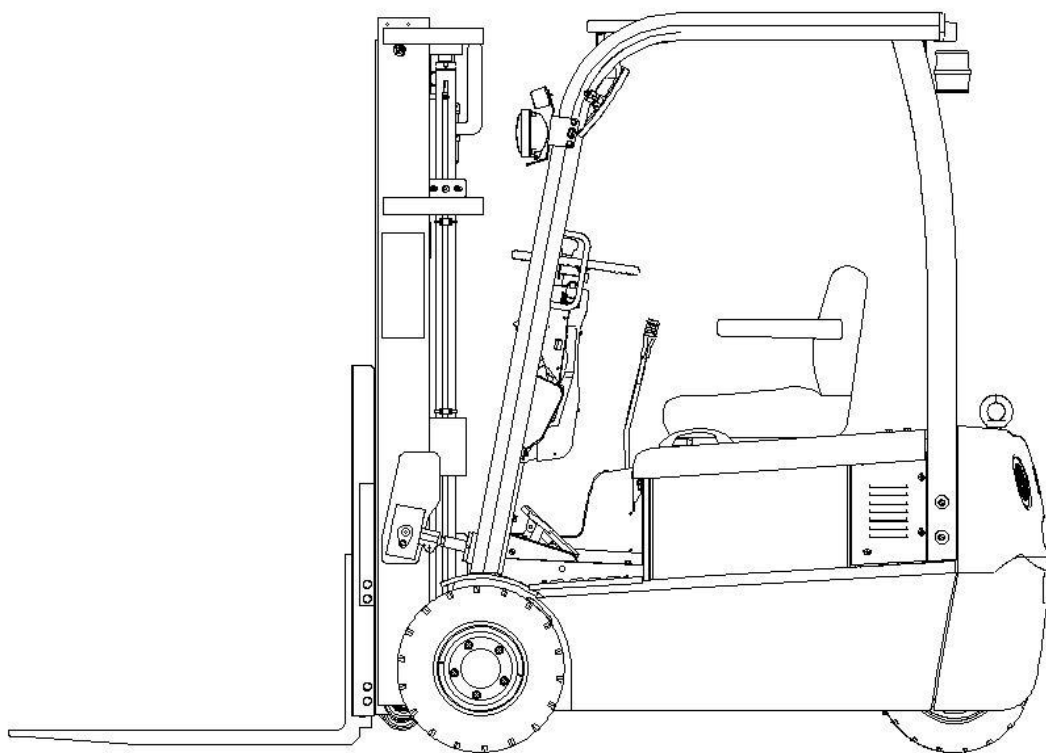


**1-3.5T Electric Forklift Truck
Operator manual**



Suit model: 1-3.5T Electric Forklift Truck

KION Baoli(Jiangsu)Forklift Co.,Ltd

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Introduction

This manual should be kept by operator and read it repeatedly.

- This operator's manual provides the paper operation, easy maintenance and routine inspection.

- Prior to operation, read this carefully to secure safe and efficient materials handling by proper driving and maintenance.

- This manual content might not correspond with the actual condition because of the improving of our products.

- When load or transfer the forklift truck, this manual should be attached to the forklift truck.

- If you have any questions, please consult with the sale apartment of our company.

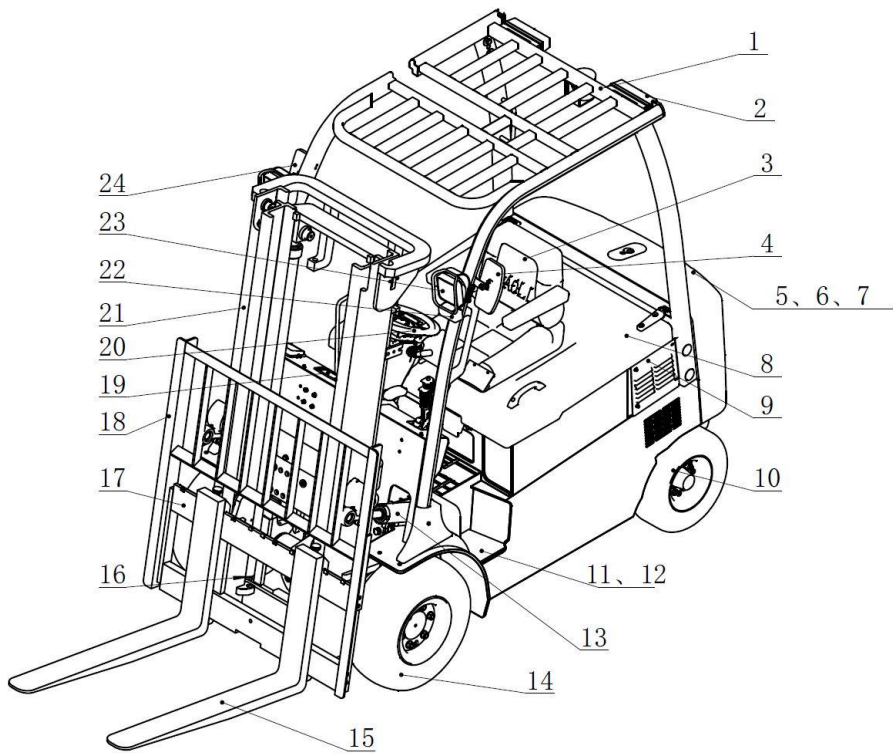


and



marked instruction is very important for you and others for safety. You shall keep to the instructions.

	DANGER	Indicates an immediately hazardous situation which, if not avoided, will result in death or serious injury. You must observe this instruction.
	WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. You must observe this instruction.
	CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. You must observe this instruction.
	NOTICE	Indicates a statement of directly or indirectly related to the safety of personnel and maintain of the truck.



1.Overhead guard	2. Rear combination lamp	3.Seat
4. Rear view mirror(L)	5. Balance weight	6. Rear board
7. Draw bar pin	8. Battery cover	9. Side board
10. Rear wheel	11. Floor	12. Floor
13. Tilt cylinder	14. Front wheel	15 .Fork
16.Lift chain	17. fork carriage	18. Load bracket
19.Instrument board	20. Steering wheel	21. Mast
22.Front combination lamp	23. Head lamp	24.Rear view mirror

I . Parts name and function

1. Liquid crystal displayer



(1) Turn the key switch to “ON”, the electric control circuit is on. After the screen of the liquid crystal displays flashes four times, the signals display.

(2) Battery capacity indicator

The indicator is displayed as follows when the electrolyte level is at the highest mark. The indicator includes 9 marks, each mark means about 10% electric quantity. The lamp in the indicator will turn off when the electrolyte level goes to next mark. When the electrolyte level goes to the last two mark, the battery shall be charged.

(3) Battery capacity warner lamp

When the battery voltage of every cell is lower than 1.75V or the electrolyte level gets to the last mark, the battery capacity warner lamp flashes and the back buzzer sounds. After the time delay of about 20 sec., the relay for insufficient voltage protection works to turn off the lift contacting coil. Then, the lift motor is off to avoid excessive discharge of the battery.

(4) Parking brake indicator

When the truck is parking, **【P】** display on the liquid crystal displayer. When releasing the parking, **【P】** displays on the liquid crystal displayer.

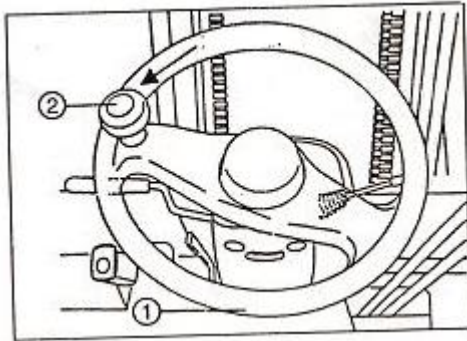
(5) Breakdown code indicator

Anyone of breakdown code 001 to 999 represents a kind of troubles. When a trouble arises, the “**F**” indicator Flashes and corresponding code appears. When breakdown code is 10 or more appears, it represents the charge in the battery has been used up and insufficient voltage, the function 3 alarms.

(6) Hour displayer

The displayer is used to record the working time accumulated. Letter length is six bits, within the range of 0 to 99999.9 hours.


2. Controls & Switches

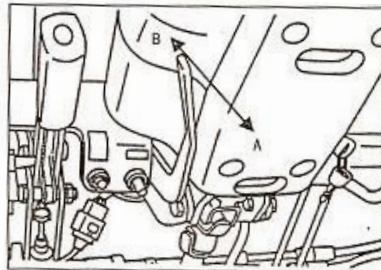



①Steering handle and ②Steering handle knob

When steering, grasp the wheel knob by the left hand, while the right hand is put either on the valve lever or the steering wheel lightly.

- An electric power steering is equipped for a standard equipment.
- A tilting handle is equipped for a standard equipment.

 **NOTE**
Adjust the best angle corresponding to the operating position.




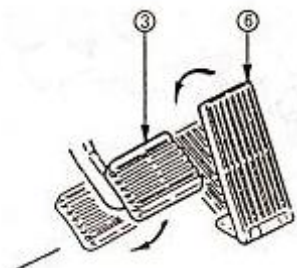
 **NOTE**
After adjusting the tilt angle, lock the handle by tilt knob securely.

③Brake pedal and ⑥Accelerator pedal

Depress the accelerator pedal softly.

Truck's speed is controlled by depressing angle of the pedal.

 **NOTE**
When depressing the brake pedal, make sure to release your foot from the accelerator pedal.

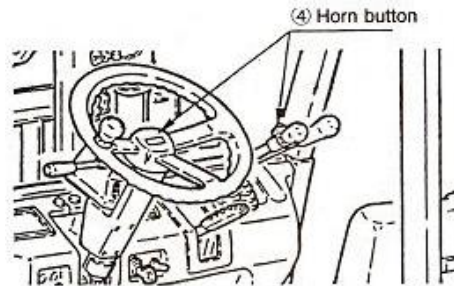


④Horn button

Horn buttons are supplied on the center of the steering wheel and left side of the front board.

⑤Directional switch lever

Indicate the traveling direction. Forward traveling: push the lever and depress the accelerator pedal. Reverse traveling: pull the lever and depress the accelerator pedal.



NOTE

The traveling speed is controlled by depressing angle of the pedal.



NOTE

When parking the truck, return the directional switch lever to neutral.

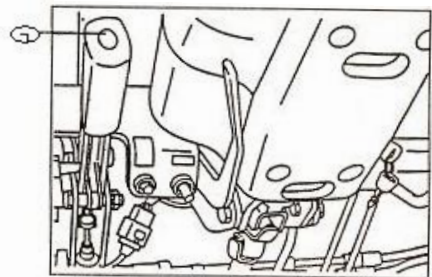


CAUTION

Do not depress the accelerator pedal at a stroke for avoiding a student start or a sudden acceleration.

⑦Parking brake lever

Prevent to move the truck. When Park the truck, pill the parking brake lever fully. In returning, push the parking lever to forward correctly.



NOTE

When leave the truck, lower the forks to the floor and pull the parking lever

correctly.



NOTE

When park the truck, take off the key switch.



NOTE

When operate the parking brake lever, depress the brake pedal.

⑧Lift lever

Lift up the forks: Pull the lift lever backward.

Left down the forks: Push the lift lever forward.



NOTE

Appropriate lift and lower speeds by handling are regulated by the stroke of lift lever.



NOTE

When turn the key switch on with pulling or pushing the lift lever, the lifting movement will not work.



NOTE

Do not make a sudden lifting and lowering stop. Do not stop lifting and lowering suddenly.

⑨Tilt lever

Tilt the mast backward: pull the tilt lever backward.

Tilt the mast forward: push the tilt lever forward.



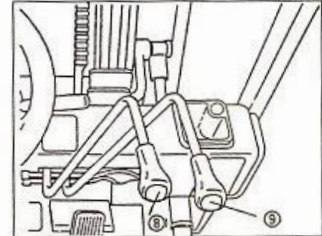
NOTE

Appropriate tilting speeds by handling are regulated by the stroke of tilt lever.



NOTE

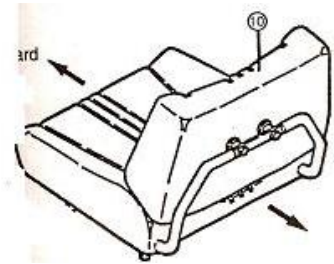
When turn the key switch on with pulling or pushing the tilt lever, the tilting movement will not work.



⑩ Seat

Seat is adjustable for best position in front and in the rear.

Adjustable position of the seat Forward: 60mm
Backward: 45mm



⑪ Key switch

OFF: This is the position where the switch is off and the key can be put in or taken off.

ON: Turning to right from the off position closes the switch to allow the operation of the truck.



CAUTION

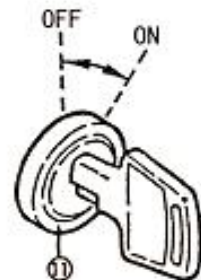
Do not turn the switch on with depressing the accelerator pedal.

Be sure to take the key off when leaving the truck.



NOTE

When parking the truck or charging the battery on the truck, remove the key.

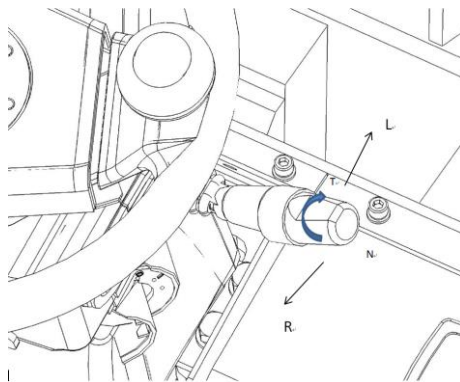


⑫ Lamp switch

This switch is two step drawn.

Operation Lamp	L	R	T	T×2
Width lamp	×	×	○	○
Head lamp	×	×	×	○
steering lamp left	○	×	×	×
steering lamp right	×	○	×	×

○: lamp on ×: lamp off



II .Safety operation

1. Information of safety operation

(1) Operation training



CAUTION

The characteristic of brake, accelerator and hydraulic control levers are different and every truck which has same specification. After getting accustomed to operation, operate the forklift truck.

(2) Clothing of forklift truck working



CAUTION

Wear a helmet, safety shoes and working clothes.

For security, do not wear loose clothes which have a fear to be hooked or caught in.



- When the clothes hooked, this will lead to a dangerous condition unexpectedly.

(3) Observe rules



CAUTION

Do not operate the forklift truck when you have tired, emotional mixed, having drug or drunk.

- When operating or servicing a forklift truck, observe the rules for safety.

(4) Safety for your place of work



CAUTION

- Keep good condition of road surface, traffic control should be clear.
- Lighting for operating area is needed for safety working.
- Operating on a platform or dockboards is in danger of turnover, provide wheel stops or other positive protection to prevent a turnover.

(5) Keep clean condition of operator's compartment



CAUTION

Operator's compartment shall be kept in a clean condition at all times.



CAUTION

- Do not operate forklifts with oily hands or wet hands.
- When having slippery oily hands or muddy hands, this condition will lead a dangerous operation.



CAUTION

Tools and other metallic objects shall be kept away from the operator's compartment.

- These obstruct the movements of lever or pedal.

(6) Truck complete



CAUTION

Truck should be equipped with an overhead guard and a load backrest.



NOTE

An overhead guard shall be used as protection against falling objects. It should be noticed that an overhead guard is intend to offer protection from the impact of small packages, boxes, etc., representative of job application, but not to withstand the impact of falling capacity load. Precaution shall be taken to falling objects.




WARNING

Do not modify the forklift trucks.


- When operating forklift trucks, inspecting and servicing, observe the safety rules and the rules at your place of work.
- Modification and additions shall not be performed without the written approval of our company.
- Modification might affect capacity or safety operation.

- Do not install any parts blocking visibility from operating position.

(7) working program for safety operation

	<p>NOTE</p> <p>Make a working program prior operation, arrange for safety thoroughly.</p>
---	--


(8) Prohibition of operation with not in safe operating condition

	<p>CAUTION</p> <p>Carry out daily servicing and periodic servicing.</p>
---	--


- Carry out daily servicing before operation.
- When find an abnormal condition on inspection, repair or replace it.




(9) Prohibition of operation with an abnormal condition truck

	<p>WARNING</p> <p>When find a damage or a fault at the truck, stop operating the truck and inform an employee about the truck condition immediately. Do not operate the truck until the truck has been repaired completely.</p>
--	--

(10) Prohibition of overload

	<p>CAUTION</p> <p>Do not overload and observe the allowable load.</p>
---	--

- Observe the capacity chart on the truck.

	<p>NOTE</p> <p>Allowable Capacity means what the maximum load can be put on the forks in accordance with a load center.</p>
---	--





CAUTION

Make sure the weight of load and the center of gravity at the load position.



(11) Using a proper pallet



CAUTION

Use a pallet which is suitable Size and strength for a load.



(12) Check of loading



CAUTION

Make sure palletized load is in proper shape and securely palletized.

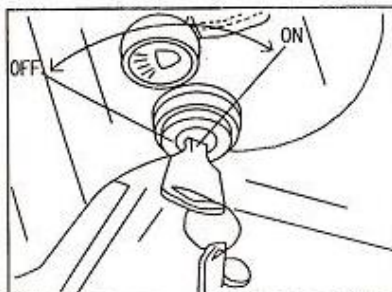


(13) Check of electric system



CAUTION

When check the electric system, turn off the key switch and disconnect the battery plug.



2. Information of Driving

(1) Check for safety around the truck



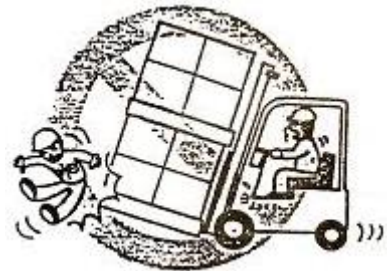
NOTE

Make sure no person is around truck before starting the truck.



NOTE

When carrying the large load and visibility is poor, make a drive backward or someone should induce the truck.



NOTE

When driving to backward, make sure no person is around the truck.




NOTE

Someone should induce the truck at narrow aisle.




NOTE

The driver shall be required to stop at cross aisles and other location where vision is obstructed and make sure security at right and left of the truck.


 **NOTE**
Do not look aside.

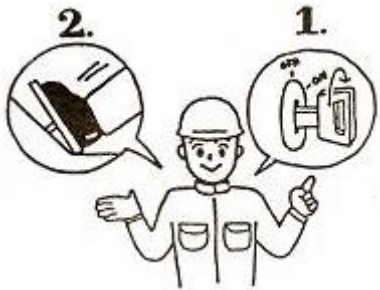



 **NOTE**
A forklift truck is rear wheel steering which is different from a car. Slow down the traveling speed and approach to a turning corner then operate steering wheel with taking care of a turn at the truck back.



(2) Prohibition of rough driving


 **CAUTION**
Do not turn on the key switch with depressing the accelerator pedal.




 **CAUTION**
Do not make a sudden start, braking or turn.




- A sudden start and braking can cause a falling of load.
- A sharp turn on traveling can cause an overturn of truck and may relate to a serious accident. Slow down traveling speed and make a turn carefully.

 **NOTE**
Do not run over bumps and obstacles scattered on the road.




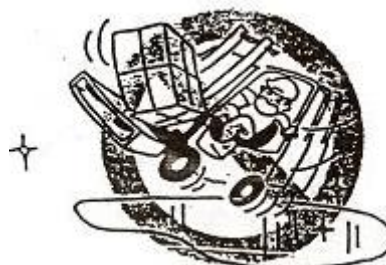
 **NOTE**

- Observe the rules at place of work and safety regulations
- When passing by the other truck, slow down the traveling speed and sound the horn.
- Do not make a passing where vision is obstructed.


 **NOTE**
Do not drive into a weak floor or ground.



 **NOTE**
Slow down the traveling speed on a wet, slippery, uneven and inclined place, etc.




- Do not drive into the flooding or the covered water.

 **NOTE**
Make sure that there is sufficient clearance between mast and ceiling or entrance of a structure.




(3) Prohibition of driving with forks lifted up the air.

 CAUTION
Do not drive with forks lifted up.

- When traveling with lifted forks, this could cause an unstable condition and a turn over of the truck.




(4) Prohibition of fork tip working

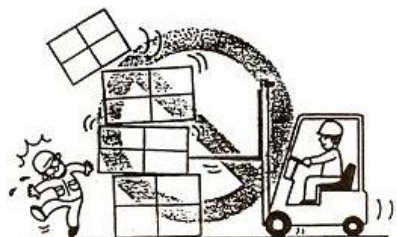
 CAUTION
Do not push a load or lift up by the tip of forks.



- When catch a load by the tip of forks, it can cause jumping up the truck or a load.


(5) Prohibition of pushing and pulling working

 CAUTION
Do not push or pull a load.




- The load would be damaged or dropped.

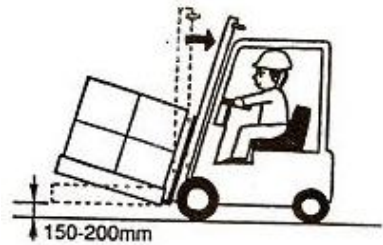
(6) Keep off

 WARNING
Do not stand on the load or pass under forks.




(7) Stabilized load

 **CAUTION**
Drive the truck with mast tilting back for stabilizing the load.



- When traveling with or without load, raise the forks for 150-200mm from the floor.


(8) Prohibition of sideway driving

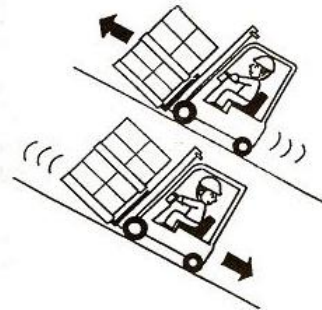
 **CAUTION**
Make sure the safety distance from sideways or platform's edges.




- Working on the sideways or platform may cause the truck dropping, put stopper and so on.

(9) Driving on a slope

 **CAUTION**
Drive the truck on a slope as following.
LOADED: Drive the truck forward to ascend and backward to descend.
UNLOADED: Drive the truck backward to ascend and forward to descend.



 **CAUTION**
When the truck goes down on a slope, drive slowly with the brakes on. Make sure that the forks should not touch the ground.

- Braking on a decent or wet road, the stopping distance is longer in comparison with a normal stopping distance on flat or dry floor. Braking should be applied early.



CAUTION

Driving, turning and loading shall not be taken on a slope. It could cause turning sideways of the truck, it is very dangerous.



3. Information of operation

(1) Prohibition of overload



CAUTION

Handle only loads within the allowable capacity of the truck.

- To handle a load shall be based on the load chart.
- When traveling with an exceed load, the rear wheel will be raised from the floor and the steering can not be controlled. This condition could lead to an accident.



(2) Prohibition of off-center loads



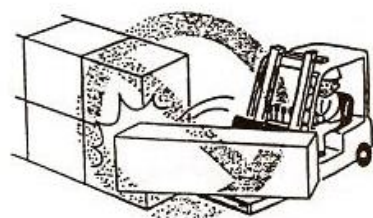
CAUTION

Make sure if loads are arranged stable and safety, insert the forks to the pallet correctly. The load center must be in the fork load center.


- To handle off-center loads could led to overturn the truck and falling loads.




- When handle protrude from a pallet, there is a danger of hitting post or others.




(3) Prohibition of permitting passengers to ride

 **WARNING**
Do not permit passenger to ride on the forks or a pallet.




 **CAUTION**
Do not ride people on the truck except driver.


 **CAUTION**
Do not ride people on the truck as a counterbalance.





(4) Prohibition of putting into mast structure

 **WARNING**
Never put any part of the body into the mast structure or between the mast and truck.



 **CAUTION**
Operating levers shall be operated in proper operating position.

 **CAUTION**
When levers are hooked by a part of body or clothes, the mast is moved and there is a danger of squeezing hands or feet.


 **CAUTION**
Keep hands and feet inside the operator's compartment. Do not put any part of the body outside the operator's compartment of the truck.




- Extreme care must be taken to handle loads and travel in the racks area.


- There is a danger if hitting a rack or a post.

(5) Prohibition of operating levers suddenly

 **CAUTION**
Operate hydraulic control levers slowly when loading and unloading.



 **CAUTION**
There is a danger of falling load or overturning the truck when operating the levers suddenly at high height position of forks.


 **CAUTION**
Do not lower and stop the load suddenly.




- There is a danger of falling loads and overturning the truck when lowering and stopping load suddenly.

•

(6) Prohibition of lifting when tilting loads forward


 **CAUTION**
Do not lift up load and drive a truck when tilting the mast forward. When lifting loads or driving the truck, tilt the mast backward enough and stabilize the load.




 **CAUTION**

- Do not tilt the mast forward with the load.
- When lifting or lowering the load, be sure the truck is stopped.
- Do not load and unload the load at the condition which the truck is leaning.

(7) Driving into trailer

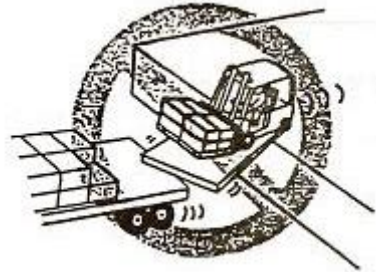
 CAUTION
Operate the truck at the place where has holding means of a trailer at docks.




 CAUTION

- Before starting operation of truck, fix a deck board and inspect its strength.

When getting into or off the trailer, drive carefully and slowly across the deck board or bridge plate.




(8) Getting on and off the truck

 CAUTION
Do not jump on and off the truck.


- When get on and off the truck, grasp a grip, put on your foot at step and supporting your body.
- When get on and off the truck, do not grasp a steering wheel or hydraulic control levers.



(9) Prohibition of towing

 CAUTION
When a truck has failure of a brake or a steering device, do not tow the truck with another truck. There is a danger of running away.

(10) Prohibition of loading high stacked loads

 CAUTION
The load height should be lower than the backrest.

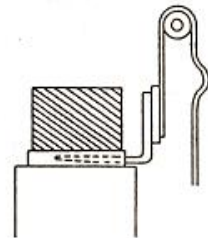
- Loaded load should be contacting with a load backrest.
- When making a double stack loading, fasten the loads with rope to prevent falling of loads.
- When loads go over a load backrest, there is a danger of load's falling against operator.



(11) Loosen chains

CAUTION
Do not draw out the forks from a pallet when chains are loosen.

- When chains are loosen, there is a danger of catching loads and rack by forks or falling of loads and overturning of truck.



NOTE
When chains are loosen:

- Lift the lift lever a little and lift the forks, the loosen chains could be corrected.
- After correcting the loosen chains, draw out the forks from a pallet.

(12) Prohibition of using forks except for operation

CAUTION
Do not use forks except of fork
Operation

- Do not lift or pull loads by hanging ropes on the forks.



NOTE
When lift up the loads by forks, operate a truck which has a suitable attachment.

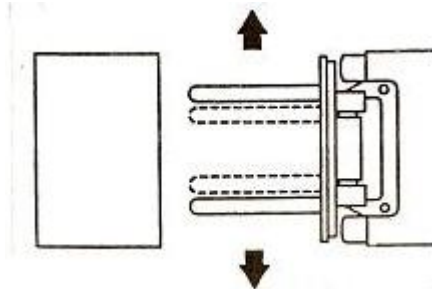
CAUTION
Do not operate the forklift truck as a towing tractor by using a draw-bar pin.

(13) Adjustment of forks



CAUTION

Adjust the spreading of forks in accordance with a pallet size.



CAUTION

Take care your fingers when adjust the fork spread.

- When adjusting the width of forks, making sure that the setting pin of forks are fixed.
- When the forks are not fixed, the forks could move and there is a danger of load's crumbing and falling.

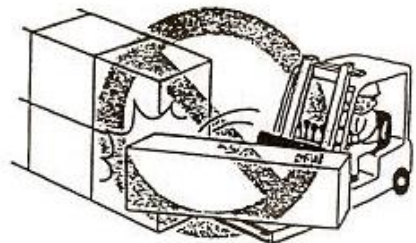
(14) Handling of wide loads



CAUTION

Careful driving should be taken when handling long or wide loads.

- Be careful of around security when turning, and turn slowly in order not to move loads.
- Be careful of balancing of loads, and handle the loads at low height position.
- Lifting and lowering loads should be slowly, an be careful of around security.



NOTE

When carrying a wide load, operate a forklift truck which has a suitable wide bar.

(15) Prohibition of holding down loads by hands



CAUTION

Do not hold down the loads by hands. There is a danger of load's falling.

(16) Prohibition of no pallet using



NOTE

When operating, the loads must be positioned on pallet.

(17) Parking of disabled forklift truck



NOTE

When park the off road forklift truck, warning or "out of order" signs shall be placed on the truck and remove the key.



- When the forks could not be lowered by fault, place a large mark in order not to be tilt by other truck or walkers.

4. Information of after finished working

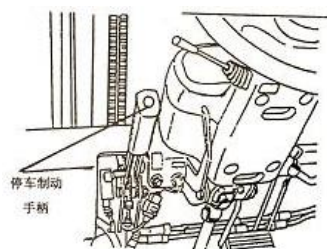
(1) Parking



CAUTION

Before leaving the truck:

- Tilt the mast assy forward and fully lower the forks.
 - Place directional switch lever in neutral.
 - Apply the parking brake securely.
 - Turn off the key switch and remove the key.
- If do not lower the forks to the floor, there is a danger of stumbling or hitting body.



(2) Parking at reserved place



CAUTION

- Park at reserved place.
- Parking place should be hard sufficiently.
- Park a place which does not disturb traffic.
- Do not park on or near an inflammable object.

(3) Prohibition of parking on a slope

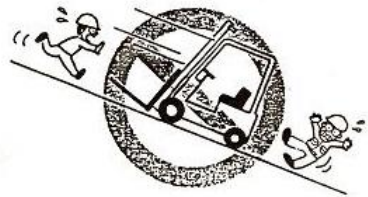


CAUTION

Do not park trucks on a slope.

When park trucks on a slope, the trucks could move inconceivable.

When park trucks on a slop by necessity, put wheel drags securely.



(4) Lift up to maximum lift height



CAUTION

Lift up the forks to maximum lift height several times.



NOTE

When lifting is only a low height, the interior of lift cylinders could be rusted.

(5) Cleaning



CAUTION

A cleaning of the electrical system should be made by a compressed air. Wear a goggle while using a compressed air. Do not dash water.

- When the electrical system is dashed water, it causes failures and malfunctions.

(6) Charging



CAUTION

Charging facility shall not be got wet in the rain and it shall be provided for adequate ventilation for dispersal of fumes from gassing batteries.



CAUTION

Indicate what the battery on the truck is charging.



III Driving and operation



NOTE

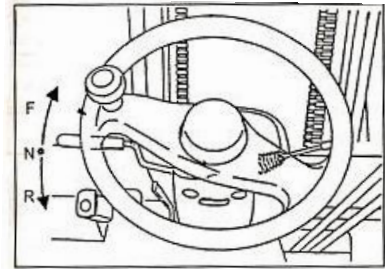
Do not operate the truck prior to daily check and not approving a periodical servicing.

Make sure safety around the truck before taking a seat.

1. Preparation for start

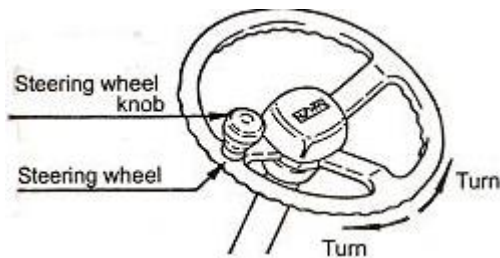
(1) Check the directional switch lever position

Put the directional switch lever to the neutral position.



(2) Turn on the key switch

Grasp the steering wheel knob. Then turn on the key switch



(3) Tilting back the mast assy

Lift up the forks about 150-200mm from the floor by pulling backward the lift lever.

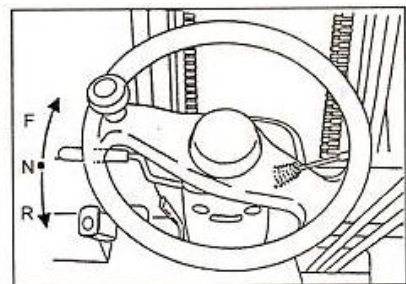
Tilt back the mast assy by pulling backward the tilt lever.

(4) Operation of the directional switch lever

Operation of the directional switch lever to move direction (forward-backward).

Forward: Push the lever forward

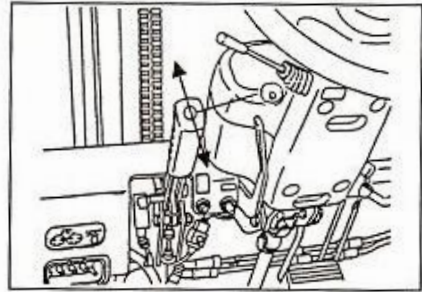
Backward: Pull the lever backward



(5) Taking off the parking brake

Depress the brake pedal. Push the parking brake lever forward fully.

Grasp the steering wheel by left hand, put right hand lightly on the steering wheel.




2. Driving

(1) Start

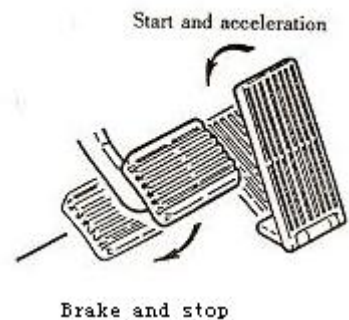
Take off your foot from the brake pedal and depress the accelerator pedal gradually, then the truck will begin to move.

Acceleration varies in accordance with the depth of the accelerator pedal depressed.




CAUTION
Do not a sudden start and stop.

- A sudden start and stop will cause the load falling.



(2) Slow down

Reducing depressing of accelerator pedal slows down travel speed.



CAUTION
Slow down then:

- turning a corner
- approaching a load or pallet
- approaching storage
- narrow aisle
- floor/road condition is bad

(3) Turning

- A forklift truck is different from a car, because of the rear wheel steering. Slow down and operate steering wheel paying careful attention to swing of the truck's rear end.

(4) Stop

Slow down and apply the brake slowly.



CAUTION

Do not apply brake suddenly.

- A sudden stop causes a lode falling.
- When apply brakes suddenly on a full traveling speed, it makes the driver bend forward and hitting to the steering wheel.



(5) Parking



NOTE

When getting off the truck, pull the parking lever correctly and tilt forward the mast assy. Lower the forks on the floor. When parking on a slope, must put the drags under wheels.



NOTE

When leave the truck, remove the key.

3. Stacking operation



CAUTION

Check the following items before starting operation of truck.

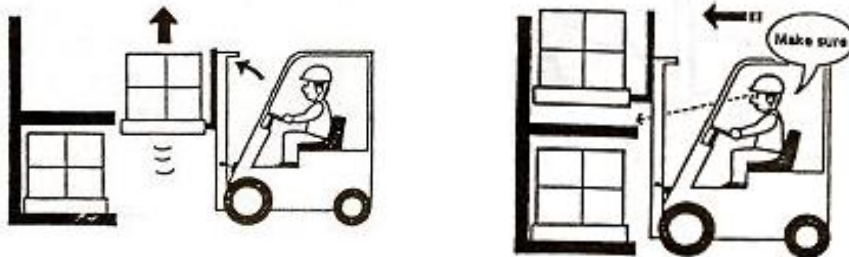
- Make sure that there is not load's falling and damage of load at loading area.
- Make sure that there is no object will affect stacking safety.

When stacking a load, observe the following procedures.

- (1) Slow down the travel speed when approaching a stacking area.
- (2) Stop the truck in front of stacking area.
- (3) Check for safety around the stacking area.
- (4) Adjust the truck position which a load(pallet) locates in front of the stacking area.

(5) Tilt the mast to vertical position and lift up the forks above the stacking position.

(6) Check the stacking position and move forward and stop slowly at the proper position.



(7) Make sure the load is just above the stacking position and lower the forks slowly.

Make sure the load stacked correctly.

NOTE

When the load is not aligned at front/rear ends of the load or pallet.

a) Lower the forks until the load weight on the forks becomes free.

b) Move the truck backward about 1/4 length of the forks.

c) Lift(50-100mm) the forks again and move to forward then lower the load slowly at a proper stacking position.



(8) Check clearance backward and move backward avoiding hitching forks to pallet or load.

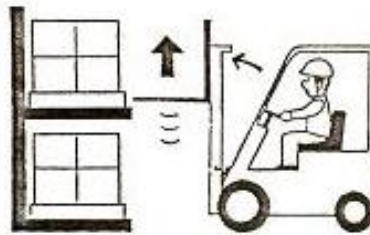
(9) Make sure the tips of forks are off the load or pallet, and lower the forks to the position for running(150-200mm above the floor).



4. Picking operation

When picking up the loads, observe following procedures.

- (1) Slow down the traveling speed when approaching a load to be picked up.
- (2) Stop the truck in front of the load (about 30cm between the load and the fork tips).
- (3) Adjust the truck position which forks locate in front of the load.
- (4) Make sure safety of the load which is not collapsed.
- (5) Tilt the mast to vertical position.



- (6) Check the inserting position and move the truck forward slowly until the forks are fully inserted into the pallet.



NOTE

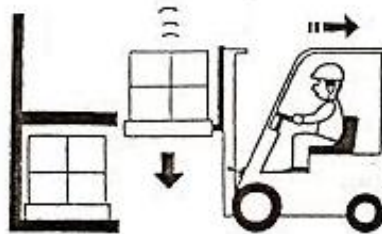
When it is difficult to insert the forks fully into the pallet:

- a) Insert the forks by its 3/4 length and lift up the pallet a little (50-100mm), and draw out the pallet about 100-200mm and lower the pallet again.
- b) Insert the forks fully into the pallet.



(7) After inserting the forks, lift up the pallet(50-100mm).

(8) Check the clearance and move the truck backward until the load is lowered.



(9) Lower the load up to 150-200mm above the floor.

(10) Tilt the mast backward for stabilizing the load.



(11) Carry the load to its destination.

IV. Battery and charger

When the truck is equipped local supply battery and charger, please follow the instructions of manufacturer.

1. Precaution in handling of the battery



CAUTION

When making a wrong use of battery, it causes damage of an ignite explosion or injuries. After learning a correct use of battery, handle the battery.

(1) Smoking shall be prohibited



CAUTION

A battery produces hydrogen gas. When making a short circuit, sparking and a fire of cigar approaching to the battery, it causes an explosion and a fire.



(2) Prevention of an electric shock



CAUTION

The battery has a high voltage. Do not touch the electric conductor of the battery when installing and servicing. It causes a serious burn.

(3) Connecting correctly



CAUTION

Do not charge the battery which the terminal is charged places with the terminal.

- It causes heating, ignition, smoking and an ignite explosion.

(4) Prohibition of putting a kind of metallic goods on the battery surface



CAUTION

Do not make a short circuit between both terminals by bolt or tool.

- It causes injuries and an ignite explosion.

(5) Prohibition of over discharging




CAUTION

Do not operate the truck until it does not move.

- The battery life will be shortened.
- When the battery capacity warning flashes, charge the battery.

(6) Keep clean


(Static electricity is dangerous.)

 CAUTION

- Keep the upper surface of the battery clean.
- Do not use a dry cloth, a chemical fiber cloth for cleaning the battery surface. And do not cover the battery by a vinyl sheet.
- It causes an ignite explosion by a slatic electricity. Use a wet cloth for cleaning the top of uncovered battery.



(7) Wearing safeguard

 CAUTION

When servicing the battery, wear goggle, rubber gloves and boots.

(8) Electrolyte of battery is hazardous

 CAUTION

The electrolyte of battery is made of the dilute sulphuric acid.
Handling should be taken care.

- When the electrolyte adheres to eye, skin and clothes, it causes to lose eyesight and a scald.



(9) Emergency first aid



NOTE

When an accident is occurred, take the emergency first aid as following and consult a physician immediately.

- Spilled on the skin:
It should be washed off with water for 10-15 minutes.
- Splashed in eyes:
It should be washed off with water for 10-15 minutes.
- Flow out on a large scale:
Neutralize the electrolyte of battery by the baking soda(sodium bicarbonate) or it should be washed off with water.
- Swallowed:
Drink milk or water on a large quantity.
- Splashed on clothes:
Take off clothes immediately.

(10) Close the vent caps securely.



CAUTION

Close the vent caps of the battery securely in case of electrolyte leaks.

- Care must be taken not to refill electrolyte excessively. An overflowed battery could cause an electric leakage.

(11) Washing



CAUTION

Do not wash the truck which the battery is getting on.

- If washing the battery, it causes damage to the truck.
- Tighten the vent caps in order to prevent water.

(12) Sea water



CAUTION

The battery should not be got wet with rain or sea water.

- It causes a damage of battery or fire.

(13) Abnormal battery



CAUTION

When the battery shows the following condition, contact the sale apartment of our company.

- The battery stinks.
- The electrolyte becomes muddy.
- The temperature of electrolyte is high.
- The decreasing speed of electrolyte is fast.

(14) Prohibition of disassembling



CAUTION

Do not drain the electrolyte from the battery.

Do not disassemble the battery.

Do not repair the battery.

(15) Storage



CAUTION

When do not use the battery for a long time, store it in the place where is well ventilated and there is no sign of fire.

(16) Abandonment of battery



CAUTION

Regarding used batteries, contact the sale apartment of our company.

2. Precautions on Charging

(1) Do not run out of the batter's electrolyte.



CAUTION

The minimum quantity of electrolyte should be kept. If the quantity is short. It causes overheating or burning of the battery.



- When the electrolyte of battery is in short supply, its life will be shorten. Check the electrolyte once a week.

(2) Replenishment of refined water or distilled water

Refer to Operation & Service Manual of Battery.

(3) Prohibition of overcharging

(4) Being well ventilated place



CAUTION

Charge the battery at a place where is well ventilates and does not get wet with in the rain.

(5) Open the battery cover



CAUTION

When charging the battery, hydrogen gas is occurred. Open the battery cover under charging, make it not being closed.

(6) Check for terminal, cable and plug



CAUTION

Prior to charging, check determine if the plug and cable are not damaged.



CAUTION

Do not charge the battery which has condition as following:

- The electrode of plug is damaged.
- The terminal and cable are rusted.
- This cause sparks, damages of burn and ignite explosions.

(7)Charging after turning off the key switch

(8) Check for specific gravity

Measure the specific gravity of all cells before charging.

Any abnormality within the battery could be found and an accident prevented by knowing the specific gravity before and after charging.

(9) Pulling out or putting on the plug should be done by holding plug itself not cable



CAUTION

Do not pull cables.



CAUTION

When cable and plug has damaged, contact the sale apartment of our company. Replace them.

(10) Discontinuance of charging



CAUTION

When discontinuance the charging of battery, operate it according to the stipulations in the Operation & Service Manual for the charger.



CAUTION

When pull out the plug of charger under charging, it causes sparks which is dangerous.

3. Charging

When charging, obey the requirements in the Operation & Service Manual for Battery. Charge the battery with the proper charger and operate it according to the stipulations in the Operation & Service Manual for the charger.

4. Exchanging battery




CAUTION

When exchange a battery, make sure that the battery should match with the truck.


- When use a battery which does not match with the truck, it causes a shortage of

working or a turnover of truck under traveling.

- When truck operates continuously over a working shift and battery power is consumed, change the battery with another battery which is charged fully at the time of shift and then charge the dismantled battery fully.

 CAUTION Exchanging battery should be done on a flat floor.

Exchange the battery should be done by serving the following instructions.

 CAUTION <ul style="list-style-type: none">• When exchange the battery by operating another forklift truck, provide suitable slings (attachment).• Hanging the battery should be made by specified personnel.
--

(1) Disconnect the battery plug.


(2) Open the battery cover.

Locking the battery cover by gas spring or others to avoid the falling down of the cover, cause the injury of people or damage of the truck body.

(3) When lifting the battery box out of the truck, care must be taken not to hit the steering wheel or others.

(4) After installing a full charged battery, connect the battery plug securely.

(5) Close the battery cover.

 CAUTION <ul style="list-style-type: none">• Take care your fingers when close the battery cover.• When hang up the battery box, care must be taken not to hit at the frame with swinging it.
--

V. Inspection prior to operation

Inspection the truck prior to operation should be done for safety operation and keep good condition of the truck. This is a duty in law. When revealed fault, contact the sales department of our company.

CAUTION

- A small fault could cause a serious accident. Do not operate or move the truck prior to finishing repair works and inspect.
- Inspecting trucks should be made on a flat floor.
- When truck's electrical system in need of inspection, key switch shall be turned off and the battery disconnected prior to such inspection.



1. Check points and contents

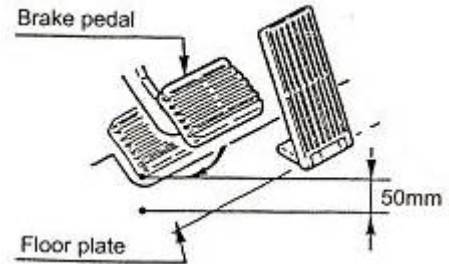
	No.	Check points	Contents
Braking system	1	Brake pedal	Depth of foot brake pedal and braking force
	2	Brake oil	Quantity and stain
	3	Parking brake	Pulling depth of lever and operation force
Steering system	4	Play of steering wheel	Loosened, play and/or vertical movement
	5	Powering steering operation	Operating of all parts
Hydraulic system & mast	6	Function	Function, any crack, lubrication
	7	Oil piping	Oil leakage
	8	Hydraulic oil	Appropriate quantity
	9	Lift chains	Equal tension of chains on R.H. and L.H. sides
wheel	10	Tyres	Air pressure, abnormal wearing and/or damage
	11	Hub nuts	Securely tighten
battery	12	Charging	Confirmation of state of battery capacity indicator and specific gravity, plug is securely connected
Lamps & horn	13	Head lamps, tail lamps, back lamps, turn signal lamps and horn	Turn on and off, sound
Monitor & lamps	14	Function	When key switch is turned on, "MONITORING OK" is displayed
others	15	Overhead guard, load backrest	Fitting bolts and nuts are tighten
	16	Others than the above	Any abnormality

2. Inspection procedure

(1) Check of foot brake pedal

Check performance of brake and make sure that it is over 50mm from the floor plate when depressing the brake pedal fully.

Proper braking distance without a local is about 2.5mm.

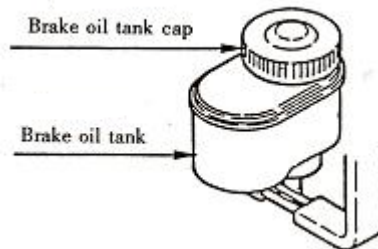


(2) Check of brake oil



CAUTION

Remove the cap of brake oil tank and check the quantity and condition of the brake oil.

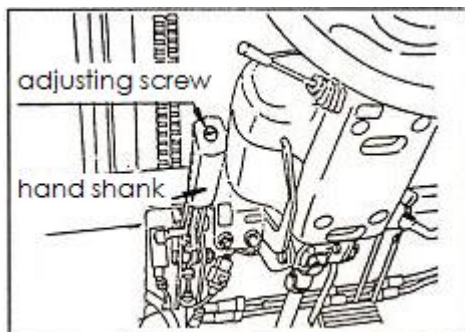


(3) Check of parking brake lever pulling the parking lever and to see:

- Suitable pulling stroke
- Braking force
- Damaged parts

Lever operation force (standard 17-22kg) is suitable for operator or not.

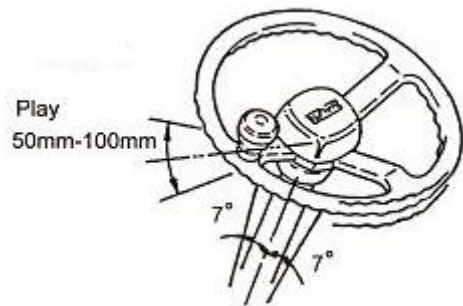
Adjustment should be done by a screw which located on the top of lever.



(4) Check of play of steering wheel

Turn the steering wheel clockwise and counterclockwise lightly and check to see if there is play.

Appropriate play is 50-100mm. The steering wheel moves forward and backward by about 7° , this is normal play.



(5) Check of power steering function

Turn the steering wheel to clockwise and counterclockwise, check the power steering operation.

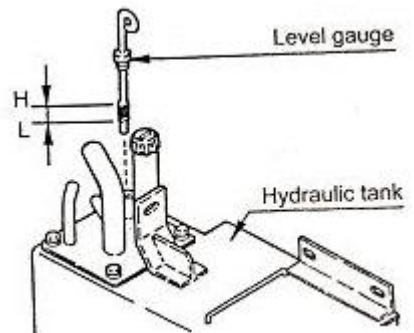
(6) Check of function

Check if lifting and tilting operation is smooth.



(7) Check of oil piping

Check for any leakage from the lift cylinders, tilt cylinders and oil piping.



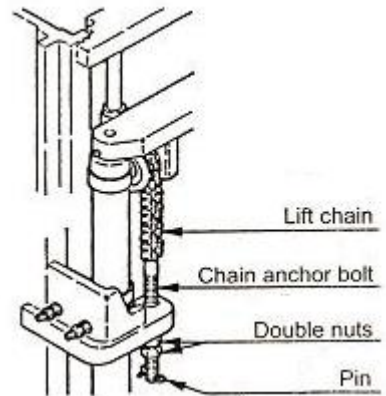
(8) Check of hydraulic oil


Check oil level, using the oil level dip stick with the forks lowered on the floor. Appropriate oil quantity is within the range of H to L.

Models	H	L
KBE15/18	23 L (6.1 Gal)	21 L (5.5 Gal)
KBET15/18	24 L (6.3 Gal)	21 L (5.5 Gal)
KBE20/25	27 L (7.1 Gal)	25 L (6.6 Gal)
KBE30/35	31 L (8.0 Gal)	29 L (7.7 Gal)

(9) Check of lift chains

Lift up forks by 200-300mm above the floor, and make sure lift chains are equivalent in tension. Check the finger bar if it does not decline either to right or left side. If the tension is different, adjust using the chain anchor bolts.



CAUTION
 After having adjusted, tighten Up the double nuts securely.

(10) Check of tyres

Measure the air pressure by using the tyre gauge after removing the cap.

Standard air pressure kg/cm²



Model Tyres	CPD10B	CPD15B	CPD20B	CPD25B	CPD30B
Front	8.50	7.00	7.00	9.00	8.00
Rear	8.00	8.00	8.00	9.00	7.00

After checking air pressure, make sure air does not leak from the valve before replacing the cap.



CAUTION

Air pressure for forklift truck is higher than a normal car, do not raise the pressure over the appointed pressure.

(11) Check of hub nuts

Check the hub nuts are loosen by tightening them using a box wrench.



(12) Check of charging

Measure the specific gravity of battery. When they show 1.275-1.285 at 30°C conversion, the battery is full charged. And check the terminals which are loosen and the cable which is damaged.

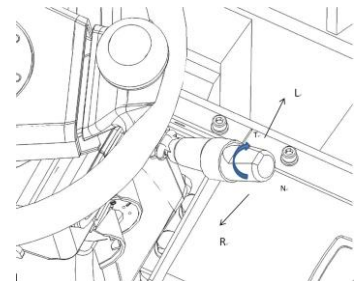


(13) Check of head lamps, turn signal lamps and horn

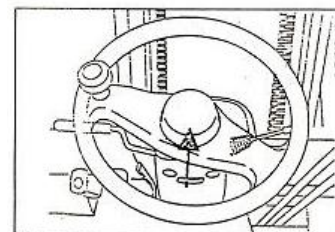
Check if lamps turn on. Check if horn sound.

Turn signal lever

L	Left turn
N	Neutral
R	Right turn
T	Width lamp
T×2	Width lamp & head lamp



The horn sounds when passing the past shown by the arrow.



(14) Check of function of instrument board

After turn on the switch for several seconds, the signals

on the instrument board are usually shown as following figure.



(15) Check of overhead guard and load backrest

Check if any fitting bolts or nuts are not loosen.

(16) Others

Check for any other abnormality.



Check

Be sure to turn off the key switch and disconnect the battery plug while checking electric system except turning on the lamps and checking operation.

VI Inspection of after operation

When close working, remove stains on the truck and inspect the truck as following items.

- Deterioration or leakage at all parts.
- Deformed, distorted, worn or cracked members.
- Apply grease in accordance with condition.
- Lift forks to the maximum lift height of the truck several times after operation.

(When the maximum lift height was not used in the day's operation, provide oil to cover at internal cylinders for preventing rust.)

- Verify an abnormal part which observed and defects during operation.



CAUTION

A small fault could cause a serious accident. Do not operate or move the truck prior to finishing repair works and inspect.

VII Periodic servicing

Complete inspection of the forklift truck prevents faults previously and extends an usable period of the truck. Hours shown at the maintenance schedule are based on eight hour operation a day and 200-hour operation a month. Make a maintenance schedule for safety operation.



CAUTION

All servicing and repairs shall be made by authorised personnel.

- Leave servicing of adjustment and replacements to the sale apartment of our company.

1. Precautions of maintenance



CAUTION

Use genuine parts of our company for replacement. All parts of the truck requiring replacement shall be replaced only by parts equivalent as to safety with those used in the original design.



CAUTION

Use oil recommended by our company.

(1) Maintenance place



CAUTION

- Servicing facility should be provided adequate equipment and safety guards, and this place should be appointed.

- Servicing place should be a flat footing.
- Servicing place should be provided for adequate ventilation.
- Fire extinguishers shall be provided at the servicing facility.

(2) Precautions of maintenance

CAUTION

- Smoking shall be prohibited.
- Wear safeguard (helmet, shoes, glasses, gloves and boots) and suitable clothes.
- Wipe off split oil at once.
- On lubricating, lubricate after removing grease and dust off nipples and fittings with a brush or a cloth.
- Turn off key switch and pull out the battery plug except being in case of need.
- When servicing a forklift truck, lower forks to the floor.
- Clean the electrical components with compressed air.

(3) Precautions of servicing

CAUTION

- Care must be taken not to put your feet under forks and not to stumble over forks.
- When forks are lifted up, put blocks under an inner mast not to fall down forks and mast.
- Care must be taken not to snip your hands when opening and shutting of a floor plate and a battery cover.
- When having a group work, proceed working by making a sign each other.
- Use suitable tools and do not use temporary tools.
- As maintenance of hydraulic circuit is always high pressure condition, do not work before lowering inside pressure.
- When being struck by a high voltage shock, consult a physician immediately.
- Do not use a mast assy instead of a ladder.





CAUTION

Prohibit putting into your hands, feet and body between the frame and mast assy positively.

(4) Inspection and exchange of tyre



CAUTION

- Leave a dismounting and mounting tyres to qualified service facility by our company.
- Handling a high pressure air shall be made by authorized personnel.
- When use a compressed air, wear goggle.
- When dismounting the tyre, do not loosen bolts and nuts of joint rim.

As inside tyre is high pressure, there is a danger of braking bolts, nuts and rim.



(5) Jack up working (exchanging tyres)



CAUTION

Do not enter under the truck while jacking up the truck.



CAUTION

- Before jacking up, make sure that nobody in the truck and no load on the truck.
- When wheels rise up from ground, stop jacking up and

put blocks under the truck to prevent the truck falling down.

- Before lacking up, put wheel drags.



(6) Treatment of used parts

- Hanging up the truck



CAUTION

- Hang up the truck by trained person.
- Hook the wire at the appointed position.
- Use wire rope which has a sufficient strength.

2. Weekly (50-HOUR) servicing

Inspect the following servicing in addition to the inspection prior to operation.

Check points	Contents
Electrolyte quantity	Check the electrolyte level. When the level is low, replenish with refined water.
Specific gravity of electrolyte	Measure the specific gravity and temperature of the electrolyte of all sells.
Cleaning of battery	Clean the top of uncovered batteries and vent caps.
Checking of contactors	Polish the roughness of the contact by a sand paper.



CAUTION

Be sure to disconnect the battery plug when inspecting the electrical system.

(1) Check for quantity of electrolyte

Refer Operation & Service Manual for battery. Check of electrolyte and replenishment of refined water.



CAUTION

- After completed the replenishment, close the vent caps securely.
- Do not replenish too much distilled water. Flooding could make an electric shock.

(2) Check for specific gravity of electrolyte

Measure the quantity and specific gravity of all cells.

Normal: When all cell's specific gravity are the same figure as converted figure at 30, it is normal.

Abnormal: When the specific gravity is less than 0.05 from the average figure of others, it is abnormal.

(3) Cleaning of battery

Keep fry condition by wiping off with a wet cotton cloth to protect corrosion at the connecting area of top batteries.



CAUTION

- Cleaning of the battery should be done before charging.
- Wear rubber gloves and boots to prevent an electrical shock.
- Handle the battery plug not to touch water.

- The inside of vent caps will be stained. Clean them as following procedures.

① Remove the vent caps.

② Wash the inside of vent caps with a neutral cleanser.

③ Install the vent caps.



CAUTION

Make sure the vent caps are closed securely.

(4) Check of contactor

Put in a sand paper between the contact sand push the movable contact to close

and then draw out the sand paper. Remove this procedure.

3. Monthly (200-hour) servicing

Carry out the following service besides the weekly (50-hour) maintenance.

As a result of inspection, when adjustment or replacement should be necessary, call serviceman of our company. (Record of monthly maintenance should be kept.)

system	No.	Check points and contents	
Truck	1	General	Distortion, check and abnormal noise
	2	Horn	Sound
	3	Accessories(head Lamps, turn signal lamp) lamps,	Function
Battery, charger & Electric system	4	Battery electrolyte	Quantity, specific gravity and clean
	5	Terminal plug	Damage and clean
	6	Key switch	Function
	7	Contactors	Contact and functions
	8	Micro-switch	Function
	9	controller	Function
	10	Traction motor (brush, commutation)	Wearing and spring force
	11	Hydraulic motor (brush, commutation)	Wearing and spring force
	12	fuses	Looseness and capacity
	13	Wiring, terminal	Damage and looseness

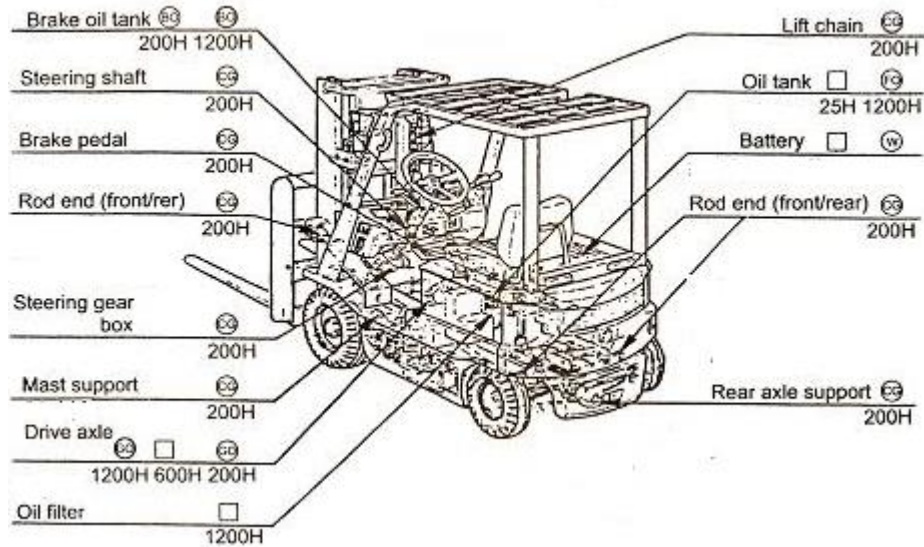
14	Steering wheel	Play and movement
15	Steering link	Lubrication
16	Gear case	Oil quantity, leakage and abnormal noise
17	Fitting nuts for tyres	looseness
18	Tyres	Damage and wearing
19	Lift chain	Lubricant and tension
20	Cylinder rod guide pins	Looseness and damage
21	Lift bracket	Adjustment, lubricant, crack and distortion
22	Forks	Crack and transformation
23	Lift rollers	Adjustment and lubricant
24	Mast rollers	Adjustment and lubricant
25	Outer mast, inner mast	Jolt
26	Lift cylinder	Oil leakage
27	Tilt cylinder	Oil leakage
28	Control valve	Function and oil leakage
29	Hydraulic tank	Oil quantity and leakage
30	H.P. hoses	Oil leakage and transformation
31	Overhead guard, load	Damage, crack and transformation
32	Brake linkage	Lubricant and movement
33	Parking brake lever	Adjustment and lubricant
34	Bolts and nuts	Looseness

	35	Power steering	function
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4. Lubrication points and recommended oil

(1) Lubrication point

- : Replace FO: Hydraulic oil
- : Replenishment GO: Gear oil
- : Brake oil W: Chassis grease
- BO: Brake oil W: Refined water



(2) Recommended oil


Manufacture use	TRUCK	Shell	ESSO	Mobile	Brand for home users
Hydraulic system	KBE-	Tellus Oils32	Powerlex 32	Hydraulic oil 28	N 32
Gear oil	KBE-	Spirax EP90	ESSO gear oil	Mobilube BX-80	85W/90

			GP-90		
	KBET15/18	SAE80W			GL-5 80W
Grease	KBE-	Alvania grease2 Retinax A			3# lithium base grease (drop point 170)
Brake fluid	KBE-	Shell brake Fluid H.D.	ESSO Fluid H. Brake fluid H.D.400	Mobile brake (SAI70RI)	4604 Compound brake fluid

5. Every three-month (600-hour) servicing

At the same time with the every three month (600-hour) servicing, repeat the sequence of monthly (200-hour) servicing. When adjustment or replacement of part should be necessary, call qualified serviceman of our company.

Check points	Contents
Contactors	Polish up the roughness of the contact with sand paper.
	When roughness is excessive, replace it.
Motors	Wearing of the carbon brushes.

	<p>CAUTION Be sure to turn off the key switch and disconnect the battery plug while checking electric system.</p>
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6. Semiannually (1200-hour) servicing

At the same time with the semiannually (1200-hour) servicing, repeat the sequence of every three month (600-hour) servicing. When adjustment or replacement of part should be necessary, call qualified serviceman of our company.

Check points	Contents
Contactors	When roughness of the contact is excessive, replace it.
Motors	Wearing of the carbon brushes
Front axle	Change of gear oil
Hydraulic oil	Strain and change of hydraulic oil

Oil filter	Cleaning the oil filter
Brake oil	Strain and change of the brake oil



CAUTION

Be sure to turn off the key switch and disconnect the battery plug while checking electric system.

★Inspection of carbon brush

Raise up the while spring and then pull out the carbon brush to check. Check if the surface of the commutation is rough and wearing has gone over the wearing limitation.

Model	Applied	H	Wearing limit	Q'ty
KBE-	Traction motor	28mm	15mm	8
	Lifting motor	28mm	15mm	8

7. Replacing parts guidance

(1) Replacing fuses



CAUTION

Be sure to disconnect the battery plug.

	Replacing procedures
Fuses	Loosen the mounting nuts and remove the fuses.
Cartridge fuse	Loosen a cap and remove the fuse.
Insufficient tightening cause a poor contacting and it will lead to making failures. Tighten the nuts securely.	



CAUTION

Be sure to use prescribed fuses.

- ① Fuse 400A (for travel)
- ② Fuse 400A (for hydraulic)
- ③ Fuse 50A (for power steering)
- ④ Cartridge fuse 10-15A (for control circuit)

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We reserve the right to make any changes or modifications in this manual without giving previous notices and without incurring any obligation

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