

H3 series 1-3.5t

Counterbalanced Type
Forklift Truck with Engine

OPERATION & MAINTENANCE MANUAL

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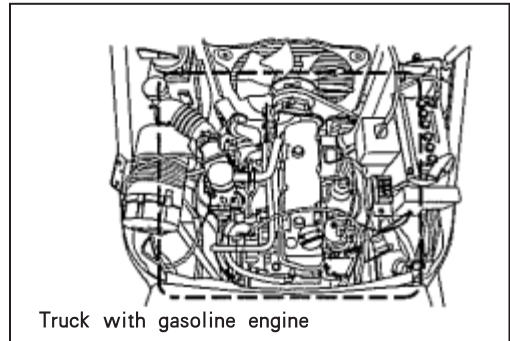
2.2 Protecting against fire

2.2.1 Protect engine against fire

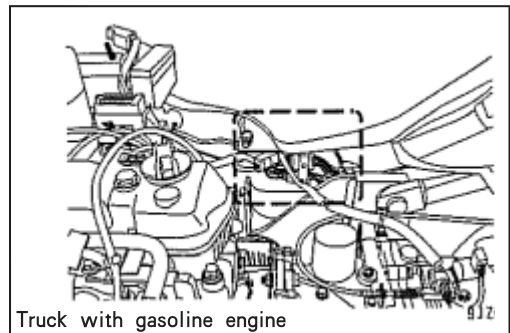
Before starting the engine, check the following parts: if the battery terminal is loose, fix it. And if there is dirt such as smudginess, leaf or paper, remove it.

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

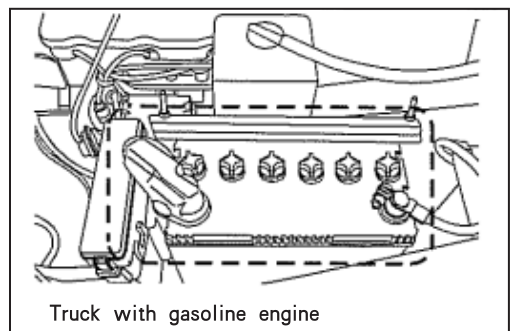
- 1. Check around engine
 - Check if there is any leaves or paper around engine;
 - Check if there is engine oil or fuel leakage around engine;
 - Check if the muffler and air exhaust pipe are well;



- 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

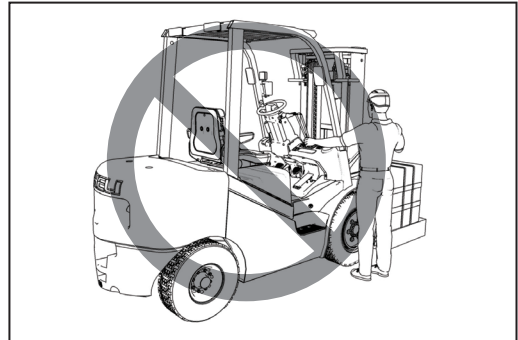
Carry out starting check every day in order to ensure truck safe operation. Refer to “check and maintenance” for the detailed check item.

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;



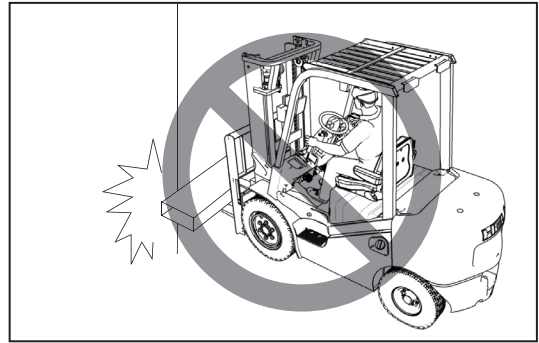
- Notes in cold weather
 - Make the engine warm completely in cold weather, or the truck may move slowly or change direction suddenly which may cause accident.



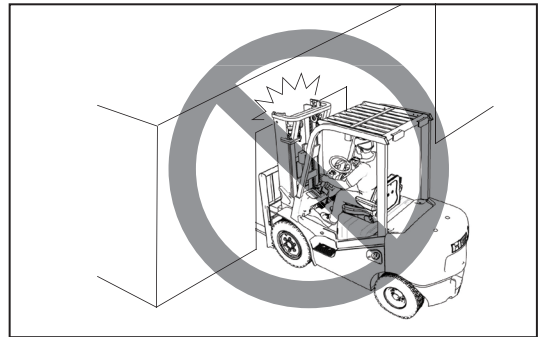
2.4.3 Starting check

- Check the working condition of the meter especially the alarm light;
 - The indicators on the meter turn on after the key switch is turned on. After 3 seconds, the indicators turn on or off according to actual condition.
 - 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.

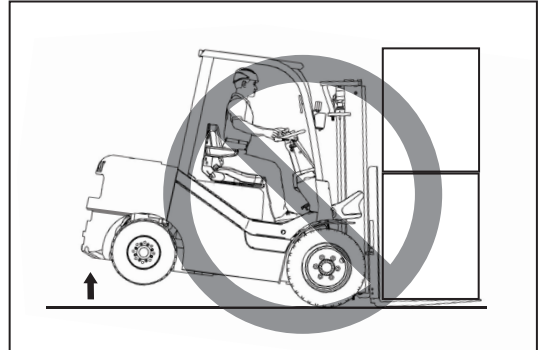
- Take care when carrying long and wide goods;
 - Take care when carrying long and wide goods. Lift the goods slowly so as not to collide anything around;
 - Keep the goods as low as possible and keep balance when changing direction.



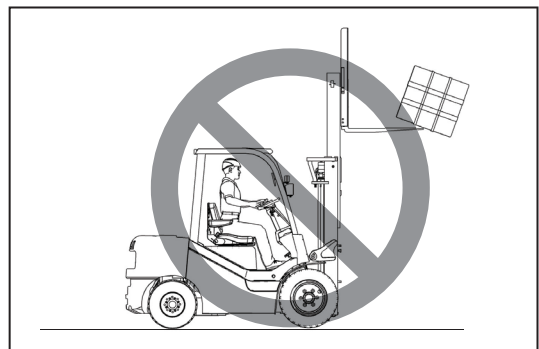
- Pay attention to the mast height
 - The mast height will increase with the lifting of fork. Take care when carry out such operation;
 - Take care not to touch electric wire, pipeline, water sprinkler, cross beam and so on. If there is any touch, goods on fork may fall.



- 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.

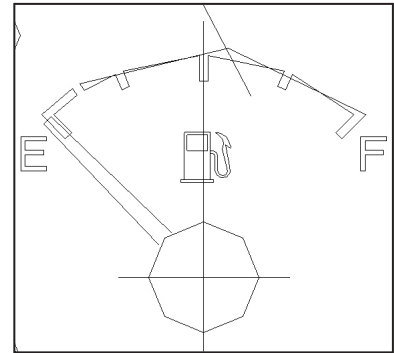
■ Fuel gauge

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.

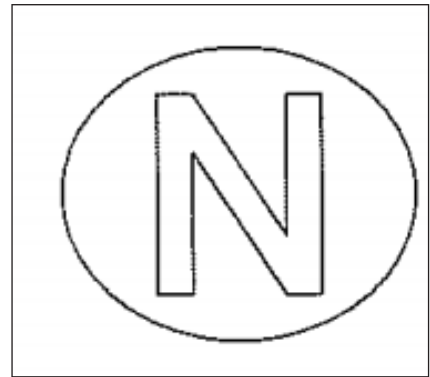


■ Neutral indicator

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.

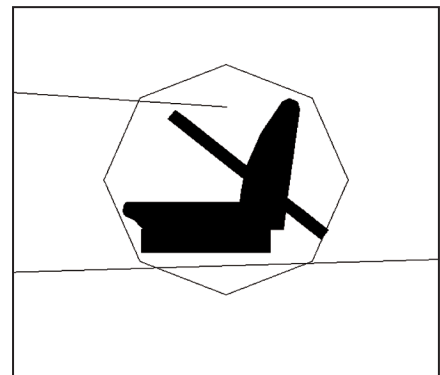
Before starting the engine, turn the starting switch to the ON position and check if the neutral indicator is on.



■ OPS indicator (hydraulic powered truck) (optional)

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.

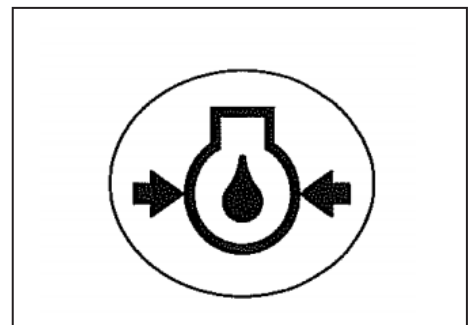


■ Engine oil pressure alarm indicator

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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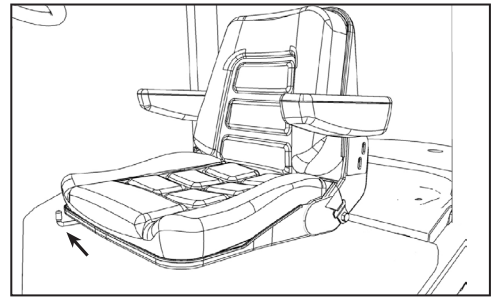
■ Seat position adjusting



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

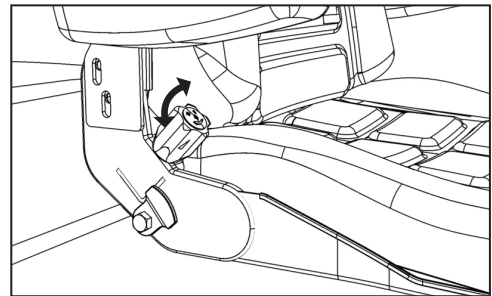
Make sure you can step the brake pedal fully when you lay against the seat.

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

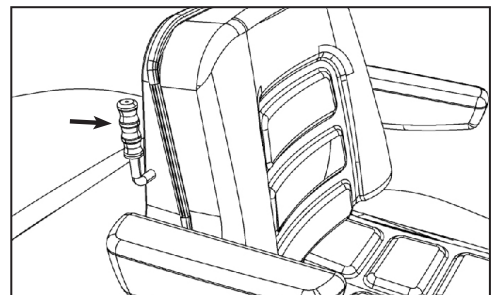
Adjust the suspension level through adjusting knob.

Pull the knob upward if the operator is light.

Push the knob downward if the operator is heavy.

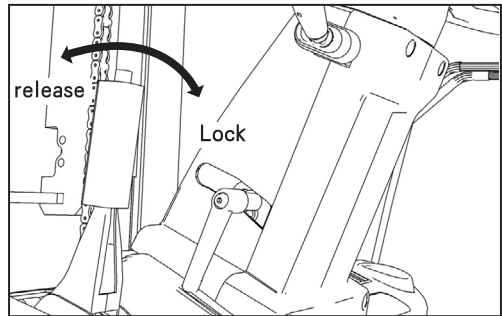
Place the knob in middle position if the operator is moderate.

Weight adjusting range: 50-120kg.

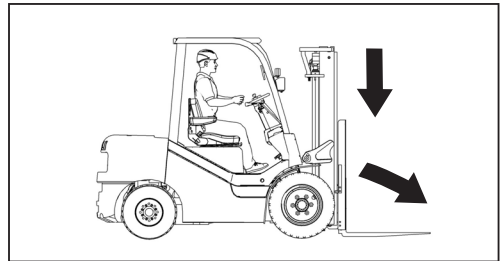


■ Truck parking procedures

1. Park the truck on flat ground.
2. Apply parking brake.
3. Place the forward/backward operation lever and high speed/low speed 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

■ Space between fork adjustment

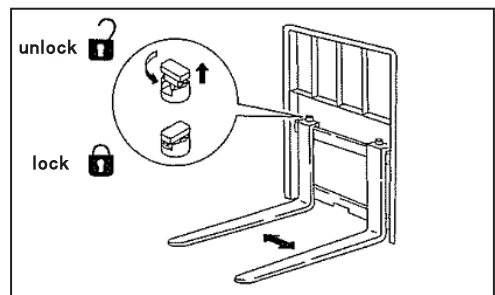
Adjust the space between the fork before loading to suits pallet size and loads.



CAUTION

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

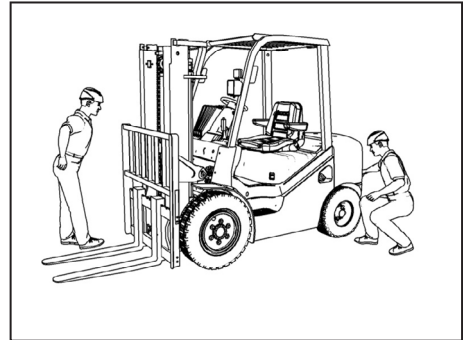
1. Stop the truck right before the loads.
2. Make the mast be vertical and lift the fork 10cm above the ground.
3. Tilt the mast forward.
4. Lift the fork stopper and rotate 90° to releasing position. (fork can move left or right under this condition.)
5. Adjust the space between fork according to loads size and align the loads center of gravity with the truck.
6. Make the mast be vertical and rotate the stopper 90° to the lock position. (At this time, fork is locked.)
7. After space adjusting, check if the fork is locked by stopped. If not, the fork may move towards two sides and goods may fall down when travelling.



Item	Checking parts
Load handling	Mast operation condition
	Tightness of lifting chain; check if it is damaged or rust.
Safety function check	OPS (hydraulic-powered truck)
	Parking brake

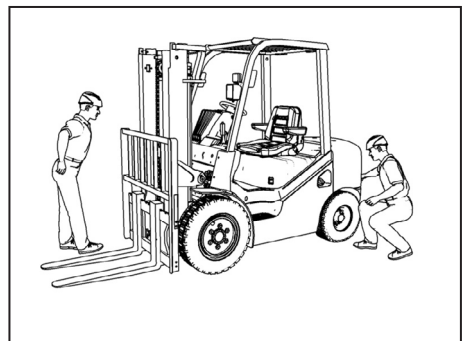
4.2.1 Check the abnormal found the day before

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

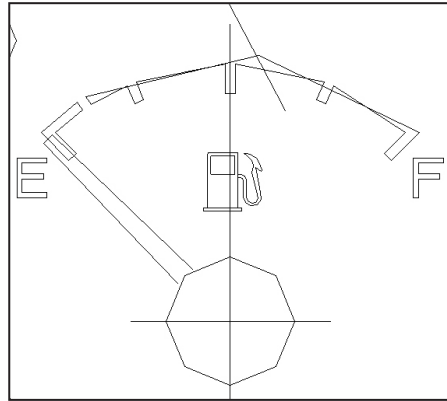


4.2.2 Forklift truck

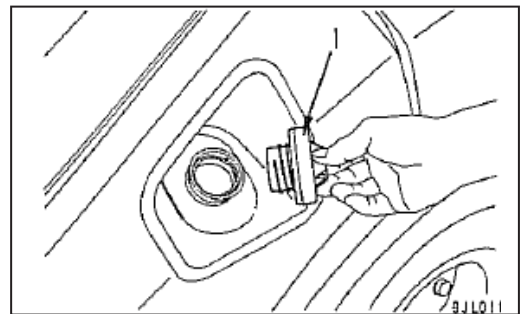
- Check if there is leakage of oil and electrolyte.
 - Check if there is leakage of oil, fuel, coolant and battery electrolyte.
 - check if there is leakage of oil and electrolyte under the truck.



- 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 fuel type.
- When adding fuel, clean the oil sluge in and around oil adding cap protecting 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)
1-1.8t	19	38
2-3.5t	30	60

■ **Back buzzer check**

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

4.4.2 Filter element cleaning

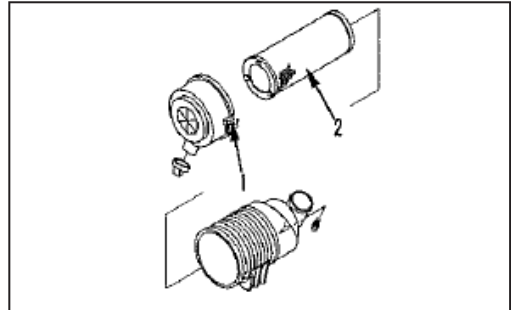
CAUTION

- 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.

4.4.3 Water and gas exhausting of the fuel filter (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.

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 specified 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.

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)
Clutch	Check the spare travel of the clutch and the distance between the pedal and the floor when it is released.	ruler	○				
	Sound and operation condition		○				
	Slide and engage condition		○				
Mechanical transmission box	Gear shifting lever operation condition and check if it is loose.			○			
	Leakage condition		○				
	Change the oil			○	●		
Hydraulic-powered transmission box	Leakage condition		○				
	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.			○			

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