Min outside turning radius	mm	2180	2250	2340	2415
Max. Grade ability (Full load)	%	20	20	20	20

Wheel-base	mm	1650	1650	1700	1700
Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2
Battery V/ capacity Ah		12/90/20h	12/90/20h	12/90/20h	12/90/20h
Diesel engine	Model	Cummins, QSF2.8T3NA49			
	Rated capacity/rpm	36.5kW/2500r/min			
	Max torque/rpm	186N·m/ 1500 r/min			
	Displacement L	2.8			

Model		FD20-XW55	FD25-XW55	FD30-XW55	FD35-XW55
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	620	620	490	430
Tilt of the mast	F/B	6°/12°	6°/12°	6°/12°	6°/12°
Max travel speed (without load)	km/h	16.5/16.8	16.5/16.8	17.5/17.9	17.5/17.9
Ground clearance	mm	115	115	130	130
Min outside turning radius	mm	2180	2250	2340	2415

Max. Grade ability % (Full load)		20	20	20	20
Wheel-base	mm	1650	1650	1700	1700
Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2
Battery V/ capacity Ah		12/90/20h	12/90/20h	12/90/20h	12/90/20h
Diesel engine	Model	Mitsubishi Motors, S4S-DPEU2			
	Rated capacity/rpm	35.3kW/2250r/min			
	Max torque/rpm	177N·m/ 1700 r/min			
	Displacement L	3.331			

Model		FD20-XW56	FD25-XW56	FD30-XW56	FD35-XW56
Rated capacity	kg	2000	2500	3000	3500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	140	140	145	145
Maximum lift speed (with load)	mm/s	620	620	490	430
Tilt of the mast	F/B	6°/12°	6°/12°	6°/12°	6°/12°
Max travel speed (without load)	km/h	17.5/18	17.5/18	18.6/19	18.6/19
Ground clearance	mm	115	115	130	130

Min outside turning radius	mm	2180	2250	2340	2415
Max. Grade ability (Full load)	%	20	20	20	20
Wheel-base	mm	1650	1650	1700	1700
Track (F/R)	mm	965/973	965/973	1005/975	1005/975
Service mass	kg	3405	3765	4350	4705
Overall dimension (L×W×H)(include forks)		3600×1155×2115	3675×1155×2115	3800×1225×2130	3870×1225×2165
Tyre (F/R)		7.00-12-12PR 6.00-9-10PR	7.00-12-12PR 6.00-9-10PR	28×9-15-12PR/2 6.50-10-10PR/2	28×9-15-12PR/2 6.50-10-10PR/2
Battery V/ capacity Ah		12/90/20h	12/90/20h	12/90/20h	12/90/20h
Diesel engine	Model	Yanmar, 4TNV94L-BXPHZ			
	Rated capacity/rpm	34.6kW/2400r/min			
	Max torque/rpm	191.5~208.5N·m/ 1500(±100) r/min			
	Displacement L	3.054			

Model		FD40-XW35	FD45-XW35	FD50-XXW35	FD55-XXW35
Rated capacity	kg	4000	4500	5000	5500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	160	160	160	160
Maximum lift speed (with load)	mm/s	460	460	400	400
Tilt of the mast	F/B	6°/12°	6°/12°	6°/12°	6°/12°
Max travel speed (without load)	km/h	24	24	24	24

Ground clearance	mm	170	170	170	170
Min outside turning radius	mm	2690	2720	2875	2905
Max. Grade ability (Full load)	%	20	20	20	20
Wheel-base	mm	2000	2000	2150	2150
Track (F/R)	mm	1173/1130	1203 / 1130	1203 / 1130	1203 / 1130
Service mass	kg	6500	6700	6850	7250
Overall dimension (L×W×H)(include forks)		4155×1420×2270	4185×1503×2270	4335×1503×2270	4530×1503×2270
Tyre (F/R)		8.25-15-14PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2
Battery V/ capacity	Ah	24/90	24/90	24/90	24/90
Diesel engine	Model	PERKINS 1104D-44			
	Rated capacity/rpm	55.9kw / 2200 r/min			
	Max torque/rpm	265N·m/1700 r/min			
	Displacement L	4.410			

Model		FG40-XW57	FG45-XW57	FG50-XXW57	FG55-XXW57
Rated capacity	kg	4000	4500	5000	5500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	160	160	160	160
Maximum lift speed (with load)	mm/s	460	460	400	400
Tilt of the mast	F/B	6°/12°	6°/12°	6°/12°	6°/12°
Max travel speed (without load)	km/h	24	24	24	24

Ground clearance mm		170	170	170	170
Min outside turning radius mm		2690	2720	2875	2875
Max. Grade ability % (Full load)		20	20	20	20
Wheel-base mm		2000	2000	2150	2150
Track (F/R) mm		1173 / 1130	1203 /1130	1203 /1130	1203 /1130
Service mass kg		6500	6700	6850	7250
Overall dimension (L×W×H)(include forks)		4155×1420×2270	4180×1490×2270	4335×1503×2270	4530×1503×2270
Tyre (F/R)		8.25-15-14PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2
Battery V/ capacity Ah		12/60	12/60	12/60	12/60
Dual Fuel engine	Model	GM4.3L LX			
	Rated capacity/rpm	74kw / 2300r/min			
	Max torque/rpm	301N·m/1600 r/min			
	Displacement L	4.294			
	Power	LPG			

Model		FG40-XW57	FG45-XW57	FG50-XXW57	FG55-XXW57
Rated capacity	kg	4000	4500	5000	5500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	160	160	160	160
Maximum lift speed (with load)	mm/s	460	460	400	400
Tilt of the mast	F/B	6°/12°	6°/12°	6°/12°	6°/12°

Max travel speed km/h (without load)		24	24	24	24
Ground clearance mm		170	170	170	170
Min outside turning radius mm		2690	2720	2875	2875
Max. Grade ability % (Full load)		20	20	20	20
Wheel-base mm		2000	2000	2150	2150
Track (F/R) mm		1173 / 1130	1203 /1130	1203 /1130	1203 /1130
Service mass kg		6500	6700	6850	7250
Overall dimension (L×W×H)(include forks)		4155×1420×2270	4180×1490×2270	4335×1503×2270	4530×1503×2270
Tyre (F/R)		8.25-15-14PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2
Battery V/ capacity Ah		12/60	12/60	12/60	12/60
Dual-fuel engine	Model	GM4.3L LX			
	Rated capacity/rpm	74kw / 2300r/min			
	Max torque/rpm	301N·m/1600 r/min			
	Displacement L	4.294			
	Power	LPG			

Model		FG40-XW58	FG45-XW58	FG50-XXW58	FG55-XXW58
Rated capacity	kg	4000	4500	5000	5500
Load centre distance	mm	500	500	500	500
Overall maximum lift height	mm	3000	3000	3000	3000
Free lift height	mm	160	160	160	160
Maximum lift speed (with load)	mm/s	460	460	400	400

Tilt of the mast	F/B	6°/12°	6°/12°	6°/12°	6°/12°
Max travel speed (without load)	km/h	24	24	24	24
Ground clearance	mm	170	170	170	170
Min outside turning radius	mm	2690	2720	2875	2905
Max. Grade ability (Full load)	%	20	20	20	20
Wheel-base	mm	2000	2000	2150	2150
Track (F/R)	mm	1173 / 1130	1203 /1130	1203 / 1130	1203 /1130
Service mass	kg	6500	6700	6850	7250
Overall dimension (L×W×H)(include forks)		4155×1420×2270	4185×1503×2270	4335×1503×2270	4350×1503×2270
Tyre (F/R)		8.25-15-14PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2	300-15-18PR/2 7.00-12-12PR/2
Battery V/ capacity Ah		12 / 95	12 / 95	12 / 95	12 / 95
Diesel engine	Model	QSF2.8T4F			
	Rated capacity/rpm	55kw / 2200r/min			
	Max torque/rpm	298N·m/1600 r/min			
	Displacement L	2800			

Model		FD50-XW38	FD60-XW38	FD70-XW38
Rated capacity	kg	5000	6000	7000
Load centre distance	mm	600	600	600
Overall maximum lift height	mm	3000	3000	3000
Free lift height	mm	160	160	160
Maximum lift speed (with load)	mm/s	488	488	420

Tilt of the mast F/B		6/12	6/12	6/12
Max travel speed (without load) km/h		29	29	29
Ground clearance mm		200	200	200
Min outside turning radius mm		3250	3300	3350
Max. traction (loaded/no load) N		25440/63960	26720/64280	27500/65000
Max. Grade ability (Full load) %		20	20	20
Wheel-base mm		2300	2300	2300
Track (F/R) mm		1489/1700	1489/1700	1489/1700
Service mass kg		7950	8480	9250
Overall dimension (L×W×H)(include forks)		4698.5×2050×2500	4728.5×2050×2500	4803.5×2050×2495
Tyre (F/R)		8.25-15-14PR/4 8.25-15-14PR/2	8.25-15-14PR/4 8.25-15-14PR/2	8.25-15-14PR/4 8.25-15-14PR/2
Battery V/ capacity Ah		24/90/20h	24/90/20h	24/90/20h
Diesel engine	Model	QSB3.3 (Cummins)		
	Rated capacity/rpm	74kW/2200r/min		
	Max torque/rpm	415N·m/1600r/min		
	Displacement L	3.3		

Model		FD50-XW46	FD60-XW46	FD70-XW46
Rated capacity kg		5000	6000	7000
Load centre distance mm		600	600	600
Overall maximum lift height mm		3000	3000	3000
Free lift height mm		160	160	160

Maximum lift speed (with load)	mm/s	488	488	420
Tilt of the mast	F/B	6/12	6/12	6/12
Max travel speed (without load)	km/h	29	29	29
Ground clearance	mm	200	200	200
Min outside turning radius	mm	3250	3300	3350
Max. traction (loaded/no load)	N	25440/65000	26720/65000	27500/65000
Max. Grade ability (Full load)	%	20	20	20
Wheel-base	mm	2300	2300	2300
Track (F/R)	mm	1489/1700	1489/1700	1489/1700
Service mass	kg	7950	8480	9250
Overall dimension (L×W×H)(include forks)		4698.5×2050×2500	4728.5×2050×2500	4803.5×2050×2495
Tyre (F/R)		8.25-15-14PR/4 8.25-15-14PR/2	8.25-15-14PR/4 8.25-15-14PR/2	8.25-15-14PR/4 8.25-15-14PR/2
Battery V/ capacity Ah		24/90/20h	24/90/20h	24/90/20h
Diesel engine	Model	QSB3.3 100 (Cummins)		
	Rated capacity/rpm	75kW/2200r/min		
	Max torque/rpm	414N·m/1600r/min		
	Displacement L	3.3		

Model		FG50-XW57	FG60-XW57	FG70-XW57
Rated capacity	kg	5000	6000	7000
Load centre distance	mm	600	600	600
Overall maximum lift height	mm	3000	3000	3000

Free lift height	mm	160	160	160
Maximum lift speed (with load)	mm/s	510	510	439
Tilt of the mast	F/B	6/12	6/12	6/12
Max travel speed (without load)	km/h	29	29	31
Ground clearance	mm	200	200	200
Min outside turning radius	mm	3200	3250	3350
Max. traction (loaded/no load)	N	25440/50000	26720/50000	27500/50000
Max. Grade ability (Full load)	%	20	20	20
Wheel-base	mm	2300	2300	2300
Track (F/R)	mm	1489/1700	1489/1700	1489/1700
Service mass	kg	7950	8350	9250
Overall dimension (L×W×H)(include forks)		4698.5×2050×2500	4728.5×2050×2500	4803.5×2050×2495
Tyre (F/R)		8.25-15-14PR/4 8.25-15-14PR/2	8.25-15-14PR/4 8.25-15-14PR/2	8.25-15-14PR/4 8.25-15-14PR/2
Battery V/ capacity Ah		12/60/20h	12/60/20h	12/60/20h
Dual fuel engine	Model	GM4.3L LX (LPG dual fuel)		
	Rated capacity/rpm	74kW/2300r/min		
	Max torque/rpm	301N·m/1600r/min		
	Displacement L	4.294		

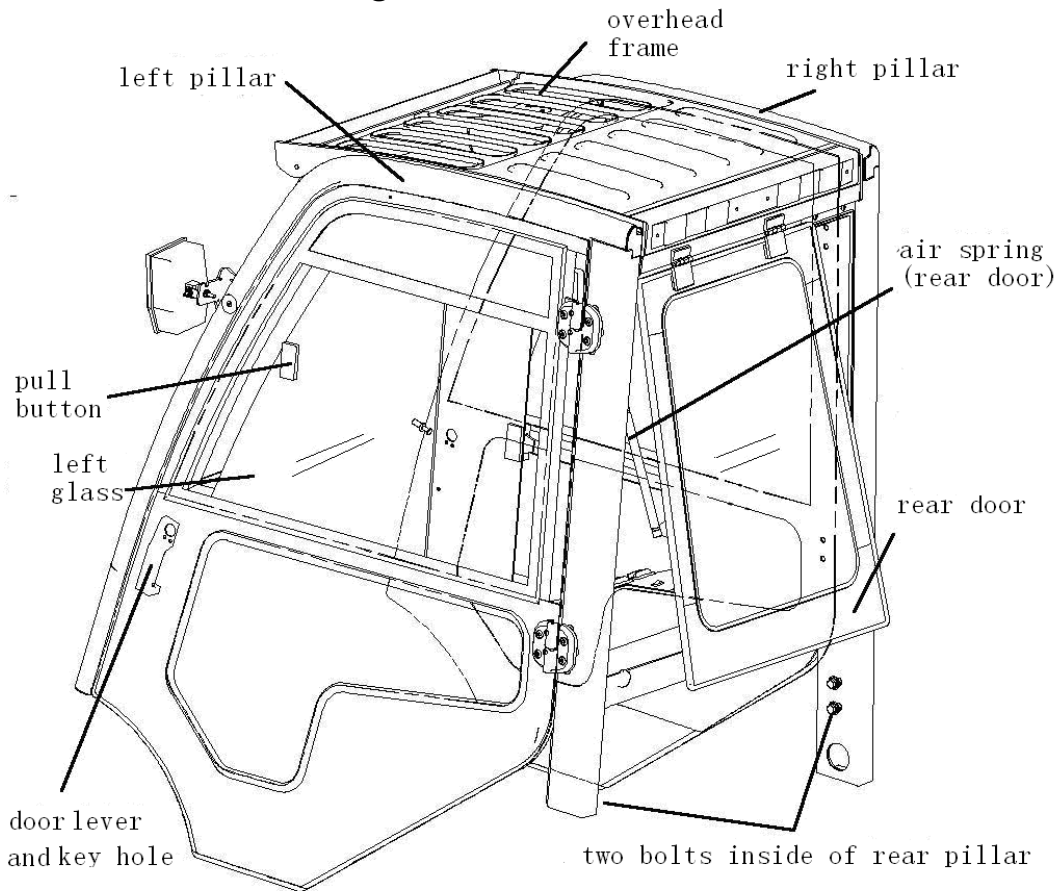
Model		FD80-XW28	FD100-XW28
Rated capacity	kg	8000	10000
Load centre distance	mm	600	600

Overall maximum lift height mm		3000	3000
Free lift height mm		200	200
Maximum lift speed (with load) mm/s		440	350
Tilt of the mast F/B		6/12	6/12
Max travel speed (without load) km/h		32	31
Ground clearance mm		250	250
Min outside turning radius mm		3630	3900
Max. traction (loaded/no load) N		45000/60000	50000/60000
Max. Grade ability (Full load) %		20	20
Wheel-base mm		2500	2800
Track (F/R) mm		1628/1700	1628/1700
Service mass kg		7950	8350
Overall dimension (L×W×H)(include forks)		5395×2165×2700	5724×2165×2850
Tyre (F/R)		9.00-20-14PR/4 9.00-20-14PR/2	9.00-20-14PR/4 9.00-20-14PR/2
Battery V/ capacity Ah		24/90/20h	24/90/20h
Diesel engine	Model	QSB4.5 (Cummins)	
	Rated capacity/rpm	82kW/2200r/min	
	Max torque/rpm	488N·m/1500r/min	
	Displacement L	4.5	

Model		FD80-XW48	FD100-XW48
Rated capacity kg		8000	10000

Load centre distance	mm	600	600
Overall maximum lift height	mm	3000	3000
Free lift height	mm	200	200
Maximum lift speed (with load)	mm/s	440	350
Tilt of the mast	F/B	6/12	6/12
Max travel speed (without load)	km/h	32	31
Ground clearance	mm	250	250
Min outside turning radius	mm	3630	3900
Max. traction (loaded/no load)	N	45000/60000	50000/60000
Max. Grade ability (Full load)	%	20	20
Wheel-base	mm	2500	2800
Track (F/R)	mm	1628/1700	1628/1700
Service mass	kg	11200	13000
Overall dimension (L×W×H)(include forks)		5395×2165×2700	5742×2165×2850
Tyre (F/R)		9.00-20-14PR/4 9.00-20-14PR/2	9.00-20-14PR/4 9.00-20-14PR/2
Battery V/ capacity Ah		24/90/20h	24/90/20h
Diesel engine	Model	QSB4.5 110 (Cummins)	
	Rated capacity/rpm	82kW/2200r/min	
	Max torque/rpm	489N·m/1500r/min	
	Displacement L	4.5	

XIII. Cab and overhead guard



The structure of cabin:

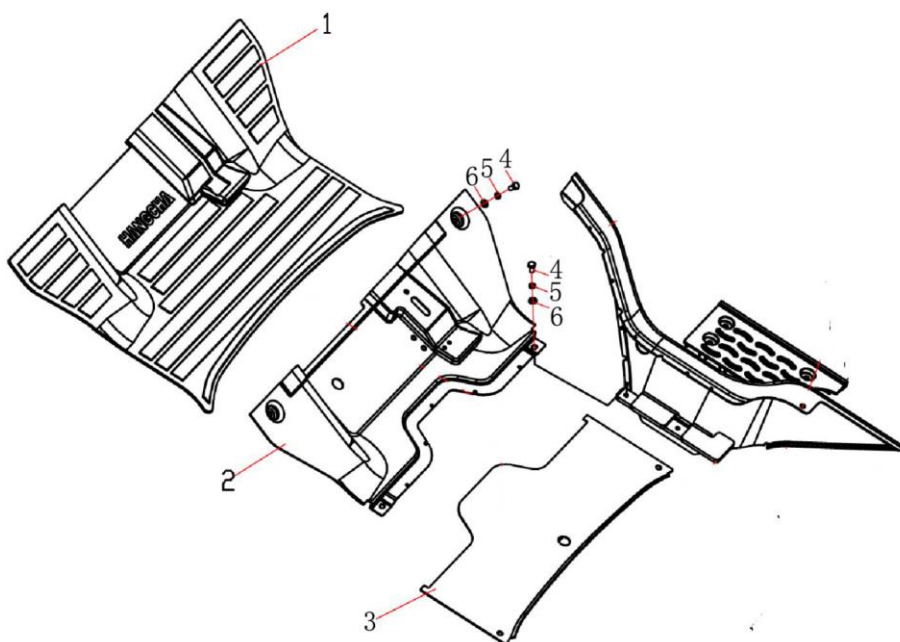
New type design, it is consist of left support leg, rear support leg, front glass, left door, right door, rear door.

The operation of cab:

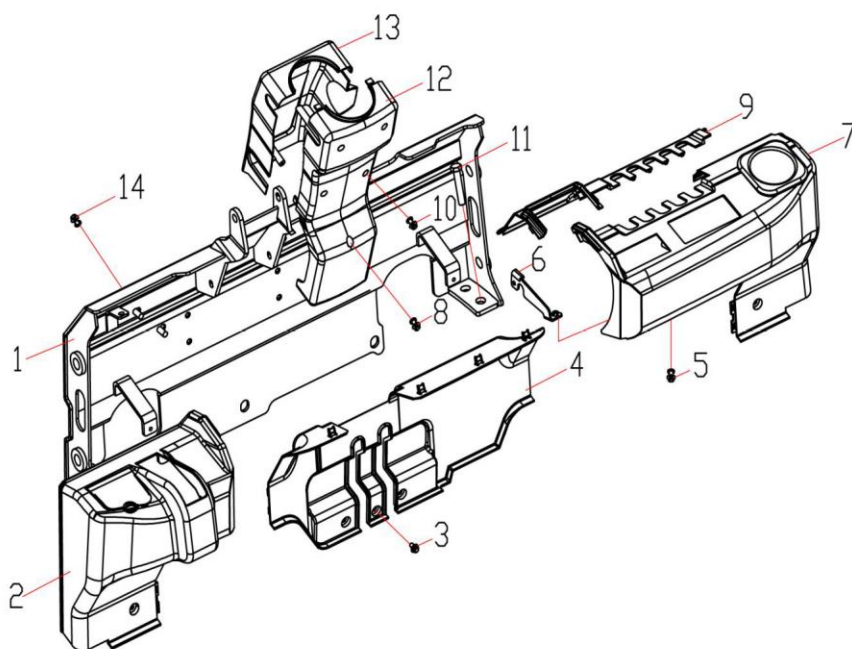
1. Open left door with key, enter into cab.
2. Close door, make sure left and right door close before working.
3. The glass of left and right door can be moved by draw button on the glass.
4. The rear door can be opened by losing lock buckle.

Disassemble cab:

1. Stop the truck on solid and smooth level ground; close switch, pull down hand brake, engine flameout, ensure the door could open.
2. Open the left and right door to the max.
3. Dismantle the pedal mat, rear soleplate, front soleplate.



4. Dismantle the left, middle and right protect cover which conjoint with instrument frame.



- | | | | |
|----------------------------------|-----------------------|-----------------------------|-----------------------|
| 1. Instrument frame discreteness | 2. left protect cover | 3. bolt discreteness (5pcs) | 4. rear protect cover |
| | | 7. right protect | 8. bolt |
| 5. bolt discreteness | | | discreteness |
| 6. bracket | | cover | M5×16 (3pcs) |
| 9. front protect | 10. bolt | 11. bolt | 12. switch rear |

cover

discreteness
M4×16 (2pcs)

discreteness

cover

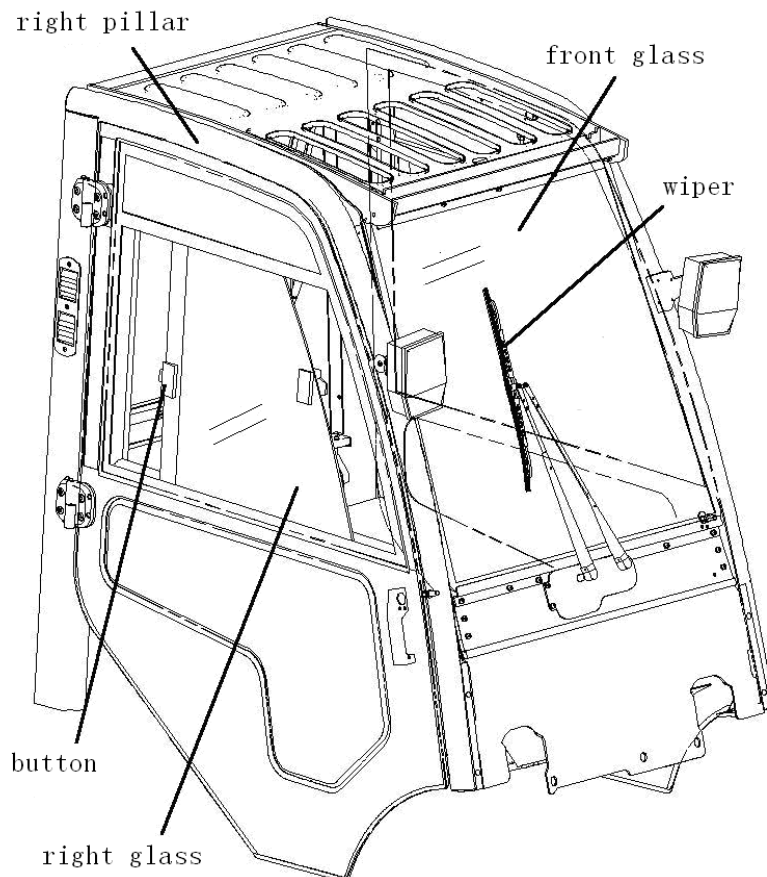
13.switch rear cover

14.bolt discreteness M6×16 (5pcs)

5. Remove switch connection of fan, rain wiper, alarm light etc
6. Remove 4 bolts from left front and right front legs.
7. Open the hood.
8. Remove 2 bolts inside left rear legs.(hand spanner)
9. Remove the assistant water tank of right leg and 2 pcs tighten bolt.
10. Remove the glass on cabin (caution), dismantle backboard and beam.
11. Sling the cabin, remove the wire at 4 legs.
12. Put down gently.

Install cab:

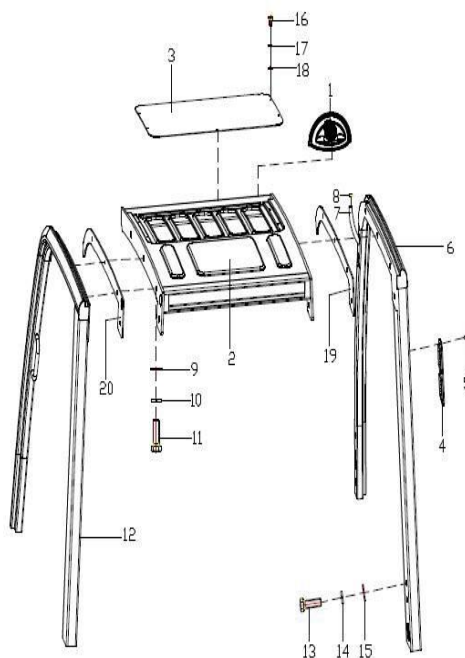
The installing procedure is opposite to removing procedure. Fastening torque of 8 bolts connected support legs and truck body : $T=137\text{N}\cdot\text{m} \sim 167\text{N}\cdot\text{m}$.





two fix bolts inside of front pillar

Disassemble overhead:



1.rearview
mirror

2.cabane

3.clearstory
board

4.cover board

5.bolt M5×12

6.right support
assembly

7.glue pipe

8.pipe hoop

9.gasket 14
(8 pcs)

10.gasket 14
(8 pcs)

11.bolt M14× 1.5×45(8 pcs)	12.left support assembly	13.bolt M16× 1.5×45 (8 pcs)	14.gasket 16 (8pcs)	15.gasket (8pcs)
16.bolt M6×12 (6 pcs)	17.gasket 6 (6 pcs)	18.gasket 6 (6 pcs)	19.right rubber mat	20.left rubber mat

1. Stop the truck on solid and smooth level ground; close switch, pull down hand brake, engine flameout, ensure the door could open.

2. Dismantle the left, middle and right protect cover which conjoint with instrument frame.

3. Dismantle the pedal mat, rear soleplate, front soleplate. (see the overhead part).

4. Remove switch connection of fan, rain wiper, alarm light etc

5. Remove 4 bolts inside left front and right front legs.

6. Open the hood.

7. Remove 2 bolts inside left rear legs. (hand spanner)

8. Remove the assistant water tank of right leg and 2 pcs tighten bolt.

9. Sling the cabin, remove the wire at 4 legs.

10. Put down gently.

The installing procedure is opposite to removing procedure. Fastening torque of 8 bolts connected support legs and truck body : $T=137N\cdot m \sim 167N\cdot m$.

XIV. Operation and notice about LPG forklift

1.5-3.5t LPG Forklift for more details refer to 《1.0t-3.5t LPG Forklift Operation and maintenance manual》.

4.0t-7.0t	Equipped with American GM4.3 LX Dual fuel engine

LPG fuel system consists of cylinder, filter, press reducing regulator, mixer, etc.. LPG is from cylinder to combination valve and high pressure pipeline, then pass filter and last into reducer. After boiloff into mixer, commix with air boiloff in fixed proportion, burnt in engine cylinder, drive forklift to work. GM 4.3L engine equip with press reducing regulator and mixer.

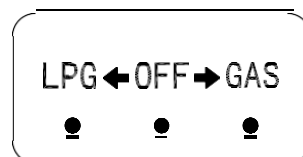
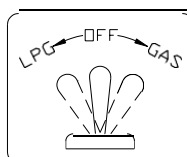
1. LPG fueling and replace

After the fuel in cylinder is run out, replace it. First close the outlet valve, disconnect quick coupling, put the quick connectors on the cylinder outlet valve with dust cover, remove the cylinder and fuel it at gas station. During fueling, lay down the cylinder, put the inlet meter valve on top(liquid level indicating meter to horizontal line at 60°degree angle at this time), and then screw off the dust cover on the inflation valve, insert inflation plug, open the inlet limit valve to fuel. When the LPG fuel to 80% of the cylinder volume, take out the inflation plug(when fuel to 80% of rated volume, its limit device will shut down automatically). After finishing fueling, take out the plug, screw on the dust cover of inflation valve, and tighten the inlet limit valve.

After install the cylinder in certain angle(liquid level indicating meter to horizontal line at 60°degree angle), connect pipeline with quick connector, turn on the outlet valve switch to check if there is air leakage, otherwise eliminate it. Then start the truck. Close it after truck use.

2. The operation of dual fuel switch

1. Turn switch to GAS, then fuel is switched to gasoline;
2. Turn switch to LPG, then fuel is switched to LPG;
3. Middle position, no connection.



3. Starting the engine

(1) By gasoline

Shut off LPG tank, switch on the gasoline switch for several seconds, turn the ignition key to start the motor-----the engine starts;

(2) By LPG

① Carburetor without gasoline: If you know the carburetor without any gasoline before start, use LPG directness. Close the gasoline switch, open LPG switch a few seconds, then open key to start motor, the engine move;

② Carburetor with gasoline : start engine is not easy by LPG, close the LPG and Gasoline switch(choose to middle position), start by gasoline. When the gasoline will be run down in carburetor, rotate speed of engine is lower, open LPG switch, turn to LPG. Or the gasoline will be burn fully in carburetor, engine stop, open LPG switch, use the key to start motor, engine works.

4. Change fuel during the engine runs

From LPG to gasoline:

- ① Switch the fuel change switch from LPG position to Neutral, step the accelerator pedal slightly, keep still and speed up the engine until it stops.
- ② After the engine completely stopped, switch the fuel change switch to GAS position again, and then re-start the engine.

From Gas to LPG:

- ① Switch the fuel change switch from GAS position to Neutral, step the accelerator pedal slightly, keep still and speed up the engine until it stops.
- ② After the engine completely stopped, open one side LPG cylinder outlet shut-off valve, switch the fuel change switch to LPG position, and re-start the engine.



Caution :

1. Do not change fuel when engine is working. Only after the engine completely stopped can you change fuel.
2. Use gasoline to drive several miles at least every two weeks to avoid gasoline deterioration.
3. After engine starts, do not change fuel at once, and the engine should be in normal work temperature before change fuel.
When using LPG, you should pay attention to the following points
Before driving, check cylinder and pipe for leakage
After LPG is working, shutting down the engine according to the following way:
 - ① Switch the fuel change switch to neutral;
 - ② Idle the engine until stops;
 - ③ Make sure the rest LPG run out. Place the key to "OFF" position after engine stopped.
4. Before storing for a long time, you should completely close the cylinder shutoff valve and check if the engine leaks.
5. During moving, if there is leakage, fault, or other abnormal condition, completely shut off the cylinder shutoff valve and have LPG system serviced.

5. Attentions

- (1) If there is LPG leakage in truck working, turn off the LPG switch, shut the outlet valve, check if loose of the connectors, and deal with it in time. Travel with gasoline when the fault is not yet eliminated.
- (2) Dual fuel truck should use 93# gasoline or truck used LPG as fuel, otherwise it may influence the accuracy of ignition time and drop the power.
- (3) If park over 10 minutes, shut off the LPG switch (or outlet valve).
- (4) During engine running, keep it water temperature between 70°C and 85°C.

6. Press reducing regulator (K21 LPG\K25LPG\4.0-7.0t engine equip with)

There are two functions of press reducing regulator. One is decompress, it drops the LPG pressure from cylinder to one atmospheric pressure. Second is transpiration, liquid LPG absorbs the heat of engine circular to let itself boiloff.

7. Mixer ((K21 LPG\K25LPG\4.0-7.0t engine equip with)

Mixer is based on the engine running condition, send the vaporized LPG and air together into engine to meet requirement of engine under different work conditions.

8. Cylinder

(1) Function

It is composed of safety valve, LPG inlet, quick fitting and other relevant accessories. It supports and stores fuel, and it is located at the back of truck. The functions:

a. Shut off valve

Controls inlet and outlet lines of the LPG

b. Charging limit valve

Opens the charging limit valve to charge LPG till the charging device is automatically closed when 70%- 80% volume of the container is full.

c. Level indication

The gauge on the tank shows remaining volume.

d. Outpouring limit valve

When outpouring exceeds the stated value, or the pipe is broken, the outpouring device on the valve will be closed automatically.

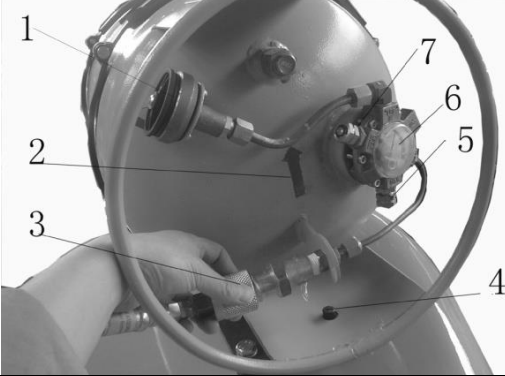
e. Safety valve

Safety valve will open automatically when pressure in cylinder is over the standard pressure.

(2) Main parameters

Work temperature:-40°C~+60°C; Work pressure : 2.2MPa; opening pressure of safety valve: 2.5±0.2MPa; Max. capacity : 80% of cylinder volume

(3) Cylinder structure

	1. Inflation valve (air intake and dust cover)	2. Install label
	3. Outlet valve (vent connector)	4. Fixed Pin
	5. Outlet shut off valve	6. Level indicator
	7. Inlet shut off valve	

(4) Cylinder replacement

Paste safety operation procedures on cylinder (See Fig.1)

1. Park the truck on flat and stable ground, stop engine, apply hand brake;

2 Remove cylinder:

a. Close outlet shut off valve, and remove outlet connector. (See Fig.2)



Fig.1

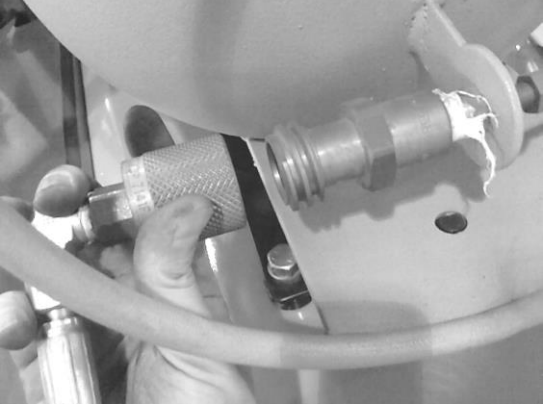
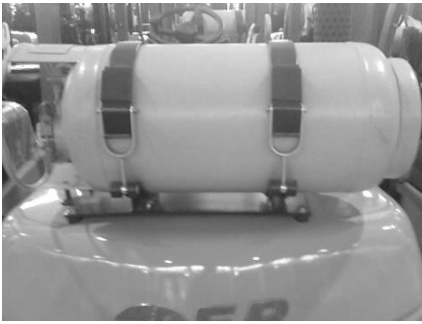


Fig.2

b. Loosen cylinder fixed parts, see following:

Metal band bracket



Buckle belt bracket



Buckle belt and tightening device



1. Hold tightening device with right hand, use forefinger, middle finger, and ring finger to pull lock buckle out.



2. Keep holding lock buckle up, and push up tightening device until it touches cylinder.



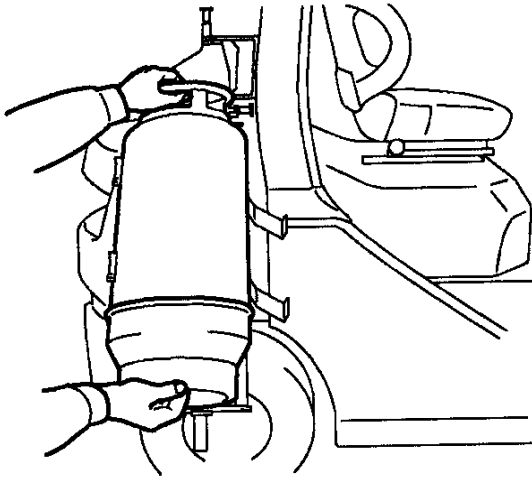
3. Keep the lock buckle out and pull downward the whole tightening device



4. Then buckle belt is loosened from tighten device.

5. Remove the left tightening device from buckle belt using the same procedure.

Remove cylinder and charge



Caution:

1. Avoid banging cylinder against truck when removing.
2. Make sure the outlet shut off valve is closed.
3. Only take empty cylinder to authorized charging place. Not allow charge privately, and the LPG ingredient should meet table 1 Truck Used LPG Technical Requirement.

- Note:**
- a) 1# may use more than -20°C ;
 - b) 2 # may use more than -10°C ;
 - c) 3 # may use more than 0°C .

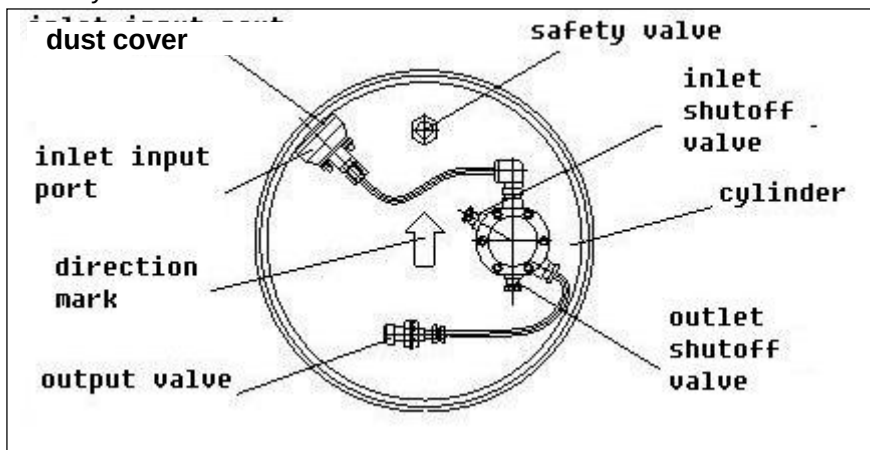


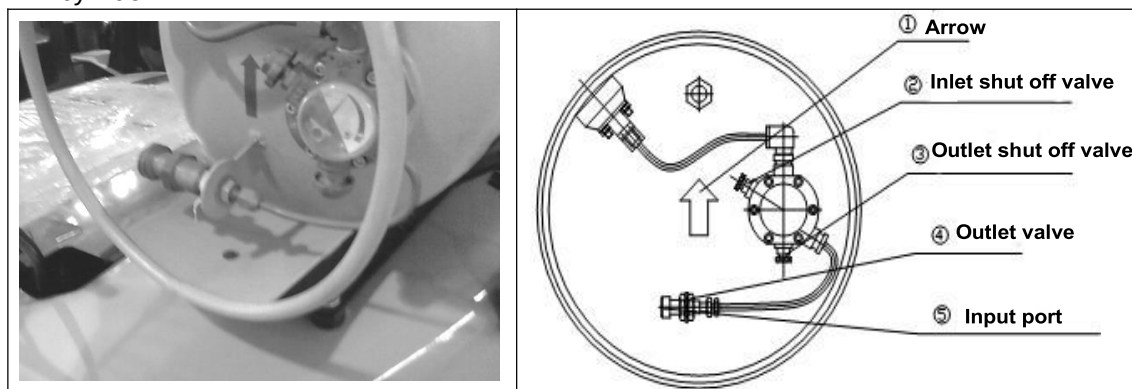
Table 1 Technical Requirement to Truck used LPG

Item		Quality index			Test method
		114			
		1#	2#	3#	
Vapour pressure (37.8℃, gage pressure) /kPa		≤1430	890~1430	660~1340	GB/T 6602 ^a
Mass fraction of component/%	Dimethylmethane	>85	>65~85	40~65	SH/T 0614 ^b
	Butane and above component	≤2.5	—	—	
	Pentane and above component	—	≤2.0	≤2.0	
	Total olefin	≤10	≤10	≤10	
	Butadiene (1,3 Butadiene)	≤0.5	≤0.5	≤0.5	
Residue	Evaporated residue/(mL/100mL)	≤0.05	≤0.05	≤0.05	SY/T 7509
	Observe soiled-oil	Pass	Pass	Pass	
Density(20℃)/(kg/m ³)		actually measure	actually measure	actually measure	SH/T 0221 ^c
Sheet copper corrosion /grade		≤1	≤1	≤1	SH/T 0232
Total sulfur content /(mg/m ³)		<270	<270	<270	SH/T 0222 ^d
Sulphuretted hydrogen		None	None	None	SH/T 0125
Free water		None	None	None	Eyeballing
Note 1: Gaseity content, total sulfur content is at 0℃, 101.35kPa.					
Note 2: It can be measured whether it exists free water by eyeballing when measuring density.					
a Evaporation pressure can be evaluated by GB/T 12576, measured by GB/T 6602 when arbitration.					
b Component can be measured by SH/T 0230, but measured by SH/T 0614 when arbitration.					
c Density can be measured by GB/T 12576, but measured by SH/T 0221 when arbitration.					
d Total sulfur content can be measured by SY/T 7508, but measured by SH/T 0222 when arbitration.					

From : PRC STANDARD LPG IN VEHICLE (GB 19159-2003)

9. Procedure for replacing LPG cylinder

- (1) Wear canvas gloves to avoid leaking gas from preventing frostbite to fingers while changing gas.
- (2) Make sure the place is clear and well-ventilated when charging LPG, it is forbidden to smoke ,keep away from other naked flame.
- (3) Fill LPG as follows: Lay the LPG cylinder flat, and set the charging limit valve upward, then screw off the dust cap on the inlet shut off valve, plug the filling connector, open the inlet shutoff valve to charge LPG till 80% of rated volume of the cylinder (the charging device is automatically closed when charge to 80% of rated volume), take out the filling connector, screw down the dust cap and the inlet shut off valve. Check all parts and make sure they are all intact.
- (4) Lift the cylinder up to truck, and fix it, put the arrow (①) upward, then insert the fixed pin to cylinder.



- (5) Make sure the inlet and outlet shutoff valve (②③) are closed.
- (6) Connect the inlet connector (⑤) with outlet valve (④) , and tighten
- (7) Open outlet shutoff valve (③) slowly.
- (8) Make sure there is no leakage before using, if there is leakage, close outlet shutoff valve (③) in time, turn on the forklift input connector (⑤) .

Note: After installing cylinder, then connect the connecting pipe with quick connector, open outlet shutoff valve ③, smear every joint with soap bubble to check whether the joint is leaking, if there is leaking at joint, eliminate the problem, then operate forklift. Close outlet shutoff valve ③ when finished operating forklift.

10. Cylinder fixed way:

Metal belt bracket



The fixed way is opposite to disassembly.

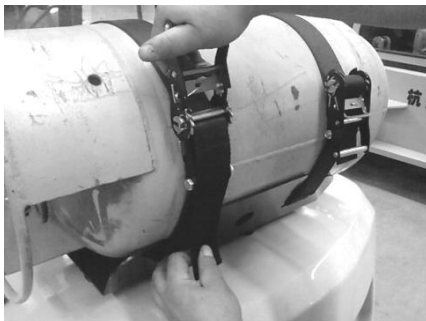
Buckle belt bracket



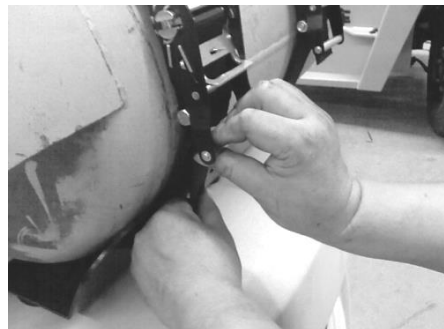
a. Hold restraint with right hand, take buckle belt with left hand, direct to the notch on ratchet wheel



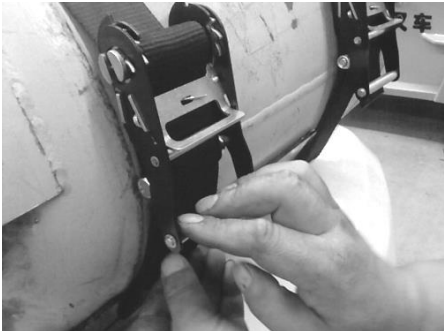
b. Pass buckle belt through the notch on ratchet wheel.



c. Pull buckle belt downward with left hand, pull out the lock buckle with fore finger, middle finger and third finger in right hand, and push up to touch cylinder at the same



d. Keep the buckle belt tensioning and keep the lock buckle out, revolve restraint downward with right hand until touch

time.	cylinder.
 e. Keep tension with left hand, hold restraint with right hand, loosen lock buckle, and rotate restraint several times until it cannot be moved.	 f. Turn downward until touch cylinder.

11. Notice during usage

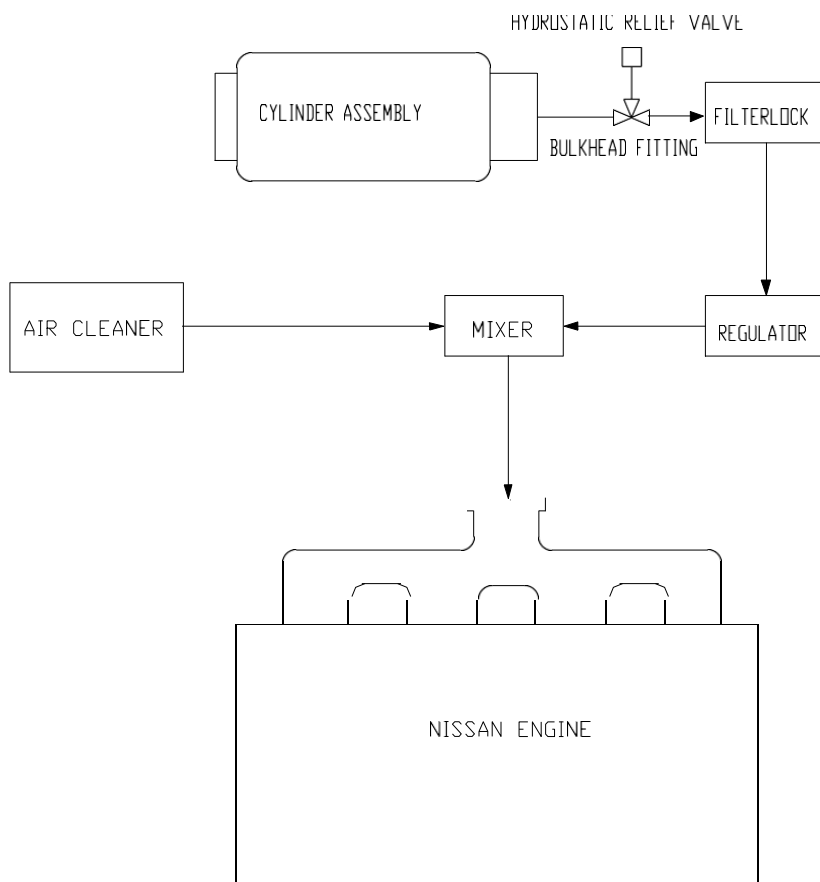
- (1) When charging LPG assembly, first open inlet shutoff valve, close outlet shutoff valve, when charge is done, close inlet shutoff valve.
- (2) When take assembly to the truck, it should be fixed and the arrow should point upward, and inlet shutoff valve closed. Connecting inlet connector with assembly outlet port, and then revolve to tighten, open outlet shutoff valve, make sure there are no leaks, and convenient to use.
- (3) It must check the cylinder assembly whether leak or not per charging and fixing it on truck.
- (4) Prevent dust from entering into the inlet, and revolve dustproof cover after filling LPG out to protect the airproof of check valve
- (5) It is forbidden to change the pressure of safety valve.
- (6) Call the qualified unit to check and maintain, do not repair by self. And keep apart the abnormal cylinder.
- (7) This assembly has 2 ways to fill LPG, one is volume and the other is weight. Weight: make sure the cylinder stand vertically when filling LPG. Volume: make sure the cylinder lay horizontally when filling LPG, and let the direction mark up.
- (8) Please obey the *gas cylinder safe supervise rule* awarded by the State Bureau of Quality and Technical Supervision when charging ,transporting, depositing ,using and inspecting.
- (9) When fixing and disassembling cylinder please do it lightly, it is forbidden to hit other object. Keep cylinder assembly intact and do not disassemble, adjust and replace components.
- (10) The LPG conform to GB11174 can be recharging; the maximum volume is no more than 80% of cylinder.
- (11) The LPG must be charging at the place awarded by qualified Quality and Technical Supervision Bureau, do not fill by self.
- (12) Charging unit must vacuumize or displace with nitrogen when the new or recheck cylinder is used at the first time.
- (13) Before reinstalling cylinder, lay the cylinder horizontal perpendicular to installing sign, close outlet shutoff valve, open inlet shutoff valve, see the finger of fluid indicator whether is lifting

with the charging fluid when charging. Stop charging when the limit charging valve is working in time, and check whether the finger of fluid indicator is at the correct position. Close inlet shutoff valve after charging out.

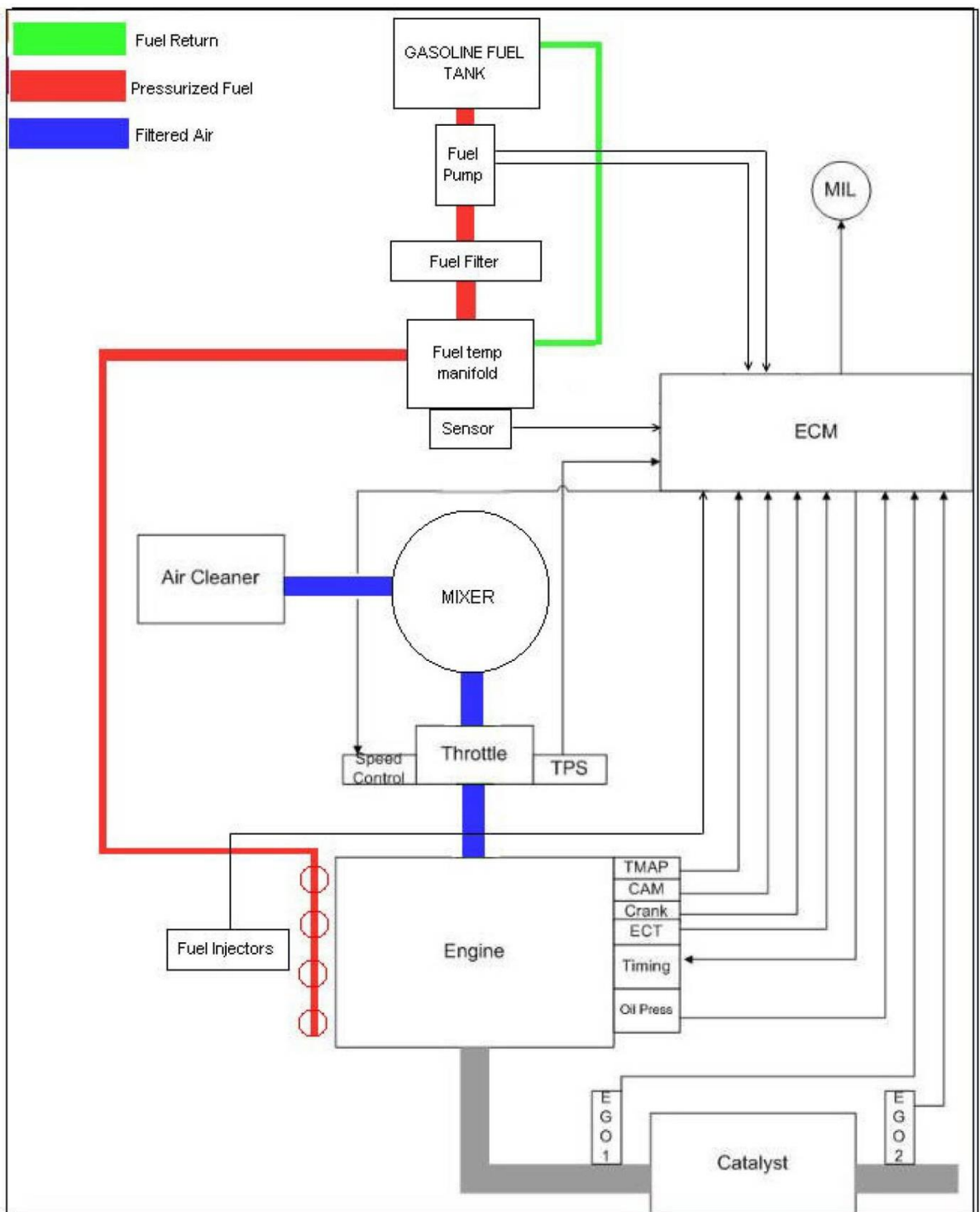
- (14) Check the forklift truck fully ahead to ensure no leak of LPG, then open the LPG outpouring valve on the LPG cylinder, check more to ensure no leak of LPG fuel system before starting-up.
- (15) If there is LPG leak during operation, shut off the LPG switch and the outpouring valve at once, check every part and all connections to see if there is a leak or it's loose, and replace it in time. Fuel by petrol before malfunction is removed.
- (16) If there is more than a 10 minutes stoppage in operation, you should shut off the LPG switch and the outpouring valve.
- (17) Avoid leaving cylinder in the sun for prolonged periods, and keep it far away from heat sources, and forbidden to heat cylinder with heat source which the temperature is more than 40°C.
- (18) It should have no less than 0.5% the cylinder volume to remain.
- (19) It is forbidden to modify cylinder mark and color sign.
- (20) Cylinder must be taken to the special unit per 5 years to inspect, the unit have qualification awarded by pressure vessel safety supervisor bureau.
- (21) Observe the level indication frequently during operation, if it is found that LPG consumption is not in proportion to working time, you should stop to check where leaks, and shut off power, the LPG valve and all valves concerned at once to take good measure in time.
- (22) Park the truck in shady and ventilated sites; close the valves on the LPG cylinder. Never leave the truck in the sun for a prolonged period.
- (23) Shut off power and all valves after the truck is garaged. Keep well-ventilated and extinguishing measure in the garage.
- (24) Never repair the LPG cylinder, valves or pipes at garages or parking lots, or in the presence of anyone smoking.

12. Service & maintenance

- 1) This truck has undergone pressure trials and performance testing before leaving factory. If there is performance failure, strictly forbid repairing without permission.
- 2) Close the valves on the LPG cylinder before disassembly and maintenance of the LPG device.
- 3) Suitably adjust the measure valve, for LPG consumption varies seasonally.
- 4) Often check and clean the air cleaner and the LPG filter, replace it with a new one in time if it is damaged.
- 5) After finishing the LPG forklift debugging and one day well run (or a full container of LPG is used up), you should adjust the LPG vaporizer again to ensure proper ratio of fuel to air.
- 6) Check the electric system every three months if any switch connection-peg is oxidized or rusted, and replace it in time.
- 7) Take routine care for the whole LPG fuel system every year working, that is, clean the vaporizer, check airproof capacity of each tie-in in the high pressurized pipes and the low pressurized pipes.



IMPCO single fuel system



LPG system drawing

XV. Operational method of lead acid battery

I. 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.

II. Storage and maintenance

2.1. Storage

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

2.2. Maintenance

- Make sure there is no terminal corrosion, link part looseness, outer crack and fastening looseness on the battery.
- If the truck parks over 30 days, in order to keep the battery in normal charging technique condition, you should do the following:

2.3. Battery check and maintenance

Maintenance-free battery check

When the battery volume status is normal and electrolyte density reaches the standard, the small ball is in green; when the battery volume is insufficient and electrolyte density drops, the color is white; if the ball is in red, that means the electrolyte is badly insufficient, you should check whether there is fracture, leakage or fault to battery.



The indicator of battery refers to the prompt on the battery label.

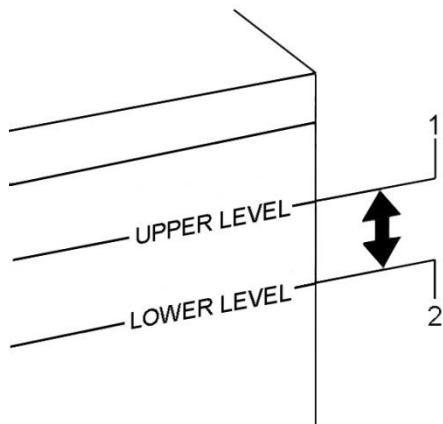
Maintenance-free battery maintenance

- 1) Insure the green status visual in inner indicator;
- 2) Disconnect negative earth wire to avoid discharging by additional current release;
- 3) Keep the battery charged completely when the battery cannot be removed from the truck;
- 4) Make a general schedule, charge every 30-45 days if truck is not used during this period;

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

Low-maintenance battery check

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 spill out to erode your forklift.



Check and make sure the electrolyte is between "UPPER LEVEL" and "LOWER LEVEL"

1: "UPPER LEVEL"

2: "LOWER LEVEL"

If the electrolyte is or lower than "Lower Level", please add distilled water.

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

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 refers to the prompt on the battery label.

Low-maintenance battery maintenance

- 1) Ensure that the battery electrolyte fluid level in the UPPER LEVEL;
- 2) Disconnect negative earth wire to avoid discharging by additional current release;
- 3) Keep the battery charged completely when the battery cannot be removed from the truck;
- 4) Make a general schedule, charge every 30-45 days if truck is not used during this period;
- 5) When the battery electrolyte level is lower than LOWER LEVEL, please add distilled water to UPPER LEVEL, install the vent-plug to original place and fix it.



Caution

Avoid overfill when adding distilled water. During battery recharging, spilled water may cause corrosion.

2.4. Before recharging

When battery is recharging, the generated hydrogen is flammable and explosive gas, so pay attention to the following item before operation:

- If charge to the battery still installed on the truck, one must disconnect ground cable.
- When connect and disconnect the battery charger cable, make sure charger power is off.



Caution

- Safe place for battery charging should be at open ground. Never charge in bad ventilated garage or closed indoor.
- Never charge the battery when the engine is working. Make sure close all enclosure.

III. Notice for usage

Battery can produce explosive gas, electrolyte is corrosive, and the current can burn skin from battery producing. When handle battery or work near it, comply with the following cautions:



Caution

- When working near battery, one must wear safety inspection.
- Never let tools contact battery terminal and cause spark.
- Never expose the battery in open fire or spark.
- When battery connects electric equipment, make sure the electric equipment is correctly connected with the battery positive and negative to avoid damage of electric equipment or battery;
- Never cover electric things on the battery to avoid battery short cut.
- To avoid electrolyte contact eyes, skin or clothes.
- Never let the children close the battery.

Emergency measure to electrolyte :

- If the electrolyte spilled eyes

Please wash your eyes at least for 15 minutes and seek medical advice at once. If possible, use wet sponge or cloth clean eye on the way to hospital.

- If the electrolyte spilled skin

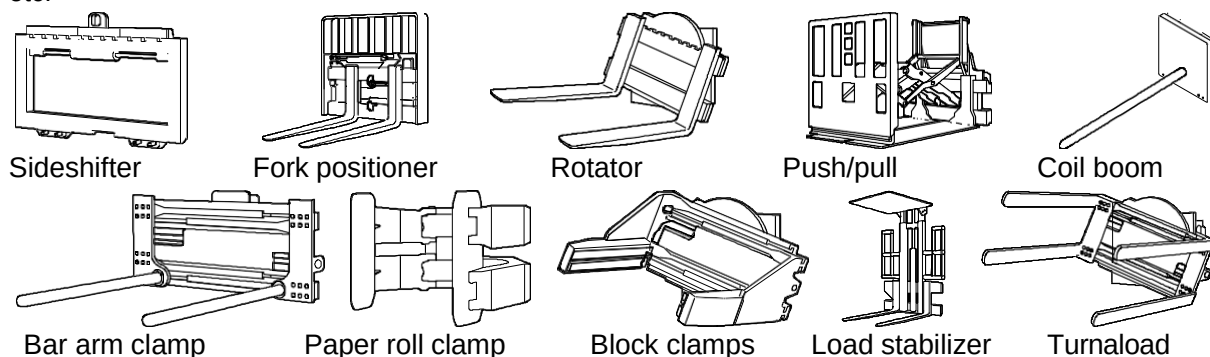
Wash this part thoroughly. If you have burn pain, please seek medical advice at once.

- If the electrolyte spilled clothes

It may permeate clothes and contact skin. You must take off the clothes at once and do the above measure if necessary.

XVI. Use, installation and safety rules of attachment

The attachment is in accordance to International standard *ISO2328 Hook-on type fork arms and carriages - mounting dimensions*, such as clamp, rotator, paper roll clamp, carrying ram, side-shifter etc.



1. Attachment use

- (1) Understand the contents listed on the nameplate of the attachment, read the instruction manual before operating attachment. (Especially the manual from attachment company)
Before operating the attachment, personnel should be properly trained and qualified.
 - (2) The Basic capability and operating methods of attachment should be understood, especially the admit load, lift height, size of cargo and adapt range of attachment.
 - (3) When operating the multi-functional attachment, such as with side-shifter, clamp or rotator, only operate one function at a time.
 - (4) DO NOT move a truck with attachment when load is in a high position. If the size of cargo is too large, DO NOT move the truck. When transporting cargo, ensure ground clearance between the bottom of cargo and ground is less than 300mm and the mast is inclined back.
 - (5) The weight of cargo shouldn't exceed the combined limit of the carrying capacity of forklift and attachment. It is not allowed to have a partial load at high position. It is a short time work for attachment with side-shifter. Partial load is around 100mm (Above 5 ton (including 5 ton), the side-shifter is movable within 300mm.
 - (6) In the range of the projection forth 2m of the lower of attachment and cargo, prohibit stand to avoid the suddenness except the driver position under overhead.
 - (7) DO NOT apply emergency brake while moving. Travel slowly with load.
 - (8) Prohibit outside force when attachment working.
 - (9) DO NOT operate attachment beyond normal parameters. (10)
- When the attachment malfunctions, prohibit use without check.

Check and maintenance

- (1) Check the clearance of carriage beam and below catch of attachment according to the attachment manual.
- (2) Check the rise catch is right on the flute of fork carriage.
- (3) Use the auto currency lithic-grease per 500 hours to bearing surface.
- (4) Check mounting hardware
- (5) Check the tie-in of hydraulic pressure loop, if tube is damaged. Prohibit use until after repair.
- (6) Check the operation of attachment and replace any damaged components
- (7) Check each attachment operation is functioning correctly. If not, check the hydraulic pressure loop, find out the broken part, replace or repair part or whole loop part.

2. Attachment assembly



Warning

1. Any change to safety or capability of attachment without authorization is strictly prohibited.
2. Actual load capacity should be the least of rated load capacity, attachment load capacity, combined load capacity of truck and attachment, combined load capacity of truck. Generally speaking, the combined load capacity of truck is the least. Attachment load capacity may depend on attachment pressure.
3. Check assembly of attachment to ensure no movement on carriage
4. After hang attachment, embed the rise catch block to the gap of top beam. Ensure the center line of the attachment offset from the center line of the truck is less than 50mm. Otherwise it will affect the lateral stability of the forklift
5. To attachments with rotating functions, such as paper roll clamp, bale clamp, multi-purpose clamp, and drum clamp, it needs to weld chock block in the joint of carriage beam and attachment to prevent movement from side to side in the operation.
6. Assemble the lower attachment mounting to ensure correct clearance with carriage

XVII. Description of OPSSystem

OPS System (For hydraulic electronic shifting truck only)

The OPS (Operator Presence Sensing) System is developed to assure the safety and prevent the operators from travelling or handling operation when the operator is not seated or not in the proper position, helping to decrease or prevent the accidents due to the maloperation.

Engine Stalling.

If the driver leaves the seat or the seatbelt is unfastened (if seat pressure switch is applied on the seat) or the parking brake is not applied, the buzzer will alarm.

If there is no seat pressure switch input, when the driver sits correctly or applies the parking brake, the alerting alarm stops.

If there is seat pressure switch input, when the driver sits correctly and fastens the seatbelt or applies the parking brake, the alerting alarm stops.

Engine Running

1. Start the engine

When the gear switch is in the neutral position and the driver sits correctly with the buckle of seatbelt well put in the receptacle, or applies the parking brake, the engine is able to start. If the gear switch is not in the neutral position, there is no starting signal output.



Warning

If a forklift truck is parking in a slope, it's necessary to apply the brake pedal before starting in case of slipping.

2. Forward or Reverse Protection

After the engine has started, shift the gear switch to first gear of forward or reverse, the vehicle is able to start. If the gear switch is shifted to second gear of forward or reverse, the neutral indicator light flashes and the vehicle cannot start. The forward or reverse power can recover if the gear switch hangs in neutral switch.

If the driver leaves the seat or unfastens the seatbelt (if seat pressure switch is applied) over 3 seconds in the process of travelling, the buzzer will alarm and the neutral indicator flashes and OPS lights are on and the truck stops automatically.

If the driver returns and sits correctly, the alerting alarm stops and OPS light turns off. The neutral indicator light is normally on when the gear switch is in the neutral position. When gear switch hangs in the forward or reverse gear, the vehicle recovers travelling.



Caution

There is no OPS light on the instrument for some truck models.

For trucks mounted with seat applied with the seat pressure switch, it's required that the driver sits correctly and then put the buckle of the seatbelt into the receptacle. Note if the sequence is not followed, the truck will not start.

The gear switch is set in the neutral place by default in the procedure, neutral indicator light flashing reminds the driver to hangs the gear switch in the neutral position.



Warning

If the OPS is activated by abnormal operation when a forklift truck is travelling in a slope, the power supply will be cut off which leads to the slipping on a slope. To avoid this kind of accident, the driver must operate the truck in a proper position.

3. Working Device Protection

If the driver leaves the seat or unfastens the seatbelt (if seat pressure switch is applied) over 3 seconds in the process of handling, the buzzer will alarm and the neutral indicator flashes and OPS lights are on. Operation of handling stops automatically. If the driver returns and sits correctly, the handling can be continued.



Caution

For trucks mounted with seat applied with the seat pressure switch, it's required that the driver sits correctly and then put the buckle of the seatbelt into the receptacle. Note if the sequence is not followed, the truck will not start. Before unlocking the working device, put the tilting lever and the attachment lever back to the original position.

Abnormity of OPS Controller

If it happens to encounter the following situations, please park the forklift truck in a safe place and contact the local agency of ENFORCER forklift for inspection.

- a) Shift the gear switch to first gear of forward or reverse, but the neutral indicator light flashes when ready to start.
- b) The buzzer keeps alarming when the parking brake is already applied.
- c) The neutral indicator light keeps flashing when the gear switch is in the neutral position.
- d) When the driver leaves the seat or unfastens the seatbelt (if seat pressure switch is applied) over 3 seconds in the process of handling, the buzzer fails to alarm and OPS light is not on.
- e) When the driver returns and sits correctly, the buzzer keeps alarming and the OPS light keeps on.



Caution

There is no "1" OPS light on the instrument for some truck models.

XVIII. Relevant safety command and standard

The model with CE certification which accords to the following directive and standard: Machinery Directive 2006/42/EC (*The European Council of the Laws of the Member States concerning Machinery*), Noise Directive 2000/14/EC (*Directive of the Laws of the Member States concerning Outdoor Equipment Noise Radiation*), EN1726-1:1999+A1:2003(*Safety Standards for Machinery Industrial Vehicles*), EN12053:2001, ISO 3691-1:2015, EN16307-1:2013+A1:2015

EN1175-2:1998+A1:2010,

EN13059:2002, EN 12053:2001 etc. coordinative standards.

- ☐ Main safety factors accord with Machinery Directive 2006/42/EC, ISO 3691-1:2011, ISO/TS 3691-7:2011, EN1175-2:1998+A1:2010.
- ☐ Noise is measured according to EN12053:2001, and meets with 2000/14/EC, 2005/88/EC
- ☐ Vibration parameter is measured according to ISO5349-2:2001, EN13059:2002.

Model	Vibration coefficient m/s ²	At the operator' position: measure with sound pressure level dB(A)	Acoustic power level of radiation noise dB(A)
FG/D18-X	0.551	83	101
FG/D25-X	0.614	85	102
FG/D35-X	0.616	86	102
FG/D35-XW55	0.7	85	103.0
FG/D35-XW56	1.0	85	100.3
FG(Y)D18-X FG/D18-X	0.564	82	101
CPQ(Y)D25-X CPYD25-X	0.614	84	101
FG/(Y)D35-X FG/D35-X	0.537	85	102
FG/D40-XW35	0.6934	85.08	104.81
FG/D45-XW35	0.5684	85.08	104.81
FG/D50-XXW35	0.4506	88.1	103.3
FG/D55-XXW35	0.5808	88.22	103.37
FG/D40-XW57	0.52	88.3	103.7
FG/D45-XW57	0.43	88.3	103.7
FG/D50-XW57	1.26	85.5	104.6
FG/D55-XW57	1.09	85.5	104.6
FG/D40-XW58	0.8110	88.35	104.24
FG/D45-XW58	0.8740	88.35	104.24
FG/D50-XXW58	1.069	87.89	103.17
FG/D55-XXW58	0.5737	88.05	103.26
FG/D50/60/70-X FG/D50/60/70-X		88	90

FG/D80/100-X	0.9725	87.7	105.7
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- ☐ Electromagnetism compatibility is measured according to EN12895:2000, and meet with 2004/108/EE Directive.
- ☐ Static test coefficient for lifting attachment is 1.33.

XVI.Maintenance record

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