

H3C series 2-3.2t

Forklift Truck with Cushion Tire

OPERATION & MAINTENANCE MANUAL

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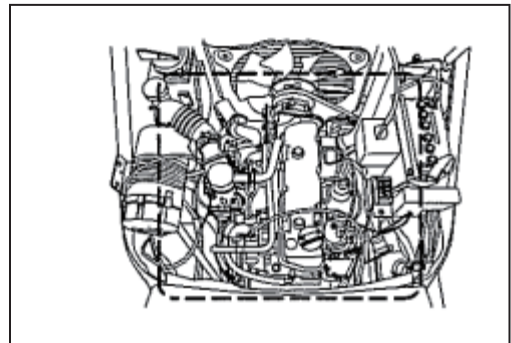
2.2 Protecting against fire

2.2.1 Protect engine against fire

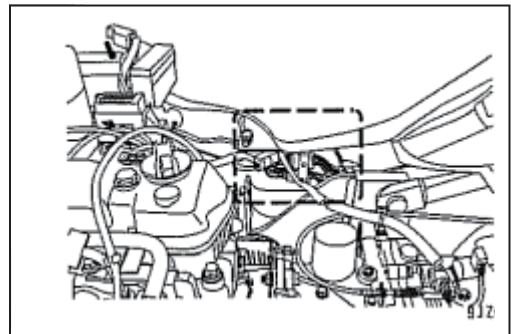
Before starting the engine, check the following parts: if the battery terminal is loose, fix it. And if there is dirt such as smudginess, leaf or paper, remove it.

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

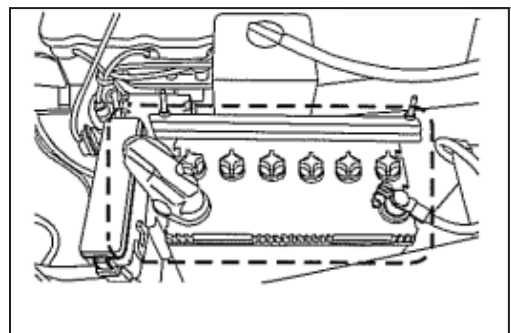
- 1. Check around engine
 - Check if there is any leaves or paper around engine;
 - Check if there is engine oil or fuel leakage around engine;
 - Check if the muffler and air exhaust pipe are well;



- 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.



2.4 Before operatio

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.

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

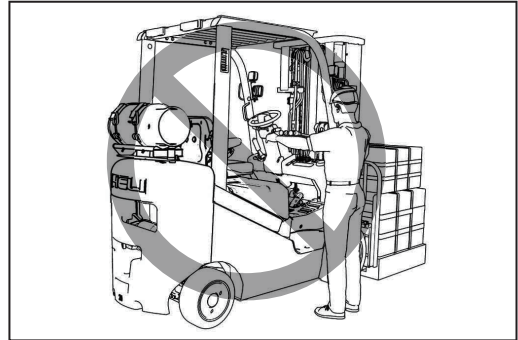
- Before starting, check if the parking brake is applied and operation levers (forward/backward and high/low speed lever) are in neutral position;
 - Before starting, sound the horn to warn around;
- When starting, check if it is safe around and sit on driver’s seat;

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;

- Use gas or soap to check if the LPG pipelines leak. It is prohibited to check with flame. If there is leakage, turn off all valves, keep the truck away from the open flame and contact with HELI dealer.

■ 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.
-

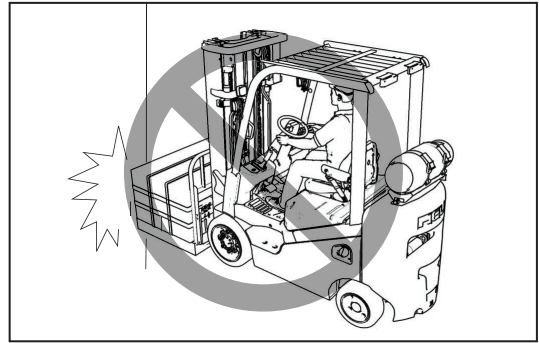


2.4.3 Starting check

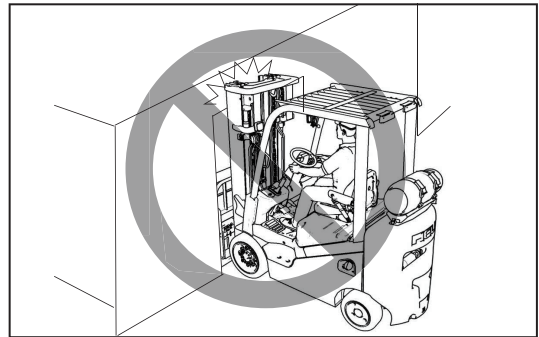
■ Check the working condition of the meter especially the alarm light;

- Make sure the operator presence sensing system work well;
- If there is any abnormal such as noise, vibration, heating, smell, improper adjusting of meter, engine oil or fuel leakage, be sure to remove the faults before operation.

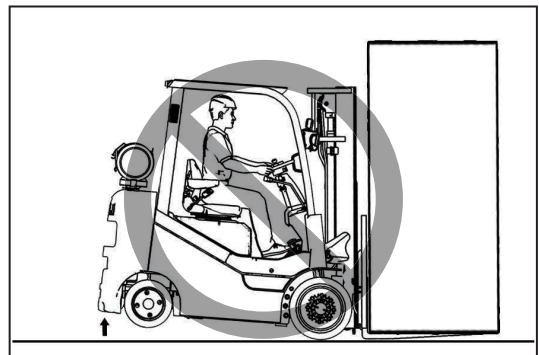
- Take care when carrying long and wide goods;
 - Take care when carrying long and wide goods. Lift the goods slowly so as not to collide anything around;
 - Keep the goods as low as possible and keep balance when changing direction.



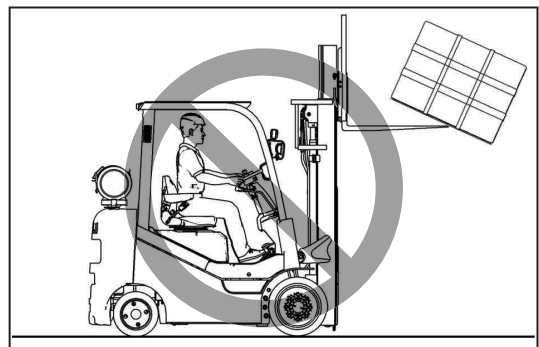
- Pay attention to the mast height
 - The mast height will increase with the lifting of fork. Take care when carry out such operation;
 - Take care not to touch electric wire, pipeline, water sprinkler, cross beam and so on. If there is any touch, goods on fork may fall.



- 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 travel with the mast tilt forward.



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



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.

2.7.20 Regular check on the key part

- 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.

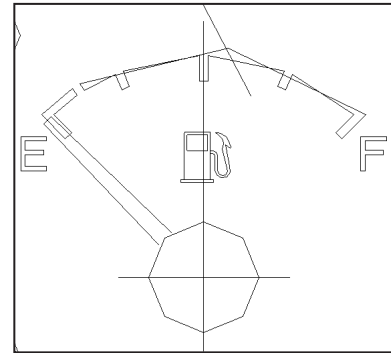
■ Fuel gauge

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.

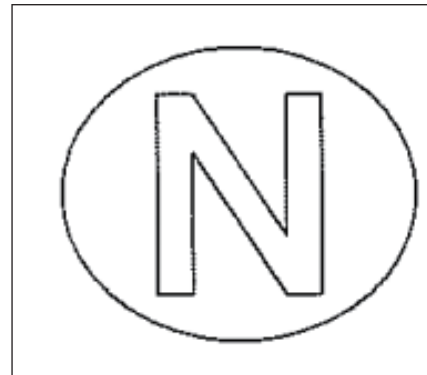


■ Neutral indicator

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.

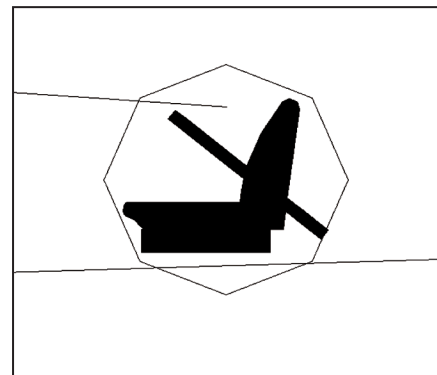
Before starting the engine, turn the starting switch to the ON position and check if the neutral indicator is on.



■ OPS indicator

When OPS is activated, the indicator turns on and the transmission box power is cut.

When you sit on the driver's seat with proper posture and place the forward/backward operation lever, the indicator turns off and the truck is ready for travelling.

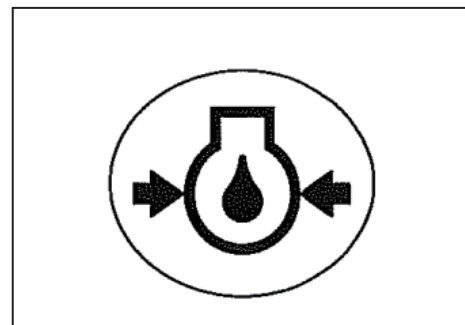


■ Engine oil pressure alarm indicator

It means the abnormal of the engine lubricating oil pressure.

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.



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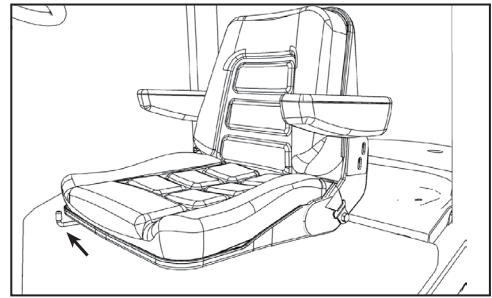
■ Seat position adjusting

⚠ CAUTION

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

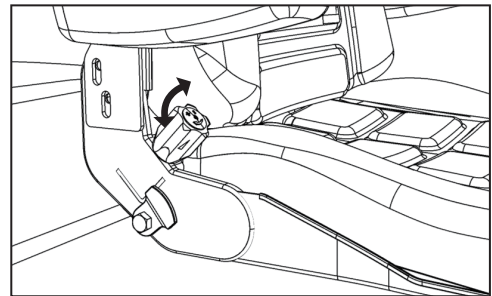
Make sure you can step the brake pedal fully when you lay against the seat.

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 is locked.



Seat back angle adjusting:

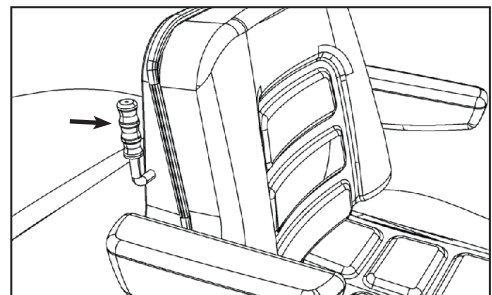
1. Rotate the knob right, the angle is increased and the back turn towards back.
2. Rotate the knob left, the angle is decreased and the back turn towards front..



Suspension adjusting

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.

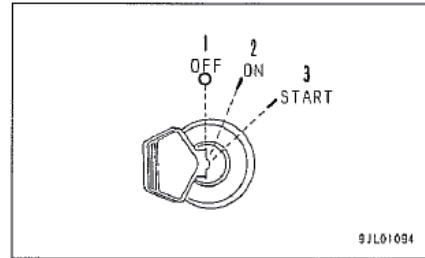


5. Turn the key switch to OFF position.
6. Draw out the key switch and leave.

Note: if the parking brake is unlocked when leave the truck, the alarm will sound up.
(Optional)

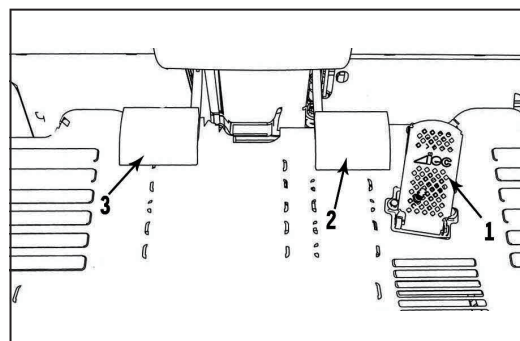
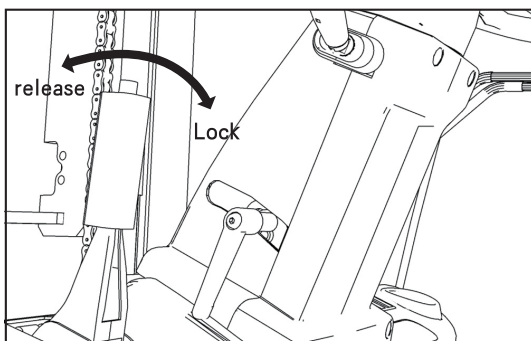
Important:

- If the engine is stopped when it is hot, its service life will be badly affected. Do not stop the truck emergently unless necessary.
- If the engine is hot, do not stop suddenly. Stop it in idle speed.



3.3.4 Start and stop on a slope

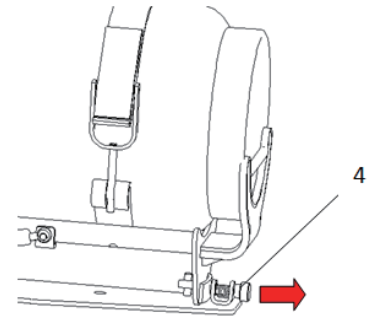
1. Apply the parking brake when starting on a slope.
2. Slowly release the parking brake when pressing the acceleration pedal (1) increasingly , and then the truck can go uphill.
3. Release the parking brake completely when truck reaches certain speed. The going uphill speed can be controlled by the pressing distance of the acceleration pedal.
4. When stop or deceleration on a slope, release the acceleration pedal (I) slowly and step on the brake pedal at once before stopping.
5. Apply the parking brake when the truck is stopped.



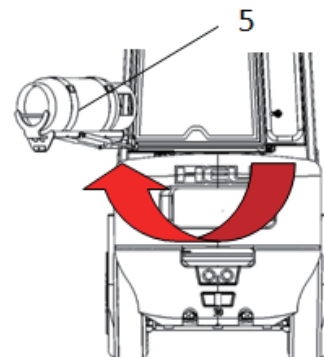
4. Replace the cylinder with a full one.
5. Push the lock plate (4) until it is locked. Push the LPG cylinder slightly (5) and check if it is safely locked.
6. Tighten the LPG cylinder connecting bolt (2) and connect the high pressure pipe (3) to engine.
7. Turn on the releasing valve fully (1) and check if LPG leaks from high pressure pipe (3).

Forklift truck with rotating and tilting steel cylinder bracket

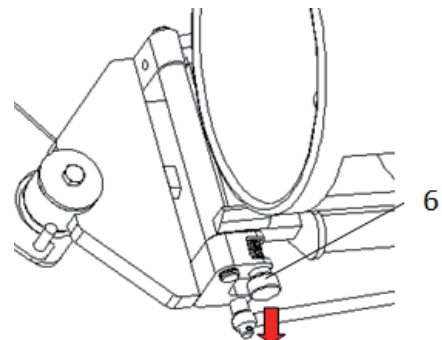
1. Turn off the releasing valve (1).
2. Loose LPG cylinder connecting bolt (2) and remove the high pressure pipe to the engine(3).



3. Pull the right side safety lever(4) to the right side and then swing the LPG cylinder (5) to the left side.



4. Pull the LPG cylinder bracket safety switch (6).

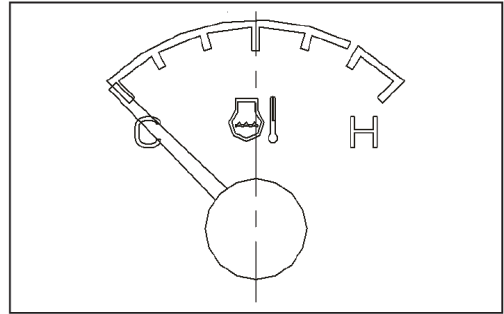


Starting checking parts table

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 cylinder valve and fuel level.
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
	clearance and height of clutch pedal and inching pedal
	Parking brake operation lever 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
Start the engine	Abnormal noise and vibration
	Exhausting air color
	Hand wheel clearance
	Check if the high pressure pipe leaks.
Drive slowly	Hand wheel operation condition (radial run-out and unstable driving)
	Brake operation condition (respond)
	Inching and clutch pedal operation condition

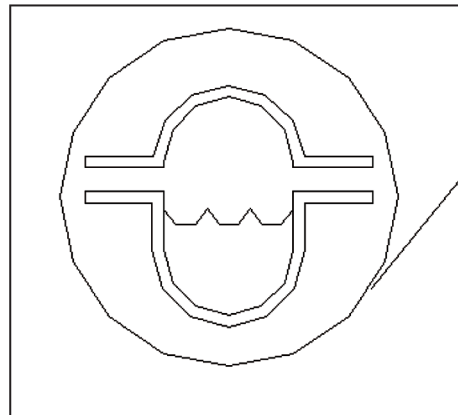
■ Engine coolant temperature meter

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 ((it is used as fault 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.



■ Lights check

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

■ Fuel level check and adding

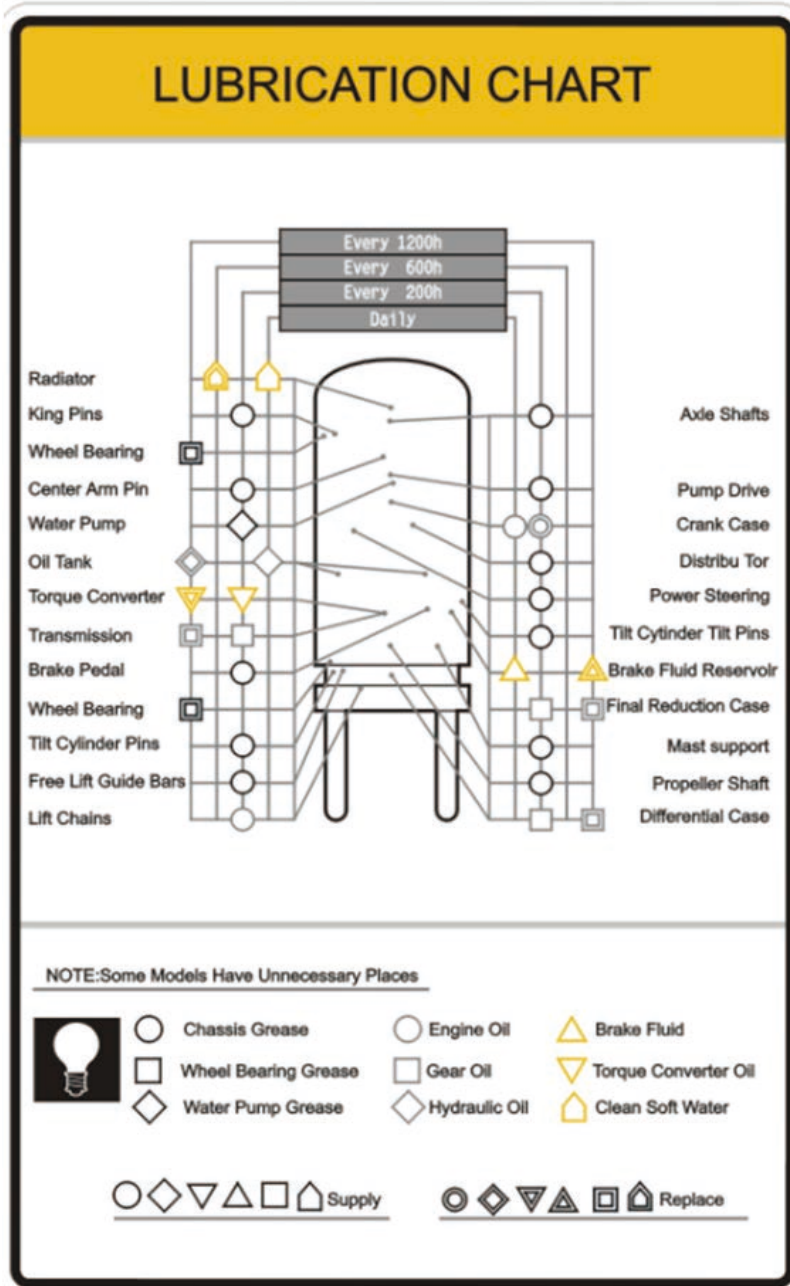


CAUTION

- 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.

4.4.1.2 Lubricating chart

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



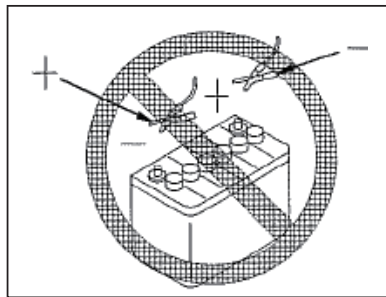
4.5 Steps of dealing with the fault battery

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(+) and 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.



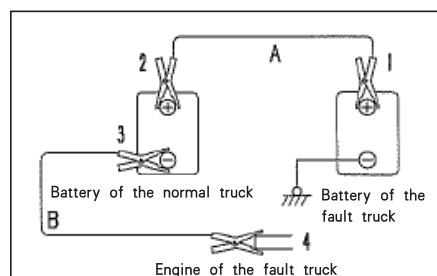
- Jumper cable connecting

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.



4.14 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.

Table 4-1 Engine maintenance time table

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, first time)		○	
	Cylinder compression pressure	Pressure gauge					○
Crankshaft 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)			

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