



Operator's Manual

Electric Counterbalanced Forklift Truck

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Introduction

This manual shall be kept and repeatedly read by the operator.

- This manual provides proper operation, simple maintenance and routine inspection procedures for the electric counterbalanced forklift truck.
- Read this manual carefully to ensure safe and efficient materials handling by the means of proper driving and maintenance prior to operation.
- This manual may differ from the actual condition due to the improvement of our products.
- Please attach this manual to the forklift truck when renting or transferring the forklift truck.
- If you have any question, please contact with the Sales Department of our Company.

Those instructions marked with “” or “” are very important to you and others for safety. You shall comply with those instructions.



DANGER

It indicates the imminent hazardous situation, which, if not avoided, may cause death or serious injury. You must observe this instruction.



WARNING

It indicates the potential hazardous situation, which, if not avoided, may cause death or serious injury. You must observe this instruction.



CAUTION

It indicates the potential hazardous situation, which, if not avoided, may cause mild or moderate injury. You must observe this instruction.



NOTE

It is used to give the instructions directly or indirectly related with the safety of personnel and maintenance of the forklift truck.

I. About Safety

Safety is your business and your responsibility. This section mainly covers the basic safety regulations and warnings for the general use of typical forklift trucks; however, it also applies to special forklift trucks with masts and attachments.

1. Main Uses of the Forklift Truck

(1) Main uses of the forklift truck

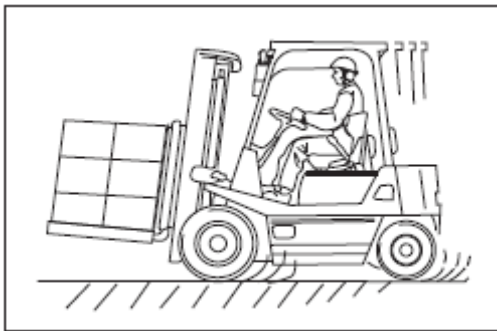
The forklift truck is mainly used to handle and stack goods on the pallet. In addition, the forklift truck can also be used to handle and stack goods unplaced on the pallet when equipped with proper attachments.

(2) Prohibitive uses

The prohibitive uses include but not limited to: driving the forklift truck loaded with people besides the operator; lifting people high; or towing other trucks. The prohibitive uses in this manual shall never be allowed to be performed.

Here are some examples of prohibitive uses:

- Raising the forks or the pallet with people on.
- Standing on the pallet to press goods.
- Directly hanging the steel wire rope on the forks to hoist goods.
- Towing other trucks.
- Pushing goods or other trucks with the forks.
- Opening or closing the doors of other trucks with the forks.



2. Operation Site and Working Environment of the Forklift Truck

(1) Ground condition

The forklift truck shall be used on the flat and solid road surface or ground with good ventilation.

The performance of the forklift truck depends on the road surface or ground condition. The traveling speed shall be adjusted properly. Take special care when operating the forklift truck on a slope or rough road surface.

▲WARNING

- Make sure that the forklift truck running on a muddy road can be stopped in time.
- Bypass rocks and stumps. If impossible, reduce the traveling speed. Take care not to damage the chassis.

When traveling on a ground covered with snow or ice, use tyre chains and avoid sudden acceleration or swerving. In addition, control the traveling speed through the accelerator pedal force.

▲WARNING

- If equipped with tyre chains, the forklift truck gets a larger driving force; however, the anti-sideslipping performance deteriorates. It is necessary to take special care.

(2) Measures against cold or hot weather

a) Oil

Use the oil suitable for the ambient temperature.

b) Battery

- In cold weather

The freezing point of battery electrolyte is about -35°C under the normal charging condition,

Always keep charging the battery in good condition since the electrolyte may damage the battery housing if frozen. To prevent the electrolyte from freezing, charge at least 75% of the whole capacity.

The most effective way is to keep a specific gravity of 1.260. It is prohibited to exceed the value.

- In hot weather

Since the battery electrolyte is easy to evaporate in hot weather, replenish distilled water from time to time. Check the battery once a week and replenish distilled water in time.

Reduce the specific gravity of the battery to 1.220 ± 0.01 when the ambient temperature is comparatively high.

Since the battery has comparatively higher efficiency in hot weather, no other maintenance is needed.

▲DANGER

- The gases produced by the battery may be explosive. Do not smoke or use open flame; in addition, do not create arcs or sparks near the battery. Keep good ventilation when the battery is stored or charged in an enclosed space. The battery contains sulfuric acid which may cause severe burns. Don't splash the sulfuric acid in eyes, on the skin or clothing. In case of contact, flush immediately and thoroughly with clean water. Seek for medical care if the sulfuric acid is splashed in eyes.

In hot weather, to maintain good cooling effects, park the forklift truck in shade.

3. Safety Problems Before Use

(1) Obtaining operation qualification

▲CAUTION

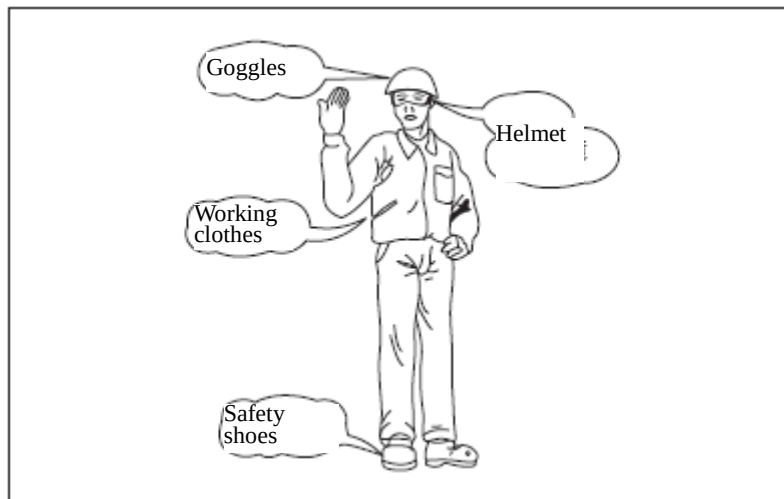
- Only the trained and authorized operator is permitted to operate the forklift truck.
- Even the forklift trucks with the same technical parameters have different

characteristics of brakes, accelerators and hydraulic control levers. Please carefully read this manual and the nameplate and get accustomed to all operations before operating the forklift truck.

(2) Clothing when operating the forklift truck

▲WARNING

- Wear working clothes, safety shoes and a helmet when operating the forklift truck.
- For safety, don't wear loose clothes which may be hooked or caught in, or else unexpected hazardous conditions may be caused.



(3) No operation after drinking

▲CAUTION

- Don't operate the forklift truck when you feel tired or absent-minded or have taken anesthetics or drunk.



(4) Safety of working sites

▲CAUTION

- Keep the road in good condition and smooth.
- Sufficient lighting must be guaranteed for the working site for safety.
- Since the forklift truck may have the danger of turnover when working on a platform or dockboard, please adopt wheel stops or other protective measures to prevent the forklift truck from overturning.

(5) Keeping the operator's cab clean

▲CAUTION

- The operator's cab shall be kept clean at all times.
- Don't operate the forklift truck when your hands are wet and slippery or have oil dirt.
- Tools and other metallic objects shall be kept away from the operator's cab, which may obstruct the operation of the control lever or pedal.

(6) Integrity of the forklift truck

▲CAUTION

- The forklift truck shall be equipped with an overhead guard and a load backrest before leaving the factory.

📖NOTE

- The overhead guard is used to prevent falling objects. It should be noted that the overhead guard is intended to offer protection from the impact of small objects, boxes, etc., but not to withstand the impact of falling rated load. Precautions shall be taken for falling objects.

▲WARNING

- No modification or addition shall be performed on the forklift truck without the written approval of our Company, or else it may affect the rated load or safety operation.
- Don't install any part which may block the operator's visibility.

(7) Regular maintenance

▲CAUTION

- Carry out both daily and regular checks and maintenance.



▲WARNING

- When finding the forklift truck is damaged or malfunctions, stop operating the forklift truck and immediately inform the service personnel of the forklift truck condition. Don't operate the forklift truck until it has been repaired completely.



(8) Fire prevention

▲CAUTION

- Set the fire extinguisher in place and operate it as specified to avoid fire disasters, accidents or other unexpected conditions.

(9) Prohibition of overload

▲CAUTION

- Don't overload the forklift truck; observe the allowable load and the load curve of the forklift truck; and make sure the gravity center of the goods at the load center.

📌NOTE

- The allowable load means the maximum load applicable at the load center of the forks.



(10) Using a proper pallet

▲CAUTION

- Use the pallet with a suitable size and a suitable strength to bear goods;
- Make sure the palletized goods are in proper shape and securely fastened.
- Handling goods without use of the pallet is prohibited.



4. Safety Problems During Use and Operation

(1) Cautions for startup

⚠CAUTION

- Pull up the hand brake lever.
- Place the gear shift lever in the position of "N".
- Depress the clutch pedal or the brake pedal.
- Adjust the seat to facilitate operation by hands and feet.
- Make sure no one is on, under or close to the forklift truck.



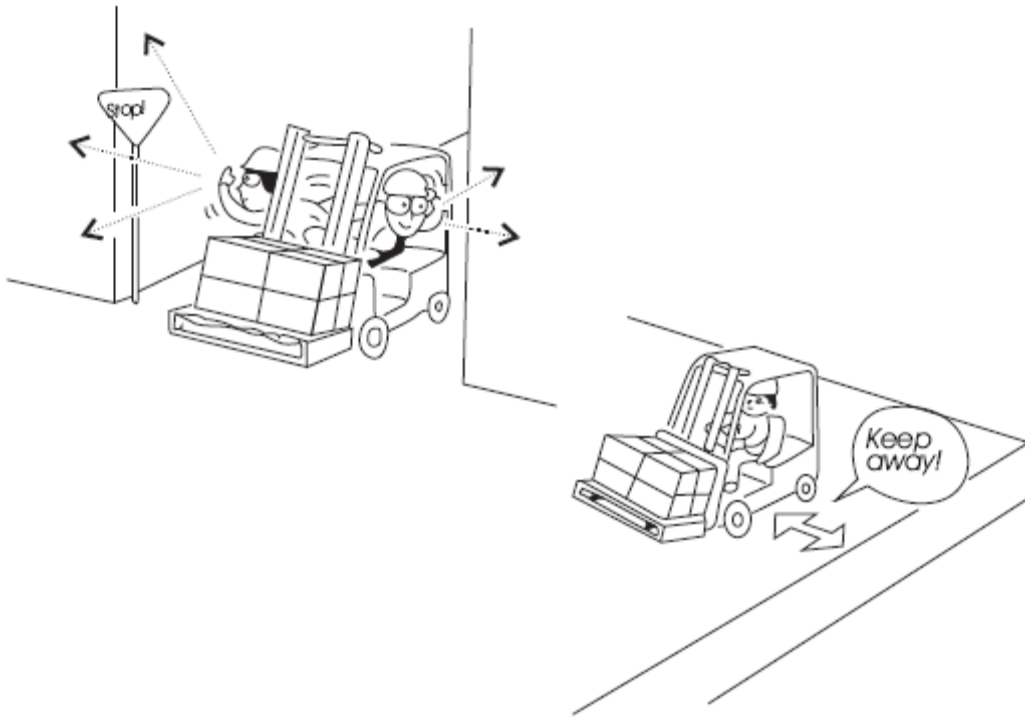
(2) Safety around the forklift truck

⚠CAUTION

- When using the forklift truck to carry large goods, if the visibility is poor, drive backward or request another person to guide the driving.
- When driving backward, look backward and make sure no person or obstacle behind the forklift truck. The rear-view mirrors and reversing alarm buzzer are for helping.
- Request another person for guidance when driving the forklift truck in a narrow passage.



- Park the forklift truck when passing by the crossroads or other locations where the vision is obstructed and don't move on until no one is around the forklift truck.
- Make sure the forklift truck has a safety distance away from sideways or platform edges to prevent the forklift from falling down.
- The steering mode of the forklift truck is rear-wheel steering, which is different from that of common vehicles. Slow down the traveling speed when approaching the turning corner and then operate the steering wheel to make the rear of the forklift truck to turn.



(3) Prohibition of rough driving

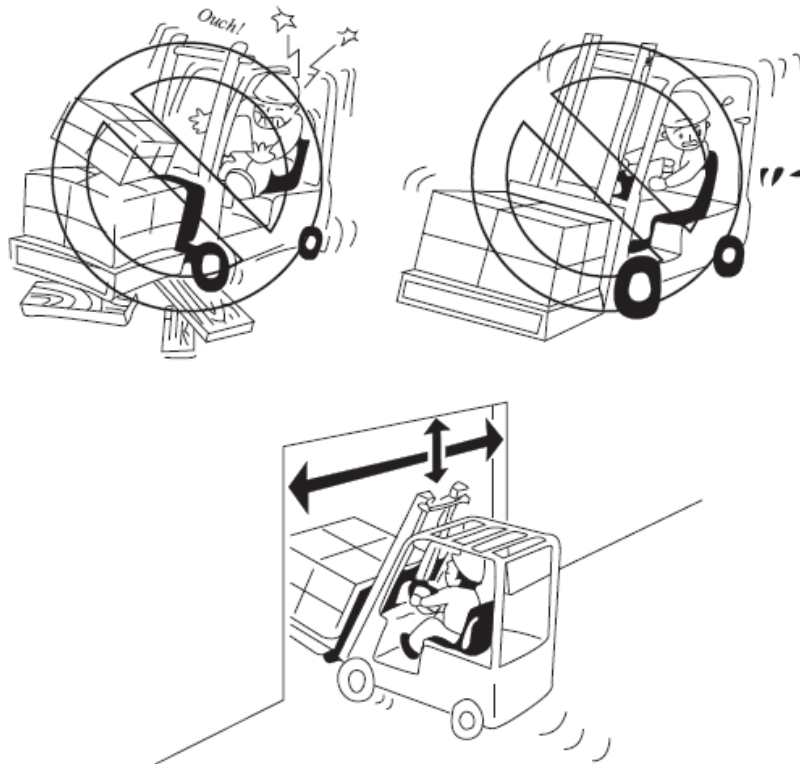
▲CAUTION

- Don't turn on the key switch while the accelerator pedal is depressed.
- Don't start, brake or swerve the forklift truck suddenly. Sudden startup or braking may cause the goods to fall off while sudden swerving may cause the forklift to overturn and result in serious accidents.
- Operate the hydraulic control lever slowly no matter whether the forklift truck is in full-load condition or no-load condition. The goods may fall off or the forklift truck may overturn if the control lever is suddenly released when the forks are in a high position.



👉NOTE

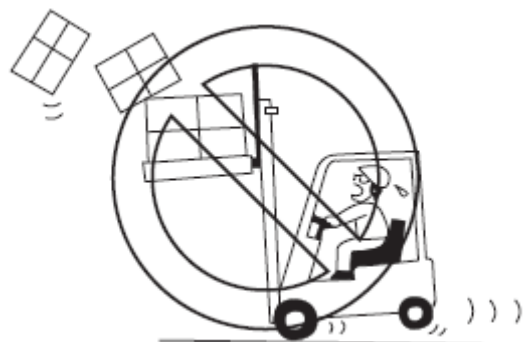
- Don't run over the baffles or obstacles scattered on the road.
- When passing by other forklift trucks, slow down the traveling speed and sound the horn.
- Don't drive on a soft ground.
- Slow down the traveling speed when driving on a wet, slippery, uneven or inclined road surface, etc.
- Make sure there is sufficient clearance between the mast and the ceiling or accesses of the building structure.



(4) Prohibition of driving with the forks lifted up in the air

⚠CAUTION

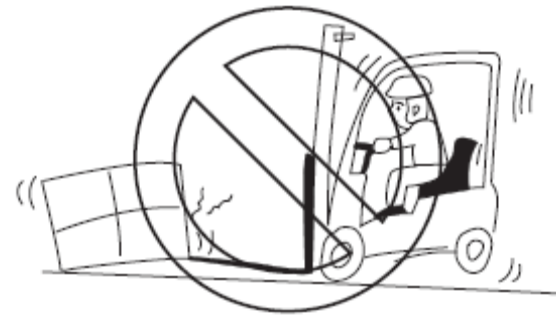
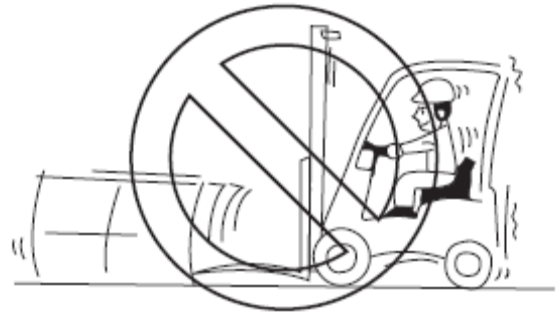
- Don't drive the forklift truck with the forks lifted up in the air, or else it may cause an unstable condition and even cause overturning of the forklift truck.



(5) Prohibition of working with the fork tips

⚠CAUTION

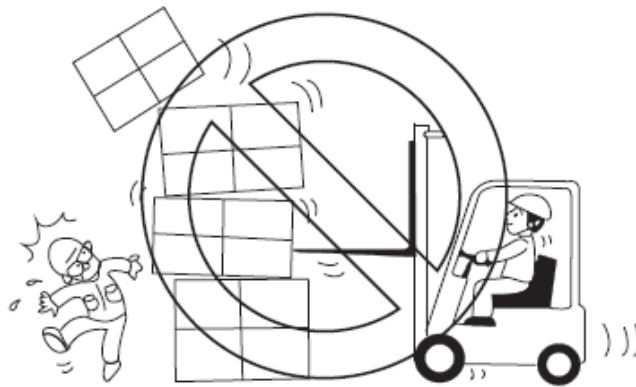
- Don't push or lift goods with the fork tips, or else it may cause the fork tips or goods to rock.



(6) Prohibition of pushing and pulling operations

⚠CAUTION

- Don't push or pull goods with the forklift truck, or else the goods may be damaged or drop off.



(7) Driving on a slope

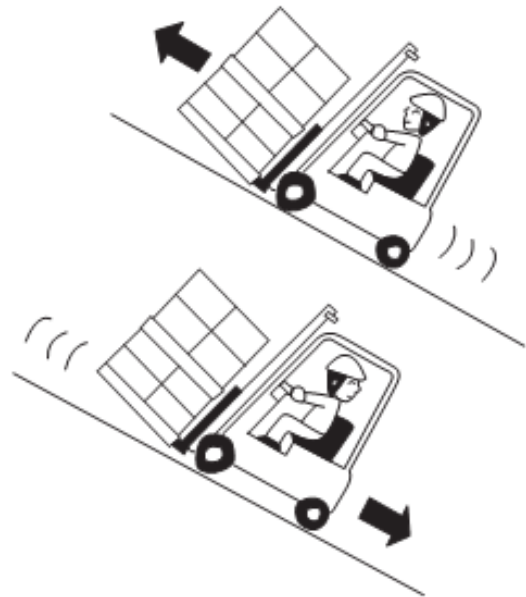
⚠CAUTION

- Comply with the following rules when driving the forklift truck on a slope:

LOADED: Drive up/down a slope respectively with the forward/reverse gear.

UNLOADED: Drive up/down a slope respectively with the reverse/forward gear.

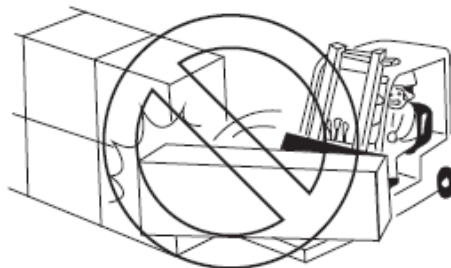
- When the forklift truck goes down a slope, drive slowly with the hand brake applied. Make sure the forks are away from the ground.
- Don't swerve the forklift truck or perform loading/unloading work on a slope, or else the forklift truck may overturn.



(8) Prohibition of unbalanced stacking

⚠CAUTION

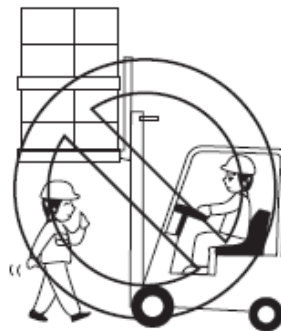
- Make sure the goods are stacked stably and securely. Insert the forks into the pallet correctly and ensure the gravity center of the goods at the forklift truck center.
- Handling unbalanced goods may cause the goods to fall off or cause the forklift truck to overturn.



(9) Prohibition of loading passengers or permitting passengers under the forks

▲WARNING

- Don't permit passengers to ride on the forks or the pallet.
- Don't load passengers on the forklift truck except the operator.
- Don't load passengers on the forklift truck as the counterbalance.
- Don't stand on the goods or pass under the forks.



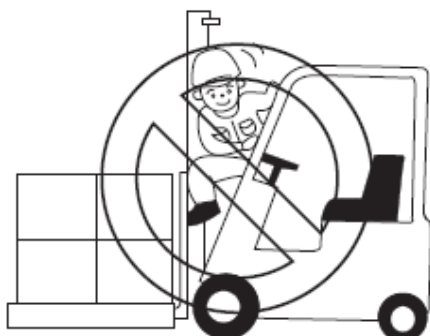
(10) Prohibition of entering the mast mechanism

▲WARNING

- Never put any part of your body into the mast mechanism or between the mast and the truck body.

▲CAUTION

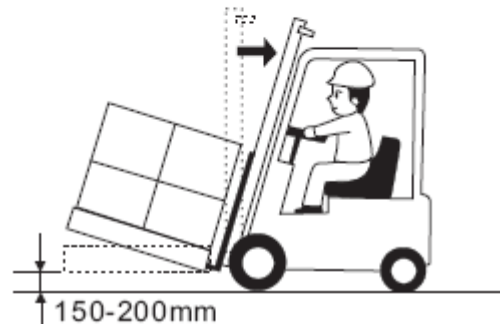
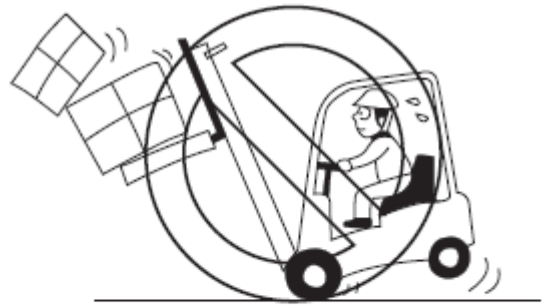
- Keep your body under the overhead guard. Don't put any part of your body out of the forklift truck.



(11) Prohibition of lifting the forks when tilting the mast forward

▲CAUTION

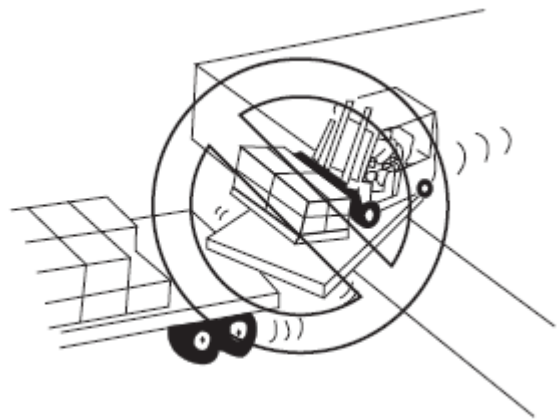
- Don't lift the goods or drive the forklift truck when tilting the mast forward. Before lifting the goods or driving the forklift truck, tilt the mast backward in place to stabilize the goods. When driving the forklift truck (with or without load), raise the forks for 150-200 mm from the floor.
- Don't tilt the mast forward while forking goods.
- Be sure to stop the forklift truck before lifting or descending goods.
- Don't load or unload goods when the forklift truck is leaning.



(12) Driving into the trailer

▲CAUTION

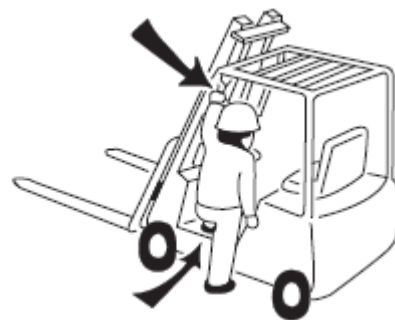
- The forklift truck can only load or unload goods on the trailer dock securely fastened.
- Securely fasten the dockboard and check its strength before starting operation.
- Slow down the traveling speed and take care for the safety of dockboard when getting into or out of the trailer.



(13) Getting on/off the forklift truck

▲CAUTION

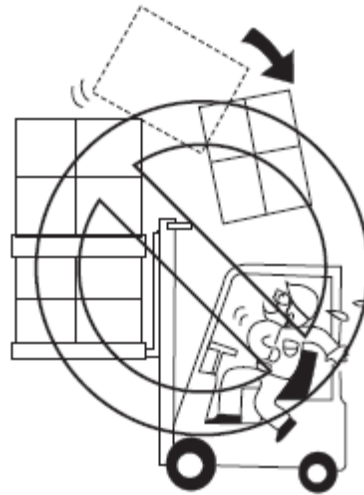
- Don't jump on/off the forklift truck.
- Grasp the grip and tread on the step when getting on/off the forklift truck.
- Don't grasp the steering wheel or the control lever when getting on/off the forklift truck.



(14) Prohibition of stacking goods too high

⚠CAUTION

- The goods shall lean against the backrest. Don't stack the goods higher than the backrest, or else the goods may slip towards the operator, thus causing the operator to be injured by the falling goods.
- Fasten the over-stacked goods with ropes to prevent the goods from toppling down.



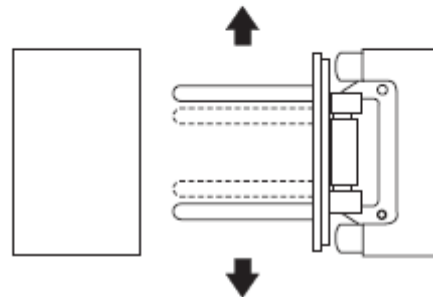
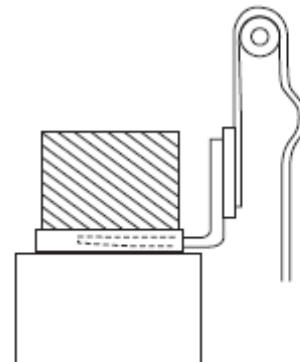
(15) Prevention of loose chains

⚠CAUTION

- Don't draw out the forks from the pallet when the chains are loose, or else it may cause the goods to fall off or the forklift truck to overturn.

👉NOTE

- When the chains are loose, slightly pull up the lifting lever to make the forks rise so as to correct the loose chains; and then draw out the forks from the pallet.



(16) Adjusting the forks

⚠CAUTION

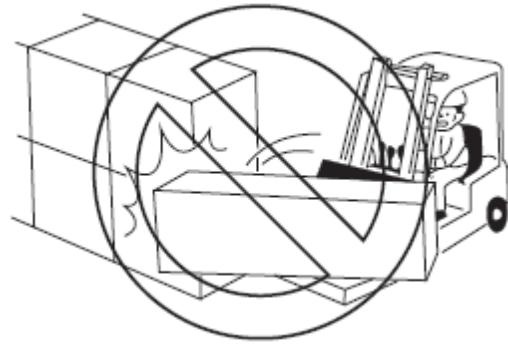
- Adjust the spacing of forks according to the pallet size. Take care not to jam your fingers during the adjustment.
- After the adjustment, fasten the forks with the lock pin, or else the forks may move easily during the traveling, thus causing the goods to fall off or to be crumbled.



(17) Handling over-wide goods

⚠CAUTION

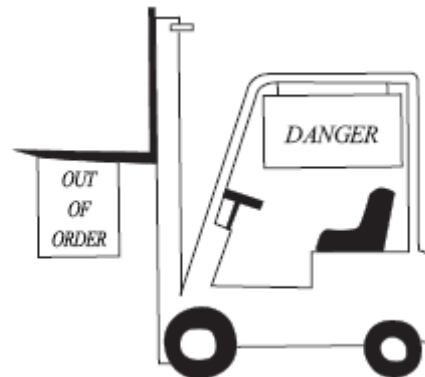
- Take special care when driving the forklift truck with overlong and over-wide goods.
- Slowly turn and lift/lower the goods to prevent the goods from movement meanwhile, take care of the surroundings for safety.
- The forklift truck shall be equipped with a suitable and widened fork carriage when handling over-wide goods.



(18) Prohibition of unloading goods by hands

⚠CAUTION

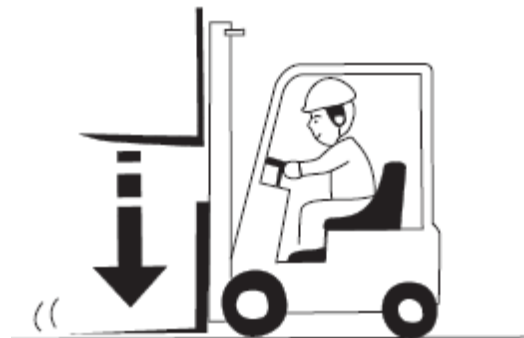
- Don't unload goods by hands, or else the goods may fall off.



(19) Parking malfunctioning forklift trucks

👉NOTE

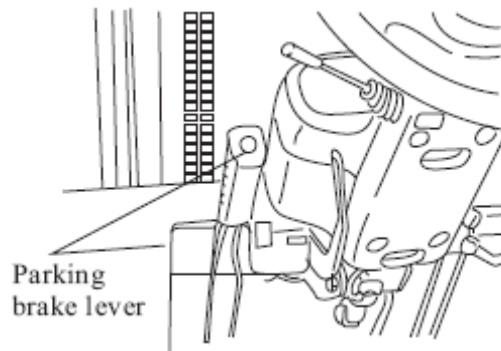
- When parking the malfunctioning forklift truck by the road, place a warning sign or "OUT OF ORDER" sign on the forklift truck and remove the key.
- If the forks cannot be lowered due to the malfunction, place an obvious sign to prevent other vehicles or pedestrians from colliding with the forklift truck.



(20) Cautions before leaving the forklift truck after finishing work

 NOTE

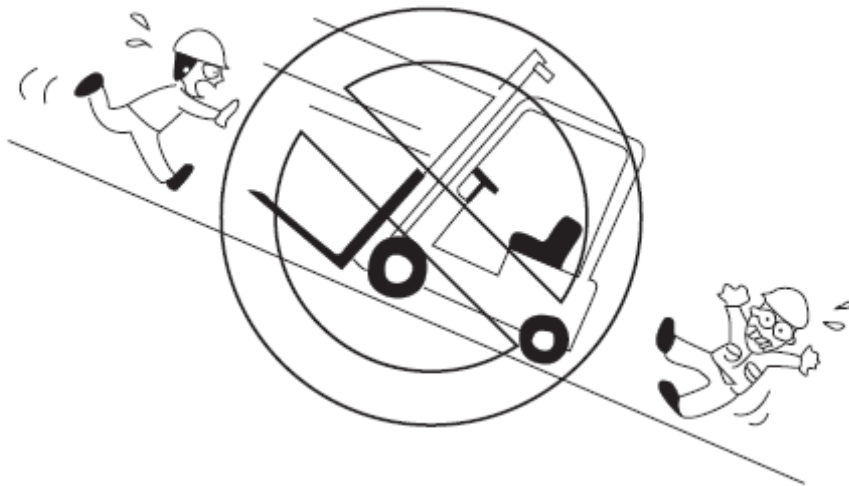
- Slightly tilt the mast forward and normally lower down the forks, or else there is a danger of being stumbled or injured.
- Place the direction control lever at "N".
- Pull up the parking brake lever.
- Turn off the key switch and remove the key.



(21) Parking

 CAUTION

- Park the forklift truck at the specified place.
- The parking location should be hard sufficiently and does not disturb the traffic.
- Don't park the forklift truck at or near the place with inflammable objects.
- Don't park the forklift truck on a slope, since the forklift truck may move unintentionally. If the forklift truck has to be parked on a slope, apply wheel stops in addition to performing the common parking procedures in order to prevent the forklift truck from movement.



5. Safely Problems During Maintenance

(1) Maintenance place

 CAUTION

- The forklift truck shall be maintained at the specified place equipped with adequate equipment and safety protection facilities for the service agency.
- The floor of the maintenance place shall be flat.

- The maintenance place shall have good ventilation.
- The maintenance place shall be equipped with fire extinguishers.

(2) Precautions before maintenance

▲CAUTION

- No smoking.
- Wear protective equipment (helmet, safety shoes, goggles, gloves and boots) and suitable clothes.
- Wipe off the splashed oil at once.
- Remove the dirty oil or dust on the connectors with a brush or cloth before adding lubrication oil.
- Unless otherwise specified, turn off the key switch and pull out the battery plug.
- Lower the forks onto the floor when maintaining the forklift truck.
- Clean the electrical elements with compressed air.

(3) Precautions during maintenance

▲CAUTION

- Take care not to put your feet under the forks and not to be stumbled by the forks.
- Place cushion blocks or other objects under the inner mast to prevent the forks and the mast from suddenly falling off when lifting the forks. Take care to open and close the front bottom plate and the battery cover in order to prevent your fingers from being squeezed.
- Make a mark to facilitate the subsequent work when the work cannot be finished at once.
- Use suitable tools but not temporary tools.
- Seek for medical care at once when suffering from a high-voltage electrical shock.
- Don't use the mast as a ladder.
- Never put your hands and feet or your body between the frame and the mast assembly.

(4) Checking and replacing tyres

▲CAUTION

- The dismounting and mounting of tyres shall be performed by the service agency appointed by our Company.
- The high pressure air shall be handled by the authorized personnel.
- Wear goggles when using compressed air.
- Don't screw off the bolts and nuts at the wheel rim connections when dismounting the tyres, since the loose bolts, nuts and wheel rims may result in very dangerous conditions due to the high pressure air in the tyres.

(5) Using jacks (when replacing tyres)

▲WARNING

- Don't go under the forklift truck when jacking up the truck.

▲CAUTION

- Make sure there is no man or load on the forklift truck before jacking up the truck.
- Stop using the jack and place cushion blocks under the forklift truck when the truck wheels go away from the floor in order to prevent the forklift truck from falling off.
- Take measures to prevent the forklift truck from movement before jacking up the truck.

(6) Lifting the forklift truck

▲CAUTION

- The forklift truck shall be lifted by the specially trained personnel.
- The ropes shall hook the specified lifting points of the forklift truck.
- All ropes shall have enough bearing capacities.

(7) Requirements for draining wastes (waste electrolyte, oil, etc.)

▲CAUTION

- The waste fluid of the forklift truck shall be reclaimed according to the provisions of the local government and cannot be randomly drained.

6. Safety Problems When Using the Battery

(1) No smoking

▲CAUTION

- The battery can produce oxygen and electrical sparks if short circuited. When a lit cigar approaches to the battery, it may cause explosion.



(2) Prevention of electrical shocks

▲CAUTION

- The battery voltage is high. Don't touch the electrical conductor of battery during the installation and maintenance, or else it may cause serious burns.

(3) Correct connection

▲CAUTION

- Don't connect the positive and negative poles adversely when charging the battery, or

else it may cause heat, combustion, smoke or explosion.

(4) Prevention of putting metallic objects on the battery

⚠CAUTION

- Don't let the positive pole contact with the negative pole due to bolts or tools to produce a short circuit, or else it may cause injury or explosion.

(5) Prohibition of excessive discharging

⚠CAUTION

- Don't operate the forklift truck until it cannot move, or else the service life of the battery may be shortened. When the charging alarm indicator lamp of the battery continuously flashes, it indicates that the battery needs to be charged.

(6) Keeping clean

⚠CAUTION

- Keep the battery surface clean.
- Don't clean the battery surface with dry cloth or chemical fiber cloth; meanwhile, don't cover the battery with polyethylene films.
- The static electricity may cause explosion.
- Clean the uncovered top of battery with wet cloth.

(7) Wearing protective clothing

⚠CAUTION

- Wear goggles, rubber gloves and boots when maintaining the battery.



(8) Hazardous battery electrolyte

⚠CAUTION

- Take care when handling the battery electrolyte since it is made of dilute sulfuric acid.
- If the electrolyte adheres to eyes, skin and clothes, it may cause loss of eyesight and scalds.

(9) First aid measures

 NOTE

If an accident occurs, take the following first aid measures and contact with the doctor immediately.

- The electrolyte is spilled on the skin: Rinse eyes with clean water for 10-15 minutes.
- The electrolyte causes large-area pollution: Neutralize the electrolyte with dry soda (sodium bicarbonate) or wash off it with clean water.
- The electrolyte is swallowed: Drink a large amount of water or milk.
- The electrolyte is splashed on clothes: Take off the clothes immediately.

(10) Closing the upper battery cover securely

 CAUTION

- Close the upper battery cover securely in order to prevent the electrolyte from leakage.
- Take care not to refill electrolyte excessively since it may cause electricity leakage if the electrolyte overflows.

(11) Cleanout

 CAUTION

- Don't wash the forklift truck loaded with the battery, or else it may cause damage to the battery.
- Tighten the upper battery cover in order to prevent water.

(12) Seawater

 CAUTION

- The battery cannot be wet by rain or seawater, or else it may cause damage to the battery or cause fire.

(13) Abnormalities of the battery

 CAUTION

Contact with the Sales Department of our Company when the battery shows the following conditions:

- The battery stinks.
- The battery gets dirty.
- The electrolyte temperature rises.
- The electrolyte capacity decreases too quickly.

(14) Prohibition of disassembly

 CAUTION

- Don't drain off the electrolyte from the battery.
- Don't disassemble the battery.
- Don't repair the battery.

(15) Storage

 CAUTION

- When the battery is unoccupied for long, store it at a place with good ventilation and

away from fire; in addition, charge the battery once a month.

(16) Disposal of abandoned batteries

⚠CAUTION

- Contact with the Sales Department of our Company when disposing the abandoned batteries

7. Decals

The decals sticking on the forklift truck are used to explain to the operator how to operate the forklift truck and what needs to be cared, which are prepared for you and your machine. Please attach the decals to the forklift truck immediately once they fall off.

(1) Safety

⚠WARNING



(2) Operation instructions

⚠CAUTION

使用须知

启动



禁止未经培训或无驾驶执照的人操作叉车。

请在开车前检查各控制和报警装置：请勿驾驶有故障的叉车。

在启动、转向、行驶、制动、停车时，应尽量使叉车的动作平稳。

加燃油或检查电瓶或油箱液位时，司机不应在车上进行，并使发动机熄火。

带属具叉车空车运行时应作为有载叉车来操作。

装卸



禁止载运未固定或松散堆垛的货物



禁止超负荷载运



高升程叉车应注意上方货物下坠



货叉必须全部插进货物下部



禁止从司机座以外的位置操作



禁止单叉挑货



注意上方间隙



高起升叉车装卸时应在最小范围内做前倾后仰

行使



● 在潮湿、易滑的路面上行驶时，转向注意减速。

● 在坡道上应小心行驶。在大于十分之一的坡道上行驶时，上坡应向前行驶，下坡应倒退行驶。



● 在码头或临时铺板上行驶时，应倍加小心。

● 叉车在任何部位都禁止载人。

● 上下坡时禁止转向。

● 载货行驶时，应尽量将货物放低，并使门架后倾。



停车



将货叉下降着地，将挡位手柄置于空挡，发动机熄火或断开电源。

坡道停车时，将停车制动装置拉好。

较长时间停车时须用垫块垫住轮胎。



SCI-005

Operation Instructions				
Startup  	- Only the personnel trained and with the operator's license can operate the forklift truck. - Check all control devices and alarm devices before operation; never operate the malfunctioning forklift truck. - Try to start, turn, drive, brake and park the forklift truck stably. - When refilling fuel and checking the battery or the fuel tank level, the operator shall get off the forklift truck and stop the engine. - When running the unloaded forklift truck with attachments, operate it as the loaded forklift truck.			
Loading/ unloading   	 Prohibition of carrying unfastened or loosely-stacked goods	 Prohibition of overload	 Take care of the falling goods for the high-lift forklift truck	 Insert the forks completely into the bottom of the goods
	 Prohibition of operation from other positions other than the operator's cab	 Prohibition of forking goods with a single fork	 Take care of the above clearance	 Lift and lower the forks within the smallest range when performing loading/unloading operation
Traveling 	- Slow down the traveling speed when turning the forklift truck on a wet and slippery road. - Take care when driving on a slope; for a slope with a gradient higher than 1/10, drive down/up the slope respectively with the reverse/forward gear.			- Take special care when driving on a dock or a temporary deck. - No part of the forklift truck is permitted to carry people. - Never make a turn when driving down/up a slope. - Try to lower the goods and tilt the mast backward when driving the loaded forklift truck.
				
Parking 	- Lower the forks down to the floor, place the gear shift lever at "N", and then stop the engine or switch off the power. - Pull up the parking brake lever in place when parking the forklift truck on a slope. - Apply wheel stops when parking the forklift truck for long.			

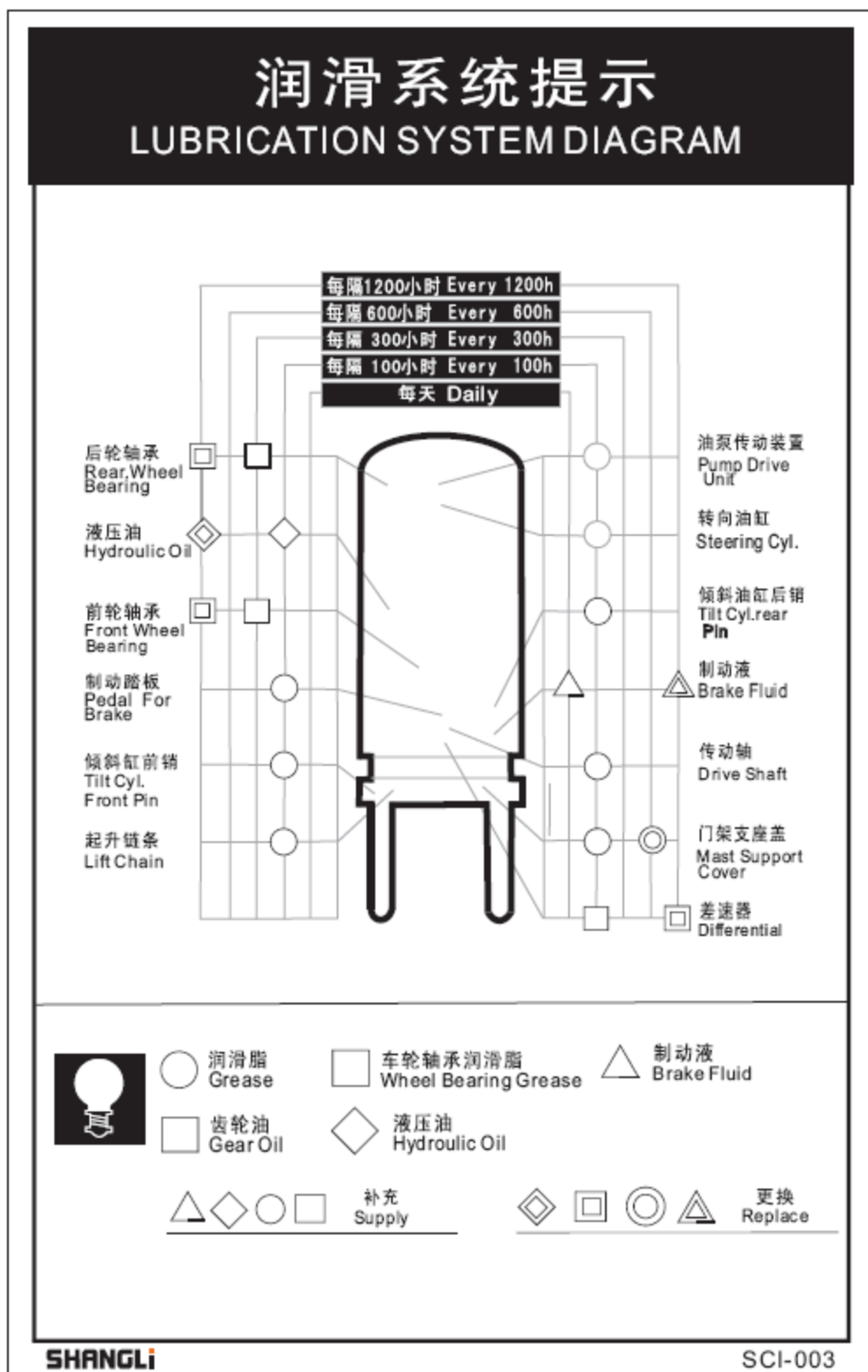
(3) Nameplate of the forklift truck

蓄电池叉式装卸车 BATTERY FORKLIFT TRUCK		CE Certificate
型 号	Model	
额定起重量	Rated Capacity	
标准载荷中心	Standard Load Centre	
最大起升高度	Max Lift Height	
自 重	Service Weight	
自重(不含蓄电池)	Service Weight Without Battery	
允许最大蓄电池重	Max Allowed Battery Weight	
允许最小蓄电池重	Min Allowed Battery Weight	
蓄电池额定电压	Battery Voltage	
出厂编号	Serial Number	
制造许可证号	No. of manufacture License	

SHANGLI 上海宝安公路2611号 SHANGHAI SHANGLI FORKLIFT TRUCK CO., LTD.
 制造基地: 上海宝安公路2611号 made base: 2611 bao'an highway shanghai
 服务热线: 800-820-5860 Hotline: 800-820-5860 SCI-028

Electric Counterbalanced Forklift Truck
Model
Rated Lifting Capacity
Standard Load Center
Max. Lifting Height
Dead Weight
Dead Weight (without battery)
Max. Battery Weight
Min. Battery Weight
Rated Battery Voltage
Ex-factory No.
Manufacturing License No.
SHANGHAI SHAGNLI FORKLIFT CO., LTD.
Production Base: No.2611, Bao'an Highway, Shanghai, China
Service Hotline: 800-820-5860

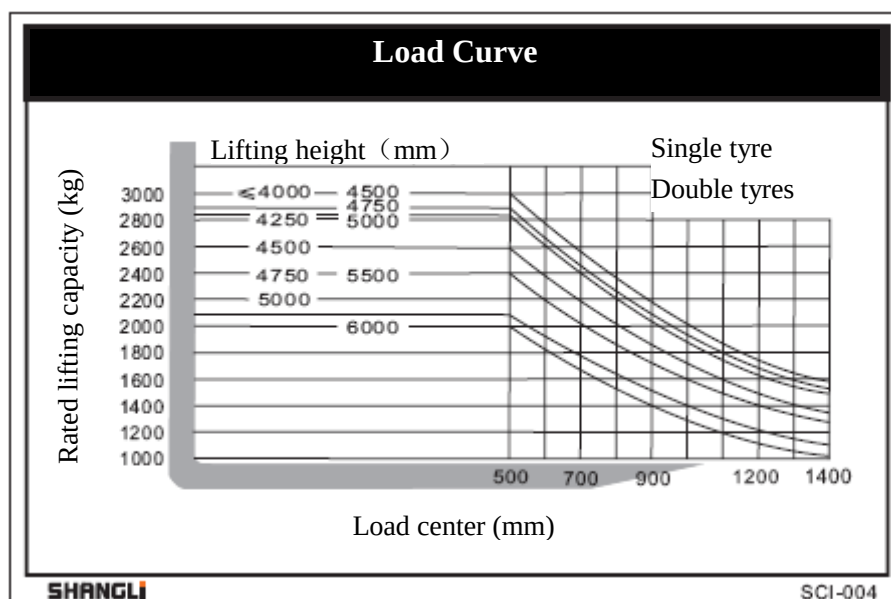
(4) Lubrication chart



Instructions for the Lubrication System		
Every 1,200 h Every 600 h Every 300 h Every 100 h Daily		
Rear wheel bearing Hydraulic oil Front wheel bearing Brake pedal Front pin of tilting cylinder Lifting chain	Driving device of oil pump Steering cylinder Rear pin of tilting cylinder Brake fluid Drive shaft Mast support cover Differential	
Lubrication grease	Lubrication grease for wheel bearings	Brake fluid
Gear oil	Hydraulic oil	
Supply		Replace

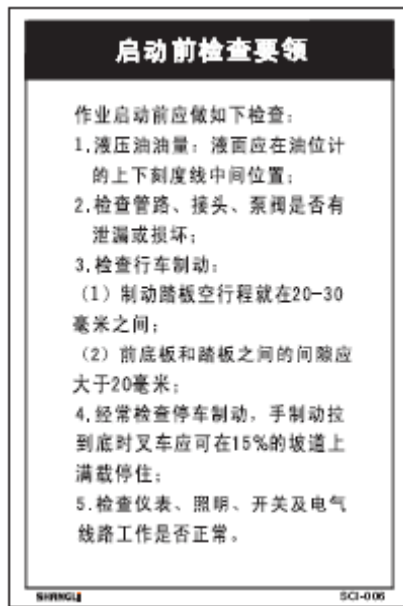
(5) Load curve

⚠ CAUTION



(6) Checking points before startup

⚠CAUTION



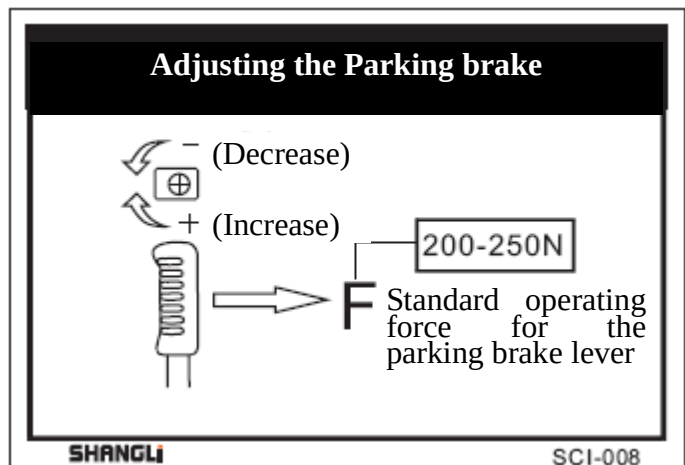
Checking points before startup

Check the following items before startup:

1. Hydraulic oil level: The hydraulic oil level shall be between the upper and lower marks on the oil level gauge;
2. Check if the pipeline, connectors and pump valves leak or are damaged;
3. Check the service brake:
 - (1) The free travel of the brake pedal shall be between 20 ~ 30 mm;
 - (2) The clearance between the front bottom plate and the pedal shall be more than 20 mm;
4. Check the parking brake frequently; the fully-loaded forklift truck shall be able to be parked on a slope with a gradient of 15% when the hand brake is pulled up completely;
5. Check if all instruments, lighting devices, switches and electrical circuits operate normally.

(7) Adjusting the parking brake

⚠CAUTION



(8) Refilling hydraulic oil

👉NOTE



(9) Tyre safety (pneumatic tyres)

⚠CAUTION



Warning

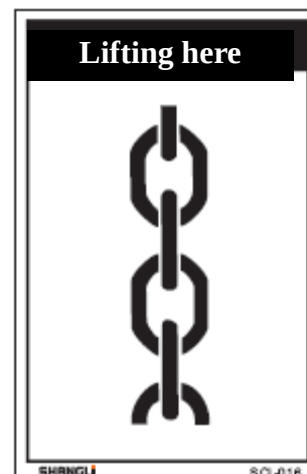
- Removing/installing the forklift truck tyres is very dangerous due to the high tyre pressure.
- The removal/installation of the casings, tubes, rims and retainer rings and the inflation work shall be performed by the specially trained personnel.
- When removing the wheels from the frame, completely release the tyre pressure before removing the rim bolt (A).
- Remove the valve and release the tube pressure before removing the casings from the rims.
- Never screw off the bolt (B) before the tyre pressure is completely released.
- The tyre inflation shall be performed when the forklift truck is in loading condition or the tyre is surrounded by solid safety guardrails.
- The tyre pressure shall be not higher than the rated pressure.

Divided-type wheel rim

Safety guardrail

(10) Lifting instructions

⚠CAUTION

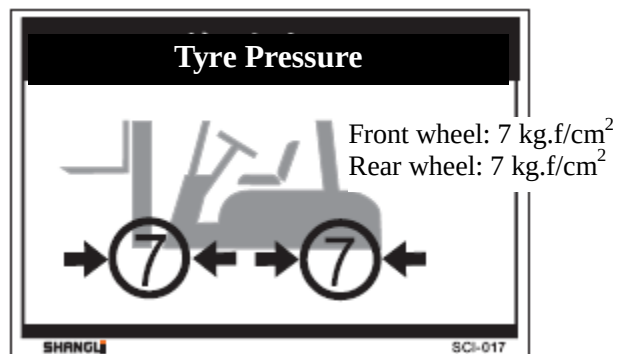


(11) No entry into the space behind the mast

⚠WARNING



(12) Tyre pressure (pneumatic tyres)



(13) Prevention of hurting hands

⚠ WARNING



(14) Battery nameplate

蓄电池铭牌 BATTERY NAMEPLATE	
型号 Model	重量 Weight Kg
容量 Capacity	AH/5HR
电压 Voltage	V
箱体尺寸 长 Length	宽 Width
Battery Box Size 高 High	Mm
出厂编号 Serial Number	
生产单位 Produce Manufacture	

SHANGLI SHANGHAI SHAGNLI FORKLIFT TRUCK CO., LTD.
 制造基地: 上海宝安公路2611 (made base 2611 baod n highway shanghai)
 服务热线: 800-820-5860 Hotline: 800-820-5860 SCI-071

Battery Nameplate

Model Weight
 Capacity
 Voltage
 Battery box size Length Width Height
 Ex-factory No.
 Manufacturer
 SHANGHAI SHAGNLI FORKLIFT CO., LTD.
 Production Base: No.2611, Bao'an Highway, Shanghai, China
 Service Hotline: 800-820-5860

(15) Battery operation cautions

⚠ CAUTION

蓄电池使用注意事项
1. 补充电解液时应缓慢注入适量蒸馏水或稀硫酸, 液面高度以浮漂微动为准, 严禁液面过高。
2. 充电时, 必须打开所有的蓄电池盖帽并保证通风良好。
3. 叉车行驶时蓄电池盖帽必须盖好, 以防电解液溅出。
4. 更换蓄电池时, 保持蓄电池箱体垂直方向吊出车体, 缓慢放下, 以防电解液外溢。
5. 定时冲洗蓄电池托架, 以防蓄电池酸液腐蚀托架。

SHANGLI SCI-023

Battery operation cautions

1. Slowly fill adequate distilled water or dilute sulfuric acid when replenishing battery electrolyte until the float shakes slightly; never fill excessive fluid.
2. Open all battery caps and ensure good ventilation when charging the battery.
3. Close the battery caps in place during the traveling process in order to prevent the electrolyte from spilling out.
4. Vertically lift the battery box out of the truck body and slowly lower it down to prevent the electrolyte from spilling out when replacing the battery.
5. Regularly clean the battery bracket in order to prevent the electrolyte from corroding the bracket.

(16) Battery maintenance cautions

⚠ CAUTION

保养电池注意事项

1. 蓄电池在使用过程中，电压不准低于额定电压的85%；
2. 蓄电池使用后必须在24小时以内补充充电，充电应充足，但严禁过充电；
3. 应经常补充蒸馏水或稀硫酸，以保持正常的电解液比重和液面高度，蓄电池表面应保持干燥清洁；
4. 蓄电池如长期不使用，应充足电存放，并每月补充电一次；
5. 严禁蓄电池在超过55℃的温度下使用；
6. 绝对禁止蓄电池接近明火。

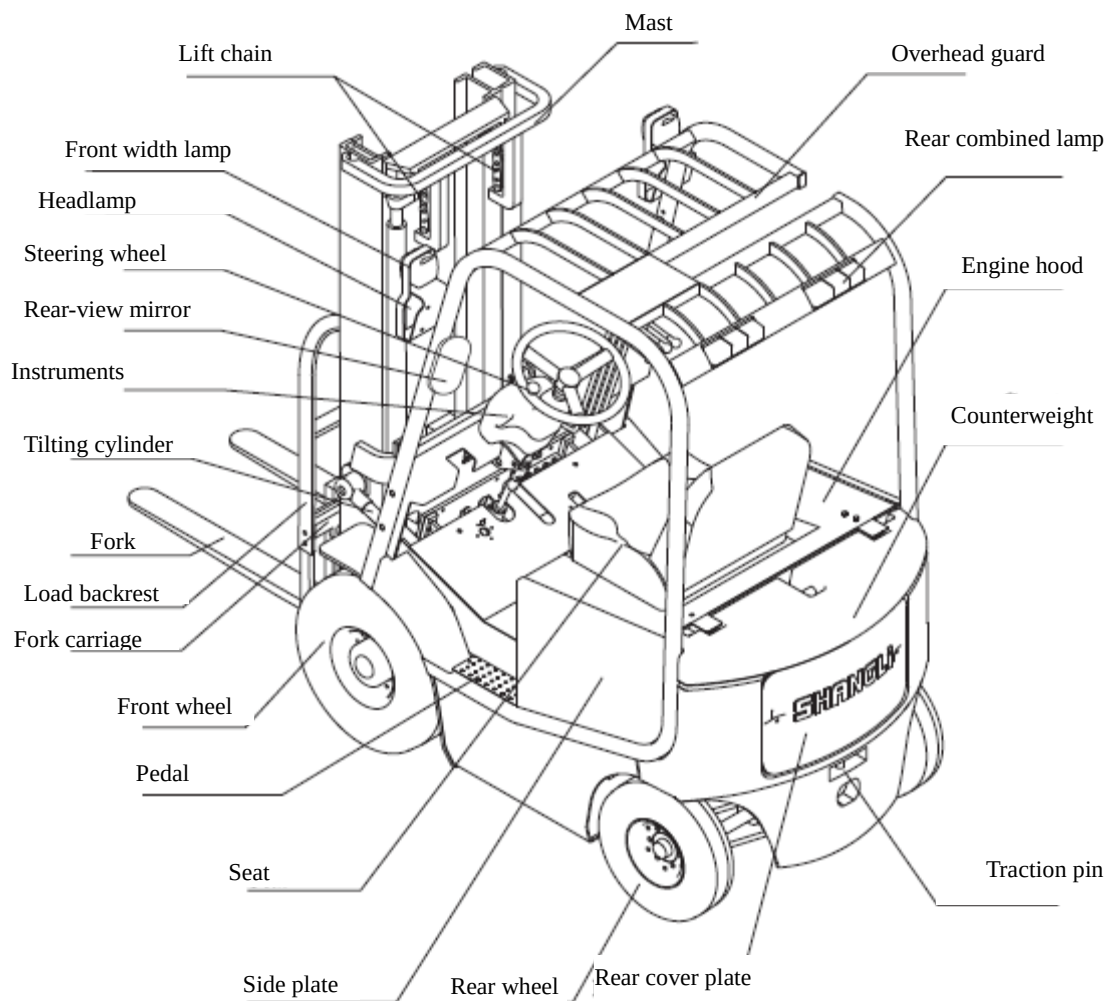
SHANGHAI

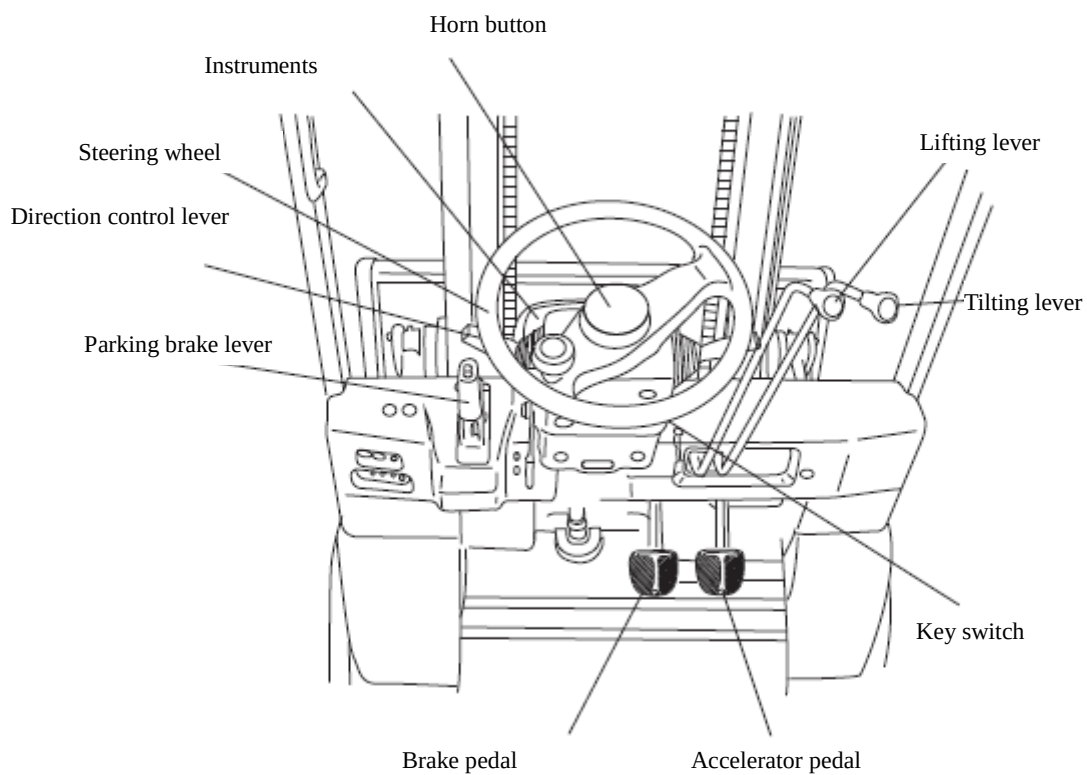
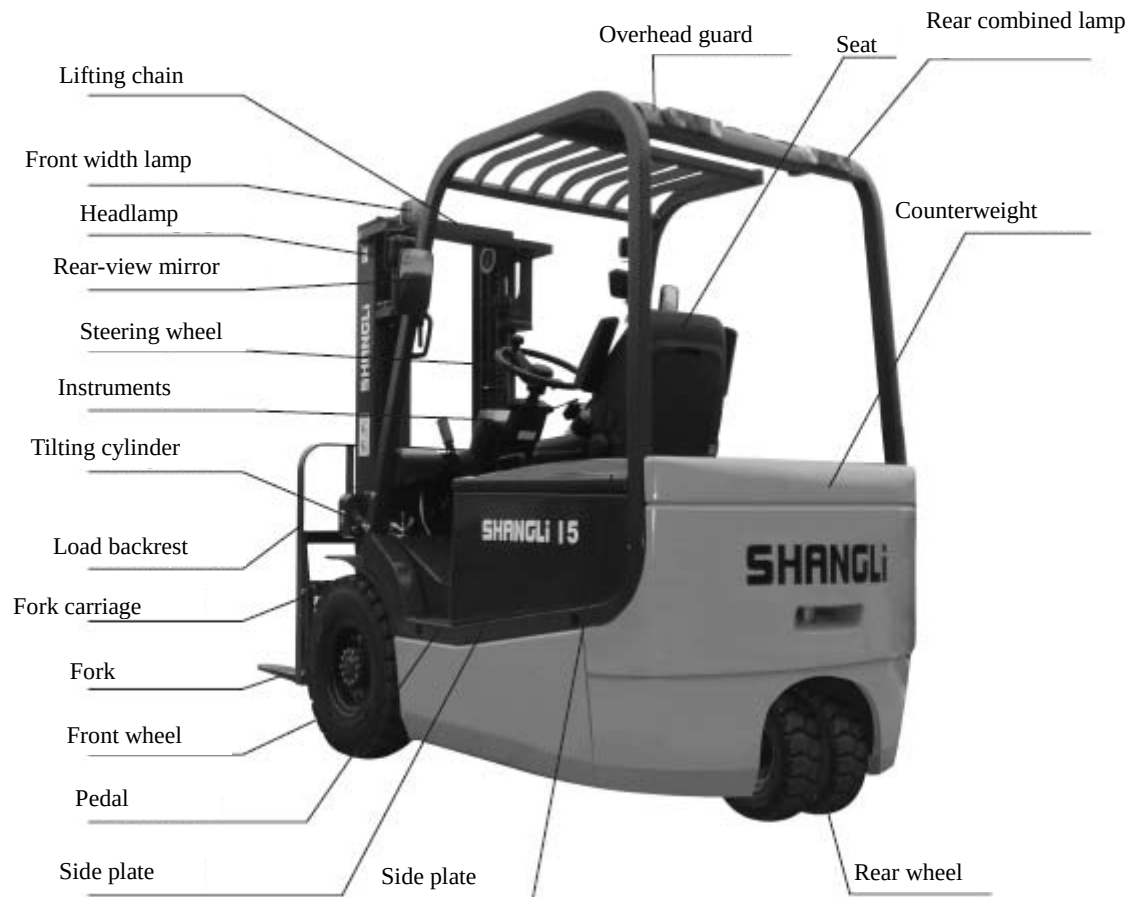
SCI-023

Battery Maintenance Cautions

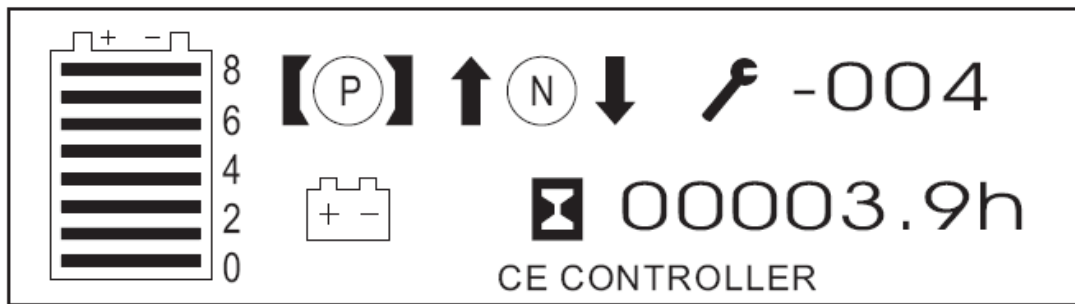
1. The voltage of the battery in work condition shall be not lower than 85% of the rated voltage.
2. The battery shall be charged adequately within 24 h after work; never charge the battery excessively.
3. Replenish distilled water or dilute sulfuric acid frequently in order to keep the specific gravity of electrolyte and the fluid level normal; keep the battery surface clean.
4. If the battery is unoccupied for long, adequately charge it before storage and re-charge it once a month.
5. Never use the battery when the temperature is higher than 55 °C.
6. Never place the battery near to open fire.

II. Operation Devices and Methods





1. LCD Instrument (equipped with ZAPI electric controller)

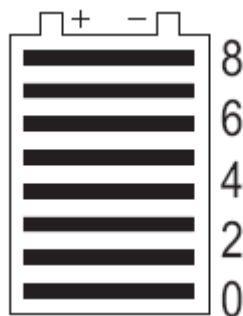


- (1) Turn the key switch to “ON” position to connect the electric control circuit. After the display screen of the LCD instrument flashes 4 times, the signal appears.

(2) Battery capacity indicator

The battery capacity indicator displays as follows when the electrolyte level is at the highest mark. The indicator includes 8 cell marks, and each cell mark means about 12.5% of the capacity.

When the electrolyte level decreases, the indicator lamp of each cell mark will turn off successively. When the electrolyte level decreases to the lowest mark, the battery shall be charged.



(3) Battery capacity alarm lamp

When the single cell voltage of the battery pack is lower than 1.75 V, i.e. when the electrolyte level decreases to the lowest cell mark, the battery capacity alarm lamp flashes and the reversing alarm buzzer sounds. After 20 s time delay or so, the under-voltage protection relay will work; disconnect the power supply of the lifting contactor coil in order to switch off the lifting motor power supply and prevent the battery from discharging.

(4) Parking brake indicator

When the parking brake lever is applied, the LCD instrument displays “”;

When the parking brake lever is released, the LCD instrument displays “”.

(5) Direction indicator

When the direction control lever is moved to “Forward” and the accelerator pedal is depressed, the LCD instrument displays “”; when the direction control lever is moved to

“Reverse” and the accelerator pedal is depressed, the LCD instrument displays “↓”; when the direction control lever is moved to “Neutral”, the LCD instrument displays “N”.

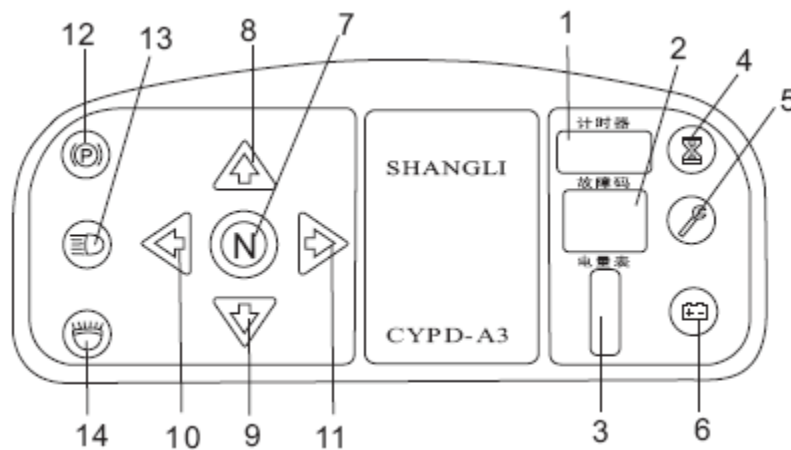
(6) Fault code indicator

The fault codes from 001 ~ 009 indicate different faults. When a fault occurs, the “”-type indicator flashes and the corresponding fault code will be displayed. When the displayed fault code is 010 or above, it means the battery energy has been used up (i.e. the battery is in the under-voltage condition). The fault code indicator will give alarms with the battery capacity alarm lamp.

(7) Hour meter

Turn the key switch to “ON” position to make the hour meter work. The hour meter can display 6 digits, i.e. it can display the accumulated working time of 0 ~ 99999.9 hours.

Instrument (equipped with CURTIS electric controller)



- | | | |
|----------------------------------|----------------------------------|------------------------------------|
| 1. LCD time counter | 2. Fault code display window | 3. Battery coulometer |
| 4. Instrument “ON” indicator | 5. Fault indicator lamp | 6. Battery capacity indicator lamp |
| 7. “Neutral” gear indicator lamp | 8. “Forward” gear indicator lamp | 9. “Reverse” gear indicator lamp |
| 10. “Left turn” indicator lamp | 11. “Right turn” indicator lamp | 12. “Hand brake” indicator lamp |
| 13. “Width” indicator lamp | 14. “Headlamp” indicator lamp | |

(1) Turn on the key switch, and the 12 V power supply is supplied to the instrument; meanwhile, the 48 V power supply is supplied to the instrument and the electric control circuit via the starter relay in the relay box. The instrument “ON” indicator lamp is on; the LCD display of time counter first displays “88888.8” and then displays the accumulated working time (unit: 0.1 H); therefore, when the fault code display window displays “88”, it means the traction control device operates normally.

(2) Hand brake display

When the hand brake is applied, the “hand brake” indicator lamp is on; when the hand brake is released, the “hand brake” indicator lamp is off.

(3) Traveling direction display

When the direction control lever is at “Neutral”, the “Neutral” gear indicator lamp is on; when the direction control lever is at “Forward”, the “Forward” gear indicator lamp is on; when the direction control lever is at “Reverse”, the “Reverse” gear indicator lamp is on and the reversing alarm buzzer sounds. No matter whether the direction control lever is at “Forward” or at “Reverse”, the “Neutral” indicator lamp shall be off.

(4) Battery capacity display

After the instrument is switched on, the battery coulometer (“3” in the above figure) shall display the current battery capacity level. The battery coulometer has 10 indication marks, representing 10 capacity levels. The battery voltage is within the range of 41.5 V ~ 56 V. When the highest mark lights on, it means the battery capacity is full; when the lowest two marks alternately flash, it means the battery has insufficient capacity and needs to be charged. As one indication mark reduces, the battery capacity reduces about 8%.

(5) Lower limit alarm for the battery capacity

If the lowest two indication marks on the battery coulometer alternately flash, it means the battery capacity reaches the lower limit; then the battery capacity indicator lamp is off; at the same time, the protection relay of the lifting power supply circuit acts according to the following two conditions:

- If the lifting motor doesn’t act, disconnect the power supply circuit of the lifting contactor immediately.
- If the lifting motor is acting, disconnect the power supply circuit of the lifting contactor after 10 s time delay (i.e. after one lifting action).

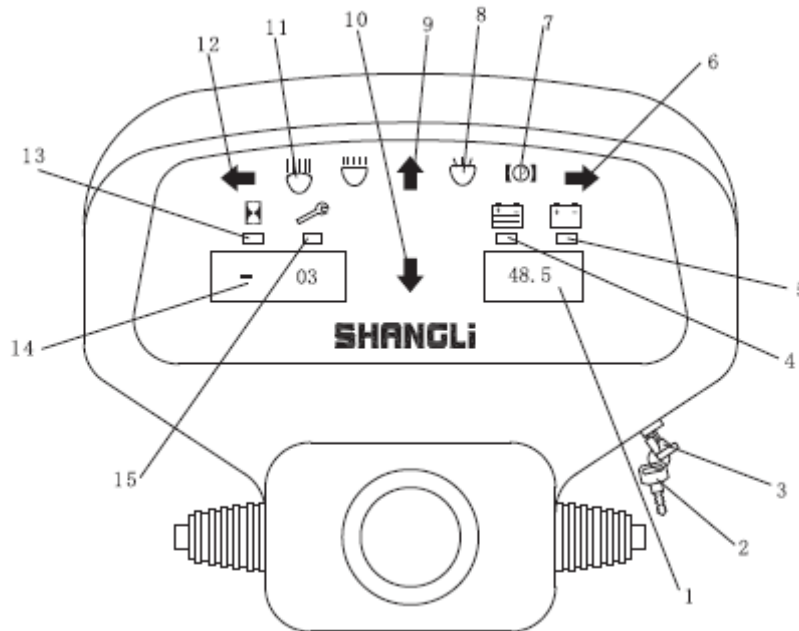
(6) Driving state display

When the left turn signal lamp is turned on, the “left turn” indicator lamp is on; when the right turn signal lamp is turned on, the “right turn” indicator lamp is on; when the width lamp is turned on, the “width” indicator lamp is on; when the headlamp is turned on, the “headlamp” indicator lamp is on.

H2000-E2 Combination Instrument (equipped with EV100 electric controller)

The H2000-E2 combination instrument, taking advantage of the microcomputer technology and with the advantages of real-time sampling, display and control, makes the operator operate more flexibly and comfortably; with the functions of battery under-voltage alarm and protection, the instrument can provide better protection for the battery and the forklift truck.

(1) Display instructions



(2) Operation instructions

1. Voltage meter: displaying the current battery voltage value.
2. Light switch.
3. Electronic lock.
4. Battery voltage indicator lamp: Lighting on when the electronic lock is closed to indicate the forklift truck is electrified and can work.
5. Under-voltage indicator lamp: when this lamp lights on, it indicates the battery is in under-voltage condition; meanwhile, the control power supply (negative pole) of the lifting switch is disconnected and the lifting operation cannot be performed, thus achieving the protection function. The under-voltage value of the 48 V battery is set as 40 V in consideration of the general operation condition of the electric counterbalanced forklift truck; in other words, when the forklift truck works, if the battery voltage is lower than 40 V, the under-voltage protection relay will work after the value of 40 V is displayed for several seconds.
6. Right turn indicator lamp.
7. Hand brake indicator lamp.
8. Width indicator lamp.
9. Traveling indicator lamp.
10. Reversing indicator lamp.
11. Headlamp indicator lamp.

12. Left turn indicator lamp.
13. Electric controller hour meter.
14. Electric controller fault code display: when the electric controller has a fault, this instrument will display a certain code and provide fault diagnosis information for the service personnel.
15. Electric controller fault alarm lamp.

2. Switches

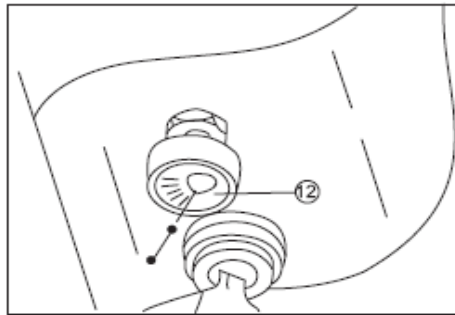
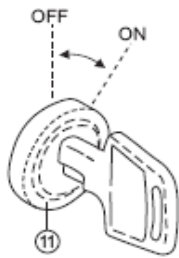
(1) Key switch

OFF: The key switch is turned off and the key can be inserted in and pulled out.

ON: Turn right from the "OFF" position to turn on the key switch and start the forklift truck.

⚠CAUTION

- Don't depress the accelerator pedal while turning on the key switch.
- Be sure to take off the key when leaving the forklift truck.
- When parking the forklift truck or charging the battery on the forklift truck, remove the key.



(2) Light switch

This switch is 2-postion pull type.

Position Lamp	OFF	I	II
Width lamp	×	○	○
Tail lamp	×	○	○
Headlamp	×	○	○

○ : Lamp ON

×: Lamp OFF

3. Controls

(1) Steering wheel^② and steering wheel knob^①

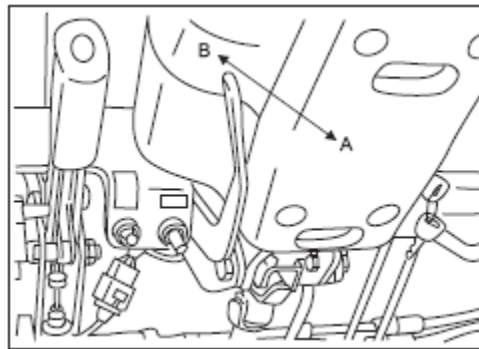
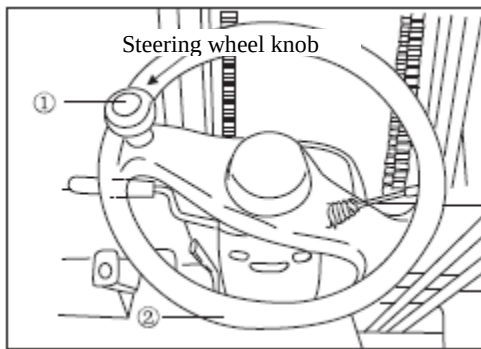
The steering wheel is operated in the conventional manner; in other words, when the steering wheel is turned right, the forklift truck will turn to the right; when the steering wheel is turned left, the forklift truck will turn to the left. The steering wheel is located at the rear of the forklift truck. This makes the rear of the forklift truck swing out when a turn is made.

When making a turn, hold the steering wheel knob with your left hand and put your right hand on the multi-way valve control lever or on the steering wheel.

The forklift truck is equipped with the full hydraulic steering system and the steering wheel tilt device as standard.

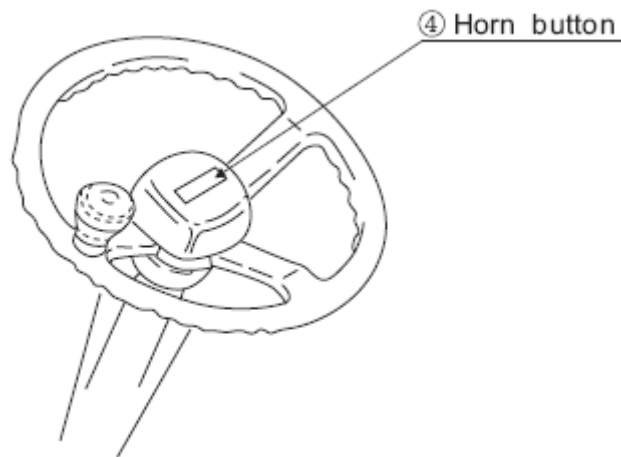
 NOTE

- Adjust the steering wheel tilt angle according to the operator's position.
- After adjusting the tilt angle, lock the steering column with the tilting lever.

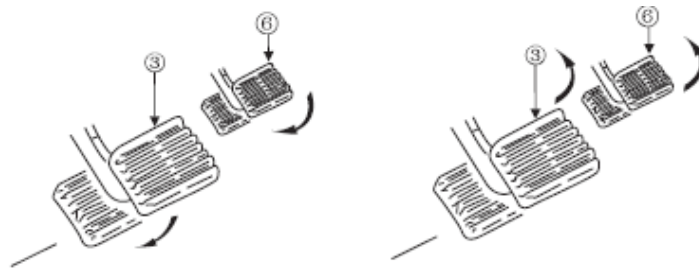


(2) Horn button^④

Press the rubber cover at the center of steering wheel to sound horn. The horn can sound even when the key switch is set at "OFF".



(3) Brake pedal^③ and accelerator pedal^⑥



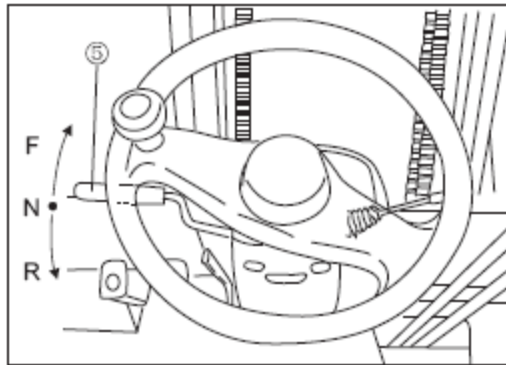
The brake pedal and the accelerator pedal are respectively as shown in the left side and right side of the above figure.

The accelerator pedal shall be slowly depressed and the traveling speed of the forklift truck is controlled by the depressed angle.

 NOTE

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

(4) Direction control lever^⑤



Indicating the traveling direction

Forward (F): Push the lever forward and depress the accelerator pedal.

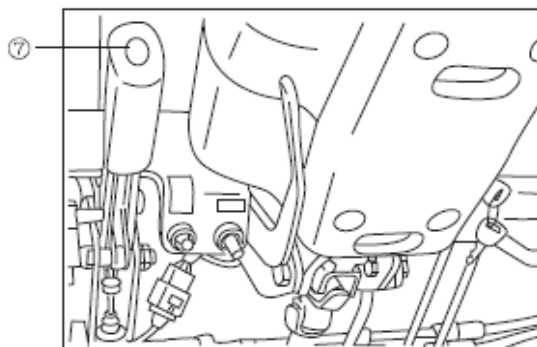
Reverse (R): Pull the lever backward and depress the accelerator pedal.

When parking the forklift truck, place the direction control lever at “Neutral (N)”.

 CAUTION

- Don't depress the accelerator pedal at a stroke in order to avoid sudden startup or sudden acceleration.

(5) Parking brake lever^⑦

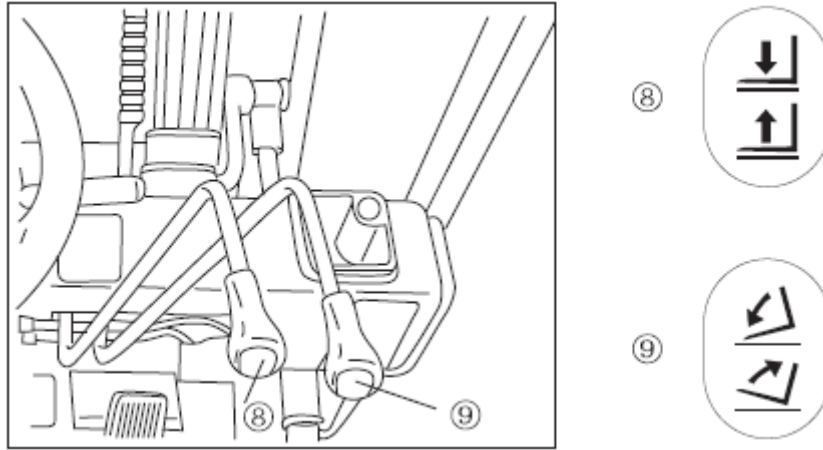


In order to prevent sudden movement, pull up the parking brake lever completely when parking the forklift truck.

▲CAUTION

- Depress the brake pedal when operating the parking brake lever.

(6) Lifting lever^⑧



The forks can be lifted or lowered by pulling the lifting lever backward or pushing forward. The lifting/lowering speed is controlled by the tilt angle of this lever. The bigger the tilt angle is, the higher the speed is.

👉NOTE

- Don't push or pull the lifting lever while the key switch is at "ON".
- Don't suddenly lower the forks or suddenly stop the lowering operation.

(7) Tilting lever^⑨

Pull this lever backward to make the mast tilt backward and push it forward to make the mast tilt forward. The tilting speed can be controlled by the tilt angle of the lever. The bigger the tilt angle is, the higher the speed is.

👉NOTE

- Don't push or pull the tilting lever while the key switch is at "ON".

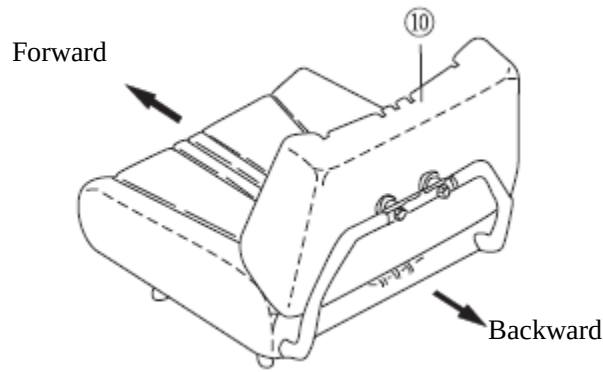
4. Body

(1) Seat^⑩

Operate the seat adjusting lever to make the seat position suitable for the operator's operation.

Pull up the adjusting lever to unlock the seat. Move the seat forward and backward slightly to make sure if the seat is securely locked after the adjustment is finished.

Adjustable range of the seat position: (forward to backward) 120 mm.



(2) Overhead guard

⚠WARNING

- The overhead guard is an important part used to protect the operator against falling objects. If the overhead guard is loose, removed or refitted, it will be very dangerous and may lead to serious accidents.

(3) Load backrest

⚠CAUTION

- The load backrest is an important safety part used to protect the operator against the sliding goods from the forks. If the load backrest is loose, removed or refitted, it will be very dangerous.

(4) Traction pin

The traction pin is only used in the following conditions:

- While the forklift truck cannot move (e.g. the tyres are entrapped in ditches).
- While loading/unloading the forklift truck onto/from the wagon.

⚠CAUTION

- Don't use the traction pin for towing work.

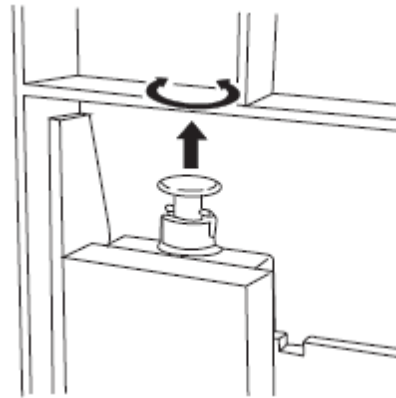
(5) Fork lock pin

The fork lock pin locks the forks in a specific position. To adjust the fork spacing, pull up the fork lock pin and turn it for 1/4 circle, and then shift the forks to the desired position. The fork spacing shall be adjusted according to the goods to be handled.

⚠CAUTION

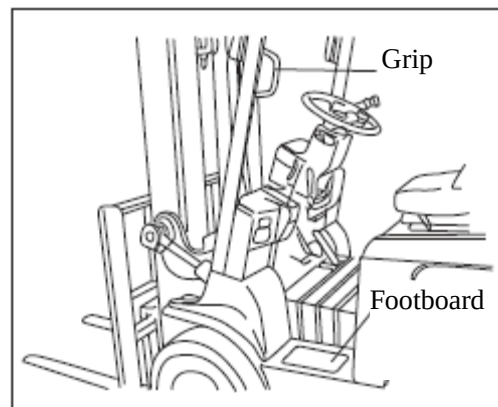
- Since the gravity center of the goods shall be in line with the machine center, both forks shall be adjusted symmetrically. Lock the fork lock pin in place to fasten the forks after the adjustment.

- When adjusting the fork spacing, lean your body against the load backrest and push the forks with your feet after getting on your feet. Never push the forks with your hands.



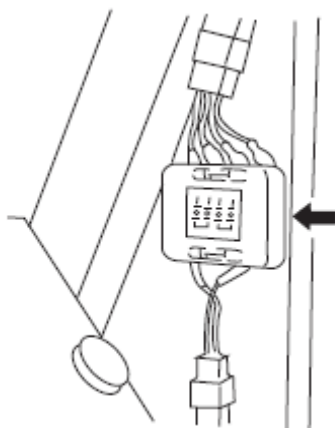
(6) Footboard and grip

The footboards are provided on both sides of the forklift truck. The grip is provided on the left front supporting rod of the overhead guard. Use the footboards and grip when getting on/off the forklift truck to ensure safety.



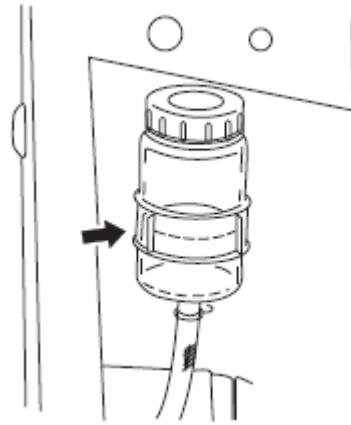
(7) Fuse box

The fuse box is located at the right inner side of the instrument stand.



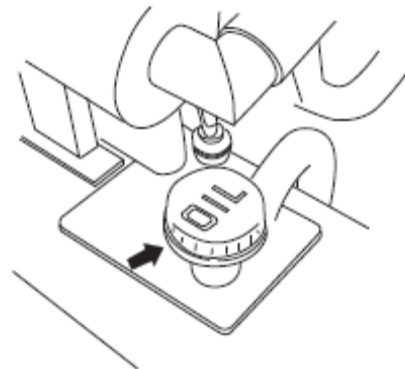
(8) Brake fluid reservoir

The brake fluid reservoir is provided at the left inner side of the instrument stand. This translucent reservoir allows you to inspect the fluid level from the outside.



(9) Hydraulic oil tank cap

The hydraulic oil tank cap is located at the right side under the flat bottom plate. Add hydraulic oil through the oil filler. The cap is provided with a dipstick.



(10) The headlamps and front combined lamps (including the turn signal lamps and width lamps) are installed at the front side of forklift truck. The rear combined lamps are installed at the rear side of forklift truck, which include the tail lamp, turn signal lamp, brake lamp and reversing lamp.

⚠CAUTION

- Check the working conditions of the lamps; if the lamp bulb burns out or the lamp lens is damaged or dirty, replace or repair the bulb or lens immediately.

(11) Rear-view mirror

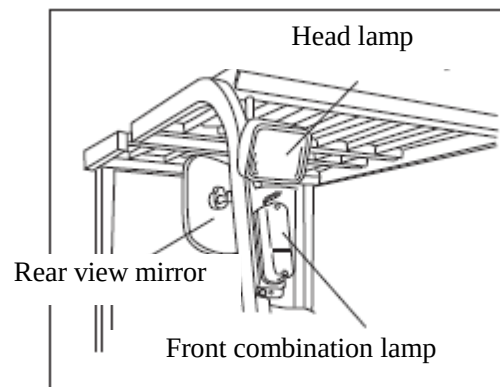
The rear-view mirrors are respectively located at the left side and right side of the front support leg of overhead guard.

⚠CAUTION

- Keep the rear-view mirror surface clean.
- Adjust the mirrors in order to see the rear area clearly.

(12) Battery plug

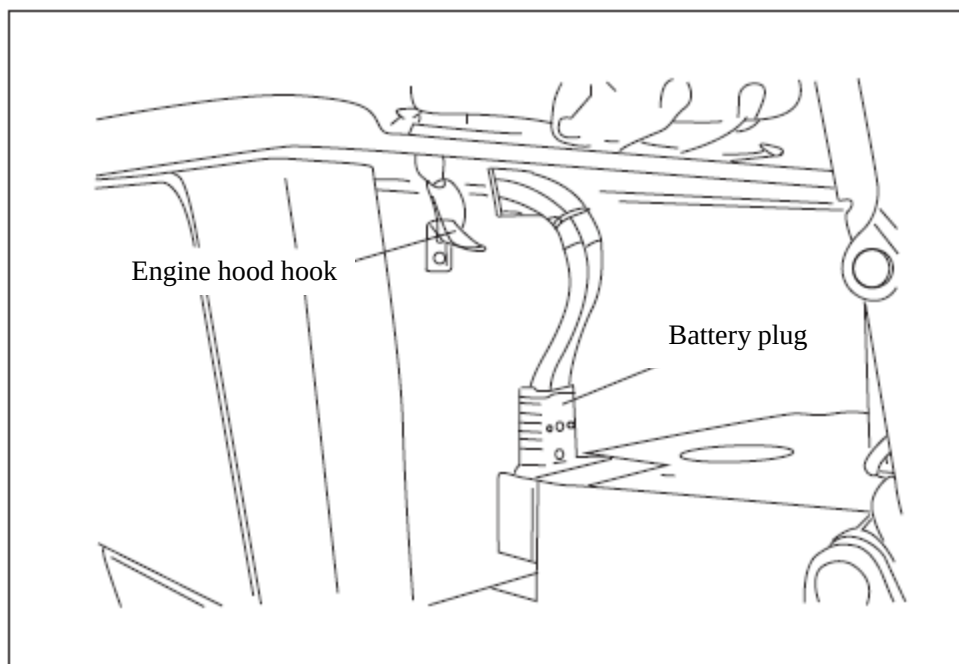
The battery plug is used to



connect/disconnect the battery to/from the electric components of forklift truck, which is normally in the connected condition.

⚠CAUTION

- Disconnect the battery plug when contacting the inner electric components with hands in order to prevent danger.
- There is also some voltage in the main circuit even when the key switch is in the “OFF” position.
- The forklift truck cannot make a turn during the traveling process if the battery plug is disconnected; unless necessary, never disconnect the battery plug.



Notes

[illegible]

III. Driving and Operation

In order to make your forklift truck keep good performance, operate safely and economically, we provide some cautions for correct operation.

1. Running-in

The service life of your forklift truck depends on the running-in condition. Please pay attention to the following cautions during the first 200 hours of operation:

⚠CAUTION

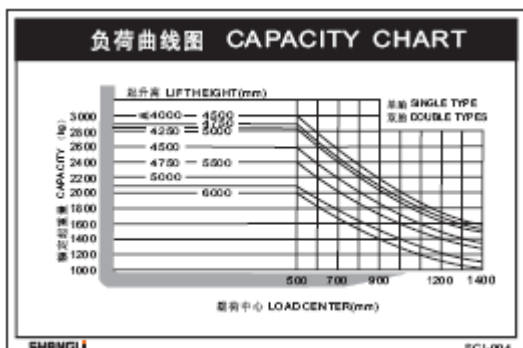
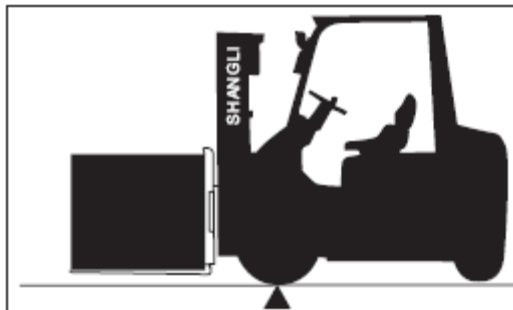
- Regardless of the weather, always warm up your machine before putting it to work.
- Perform maintenance carefully and comprehensively.
- Avoid rough operation.
- Add lubrication oil/grease and replace engine oil in time.

2. Relationship Between Goods and Forklift Truck Stability

Within the load curve range, take the front wheel center as the supporting point and keep the balance between the body and the goods on forks. Pay attention to the goods and load center to keep the forklift truck stable.

⚠WARNING

- If the curve range is exceeded, it may lead to uplift of rear wheels, a terrible condition or turnover of the forklift truck; consequently, a severe accident may be caused. As shown in the figure above, approaching the goods to the fork tips will produce the same effect with increasing the load weight. In this case, the load shall be reduced accordingly.



Load Curve

Rated
lifting
capacity
(kg)

Lifting height (mm)

Single tyre
Double tyres

Load center (mm)

3. Load Center and Load Curve

The load center refers to the distance from the front end surface of fork to the gravity center of goods. The above load curve indicates the relationship between the load center and the allowable load capacity (allowable load) of 2t forklift trucks. The load curve decal is attached

on the forklift truck, which shall be replaced with the new one if damaged or lost.

▲WARNING

- If the forklift truck is equipped with attachments for handling goods, such as side-shifter, bucket and rotary fork, the allowable load shall be less than that of the standard forklift truck (without any attachment). The causes are as follows:

- (1) The load equal to the attachment weight shall be deducted.
- (2) As the load center shifts forward due to the length of attachment, the allowable load shall be reduced as well.

The installation of attachments results in forward shift of the load center, which is called "Load center loss".

Never exceed the load allowed by the load curve on the forklift truck or attachment.

4. Forklift Truck Stability

The stability of the forklift truck is specified in ISO or other standards. However, the stability stated in these standards is not applicable to all running states. The stability changes with the running state.

Under the following running states, the maximum stability is guaranteed:

- (1) Running on a flat and solid ground.
- (2) Running under the standard no-load or loaded state.

Standard no-load state: The forks or other bearing accessories are 30 cm above the ground and the mast tilts backward in place without load.

Standard loaded state: The forks or other bearing accessories are 30 cm above the ground, the forks carry the allowable load with a standard load center, and the mast tilts backward in place.

▲WARNING

- When handling goods, try to tilt the mast forward/backward to the smallest extent. Unless the load is fixed firmly or a rigid load shelf is adopted or the lifting height is small, never tilt the mast forward.

5. Transporting and Loading/Unloading the Forklift Truck

- (1) Transporting the forklift truck

▲CAUTION

- In order to prevent the forklift truck from moving in the wagon during transportation, wedge the wheels and securely fasten the forklift truck with ropes.
- When loading/unloading or transporting the forklift truck on the highway, pay attention to the full-length, width and height limits and comply with the relevant laws and regulations.

- (2) Loading/unloading the forklift truck

▲CAUTION

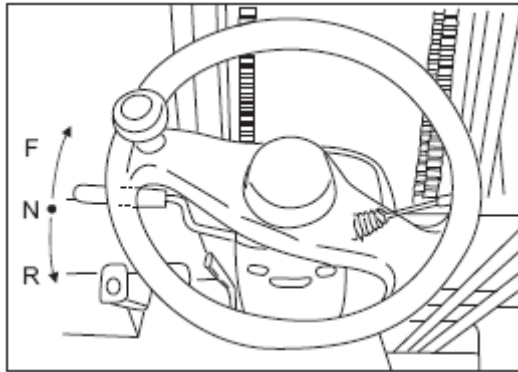
- Please use the dockboard whose length, width and strength are appropriate.
- Pull up the parking brake lever in place to prevent the wheels from movement.
- Fix the dockboard at the center of trailer, and there must be no grease on the dockboard.
- The dockboard's height shall be uniform in order to balance the forklift truck during the loading/unloading operation.

- Don't make a turn or move laterally in order to prevent danger.
- Slowly drive the forklift truck with the reverse gear in order to make the left and right wheels simultaneously get on the trailer.

6. Preparation Before Startup

(1) Checking the position of direction control lever

Place the direction control lever at "Neutral (N)".



(2) Turning on the key switch

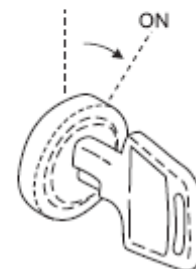
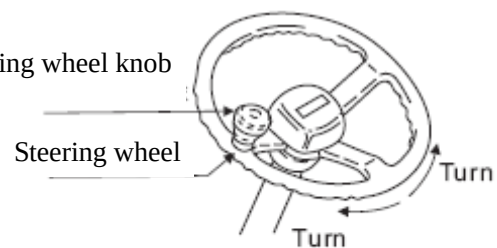
Grasp the steering wheel knob, and turn the key switch to "ON".

▲CAUTION

- Even the key switch is placed in the "ON" position, it still needs 1 s from the action of control circuit to the movement of forklift truck.

Before the key switch is turned to "ON", if the gear shift lever is at "F" or "R", the forklift truck cannot be started. Turn the gear shift lever to "N".

Be sure to take care not to depress the accelerator pedal at a stroke, or else the forklift truck will accelerate suddenly.



(3) Tilting the mast backward

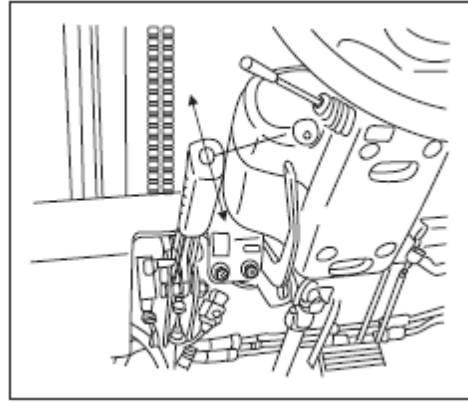
Pull the lifting lever backward to make the forks rise 150 ~ 200 mm from the floor, and then pull the tilting lever backward to make the mast tilt backward.

(4) Operating the direction control lever

The direction control lever is used to control the traveling direction (forward-reverse).

Forward (F): Push the direction control lever forward.

Reverse (R): Pull the direction control lever backward.



(5) Releasing the parking brake lever

Depress the parking brake pedal.

Push forward the parking brake lever to the end, and then hold the steering wheel with your left hand and slightly put your right hand on the steering wheel.

7. Driving

(1) Startup

Release the brake pedal and gradually depress the accelerator pedal to start the forklift truck.

The acceleration speed changes with the travel that the accelerator pedal is depressed.

▲CAUTION

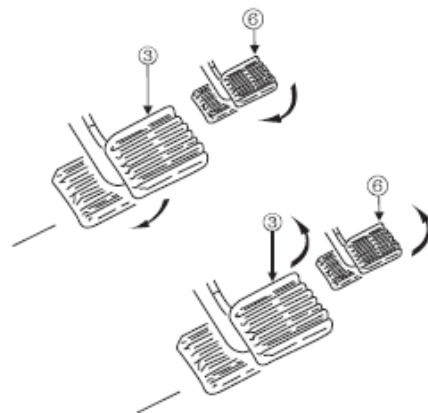
- Don't suddenly start or brake the forklift truck, or else the goods may fall off.

(2) Slow-down

Slowly release the accelerator pedal. Depress the brake pedal as needed.

If the forklift truck is not braked for emergency, slowly reduce the traveling speed after releasing the accelerator pedal until the forklift truck is braked; however, the emergency braking operation cannot be achieved even the accelerator pedal is released at a stroke.

Depress the brake pedal to brake the forklift truck in emergency.



▲CAUTION

- Reduce the traveling speed when:

- a) Making a turn
- b) Approaching goods or a pallet
- c) Approaching a stack of goods
- d) Passing a narrow passage
- e) Driving on a floor/road surface in bad condition

When reversing the traveling direction, since the forklift truck is the rear-wheel steering type, reduce the speed and pay attention to the swing of the forklift truck rear when making a turn.

(3) Making a turn

Unlike general passenger-cars, the forklift truck is the rear-wheel steering type. Reduce the traveling speed and pay attention to the swing of the forklift truck rear when making a turn.

▲CAUTION

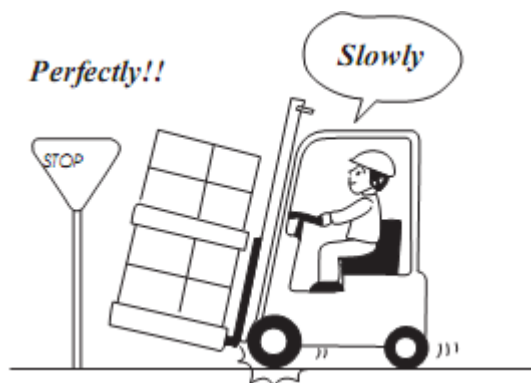
- When a turn is made, the lower the traveling speed is, the shorter the turning radius is; and the forklift truck is more likely to overturn. Be sure to pay attention.

(4) Performing traveling and lifting operations simultaneously (inching operation)

- a) Travel the forklift truck to make the front ends of the forks stay 3 ~ 5 m from the goods.
- b) Completely depress the brake pedal. (stop traveling)
- c) Depress the accelerator pedal until achieving an appropriate working height.
- d) Operate the lifting lever to make the forks perform lifting operation.

▲WARNING

- Only the highly-skilled operator can perform traveling and lifting operations simultaneously (inching operation). The operator must know the characteristics of the goods (such as the shape and gravity center) clearly, ensure the stability of the vehicle behind and slowly lift/lower the forks; in addition, the operator must pay attention to all operations.
- It is very dangerous to perform the tilting operation at a high lifting height. Don't perform other operations except for the incoming/outgoing of forks on the goods platform.
- In order to minimize the danger of traveling at a high lifting height, don't perform the lifting operation until approaching the goods platform closely.



(5) Parking or stopping

▲CAUTION

Safe parking

- Try to park the forklift truck in a wide and flat area.

If it is unavoidable to park the forklift truck on a slope, set the mast laterally downward and wedge the wheels.

- Park the forklift truck in a safe or specified place other than the work site.

Apply “CAUTION” signs and signal lamps if necessary.

- Park the forklift truck on a hard road surface and take care to prevent slipping and being entrapped.
- When the forks cannot be lowered due to a malfunction, hang a piece of cloth on the fork tips and make the fork tips face away from the footway and driveway.
- Be sure to take care of slipping or collapsing of the road surface.
- Lower the forks after the forklift truck is completely parked since it is very dangerous to lower the forks during traveling.
- Don't jump off the forklift truck.
- Face towards the forklift truck and use the footboard when getting off the forklift truck.

Reduce the traveling speed and depress the brake pedal to park the forklift truck; and move the gear shift lever to the “N” position.

- a) Pull the parking brake lever backward in place to make the parking brake work.
- b) Lower the forks down to the ground.
- c) Turn the key switch to the “OFF” position.
- d) Remove the key and keep it properly.
- e) Take care to get on/off the forklift truck.

(6) Stopping the forklift truck

🔑NOTE

- When leaving the forklift truck, completely pull up the parking brake lever and make the mast slightly tilt forward. Lower the forks down to the ground. When parking the forklift truck on a slope, wedge the wheels.
- When leaving the forklift truck, remove the key.



8. Battery Operation

(1) Charging the battery

Charge the battery with a proper charger and operate it strictly according to the stipulations in the *Operation & Maintenance Manual* for the charger.

- a) Pull the parking brake lever backward in place to make the parking brake work.

▲CAUTION

- Keep the battery electrolyte at the specified level, or else it may cause overheating or burnout of the battery.
- If the battery electrolyte is insufficient, the service life of the battery will be shortened.

- b) Add pure water or distilled water.

- c) Over-charging is absolutely prohibited.

- d) The charging place shall have good ventilation.

▲CAUTION

- Charge the battery at a place where is well ventilated and away from moisture.

- e) Open the battery cover.

▲CAUTION

- Hydrogen will be produced during the charging process; therefore, open the battery cover.

- f) Check the terminal, cable and plug.

▲CAUTION

- Check the plug and cable for damage before charging.

Don't charge the battery when:

- The plug electrode is damaged.
- The terminal and cable are rusted.

These situations may result in accidents such as electric sparks, burns and explosions.

- g) Charge the battery after turning off the key switch.

- h) Check the specific gravity.

Measure the specific gravities of the electrolyte of all cells before charging to see if there is any abnormality within the battery and prevent accidents.

- i) Hold the plug or handle other than the cable when connecting or pulling out the plug.

▲CAUTION

- Don't pull the cable.
- When the cable or plug is damaged, contact with the Sales Department of our Company for replacement.

- j) Stop charging.

▲CAUTION

- Stop charging in strict accordance with the stipulations in the *Operation &*

Maintenance Manual for the charger.

- Never pull the charger plug during the charging process, or else it may cause dangerous sparks.

(2) Replacing the battery

After the forklift truck continues working for an operation cycle and the battery energy is used up, replace the battery with a fully charged battery pack in time and then charge the dismantled battery.

▲CAUTION

- There are two drainage holes at the bottom of battery box; pull out the hole plugs to drain the waste fluid in the battery box.
- Drain the waste fluid at the specified place or to a container; the waste fluid shall be disposed as specified and cannot be discarded randomly.

▲CAUTION

- When replacing the battery, make sure that the battery matches with the forklift truck (for the 1-1.5 t forklift, the battery shall have a voltage of 48 V and a capacity no less than 400 Ah; for the 2-2.5 t forklift, the battery shall have a voltage of 48 V and a capacity no less than 620 Ah). Using unsuitable batteries will reduce the working time of the forklift truck. Using the battery with a low capacity will cause the forklift truck to overturn when traveling due to a light weight.
- The replacement shall be performed on a flat platform.

Replace the battery in the following steps:

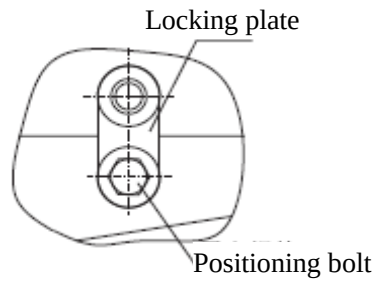
▲CAUTION

- When using another forklift truck as the lifting equipment for battery replacement, apply a suitable spreader (attachment).
- The lifting of battery shall be performed by a professional.
 - a) Pull out the battery plug and open the upper battery cover.
 - b) Remove the right shield and the locking plate.

Lock the upper battery cover securely with a gas spring or other means to prevent the upper battery cover from falling off to hurt people or the forklift truck body.
 - c) When lifting the battery box out of the forklift truck, take care not to damage the steering wheel or other components.
 - d) After installing a fully charged battery pack, connect the battery plug securely.
 - e) Hook the axis pins on the battery box with the locking plates at both sides of the battery.
 - f) Close the upper battery cover.

▲CAUTION

- Take care not to squeeze your fingers when closing the upper battery cover.
- Take care not to damage the forklift truck body due to the swing of the battery box when lifting the battery box.



9. Stacking

▲CAUTION

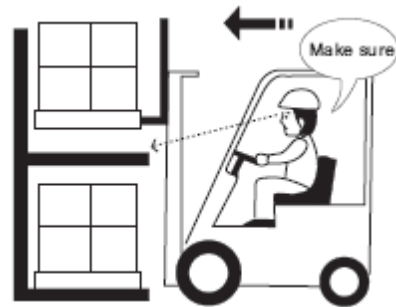
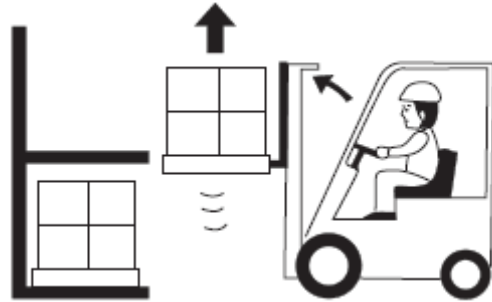
- Check the following items before operating the forklift truck:
 - a) Make sure there is no risk of falling goods or damaged goods in the loading area.
 - b) Make sure that no object or goods stack affects safety.

Observe the following procedures when stacking goods:

- (1) Slow down the traveling speed when approaching the stacking area.
- (2) Park the forklift truck in front of the stacking area.
- (3) Check the stacking area for safety.
- (4) Adjust the forklift truck position to make the forklift truck stay in front of the goods in the stacking area.
- (5) Make the mast perpendicular to the ground and lift the forks above the stack height.
- (6) Check the stacking position and travel forward, and then stop the forklift truck at a suitable place.
- (7) Make sure the goods are above the stacking position, slowly lower the forks and ensure the goods are well placed.

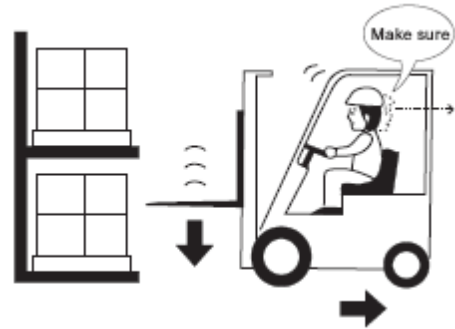
👉NOTE

- When the goods are not completely placed on the goods carrier or support:
 - a) Lower the forks until the forks no longer bear any load.
 - b) Move the forklift truck backward for about 1/4 length



of the forks.

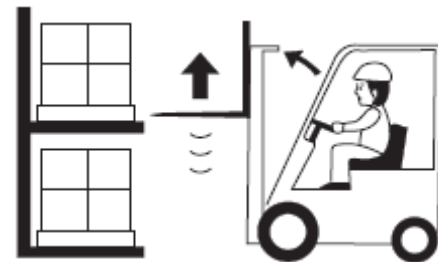
- c) Raise the forks for 50 ~ 100 mm and move the forklift truck forward; and then locate the goods in a suitable stacking position.
- (8) Check the clearance behind and move the forklift truck backward to prevent the forks from running into the pallet or the goods.
- (9) Make sure the fork tips leave away from the goods or the pallet, and then lower the forks (150 ~ 200 mm away from the ground) to facilitate traveling.



10. Unstacking

Observe the following procedures when unstacking goods:

- (1) Slow down the traveling speed when approaching the goods.
- (2) Park the forklift truck just in front of the goods, with a distance of 30 cm between the goods and the fork tips.
- (3) Adjust the fork position before the goods.
- (4) Make sure the goods weight is in the specified range.
- (5) Make the mast perpendicular to the ground.
- (6) Observe the fork position and move the forklift forward until the forks are fully inserted into the pallet.



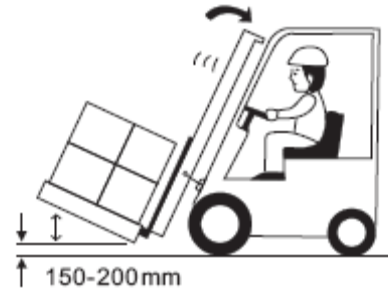
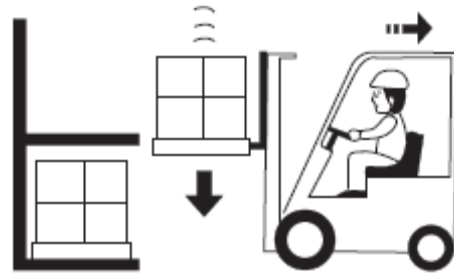
NOTE

- If it is difficult to insert the forks fully into the pallet:
 - A) Insert 3/4 length of the forks and raise the pallet a little (50 ~ 100 mm), and then pull out the pallet for about 100 ~ 200 mm; finally, lower the pallet again.
- (7) Raise the pallet for 50 ~ 100 mm after



the forks are inserted into the pallet.

- (8) Check the clearances around and move the forklift backward until the goods are lowered.
- (9) Lower the goods to 150 ~ 200 mm above the ground.
- (10) Tilt the mast backward to stabilize the goods.
- (11) Carry the goods to the destination.



11. Storage

(1) Before storage

Before storing your forklift truck, clean it thoroughly and perform inspection according to the following procedures:

- a) Wipe away the oil and grease adhering to the body of the forklift truck with cloth or water as required.
- b) While washing the forklift truck body, check the general condition of the forklift truck. Especially check the body for recess and damage and the tyres for wear and nails or stones in the tread.
- c) Check for oil leakage.
- d) Add grease if needed.
- e) Check for looseness of hub nuts and cylinder piston rod joint face. Check the piston rod surface for damage and scratches.
- f) Check whether the mast rollers rotate smoothly.
- g) Prime oil into the lifting cylinder by actuating the lifting cylinder at the full stroke.

▲WARNING

- As long as your forklift truck is in need of repair, defective or unsafe, you shall report the condition to the supervisor, and never operate the forklift truck until it is restored to safe operating condition.

(2) Daily storage

- a) Park the forklift truck at a specified place and wedge the wheels.
- b) Place the gear shift lever in the “Neutral” position and pull up the parking brake lever.
- c) Remove the key and keep it at a safe place.

(3) Long-time storage

Perform the following maintenance and checks in addition to those in “Daily storage”:

- a) Taking the rainy season into consideration, park the machine on a high and hard ground.
 - b) Dismount the battery from the machine. Even though the machine is parked indoors, if the place is hot or humid, the battery shall be kept in a dry and cool place. Charge the battery once a month.
 - c) Apply anti-rust oil to the exposed parts such as cylinder piston rods and shafts which tend to rust.
 - d) Cover the components which may be affected by moisture.
 - e) The forklift truck shall be started at least once a week. Install the battery and remove grease from the cylinder rods and shafts. Start the engine and warm it up thoroughly. Move the machine a little forward and backward. Operate the hydraulic controls for several times.
 - f) Avoid parking the forklift truck on a soft ground such as asphalt pavements in summer.
- (4) Operating the forklift truck after long-time storage
- a) Remove the covers preventing moisture.
 - b) Remove anti-rust oil from the exposed components.
 - c) Remove the foreign matters and water from the hydraulic oil tank.
 - d) Charge the battery and mount it onto the forklift truck; connect the battery plug.
 - e) Perform pre-operational checks carefully.

12. Washing the Forklift Truck

- (1) Never wash forklift truck and the battery with water.
- a) It is absolutely forbidden to wash the components such as the oil tank and the air cleaner in the forklift truck. If necessary, wash the parts below the wheels; in addition, the front bottom plate can be removed for cleaning; however, the front bottom plate cannot be placed on the axle when washed.
 - b) Don't let any impurity enter the battery from the filling port when adding water into the battery, or else the service life of the battery will be seriously affected.
- In addition, the resulted acidulous water will pollute the environment. Blow the dirty battery with air and clear it with clean cloth. If you cannot perform the cleaning operation, ask for the professional's help.
- Please remove the battery for cleaning, and re-mount it onto the forklift truck after the water on the battery is fully cleared.
- (2) Never wash the following electrical devices with water:
- a) Controller, contactor
 - b) Motors (driving motor and pump motor)
 - c) Transformer (inside the side cover)
 - d) Battery, battery plug
 - e) Instrument housing
 - f) Acceleration device (under the front bottom plate)
- (3) Key points for the washing operation

- a) Park the forklift truck and pull up the parking brake lever.
 - b) Turn the key switch to “OFF” and pull out the battery plug.
- (4) After finishing the washing operation
- a) Clear the residual water with compressed air and fully dry the forklift truck.
 - b) Test-run the forklift truck to check for any abnormality.
- (5) Summary of parts for washing

Part	If it can be washed with water	Notes
Body surface, mast, fork, tyre, rear axle, counterweight	Yes	It is absolutely forbidden to wash them with water. Keep the parts away from water. It is prohibited to wash the upper end of counterweight with water since there are electrical devices.
Side cover, flat bottom plate	Yes	Keep the side cover away from water.
Front bottom plate, flat bottom plate	No	It is prohibited to wash the parts with water since there are motors and controllers under these parts. Clean them with compressed air. Remove them for washing if they are too dirty; don't re-mount them until they are fully dried.
Engine hood, battery box and cover	No	Clean them with compressed air and cloth.
Instrument, steering wheel	No	Clean them with compressed air and cloth.
Motors	No	Clean them with compressed air and cloth.

IV. Regular Check and Maintenance

Check the forklift truck thoroughly in advance to prevent it from faults and reduction of its service life. The hours listed in the maintenance procedure are based on 8-hour operation per day and 200-hour operation per month.

1. Pre-operation Check

Check the forklift truck thoroughly before operation in order to ensure safe operation and keep the machine in good condition, which is the operator's responsibility. Contact with the Sales Department of our Company if any problem is found.

▲CAUTION

- Even a minor error may lead to a serious accident; therefore, don't operate or move the forklift truck before finishing the repair and check.
- The check shall be performed on a flat floor.
- When it is necessary to check the electric system of forklift truck, turn off the key switch and pull out the battery plug before the check.
- Disposing the replaced waste oil (such as draining it into the sewer or soil and burning it) improperly will pollute water, soil, air, etc., which is strictly prohibited by law.

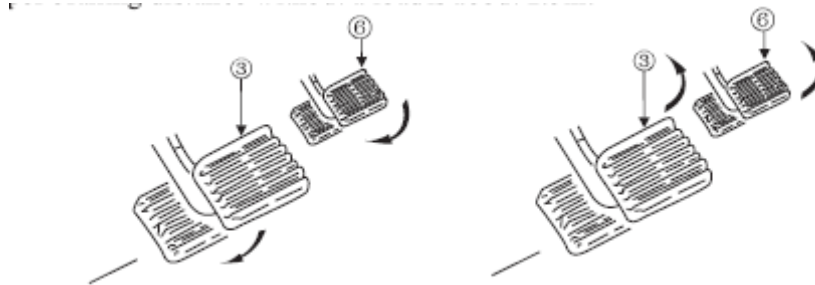
(1) Checking points and content

	No.	Checking points	Content
Braking system	1	Brake pedal	Travel and parking force of foot brake pedal
	2	Brake oil	Quantity and cleanness
	3	Parking brake	Travel and operating force of parking brake lever
Steering system	4	Steering wheel operation	Tightness, rotation and movement conditions
	5	Hydraulic power steering operation	Operation conditions of all components
Hydraulic system & mast	6	Function	Function, any crack, lubrication condition
	7	Oil tube	Oil leakage
	8	Hydraulic oil	Adequate quantity
	9	Lifting chain	Equal tensions of chains on both sides
Wheel	10	Tyre	Air pressure, abnormality or damage
	11	Hub nut	If securely tightened
Battery	12	Charging	Battery capacity indication, specific gravity, if the battery plug is securely connected
Lamps & horn	13	Headlamp, tail lamp, reversing lamp, turn signal lamp and horn	If it lights on after turned on, if the horn sounds
Monitor & indicator lamps	14	Function	If “MONITORING OK” is displayed after the key switch is turned on
Others	15	Overhead guard, load backrest	If bolts and nuts are securely tightened
	16	Other components	Any abnormality

(2) Checking procedures

a) Check the foot brake pedal.

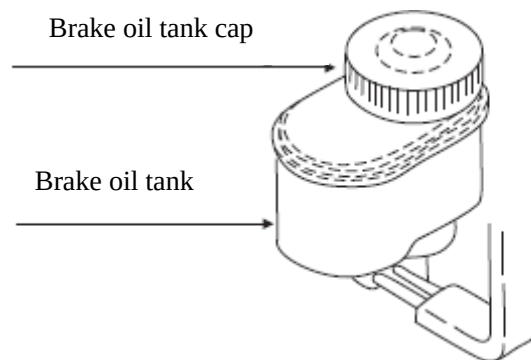
Check the brake performance and make sure the downward travel of the brake pedal exceeds 50 mm measured from the back plate surface when the brake pedal is fully depressed and the braking distance of the forklift truck without load is about 2.5 m.



b) Check the brake oil.

▲CAUTION

- Open the brake oil tank and check the quantity and condition of brake oil.

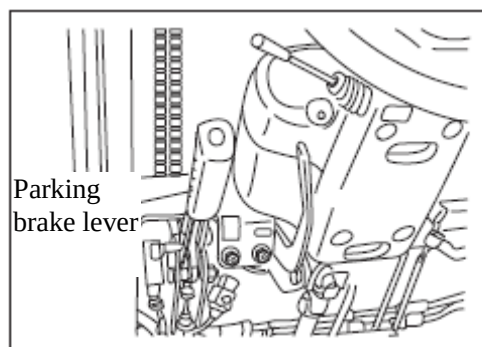


c) Check the parking brake lever.

Push the parking brake lever and check:

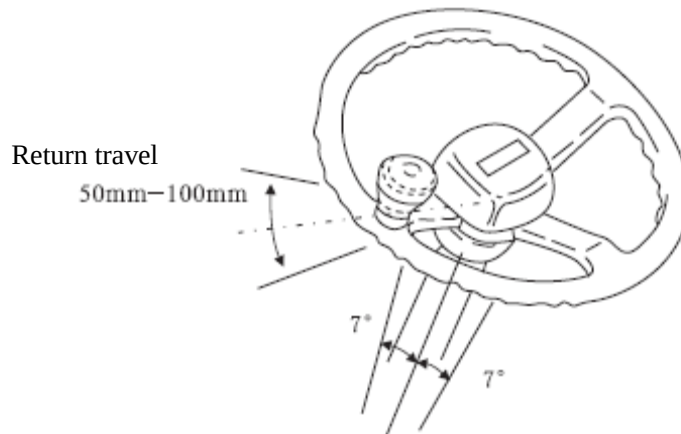
- If the pull travel is suitable
- Braking force
- If any part is damaged.
- If the lever control force (17 ~ 22 kg as standard) is suitable for the operator.

The operator can adjust the lever by a screw located at the top of lever.



d) Check the steering wheel operation.

Turn the steering wheel clockwise and counterclockwise slightly and check if the steering wheel has a return travel. The appropriate return travel is 50~ 100 mm and the steering wheel moves forward and backward by about 7°. If the above conditions are met, the steering wheel operates normally.

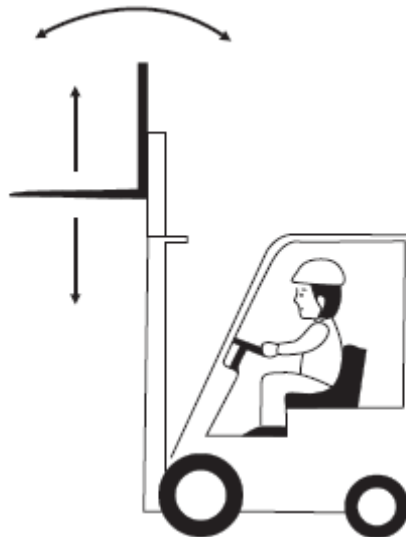


e) Check the power steering function.

Turn the steering wheel clockwise and counterclockwise to check the power steering function.

f) Check the hydraulic system and mast.

Check if the lifting and forward/backward tilting operations are smooth and normal.

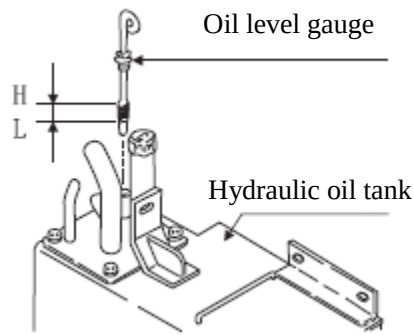


g) Check the oil tube.

Check if the lifting cylinder, tilting cylinder and all pipelines leak.

h) Check the hydraulic oil.

Lower the forks down to the ground and check the hydraulic oil level with the oil level gauge. The oil quantity is appropriate when the oil level is within the range of H to L.



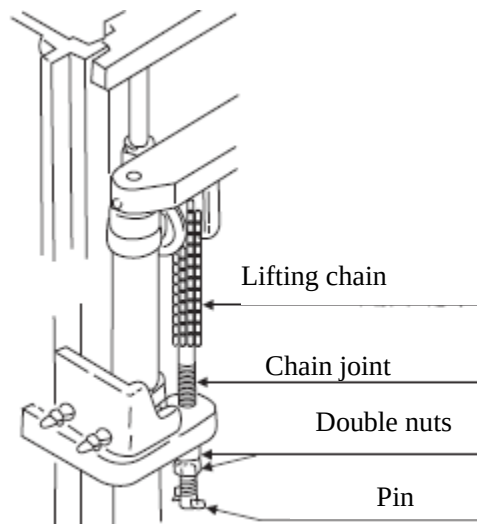
Model		H	L
CPD	10	23 L (6.1 gal.)	21 L (5.5 gal.)
	15		
CPD	10S	25 L (6.6 gal.)	25 L (6.1 gal.)
	15S		
CPD	20	27 L (7.1 gal.)	25 L (6.6 gal.)
	25		
CPD	30	31 L (8.0 gal.)	29 L (7.7 gal.)

i) Check the lifting chain.

Lift up the forks by 200 ~ 300 mm above the floor and make sure the tensions of the left and right lifting chains are uniform. Check if the finger bar locates at the center. If the tensions are different, make adjustment with the chain joints.

▲CAUTION

- Tighten the double nuts securely after the adjustment.



j) Check the tyres (pneumatic tyres).

Pull out the valve cap and measure the tyre pressure with the tyre gauge. Make sure the valve won't leak before installing the valve cap after checking the tyre pressure.

▲CAUTION

- The tyre pressure of the forklift truck is higher than that of a normal passenger car, which shall not exceed the specified value.



Model Tyre	CPD10	CPD15	CPD20	CPD25	CPD30
Front wheel	8.50	7.00	7.00	9.00	8.00
Rear wheel	8.00	8.00	8.00	9.00	7.00

Check the tyres (solid tyres).

Check the tyres and their side surfaces for any damage or crack. Check the rims and locking rings for any deformation or damage.

k) Check the hub nut.

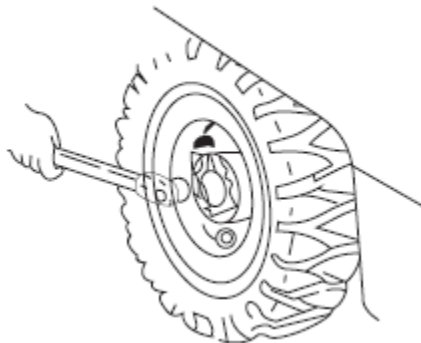
▲CAUTION

- It is very dangerous if the hub nut is loose since it may cause the wheel to fall apart and the forklift truck to overturn.

Check if the hub nut is loose. Even if only one hub nut is loose, it could be very dangerous; therefore, tighten the hub nut torque to the specified value in advance.

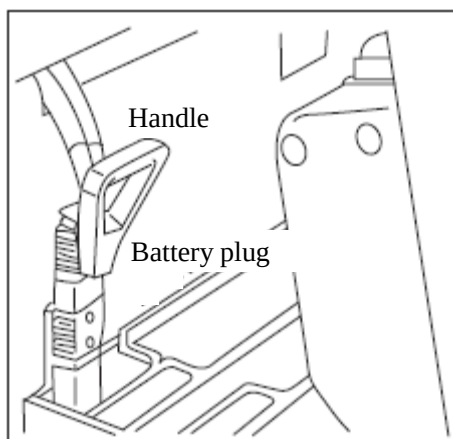
Tightening torque of the hub nut:

Front wheel: 187-8 140 N.m



l) Check the charging condition.

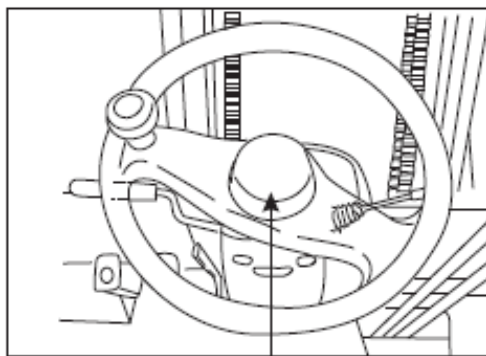
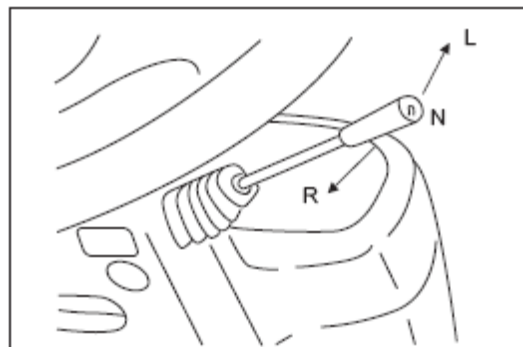
Measure the specific gravity of battery electrolyte. If the specific gravity of battery electrolyte is 1.275 ~ 1.285 when the temperature is 30 °C, it indicates the battery is fully charged. Check if the terminal is loose and if the cable is damaged.



m) Check the headlamp, turn signal lamp and horn.

Check if all these lamps light up normally and if the horn sounds normally.

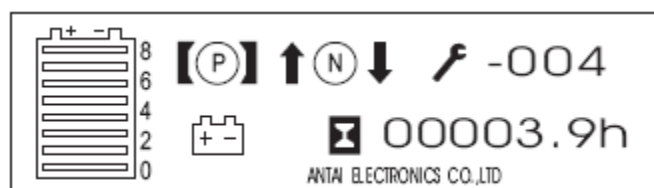
L	Left turn signal lamp on
N	Neutral
R	Right turn signal lamp on

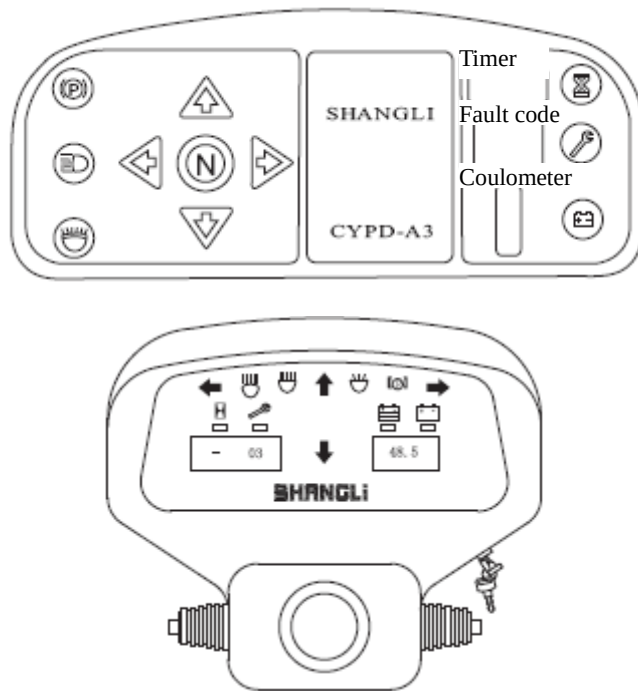


The horn sounds when the part indicated by the arrow is pressed down.

n) Check the functions of the instrument panel.

The instrument panel will be shown as follows in normal condition after the key switch is turned on for several seconds:





o) Check the overhead guard and load backrest.

Check if any bolt or nut is loose.

p) Others

Check if any other part is abnormal.

▲CAUTION

- Be sure to turn off the key switch and disconnect the battery plug before checking the electric system except for the check of lamps and operation condition.

2. Check after Operation

After finishing work, remove stains on the forklift truck and check:

- (1) If any part is damaged or leaks;
- (2) If any part is deformed, distorted, damaged or cracked.
- (3) Add lubrication grease as needed.
- (4) Lift up the forks to the maximum lifting height for several times after finishing work every day (in order to make the oil flow across the whole stroke of the oil cylinder and prevent rust).
- (5) Replace the abnormal part causing faults during the working process.

▲CAUTION

- Even a minor error may lead to a serious accident; therefore, don't operate or move the forklift truck before finishing the repair and check.

3. Weekly Maintenance (50 h)

Perform the following checks and maintenance beside the pre-check before using the forklift truck:

Checking points	Content
Electrolyte capacity	Check the electrolyte level; if the level is low, add pure water.
Specific gravity of electrolyte	Measure the specific gravity and temperature of the electrolyte of all cells.
Battery cleanness	Clean the uncovered top of battery and the cap.
Contactor	Polish the rough contractor surface with sand paper.

▲CAUTION

- Be sure to disconnect the battery plug before checking the electric system.

(1) Check the electrolyte capacity.

▲CAUTION

- Close the battery cap tightly after adding pure water.
- Don't let the pure water overflow, or else it may cause an electric shock due to electricity leakage.

(2) Check the specific gravity of electrolyte.

Normal: It is normal if the specific gravities of electrolyte of all cells keep the same when the temperature is 30°C.

Abnormal: It is abnormal if the specific gravity of electrolyte of one cell is 0.05 less than the average specific gravity of electrolyte of other cells.

(3) Clean the battery.

Wipe off stains on the battery top with wet cotton cloth and keep the battery top dry in order to prevent the connecting area of battery top from corrosion.

▲CAUTION

- The cleaning of battery shall be performed before the charging operation.
- Wear rubber gloves and boots to prevent an electric shock.
- Don't let the battery plug contact with water.

The inside of battery cap may be polluted. Clean the cap in the following steps:

- Remove all caps.
- Wash the inside of cap with neutral cleaner.
- Install caps.

▲CAUTION

- Make sure all caps are securely tightened.

(4) Check the contactor.

Put a piece of sand paper between the contacts and push the contacts to make them connect with the stationary contacts; then pull out the sand paper and repeat the above steps.

4. Monthly Maintenance (200 h)

The following maintenance shall be performed besides the weekly maintenance (50 h).

Contact with the service personnel of our Company when confirming it is necessary to make adjustment and replacement by check. (The monthly maintenance records shall be kept)

System	No.	Checking points and content	
Complete machine	1	General condition	Deformation, crack and abnormal noise
	2	Horn	Sound
	3	Accessories (headlamp, turn signal lamp)	Function
Battery, Charger & Electric system	4	Battery electrolyte	Fluid level, specific gravity and cleanness
	5	Battery plug	Damage and cleanness
	6	Key switch	Function
	7	Contractor	Contacting condition and function
	8	Inching switch	Function
	9	Controller	Function
	10	Traction motor (carbon brush, rectifier)	Wear and spring force
	11	Lifting motor (carbon brush, rectifier)	Wear and spring force
	12	Steering motor (carbon brush, rectifier)	Wear and spring force
	13	MOS tube	Current limit and function
	14	Fuse	Looseness and capacity
	15	Harness and terminal	Damage and looseness
Driving, steering, mast, hydraulic & braking systems	16	Steering wheel	Operation and adjustment
	17	Steering link	Lubrication
	18	Gear box	Oil quantity, leakage and abnormal noise
	19	Mounting nuts of tyres	Looseness
	20	Tyres	wear
	21	Lifting chain	Lubrication and tension
	22	Support pin of oil cylinder	Looseness and damage
	23	Fork carriage	Adjustment, lubrication, crack and deformation
	24	Forks	Crack and deformation
	25	Roller of fork carriage	Adjustment and lubrication
	26	Mast roller	Adjustment and lubrication
	27	Inner and outer masts	Sway
	28	Lifting cylinder	Oil leakage
	29	Tilting cylinder	Oil leakage
	30	Multi-way valve	Function and oil leakage
	31	Hydraulic oil tank	Oil quantity and leakage
	32	High pressure Hose	Oil leakage and deformation
	33	Overhead guard, load backrest	Damage, crack and deformation
	34	Brake lever	Lubrication and movement
	35	Parking brake lever and movable points	Adjustment and lubrication
	36	Bolt and nut	Looseness
	37	Hydraulic power steering	Function

5. Maintenance per 3 Months (600 h)

Repeat the monthly maintenance while performing the maintenance per 3 months. If it is necessary to adjust and replace parts, contact with the service personnel of our Company.

Checking points	Checking content
Contactor	Polish the rough contacts of contactor with sand paper.
	Replace the contact if it is seriously worn.
Motor	Wear of carbon brushes

6. Semiannual Maintenance (1,200 h)

Repeat the maintenance per 3 months while performing the semiannual maintenance. If it is necessary to adjust and replace parts, contact with the service personnel of our Company.

Checking points	Checking content
Contactor	Replace the contact if it is seriously worn.
Motor	Wear of carbon brushes
Front axle	Replacement of gear oil
Hydraulic oil	Replacement of hydraulic oil
Oil filter	Cleaning of oil filter.
Brake oil	Replacement of brake oil

NOTE

- Check of carbon brush: Raise up the spring and then pull out the carbon brush to check if the wear condition of rectifier surface exceeds the wear limit.

Model	Application	Thickness	Wear Limit	Q'ty
CPD10-CPD30	Traction motor	28 mm	15 mm	8
	Lifting motor	28 mm	15 mm	8
	Steering motor	22 mm	12 mm	8

Notes

V. Others

1. Lubrication Points and Recommended Lubrication Oil

(1) Lubrication points

○: Replace

FO: Hydraulic oil

○: Add

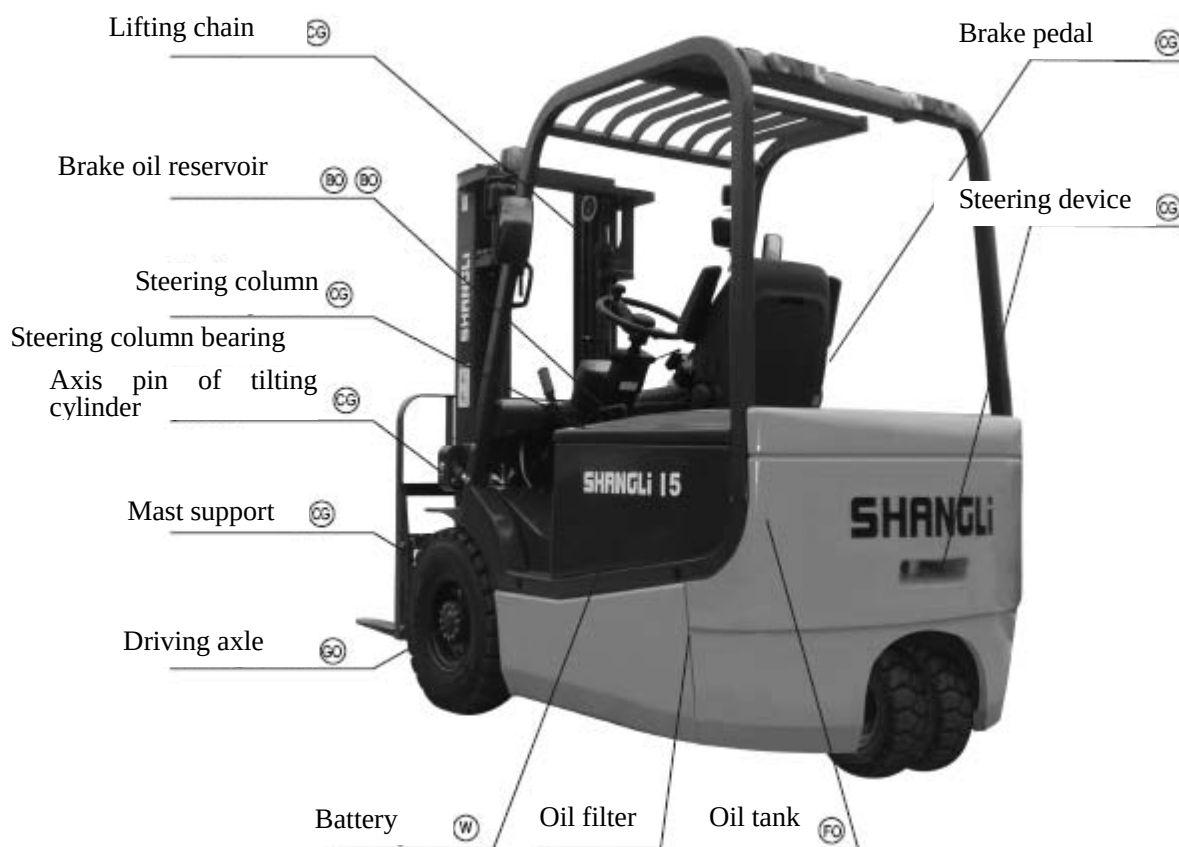
GO: Gear oil

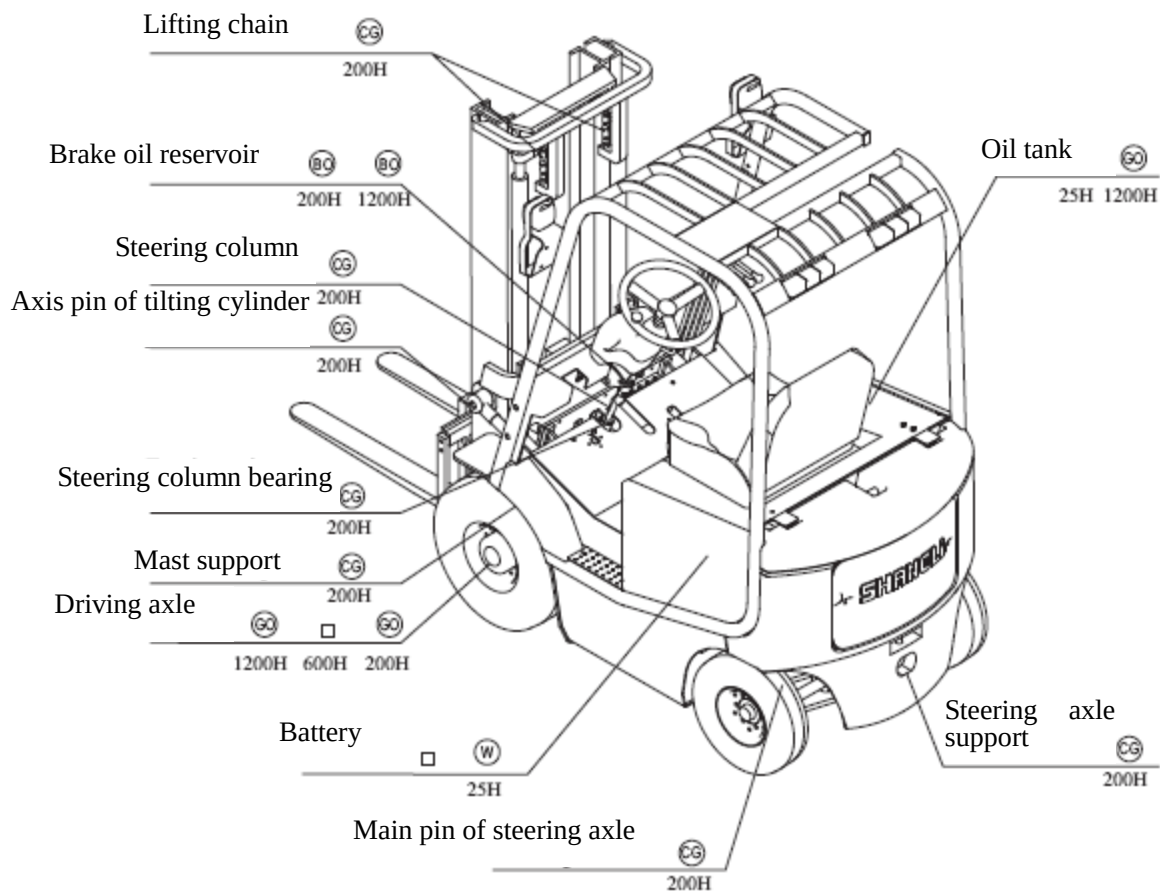
□: Check and adjust

CG: Chassis grease

BO: Brake oil

W: Pure water





(2) Recommended lubrication oil

Industrial oil	Shell	ESSO	Mobil	Domestic brands
Hydraulic system	Tellus oils 32	Poweerlex 32	Hydraulic oil 28	N32
Gear oil	Spirax Ep90	ESSO gear oil GP-90	Mobil BX-80	85W/90
Grease	Alvania Grease2 Retinax A			3# lithium base grease (dropping point: 170)
Brake fluid	Shell brake fluid H.D.	ESSO Fluid H. brake fluid H.D.400	Mobil brake fluid (SAI70RI)	4604 synthetic brake fluid

2. Guidance for Part Replacement

(1) Replacement of fuses

⚠ CAUTION

- Disconnect the battery plug.

	Replacement steps
Fuse	Loosen the mounting nut and remove the fuse.
Fuse tube	Loosen the transparent shroud and remove the fuse.
Securely tighten the mounting nut, or else it may cause poor contact and failures.	

⚠CAUTION

- Be sure to use the specified fuse.
 - a) 400 A fuse (for traction motor)
 - b) 400 A fuse (for lifting motor)
 - c) 50 A Fuse (for steering motor)
 - d) 10 ~ 15 A fuse (for control circuit)



SHANGHAI SHAGNLI FORKLIFT CO., LTD.

Address: No.2611, Bao'an Highway, Shanghai, China

Tel: 0086-21-69156666

Fax: 0086-21-69156000

Postal Code: 201801

Website: <http://www.salcn.com>