



OPERATING MANUAL

H1.5-1.8XT, H2.0XTS
H2.0-3.5XT
(D475)(D466)

HYSTER

DO NOT REMOVE THIS MANUAL FROM THIS UNIT

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■ General

- This operator manual describes the following models of lift trucks.

Model of lift truck	Rated capacity kg	Load center mm	Engine
H1.5XT	1,500	500	GCT K21 Yanmar 4TNE92
H1.8XT	1,750	500	
H2.0XTS	2,000	500	
H2.0XT	2,000	500	GCT K21 GCT K25 Yanmar 4TNE92 Yanmar 4TNE98
H2.5XT	2,500	500	
H3.0XT	3,000	500	GCT K25 Yanmar 4TNE98
H3.5XT	3,500	500	

- This manual describes instructions for proper handling of the Hyster fork lift truck as well as daily lubrication and maintenance check methods. To ensure safe and highly efficient work through correct operation and servicing, please read this manual thoroughly before using the truck.
- This manual has been prepared for the standard model. Please contact a Hyster designated service center for details on options, special specifications and any other unclear points.
※ This manual is subject to change with changes in the truck specifications.
- The following marks are used in this manual to show important items related to safety, etc. Read this points carefully in addition to the text.

 DANGER	Indicates items to be observed to prevent high-risk accidents that could lead to fatalities or personal injuries.
 WARNING	Indicates items to be observed to prevent accidents that could lead to fatalities or personal injuries.
 CAUTION	Indicates items to be observed to prevent personal injuries or damage to the truck or surroundings.
 ADVICE	Items that should be followed to prevent accidents and trouble, and to allow the lift truck to be used safely for a long time.

Make sure that this operator manual is included when transferring ownership of the lift truck.

■ Operator Protection Equipment

The LOAD BACKREST EXTENSION is installed to keep loose parts of the load from falling back toward the operator. It must be high enough, with openings small enough to prevent the parts of the load from falling backwards. Do not remove the load backrest extension. If a load backrest extension that is different from the one installed on your truck is required, contact your dealer.

The OVERHEAD GUARD is intended to offer reasonable protection to the operator from falling objects, but cannot protect against every possible impact. Therefore, it must not be considered a substitute for good judgment and care when handling loads. Do not remove the overhead guard.

■ Nameplate

The capacity for the lift truck, as it is equipped, must be shown on the Nameplate. See page 41. If the Nameplate for the lift truck already has a rating for special load handling equipment, it will be shown. If the Nameplate for the lift truck does not show the capacity, or if the lift truck equipment does not match that shown on the Nameplate, do not operate the lift truck.

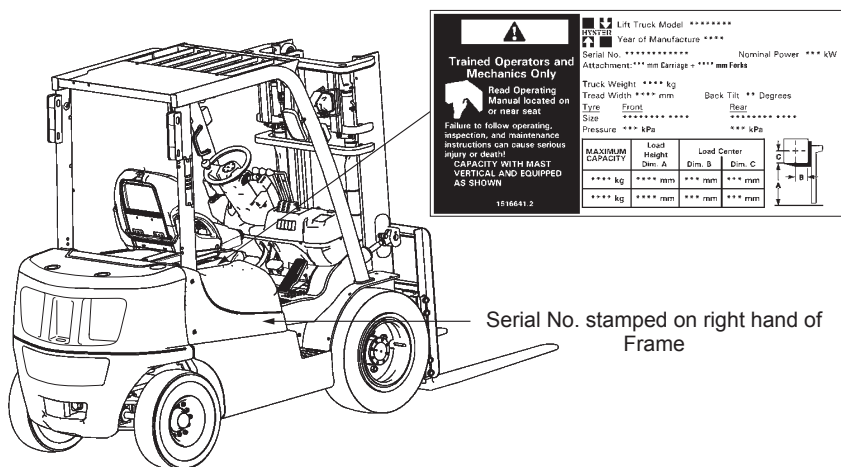
When a lift truck is shipped incomplete from the factory, the Nameplate is not complete. If your lift truck does not have a Nameplate or has an incomplete Nameplate, do not operate the lift truck. Contact your dealer to obtain a complete Nameplate.

— **⚠ WARNING** —

DO NOT add to or modify the lift truck. A change to the lift truck, the tires or its equipment can change the lifting capacity. The lift truck must be rated as equipped and the Nameplate must show the new capacity rating.

Location of Stamped Chassis No. and Serial No.

The serial No. for this lift truck is stamped at the location shown in the figure. The serial No. and model No. are stamped on the nameplate located on the upper part of the operator's seat side. Please inform your dealer of these numbers when making inquiries regarding repairs, etc.



Pre-operation and Periodic Inspections

It is important to carry out the periodic inspections to secure the safety of the lift truck during use and to provide economically feasible operation.

- ★ **Pre-operation inspection** This daily inspection must be carried out before starting work with the lift truck.
- ★ **Post operation inspection** This inspection is carried out when the daily operation and work have been completed.
- ★ **Monthly inspection** This is a spontaneous inspection that must be carried out once within a period not exceeding one month.
- ★ **Annual inspection** This is a spontaneous inspection that must be carried out once within a period not exceeding one year.

■ Handling of New Truck

Before delivery, special care has been taken for the inspection, adjustment and trial run of the new truck. However, a certain amount of time will be necessary to break the lift truck in completely. **Careful breaking in of the new truck will lead to a long-term trouble-free operation.** For the first two weeks of use, take special care to not apply excessive loads, and pay attention to the following points.

⚠ CAUTION

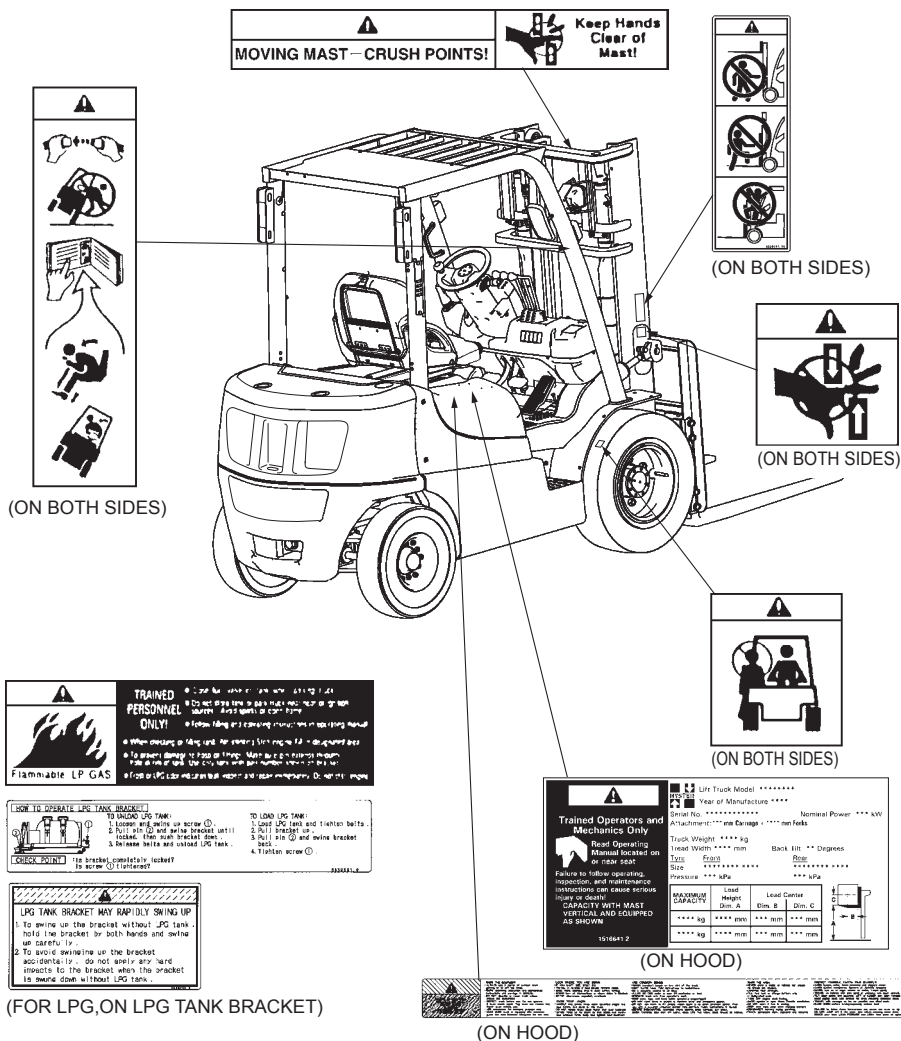
- Avoid high-speed operation, and keep the load to 70 to 80% of the rated load.
- Pay attention to loosening of bolts, nuts and hydraulic line joints during the break-in period. If any looseness is found, stop the lift truck and retighten the loose part.
- Take time to train in the usage of each on the lift truck before starting full scale operation. Even after becoming used to the handling, be careful during the actual operation to prevent personal accidents or physical accidents.
- Even if the lift truck has the same specifications, each lift truck will have its own characteristics in terms of brakes, accelerators and loading devices. Always feel the lift truck out before starting use. Take special care to get a feel of the brakes before starting.

1

Model Description

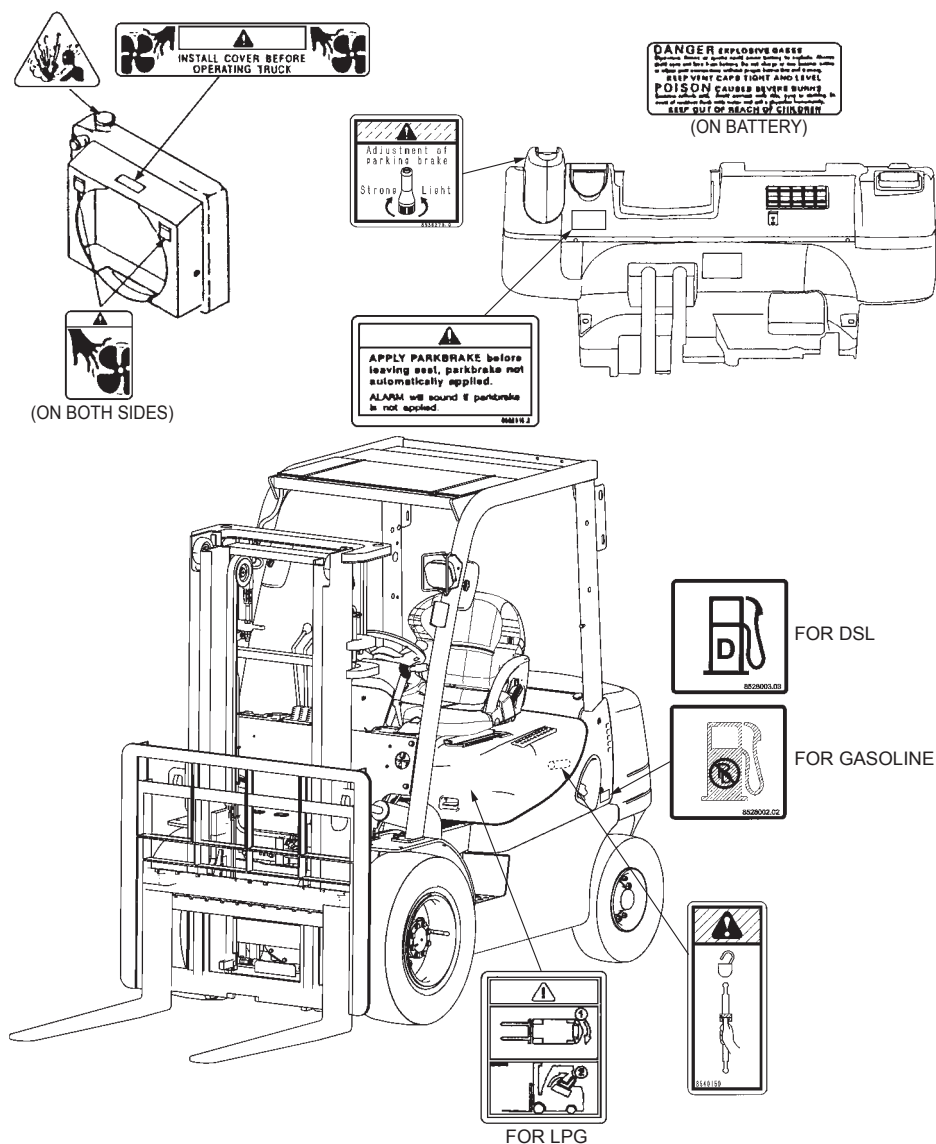
■ Nameplate Installation

Safety labels and other nameplates are attached to the positions shown below. Read these labels before starting work, and make sure that the details are well understood so that the lift truck can be operated safely and without accidents.



Model Description

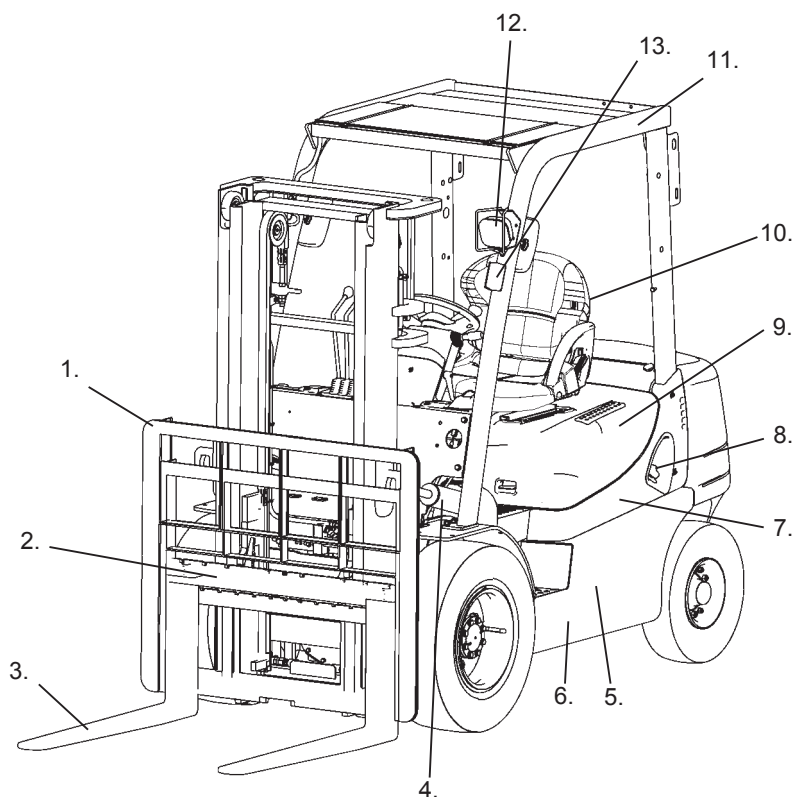
1



CAUTION

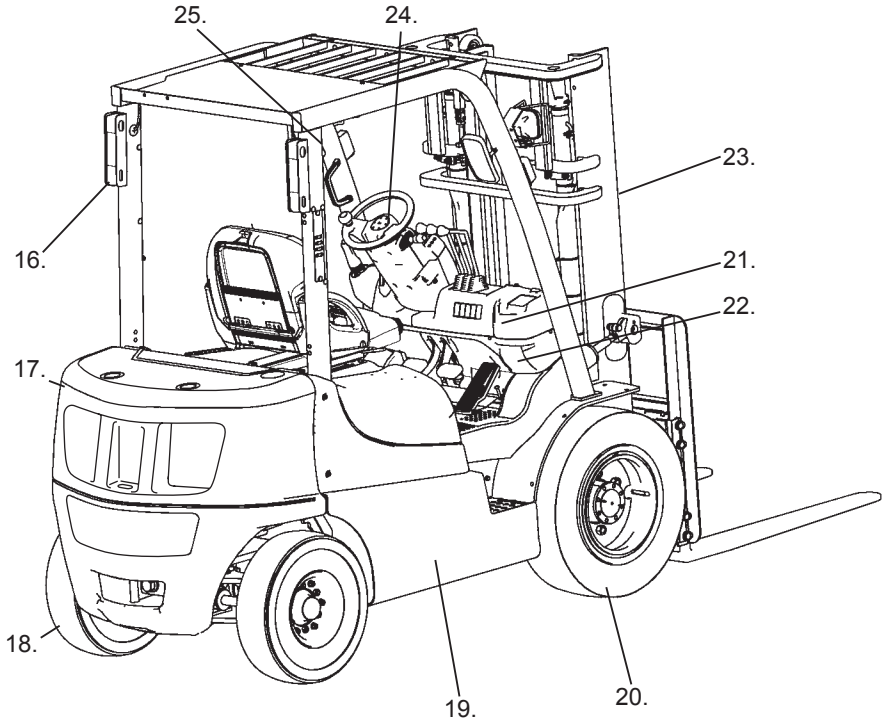
If the label is no longer readable, or if it has come off, always replace it with a new one.

■ Main Components



- 1. Load backrest
- 2. Fork carriage
- 3. Fork
- 4. Tilt cylinder
- 5. Fuel tank
- 6. Frame
- 7. Covers

- 8. Fuel port
- 9. Hood
- 10. Seat
- 11. Overhead guard
- 12. Front light
- 13. Turn signal light

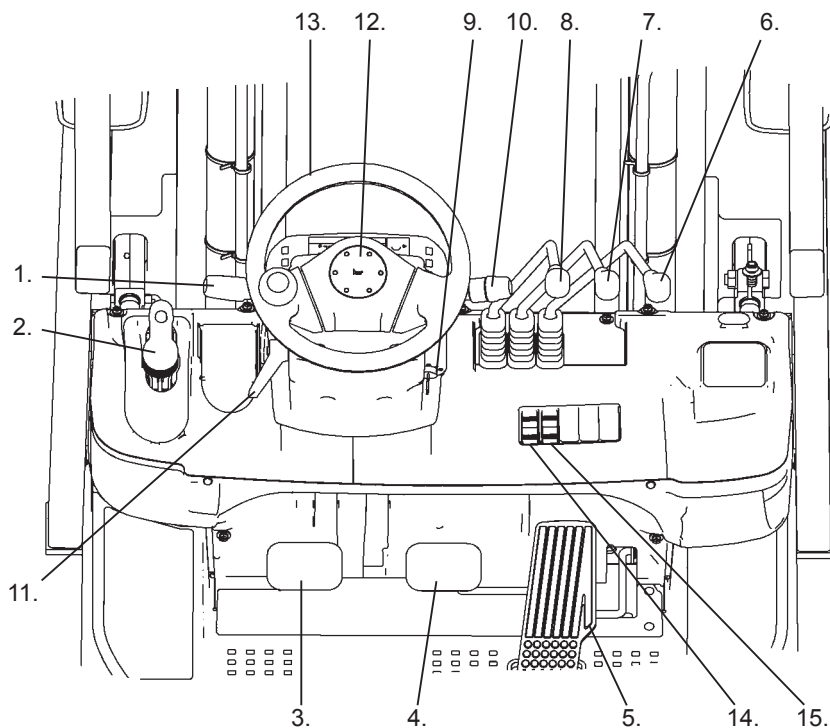


- 16. Rear combination light
- 17. Counterweight
- 18. Rear tire
- 19. Hydraulic oil tank
- 20. Front tire

- 21. Dash panel
- 22. Kick panel
- 23. Mast
- 24. Steering wheel
- 25. Rear-view mirror

Controls

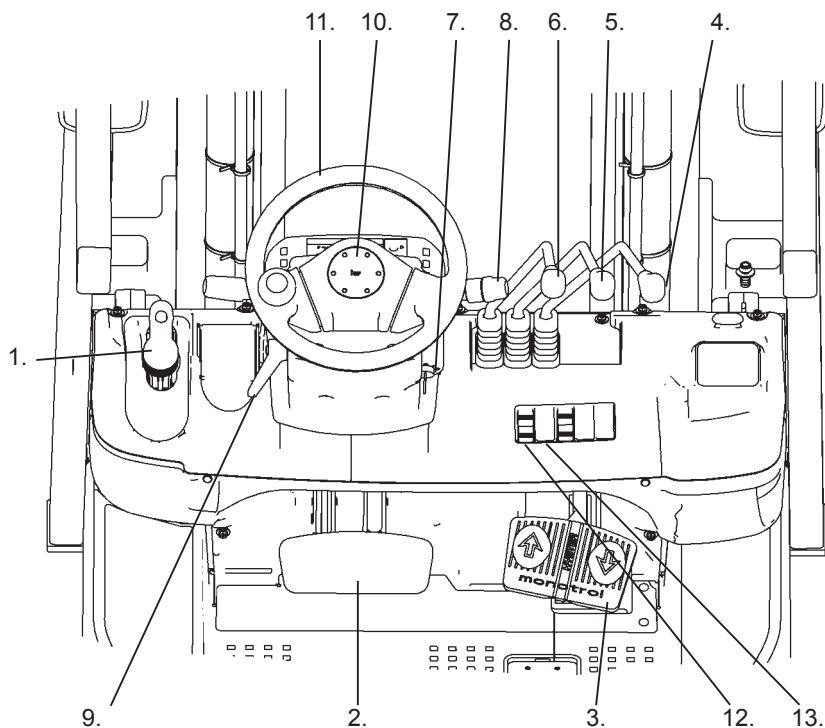
(Powershift Transmission with Direction Control Lever)



- | | |
|---|---------------------------------------|
| 1. Direction control lever | 9. Key switch |
| 2. Parking brake lever | 10. Turn signal lever/Light switch |
| 3. Inching pedal | 11. Tilt column lever |
| 4. Brake pedal | 12. Horn button |
| 5. Accelerator pedal | 13. Steering wheel |
| 6. Third control lever for auxiliary hydraulic function(s). | 14. ECO mode switch |
| 7. Tilt lever | (Electronic controlled LPG engine) |
| 8. Lift lever | 15. Fuel changeover switch(Dual fuel) |

■ Controls

(Powershift Transmission with Monotrol Pedal)



- | | |
|---|---------------------------------------|
| 1. Parking brake lever | 8. Turn signal lever/Light switch |
| 2. Brake/itching pedal | 9. Tilt column lever |
| 3. Monotrol pedal | 10. Horn button |
| 4. Third control lever for auxiliary hydraulic function(s). | 11. Steering wheel |
| 5. Tilt lever | 12. ECO mode switch |
| 6. Lift lever | (Electronic controlled LPG engine) |
| 7. Key switch | 13. Fuel changeover switch(Dual fuel) |

■ Key Switch

The key switch is on the right side of the steering column near the cowl. The key switch has three positions:

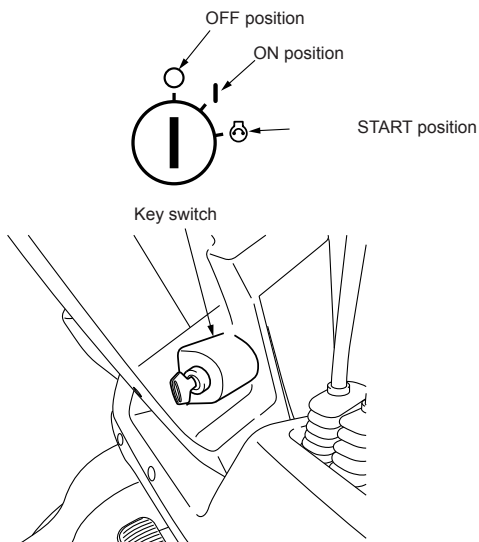
“OFF” position: Deenergizes all electric circuits except for the horn and lights.

“ON” position: Energizes all electric circuits except the starter circuit. The key switch will be in this position during normal operation.

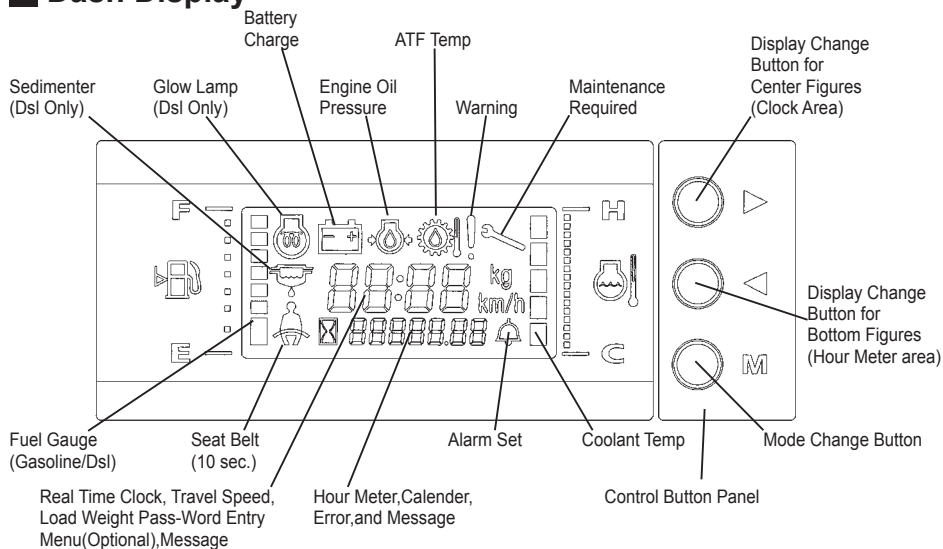
“START” position: Energizes the starter motor for starting the engine. A spring returns the key to **“ON”** position when the key is released.

NOTE:

1. The key switch has a function of anti-restart, so if the engine does not start even when the key is turned to **“ST”**, return the key to **“OFF”** once, and then try again after 5 to 10 seconds.
2. When you pull out the key, turn it to **“OFF”**.



■ Dash Display



ADVICE

All icons will be shown for 0.5 seconds when the key switch is set to "ON". If the icons do not exist even when the key switch is set to "ON", the LCD may be failed or there may be an error in the related equipment. If the icon does not exist even after repair, inspect the lift truck immediately and perform adequate measures.

Message

This icon will be displayed simultaneously with any of the following messages when an abnormality has occurred in the forklift state or operation.



Message	Description	Release method
	The operator has stood from the seat when the key switch is at the "ON" position. In addition, in case of seat belt warning option, the seat belt is not fastened.	Sit on the seat. Fasten the seat belt. (Seat belt warning option)
	When the key switch has been turned "ON" position, the shift lever is at the forward position or the reverse position.	Return the shift lever to the neutral position.
	The operator has stood from the seat without pulling the parking brake lever.	Pull the parking brake lever.
	The key switch has been turned "ON" position when the parking brake lever is not pulled and the shift lever is at the forward position or the reverse position.	Pull the parking brake lever and return the shift lever to the neutral position.
	Low battery voltage warning. The key switch is at "ON" position for ten minutes or more in the stop of the engine.	Start the engine, or return the key switch to "OFF" position.

Maintenance

- This icon indicates that the forklift is in abnormal condition.
- The icon will be displayed together with error code display when an abnormality has occurred in the vehicle system or engine control system.

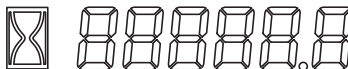


⚠ CAUTION

If the icons exist during operation, stop the lift truck immediately and perform adequate measures.

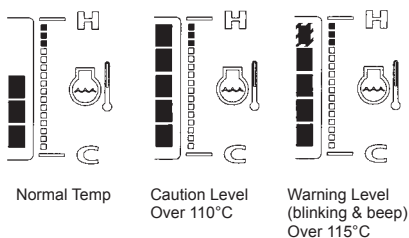
1. Hourmeter

The hour meter operates when the key switch is in the “ON” position. Periodic Maintenance recommendations are based on these hours.



2. Coolant temperature gauge

This gauge indicates the temperature of the engine cooling water. Start operation after the engine has been warmed up and the bar gauge starts raising. When the bar gauge reaches around the middle bar, the water temperature is optimum.



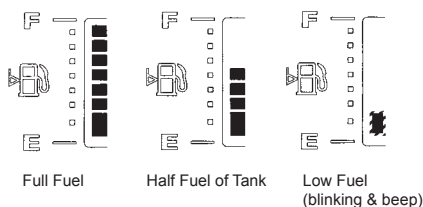
⚠ CAUTION

Do not continue to operate the lift truck when the gauge indicates that the engine is too hot (full bars indicated, and warning buzzer beeping).

3. Fuel gauge (Gasoline&Diesel)

This gauge indicates the amount of remaining fuel in the fuel tank.

Always replenish fuel before the gauge reaches (if fuel level reaches the bottom bar, warning buzzer beeps.) the bottom bar. Make it a habit to replenish fuel before ending operations.



4. Glow plug icon (Diesel)

- The icon indicates the operation of the glow plug.
- When the engine switch is turned “ON”, the icon will be lit for 3 seconds at the maximum, and the glow plug will be rapidly heated to perform starting preparations. After this, the switch will blink during glow operation until the engine switch is turned “OFF”.
- The operating time of the glow plug is automatically controlled according to the temperature of engine coolant. When the coolant temperature is low or on a cold day, the operating time tends to be longer to some extent.

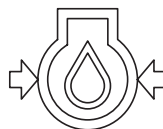


5. Engine oil pressure warning icon

The icon is “ON” when the key switch is in the “ON” position and must go “OFF” when the engine is running.

⚠ CAUTION

Stop the engine immediately if the icon is “ON” while the engine is running.

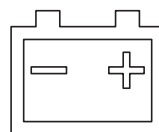


6. Charge lamp

The icon will be “ON” when the key switch is “ON” and the engine is not running. The lamp must go “OFF” when the engine is running.

⚠ CAUTION

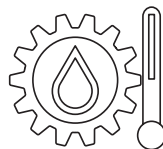
Do not continue to operate the lift truck if the icon is “ON” at engine speeds above idle.



7. Torque converter oil temperature warning icon

The icon is “ON” for 0.5 seconds when the key switch is turned “ON”, and go “OFF”.

If the icon is “ON”, torque converter oil temperature is over 120 degrees.



⚠ CAUTION

Do not continue to operate the lift truck if the icon is “ON” when the engine is running. Make sure the oil level is correct and add fluid as needed. Let the transmission cool before operating the lift truck.

8. Sedimenter warning icon (Diesel)

The icon is “ON” for 0.5 seconds when the key switch is turned “ON”, and go “OFF”.

If the icon is “ON” when the engine is running, there is water in the fuel filter.

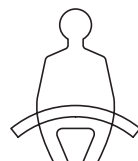


9. Seat belt warning icon

The icon flashes 10 seconds anytime the key switch is put in the “ON” position. If the seat belt interlock option is equipped, the icon goes “OFF” after fastening the seat belt.

⚠ WARNING

Always fasten the seat belt when operating the lift truck.



⚠ CAUTION

The seat belt interlock option is necessary to get into the operator’s seat before fastening the seat belt.

Do not leave seat belt fastening without operator on the seat.

10. Engine-Key-Switch-ON Reminder Buzzer

The system detects the condition in which the engine is stopped with the engine switch “ON” for 3 minutes or longer, and gives the alarm by a buzzer.

11. Low Battery Voltage Warning

- The system detects the condition in which the engine is stopped, and a driver is seated with the engine switch "ON" for 10 minutes or longer, and gives the alarm with the buzzer buzzing 3 cycles and the display showing "bTLo" (battery low).
- The system detects the condition in which the engine remains stopped, and a driver remains seated with the engine switch still "ON" for another 10 minutes or longer (20 minutes or longer in total), gives the alarm with the buzzer buzzing 5 cycles and the display showing "bTLo" (battery low), and automatically shuts down all related solenoids.
- A driver, seated or not, when the system detects that the condition exists for 30 minutes or longer where the engine is stopped with the engine switch "ON," the display shows the "bTLo" (battery low) message and the buzzer buzzes 10 cycles.

12. Service Intervals A (Option)

- When the accumulated time reaches the preset time level, "Maintenance" and "Message" will appear on the hour meter display.
- To clear the service interval display, press and hold down the mode change (M) button for 2 seconds or longer while the service interval is being displayed.

Interval	Message	Hour meter accumulated hours	Period displayed
50Hrs	50HC	50Hrs	Within one hour after the accumulated time reaching the value in the column on the left, it will be displayed for 3 minutes each time the engine switch is turned ON.
Every 200Hrs	200HC	200Hrs, (400Hrs), (600Hrs), (800Hrs), 1000Hrs...	
Every 400Hrs	400HC	400Hrs, 800Hrs, (1200Hrs), 1600Hrs...	
Every 500Hrs	600HC	600Hrs, (1200Hrs), 1800Hrs...	
Every 1200Hrs	1200HC	1200Hrs, (2400Hrs), 3600Hrs...	
Every 2400Hrs	2400HC	2400Hrs, 4800Hrs...	

13. Service Intervals B (Option)

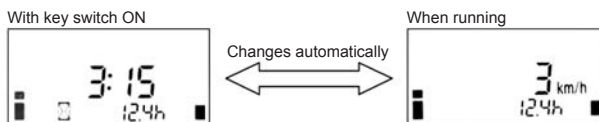
- When the accumulated time reaches the preset time level, "Maintenance" and "Message" will appear on the hour meter display.
- To clear the service interval display, press and hold down the mode change (M) button for two (2) seconds or longer while the service interval is being displayed.

Interval	Message	Hour meter accumulated hours	Period displayed
500Hrs	500H C	500Hrs, 500 x 2Hrs, 500 x 3Hrs,	Within one hour after the accumulated time reaching the value in the column on the left, it will be displayed for 3 minutes each time the engine switch is turned ON.

14. Speed meter (Option)

The speedometer changes from the clock display to the speedometer display simultaneously with the vehicle start. When the vehicle stops, the display automatically changes from the speedometer display to the clock display after a while.

※ To get the speedometer on the display, there are cases where a setting has to be made in operator mode for speedometer display. (See “Operator Mode.”)

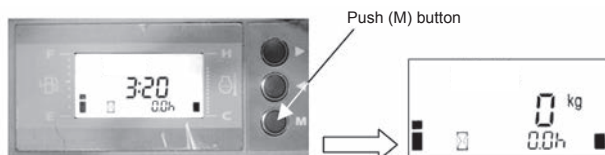


15. Load scale (Option)

Load weight is displayed in kg.

Push (M) button to get the load scale display.

Bring the fork down to the floor or ground level, set the mast to vertical position, and then lifting the fork 300mm to 500mm from the floor or ground, where the load weight is measured for display after several seconds.



When the vehicle is stopped the load scale display appears. When the vehicle is traveling the speedometer display appears. The display changes automatically in the load scale display and the speedometer display. This continues until the key switch is turned OFF.

※ When you want to make a setting so that the display will show weight while the vehicle is traveling, see "Operator Mode" for the setting procedure.

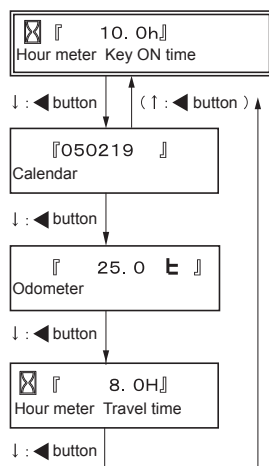
⚠ CAUTION

- This load scale is not to be used for commercial purposes. It is a simple type for approximate measurement only.
- The load scale, which is in a good operating condition with periodic recalibrations, allows a 3% margin of error when the weight of 500 kg or more is measured.
- A load as small as 40kg or less will be displayed as “0kg”.
- Once measurement is completed, no additional load can be measured on top of it.
Bring the fork down to the floor or ground level and measure again.
- Recalibrate periodically.

16. Hour meter / Calendar / Odometer

Each time you push ◀ button, the display changes as follows:

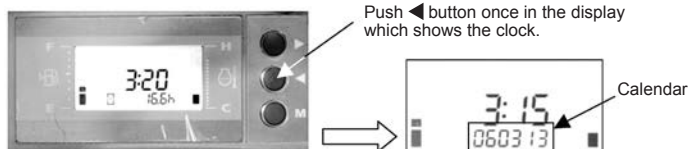
- Hour meter Key-ON accumulated time: h
- Calendar
- Odometer Accumulated travel distance : E
- Hour meter Accumulated travel time : H



(Return to the hour meter Key-ON display.)

17. Calendar

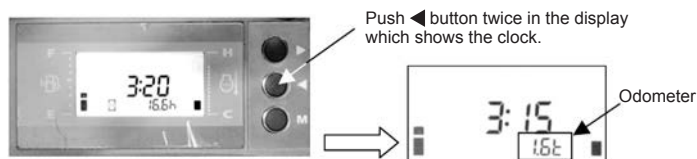
You can display a calendar at the hour meter display.



The display remains unchanged until the key switch is turned OFF.

18. Odometer

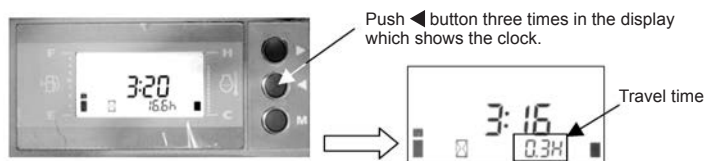
You can display the odometer at the hour meter display.



The display remains unchanged until the key switch is turned OFF.

19. Travel time

You can display the hour meter of travel time at the hour meter display.



The display remains unchanged until the key switch is turned OFF.

20. Setting clock and alarm

Clock, Calender Functions and Setting.

- When the engine switch is ON, clock (12-hour clock) is displayed in normal display mode.
- Even when the engine switch is turned OFF, the clock keeps on ticking although the time display goes out. When the battery is taken out, the clock stops.

●Adjusting date and time



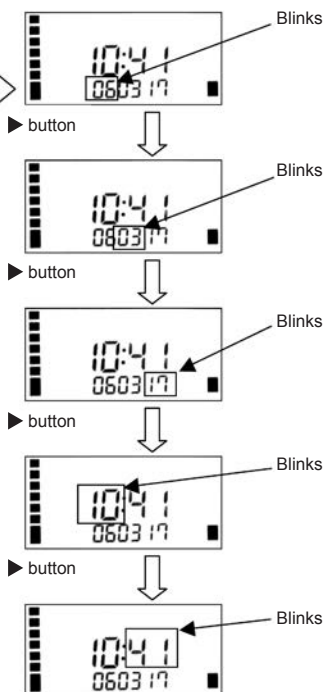
Push ► and ◀ buttons for more than 2 seconds. Then, short beep is heard and the display changes.

As shown on the right, each time you push ► button, the item activated for adjustment is selected in order the year, the month, the date, the hour and the minute and blinks.

To change the setting value of the item activated for adjustment, push ◀ button as many times as it takes to get the value you desire. If you push and keep on holding down the button, the value keeps on getting larger and larger automatically.

※ Push (M) button when the setting is completed, return to normal display mode.

When any display pushes (M) button, return to normal display mode.



Alarm Functions and Setting

- When the clock reaches the preset time, the alarm sounds for 10 seconds with the alarm icon blinking.
- Every hour on the hour, time signal is issued one cycle.
- Alarm and time signal will be issued, provided that setting is valid, and that the engine switch is ON.
- There is one setting available for alarm time. There is a “Yes or No” setting for time signal. Once a setting is made, it will be retained in memory even after the engine is turned OFF. However, when the battery is removed, settings will return to the default settings.
- The default settings are: Alarm “OFF,” Time signal “OFF,” Alarm time “9:00.”
- Even while the vehicle is traveling, when the time comes to the alarm or time signal, the existing display changes to the clock display and alarm or time signal will be issued. The alarm continues for 10 seconds unless it is stopped by pressing an operation button (any button displayed).

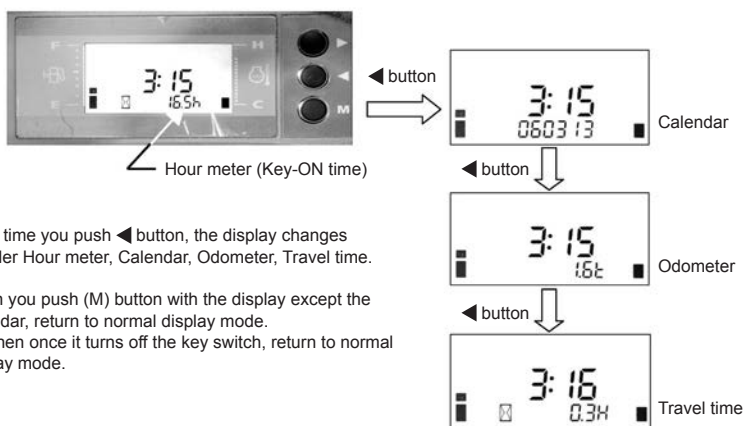
21. Display Functions

⚠ CAUTION

This system can not display all information at the same time on one display -- vehicle data, accumulated load weight (option)).
This is the system which display item one by one.

1. Vehicle data (Hour meter, Odometer, Travel time)

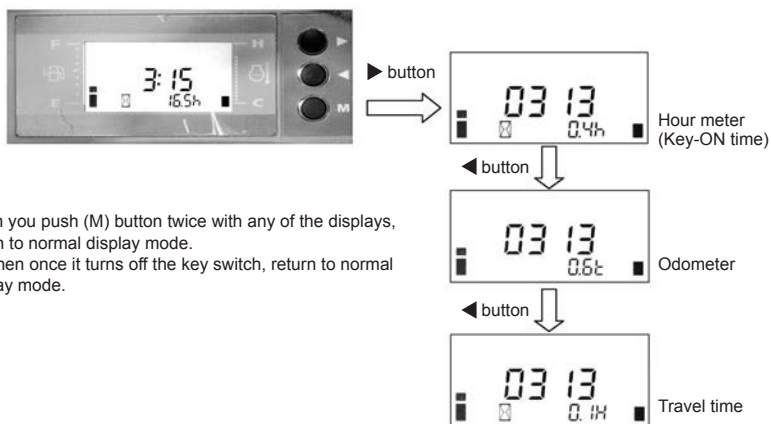
1) When looking at vehicle data (accumulated total so far)



Each time you push ◀ button, the display changes in order Hour meter, Calendar, Odometer, Travel time.

※ When you push (M) button with the display except the calendar, return to normal display mode.
Or when once it turns off the key switch, return to normal display mode.

2) When looking at today's vehicle data

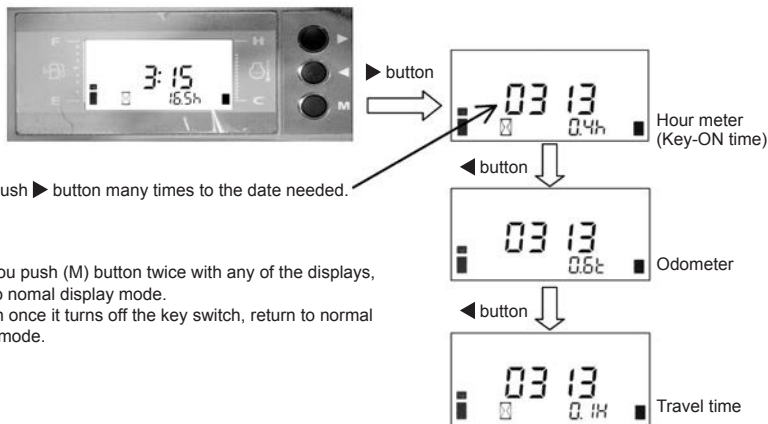


※ When you push (M) button twice with any of the displays, return to normal display mode.
Or when once it turns off the key switch, return to normal display mode.

Controls and Instrument Panel

2

3) When looking at the vehicle data in the past (you can go back to 10 days ago including today)



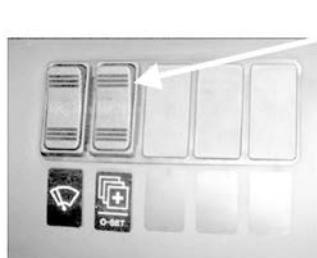
※ When you push (M) button twice with any of the displays, return to normal display mode.
Or when once it turns off the key switch, return to normal display mode.

2

Controls and Instrument Panel

2. Accumulated Load Weight Display (Option)

This function is available only for those vehicles which have an optional load memory switch for tallying accumulated load.



Load memory switch

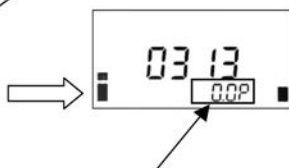
Push this switch for more than 2 seconds the load being handled with its value shown on display. Then, short beep is heard and stored into memory.

See "Load Scale (Option)" on page 19 for load information display.

Displaying accumulated data



Push ◀ button four times in the display which shows the clock.



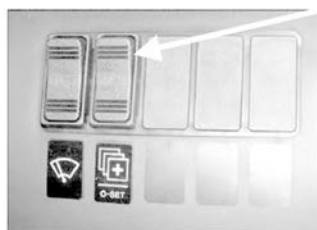
The value accumulated to here is displayed.

[How to interpret display]

0.1P represents 100Kg on the screen.

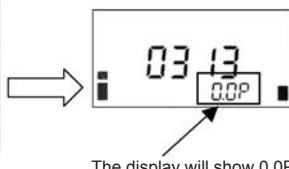
Example: 1.1P = 1.1 tons (1,100Kg)

Resetting the accumulated value



Push this switch for more than 10 seconds.

Then, short beep is heard, clear the accumulated value and reset it to "0".



The display will show 0.0P.

■ Operator Mode (Operator setting functions)

1. "0kg" setting of load scale

(Only the truck with the optional load scale)

The load value might shift when the attachment exchange or forks are exchanged. In that case, the setting of "0kg" must be reset as follows.



Push (M) button for more than 2 seconds. Then, short beep is heard and the display changes.

Mast is made vertical.
If it is not vertical,
the error margin grows.

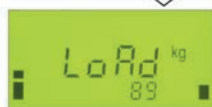
The displayed value is
a value set before.



◀ button

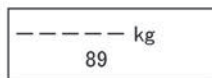


▶ button



▶ button

Taking data (oil pressure) for "0kg" is begun.



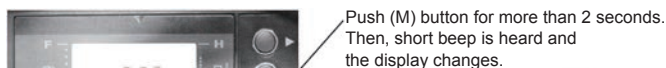
The display replaces from the above figure as follows, and the setting is completed.



※ When the button is pushed in order of (M), ◀ and (M), return once it turns off the key switch, return to normal display mode.

2. Setting of item displayed when stopping or traveling

For example, in case of speedometer and load scale (options)



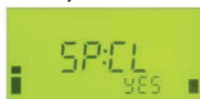
◀ button (2 times)



▶ button



Every time ◀ button is pushed,
the pattern that can be set is displayed one by one.
※ Refer to the table below.



When the display pattern is decided,
push ▶ button.



◀ button



"yes" = Setting

"no" = No setting

Push (M) button when the setting is completed.

When the button is pushed in order of (M), ◀ and (M),
return to normal indication mode.

Or when once it turns off the key switch,
return to normal display mode.

※ Table of display pattern

Pattern	Traveling	Stopping
SP:CL	Speedometer	Clock
SP:Lo	Speedometer	Load scale
CL:Lo	Clock	Load scale
CL:CL	Clock	Clock
Lo:Lo	Load scale	Load scale

⚠ CAUTION

Clock display will be reset when the battery is removed. Each time you remove the battery and put it back on, always adjust the clock to the correct time. (See “Clock Setting.”)

When the clock is reset, “2005, 01, 01 12:00” will be shown as the default value.

In this case, the operation management calendar will show “E**”, which displays the number of days as explain from the day the system was reset.

Example

Operation management

calendar display E10

E03

The meaning of the display 2005/01/10

2005/01/03

E02

2005/01/02

E01

2005/01/01

1016

10/16

1015

10/15

1014 ...

10/14 ...

If you have failed to make a clock adjustment a few times when you removed the battery, operation management data, gets mixed up.

(To prevent such an occurrence, you must always set the correct time each time the battery is removed.)

When the date is not stored in memory yet, the display shows “———”.

■ Safety device

As the standard equipment, the vehicle is provided with the travel interlock function for automatically putting the shift lever into neutral when the driver is away from his/her seat and the cargo interlock function for automatically restricting cargo handling when the driver is away from his/her seat.

1. Travel interlock function

After a passenger leaves their seat for approximately 3 seconds while the vehicle is moving, the output of the AT transmission for moving forward or backward is forcibly stopped and goes into neutral.

At the same time, there is a warning by an alarm and a display on the display screen.

CAUTION

Travel Interlock has the function of shifting into neutral but does not have the function of fixing the wheels. Because of the danger of coasting on an incline road, make sure that the parking brake is engaged before exiting the vehicle.

ADVICE

Once Travel Interlock is engaged, the vehicle will not drive until the shift lever is put into neutral and then put back to forward or reverse.

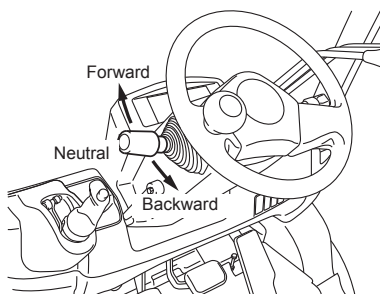
2. Cargo Interlock function

After a passenger leaves their seat for approximately 3 seconds, Cargo Interlock is engaged and all Cargo handling operations cease to work.

Levers

1. Direction control lever

This is used to changeover from forward and reverse travel.



ADVICE

- This lift truck has a neutral switch. The engine will not start at a position other than neutral.
- Always changeover the shift lever from forward/reverse when the lift truck is stopped to protect the equipment and for safety.

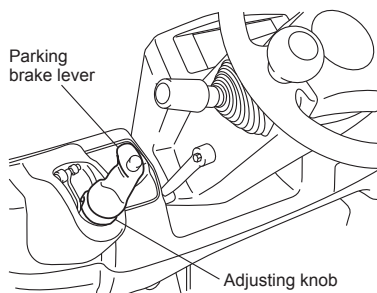
Return-to-neutral Warning Alarm

This truck series have the safety alarm. If the operator leaves at the operator seat with the Fwd/Rev lever not in neutral, warning alarm sounds even on the key switch "off".

2. Parking brake lever

When parking the lift truck, parking brake should be put on. The parking brake can be put on by pulling the parking brake lever backwards all the way. Also, by turning the adjusting knob, how the brake is put on can be adjusted. (Please refer to page 100, for how the adjustment can be made.)

Push the top button to release the lock on the lever after pulling the lever a little. Then the lever is moved to release the parking brake.



On lift trucks with a Monotrol pedal

Applying the parking brake puts the transmission in NEUTRAL.

Parking Brake Warning

The parking brake must be applied when leaving the lift truck or when starting the engine.

There is a switch in the seat that actuates an audible buzzer. If the operator leaves the seat without applying the parking brake, the buzzer will be ON for 6 seconds at the key-off condition.

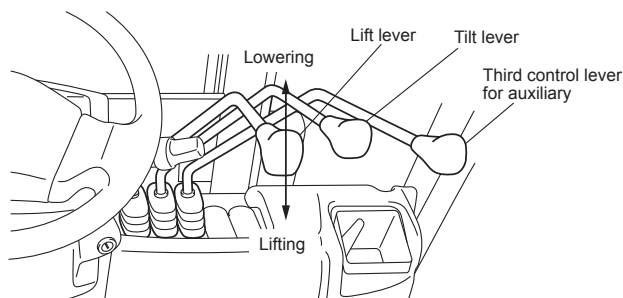


ADVICE

- When putting on the parking brake, pull the lever while pushing on the brake pedal with a foot. This will make the parking brake operation lighter.
- When parking or stopping, make sure to pull on the parking brake lever.

3. Lift lever

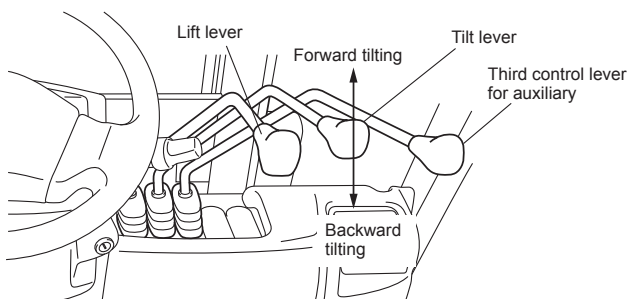
By pulling the lever backward, the fork goes up and, by pushing the lever forward, the fork goes down. The rising speed of the fork can be adjusted by the force on the accelerator pedal and the pulling stroke on the lift lever. The lowering speed of the fork can be adjusted by the pushing stroke on the lever. The maximum lowering speed of the fork is maintained at a certain speed by the flow regulator valve.



4. Tilt lever

By pulling the tilt lever backward, the mast is tilted to the rear. By pushing the tilt lever forward, the mast is tilted to front. The speed of the tilting can be adjusted by the pulling and pushing stroke.

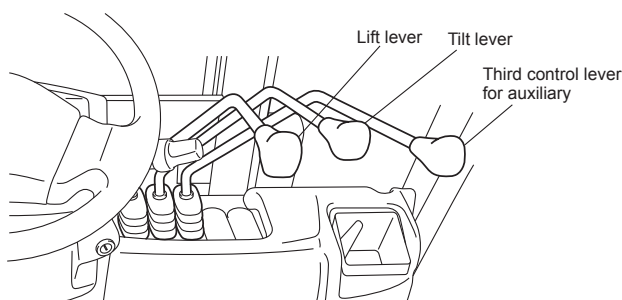
As a mechanism for preventing the mast to tilt to the front when the key switch is “OFF”, there is a built-in tilt-lock mechanism.



5. Third control lever for auxiliary

The third control lever is installed to the right of the tilt control lever. This control lever can have two methods of operation, depending on the attachment.

The lever is operated by moving it forward and backward.

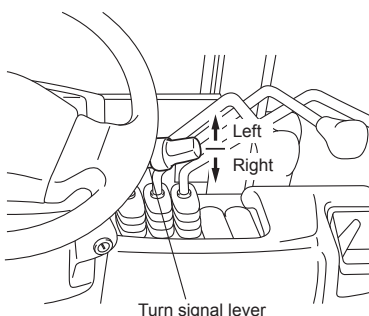


Cargo Interlock

If the operator is not in the seat or leaves from the seat, any hydraulic controls are not activated to avoid unintentional movement of front end equipments.

6. Turn signal lever

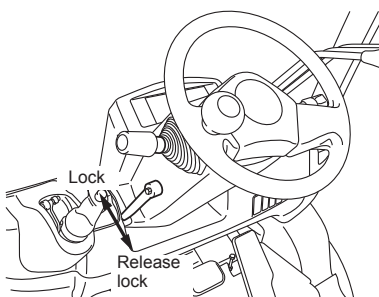
By pushing the turn signal lever to forward, the left turn signal blinks. By pulling the lever backward, the right turn signal blinks. The turning direction of the fork lift truck can be indicated.



7. Tilt column lever

The steering wheel can be adjusted to any positions within the tiltable angle.

1. Loosen the lever on the left of the steering column (release lock) and the steering wheels forward/backward position can be adjusted.
2. Tighten the lock release lever at the desired steering wheel position will lock the steering wheel. If position of the lock release lever is improper, pull the lever to left hand side and change the lever angle to the proper position.
3. After adjustment, confirm that the steering wheel is locked.

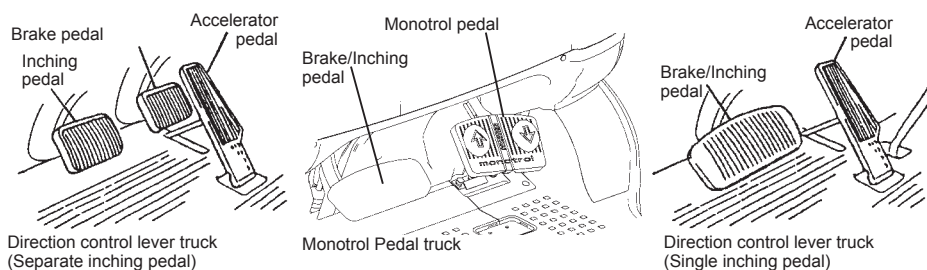


⚠ CAUTION

Adjust the steering wheel when the lift truck is stopped, as adjustment during travel is dangerous.

■ Pedals

In the lift truck which has single brake/inching pedal, the brake/inching pedal and accelerator pedal are located left to right. In the lift truck which has separate inching/brake pedal, the pedals are in a row from the accelerator pedal, brake pedal and inching pedal from the right.



1. Accelerator pedal

The travel speed can be adjusted and the load speed increased or decreased by pressing the pedal.

2. Monotrol pedal (option)

The Monotrol pedal controls the speed and direction of the lift truck. Pushing on the right side of the pedal causes the lift truck to move in REVERSE. Pushing on the left side of the pedal causes the lift truck to move in FORWARD. The speed of the engine increases as the pedal is depressed.



ADVICE

On lift trucks with a Monotrol pedal, applying the parking brake puts the transmission in NEUTRAL. The parking brake must be applied when starting the engine.

3. Brake pedal

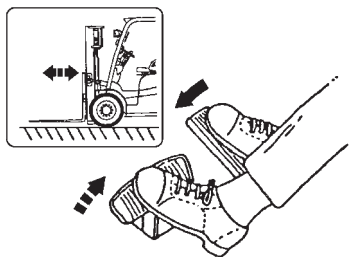
The lift truck is stopped when the pedal is pressed, and at the same time, the brakelights will light.

⚠ CAUTION

- Do not place your foot on the pedals except accelerator pedal if unnecessary during travel.
- The stopping distance will increase when traveling down a slope or on a wet surface. Always provide an allowance when braking.

4. Brake/inching pedal

The hydraulic clutch pressure will decrease and the lift truck braking force will increase when the pedal is depressed. Use this for slight travel when carrying a load, or for smooth starting, travel and stopping.



⚠ WARNING

Inching requires coordinated movement of the brake/inching pedal and the accelerator pedal. New operators must practice this procedure before attempting to handle loads.

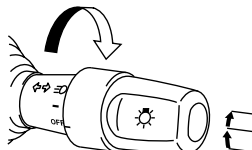
⚠ CAUTION

- Take special care not to mistake inching pedal for the clutch pedal. The lift truck will suddenly stop if pressed down with force.
- Do not place your foot on the pedals except accelerator pedal if unnecessary during travel.
- The stopping distance will increase when traveling down a slope or on a wet surface. Always provide an allowance when braking.

Light Switch

The light switch is integrated in the turn signal lever. When the switch is turned forward direction, the light is turned on. When the switch is turned rearward, the light goes out.

Mark	Lighting	
	Front light	Tail light
—		○
≡D	○	○



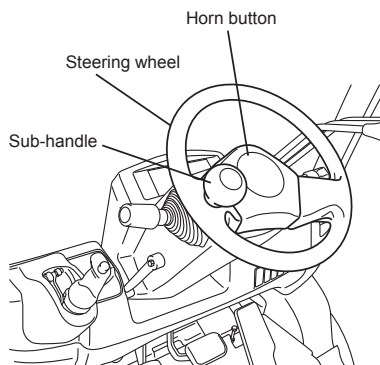
If the operator keeps the light “ON” and turn off the key, warning alarm sounds to prevent battery discharge.

Steering Wheel

To steer the lift truck, hold the sub-handle with your left hand. When advancing, turn the steering wheel in the same direction as the turning direction, and when backing, turn the steering wheel in the opposite direction of the steering direction.

This lift truck is provided with power steering, so light operation is possible.

The horn sounds when the horn button at the center of the steering wheel is pressed.



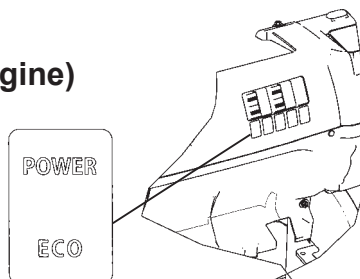
CAUTION

- Suddenly turning the handle during travel can be extremely dangerous. This can cause the load to fall or tip over. Always slow down, and turn the handle slowly.
- The knob position may be dislocated. In such a case, turn the steering right and left several times.

ECO mode switch (LPG electronic controlled engine)

This switch toggles the Standard(Power) mode and Economy(ECO) mode.

When the switch is turned to ECO mode, the acceleration becomes softer and fuel consumption can be reduced.

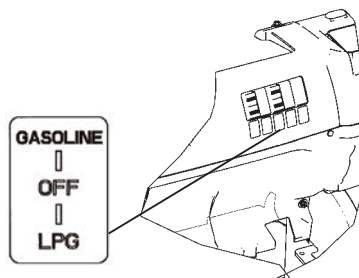


■ Fuel changeover switch(Dual fuel truck)

This switch toggles the LPG and Gasoline.

⚠ CAUTION

When changing the fuel, do in the correct procedure.



■ Return To Vertical (RTV) (Option)

1. Operation

*Push the tilt lever knob switch while moving the mast forward from backward position, with light load, the mast will return to vertical position.

*To stop return to vertical (RTV) operation, release the tilt lever knob switch.



ADVICE

- The pattern of operation when the tilt lever knob switch is pushed.

Mast position Operation	Forward-tilted	Vertical	Backward-tilted
Tilt forward	Stop immediately*1	Mast return to vertical and stopped	Tilt forward
Tilt backward	Stop immediately*1	Stop immediately*1	Tilt backward

*1: When the tilt lever knob switch is pressed with the mast already in the vertical or forward-tilted position, it will stop right there.

- Stopping RTV or executing immediate-stop will disable the tilting mast, the lifting fork and the rotating attachment.
To resume the operation, release the tilt lever knob switch and put the tilt lever back into the neutral position.
(The neutral-return function)

⚠ CAUTION

Lowering function is operative even in stopping RTV or executing immediate-stop.

2. Set the stopping (vertical) position

*Bring the mast to a desired vertical and stop. Then turn the engine switch ON. At the same time, press and hold down the tilt lever knob switch for 10 seconds or more. With this, the stopping position will be stored in memory and sounds the confirmation sound. It will be kept in memory until a new stopping position is stored, even if the engine is switched OFF.

* The stopping position is set at factory before shipment.

3. Capacity

Shown in the table below is the permissible load for each of the model capacities, within which RTV can be operated.

Model	Mast type	Permissible load	Supplementary description
1-2 ton	2LFL	Up to about 200kg	When the load is larger than the permissible load, the mast will remainstopping without performing RTV operation while the tilt lever knob switch is being pressed. (In this case, neutral return doesn't perform.)
	2FFL	Up to about 165kg	
	3FFL	Up to about 165kg	
2-2.5 ton	2LFL	Up to about 250kg	In the case of the mast type 2FFL and 3 FFL, RTV function will be operable even if the load exceeds the permissible load, provided that the lift height is low.
	2FFL	Up to about 220kg	
	3FFL	Up to about 220kg	
3-3.5 ton	2LFL	Up to about 350kg	
	2FFL	Up to about 300kg	
	3FFL	Up to about 300kg	



ADVICE

- When the load applied exceeds the permissible load shown above, the tilting mast does not perform, even if the tilt lever is operated with the tilt lever knob switch pressed.
- There may be cases where RTV cannot be operated temporarily, because of the increase of the mast operating pressure right after the lift / tilt operation. Therefore, perform RTV operation after a pause.



CAUTION

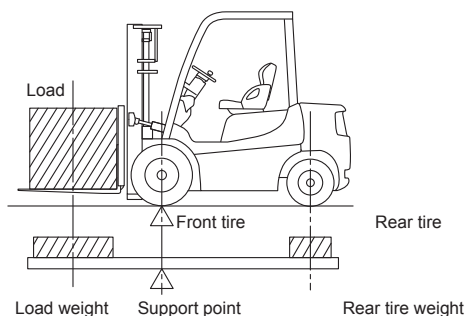
- Pressing the tilt lever knob switch while operating the mast forward or backward with excessive load, tilting operation will be stopped. Such an operation may cause the forklift tipping over, therefore, must be prohibited.
- When forklift is equipped with attachments, it is dangerous to perform RTV operation at the lifted height position with engine running at high speed.
- When forklift is equipped with heavy attachments, the operation range of RTV may be restricted for safety operation. Please contact our service department before use.

To safely operate the lift truck it is important to understand the structure and stability of the lift truck.

Load and Truck Stability

The stability of the lift truck is like that of a seesaw, where stacked load and rear tire load are balanced while the front tire works like a support point in a seesaw.

If the load center of the stack is far from the front tires, the load that can be stacked will decrease. Thus, always take care to the center, and make sure that the balance is not shifted. If a load exceeding the balance is stacked, the safety of the work will be obstructed.

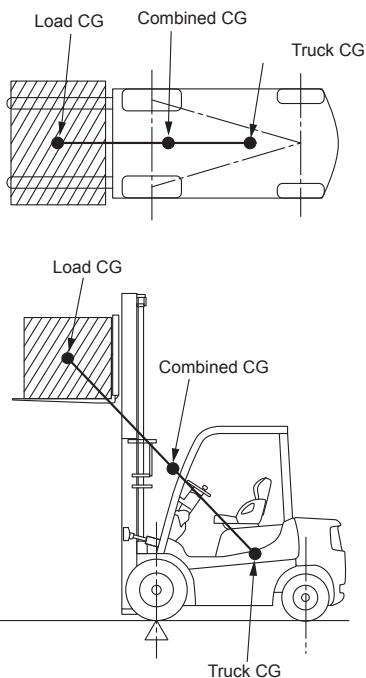


Center of Gravity

The stability of the lift truck is determined by the combined center of gravity position of the lift truck's center of gravity and load's center of gravity.

When there is no load, only the lift truck's center of gravity is used, and when a load is stacked, the combined center of gravity of the lift truck and load will be used.

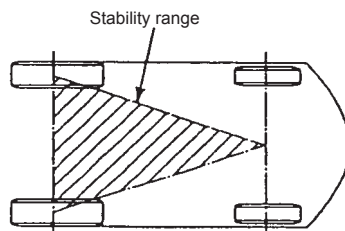
The load's center of gravity will differ according to whether the mast is tilted forward or backward, the mast is raised or lowered, and thus, the combined center of gravity will also change.



■ Stability Range

For the lift truck to be stabilized, the combined center of gravity position must be within the stability range created by the left and right front tire grounding point and rear wheel suspension pin points.

If the combined center of gravity position moves forward of the drive axle, the lift truck will tip forward. If the combined center of gravity position moves outside the stability range, the lift truck will tip to that side.



■ Load Center and Capacity Table

The capacity of the lift truck is shown on the Nameplate. The capacity is listed in terms of weight and load center. The weight is specified in kilograms. The load center is specified in millimetres. The capacity is the maximum load that the lift truck can handle. This load must weigh less than the maximum weight for a load center shown on the nameplate.

The load center of a load is determined by the location of its center of gravity. The load center is measured from the front face of the forks, or the load face of an attachment, to the center of gravity of the load. It is also assumed that the location of the center of gravity in the vertical direction is no greater than the specified horizontal dimension.

The operator must know whether or not a load is within the capacity of the lift truck before the load is handled.

 Trained Operators and Mechanics Only Read Operating Manual located on or near seat Failure to follow operating, inspection, and maintenance instructions can cause serious injury or death! CAPACITY WITH MAST VERTICAL AND EQUIPPED AS SHOWN 1515641.2		Lift Truck Model ***** Year of Manufacture ***** Serial No. ***** Attachment: *** mm Carriage ***** mm Forks		Nominal Power *** kW Back Tilt ** Degrees	
		Truck Weight ***** kg Tread Width ***** mm Type Front Rear Size ***** Pressure *** kPa		Load Height Dim. A Load Center Dim. B Dim. C MAXIMUM CAPACITY *** kg *** mm *** mm *** mm *** kg *** mm *** mm *** mm	

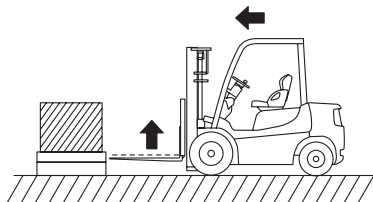
⚠ CAUTION

If a load exceeding the loading capacity given in the Loading Capacity Table is stacked, the rear tires may float during travel, and the steering wheel may not function creating a very dangerous state. The risk of tilting will also increase, so always observe the tolerable load when stacking.

■ Picking up Loads

Pick up loads according to the following procedures:

1. Slowly approach the load to be transported.
2. Bring the lift truck to a complete stop in front of the load.
3. Tilt the mast to the vertical position, and position the lift truck squarely with the load. Confirm the fork insertion position, and slowly advance, and insert the forks in completely.



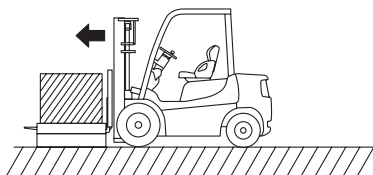
⚠ CAUTION

- Keep the forks parallel with the pallet, and insert them completely while taking care not to brush against the pallet.
- Do not operate the lift while the fork is tilted forward.
- Do not insert the forks vigorously into the pallet.

4. Raise the load 5 to 10cm, and check that the load is stable and distributed evenly.

⚠ CAUTION

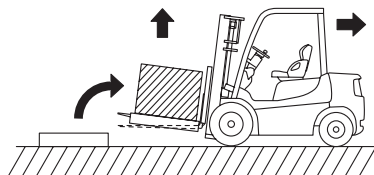
Raise the load only to the height of the back rest, and do not transport the load when raised higher than the back rest.



5. Hold the load by putting it against the backrest and then lift the fork 15 to 20cm from the ground. Then, tilt the mast back as much as possible.

⚠ WARNING

- Never place a weight on the rear of the lift truck to increase the loading capacity. (Refer to the Loading Capacity Table.)



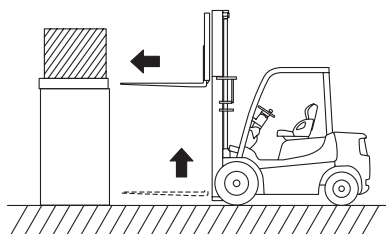
⚠ CAUTION

- Never travel, turn or tilt the forks while the load is raised, as the load will be unstable and the lift truck could tilt over.
- If the load blocks the forward vision range, travel backwards.

■ De-stacking

De-stack the load with the following procedure.

1. Slowly approach the load to be transported.
2. Bring the lift truck to a complete stop in front of the load.
3. Tilt the mast to the vertical position, and position the lift truck squarely with the load. Lift the fork to the position where the forks are inserted. Slowly advance, and insert the forks completely.



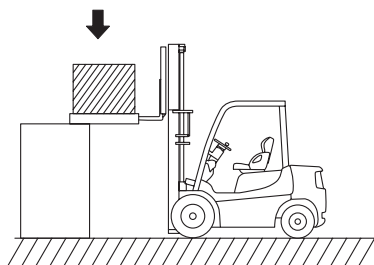
⚠ CAUTION

Keep the forks parallel with the pallet, and insert them completely while taking care not to brush against the pallet.

4

Loading and Safety Operation

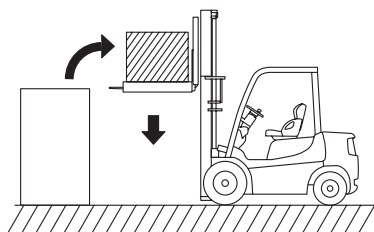
4. Raise the load 5 to 10cm and retract 10cm to 20cm. Then, lower the load once.



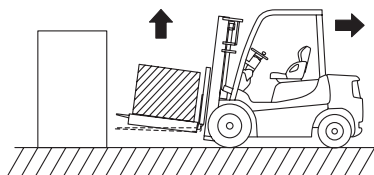
5. Fully insert the forks again, raise the load approx. 5 to 10cm and slowly back away. Then, lower the load to a safe height.

CAUTION

When lifting the load, if the fork is slanted to the front, tilt the mast to backward in order to maintain the stability of the load.



6. Lower the fork to about 15 to 20 cm from the ground and tilt the mast backward to make the load stable. Then, travel to the destination.

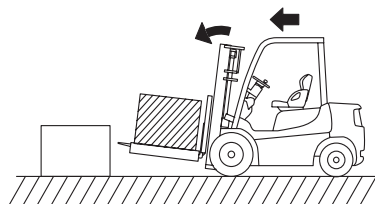


■ Stacking

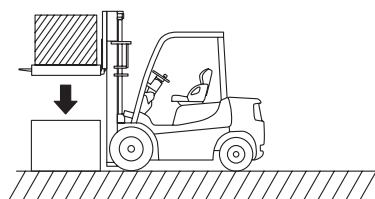
1. Slowly approach the stack.
2. Bring the lift truck to a complete stop in front of the load.

⚠ CAUTION

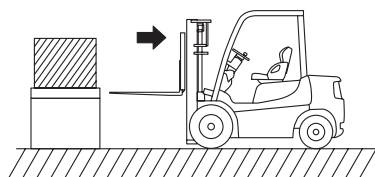
when stacking onto a shelf, take care not to hit the load.



3. Tilt the fork to the vertical position, and lift to a position slightly higher than the place where the stack is to be placed.
4. Confirm the stacking position, and gradually lower the forks.



5. Gradually pull out the forks so as to not snag the load.



It is important for the lift truck operator and supervisor to observe various rules to prevent work-related disasters during transfer work. Please observe the following items and carry out the operation and work safely.

■ Before Starting Work

⚠ CAUTION

Only operators who have completed the lift truck operation skill training may operate the lift truck.

⚠ CAUTION

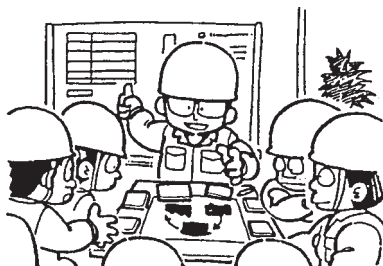
Wear designated work clothes and protective devices.

- Wear work clothes that have well-closed cuffs and collars.
- Always wear safety shoes and protection helmets.

⚠ CAUTION

Take sufficient time to discuss the work before starting.

- Discuss the work with the work leader before starting work, and always follow the work plan.



⚠ CAUTION

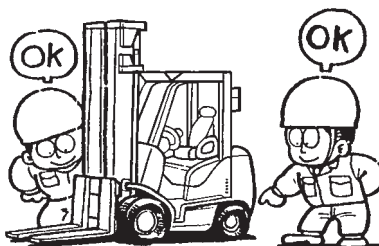
Inspect the lift truck before starting work.

- If any abnormality is found, contact the supervisor immediately. Do not operate the lift truck until repairs have been made.

⚠ CAUTION

Do not make modifications or repairs on the site.

- Contact your authorized dealer when the lift truck must be modified or repaired.



⚠ WARNING

If faults or defects are found in the safety devices such as overhead guards or back rests, make the repairs immediately before starting operation.

- Do not remove the overhead guard.
- Do not use lift truck that do not have overhead guard and load backrest.

⚠ CAUTION

Do not use the vehicle for purposes other than for cargo handling.

- Do not use the vehicle for towing.
- Do not attach a rope, etc. onto the fork to suspend or pull a load.

**⚠ CAUTION**

- Before getting in or out of the vehicle, stop it.
- When getting in or out of the vehicle, do not hold on to the steering wheel or control levers.

**■ During Travel****⚠ CAUTION**

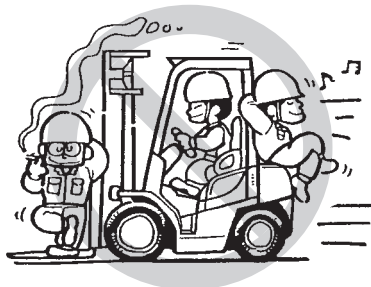
Always operate the lift truck within the speed limit.

- Set a safety speed limit for when loads are loaded, and for when the lift truck is empty, and take the work environment into consideration.
- Observe the work site rules, and operate the lift truck safely.



⚠ WARNING

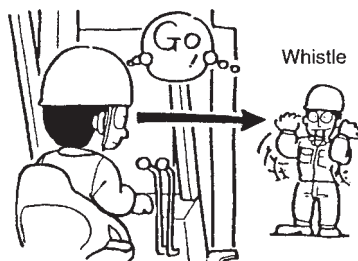
NO RIDERS. A lift truck is built for only one person --- the operator it is dangerous for anyone to ride on the forks or anywhere else on the lift truck.



⚠ CAUTION

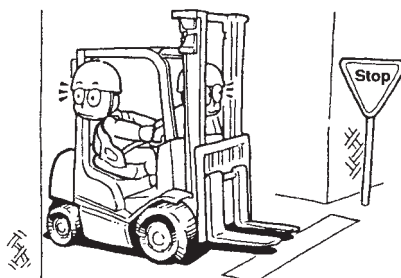
Assign a guide at narrow places, and operate safely.

- When assigning a guide, make sure to predetermine signals to be used.
- The operator must follow the signals given by the guide.



⚠ CAUTION

If the view is obstructed, always stop once, and confirm the safety on the left and right before proceeding.



⚠ CAUTION

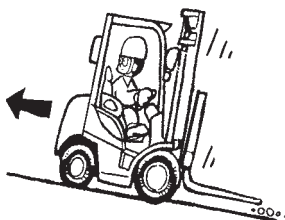
When driving a loaded vehicle on a slope, travel forwards when going up the slope and travel backwards when going down the slope.



Loaded vehicle

⚠ CAUTION

When driving an unloaded vehicle on a slope, travel backwards when going up the slope and travel forwards when going down the slope.



Unloaded vehicle

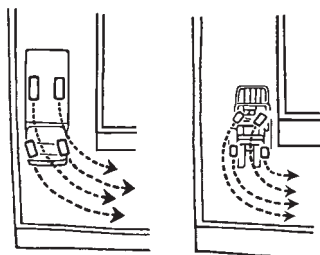
⚠ CAUTION

Never travel across a slope horizontally or change directions on a slope as the lift truck could tip over.



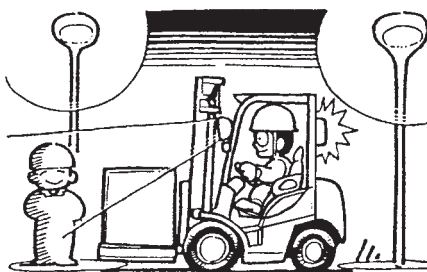
⚠ CAUTION

The fork lift truck is steered by the rear tires, so when making a turn, bring the inner side close to the corner, which is the opposite of normal passenger cars.



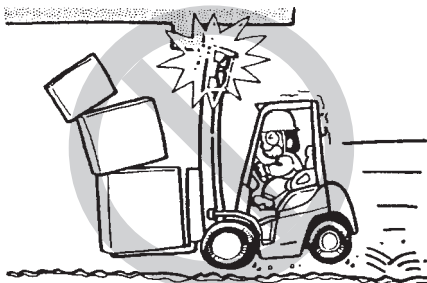
⚠ CAUTION

When driving at night, the distance of objects and road levels can be easily mistaken. Use both the front and rear lights and other means of lighting, and take caution to the persons and obstacles in the surrounding areas.



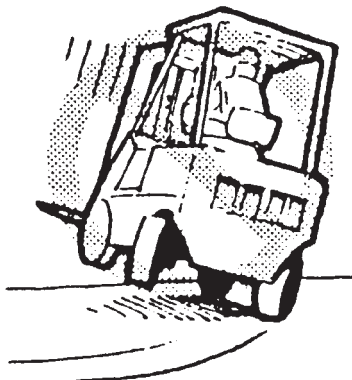
⚠ CAUTION

Be careful of the height of the upper part of the lift truck when entering or existing buildings (e.g., warehouse), so that the lift truck will not catch.



⚠ WARNING

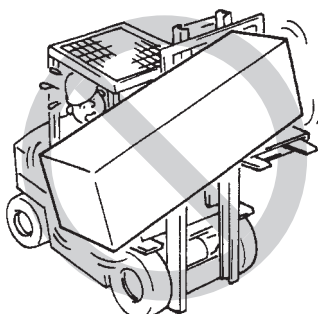
TRAVEL SLOWLY WHEN TURNING. Lift trucks can tip over even at very slow speeds. The combination of speed and the sharpness of a turn can cause a tipover. A lift truck is less stable when the forks are elevated, with or without a load.



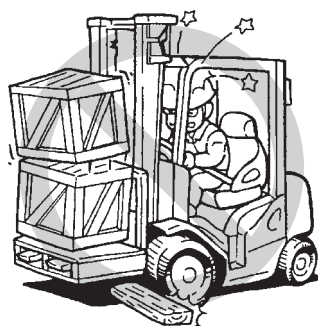
⚠ CAUTION

Take special care when carrying a long or wide load.

- Gradually lift the load while confirming the surrounding safety.
- Take care to the balance of the load, and always work with the load at a low height.
- Confirm the surrounding safety when turning, and work slowly to prevent the load from shifting.

**⚠ CAUTION**

Do not drive over objects such as pieces of wood scattered on the ground. Doing so could cause the load to shift or the operator to lose control.

**⚠ WARNING**

- Maintain a safe distance from the edge of docks, ramps, platforms and other similar working surfaces. Watch the “tail swing”. Remember when travelling in the forward direction and the steering wheel is turned to move the lift truck away from the edge of the dock the rear will swing toward the edge. This action can cause the lift truck to fall off the dock.
- IF THE LIFT TRUCK FALLS OFF THE DOCK, DO NOT JUMP OFF! HOLD FIRMLY TO STEERING WHEEL, BRACE YOUR FEET, AND LEAN FORWARD AND AWAY FROM THE POINT OF IMPACT.

⚠ CAUTION

Take care to the state of the road while traveling.

- Confirm the strength of the floor.
- Travel on slippery surfaces can cause the lift truck to slip. If these types of surfaces must be traveled over, slow down.
- Avoid traveling on weak ground and non-prepared ground.

⚠ WARNING

Traveling on the very edge of the road could cause the vehicle to tip over. Keep a safe distance from the edge.

⚠ WARNING

Pay attention to the state of the road while traveling.

- Confirm the strength of the floor.
- Travel on slippery surfaces may cause the vehicle to slip. When traveling on such a surface out of necessity, slow down.
- Avoid traveling on weak or unprepared ground.

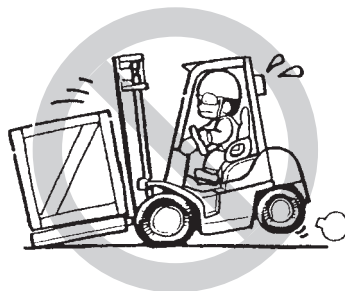


■ During Work

⚠ WARNING

Do not travel with an excessive load that causes the rear tires to float.

- Follow the load table and carry out the work.



⚠ CAUTION

Do not use the tip of the forks as a lever to raise a heavy load. Do not push a load with the tip of the forks, and do not use the tilt cylinder to pull a load.



⚠ CAUTION

Use pallets and skids suitable for the load.

- Use pallets and skids that can withstand the weight of the load.
- Do not use damaged, deformed or decayed pallets and skids.

**⚠ CAUTION**

Stack the load on the pallets and skids safety and properly.

- Take care to the center of gravity of the load to prevent eccentric loads.
- If the load might fall off or come apart, use prevention measures such as ropes (binders). The worker in charge of loading must not get on the fork and hold the load during travel.
- Do not traverse unstable loads.



○ Do not put the fork on a self

⚠ CAUTION

Do not put the fork on a shelf, a load, etc., during work.

Furthermore, if the mast falls, the hydraulic hose may be damaged and hydraulic oil may be dispersed.

**⚠ CAUTION**

Do not travel with the forks higher than 30cm from the floor, and never travel or turn with the forks in a vertical position or tilted forward.



⚠ CAUTION

Do not advance suddenly, apply the brakes suddenly or turn suddenly. If the brakes are applied suddenly while traveling forward, the load may fall off and the lift truck tip over.

- The stopping distance will increase when traveling down a slope or on a wet surface. Always provide an allowance when braking.



⚠ WARNING

Do not place hands or feet on the cross members of the mast. Your hand will be severed if the mast is lowered while your hand is on it.

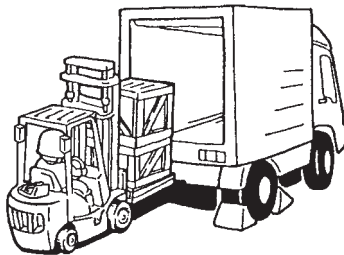


- The stopping distance will increase when traveling down a slope or on a wet surface. Always provide an allowance when braking.



⚠ CAUTION

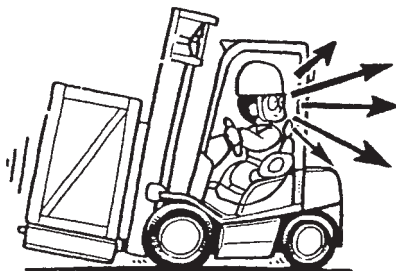
Before loading onto or unloading from a truck, confirm that the truck's parking brakes are applied and that the wheels are chocked.



⚠ CAUTION

Before moving backwards, tilt the forks back completely and confirm that the load is safe. Drive carefully when backing.

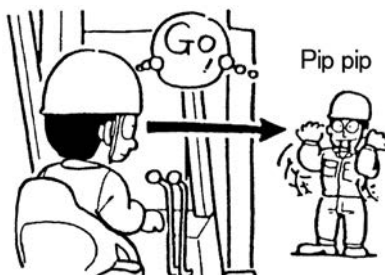
- For better visibility with large loads, travel with the load trailing, but always keep a proper lookout in the direction of travel. Normally, direction of travel is determined by the best visibility available to the operator. If the lift truck must travel in a direction where visibility is obstructed, a lookout helper can be required.

**⚠ WARNING**

Some lift trucks have mirrors for viewing along the side to observe the tail swing area. These mirrors are an aid to the driver, but are NOT driving mirrors and must NOT be used as such when operating in reverse. Always look in the direction of travel to avoid damage to something or injury to someone.

⚠ CAUTION

When a large load blocks the visibility, drive by following the instructions given by the guide.

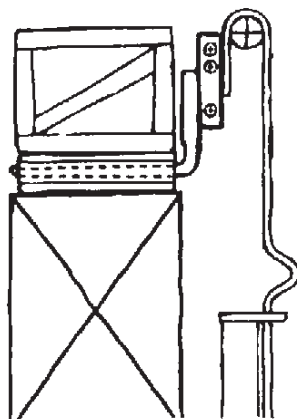


⚠ WARNING

Pay attention to the slack of the chain and hose.

Do not pull out the fork with the chain or hose slackened.

- The fork portion may get caught in a load or a fence, causing the load to fall off or the vehicle to tip over.
- If the hose is slackened, interference or pinching by other portions may cause breakage of the hose or splash of the hydraulic oil.
- If there is any slack, tilting down the lift lever slightly to the rear (front) to lift will remove the slack.



⚠ WARNING

- The lift truck can tip forward when the load is raised. Forward tipping is even more likely when tilting forward, braking when travelling forward or accelerating in reverse.
- **IF THE LIFT TRUCK TIPS OVER, DO NOT JUMP OFF! HOLD FIRMLY TO STEERING WHEEL, BRACE YOUR FEET, AND LEAN AWAY FROM POINT OF IMPACT.**

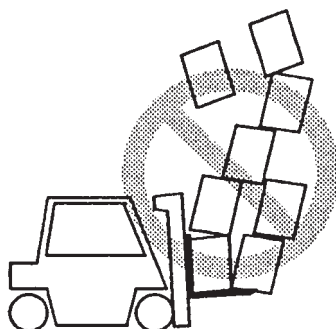


⚠ WARNING

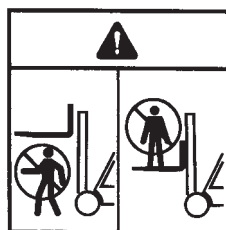
- Move carefully and smoothly when the load is raised over a stack. When the load is elevated the centre of gravity of the lift truck and the load is much higher. The lift truck can tip over when the load is raised.
- Do not rise the load on a slope or when the truck is inclined.
- **IF THE LIFT TRUCK TIPS OVER EITHER TO THE SIDE OR FORWARD, DO NOT JUMP OFF! HOLD FIRMLY TO STEERING WHEEL, BRACE YOUR FEET, AND LEAN FORWARD AND AWAY FROM THE POINT OF IMPACT.**

⚠ WARNING

Do not handle a load if any loose part of it is above the load backrest or any part of the load is likely to fall.

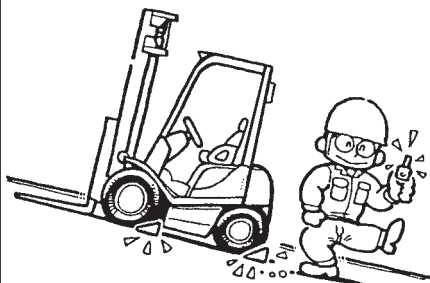
**⚠ WARNING**

- Keep yourself and all others clear of the lift mechanism. Never allow anyone under or on the forks.
- NEVER put hands, arms, head or legs through the mast or near the carriage or lift chains. This warning applies not only to the operator but also a helper. A helper must not be near the load or lift mechanism while the operator is attempting to handle a load. The lift mechanism has moving parts with close clearances that can cause serious injury.

**■ Parking****⚠ CAUTION**

When leaving the lift truck, always carry out the following.

- Park in a safe area where other work will not be obstructed.
- Lower the forks until the tips touch the ground.
- Apply the parking brakes.
- Set the shift lever to neutral.
- Turn the key switch "OFF", and remove the key.
- When parking on a slope is unavoidable, always chock the wheels.



- Do not put the fork on a self

⚠ CAUTION

Do not put the fork on a shelf, a load, etc., when parking.

Furthermore, if the mast falls, the hydraulic hose may be damaged and hydraulic oil may be dispersed.



⚠ CAUTION

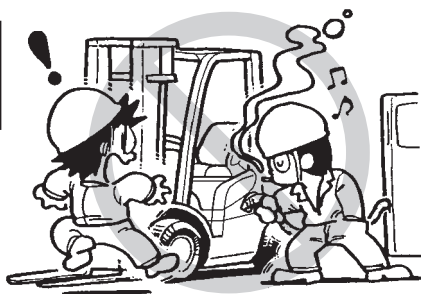
- When parking a disabled vehicle, put a sign that it is disabled, turn off the key switch, and remove the key.
- When parking a vehicle with a fork not lowered, put a large sign at the tip of the fork.



⚠ WARNING

Never fail to stop the engine and keep fire away when refueling.

- After refueling, close the fuel filler cap tightly and wipe off the spilled fuel.



■ Before Driving

Before getting into the operator's seat, carry out the start up inspection explained in the "Pre-operational Inspection" section on pages 71~86. Always carry out this inspection for safety purposes even when in a hurry.

■ Adjusting Seat

The seat position can be adjusted to front and back direction. By using the lever, the seat slide lock is released and front and back position can be adjusted.

⚠ WARNING

Before operating the lift truck **FASTEN YOUR SEAT BELT.**



⚠ CAUTION

Adjust the seat position with the key "OFF". After adjustment, return the release lever to lock position and confirm that the seat is locked.

Seat Belt Interlock (Option)

On the truck with this option, engine starting and travel control doesn't work unless the operator wears the seat belt.

⚠ CAUTION

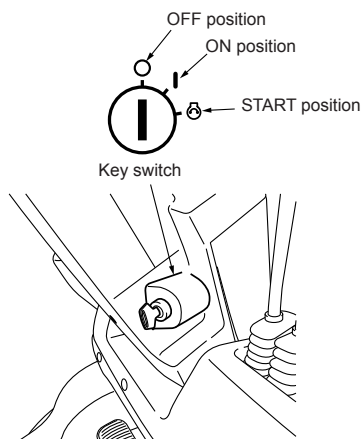
It is necessary to get into the operator's seat before fastening the seat belt.

Do not leave seat belt fastening without operator on the seat.

■ Starting Engine

1. Gasoline / LPG

1. Apply the parking brake.
2. Set the shift lever at neutral position if the lift truck has the shift lever.
3. Insert the key. Set the key to “**START**”, and the engine will start.
When your hand is released from the key after starting the engine, the key will return to “**ON**”.



2. Diesel

1. Apply the parking brake.
2. Set the shift lever at neutral position if the lift truck has the shift lever.
3. Insert the key.
4. When the engine is cold
When the key is inserted and turned to the “**ON**” position, the icon indicating the glow plug operation will be lit for 3 seconds at the maximum. Then, the glow plug will be rapidly heated to perform starting preparations. When the glow indicator blinks or goes out, set the engine switch to the “**START**” position to start the engine. After the start, release the hand from the engine switch.



ADVICE

The glow indicator will not be lit even if the engine switch is turned **ON** when the temperature of engine cooling water is 21°C or more.

3. Electronic controlled engine (LPG)

1. Apply the parking brake.
2. Set the shift lever at neutral position if the lift truck has the shift lever.
3. Insert the key. **Set the key to “START” without pressing down the accelerator pedal** and the engine will start.

When your hand is released from the key after starting the engine, the key will return to “ON”.



ADVICE

- This lift truck has a neutral switch. The engine will not start at a position other than neutral if the lift truck has the shift lever.
- Do not rotate the starter motor for more than 10 seconds at a time.
- This lift truck has a function for anti-restart, so if the engine does not start even when the key is turned to “START”, return the key to “OFF” once, and then try again after 5 to 10 seconds.
- Do not leave the lift truck with the key at the “ON” position when the engine is stopped.
- When you pull out the key, turn it to “OFF”.



CAUTION

- Do not start the engine in positions other than when seated in the driver's seat.
- Confirm that the parking lever is completely applied and shift lever is in neutral position before starting the engine.
- Ventilate the area well when operating the lift truck indoors.



WARNING

- Exhaust from internal combustion engines contains carbon monoxide and other harmful chemicals. Carbon monoxide is a colorless, odorless poison and can cause unconsciousness or death without warning. Long term exposure to exhaust or chemicals in the exhaust can cause cancer, birth defects and other reproductive harm. Avoid exposure to engine exhaust.
- Do not use diesel engines indoors where soot can accumulate. If engines are operated in confined spaces maintain adequate ventilation or vent exhaust to the outside. Do not exceed applicable air contaminant limits.
- Follow the inspection and maintenance schedule and procedures in this manual. Do not alter exhaust, ignition or fuel systems.

■ After Starting

1. Warm the engine until the water temperature meter bar indicates two gages.
2. Inspect the following items during the warm up operation.
 - Are all warning indicators on the dash display out?
 - Are the meter bars at the normal position?
 - Is the engine making any abnormal noise?
 - Is the exhaust color normal?
3. Operate the hoist control lever and tilt control lever and confirm that they operate normally.

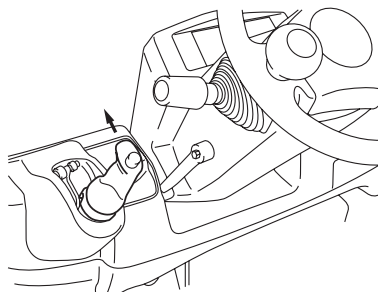
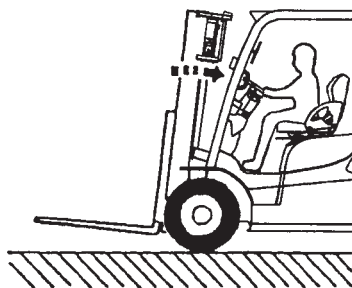


ADVICE

Take special care when the temperature is low as the hydraulic oil viscosity will increase and cause the hydraulic equipment damage. Don't raise the engine speed suddenly when the engine is still cold.

■ Starting and Driving

1. Confirm that the surrounding area is safe before starting.
2. Lift the forks approximately 15 to 20cm from the ground, and fully tilt the mast backward.
3. While pressing the brake/inching pedal, put the direction control lever in either forward or reverse. Then, release the parking brake, and release the brake/inching pedal while slowly pressing the accelerator pedal.
If the lift truck has the Monotrol pedal, push on either the right side or the left side of the pedal. (See page 35.)
4. The lift truck acceleration/deceleration speed is adjusted by the degree that the accelerator pedal or Monotrol pedal is pressed.
5. Always changeover the direction when the lift truck is stopped to protect the equipment and for safety.



⚠ CAUTION

- The rear-wheel operation power steering is incorporated, so the lift truck can be easily steered by turning the handle. However, take care not to turn the handle suddenly during travel.
- If the key switch is turned “OFF” during travel, the handle will become heavy. Do not turn the switch “OFF”.

**ADVICE**

Do not operate the shift lever while the accelerator pedal is pressed down.

Observe the following points during travel to ensure safe operation.

⚠ CAUTION

- Remain focussed during operation. Note the state of pedestrians, workers and obstacles in the area while driving.
- Lower the speed and confirm the surrounding safety when traveling in places where the vision is poor. Do not pass other vehicles.
- Sufficiently drop the speed and apply the brakes when traveling down hills. When going down a hill while carrying a load, travel in the backward direction. When there is no load, travel in the forward direction.
- When going up sharp hills, take care not to contact the end of the fork or the base of the pallet at the onset of the hill. When going up the slope, use go forward when with the load. When without the load, go backward.

■ Stopping and Parking

1. When stopping the lift truck, release the foot from the accelerator pedal or Monotrol pedal and push on the brake pedal to slow down.
2. When parking, let down the fork on the floor surface and tilt the mast forward. Then, put on the parking brake and put the shift lever into neutral.
3. When leaving the fork lift truck, confirm engine speed is low idle speed.
(Do not step accelerator pedal, and do not increase engine speed.)
Then, turn the key switch “OFF”, and always remove the key.
4. If the key switch stays “ON” for 3 minutes after the engine turned off, warning alarm sounds.

CAUTION

- Always park at the designated place.
- Do not park on a slope.
If parking on a slope is unavoidable, securely chock the tires.
- Select a safe place where traffic will not be obstructed when parking, and install cautionary signs, signal lights or fences, etc., as required.
- Select a sufficiently hard surface for parking, and make sure that the tires will not slip or sink into the ground.
- Always lower the forks to the ground. If the forks cannot be lowered due to a fault, etc., wrap the ends with cloth, etc., and park in a place and direction where persons or lift trucks will not pass.
- Leave the lift truck after it has completely stopped. Always leave the lift truck while facing its direction.
- Never jump off the lift truck as it is dangerous.

■ After Operation

After operating, always carry out the post-operation inspection.

■ Before Operating with LPG

To properly run the lift truck that uses LPG fuel, the following cautions must be followed in addition to the operation methods for the lift truck with the gasoline engine. Read this section thoroughly before use.

⚠ WARNING

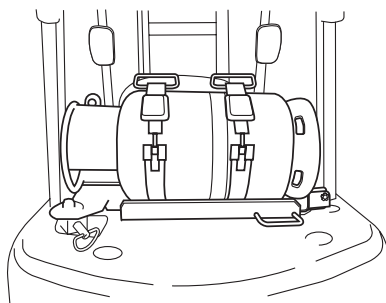
- Close the fuel valve on the tank when parking the lift truck more than momentarily. Do not park the lift truck near heat or ignition sources.
- Do not store LPG tanks near heat or an open flame.
- LPG is extremely flammable. When checking or filling an LPG tank: No smoking. Stop engine.
- Frost on the surface of the tank, the valves or fittings and the odour of LPG fuel indicates a leak. Inspect the LPG system and repair a leak immediately. An LPG fuel leak creates an explosion and fire hazard. Do not attempt to start the engine if there is a leak in the LPG fuel system.
- Only trained and authorized personnel are permitted to operate filling equipment.

1. Confirm the top and bottom of the LPG container.
2. Confirm that the filling valve on the container is closed.



ADVICE

The container has a fuel outlet valve and a filling valve. Each of these valves are labeled.



3. Check the bolts on the container fixing frame for looseness and the hose connections, etc., for looseness.
4. Gradually open the fuel outlet valve on the container.
5. Use detection fluid, etc., to check for gas leaks on the hose connections, etc.

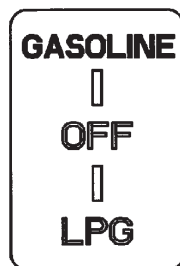
⚠ WARNING

- LP gas has a distinctive odor, but detection fluid should be used for inspection.
- Never inspection for leaks with fire such as with a match.
- Do not start the engine until the fuel leak is repaired.

6. Confirm that there are no water leaks on the joints of the hot water hose ends between the engine and regulator.
7. Check that there is no trouble on the electrical wiring sheaths or connections, and confirm that sparks are not generated.

■ Changing Fuel for Dual Fuel Truck

1. Set the key switch to “ON”, set the fuel changeover switch to “OFF” to shut off the supply of both LPG and gasoline.
2. Start the engine and allow it to stop naturally so that the fuel in the fuel line is used up.
3. Set the fuel changeover switch to LPG or GASOLINE.



⚠ CAUTION

If the fuel changeover switch is set to LPG or GASOLINE before the fuel in the fuel line is used up, the engine may malfunction and is dangerous.

4. Start the engine.

⚠ CAUTION

This lift truck can be operated on either LPG or gasoline, but the engine is set for the optimum performance with LPG.

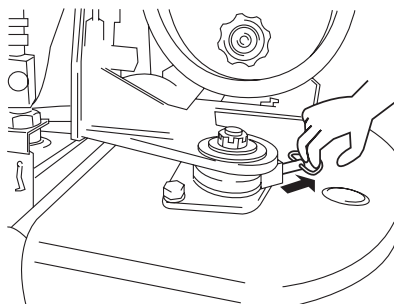
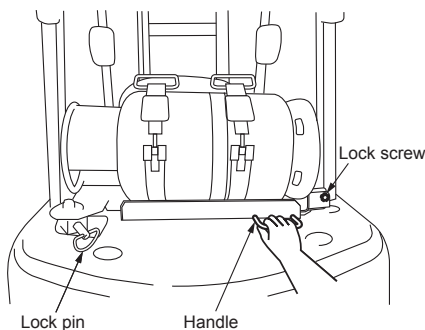
Consult with your authorized service dealer when using the lift truck with gasoline constantly for a long period.

■ Parking for LPG Truck

1. When entering the garage or parking for a long period, close the fuel outlet valve, and wait for the engine to stop naturally. Then, turn off the key switch.
2. Avoid parking in direct sunlight when parking outdoors for long periods during the summer, etc.

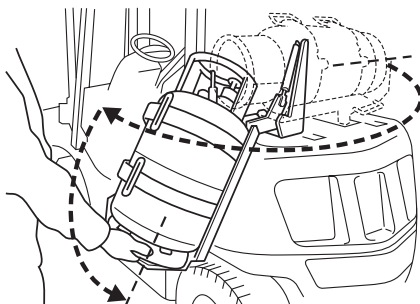
■ Replacement of LPG Container

1. Confirm that the containers fuel outlet valve is closed.
2. Close the green handle on the valve assembly, if equipped.
3. Disconnect the valve assembly from the outlet valve.
4. Loosen and swing up the lock screw, then pull the lock pin and the swing LPG bracket 180 degree. The LPG bracket is locked by the lock pin at the swung position.
5. Push down the LPG tank bracket and replace the LPG tank. Tighten the belts.
6. Pull up the LPG tank.
7. Pull the lock pin and swing the LPG tank to the normal operating position.
8. Tighten the lock screw.



⚠ CAUTION

- Do not run when the LPG tank is in the swung position and swung-down position.
- To open hood, need to swing the LPG tank.
- Do not replace the LPG tank on the way to swing the LPG tank.
- Route the LPG hose not to protrude from the truck outline.
- To swing up the bracket without LPG tank, hold the bracket by both hand and swing up carefully.
- To avoid swing up the bracket accidentally, do not apply any hard impacts to the bracket when the bracket is swung down without LPG tank.



■ Handling during Winter

1. Engine oil, transmission oil, differential gear oil, hydraulic oil
Refer to the table of Recommended Oils and Grease on page 111~114, and select oils suitable to the temperature.
2. Cooling water
40% of long-life coolant is mixed into the cooling water, and replacement is not necessary for two years. Only the water level needs to be inspected. The freezing point of the cooling water with 40% long-life coolant is -24°C , so operation during summer and winter is normally possible. (Increase the amount of long-life coolant according to the temperature when using the lift truck in cold climates colder than -24°C during the winter.)

Cooling water capacity

7.5ℓ (K21 engine)

7.8ℓ (K25 engine)

7.5ℓ (4TNE92 Diesel)

7.8ℓ (4TNE98 Diesel)

3. Battery

The freezing point of the electrolyte is approximately -35°C when the battery is completely charged. The specific gravity is 1,280 (at 20°C). Always keep the battery fully charge, because if it is not charged, the specific gravity will decrease. This will increase the possibility that the electrolyte will freeze. In particularly cold weather, remove the cables to prevent the battery from discharging, and insulate it with a cover.

■ Handling during Summer

1. Engine oil, transmission oil, differential gear oil, hydraulic oil

Refer to the table of Recommended Oils and Grease on page 111~114, and select oils suitable to the temperature.

2. Cooling water

The cooling water will evaporate easily during the summer, so inspect it often. If insufficient, replenish with soft-water (tap water).

3. Battery

The water content of the electrolyte will evaporate easily during the summer, so inspect it often, and replenish with distilled water as required. Do not over-fill, or the electrolyte will overflow during operation causing corrosion or short circuits.

■ Pre-operational Inspection

Inspect the lift truck before starting daily operations to ensure safe operations and to maintain the lift truck performance.

If damage or faulty operation are found during the inspection, contact your authorized service dealer.

⚠ WARNING

Do not operate a lift truck that needs repairs. Report the need for repairs immediately. If repair is necessary, put a “DO NOT OPERATE” tag in the operator’s area. Remove the key from the key switch.

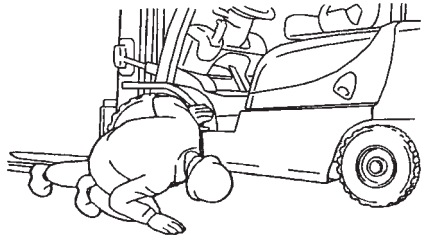
⚠ CAUTION

When inspecting or servicing the lift truck, stop on a level and solid place, lower the forks to the ground, turn the key switch “OFF”, place the operation levers into neutral and pull the parking brake.

1. General

Look over the entire the lift truck.

1. Is there any damage to the chassis?
2. Is there fuel, oil or coolant leaks on the ground or parts?



⚠ WARNING

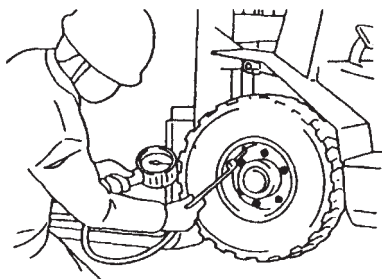
All fuels are very flammable and can burn or cause an explosion. Do not use an open flame to check the fuel level or to check for leaks in the fuel system. If there is a leak in the fuel system, extra care must be used during the repair. Do not operate the lift truck until a leak is repaired.

2. Inspection of the tires and hub nut

1. Use the tire air pressure gauge and measure the pressure. Adjust to appropriate air pressure.

⚠ WARNING

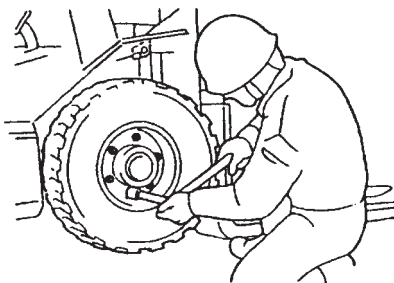
- If the air pressure is different in the left and right tires, the truck may lose balance or the stability is lost sideways. Also, there may be an unexpected force on the steering wheel, which is dangerous.
- If the air pressure is less than 80% of the correct air pressure, the tyre must be removed before air is added. Put the tyre in a safety cage when adding air pressure to the tyre.



2. Check for loose hub nuts and tighten uniformly.

⚠ WARNING

Check all wheel nuts after 2 to 5 hours of operation: when new lift trucks begin operation and on all lift trucks when the drive wheels have been removed and installed. Tighten the nuts in a cross pattern to the correct torque value shown in page 108.



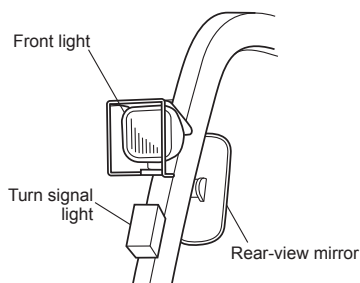
3. Check on the damage, cracks or abnormal wear of tires.
4. Check on the damage or bend and the like on the wheel.

3. Inspection of lights (if equipped)

Check that the light lens is not damaged or dirty.

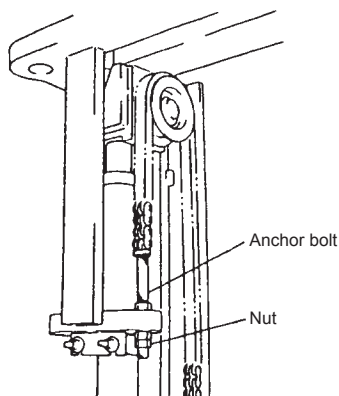
4. Inspection of rear-view mirror (if equipped)

Check for damage and dirt on the rear-view mirror. Also, adjust the mirror angle for good rear view.



5. Inspection of loading equipment

1. Check that there is no strain, biting or cracking, etc., in the mast.
2. Check the chain lubrication state.
3. Check that the fork anchor pin is securely engaged in the notched section of the fork carriage.
4. Check that the left and right chain tension is even.
5. Check on the damage or bend and the like on the forks.



⚠ CAUTION

If the chain tension is different on the left and right sides, adjust the anchor bolt nut.

⚠ WARNING

- Do not try to correct the alignment of the fork tips by bending the forks or adding shims. Replace damaged forks.
- Never repair damaged forks by heating or welding. Forks are made of special steel using special procedures. Replace damaged forks.

6. Inspection of load backrest and overhead guard

1. Check on deformation, cracks on the load backrest and overhead guard.
2. Check for any loose bolts and nuts.

7. Inspection of engine compartment

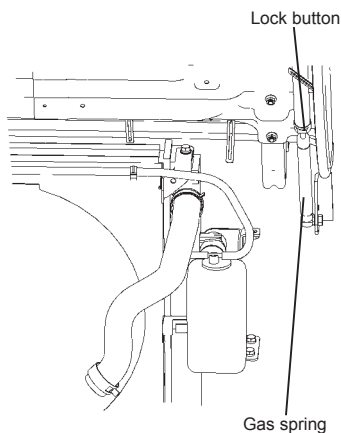
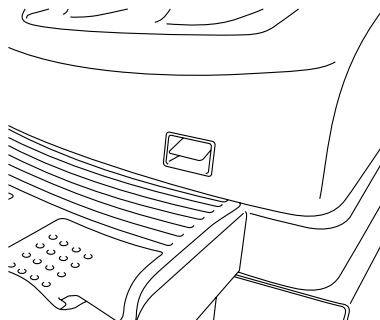
Stand on the left side of the lift truck, and lift open the engine hood as shown on the figure. The gas spring will work as a stopper. When the hood is closed, release the lock button on the gas spring before pushing the hood down.

⚠ CAUTION

For LPG trucks, swing the LPG tank bracket before opening the engine hood.

⚠ CAUTION

Confirm that the gas spring stopper is locked before release the hood. Don't forget to release the lock button on the gas spring before closing the hood.



👉 ADVICE

Remove any items in shirt pockets before opening the cover and inspecting the inside so that they will not fall inside the engine area.

⚠ CAUTION

Do not use a flame for illumination. Do not use a bare bulb to inspect the levels of the oil, cooling water, fuel and battery fluid and to check for oil leaks.

8. Inspection of sedimenter (Water/dust separator) [Diesel]

The sedimenter is built into the bottom of the cartridge-type fuel filter. The sedimenter warning indicator on the dash display will come up when water accumulates in the sedimenter.



ADVICE

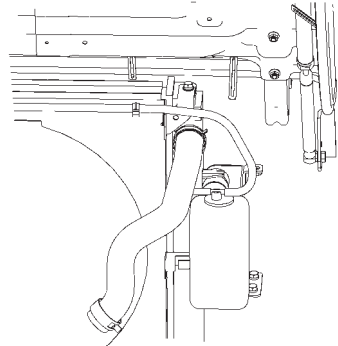
- Loosen the drain plug of the sedimenter immediately and drain the water when the warning indicator exists.
 - The air in the sedimenter must be bled after draining the water. (Refer to page 99.)
- The fuel tank must be drained if the warning indicator come up again.

9. Inspection of radiator and reserve tank

1. Inspection of coolant level

The coolant level should be between the “**FULL**” level and “**LOW**” level positions of the reserve tank.

To replenish the coolant, remove the reserve tank cap and pour the water into the reserve tank. (The standard cooling water contains 40% long-life cooling water.) Do not pour water over the “**FULL**” level when the engine is cold.



WARNING

DO NOT remove the radiator cap from the radiator when the engine is hot. When the radiator cap is removed, the pressure is released from the system. If the system is hot, the steam and boiling coolant can cause burns.

2. Inspection for coolant leaks

- 1) Inspect the core and tank of the radiator for coolant leaks. Also check each hose connection for leaks.
- 2) For LPG trucks, check the LPG regulator and connections for coolant leaks.



ADVICE

The periodic replacement interval of the coolant is once every 24 months.

10. Inspection of engine oil

After the engine has stopped, wait one minute before checking the oil level. Keep the oil at the correct level as indicated on the dipstick.

Replenish the oil if insufficient. If dirty, replace the oil.



ADVICE

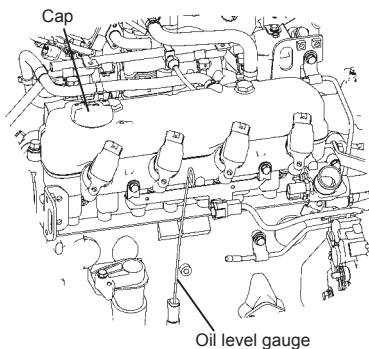
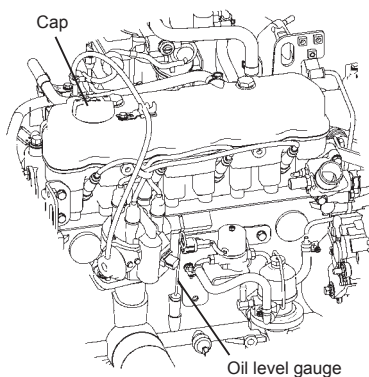
The initial periodic change of the engine oil and engine oil filter should be performed after 200 hours of operation. Thereafter, the change should be performed every 500 hours or two months. The filter should be changed every three months.



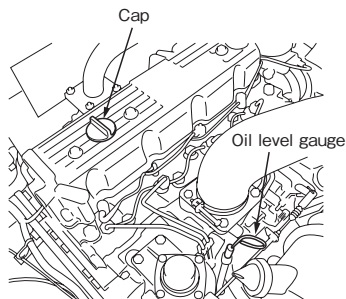
WARNING

At operating temperature the engine oil is HOT. Do not permit the hot oil to touch the skin and cause a burn.

Adequate



Electronic controlled LPG engine

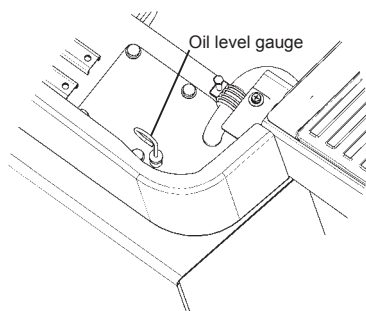


4TNE92/4TNE98 engine

11. Inspection of hydraulic oil

With the forks lowered to the lowest position, pull out the level gauge, and wipe with a clean cloth. Insert the gauge into the same position, pull it out slowly, and confirm the oil level.

If the level is indicating the proper model and mast height on the level gauge as follows, the oil level is adequate. If the oil is dirty, replace it.



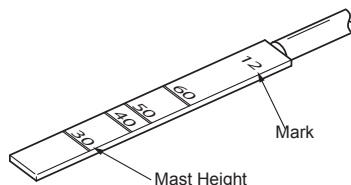
		Mast height			
	Mark on the gauge	~3.0m	~4.0m	~5.0m	~6.0m
1.5 to 2.5 ton	12	30	40	50	60
3.0 to 3.5 ton	3	30	40	50	60

CAUTION

- Always part at a flat place when inspecting the hydraulic oil.
- Completely wipe off any spilt oil.

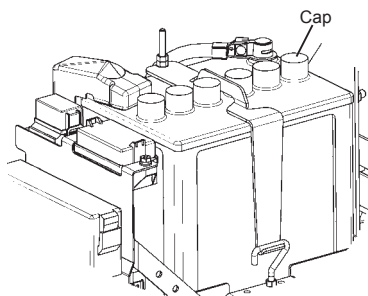
ADVICE

The periodic replacement of the hydraulic oil is 24 months. Clean the hydraulic oil suction strainer and replace the hydraulic oil return filter element once every 12 months.



12. Inspection of battery fluid

The battery fluid level should be between the upper level and lower level. Replenish distilled water if the level is low.

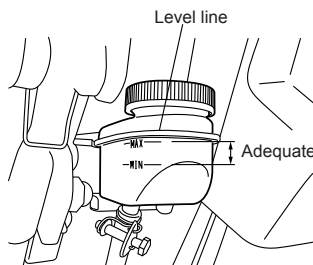


⚠ WARNING

- The acid in the electrolyte can cause injury. If the electrolyte is spilled, use water to flush the area. Use a solution of sodium bicarbonate (soda) to make the acid neutral. Acid in the eyes must be flushed with water immediately. Wear eye protection.
- Batteries generate explosive fumes. Keep the vents in the caps clean. Keep sparks or open flame away from the battery area. Do not make sparks from the battery connections. Disconnect the battery ground cable when doing maintenance.

13. Inspection of brake fluid

Check on the proper level of the brake fluid. Brake fluid should be always filled to the level line. If the fluid is dirty, change it.



WARNING

Loss of fluid from the brake fluid reservoir indicates a leak. Repair the brake system before using the lift truck. Replace the brake fluid in the system if there is dirt, water or oil in the system.

CAUTION

- When replenishing brake fluid, take measures to prevent foreign matters from getting into the fluid.
- Keep the cap clean so that the ventilation hole is not clogged.
- Always use genuine brake fluid. Mixing different type of brake fluid could lead to deteriorated performance.

ADVICE

The periodic replacement interval of the brake fluid is once every six months.

Inspection on the lift truck

Now you may get into the lift truck.

14. Seat adjustment

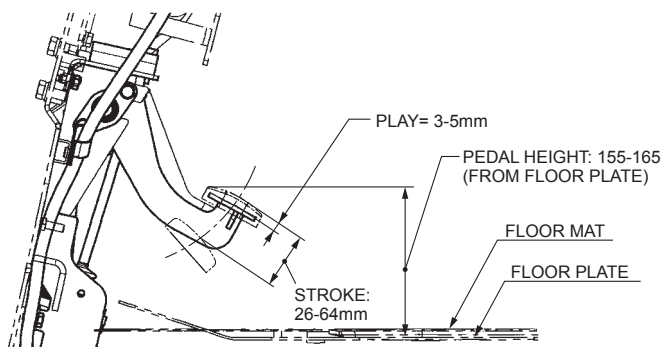
Adjust so that the machine can be easily operated. Check that there are no damages and no installation looseness of the seat.

WARNING

FASTEN YOUR SEAT BELT! The seat belt is installed to help the operator stay on the truck if the lift truck tips over. **IT CAN ONLY HELP IF IT IS FASTENED.**

15. Inspection of brake pedal [For twin pedal arrangement]

1. Press down on the brake pedal, and inspect whether there is any snagging or abnormal resistance.
2. Check that the pedal height is at the specified height.
3. Check that the pedal play is within the specified rate when the pedal is pressed down by hand until a resistance is felt.
4. Check that the pedal stroke is within the specified rate when the pedal is pressed down by 100 N (10 kgf).



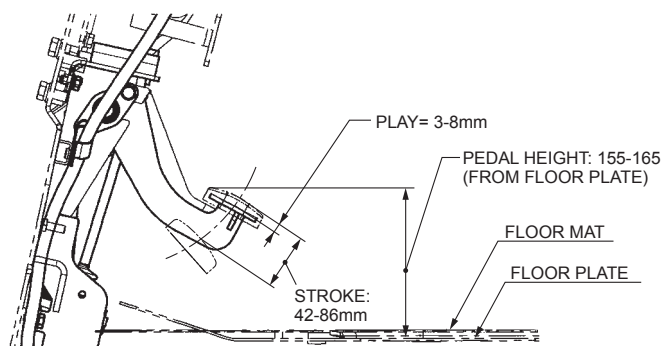
PEDAL STROKE: 26-64mm
PLAY= 3-5mm

⚠ CAUTION

Contact your authorized service dealer for repairs if the play is large, the pedal movement is abnormal or the brakes do not work.

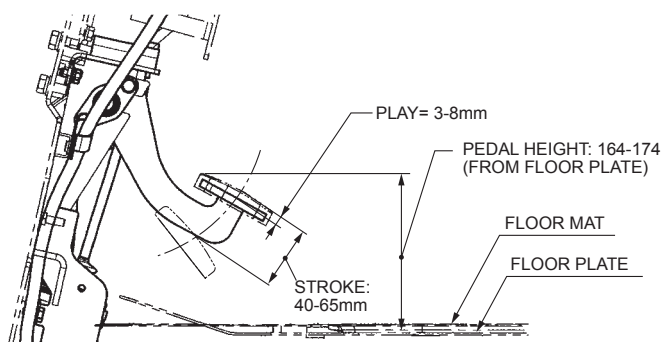
16. Inspection of brake/inching pedal [For both single and twin pedals]

1. Press down on the brake/inching pedal, and inspect whether there is any snagging or abnormal resistance.
2. Check that the pedal height is at the specified height.
3. Check that the pedal play is within the specified rate when the pedal is pressed down by hand until a resistance is felt.
4. Check that the pedal stroke is within the specified rate when the pedal is pressed down by 100 N (10 kgf).



PEDAL STROKE: 42-86mm
PLAY= 3-8mm

Separated pedal



PEDAL STROKE: 40-65mm
PLAY= 3-8mm

Single pedal(Brake/Inching)

⚠ CAUTION

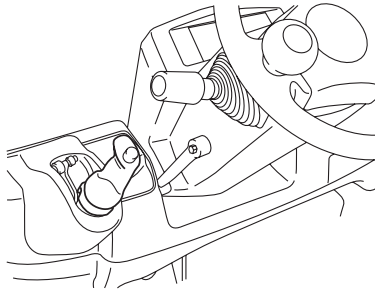
Contact your authorized service dealer for repairs if the play is large, the pedal movement is abnormal or the brakes do not work.

17. Inspection of accelerator pedal (Monotrol pedal Option!)

Press in the pedal and release it to see if the pedal returns smoothly.

18. Inspection of parking brake

1. Confirm that, when pulling the parking brake lever, brake comes on each time. Also confirm that, when returning the lever to its original position, the brake is released each time.
2. Check the operating force when pulling the parking brake lever in full. Parking lever operating force: 145 to 195 N (15 to 20 kgf).
If the operating force is not within the standard range, adjust the brake. (Please refer to page 100 for adjustment method.)

**Starting engine**

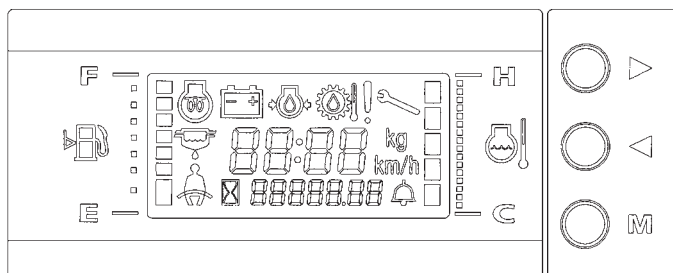
1. Confirm that the parking brake is applied.
2. Check to see that the shift lever is in neutral if the lift truck has the shift lever, and then turn on the key switch.

👉 ADVICE

This lift truck has a neutral switch. The engine will not start at a position other than neutral if the lift truck has the shift lever.

19. Inspection of dash display

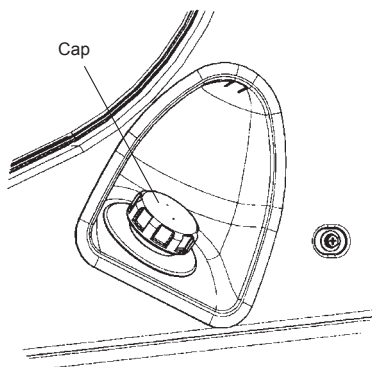
1. Inspect the battery warning icon and engine oil pressure warning icon and glow plug indicator [diesel] .
 - a. Do the icons exist when the key switch is turned “ON”?
 - b. Do the icons go out after the engine is started?
2. The torque converter oil temperature warning icon, sedimenter warning icon [diesel] and the other warning icons exist when the key switch is set to “ST”.
3. Inspect the hourmeter, water temperature gauge and fuel gauge.
 - a. Do the gauges operate properly?
 - b. Is there any damage?
 - c. Are the gauges dirty or hard to read?



- d. Is there ample fuel for operation?

20. Inspection of fuel amount

If the fuel is insufficient, turn off the engine, remove the cap shown on the right, and replenish the fuel.



⚠ WARNING

- Stop the engine. Turn the key switch to “OFF”. The operator must be off of the lift truck while fuel is added.
- No smoking.
- All fuels for internal combustion engines are very flammable.
- Fill the fuel tank only in a designated area with good ventilation. Have a fire extinguisher available.
- Never fill the fuel tank near an open flame or near equipment that can create sparks. Never check fuel level or check for leaks with an open flame.
- Breathing fuel vapor may cause nausea, unconsciousness or death. Long term exposure to gasoline vapors may cause liver or kidney damage and cancer. Avoid breathing vapor.

21. Inspection of light operation (if equipped)

Turn on switches for front light, turn signal light, brake light, tail light, and backup light and confirm that all the lights come on.

22. Inspection of horn operation

Press the horn button, and confirm that the horn sounds.

23. Inspection of loading equipment operation

1. Gradually raise and lower the forks two or three times from the lowest to highest positions. Confirm that the fork and mast move smoothly, and that there is no creaking sound.
2. Gradually push the mast out and in two to three times. Confirm that the mast moves left and right smoothly without any difference in movement.

⚠ CAUTION

If right and left movements in the mast are different, check looseness in the rod section of the tilt cylinder and make adjustments.

Start warm up operations.

Confirm that the parking brake is completely applied, get down from the drivers seat and go to the back.

24. Inspection of exhaust gas (at idling)

Is the exhaust color normal?

⚠ WARNING

Exhaust from internal combustion engines contains carbon monoxide and other harmful chemicals. Carbon monoxide is a colorless, odorless poison and can cause unconsciousness or death without warning. Long term exposure to exhaust or chemicals in the exhaust can cause cancer, birth defects and other reproductive harm. Avoid exposure to engine exhaust.

Inspection during travel

If there are no problems in the above inspections, start advancing slowly. Make sure not to travel fast.

25. Inspection of brakes

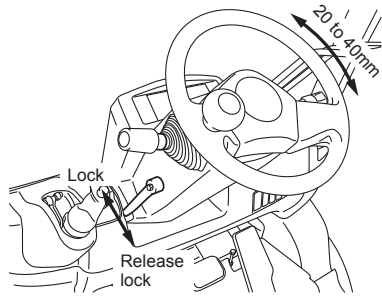
1. Press on the brake pedal and check on braking. Check to see brakes are working evenly on right and left.
2. Pull on the parking brake and confirm that the truck stops and stop position can be maintained.

⚠ CAUTION

If there is abnormality in the brake system, this is very dangerous. If any abnormality is found, consult with your authorized service dealer.

26. Inspection of steering wheel (handle)

1. Check the rear wheels in the straight travel state, and check the steering wheel play amount.
Play amount: 20 to 40mm
2. Operate the steering wheel, and confirm that it moves smoothly.
3. Move the steering wheel up and own, and check for looseness.
4. Turn the steering wheel to both directions, and then check the spinner knob location in the proper position when the steer tires in straight travel condition.



27. Inspection of power steering cylinder

Check to see that there is no oil leak from rod and joint section of the power steering cylinder.

⚠ WARNING

- The work with the lift truck should not be started unless all the above checks are normal.
- Do not operate a lift truck that needs repairs. Report the need for repairs immediately. If repair is necessary, put a “DO NOT OPERATE” tag in the operator’s area. Remove the key from the key switch.

■ Post Operation Inspection

After finishing operations, clean the inside and outside of the lift truck and check the following points.

1. Check any trouble points found during operation.
2. Check for any visible damage or missing bolts, etc.
3. Check for any oil leaks.
4. Check for any tire trouble.
5. Check for any looseness in the bolts or hydraulic piping, etc.
6. Replenish the fuel so that the fuel tank is full.

CAUTION

- **If any trouble is found, make the repairs on the same day.**
- **Always maintain the lift truck so that it can be used at any time.**

■ Daily Storage

Take care to the following points when storing the lift truck.

1. Park on a dry and level place.
2. Make sure to put on the parking brake.
3. Always tilt the mast to the vertical position and lower the forks to the ground.
4. Turn the key switch to the “**OFF**” position, and remove the key.
5. Move the lift lever and tilt lever back and forth three to four times to release the remaining pressure in the piping to the cylinder.
6. When using an LPG engine, close the fuel outlet valve on the LPG container, and turn the key switch “**OFF**” after the engine has stopped naturally.

■ Long Term Storage

Always perform the following points when storing the lift truck for a long time.

1. Disconnect the battery plug to prevent electrical discharge, and store in a dark place.
2. Apply anti-rust grease to the shaft, rod and other exposed parts.
3. Cover the breather and other places where moisture may enter.
4. Cover the entire lift truck with a sheet, etc.
5. Lubricate all lubrication points.
6. Maintain the tire air pressure to standard. (Truck with pneumatic tires)
7. Enter the operation state and run the lift truck once a week.
8. When using an LPG engine, close the fuel outlet valve on the LPG container, and turn the key switch “**OFF**” after the engine has stopped naturally.

■ Periodic Inspection and Servicing

Accidents can be prevented and the life of the lift truck can be lengthened by carrying out inspections and servicing.

The periods given in this sections apply for standard use, and will differ according to the usage conditions. Service the lift truck according to the usage conditions.

Cautions for inspections and servicing

⚠ CAUTION

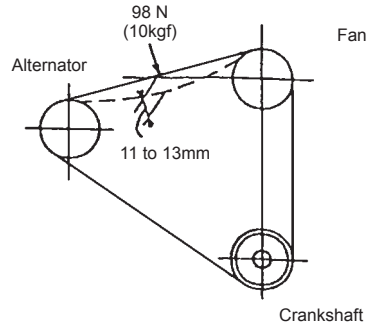
- Always use genuine parts for the replacement parts.
- Always use the correct oil and grease when oiling and lubricating.
- Always park the lift truck on a flat and rigid place before starting inspection or servicing.
- When inspecting the lift truck indoors, make sure that the area is well ventilated.
- When two or more workers are carrying out the work, confirm each step with signals.
- Use proper tools, and do not use makeshift tools.
- Wear protective equipment (helmet, safety boots, goggles, gloves, etc.), and proper work clothes.
- Lower the forks to the ground before starting the inspections. Make sure that all operation levers are set to neutral.
- When raising the forks to inspect under them, make sure to place a wood block, etc., between the forks, mast inner frame and ground to fix them so that they will not drop down.
- Do not place your foot under the forks.
- If any abnormality is found during the inspection, report the state to the supervisor, and never operate the lift truck until the repairs are completed.
- Improper disposal (disposal in sewage or ground, burning, etc.) of the waste oil obtained when the oil is replaced, etc., can lead to contamination and soil or atmospheric pollution. This may also be banned by law.

■ Weekly Inspection (Every 50 Hours)

Besides the daily inspection, carry out the following inspections once a week (every 50 hours).

1. Inspection of fan belt

1. Press down on the fan belt between the alternator and fan pulley with a force of 98 N (10kgf).
 - a. Is the belt tension adequate? 11 to 13mm (when pressed with 98 N)
 - b. Is there any damage?



ADVICE

The belt can be adjusted by moving the installation position of the alternator.

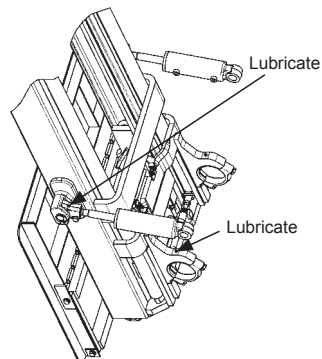
⚠ WARNING

Inspecting the fan belt tension while the engine is running is dangerous. Always stop the engine before inspecting the rotating sections and peripheral areas.



2. Lubrication and greasing of lift truck parts

1. Clean the grease nipples with a clean cloth and apply grease to the following points with a grease gun.
Grease Used: Albania EP2
Mast trunnion and Tilt rod end
(At one location each on right and left)

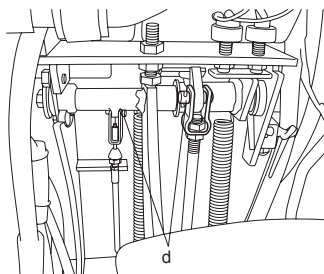
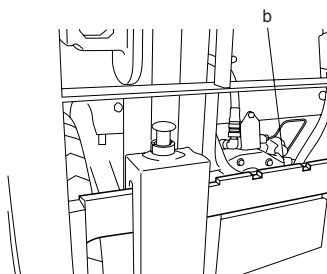
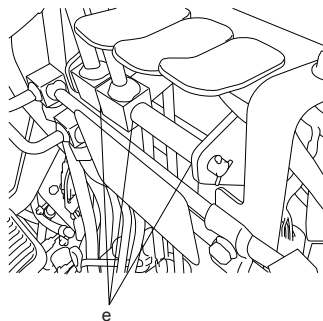
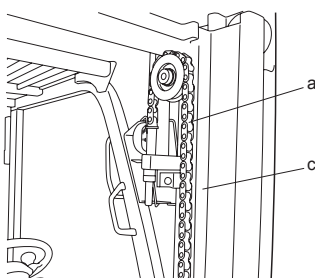


⚠ CAUTION

Apply grease until it overflows and then wipe off the excess.

2. Apply grease to the following points with a brush, etc.

- a. Lift chain
- b. Fork sliding section
- c. Mast roller sliding surface
- d. Brake (brake/inching) pedal linkage pin
- e. Hydraulic control lever linkage

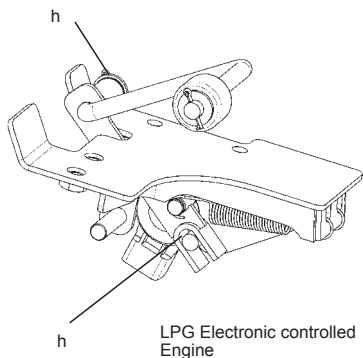
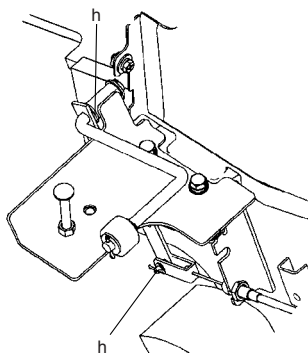
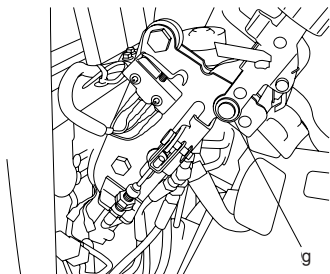


⚠ CAUTION

- Wipe off old grease with a clean cloth.
- If oil or grease gets on the operator's seat, handles or steps, wipe it off immediately. Failure to do so could cause the operator to slip and fall.

3. Lubricate the following places with machine oil using an oiler.

- g. Parking brake
- h. Accelerator pedal linkage



⚠ CAUTION

- Wipe off any oil that leaks out after lubricating.
- Use clean oil and grease. The containers must be also clean and prevent dusts and the like from getting into the containers.

■ Monthly Inspection (Every 200 Hours)

1. Existence of braking device, clutch and steering equipment trouble
2. Existence of loading equipment and hydraulic system trouble
3. Existence of head guard and back rest trouble

Inspect the above items and following parts monthly.

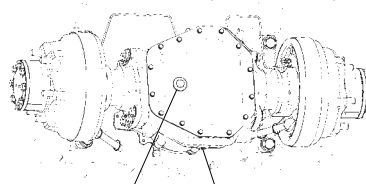
1. Inspection of differential gear oil

Remove the level gauge plug and confirm the oil level. The oil level should be at level gauge hole. If the level is lower, then replenish. If the oil is dirty, change the oil.



ADVICE

Replace the oil for the first time after six months of use, and after that replace it every 12 months.



Oil level plug

Drain plug

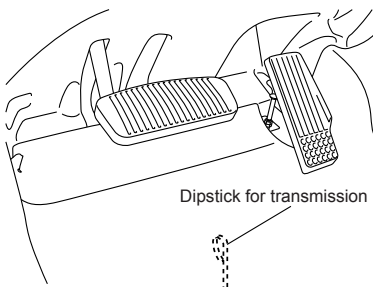
2. Inspection of torque converter oil

Remove the floor plate and pull out the dipstick. The oil should be between holes ("F" and "L") on the dipstick. Replenish the oil if insufficient and replace if dirty.



CAUTION

Do not permit dirt to enter the transmission when the oil level is checked.



Dipstick for transmission

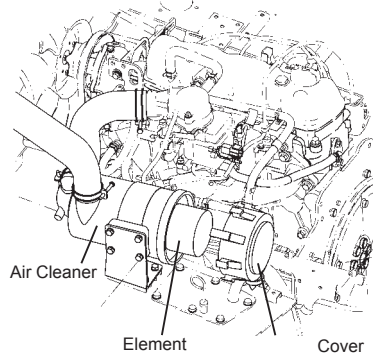


ADVICE

- When inspecting the oil level, rotate the engine, and then stop and inspect within one minute.
- Replace the torque converter return filter element for the first time after six months of use, and after that replace it every 12 months. The torque converter suction strainer must be cleaned every six months. This strainer does not need to be replaced.
- Replace the oil every 6 months.

3. Cleaning of air cleaner element

Remove the air cleaner dust pan and pull out the element. Check the element every 200 hours of operation. Very dirty conditions will require inspection every 100 hours and cleaning or installation of a new element. Put a bright light inside the element and look for holes or other damage. If the element is damaged, replace it with a new element. Take care to the assembly position (top and bottom) of cover.



ADVICE

Use compressed air to clean the filter element. Air pressure must be less than 210 kPa (2.1 kgf/cm²). Apply the air from the inside to the outside of the filter element.

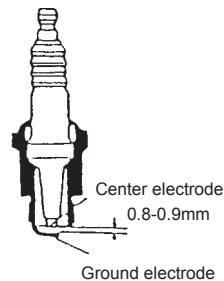
4. Inspection of spark plug [Gasoline and LPG]

1. Check the high tension cord connection.
2. Remove the plug with a plug wrench.
Check the burning state.
Check the gap between the electrodes.



ADVICE

- The electrode section should be dry and a brownish color.
- The spark plug gap is 0.8-0.9mm.



5. Inspection of fuel filter [Gasoline]

Replace the filter if it is dirty.

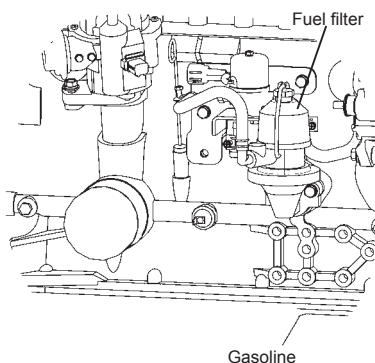
⚠ WARNING

Clean any spilled fuel.



ADVICE

The periodic replacement interval of the filter is once every three months.



[Diesel]

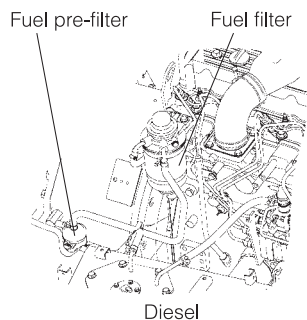
Replace the filter if it is dirty.

⚠ WARNING

Clean any spilled fuel.

⚠ CAUTION

- Apply a light coat of fuel on the filter cartridge O-ring before installing, and tighten fully by hand.
- After installing the filter, bleed the air in the fuel. Make sure that there are no fuel leaks. Refer to page 100 for the air bleeding method.



6. Drain the far from LPG regulator

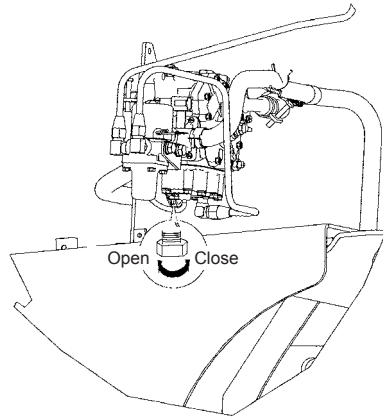
1. Park the truck. Start the engine and warm up.
2. Stop the engine and open the cover engine.
3. Prepare the clothes or dish to receive the tar.

[Non-Electronic controlled Engine]

4. Turn on the drain cock on the bottom of the LPG regulator to drain the tar.
5. After stopping the drip of tar, turn off the drain cock.

[Electronic controlled Engine]

4. Remove the drain bolt on the bottom of the LPG regulator to drain the tar.
5. After stopping the drip of tar, install the drain bolt by applying sealant.



Electronic controlled Engine

⚠ WARNING

- Check the LPG leakage after draining the tar.
- Clean any spilled tar.

7. Draining of sedimenter [Diesel]

Always bleed the air in the sedimenter after draining. (Refer to page 99.)

⚠ WARNING

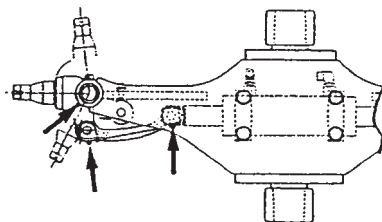
Clean any spilled fuel.

8. Steering axle

Apply grease every 1 month.

⚠ CAUTION

- Wipe off any oil that leaks out after lubricating.
- Use clean oil and grease. The containers must be also clean and prevent dusts and the like from getting into the containers.

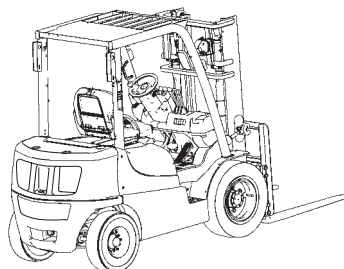


9. Inspection of overhead guard

Check for loose bolts and damage on the overhead guard and its installation section.

Bolt tightening torque:

71.5 to 85.8 N·m (730 to 875 kgf·m)



10. Inspection of mast trunnion cap bolt

Check mast trunnion cap bolts.

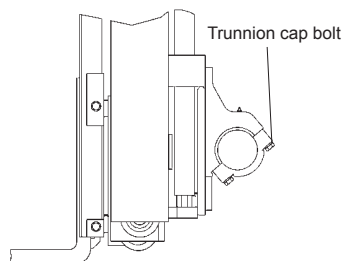
Bolt tightening torque:

1.5 to 2.0 ton (COMPACT)

71 to 85 N·m (729 to 875 kgf·m)

2.0 to 3.5 ton

117 to 212 N·m (1800 to 2160 kgf·m)



11. Inspection of counter weight retention bolt

Check for loose bolt and damage on the counter weight and its installation.

Bolt tightening torque:

1.5 to 2.0 ton (COMPACT) 597 to 717 N·m (6100 to 7300 kgf·m)

2.0 to 3.5 ton 1187 to 1424 N·m (12100 to 14500 kgf·m)

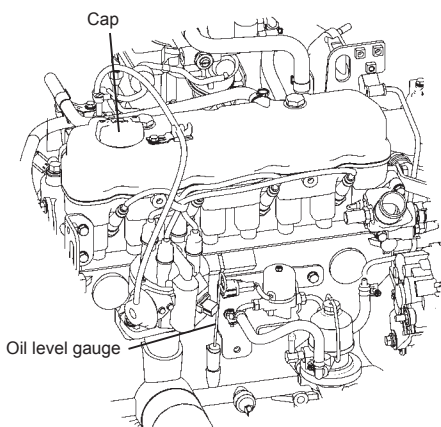
■ Replacement of Engine Oil

Remove the drain plug below the engine, and drain the oil. Install the drain plug when the oil has been drained. Remove the cap on top of the engine and pour the oil.

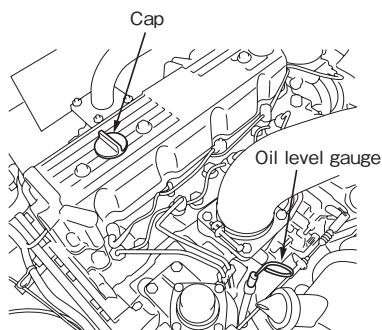
Total engine oil amounts

K21/K25 engine 3.8ℓ

4TNE92/4TNE98 engine 8.8ℓ



K21/K25 engine



4TNE92/4TNE98 engine

⚠ WARNING

At operating temperature the engine oil is HOT. Do not permit the hot oil to touch the skin and cause a burn.

👉 ADVICE

- Drain the oil while it is still warm (approx. 30 to 40°C).
- To avoid dirt from mixing in, wash the lift truck and make sure that the lubrication/greasing sections and oil level gauge are clean.
- Refer to the table of Recommended Oils and Grease for the engine oil, and use according to the temperature.
- Inspect and replace the oil in a place that is not dusty so that dirt will not mix in.

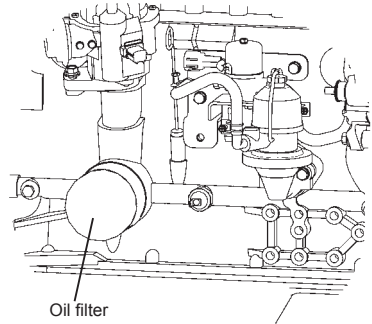
■ Replacement of Engine Oil Filter

Remove the engine oil filter with an oil filter wrench.



ADVICE

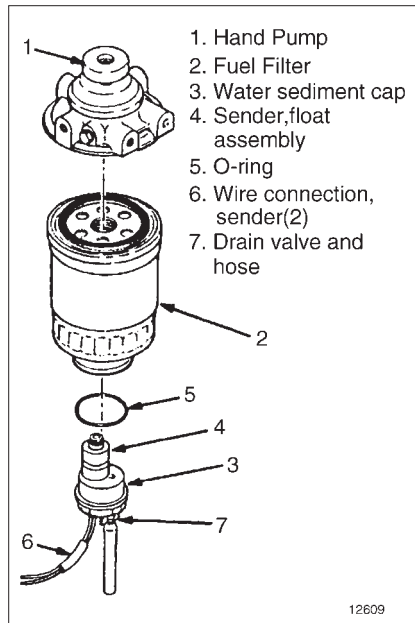
- Apply engine oil on the base O-ring when installing. Install the filter and then tighten by 2/3 of a turn after the O-ring has contacted the filter body.
- Refer to the instructions on page 111 for the Standard Periodic Cleaning and Replacement Intervals.



■ Draining of Sedimenter (Diesel)

If sedimenter warning lamp lights or once every 1 month, stop the engine and loosen the drain plug on the bottom of the sedimenter to drain the water.

1. Turn the wing nut to open the drain valve on the bottom of the fuel filter. Drain some fuel (and any water) into a container until clean fuel flows from the filter.
2. Turn the wing nut to close the drain valve.



Diesel fuel filter

12609

■ Bleeding Air in Fuel System (Diesel)

1. The air must be bled in the following cases:
 - a. When the sedimenter has been cleaned. (When water has been drained.)
 - b. When the fuel filter has been replaced.
 - c. When fuel has run out during operation.

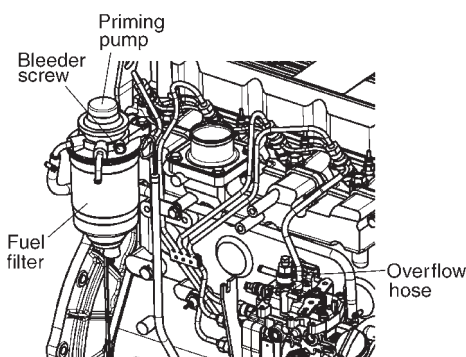
2. First, loosen the bleeder screw on the fuel filter body.

Next, press the priming pump and bleed the air.

Completely tighten the screw when fuel that contains air is no longer being ejected from the bleeder screw.

3. Next, disconnect the injection pump overflow hose, and operate the priming pump.

Connect the hose when air no longer comes out.



■ Parking Brake Lever Adjustment

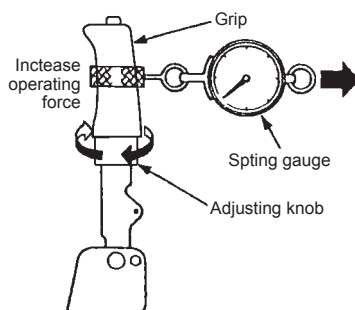
1. Put on a spring gauge in the middle of the grip of the parking brake lever and measure the operating force by pulling on the spring gauge.
2. If the operating force is not in the standard range, adjust the brake lever with the parking brake released.

Turn to right.....Operating force will increase.

Turn to left.....Operating force will decrease.

Operating Force:

145 to 195 N (15 to 20 kgf)

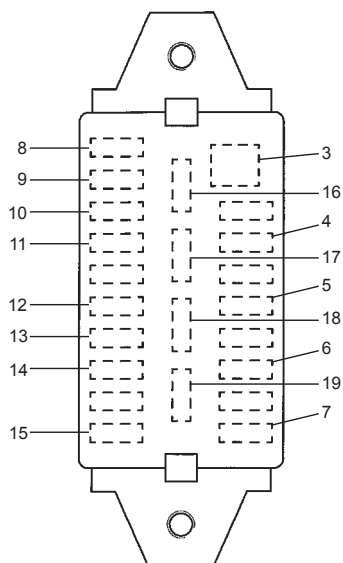
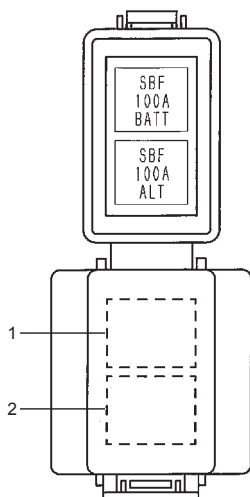


■ Checking Fuses

If any of the warning indicators, gauges or electrical equipments do not operate correctly, check the fuses.

1. Fuse box Component Parts - GCT Gas and LPG Engine

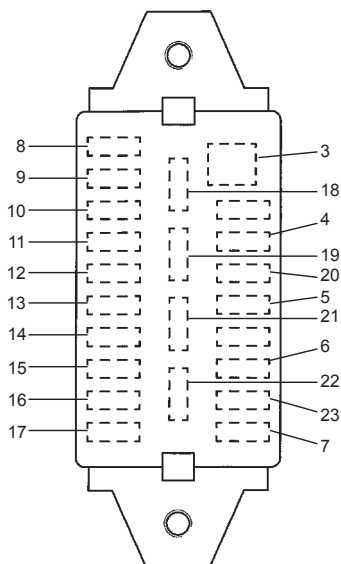
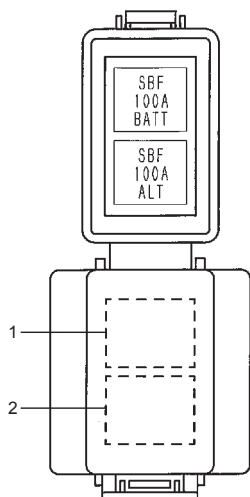
The fuse box is located in the left side of engine compartment under the engine hood.



- | | |
|-------------------------|------------------------|
| 1. BATTERY (100A) | 11. OPT-ECU (20A) |
| 2. ALTERNATOR (100A) | 12. WIPER/HEATER (20A) |
| 3. FUSE PULLER | 13. STOP LAMP (10A) |
| 4. OPT-IGN (20A) | 14. WORKING LAMP (20A) |
| 5. IGN (10A) | 15. LPG (5A) |
| 6. GAUGE/V-ECU (10A) | 16. SPARE (25A) |
| 7. TURN/BACK LAMP (20A) | 17. SPARE (20A) |
| 8. MAIN (5A) | 18. SPARE (10A) |
| 9. HEAD/TAIL LAMP (25A) | 19. SPARE (5A) |
| 10. HORN (5A) | |

2. Fuse box Component Parts - LPG Electronic controlled Engine (Option)

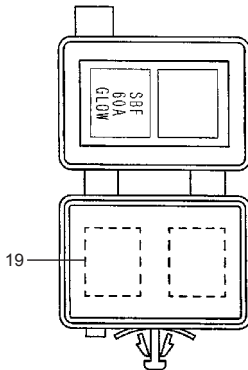
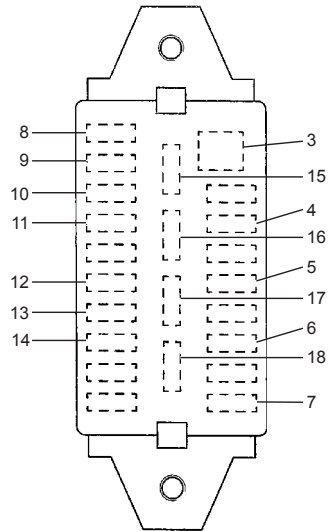
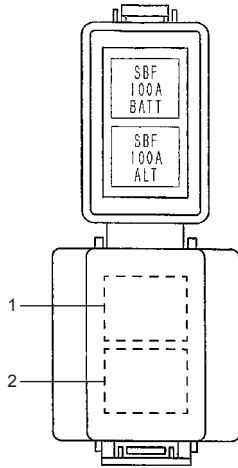
The fuse box is located in the left side of engine compartment under the engine hood.



1. BATTERY (100A)
2. ALTERNATOR (100A)
3. FUSE PULLER
4. OPT-IGN (20A)
5. FUEL/OTHERS (10A)
6. GAUGE/V-ECU (10A)
7. TURN/BACK LAMP (20A)
8. MAIN (5A)
9. HEAD/TAIL LAMP (25A)
10. HORN (5A)
11. OPT-ECU (20A)
12. ETC (15A)

13. WIPER/HEATER (20A)
14. STOP LAMP (10A)
15. WORKING LAMP (20A)
16. IGN COIL (30A)
17. ECM (30A)
18. SPARE (30A)
19. SPARE (25A)
20. SPARE (10A)
21. SPARE (20A)
22. SPARE (15A)
23. SPARE (5A)

3. Fuse box Component Parts - Diesel Engine



1. BATTERY (100A)
2. ALTERNATOR (100A)
3. FUSE PULLER
4. OPT-IGN (20A)
5. IGN (10A)
6. GAUGE/V-ECU (10A)
7. TURN/BACK LAMP (20A)
8. MAIN (5A)
9. HEAD/TAIL LAMP (25A)
10. HORN (5A)
11. OPT-ECU (20A)
12. WIPER/HEATER (20A)
13. STOP LAMP (10A)
14. WORKING LAMP (20A)
15. SPARE (25A)
16. SPARE (20A)
17. SPARE (10A)
18. SPARE (5A)
19. GLOW (60A)

■ How to Start Engine when Battery Discharged

If the battery becomes discharged and requires a booster battery to start the engine, follow these procedures carefully when connecting the jumper cables:

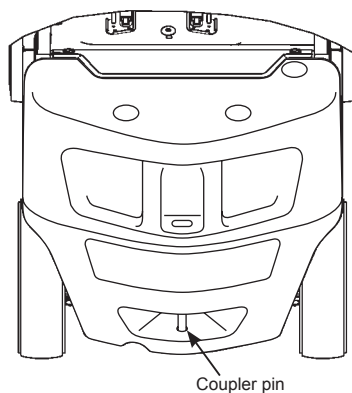
- a. Always connect the positive jumper cable to the positive terminal of the discharged battery and the negative jumper cable to the negative terminal.
- b. Always connect the jumper cable that is the ground cable last.
- c. Always connect the jumper cables to the discharged battery before connecting them to the booster battery.

■ How to Use Coupler Pin

The coupler pin at the back of the counterweight is to be used when the truck tire is caught in the gutter or mud. The coupler pin can be used when loading the lift truck by another truck.

⚠ CAUTION

The coupler pin should not be used for towing other vehicle or load.



■ Changing Tires

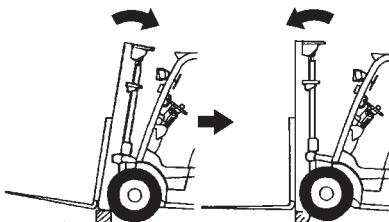
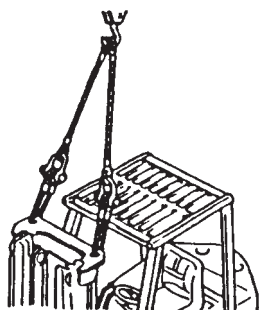
1. Preparation

1. Prepare tools, jack, stoppers, and tires.
2. Remove load from the truck and move the truck to level and hard surface. Put on parking brake.
3. Put stoppers on the tire diagonal to the one that is to be changed.

2. Setting the jack

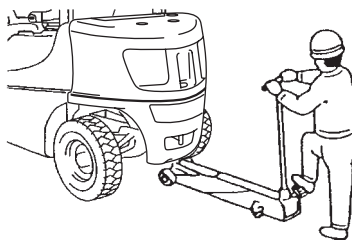
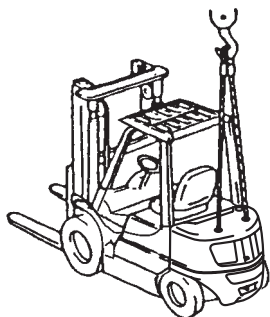
1. Changing front wheel tire

Set the jack underneath the mast. Or lift the upper part of the mast or use a hydraulic equipment.



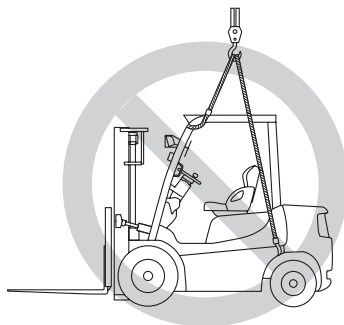
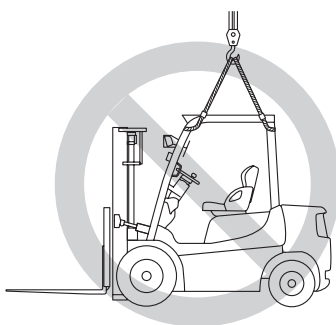
2. Changing rear tire

Set the jack underneath the counterweight. Or lift the counterweight.



⚠ CAUTION

- The jack to be used should have larger capacity than the designated capacity.
- Jack up piece should be right on the jack piece underneath the counterweight.
- Confirm that the mast trunnion installation bolt is tightened in normal state.
- The wire rope used for lifting the truck should have no damage and is of ample strength.

**⚠ CAUTION**

Never lift the truck with the overhead guard. If it is necessary to lift the truck, consult with your authorized service dealer.

3. Tire change**⚠ WARNING**

- Air pressure in pneumatic tires can cause tire and wheel parts to explode. The explosion of wheel parts can cause serious injury or death.
- Remove all of the air from the tires before the tires are removed from the lift truck.

1. Jack up until the tire is barely off the ground.
2. If it is joint rim tire, let out air completely.
3. Loose hub nuts. Do not remove tire at this point.

⚠ CAUTION

- Confirm that the wheel assembly bolts is not loose before loosening the hub nuts.
- Do not loosen the wheel assembly bolts. Loosen only hub nuts.

4. Jack up so that the tire is off the ground and then take off hub nuts. Remove the wheel.

⚠ WARNING

Do not get under the truck while jacking up. If the jack comes off, it is very dangerous.

⚠ CAUTION

- Before Jacking up, remove load off the truck and be sure to used stoppers on tire.
- When jacking up, no one should be at the operator seat.
- After jacking up, put a lumber and the like to secure safety.
- Ask a specialist to disassemble and assemble the tire.

5. Change tire and tighten nuts with hand as much as possible. The flat surface of the nut should be on the outside. Tighten the nut so that the taper section of the wheel nut and the seat section of the rim are evenly in contact.

6. Let down the jack and tighten hub nuts in the order shown below.

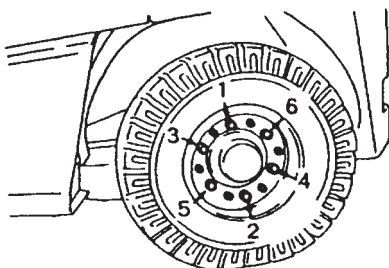
Hub nut tightening torque

2.0 - 3.5 ton

Front wheel	Single	2.0-2.5ton	294 to 343 N·m (3000 to 3500 kgf·cm)
		3.0-3.5ton	397 to 485 N·m (4050 to 4950 kgf·cm)
	Dual	inner	343 to 392 N·m (3500 to 4000 kgf·cm)
		Spacer and Outer	294 to 343 N·m (3000 to 3500 kgf·cm)
Rear wheel			157 to 188 N·m (3000 to 3500 kgf·cm)

1.5 - 2.0 ton (COMPACT)

Front tire	196 to 216 N·m (2000 to 2200 kgf·cm)
Rear tire	98 to 123 N·m (1000 to 1250 kgf·cm)



⚠ WARNING

Check all wheel nuts after 2 to 5 hours of operation: when new lift trucks begin operation and on all lift trucks when the drive wheels have been removed and installed. Tighten the nuts in a cross pattern to the correct torque value shown in this page.

7. Check on tire air pressure

After installing tire, check the tire air pressure and adjust to standard pressure. The tire air pressure is indicated on the nameplate.

8. After changing the tire, tighten hub nuts again after a while.

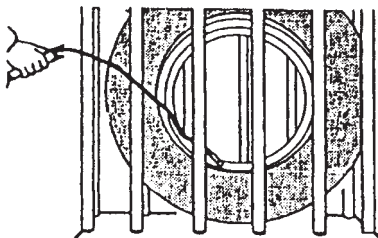
⚠ WARNING

Caution at the time of disassembly and assembly of tire

- Ask a specialist to do disassembly and assembly of tire, tube, rim and the like and to pump air into tire.

The lift truck tires use high pressure and is very dangerous. Pumping air requires the certificate of completion of special training.

- Pumping air into tires off the truck should be started after inspecting tire, rim, bolts and nuts. Put tire in a fence while pumping air for safety. Never pump air beyond the standard air pressure.



- When pumping air into tire, be sure to wear protective glasses as there is danger for dusts to get into your eye when they are blown off by compressed air.

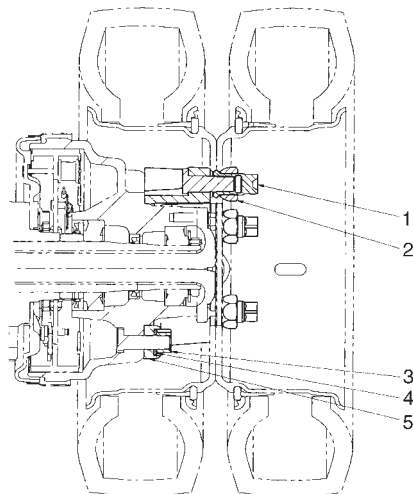
■ Installation Procedures, Dual Drive Wheels of 2.0 - 3.5 ton trucks

NOTE: Some lift trucks can have dual drive wheels. The following procedures describe the steps to install the dual sets of wheels.

1. Install the spacer on the hub. Tighten the nuts as shown on page 108.
2. Install the inner wheel and the outer wheel on the spacer. Tighten the nuts as shown on page 108.

⚠ CAUTION

Make sure the nuts that fasten the rim halves together are toward the brake drum when they are installed.



1. Nut outer
2. Nut inner
3. Nut
4. Washer
5. Spacer-dual Assy

■ Wash lift truck

When washing a lift truck, protect the electric components from being splashed with water.

⚠ CAUTION

Wash a lift truck with care to prevent the electric components (among others, controller section, tilt angle sensor section, shift switch section, horn button section, turn signal switch section, dash display, display switch section and electric components in the engine compartment) from being splashed with water.

Getting splashed with water directly can result in the starting failure of engine and malfunction/failure of electric components.



ADVICE

The maintenance schedule Table shows the required intervals under general usage conditions (operation of approx. 300 hours a month). Use an interval that matches the usage conditions of the lift trucks. Doing so will reduce faults and extend the life of the lift truck.

Contact your authorized service dealer if you have any questions.

List of Lubricants and Periodic Replacement Parts

Item	8 hr/ 1 day	300 hr/ 1 mo	500 hr/ 2 mo	900 hr/ 3 mo	1500 hr/ 6 mo	2400 hr/ 1 yr	4000 hr/ 2 yr	Procedure or Quantity	Specification
X=Check C=Change L=Lubricate CIL=Check Indicator Light during operation									
Tires	X							Check Condition	See Nameplate
Safety Labels	X							Replace as Necessary	See Parts Manual
Mast, Carriage, Lift Chains, Attachment	X							Check Condition and Lubrication	See Parts Manual
Seat Belt, Hip Restraints, and Seat Rails	X							Check Condition and Operation	
Hood and Seat Latches	X							Check Condition and Operation	
Engine Compartment	X							Remove Combustible Materials	
Check for Leaks - Fuel, Oil, Water	X							Check for Leaks See NOTE 6	
Hydraulic Hoses	X							Check Condition	See Parts Manual
Coolant Hoses	X							Check Condition	See Parts Manual
Fuel Tank (Gas)	CIL							1 - 2 ton (COMPACT) 52 liter 2 - 3.5 ton 69 liter	86 Octane Gasoline Minimum
Fuel Tank (LPG)	CIL							29.9 liter (7.9 gal) 15kg	LPG - HD 5
Fuel Tank (Diesel)	CIL							1 - 2 ton (COMPACT) 52 liter 2 - 3.5 ton 69 liter	Diesel oil No.2
Indicator Icons, Horn, Fuses and Relays	X							Check Operation	
Service Brakes	X							Check Operation	
Parking Brake	X							Check Operation	
Parking Brake Cable							C	1 Cable	See Parts Manual
Steering Column and Steering System	X							Check Condition and Operation	
Transmission	X							Check Condition and Operation	

Item	8 hr/ 1 day	300 hr/ 1 mo	500 hr/ 2 mo	900 hr/ 3 mo	1500 hr/ 6 mo	2400 hr/ 1 yr	4000 hr/ 2 yr	Procedure or Quantity	Specification
X=Check C=Change L=Lubricate CIL=Check Indicator Light during operation									
Drive Axle	X							Check for Leaks, Operation	
Hydraulic Oil	X	X					C	1 - 2 ton (COMPACT) 26 liter 2 - 3.5 ton 30 liter See NOTE 2 and NOTE 8	ISO VG 32 Hydraulic Oil -20°C and Above
Hydraulic Oil Filter						C		1 Filter	See Parts Manual
Hydraulic Tank Breather		X				C		Check Condition	See Parts Manual
Wheel Nuts Drive Wheels	X							Check Torque	1 - 2 ton (COMPACT) 196 to 216 N·m 2 - 2.5 ton 94 to 343 N·m 3 - 3.5 ton 397 to 485 N·m
Wheel Nuts Steer Wheels	X							Check Torque	1 - 2 ton (COMPACT) 98 to 123 N·m 2 - 3.5 ton 157 to 188 N·m
Battery and Cable Terminals		X						Clean	
Accelerator Cable							C	1 Cable	See Parts Manual
Engine Oil GCT Engines	X CIL		C					3.8 liter w/filter See NOTE 3	-20 to 30°C SAE 10W-30 5 to 40°C SAE 30 API SE and above
Engine Oil Yanmar Engines	X CIL		C					8.8 liter w/filter See NOTE 3	-20 to 30°C SAE 10W-30 5 to 40°C SAE 30 API CD and above
Engine Oil Filter GCT Engines			C					0.3 liter See NOTE 3	See Parts Manual
Engine Oil Filter Yanmar Engines				C				See NOTE 10	See Parts Manual
Air Filter	CIL	X			C			Clean or Replace See NOTE 7 and NOTE 5	See Parts Manual
Drive Belt GCT Engines		X						Check for Wear and Damage. Adjust as Needed.	See Parts Manual
LPG Regulator (GCT)		X						Drain Tar	
Engine Idle Speed GCT Engines		X							700 ± 50 rpm

Service Data

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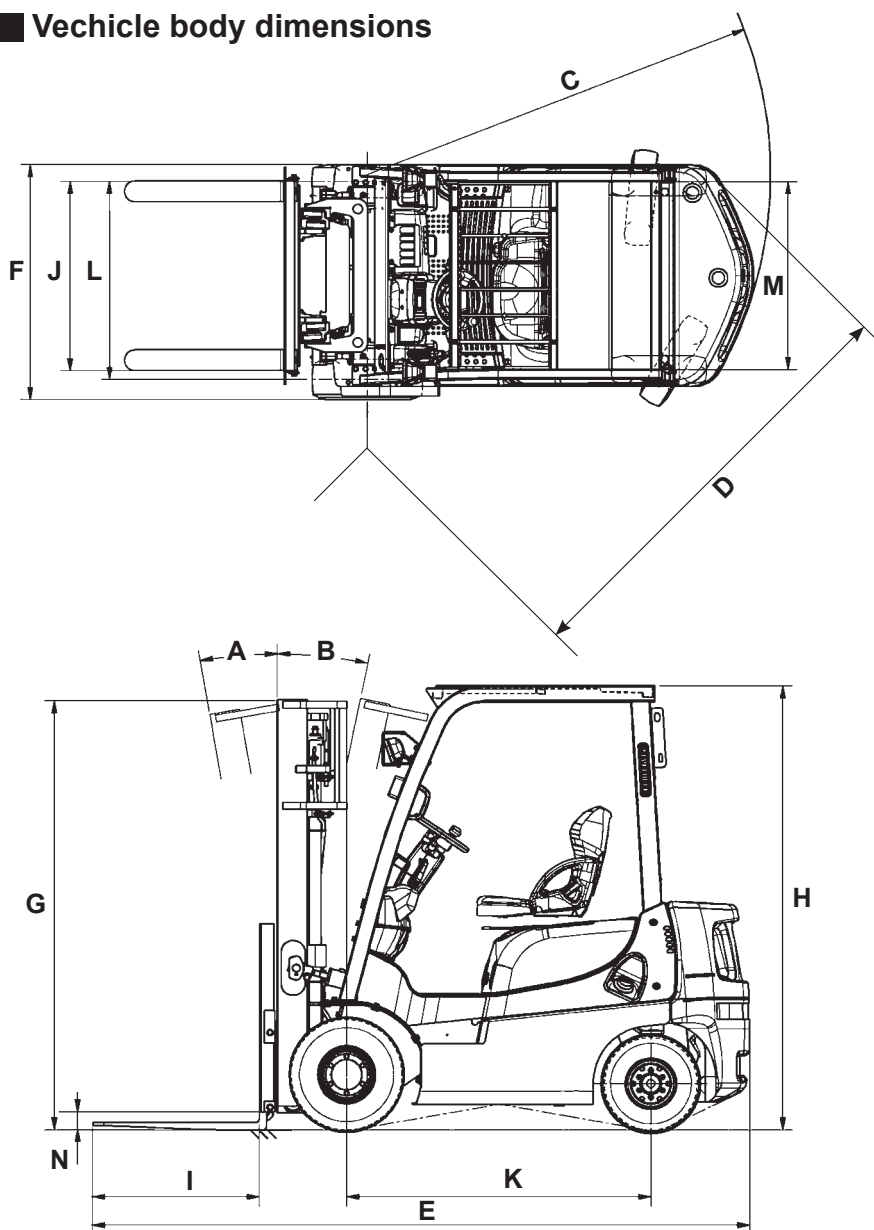
Item	8 hr/ 1 day	300 hr/ 1 mo	500 hr/ 2 mo	900 hr/ 3 mo	1500 hr/ 6 mo	2400 hr/ 1 yr	4000 hr/ 2 yr	Procedure or Quantity	Specification
X=Check C=Change L=Lubricate CIL=Check Indicator Light during operation									
Engine Governed Speed GCT Engines		X							2700 ± 100 rpm
PCV Valve GCT Engines				X					See Parts Manual
Valve Adjustment GCT Engines					X			Adjust as Required	Intake 0.38 mm Hot Exhaust 0.38 mm Hot
Timing GCT K21 Engine					X			Adjust as Required	2 BTDC(CARB.) 0 BTDC(EGI)
Timing GCT K25 Engine					X			Adjust as Required	0 BTDC
LPG Fuel Regulator Filter GCT Engines				X		C		1 Filter	See Parts Manual
Fuel Filter GCT Engines (CARB.)				C				1 Filter	See Parts Manual
Fuel Filter Yanmar Engines.				C				1 Filter See NOTE 10	See Parts Manual
Fuel Injectors GCT Engine (EGI)				X				4 Injectors	Check and Replace If Required
Spark Plugs GCT Engines		X						Check Plug Wires 4 Plugs	See Parts Manual 0.8 ~ 0.9 mm
Cooling System	X CIL						C	7.5 liter (K21, 4TNE92) 7.8 liter(K25, 4TNE98)	50% Water and 50% Ethylene Glycol Boron- Free Antifreeze
Clean Debris From Radiator Core		X						See NOTE 5	
Transmission Oil		X			C			8.3 liter	DEXRON II or III
Transmission Oil Filter						C		1 Filter See NOTE 4	See Parts Manual
Suction Strainer					X			See NOTE 5	
Forks	X	X						Check Condition	
Mast Sliding Surfaces and Load Roller Surfaces	X	L						As Required	Multipurpose Grease See NOTE 1
Lift Chains	X	L						Lube as Required Check for Wear	
Mast Sideshift Carriage	X	L						Lube as Required 2 Fittings	Multipurpose Grease See NOTE 1
Mast Pivots		L						2 Fittings	Multipurpose Grease See NOTE 1
Mast Integral Sideshift Carriage (Upper/ Lower Bearings)		L			X	C		Lube as Required 2 Fittings 4 Bearings	Multipurpose Grease See NOTE 1 2.5 mm Minimum Thickness

Item	8 hr/ 1 day	300 hr/ 1 mo	500 hr/ 2 mo	900 hr/ 3 mo	1500 hr/ 6 mo	2400 hr/ 1 yr	4000 hr/ 2 yr	Procedure or Quantity	Specification
X=Check C=Change L=Lubricate CIL=Check Indicator Light during operation									
Tilt Cylinder Ends		L						4 Fittings	Multipurpose Grease See NOTE 1
Brake Master Cylinder Rod End Pin		L							Multipurpose Grease See NOTE 1
Manual Hydraulic Hand Levers		L							Multipurpose Grease See NOTE 1
Brake Fluid	X				C			0.2 liter	SAE J-1703 (DOT 3)
Steering Axle Tie Rod Ends		L						4 Fittings	Multipurpose Grease See NOTE 1
Steering Axle King Pin		L						2 Fittings	Multipurpose Grease See NOTE 1
Pedals, Levers, Seat Rails, Cables, Hinges, Linkages, Hood Latch	X					L		Lubricate as Necessary	See Parts Manual
Wheel Bearings Steer Wheels						X		See NOTE 9	Multipurpose Grease See NOTE 1
Wheel Bearings Drive Wheel (Inner)						X		See NOTE 9	Multipurpose Grease See NOTE 1
Service Brakes						X		Check Lining Thickness	1.0 mm Minimum
Differential and Drive Axle Oil		X				C		1 - 2 ton (COMPACT) 5.0 liter 2 - 3.5 ton 6.5 liter	SAE 80W-90 or 85W-140
NOTE 1: Multipurpose grease with 2 to 4% Molybdenum Disulfide.									
NOTE 2: Heavy-duty or high-temperature operations require more frequent checks.									
NOTE 3: Change Oil and filters on NEW lift trucks at first 200 hours on hourmeter.									
NOTE 4: Change filters on new lift trucks at first 1500 hours on hourmeter.									
NOTE 5: Very dirty conditions will require daily clean and check.									
NOTE 6: Check fuel system, hydraulic system, cooling system for leaks prior to any service or maintenance activity.									
NOTE 7: In dirty or dusty environments, replace at 900 hours or as needed.									
NOTE 8: Heavy-duty or contaminated applications will require hydraulic oil change at 2400 hours.									
NOTE 9: When not equipped with lube fittings, lube whenever new bushings, bearings or seals are installed.									
NOTE 10: Change filters every 3 months or 1000 hours which reaches earlier.									

■ List of Periodic Replacement of Safety Parts

No.	Parts description	Years
1	Cup, dust seal, etc. of brake master cylinder and wheel cylinder	1
2	Brake hoses and / or tubes	1 - 2
3	Brake reservoir hose	2 - 4
4	Power steering hoses	2
5	Service brake switch (hydraulic type)	2
6	Fuel supply and / or return hoses	2 - 4
7	Rubber parts in the power steering system	2
8	Lift chains	2 - 4

■ Vehicle body dimensions



Main Specification Table

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■ Specification sheet for I.C.E lift truck (METRIC)

Model		Symbol	H1.5XT -AG/AL/AT (-ALE)	H1.8XT -AG/AL/AT (-ALE)	H2.0XTS -AG/AL/AT (-ALE)
Performance	Capacity (kg)		1500	1750	2000
	With load center at (mm)		500	500	500
	Lift height (mm)		3000	3000	3000
	Standard free lift (mm)		145	145	150
	Tilt of mast Forward/backward (deg)	A/B	6/10	6/10	6/10
	Travel speed Forward (Laden/unladen) (km/h)		18/19 (18/19.5)	18/19.5 (18/19.5)	18/19.5 (18/19.5)
	Lifting speed Laden/unladen (mm/s)		625/680 (675/700)	615/680 (675/700)	615/680 (670/700)
	Drawbar pull 1.5km/h, laden/unladen (N)		19200/ (21900/)	19100/ (21700/)	19200/ (21800/)
	Gradeability 1.5km/h, laden/unladen (%)		37/24 (47/24)	33/22 (42/22)	30/20 (38/19)
	Turning radius (mm)	C	1960	1995	2030
Dimensions	Aisle width (mm)	D	1845	1895	1920
	Overall length Length to top of forks (mm)	E	3200	3240	3275
	Overall width Tire/frame (mm)	F	1070/1070	1135/1070	1135/1070
	Height	Height of canopy guard (mm)	G 2060	2060	2060
		Height with collapsed mast (mm)	H 1995	1995	1995
		Height with extended mast (mm)	4105	4105	4105
	Fork length (mm)	I	920	920	920
	Fork spread max/min (mm)	J	915/205	915/205	910/250
	Wheelbase (mm)	K	1410	1410	1410
	Tread Standard tread : front/rear (mm)	L/M	915/905	950/930	950/930
	Ground clearance Mast (mm)	N	110	110	110
	Unladen weight	Standard tread (kg)	2640	2880	3090
		Dual tread (kg)	2670	2880	3090
Tire	Tire size	Front (standard tread)	6.00-9-10PR	21x8-9-14PR	21x8-9-14PR
		Front (dual tread)	21x8-9-14PR	21x8-9-14PR	21x8-9-14PR
		Rear	5.00-8-8PR	18x7-8-10PR	18x7-8-10PR
Engine	Engine	Manufacturer	GCT	GCT	GCT
		Model	K21	K21	K21
		Permanent output (kW)	31 (39)	31 (39)	31 (39)
		At revs, (rpm)	2250 (2700)	2250 (2700)	2250 (2700)
		Rated torque (Nm/rpm)	144/1600 (145/2000)	144/1600 (145/2000)	144/1600 (145/2000)
		No. of cylinder/cubic capacity (cm ³)	4/2065	4/2065	4/2065
		Fuel tank (Ltr)	52	52	52

Model		Symbol	H2.0XT -AG/AL/AT	H2.0XT -BG/BL/BT (-BLE)	H2.5XT -AG/AL/AT
Performance	Capacity (kg)		2000	2000	2500
	With load center at (mm)		500	500	500
	Lift height (mm)		3000	3000	3000
	Standard free lift (mm)		155	155	155
	Tilt of mast Forward/backward (deg)	A/B	6/10	6/10	6/10
	Travel speed Forward (Laden/unladen) (km/h)		18/19.5	18/19.5 (18/19.5)	18/19.5
	Lifting speed Laden/unladen (mm/s)		525/580	635/695 (685/710)	515/580
	Drawbar pull 1.5km/h, laden/unladen (N)		18900/	20400/ (25100/)	18900/
	Gradeability 1.5km/h, laden/unladen (%)		30/26	35/26 (40/26)	26/22
	Turning radius (mm)	C	2185	2185	2245
Dimensions	Aisle width (mm)	D	2025	2025	2090
	Overall length Length to top of forks (mm)	E	3470	3470	3685
	Overall width Tire/frame (mm)	F	1160/1140	1160/1140	1160/1140
	Height	Height of canopy guard (mm)	G	2130	2130
		Height with collapsed mast (mm)	H	1995	1995
		Height with extended mast (mm)		4120	4120
	Fork length (mm)	I	920	920	1070
	Fork spread max/min (mm)	J	1010/250	1010/250	1010/250
	Wheelbase (mm)	K	1625	1625	1625
	Tread Standard tread : front/rear (mm)	L/M	970/1000	970/1000	970/1000
	Ground clearance Mast (mm)	N	120	120	120
	Unladen weight	Standard tread (kg)	3390	3390	3720
		Dual tread (kg)	3520	3520	3850
Tire	Tire size	Front (standard tread)	7.00-12-12PR	7.00-12-12PR	7.00-12-12PR
		Front (dual tread)	7.00-12-12PR	7.00-12-12PR	7.00-12-12PR
		Rear	6.00-9-10PR	6.00-9-10PR	6.00-9-10PR
Engine	Engine	Manufacturer	GCT	GCT	GCT
		Model	K21	K25	K21
		Permanent output (kW)	31	34 (45)	31
		At revs, (rpm)	2250	2100 (2700)	2250
		Rated torque (Nm/rpm)	144/1600	173/1600 (169/1600)	144/1600
		No. of cylinder/cubic capacity (cm ³)	4/2065	4/2488	4/2065
		Fuel tank (Ltr)	69	69	69

Main Specification Table

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Model		Symbol	H2.5XT -BG/BL/BT (-BLE)	H3.0XT -BG/BL/BT (-BLE)	H3.5XT -BG/BL/BT (-BLE)
Performance	Capacity (kg)		2500	3000	3500
	With load center at (mm)		500	500	500
	Lift height (mm)		3000	3000	3000
	Standard free lift (mm)		155	160	165
	Tilt of mast Forward/backward (deg)	A/B	6/10	6/10	6/10
	Travel speed Forward (Laden/unladen) (km/h)		18/19.5 (18/19.5)	19/20 (19/20)	15.5/16 (19.5/20)
	Lifting speed Laden/unladen (mm/s)		625/695 (680/710)	515/575 (565/585)	435/485 (475/490)
	Drawbar pull 1.5km/h, laden/unladen (N)		20500/ (25200/)	19000/ (23400/)	21900/ (21500/)
	Gradeability 1.5km/h, laden/unladen (%)		30/22 (34/22)	24/22 (27/21)	23/19 (22/19)
	Turning radius (mm)	C	2245	2365	2415
Dimensions	Aisle width (mm)	D	2090	2195	2235
	Overall length Length to top of forks (mm)	E	3685	3835	3905
	Overall width Tire/frame (mm)	F	1160/1140	1235/1140	1235/1140
	Height	Height of canopy guard (mm)	G	2130	2150
		Height with collapsed mast (mm)	H	1995	2060
		Height with extended mast (mm)		4120	4125
	Fork length (mm)	I	1070	1070	1070
	Fork spread max/min (mm)	J	1010/250	1060/250	1065/305
	Wheelbase (mm)	K	1625	1700	1700
	Tread Standard tread : front/rear (mm)	L/M	970/1000	1010/1000	1010/1000
	Ground clearance Mast (mm)	N	120	140	140
	Unladen weight	Standard tread (kg)	3720	4260	4720
		Dual tread (kg)	3850	4345	4835
Tire	Tire size	Front (standard tread)	7.00-12-12PR	28x9-15-12PR	28x9-15 SOLID
		Front (dual tread)	7.00-12-12PR	7.00-12-12PR	6.00-15 SOLID
		Rear	6.00-9-10PR	6.50-10-10PR	6.50-10 SOLID
Engine	Engine	Manufacturer	GCT	GCT	GCT
		Model	K25	K25	K25
		Permanent output (kW)	34 (45)	34 (45)	34 (45)
		At revs, (rpm)	2100 (2700)	2100 (2700)	2100 (2700)
		Rated torque (Nm/rpm)	173/1600 (169/1600)	173/1600 (169/1600)	173/1600 (169/1600)
		No. of cylinder/cubic capacity (cm ³)	4/2488	4/2488	4/2488
		Fuel tank (Ltr)	69	69	69

Model		Symbol	H1.5XT -AD	H1.8XT -AD	H2.0XTS -AD
Performance	Capacity (kg)		1500	1750	2000
	With load center at (mm)		500	500	500
	Lift height (mm)		3000	3000	3000
	Standard free lift (mm)		145	145	150
	Tilt of mast Forward/backward (deg)	A/B	6/10	6/10	6/10
	Travel speed Forward (Laden/unladen) (km/h)		17/18	17/18.5	17/18.5
	Lifting speed Laden/unladen (mm/s)		675/710	665/710	655/710
	Drawbar pull 1.5km/h, laden/unladen (N)		17500/	17400/	17500/
	Gradeability 1.5km/h, laden/unladen (%)		36/24	32/22	29/20
	Turning radius (mm)	C	1960	1995	2030
Dimensions	Aisle width (mm)	D	1845	1895	1920
	Overall length Length to top of forks (mm)	E	3200	3240	3275
	Overall width Tire/frame (mm)	F	1070/1070	1135/1070	1135/1070
	Hight	Height of canopy guard (mm)	G	2060	2060
		Height with collapsed mast (mm)	H	1995	1995
		Height with extended mast (mm)		4105	4105
	Fork length (mm)	I	920	920	920
	Fork spread max/min (mm)	J	915/205	915/205	910/250
	Wheelbase (mm)	K	1410	1410	1410
	Tread Standard tread : front/rear (mm)	L/M	915/905	950/930	950/930
	Ground clearance Mast (mm)	N	110	110	110
	Unladen weight	Standard tread (kg)	2730	2970	3180
		Dual tread (kg)	2730	2970	3180
Tire	Tire size	Front (standard tread)	6.00-9-10PR	21x8-9-14PR	21x8-9-14PR
		Front (dual tread)	21x8-9-14PR	21x8-9-14PR	21x8-9-14PR
		Rear	5.00-8-8PR	18x7-8-10PR	18x7-8-10PR
Engine	Engine	Manufacturer	YANMAR	YANMAR	YANMAR
		Model	4TNE92	4TNE92	4TNE92
		Permanent output (kW)	29	29	29
		At revs, (rpm)	2050	2050	2050
		Rated torque (Nm/rpm)	143/1400	143/1400	143/1400
		No. of cylinder/cubic capacity (cm ³)	4/2659	4/2659	4/2659
		Fuel tank (Ltr)	52	52	52

Main Specification Table

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Model		Symbol	H2.0XT -AD	H2.0XT -BD	H2.5XT -AD
Performance	Capacity (kg)		2000	2000	2500
	With load center at (mm)		500	500	500
	Lift height (mm)		3000	3000	3000
	Standard free lift (mm)		155	155	155
	Tilt of mast Forward/backward (deg)	A/B	6/10	6/10	6/10
	Travel speed Forward (Laden/unladen) (km/h)		17.5/19	18/19.5	17.5/19
	(Standard tread)				
	Lifting speed Laden/unladen (mm/s)		620/670	675/690	610/670
	Drawbar pull 1.5km/h, laden/unladen (N)		16700/	21800/	16700/
	Gradeability 1.5km/h, laden/unladen (%)		26/26	35/26	22/23
Dimensions	Turning radius (mm)	C	2185	2185	2245
	Aisle width (mm)	D	2025	2025	2090
	Overall length Length to top of forks (mm)	E	3470	3470	3685
	Overall width Tire/frame (mm)	F	1160/1140	1160/1140	1160/1140
	Hight	Height of canopy guard (mm)	G	2130	2130
		Height with collapsed mast (mm)	H	1995	1995
		Height with extended mast (mm)		4120	4120
	Fork length (mm)	I	920	920	1070
	Fork spread max/min (mm)	J	1010/250	1010/250	1010/250
	Wheelbase (mm)	K	1625	1625	1625
	Tread Standard tread : front/rear (mm)	L/M	970/1000	970/1000	970/1000
	Ground clearance Mast (mm)	N	120	120	120
	Unladen weight	Standard tread (kg)	3480	3480	3810
		Dual tread (kg)	3610	3610	3940
Tire	Tire size	Front (standard tread)	7.00-12-12PR	7.00-12-12PR	7.00-12-12PR
		Front (dual tread)	7.00-12-12PR	7.00-12-12PR	7.00-12-12PR
		Rear	6.00-9-10PR	6.00-9-10PR	6.00-9-10PR
Engine	Engine	Manufacturer	YANMAR	YANMAR	YANMAR
		Model	4TNE92	4TNE98	4TNE92
		Permanent output (kW)	29	43	29
		At revs, (rpm)	2050	2300	2050
		Rated torque (Nm/rpm)	143/1400	189/1600	143/1400
		No. of cylinder/cubic capacity (cm ³)	4/2659	4/3319	4/2659
		Fuel tank (Ltr)	69	69	69

Model			Symbol	H2.5XT -BD	H3.0XT -BD	H3.5XT -BD
Performance	Capacity	(kg)		2500	3000	3500
	With load center at	(mm)		500	500	500
	Lift height	(mm)		3000	3000	3000
	Standard free lift	(mm)		155	160	165
	Tilt of mast	Forward/backward (deg)	A/B	6/10	6/10	6/10
	Travel speed	Forward (Laden/unladen) (km/h)		18/19.5	17.5/18.5	17.5/18
	(Standard tread)					
	Lifting speed	Laden/unladen (mm/s)		675/690	560/570	475/490
	Drawbar pull	1.5km/h, laden/unladen (N)		21900/	22300/	20400/
	Gradeability	1.5km/h, laden/unladen (%)		30/23	27/22	21/19
Dimensions	Turning radius	(mm)	C	2245	2365	2415
	Aisle width	(mm)	D	2090	2195	2235
	Overall length	Length to top of forks (mm)	E	3685	3835	3905
	Overall width	Tire/frame (mm)	F	1160/1140	1235/1140	1235/1140
	Hight	Height of canopy guard (mm)	G	2130	2150	2150
		Height with collapsed mast (mm)	H	1995	2060	2140
		Height with extended mast (mm)		4120	4125	4125
	Fork length	(mm)	I	1070	1070	1070
	Fork spread	max/min (mm)	J	1010/250	1060/250	1065/305
	Wheelbase	(mm)	K	1625	1700	1700
	Tread	Standard tread : front/rear (mm)	L/M	970/1000	1010/1000	1010/1000
	Ground clearance	Mast (mm)	N	120	140	140
	Unladen weight	Standard tread (kg)		3810	4350	4940
		Dual tread (kg)		3940	4435	5055
Tire	Tire size	Front (standard tread)		7.00-12-12PR	28x9-15-12PR	28x9-15 SOLID
		Front (dual tread)		7.00-12-12PR	7.00-12-12PR	6.00-15 SOLID
		Rear		6.00-9-10PR	6.50-10-10PR	6.50-10 SOLID
Engine	Engine	Manufacturer		YANMAR	YANMAR	YANMAR
		Model		4TNE98	4TNE98	4TNE98
		Permanent output (kW)		43	43	43
		At revs, (rpm)		2300	2300	2300
		Rated torque (Nm/rpm)		189/1600	189/1600	189/1600
		No. of cylinder/cubic capacity (cm ³)		4/3319	4/3319	4/3319
		Fuel tank (Ltr)		69	69	69

