

**HELI**

**OPERATION &  
MAINTENANCE MANUAL**



**G Series Counterbalanced Type  
Forklift Truck with Engine**

**5-10t**

S102-12-2020

# Foreword

## 1.1 Application Scope and Instruction on the Manual

- The manual contains the following contents: proper operation, easy maintenance and daily check;
- Before operation, please read the manual thoroughly to guarantee safe and effective material handling through proper operation and maintenance;
- Actual condition may be different from the description in the manual because of product improvement;
- The manual should be attached to the truck when lending or transferring the truck;
- If there is any question, please consult with the sales department of our company;
- Instructions with  or  mark are very important to your and others safety, Please keep to them.

The OPERATION & MAINTENANCE MANUAL is delivered to you along with the truck. If there is no manual, please contact with local agent or dealer.

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## 1.2 Safety signal, expression and mark

### 1.2.1

It indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. You must observe this instruction.



**DANGER**

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### 1.2.2

It indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. You must observe this instruction.



**WARNING**

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### 1.2.3

It indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. You must observe this instruction.



**CAUTION**

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### 1.2.4

It indicates a statement of directly or indirectly related to the safety of personal and maintenance of the truck.



**NOTE**

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## 1.3 Applied model

The manual is suitable for the following models:

- CPCD50/60/70/85/100-WX3G assembled with XiChai CA6110 /125-HL30 engine (meeting China II emission standard)
- CPCD50/60/70/85/100-P1G assembled with Perkins 1104D-44TA engine (meeting Europe III and EPA Tier III emission standard)
- CPCD50/60/70-CU3G assembled with Cummins QSB 4.5 engine (meeting Europe III and Tier III emission standard)
- CPCD85/100-CU1G assembled with Cummins QSB 4.5 engine (meeting Europe III and EPA Tier III emission standard)
- CPCD50/60/70-W2G assembled with Isuzu 6BG1QC engine
- CPCD85/100-W5G assembled with Isuzu 6BG1QC engine
- CPQD50/60/70-M1G assembled with Mitsubishi S6S-T engine (meeting Europe III and EPA Tier III emission standard)
- CP(Q)(Y)D50/60/70-TY1G assembled with non-certificated type GM4.3 electric control engine
- CPCD50/60/70/85/100-P3G assembled with Perkins 1204E-E44TA engine (meeting Europe III B and Tier 4i)
- CPCD50/60/70/85/100-WX6G assembled with Xichai 4DF3GG3 diesel engine (meeting China III emission standard)
- CPCD50/60/70/85/100-CU5G assembled with Cummins QSF3.8 engine (meeting China III and Europe III emission standard)
- CPCD50/60/70-DE1G assembled with Deutz TCD3.6 engine (meeting Europe IIIB and Tier 4F)
- CP(Q)(Y)D50/60/70-TY2G assembled with certificated type GM4.3 engine
- CPCD50/60/70/85/100-C14G assembled with Chaochai 6BG-332 engine (meeting China III)
- CPCD50/60/70/85/100-WX10G assembled with CA4DF3-12GCG3U engine and wet type brake axle (meeting China III)
- CPCD50/60/70/85/100-CU7G assembled with Cummins QSF3.8 engine (meeting Euro IV and Tier 4F)
- CPCD50/60/70/85/100-CU8G assembled with Cummins QSB4.5 engine (meeting Euro IIIB)
- CP(Q)YD50/60/70-PW1G assembled with Non-certificated type PSI4.3 electric control engine
- CP(Q)YD50/60/70-PW2G assembled with certificated type PSI4.3 electric control engine
- CPCD50/60/70/85/100-QCG assembled with Quanchai 4J1 engine
- CPCD50/60/70/85/100-QC3G assembled with Quanchai 6J1engine
- CPCD50/60/70-DE2G assembled with Deutz TCD 3.6 LQ4 engine (Euro V)
- CPCD50/60/70/85/100-YC1G assembled with Yuchai AQ5 engine (China III)
- CPCD50/60/70/85/100-YNTLG assembled with Yunnei YNF145 LPG truck

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## 1.4 Truck general view

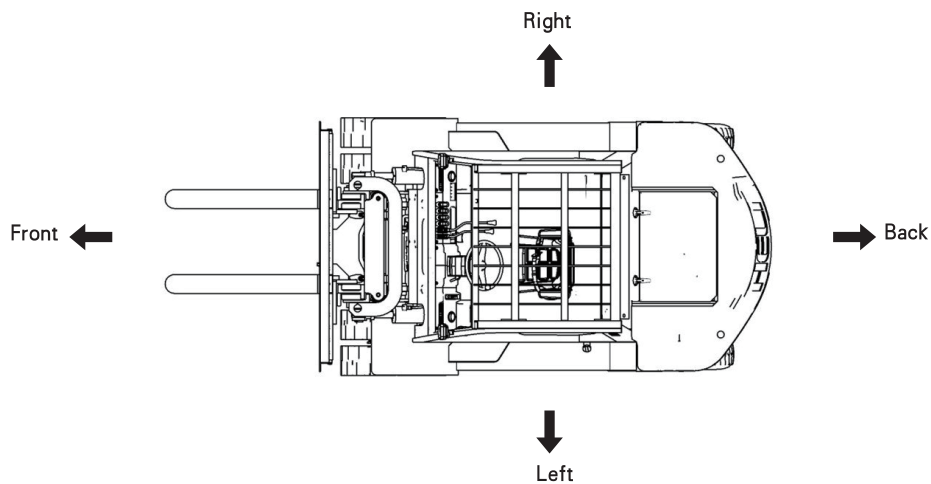
### 1.4.1 Truck application

It is mainly used for load carrying.

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### 1.4.2 Direction affirming

Direction in this manual is affirmed from the operator's seat.



## 1.5 Measuring unit

The measuring units used in the manual are international system units.

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## 1.6 Operation certification



The truck can only be operated by trained and authorized person, or serious injury or death may be caused.

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## 1.7 Notes on new truck usage

### 1.7.1 Running-in of new truck

Though the truck has experienced thoroughly adjust and test before delivery, the truck need moderate operation in the first month (200 hours) until all parts of the truck have full running-in time. If the new truck works at bad environment at very first, the service life of the truck will be shortened and the performance will experience bad impact.



Pay attention to the following when the truck is run-in:

- Keep the engine running at idle speed for 5 minutes after the engine is started;
  - Do not operate the truck when the truck is heavy loaded or travelling with high speed;
  - The operation shall be smooth, avoiding emergency gear shifting, emergency braking, sharp turning and sudden acceleration;
  - During the running in period or after replacing the new brake friction plate, the friction plate shall be fully run in to achieve the best braking effect.
- 

### 1.7.2 Maintenance of the new truck

The new truck needs oil changing, oil filter cleaning and bolts and nuts retightening during the first month usage (200 hours). Heli vehicles are to be maintained by HELI dealers.

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## 1.8 Quality guarantee and maintenanc

### 1.8.1 Parts changing at regular time

Heli truck requires parts changing at regular time except for the legal rules. Parts which are important for safety will inescapably go bad if they exceed their service time, so whether the parts are damaged, change according to regulated time. Refer to CHECK AND MAINTENANCE TABLE for the key parts changing.

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### 1.8.2 Usage of HELI original parts and oil

Problems caused by the usage of non heli original parts (including oil) are not covered by our warranty.

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## 1.9 Basic information of the truck

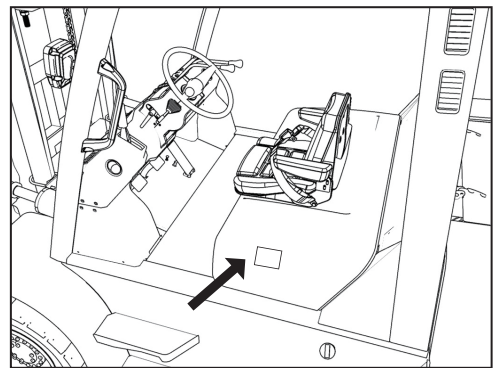
Please offer HELI dealer or agent the basic information of the truck such as model, truck number, engine series number, accessories, optional devices and so on when maintaining truck or ordering parts.



### 1.9.1 Truck basic information table (complete by HELI dealer or agent)

Model	
Truck number	
Engine series number	
Accessories, optional equipments	
Dealer/agent	
Address	
Telephone number, fax number	
Service person	
Sales person	

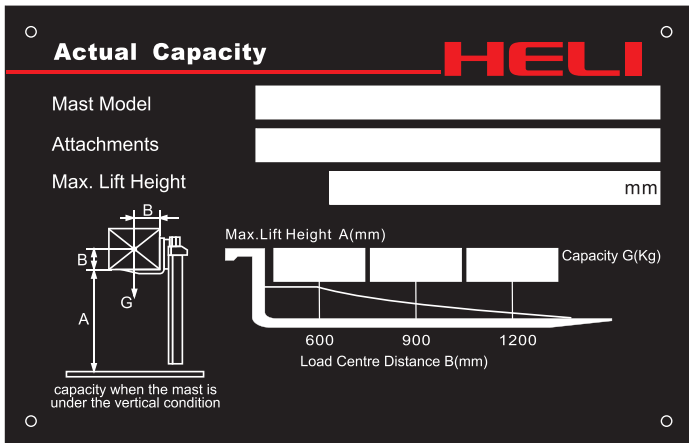
### 1.9.2 Displaying position of the truck model and number

The truck model and number is displayed on the truck plate which is on the left side of the engine hood.



○ COUNTERBALANCED FORKLIFT TRUCKS WITH ENGINE <b>HELI</b> ○		Model description		
Model	<input type="text"/>	Configuration No.	<input type="text"/>	Truck information
Rated Capacity	<input type="text"/>	Engine Power	<input type="text"/>	
Load Centre Distance	<input type="text"/>	Serial No.	<input type="text"/>	Brand information
Service Weight	<input type="text"/>	The Year of Construction	<input type="text"/>	
  ANHUI HELI CO., LTD. MADE IN CHINA				

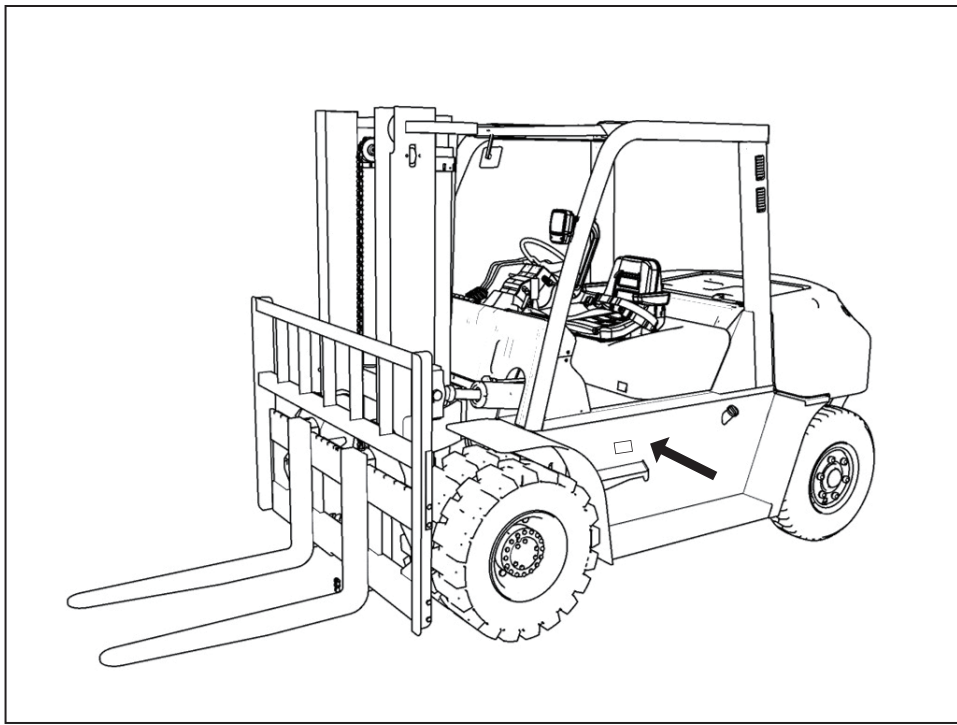
Model description shows the classification of industrial truck and manufacturer. Truck information includes truck type, rated lifting capacity, service weight (including oil and water, excluding fuel), serial number, and manufacture license number. The rated lifting capacity refers to the capacity of the truck with standard mast, standard fork and without any attachments at 600mm load center. Brand information includes manufacturer and whether the product meets Europe CE certification.



Mast information

Mast information consists the truck model assembled with the mast, mast type and height (M stands for two stage basic type mast, ZM standards for full-free two stage mast, ZSM stands for the full free three stage mast. The unit is cm.) Attachments consist types of side shifter, rotator, bale clamps and so on. Please refer to the attachments manual for more details such as model and function. Actual load capacity which is different from the rated lifting capacity stands for the capacity with attachments fixed. Because the service weight of the attachments and the moving forward of the load center, the capacity is lower than the rated capacity.

The truck number is also shown on the external plate of the truck. besides shown on the name plate.

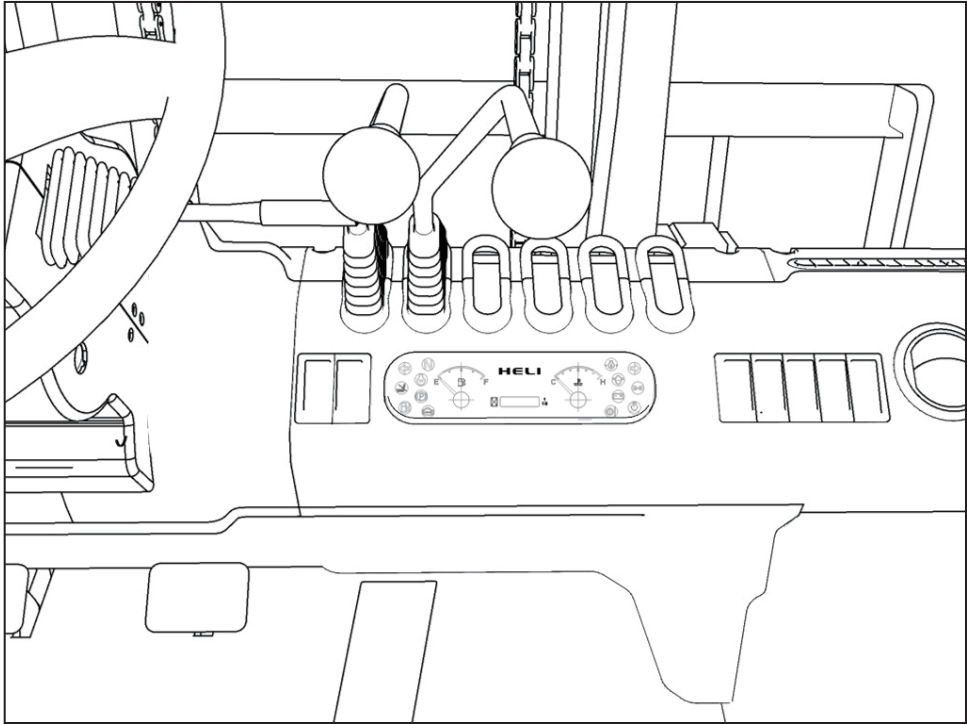




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### 1.9.3 Displaying position of the truck working hours

It is in the middle of the meter.



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# SAFETY NOTES



## WARNING

Please read the manual and safety notes carefully.

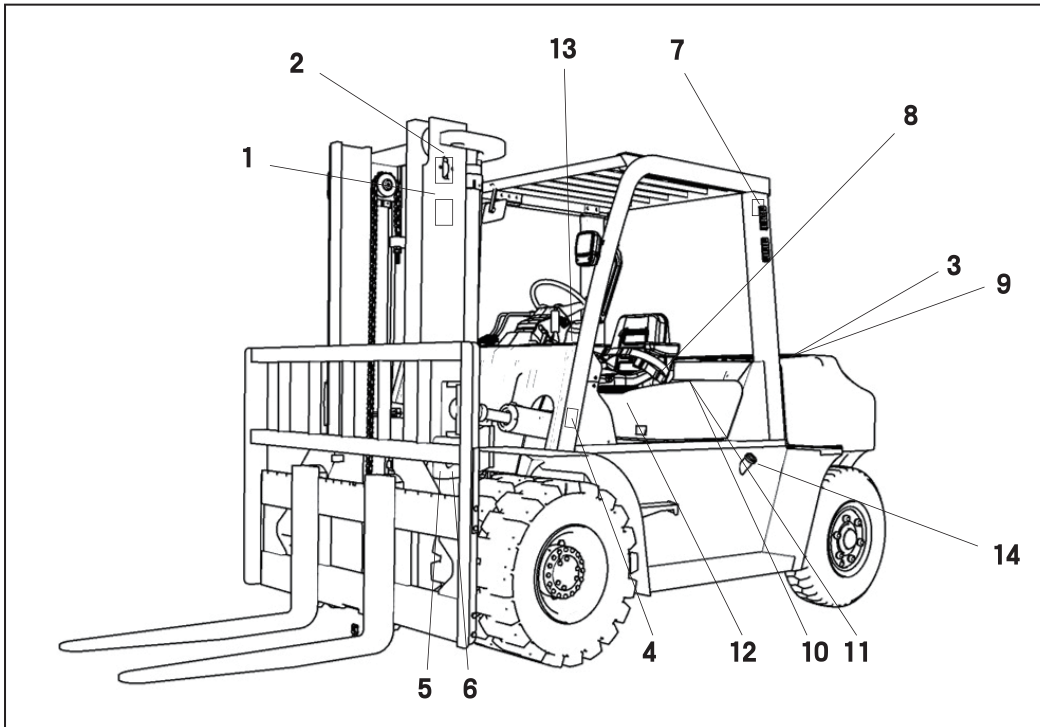
When operating the truck, please follow the safety notes or serious injuries may be caused.

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## 2.1 Description of the safety plates

### 2.1.1 Position of the safety plates



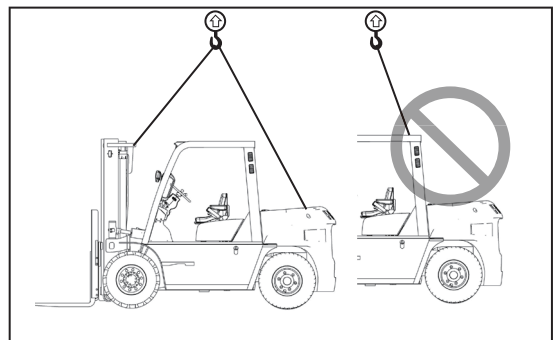
Safety plate		Position
1	Safety mark	The upside of the outer mast (both sides)
2	Truck slinging	The top of the outer mast (both sides)
3	Fan safety	The top of the radiator's wind cover
4	Tyre safety	The lower side of overhead guard front pillar
5	It is prohibited to enter the space between mast and frame	The rear side of the tilting mast pillar and top pillar (the middle cross beam of the external mast)
6	Mind your hands	The rear side of the tilting mast pillar and top pillar (the middle cross beam of the external mast)
7	No flushing water	The upside of the overhead guard left rear pillar
8	Safety belt	The side of the seat armrest
9	Aluminum radiator warning plate	On radiator's cover
10	Usage note	left side of the engine hood surface
11	Check points before starting	left side of the engine hood surface
12	Gas spring safety lock	Left front side of the engine hood
13	Battery usage notes	Right side of the engine hood surface
14	Fuel adding instruction for truck with P3G engine	next to the fuel adding port ( only for the Perkins 1204E-E44TA engine)

## 2.1.2 Safety plates

- (1) It is prohibited to stay at the area above or below the fork.
  - Do not enter the area below the fork.
  - Do not stay on the fork.



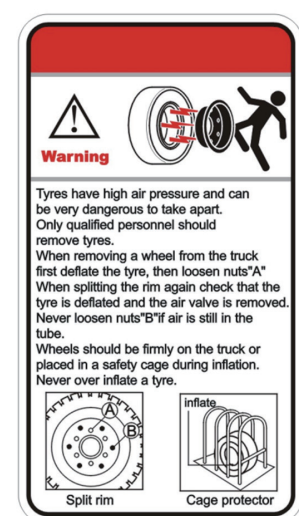
- (2) Notes when slinging
  - Never sling the truck at the overhead guard.
  - Sling the truck at the designed position shown in the figure.



- (3) Be care of cut
  - Keep your hand away from the working fan.



- (4) Tyre safety
  - Before assembling and disassembling, please read the tyre safety plate carefully.
  - The tyre pressure should not exceed the regulated value.



- (5) It is prohibited to enter the space between mast and frame.
- It is prohibited to enter the space between mast and frame.



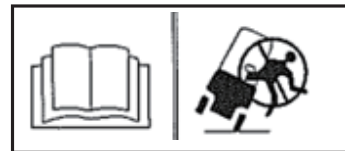
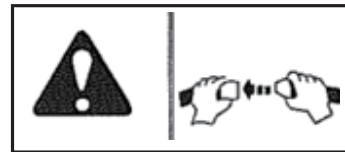
- (6) Caution: mind your hands
- Do not put your hands where may be caught.



- (7) Truck washing note
- Do not flush the electric parts such as electric cabinet, meters, sensors, connectors and so on.
- It is prohibited to flush the air intake cover on the overhead guard.



- (8) Take care of truck tipping over
- Before operation:
  1. Wear safety belt when operating;
  2. Be sure to read and understand what is said in OPERATION AND MAINTENANCE MANUAL;
- If there is a possibility of tipping over during operation
  1. Do not jump off the truck;
  2. Body incline opposite the truck tipping over direction;
  3. Grasp the steering wheel tightly;
  4. Support your body with two feet.



- (9) Use the radiator with care
- Rotate the radiator cap slowly until the coolant is cool.
- Add designed anti-freeze liquid into Aluminum radiator. It is prohibited to add hard water such as tap water, river water and well water.





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■ (13) No jump starting

- Start the engine only when the operator sit well on the seat;
- Never try to make the engine starting circuit short circuit on purpose to start the engine, or serious injury or fire may be caused.



■ (14) Operate with proper posture (only hydraulic-powered transmission truck with OPS)

- If the truck is operated with such posture (the seat does not bear your whole weight, for example stand or lean against forward, backward or side when operating), the power will be cut for 3 seconds and in that case, the truck will not travel or operate.

It is very dangerous to operate like this when travelling on a slope. The truck will slide down even acceleration pedal is pressed because the power is cut. Accident such as collision or falling will occur.



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## 2.2 Protect against fire

### 2.2.1 Protect engine against fire

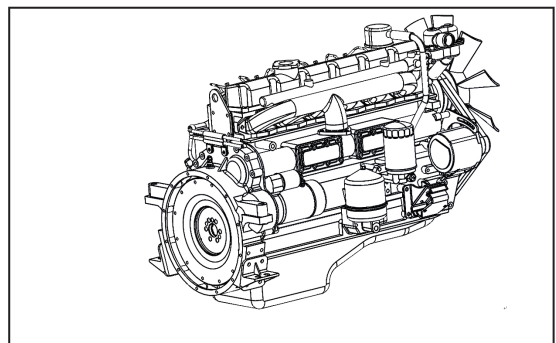
Before starting the engine, check the following parts: if the battery terminal is loose, fix it. And if there is dirt such as smudginess, leaf or paper, remove it.

If problems still exist, contact with HELI dealer for repair.

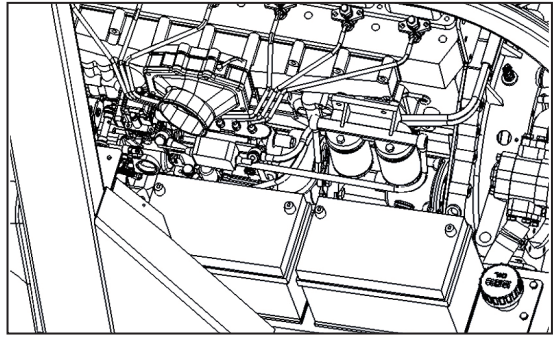
■ 1. Check around engine

- Check if there is any leaves or paper around engine;
- Check if there is engine oil or fuel leakage around engine;
- Check if the muffler and air exhaust pipe are well;

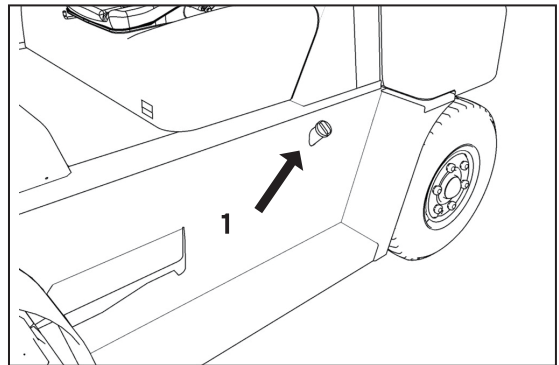
- Check if the wire and wire clamps are loose or damage.



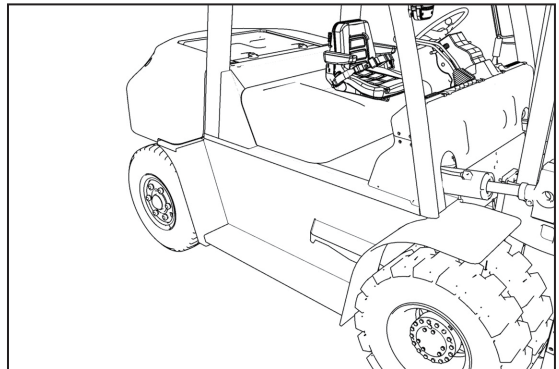
- 2. Check around the battery
  - Check if the battery terminal, contactors or wire clamps are loose or rust;
  - Check is there are leaves, paper or metal around battery;
  - Check if the cables or harness are damaged.



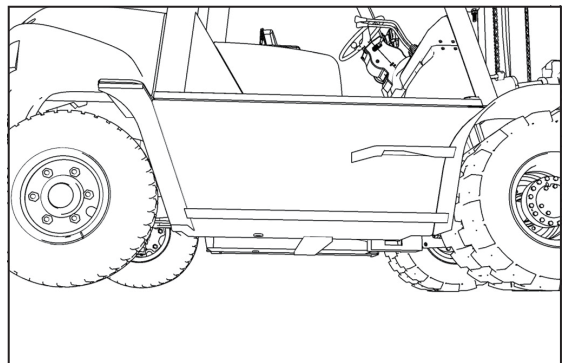
- 3. Check if oil or fuel leaks.
  - Check if the pipes or fuel tank (1 shown in the figure) leak;



- Check if there are leaves or paper around fuel tank or hydraulic oil tank;



- Check if there are dirt gathering under the truck chassis (engine or transmission system), especially the truck with floor board.



- 4. Check the inside of the driver's cab.
  - Check if there are cigarettes or other flammable things in the driver's cab.

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### **2.2.2 Protect against fire caused by fuel or oil**

- Keep the fuel, oil, hydraulic oil, cooling liquid and window washing solution which are flammable away from the open flame. Obey the following instruction in actual operation;
  - Do not smoke or keep the fire near the fuel, hydraulic oil, cooling liquid or wind washing solution and clothes sucked with these liquid;
  - Shut off the engine before fuel adding;
  - Do not go away when adding hydraulic oil or fuel;
  - Tighten the oil adding cap;
  - Do not let the fuel run out onto the hot surface or electric parts;
  - Keep the fuel and oil in well ventilated shaded place;
  - Keep the fuel and hydraulic oil in specified place away from people;
  - Remove the spilled fuel, hydraulic oil and grease after oil adding;
  - Keep the clothes sucked with oil and other flammable things in a safe container and store in a specified safe place;
  - When checking or maintaining the truck with devices and equipments, take care and protection measures of the fire caused by spark or flame.

Serious injuries or death will be caused if these safety measures are not obeyed.

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### **2.2.3 Protect against fire caused by adhered flammable things**

- Adhering or blocking of flammable thing around engine air exhausting manifold, muffler, air exhausting pipe, battery and inside of floor board will cause fire. Remove these flammable things.
- 

### **2.2.4 Protect against fire caused by wire fault**

- Fire will be caused by short circuit of wire.
    - Clean all wire contactors and fix them;
    - Check if the harness is loose, worn or damaged daily. Tighten the loose contactor and wire clamp. The damaged harness must be repaired or changed by HELI dealer.
- 

### **2.2.5 Protect against fire caused by oil pipe fault**

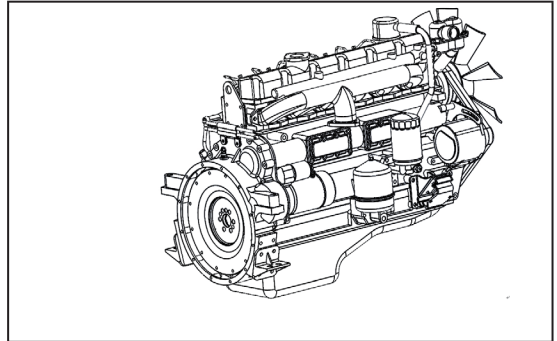
- Be sure the snap clip, guard board and cushion pad are proper fixed. Loose pipe or hose may be damaged because of vibration or friction with other parts when operated and fire or injury may be caused by ejection of high pressure liquid.

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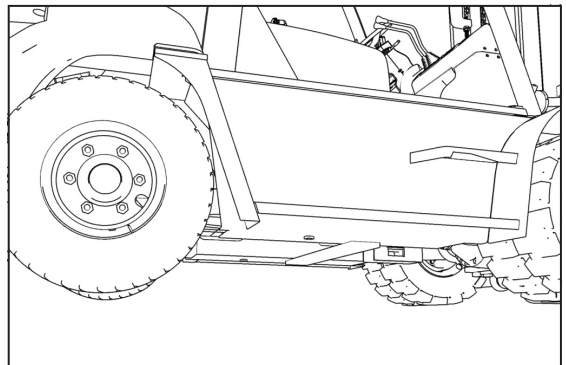
## 2.2.6 Cleaning after operation

- Remove the dirt, leaves or paper with fan after operation.

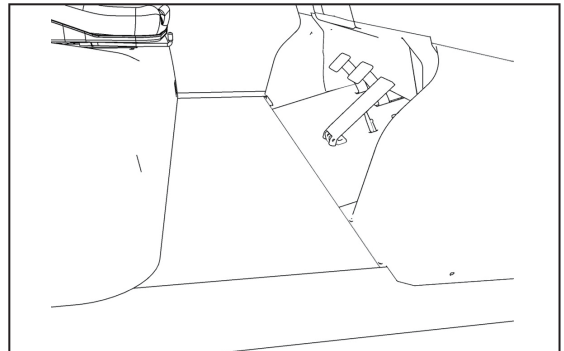
- Around engine  
Clean around air exhausting manifold.



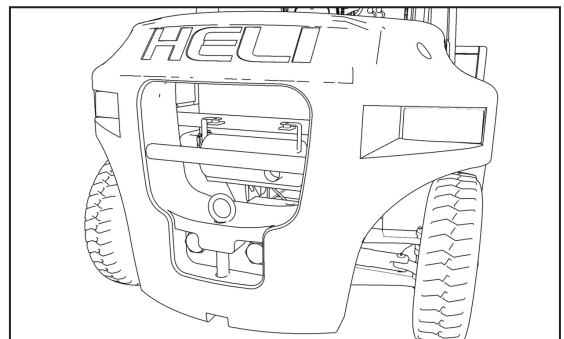
- The bottom of the chassis  
Lay emphasis on the truck with bottom plate where dirt is easy to gather.



- Floor board



- Around the muffler





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## 2.2.7 If fire occurs

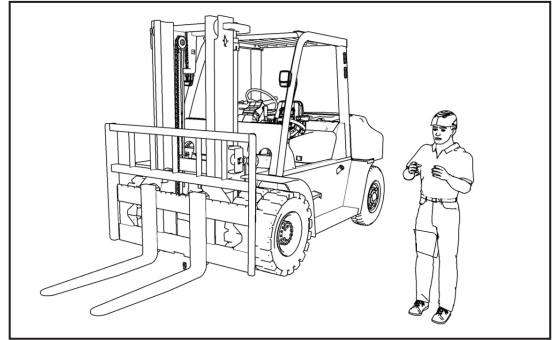
- If fire occurs, turn the starting switch to OFF position to shut off engine.
- Do not jump off the truck in a hurry. Support yourself with handle and pedal in order to leave safely.

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## 2.3 Basic notes

### 2.3.1 Follow the rules

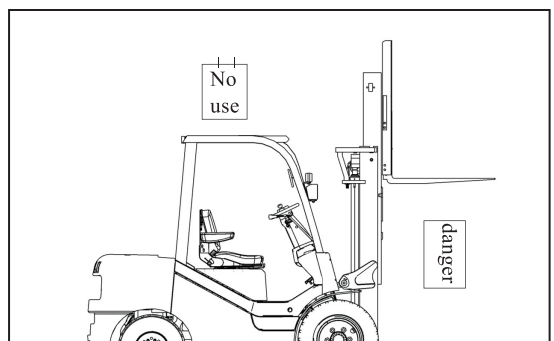
- Only trained and authorized person can operate the truck.
- Fully understand and obey the OPERATION AND MAINTENANCE MANUAL.
- Do not operate the truck when you have tired, mix emotional problems, drugs or alcohol.
- Make a safety plan in advance.
- Before operation, make operation plan according to the working environment, truck type, truck capacity and road condition.
- Assign a towerman and operate according to his guide when travelling in a narrow place or loading or unloading big goods.
- The main responsibility during operation is safety. Ensure the safety of yourself, truck, place around working and other property in the working area.



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### 2.3.2 Do not operate fault truck.

- If there is any abnormal during check or operation (such as noise, vibration, smell, smoking, miss-working of alarming device and meter), report it to manager and take proper measures.
- Do not operate the truck until it is repaired.
- Remove the key from the fault truck and place a mark in the cab avoiding miss-using.
- If the truck with the fork lifted has to be stopped because of fault, place a mark on the fork and take measures preventing touch by pedestrian and truck.
- Place the truck where no person or truck will pass by avoiding person going under the fork.



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### 2.3.3 Proper wearing when operation

- Do not wear loose clothes and fittings. It is very dangerous if it is caught by control lever or other protrusions.
- Do up long hair or it may be caught by rotating parts.
- Wear safety cap and shoes. Wear equipments fits working condition or requirements.
- Before operation, check if the safety equipments are well.



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### 2.3.4 Fire extinguisher and first-aid kit

- Be aware of the position of fire extinguisher and first aid kit and know how to use them in case of fire or injury.



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### 2.3.5 Note on the safety devices

- Check if the protection cover, shield and back mirror are proper fixed.
- Make sure you know the usage of safety devices fully.
- Do not disassemble the safety devices and make sure they are in good condition.
- If there is damage or loose of overhead guard or backrest, do not operate the truck until HELI dealer or agent fix it well.

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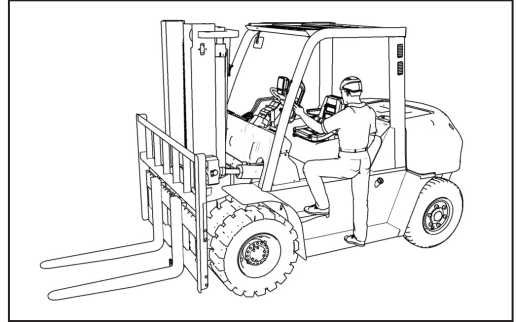
### 2.3.6 Practice before operation

- Before operation, learn with enough time until all parts are familiar.
- Take care when driving even you are familiar with the truck or injuries or damage may occur.
- Truck even in same model has its own character in brake, accelerator and load handing device and so on. Before operation, be familiar with the truck if you change a new one. Take care when braking .

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### 2.3.7 It is prohibited to jump on and off the truck

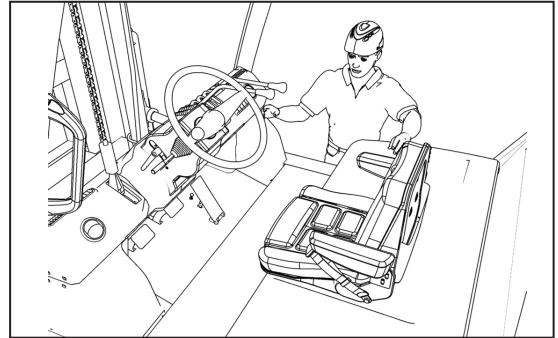
- It is prohibited to jump on and off the truck.
- Do not jump onto the truck to try to stop it when it moves accidentally without any operation.
- Get on or off the truck from the left side.
- Support yourself at least in three points with hand and foot when getting on or off the truck. Step on the step, grasp the handle with left hand and grip the seat back or seat when getting on and off.
- Do not grasp control lever and steering wheel when getting on or off the truck.



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### 2.3.8 Keep the driver's cab clean and tidy

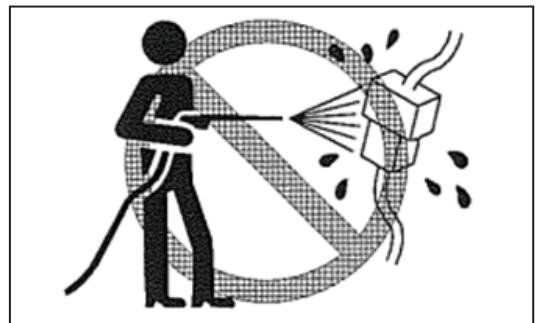
- Keep the driver's cab and area such as handle, step and floor board clean and tidy. Oil, mud, dust adhering around driver's cab or parts scattering around may cause slipping or fabric caught in which will cause accidental falling or mis-operation.



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### 2.3.9 Notes when flushing truck

- Do not flush the electric parts (controller, sensor, contactor, instrument, starter, generator and so on) or fault may occur. Do not flush the truck with high pressure washer (steam washer).
- It is prohibited to flush the electric controlled engine to avoid ECU short circuit because of water entering.



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### 2.3.10 Beware of scalding

■ Cooling liquid with high temperature

- The cooling liquid has high temperature if the truck is just stop. There is a danger of scalding caused by the ejecting of steam or boiling water if the radiator cap is removed at once. Remove the radiator cap slowly after the cooling liquid is cool.



■ Parts and oil with high temperature

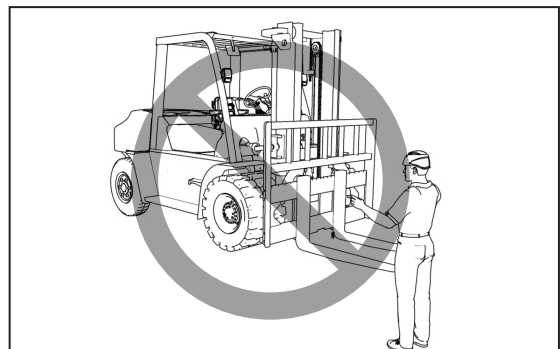
- Check and maintain the truck until it is cool in order to preventing scalding by oil ejecting from the high temperature parts.



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### 2.3.11 Do not modify the truck.

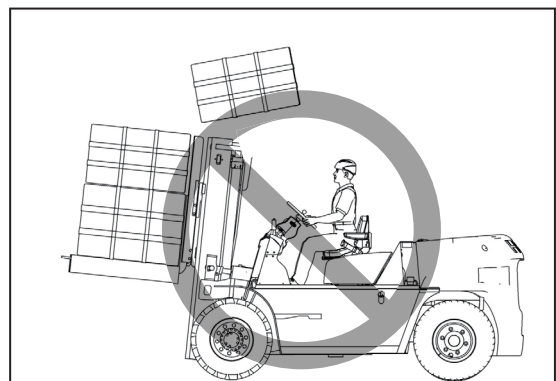
- Contact with HELI sales and service agent before carrying out any modification (fix, disassembly and change) on the truck, accessories, optional parts because accidents or illegal occasion may happen.
- We are not responsible for any injuries, damages and accidents caused by unauthorized modify by HELI.



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### 2.3.12 Do not disassemble overhead guard and backrest.

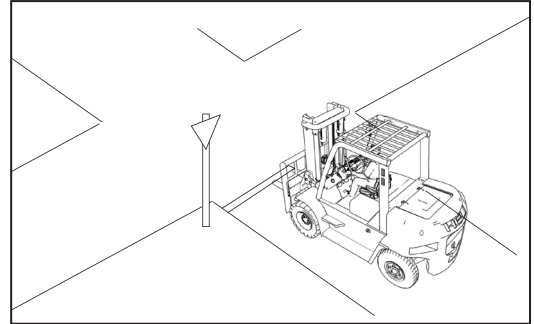
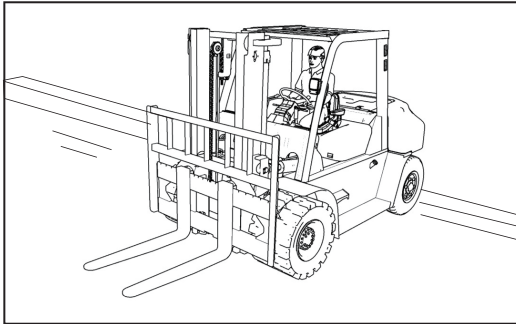
- The overhead guard and backrest are used to protect operators against harm from falling goods. Do not disassemble overhead guard and backrest.
- The overhead guard is made according to the safety standard, but it may not satisfy any occasion. Beware of the harm caused by the falling goods.



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### 2.3.13 Ensure the working area safety

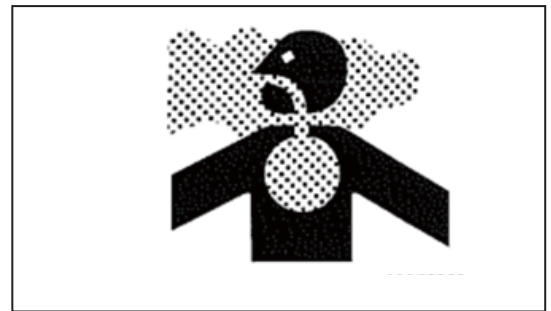
- Ensure the flatness of the road and working area and clean the oil and grease on the working area avoiding injury caused by bump and slip.
- When working in place that has a danger of falling such as dock, platform and so on, place blocks avoiding truck travelling surpassing boarder.
- Place a warning in dangerous place in working area to warn the drivers stay away.
- Plates such as limit speed, temporary parking line and no entering of other vehicles and pedestrian should be marked in the working area.



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### 2.3.14 Beware of the engine exhausting

- The engine exhausting has carbon monoxide which is poison. Do not make the engine run all the time in poor ventilated place. Open the door and window to keep good ventilation.



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### 2.3.15 Note on window washing solution

- Do not use window washing solution with carbinol which is harmful for eye, but use washing solution with alcohol.

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### 2.3.16 No welding

- If it electric controlled engine, it is prohibited to carry out welding work on the truck. If it has to, weld after dismount the ECU.
- All parts of the fork are not allowed to be welded. If welding is required, it must be carried out according to the specified welding process.

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## 2.4 Before operation

### 2.4.1 Starting check

Carry out starting check every day in order to ensure truck safe operation. Refer to “check and maintenance” for the detailed check item.

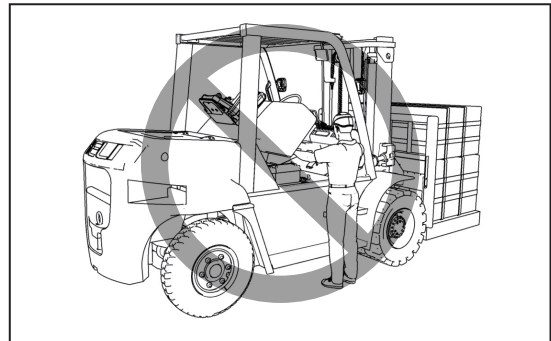
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### 2.4.2 Check and adjust before starting

- Check the following item before starting
- Check the lever of cooling liquid, fuel and engine oil. Check if air cleaner is blocked.
- Adjust seat (seat position, back angle), steering wheel and back mirror. Make sure all lock devices are locked.

- Note when starting engine
- Before starting, check if the parking brake is applied and forward/backward operation levers are in neutral position;
- Before starting, sound the horn to warn around;

When starting, check if it is safe around and sit on driver’s seat;  
Never try to make the engine starting circuit short circuit on purpose to start the engine, or serious injury or fire may be caused. Do not start the engine through pushing the truck;



- Notes in cold weather
- Make the engine warm completely in cold weather, or the truck may move slowly or change direction suddenly which may cause accident.



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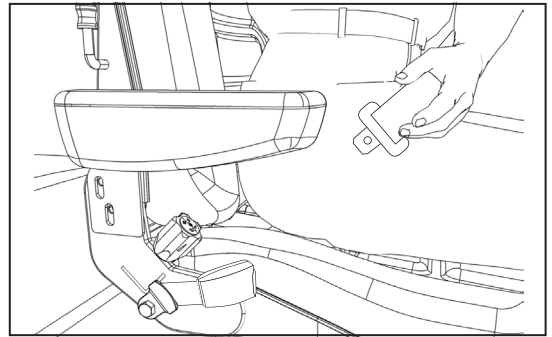
### 2.4.3 Starting check

- Check the working condition of the meter especially the alarm light;
- When the key switch is turned on, the indicators on meter light on and after 3 seconds, the indicators are on or off according to actual signal.
- Make sure the operator presence sensing system work well;
- If there is any abnormal such as noise, vibration, heating, smell, improper pointing of meter, engine oil or fuel leakage, be sure to remove the faults before operation.

## 2.5 Travelling

### 2.5.1 Preparation before travelling

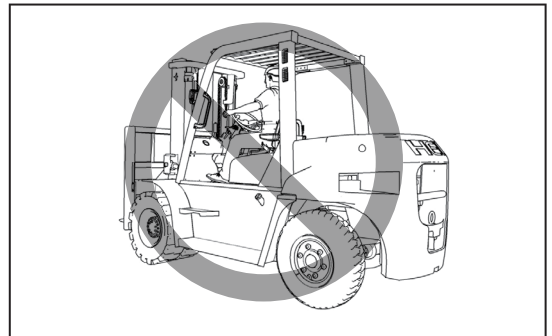
- Wear safety belt
  - Wear safety belt before operation;
  - Check if the safety belt is well;
  - Injury may occur if safety belt is improper fixed.



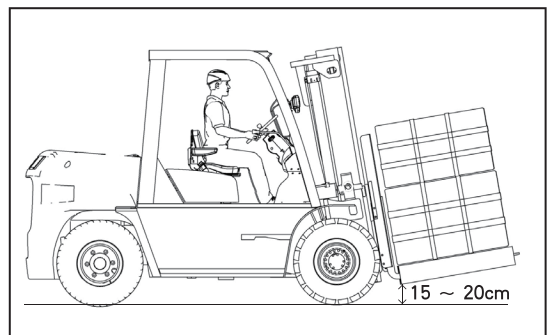
- Proper seat figure
  - If you operate the truck with improper seat figure or away from the seat, accident may occur.



- Standard operation figure
  - Do not put your hand and foot outside the overhead guard;
  - Keep your body under the overhead guard all the time.



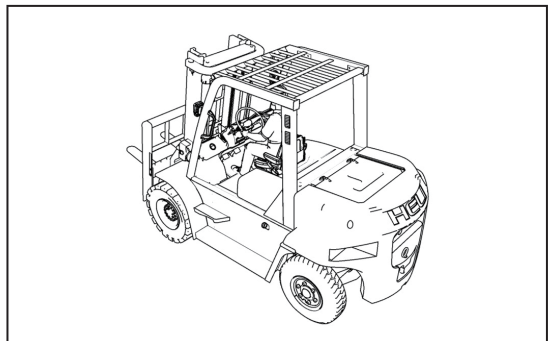
- Take care of the safety around before travelling;
  - Before travelling, check if there is any barrier around such as pedestrian, other vehicles or goods.
  - Lift the truck 15-20cm above and tilt back the mast;
  - Sound the horn if possible.



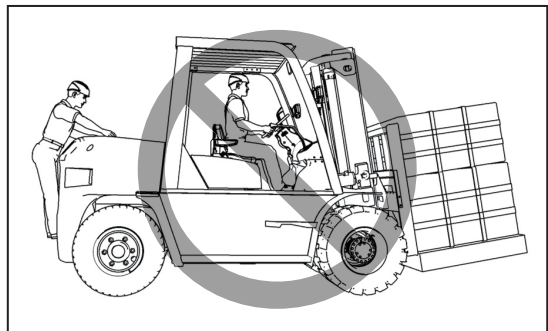
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## 2.5.2 Notes when travelling

- Avoid sudden start, stop and direction change;
- Stop truck before direction change;
  
- Keep safety in mind during travelling
  - Avoid sudden start, brake and sharp turning;
  - Keep the travelling road with good visibility;
  - Slow down and keep a safe distance with the passing truck when passing truck;
  - Comply with the regulated limit speed and keep a safe distance with the other truck;
  - Pay attention to the area around the truck especially the travelling direction or when steering;
  - Never try to overtake other trucks in narrow road or area with poor sight such as crossroad;
  - Stop to ensure the safety around and sound the horn if necessary when turning at crossroad or travelling into narrow road;
  - Even the horn is sounded, pay attention to the moving of people around;
  - Do not let people enter the working area;
  - Give way to the loaded truck on ramp or in narrow area.



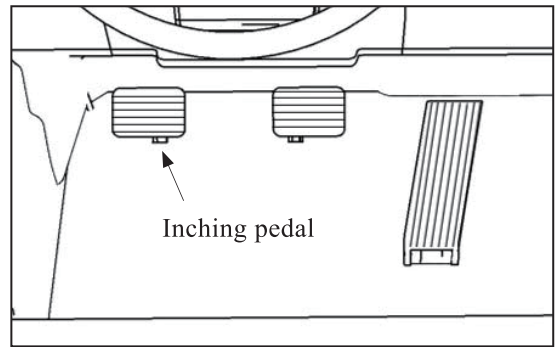
- Do not ride any people on the truck.
  - Do not ride any people on the truck at any case;
  - Do not ride people on the truck as a counter weight.



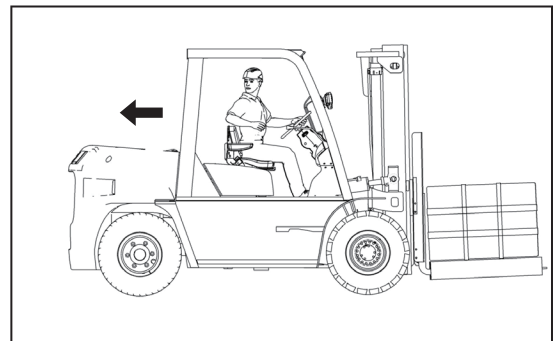
- Do not shut off the engine during travelling;
  - If starting key is turned to off position during travelling, the engine will flame out and danger or accident may occur.



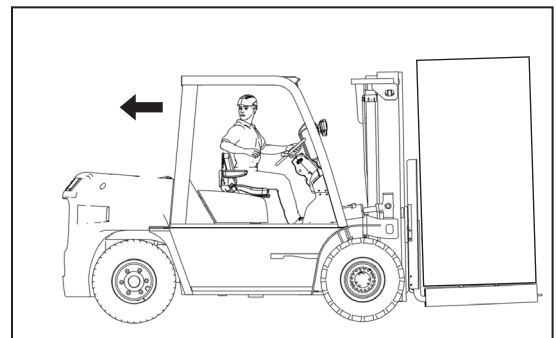
- Do not stay your foot on the inching pedal during travelling all the time.
- Keep foot away from the inching pedal during normal travelling or the clutch may worn out untimely and the transmission unit will be overheat.



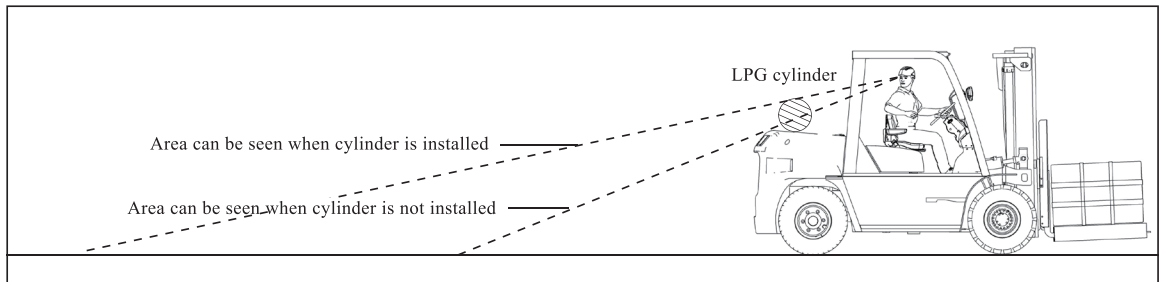
- Take care to control the reversing direction when travelling backward.
- When travelling backward, check the back area visually. Do not depend on the backview mirror which is just an auxiliary device only when travelling backward.
- Take care if there is anybody backward even the horn is sounded.



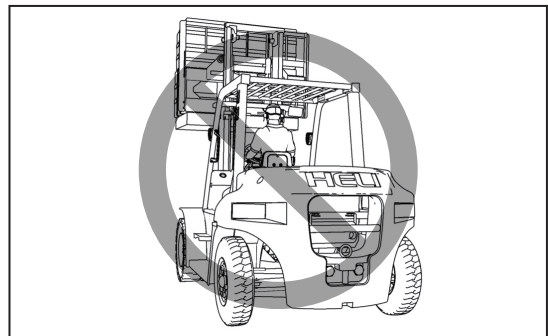
- Assign a towerman or travel backward when carrying a load with huge size.
- Assign a towerman or travel backward if the front view is cut off in order to ensure the safety around;



- Take care of the backview for the truck with LPG container.
- Keep in mind that the truck with LPG container has poor backview which has a danger of collision of people around or goods. So make sure to check the back view;

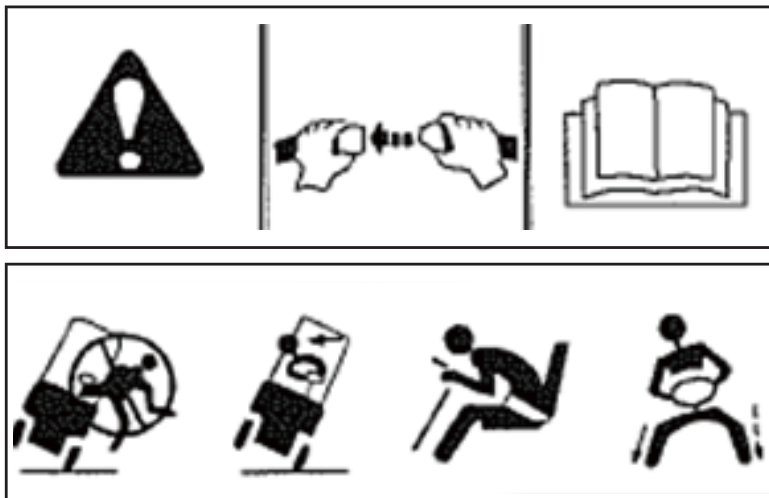


- Avoid travel with goods lifted.
- The center of gravity will be lifted if the goods is lifted. So the possibility of tipping over will be increased. Do not travel with goods lifted. Lift the goods 15~20cm above and tilt back the mast before travelling.

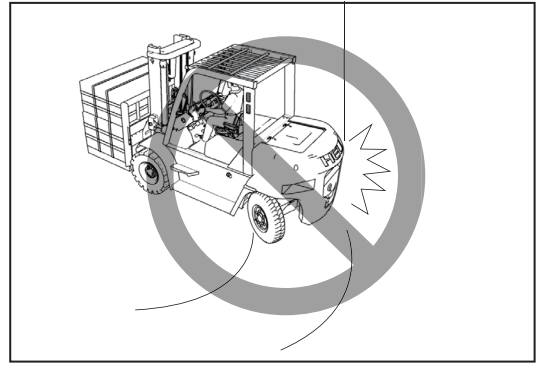


- Do not jump off the truck when the truck is tipping over.
- Wear safety belt in case of truck tipping over;
- Read the OPERATION AND MAINTENANCE MANUAL carefully and operate, check and maintain properly in order to avoid accident such as truck tipping over;
- Do not jump off the truck if the truck tips over or serious injury may be caused ;
- Body incline opposite the truck tipping over direction;
- Grasp the steering wheel tightly;
- Support your body with two feet.

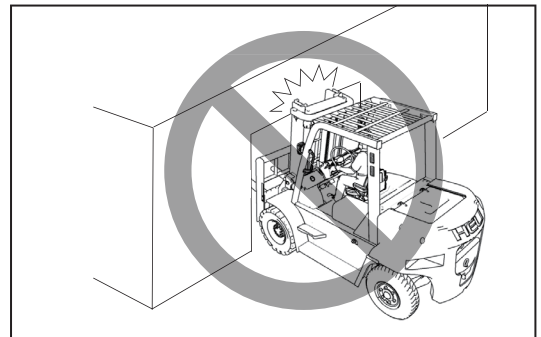
Practice the actions below and ensure you know how to do in case of emergency.



- Beware of the rear part rotation;
  - The steering wheel of the truck is its rear wheel which is different from the other kind of truck;
  - Keep a safe distance with the wall because the counter weight will rotate outside when steering.



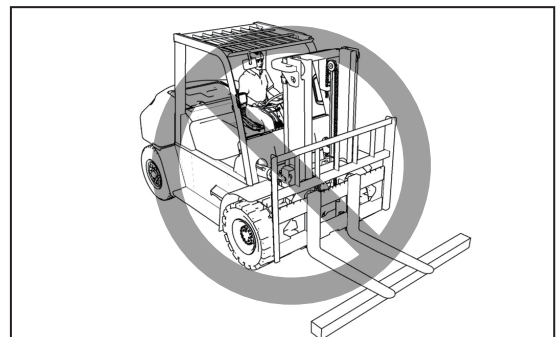
- Pay attention to the max. height and width of the truck
  - Make sure there is enough height and width when truck passing;
  - Keep a safe distance with mast, harness and pipeline;
  - Take care of the height of the mast and backrest when fork is lifted high.



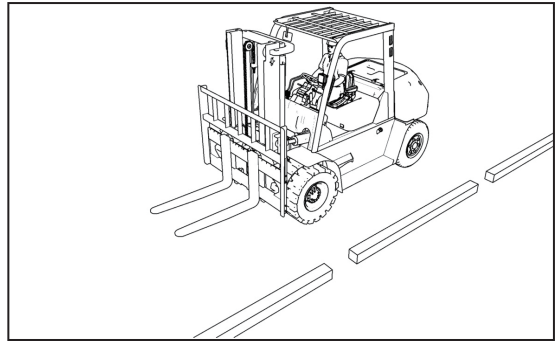
- Do not travel on uneven or slipping road.
  - Do not travel on uneven or soft road or serious accident will occur if steering is out of control or tyre is sunk into mud;
  - Avoid travel slipping road with water or oil, or you will lose control of braking and steering.

- Pay attention to the load weight limit.
  - Never overloaded when travelling on road with weight limit.

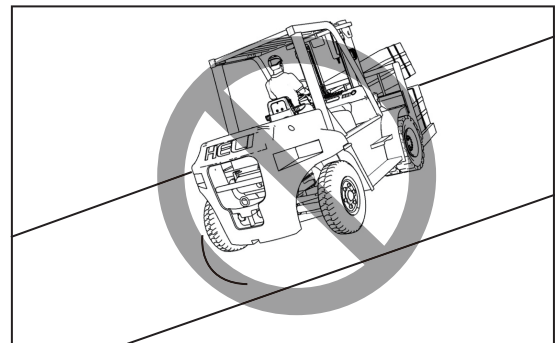
- Do not travel over the barriers directly.
  - Avoid sundries, road teeth, rail, open trench and other barriers and do not travel over them. The compact force will cause body harm.



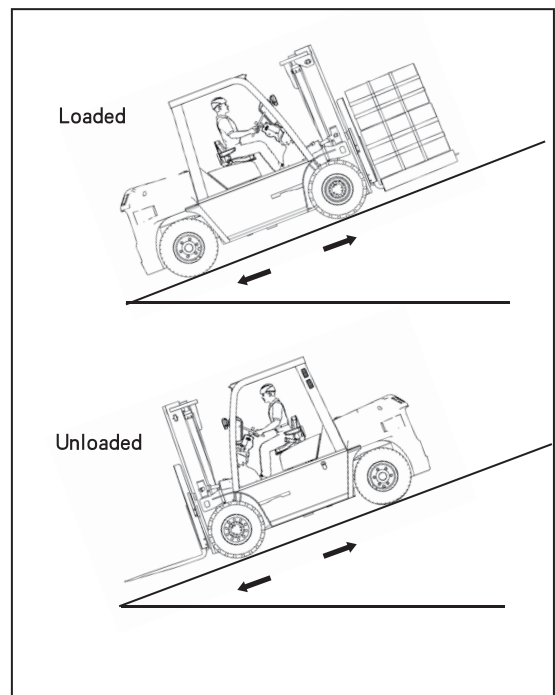
- Avoid travel on road shoulder.
- Do not travel close to the road shoulder which may sink.
- Keep a safe distance from the road shoulder or platform in preventing of truck falling.



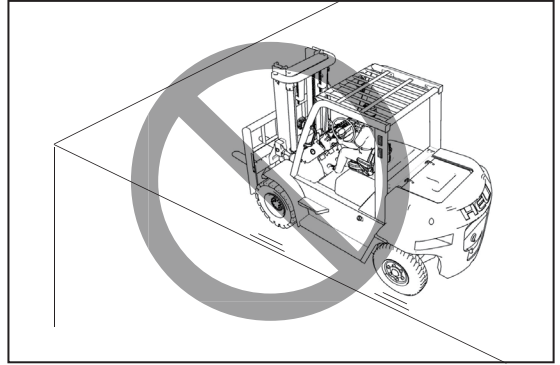
- Notes when travelling on a slope
- Do not make a sharp turn on the slope and take care of the distance from other truck, and departure angle avoiding danger.
- Before travel on a slope, stop the truck and adjust the distance between the fork and ground to keep the bottom of fork and pallet away from the ground, so as to avoid the fork top inserting to ground.



- Safe travel on a slope
- Loaded: travel forward when driving uphill; travel backward when driving downhill;
- Unloaded: travel backward when driving uphill; travel forward when driving downhill;
- Travel downhill slowly with engine brake;
- It is prohibited to move your hip away from the seat when travel up or down the slope if the hydraulic-powered truck is assembled with OPS device or the power will be cut and accident will occur.



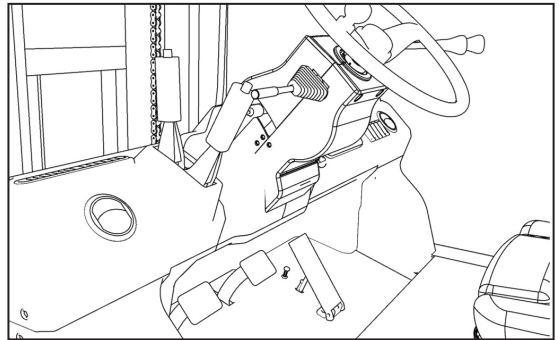
- Notes when travel into railway lorry or container
  - Check the brake and block applying to the lorry, trailer and container and make sure they are well stopped;
  - Do not move the vehicles before the load carrying operation is finished;
  - Make sure the board connecting to the vehicles can hold the travelling of forklift truck;
  - Board should be connected firmly between lorry and trailer;
  - Do not travel near the border of the platform or dock or the truck may fall down.



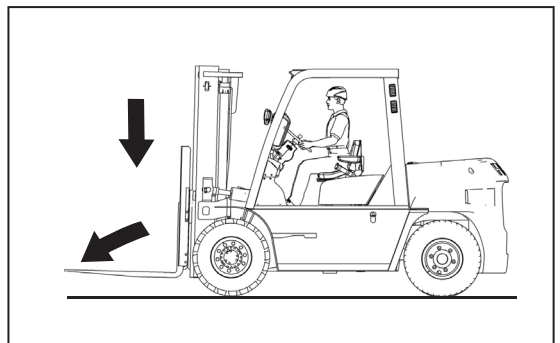
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### 2.5.3 Notes on truck stopping and parking

- Stop and park the truck according to proper procedures.
  - Park the truck on solid and flat ground;
  - Apply parking brake avoiding truck moving;
  - Place the gear shifting levers on neutral.
  - Tilt the mast and lower the fork to the ground;
  - Turn the starting switch to the OFF position;
  - Remove the starting switch key.



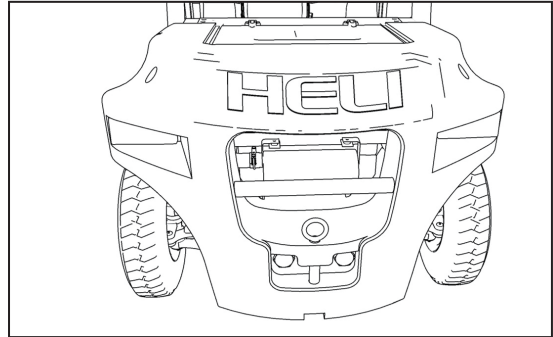
- Park the truck at a safe place.
  - Place the truck on solid and flat ground;
  - Park at the place that does not disturb any passersby or other trucks;
  - Do not park the truck on slope. If it has to, wedge the wheels.



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## 2.5.4 Notes on towing

- Proper using of traction pin
  - Traction pin is designed for the towing when it is sunk into channel or mud;
  - Do not use it for towing or lifting;
  - Use the traction pin as a fasten point when carrying by lorry.
  
- Do not tow damaged truck.
  - If there is any fault on the brake or steering system, do not tow with the other truck, or dangerous may occur.



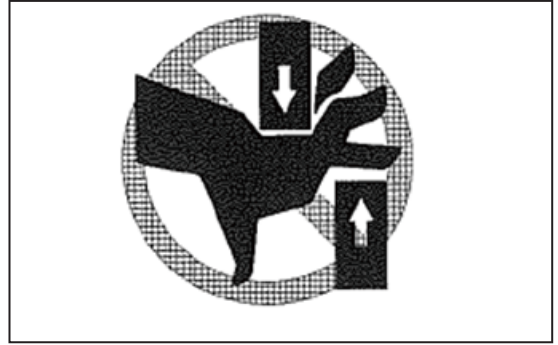
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## 2.6 Load carrying operation

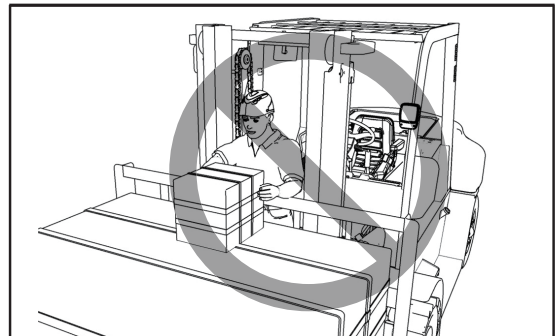
- People and trucks without permit should leave the working area except for the towman.
  - Let the unauthorized persons and trucks be away from the working area except towman when loading and unloading to avoid accidents.
  - Assign a towman if necessary to ensure sight and other safety reasons;
  - Do according to the towman if towman works together.
  
- Do not stay under the lifted fork.
  - Lifted fork may fall down accidentally which may damage people under the fork. So stay away from the lifted fork.
  
- It is prohibited to work on fork.
  - Do not place load manually directly onto the fork;
  - Do not unload the load manually directly from the fork;
  - Do not step on the fork to load or unload goods because goods may slid from the fork;
  - Do not support the goods with hand because the sudden moving may cause load falling onto people.



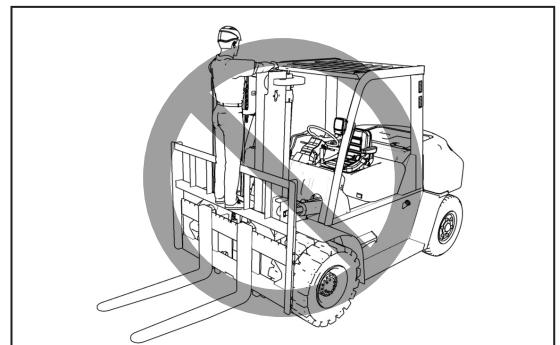
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- Take care not to be caught by mast.
  - Do not put hand, feet or other parts of your body into mast;
  - There is a danger of being caught by moving parts and serious injury.



- Do not stand between the mast and driver's cab because serious injury or death may be caused by extruding.
- Operate the mast and fork from the driver's cab.

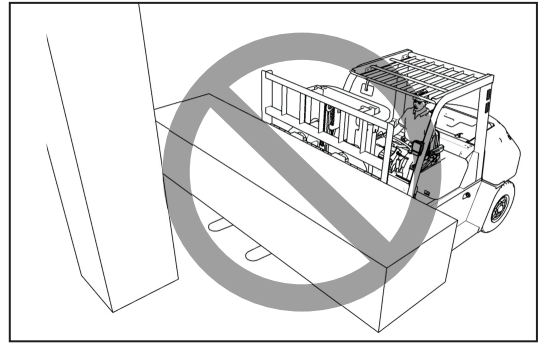


- Do not climb the mast or backrest.
- There is danger of being caught by moving parts or falling if you climb onto the mast or backrest.

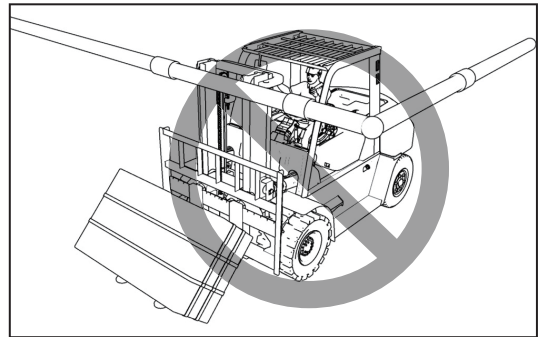


- Use the pallet with enough strength.
- Use pallets and sliding plates with strong structure. Do not use damaged one.
- Before travelling, check if the goods are placed on the pallet firmly and safety.

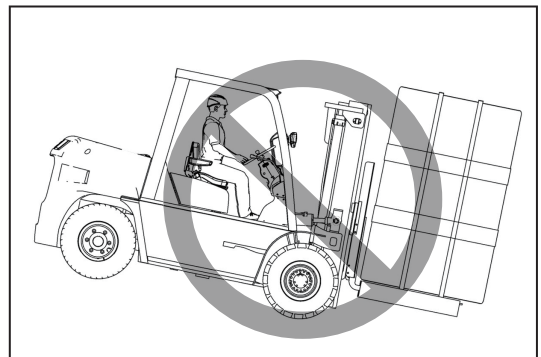
- Take care when carrying over long and over wide goods;
- Take care when carrying long and wide goods. Lift the goods slowly so as not to collide anything around;
- Keep the goods as low as possible and keep balance when changing direction.



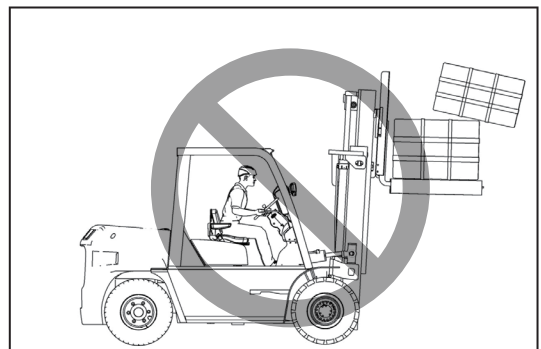
- Pay attention to the mast height
- The mast height will increase with the lifting of fork. Take care when carry out such operation;
- Take care not to touch electric wire, pipeline, water sprinkler, cross beam and so on. If there is any touch, goods on fork may fall.



- No over loading.
- The rear wheel will be away from the ground if the truck is over loaded and thus the truck will be out of balance. Do not exceed the max. capacity listed in the chart.

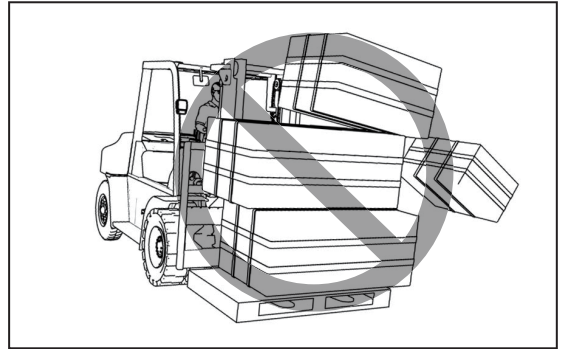


- Do not tilt the mast forward if there is load on the fork.
- Do not tilt the mast forward when the load is lifted, or the good may fall down and truck may tip over; Do not tilt forward when the mast is tilting forward.
- Do not travel with the mast tilt forward.

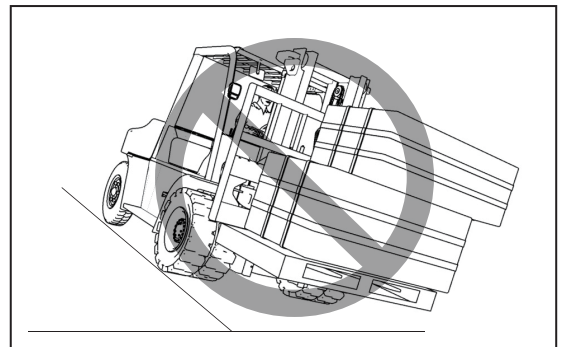




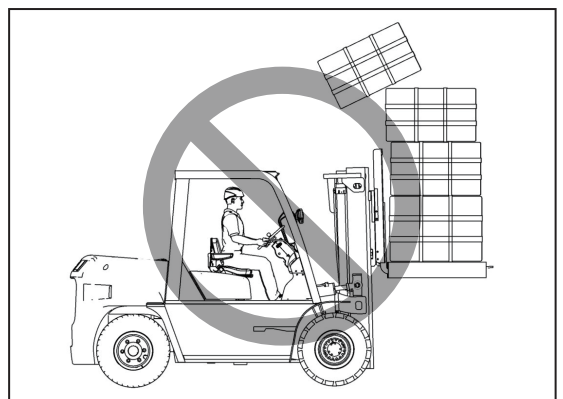
- Do not carry goods with insecurity measure.
- Make sure the goods' center of gravity is in the same line with the truck's center of gravity. Do not carry unbalanced goods;
- Fix the goods avoiding falling or collapse. Do not carry unstable goods;
- Keep the goods in touch with the backrest.



- Do not load and unload on a slope.
- The truck will be out of balance and tip over when loading and unloading on the slope.

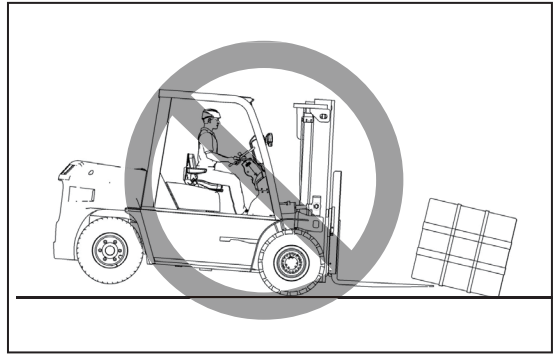


- Do not lower the loaded fork sharply.
- Do not operate fork carelessly or stop it suddenly. Sudden lowering may cause goods to sink or fall down and thus the truck will be out of balance and tip over.

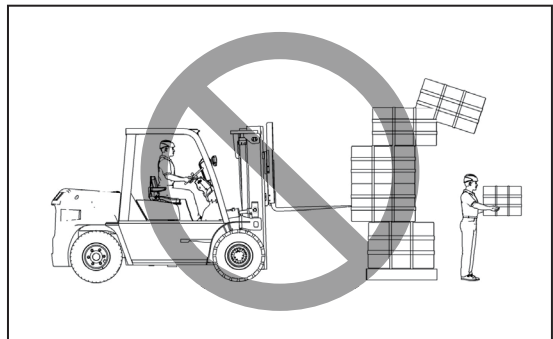


- Do not carry goods higher than the back rest.
- If the goods are higher than the backrest, there is a danger of goods falling onto driver. So never carry goods higher than the back rest.

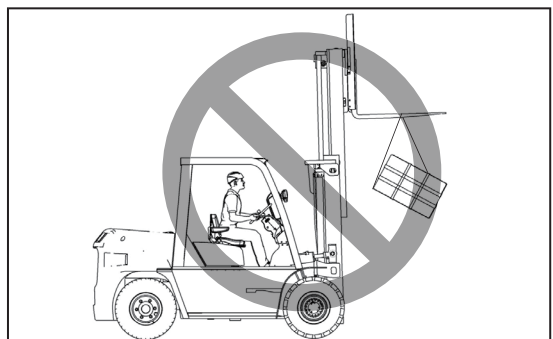
- Do not push goods by the tip of fork.
- Do not push goods by the tip of fork or the good may break away from the fork tip and be damaged. The reaction may cause the truck and goods to move accidentally and is dangerous.
- Do not lift the goods with the tip of the fork, or the truck or goods may shake.



- Do not push or pull goods by fork.
- There is a danger of goods damage or falling down.

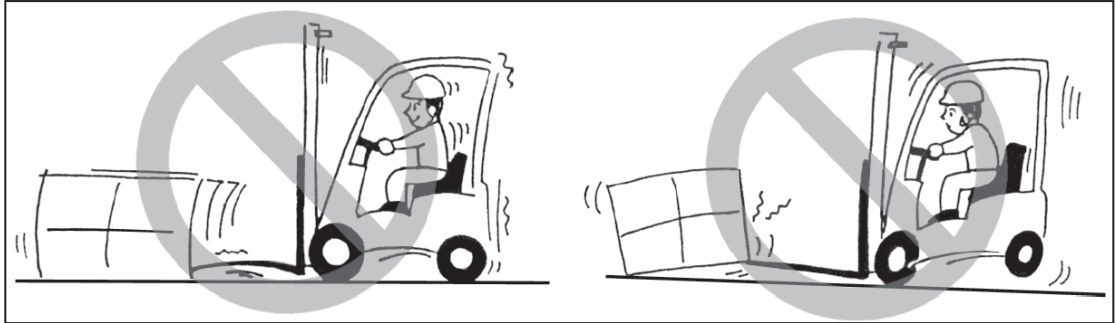


- Do not use the truck in other applications.
- Do not use the truck in other applications except carrying goods with forks and other attachments;
- Do not open or close the door of the wagon or warehouse;
- Do not push or pull other vehicles;
- Do not lift goods with rope. The rope hanged on the fork may slip, break away from the fork or be damaged. And meanwhile the truck may be out of balance because of the rotating of goods.



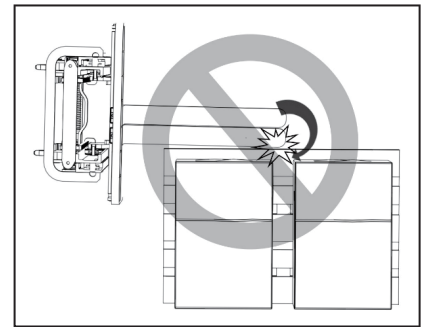
■ Prohibition of fork tip working

● Do not push a load or lift up by the tip of forks. When catch a load by the tip of forks, it can cause jumping up of the truck or a load and permanent deformation of forks.



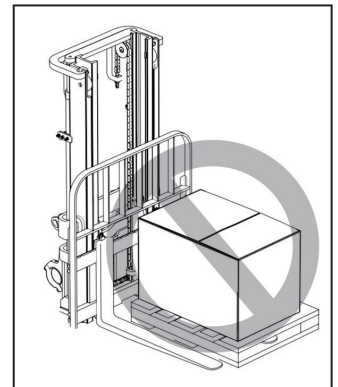
■ Prohibition of prod goods horizontally with forks

● Do not prod goods horizontally with forks or parts damage may be caused.



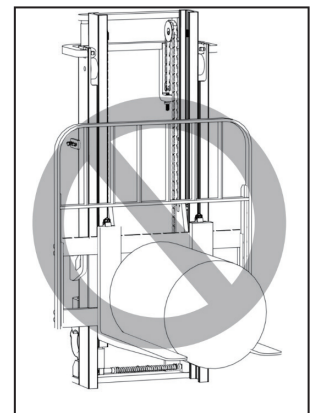
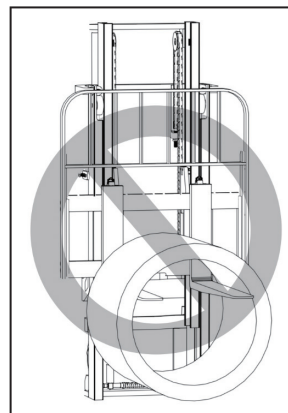
■ Prohibitions of carry goods with a single fork

● When loading, two forks shall be loaded at the same time. When using a single fork to pick up goods, the goods will fall off and the parts of will be damaged.



■ Prohibition of carrying goods with arc-shaped bottom

● When the forklift truck is loaded, the load shall be evenly distributed on the upper surface of the horizontal section of the two forks, and the direction of force should be vertical downward, so that no force of other direction can be generated; it is forbidden to carry the goods with arc-shaped bottom.



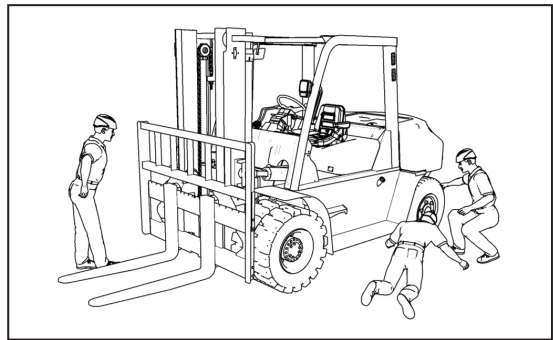
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## 2.7 Check and maintenance notes

### 2.7.1 Be sure to carry out the starting check.

■ Only easy check and maintenance are included in the OPERATION & MAINTENANCE MANUAL. For the check and maintenance that should be carried out by trained and qualified people, please contact with HELI dealer/agent.

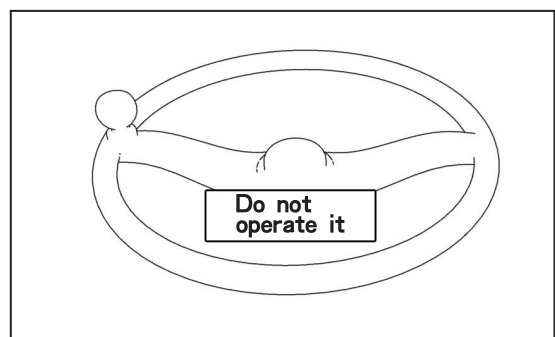
- Do not start the truck before starting check;
- If there is any abnormal, report to the manager at once and do not operate the truck until it is repaired;
- Serious accident and adverse effect may be caused by improper check, maintenance and repair. For safety reason, contact with HELI dealer/agent for certain check, maintenance and repair.



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### 2.7.2 Place a warning sign around during check and maintenance.

- Place a warning mark on the steering wheel or operating lever when checking and maintaining. If necessary, place the mark near the truck.
- During check and maintenance, Nobody is allowed to start engine or operating levers except the checking and maintenance person, or serious injury may be caused.
- Assign a responsible person and do according his guide when check or maintenance are carried by more than one person.



---

### 2.7.3 Keep the working area clean and tidy.

- Keep the working area clean and tidy. Remove the barriers, grease and oil.
  - The truck should work on flat ground with enough space.
  - Ensure good ventilation if the truck works inside a building.
- 

### 2.7.4 Notes before check and maintenance

- Allocate a fire extinguisher and know its position and using method;
  - Keep the people with long or fluffy hair or loose clothes away from the mast during operation;
  - Wear proper working suits and safety equipments (safety cap, safety shoes, glasses and gloves);
  - Lower the fork to the ground and apply parking brake. Place all levers on neutral position and turn the starting key to OFF position and shut off engine;
  - Wedge up wheels.
- 

### 2.7.5 Let the unauthorized people be away.

- Unauthorized people should not stay near the truck during maintenance.
- 

### 2.7.6 Proper using of the tools and devices

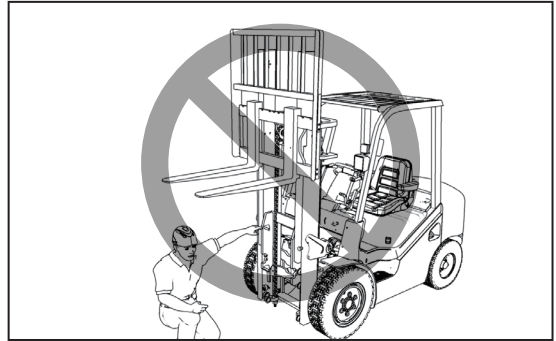
- Use the proper tool correctly. Do not use damaged or deformed tool and tool using for other purpose or serious accident will be caused.



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### 2.7.7 Notes when working under the working devices

- Support fork and mast avoiding falling when working under the fork or serious accident will be caused.



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### 2.7.8 Beware not to be caught by mast or falling

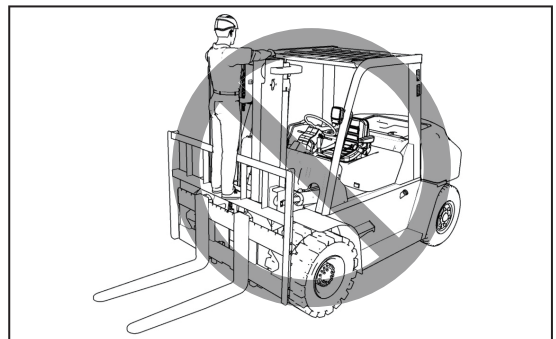
- Do not put your hand, foot or other part into mast or there is a danger of being caught.



- Do not stand between the mast and driver's cab or you may be extruded and serious injury or death may be caused.

- Operate the mast and fork from the driver's cab.

- Do not climb onto the mast, backrest or splash guard, or you may slip into or be caught by moving parts. Check and maintain the top area with ladder.



---

### 2.7.9 Beware of the boiling cooling liquid

- Do not remove the radiator's cap as soon as the truck is stopped because the cooling liquid has high temperature and pressure, or you may be scalded.

- When removing the radiator's cap, rotate it slowly until the cooling liquid is cool to release inside pressure.



---

### 2.7.10 Take care of the high pressure oil

Remember: the hydraulic system is under the pressure condition all the time. Before check or change hoses or pipes, check if the hydraulic system has pressure or serious accident may occur. Please abide the following description:

- Do not touch the hoses or pipes with hand directly when checking if there is leakage. The hoses and pipes may be pressurized.



- If your skin or eye is harmed by high pressure oil, wash with clean water at once and go to see a doctor.

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### 2.7.11 Beware of the rotating belt and fan

- Keep your hand away from the rotating belt and fan.
  
- Shut off the engine before open the engine hood which is only can be done by authorized person.



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### 2.7.12 Notes when repairing electric system

- Disconnect the cable of the positive terminal in order to disconnect the power when repairing electric system.

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### 2.7.13 Notes when cleaning with compressed air

- Dust is harmful to health when washing with compressed air.
  
- Wear protection devices such as glasses, gloves and mask.

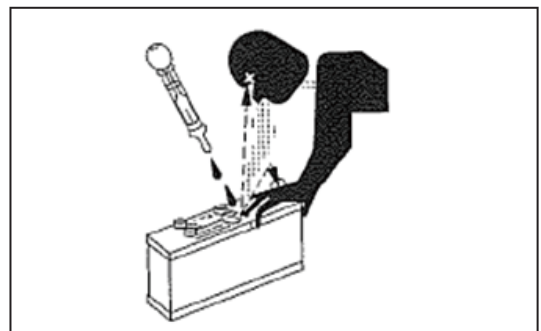
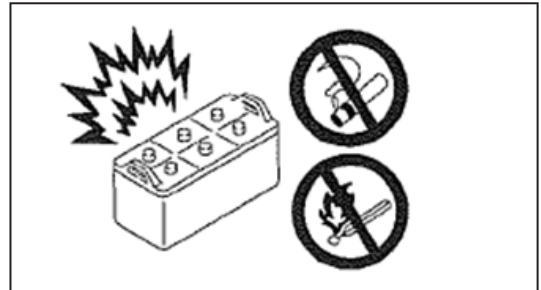


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### 2.7.14 Notes when dealing with battery

The battery will produce flammable hydrogen which may explode during charging and electrolyte contains dilute sulphuric acid. Personal injury, explosion or fire may be caused if the battery is improper dealt. Please follow the rules below:

- Check the charging condition and quality condition according to the displayer. Green means qualified, black means insufficient voltage and white means that the battery needs to be changed.
- Wear safety glasses and rubber glove when dealing with the battery.
- Do not smoke or make the open flame be close the battery.
- If electrolyte gets onto your body, wash the part with plenty of tap water at once.
- If electrolyte gets into eye, wash with plenty of tap water at once and see a doctor in time.
- Turn the starting switch to the OFF position when dealing with the battery.



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### 2.7.15 Follow the rules strictly so as to avoid spark

- Do not place tools or other metal object on battery for they may contact with the battery positive and negative terminals.
- Disconnect the negative terminal cable first when disconnecting the batter cable. On the opposite side, connect the positive terminal cable first when connecting.

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### 2.7.16 Note when installing or removing the battery

- When installing or removing the battery, take care not to damage the battery or electrolyte may leak.

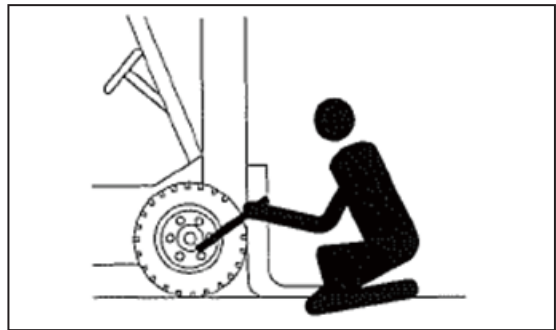
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### 2.7.17 Note when dealing with the tyres

Deal with the tyre which has high pressure properly or the tyre may explode or be damaged and rim may be broken. For your safety, follow the notes below:

- Do not assemble or disassemble the tyre and do not inflate the removed tyre.

- For your safety, when changing or inflating the tyre, stay right before the tyre surface as shown in the figure. Never stay on the side of the tyre surface.



- Please use the special tyre for HELI truck and follow the set inflation pressure.

- Make sure there is no person around when inflating the tyre. Make sure the gas outlet port of the air pump is connected with tyre valve core tightly. Check with pressure gauge as inflate the tyre in order to avoid over inflation.

- Rim will not well fit the tyre if its improper assembled or there is any fault with the tyre or rim. Rim should well contact with the tyre in any place. If necessary, contact with HELI dealer.

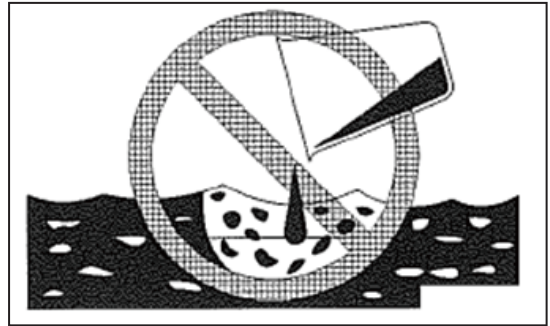
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### 2.7.18 Note when dealing with the waste

Take care to deal with the waste in order to protect the environment.

■ Keep the waste liquor such as engine oil and electrolyte in a container like jar. (Do not keep the electrolyte in a metal container and be sure to keep it in a plastic container). Never drain the waste liquor into earth, river, drainage ditch, lake or sea.

■ When dealing with injurant such as engine oil, fuel, cooling liquid, solution and battery, stick to the relative law.



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### 2.7.19 Notes after check and repair

■ Wipe off the oil and lubricating grease at once. If the truck is dirty, fault such as crack is hard to be found.

■ Check if there is any abnormal after the truck is repaired.

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### 2.7.20 Regular check on the key parts

● Lubricate, check and maintain the truck especially the key parts regularly in order to ensure the truck safety and long service life. Change then regularly.

● Parts will go bad, worn or fatigued if they overrun their service time and serious injury and damage will be caused. Parts service life is hard to be distinguished by visual check.

● Replace the key parts regularly.

● If there is any abnormal, change the key part even it is undue.

■ Note

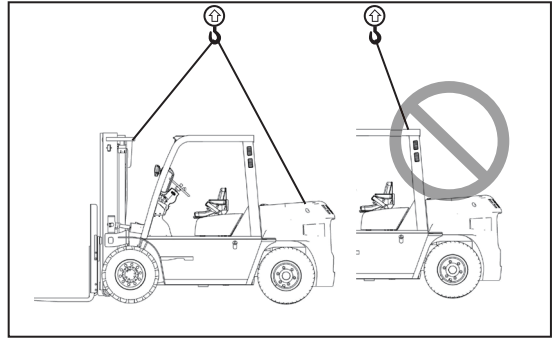
● Check and change of the key parts and lubrication grease adding should be carried out by HELI dealer or agent.

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## 2.8 Transportation and hanging up

### 2.8.1 Notes when hanging up truck

- Do not hang up the truck at the overhead guard.
- Before hanging up, check if the bolts of the mast and counter weight are tighten to the regulated torque.
  - Refer to the “maintenance data” for torque value of the counter weight fixing bolts.
  - Refer to the “maintenance data” for torque value of the lower mast fixing bolts.



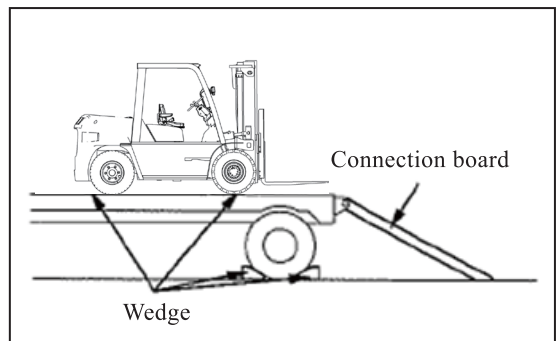
- When hanging up truck, hook the hole on the bottom of the external mast and the counter weigh or rear axial.
- Do not stay under the lifted truck.
- Use undamaged slings and steel rope with enough strength.
- Please contact with HELI dealer or agent for special sling equipment if the truck has to be hung up frequently.

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### 2.8.2 Notes when loading or unloading the truck

There is a danger of tipping over and falling when loading or unloading the forklift truck onto or from the trailer. So follow the rules below:

- Park the trailer on a flat road. Apply parking brake and wedge the wheels.
- Use connection board with proper length, width and strength.
- Operate the truck with proper posture.
- If the truck which is hydraulic powered type and assembled with OPS is operated with such posture (the seat does not bear your whole weight, for example stand or lean against forward, backward or side when operating), the power will be cut for 3 seconds and in that case, the truck will slide down even acceleration pedal is pressed or the truck is going uphill. If necessary, assign a towerman, so that the driver is not necessary to stand or lean forward or side to observe around.
- Place the board to form a gentle slope when using it. Align the center of the forklift truck and trailer’s and lock it firmly to avoid displacement.
- Do not change the direction when travelling on a board. If necessary, place the board again according to the needed direction and travel again.

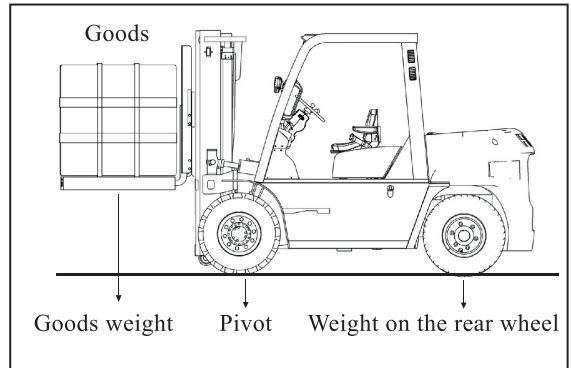


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## 2.9 Truck structure and stability

### 2.9.1 Longitudinal stability

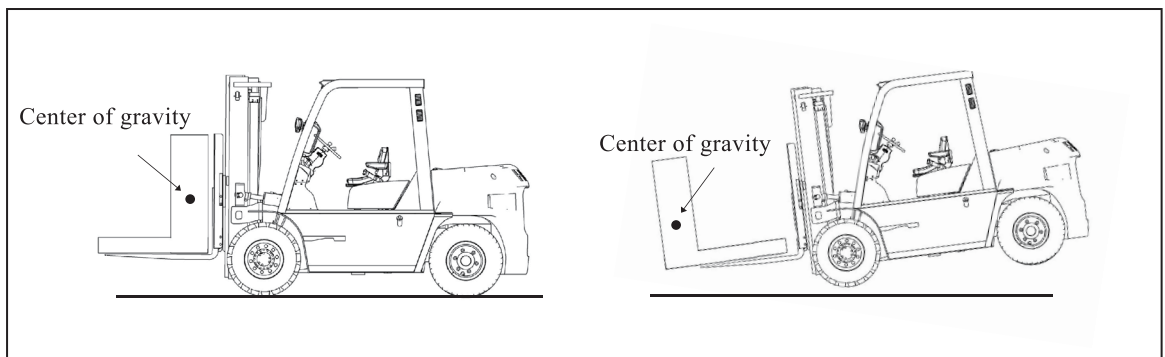
- Load is balanced with the weight on the rear wheel with the front wheel as the supporting point so as to avoid truck tilting forward.
- If the truck is overloaded, the rear wheel will lift away from the surface. It is dangerous and serious accident will occur such as tipping over.



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### 2.9.2 Load center of gravity

- Shapes of goods are different.
- Ensure load center of gravity is very important for truck stability.



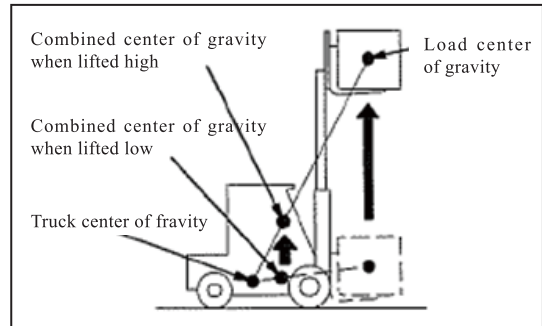
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### 2.9.3 Combined center of gravity and loaded truck stability

- Combined center of gravity  
When truck is loaded, its center of gravity will move forward and combined center of gravity is formed. The combined center of gravity is lifted as the goods are lifted.
- Combined center of gravity and stability  
The stability in both longitudinal and horizontal direction will be poorer and poorer with the center of gravity being higher and higher. Besides, swinging and vibration during travelling and loading affect the truck stability.

■ Truck stability will change because of the following factors:

- Load size, weight and shape (center of gravity)
- Lifting height
- Mast tilting angle
- Tyre inflation pressure
- Acceleration and deceleration during travelling and loading and unloading and steering speed
- Road condition and gradient
- Attachments type



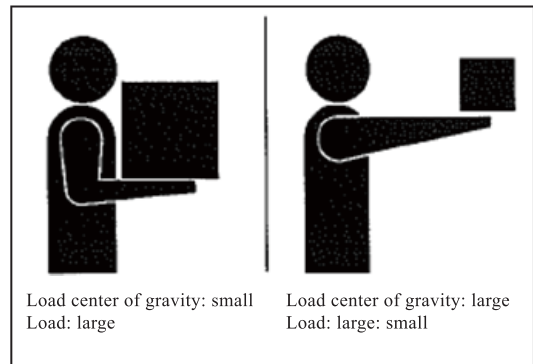
Do not travel when the fork (goods) is lifting; do not steer sharply; do not brake suddenly; do not lift or tilt fork suddenly; or there is a danger of accident such as tipping over.

### 2.9.4 Actual loading capacity

■ Load center refers to the horizontal distance from the center of gravity on the fork to the backrest. Actual loading capacity is the max. loading capacity on certain load center.

■ Capacity chart is shown on the name plate which is on the left side of the engine hood. It shows the relationship between the actual loading capacity and the load center.

■ When load center moves to the fork tips, lower the load capacity to maintain the balance in actual operation.



### 2.9.5 Instruction on optional safety devices

Safety devices are optional. Contact with HELI dealer or agent for detail. Devices and equipments listed below may not work in certain conditions. Install the devices according to the instructions for safety reason.

- Working light
  - on top of the truck and at the rear side of the truck
- Travelling (forward/backward) alarm
  - rotating warning light and flash light
- Speed alarm
  - Speedometer and buzzer
- Fire extinguisher

---

## 2.10 Towing

### ■ Fault truck towing

Be care if there is any of the fault below when towing a truck:

- Fault of brake
- fault of steering
- fault of tyre
- fault of traction pin
- Move the truck on a abrupt slope

The truck is hard to control if the steering motor does not work. if there is no power, there is no powered steering. Do not tow the truck which has no power, or truck may be damaged or slip because of improper towing.

If towing on a abrupt slope, apply another brake power to stop the truck.

Never handle the fault truck with another forklift truck unless it has to be moved and it can not be towed. The handling truck must has the capacity equals to or larger than the weight of the fault truck.

The towing truck's fork length must larger than the width of the whole fault truck. Keep the weight of the fault truck stay on the center of two forks. Take care not to damage the bottom of the truck.

### ■ Towing

Towing method:

- The towed truck must have operator.
  - Tow the truck slowly.
  - Lift the pallet and mast for towing.
  - If a forklift truck is used to tow a fault truck, the truck's capacity must be no less than the fault one.
- When towing, load the truck with goods that have half of the rated capacity's weight to increase the towing force and keep the goods as low as possible.
- Connect the two truck's towing pin on counter weight with a steel traction chain.

# OPERATION



## WARNING

Please read the manual and safety notes carefully.

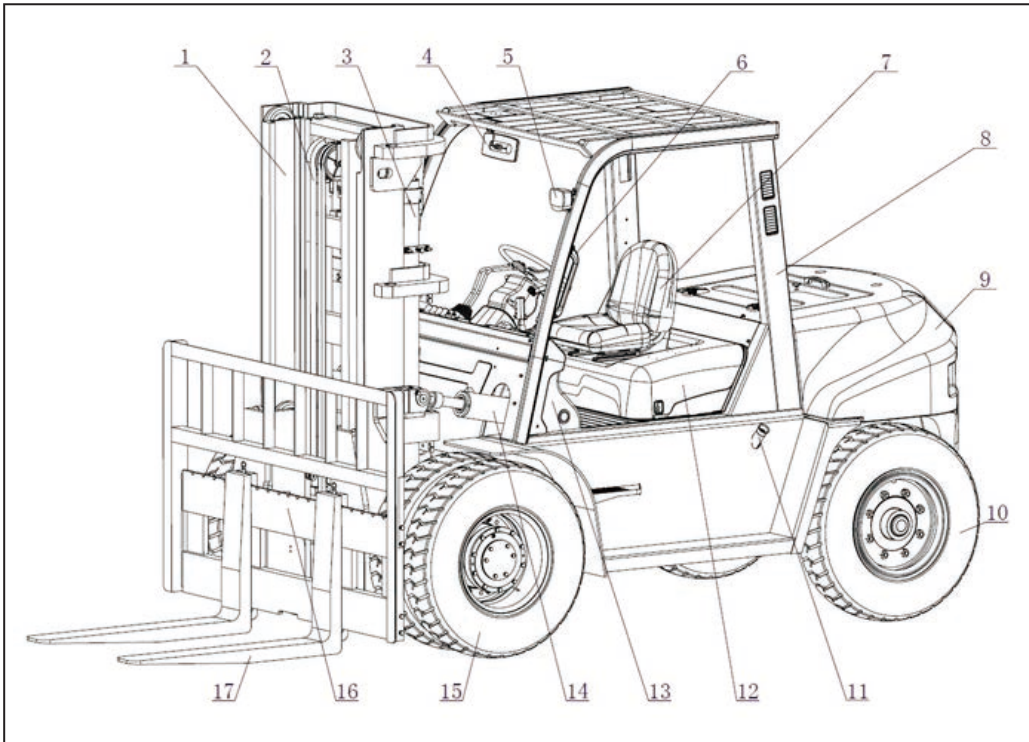
When operating the truck, please follow the safety notes or serious injuries may be caused.

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## 3.1 General view

### 3.1.1 Truck general view



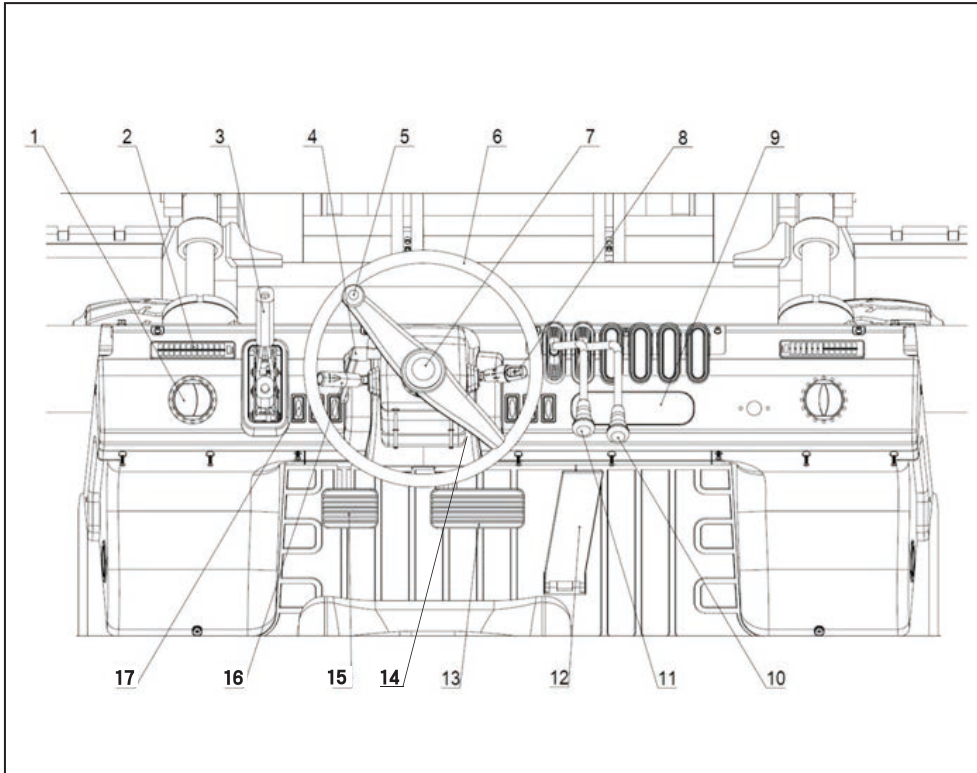
1. Mast
2. Lifting chain
3. Lifting cylinder
4. Rear view mirror
5. Front lamp
6. Handle
7. Seat
8. Overhead guard
9. Counter weight

10. Rear wheel
11. Fuel adding port
12. Engine hood
13. Instrument panel
14. Tilting cylinder
15. Front wheel
16. Fork bracket
17. Fork

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### 3.1.2 Instrument and control devices

#### ■ Cab



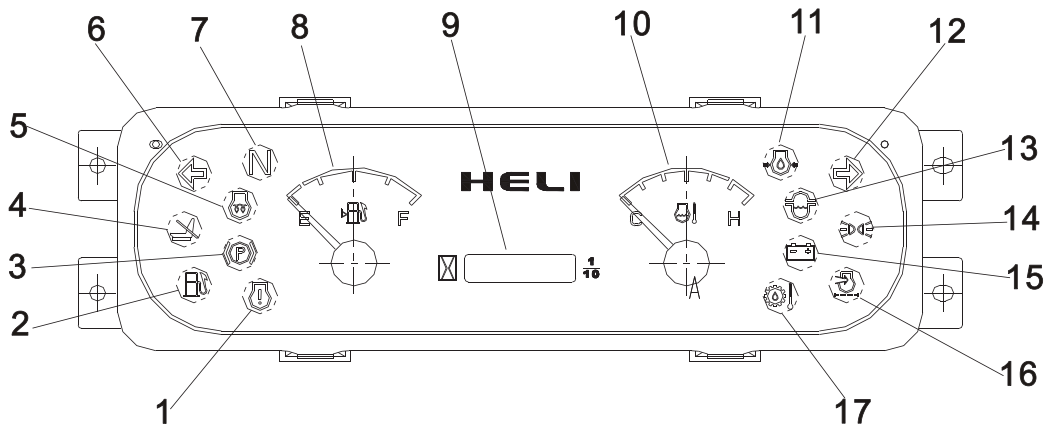
- |   |                                    |
|---|------------------------------------|
| 1. Warm air outlet port(optional)         | 10. Tilting controlling lever      |
| 2. Defrosting grid tuyere(optional)       | 11. Lifting controlling lever      |
| 3. Parking brake handle                   | 12. Acceleration pedal             |
| 4. Tiltable steering wheel lock lever     | 13. Braking pedal                  |
| 5. Steering wheel ball type handle        | 14. Starting switch                |
| 6. Steering wheel                         | 15. Inching pedal                  |
| 7. Horn button                            | 16. Forward/backward lever         |
| 8. Combined lights switch                 | 17. Extended electric function key |
| 9. Multifunction integrated display meter |                                    |

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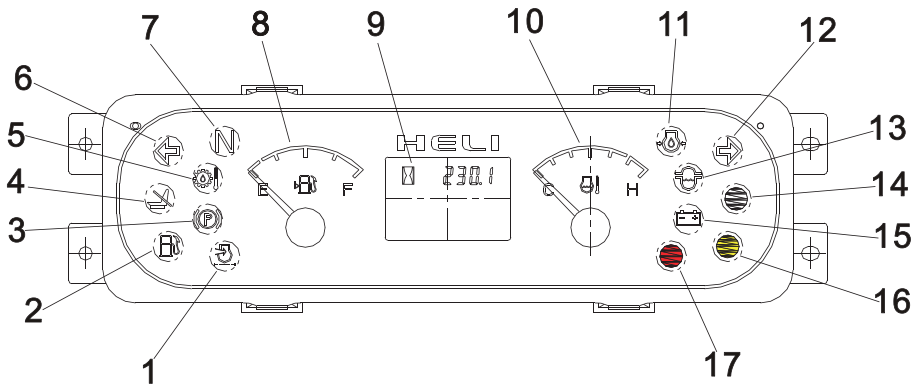
## 3.2 Parts instruction

■ Devices necessary for the truck are described below.  
It is very important to be familiar with the devices in order to operate the truck properly.

### 3.2.1 Meter



- |  |   |
|--|---|
| 1. engine fault signal (for certain electric control engine) | 9. Hour meter   |
| 2. Low fuel alarm indicator                                  | 10. Engine coolant temperature meter                            |
| 3. Parking brake signal                                      | 11. Engine oil pressure alarm indicator                         |
| 4. OPS indicator (optional)                                  | 12. Right turning indicator                                     |
| 5. Preheating indicator (truck with diesel engine)           | 13. Oil-water separator alarm indicator (optional)              |
| 6. Left turning indicator                                    | 14. Meter lighting indicator                                    |
| 7. Neutral indicator   | 15. No charging alarm indicator                                 |
| 8. Fuel gauge  | 16. Air cleaner block alarm indicator (optional)                |
|  | 17. Torque converter oil temperature alarm indicator (optional) |



Note: the meter is only for model CPCD50/60/70/85/100-P3G

- |  |  |
|--|--|
| 1. Air cleaner block alarm indicator                           | 10. Engine coolant temperature meter               |
| 2. Low fuel alarm indicator                                    | 11. Engine oil pressure alarm indicator            |
| 3. Parking brake signal  | 12. Right turning indicator                        |
| 4. OPS indicator   | 13. Oil-water separator alarm indicator (optional) |
| 5. Torque converter oil temperature alarm indicator (optional) | 14. Engine standby indicator (white)               |
| 6. Left turning indicator                                      | 15. No charging alarm indicator                    |
| 7. Neutral indicator   | 16. Engine fault indicator (yellow)                |
| 8. Fuel gauge  | 17. Engine flameout indicator (red)                |
| 9. LED display   |  |

---

■ Methods of alarm indicator checking

- Make sure the alarm indicators light on when the engine is not working and the starting switch is turned to ON position.
- Check if the indicators are damaged if any of the indicator is off. It is abnormal when the alarming indicator is on during operation. Repair it and contact with HELI dealer or agent.

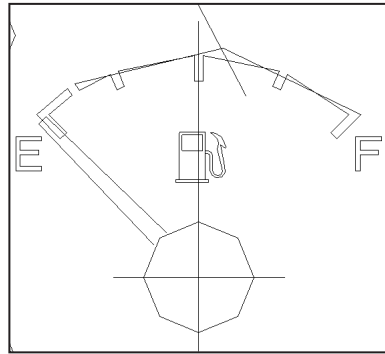
■ Fuel gauge

- Oil quantity is shown on the fuel gauge. Check it on a flat ground. Check the oil quantity when the engine starting switch is on ON position.

Position E: it means that the oil level is low.

Position F: it means the oil tank is full.

- Add fuel before it runs out.

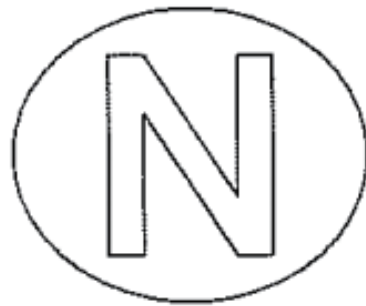


■ Neutral indicator

- Neutral indicator means the forward/backward operation lever is on neutral position.

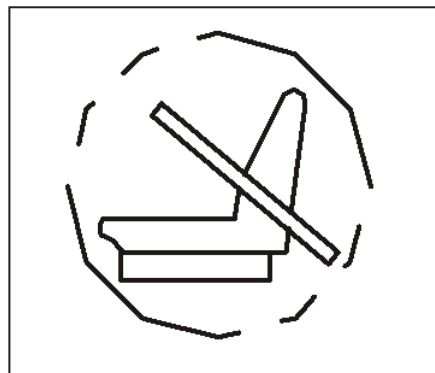
- When the starting switch is on ON position, the neutral indicator will light on if the forward and backward operation lever is on neutral position. The indicator turns off when the lever is on forward or backward position.

- Before starting the engine, turn the starting switch to the ON position and check if the neutral indicator is on.



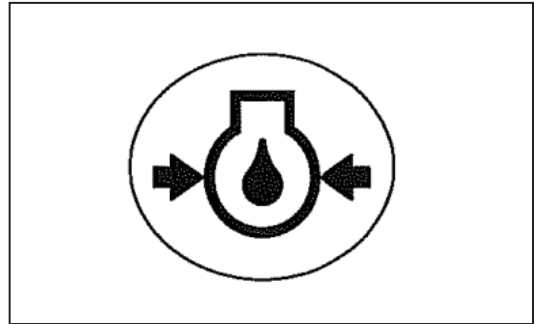
■ OPS indicator (optional)

- When OPS is activated, the indicator turns on.
- When you sit on the driver's seat with proper posture, the indicator turns off.



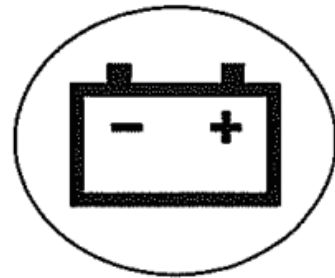
■ Engine oil pressure alarm indicator

- It means engine lubricating oil pressure is abnormal.
- The light will turn on when the starting switch is turned to ON position and it will turn off after the engine is started.
- During operation, stop the engine and check the engine lubricating system and engine oil level when it turns on.



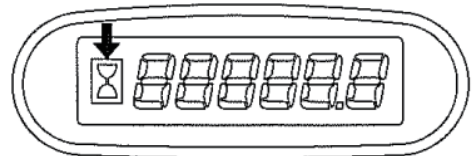
■ No charging alarm indicator

- When the engine is working, the alarm indicator indicates the abnormal of the AC type generator's charging system.
- When the starting switch is turned to ON position, the indicator will turn on and it will turn off after the engine is started.
- During travelling, if the indicator turns on, check the electric system and if the V belt is loose.



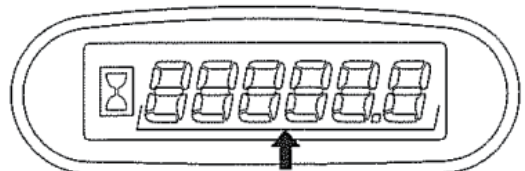
■ Working indicator

- The hourglass signal on the left side of the hour meter means the hour meter is working.
- The signal flickers when the engine is working.



■ Hour meter

- When the engine is started, the hour meter begins to work and accumulated working time is displayed. (when the hour meter is working, the operation indicator keeps flickering.)
- Affirm the checking interval and working hours referring to the hour meter.
- If the engine works 6 minutes continually, 1 is carried over to the last digit (it means 0.1 hour.)



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■ Oil-water separator alarm indicator (it is used as fault indicator.)(truck with diesel engine)

When the water in the oil-water separator reaches to certain quantity, the indicator will turn on and the water in it has to be drained. If not drained, the performance of fuel injection pump and nozzle will be badly affected. Refer to water and gas exhausting of the water-oil separator for detailed operation (truck with diesel engine).



■ Preheating indicator (truck with diesel engine)

The indicator means that the engine is preheating. At this time, do not start the engine. When the starting switch is turned to ON position, the indicator turns on and will turn off 14s later.



■ Engine coolant temperature meter

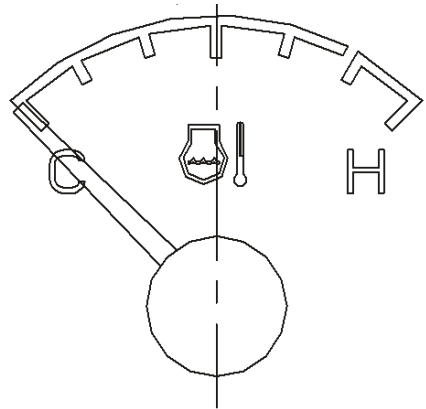
● Engine coolant temperature is indicated by a pointer.

- White range: normal
- Red range: over heat

Important

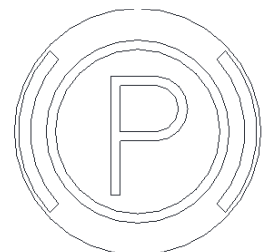
Stop operating the truck at once and park it in a safe place if the pointer point to the red range and then carry out corresponding measures.

For engine overheating, refer to Measures of engine overheating.



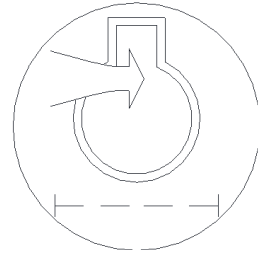
■ Parking brake indicator

The indicator indicates that the parking brake is locked.



■ Air cleaner block alarm indicator

The indicator indicates if the air cleaner is blocked.



### 3.2.2 Operating devices

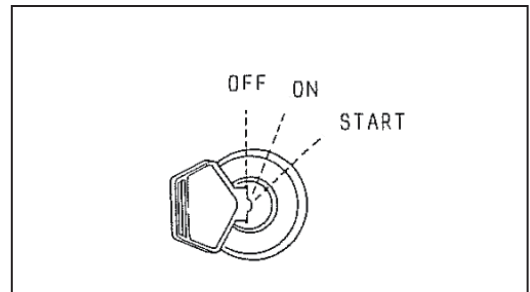
■ Starting motor switch

The switch is used to start or shut off the engine.

(1) [0] position: on OFF position, you can insert or draw out the starting key.

(2) [I] position: on ON position, the electric circuit has electricity. For truck with diesel engine with automatic preheating function, preheating is started automatically.

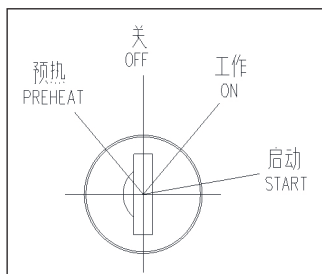
(3) [II] position: On starting position, starter begins to work so as to start the engine. The key will be back to [I] position automatically when you loose the engine starting key after the engine is started.



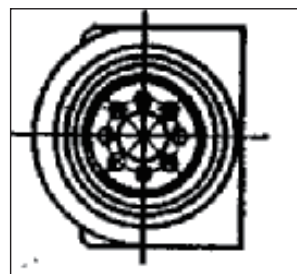
**Important**

Do not let the starting key stay on the [II](ON) position or battery electricity will be reduced and is hard to start the engine.

Note: Preheating is achieved manually in anti clockwise direction when Isuzu engine starting switch is used.



Starting switch general view



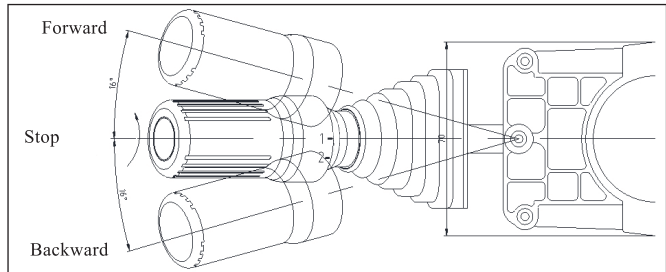
Preheating indicator

■ Horn

Press the button on the middle of the steering wheel and the horn will sound.

■ Forward/backward operating lever (direction switch)

- ↑ : F(forward)
- : N(neutral)
- ↓ : R (reverse)
- 1 : low speed gear
- 2 : high speed gear



When the truck needs changing direction, push the direction switch forward or pull the direction switch backward; if the truck needs changing gears, turn the knob on the front end of the direction switch and the shifting between gear 1 and gear 2 can be achieved.

The truck can change gears intelligently: when the direction switch is shifted to gear 2 from neutral gear directly without staying on gear 1, the truck will start at gear 1 automatically ; when the truck speed reaches to certain value, it will shifted to gear 2 automatically ; when the truck speed is lower than certain value, it will return to gear 1 automatically.

Important:

1. Turn to gear 1 automatically when the truck has to go uphill or start on a slope;
2. If the direction switch is not on neutral gear, engine can not start.

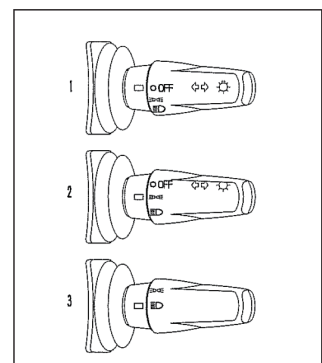
■ Lights combined switch (lighting switch /steering signal switch)

The handle includes lighting switch and steering signal switch.

■ Lighting switch

When the switch is turned to the arrow mark, lights will turn on or off as shown

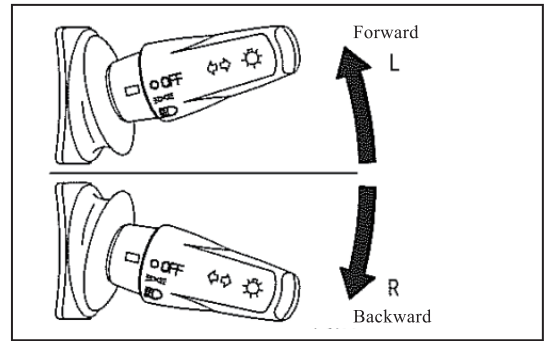
NO.	Front light	Meter light, front width light, rear width light
1	OFF	OFF
2	OFF	ON
3	ON	ON





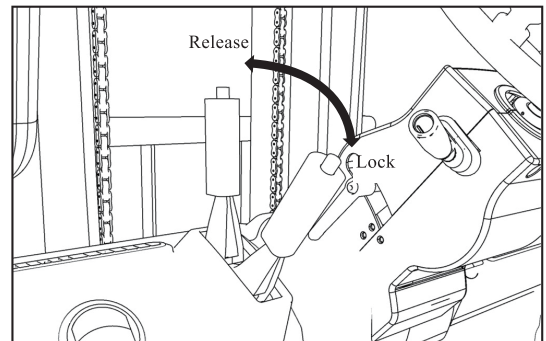
■ Steering signal switch

Left turning (L): push the knob forward  
Right turning (R): pull the knob backward



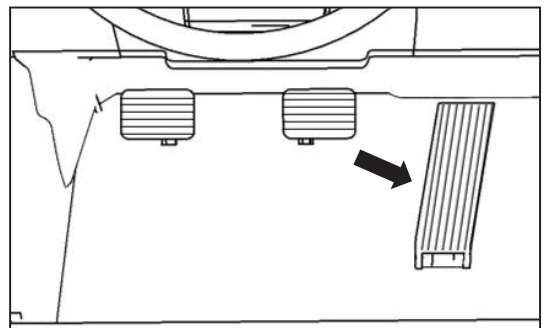
■ Parking brake handle

The handle is used to apply parking brake.  
Pull the handle back completely (lock position)  
and parking brake is applied.  
Press the button at the end of the handle and push  
the handle forward to release the brake.



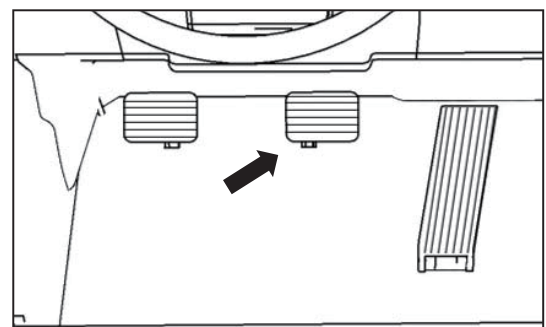
■ Acceleration pedal

The pedal is used to adjust travelling speed.  
Engine rotation speed will increase according to  
the stepping distance.



■ Brake pedal

The pedal is used to stop or slow down.



### ■ Inching pedal

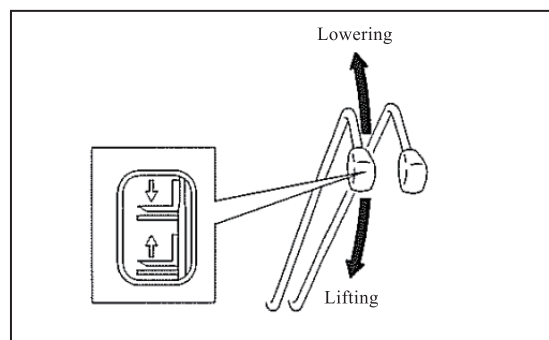
When travelling with low speed (such as loads handing operation), the pedal is used to adjust the travelling speed.

Step on the pedal slightly to make the clutch half engaged and the truck will inching forward. Step the pedal more and the brake pedal together, the brake force is applied. Step on the pedal fully and the clutch will be separated and brake force will be applied.

### ■ Lifting control lever

It is used to control the fork lifting and lowering.

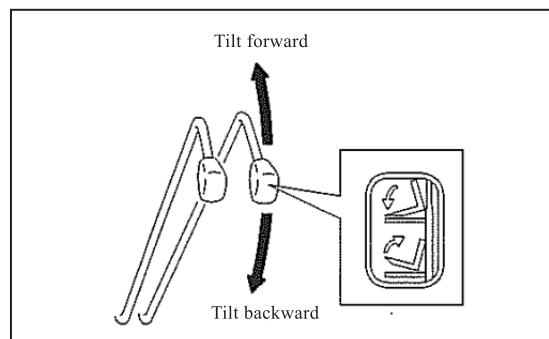
Lifting: press the control lever downward;  
Lowering: push the control valve upward.



### ■ Tilting control lever

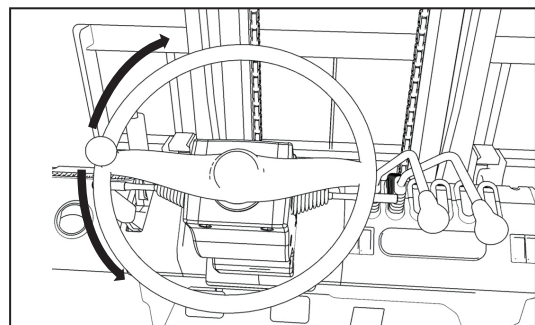
It is used to tilt the mast forward or backward.

Tilt forward: Push the control valve upward;  
Tilt backward: Press the control lever downward



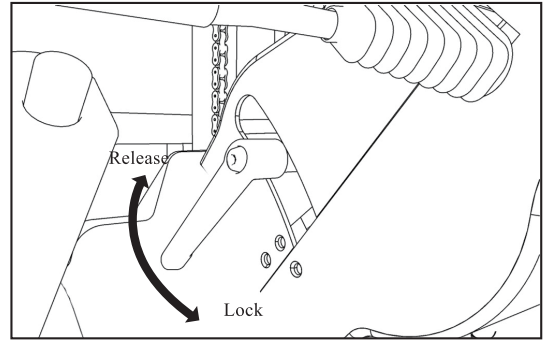
### ■ Steering wheel and knob

Steering wheel is used to change the left-right direction. Operate the steering had wheel with the knob.



### ■ Tiltable steering wheel lock lever

The lever is used to adjust the steering wheel tilting angle (upward/downward). Raise the lever, the steering wheel lock nut will lose and the steering wheel tilting angle can be adjusted. Push the lever down to lock the steering wheel after adjusting.



## 3.2.3 Assembly and disassembly of the attachments

### Safety notes



### WARNING

Attachments and main parts are heavy and serious injury will be caused if they are carried improperly.

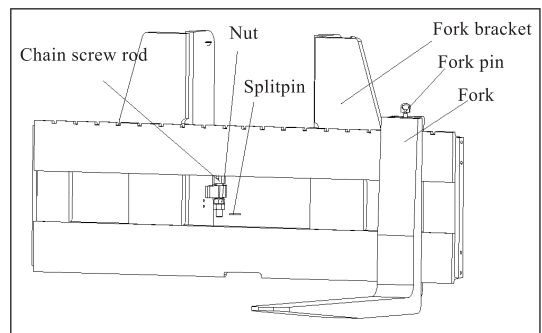
1. When working under the lifted attachments with goods, fix them avoiding lowering. Do not walk or stay under the impending goods. Use load support equipments such as steel rope and steel chain with good condition.
2. If work is done, fix the truck avoiding truck moving accidentally.
3. When repairing or changing the hydraulic or electrical parts, observe truck related set value.
4. Any person is prohibited to stay in the dangerous place around the truck.

### ■ Fork

Fork for 5-8t truck:

1. Remove the fork bracket until the forks fall onto the ground and the lifting chain is tensed.
2. Loose the fork lock pin and move the fork to the middle of the fork bracket, then remove the fork from the slot of the beam.
3. Assembling steps are opposite from the disassembling steps. Apply lubricating grease onto the fork hook and adjust the fork space to proper width.

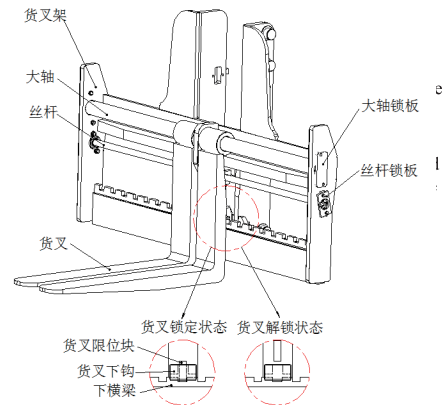
NOTE: Forks with pairing marks shall be installed in a paired way. It is strictly forbidden to install in a mixed way.



Fork for 10t truck:

1. Remove the fork bracket until the forks fall onto the ground and the lifting chain is tensed.
2. Remove the stopper from the slot.
3. Dismantle the screw lock plate which is connected with bolt and remove the bearing inside the side plate of the fork bracket, then remove the screw rod.
4. Dismantle the main shaft lock plates on two sides of the fork bracket which is connected with bolts. Draw out the main shaft from the fork bracket through knocking the other end of the shaft. Then the fork can be removed.
5. Assembling steps are opposite from the disassembling steps. Apply the lubricating grease to the fork sleeve and then adjust the fork space to proper width through screw rod.

NOTE: Forks with pairing marks shall be installed in a paired way. It is strictly forbidden to install in a mixed way.



#### ■ Fork bracket

- Lower the fork bracket until the fork contact with the ground.
- Disconnect the lifting chain and connect the end of the chain to the upper beam of the outer mast.
- Lift the inner mast with the lifting equipment until the bottom of the inner mast be away from the roller assembly on top of the carrier.
- Make sure that the chain does not kink when lifting.
- Reverse the truck and make it be away from the carrier.
- The steps of assembly are opposite from the disassembly. If there is no side shifting carrier, move the fork bracket to the limit several times and exhaust the air in the system.

#### ■ Mast

Before disassemble the mast, disassemble the fork bracket and fork referring to the instruction before.

Disassemble the driving wheel (if needed)

1. Suspend the lifting slings to the lifting eye on the upper cross beam and lift the mast. Remove the tilt cylinder from the mast pin roll.
2. Disconnect the hydraulic pipeline from the lifting cylinder and block all open mouth in preventing foreign matters entering.



The remaining oil will be exhausted out when disconnected.

3. Tilt the mast a little forward and disassemble the assembling bolts.

The steps of assembly are opposite from the disassembly. Take care of the following notes:

- 1) Replace the cotter with new ones;
- 2) Tighten the mast locking bolts to proper torque. (refer to the maintenance data)
- 3) Lubricate all pins.
- 4) If assembly and disassembly affects the tilting angle, check and adjust the tilting angle.

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## 3.3 Operation

### 3.3.1 Starting check

#### CAUTION

Do not operate the truck until all checks are done.

If there is any abnormal, report to the manager and do not operate the fault truck until it is repaired.

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Carry out the starting check for safety.

Refer to 4.2 Starting check for detail.

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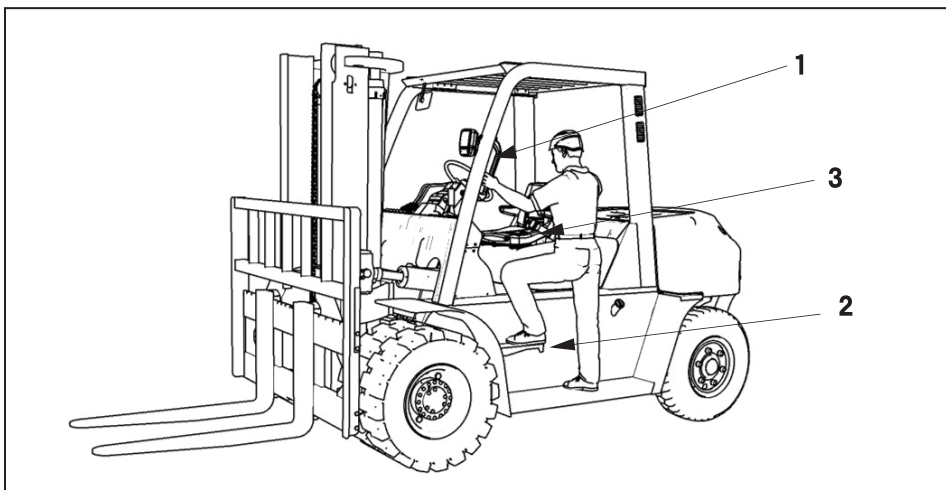
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### 3.3.2 Getting on and off the truck and operation posture adjusting

#### ■ Getting on and off the truck

#### CAUTION

- Get on or off the truck until the truck is stopped well.
  - It is prohibited to jump on and off the truck.
  - Do not grasp control lever and steering wheel when getting on or off the truck.
  - Keep the handle and steps clean. And if damaged, repair it.
  - Do not use the handle in other applications except when getting on or off the truck.
  - Get on or off the truck from the left side.
  - Support yourself at least in three points with hand and foot when getting on or off the truck. Step on the step(2), grasp the handle with left hand (1) and grip the seat back or seat(3) when getting on and off.
- 



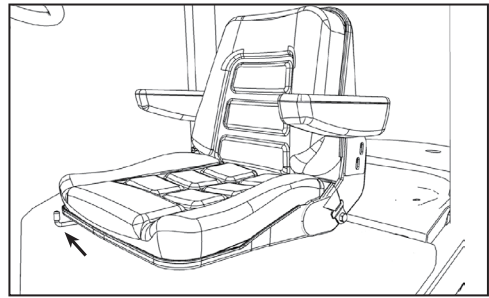
## ■ Seat position adjusting

### CAUTION

Adjust the seat position before getting on the truck or changing a driver. (Adjust only the truck is well stopped.)

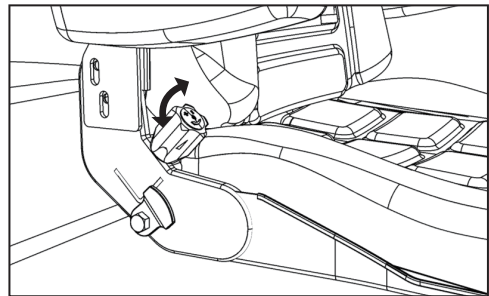
Make sure you can step the brake pedal fully when you lay against the seat.

1. For truck parking, refer to 3.3.8 STOPPING FOR A WHILE for detail.
2. Pull the knob to the right side when sitting on the seat. (on this position, operator can slide forward or backward when sitting on the seat. )
3. Lose the knob until the satisfied position is found and then the seat is locked.
4. Pull the seat forward or backward after adjusting to make sure the seat s locked.



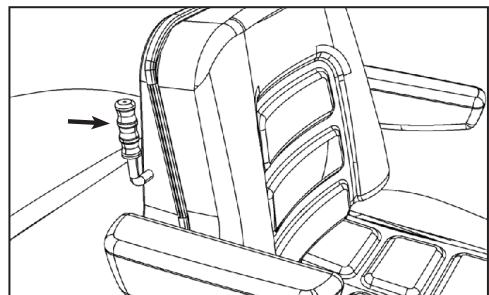
#### Seat back angle adjusting:

1. Rotate the knob right, the angle is increased and the back turn towards back.
2. Rotate the knob left, the angle is decreased and the back turn towards front.



#### Suspension adjusting (optional)

Adjust the suspension level through adjusting knob. Pull the knob upward if the operator is light. Push the knob downward if the operator is heavy. Place the knob in middle position if the operator is moderate.



Weight adjusting range: 50-120kg.

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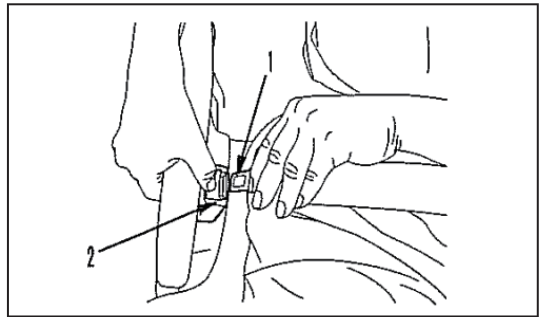
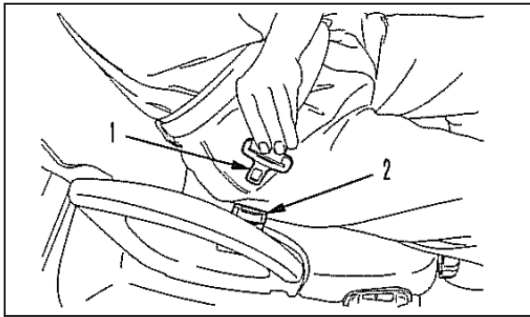
■ Fasten and lose the safety belt



Wear safety belt during operation.

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1. Insert the spring bolt(1) on the left side belt to the lock(2) on the right side. Safety belt is locked when you hear a click.
2. Hold the safety belt with left hand and press the red button on the lock(2) with right hand when loose the belt.
3. Hold the spring bolt(1) to roll the belt slowly.



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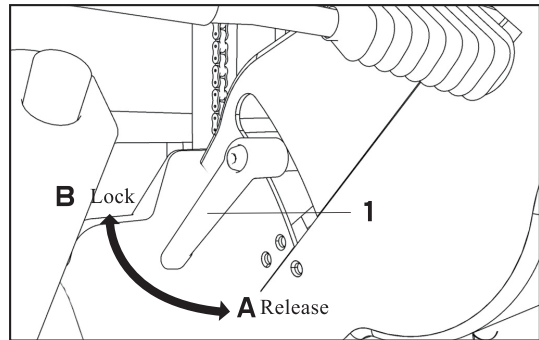
## ■ Steering wheel position adjusting

### ⚠ CAUTION

Park the truck well before adjusting the steering hand wheel position.  
After adjusting, move the steering hand wheel forward and backward to check if it is locked.

---

1. For parking, refer to 3.3.8 Truck parking for detail;
2. Pull the tiltable steering hand wheel lever backward to the position A.
3. Move the steering hand wheel forward and backward to choose best position.
4. Push the tiltable steering hand wheel lever forward to position B to lock the steering hand wheel.
5. After adjusting, push and pull the steering hand wheel to check if it is locked.



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## 3.3.3 Starting, gear shifting and travelling

### ■ Engine starting

### ⚠ CAUTION

Never try to make electric circuit short circuit to start the engine, or serious injury or fire may be caused.

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### ⚠ CAUTION

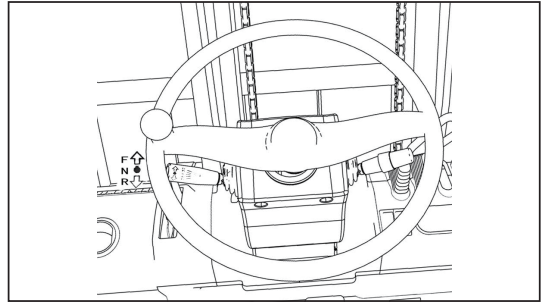
- Start the engine only when the driver sits on the seat.
  - Before starting the engine, place the forward/backward operation lever and high speed/low speed lever on neutral position and push the parking brake backward.
  - Keep the working area well ventilated when starting the engine inside or in a poor ventilated place because the exhausting air is poison.
  - If the truck is operated with such posture (the seat does not bear your whole weight, for example stand or lean against forward, backward or side when operating), the power to engine will be cut and the truck may slide down. In that case, accidents or collision may occur. Keep proper posture when going on a slope. (Truck with OPS seat)
-



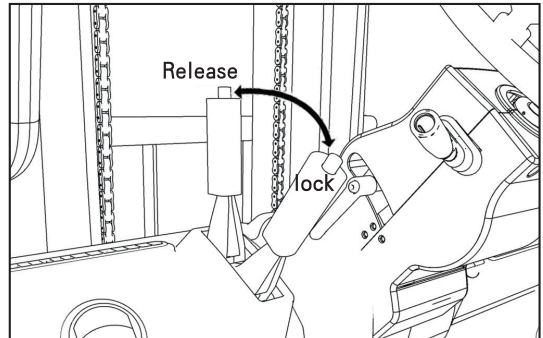
1. Place forward/backward operation lever on neutral position.

Note:

Engine can not be started unless the forward/backward operation lever is placed on neutral position.



2. Push the handle forward to release the parking brake



3. Starting switch operation

● Gasoline engine

Turn the starting key switch to the START position (II) when your foot move away from the acceleration pedal and then the engine will be started.

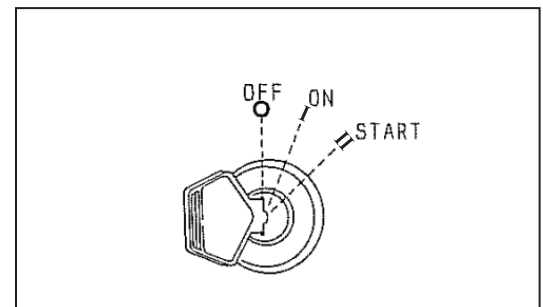
● Diesel engine

Turn the starting key switch to the ON (I) position and the preheating indicator will light on which means the engine begins to preheat. The engine can be started when the preheating indicator is off.

Note:

Preheating is achieved manually in anti clockwise direction when Isuzu engine starting switch is used. Please refer to 3.2.2 OPERATING DEVICES.

● The starting key switch will go back to the ON (I) position automatically when undo the engine starting key switch as soon as the engine is started. When the engine is working, make sure the key stays at the position.



Important note:

(1) Starter is designed based on big current and short working time principle. When starting gasoline engine in low temperature environment, its working time can not last 5 seconds each time. If it is not succeeded, start it again after 15s. For diesel engine, its working time can not last 15 seconds each time. If it is not succeeded, start it again after 1 minute.

(2) Loose the key as soon as the engine is started. When the engine is working, never turn the starting switch to the START position.

(3) When the engine is not working, do not make the starting switch stay at the ON position or the battery has insufficient voltage.

(4) if the engine can not be started in three times, check the engine or electric circuit. Or cable will be over heat if go on starting. What is more, there may be security threat.

(5) For electric controlled engine, during the process of turning key switch from OFF position to ON position and then back to OFF position and then to ON position, the interval between two consecutive stop on ON position shall be more than 6s or engine false alarm may be caused. After the electric controlled engine with main power source is turned off, ECU will check the engine systemically and records relative data. So disconnect the ECU power supply (that is power main switch) 30s after the key switch is turned off. If it is turned off too early, ECU will alarm when starting the engine next time and engine power will be badly affected.

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#### 4. Warm the engine

- Truck with gasoline engine: It will stop automatically after the engine is warm.
- Truck with diesel engine: release the acceleration pedal and go on warming the engine for a while.

#### IMPORTANT:

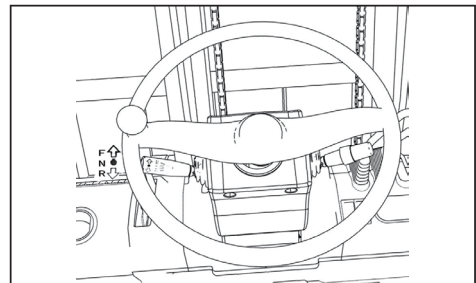
- Keep the starting key switch on OFF (0) position when the engine is not working. Do not keep it on ON (I) position or battery quality will be reduced which causes the engine be hard to be start.

#### ■ Drive the truck

1. step on the clutch pedal fully and place the forward/backward operation lever to the forward or backward position.
2. Release the parking brake.

#### IMPORTANT

If the parking brake is not released when the truck is travelling, the brake will be overheat and worn. What is more, the brake function will be affected.

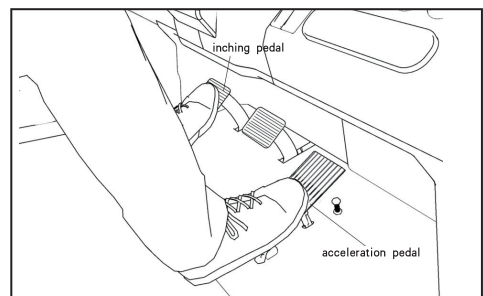


3. Check the safety around the truck and in the travelling direction.

4. Slowly release the inching pedal when you softly step on the acceleration pedal, and then the truck will travel. Once it begins to travel, move your foot away from the inching pedal.

#### IMPORTANT

Do not stay on the inching pedal or brake pedal unless it is necessary.



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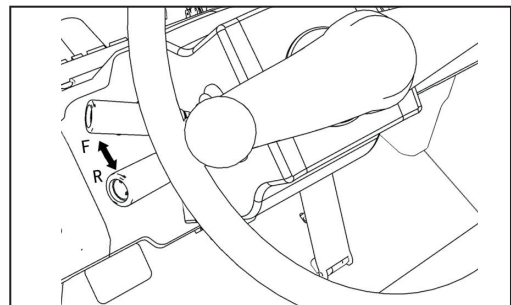
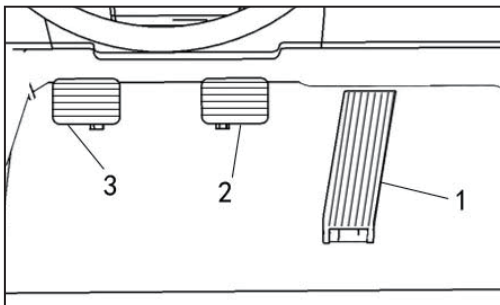
■ OPS (travelling function)(optional) (Standard for CPCD50/60/70/85/100-P3G)

- If the seat does not bear your whole weight, for example stand or lean against forward, backward or side when operating, the safety device will prevent the truck from working. If you operate the truck with such posture, the OPS will be activated in 5s and transmission box power will be cut. In that case, the truck can not move even acceleration pedal is pressed or forward/backward lever is operated.
- When the OPS is activated, the OPS indicator on the meter will light on.
- Return to travel condition: sit on the seat with proper posture and place the forward/backward lever on neutral position and then the truck will be ready for travel. Ensure the safety around.
- The OPS only cut the power but not put the brake into effect.



■ Direction changing

1. Release the acceleration pedal (1) and step on the brake pedal (2). Before stopping, step on the inching pedal fully (3).
2. Before truck stopping completely, shift the forward/backward operation lever to (R) position from (F) position and vice versa.



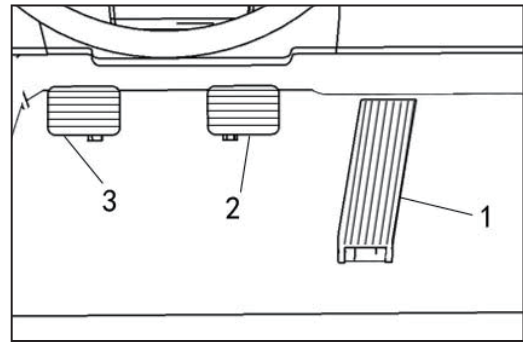
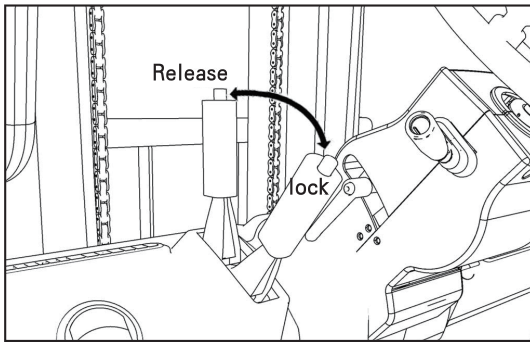
**IMPORTANT**

Change the direction only when the truck is completely stopped.

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### 3.3.4 Start and stop on a slope

1. Apply the parking brake when starting on a slope.
2. Slowly release the parking brake when pressing the acceleration pedal (1) increasingly, and then the truck can go uphill.
3. When stop or deceleration on a slope, release the acceleration pedal (1) slowly and step on the brake pedal at once before stopping.
4. Apply the parking brake when the truck is stopped.



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### 3.3.5 Inching

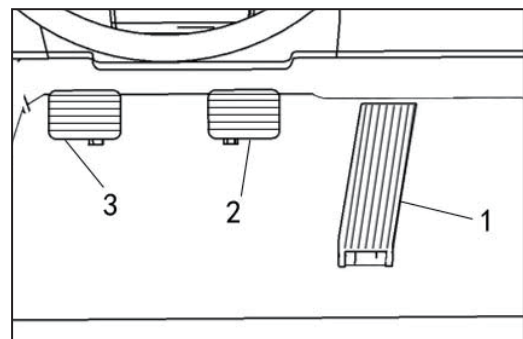


Do not make the truck inching through stepping on the acceleration pedal and adjusting brake pedal pressing distance.

Make the truck inching through inching pedal.

#### IMPORTANT

- Do not step on the inching pedal all the time, or clutch may be engaged by accident and may be damaged.



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### 3.3.6 Steering

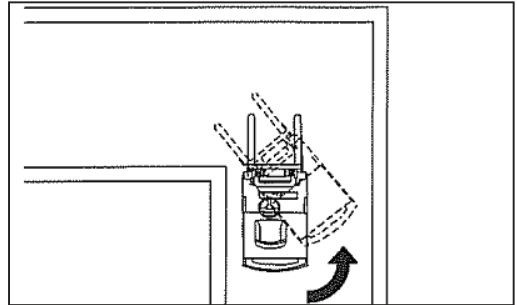
#### CAUTION

When steering, take care that the external side of the counter weight may collide with the person or object around.

The rear wheel is steering wheel. If it travels forward when steering, it remains inside; if it travels backward when steering, it remains outside.

#### NOTE

- Turning fixedly will accelerate the wear of the tyres.
- Steering with low speed is good for tyre.



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### 3.3.7 Operate on snow field and icy field

#### CAUTION

Slipping can not be prevented completely even the truck is assembled with anti-slipping tyre or chain. Some model may not be suitable to assemble anti-slipping tyre or chain.

- When travelling on snow or icy field, assemble anti-slipping tyre or chain.
- Avoid sudden brake, acceleration or steering on snow or icy field. Take care to operate acceleration pedal in case of slipping.

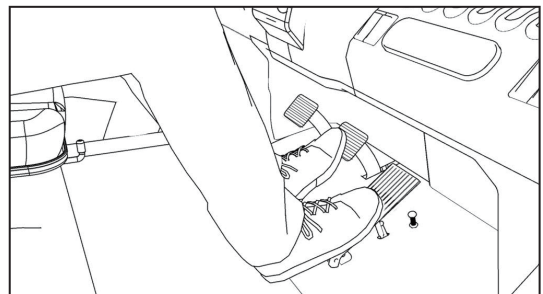
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### 3.3.8 Parking

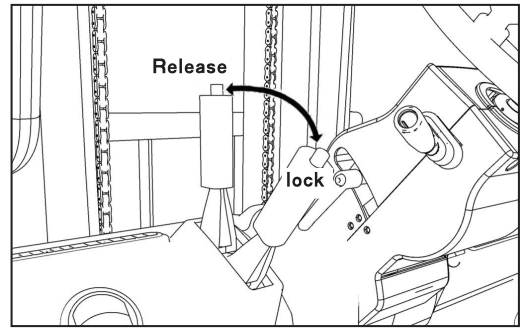
#### CAUTION

Park the truck away from the traffic area.

1. Undo the acceleration pedal and press the braking pedal then.

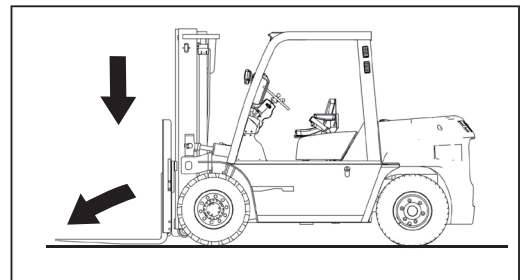


2. Apply the parking brake when the truck is stopped. Place the forward/backward operation lever in neutral position after the truck is stop completely.



■ Truck parking procedures

1. Park the truck on flat ground.
2. Apply parking brake.
3. Place the forward/backward operation lever on neutral position.
4. Tilt the mast forward and lower the fork to the ground.
5. Turn the starting key switch to OFF (0) position.
6. Draw out the key and go away from the truck.



### 3.3.9 Load handing operation

■ Fork space adjustment

Adjust the space between the fork before loading to suits pallet size and loads.

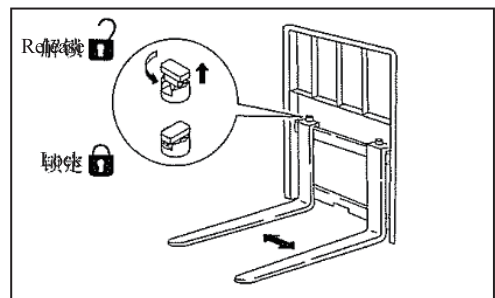
**CAUTION**

Take care not to make hand or finger be caught when adjusting.

For the forks with hydraulic fork positioning function, the adjustment of fork width shall be carried out without load. It is prohibited to adjust with load.

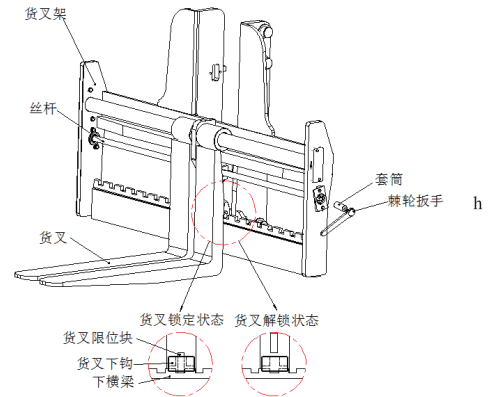
■ Fork space adjusting of 5-8.5t truck

1. Make the truck in front of the goods;
2. Make the mast be vertical and lift the fork to be 10cm above the ground;
3. Tilt the mast forward;
4. Lift the fork stopper turner and rotate it 90° to release position (In this case, fork can move left or right.)
5. Adjust the fork space according to load size to make the load center fit with the truck's center of gravity.
6. Make the mast be vertical and rotate the turner to lock position. (In this case, the fork is lock at the very position.)
7. After space adjusting, check if the fork is locked by the stopper. If it is not, the fork may move towards two sides freely and goods may fall down during travelling.



■ Fork space adjusting of 10t truck

1. Make the truck in front of the goods;
2. Make the mast be vertical and lift the fork to be 10cm above the ground;
3. Lift the stopper until it is removed from the fork hooking slot. (In this case, fork can move left or right.)
4. Adjust the fork space through sleeve and ratchet wrench according to goods size to make the load center fit with the truck's center of gravity.
5. Make the mast be vertical, and insert the stopper into the slot of the lower beam of the fork bracket. (At this time, the fork is locked at the fixed position.)
6. After space adjusting, check if the fork is locked by the stopper. If it is not, the fork may move towards two sides freely and goods may fall down during travelling.



■ Operation lever



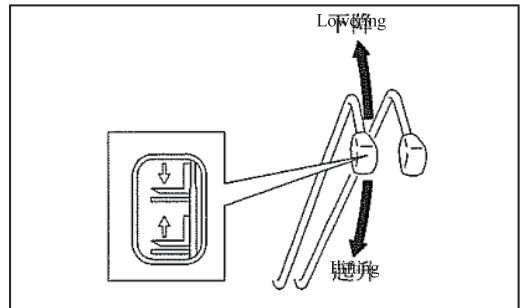
Sit on seat properly and ensure the safety around when operating lifting operation lever. Improper operation and even serious injury may be occur if operating with improper posture or operating outside of the cab.

Lifting operation lever

- Lifting: press the operation lever downward.  
Lowering: push the operation lever upward.

NOTE

Lifting and lowering speed can be adjusted by the operation lever tilting degree; lifting speed can be adjusted by the pressing distance of the acceleration pedal.

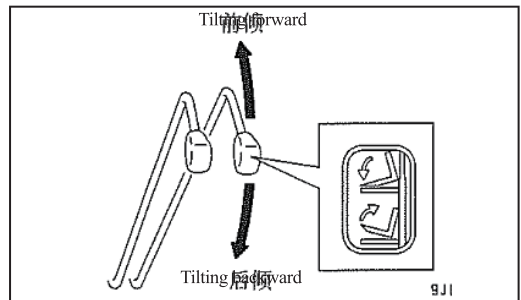


Tilting operation lever

- Tilting forward: push the operation lever upward  
Tilting backward: press the operation lever downward

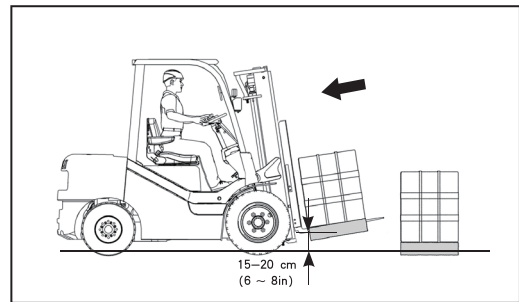
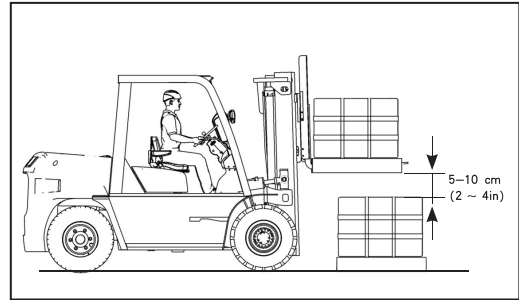
NOTE

The fork forward and backward tilting speed can be adjusted by the operation lever tilting degree and pressing distance of the acceleration pedal.



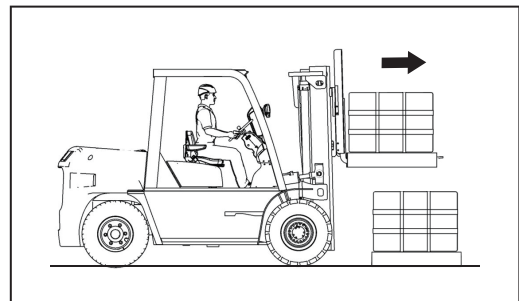
## Load picking

1. Insert the fork to the load bottom.
2. If it can not be done once, drive the truck forward until 2/3-3/4 of the fork is inserted into the pallet. Then lift the load 5-10cm and drive the truck backward 10-20cm. At last, lower the load and drive the truck forward until the fork is inserted to the pallet completely.
3. Lift the load 5-10cm and drive the truck backward to where load can be lowered.
4. Lower the load to be 15-20cm above the ground and tilt the mast backward.



## Stacking

1. Make the mast be vertical and lift the fork to be 5-10cm higher than stacking position. And then move the truck forward slowly.
2. Put the truck on desired position.
3. Draw the fork out.



---

### 3.3.10 Notes when the truck is equipped with solid tyre

When the truck is equipped with solid tyre, please pay attention to the following notes:

- 1) The truck with solid tyre is suitable for intermittent working condition and the working radius shall not exceed 2km.
- 2) The speed of the truck with solid tyre should not exceed 25km/h and avoid to work with overload.
- 3) The daily mean travelling speed shall not exceed 5km/h (intermittent working under 20°C ambient temperature) when the travelling speed exceed 25km/h.
- 4) When working under harsh condition, and the truck are beyond the requirements above, it is suggested to reduce travelling speed and using frequency and pay attention to the tyre's temperature increase. Avoid fast increase of temperature.

---

### 3.3.11 Check after operation

Carry out all checks described above and clean the truck. Before storing, carry out the checks below:

1. Check if there is leakage of fuel, battery and electrolyte.
2. Check if there are any cracks or damage.
3. If there is any fault, report it the manager and place a mark or sign on the truck. (if necessary)
4. Lubricate the truck if necessary.



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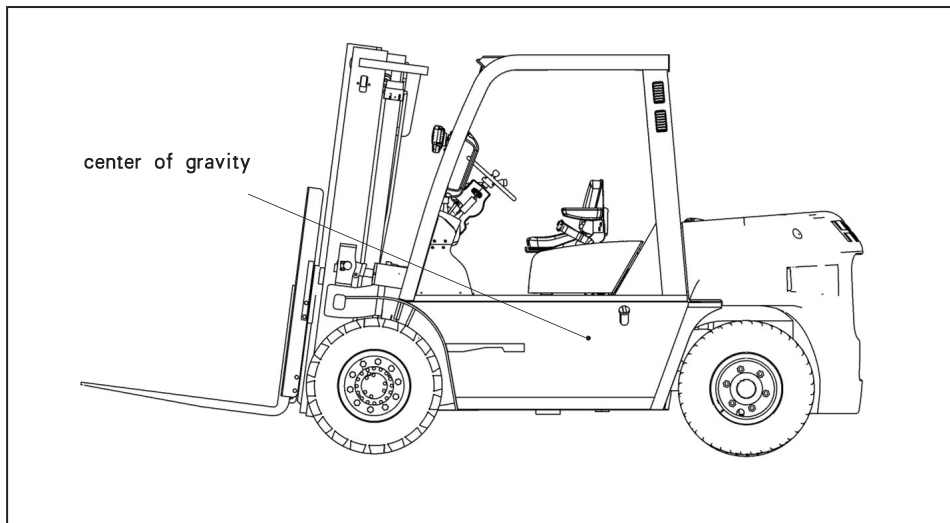
Refer the following points for other information:

- Refer to 4.6 WORKING IN COLD WEATHER for notes when working in cold weather.
  - Refer to 4.7 MEASURES OF ENGINE OVERHEATING for measures when the engine is overheating.
  - Refer to 4.11 STORING FOR A LONG TIME for storing for a long time.
  - Refer to 4.13 LOADING AND UNLOADING for relative operation.
- 

## 3.4 Transporting

Refer the technical parameter for truck size and weight.

Refer to the following figure for truck center of gravity. For more information, please contact with HELI dealer.



### 3.4.1 Truck fixing



Authorized transporting company is recommended to transport the truck through highway, railway and waterway.

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No matter which method is chosen to transport the truck, a common storing method is needed which can reduce the truck and paint damage possibility.

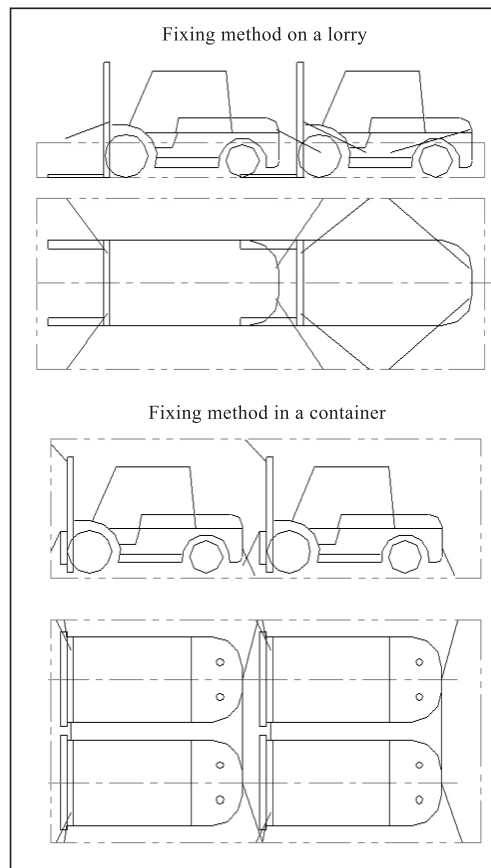
Forklift truck fixing method on a lorry:

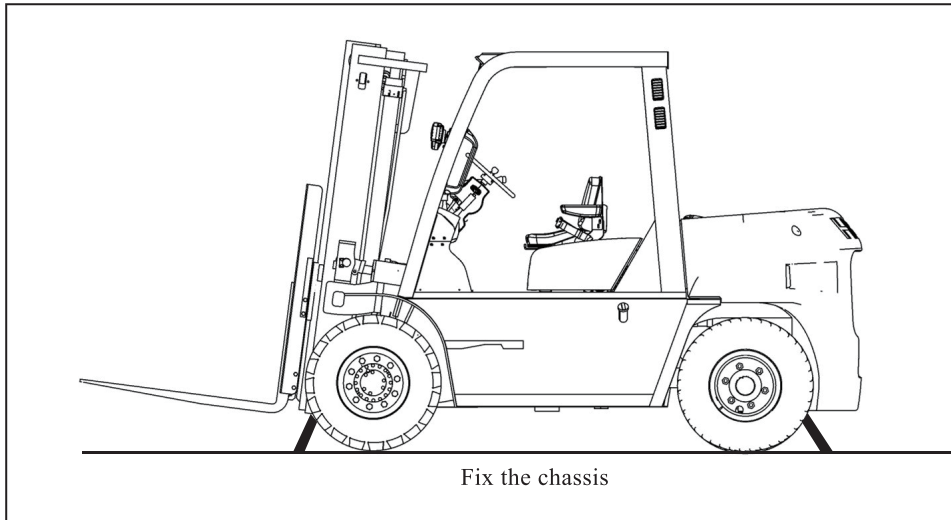
1. Keep a proper distance (at least 10cm) between two trucks for safety during transporting.
2. Put a wood block under the rear axle surface avoiding a bad effect on rear wheel because of the large gravity of counter weight. Apply the parking brake.
3. Bind the truck carefully avoiding appearance damage. Avoid direct contact with the rope. Put a rag on each binding point.
4. When binding, chose the position which can bear large force. Usually, chose the center beam as the front fixing point and hole on the counter weight as the rear fixing point.
5. The steel rope and iron wire must not interfere with the truck important parts such as tilting cylinder, lifting cylinder avoiding deforming because of force.

6. Fix the truck according to the sketch map below in order to bear small force.
7. In principle, place the truck facing opposite the lorry travelling direction. Because a spin may be caused during travelling if center of gravity is moved to one side. According to practical condition, placement of facing the lorry travelling direction and opposite the travelling direction can be mixed. Be sure to fix the load firmly.
8. After arriving, loose the fixing steel rope when unloading. Then lift the counter weight with lifting equipment and remove the wood block. At last the truck can be driven.

Forklift truck fixing method in a container:

1. For container space limit, trucks position is compact. The min. distance between the two trucks is 20-30mm to ensure disconnecting with each one.
2. Protect the left and right sides of the frame and counter weight with felt pads before going to the container avoiding truck appearance damage.
3. Lift the counter weight with lifting device and put a metal block under it avoiding a bad effect on rear wheel because of the large gravity of counter weight. Apply the parking brake.
4. Wedge the wheels with metal blocks and fix them to the floor board of container for safety.
5. Bind the truck carefully avoiding appearance damage.
6. Chose the lifting holes on top of the mast as front fixing points. For the outside, connect the listing hole with the hook on container. For the middle, connect the two trucks' lifting holes with steel wire. And connect the fork cross beam with the lower hook on the container. Chose the traction pins on the counter weight as rear fixing points. For the outside, connect the pin with the lower hook on the container. For the middle, connect the two trucks' pins with steel wire.
7. When binding put rag or felt pad to protect the paint on the fixing point from damage.
8. After arriving, loose the fixing steel rope when unloading. Remove the wheel blocks. Lift the counter weight with lifting equipment and remove the metal block. At last the truck can be driven.
9. In principle, trucks should be placed side by side. Placement of facing the travelling direction and opposite the travelling direction can be mixed or placement of facing the travelling direction. Be sure to fix the load firmly.





### 3.4.2 Mast transporting and reassembling

Some mast has to be disassembled during transporting for height limit.

1. Seal the hydraulic pipeline disassembling ends after disassembly. Fix the pipelines with belts. Wrap the connectors and transport with the whole truck.
2. Reassemble the mast after arriving by professionals.

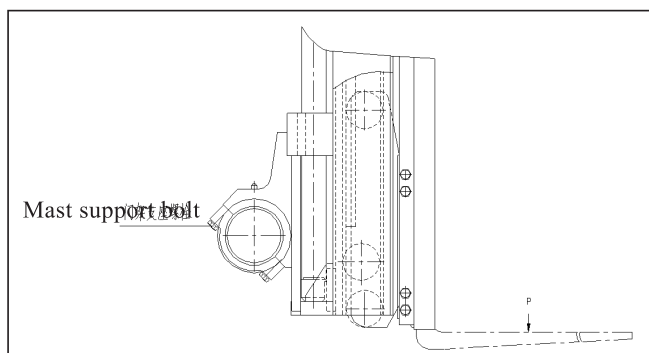
Main technical requirements are followed:

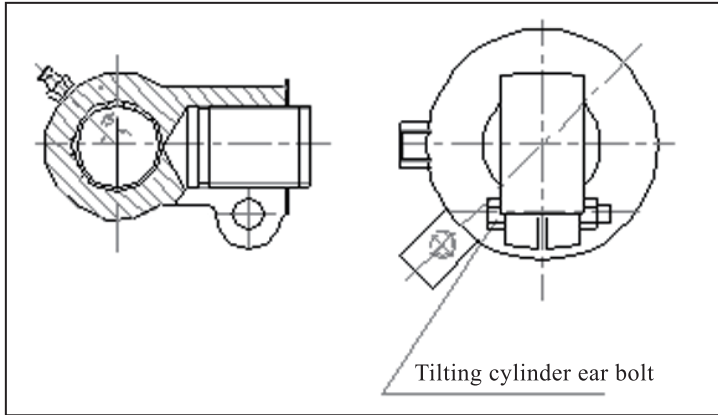
(1) Mast assembly

- a. Check the clearance between the mast and side rollers.
- b. connection between the mast support and frame: apply lubricating grease to bushing. The tighten torque of the mast support bolts: 630-940Nm. Apply anaerobic adhesive GY-340.
- c. Assembly of the tilting cylinder ear fixing bolts: tighten torque 182-274Nm. Apply anaerobic adhesive GY-340 (do after mast tilting angle adjustment and check).
- d. The connection and moving trend of pipelines are reasonable. Fix the pipeline with clamps

(2) After mast assembly

- a. Check the mast tilt angle referring to the parameters;
- b. Adjust the chain tension after reassembly.
- c. The pipeline can not interfere with the mast moving.





The disassembled mast usually is transported through horizontal method. Place the mast into the container vertically by special clamp in particular. When loading, refer to the practical space. Fix the mast to the middle hook in the container. Block the connecting point between mast support half and the floor board avoiding damage to the container floor.

■ Electricity and hydraulic connection

Block all connecting points of the electricity and hydraulic system in disconnecting condition.

Lifting

The lifting plate shown in the figure shows the proper lifting points. The points are on the mast and counter weight.

For more information, contact with HELI dealer or agent.

IMPORTANT

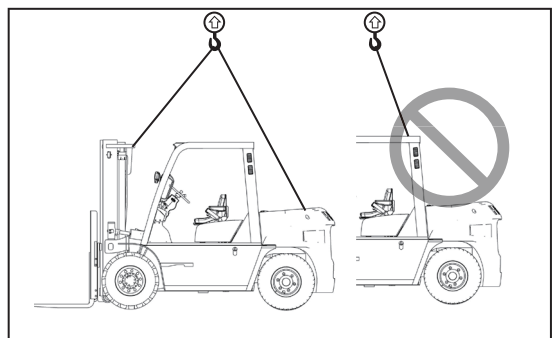
Make sure all slings have the safe capacity to lift up the truck.

Make sure the mast is under vertical condition before lifting up the truck.

■ Lifting the truck

Put proper lifting equipment on the lifting points.

1. Put sealing material where the lifting equipment may connect the truck avoiding appearance damage.
2. Tighten the slack rope and be away from the truck.
3. Carry out one lifting test to ensure balance lifting. If not, lower to the ground and adjust the lifting equipment.
4. If all above descriptions are correct, lift the truck to required position slowly.
5. Place the truck to required place and remove the lifting equipment.



# CHECKING AND MAINTENANCE



## WARNING

Please read the manual and safety notes carefully.

When checking and maintaining the truck, please follow the safety notes or serious injuries may be caused.

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## 4.1 About checking and maintenance

- Starting check, oil change, filter cleaning and other simple maintenance work are described below. For others that are not described, contact with HELI dealer or agent.
  - Refer to the second chapter SAFETY NOTE for safe checking and maintenance.
  - Improper maintenance and repair may cause serious accident and shorten truck service life. Please contact with HELI dealer or agent for maintenance and repair.
- 

## 4.2 Starting checking



- Do not operate the truck before checking.
  - If there is any abnormal, report to the manager. Do not operate the truck until it is repaired.
- 

For safety, carry out the starting check before operation.  
Record checking results in checking record.

Starting checking parts table

Item	Checking parts
—	Check the abnormal found the day before
Forklift truck	Leakage of oil and electrolyte
	Crack, damage and fixing condition (overhead guard, fork, backrest and so on)
	Tightness of the locking nut of the tilting cylinder piston rod
	Check if the light and glass cover are clean or damaged.
	Check if the backview mirror and truck plate are clean or damaged.
	Check the tightness of hub nuts.
	Check if the tyre and rims are damaged or out of shape.
	Check the inflation pressure.
Open the engine hood	Hydraulic oil level
	Engine oil level and check if it is dirty.
	Check the tightness of the battery connection.
	Coolant level
	Brake liquid level
Sit on seat	Performance of the safety belt
	Seat and hand shark
	Brake pedal clearance and height
	Inching pedal clearance and height
	Parking brake handle operation force
	Horn
	Cleanness, damage and angle of the backview mirror
Turn the starting switch to ON position	Alarming indicator on the meter ( check through switch the starting switch to ON and OFF position)
	Light
	Fuel level
	Abnormal noise and vibration
Start the engine	Exhausting air color
	Hand wheel clearance
Drive slowly	Hand wheel operation condition (shake and unstable driving)
	Brake operation condition(respond)
	Inching and clutch pedal operation condition
Load handling	Mast operation condition
	Tightness of lifting chain; check if it is damaged or rust.
Safety function check	OPS (travelling function)
	Neutral position safety function check
	Parking brake

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### **4.2.1 Check the abnormal found the day before**

Check the abnormal found the day before.  
Make sure there is no fault.

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### **4.2.2 Forklift truck**

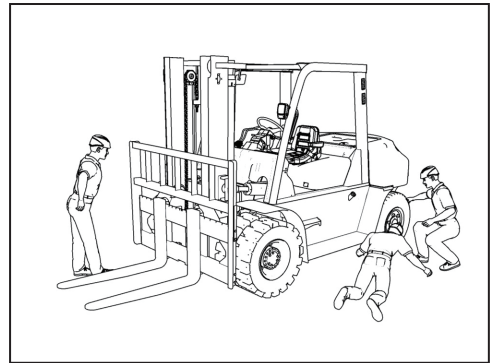
- Check if there is leakage of oil and electrolyte.
- Check if there is leakage of oil, fuel, coolant and battery electrolyte.
- Check if there is leakage of oil and electrolyte under the truck.



■ Crack, damage and fixing condition check

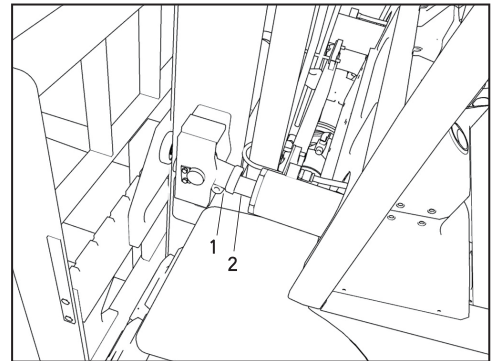
Check if there is any damage, cracks, loose and clearance through visual check. Check the following parts preferentially:

- Overhead guard
- Fork
- Backrest
- Fork bracket
- Mast
- Fuel tank
- Hydraulic oil tank



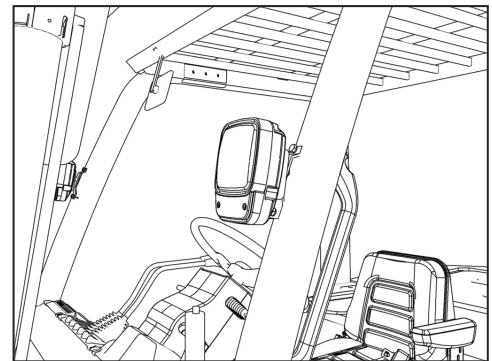
■ Check the tightness of the locking nut of the tilting cylinder piston rod

Check if the tilting cylinder piston rod, piston head and locking nut are loose visually.



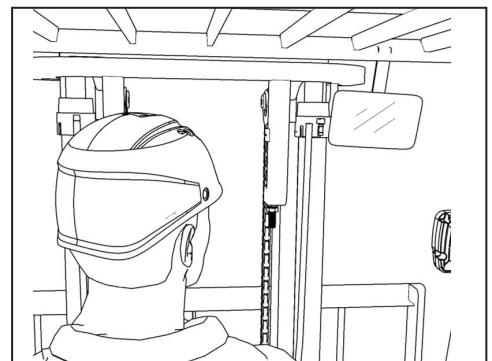
■ Check if the light and light glass are dirty or damaged.

Check if the light and light glass are dirty or damaged visually.



■ Check if the backview mirror is dirty or damaged.

Check if the backview mirror is dirty or damaged visually.

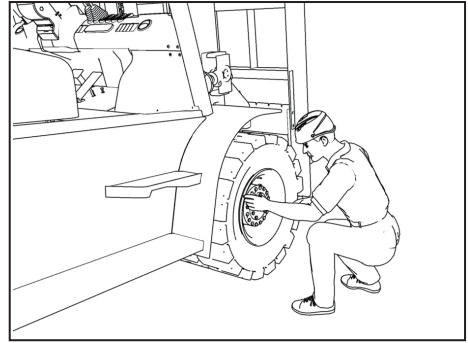


- Check if the rim nut is loose.

Check if there is loose nut by wrench.

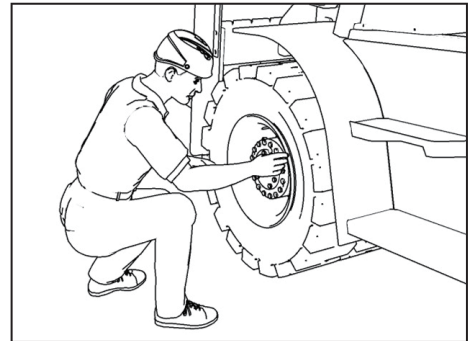
#### IMPORTANT

Tighten the rim nut to the regulated torque.  
For proper tighten torque, refer to 4.16 REPAIR  
PARAMETER



- Tyre and rim checking

- Check if the tyres are worn, damaged. Check if there is any adhered nail and other foreign matters. Check if the rim is out of shape or damaged.
- If the rim tread depth is less than 5mm or there is tyre worn alarming mark, change the tyre.

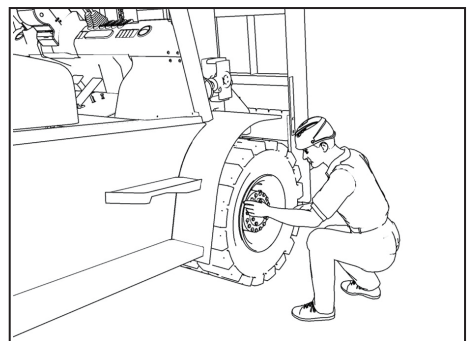


- Check the tyre inflation pressure.

#### CAUTION

There is high pressure inside the tyre. When checking inflation pressure, face the tyre thread surface (refer to the figure) and hold the tyre inflation gauge.

Check the inflation pressure with inflation gauge and adjust it to regulated value. Refer 4.16 REPAIR  
PARAMETER for inflation pressure.



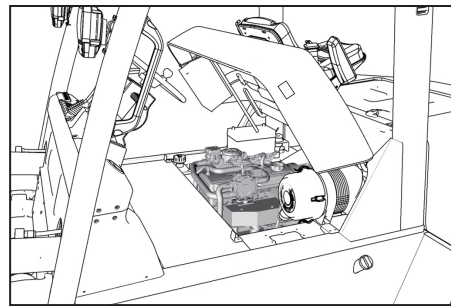
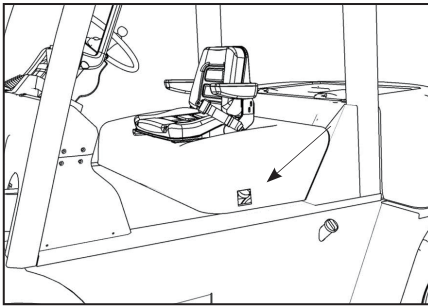
## 4.2.3 Open the engine hood to check



- Before opening the engine hood, shut off the engine.
- Take care not to press your hand when opening or closing the engine hood.
- Only authorized person is allowed to open the engine hood.

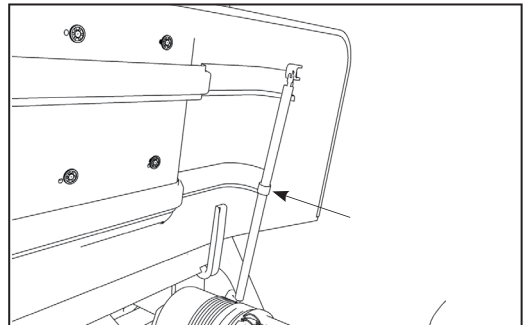
### ■ Methods of opening the engine hood

1. Release the hood lock through pushing the hand shank on the left front of the engine hood.
2. Push then engine hood upward until the red stopper of the engine hood supporting gas spring is taken its place.



### ■ Methods of closing the engine hood

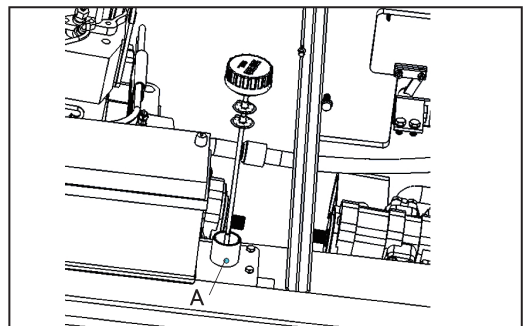
- Press the supporter's red stopper (marked with PRESS) to the direction of arrow (backward) with one hand and close the engine hood with the other hand slowly.
- Check if the engine hood is closed and locked.



### ■ Hydraulic oil level check

Check if the hydraulic oil is added to regulated level.

1. Place the truck on a flat ground. Lower the fork to the ground and keep the mast be vertical.
2. Draw out the oil dipstick on the right side of the truck (integrated with the ventilating device). Clean the oil dipstick with rag and then insert it to the oil tank.
3. Draw out the oil dipstick and check if the adhered oil is in normal range.
4. Add oil if oil level is low; if oil run out, clean it.



**IMPORTANT**

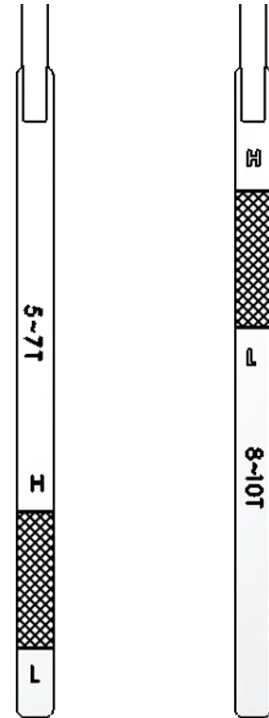
- Only pure HELI hydraulic oil or recommended oil can be used.

- 5-10t truck hydraulic oil level gauge instruction

For different lifting system, please refer to corresponding scale mark.

For 5-7t trucks with basic type mast and lifting height lower than 4750 and without attachment, please refer to the oil level gauge face marked with 5-7t, for other 5-7t trucks, refer to the oil level gauge face marked with 8-10t. H and L are marked on two faces to show the highest level and lowest level. Carry out once full lifting, tilting and steering after adding oil. The oil shall stay between the two levels after making the mast to be vertical, fork to reach the ground and steering cylinder to stay in neutral position.

For 8-10t trucks, please refer to the oil level gauge face marked with 8-10t. H and L are marked on two faces to show the highest level and lowest level. Carry out once full lifting, tilting and steering after adding oil. The oil shall stay between the two levels after making the mast to be vertical, fork to reach the ground and steering cylinder to stay in neutral position.



5-10t truck oil level gauge diagram

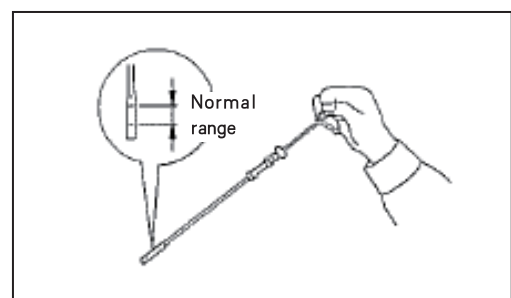
■ Engine oil level check

1. Check if the engine oil is in normal range.
2. Draw out the oil dipstick on the left side of the truck. Clean the oil dipstick with rag and then insert it to the oil tank.
3. Draw out the oil dipstick and check if the adhered oil is in normal range.
4. Add oil if oil level is low; if oil run out, clean it.

**IMPORTANT**

If the engine oil is polluted or goes color, change the engine oil.

Only pure HELI engine oil or recommended oil can be used.



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■ Electrolyte level check



Flammable hydrogen produced by the battery is explosive. Dilute sulphuric acid is also contained in the electrolyte. Serious injuries, explosion and fire may be caused if it is handle improperly. Stick the notes described in 2.7.14 NOTES WHEN DEALING WITH BATTERY.

- Keep the ventilation device and battery terminals clean. Make sure there is no adhered dust.

**IMPORTEANT**

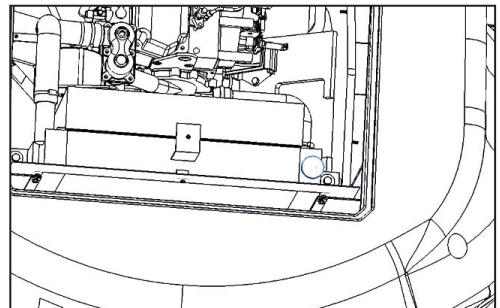
- If the battery electrolyte runs out, change it with the same type battery.

■ Coolant level check



Do not open the radiator cap as soon as the truck is stopped. Because the coolant temperature is very high, burning water may ejected out and burn others. Slowly remove the radiator cap slowly after the coolant is cool.

1. Check if the coolant in the auxiliary radiator stays between the FULL and LOW mark when he coolant is cool.
2. If the level is low, add it to the full position.
3. Check if the radiator and radiator hose leak.
4. Reopen the radiator cover after engine running for several seconds. check if the coolant is full, if not, add it to the full position and then retighten the radiator cover.

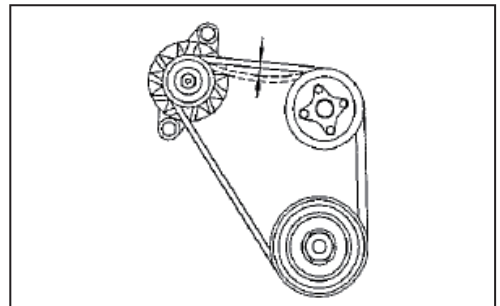


■ Check the V belt's deflation

For the V belt tension check, press the middle of the belt with 98N. The deflection should stay between 10-13cm.

**NOTE:**

Change the belt if it is stretched and there is no adjusting possibility or it is damaged. Please contact with HELI dealer or agent for belt change.



## 4.2.4 Check sitting on the chair

### ■ Safety belt check

Check the safety belt first.

- Check if the belt and connectors are damaged.
- Check if the belt can be pulled out and withdrawn smoothly; check if the connector can be locked or loosen normally.
- Check if the belt can be locked when pulling suddenly.

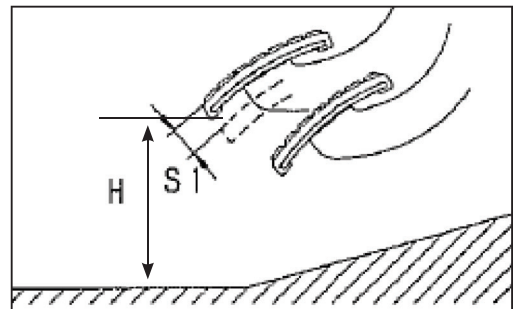
### ■ Check the position of the seat and steering hand wheel.

Check if pedals, operation levers and switches can be operated stably when sitting on seat.

### ■ Brake pedal check

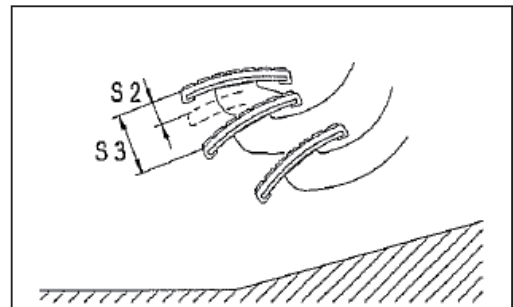
Check if the brake pedal operation force and pedal distance are correct.

Refer to 4.16 REPAIR PARAMETER for clearance standard value (S1) and pedal height (H) during brake.



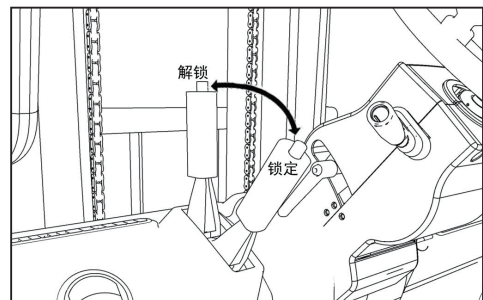
### ■ Inching pedal check

Check the inching pedal operation force, clearance and interlocking distance. Refer to 4.16 REPAIR PARAMETER for clearance standard value (S2) and interlocking distance (S3).



### ■ Parking brake handle check

Check if the parking brake handle can be locked or released completely and smoothly. Refer to operation force adjusting of parking brake shank for operation force standard value.



■ Rear mirror check

Check if the driver can see the rear view easily from the rear mirror. Check if it is dirty or damaged.

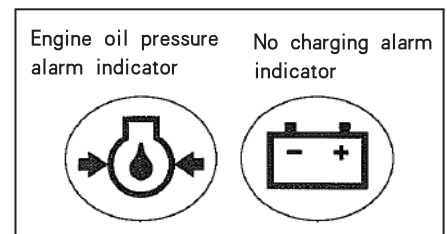


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#### 4.2.5 Check when the starting key switch is on ON position.

■ Alarm indicator check

When the starting switch stays on ON position, check if indicators (engine oil pressure alarm indicator and no charging alarm indicator) are on.



■ Fault indicator

For electric controlled engine, when key switch is turned to ON position from OFF position, fault indicator  lights on for 5 seconds. If the engine has no fault, the indicator turns off; if the engine has a fault, the indicator will be on until the fault is removed.

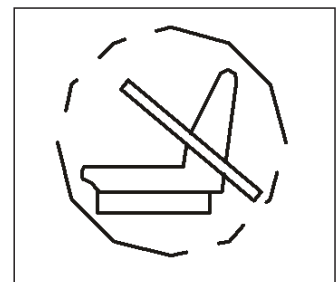
■ Neutral gear indicator

If the indicator turns on when the starting switch is on ON position and it turns off when the forward/backward operation lever is on forward or backward position, the neutral gear indicator is OK.



■ Seat alarm indicator (the truck with OPS)

If the indicator will turn on when the starting key switch is turned to ON position, and the indicator will turn off when the driver is sitting on the seat with right posture, or it will be on all the time, it means the indicator is OK.



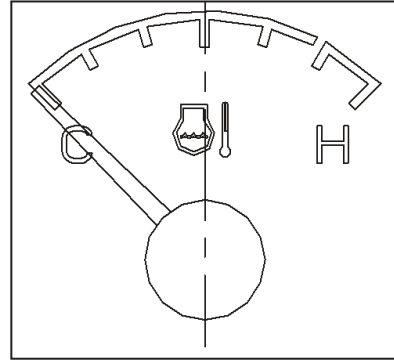
■ Parking brake indicator

If the indicator will turn on when the starting key switch is turned to ON position and it will turn off when the parking brake is released, it means the indicator is OK.

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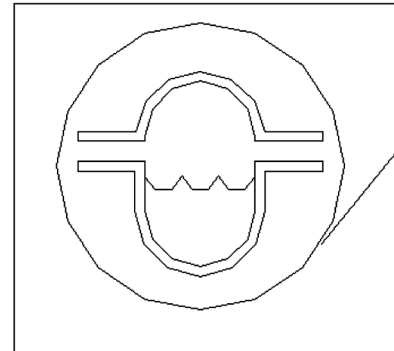
■ Engine coolant temperature meter

When the engine is cold, the pointer points to the left side and when the engine is preheated, the pointer points to the white range.



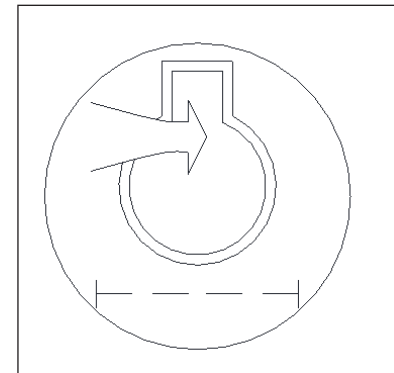
■ oil-water separator alarm indicator (Truck with diesel engine)

- The indicator is ok if it turns on when the engine starting key switch is turned to ON position and it turns off when the engine is started.
- Drain the water in oil-water separator if the indicator still lights on when the engine is started.



■ Air cleaner block alarm indicator

- The indicator is OK if the indicator turns on when the starting key switch is turned to ON position and then turns off.



■ Lights check

- Check if the front lamp, contour light, steering signal, brake light and reversing light are normal.

■ Fuel level check and adding

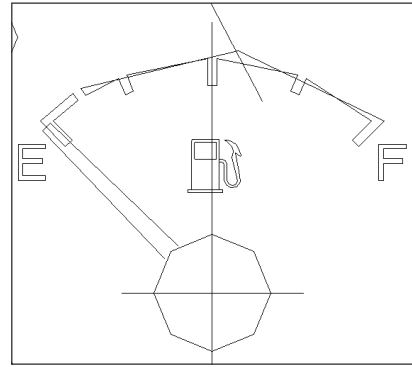
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 CAUTION

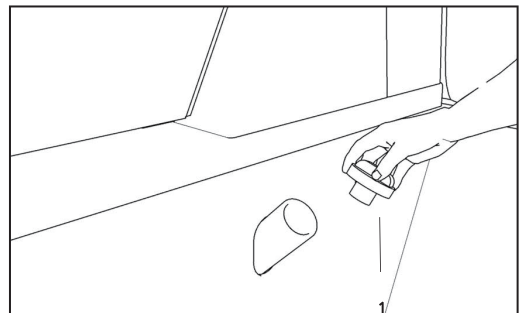
- Before fuel adding, shut off the engine and be away from the open flame.
  - Do not let the fuel run out when adding fuel, or fire may be caused. If it runs out, clean it.
-



- Check the fuel meter and make sure if it is enough for one day's work.
- If the pointer points to F, the tank is full.
- if the fuel level is low, shut off the engine and add fuel from the adding point. Refer to OIL TYPE TABLE for oil type.



- When adding fuel, clean the oil sludge in and around oil adding cap to protect dirt from falling into the tank.
- After adding, tighten the oil adding cap and clean the oil running out.



**IMPORTANT**

Never use the fuel mixed with kerosene in truck assembled with diesel engine because such fuel will facilitate the aging of fuel injection system.

The table below lists the corresponding oil level:

Truck model	Middle position (L)	Full (L)
5-10t	64	160

■ Back buzzer check

Check if the back buzzer sounds when the operation lever is placed on backward position.

■ Horn check

Sound the horn and check if the horn is ok.

---

## 4.2.6 Check when the engine is started

### CAUTION

- Take care of the ventilation condition when starting engine indoor or in poor ventilated place because the exhausting air is poison.
- 

#### ■ Alarm indicator on the meter

- Check if the alarm indicator on the meter turns off as soon as the engine is started.
- Engine pressure alarm indicator may turns off a little later. But that does not mean the indicator has fault.
- Check if the engine fault alarm indicator (certain electronic controlled engine) is off, if not, please contact with HELI dealer/agent for repair.
- Check if there is any fault code or fault message on the LED display (certain modes), if there is, shut off the engine and contact with HELI dealer/agent.

#### ■ Abnormal noise and vibration

- Especially check if the engine and hydraulic pump has abnormal noise and vibration.

#### ■ Exhausting air color

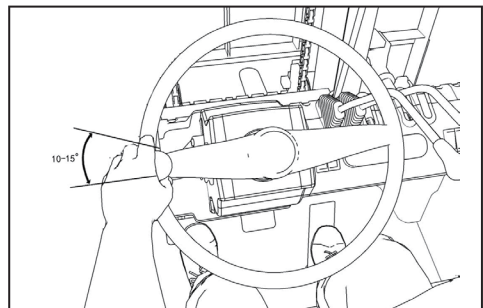
- Check if the exhausting air is black or white.

#### NOTE

- For diesel engine, the exhausting air may be black or white. It is normal.
- The black and white exhausting air is caused by:  
Black: incompletely burning;  
White: low engine temperature or fuel mixed with water

#### ■ Steering wheel clearance check

- Rotate the steering wheel to check the clearance.  
If it is between 3-10°, it is normal.
- Check if it is loose through shaking in both vertical and horizontal direction.



---

## 4.2.7 Check when travelling slowly

### ■ Steering wheel check

Check the steering wheel when driving slowly:

- Check if there is clearance;
- Check if the steering wheel is stable in left and right side when driving straightly;
- Check if the steering wheel is heavy or if there is abnormal shake when rotating the steering wheel.

### ■ Brake check

Check the brake respond through stepping on the brake pedal when driving slowly.

- Check if brake can meet the requirements.
- Check if the brake forces on two sides are equal.

### ■ Inching pedal check

Check its function through stepping on the inching pedal when driving slowly.

- Check if travelling speed can be adjusted according to pressure applied on the inching pedal.
- Check if the truck can be stopped completely when the inching pedal is pressed down fully.

### ■ Abnormal noise and smell check

- Make sure there is no abnormal noise and smell when travelling slowly.
- 

## 4.2.8 Check through operating the working devices operation lever

### ■ Mast check

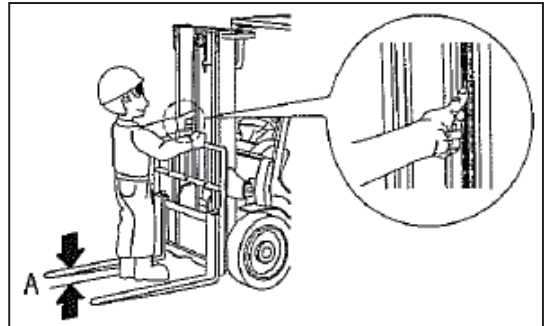
- Check if the fork can be lifted or lowered smoothly and mast can tilt forward and backward smoothly when operating the levers. Before everyday working, operate the piston fully 2 or 3 times.
- When operating working devices operation lever, make sure there is no abnormal noise and smell.

## ■ Chain tension check



- If the chain tension is not equal on left and right side, then the load will be applied on one side. In that case, the chain may be broken and goods may fall down and then truck may tip over.
- Before checking, place the forward/backward lever on neutral position, apply the parking brake, shut off the engine and get down from the engine avoiding truck uncontrolled moving or checkman being caught.
- Never put feet under the fork for they may be pressed.

1. Lift the fork 5-10cm above the ground (A).
2. Press the middle of the chain with finger to check if the tension are equal on left and right side.



## ■ Lifting chain check



- If the lifting chain is broken, the goods may fall down or truck may tip over. If there is any fault with the chain, contact with HELI dealer/agent to replace the lifting chain.
- Rust on the chain is the main cause of chain damage, so keep the chain from rusting in early stage.

1. Check if the chain is damaged, broken or rusted through visual check.
2. Check the lubricating condition. If the chain is rusted or poor lubricated, coat the chain with engine oil.

## ■ Accessories check (truck with accessories)

Check the accessories referring to the relative operation manual.

---

## 4.2.9 Safety function check



- Park the truck on a flat ground before carrying out the check.
- Make sure there are no people and barriers around and there is enough driving space.

### ■ OPS(travelling function)check (optional)

The truck is not allowed to move by the OPS system when the driver goes away from the seat. Check the safety function.

Checking steps

1. Park the truck on a flat and solid ground and apply the parking brake.
2. Place the forward/backward operation lever on neutral position and lift the fork 15cm above the ground.
3. Move foot way from the brake pedal, inching pedal and acceleration pedal.
4. Place the forward / backward operation lever on forward or backward position and move you buttock away from the seat.
5. Check if the OPS alarm indicator on the meter lights.
6. Release the parking brake.
7. Make sure the truck will not move when you press the acceleration pedal 5 seconds after moving buttock away from the seat.
8. Sit on the seat with correct posture and place the forward/backward operation lever on neutral position. The truck will return to normal operation condition and the flickering OPS alarm indicator turns off.

### ■ OPS (loading function) check

The truck is not allowed to lift by the OPS system when the driver goes away from the seat. Check the safety function.

Checking steps

1. Park the truck on a flat and solid ground and apply the parking brake.
2. Place the forward/backward operation lever on neutral position and lift the fork above until the driver can see it.
3. Move foot way from pedals and move your buttock from the seat.
4. Check if the OPS alarm indicator on the meter lights on.
5. Ensure the following points five seconds after moving your buttock away from the seat:  
Fork will not be lifted or lowered even the lifting and lowering operation lever is operated.  
Mast will not tilt forward or backward even the tilting operation lever is operated.
6. The truck will return to normal operation condition and the OPS alarm indicator turns off when sitting on the seat with correct posture.

### ■ Neutral position safety function check

The function is used to avoid truck moving suddenly when starting the engine as the forward/backward operation lever is placed on forward or backward position.

Checking steps

1. Park the truck on a flat and solid ground and apply parking brake.
2. Place the forward/backward operation lever on neutral position and shut off the engine.
3. Make sure the starting motor and engine do not work even starting switch is turned to starting position when the forward/backward operation lever is placed on forward or backward position.
4. Release the neutral position safety function.

Place the forward/backward lever on neutral position after checking. Then the function is released and engine returns to normal condition. The engine will start when the starting key switch is turned to starting position.

---

## 4.3 Check after operation and report

Check after operation and report everyday are important things which is helpful for next day's operating preparation. Before clean and store the truck after operation, check the following points and report to the manager.

1. Check if the engine oil and electrolyte leaks.
  2. Check if there are cracked, damaged or loose parts.
  3. Lubricate parts if necessary.
  4. Check the abnormal parts found during operation.
- 

## 4.4 Simple maintenance

### 4.4.1 Lubricating grease and fuel

#### 4.4.1.1 Notes

When lubricating according to STARTING CHECK and CHECK AFTER OPERATION, please understand the following notes.

##### ■ Oil

#### CAUTION

- Do not check the pipeline or hose with hand directly when checking if there is leakage because the pressure may be applied and danger may be caused.
- If your skin or eye is harmed by high pressure oil, wash with clean water at once and go to see a doctor.
- Please let HELI dealer to carry out the visual checking items except the leakage.
- Engine oil, hydraulic oil, transmission oil and gear oil that used under bad condition (high temperature and high pressure will go bad as time pass by. Change the oil regularly referring to OIL AND GREASE and OIL TYPE TABLE.



- Change the oil in regulated time even it does not go bad.
- Be sure to use HELI pure engine oil. Oil listed in the LUBRICATING CHART is filled in the truck before delivery.
- Do not use oil mixing with different degrees and numbers.
- Most fault may be caused if foreign matter goes into oil or grease. Take care not to let foreign matters fall into oil or grease during storing and lubricating.
- Add oil with proper quantity because fault may be caused because of insufficient oil or too much oil.
- If the hydraulic oil becomes turbid or there is possibility of air or water going into oil, fault may be caused if measures are not taken. In that case, please contact with HELI dealer or agent.
- When changing oil, change the corresponding filter. Please contact with HELI dealer or agent for oil and filter changing.

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## ■ Fuel



### CAUTION

Only HELI specified fuel is allowed to be used or the cleanness of the exhausting air can not meet the standard requirement. For your health and environment, use HELI specified fuel.

- Add the fuel to the full level after one day's work. Reducing the air in the tank is helpful to reduce the possibility of moisture mixed into the fuel.
- Fuel pump which is precise instrument may not work if fuel mixed with moisture or impurity is used. Take care not to let moisture and impurity mixed into fuel during storing and lubricating.
- Only fuel listed in the LUBRICATING CHART can be used.
- Clean the fuel circuit when the fuel is over or filter is changed.

## ■ Coolant



### CAUTION

- The coolant temperature is very high when the engine is stopped and there is high pressure inside the radiator. Do not remove the radiator's cap in this case or serious burn may be caused. Rotate the cap slowly before remove it so as to release the pressure when the coolant temperature is lowered.
- Please use new HELI special coolant. It is prohibited to add hard water such as tap water, mineral water, river water, well water to the cooling system avoiding radiator corrosion or scale forming which will reduce radiator performance and service life.
- The coolant filled in the truck can not only protect the truck against freezing above  $-35^{\circ}\text{C}$ , but also protect the cooling system from corrosion, scale-forming and increase the coolant boiling point remarkable.
- Change the coolant once a year. If the coolant is bad in less than one year, change it when necessary. When changing the coolant, clean the interior of the cooling system. The freezing point of the coolant should be at least  $10^{\circ}\text{C}$  lower than the lowest environment temperature.

## ■ Lubricating grease

- The lubricating grease is used to prevent the connecting parts from lock, rust and producing noise.
- Only recommended lubricating grease is to be used and lubricate the parts according the interval. For lubricating grease type, refer to the LUBRICATING CHART.
- Clean the lubricating grease pressed out after lubricating. Clean the lubricating grease from the parts adhered with sand and dirt.

## ■ Filter

Filter is very important parts which prevents the impurity in oil and hydraulic oil circuit from getting into the machine. Change the filter regularly. Please contact with HELI dealer or agent.

Filter changing note no matter it is carried out by yourself or HELI dealer or agent:

- When changing the filter, check if there is metal powder adhered on the filter. If there are powder, find out the reason and take proper measures.
- Before assembly, do not open the new filter's package too early.

## NOTE

- Only HELI pure filter is to be used.
- Filter with poor quality may affect truck performance and durability. Quality assurance is invalid.

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■ Wet type drive axle (optional configuration)

Oil for wet type drive axle

Oil code	Brand	Volume	Note
GL-5 75W-80	Long Pan	24L (be subject to the oil out opening in actual condition)	Add LUBRIZOL 9990A or 6279 antiwear additive. The volume of addition is 3%-6% of the gear oil volume (about 1000ml).

Maintenance notes of wet type drive axle:

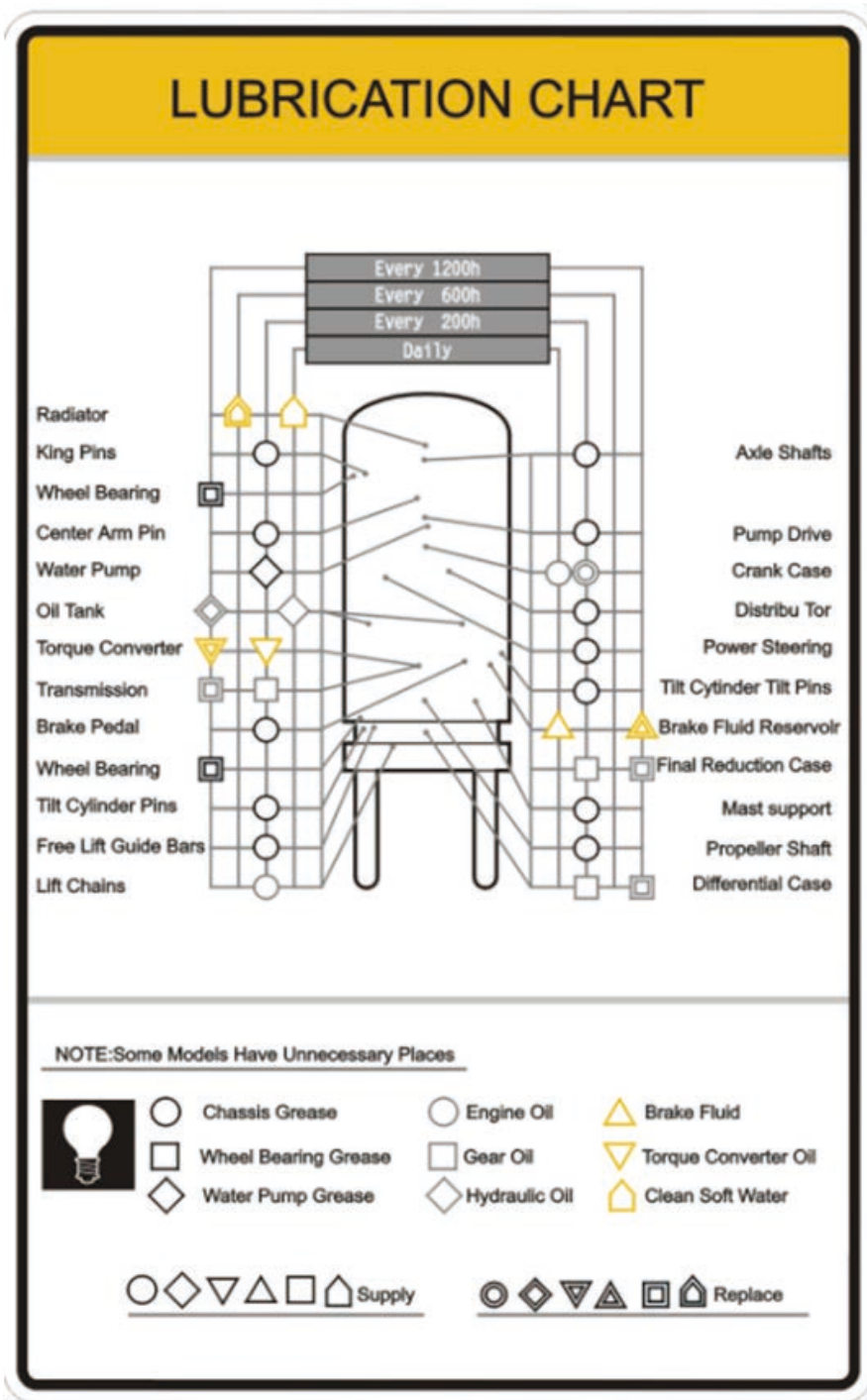
- Change the oil every 1200h. It is prohibited to mix water into the oil or brake performance could be badly affected and the worn out of friction disc could be accelerated.
- Make sure the oil level of wet type drive axle is appropriate; check the connection of each part regularly, remove the fault if any leakage is detected.
- If the accumulator alarms, stop using at once.
- If the brake system is found to be overheat, stop using and consult with engineer or manufacturer to prevent aging of seals, thermal failure of gear oil and damage of circulating pump and so on.

Note: Assembly and disassembly of drive axle can only be done by professional persons.



### 4.4.1.2 Lubricating chart

Oil and grease adding chart (oil and grease adding position and maintenance interval).



■ Oil type table

Type	Brand	Oil number, oil code and applying temperature			
Diesel (refer to note)	Light diesel number	0#	-10#	-20#	-35#
	Applying temperature (°C)	≥ 4	≥ -5	≥ -5 ~ -14	≥ -14 ~ -29
Engine oil (refer to note)	Viscosity degree	5W/30	10W/30	15W/40	20W/50
	Applying temperature (°C)	-30 ~ +30	-25 ~ +30	-20 ~ +40	-15 ~ +50
Hydraulic oil	HLW-40(Dedicated for HELI)				
	Normal temperature: Mobil DTE 10 Excel 25 Shell Tellus S2 V 46	Low temperature: Mobil DTE Excel 46 Shell Donax TC 10W			
Hydraulic- powered transmission oil	HLT-9(Dedicated for HELI)				
	Normal temperature: Total Dyantrans AC 30 FUCHS RENOLIN ATF-Y 8	Low temperature: Mobil Fluid 424 Shell Donax TD 10W			
Lubricating grease	3# common lithium base grease				
Heavy duty tuck gear oil (GL-5)	Viscosity degree	85W/90		80W/90	
	Applying temperature (°C)	-15~+49		-25~+49	
Anti-freezing liquid	Code	FD-1	FD-2	FD-2A	FD-3
	Applying temperature (°C)	≥-25	≥-35	≥-45	≥-50

NOTE:

- Use the diesel, gasoline and engine oil meeting relative quality standard. Please refer to the engine operation manual for quality standard or consult with dealer or agent.
- Please use low sulfur fuel with sulphur content no more than 15ppm for truck meeting EURO IIIB or Tier 4i or higher emission standard.

Refer to the following table for details.

Property	Unit	Value
Distillation Temperature	°C90%	282-338
Kinematic Viscosity	mm <sup>2</sup> /s at 40°C	1.9-4.1
Sulfur	ppm(μ g/g) max	15
Cetane index	-, min	40
Aromaticity	% vol,max	35
Lubricity, HFRR	Mm,max	520

**NOTICE**

1. Do not use bio-diesel fuel. Damage to engine will occur.
  2. In cold weather, use winter diesel fuel to prevent clogging of the fuel filter caused by paraffin precipitation. In hot weather, do not use winter diesel fuel. Damage to engine will occur.
  3. Do not use deteriorated fuel which has been stored for a long period of time or impure fuel in which foreign material, water and etc. is included.
- Do not mix-use oil of different oil brand.

■ Oil level table

Parts Model	Hydraulic powered transmission box (torque converter included)	Drive axle		Hydraulic oil tank (basic mast)	Fuel tank	Radiator	
		Main reductor Differential	Hydraulic-powered			Isuzu	Other type
						C240-30	Dachai, jiangling
G5-7t	30L	10L	8L(right and left)	85L	160L	21L	18L
G8.5-10t			10L(right and left)	105L	160L		

**IMPORTANT**

- Never use the fuel mixed with kerosene because such fuel will facilitate the aging of fuel injection system.

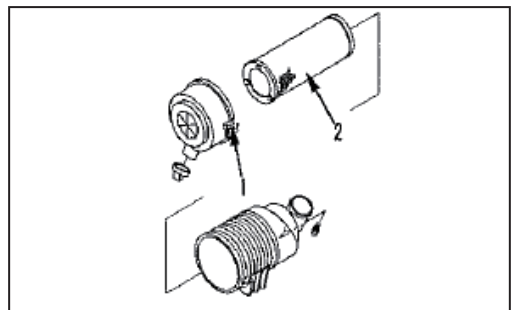
**4.4.2 Filter element cleaning**

**⚠ CAUTION**

- When the engine is working, serious injury may be caused by fan or belt. Shut off the engine before disassemble or clean filter element.
- When cleaning filter element, dust on it may get into eye or be breathed inside. Wear protection glass, dust-proof cover and other protection devices. Clean it where has no people around.

1. Disassemble clamps (three positions) on air cleaner and disassemble the filter element.

2. Knock the filter element gently avoiding damage the sealing surface or clean the element with compressed air (no more than 0.68MPa) carefully from inside to the outside.



3. Check the filter element visually after cleaning.  
If there is any damage or dirt still, change the filter element.

**IMPORTANT**

Dust may enter into the engine and may be damaged when checking, cleaning or maintaining the filter element with engine running.

Carry out the maintenance work after shutting off the engine.

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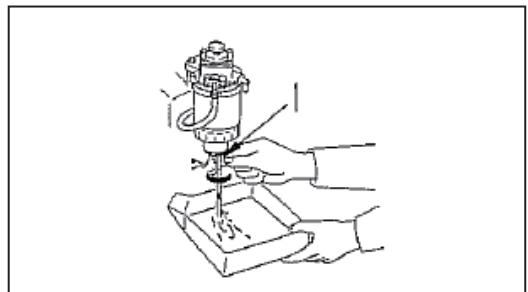
### 4.4.3 Water and gas exhausting of the oil-water separator (diesel engine)

**! CAUTION**

- Exhaust the water or air until the engine is cooled because the engine is very hot as soon as it stops.
- When exhausting water, fuel will be exhausted out also. Keep it in a tank away from open flame. Clean the running out fuel.

When the oil-water separator alarm indicator flickers, water subsided on the bottom of the filter exceeds the regulated limit. Drain out the water according to the following steps:

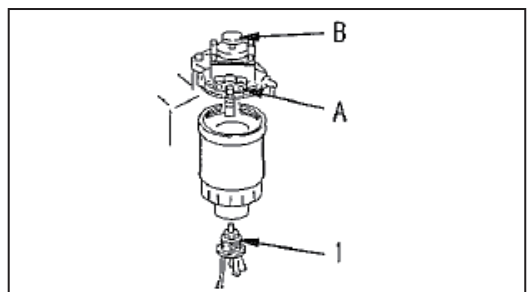
1. Loose the exhausting plug at the bottom of the oil-water separator. (It is also used as sensor)(1)  
And drain out the water.



2. Tighten the plug after draining.

3. Air exhausting

Loose the plug A and move the button B upward and downward. Tighten the plug until there is no air bubble.



## 4.4.4 Tyre changing

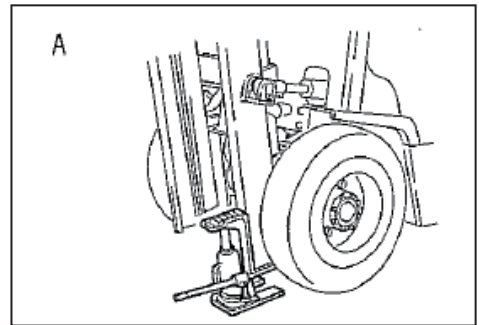
### CAUTION

- Be care not to be pressed by jack when it slips away. When using jack, ensure the supporting position is firm. Do not crawl under the lifted truck.
- The pressure of the tyre is very high and dangerous.
- Do not disassemble and reassemble the tyre, inner tube and rim or charge the tyre. (These operations need special devices and skills and can only be carried out by trained people.)

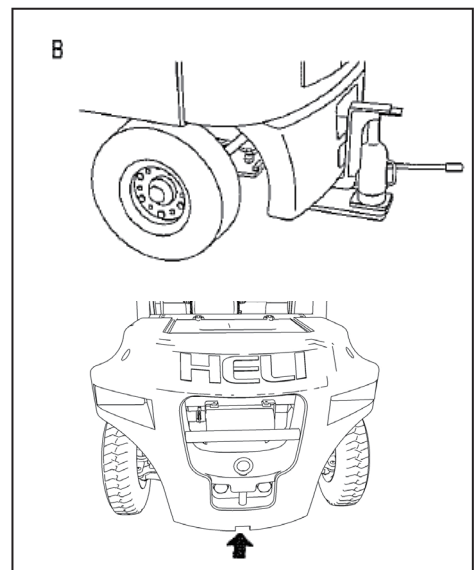
1. Unload the goods on truck and park the truck on flat and solid ground. Apply parking brake.

2. Lift the truck at the required position.

- (1) Replace the front tyre: (A) under the outer mast
- (2) Replace the rear tyre: (B) under the counter weight



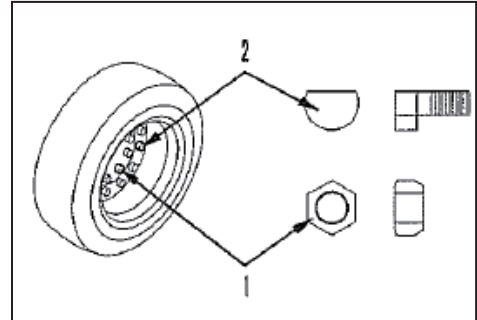
3. Lift the truck to the position where the tyre connects with the ground a little and place a support under the frame. When replacing front tyre, place a support under the forepart and when replacing rear tyre, place one under the rear part.



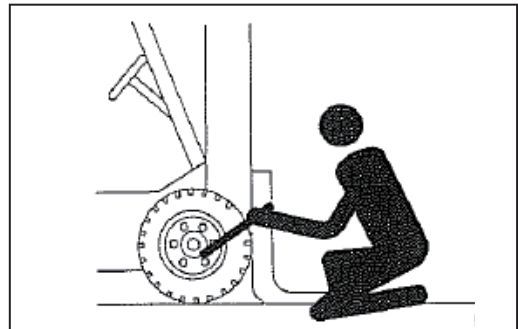
#### 4. Disassembling the tyre

### CAUTION

- Do not loose the rim connecting bolt (special bolt)(2) and nut for the tyre assembled with divided rim.
- For your safety, when changing or inflating the tyre, stay right before the tyre surface as shown in the figure. Never stay on the side of the tyre surface.
- When adjusting pressure with compressor, adjust the pressure of compressor first so as to prevent the inflation pressure exceed the regulated value.
- Deformed or cracked rim is very dangerous. When changing tyre, check carefully not to use fault one.



- (1) Loose the hub nut with hub nut wrench or other tools until it can be rotate by hand.
- (2) Lift the truck with jack to the position where the tyre connects with the ground a little. Disassemble the hub nut and tyre.



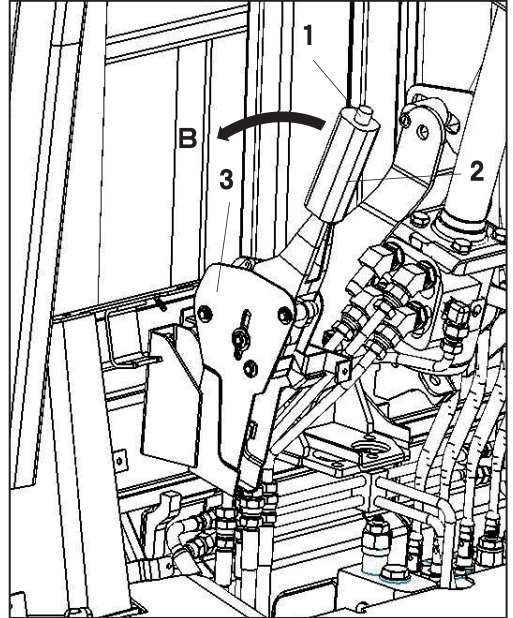
5. Install a new tyre to the hub and rotate the nut one by one. At last tighten the nut diagonally.
6. Move the support from the frame. Lower the jack and tighten the hub nut to regulated torque. For standard torque value, refer to REPAIR PARAMETER.
7. Adjust the inflation pressure to the regulated value. For standard inflation value, refer to REPAIR PARAMETER.
8. After changing, carry out a test run to check if the hub nuts are loose. If necessary, tighten it.

#### 4.4.5 Parking brake handle operation force adjusting



- Wedge the front and rear tyre before adjusting.

1. Press the button (1) and release the parking brake (2) to position B.
2. Adjust the nut (3) with screwdriver until the operation force of the parking brake is reached. The operation force is 250Nm before delivery. The output brake force may be reduced because of the wear of brake and clearance adjusting mechanism.



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#### 4.4.6 Fuse changing

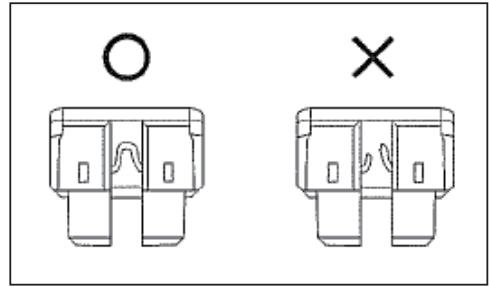
Fuse may be broken if lights or indicators or the controlling system do not work. Check if the fuses protecting each devices and systems are burn.



- Before changing the fuse, turn off the power. (Turn the starting switch to OFF position)
- Change the fuse with the same standard and capability.
- If the replaced fuse is burn again, it may be caused by the abnormal electric system. please contact with HELI dealer or agent.

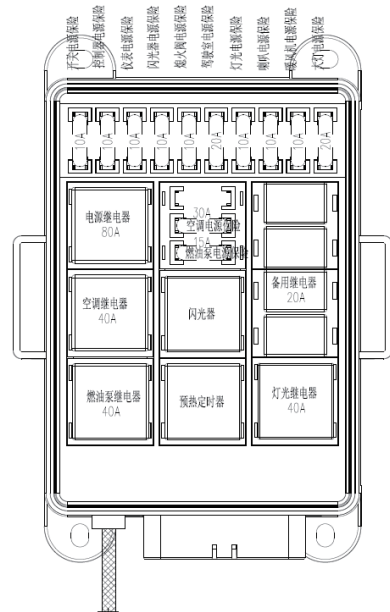
■ Diesel engine and gasoline engine

1. Switch the starting key switch to OFF position.
2. Open the electric cabinet on the right side of the truck, fuses are in it.
3. Open the electric box and disassemble the puller inside.
4. Clamp the fuse with puller and remove it. Check if it is broken visually.
5. If fuse is broken, change it with the same standard and capability.



■ Electric cabinet (fuse and relay)

Refer to the following table for fuse capability and corresponding electric parts.





Number	Capability	Color	Corresponding electric parts	Note
1	7.5A	Brown	Switch power	
2	7.5A	Brown	Controller	
3	7.5A	Brown	Meter	
4	7.5A	Brown	Steering light	
5	10A	Red	Shutting off valve	
6	10A	Red	Cab	
7	10A	Red	Light	
8	10A	Red	Horn	
9	10A	Red	Heater	
10	20A	Yellow	Head lamp	
11	30A	Green	Air conditioner	
12	15A	Blue	Fuel pump	

Number	Capability	Corresponding electric parts	Note
1	80A	Power relay	
2	40A	Air conditioner relay	Optional
3	40A	Fuel pump relay	Certain truck model with fuel pump
4		Flasher	
5		Timer	
6	20A	Relay	Spare
7	40A	Light relay	

## 4.4.7 Lights changing

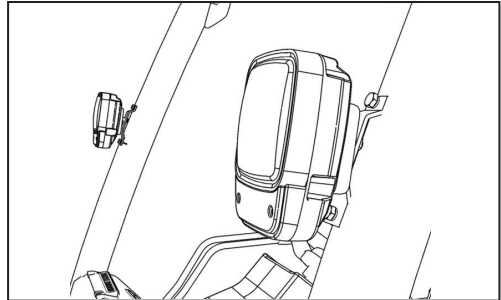
If the light does not light on, the light itself may be broken except the fault of fuse. Change the light after checking if the fuse is broken.

### CAUTION

- Change the light with the same standard.
- If the light still does not light on, it may be caused by the abnormal system. Please contact with HELI dealer or agent.

### IMPORTANT

- Switch the starting key and light switch to the OFF position.



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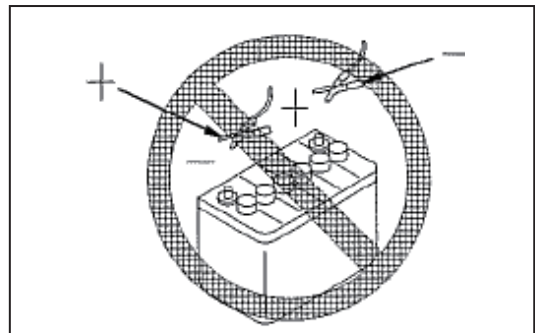
## 4.5 Steps of dealing with the fault battery

If a battery has fault, start the truck with jumper cable to use other truck's battery.

- Notes when disconnecting and connecting jumper cable

### CAUTION

- Never connect the positive(+) with negative (-) terminal when connecting the jumper cable.
- Wear safety glass and rubber glove when starting engine with jumper cable.
- Take care not to let the fault truck contact with the normal one when starting the engine with other truck. Hydrogen which is flammable is produced by battery is easy to be lighted by small spark around battery.
- Turn the starting key switch on two trucks to OFF position when connecting jumper cable or truck may move suddenly after the power is connected.

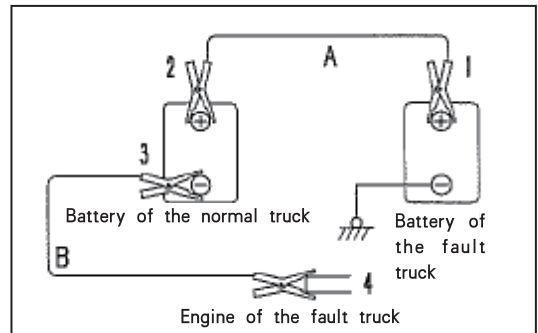


- Connect the jumper cable correctly. Connect the positive cable first when connecting while disconnecting, disconnect the negative cable first. When connecting, connect the last cable to the engine block of the fault truck which produces spark. Keep the connecting point away from the battery.
- When disconnecting cable, never make the clamp connect with the other clamp or the truck.
- The two truck must have the same voltage.

## ■ Jumper cable connecting

Turn the starting key switch on both truck to OFF position and place the forward/backward lever on neutral position. Check if the parking brake is applied. Connect the cables referring to the figure.

- (1) Connect the clamp of jumper cable A to the positive terminal of the fault truck;
- (2) Connect the other clamp of jumper cable A to the positive terminal of the normal truck;
- (3) Connect the clamp of jumper cable B to the negative terminal of the normal truck;
- (4) Connect the other clamp of jumper cable B to the engine block of the fault truck.



### IMPORTANT

- Use proper connecting jumper cable and clamp with proper size according to the battery size.
- Two trucks must have batteries with same capacity.
- Make sure the clamps and cables are not damaged or corroded.
- Connect the clamps to terminals or blocks correctly and firmly.

## ■ Engine starting



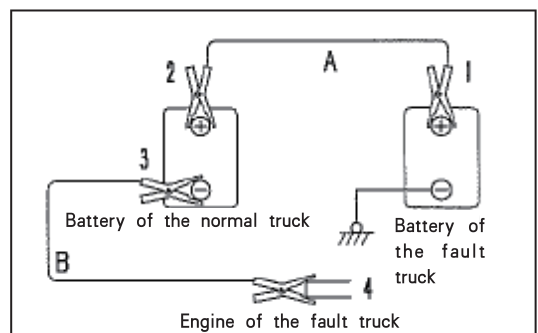
Check if the forward/backward operation levers of two trucks are placed on neutral position and if parking brakes are applied.

1. Make sure clamps are connected to battery terminal firmly.
  2. Start the normal truck's engine and make it run at highest speed.
  3. Turn the starting key switch on the fault truck to the STARTING position to start the engine.
- If the engine is not started, start it again 2 minutes later or after a longer time.

## ■ Cable disconnecting

After the engine is started, disconnect the cable according to the opposite order.

1. Disconnect the other clamp of jumper cable B from the engine block of the fault truck.
2. Disconnect the clamp of jumper cable B from the negative terminal of the normal truck;
3. Disconnect the other clamp of jumper cable A from the positive terminal of the normal truck;
4. Disconnect the clamp of jumper cable A from the positive terminal of the fault truck;



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## 4.6 Working in cold weather

### ■ Notes when the temperature is low

It is hard to start the engine when the temperature is low. What is more, the coolant may be frozen. Do as the following:

### ■ Fuel, lubricating oil and hydraulic oil

Use fuel, lubricating oil and hydraulic oil with low viscosity.  
For regulated viscosity, refer to OIL TYPE TABLE.

### ■ Coolant



- Coolant is poison and take care not to get in touch with your skin. If so, wash with lots of clean water and see a doctor.
- Contact professional company or HELI dealer or agent to deal with the drained coolant. Never pour it onto ground or drainage ditch because it is poison.

### IMPORTANT

Use HELI original coolant.

When delivery, coolant suits for the -35°C environment temperature is filled.

Notes when adding or changing coolant:

- Check if radiator, water pump and pipes leak.
- Drain out the coolant and clean the interior of the system before adding coolant.

### ■ Battery



- Battery will produce flammable gas and keep it away from open flame.
- Electrolyte is poison and take care not to get in touch with your skin. If so, wash with lots of clean water and see a doctor.
- Never pour electrolyte onto ground or drainage ditch because it is poison.
- If electrolyte gets in touch with the truck, clean it with clean water.
- If battery freezes, do not charge it or start the engine with other power, or the battery may explode.
- Battery performance will be badly affected under low temperature environment and thus engine will be hard to start. Battery with insufficient charging will freeze. So charge the battery fully for next day's start.
- Battery performance will be badly affected under low temperature environment so disassemble it from the truck to keep it in a warm place and assemble it the next day. (Especially when the temperature is low or the truck will not use for a long time.)

### ■ Note after working

Drain out the water in fuel pipeline in preventing of freezing.

Please refer to the WATER AND GAS EXHAUSTING OF THE WATER-OIL SEPERATOR for oil-water separator water draining of the diesel engine.

### ■ When the cold weather is over

Do the following as the weather gets warm.

- According to the OIL TYPE TABLE, change the fuel and engine oil to regulated viscosity.

## 4.7 Measures for engine over heating

### ■ Measures for engine overheating



There is a danger of scalding caused by the ejecting of steam or boiling water if the radiator cap is removed at once. Remove the radiator cap slowly after the cooling liquid is cool.

Take the following measures when the coolant temperature gauge points to the red range:

1. Park the truck in a safe area.
2. Keep the engine idling and open the engine hood for good ventilation.  
Shut off the engine at once if cooling fan does not work.
3. Shut off the engine when the coolant temperature gauge points to the white range:
4. Check the following items when the engine is cool:
  - coolant level
  - check if fan belt is cut or loose;
  - engine oil level
  - check if the radiator is blocked;
5. If the coolant or engine oil level is low, add to proper level.

If the fault reasons, contact with manager and stop use the truck. And then contact with HELI dealer or agent.

### ■ Clean the interior of the cooling system

If water logging or rust is produced in the cooling system, it means the cooling system efficient is poor and it causes overheat.

Please contact with HELI dealer or agent for maintenance because the cooling system needs periodical check and cleaning with radiator washing solution.

### ■ Cleaning of the radiator



- Wear glasses in preventing of foreign matters getting into eye.
- Never make the compressed air, steam or water flow point to people or serious injury may be caused.

Engine overheat may be caused if radiator is blocked, clean it with gas flow, steam or water flow.

Set the gas flow or steam to the regulated pressure and adjust the nozzle to proper angle:

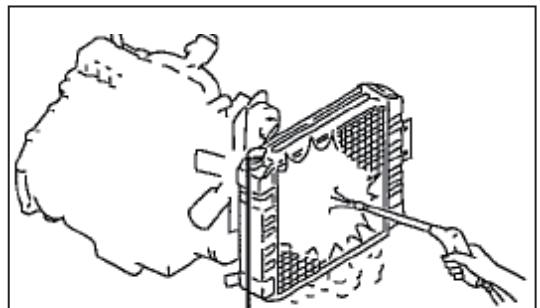
Gas pressure: lower than 0.98MPa (10kgf/cm<sup>2</sup>)

Water pressure: lower than 0.49MPa (5kgf/cm<sup>2</sup>)

### ■ Check the fan belt tension

If the belt is loose, adjust it to regulated tension.

For belt tension adjusting, please contact with HELI dealer or agent.



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## 4.8 Accumulator

### ■ Inspection and maintenance----daily maintenance

- Leakage inspection: Check the pressure inside of the bag regularly after the accumulator is put into operation. At the beginning, check the bag pressure once a month. After half a year, check every half a year. If there is leakage, recharge the gas. If the leaked volume is much, find out the leak reason (for example, the bag is broken, charging valve is not sealed or the sealing between the charging valve and valve seat is poor.) and repair it.
- Inspection method: shut off the engine and press the brake pedal repeatedly. Measure the gas pressure through measuring the brake fluid pressure. The pressure will reduce to one value and then drop to zero suddenly. The value before dropping to zero is charging pressure. Besides, check the charging pressure with charging tool directly. But at first, drain the brake fluid in the accumulator first. Each time when checking, gas will be released a little.

### ■ Charging condition:

When the gas pressure is lower than 5.5MPa, charge the accumulator.

### ■ Charging method

- (1) Before charging, get nitrogen bottle and charging tool ready. Charge with charging tool;
- (2) Apply washing powder liquid or soapy water onto the connecting port and sealing parts of the accumulator with brush. If there is leakage, release the pressure and repair in time;
- (3) Connect pressure measuring device. Tighten the air relief plug to prevent leakage during charging;
- (4) Connect one end of the charging tool with the accumulator charging port, and the other end with nitrogen bottle air outlet port through charging pipeline;
- (5) Turn on the needle valve on top of the accumulator through rotating the valve in clockwise direction to open the valve;
- (6) Turn on the valve on the nitrogen bottle to connect the gas source;
- (7) Charge slowly on one side and read the pressure gauge carefully on the other side;
- (8) Charge slowly. Increase charging speed properly only when the bag is expanded and the oil inlet valve is closed.
- (9) When the pressure reaches to preset pressure (5.5MPa), close the charging tool control switch;
- (10) Turn off the valve on the nitrogen bottle and rotate the needle valve anti-clockwise on top of the accumulator to turn off the valve;
- (11) Disconnect the charging tool from the accumulator charging port and nitrogen bottle. Keep the charging tool and nitrogen bottle well.

### ■ Notes:

- In order to bring accumulator into full play, it should be installed vertically. Leave a certain space above and around the accumulator for inspection and maintenance.
- Fix the accumulator on the bracket or chassis. Tighten the clamp.
- Do not make welding, riveting or machining working on the accumulator.
- Only nitrogen can be charged into bag. Air or oxygen are not allowed to be charged into bag. The medium outside bag is petroleum base hydraulic fluid.
- Accumulator is kind of pressure container under the law jurisdiction, please consult and keep to the local current regulation and law before using;
- Please use the same liquid medium of the completed truck, if the actual using liquid does not conform with the required one, our company is excluded from any responsibility on the consequence;
- Please pay attention to the using environment. If necessary, please protect from heat source, electric field, magnetic field, lighting, humidity and other harsh environment;
- Please change the name plate when it is broken or lost. It is prohibited to use the accumulator without name plate.

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## 4.9 Operate truck in special environment

The truck is designed and tested for normal working condition and environment. If it is used under special environment and condition, truck will be badly affected such as aging, life time reducing, parts harm.

If the truck has to be operated under special environment, the truck needs special maintenance and measures to bear the harsh working condition or environment. For detail, please contact with HELI dealer or agent.

### ■ Examples when using the truck in special environment

- Truck travel on road with saline water, chemicals (acidity or alkalinity) or solution directly or contact with such environment indirectly through driver's hand or feet;
- Environment full with erosive gas;
- Blow by salty sea wind;
- Environment with dew or often soaked by water.
- Dusty environment;
- Other applications other than the design purpose;
- Specialized or special working for a long time;
- Applications prohibited in this manual;
- Others.

### IMPORTANT

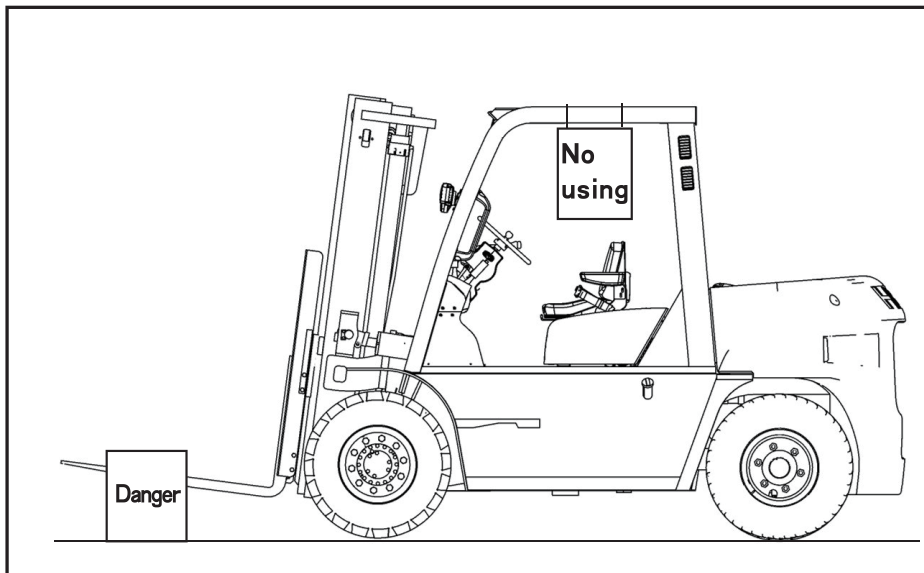
- HELI will not bear the responsibility if the truck is used under the special environment or with force.
- The truck can not be used where has a danger of explosive.

## 4.10 Measures if the fork can not be lowered

### CAUTION

- Stop working at once if the fork can not be lowered during operation. Never use the truck before repair.
- Place signs such as NO ENTERING or NO USING on the truck in preventing of people going under the lifted fork.
- Do not touch mast, fork, chain or other loading devices or truck may move accidentally and serious accident may be caused.
- Contact with HELI dealer or agent for repairing.

1. Stop working at once if the fork can not be lowered during operation.
2. Park the fault on a flat ground away from the emergency exit and fire extinguisher. For parking, refer to STOPPING AND PARKING and STOPPING AND PARKING FOR A TIME.
3. If the loaded fork can not be lowered during operation, check if there is a danger of goods falling. Make sure there is a wide area marking NO ENTERING or park the truck facing the wall.





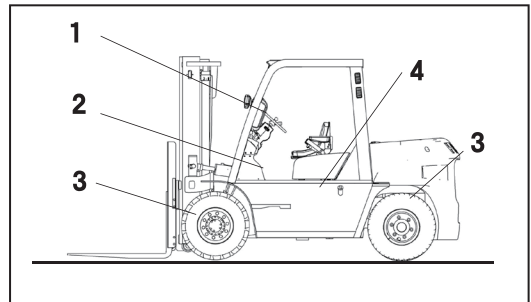
## 4.11 Truck cleaning

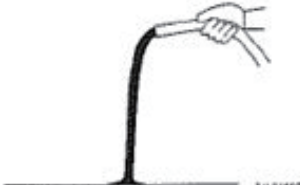

### CAUTION

There is a danger of truck being out of work or mis-moving if water entering into electric system (controller, sensor, contactor and so on). Do not clean the electric system with water or air with high pressure.

#### Cleaning steps

1. Turn the starting key switch to the OFF position and draw out the key.
2. Clean the parts (1~4) shown in the figure and follow the notes described in the table.
3. Dry the cleaning parts.
4. Insert the key and turn it to ON position after the cleaning parts are dry completely. Check if there is any abnormal and then begin to operate.



No.	Cleaning parts	Cleaning method
1	Instrument display	Clean it with water from soft pipeline NOTE: when cleaning, reduce the water flow so as to reduce the water pressure as shown in the figure below. ( for part 1 and part 2)
2	Instrument panel, front floor board	 
3	Front and rear tyres Front and rear axle	Clean with air or water with high pressure from soft pipeline
4	External parts except the parts above	Clean with air or water with high pressure from soft pipeline
	Other notes	<ol style="list-style-type: none"> <li>1. Do not clean the interior of the meter;</li> <li>2. Cover the engine, transmission box and their electric system such as electric wire, contactor and fuses and so on with water proof cloth when cleaning engine hood and parts under the floor board with high pressure air and water.</li> </ol>

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## 4.12 Storing for a long time

Stick to the following points when storing the truck for long time (more than one month).

### ■ Before storing

Before storing the truck, carry out the following maintenance after cleaning the parts. If the truck has to be kept outside, park the truck on a flat ground and cover it with canvas.

- Add the fuel tank fully so as to prevent water from depositing.
- Apply lubricating grease and change the engine oil.
- Apply lubricating grease to the exposed part of the hydraulic cylinder piston rod.
- Disconnect the battery negative terminal and cover it or disassemble it from the truck and store it inside.
- Use HELI original coolant avoid freezing.

### ■ During Storing



If anti-rust operation has to be done inside, open the window for ventilating and take measures from gas poisoning.

- Operate or drive the truck once a month so as to ensure the lubricating parts are protect by oil film completely during storing.
- Clean the lubricating grease on hydraulic piston rod when operating working devices.
- Charge the battery once a month because the battery will discharge even it does not work.

### ■ After storing

Carry out the following maintenance before operation after storing.

- Clean the lubricating grease on hydraulic piston rod.
- Apply lubricating grease and engine oil where necessary.
- Check the engine oil before and after engine starting. If the engine oil is mixed with moisture, change the engine oil.

### IMPORTANT

Please contact with HELI dealer or agent before operation when using the truck without anti-rust maintenance once a month.

## 4.13 slinging the truck

### CAUTION

- Put the sling into the specified holes on top of the overhead guard and counter weight.
- Never sling the truck at the over head guard and cab base (if cab is assembled), or there is a danger of falling down.
- Put the sling into the specified holes on top of the overhead guard and counter weight after ensuring the mast and counter weight are assembled firmly.
- Any person is not allowed to stay under or near the truck.

1. The slinging positions are the top part of the over head guard and the holes of the counter weight.

2. Check if the mast and counter weight are assembled firmly.

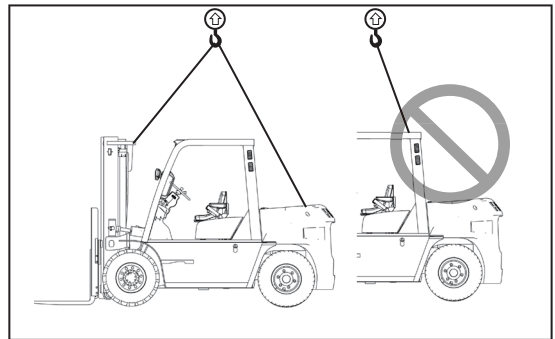
Tighten the counter weight bolts to regulated torque.

Tighten the mast lower part fixing bolts to regulated torque.

Please refer to 4.16 REPAIR PARAMETER for torque value.

3. Use undamaged sling and steel rope with enough strength.

4. When slinging the truck, be care not to let the over head guard or cab contact with steel rope and so on. Adjust the steel rope to proper length so as to avoid truck tilting. Do not hit the truck when slinging.



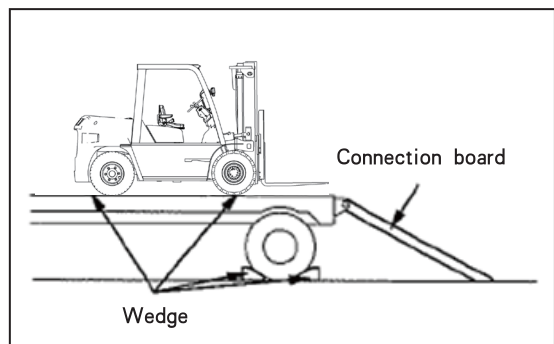
## 4.14 Loading and unloading the truck

### CAUTION

There is a danger of tipping over and falling when loading or unloading the forklift truck. So follow the rules below:

- Park the trailer on a flat road. Apply parking brake and wedge the wheels.
- Use connection board with proper length, width and strength.
- Operate the truck with proper posture.
- If the truck is operated with such posture (the seat does not bear your whole weight, for example stand or lean against forward, backward or side when operating), the OPS will act and engine power transmission will be cut. In that case, the truck will slide down even acceleration pedal is pressed or the truck is going uphill. If necessary, assign a towerman, so that the driver is not necessary to stand or lean forward or side to observe around. Please refer to the OPS (driving function) for detail.
- Place the board to form a gentle slope when using it. Align the center of the forklift truck and trailer's and lock firmly avoiding displacement.
- Do not change the direction when travelling on a board. If necessary, place the board again according to the needed direction and travel again.

1. Use a trailer with enough capacity according to forklift truck weight and size.
2. Park the trailer on a flat ground. Apply the parking brake and wedge the wheels.
3. Connect the loading platform and ground with connection board and make sure it will not disconnect.
4. Do not move the trailer before loading is finished.
5. Operate the truck slowly with proper posture when loading or unloading the truck.
6. Wedge the wheels of the truck and fix the truck with steel rope or chain in order to prevent the truck from moving during transportation.



## 4.15 Check and maintenance time table

- Please contact HELI dealer or agent for check and maintenance items not described in the manual.
- Serious accident may be caused or truck service life may be affected if the truck is not checked or maintained improperly. For safety reason, please contact HELI dealer or agent for check, maintenance and repair.

### ■ Check and maintenance time table

Check and maintain the truck as recommended by HELI.

Table 1-9 are HELI internal combustion forklift truck maintenance time table based on standard working time and condition (8 hours for one day, 200 hours for one month). If the truck works under harsh condition, maintain ahead of schedule. ○ refers to check, maintain and replenish. ● refers to change. Please refer to gasoline truck maintenance for LPG truck maintaining.

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Engine	Engine working condition by visual check		○				
	Engine sound		○				
	Exhausting gas color		○				
	Clean or change filter element			○	●		
	Cleanness of crankcase				○		
	Clearance of adjusting valve	Thick plug gauge				○	
	Tighten cylinder head bolt	Torque wrench		○ (gasoline engine, only the first time)			○ (only diesel engine)
	Cylinder compression pressure	Pressure gauge					○
Crankshaft box ventilation	Check if valve and pipeline are blocked or damaged.				○		
Speed controller or injection pump	Check the max. rotation speed without load	Speedometer				○	
Lubricating system	If engine leaks		○				
	Check the oil level and cleanness		○				
	Change engine oil			● (50hrs for the first time, every 200hrs in the future)			
	Change engine oil filter element			● (50hrs for the first time, every 200hrs in the future)			

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Fuel system	Check if the oil pipeline, oil pump and oil tank leak visually.		○				
	Check if fuel filter is blocked				○		
	Clean the fuel filter (gasoline engine)				○		●
	Change the fuel filter (diesel engine)				●		
	Check the nozzle; adjusting pressure, condition (diesel engine)					○	
	Ignition time (gasoline engine)	Timer			○		
	Injecting time(diesel engine)						○
	Water exhausting of the fuel tank				○		
	Clean the fuel tank					○	
	Check the fuel level		○				
Cooling system	Coolant level		○				
	Leakage condition		○				
	Pipeline ageing condition				○		
	Performance and mounting condition of the radiator cap		○				
	Clean or change the coolant				●		
	Check the tension of fan belt and condition		○				

Table 4-2 Transmission system maintenance time table

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Hydraulic- powered transmission box	Leakage check		○				
	Check the oil level or change the oil			○		●	
	Gear shifting lever operation condition and check if it is loose.			○			
	Performance of controlling valve and hydraulic-powered clutch		○				
	Inching valve performance		○				
	Spare travel of inching pedal and its working condition		○				
	Change filter element					●	
Front axle	Leakage check		○				
	Change the oil					●	
	Check if the fixing bolts are loose.	Test hammer		○			

Table 4-3 Wheel maintenance time table

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Tyre	Inflation pressure	Pressure gauge	○				
	Crack or damage		○				
	Wear condition	Depth meter		○			
	Abnormal wear condition		○				
	Check if there are any foreign matters on the tyre such as nail.			○			
Tyre mounting	Check if the bolts are loose.	Test hammer	○				
	Check if there is any damage.		○				
Rim and spoke	Check if the rim, spoke and plate wheel have any damage.		○				
Wheel bearing	Check if there is any loose and noise.			○			
	Clean and apply the lubricating grease again.					●	
Axle	Check if the axle body is deformed, has any crack or damages.			○			



Table 4-4 Steering system maintenance time table

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Steering wheel	Clearance check		○				
	Check if there is any loose in axial direction.		○				
	Check if there is any loose in radial direction.		○				
	Check the operation condition.		○				
Steering unit	Check if the fixing bolt is loose.			○			
Knuckle of the rear axle	Check if the king pin is loose or damaged.	Test hammer		○			
	Check if there is any curve, deformation, crack or damage condition.			○			
	Check the mounting condition.			○			
Steering cylinder	Check the operation condition.		○				
	Check if there is any leakage.		○				
	Check if there is any loose when mounting and Hinged.			○			

Table 4-5 Braking system maintenance time table

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannual (1200 hr)	Annually (2400hrs)
Brake pedal	Spare travel		○				
	Pedal travel		○				
	Operation condition		○				
	Check if there is air in the pipeline		○				
Parking brake operation	Check if brake works well and has enough travel.		○				
	Operating performance		○				
Rod, cable and so on	Operating performance			○			
	Check if the connection is loose.			○			
Pipeline	Check if there is any damage, leakage or crack.			○			
	Check the condition of connection and clamp parts.			○			
Master cylinder and wheel cylinder	Leakage condition		○				
	Check the oil level and change it when necessary.		○			●	
	Working condition of master pump and wheel cylinder						○
	Check master cylinder and wheel cylinder for leakage or damage.						○
	Check the wear condition of the master pump, piston cup, one-way valve. Change if necessary.						●
Brake drum and brake shoe	Check drum mounting parts for looseness.	Test hammer		○			
	Wear condition of friction plate						○
	Working condition of brake shoe						○
	Check anchor pin for rust.						○
	Check return spring for damage.						○
	Check if the clearance of automatic adjusting device in working is proper.						○
	Check brake drum for wear and damage.	Ruler					○
Brake floor board	Check if the floor board deforms.						○
	Check if it is crack.	Penetrant test					○
	Check if it is loose when mounting.	Test hammer					○

Table 4-6 Lifting system maintenance time table

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Fork	Check forks for damage, deformation and wear condition.		○				
	Check for stopper pin for damage or wear.				○		
	Check fork base and hook welding for defective cracks or damage.			○			
Mast and fork bracket	Check if the welding between the inner mast, outer mast and cross beam has crack and damage.			○			
	Check tilt cylinder bracket and mast for defective weld, cracks or damage.			○			
	Check inner and outer mast for defective weld, cracks or damage.			○			
	Check fork bracket for defective weld, cracks or damage.			○			
	Check roller for looseness			○			
	Check mast support bushings for wear or damage.						○
	Check mast support cap bolts for looseness.	Test hammer		○ (only the first time)		○	
	Check lift cylinder tai bolts, piston rod head bolts, U-bolts and piston head guide bolts for looseness.	Test hammer		○ (only the first time)		○	
	Check roller, roller axle and welded parts for cracks or damage.			○			
Chain and sheave	Check chains for tension, deformation, damage or rust.		○				● (2-4 years)
	Chain lubricating			○			
	Check connection of chain anchor pin and chain for looseness.			○			
	Check sheaves for deformation or damage.			○			
	Check sheave bearing for looseness.			○			
Attachments	Check working condition of attachments			○			
Lifting cylinder	Check piston rod, rod screw and rod end for looseness, deformation or damage.	Test hammer	○				
	Operating condition		○				
	Leakage condition		○				
	Check pins and bearings for wear or damage.			○			
Hydraulic pump	Check hydraulic pump for leaks or noise.		○				
	Check pump drive gear for wear.			○			

Table 4-7 Hydraulic system maintenance time table

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Hydraulic oil tank	Oil level check and oil change		○				● (1500hrs for the first time, every 2400hrs in the future)
	Clean oil suction filter element					○	
	Remove the foreign matter					○	
Return oil filter	Change the return oil filter				● (300hrs for the first time, every 600hrs in the future)		
Control lever	Check if the connection is loose		○				
	Operating condition		○				
Control valve	Oil leakage		○				
	Working condition of safety valve and tilting self lock valve			○			
	Safety valve pressure measurement	Oil pressure gauge				○	
Pipeline connectors	Check for oil leakage, looseness, crack, deformation and damage.		○				
	Pipeline change						● 1-2 years
Hydraulic motor (only for hydraulic driving system)	Check hydraulic motor for leaks or noise.		○				
	Check motor drive gear for wear.			○			

Table 4-8 Electric system maintenance time table

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Ignition device (for gasoline engine)	Check distributor cap for check.				○		
	Check spark plug for burn.						○
	Adjust spark plug clearance				○		
	Clean spark plug				○		
	Check distributor cap high-voltage cord for installation						○
	Check distributor cap for burn						○
	Check distributor center piece for wear or damage						○
	Apply grease on spindle					○	
	Check high voltage wire for damage						○
Starting motor	Engagement of small gears				○		
Battery	Electrolyte level, cleaning				○		
	Proportion of electrolyte				○		
Wire	Wire harness damage and loose condition				○		
	Electric circuit connection condition				○		
Generator	Generator connection condition				○		
	Generator belt loose or damage condition				○		
	Generator electricity generating condition						○
Electric box	Check plug and connector condition				○		
	Check the box and plug and connector anti-water function.				○		

Table 4-9 Safety devices and accessories maintenance time table

Item	Checks	Tool	Check and maintenance interval				
			Daily (8 hrs)	Monthly (200hrs)	Quarterly (600hrs)	Semiannually (1200hrs)	Annually (2400hrs)
Overhead guard and backrest	Check if the mounting is firm	Test hammer	○				
	Check if there is deformation, crack and damage		○				
Steering indicator	Working and mounting condition		○				
Horn	Working and mounting condition		○				
Light	Working and mounting condition		○				
Buck buzzer	Working and mounting condition		○				
Rear view mirror	Check if there is dirt or damage		○				
	Rear view condition		○				
Meter	Meter working condition		○				
Seat	Check if the bolts are damaged or loose			○			
Body	Check if the frame and cross beam are damaged or cracked.				○		
	Check rivet or bolts are loosed.				○		
	If necessary, check the parts that repaired before.		○				
	Overall check				○		
Grease adding and oil change	Check the chassis's lubricating condition after cleaning			○			

---

## 4.16 Change the safety key parts regularly

Safety parts listed in the table below should be changed regularly for safety reason.

If the parts exceed their service life, they may be aging and go bad. Their condition is hard to be known through regular maintenance. So no matter how are the parts, change them if their service life is reached. If there is any abnormal before its service life is reached, repair or replace the part at once.

If the pipe clamp has any damage such as deformation or crack, change the pipeline along with the clamp.

Note: Regular changes are not included in the quality guarantee.

### ■ Key parts table

Number	Parts name	Service life
1	Main cylinder, wheel cylinder cup, dust sealing and so on	1
2	Brake pipelines	1
3	Power steering pipelines	2
4	Brake light switch (hydraulic type)	2
5	Fuel pipeline	2
6	Rubber parts inside of the powered steering system	2
7	Lifting chain	2
8	Hydraulic pipeline ( for travelling, loading and unloading and torque converter)	2-4
9	Hydraulic torque converter pipeline	2
10	Fuel pipeline	2

## 4.17 Repair parameter

Parts		Checks	Unit	5-7t	8.5-10t	
Driving system	Tyre	Tyre inflation pressure	Front tyre	kPa	830	760
			Rear tyre	kPa	830	760
	Hub nut	Tighten torque	Front tyre	Nm	520–560	520–560
			Rear tyre	Nm	520–560	520–560
Steering system & braking system	Steering hand wheel	Clearance (when pump is working)	mm	3–10°	3–10°	
	Inching pedal	Clearance	mm	1–3	1–3	
		Inching travel	mm	0	0	
		The initial height of the front floor board	mm	95	95	
	Brake peda	Clearance	mm	16	16	
		The initial height of the front floor board	mm	95	95	
Brake	Operation force of the parking brake	N	250	250		
Overhead guard	Leg fixing bolt	Tighten torque	Nm	90	90	
	Top connecting bolt	Tighten torque	Nm	90	90	
Counter weight		Tighten torque	Nm	740–1100	740–1100	
Front axle fixing bolt		Tighten torque	Nm	630–940	630–940	



# standard equipments and optional equipments

Standard configuration	
Hour meter	Oil level gauge
Horn	Charging indicator
Oil pressure alarm	Wide view mast
Control valve	Air intaking device
Wholly hydraulic-powered steering	Durable tire with decorative pattern
Rubber pad	Lifting and tilting operating handles
Backrest	Traction pin
Rear view mirror	Semi-suspension seat
Front combined lamp (LED light)	Hydraulic oil dipstick
Transmission oil filter	Overhead guard rain cover
Engine flame out device	Torque converter oil dipstick
Ratchet type parking brake	Combined instrument
Water temperature meter	
Driver's tool	
Rear combined lamp(LED)	
Reversing buzzer	
Tilt-lock valve	
Tilt adjustable steering column	
Back view mirror	
Overhead guard	
Standard fork	
Neutral gear switch	
Hydraulic circuit oil filter	
Electro-hydraulic changing-over	
Intelligent shift	
Speed-limiting valve	

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## Optional

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Driver's cab

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Warning light

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High air exhausting device (certain models)

---

Double air cleaner (certain models)

---

Suspension seat

---

Fork extension

---

Heater

---

Solid tyre

---

Widen fork carriage

---

Wind shield (rear wind shield is standard for certain models)

---

Purifying muffler (certain models)

---

Fire extinguisher muffler (certain models)

---

Fire extinguisher

---

Rear working light

---

Air conditioner (certain type)

---

OPS (travelling function)

---

Torque converter oil temperature meter

---

Tilting cylinder sleeve

---

Steering cylinder sleeve

---

User-specified color

---

Optional attachments

---

Sling

---

Full LED light ass'y

---

Power switch (certain models)

---

Reversing voice speaker

---

Universal key

---

Overspeed 10km/h alarm

---

Electric fan

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# Annex

## **New standard operation instruction for Australia customer's requirements**

1.Starting: the truck can be started when the direction switch is on neutral gear, the hand brake switch is closed,the seat switch is closed, the seat belt switch is close and the starting voltage signal of key switch is normal. The sequence requirements for the signals are : ① The brake switch is closed. ② The seat switch is closed. ③ The seat belt switch is closed. The truck can only be started according to this sequence or the truck can not be started.

2.Seat blet safety function: If the seat belt is disengaged when the truck is running, the driving power will be cut off. It is necessary to operate according to the following sequence in order to release the lock. If the sequence is incorrect, the buzzer will sound up to alarm.

- ① set the direction switch on neutral gear;
- ② apply the hand brake;
- ③ fasten the seat switch;
- ④ set the direction switch on forward or backward gear;
- ⑤ release the hand brake.

# OPERATION & MAINTENANCE MANUAL

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