CAT® Lift Trucks

Operation & Maintenance Manual

FC/MC

P8000	AT40-00011-up
P9000	AT29D-50001-up
P10000	AT29D-80001-up
P11000	AT33C-50001-up
P12000	AT33C-80001-up
PD8000	AT12B-00011-up
PD9000	AT19D-50001-up
PD10000	AT19D-80001-up
PD11000	AT28C-50001-up
PD12000	AT28C-80001-up

Keep this manual in your lift truck as a ready reference

99730-89100

FOREWORD

The Occupational Safety and Health Administration (OSHA) prohibits employees under the age of 18 years old from operating lift trucks, and is now mandating operator training for all lift truck operators.

SAFE and EFFICIENT OPERATION of a lift truck depends to a great extent on the skill and alertness of the operator. To develop the skill, the operator should read this manual to understand the following points.

1. Working capabilities and limitations of the lift truck

2. Make-up of the lift truck

3. Safe driving and load handling procedures

It is the employer's responsibility to make sure the operator can see, hear and has the physical and mental ability to operate the lift truck safely.

It is also important that a qualified person experienced in lift truck operation should guide new operators through several driving and load handling operations before they attempt to operate the lift truck on their own.

Note:

- This manual contains information necessary for the operation and "Do-it-yourself" maintenance of standard lift trucks.
- Optional equipment is sometimes installed; it can change some operating characteristics described in this manual. Before operating such a lift truck, make sure the necessary instructions are available and understood.
- Lift truck operator training is provided through your authorized Cat® lift truck dealer. They will be glad to help you and answer any questions you may have about operating your new lift truck. Lift trucks are NOT intended for use on public roads.
- If you resell a lift truck, be sure to attach the original Operation & Maintenance Manual to the lift truck. In some countries, strict regulations do not allow imported lift trucks for resale. For resale information, contact your authorized Cat® lift truck dealer.
- If a lift truck is resold from another country, an Operation & Maintenance Manual attached to the lift truck may not meet your country's rules and regulations. For manual information, contact your authorized Cat lift truck dealer.

HOW TO USE THIS MANUAL

The following safety signs and NOTE are used in this manual to emphasize important and critical instructions.

This is the safety alert symbol. It is used to alert you of potential personal injury hazards or damage that could occur to property or the environment. Obey all safety messages that follow this symbol to reduce the risk of serious injury, death, or damage.

Be sure to read these precautionary instructions and all safety related decals installed on your lift truck before you operate it.

DANGER	This indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	This indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	This indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or damage to your lift truck.
Note	This indicates important matters and useful information on operation and maintenance.

Mitsubishi Caterpillar Forklift America Inc. (MCFA) cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are therefore not all inclusive.
If a tool, procedure, work method or operating technique not specifically recommended by MCFA is used, you must satisfy yourself that it does not pose a safety hazard to yourself and others. You should also ensure the product will not be damaged or made unsafe by the operation, lubrication, maintenance or repair procedures you choose.

All information, specifications, and illustrations in this manual are based on the latest data available at the time of publication. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service given to the product.

Obtain the most complete and current information from your authorized Cat lift truck dealer before starting any job. Additional manuals are available from your authorized Cat lift truck dealer.

DIRECTIONAL TERMS:

The directions "Left", "Right", "Front" and "Rear" are given from the viewpoint of the operator facing forward.

Truck Models Covered in This Manual

Truck type	Truck model	Engine model	Transmission	Control lever	Wet Disc Brake
4 ton model	P8000	TB45	Powershift	MC / FC	optional
	P9000	TB45	Powershift	MC / FC	optional
	PD8000	S6S	Powershift	MC / FC	optional
	PD9000	S6S	Powershift	MC / FC	optional
5 ton model	P10000	TB45	Powershift	MC / FC	optional
	P11000	TB45	Powershift	MC / FC	optional
	P12000	TB45	Powershift	MC / FC	optional
	PD10000	S6S	Powershift	MC / FC	optional
	PD11000	S6S	Powershift	MC / FC	optional
	PD12000	S6S	Powershift	MC / FC	optional

Abbreviation

- TB45 engine symbolizes either electric controlled gasoline engine, electric controlled dual fuel gasoline / LPG engine, or LPG engine.
- S6S engine symbolizes non-electric controlled diesel engine.
- MC is short for mechanical control levers.
- FC is short for fingertip electric control levers.

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8. TRANSPORTATION HINTS

9. SPECIAL SITUATIONS

10. TROUBLESHOOTING

11. MAINTENANCE

12. SERVICE DATA

13. TO THE CAT LIFT TRUCK OWNER

SAFETY RULES FOR LIFT TRUCK OPERATORS

♦ General

The safety rules and regulations in this section are representative of some, but not all rules and regulations that apply to lift trucks. Rules are paraphrased without representation that they have been reproduced verbatim.

Your lift truck was manufactured in accordance with the National Fire Protection Association (NFPA) No. 505 and the American National Standards Institute, Inc. / Industrial Truck Standards Development Foundation (ANSI/ITSDF) B56.1, Safety Standard for Low and High Lift Trucks. Operate this lift truck in accordance with local regulations.
See www.itsdf.org web site for more information on the B56.1 Safety Standards for Low Lift and High Lift Trucks.

The most effective way of reducing the risk of serious injuries, or even death, to you and others, is for you to know how to operate the lift truck properly. Drive alertly and avoid maneuvers or conditions that could cause accidents.
Be professional.

Do not operate a lift truck if it is in need of maintenance, repair or appears to be unsafe in any way. Report all unsafe conditions immediately to your supervisor, then contact your authorized lift truck dealer.
Do not attempt any adjustments or repairs unless you are trained and authorized to do so.

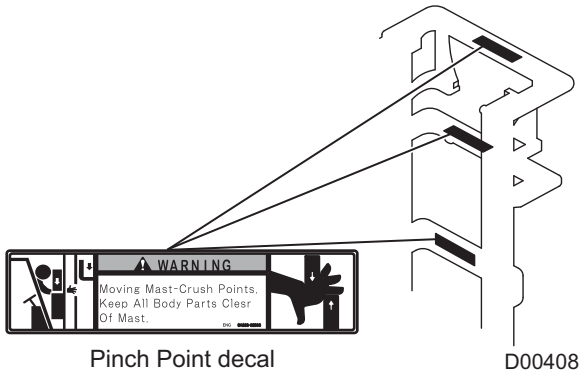
Continuing improvement and advancement of product design may have caused changes to your lift truck, which are not included in this publication. Whenever a question arises regarding your lift truck, or this publication, please consult your authorized Cat lift truck dealer for the latest available information.

All lift truck users should be familiar with their Local, Regional, and National regulations. United States users should be familiar with the Occupational Safety and Health Administration (OSHA), and ANSI/ITSDF B56.1, Safety Standard for Low and High Lift Trucks.
See www.osha.gov web site for more information on Regulations (Standards – 29 CFR) Powered industrial trucks – 1910.178.

You should also be familiar with areas of use of different types of lift trucks as specified in the National Fire Protection Association (NFPA) 505.

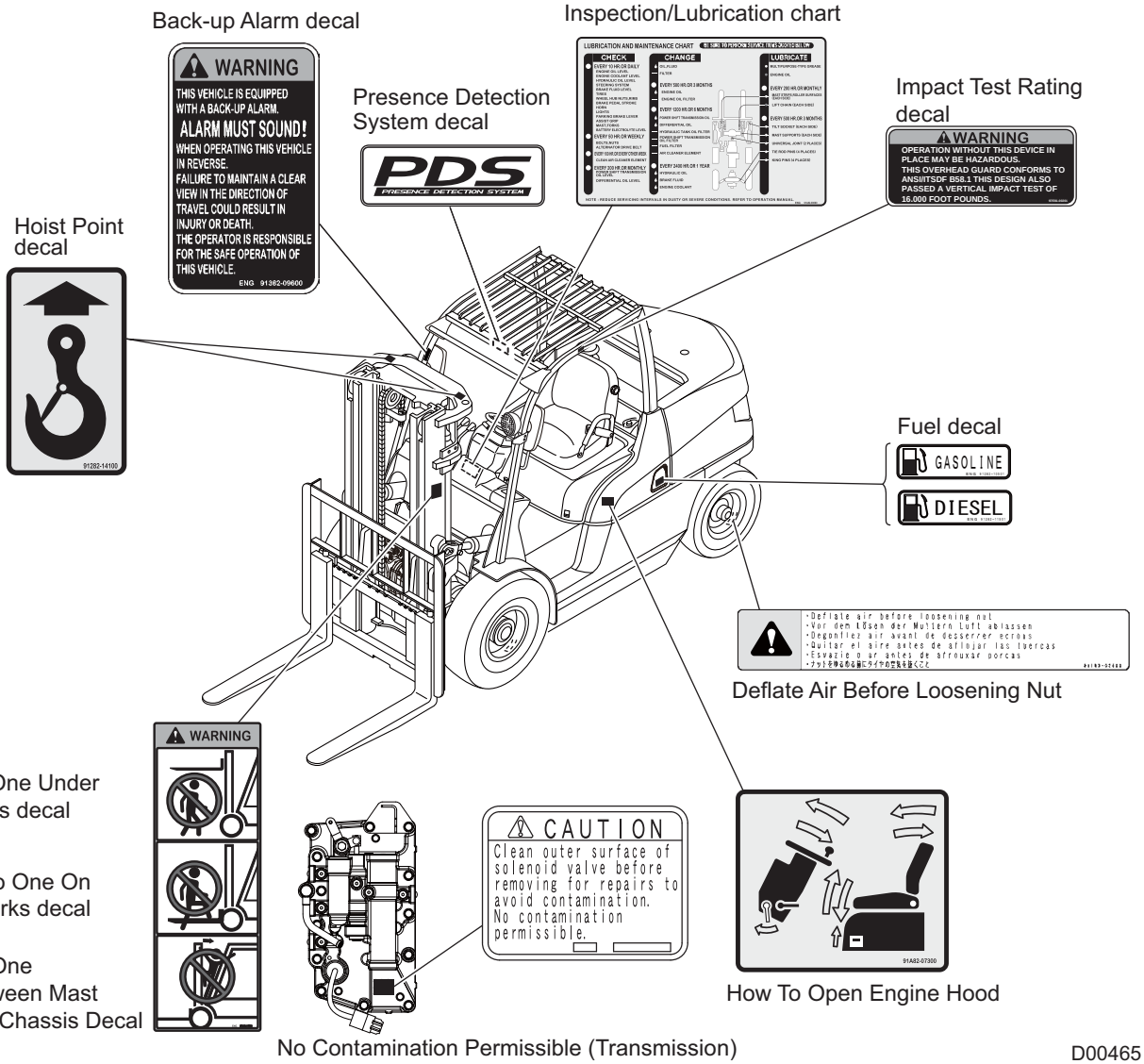
♦ Warning Decals, Location

- There are several specific warning decals on your lift truck. Their exact location and description of the potential hazard are reviewed in this section. Please take the time to familiarize yourself with these decals.
- Make sure you can read all warning and instruction decals. If you cannot, clean or change them. Use a cloth and soap and water to clean them.
- You must change a decal if it is damaged, missing or cannot be read. If a decal is on a part that is changed, make sure a new decal is placed on the new part. Contact your authorized Cat lift truck dealer for new decals.

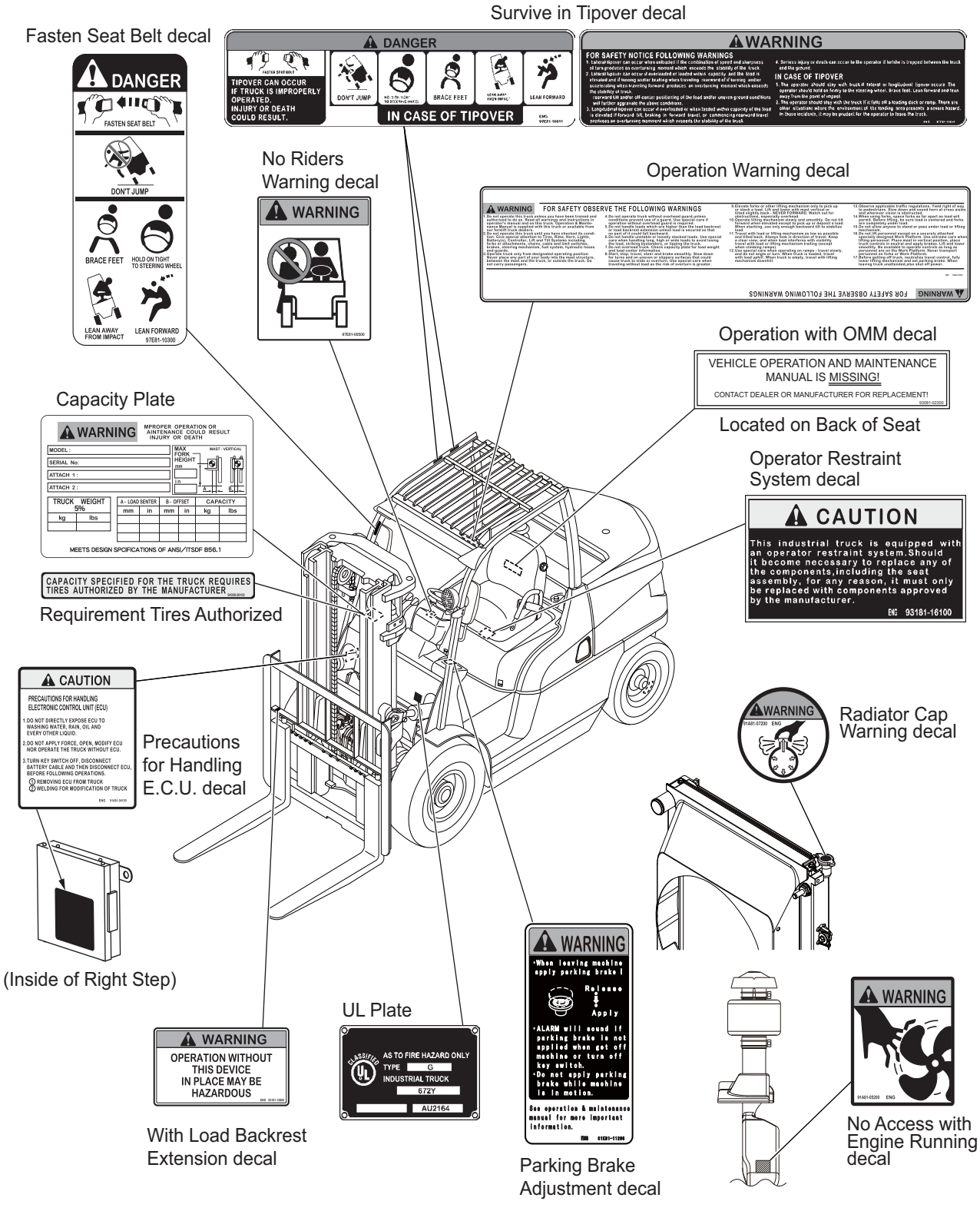


Pinch Point decal

D00408

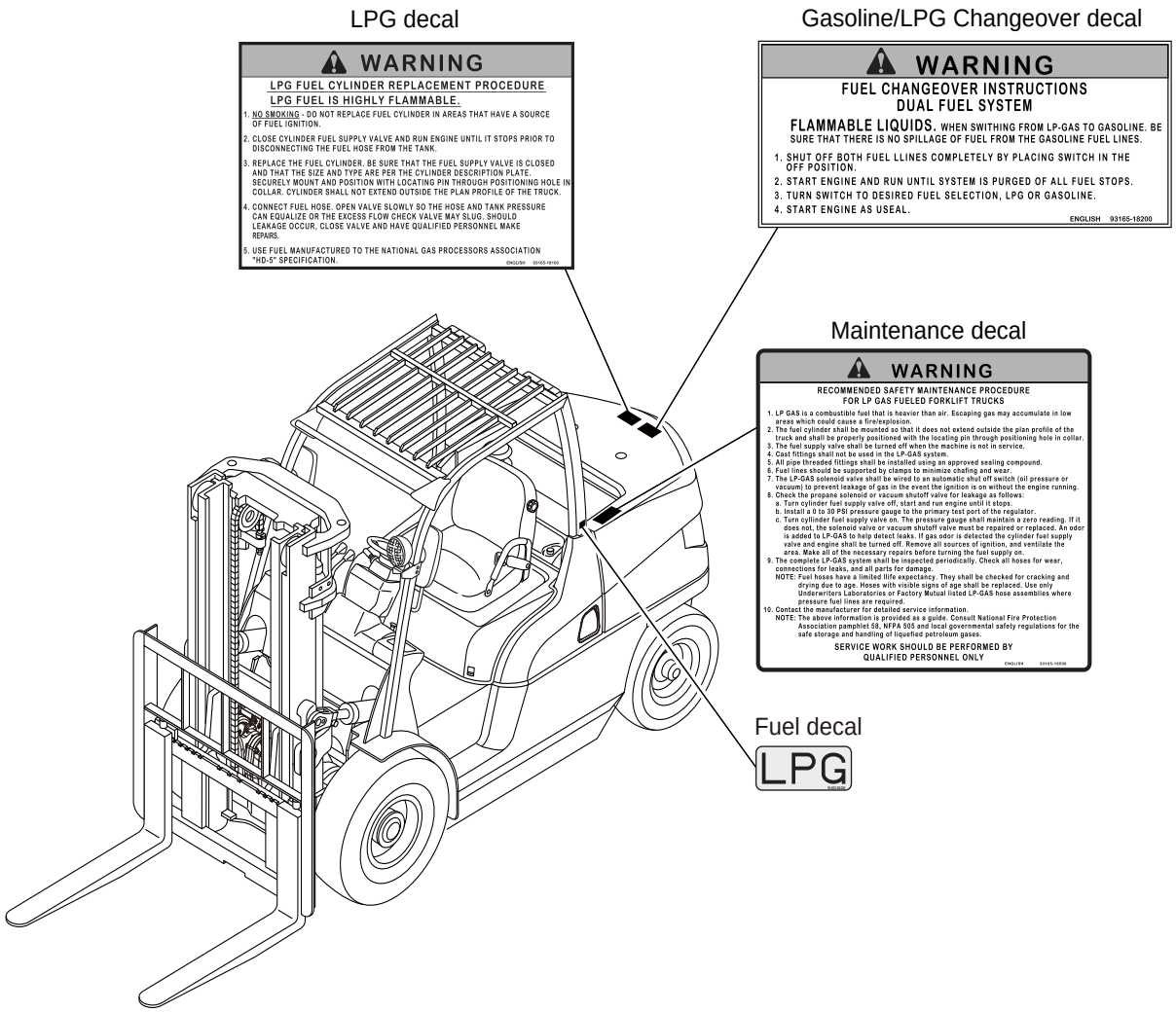


D00465


Fasten Seat Belt decal
DANGER
FASTEN SEAT BELT
DON'T JUMP
BRACE FEET
HOLD ON TIGHT TO STEERING WHEEL
LEAN AWAY FROM IMPACT
LEAN FORWARD
97E81-10300
Survive in Tipover decal
DANGER
TIPOVER CAN OCCUR IF TRUCK IS IMPROPERLY OPERATED. INJURY OR DEATH COULD RESULT.
DON'T JUMP
BRACE FEET
LEAN AWAY FROM IMPACT
LEAN FORWARD
IN CASE OF TIPOVER
WARNING
FOR SAFETY NOTICE FOLLOWING WARNINGS
IN CASE OF TIPOVER
No Riders Warning decal
WARNING
Operation Warning decal
WARNING
FOR SAFETY OBSERVE THE FOLLOWING WARNINGS
Operation with OMM decal
VEHICLE OPERATION AND MAINTENANCE MANUAL IS MISSING!
CONTACT DEALER OR MANUFACTURER FOR REPLACEMENT!
Located on Back of Seat
Capacity Plate
WARNING
IMPROPER OPERATION OR AINTENANCE COULD RESULT INJURY OR DEATH
MODEL :
SERIAL No:
ATTACH 1 :
ATTACH 2 :
MAST : VERTICAL
TRUCK WEIGHT 5%
A - LOAD SENTER
B - OFFSET
CAPACITY
MEETS DESIGN SPCIFICATIONS OF ANSI/ITSDF B56.1
CAPACITY SPECIFIED FOR THE TRUCK REQUIRES TIRES AUTHORIZED BY THE MANUFACTURER
Requirement Tires Authorized
Operator Restraint System decal
CAUTION
This industrial truck is equipped with an operator restraint system.Should it become necessary to replace any of the components,including the seat assembly, for any reason, it must only be replaced with components approved by the manufacturer.
ENG 93181-16100
CAUTION
PRECAUTIONS FOR HANDLING ELECTRONIC CONTROL UNIT (ECU)
1.DO NOT DIRECTLY EXPOSE ECU TO WASHING WATER, RAIN, OIL AND EVERY OTHER LIQUID.
2.DO NOT APPLY FORCE, OPEN, MODIFY ECU NOR OPERATE THE TRUCK WITHOUT ECU.
3.TURN KEY SWITCH OFF, DISCONNECT BATTERY CABLE AND THEN DISCONNECT ECU, BEFORE FOLLOWING OPERATIONS.
① REMOVING ECU FROM TRUCK
② WELDING FOR MODIFICATION OF TRUCK
Precautions for Handling E.C.U. decal
(Inside of Right Step)
WARNING
Radiator Cap Warning decal
WARNING
OPERATION WITHOUT THIS DEVICE IN PLACE MAY BE HAZARDOUS
With Load Backrest Extension decal
UL Plate
CLASSIFIED UL
AS TO FIRE HAZARD ONLY
TYPE G
INDUSTRIAL TRUCK
672Y
AU2164
WARNING
•When leaving machine apply parking brake !
Release
Apply
•ALARM will sound if parking brake is not applied when get off machine or turn off key switch.
•Do not apply parking brake while machine is in motion.
See operation & maintenance manual for more important information.
Parking Brake Adjustment decal
WARNING
No Access with Engine Running decal

D00466

♦ Decals for LPG Fuel and Dual Fuel Only



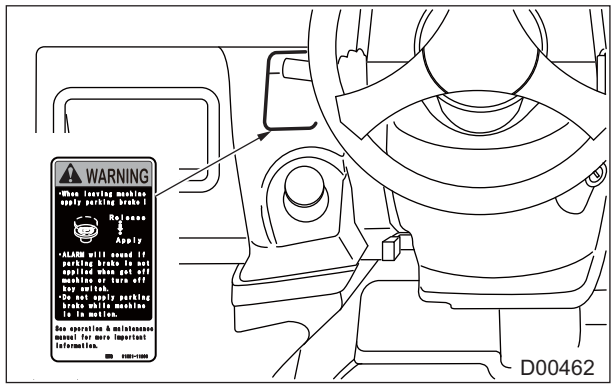
D00470

♦ Warning Decals, Description

•Parking Brake

⚠ WARNING

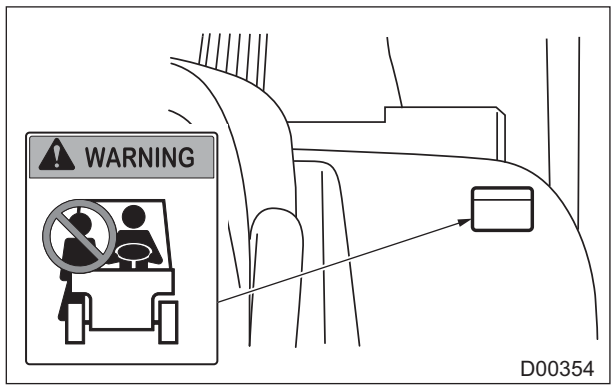
- When leaving machine, apply parking brake!
- ALARM will sound if parking brake is not applied when operator gets off the machine or turns off the key switch.
- Do not apply parking brake while machine is in motion.



•No Rider

⚠ WARNING

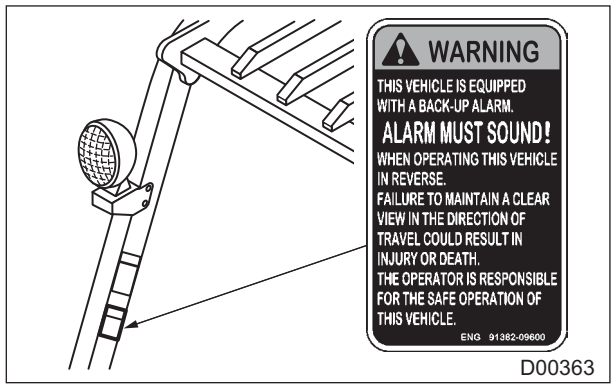
To avoid serious injury, DO NOT carry passengers. This lift truck is designed for only one operator and no riders.



•Back-up Alarm

⚠ WARNING

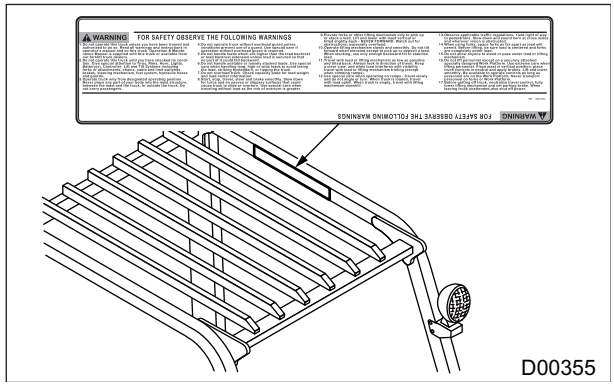
This vehicle is equipped with a back-up alarm. Alarm must activate when operating this vehicle in reverse. Failure to maintain a clear view in the direction of travel could result in injury or death. The operator is responsible for the safe operation of this vehicle.



•For Safety Observe the Following Warnings

⚠ WARNING

1. Do not operate this truck unless you have been trained and authorized to do so. Read all warnings and instructions in operator manual and on this truck. Operation & Maintenance Manual is supplied with this truck or available from our forklift truck dealers.
2. Do not operate this truck until you have checked its condition. Give special attention to Tires, Rims, Horn, Lights, Battery(s), Controller, Lift and Tilt Systems including forks or attachments, chains, cable and limit switches, brakes, steering mechanism, fuel system, hydraulic hoses and guards.
3. Operate truck only from designated operating position. Never place any part of your body into the mast structure, between the mast and the truck, or outside the truck. Do not carry passengers.
4. Do not operate the truck without the overhead guard, unless conditions prevent use of a guard. Use special care if operation without overhead guard is required.
5. Do not handle loads which are higher than the load backrest or load backrest extension unless load is secured so that no part of it could fall backward.
6. Do not handle unstable or loosely stacked loads. Use special care when handling long, high or wide loads to avoid losing the load, striking bystanders, or tipping the truck.
7. Do not overload truck. Check capacity plate for load weight and load center information.
8. Start, stop, travel, steer and brake smoothly. Slow down for turns and on uneven or slippery surfaces that could cause truck to slide or overturn. Use special care when traveling without load as the risk of overturn is greater.
9. Elevate forks or other lifting mechanism only to pick up or stack a load. Lift and lower with mast vertical or tilted slightly back—NEVER FORWARD. Watch out for obstructions, especially overhead.
10. Operate tilting mechanism slowly and smoothly. Do not tilt forward when elevated except to pick up or deposit a load. When stacking, use only enough backward tilt to stabilize load.



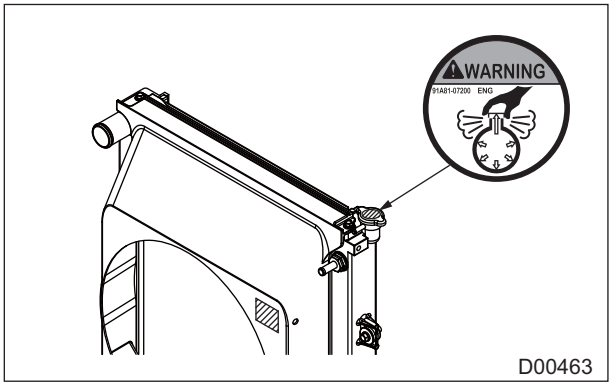
⚠ WARNING

11. Travel with load or lifting mechanism as low as possible and tilted back. Always look in direction of travel. Keep a clear view, and when load interferes with visibility travel with load or lifting mechanism trailing (except when climbing ramps).
12. Use special care when operating on ramps—travel slowly, and do not angle or turn. When truck is loaded, travel with load uphill. When truck is empty, travel with lifting mechanism downhill.
13. Observe applicable traffic regulations. Yield right of way to pedestrians. Slow down and sound horn at cross aisles and wherever vision is obstructed.
14. When using forks, space forks as far apart as load will permit. Before lifting, be sure load is centered and forks are completely under load.
15. Do not allow anyone to stand or pass under load or lifting mechanism.
16. Do not lift personnel except on a securely attached specially designed Work Platform. Use extreme care when lifting personnel. Place mast in vertical position, place truck controls in neutral and apply brakes. Lift and lower smoothly. Be available to operate controls as long as personnel are on the Work Platform. Never transport personnel on forks or Work Platform.
17. Before getting off truck, neutralize travel control, fully lower lifting mechanism and set parking brake. When leaving truck unattended, also shut off power.

•Radiator Cap

⚠ WARNING

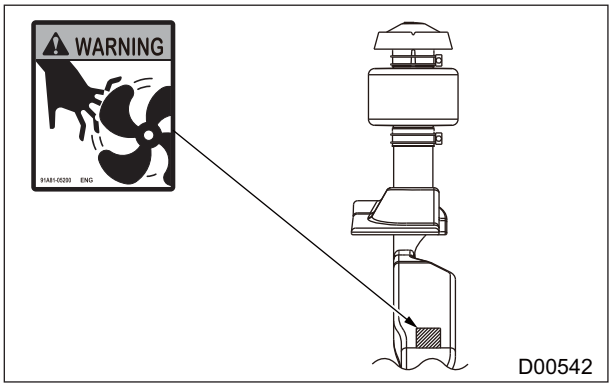
Check the coolant level only after the engine has been stopped and the filler cap is cool enough to touch with your hands. Remove the filler cap slowly to relieve pressure.



•Cooling Fan

⚠ WARNING

To avoid serious injury, stay clear of the moving fan.



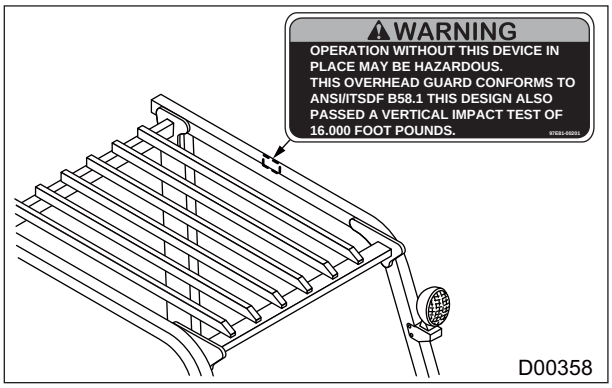
•Overhead Guard

⚠ WARNING

Operation without this device in place could be hazardous.

⚠ WARNING

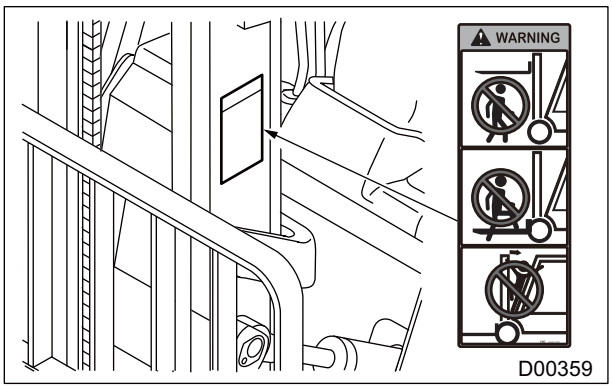
DO NOT remove the overhead guard.



•No One under / on Forks

⚠ WARNING

- DO NOT stand or ride on the forks.
- DO NOT stand or ride on a load or pallet on the forks.
- DO NOT stand or walk under the forks.
- DO NOT place any part of your body between the mast and the lift truck chassis.



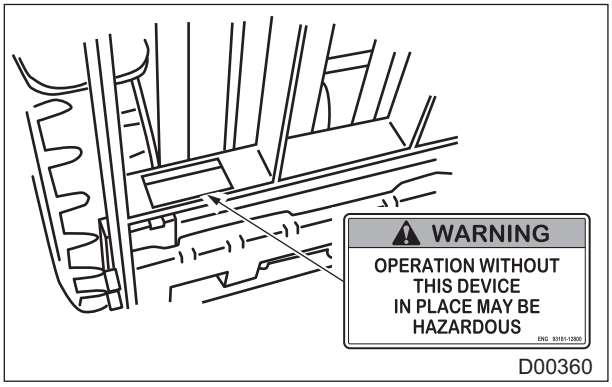
•Load Backrest Extension

⚠ WARNING

Operation without this device in place could be hazardous.

⚠ WARNING

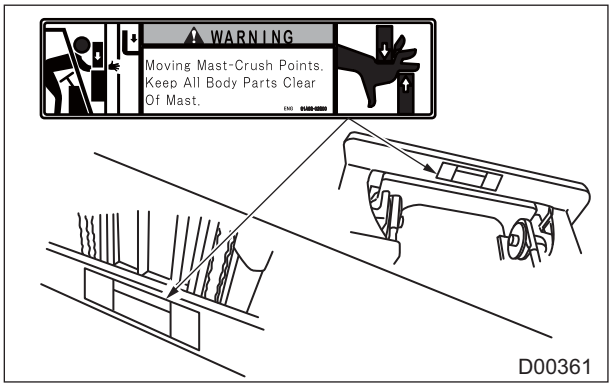
DO NOT remove the load backrest extension.



•Crush and Pinch Points

⚠ WARNING

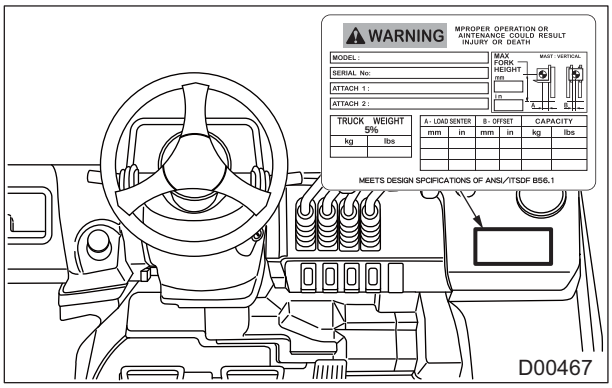
Moving Mast—Crush Points.
Keep All Body Parts Clear of Mast.



•Capacity Plate

⚠ WARNING

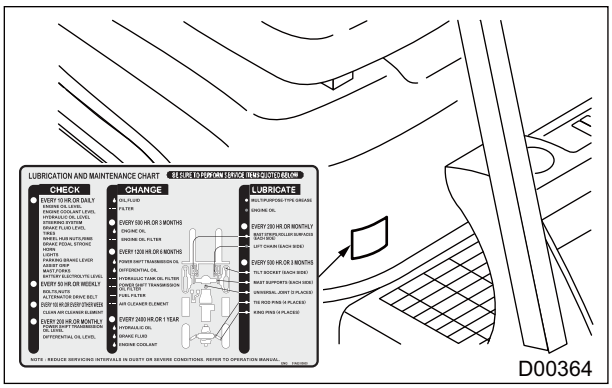
Improper operation or maintenance could result in injury or death. DO NOT operate or work on the lift truck unless you are properly trained.



•Inspection / Lubrication Chart

⚠ WARNING

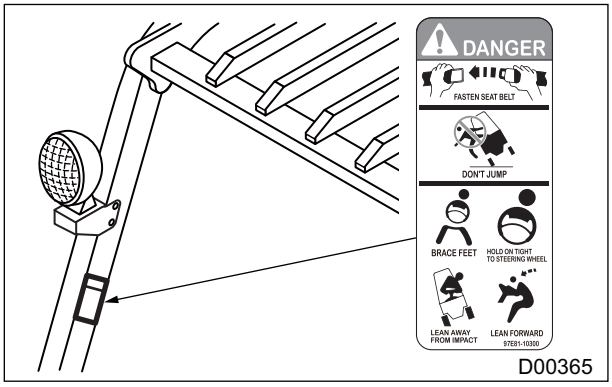
Improper operation or maintenance could result in injury or death. DO NOT operate or work on the lift truck unless you are properly trained.



•Tipover Warnings

⚠ DANGER

Tipover could occur if truck is improperly operated. Injury or death will result.



Located inside the frame member of the overhead guard.

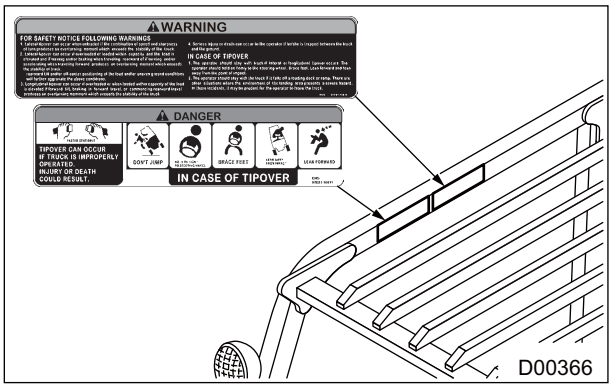
⚠ WARNING

FOR SAFETY NOTICE the FOLLOWING WARNINGS

1. Lateral tipover can occur when unloaded if the combination of speed and sharpness of turn produces an overturning moment which exceeds the stability of the truck.
2. Lateral tipover can occur if overloaded or loaded within capacity and the load is elevated and if turning and/or braking when traveling rearward or if turning and/or accelerating when traveling forward produces an overturning moment which exceeds the stability of the truck.

   - Rearward tilt and/or off-center positioning of the load and/or uneven ground conditions will further aggravate the above conditions.

3. Longitudinal tipover can occur if overloaded or when loaded within capacity of the load is elevated if forward tilt, braking in forward travel, or commencing rearward travel produces an overturning moment which exceeds the stability of the truck.
4. Serious injury or death can occur to the operator if he/she is trapped between the truck and the ground.



⚠ WARNING

IN CASE OF TIPOVER

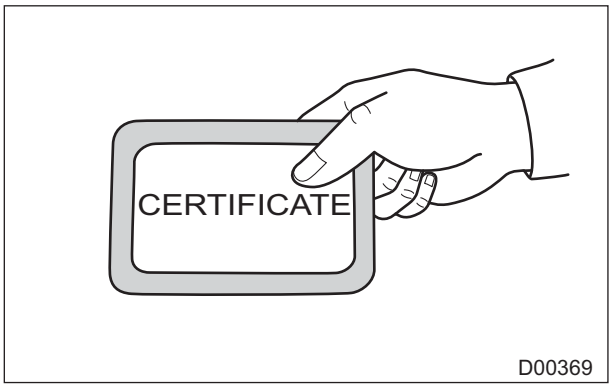
1. The operator should stay with truck if lateral or longitudinal tipover occurs. The operator should hold on firmly to the steering wheel, brace feet, lean forward and lean away from the point of impact.
2. The operator should stay with the truck if it falls off a loading dock or ramp. There are other situations where the environment of the landing area presents a severe hazard. In those incidents, it may be prudent for the operator to leave the truck.

♦ Safety Rules

Authorized and trained operators only!

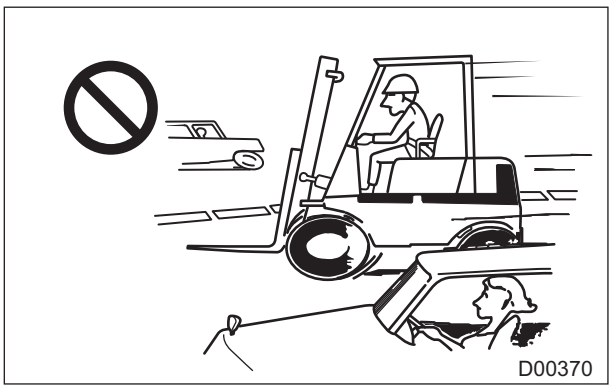
⚠ WARNING

DO NOT operate this lift truck unless you have a certificate for operating this type of lift truck and have the ability to operate the lift truck safely.



⚠ WARNING

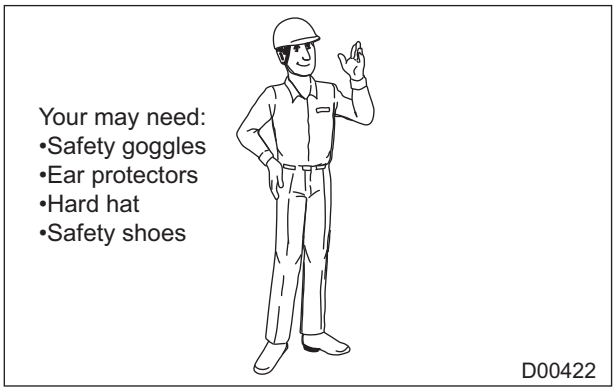
DO NOT travel on public roads.



Dress properly for the job!

⚠ WARNING

DO NOT wear loose clothing or accessories—loose cuffs, dangling chains, necktie, scarves, or rings—that could catch in moving parts.
Wear personal protective equipment appropriate for the conditions of your work places.



⚠ WARNING

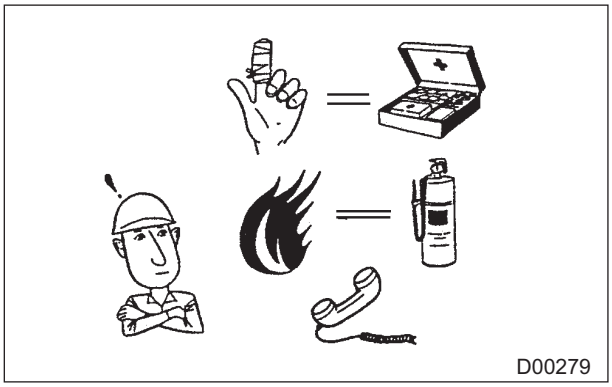
DO NOT perform the following which could affect safe operation!

- Inattentive driving
- Drowsy driving
- Listening to music through a headset
- Drinking and eating
- Smoking
- Using a cell-phone

Always be alert!

⚠ WARNING

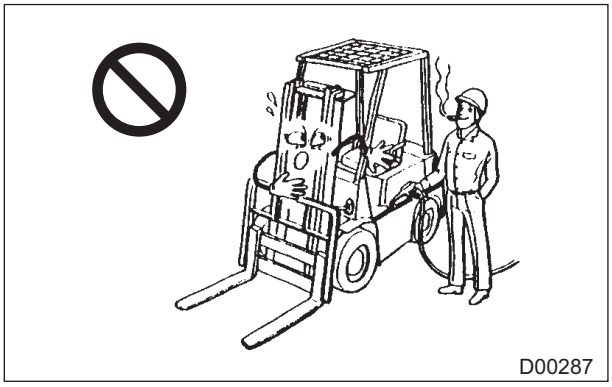
Know how to use a first aid kit and a fire extinguisher—and where to get prompt assistance.



No smoking while refueling!

⚠ WARNING

DO NOT fill the fuel tank while the engine is running or the operator is on the lift truck. Keep away from flames or spark sources. Turn off all electrical switches on the lift truck. Pump fuel in a well-ventilated area.



Know all signals and traffic rules!

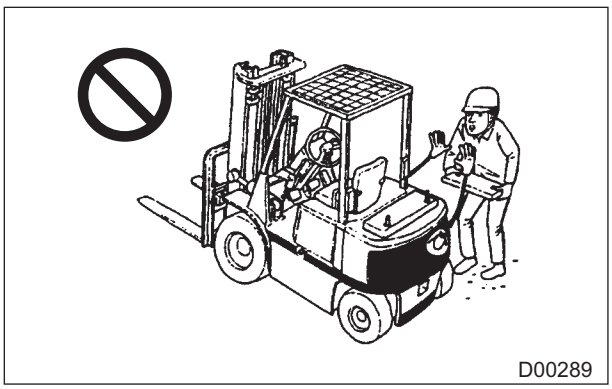
⚠ WARNING

Know who is responsible for signaling. Learn to tell at a glance what the signal means, and what action you must take.

Unauthorized addition or modification is prohibited!

⚠ WARNING

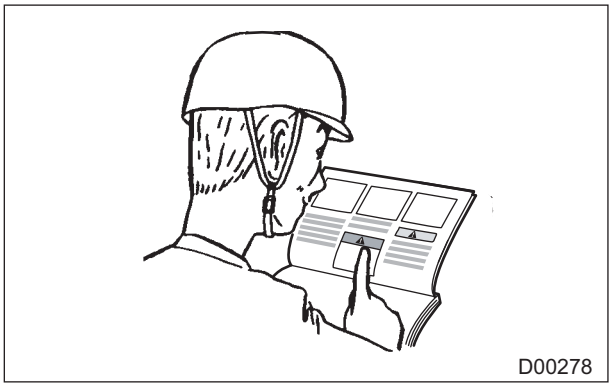
DO NOT add to or modify the lift truck unless authorized in writing by the manufacturer to do so. Any changes approved by the manufacturer requires a new capacity plate and decals after modification.



Know the lift truck and attachments!

⚠ WARNING

Read and understand the operating, inspection and maintenance instructions in the Operation & Maintenance Manual and the decals on the lift truck.



Avoid being splashed by scalding hot coolant!

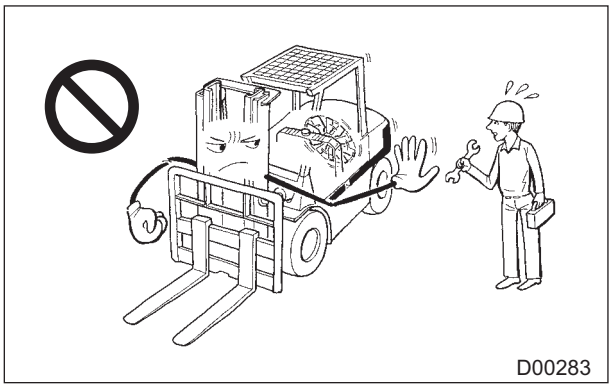
⚠ WARNING

Wait until the engine cools before opening or loosening the radiator cap. If you cannot wait, use a heavy cloth and gloves to protect yourself. Stand to the side, protect your face, and slowly loosen cap.

Turn OFF the key switch before servicing!

⚠ WARNING

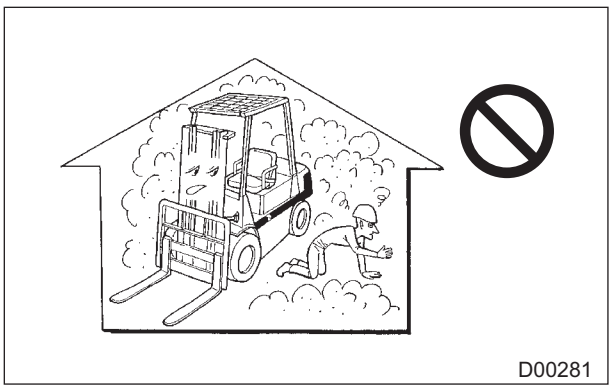
DO NOT service this lift truck while engine is running unless absolutely necessary.



Lift truck exhaust fumes contain carbon monoxide and could kill you!

⚠ WARNING

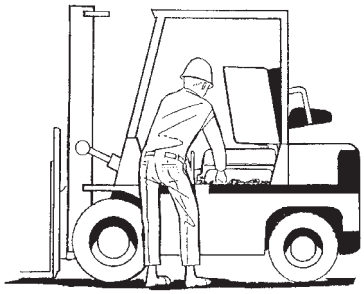
DO NOT operate the lift truck in an enclosed area, without adequate ventilation.



Inspect the lift truck prior to operation!

⚠ WARNING

At the beginning of each shift, fill out a daily inspection sheet. Defects when found must be immediately reported and corrected before operating the lift truck, or the lift truck must be taken out of service.

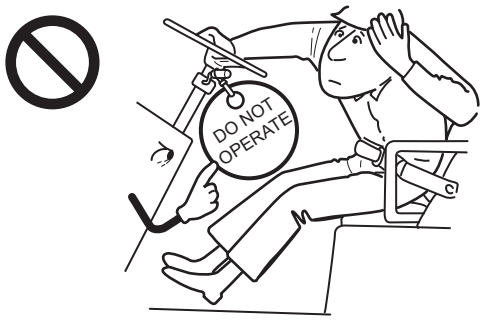


D00284

DO NOT operate an unsafe lift truck!

⚠ WARNING

If the lift truck has a "DO NOT OPERATE" or similar warning tag, the lift truck must not be operated until it has been restored to safe operating conditions. Inspect the lift truck before you operate it.



D00372

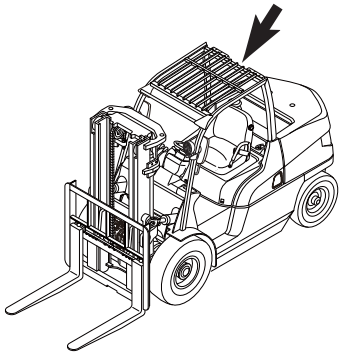
⚠ WARNING

DO NOT operate the lift truck if you are pregnant or have suffered an abdominal disease or injury.

DO NOT remove the overhead guard!

⚠ WARNING

The overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.

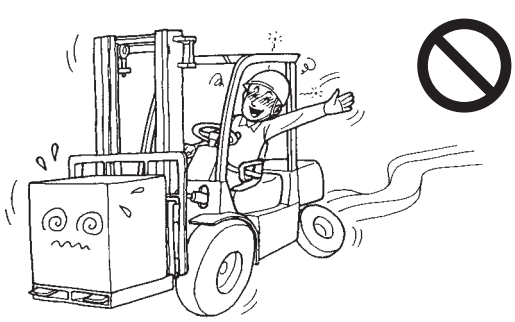


D00469

DO NOT operate the lift truck under the influence of drugs or alcohol!

⚠ WARNING

Always stay healthy on the job. Operators of lift trucks must be qualified as to visual, auditory, physical, and mental ability to operate the lift truck safely.

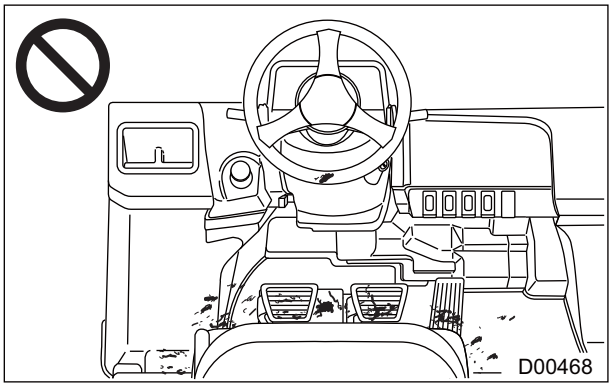


D00282

Keep the operator compartment clean!

⚠ WARNING

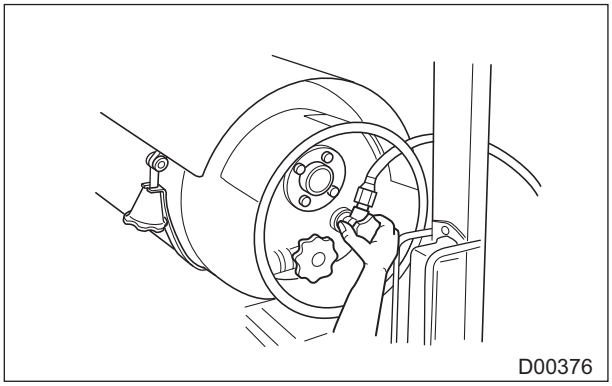
Keep your hands and shoes, as well as the floor and controls (steering wheel, levers and pedals) clean and free of grease, mud and other materials. A slip could cause an accident.



LP-Gases are flammable.

⚠ WARNING

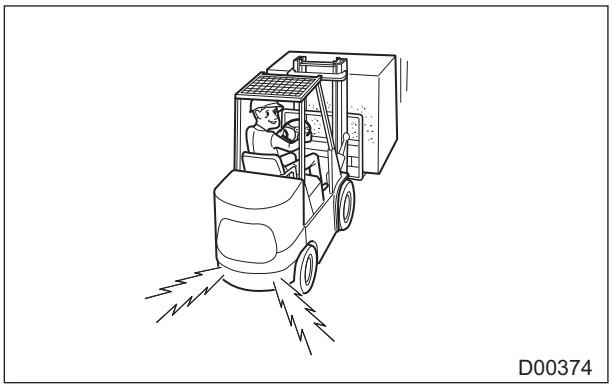
DO NOT attempt to exchange or refill a LP-Gas tank unless you are trained and authorized to do so.



The back-up alarm must activate when traveling in reverse!

⚠ WARNING

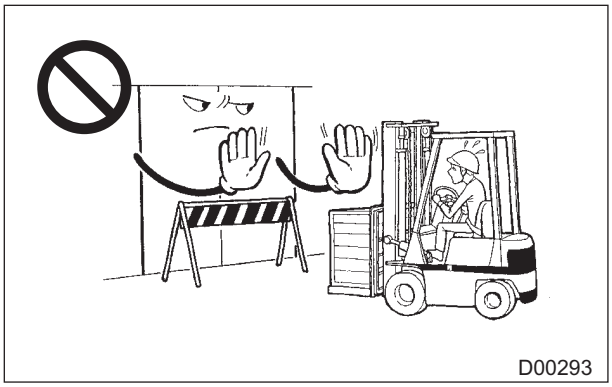
Make sure the back-up alarm is in working order. The horn can also be used to alert other lift trucks or pedestrians when traveling in reverse. Always look in the direction of travel.



Operate only in approved areas!

⚠ WARNING

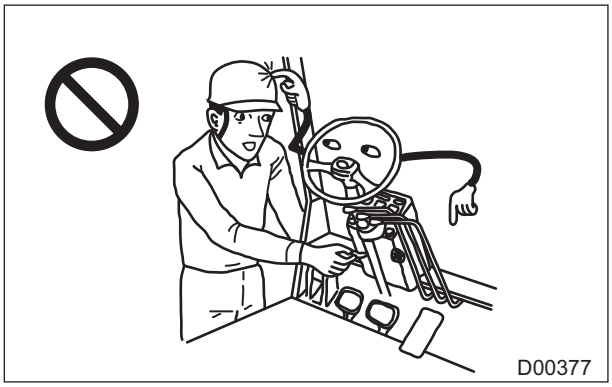
Certain areas such as those containing hazardous flammable gases, liquid or other combustibles require a Safety Rated truck, if your lift truck is not Safety Rated, the area must be avoided.



Sit in the operator seat when starting the engine!

WARNING

Start the engine only when seated in the normal operating position.



DO NOT operate a damaged or defective lift truck!

WARNING

If the lift truck is damaged, take it out of service until it has been restored to safe operating conditions. Park it in a non-operating area and remove the key. Attach a "DO NOT OPERATE" or similar warning tag to the lift truck.

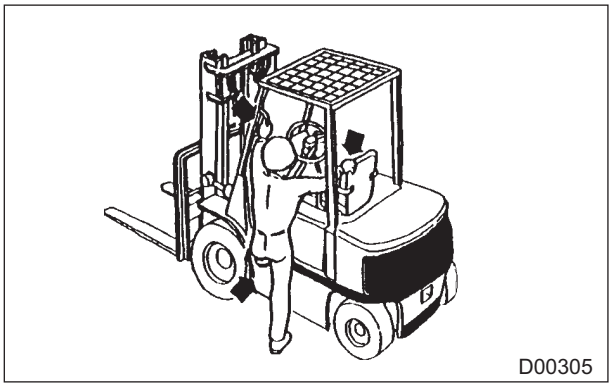
Contact your authorized Cat lift truck dealer for repairs.

Face the lift truck when mounting and dismounting!

⚠ WARNING

Maintain a three point contact (one foot and two hands) with the floor and handholds.

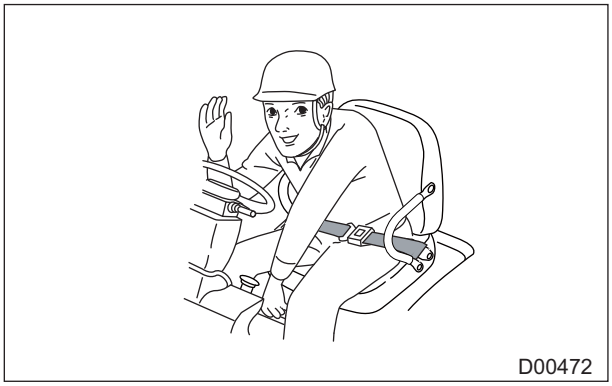
- DO NOT get on or off the moving lift truck.
- DO NOT jump on or off the lift truck.
- DO NOT use the control levers or steering wheel as handholds when entering or leaving the operator compartment.
- DO NOT get on or off the right side of the lift truck.



Adjust the operator seat before operating the lift truck!

⚠ WARNING

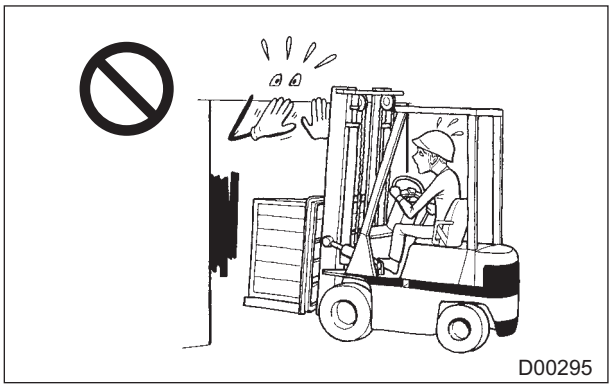
DO NOT adjust the operator seat while the lift truck is in motion.



Always check overhead clearance!

⚠ WARNING

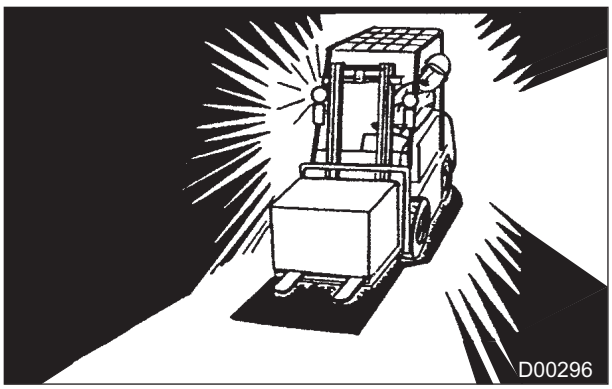
Serious accidents and damages could be caused by the mast and overhead guard hitting pipes, beams or other overhead obstructions. Watch out for power lines.



Use lights in dark, dim areas!

⚠ WARNING

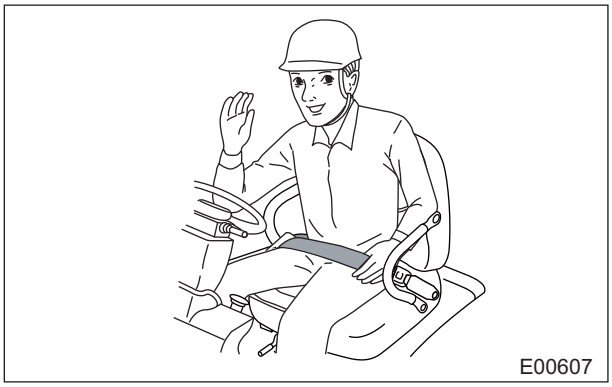
Even with lights on, DO NOT assume people see you and will move out of your way.



When operating the lift truck, BE SURE to fasten the seat belt!

⚠ WARNING

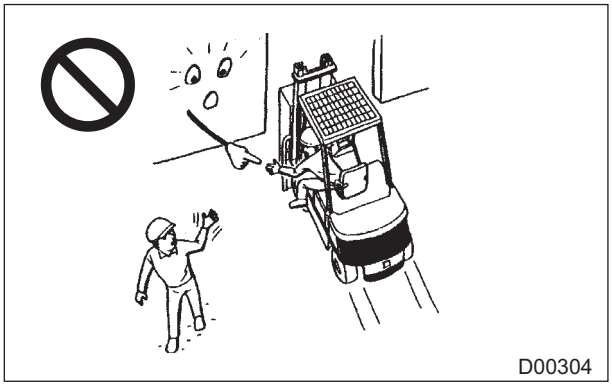
If not, the operator could be thrown out of the lift truck or crushed under the lift truck.



Stay within the confines of the lift truck!

⚠ WARNING

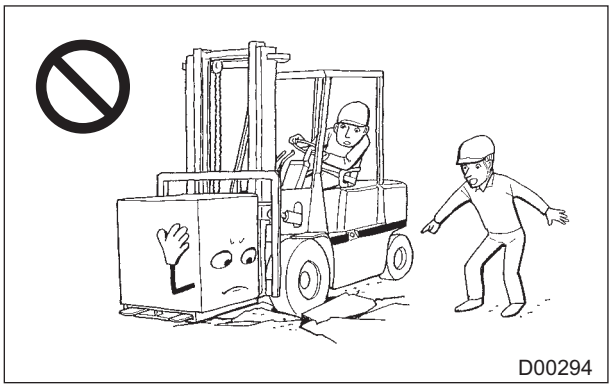
Keep your hands and feet inside the operator compartment. DO NOT put any part of the body outside the operator compartment of the lift truck.



Always be aware of floor capacity!

⚠ WARNING

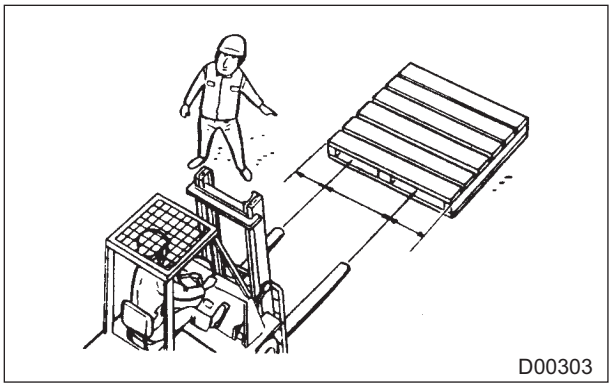
Make sure the floor will support the weight of the loaded lift truck.



Avoid off-center loading!

⚠ WARNING

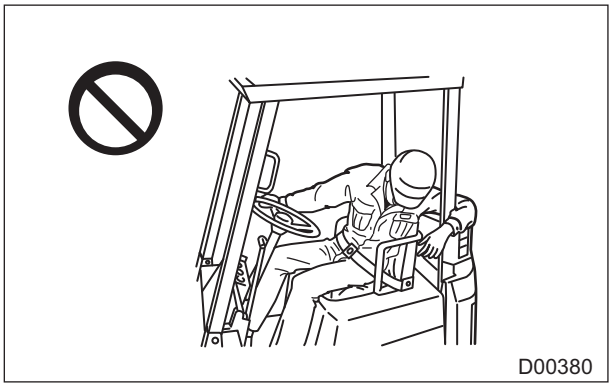
Set the forks as far apart as possible for maximum support of the pallet or load. Too small of a fork spread could cause instability of the load. DO NOT pick up an off-center load.



Stay under the overhead guard!

⚠ WARNING

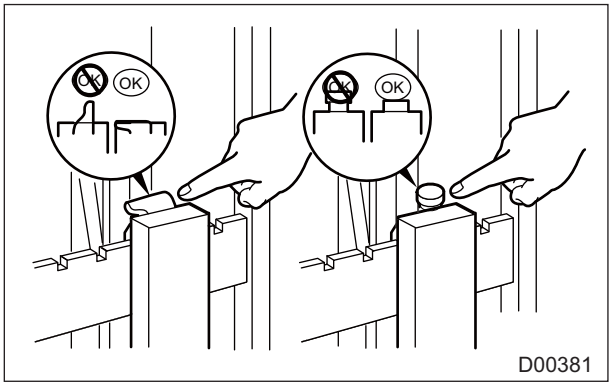
DO NOT hold on to the overhead guard.



Check fork locking pins for engagement!

⚠ WARNING

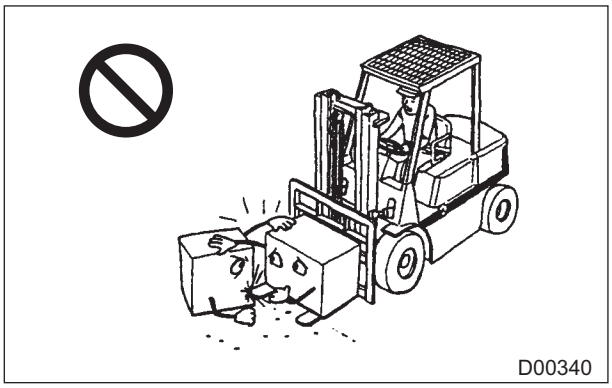
If the fork locking pins are not properly engaged, nor in good repair, the forks could shift and cause off-center or unstable loads.



Be careful of forks that extend beyond the load!

⚠ WARNING

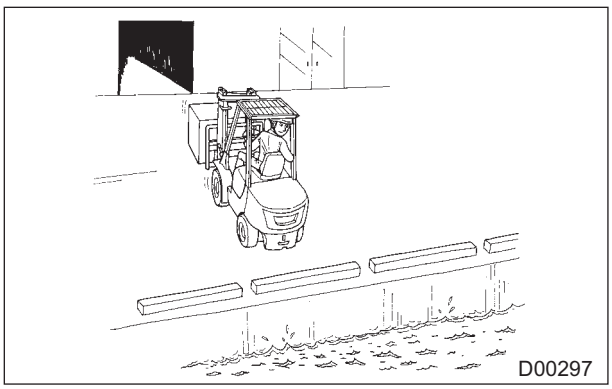
If the forks extend beyond the load, use extra caution. Make sure the fork tips do not contact other material.



Check work places for high risk!

⚠ WARNING

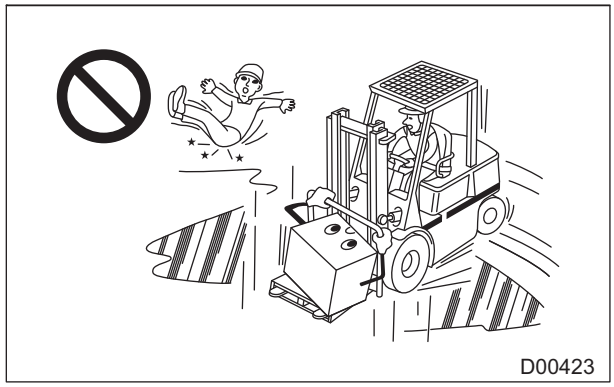
When working on docks, ramps, platforms and other high risk areas, use adequate blocks to reduce the risk of the lift truck from falling off.



Slow down for wet and slippery surfaces!

⚠ WARNING

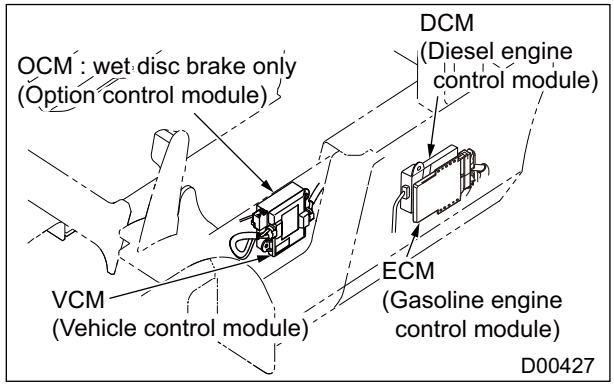
- Loose or slippery materials such as sand, gravel, ice, mud, etc., on your operating surfaces could cause a skid or tipover.
- Avoid these conditions or slow down.
- Keep your operating surfaces clean and dry at all times.
- Wet spots could cause a skid or tipover. You need a greater stopping distance on wet surfaces.
- Apply brakes earlier on slippery surfaces than on dry surfaces. DO NOT drive into a flooded area.



Precautions when handling controllers and sensors!

⚠ CAUTION

- DO NOT allow washing water, rain, oil or any other liquid on controllers and their related sensors.
- DO NOT apply force, open or modify controllers or operate the lift truck without controllers.
- Before conducting the following operations, be sure to turn off the key switch and disconnect battery cables and controller connections:
  - Removing controllers from the lift truck.
  - Factory-approved welding.

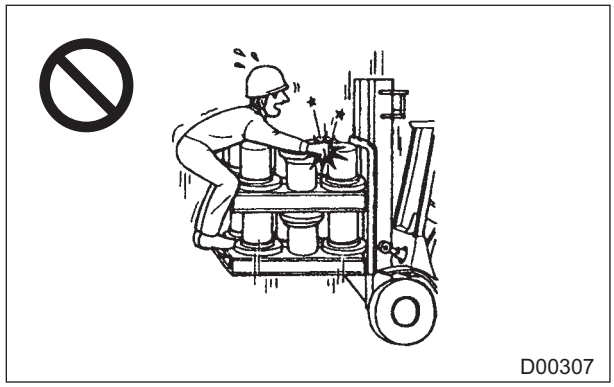


Note:
Also keep the above CAUTION for the input and output unit of FC model and the related sensors. (For use with FC model)

♦ Operating Precautions

⚠ WARNING

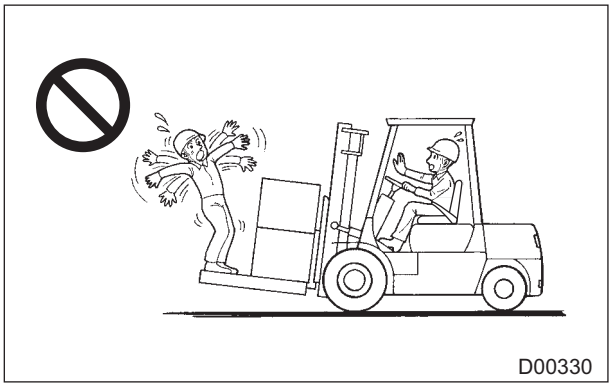
DO NOT allow anyone to hold loads.



DO NOT allow any riders!

⚠ WARNING

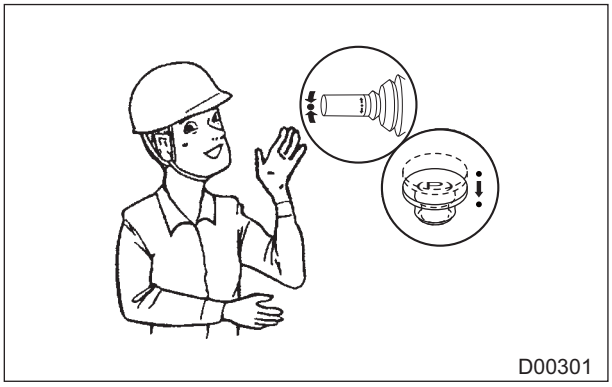
DO NOT allow anyone to ride on the forks or on any other part of the lift truck at any time.



Position levers correctly for starting!

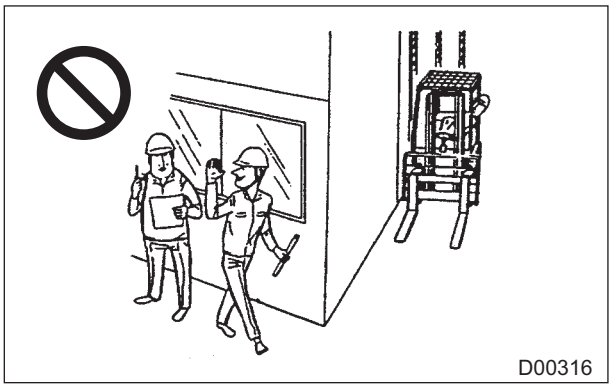
⚠ WARNING

Make sure the direction lever is in the NEUTRAL position and push the parking brake switch to the applied position.



⚠ WARNING

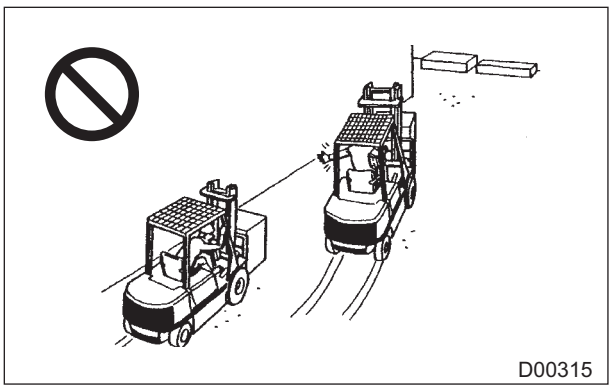
The operator is required to slow down and activate the horn at cross aisles and other locations where vision is obstructed.



DO NOT pass another lift truck!

⚠ WARNING

DO NOT pass another lift truck traveling in the same direction at intersections, blind spots or at other dangerous locations.



DO NOT engage in stunt driving or horse-play!

⚠ WARNING

Stunt driving and horseplay is hazardous for both the lift truck operator and fellow workers.

Take care when turning with a load!

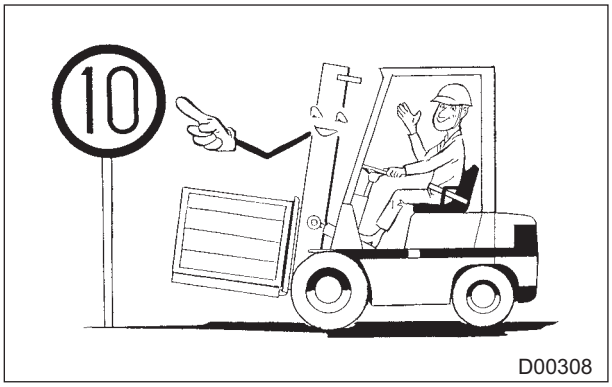
⚠ WARNING

- When operating with a load, the load or tip of the forks are hard to see.
- If operated carelessly, the load or forks could collide with nearby objects.
- When taking a turn while operating in reverse with a load, always pay attention to the position of the load.
- If not, the load could collide with nearby objects.

Obey all traffic regulations and warning signs, including authorized facility speed limits!

⚠ WARNING

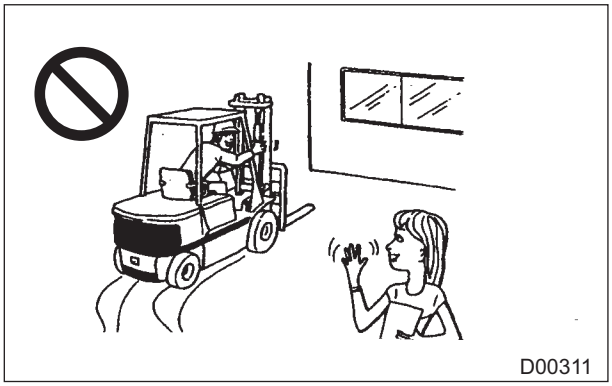
A safe distance must be maintained approximately three lift truck lengths from the lift truck ahead, and the lift truck must be kept under control at all times. Use special care when traveling without a load as the risk of tipover is greater.



Always look in the direction of travel!

⚠ WARNING

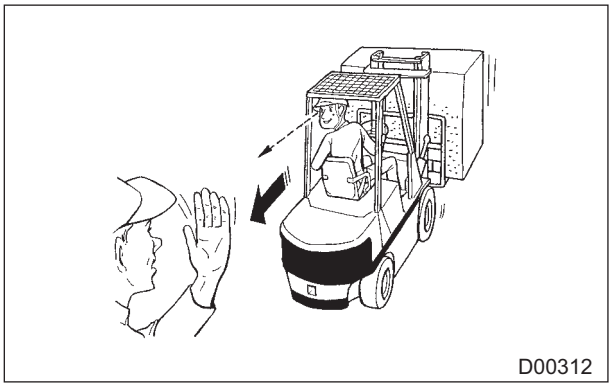
Always be aware of people near your lift truck. DO NOT proceed until they are at a safe distance and are aware of you.



Travel in REVERSE if forward visibility is blocked!

⚠ WARNING

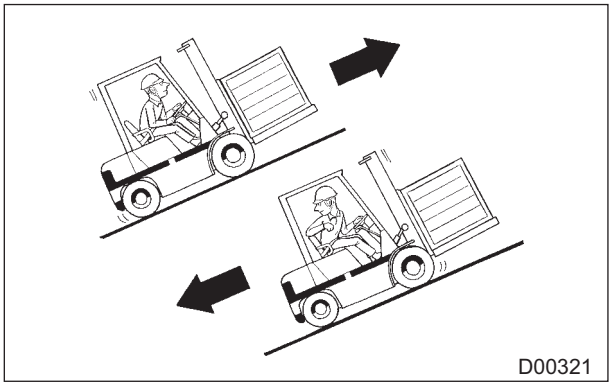
For better visibility with large loads, travel in reverse, but always keep a lookout in the direction of travel.



Travel safely on grades with a loaded lift truck!

⚠ WARNING

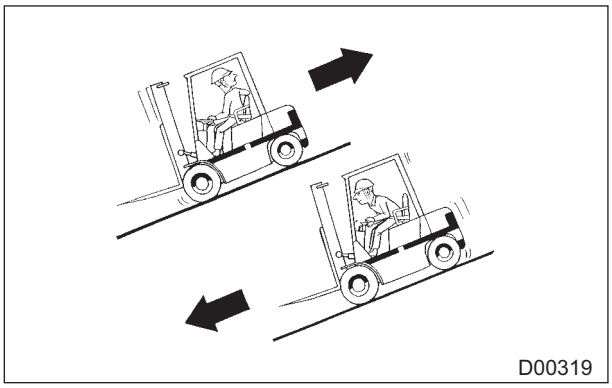
When ascending or descending grades in excess of 5%, loaded lift trucks must be driven with the load upgrade.



Travel safely on grades with an empty lift truck!

⚠ WARNING

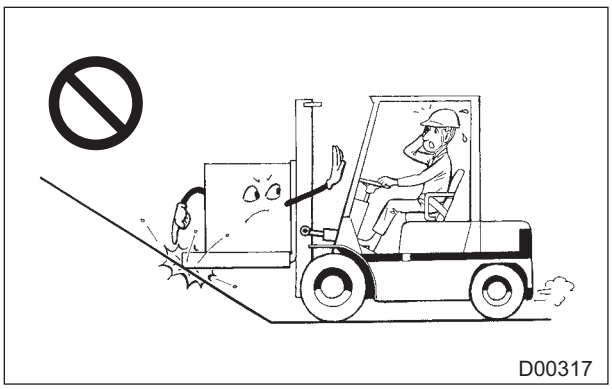
Unloaded lift trucks must be operated on all grades with the forks downgrade.



Be particularly careful when driving up or down a steep slope!

⚠ WARNING

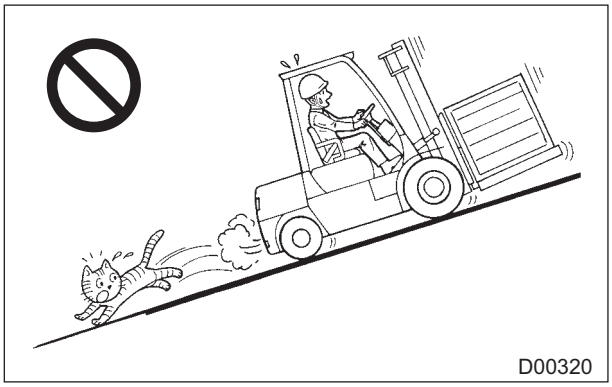
Use extreme care to reduce the risk of fork tips or the bottom of the pallet from touching the ground.



Starting the lift truck on an upgrade carefully!

⚠ WARNING

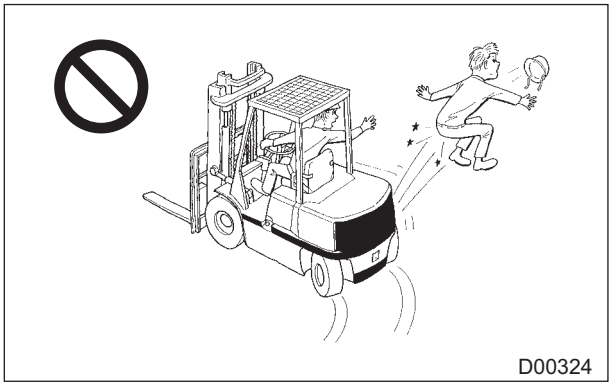
When starting the lift truck on an upgrade, BE SURE to use the parking brake.



Be careful of rear end swing when turning while operating with load end leading!

⚠ WARNING

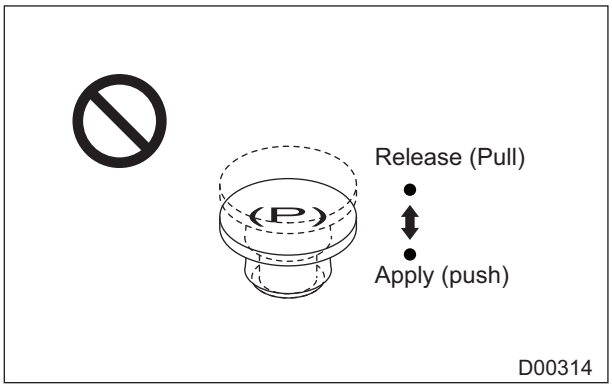
Make sure that personnel stand clear of the rear swing area before conducting turning maneuvers.



DO NOT operate the parking brake switch during driving!

⚠ WARNING

DO NOT apply the parking brake during driving.



DO NOT operate the lift truck under windy conditions!

⚠ WARNING

Lift truck operation under a windy condition could worsen the following situations:

- Fall of a load from the forks
- Tipover of the lift truck

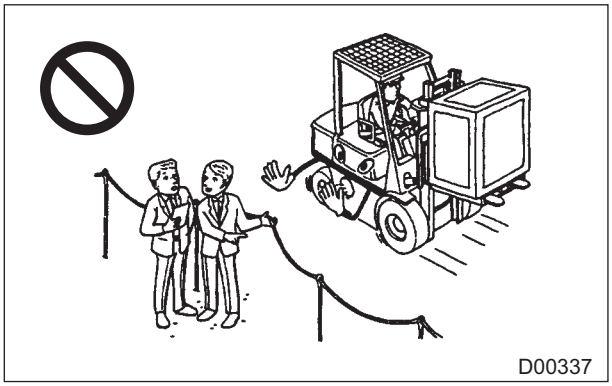
Be sure to operate the lift truck after the wind dies down.

♦ Working Precautions

Keep out!

⚠ WARNING

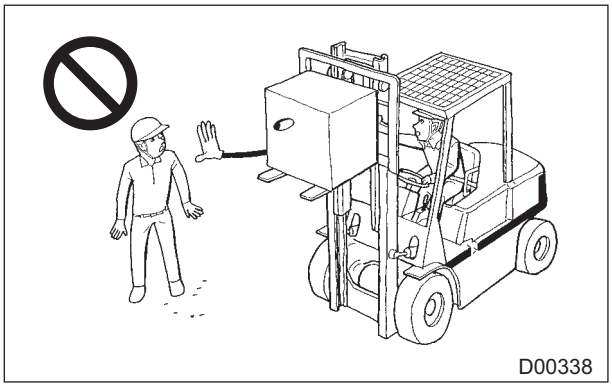
DO NOT allow any unauthorized persons in the work area where the lift truck is operated.


D00337

A helper must NOT be near the lift truck!

⚠ WARNING

Personnel must be clear of the lift truck operating area.


D00338

Be careful of changes in capacity!

⚠ WARNING

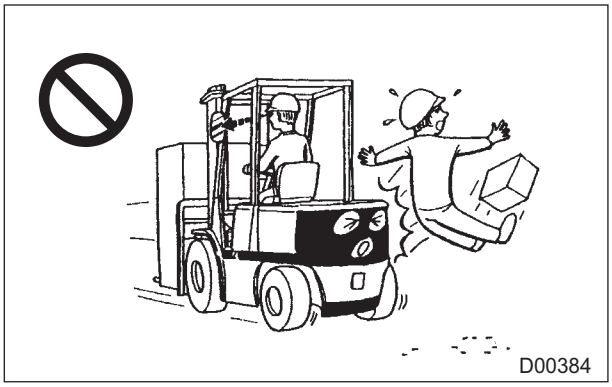
Know the capacity when attachments are used. Extra care must be taken in securing, manipulating, positioning, and transporting the load. Operate a lift truck equipped with attachments as a partially loaded lift truck when not handling a load.


D00334

Watch out for pedestrians at all times!

⚠ WARNING

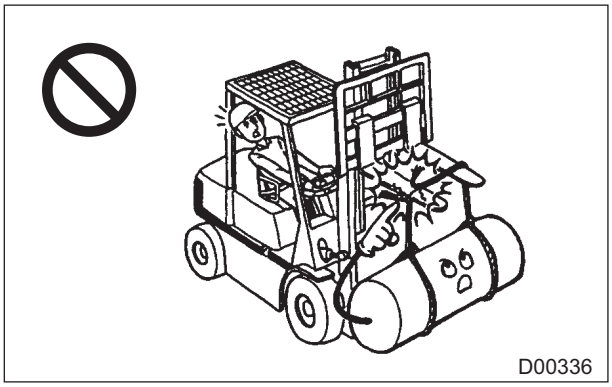
Yield the right-of-way to pedestrians at all times.


D00384

Use the proper attachment!

⚠ WARNING

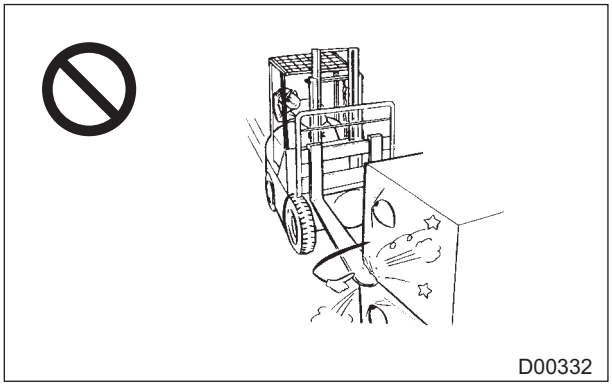
When lifting a load, use the proper attachment designed for the load. DO NOT operate at high speeds.



DO NOT speed when approaching loads!

⚠ WARNING

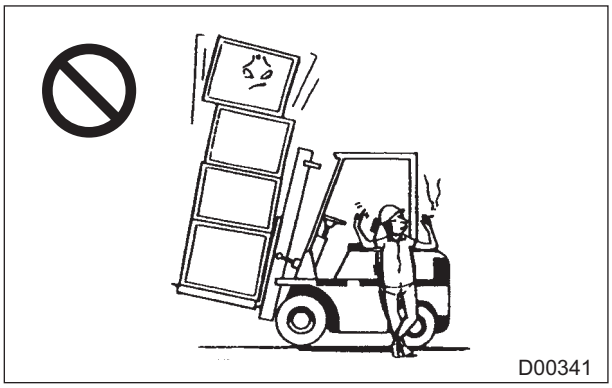
Approach the load carefully at slow speeds.



Ensure the load isn't too high!

⚠ WARNING

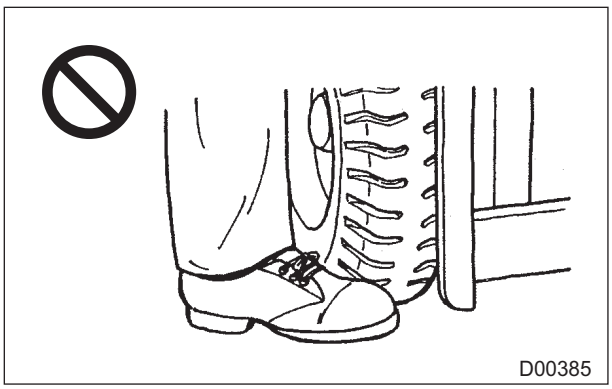
DO NOT pick up unsecured loads that extend above the load backrest extension height.



DO NOT move when someone's next to the lift truck!

⚠ WARNING

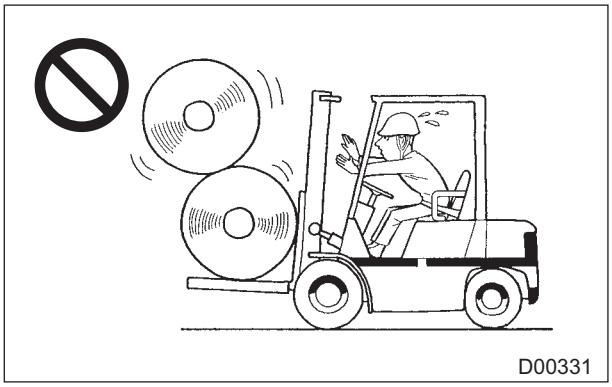
If someone is standing next to the lift truck, DO NOT proceed until they are a safe distance away. DO NOT assume that people are aware of you and will move out of your way.



Handle only stable and safely arranged loads!

⚠ WARNING

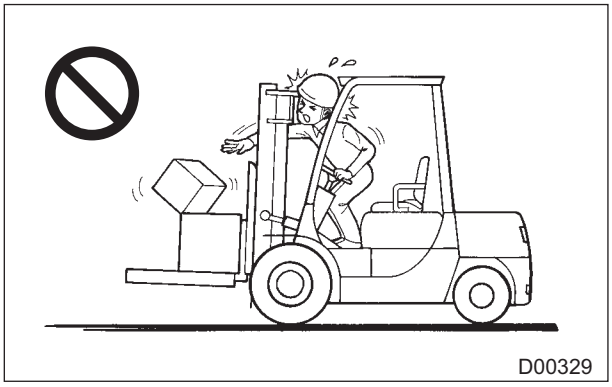
If a load is unstable, it could easily shift and fall on someone.



Stay clear of pinch points!

⚠ WARNING

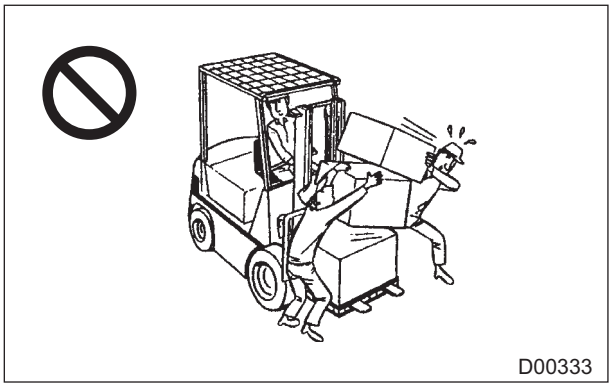
Keep all parts of your body away from moving parts such as the mast, carriage and attachments. DO NOT place any part of your body between the overhead guard and the mast. If the mast moves unexpectedly, you could get caught between the mast and overhead guard and a serious accident could occur.



DO NOT allow unloading from raised loads!

⚠ WARNING

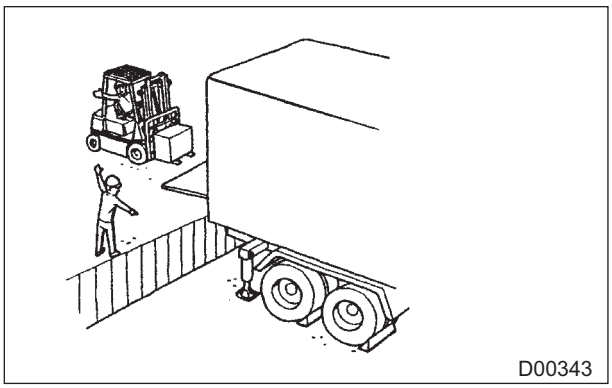
Failure to follow these rules could cause serious injury.



Inspect a trailer before entering!

⚠ WARNING

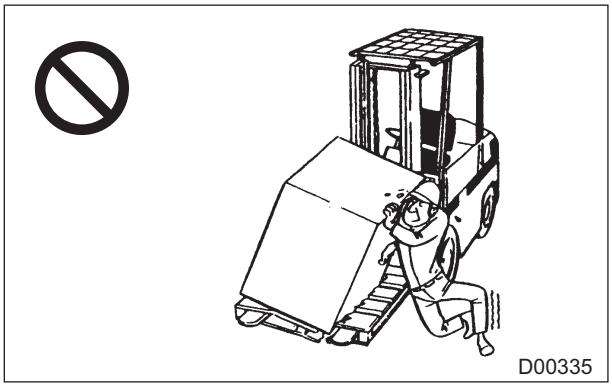
The brakes on the highway trucks or trailers must be applied, and wheel chocks or other positive mechanical means must be used to prevent unintentional movement of highway trucks and trailers.



DO NOT use damaged pallets!

⚠ WARNING

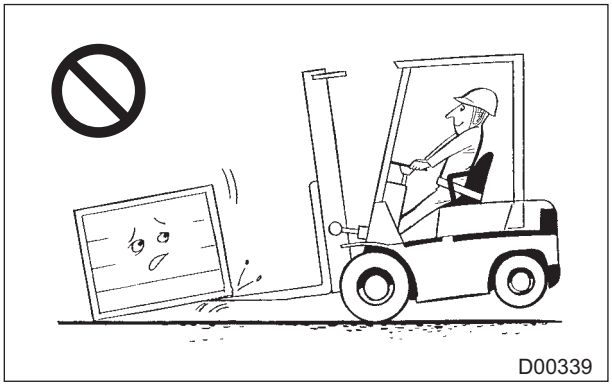
Make sure pallets and skids are sturdy and in safe operating conditions.



DO NOT abuse forks!

⚠ WARNING

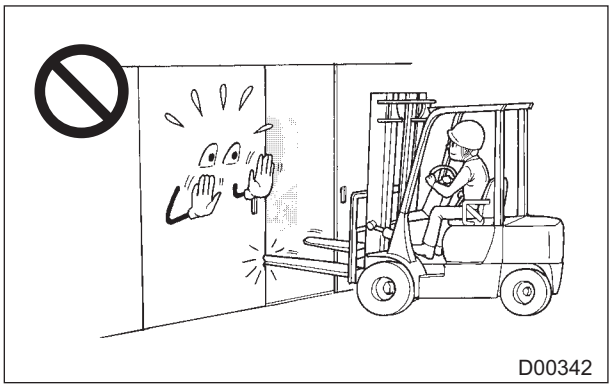
Fork misuse could cause accidents, serious injuries, damage to the lift truck and damage to the load.



DO NOT use lift truck improperly!

⚠ WARNING

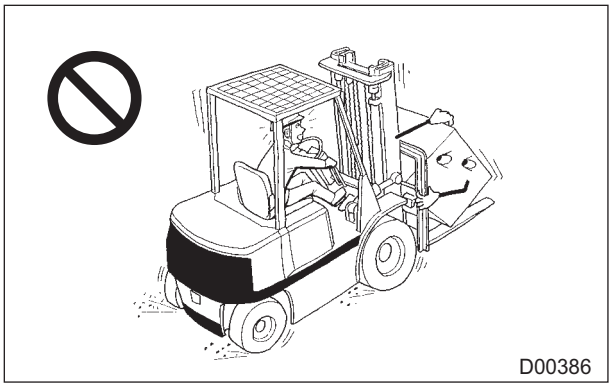
DO NOT use the lift truck for opening or closing railroad car doors, unless the lift truck utilizes an attachment specifically designed for opening and closing railroad car doors.



Operate the direction lever smoothly!

⚠ CAUTION

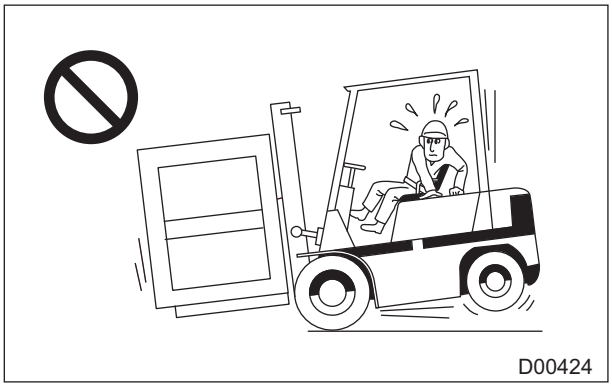
Avoid sudden changing of traveling direction. This may cause damage to the transmission.



Always stay within the capacity!

⚠ WARNING

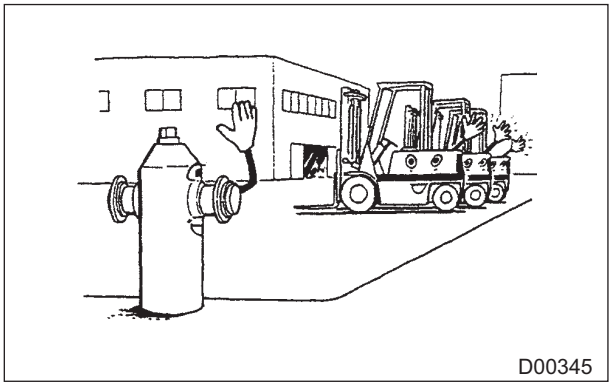
Read the capacity plate to make sure a load is within the capacity of the lift truck before you handle the load.



Park in authorized areas only!

⚠ WARNING

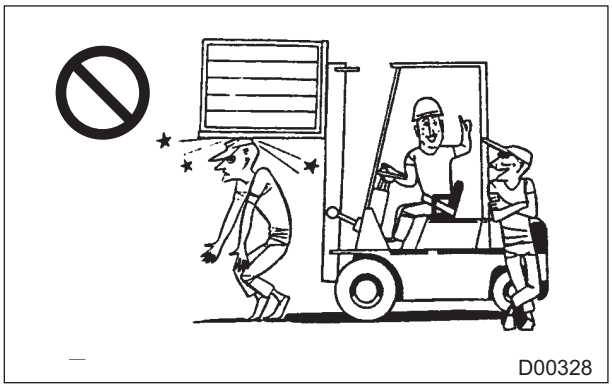
Park a safe distance from access to fire aisles, stairways and fire equipment. DO NOT park near a flammable material storage area.



Watch out for personnel!

⚠ WARNING

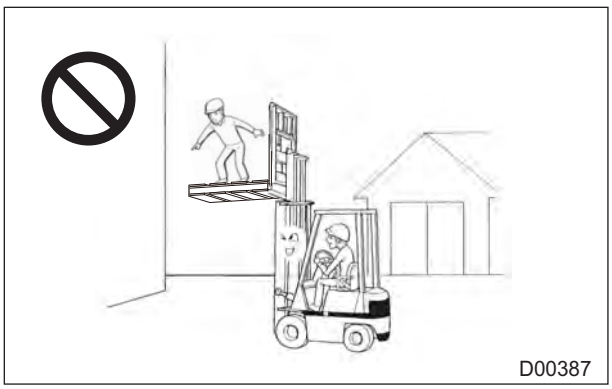
DO NOT allow anyone to walk or stand under raised forks.



DO NOT lift personnel except on a securely attached, specially designed work platform!

⚠ WARNING

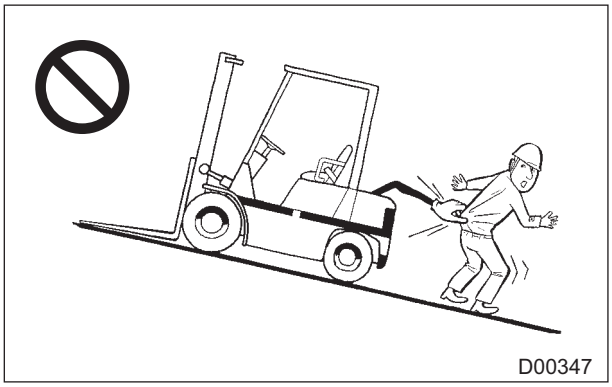
Use extreme care when lifting personnel. Place the mast in the vertical position, place the control levers in the NEUTRAL position and apply the parking brake. Lift and lower smoothly. Have a trained operator in position to control the lift truck as long as personnel are on the work platform. DO NOT transport personnel on forks or work platform.



Park disabled lift truck safely!

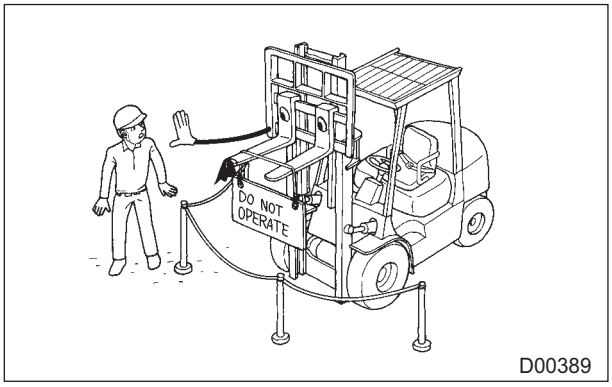
⚠ WARNING

DO NOT park on a grade.



⚠ WARNING

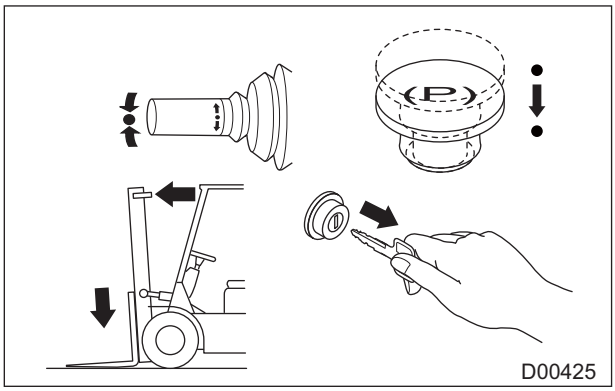
- If the lift mechanism is disabled and the forks cannot be lowered, park the lift truck in a non-operating area.
- Use barriers to keep anyone from standing or passing under the forks.
- Remove the key and attach "DO NOT OPERATE" or similar warning tag to the lift truck.



⚠ WARNING

When you leave or park the lift truck:

- Push the parking brake switch to the applied position.
- Place the direction lever in the NEUTRAL position.
- Lower the forks fully to the floor or ground.
- Tilt the mast forward until the fork tips touch the floor or ground.
- Turn the key switch to the ○ (OFF) position.



♦ LP-Gas

Only trained and authorized personnel must fill or change LP-Gas tanks. Personnel engaged in filling LP-Gas tanks must wear protective equipment such as a face shield, long sleeves and gauntlet gloves.

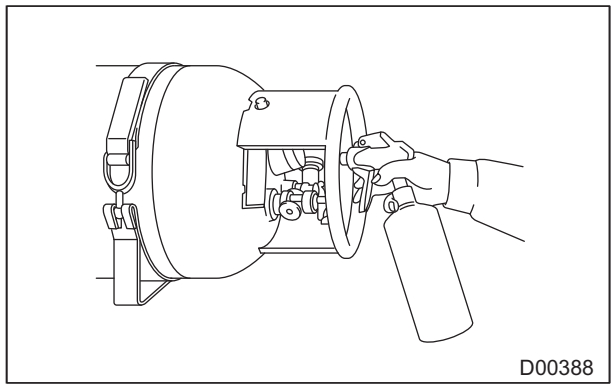
Do not refuel or store LP-Gas powered lift trucks near underground entrances, elevator shafts, or other places where LP-Gas could collect in a pocket and cause potential danger for an explosion.

Do not leave the lift truck, for even a short time, near equipment that generates high temperatures. Ovens and furnaces are examples. The heat may raise the pressure of the fuel and open the relief valve.

Close the service valve on the tank when LP-Gas fueled lift trucks are parked overnight or stored for long periods indoors with the fuel tank in place. Close the valves on empty tanks.

Inspect LP-Gas tanks before filling and before reuse. Look for damage to the valve, liquid gauge, fittings and hand wheels. Check for dents, scrapes or other damage to the pressure vessel and for dirt or debris in the openings.

Defective or damaged LP-Gas tanks must be removed from service. Check the LP-Gas fuel lines and fittings with a soap solution after filling the tank or when looking for leaks.



Do not drop, throw, roll or drag LP-Gas tanks. Do not strike LP-Gas tanks or any associated parts of the tanks or fuel systems. The careless handling of LP-Gas tanks could result in a serious accident. To reduce the risk of damage to tanks, use extreme care when transporting them.

Only trained and authorized personnel must fill or change LP-Gas tanks. The lift truck must be refueled only at designated safe locations. Safe outdoor locations are preferable to those indoors. Do not completely fill the tank. The fuel expands when it gets warm and it may overflow. This will create a fire hazard.

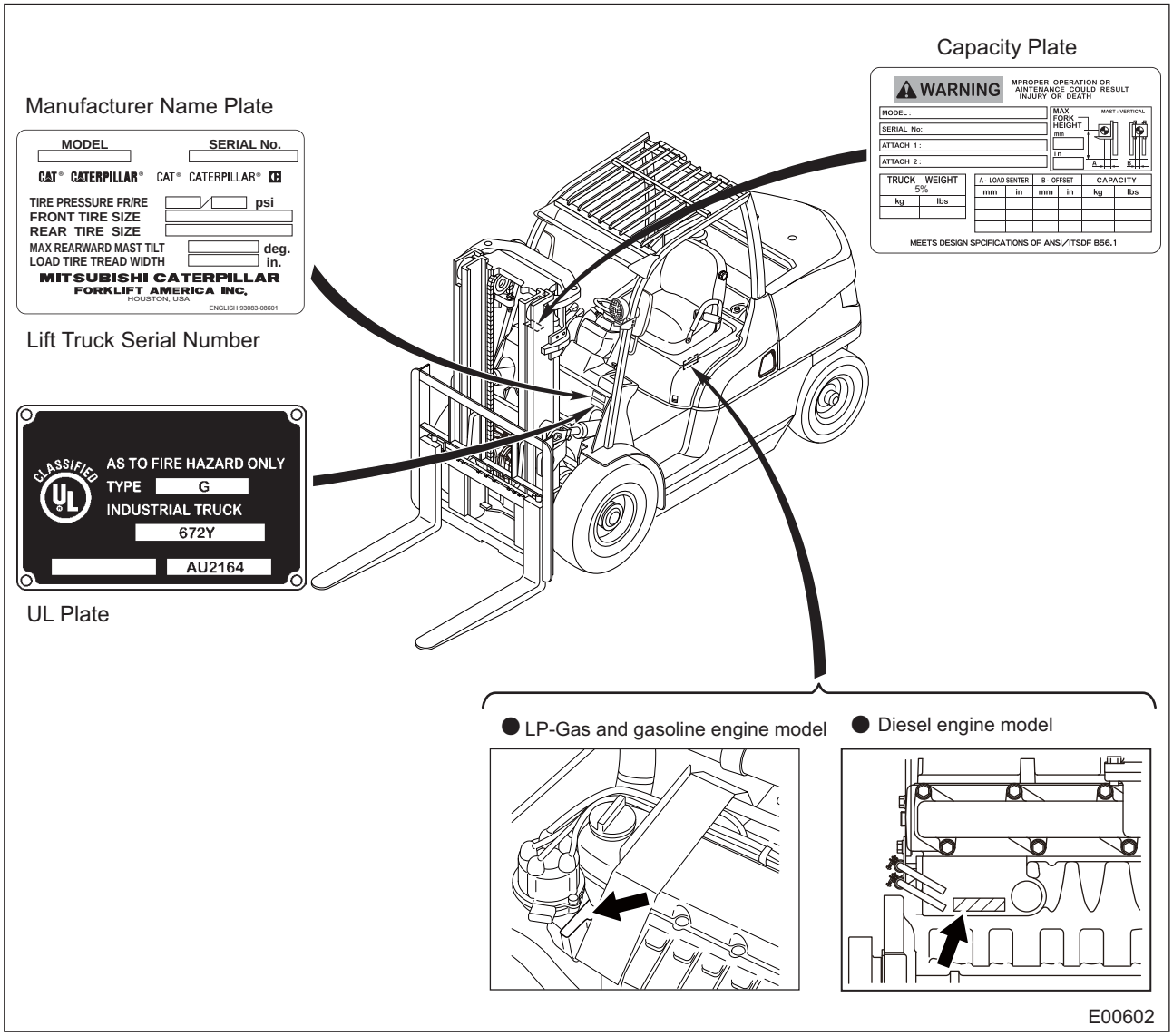
Check the LP-Gas tank for secure mounting. Loose tanks could cause pressure fuel lines to leak resulting in serious injury.

The storage and handling of liquid fuels in the U.S.A. must be in accordance with the NFPA No. 30, "Flammable and Combustion Code." Outside the U.S.A., store and handle in accordance with local regulations.

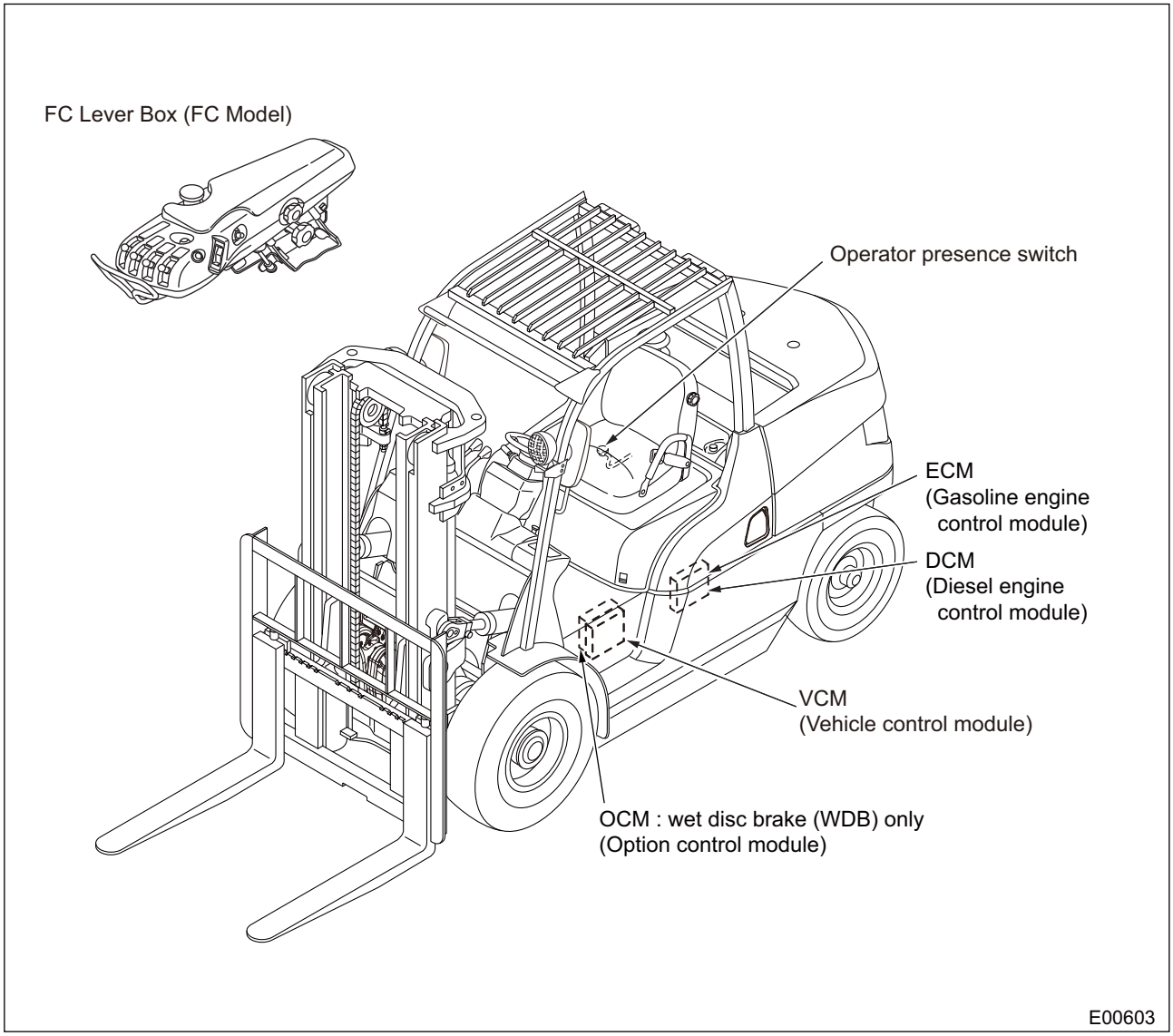
KNOW YOUR LIFT TRUCK

♦ Serial Number and Capacity Plate

For quick reference, record your lift truck's serial numbers in the spaces provided on “Service Registration” of chapter 13 “TO THE CAT LIFT TRUCK OWNER.”



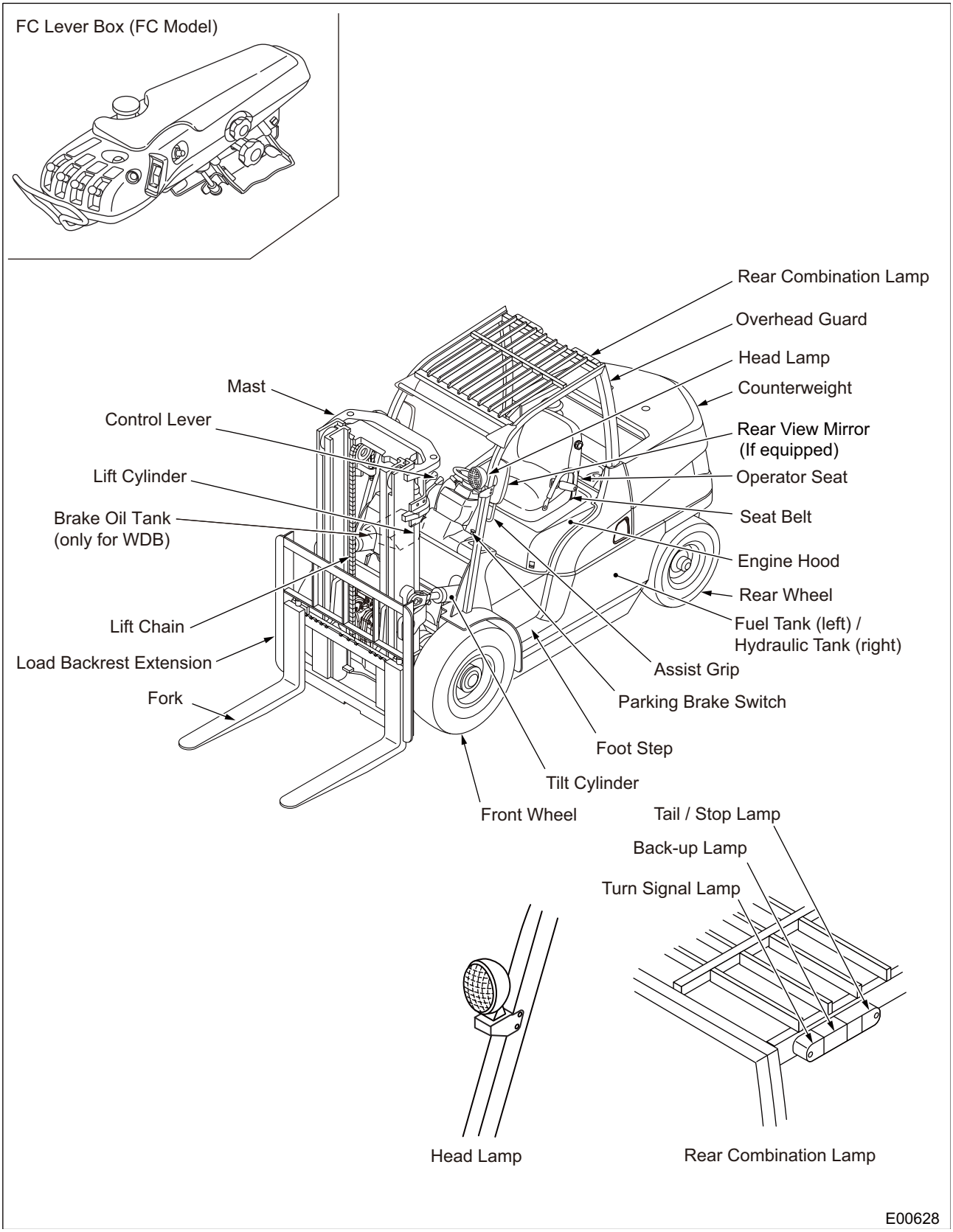
♦ Electrical Components



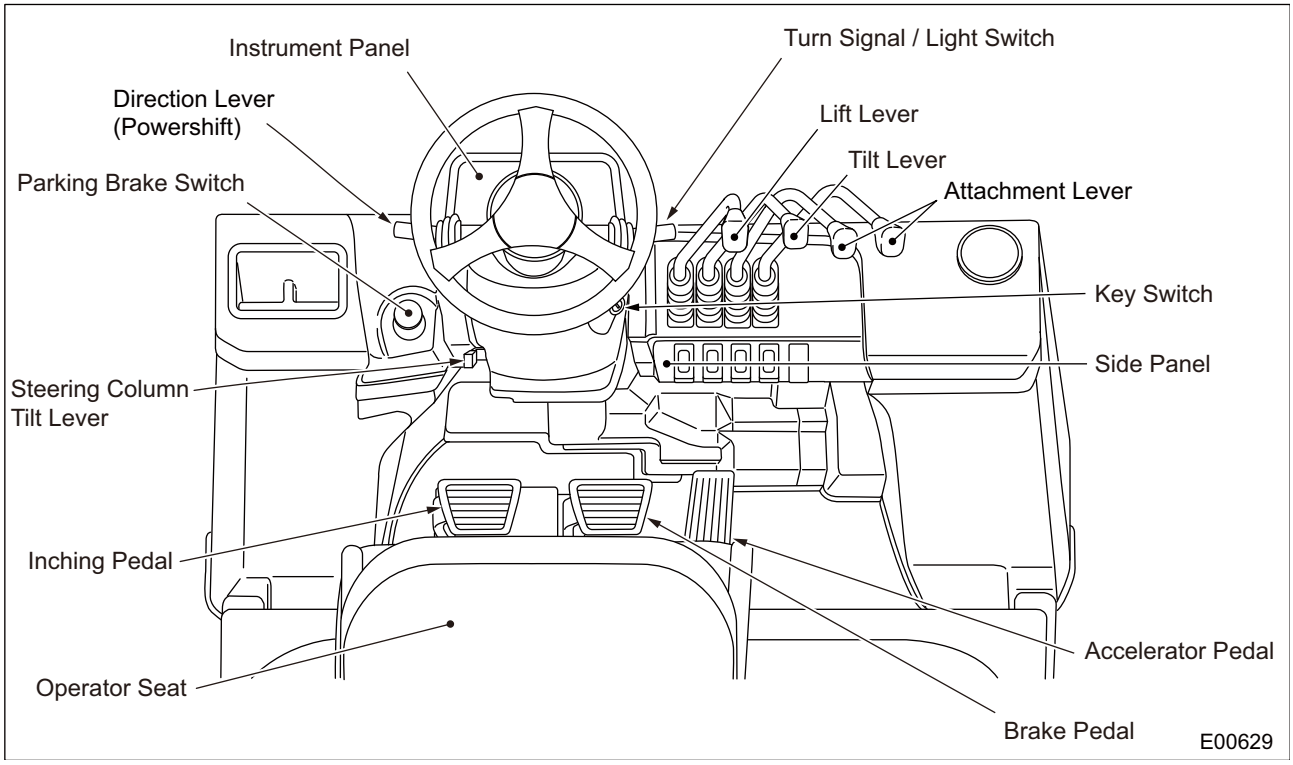
⚠ CAUTION

- This system consists of precise components. DO NOT attempt to make adjustments or repair by yourself. Consult your authorized Cat lift truck dealer.
- Moisture is harmful to controllers and their related sensors. When cleaning, DO NOT splash water, pressure wash or steam clean the VCM / OCM inside the left step, the ECM / DCM inside the engine compartment, and their related sensors.
- The operator is unable to move the mast and attachments (FC model) / to move the mast (MC model) unless properly seated. When replacing the operator seat, BE SURE to order a genuine Cat lift truck seat with an operator presence switch.

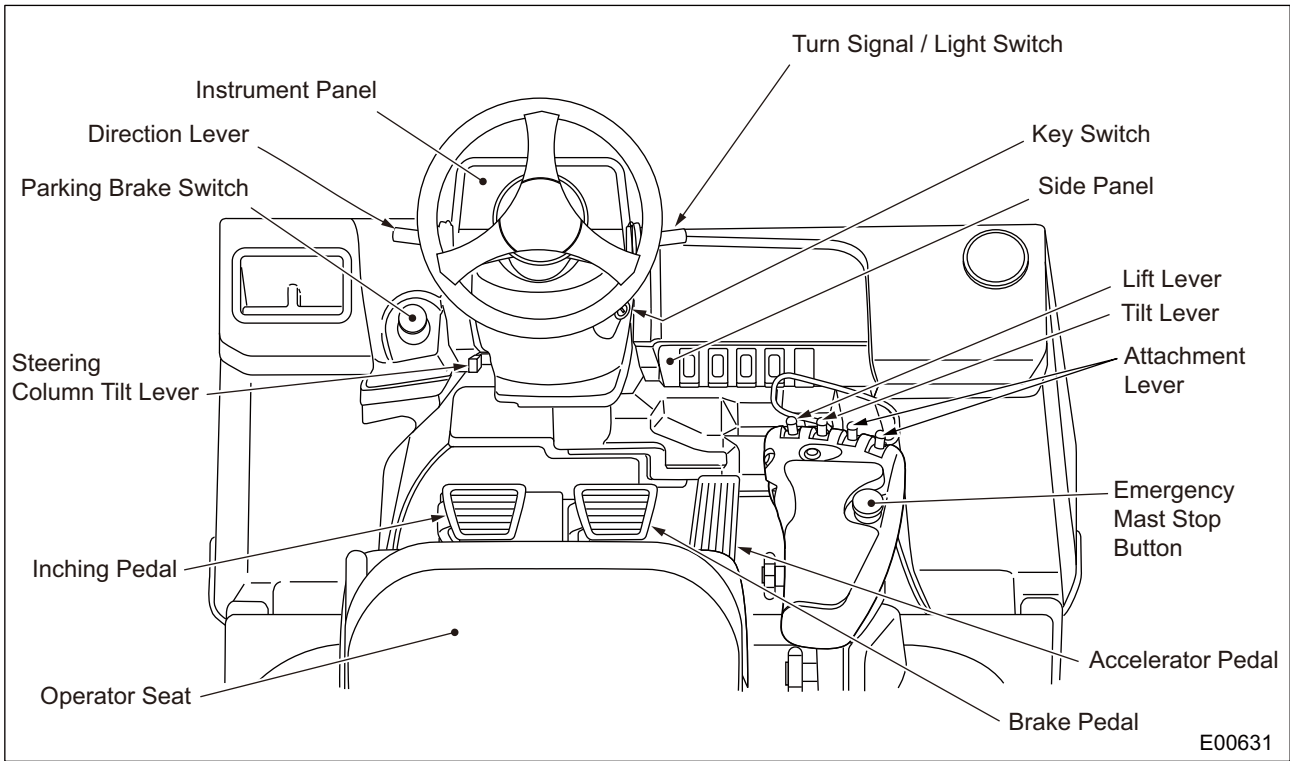
♦ Model View


FC Lever Box (FC Model)
Rear Combination Lamp
Overhead Guard
Head Lamp
Counterweight
Mast
Control Lever
Rear View Mirror
(If equipped)
Lift Cylinder
Operator Seat
Brake Oil Tank
(only for WDB)
Seat Belt
Engine Hood
Rear Wheel
Lift Chain
Fuel Tank (left) /
Hydraulic Tank (right)
Load Backrest Extension
Assist Grip
Fork
Parking Brake Switch
Foot Step
Tilt Cylinder
Front Wheel
Tail / Stop Lamp
Back-up Lamp
Turn Signal Lamp
Head Lamp
Rear Combination Lamp
E00628

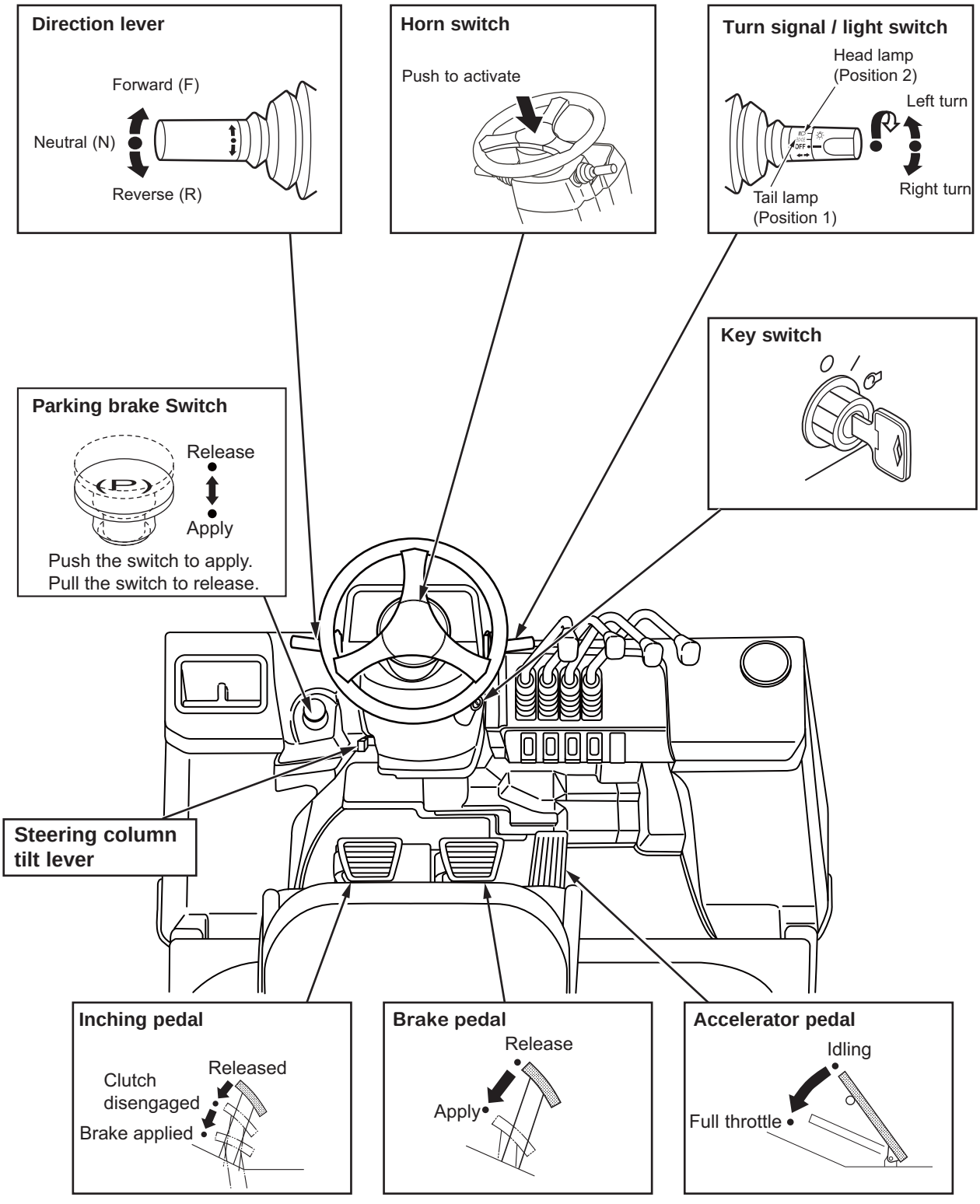
•MC Model



•FC Model (For use with FC model)



♦ Driving Switches and Controls



E00601

•Key Switch

The key switch has as a built-in mechanical lockout that prevents the key switch from being turned to the (START) position while the engine is running. Turn the key switch back to the ○ (OFF) position before re-cranking the engine.

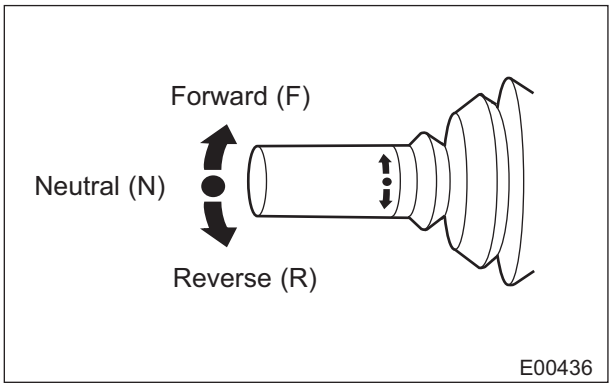
⚠ CAUTION

DO NOT crank the engine for more than 10 seconds at any one time. This may cause damage to the starter and run down the battery.

○ (OFF)	The key switch in the ○ (OFF) position removes power from instrument panel and electrical circuits except for horn, parking brake warning buzzer and lamps.
| (ON)	The key switch in the | (ON) position applies power to all electrical circuits except for starter circuit. **Note:** In diesel models, power is applied to glow plugs for 1.5 to 10 seconds depending on the engine coolant temperature and glow plug pilot lamp glows.
(START)	The key switch in the (START) position applies power to the starter motor to crank the engine. A switch spring returns the key switch to the | (ON) position when the key is released.

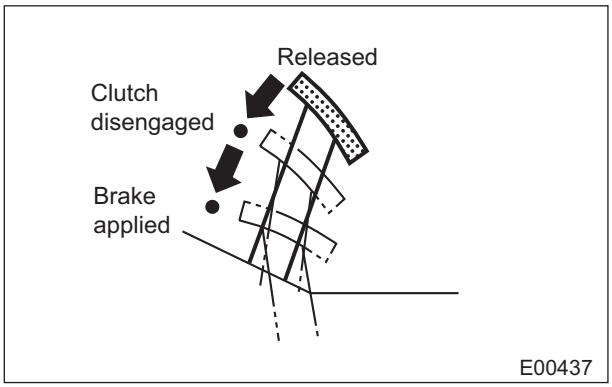
•Direction Lever (Powershift)

This lift truck is equipped with a neutral switch. Be sure to put the direction lever in NEUTRAL position before starting the engine.



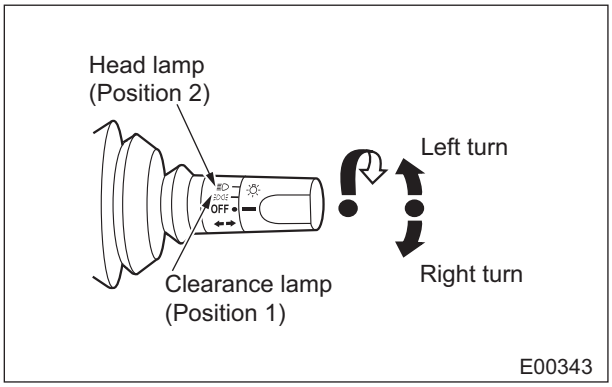
•Inching Pedal (Powershift)

By varying the position of this pedal, the operator can move the lift truck slowly for inching while maintaining engine speed.
Full application of the pedal puts the transmission in neutral and applies the service brake.



•Turn Signal / Light Switch

- When turning to the right or to the left, operate the turn signal switch in the direction of the arrow as shown on the left. The turn signal switch automatically returns when the steering wheel is returned, but it can also be returned manually.
- When the light switch is placed to the ≡D◁≡ position, the instrument panel lamp, tail lamps, and clearance lamps illuminate. When it is placed to the ≡D position, head lamps also illuminate in addition to the above lamps.

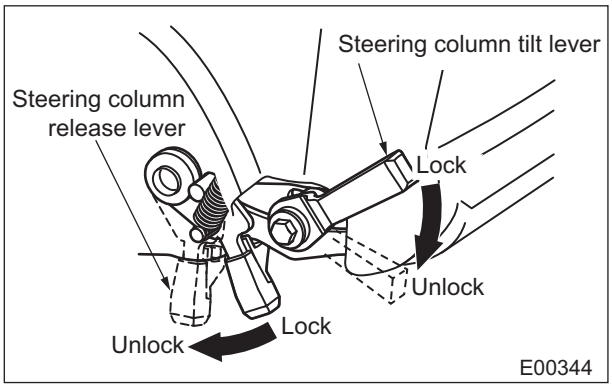


Lamp	Position	
	1	2
Instrument Panel Lamp	○	○
Tail Lamps	○	○
Clearance Lamps	○	○
Head Lamps		○

Note:
The lamps may be turned on by placing the light switch in position 1 or 2 regardless of the key switch position. Turn off the lamps when the lift truck is not being operated to prevent the battery from discharging.

•Steering Column Tilt Lever

The steering column position can be adjusted with the steering column tilt lever to an operator's desired driving position.



Adjustment of steering column position

1. Unlock the steering column tilt lever.
2. Hold the steering column and adjust it to an appropriate position.
3. After adjustment, lock the steering column tilt lever.

Steering column release lever

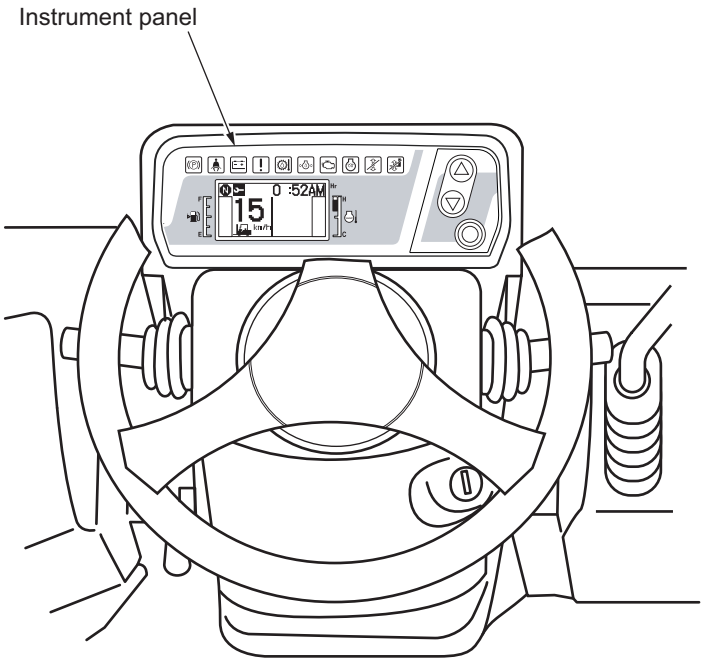
For easy getting on and off, unlock the steering column release lever and tilt the steering column toward the front of the lift truck.
After returning to the operator seat, tilt the steering column toward the operator seat and make sure that it is automatically locked. It will return to the same position it was set at prior to getting off the lift truck.
This lever is also used when opening and closing the engine hood.

⚠ WARNING

- Always adjust the steering column tilt angle while stopped at a safe place, as adjustment while driving could lead to accidents.
- Make sure that the steering column is firmly secured.

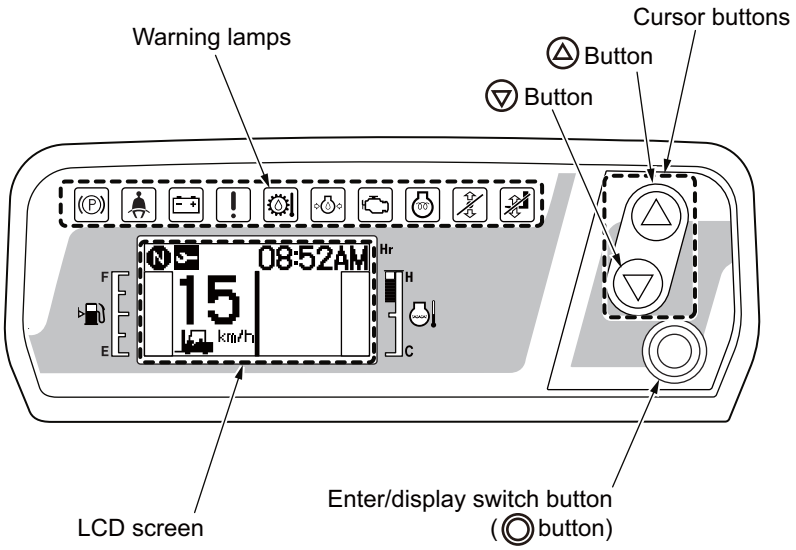
♦ Instrument Panel

When any warning lamp in the instrument panel glows or blinks, stop the lift truck and take corrective action. (Except for the glow plug pilot indicator lamp.)



E00438

Instrument panel consists of warning lamps, LCD (Liquid Crystal Display) screen, cursor buttons (△ button and ▽ button) and entry/display switch button (◯ button).

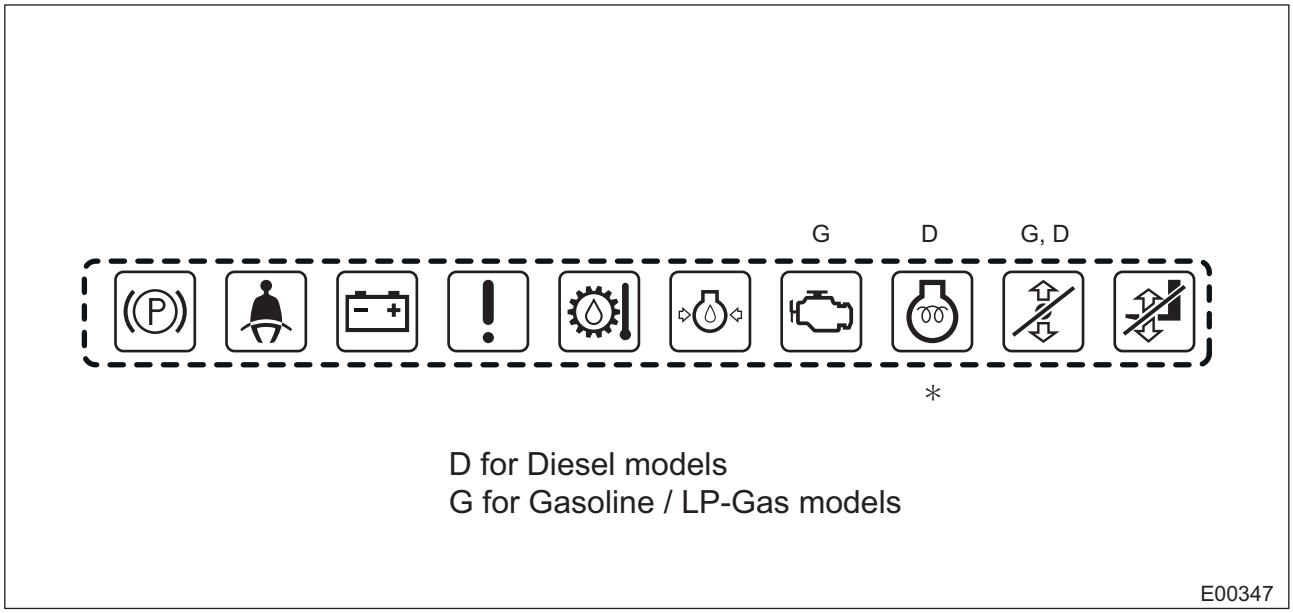


E00488

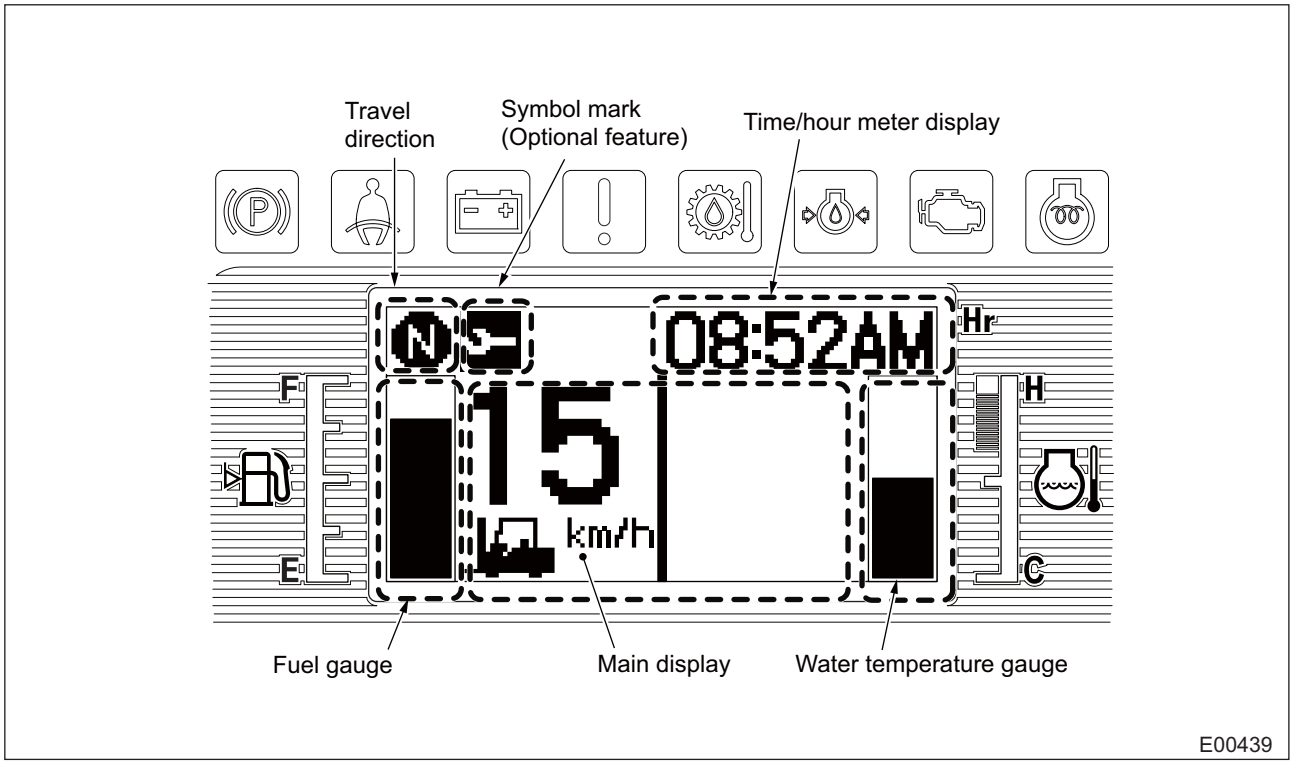
•LCD Screen

When the key switch is turned to the | (ON) position, warning lamps and indicator lamps will glow. (Except the lamps marked G or D; G for Gasoline and LP-Gas models and D for Diesel models)

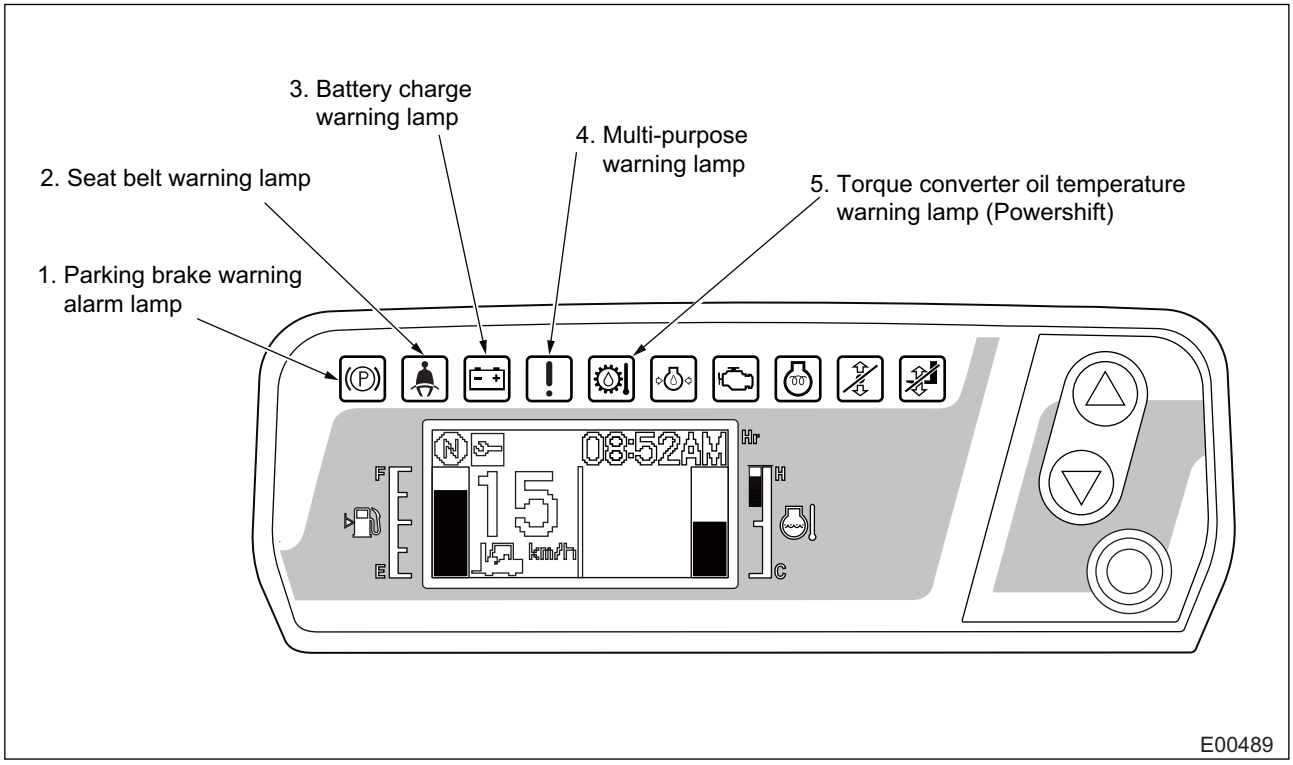
On Diesel models, the warning lamp marked ✳ will keep glowing until glow plug heating is completed. If not, LED (Light-Emitting Diode) may have a defect. If LED fails to glow with the key in the | (ON) position, consult your authorized Cat lift truck dealer.



The LCD screen consists of main display, fuel gauge, travel direction, symbol mark, time/hour meter and engine coolant temperature gauge. The main display is divided into two parts; right and left.



•Warning Lamps and Indicators



1. Parking brake warning alarm lamp

- This warning lamp glows when the parking brake is applied, and it goes out when released.
- Parking brake warning buzzer will activate when the operator leaves the operator seat for 2 seconds without applying the parking brake.
- When the operator leaves the operator seat for 2 seconds while the engine is running and the parking brake is released, the parking warning lamp blinks and warning buzzer will activate.

2. Seat belt warning lamp

- This warning lamp glows when the seat belt is not worn or when the seat belt is not properly buckled.

3. Battery charge warning lamp

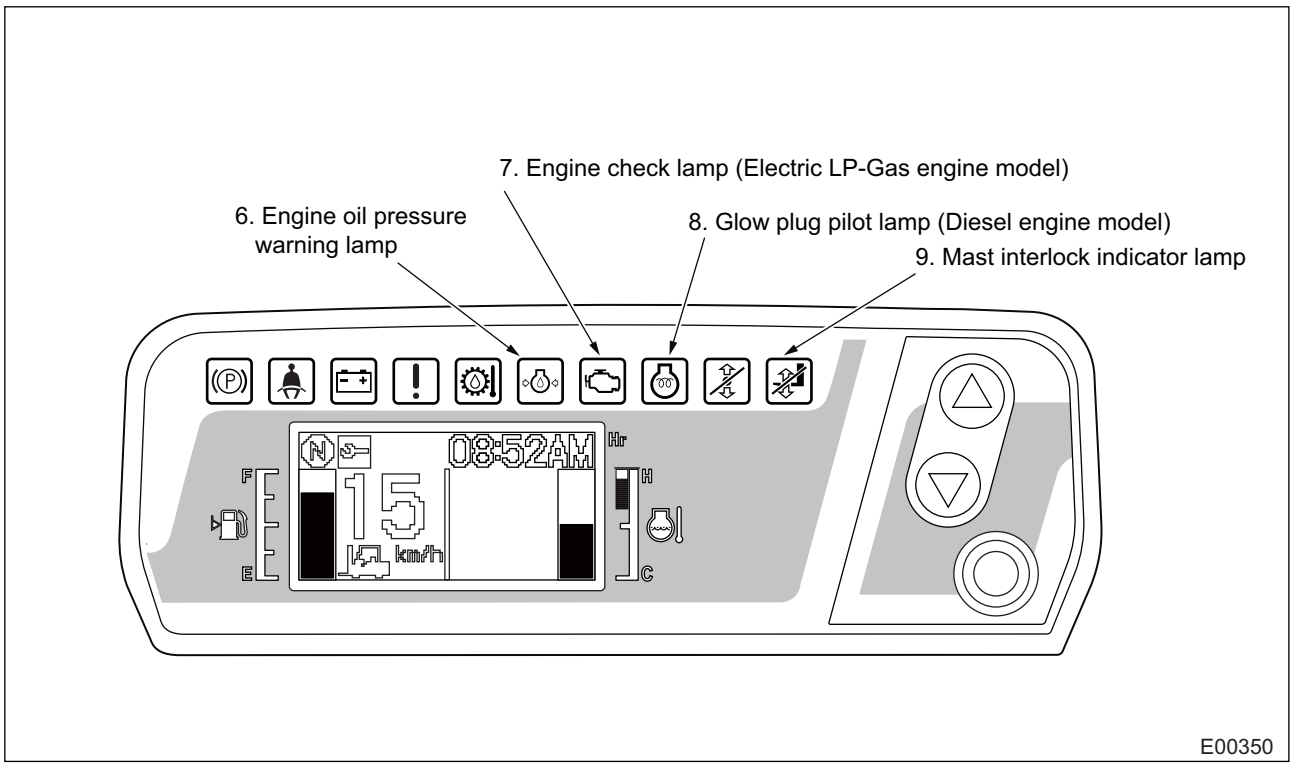
- This warning lamp glows when the charging system is not functioning properly.
- First, check the battery voltage. If the battery is fine, check the alternator drive belt for slippage or breakage.

4. Multi-purpose warning lamp

- This warning lamp glows when a minor failure occurs. The error codes and symbols are also displayed.

5. Torque converter oil temperature warning lamp

- This warning lamp glows when the oil temperature is high and the danger of overheating is present. See the topic, "Torque converter oil temperature warning lamp glows!"



6. Engine oil pressure warning lamp

- If this lamp glows during operation, stop the engine and check the oil level. Add oil as required.

⚠ CAUTION

- If the lift truck is operated with low engine oil level or with this warning lamp glowing, overheating may result.
- If this warning lamp glows even when the engine oil level is correct, have the engine checked by your authorized Cat lift truck dealer.

7. Engine check lamp (LP-Gasoline engine model)

- This warning lamp glows when the engine experiences an issue. When this lamp glows, consult your authorized Cat lift truck dealer.

8. Glow plug pilot lamp (Diesel engine model)

- This warning lamp glows when the key switch is turned to the | (ON) position and goes OUT after heating is completed. Turn the key switch to the (START) position.

9. Mast interlock indicator lamp

- This warning lamp blinks when the operator is not sitting properly in the operator seat for 2 seconds. The mast will not move even if the lift and/or tilt lever is operated. This warning lamp goes OUT if the lift and/or tilt lever is placed to the neutral position and the operator sits in the operator seat properly.

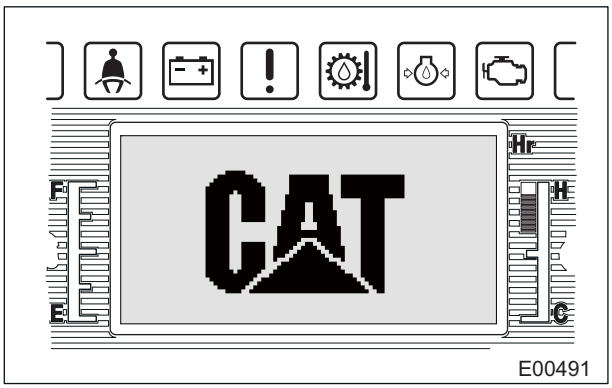
•Basic Screen Display

LCD screen when the key switch is turned ON

When the key switch is turned to the │ (ON) position, the LCD screen changes in the following order; brand logo screen, password input screen (optional) and standard screen. Pressing a button can also show the error history display on the screen.

Brand logo screen

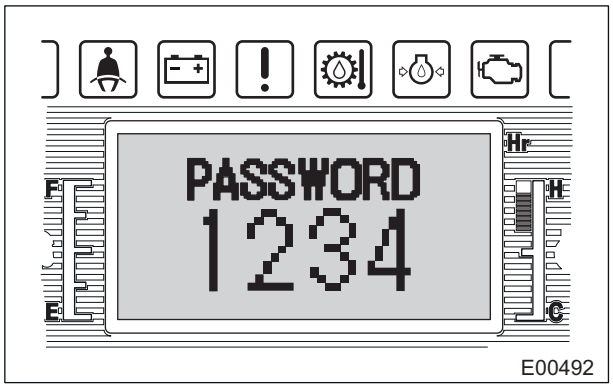
When the key switch is turned to the │ (ON) position, the brand logo screen will be displayed for 2 seconds while the lamps are being checked.



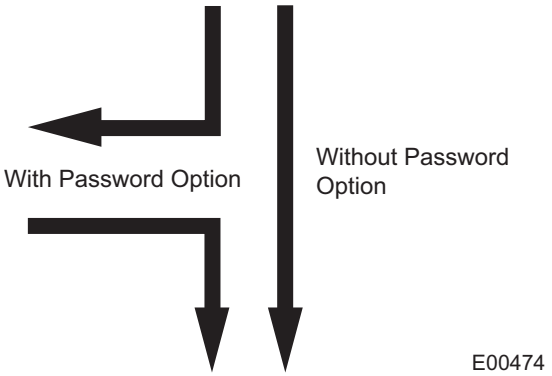
E00491

Password input screen (optional)

The lift truck can be operated after inputting the registered password. (Available when password option is selected.)



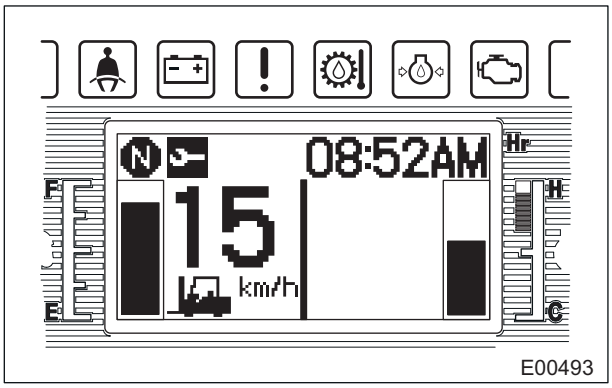
E00492



E00474

Standard screen

The screen changes to the standard display.

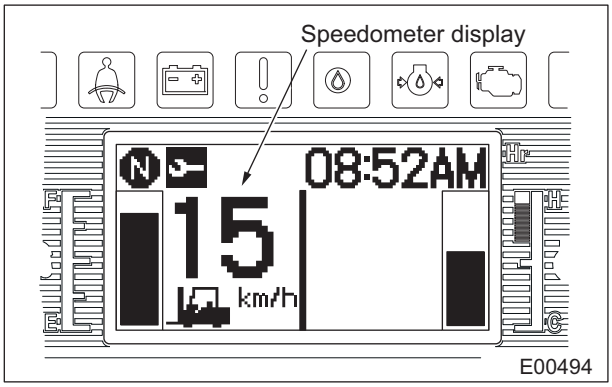


E00493

Speedometer display

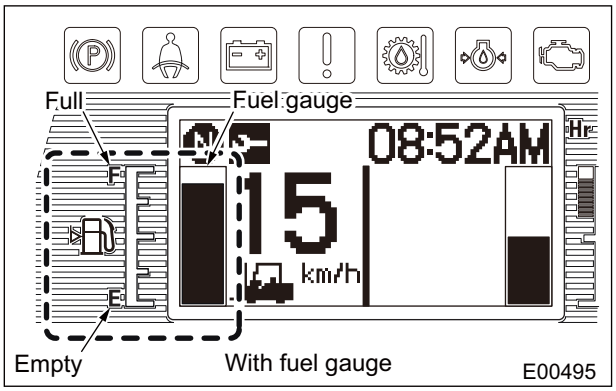
Speedometer reads the current speed.

Actual speed	Display
0.1 to 1.0 km/h (0.06 to 0.6 mph)	1 km/h (0.6 mph)
1.1 to 2.0 km/h (0.6 to 1.2 mph)	2 km/h (1.2 mph)
.	.
.	.
.	.
24.1 to 25.0 km/h (14.9 to 15.5 mph)	25 km/h (15.5 mph)



Fuel gauge display

When the key switch is turned to the | (ON) position, the fuel gauge will indicate the remaining fuel amount in the tank. If the ground is not level, the correct fuel amount will not be shown.
When the fuel gauge shows E (Empty), the low fuel level warning lamp will be displayed on the LCD screen.

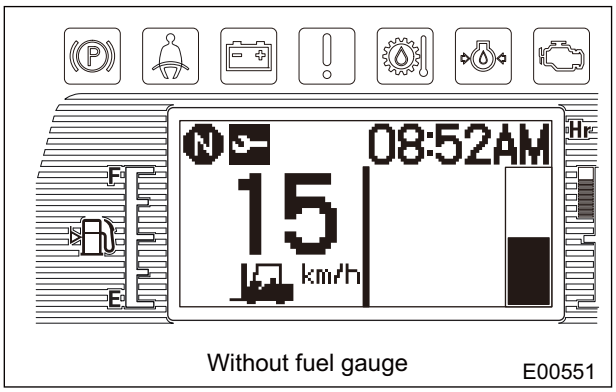


Amount of fuel remaining when fuel gauge shows E (Empty)

Unit: liter (cu.in.)

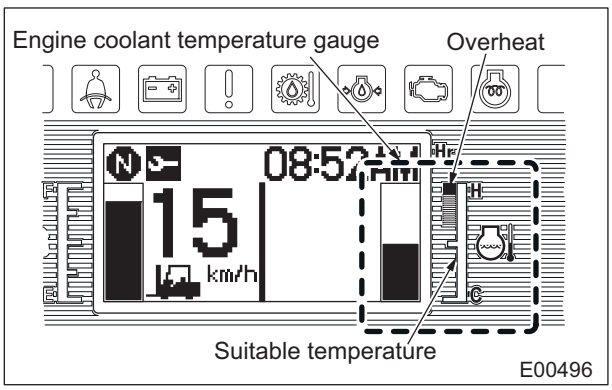
Class	Amount
4.0 to 5.5 ton class	less than 14.3 (873)

LP-Gas fuel model does not show the fuel gauge.



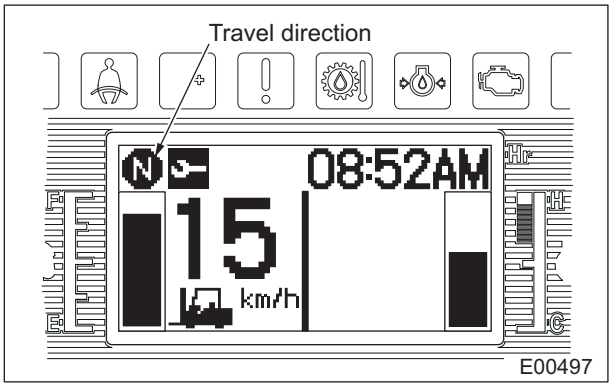
Engine coolant temperature gauge display

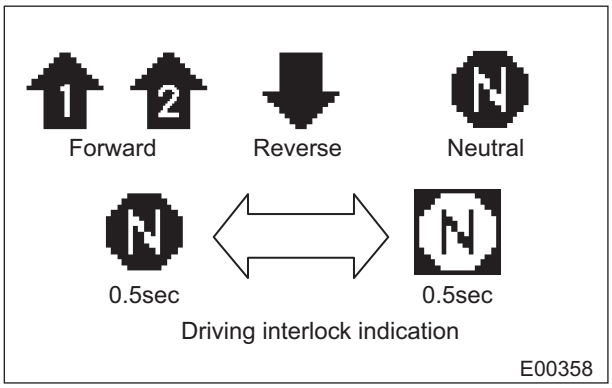
This gauge indicates the engine coolant temperature. When the gauge shows the red zone, the engine may be overheated.
See the topic, "When the Engine Coolant Temperature Gauge Shows Red Zone."



Travel direction display

The lift truck travel direction is displayed. If the direction lever is not in the neutral position when starting the engine, the engine will not start with "N" blinking on the screen. If the operator leaves the operator seat for 2 seconds while the engine is running and the direction lever is not in the neutral position, "N" on the screen will blink, and the transmission will electrically shift into neutral.

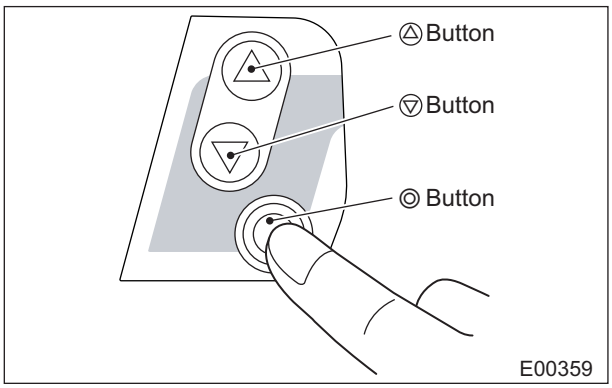




•Basic Operation

Operation buttons

The operation buttons are located on the right side of the instrument panel. There are three types of buttons; △ button, ▽ button and ◎ button. The function/operation of these three buttons varies with each display screen.
Button operation is available only when the key switch is in the | (ON) position.
Some changes to the display are not available when the engine is running.



Note:
Adjustment of screen contrast and selection between hour meter display and time display will operate with the engine running.

Short press of button:

Press button for less than two seconds.

Long press of button:

Press button for more than two seconds.

Multiple button presses:

All buttons pressed at the same time for more than two seconds.

How to adjust screen contrast

Turn the key switch to the | (ON) position. Adjustment of screen contrast is available while the engine is running.

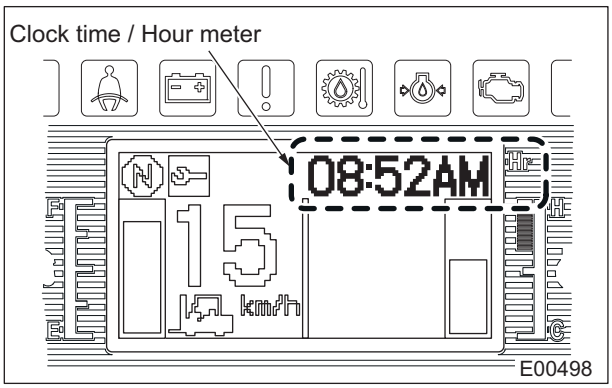
Button	Press	Screen contrast
△	Short press	Light to Dark
▽		Dark to Light

The screen contrast varies with the number of times a button is pressed.

How to display clock time

Turn the key switch to the | (ON) position. Screen display selection is available while the engine is running. With a short press of the ◎ button, the display changes between the clock time and the hour meter.

Button	Press	Display
◎	Short	Hour meter ↔ Clock time



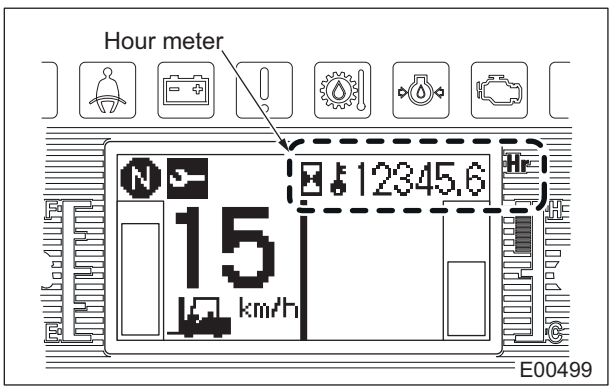
How to change clock system (12Hr. / 24Hr. system)

Turn the key switch to the | (ON) position. Screen display selection is available while the engine is running. With a long press of the △ button while the clock time is on display, the clock system changes alternately between 12 hour display and 24 hour display.

Button	Press	Display
△	long press	12 Hr. ↔ 24 Hr. 08:52PM ↔ 20:52

Display image from clock time to hour meter

When the key switch is turned to the | (ON) position, the last selected screen is placed in memory to display the next time.

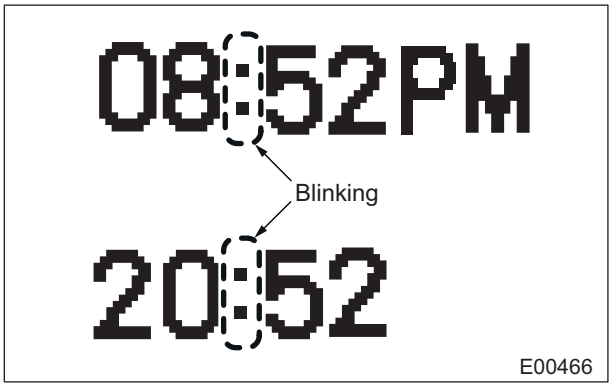


How to adjust clock time

Turn the key switch to the | (ON) position. Do not start engine.

Select clock time display.

Button	Press	Display
◎	Short	Clock time (: Blinks)

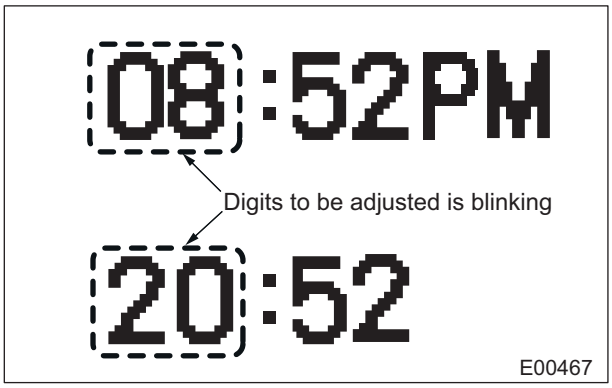


Time adjust mode

Button	Press	Display
◎	Long	Time setting mode of hours

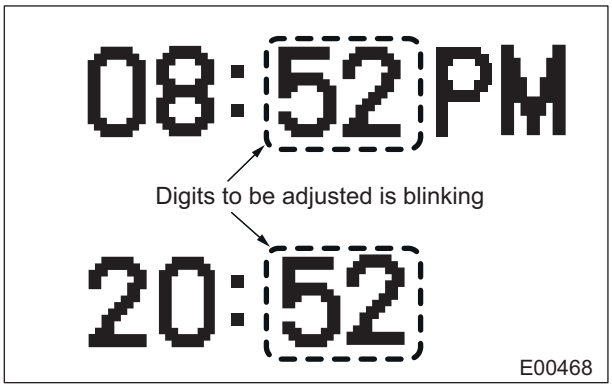
Time setting of hours

Button	Press	Display
△	Short	01 to 12 / 01 to 24 (1 hour at each press)
	Long	01 to 12 / 01 to 24 (continuous)
▽	Short	12 to 01 / 24 to 01 (1 hour at each press)
	Long	12 to 01 / 24 to 01 (continuous)
◎	Short	Move to the time setting of minutes



Time setting of minutes

Button	Press	Display
△	Short	00 to 59 (1 min. at each press)
	Long	00 to 59 (continuous)
▽	Short	59 to 00 (1 min. at each press)
	Long	59 to 00 (continuous)
◎	Short	Move to the standard screen



Time accuracy

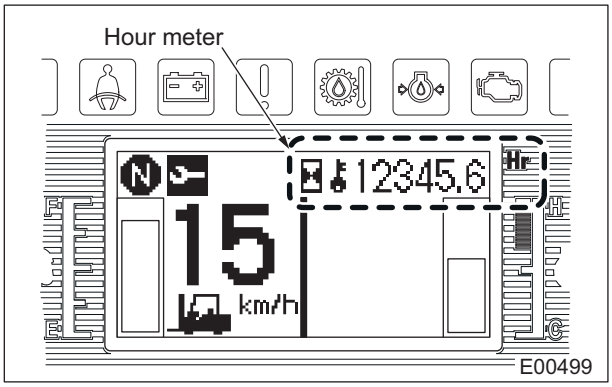
Precision errors will be a minute or less per month.

How to display hour meter

Turn the key switch to the │ (ON) position. Screen display selection is available while the engine is running.

With a short press of the ◎ button, the display changes between the clock time and the hour meter.

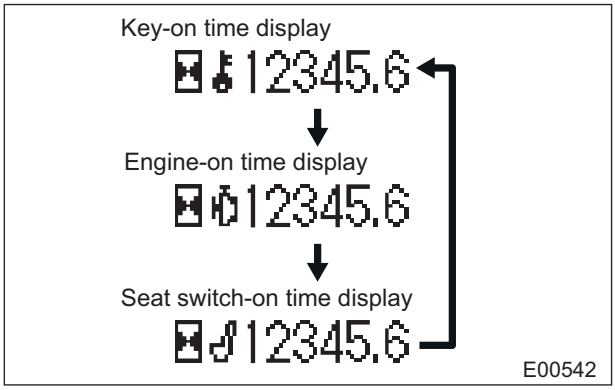
Button	Press	Display
◎	Short	Clock time ↔ Hour meter



How to change hour meters

Turn the key switch to the │ (ON) and select the hour meter. There are three hour meter counters; key-on time, engine-on time and seat switch-on time. With a long press of the △ button, the display changes.

Button	Press	Display
△	Long	key-on time ↓ Engine-on time ↓ Seat switch-on time



Key-on time:

Total hours of engine key switch ON time

Engine-on time:

Total hours of engine operation time

Seat switch-on time:

Total hours the seat switch has been activated.

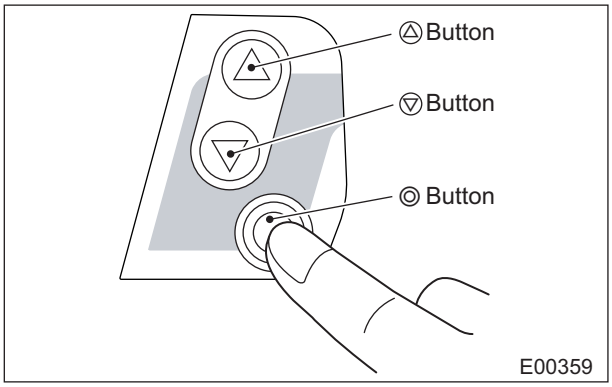
Note:

- 0.1 hour is added for every six minutes that pass.
- At the manufacturing facility, key-on time is set to display on the screen.
- When the key switch is turned to the │ (ON) position, the last selected screen is placed in memory to display the next time.

How to display error history

Turn the engine key switch to │ (ON).position. Do not start the engine. Pressing all three buttons at the same time for more than 2 seconds brings up the error history on the hour meter screen.

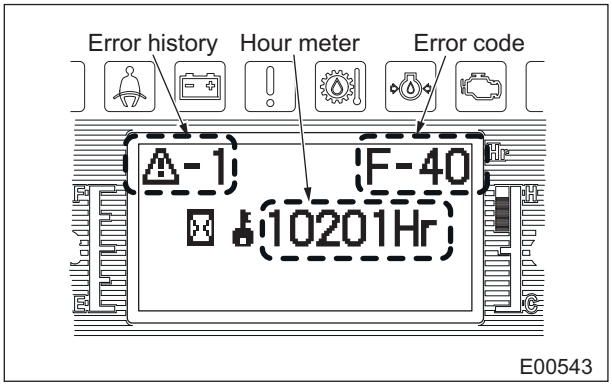
Buttons	Press	Display
△▽◎	Simultaneous long press of all buttons	Error history



Error messages displayed are limited to F error codes only.

Error codes are displayed from the latest error (⚠-1) up to the past 32 errors (⚠-32). Oldest data (error) exceeding the limit (32 errors) is automatically erased.

Each error record in the dotted line on the display can be changed with a press of △ or ▽ button.



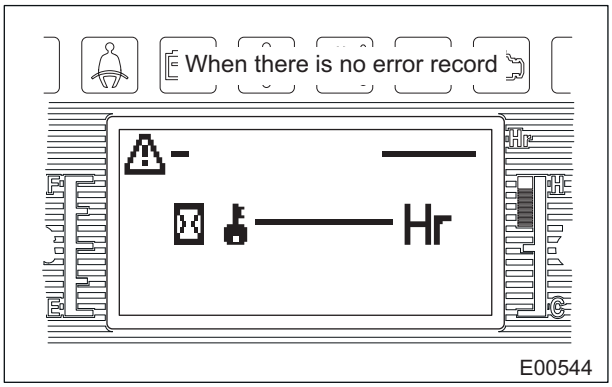
The display order of error codes can be changed with short press of △ or ▽ button.

Buttons	Press	Display
△	Short	Oldest first
▽		Latest first

Pressing all three buttons at the same time for more than 2 seconds brings back to the standard display screen.

Buttons	Press	Display
△▽◎	Simultaneous long press of all buttons	Standard display screen

The illustration shows the error history screen when there is no record of error.

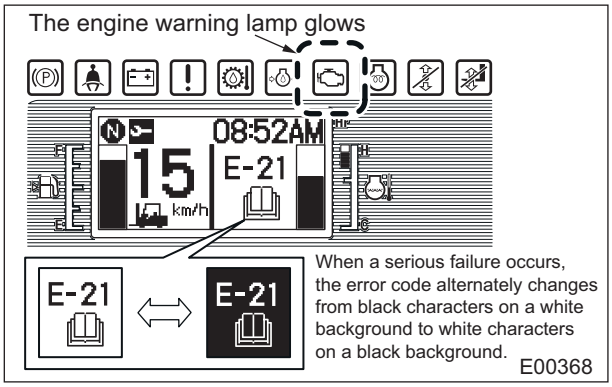


•When an Error Occurs

When an error occurs, the screen will display the corresponding error code.
(The error code remains displayed on the screen until the automatic error reset is successfully completed.)
The order of error display is; engine failures, serious failures and minor failures.

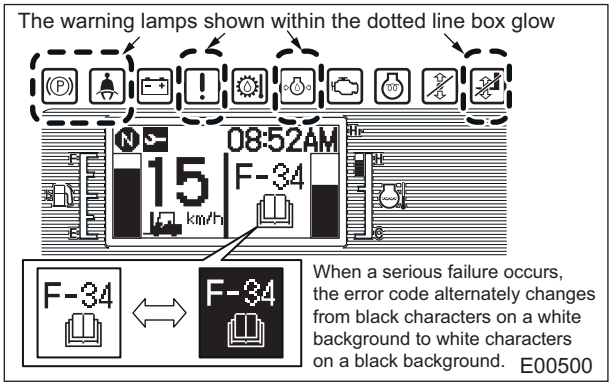
When an engine failure occurs

The corresponding error code will be shown on the main display, and the error code display will change between black and white alternately. Also engine check lamp will glow.



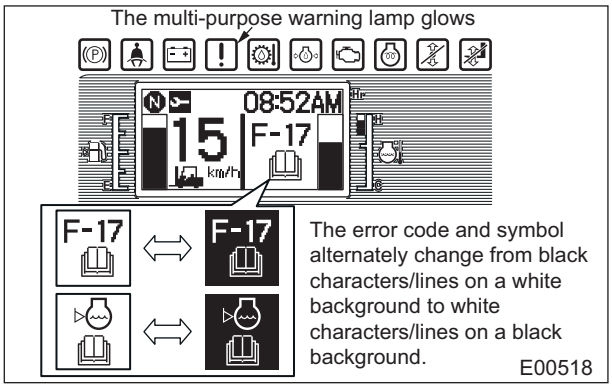
When a serious failure occurs

The corresponding error code will be shown on the main display, and the error code display will change between black and white alternately. Also, all of the corresponding warning lamps will glow.



When a minor failure occurs

The corresponding error codes and error symbols will be shown on the main display, and the error code and error symbol display will change between black and white alternately. Also, the multi-purpose warning lamp will glow.



Error symbols

The error symbols shown on the main display are listed below:

Symbol	Name	Condition
	Fuel Filter Drain Warning Lamp	When fuel filter needs to be drained (Diesel model)
	Coolant Level Warning Lamp	When coolant level is low (Option)
	Clogged Air Cleaner Element Warning Lamp	When air cleaner element is clogged (Option)
	Low Fuel Level Warning Lamp	When fuel level is low
	LPG Level Warning Lamp	When LPG level is low

•Optional Functions

The following optional functions are available:

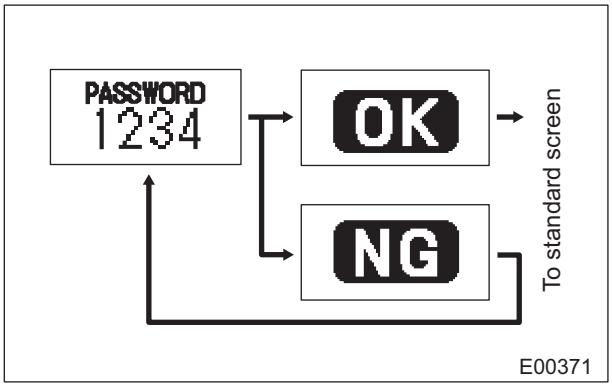
- Password authentication
- Service interval display

Password authentication

This function prevents an unauthorized person from operating the lift truck. To operate the lift truck, you need to enter the registered four-digit password.

Inputting a password

Turn the key switch to the │ (ON) position.
When the password input screen is displayed after brand logo screen, enter the registered four-digit password.



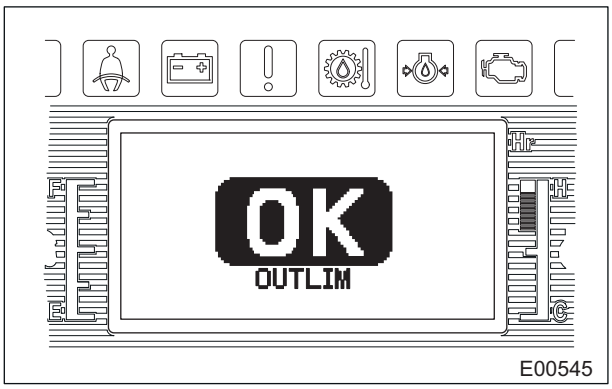
Password input procedure

Button	Press	Display
△	Short	0 to 9, ← (one at each press)
	Long	0 to 9, ← (continuous)
▽	Short	← , 9 to 0 (one at each press)
	Long	← , 9 to 0 (continuous)
◎	Short	Enter to move to the next digit

- Press ◎ at ← to return to the previous digit.

- Press ◎ to move to the next digit.

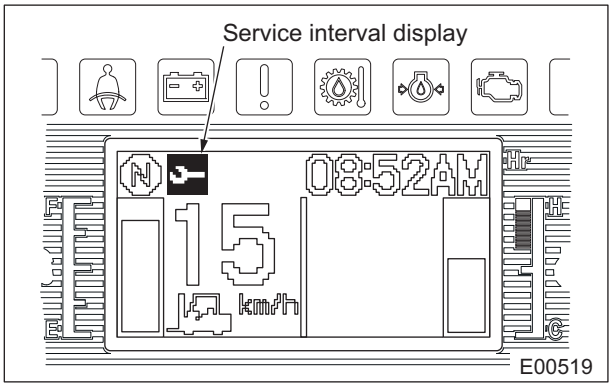
Note:
When the password is correct, the "OK" message will be displayed. When the password is wrong, the "NG" message will be displayed.
With the "NG" message, the engine can be started, but the lift truck will neither travel nor operate.



- In case of an emergency or when the registered password is forgotten, enter "1111" as shown for the minimized use of travel and operation.
- Password input is necessary when starting the operation, but if it is within 3 minutes after the operator leaves the operator seat or after the key switch is turned to the ○ (OFF) position, you need not enter the password again.
- When the lift truck shipped from manufacturer, password effective hour is set 3 minutes. 0, 10, 30, 60 and 90 minutes can be set as password effective hour. (Password will time out after 3 minutes)
- Password registration, change and cancellation should be set up by your authorized Cat lift truck dealer.
- Password registration of "0000" and "1111" are not available. Register a different four-digit password.

Service interval display

When the hour counter reaches the pre-set number of hours, the service interval symbol mark will be displayed to notify the lift truck operator of the periodic inspection and maintenance time.



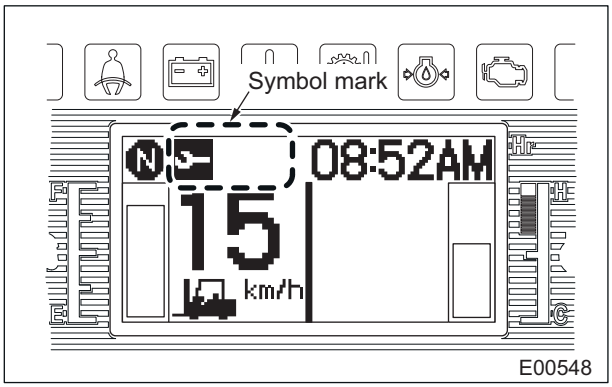
Note:

Service interval symbol will not be displayed if this setup is not installed.

- The service interval setting, should be set up by your authorized Cat lift truck dealer.

Symbol area

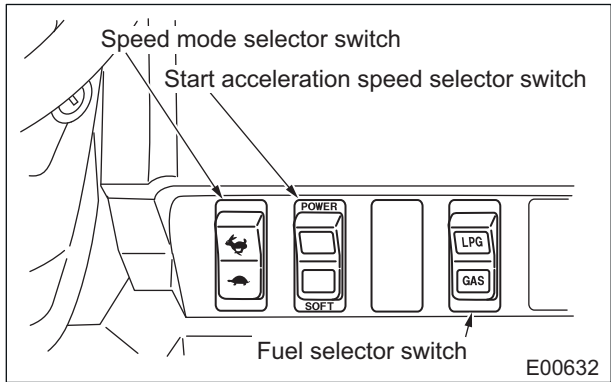
Symbol area shows truck functions.
Symbols are displayed.



•Side Panel

The side panel may have the following switches.

- Speed mode selector switch
- Start acceleration speed selector switch
- Fuel selector switch

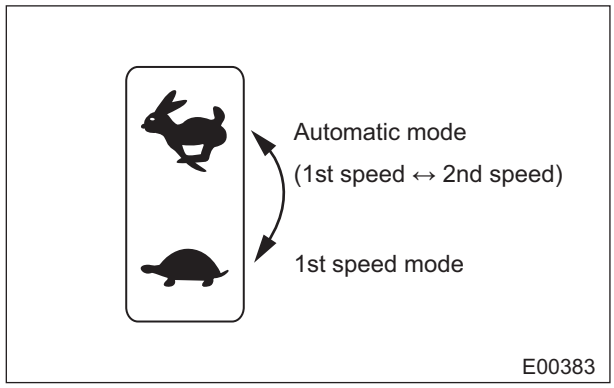


Speed mode selector switch

Keep speed mode in 1st speed for operating at the speed-limit area (14 km/h [8.7 mph] at max.), climbing or towing a lift truck.

⚠ CAUTION

Operate the selector switch after the lift truck is stopped.



Start acceleration speed selector switch

Start acceleration speed can be set to SOFT or POWER.
SOFT accelerates slowly and POWER accelerates quickly.

Fuel selector switch

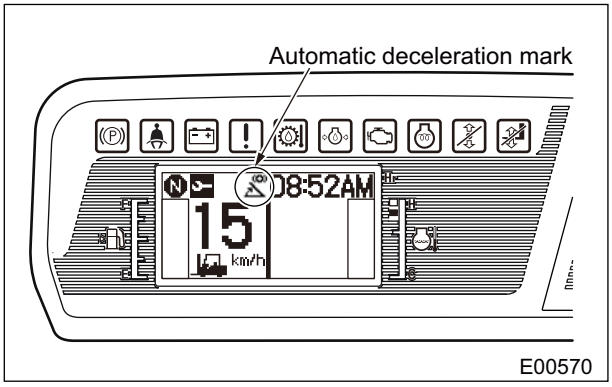
Fuel can be set to LP-Gas (if equipped with dual fuel) and gasoline.
For instruction for changeover of fuel, see the topic, "Before starting Engine under Operation."

•Optional Functions to Use with Wet Disc Brakes (WDB)

Automatic deceleration function

Once the automatic deceleration function is set, the automatic deceleration mark on the LCD will remain.

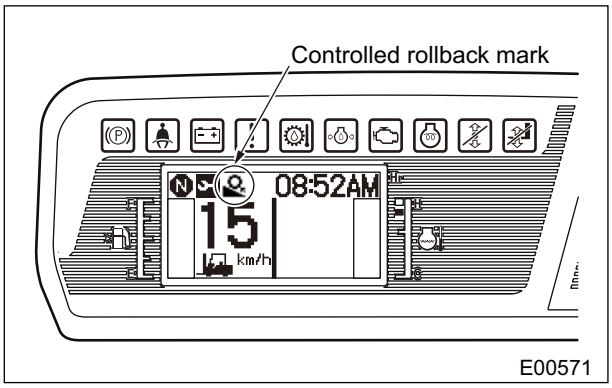
- The automatic deceleration function setting, should be set up by your authorized Cat lift truck dealer.



Controlled rollback function

Once the controlled rollback function is set, the controlled rollback mark will glow only during operation.

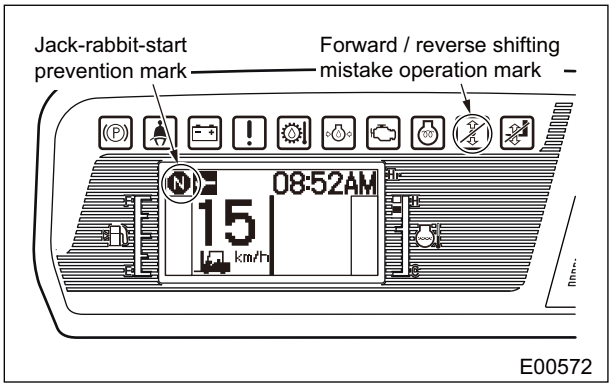
- The controlled rollback function setting, should be set up by your authorized Cat lift truck dealer.



ProShift™ function

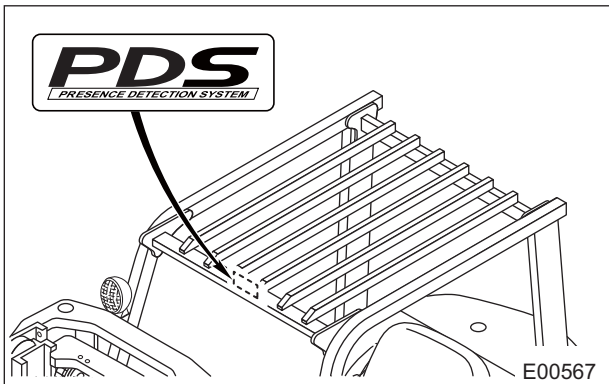
Once the ProShift™ function is set:
The neutral lamp will be blinking during the operation of the jack-rabbit-start prevention function.
The ProShift™ lamp will glow during the operation of the forward / reverse shifting mistake prevention function.

- The ProShift™ function setting, should be set up by your authorized Cat lift truck dealer.



♦ Presence Detection System (PDS)

Lift trucks with this label are equipped with an "Presence Detection System" (PDS). This system features an enhanced, integral computer-based feed back system which provides "certain product intelligence" to the operator.
Be sure to operate the lift truck and system correctly. Also be sure to properly maintain as well as operate the system at all times.



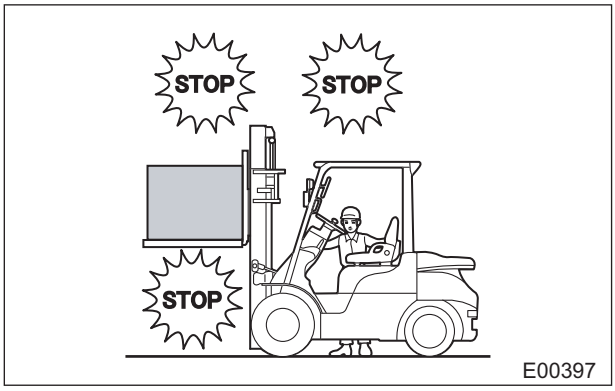
•Mast Interlock System (MC Model)

The Mast Interlock System is one of the functions of the Presence Detection System installed on this lift truck. The lift truck senses when the operator is not properly seated in the operator seat and will prevent the mast from operating until the operator is properly seated. In the following cases, the mast interlock system disconnects power to the hydraulic control valve and the mast will not lift, lower or tilt even if the control levers are operated:

⚠ WARNING

- Check the function of the mast interlock system at the daily pre-start inspection.
- Even when the engine is not running, while the operator is sitting correctly in the operator seat and with the key switch in the | (ON) position, it is possible for the mast to descend. Please be very careful.
- When replacing the operator seat, BE SURE to order a genuine Cat lift truck seat with an operator presence switch and an operator restraint system.

1. The operator leaves the operator seat for 2 seconds with the key switch in the | (ON) position regardless of whether the engine is running or not.
2. When the operator leaves the operator seat for 2 seconds while the engine is running, the operator presence switch in the operator seat is activated, which causes the mast to be irresponsive, even if the lift or tilt levers are operated.



Note:
The mast interlock will work only for the lift and tilt levers. Attachments can be moved regardless of whether the mast interlock function is operating or not. Therefore, when the attachment lever is operated, some of the attachments will move, even though the engine is not running or the key switch is in the ○ (OFF) position, as a result of the handling load or of its own weight.

•Mast Interlock System (FC Model)

The Mast Interlock System is one of the functions of the Presence Detection System installed on this lift truck. The lift truck senses when the operator is not properly seated in the operator seat and will prevent the mast from operating until the operator is properly seated. In the following cases, the mast interlock system disconnects power to the hydraulic control valve and the mast and attachment will not move even if the control levers are operated:

1. The operator leaves the operator seat for 2 seconds with the key switch in the | (ON) position regardless of whether the engine is running or not.
2. When the engine is running but the emergency mast stop button is in the STOP (lock) position (being pushed down).

Note:

The mast interlock will work for the lift, tilt and attachment levers. If the engine is not running or the key switch is in the ○ (OFF) position, the lift, tilt and attachment levers will not activate the hydraulic control valve regardless of whether the operator presence switch position is ON or OFF.

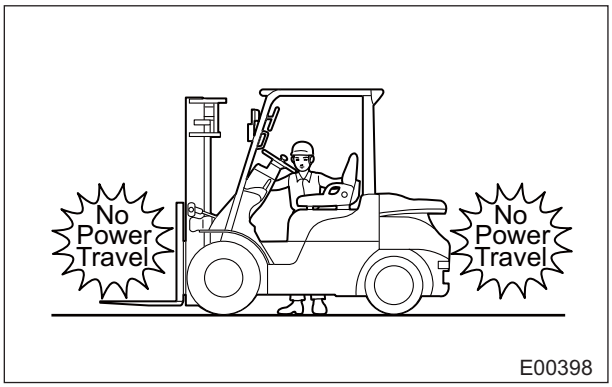
•Mast Interlock System Functions

Conditions			Mast Interlock Indicator Lamp	Control Levers' Operation		
Key Switch	**Engine**	**Operator Seat**		**Lift Lever**	**Tilt Lever**	**Attachment Lever (FC only)**
○ (OFF)	OFF	Seated or Not Seated	OFF	Inoperative	Inoperative	Lowering of its own weight
| (ON)	OFF	Not Seated	Blink	Inoperative	Inoperative	Lowering of its own weight
		Seated	OFF	Lowering only	Inoperative	Lowering of its own weight
		Seated to Not Seated	Blink (After 2 seconds)	Lowering (for 2 seconds)	Inoperative	Lowering of its own weight
		Not Seated to Seated	OFF	Lowering only	Inoperative	Lowering of its own weight
(START)	ON	Not Seated	Blink	Inoperative	Inoperative	Lowering of its own weight
		Seated	OFF	Operative	Operative	Operative
		Seated to Not Seated	Blink (After 2 seconds)	Operative (for 2 seconds)	Operative (for 2 seconds)	Operative (for 2 seconds)
		Not Seated to Seated	OFF	Operative	Operative	Operative

•Driving Interlock System

⚠ WARNING

- Check the function of the driving interlock system during the daily pre-start inspection.
- The parking brake is not automatically applied when the interlock is activated.
- When replacing the operator seat, BE SURE to order a genuine Cat lift truck seat with an operator presence switch and an operator restraint system.



- In normal operation your lift truck will drive in a creep mode when the direction lever is placed in the forward or reverse position at engine idling (not pressing the accelerator pedal).
- The driving interlock system will not allow the lift truck's transmission to stay in the forward or reverse position when you are out of the operator seat.
- If the operator leaves the operator seat for 2 seconds, a switch in the operator seat activates the driving interlock system. This action causes the system to cut power and to electrically shift the transmission to neutral. The transmission will disengage but the direction lever will not physically move to the neutral position.
- To reactivate the transmission, sit in the operator seat and place the direction lever to the neutral position and back to the direction of travel.
- The parking brake will work when the lift truck is on level ground, synchronizing with the driving interlock. However, when the lift truck is on an incline, the lift truck will start to move in the direction of the downgrade.
- Even if the driving interlock system is activated, the lift truck may move in the direction of the downgrade when the lift truck is on a grade. In this case, apply the brakes and sit securely in the operator seat.

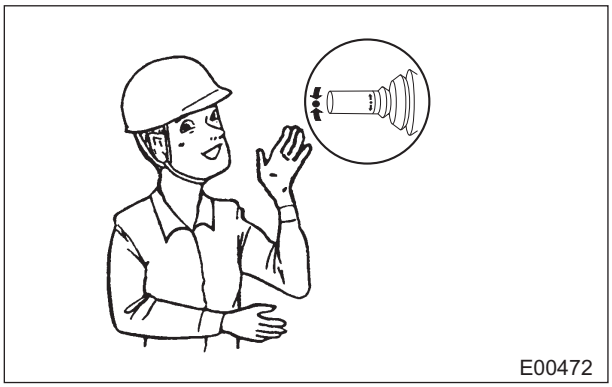
•Driving Interlock System Functions

(Powershift models only)

Conditions				Function	Safety Warning
Key Switch	**Engine**	**Operator Seat**	**Direction Lever**		
ON	ON	Not Seated	F / R	Driving inoperative	Driving Interlock Indicator Lamp [Blink]
		Seated	F / R	Driving operative	Driving Interlock Indicator Lamp [OFF]
		Seated to Not Seated	F / R	For 2 seconds driving operative	After 2 seconds Driving Interlock Indicator Lamp [Blink]
		Seated to Not Seated to Seated	F / R	Within 2 seconds driving operative	Within 2 seconds Driving Interlock Indicator Lamp [OFF]
		Not Seated to Seated	F / R	Driving inoperative	Driving Interlock Indicator Lamp [Blink]
		Not Seated to Seated	F / R to N to F / R	Driving inoperative, then operative after Neutral	Driving interlock indicator [Blink] then [OFF] after Neutral

•Neutral System

The lift truck is equipped with a device that prevents the engine from being started if the direction lever is not in the NEUTRAL position.



•Neutral System Functions

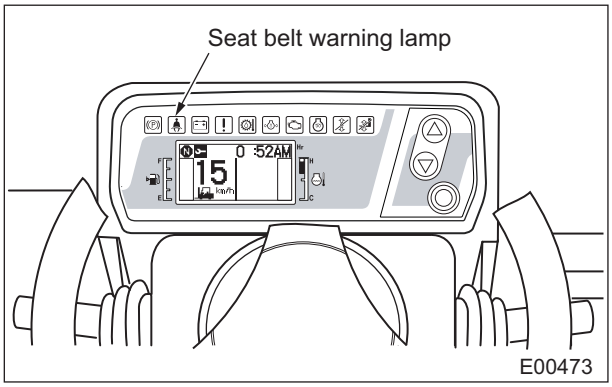
Conditions			Safety Function
Key Switch	Operator Seat	Direction Lever	
OFF or ON	Seated or Not Seated	Neutral	Engine starts only when the direction lever is in the NEUTRAL position.

•Seat Belt Warning Lamp

The seat belt has a switch that activates a warning lamp. The warning lamp in the instrument panel stays on until the seat belt is buckled. The seat belt warning is one of the PDS functions installed on this lift truck.

⚠ WARNING

- Prior to operating the lift truck, BE SURE that the seat belt warning lamp is functioning.
- This warning lamp reminds the operator to fasten the seat belt. Maintain it so that it is always functional.



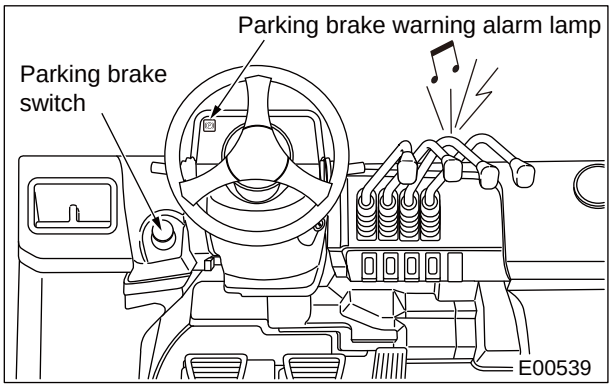
•Seat Belt Warning Functions

Conditions				Safety Warning
Key Switch	Engine	Operator Seat	Seat Belt	
ON	ON or OFF	Not Seated	Not Buckled	Seat Belt Warning Lamp [ON]
			Buckled	Seat Belt Warning Lamp [OFF]
		Seated	Not Buckled	Seat Belt Warning Lamp [ON]
			Buckled	Seat Belt Warning Lamp [OFF]

•Parking Brake Warning Buzzer and Alarm Lamp

The parking brake is a push/pull type switch installed on the left hand side of the dashboard. Push to apply and pull to release the parking brake. When leaving the lift truck, always apply the parking brake.

Note:
The parking brake is not automatically applied.



PDS function

When the engine is stopped or running,
operator is leaving or rising from the operator seat for 2 seconds,
truck speed is under 0.2 km/h (0.1 mph)
and turning the key switch to the ○ (OFF) position without applying the parking brake,
activates the parking brake warning buzzer and the parking brake is applied. To release the parking brake, push to apply the parking brake and then pull to release. The parking is now released.

The parking brake warning alarm lamp in the instrument panel glows when the parking brake is applied. The parking brake warning buzzer and alarm lamp are one of the PDS functions.

⚠ WARNING

- Prior to operating the lift truck, BE SURE to check that the parking brake warning buzzer and alarm lamp are functioning.
- The buzzer and warning lamp remind the operator to apply the parking brake when leaving the lift truck. Maintain them so that they are always functional.

⚠ WARNING

- Park the lift truck on level ground with the forks lowered until the fork tips touch the ground, parking brake applied, direction lever in the NEUTRAL position, engine stopped and the wheels blocked.
- When replacing the operator seat, BE SURE to order a genuine Cat lift truck seat with an operator presence switch and an operator restraint system.

•Parking Brake Warning Functions

Conditions				Safety Warning	
Key Switch	**Engine**	**Operator Seat**	**Parking Brake**		
OFF	OFF	Seated or Not Seated	Not Applied	Parking Brake Warning Alarm Lamp [OFF]	Buzzer [ON]
			Applied	Parking Brake Warning Alarm Lamp [OFF]	Buzzer [OFF]
ON	ON or OFF	Not Seated	Not Applied	Parking Brake Warning Alarm Lamp [OFF]	Buzzer [ON]
			Applied	Parking Brake Warning Alarm Lamp [ON]	Buzzer [OFF]
		Seated	Not Applied	Parking Brake Warning Alarm Lamp [OFF]	Buzzer [OFF]
			Applied	Parking Brake Warning Alarm Lamp [ON]	Buzzer [OFF]
		Seated to Not Seated	Not Applied	Parking Brake Warning Alarm Lamp [OFF]	After 2 seconds, Buzzer will turn [ON]

♦ Parking Brake Dragging Warning

Driving the lift truck without releasing the parking brake, the parking brake warning buzzer activates.

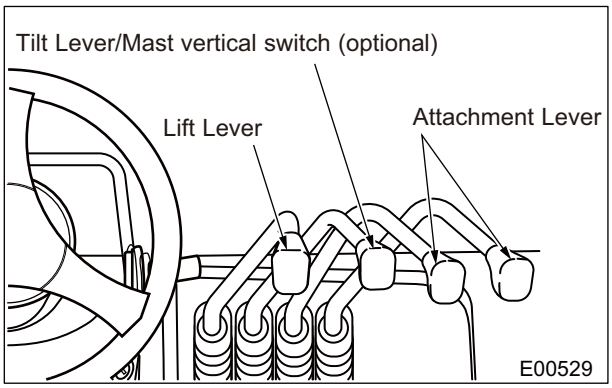
Conditions			Safety Warning
Key Switch	**Parking Brake**	**Speed**	
ON	Release	0 km / h	Buzzer [OFF]
		Faster than 0 km / h	Buzzer [OFF]
	Apply	0 km / h	Buzzer [OFF]
		Faster than 0 km / h	Buzzer [ON]

♦ Operating Switches and Controls (MC Model)

Equipped with mast interlock system

The mast interlock will only work for the lift and tilt levers.

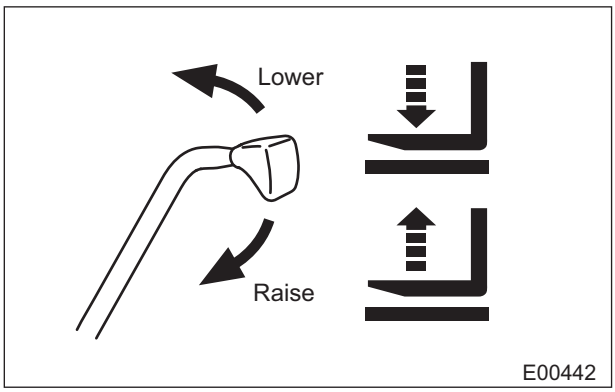
If the operator leaves the operator seat for 2 seconds while the key switch is in the | (ON) position, regardless of whether the engine is running or not, the mast will not lift, lower, or tilt when the lift or tilt lever is operated. This is not a failure, but the interlock system is being activated.



•Lift Lever

Lifting speed is controlled by the speed of the engine (the position of the accelerator pedal) and the position of the lift lever. Lowering speed is controlled only by the position of the lift lever regardless of the speed of the engine. The lever will return to the neutral position when released.

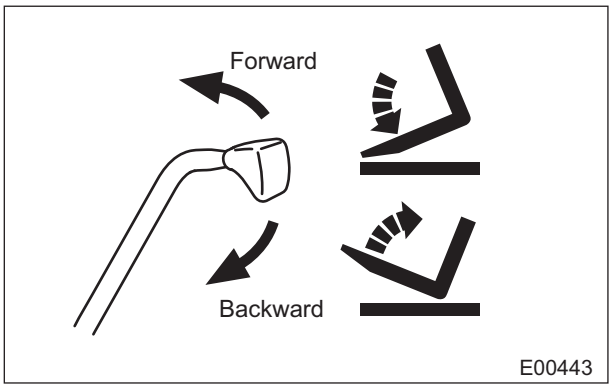
To deactivate the mast interlock system, the operator sits on the operator seat while the key switch is in the | (ON) position with the engine running, and then operate the lift lever.



•Tilt Lever

Tilt speed is controlled by the speed of the engine (the position of the accelerator pedal) and the position of the tilt lever. The lever will return to the neutral position when released.

To deactivate the mast interlock system, the operator sits on the operator seat while the key switch is in the | (ON) position with the engine running, and then operate the tilt lever.



•Attachment Lever

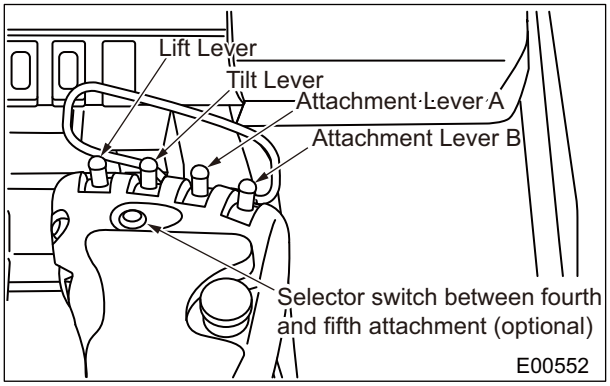
The mast interlock will not work for the attachment levers. Therefore, when the attachment lever is operated, some of the attachments will move, even though the engine is not running or the key switch is in the ○ (OFF) position, as a result of the handling load or of its own weight.

♦ Operating Switches and Controls (FC Model)

Equipped with mast interlock system

The mast interlock will work for the lift, tilt and attachment levers.

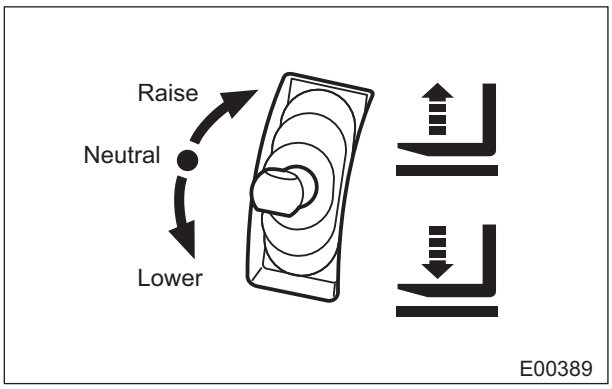
If the operator leaves the operator seat for 2 seconds while the key switch is in the │ (ON) position, regardless of whether the engine is running or not, the mast and attachment will not lift, lower, or tilt when the lift, tilt or attachment lever is operated. This is not a failure, but the interlock system is being activated.



•Lift Lever

Lifting speed is controlled by the speed of the engine (the position of the accelerator pedal) and the position of the lift lever. Lowering speed is controlled only by the position of the lift lever regardless of the speed of the engine. The lever will return to the neutral position when released.

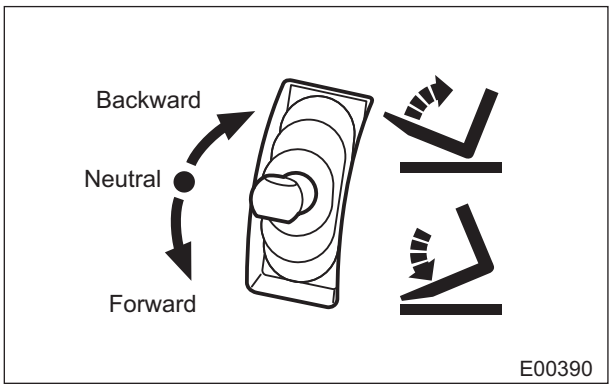
To deactivate the mast interlock system, the operator sits on the operator seat while the key switch is in the │ (ON) position with engine stopped, and then operate the lift lever.



•Tilt Lever

Tilt speed is controlled by the speed of the engine (the position of the accelerator pedal) and the position of the tilt lever. The lever will return to the neutral position when released.

To deactivate the mast interlock system, the operator sits on the operator seat while the key switch is in the │ (ON) position regardless of whether the engine is running or not, and then operate the tilt lever.



•Attachment Lever A/B (Optional)

To deactivate the mast interlock system, the operator sits on the operator seat while the key switch is in the │ (ON) position with engine running, and then operate the attachment lever.

Attachment lever A (optional)

This lever is for operating the third attachment.

Attachment lever B (optional)

This lever is for operating the fourth attachment.

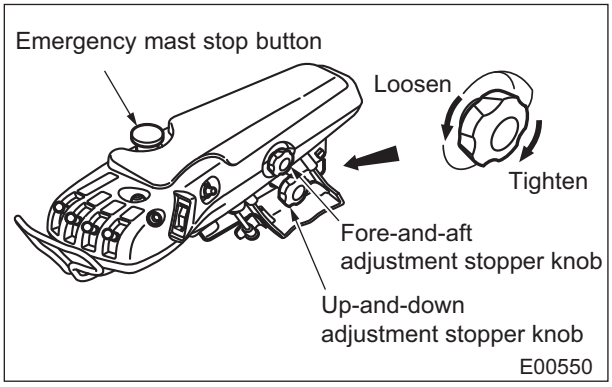
•Selector Switch Between Forth and Fifth Attachment

For operation of the fifth attachment, operate the attachment lever B while pressing this switch.

•Other Controls (Standard)

Besides lift, tilt and attachment levers, FC lever box has the following standard controls.

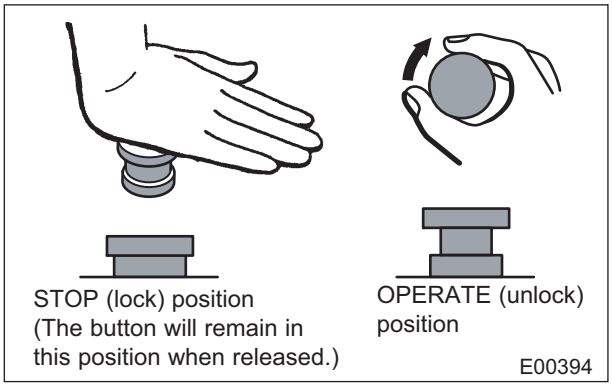
- Emergency mast stop button
- Fore-and-aft adjustment stopper knob
- Up-and-down adjustment stopper knob



•Emergency Mast Stop Button

Use this button for the following situations.

- When you have to stop the mast and attachment actions in an emergency without stopping the engine.
- When you get off the lift truck.



How to use

- To stop (lock) lift, tilt and attachment actions, push down on the button. The mast and attachments will not move even if the control levers are operated. At this time, error code "F75" is displayed on the instrument panel. This does not indicate an abnormality. This error code is cleared by turning the key switch to the ○ (OFF) position and then turning it to the | (ON) position.
- To operate (unlock these actions), turn the button clockwise.
- The lights will go out when the emergency mast stop button is pushed down.
- To turn ON the lights when the emergency mast stop button is being pushed down, turn the light switch to the ≡D or ≡DC≡ position.

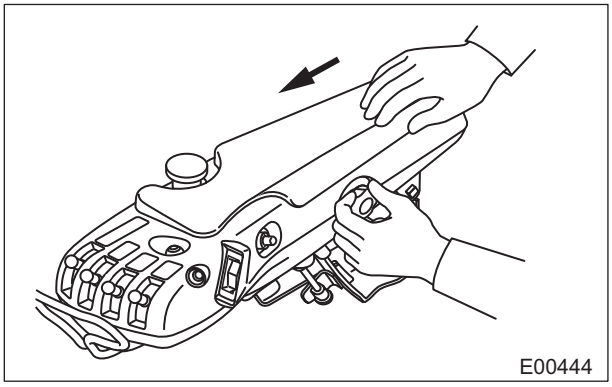
Note:

The emergency mast stop button applies to the lift, tilt and attachment levers only. The emergency mast stop button does not apply the parking brake or disengage the transmission.

•Forward and Back Adjustment Stopper Knob

⚠ CAUTION

DO NOT insert fingers under this box at the front or rear when adjusting the FC lever box forward or backward.

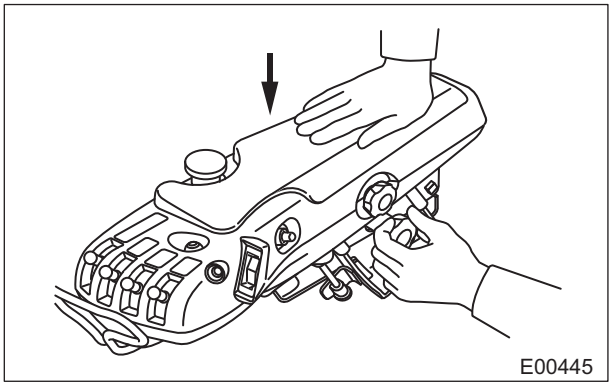


1. Loosen the knob to unlock with LEFT HAND.
2. In order to adjust the FC lever box to an appropriate forward and back position, push forward with RIGHT HAND.
3. Tighten the knob to lock with LEFT HAND.
4. Make sure that the box is firmly secured.

•Up and Down Adjustment Stopper Knob

⚠ CAUTION

DO NOT place fingers around the gas springs or insert fingers into the slot of the adjuster when adjusting the FC lever box up or down.

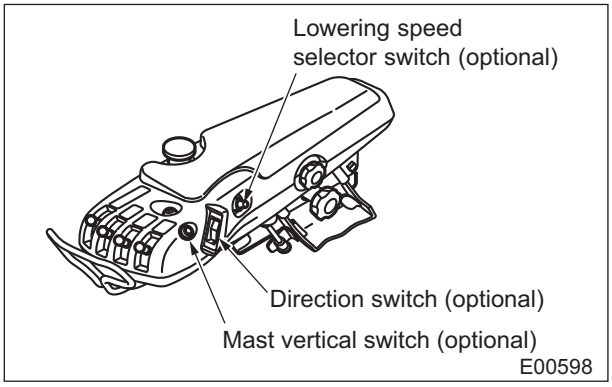


1. Loosen the knob to unlock with LEFT HAND.
2. In order to adjust the FC lever box to an appropriate height, push down with RIGHT HAND. The box is assisted with gas springs.
3. Tighten the knob to lock with LEFT HAND.
4. Make sure that the box is firmly secured.

•Other Controls (Optional)

Besides lift, tilt and attachment levers, FC lever box has the following optional controls.

- Lowering speed selector switch
- Mast vertical switch
- Direction switch



•Lowering Speed Selector Switch (Optional)

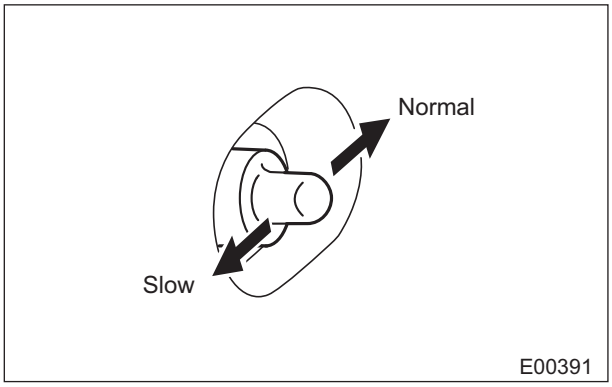
Do not touch the lift/tilt or attachment lever when turning this switch ON or OFF.

Slow

This position allows you to lower the forks at 70% of the normal or rated speed. Use this switch until you feel sure of what is going to happen when you move the lift control, or when you handle fragile loads.

Normal

This position allows you to lower the forks at the normal speed.

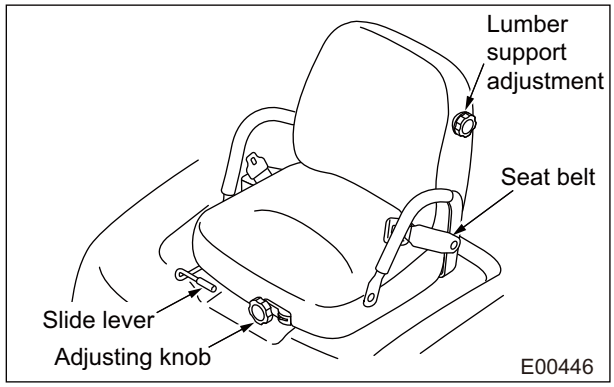


♦ Operator Seat

•Seat Adjustment

⚠ WARNING

Adjust the operator seat slide fore and aft position before starting the engine. After adjusting, check the operator seat to make sure it is properly locked. DO NOT adjust the operator seat while the lift truck is in motion.

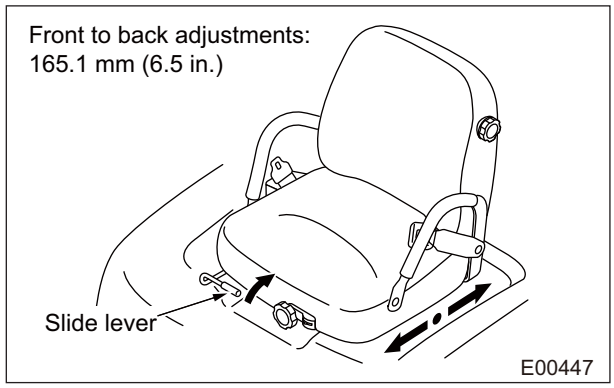


•Forward and Back Adjustment

Move the lever, slide the seat to one of the thirteen positions, and release the lever.

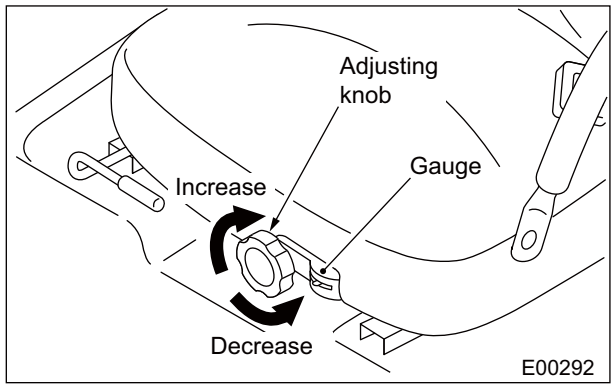
⚠ WARNING

Your lift truck comes equipped with a genuine Cat lift truck operator restraint system and an operator presence switch. Should it become necessary to replace the seat for any reason, it must only be replaced with a genuine Cat lift truck operator restraint system equipped with an operator presence switch.



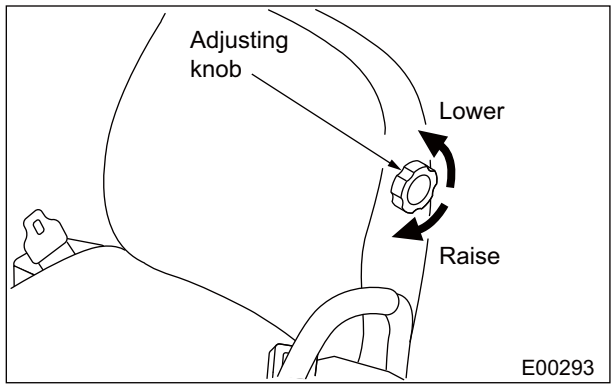
•Adjustment of Suspension

Adjust the suspension before sitting on the seat. Turn the knob until the gauge indicates the weight of the operator. Turning the knob clockwise, increases the gauge indication, and turning it counterclockwise decreases the gauge indication.



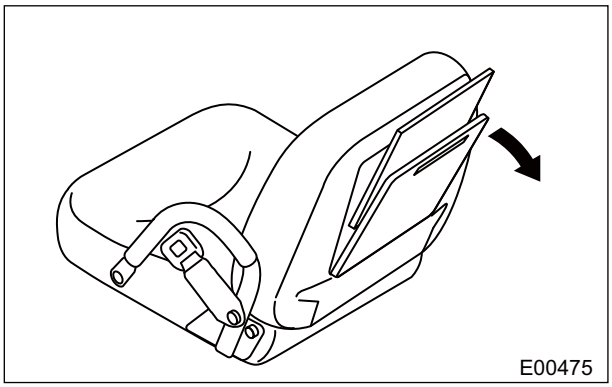
•Lumbar Support Adjustment

Turn the knob clockwise to raise the backrest. Turn the knob counterclockwise to lower it.



•Pocket for the Manual

Place the operator manual in this pocket. Use both hands to open or close the pocket.

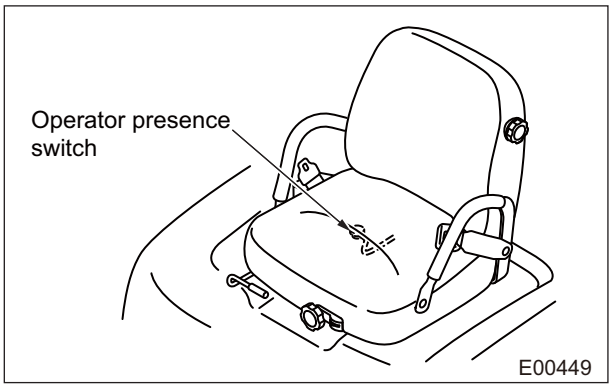


•Operator Presence Switch and Buzzer

The operator seat has an operator presence switch. The mast and attachments cannot be moved unless the operator is seated in the operator seat. If the attachment is installed to an MC model, see the topic, "Mast Interlock system" for MC model.

Regardless of the running or stopping of the engine, the parking brake warning buzzer activates and parking brake warning alarm lamp blinks if an operator leaves the seat without applying the parking brake.

When leaving the lift truck, always apply the parking brake and turn the key switch to the ○ (OFF) position.



⚠ WARNING

- When replacing the operator seat, BE SURE to order a genuine Cat lift truck seat with an operator presence switch and an operator restraint system.

•How to Tip the Seat Forward

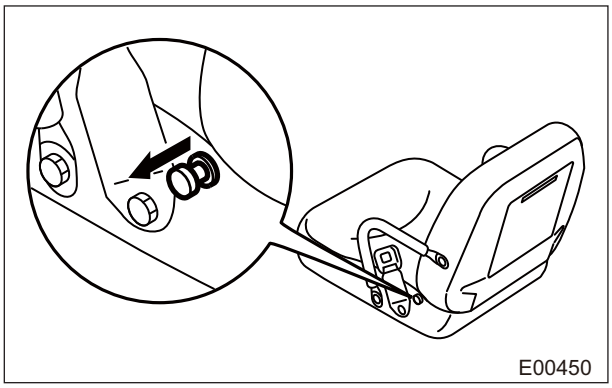
To open the engine hood on a lift truck equipped with the LPG system, tip the seat forward to obtain clearance for the LPG tank.

To tip the seat forward

The release lever is located on the left side of the seat. Pull this lever all the way in the direction of the arrow, hold the lever in that position, and tip the seat forward by pushing the backrest.

To reposition the seat

Reposition the seat by pushing the backrest back and then push the lever to lock.



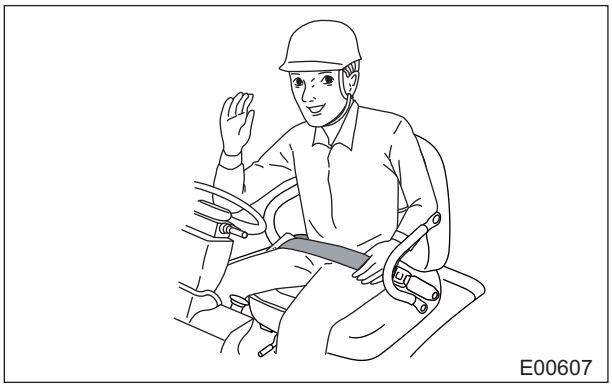
♦ Seat Belt

⚠ WARNING

- The seat belt will help to restrain the operator in accidents such as a tipover or mast and attachment collisions.
- An unrestrained operator in a tipover could fall outside of the operator compartment and be crushed by the lift truck.
- An unrestrained operator could continue to move forward if a sudden stop occurs.
- Always fasten the seat belt when operating the lift truck.

⚠ WARNING

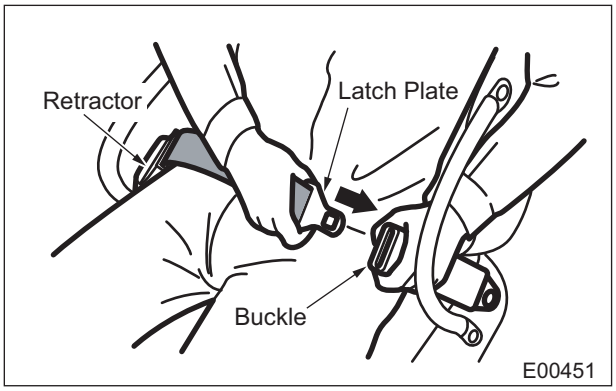
- Seat belts could "jack-knife" the operator—the upper body bends tightly at the waist.
- If the seat belt is fastened across the operator's abdomen during an accident, it could cause serious internal injuries.



How to fasten the seat belt

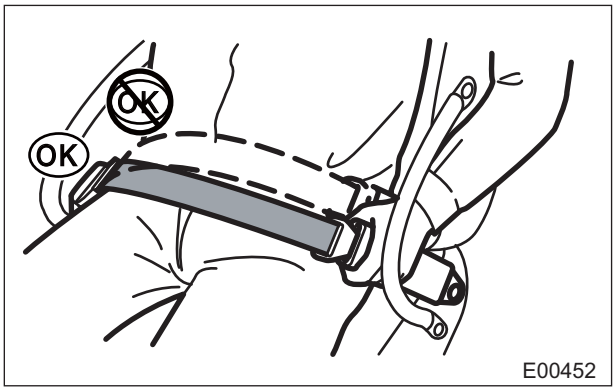
1. Hold the latch plate of the belt and pull the belt from the retractor.
2. Insert the plate into the slot of the buckle until a snap is heard.

Note:
Make sure the belt is not twisted.



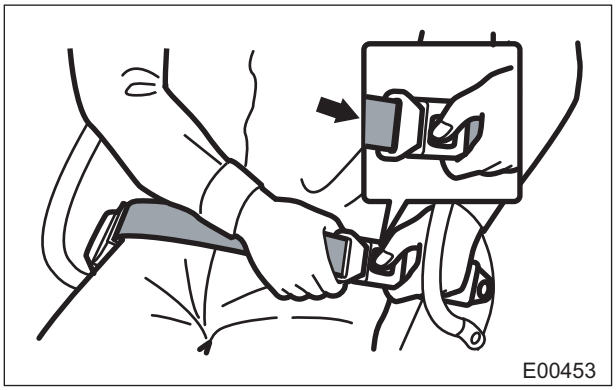
3. Be sure to fasten the belt as low as possible across your hips, not across your abdomen.

Note:
It is not necessary to adjust the belt length. Tug on it to check for a tight fit.

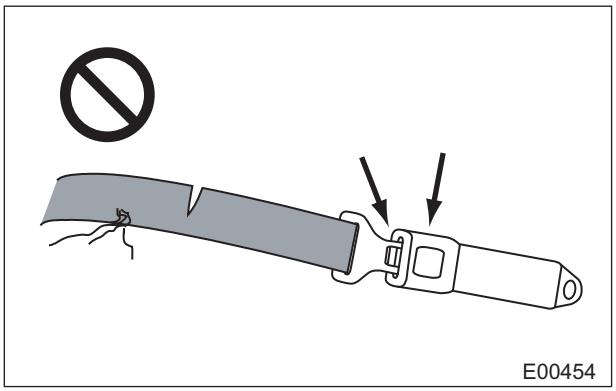


How to release the seat belt

1. Push the button in the buckle to release the belt. The belt will automatically retract when released.
2. Hold the plate of the belt and allow the belt to slowly retract.



If the seat belt is torn, the pulling motion of the belt is interrupted during extension, or the belt cannot be inserted into the buckle properly, replace the seat belt assembly. The seat belt must be checked at regular service intervals.



Note:
The following maintenance guidelines detail how to inspect seat belt for "cuts, fraying, extreme or unusual wear of the webbing, etc., and damage to the buckle, retractor, hardware, or other factors", which indicate that belt change is necessary.

- Cuts, fraying, or excessive wear on the webbing would indicate the need for change of the seat belt system.
- Check buckle and latch for proper operation and to determine if latch plate is worn, deformed, or buckle is damaged or casing broken.
- Check the retractor web storage device operation to make sure that it locks properly and that it spools out and retracts webbing properly.

⚠ WARNING

When replacing seat belt components, replace them with genuine Cat lift trucks' parts.

♦ Fork Locking Pins

For load stability, adjust the forks as wide as possible.

⚠ WARNING

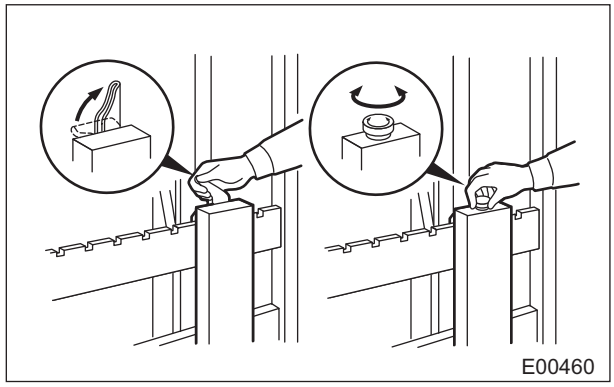
When adjusting the fork spread, DO NOT place your hands between the fork and load backrest extension or lift bracket, to avoid pinching your hands.

⚠ CAUTION

- After adjusting the fork spread, restore the fork locking pins or levers to the original position to lock the forks.
- Position each fork the same distance from the center of the lift bracket.

How to adjust fork spread

1. Pull up and turn the locking pins 90 degrees of angle or pull the levers upward.
2. Spread the forks to fit the load.



♦ Changing Forks

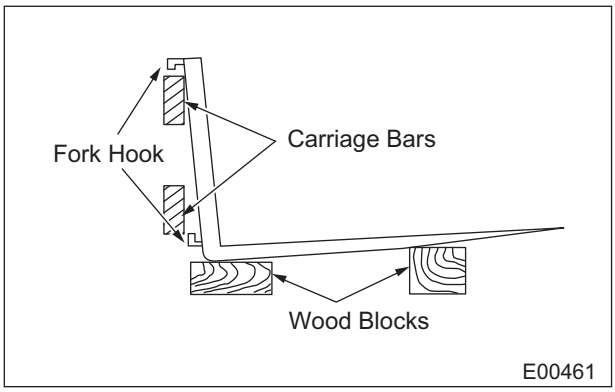
Remove a fork from the lift bracket to change it or to access other parts of the lift truck for maintenance.

⚠ WARNING

DO NOT try to install or remove a fork without a lifting device. Each fork could weigh in excess of 45 kg (100 lb.).

How to remove forks

1. Slide the forks, one at a time, to the installation/removal recess on the bottom carriage bar.
2. Tilt the lift bracket forward, then lower it until the fork hook disengages the forks from the lift bracket.
3. Use a lifting device to move the forks away from the lift truck.



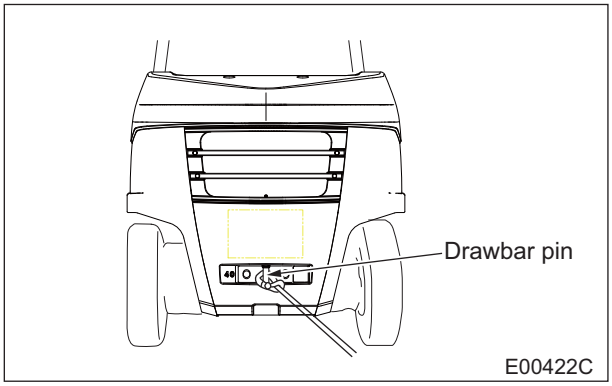
How to install forks

1. Position the forks side-by-side on the floor in a location where they can be approached from the rear by the lift truck.
2. Slowly drive the lift truck, with the lift bracket fully lowered and fully tilted forward, to a point just to the rear of the forks.
3. Carefully slide the forks, one at a time, onto the lift bracket so the top hook of the fork is placed above the top carriage bar.
4. Raise the lift bracket to engage the top hooks allowing the bottom hooks to pass through the installation/removal recess.
5. Carefully slide each fork on the carriage bar so both the upper and lower hooks engage the lift bracket.
6. Lock the forks in place by engaging the fork lock pins.

♦ Drawbar Pin (If Equipped)

Use the drawbar pin for the following situations:

- Pulling the lift truck out of a drop-off or ditch.
- Loading and unloading the lift truck on a transport truck.
- Load the lift truck on a transport truck by using the drawbar pin, then start the engine, and pull the parking brake switch to release.



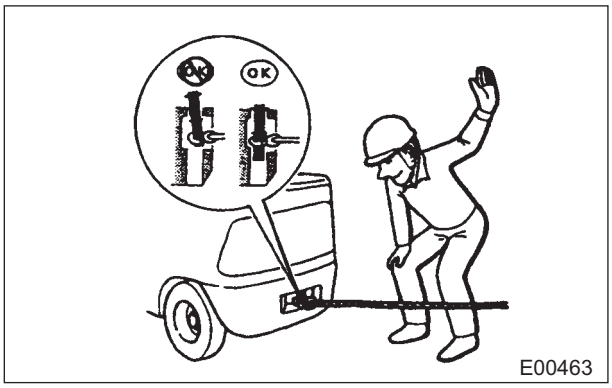
⚠ WARNING

DO NOT use the drawbar pin for towing loads.

⚠ WARNING

Precautions for the use of the drawbar pin

- When hitching a cable to the pin, make sure the pin is inserted safely.
- Take up slack slowly—DO NOT jerk. Keep the cable taut. If the cable has slack, the sudden impact of the load could snap it, resulting in an accident.
- A helper must stand at a safe distance and watch the pin. Stop pulling with the lift truck, relieve tension, and reduce load if the pin starts to come out.

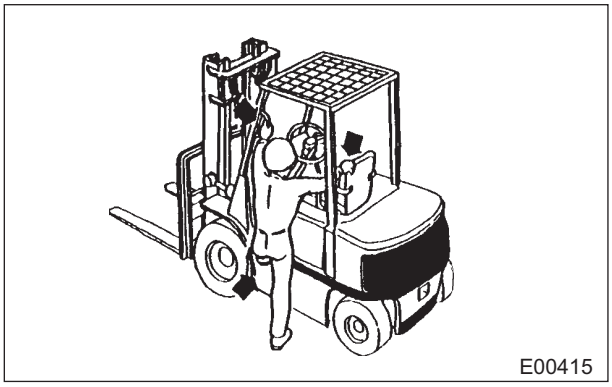


♦ Assist Grip

Grasp the assist grip with the left hand, the seat backrest with the right hand, and step up with the left foot to get on the lift truck safely.

⚠ WARNING

- DO NOT grab the steering wheel or the control lever.
- DO NOT jump on or off the lift truck.
- DO NOT get on or off the lift truck from the right side of the lift truck..



♦ Engine Hood

⚠ CAUTION

When closing the engine hood, be careful not to pinch your hand.

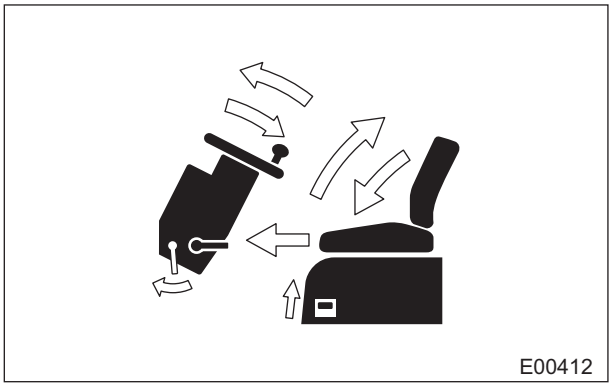
The engine hood swings up to fully expose the engine compartment for daily inspection, servicing and lubrication.

- Engine Oil Level
- Engine Coolant Level
- Hydraulic oil level
- Air Cleaner Element
- Alternator Drive Belt
- Battery Electrolyte Level

•Hood Latch

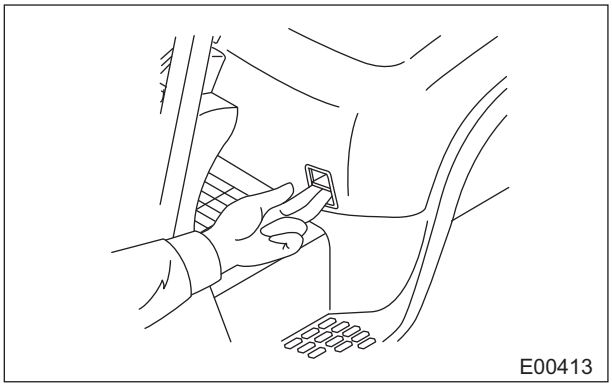
How to open

1. Unlock the steering column release lever and tilt the steering wheel toward the front of the lift truck. See the topic, "the Steering Column Tilt Lever.
2. Slide seat assembly forward.
3. Lower seat back cushion.
4. Pull the engine hood lever in the direction of the arrow.
5. Raise the engine hood.



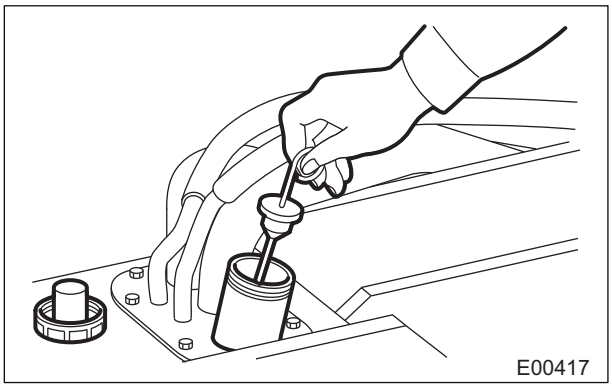
How to close

1. Push the engine hood down until it is locked.
2. Raise seat back cushion to the upright locked position.
3. Slide seat assembly back to desired position.
4. Tilt the steering wheel toward the operator seat and make sure that it is automatically locked.



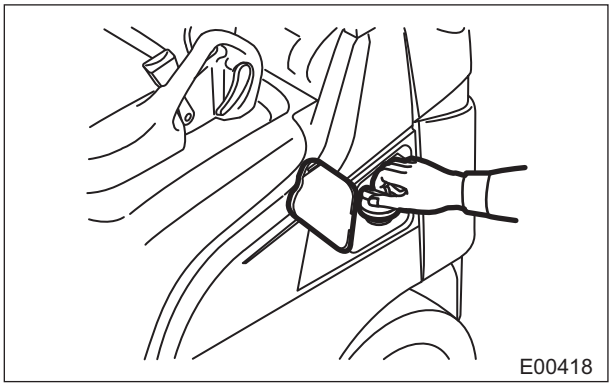
♦ Hydraulic Tank Oil Level / Filler Hole

The oil level / filler hole is located on the right side in the engine compartment. To check the oil level, use the dip stick located in the hole.



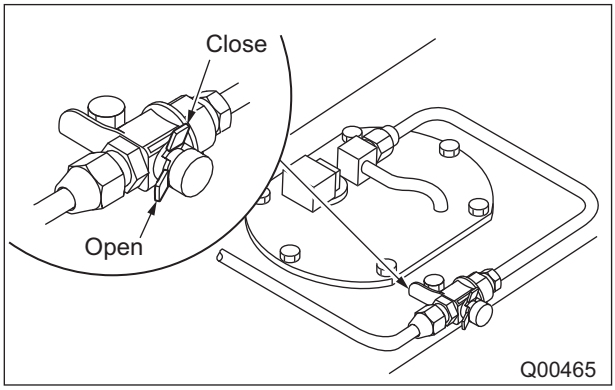
♦ Fuel Filler

The fuel filler is located on the left side of the lift truck. The cap can be removed by turning it counterclockwise.



♦ Fuel Shut-off Valve

The fuel shut-off valve is located inside the engine hood. Close this valve in an emergency or when performing maintenance.

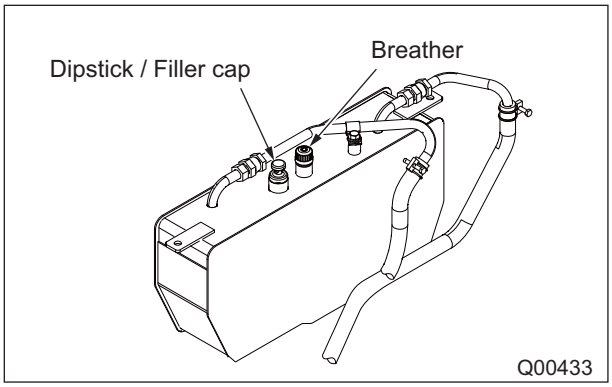


♦ Brake Tank Oil Level / Air Breather

(For use with wet disc brake option)

The oil level / filler hole is located on the right side of the lift truck.

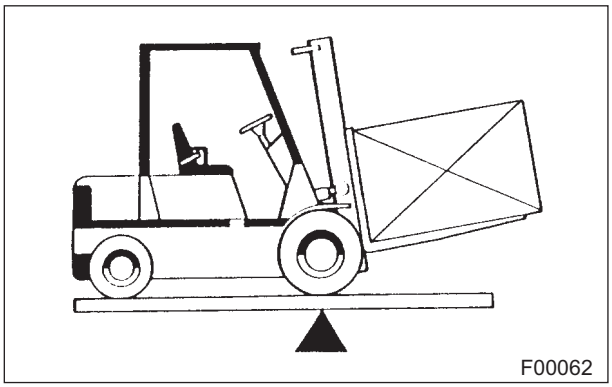
1. Check the oil level using the dipstick / filler cap located on the brake oil tank.
2. Check the breather and make sure it is free from clogging.



HOW TO AVOID A TIPOVER; HOW TO SURVIVE ONE

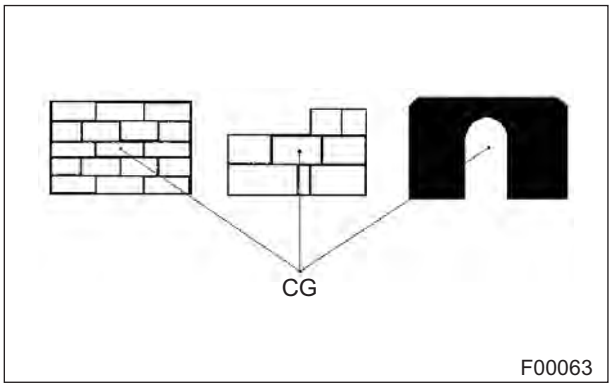
♦ Know What Lift Truck Stability Is

Counterbalanced lift truck design is based on the balance of two weights on opposite sides of a fulcrum (the front axle).
The load on the forks must be balanced by the weight of the lift truck. The location of the center of gravity of both the lift truck and the load is also a factor.
This basic principle is used for picking up a load. The ability of the lift truck to handle a load is discussed in terms of center of gravity and both forward and sideways stabilities.



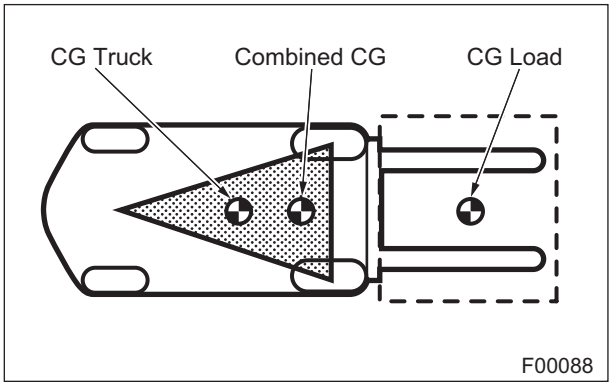
♦ Center of Gravity (CG)

Center of Gravity (CG) is defined as the point of an object where its weight is evenly distributed.
If the object is uniform, its geometric center will be the same as its CG. If it is not uniform, the CG could be a point on either side of the normal geometric center.
When the lift truck picks up a load, the lift truck and load have a new, combined CG.



♦ Stability and Center of Gravity (Top View)

The stability of the lift truck is determined by the location of its CG, or if the lift truck is loaded, the combined CG.
The lift truck has moving parts and, therefore, has a CG that moves. The CG moves forward or backward as the mast is tilted forward or backward. The CG moves up or down as the mast moves up or down.

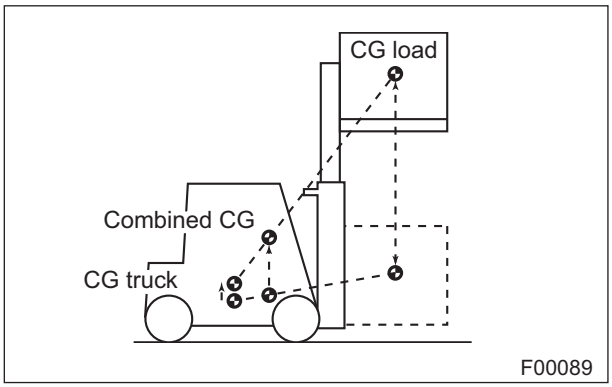


The CG and the stability of the loaded lift truck, are affected by a number of factors such as:

- The size, weight, shape and position of the load.
- The height of the lifted load.
- The amount of forward or backward tilt.
- Dynamic forces created when the lift truck is accelerated, braked or turned.
- Condition and grade of surfaces on which the lift truck is operated.

♦ Stability and Center of Gravity (Side View)

These factors must be considered when the lift truck is unloaded, as well, because an empty lift truck will tip over to the side more easily than a lift truck carrying a load in the lowered position.

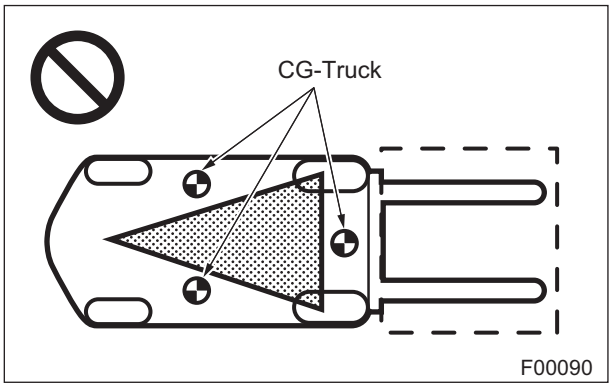


♦ Lift Truck Stability Base

In order for the lift truck to be stable (not tip over forward or to the side), the CG must stay within the area of the lift truck stability base—a triangle drawn between the front wheels and the pivot of the rear axle.

If the CG moves forward of the front axle, the lift truck will tip over forward.

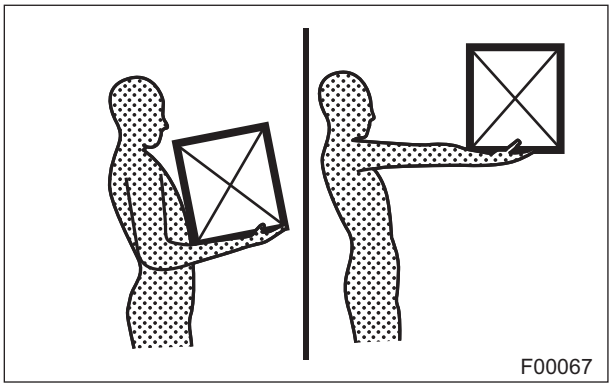
If the CG moves outside of the line on either side of the stability base, the lift truck will tip over to the side.



♦ Capacity (Weight and Load Center)

The capacity of the lift truck is shown on the capacity plate. It is determined by the weight and load center. The load center is determined by the location of the CG of the load.

The load center shown on the capacity plate is the horizontal distance from the front face of the forks, or the load face of an attachment, to the CG in the load. The location of the CG of the vertical direction is the same as the horizontal dimension.



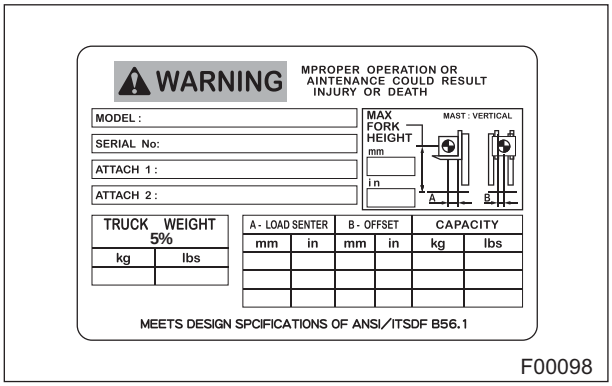
Keep in mind that, unless otherwise indicated, the capacity shown on the capacity plate is for a standard lift truck with standard backrest, forks and mast, and having no special-purpose attachment. In addition, the capacity presumes the load center is no further from the top of the forks than it is from the face of the backrest.

If these conditions do not exist, the operator may have to reduce the safe operating load because the lift truck stability may be reduced. The lift truck should not be operated if its capacity plate does not indicate capacity.

♦ Capacity Plate

⚠ WARNING

Capacity plate originally affixed to lift trucks must not be removed, altered or changed without the manufacturer's approval.



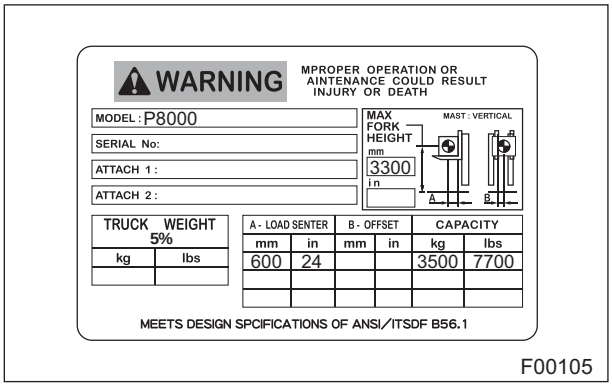
F00098

•Sample

The capacity plate shown above is for a 4.0 ton model standard lift truck whose capacity is 3500 kg (7700 pounds) at 600 mm (24 in.) load center.

The capacity plate specifies this lift truck can lift up to 3500 kg (7700 pounds) if the load center is not more than 600 mm (24 in.) forward from the face of the backrest.

Before attempting to pick up or lift a load, make sure its weight is within the capacity of the lift truck at the load center involved.



F00105

Note:

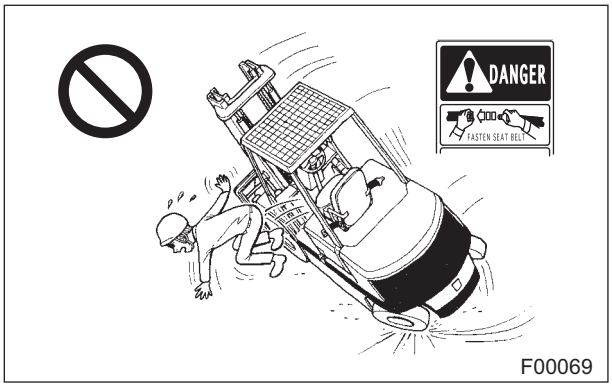
If the load is not uniform, the heaviest portion should be placed closer to the backrest and centered on the forks.

♦ Do’s and Don’ts to Avoid Tipover

Fasten the seat belt!

⚠ DANGER

The seat belt is used to protect your head and torso from being trapped between the lift truck and the ground; however, it may not protect the operator against all possible injury.

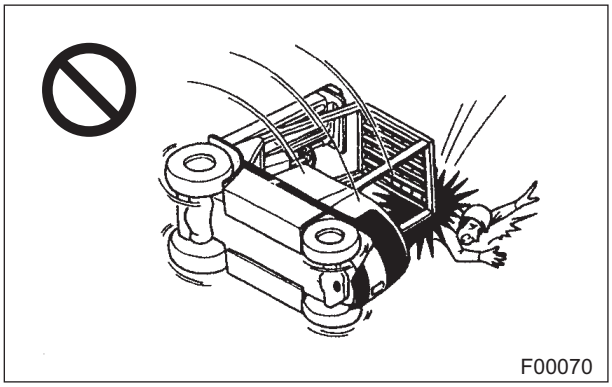


F00069

DO NOT jump off your lift truck if it starts to tip over!

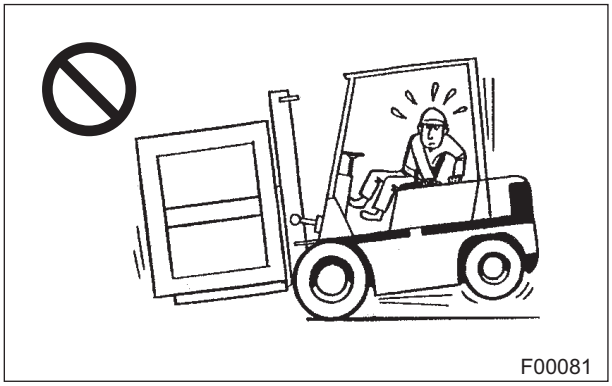
DANGER

The operator must stay in the operator seat, hold on firmly and lean away from the point of impact to reduce the risk of serious injury of death.



WARNING

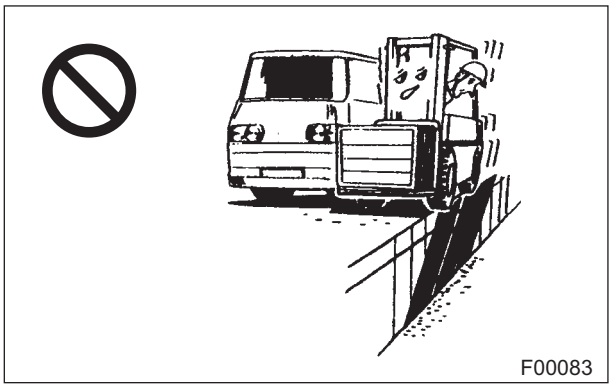
DO handle loads only within the capacity shown on the capacity plate.



DO watch "Tail swing!"

WARNING

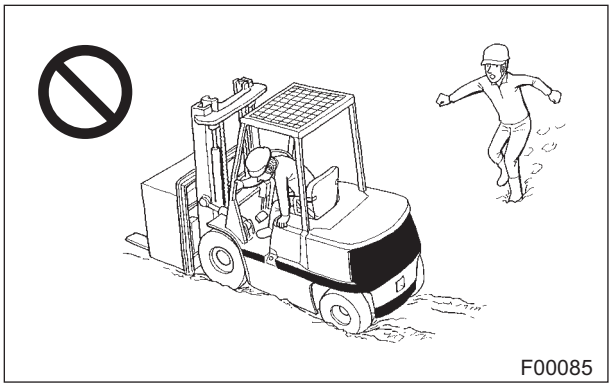
Always maintain a safe distance from the edge of docks, ramps and platforms.



DO check surface strengths!

WARNING

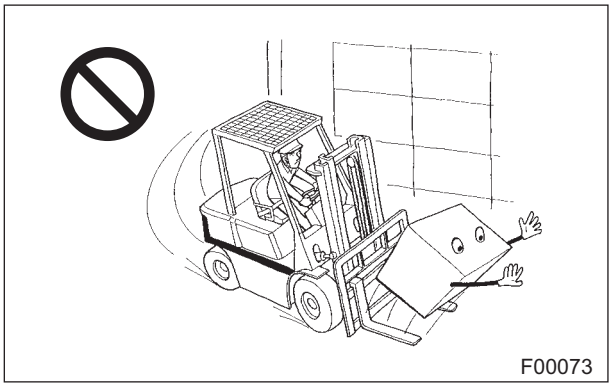
Stay away from soft ground to avoid tipover.



DO avoid fast starts, turns and sudden stops!

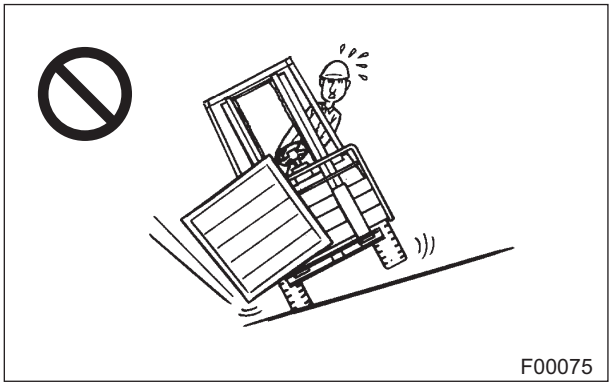
⚠ WARNING

These movements could cause the lift truck to tip over.



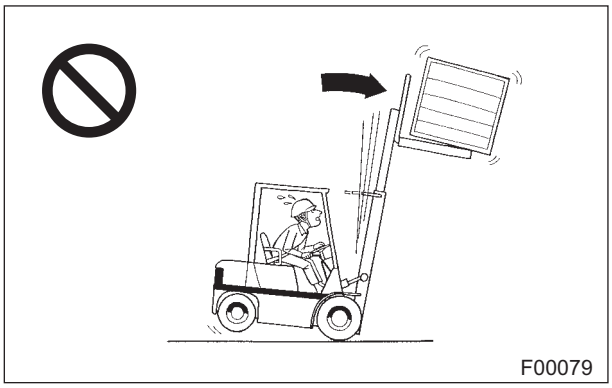
⚠ WARNING

Avoid turning, if possible, and use extreme caution on grades, ramps, or inclines.



⚠ WARNING

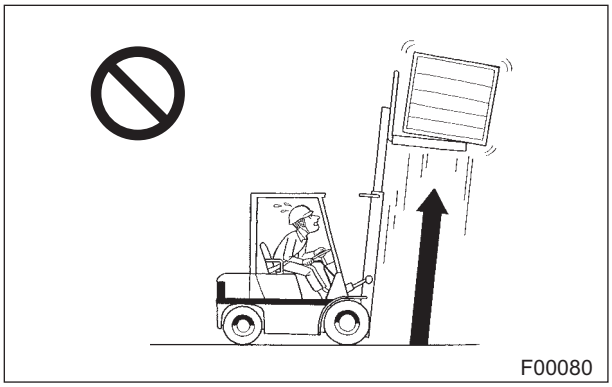
DO NOT tilt elevated loads forward except when the load is in a deposit position over a rack or stack. This could cause the lift truck to tip over.



DO NOT elevate forward tilted loads!

⚠ WARNING

This could also cause the lift truck to tip over.

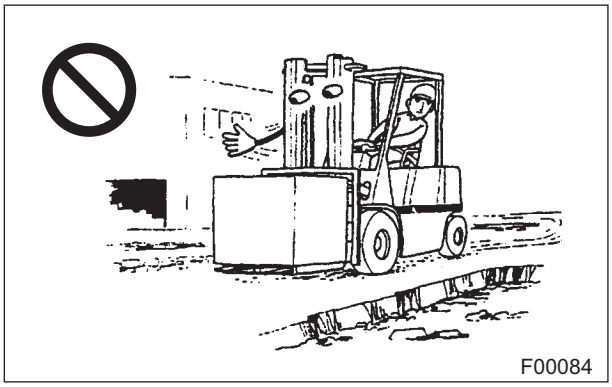


Travel at a reduced speed on rough surfaces!

⚠ WARNING

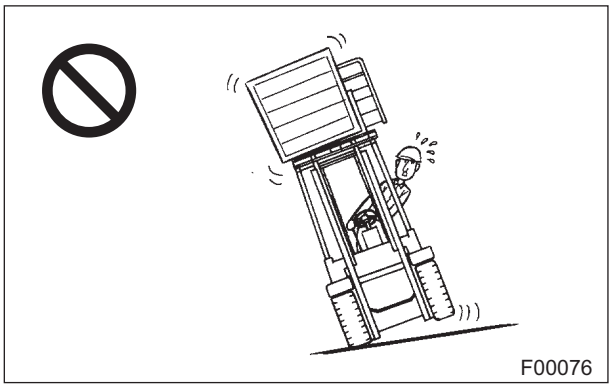
If not, the following accidents could result:

- The lift truck tips over.
- Hard to turn the steering wheel appropriately, leading to improper operation.
- Personnel is hit by the lift truck.


F00084

⚠ WARNING

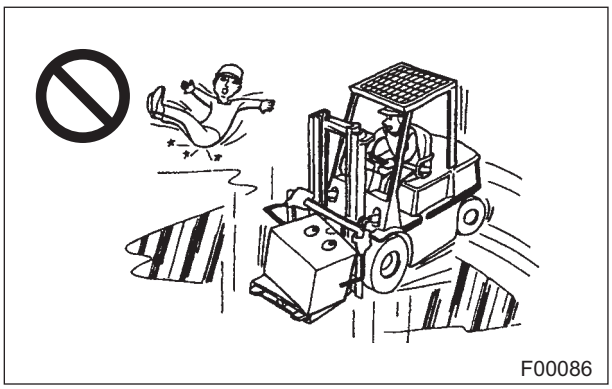
DO NOT attempt to pick up or deposit a load on ramps and other sloped surfaces that could affect the lift truck's stability.


F00076

DO avoid slippery surfaces!

⚠ WARNING

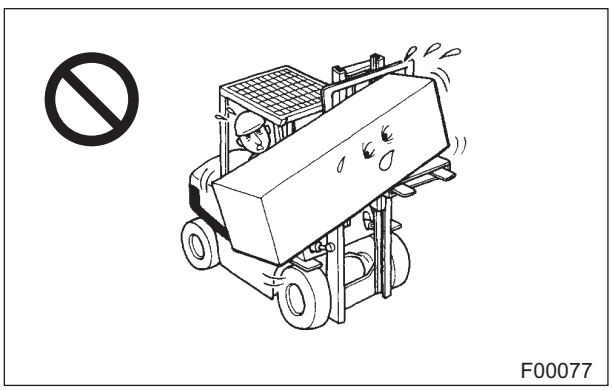
Slow down for wet and slippery surfaces.
Sand, gravel, ice or mud could cause a tipover. If unavoidable, slow down.


F00086

Only stable or safely arranged loads must be handled!

⚠ WARNING

DO NOT pick up an off-center load.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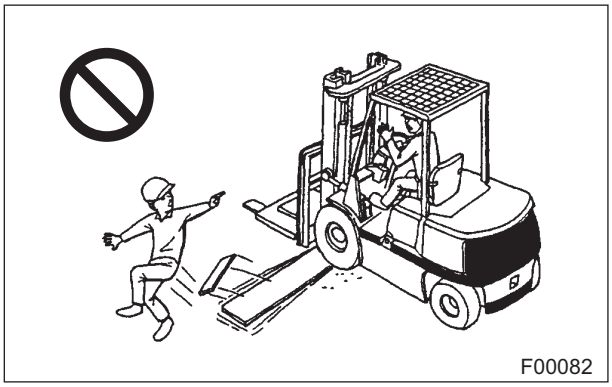
⚠ WARNING

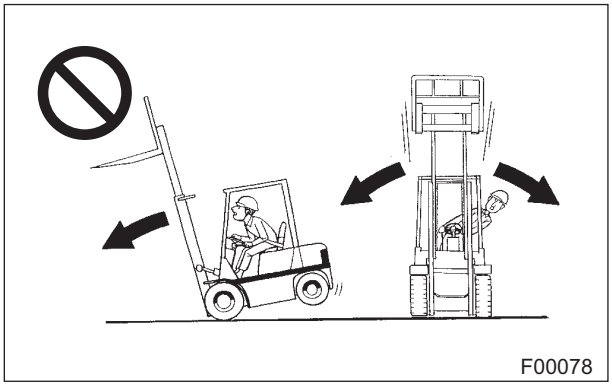
DO NOT run over loose objects on the roadway surface.



DO NOT travel with forks higher than 15 to 20 cm (6 to 8 in.) above the ground!

⚠ WARNING

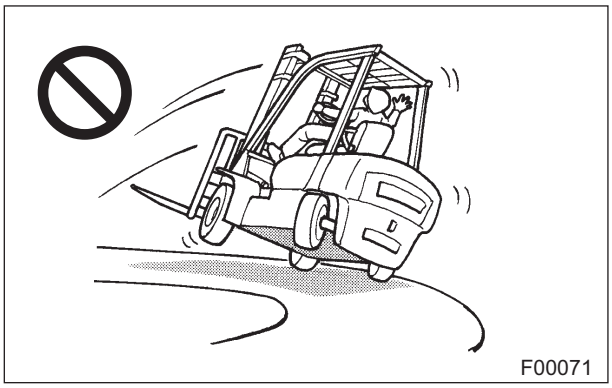
The CG moves up increasing the possibility of a tip over.



DO NOT make fast or sharp turns with a loaded or unloaded lift truck!

⚠ WARNING

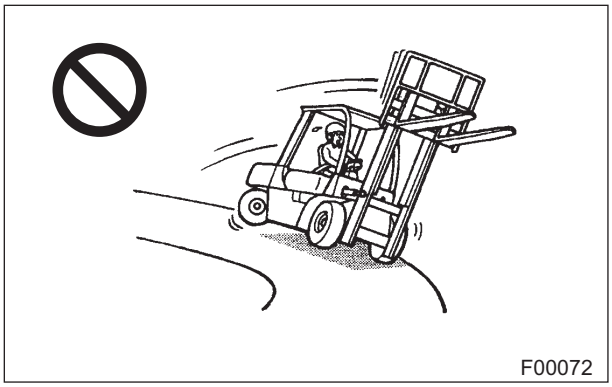
When negotiating turns, reduce speed to a safe level consistent with the operating environment.



DO NOT turn sharply, even with an empty raised mast, to avoid a tipover!

⚠ WARNING

A lift truck with a raised mast will tip over more easily than a lift truck with a lowered mast because the stability of the lift truck worsens.



DO wear a hard hat!

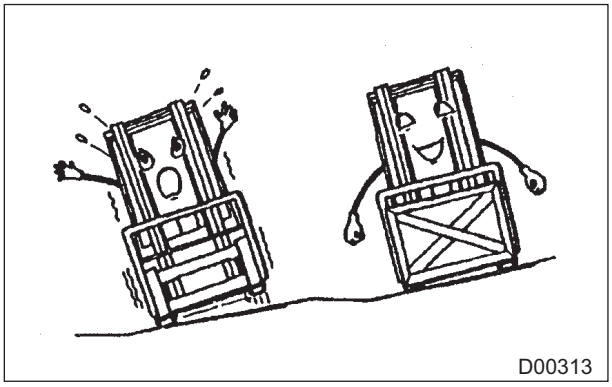
⚠ WARNING

It will help protect your head from serious injury.

Be aware of the stability of an empty lift truck!

⚠ WARNING

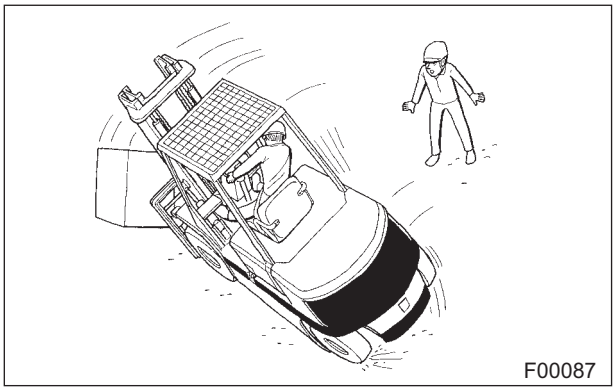
An empty lift truck will tip over more easily than a loaded one in a lowered position.



♦ How to Survive in a Tipover

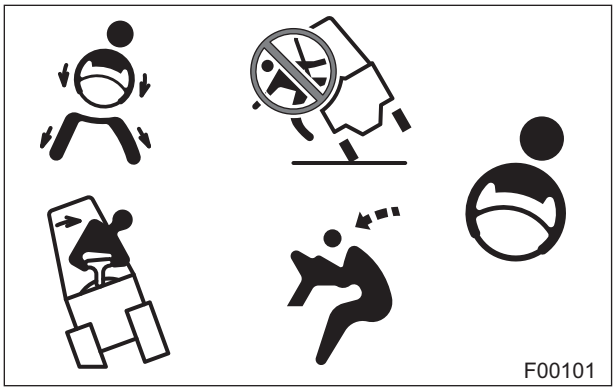
⚠ DANGER

Remember, your chances for survival with the seat belt fastened in a tipover are better if you stay in the lift truck. If the lift truck starts to tip over:



⚠ DANGER

- DO NOT jump off!
- Firmly hold on to the steering wheel.
- Brace your feet.
- Lean away from impact.
- Lean forward.



REFUELING

♦ Gasoline and Diesel Engine Equipped

⚠ WARNING

- BE SURE to use the fuels specified in the SERVICE DATA. If not, the engine could fail.
- Lift trucks must be refueled only at designated safe locations. Safe outdoor locations are preferable to those indoors.
- Stop the engine and get off the lift truck during refueling.

⚠ WARNING

- Explosive fumes could be present during refueling.
- DO NOT smoke in refueling areas.

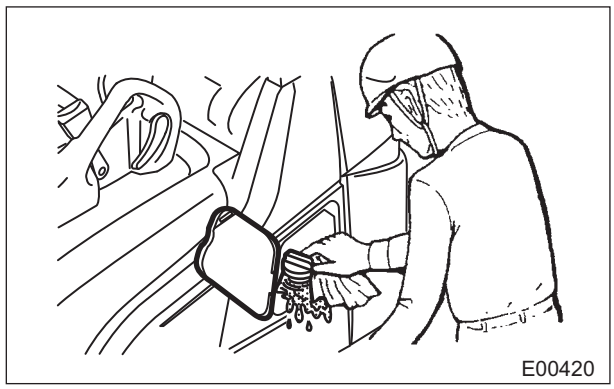
⚠ WARNING

Fire caused by static electricity!

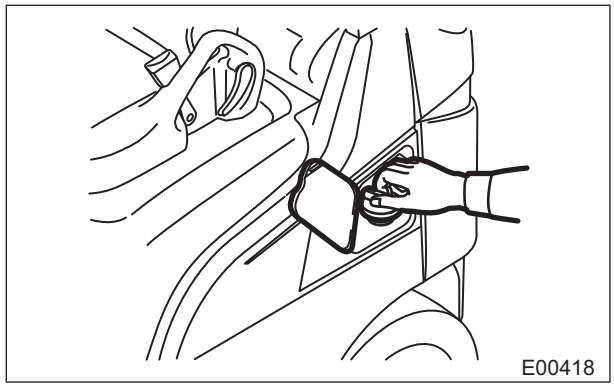
- In dry seasons there is a lot of static electricity.
- When refueling, touch grounded metals with bare hand to discharge the static electricity before opening the filler cap. If not, the fuel could catch fire due to the static electrical spark.

Note:

- Do not allow the lift truck to become low on fuel or completely run out of fuel. Sediment or other impurities in the fuel tank could be drawn into the fuel system. This could result in difficult starting or damage to components.
- Fill the fuel tank at the end of each day of operation to drive out moisture laden air and to prevent condensation.
- Do not fill the tank to the top. Fuel expands when it gets warm and may overflow.


E00420

1. Park the lift truck only at a location designated safe.
2. Lower the forks until the fork tips touch the floor or ground.
3. Apply the parking brake.
4. Place the direction lever in the NEUTRAL position.
5. Stop the engine.
6. Block the wheels.
7. Open the filler cap.
8. Fill the fuel tank slowly. Close and tighten the filler cap. If spillage occurs, wipe off excess fuel.


E00418

Note:

Drain water and sediment from the fuel tank as needed. Also, drain water and sediment from the main fuel storage tank before it is filled and as a weekly routine. This will help prevent water or sediment being pumped from the storage tank into the lift truck fuel tank.

♦ LP-Gas Equipped

⚠ WARNING

BE SURE to use the proper fuels specified in the SERVICE DATA. If not, the engine could fail.

⚠ WARNING

- Only trained and authorized personnel must fill or exchange LP-Gas tanks.
- Personnel engaged in filling LP-Gas tanks must wear protective equipment such as a face shield, long sleeves and gauntlet gloves.
- DO NOT refuel or store LP-Gas powered lift trucks near underground entrances, elevator shafts, or other places where LP-Gas could collect in a pocket and cause an explosion.
- Inspect all LP-Gas tanks before filling, and again before reuse for damage to the valves, liquid gauge, fittings and hand wheels.
- All defective or damaged LP-Gas tanks must be removed from service.
- The careless handling of LP-Gas tanks could result in a serious accident.
- To reduce the risk of damage to tanks, use extreme care when transporting them.

⚠ WARNING

The LP-Gas tank must not extend past the counterweight and must be inside the confines of the lift truck.

⚠ WARNING

Reduce the risks of fire caused by static electricity!

Touch grounded metals with bare hand to discharge the static electricity before changing compressed LP-Gas tanks. If not, the fuel could catch fire due to the static electrical spark.

⚠ CAUTION

LP-Gas tanks can be heavy, follow the instructions below:

- DO NOT insert fingers into the straps or brackets. If this warning is not adhered to, fingers may be pinched.
- DO NOT lift LP-Gas tank with your body in an improper position. You may injure your back.
- Take care not to drop an LP-Gas tank. It may fall on your body and lead to serious injury including bone fractures.
- Wear appropriate personal protective equipment.

⚠ CAUTION

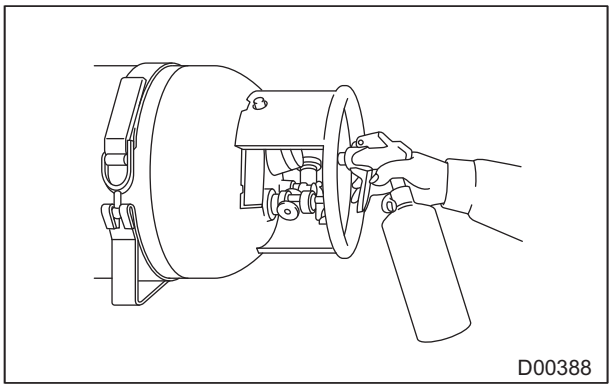
Be careful not to pinch fingers in the bands when installing a LP-Gas tank.

Note:

- MOUNT THE TANK PROPERLY. To insure full usage of fuel, use the mounting holes located on the collar for horizontal mounting and the slot in the foot ring.
- Open the valve slowly so that hose and tank pressure can equalize. Or the valve may shut off.
- For proper operation of LP-Gas system, use HD-5 LPG fuel.

•For Standard LP-Gas Tank

1. Park the lift truck on level ground.
2. Lower the forks until the fork tips touch the ground.
3. Apply the parking brake.
4. Place the direction lever in the NEUTRAL position.
5. Run the engine at low idle.
6. Close the fuel valve on the LP-Gas tank. Run the engine until it stops, then turn the key switch to the ○ (OFF) position.
7. Disconnect the fuel supply line.
8. Loosen the retaining clamps, and remove the tank.
9. Make sure the replacement tank is the correct type.
10. Inspect the replacement tank for damage such as dents, scrapes or gouges and for leakage at valves or threaded connections.
11. Check for debris in the relief valve and for damage to various valves and the liquid level gauge.
12. Inspect the couplings for deterioration, damage or missing flexible seals.
13. When lifting the tank for mounting, hold with both hands to prevent injury, and check the tank clamp lock.
14. Clamp the tank securely.
15. Connect the fuel supply line.
16. Open the fuel valve by turning it slowly counterclockwise. If the fuel valve is opened too quickly, a back pressure check valve will shut off the fuel supply. If this happens, close the fuel valve completely, wait five seconds, and then open the fuel valve very slowly.
17. Check the LP-Gas fuel lines and fittings with a soap solution after filling the tank or when looking for leaks.



OPERATION

♦ New Lift Truck Break-in

Correct "break-in" is important for operation and the long life of your lift truck. The first 100 service hours of operation are the "break-in period." Carefully read these precautionary instructions:

⚠ CAUTION

- After starting the engine, BE SURE to run it at idle speeds with no load for about 5 minutes. During this time, check all the instrument panel indicator lamps.
- DO avoid long periods of idling. This may cause cylinder wall glazing and prevent the piston rings from seating properly.
- DO NOT pump the accelerator pedal and DO NOT rev up the engine. This may cause cylinder wall scuffing and scoring.
- If the lift truck does not have to be put to work immediately, or the operation is light and slow, break in the lift truck under a simulated working condition.
- Try NOT to drive the lift truck continuously at the same speeds as the parts tend to better adjust themselves to other parts if various speeds are used. Also, try NOT to make severe brake applications to allow the brake linings to seat against the brake drums.
- Operate the lift truck under a lighter load and lower speeds than normal.
- It is recommended to change and re-lubricate at shorter intervals than normal periods.
- Carefully check on and around the lift truck for loose bolts and nuts. Retighten them as needed.

♦ Before Starting Engine

⚠ WARNING

- BE SURE to read the SAFETY RULES FOR LIFT TRUCK OPERATORS for your safety and the safety of fellow workers.
- BE SURE to perform the DAILY (PRE-START) INSPECTION.
- Where lift trucks are used on a round-the-clock basis, they must be inspected after each shift.

⚠ WARNING

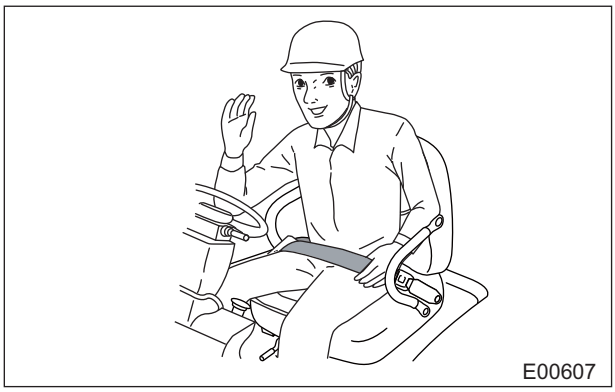
If at any time a lift truck is found to be in need of repair, defective, or in any way unsafe, the lift truck must be taken out of service until it has been restored to safe operating condition. Report it immediately to the designated authority.

⚠ WARNING

Before starting, always adjust the rear view mirror (if installed) when parked at a safe location. Adjustment while driving could lead to accidents.

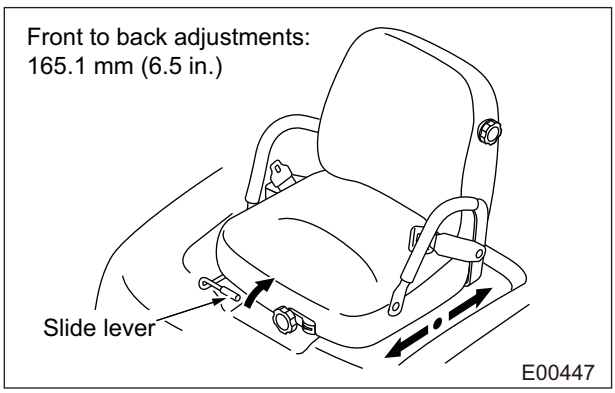
⚠ WARNING

BE SURE to fasten the seat belt before operating the lift truck. Remember, the belt will not restrain you in an accident if it is not properly fastened.



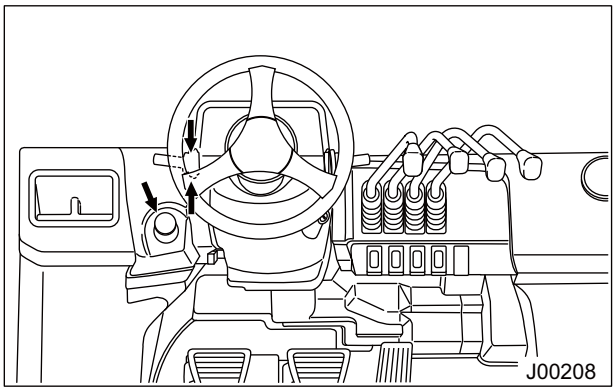
⚠ WARNING

BE SURE to adjust the operator seat before operating the lift truck so that you can press both the accelerator pedal and brake pedal full down.



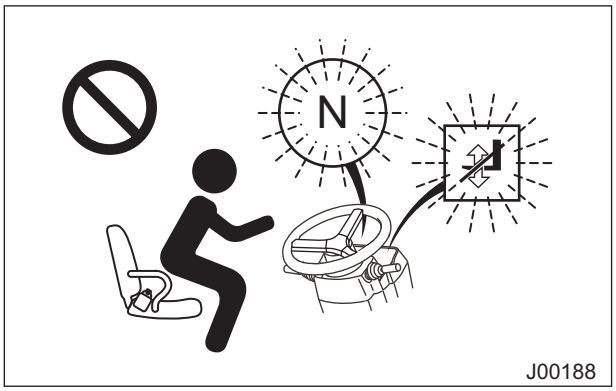
Engine start procedure

1. Press the brake pedal.
2. Apply the parking brake.
3. Make sure the direction lever is in the NEUTRAL position.
4. The engine will not start unless the direction lever is in the neutral position.
5. If the engine stalls, place the direction lever in the NEUTRAL position, turn the key switch to the ○ (OFF) position, and turn it to the (START) position to start the engine.



If the driving interlock indicator lamp or the mast interlock indicator lamp are blinking, take the following steps to turn off the lamp.

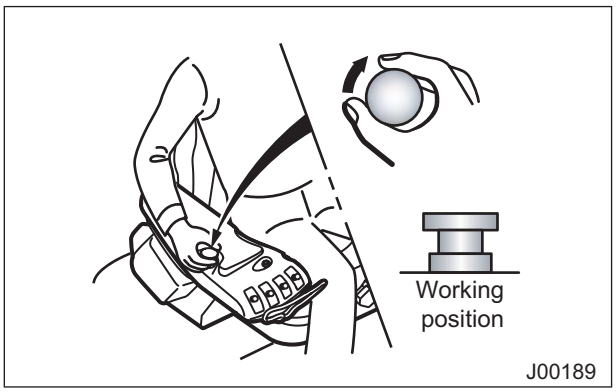
1. Sit properly on the operator seat.
2. Return the direction or lift/tilt lever to the NEUTRAL position.
3. Start operation.



For use with FC model

Make sure the emergency mast stop button is in the OPERATE position (being released).

Note:
You are unable to move the mast and attachments if the emergency mast stop button is in STOP (lock) position (being pushed down).



•Gasoline / LP-Gas Dual Fuel Type

⚠ WARNING

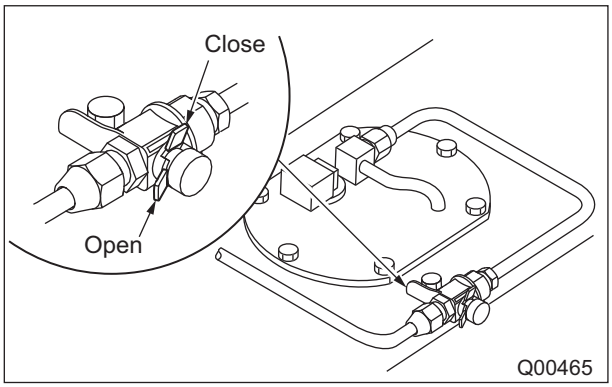
- LP-Gas and Gasoline are flammable. Leakage of these could cause a fire and explosion.
- Before changing the fuel from LP-Gas to gasoline, BE SURE to check that the fuel line for deterioration and loose connection in accordance with the maintenance section shown in this manual.

⚠ CAUTION

If the lift truck will be operated with LP-Gas for a long time, check gasoline fuel lines to make sure all the fuel lines are empty. If they are not empty, drain the fuel from the tank and run the engine until the fuel in the lines is used up.

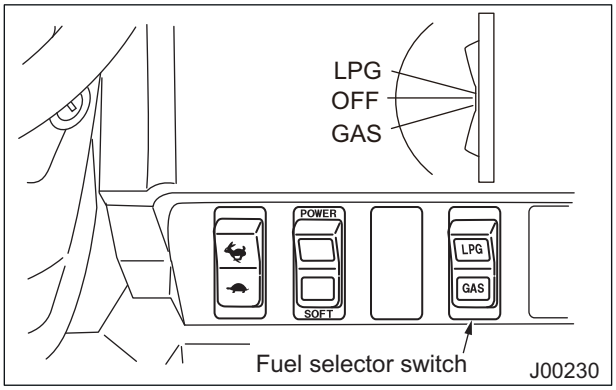
Instruction for changeover of fuel between LP-Gas and gasoline

Open the fuel shut-off valve. The fuel shut-off valve is located inside the engine hood.



To change from LP-Gas to Gasoline

1. Turn the key switch to the ○ (OFF) position and close the valve on the LP-Gas tank. Leave the fuel selector switch in the (LPG) position.
2. Turn the key switch to the (START) position. The engine should not start. If the engine starts, leave it running until it stops by itself.
3. Turn the key switch to the ○ (OFF) position and then place the fuel selector switch to the (GAS) position. Now the engine can be started using gasoline.



To change from Gasoline to LP-Gas

1. Turn the key switch to the ○ (OFF) position and place the fuel selector switch to the OFF position.
2. Turn the key switch to the (START) position. The engine should not start. If the engine starts, leave it running until it stops by itself.
3. Turn the key switch to the ○ (OFF) position and then place the fuel selector switch to the (LPG) position. Open the valve on the LP-Gas tank. Now the engine can be started using LP-Gas.

Note:

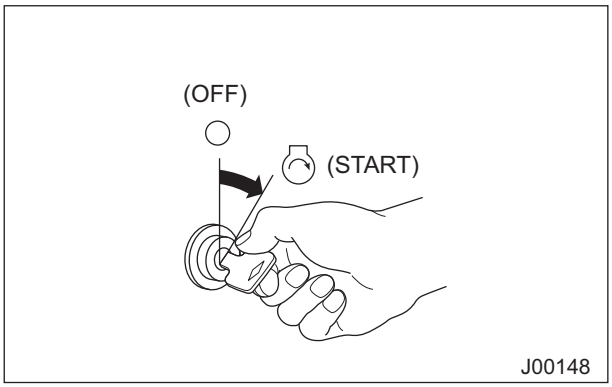
If operating on gasoline and with no LP tank installed, hook the LP hose to the bracket by screwing the coupling into place. It will secure the hose.

♦ Starting Gasoline Engine

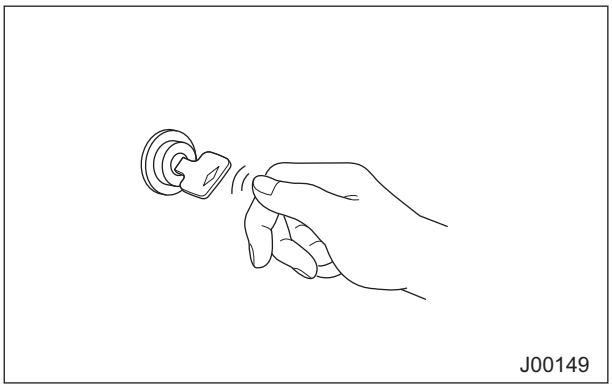
⚠ CAUTION

- DO NOT leave the key in the | (ON) position when the engine is NOT running. This may run down the battery and damage the ignition coil.
- DO NOT crank the engine for more than 10 seconds at any one time. This may cause the battery to run down.

1. Turn the key to the (START) position to crank the engine (no more than 10 seconds at a time).



2. Release it when the engine starts. Release the accelerator pedal if pressed for starting a warm engine.

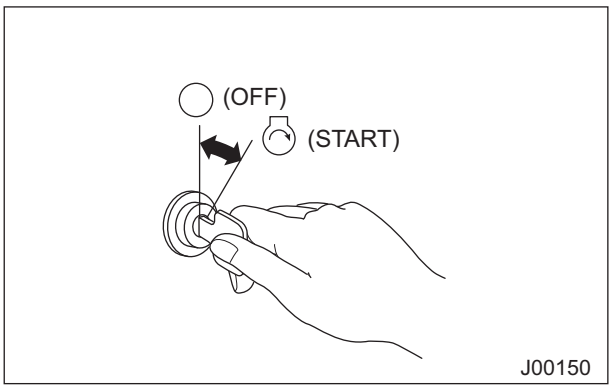


3. Let the engine warm up for about 5 minutes.

If the engine won't start:

Turn the key to the ○ (OFF) position and wait for about 30 seconds before re-cranking the engine.

If the engine won't start, see the topic, "Engine Won't Start."



♦ Starting LP-Gas Engine

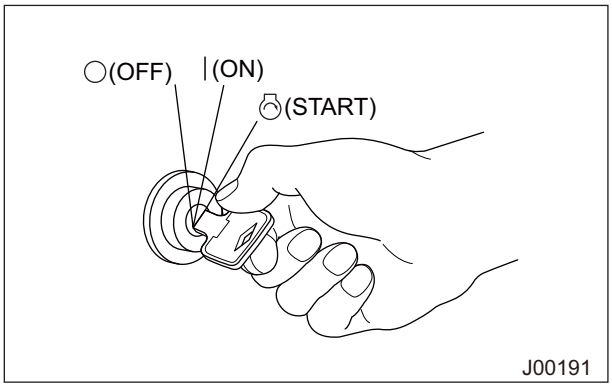
⚠ WARNING

LP-Gas fuel is flammable and could cause injuries and fires. Inspect LP-Gas fuel lines and fittings for leaks.

⚠ CAUTION

DO NOT leave the key in the | (ON) position when the engine is NOT running. This may cause the battery to run down.

1. Open the fuel valve by turning it slowly counter-clockwise. Observe the LP-Gas gauge (if equipped).
2. Turn the key switch to the (START) position. Release it when the engine starts.
3. If the engine does not start, Do not press on the accelerator. Turn the key switch to the ○ (OFF) position, then repeat step 2.

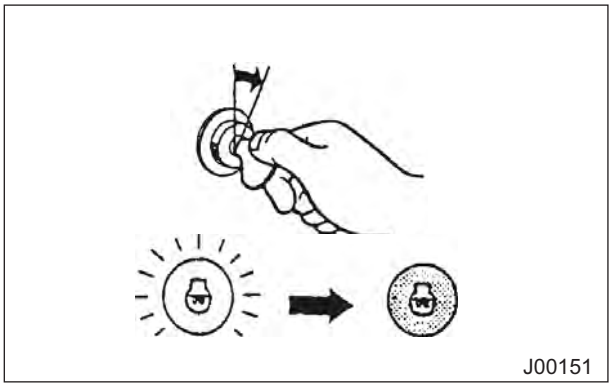


♦ Starting Diesel Engine

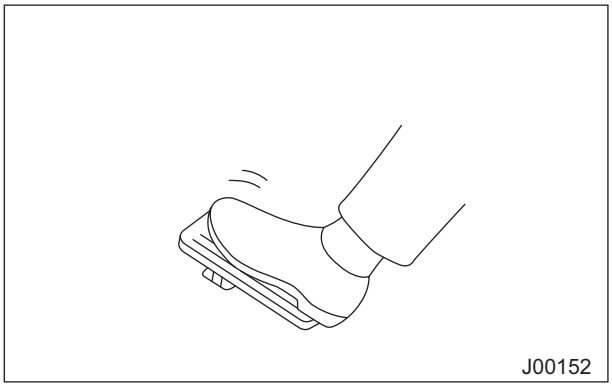
⚠ CAUTION

- DO NOT leave the key in the | (ON) position when the engine is NOT running. This may cause the battery to run down.
- DO NOT crank the engine for more than 10 seconds at any one time. This may cause the battery to run down.

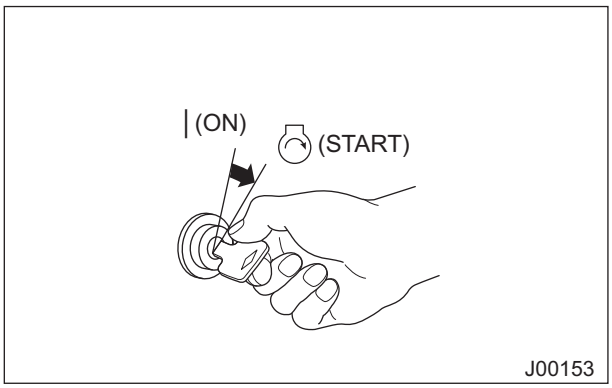
1. Turn the key switch to the | (ON) position and wait until the glow plug pilot lamp goes out.



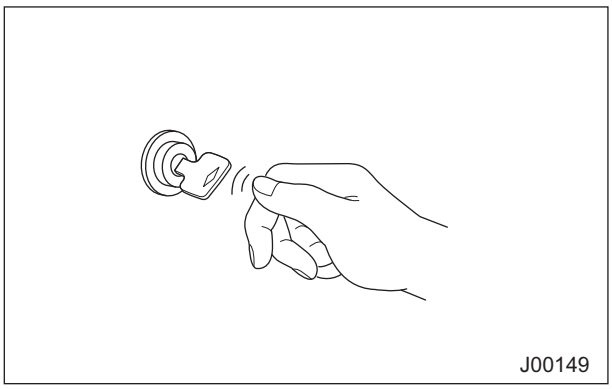
2. Press the accelerator pedal fully and hold in this position.



3. Turn the key switch to the (START) position to crank the engine (no more than 10 seconds at a time).



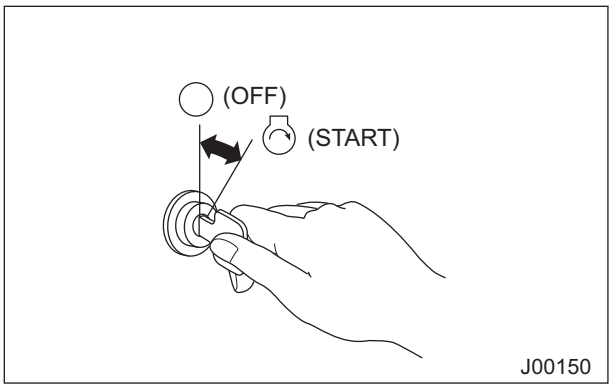
4. Release it when the engine starts.
   Release the accelerator pedal.



If the engine won't start

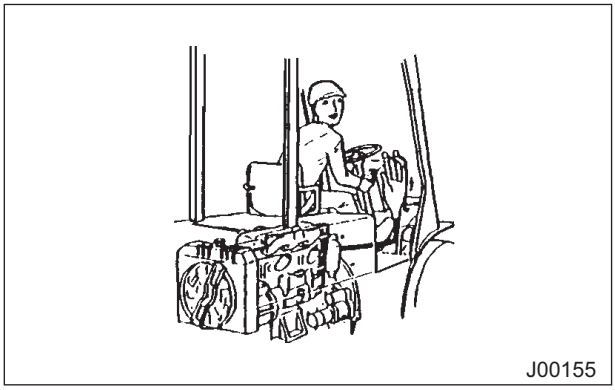
Turn the key switch back to the (OFF) position and wait approximately 30 seconds before cranking again.

If the engine won't start, see the topic, "Engine Won't Start."



♦ Engine Won't Start

Consult your authorized Cat lift truck dealer if the engine still does not start after you have attempted the following.


J00155

Does the starter crank the engine?

YES

Check the fuel gauge to see if there is fuel in the tank. If not, refuel it.

NO

The battery is dead if the head lamps don't come ON or dimly light.

•When Engine Is "Flooded"

LP-Gas engine model

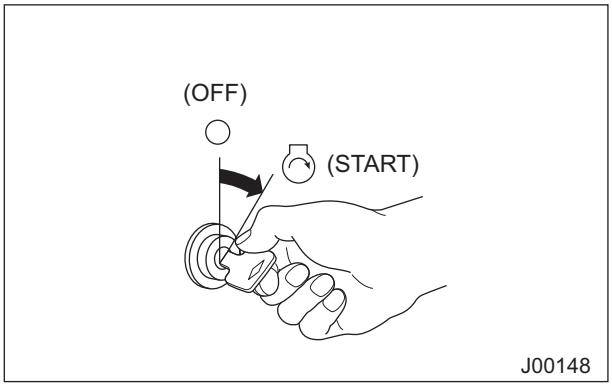
Turn the key switch to the (START) position.

Note:

The head lamps should be turned OFF for easier starting.

⚠ CAUTION

DO NOT start the engine by pushing or towing the lift truck. This may cause serious injury to the operator and damage to the lift truck.



J00148

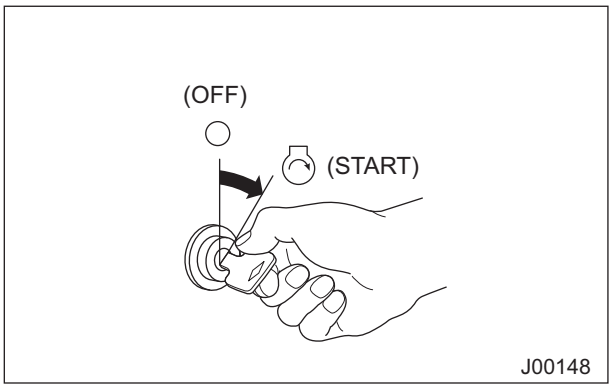
•When Engine Is Started After Long Idle Period

LP-Gas engine model

Turn the key switch to the (START) position.

Note:

The head lamps should be turned OFF for easier starting.



J00148

Diesel engine model

Air in the fuel system may cause starting failure. In this case, have your authorized Cat lift truck dealer prime the fuel system or check the fuel system for possible problems.

♦ After Starting Engine

⚠ WARNING

If the warning lamp comes on, correct the problem before operating the lift truck. Contact your authorized Cat lift truck dealer for repairs.

⚠ CAUTION

- BE SURE to warm up the engine regardless of the weather.
- Failure to warm up the engine may cause poor lubrication and incomplete fuel combustion resulting in poor engine performance.

Check the warning lamps and gauges frequently during operation to make sure all systems are working properly.

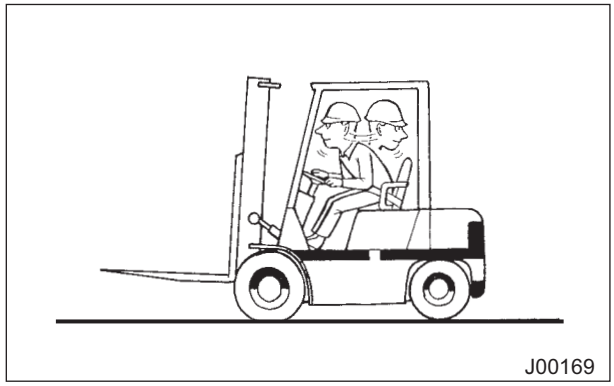
1. Run the engine at idle speeds without a load for about 5 minutes.
2. During warm-up, check to see that systems are operating properly.
   - Are all the warning lamps OFF?
   - Does the engine coolant temperature gauge show the WHITE zone?
   - Are exhaust noise and smoke color normal?
   - No excessive vibration?

♦ Before Moving Lift Truck

⚠ WARNING

DO NOT allow other personnel to enter the area around the mast!

It could cause other personnel to get caught between the mast and lift truck when operating the mast, leading to serious injury or death.

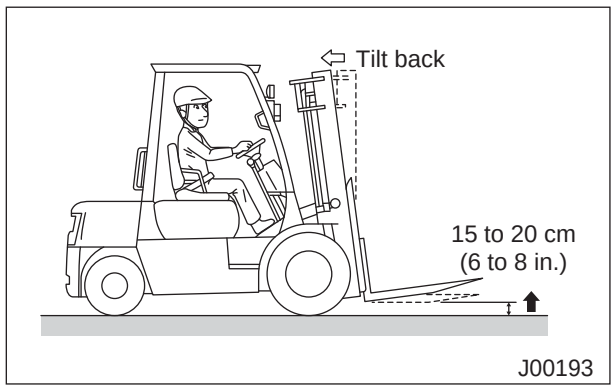

J00169

⚠ CAUTION

Before starting the engine, sit properly in the operator seat and make sure that:

- No one is around the lift truck.
- The parking brake is in the applied position.
- The direction lever is in the NEUTRAL position.

1. Pull the lift lever to raise the forks to a safe traveling height of 15 to 20 cm (6 to 8 in.) from the floor or ground.
2. Pull the tilt lever to tilt the mast fully back.



J00193

⚠ CAUTION

For use with wet disc brake option

- Before releasing the parking brake, be sure to warm up the engine regardless of the weather.
- If you continue to move the lift truck without warming up the engine, it may cause damage the brake disc.

♦ Lift Truck Operation

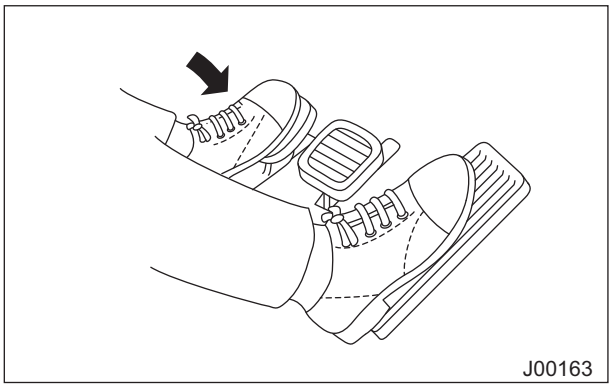
⚠ WARNING

When the engine is idling with the direction lever in the FORWARD or REVERSE position, the lift truck may move very slowly. This phenomenon is called "creep". This lift truck is equipped with a mechanism to control the maximum creep speed. When the direction lever is in the FORWARD or REVERSE position, if the accelerator pedal is not pressed for 3 seconds or more, the mechanism brings the transmission into the NEUTRAL position. The mechanism will bring the transmission back to the original (F or R) position as soon as the accelerator pedal is pressed.

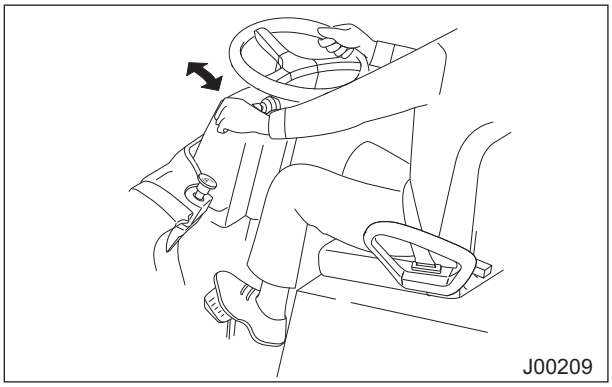
⚠ CAUTION

DO NOT "ride" the inching pedal during traveling. This produces a partly disengaged condition that will result in premature clutch plate wear.

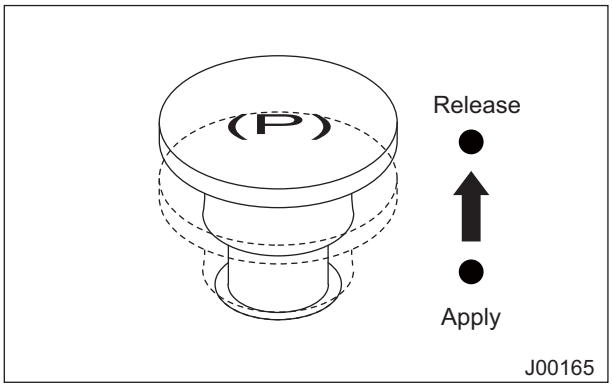
1. Press the inching pedal fully.



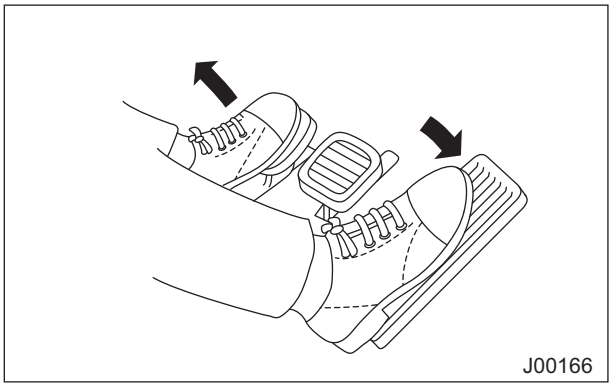
2. Move the direction lever to FORWARD or REVERSE position.



3. Pull the parking brake switch to release the parking brake.

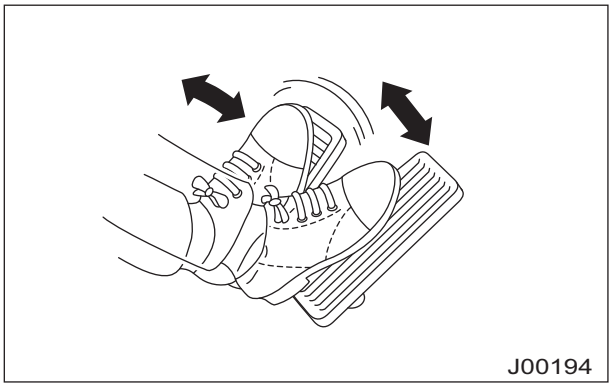


4. Gradually press the accelerator pedal while releasing the inching pedal.



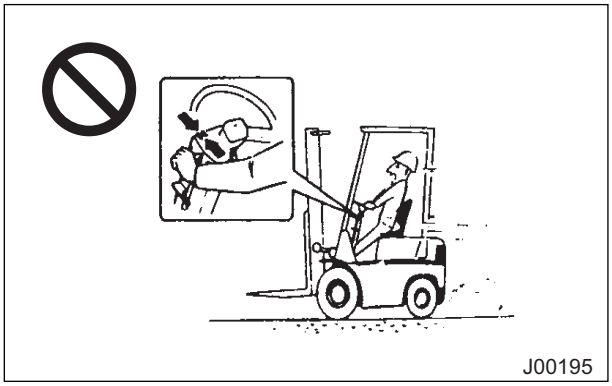
•Changing Speed

Use the accelerator pedal to increase travel speed.
Use the brake pedal to slow down.



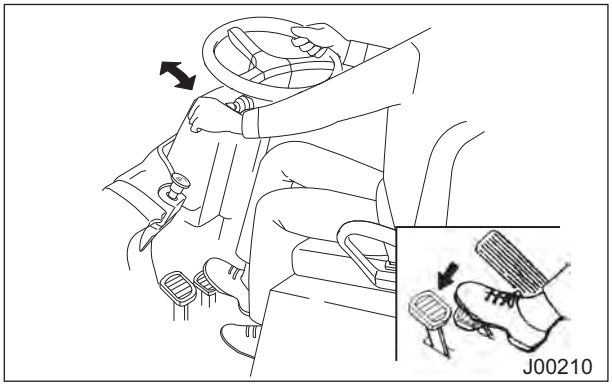
⚠ WARNING

DO NOT move the direction lever to the neutral position during traveling. This could cause the engine to race.



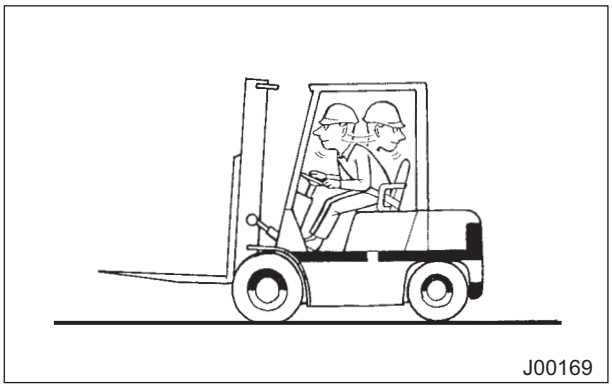
•Changing Direction

Be sure to come to a complete stop before changing directions.



⚠ WARNING

BE SURE to watch for people or hazards in the direction of travel.

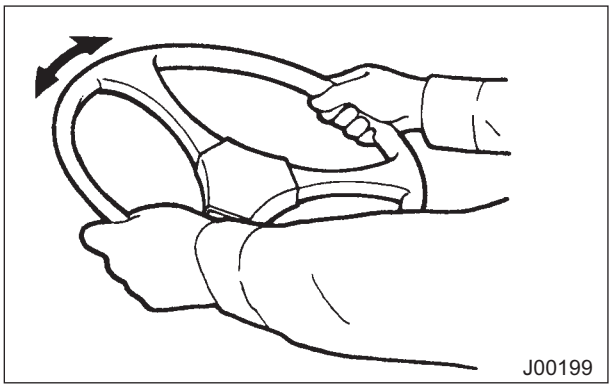


⚠ CAUTION

- Directional changes without coming to a complete stop may cause premature damage to the driveline.
- For a smoother ride and maximum service life of driveline components, bring the lift truck to a complete stop before changing direction.

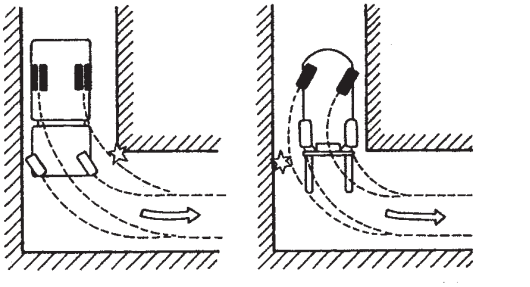
•Operating Techniques

Turn the steering wheel with LEFT HAND. When handling loads, stop the lift truck to operate the tilt, lift and attachment levers with the RIGHT HAND.



•Steering (Turning)

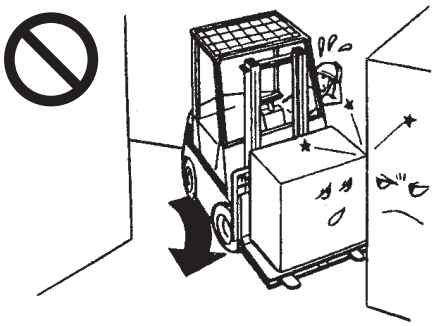
A lift truck is different from most other vehicles because it is steered by the rear wheels. This causes an exaggerated tail swing.



J00171

⚠ WARNING

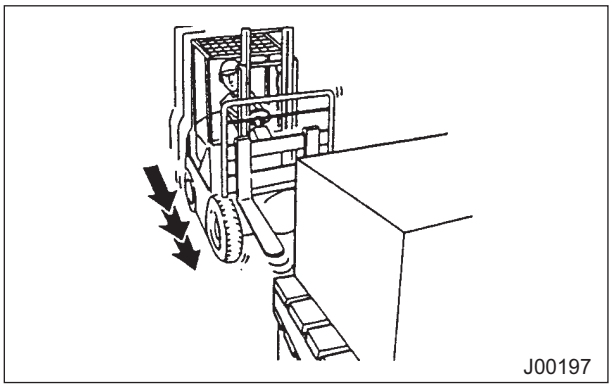
When working in close quarters, drive more slowly when making turns. Start the turn as close to the inside corner as the tail swing will permit.



J00172

•Inching

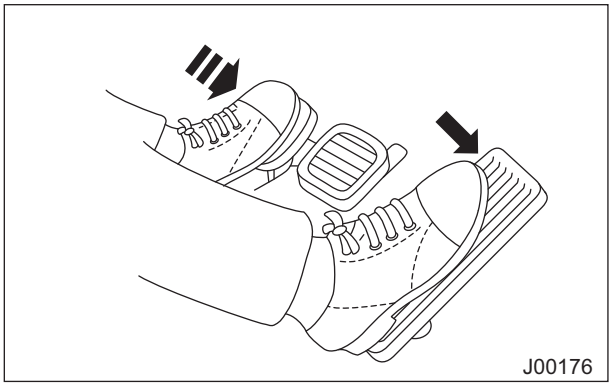
The purpose of the inching pedal is to provide precise lift truck inching control at very slow travel speed and high engine revolutions.
You can move your lift truck slowly while maintaining the engine speed by varying the position of the inching pedal.
Use this pedal when approaching the load for loading and unloading.



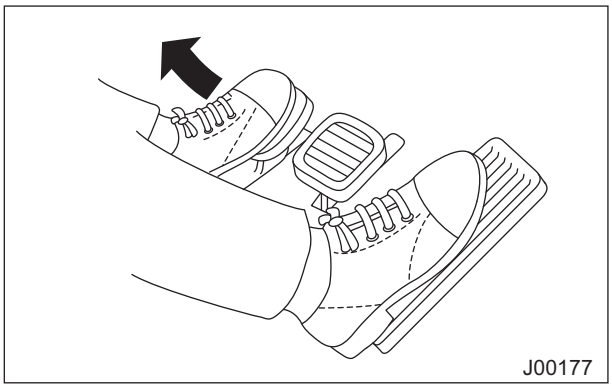
⚠ CAUTION

DO NOT ride the inching pedal. This produces a partly disengaged condition that may result in premature clutch plate wear. DO NOT press inching pedal when inching is not necessary.

1. Stop ahead of the load platform.
2. Apply the parking brake, set the direction lever to the NEUTRAL position, place the mast vertically, and raise the forks to the height of the pallet insertion openings.
3. Press the inching pedal fully down, place the direction lever to the FORWARD position, and release the parking brake.
4. Gently press the accelerator pedal.



5. When the left foot is slowly taken off the inching pedal, the lift truck will advance slowly.
6. Insert the forks slowly, taking care they do not hit the pallet.
7. Stop inserting the forks after the heels of the forks come into light contact with the pallet.



♦ Stopping Lift Truck

⚠ WARNING

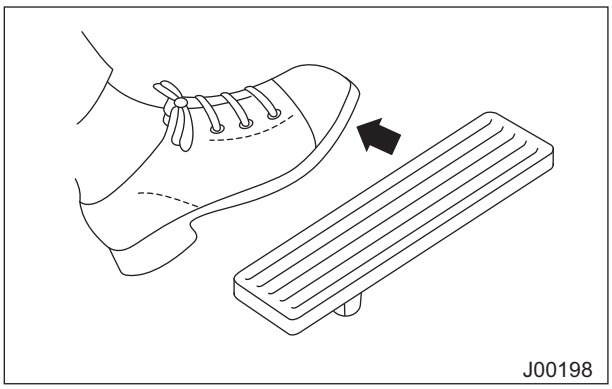
If brake linings have become wet after cleaning the lift truck or after driving through a large area of water, stopping distance could be increased. In this case, gently apply brakes several times while driving slowly in a safe area until linings have dried out and normal braking action is restored.

(For the lift truck without Wet Disc Brake Option)

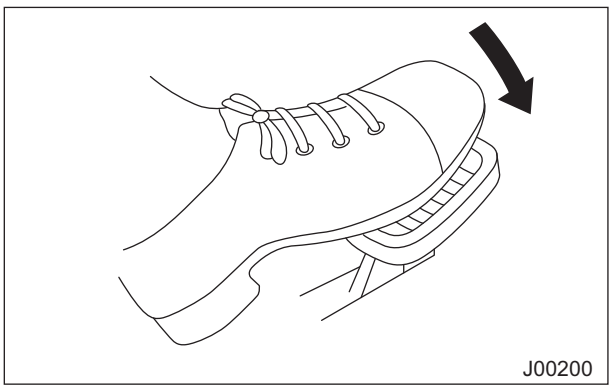
⚠ WARNING

Avoid sudden stops. This could cause the load to fall off the forks or the lift truck to tip over.

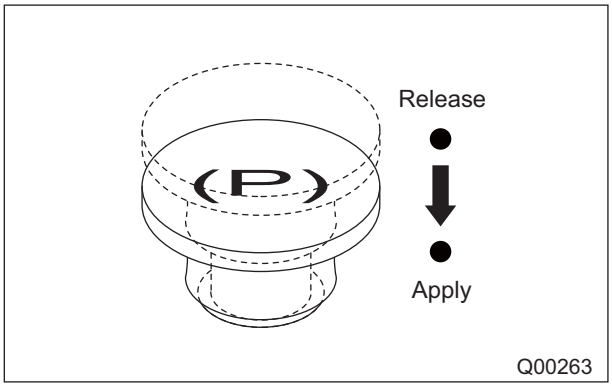
1. Release the accelerator pedal.



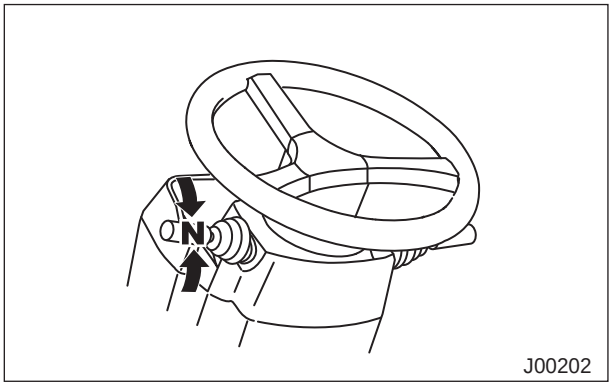
2. Press the brake pedal and come to a complete stop.



3. Apply the parking brake.



4. Place the direction lever to the NEUTRAL position.



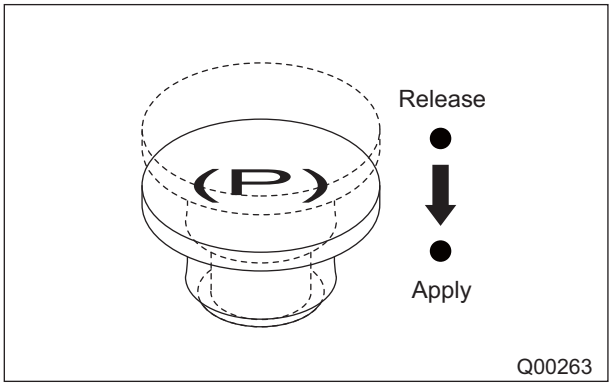
♦ Parking Lift Truck (After Stopping)

⚠ WARNING

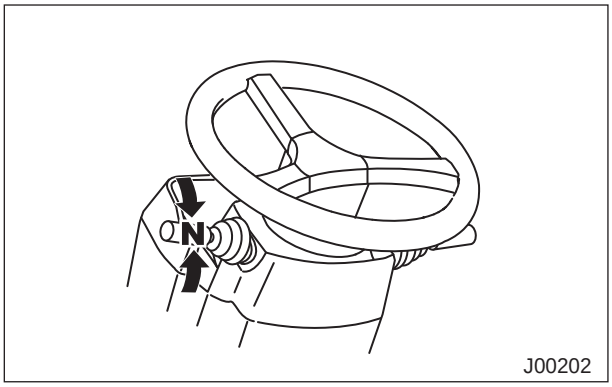
Park safely

- Select a hard level surface.
- BE SURE to park in the designated parking area.

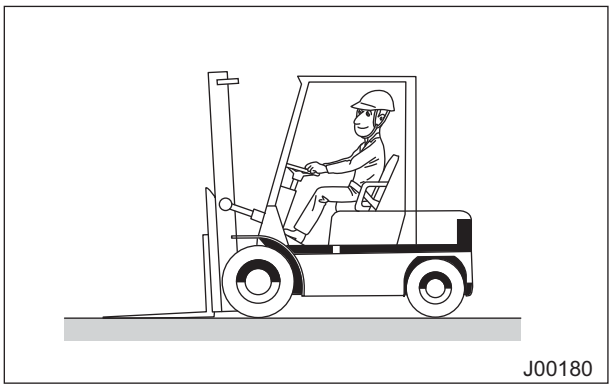
1. Apply the parking brake.



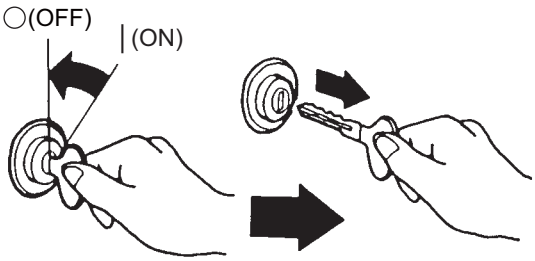
2. Place the direction lever in the NEUTRAL position.



3. Slightly, tilt the mast forward and lower the forks to the floor or ground until the fork tips touch the floor or ground.



4. Turn the key back to the ○ (OFF) position to stop the engine. When leaving the lift truck, be sure to remove the key.
5. Block the wheels securely.
6. Return the key to a key rack if specified.



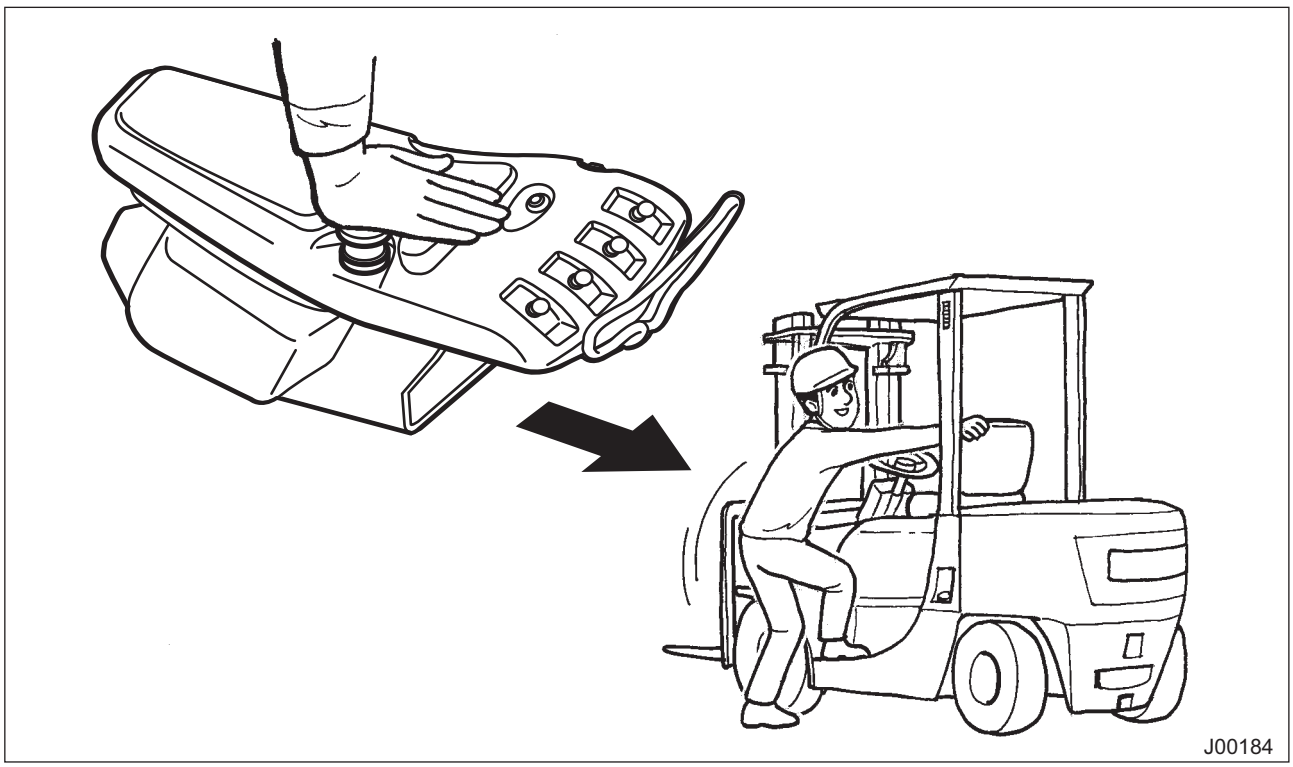
J00181

⚠ WARNING

Get off safely

- Get off after the lift truck has come to a complete stop and the above procedure has been followed.
- DO NOT jump off.
- DO NOT get off from the front right of the forklift truck.

♦ Leaving Lift Truck (FC Model)


J00184

1. Apply the parking brake.
2. Place the direction lever to the NEUTRAL position.
3. Tilt the mast forward and lower the forks to the ground.
4. Remove the key from the key switch.
5. Push down on the emergency mast stop button to stop the movement of the mast and attachments.

•For Use With Wet Disc Brake Option

Automatic deceleration function

This function will automatically activate the service brakes If the accelerator pedal is released while the lift truck is traveling faster than a set-up speed, and the automatic deceleration function will continue until the lift truck slows down to the pre-set speed.

Note:
The automatic deceleration level setting, should be set up by your authorized Cat lift truck dealer for your own level.

⚠ WARNING

- DO NOT travel at high speed with a load.
- DO NOT travel at high speed and at the high fork position.
- Take care when moving the truck on a downward slope.

Controlled rollback function

This function helps to prevent undesired backward movement of the lift truck when the driver changes from stepping on the brake pedal to the acceleration pedal when starting on a grade.

⚠ CAUTION

- This function works after stopping the lift truck without pressing the accelerator pedal.
- This function is cancelled when the accelerator pedal is pressed after the direction lever is placed in either forward or reverse. When starting on a grade, pressing the inching pedal causes a disengaged condition. Be aware of the lift truck slipping downward.

ProShift™ Function

This function prevents the power train from damage due to a mistake by the operator and has two functions, A and B.

⚠ WARNING

- DO NOT travel at high speed with a load.
- Make sure no one is around the lift truck until the completion of the forward or reverse shifting operation.
- DO NOT travel at high speed and at the high fork position.
- Take care when moving the truck on a downward slope.

Note:
While the ProShift™ function is working, the automatic deceleration function will be working too.

Function A
Jack-rabbit-start prevention function. This function permits the lift truck to start if the acceleration pedal is pressed after setting the direction lever in either the forward or reverse position.

Function B
Forward / reverse shifting mistake prevention function. This function disables the forward / reverse shifting operation, if the driver attempts to shift while the lift truck is traveling faster than a given speed.

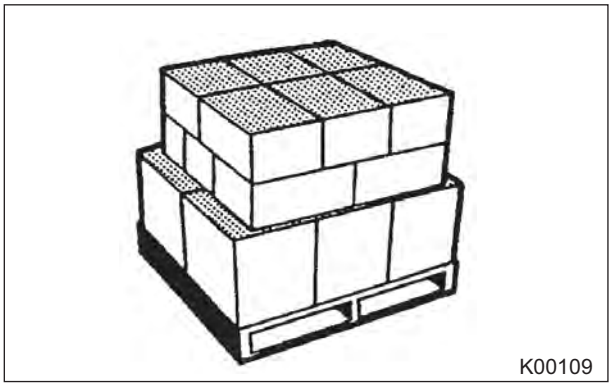
OPERATING TECHNIQUES

♦ Stacking Methods

Stability of the loads depends upon how well the stack is formed.

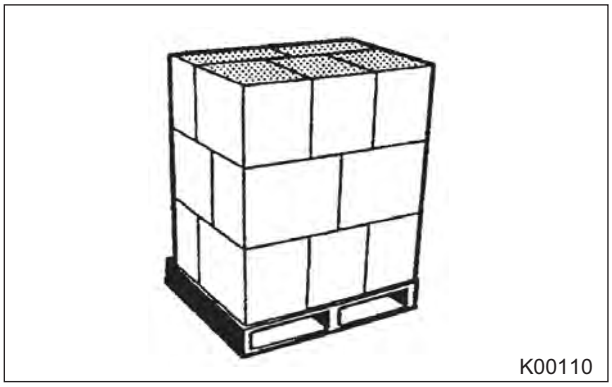
•Stacking Different Loads in Size

Make sure larger containers in a load are at the bottom of the stack and smaller ones at the top; or heavier containers at the bottom and lighter ones at the top.


K00109

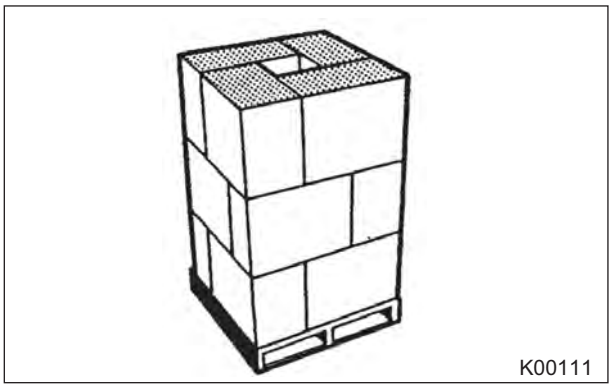
•Stacking Small Identical Loads

As in bricklaying, place layers of containers alternately so each container will sit across parts of two or more containers in the layer below. This type of stack is more stable and less likely to fall down.


K00110

•Stacking Large Identical Loads

This is one of the most common patterns for stacking large identical containers. Better load stability is achieved by reversing the end-to-side direction on each succeeding layer.

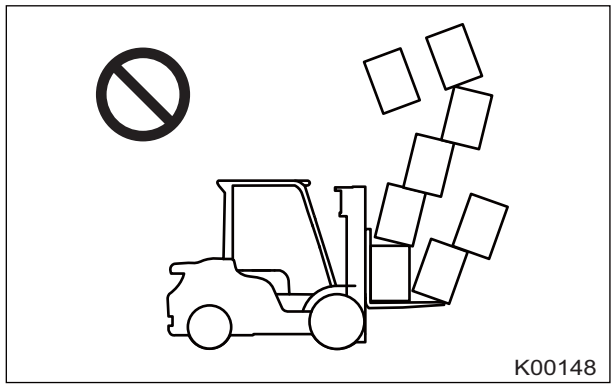

K00111

♦ Handling Loads Safely

Handle ONLY stable loads to prevent the load from falling!

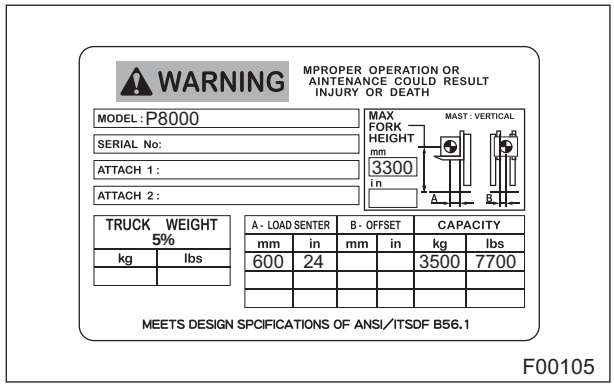
⚠ WARNING

- Handle balanced loads only.
- Visually make sure that boxes or containers have not collapsed or are potentially dangerous.
- If the loads are not balanced or there is a danger of collapse, take appropriate measures such as binding with a band or loading the material into another container.
- DO NOT use broken pallets. It could cause the load to collapse.



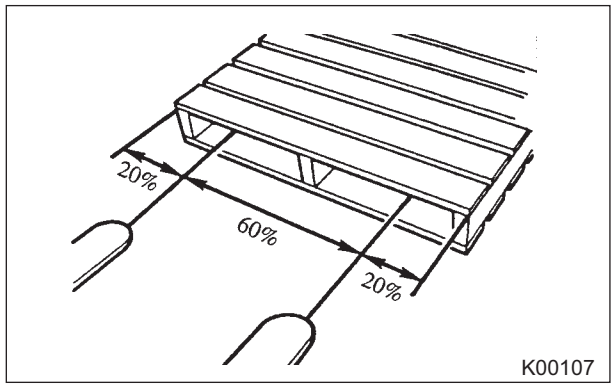
⚠ WARNING

Handle ONLY loads within the capacity of the lift truck as shown on the capacity plate.

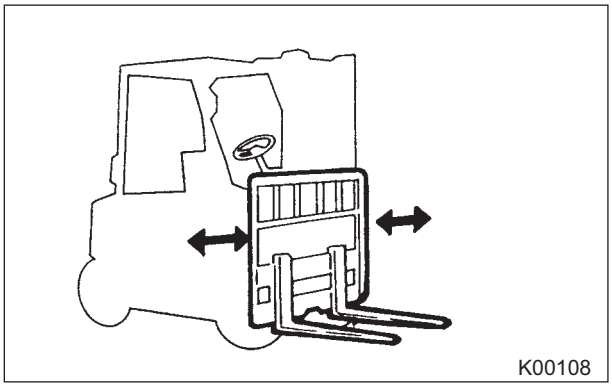


⚠ WARNING

Set the forks as far apart as possible for maximum support of the load.



Not every load can be handled using only the forks. Some loads will require a special attachment.



♦ Correct Operating Steps

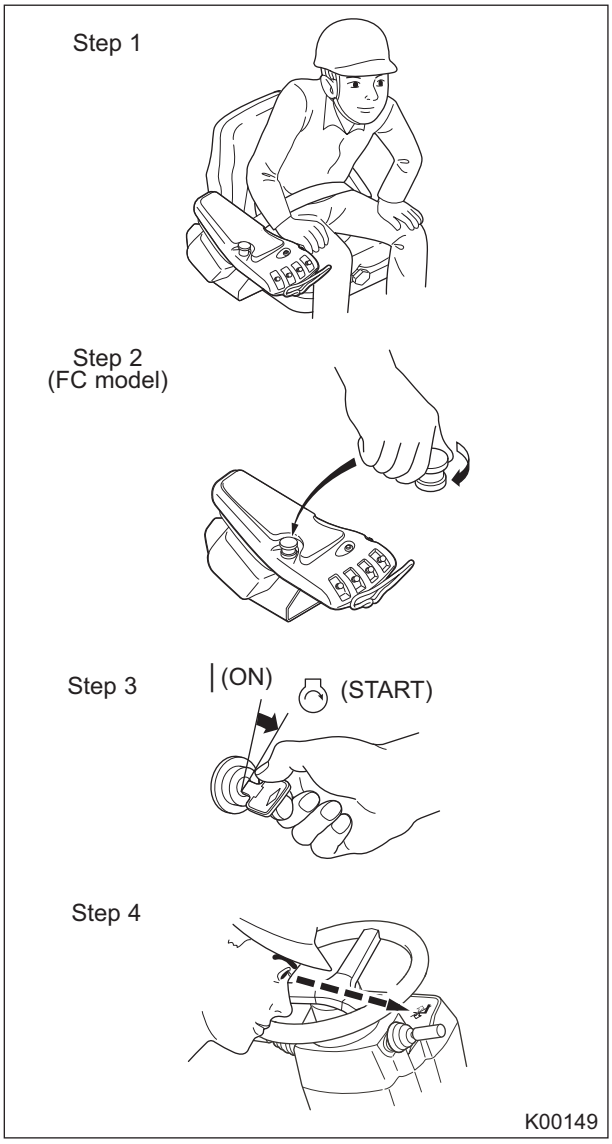
Follow the correct operating steps 1 through 4 before you operate the lift truck.
Make sure the mast interlock indicator lamp is OUT.

Correct operating steps

1. Sit properly and buckle the seat belt securely.
2. Turn the emergency mast stop button clockwise to the OPERATE position.
3. Start the engine.
4. Make sure the mast interlock indicator lamp is OUT.

Note:

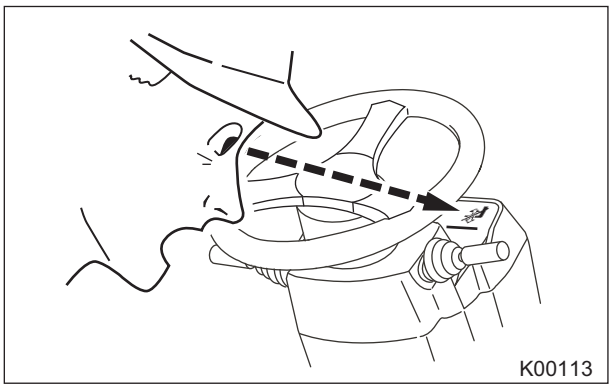
- Be sure to operate the lift, tilt and attachment levers, emergency mast stop button and lowering speed selector switch (optional) with your RIGHT HAND.
- See the topics, "Inching Into and Lifting the Load", "Traveling With the Load" and "Unloading."
- If the mast interlock indicator lamp blinks, see the topics, "Incorrect Operating Steps and Blinking of the Mast Interlock Indicator lamp."



♦ Incorrect Operating Steps

In the following three examples, the mast interlock indicator lamp blinks and the mast would not move even though the operating levers are in the operating position. This is not a fault but the function of the interlock system. In this case, follow each instruction in "Remedy."

The mast interlock will work only for the lift and tilt levers. Attachments can be moved regardless of whether the mast interlock function is operating or not. Therefore, when the attachment lever is operated, some of the attachments will move, even though the engine is not running or the key switch is in the ○ (OFF) position, as a result of the handling load or of its own weight.



Example 1

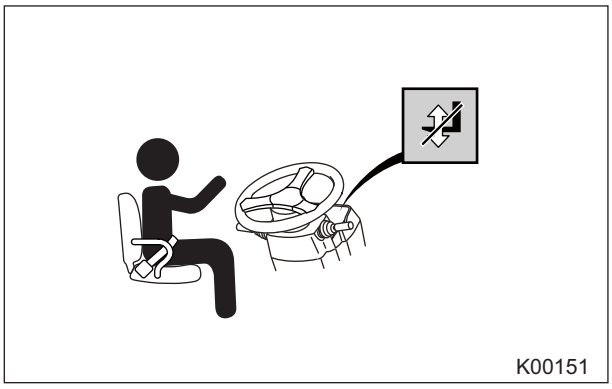
The mast interlock indicator lamp will blink when the key switch is in the | (ON) position and you are not properly sitting in the operator seat.

Remedy

Sit securely. This causes the mast interlock indicator lamp to go OUT and you can operate the lift or tilt lever.

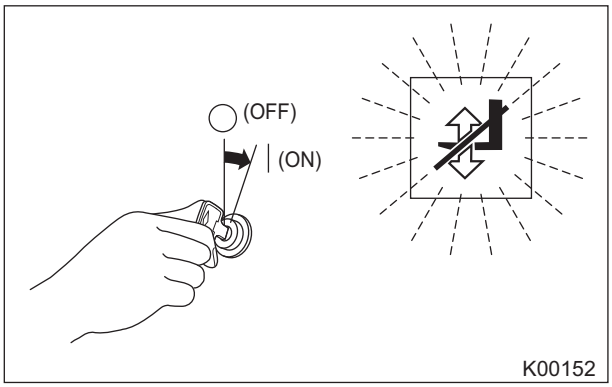
Note:

The mast interlock indicator lamp will blink when you sit on the operator seat while the lift or tilt lever is placed to the operating position. To clear this function, move the lift or tilt lever to the NEUTRAL position.



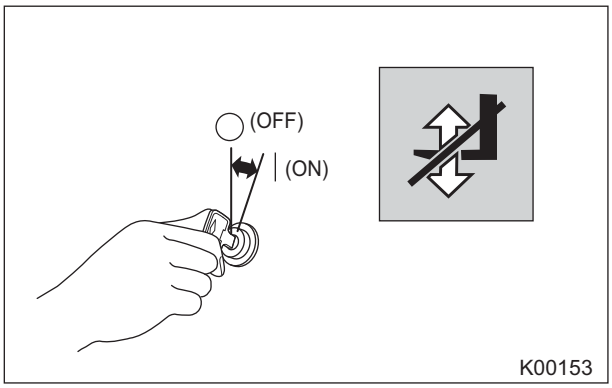
Example 2

The mast interlock indicator lamp will blink when you turn the key switch to the | (ON) position or start the engine while the lift or tilt lever is placed to the operating position.



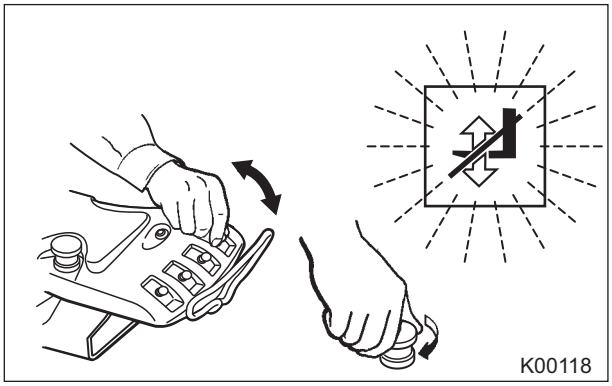
Remedy

1. Place the lift or tilt lever to the NEUTRAL position and turn the key switch to the ○ (OFF) position once.
2. Turn the key switch to the | (ON) position.
3. Make sure the mast interlock indicator lamp is OUT and start the engine.



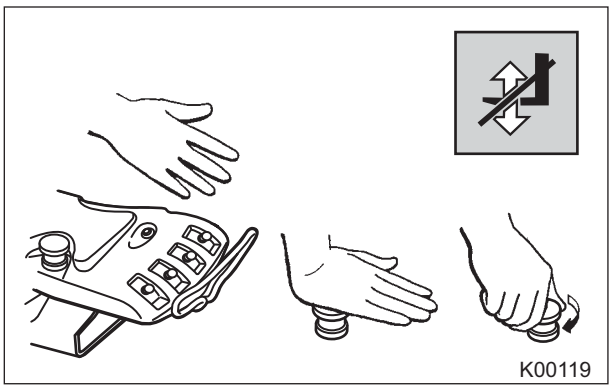
Example 3 (FC model)

The mast interlock indicator lamp will blink when you return the emergency mast stop button to the OPERATE position while the lift or tilt lever is placed to the operating position.



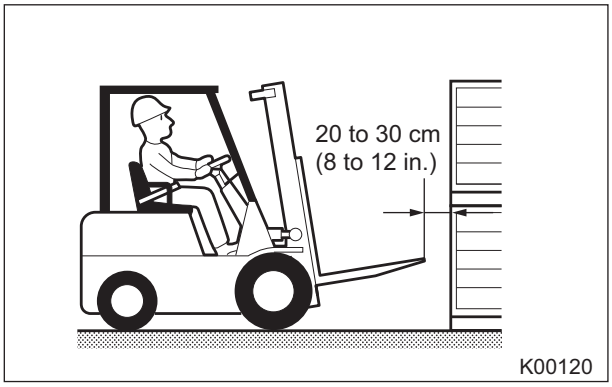
Remedy

1. Place the lift or tilt lever to the NEUTRAL position.
2. Push down on the emergency mast stop button once, then return it to the OPERATE position.
3. Make sure the mast interlock indicator lamp is OUT and start operation.



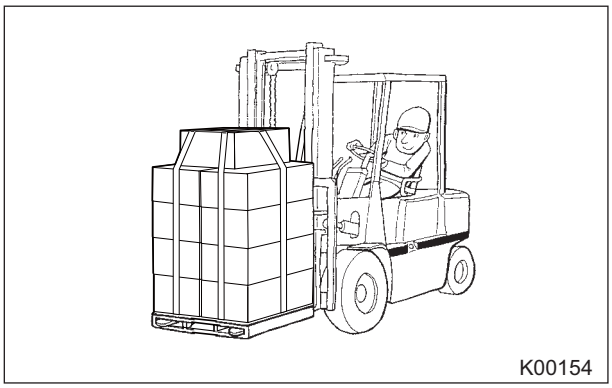
♦ Inching Into and Lifting the Load

1. Place the direction lever into the FORWARD position.
2. Inch into the load and stop the lift truck 20 to 30 cm (8 to 12 in.) short of the load.
3. Make sure the lift truck is square with the load and the forks are at the correct height.

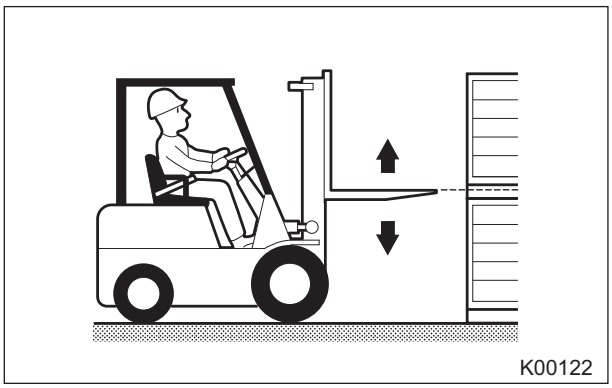


⚠ WARNING

When you pick up loads that extend above the load backrest extension height, band them together to reduce the risk of items from falling.

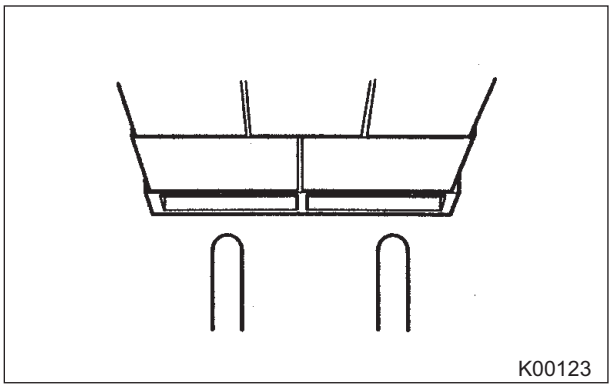


4. Place the direction lever into the NEUTRAL position.
5. Tilt the mast forward to the vertical position, and again make sure the forks are at the correct height.

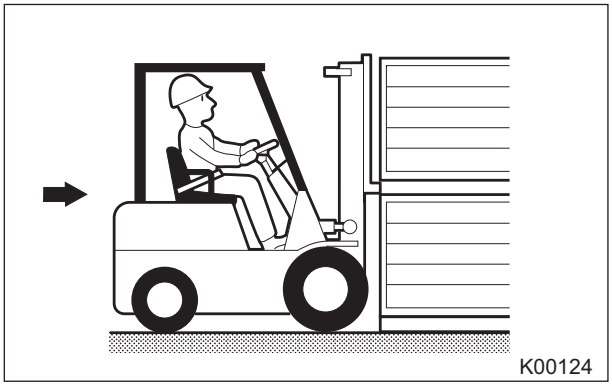


⚠ WARNING

Only stable or safely arranged loads must be handled. DO NOT pick up an off-center load. Make sure the weight of the load is centered between the forks.

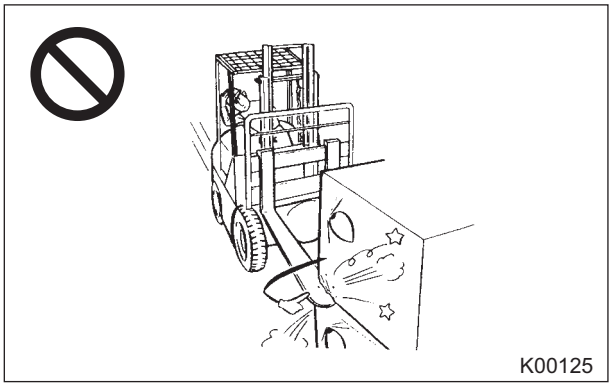


6. Place the direction lever into the FORWARD position and slowly move the lift truck forward.
7. Slide the forks into the pallet until they are fully under the load.

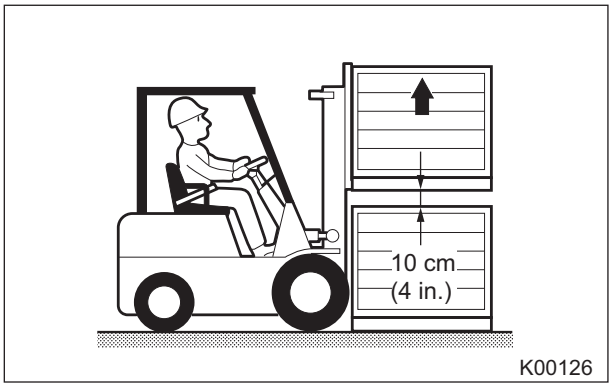

K00124

⚠ WARNING

Avoid approaching the load at high speeds. Under all travel conditions, operate the lift truck at a speed that will permit it to be brought to a stop in a safe manner.


K00125

8. Place the direction lever into the NEUTRAL position.
9. Carefully lift the load about 10 cm (4 in.) off the stack. Slowly return the lift lever to the NEUTRAL position.

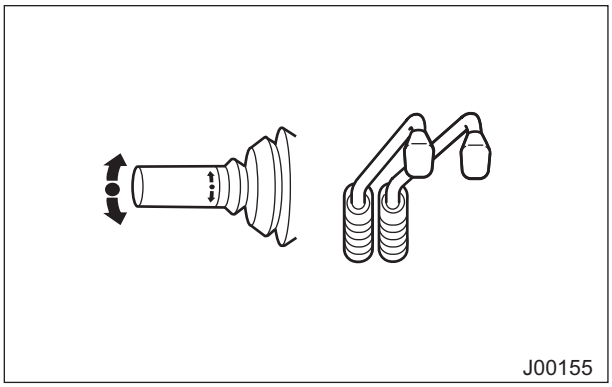


K00126

⚠ WARNING

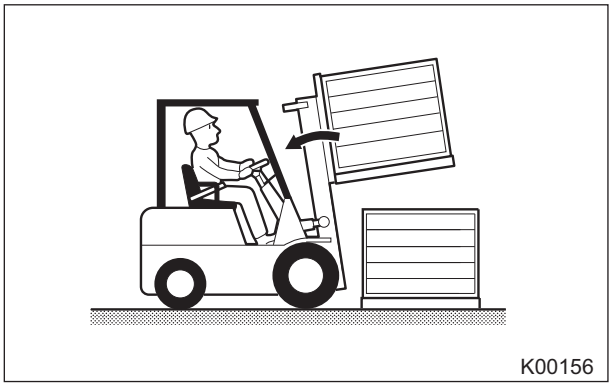
DO NOT mistake the direction and control levers!

If you operate the wrong lever, collision of the lift truck with persons or objects could occur, or you could drop the load.


J00155

♦ Traveling With the Load

1. Place the direction lever into the NEUTRAL position.
2. Make sure the load is centered on the forks.
3. Tilt the mast fully backward to cradle the load.

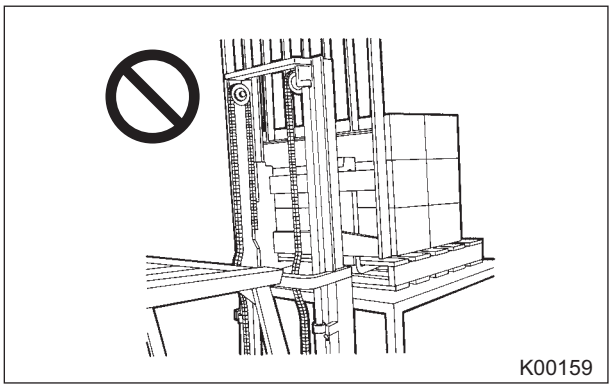

K00156

⚠ WARNING

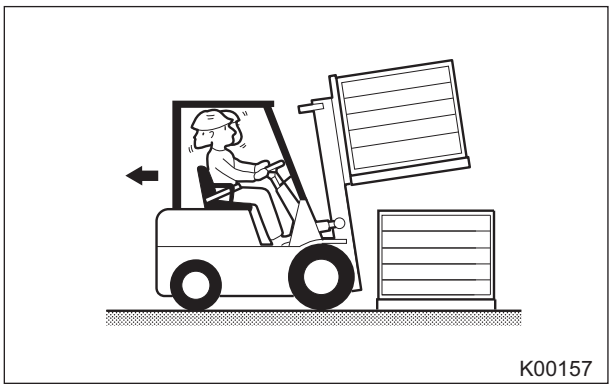
Slack lift chains means there is a rail or lift bracket hang up. Raise the mast before you move.

When stacking:

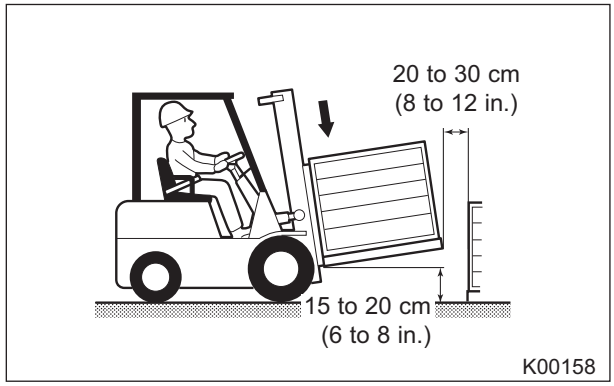
- Watch your lift chains.
- If they go slack, stop lowering. Then raise the load and lower it again.


K00159

4. Look behind you.
5. Place the direction lever into the REVERSE position.

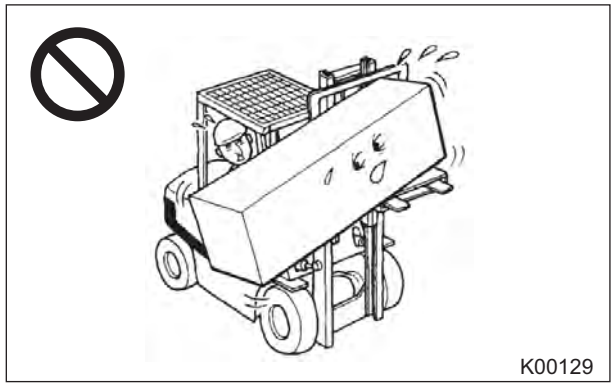

K00157

6. Slowly move the lift truck 20 to 30 cm (8 to 12 in.) away from the stack, and then stop the lift truck.
7. Place the direction lever into the NEUTRAL position.
8. Lower the forks to a position 15 to 20 cm (6 to 8 in.) from the ground.

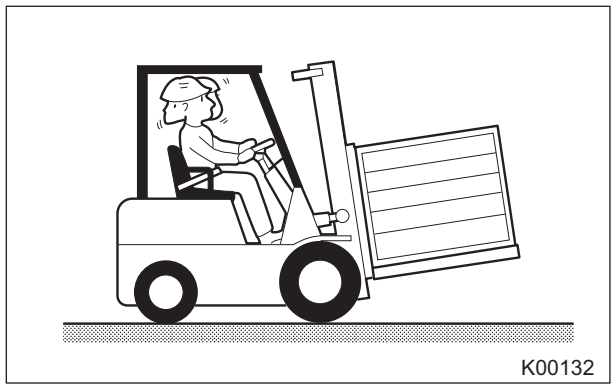


⚠ WARNING

DO NOT pick up an off-center load. Make sure the weight of the load is centered between the forks.

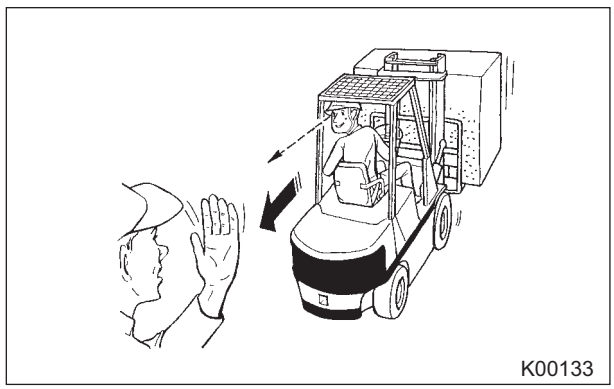


9. Look around to make sure your drive area is clear.
10. Place the direction lever into the FORWARD position and move the lift truck into the work place.



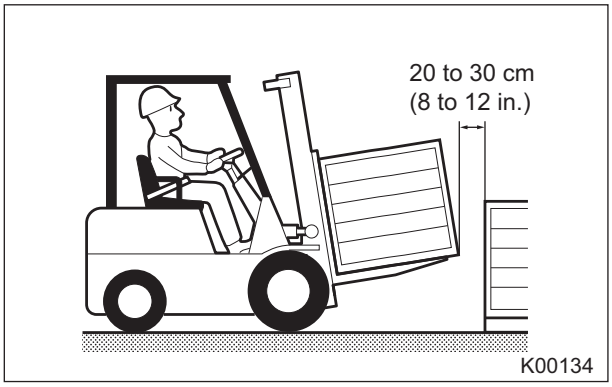
⚠ WARNING

If the load blocks your view, or when you travel down a grade with the load, drive in REVERSE. Always look in the direction of travel.

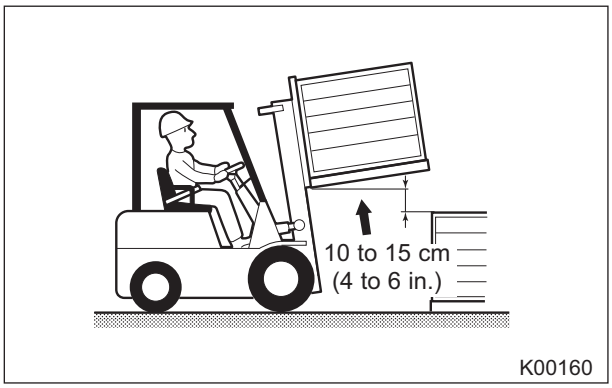


♦ Unloading

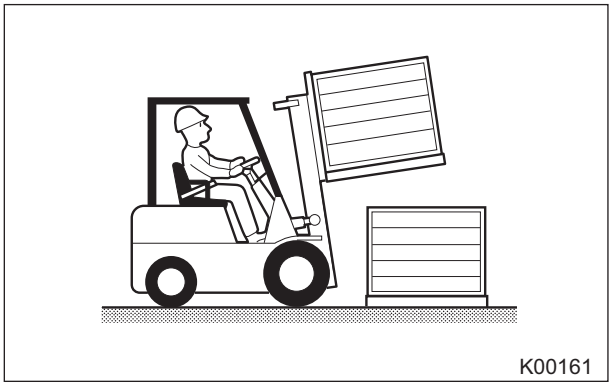
1. Stop the lift truck 20 to 30 cm (8 to 12 in.) short of the unloading zone.



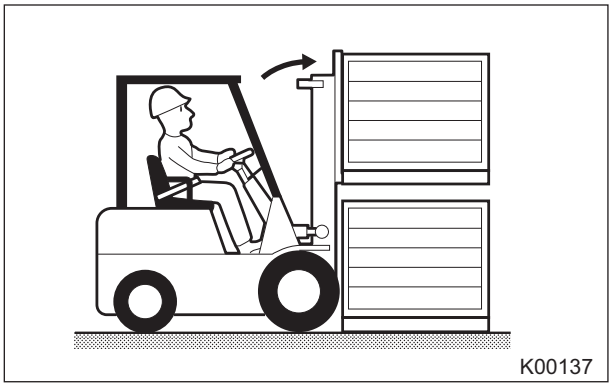
2. Place the direction lever into the NEUTRAL position.
3. Lift the load 10 to 15 cm (4 to 6 in.) higher than the stack.



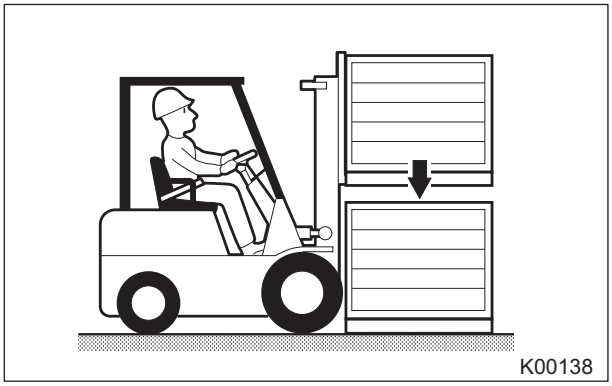
4. Place the direction lever into the FORWARD position.
5. Slowly move the lift truck forward to position the load just above the stack.



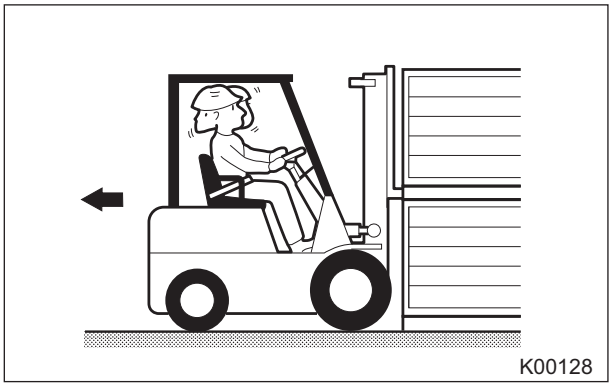
6. Place the direction lever into the NEUTRAL position.
7. Tilt the mast forward to the vertical position.



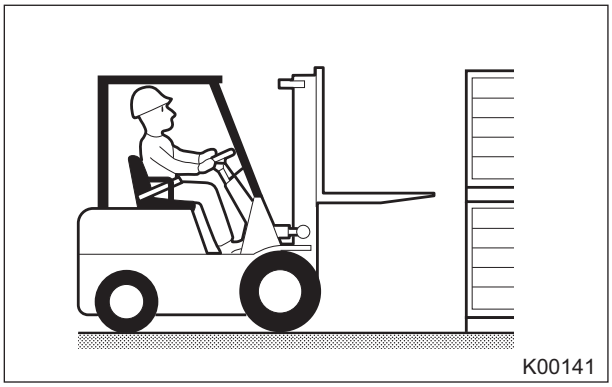
8. Carefully lower the load onto the stack.
9. Lower the forks just enough to disengage them.



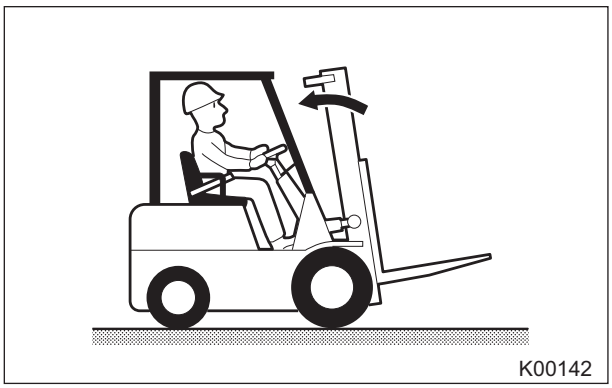
10. Look behind you.
11. Place the direction lever into the REVERSE position and carefully back the lift truck away from the load.



12. When you disengage the forks, stop the lift truck.
13. Place the direction lever into the NEUTRAL position.
14. Lower the forks to a position 15 to 20 cm (6 to 8 in.) from the ground.

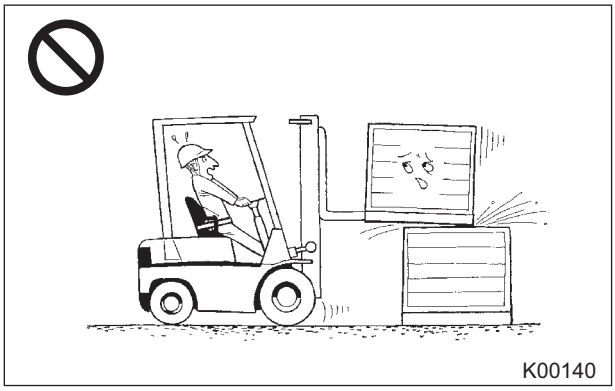


15. Tilt the mast back 6° or more.
16. Look around to see that it is safe to drive in your work location.
17. Place the direction lever into the REVERSE position.
18. Move up to your next position.



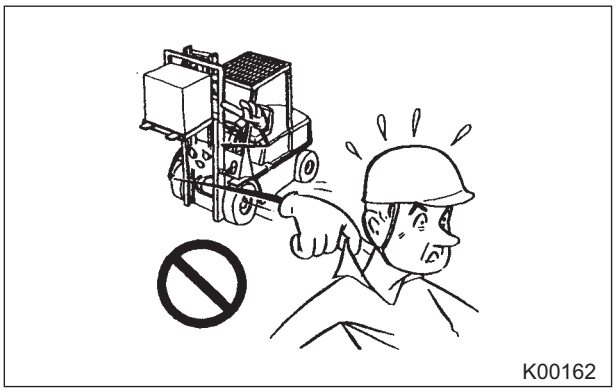
⚠ WARNING

Be careful not to drag the forks.



⚠ WARNING

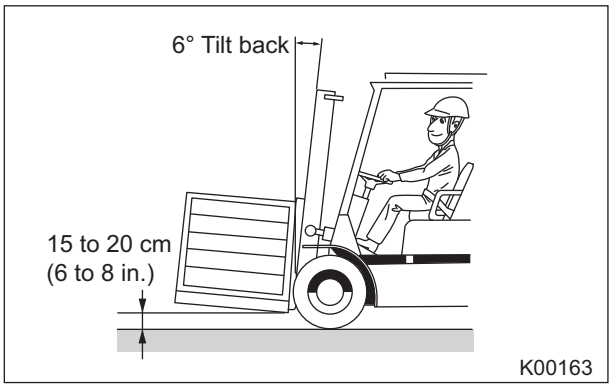
- DO NOT travel with the mast tilted forward or with the load in the elevated position. This will increase the possibility of the lift truck tipping over.
- DO NOT tilt the mast with the load in the elevated position.
- DO NOT leave the lift truck with the load in the elevated position.



♦ Working on Grades

•Normal Travel Position

- Keep the forks or the load at a safe travel height, which is 15 to 20 cm (6 to 8 in.) from the ground.
- Tilt the mast back more than 6° when the lift truck is empty. Tilt the mast fully backward when the lift truck is loaded.

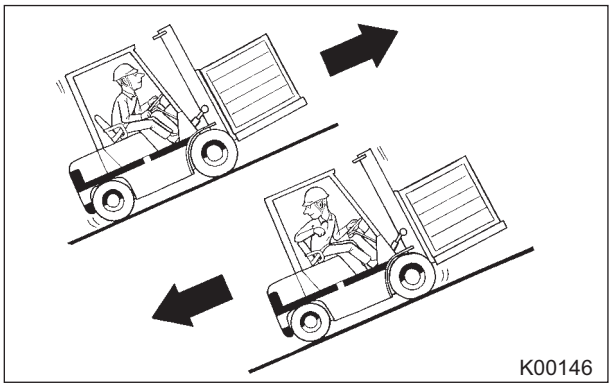


•Traveling on a Grade

Travel up a grade in FORWARD and down a grade in REVERSE when the lift truck is loaded.

⚠ WARNING

- DO NOT continuously use the brake pedal alone. This could result in brake failure and an accident.
- DO NOT use the inching pedal when traveling down a grade. This prevents the engine from acting as a brake.
- DO NOT place the direction lever in the NEUTRAL position when traveling down a grade.



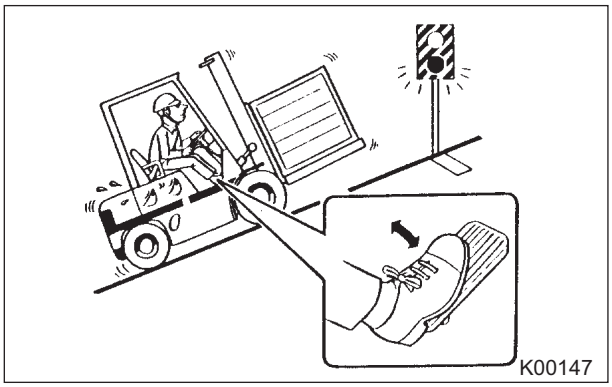
•Stopping on a Grade

⚠ CAUTION

Press the brake pedal when you have to bring the lift truck to a stop on a grade. DO NOT hold the lift truck by pressing the accelerator pedal. This may cause clutch plate wear or torque converter failure.

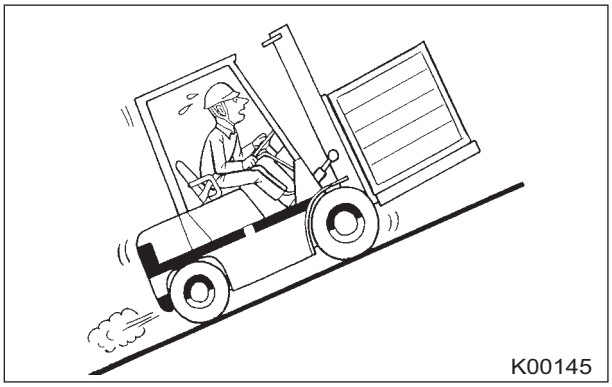
When traveling up or down a steep grade:

1. Do not stop the engine.
2. Do not make any turns.
3. Do not travel across the grade.



•Starting on a Grade (Engine Stalls on a Grade)

Powershift



1. Apply the parking brake.
2. Lower the forks to the ground.
3. Press the brake pedal.
4. Place the direction lever in the NEUTRAL position.
5. Start the engine.
6. Place the direction lever in the FORWARD position.
7. Raise the forks or load to the normal travel position.
8. Quickly shift your right foot from the brake pedal to the accelerator pedal.
9. Release the parking brake while gradually pressing the accelerator pedal.

Powershift (For use with wet disc brake option)

1. Apply the parking brake.
2. Lower the forks to the ground.
3. Press the brake pedal.
4. Place the direction lever in the NEUTRAL position.
5. Start the engine.
6. Place the direction lever in the FORWARD position.
7. Raise the forks or load to the normal travel position.
8. Quickly shift your right foot from the brake pedal to the accelerator pedal.
9. Release the parking brake while gradually pressing the accelerator pedal.

STORING THE LIFT TRUCK

♦ End of Each Shift Storage

To ensure the long life of your lift truck, be sure to take the following steps at the end of each shift.

1. Park the lift truck in an authorized area.
2. Block the wheels securely.
3. Check under the lift truck for oil or coolant leaks.
4. Clean the lift truck to keep it free of dirt and oil. This will make it easier to spot loose or defective parts.

⚠ WARNING

BE SURE to push the parking brake switch before blocking the wheel!

Before blocking or releasing the wheel, make sure that the parking brake is applied. If not, the lift truck could start moving by itself, resulting in accidents.

⚠ WARNING

Perform a thorough walk-around inspection for any damage. Report all damage or faulty operation immediately. DO NOT operate the lift truck that has a maintenance problem.

⚠ CAUTION

DO NOT put your hand between the tire and wheel chock when using a wheel chock to block wheels. The lift truck may move, causing your hand to be pinched.

⚠ CAUTION

DO NOT expose the ECU/VCM/DCM/OCM boxes to rainwater. Take care not to sprinkle water over ECU/VCM/DCM/OCM boxes when cleaning the lift truck.

♦ Long Term Storage

If your lift truck is stored for any length of time, take the following safety precautions to reduce the risk of deterioration of the lift truck components. If it is necessary to store the lift truck outdoors, park it on a hard level surface covered with wooden blocks, and cover it with a water-proof plastic sheet to protect it from humidity or dust.

•Fuel System

- Gasoline engine lift trucks
  Gasoline evaporates, leaving a sticky gum deposit in the fuel pump and carburetor. Drain the fuel from the tank and run the engine until the fuel in the lines is used up.
- Diesel engine lift trucks
  Drain the fuel from the tank and run the engine until the fuel in the lines is used up.

- LP-Gas engine lift trucks
  Due to fire hazards, lift trucks can present a storage problem. Store them in an outdoor shelter or detached garage. If the shelter is attached to another building, the separating walls should have a fire resistance rating of more than one hour. The shelter should have sprinklers and floor-level ventilation.

•Hydraulic System

After parking your lift truck for storage, retract all the hydraulic cylinders to minimize rod exposure. This will reduce the risk of rusting of the sliding contact surfaces of the rods.
To prevent rusting of the cylinder interior and rods, and deterioration of the seals, periodically operate each cylinder for lift, tilt and the attachment to full stroke.

•Engine Cooling System

Protect the cooling system from freezing by draining the system or by adding an antifreeze mixture.

•Engine Cylinders

Over a long storage period, the cylinders may rust from moisture condensation within the cylinders.
To reduce the risk of rusting of cylinder walls, drive until an engine warms up once in one week.
When using anti-rust engine oil to the engine, crank the engine several times with the starter to spread the oil uniformly on the cylinder walls.

•Battery

Remove the batteries from the lift truck and recharge them. Store them in a dry, cool place.

•Controller

Moisture is harmful to the controller.
DO NOT splash water or steam clean the following controllers when cleaning.

- VCM
- ECM
- DCM
- OCM

•Other

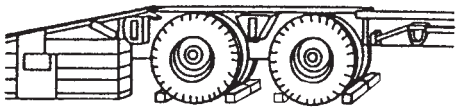
More precautions may have to be taken according to the place of storage, storage period and season. When you store your lift truck, consult your authorized Cat lift truck dealer.

TRANSPORTATION HINTS

♦ Lift Truck Loading and Shipping

Be sure to take the following safety precautions before loading and shipping lift trucks.

- Always block the trailer or rail car wheels before loading the lift truck.
- Position the lift truck on the truck bed or rail car.
- Apply the service brake and then apply the parking brake. Place the direction lever in the NEUTRAL position.
- Turn the key switch to the ○ (OFF) position and remove the key.
- Block the wheels and secure the lift truck with tiedowns.
- Do not turn the steering wheel after the lift truck has been secured. It may loosen the tiedowns.



M00002

⚠ WARNING

Check travel route for overpass clearances. Make sure there is adequate clearance if the lift truck being transported is equipped with a high mast or cab. Remove ice, snow or other slippery material from the shipping lift truck and loading dock.

♦ Lift Truck Lifting and Tiedown Information

Take the following safety precautions when lifting or tying down lift trucks.

- Weight and instructions given here apply to lift trucks manufactured by Cat Lift Trucks.
- Use proper rated cables and slings for lifting. Position the crane so the lift truck is level when lifted.
- Spreader bar widths should be sufficient to prevent contact with the lift truck.
- Use the tiedown locations provided for lift truck tiedown.

⚠ CAUTION

Improper lifting or tiedowns may cause a load to shift and cause injury and/or damage.

Note:

Check the state and local laws governing weight, width and length of a load. Contact your authorized Cat lift truck dealer for shipping instructions for your lift truck.

SPECIAL SITUATIONS

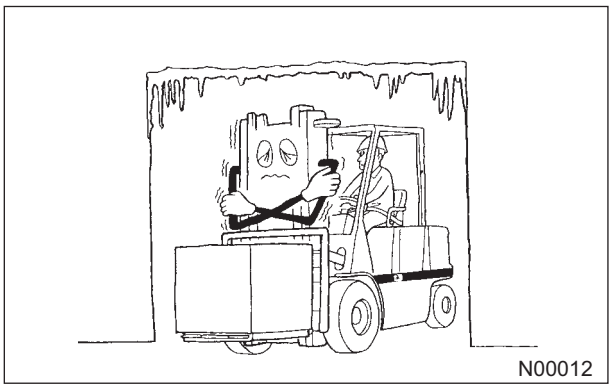
♦ Care in Cold Weather

•Fuel Oils and Lubrication Oils

Use diesel fuel to fit the ambient temperatures. The cetane number should be 40 minimum. If you operate the lift truck where ambient temperatures are normally low, you may need fuel with a high cetane number.

⚠ CAUTION

- Cloud point must be 6°C (11°F) below the lowest ambient temperature.
- Use engine oil and gear oil to fit the ambient temperature.

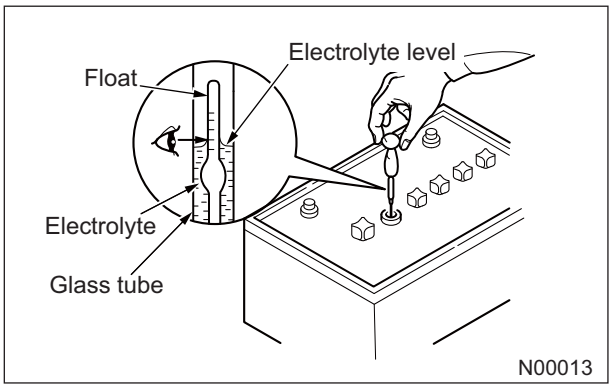


•Battery

- Consult your battery manufacturer for the specific gravity of your battery.
- When you park your lift truck overnight, leaving it outside in the elements, remove the battery and keep it warm.
- The electrolyte of a fully charged battery will not freeze to -35°C (-31°F).

⚠ CAUTION

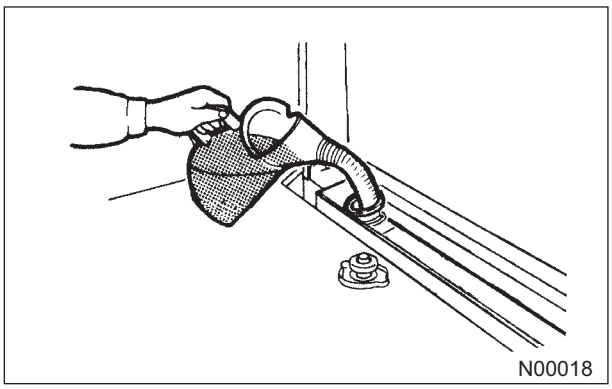
- After distilled water has been added to the battery, run the engine for a while. This mixes the added water with the electrolyte and will reduce the risk of freezing and damaging the battery.
- DO NOT attempt to restore a battery's charge by pouring boiling water over it. This may break the battery case, resulting in acid contact with skin or eyes.



•Engine Coolant

- Antifreeze used in the engine cooling system of a new lift truck shipped from the manufacturer provides sufficient freeze protection to -30°C (-22°F).
- If ambient temperatures are below -30°C (-22°F), add antifreeze.

Note:
For type and concentration of antifreeze, consult your authorized Cat lift truck dealer.

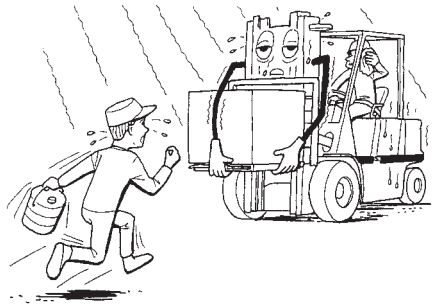


♦ Care in Hot Weather

•Fuel Oils and Lubrication Oils

Use fuel oil, engine oil and gear oil to fit the ambient temperatures.

Note:
For selection of fuel oil, engine oil and gear oil, consult your authorized Cat lift truck dealer.


N00015

•Battery

In hot and/or dry weather, check the battery cells for proper electrolyte level more often than in cold weather. Add distilled water whenever the level is low.

•Engine Coolant

⚠ WARNING

Be careful NOT to have scalding hot coolant or steam blow out of the reserve tank. Remove the radiator cap only after engine cools.

Note:
Coolant evaporates rapidly and the engine is likely to get overheated when the lift truck is operated continuously or on a grade. During such an operation, observe the engine coolant temperature gauge for symptoms of overheating.

⚠ CAUTION

If the engine coolant temperature gauge shows the red zone, the engine may be overheated.

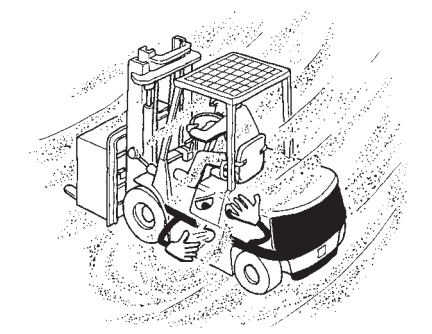
Note:
If the engine coolant temperature gauge shows the red zone, see the topic, "Engine Coolant Temperature Gauge Shows Red Zone."

♦ Severe Dust or Lint Conditions

Check and service the air cleaner element more frequently.

Recommended Inspection Period	Every 200 service hours or monthly, whichever comes first

Check the radiator core more frequently for clogging or debris build-up. Clean or wash the lift truck as needed.


N00017

TROUBLESHOOTING

♦ Stalled Engine

If the engine stalls, hydraulic pressure is lost in the power steering. This increases your steering effort. In this case, stop your lift truck in a safe area and restart the engine.

♦ Starting With Jumper Cables

To start a lift truck with a "run-down" battery, use a booster battery or jumper cables from the battery of a second lift truck.

⚠ WARNING

- Batteries give off flammable gas which could explode.
- Keep flames and sparks away from batteries. They could cause gas to explode.
- DO NOT smoke when checking battery electrolyte levels.

⚠ WARNING

- DO NOT try to start the engine by pushing the lift truck.
- BE SURE to connect the cable end 4 to the ENGINE BODY. If it is connected to the negative (-) terminal of the battery, sparks could ignite the gases.

⚠ WARNING

- Improper jump start procedures could cause an explosion that could result in injuries. Turn OFF all lamps and accessories on the stalled lift truck.
- Always connect battery positive (+) to battery positive (+) and battery negative (-) to engine body. Jump only with a battery source of the same voltage as the stalled lift truck.
- DO NOT allow jumper cable ends to contact each other or the lift truck.
- Electrolyte is an acid and could cause injury if it contacts skin or eyes. Always wear eye protector when starting an engine in the lift truck with jumper cables.

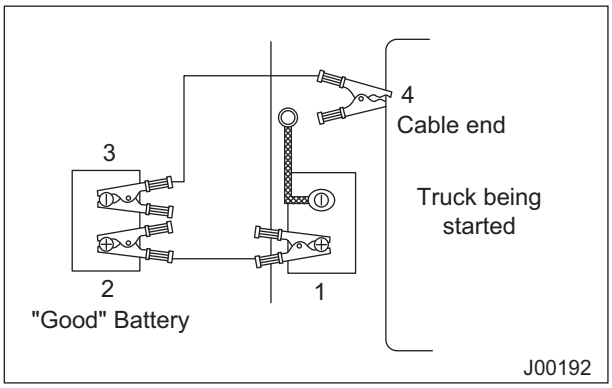
⚠ CAUTION

- Connect the jumper cables away from the moving parts in the engine compartment.
- When carrying batteries, provide short circuit prevention to the terminals. If metals come in contact with the terminals, a short circuit could result.
- DO NOT touch the cable with wet hands. If touched, it may result in an electrical shock.

Note:

- Use a 12 volt jumper cables to jump start the lift truck. This lift truck has a 12 volt starting system. Use only equal voltage for jump starting. Use of a welder or higher voltage will damage the electrical system.
- You can buy jumper cables from your authorized Cat lift truck dealer.
- Turn off the battery switch prior to the boost connection to prevent damage to electrical components on the stalled lift truck. Many "dead" batteries can be recharged.

1. Position the second lift truck, with its engine running, within jumper cable distance.
2. Connect the jumper cables in the sequence shown. Do not short across the positive (+) and negative (-) terminals.
3. After connecting the cables, increase the speed of the second lift truck's engine and then start the engine of the stalled lift truck that has the "run-down" battery.
4. After the engine starts, disconnect the jumper cables in the reverse sequence.



♦ If Lamps Won't Glow

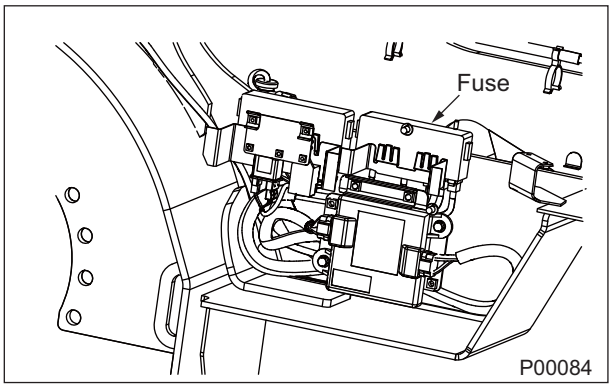
⚠ CAUTION

- Always replace fuses with fuses of the correct amperage.
- If a fuse burns out immediately after being changed and you cannot locate the cause, have your authorized Cat lift truck dealer perform a circuit check.
- Always use a lamp bulb of the same wattage.

Circuit	Capacity	
	LPG	Diesel
VCM	20A	20A
QGS (Fuel Pump)	10A	10A
Instrument Panel	10A	10A
Back-up lamp	15A	15A
Spare	20A	20A
Spare	30A	—
Working Lamp	15A	15A
ETC	15A	—
A / C	20A	20A
Wiper (Optional)	15A	15A
Head Lamp	15A	15A
Horn	10A	10A
Stop Lamp	10A	10A
EGI	30A	—
EGI	30A	—

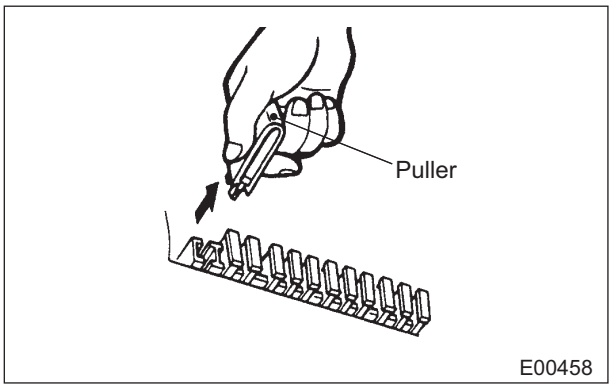
•How to Check Fuses and Lamps

1. Push clip 1 and pull up to remove cover.
   - To replace, hook cover on clip 2 and push until clip 1 locks in place.
2. Check fuses one by one with volt meter for continuity.
   - If fuse fails continuity test, replace the fuse with a new one.

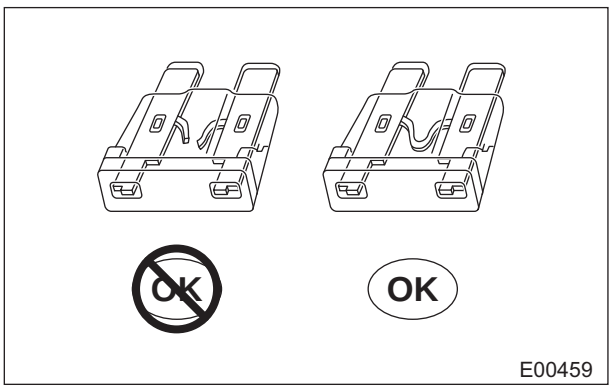


3. Push the clip 1 and pull up this side of the cover.
   - Release from the hook 2 on the other side.
   - When the cover is put back, do not push upper side. Hook the cover correctly from lower side.

Note:
To remove the fuse or insert a replacement fuse, use the puller located inside the fuse panel lid.

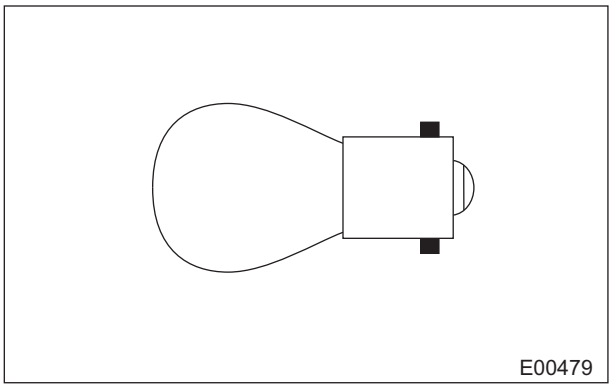


4. Check to see if fuse is blown.
5. Check to see if lamp is burned out If there is no problem with the fuses



6. Lamps may be burned out.

Lamp Type		Capacity
Head Lamp		12V-48W
Working Lamp (Optional)		12V-48W
Front	Turn Signal Lamp	12V
	Clearance Lamp	12V
Rear	Tail / Stop Lamp	12V
	Back-up Lamp	12V
	Turn Signal Lamp	12V



♦ If the Engine Coolant Temperature Gauge Shows Red Zone

⚠ WARNING

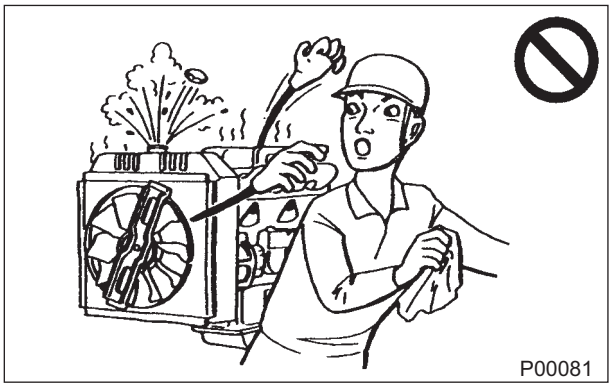
- DO NOT attempt to remove the radiator filler cap if the engine is overheated. To avoid scalding hot coolant and steam from blowing out of the radiator, wait until the engine has cooled.
- DO NOT add cold water to an overheated engine, this could cause engine damage. Wait for the engine to cool, if possible. If not, slowly pour water into the radiator.
- Immediately stop the engine if the fan belt is broken.

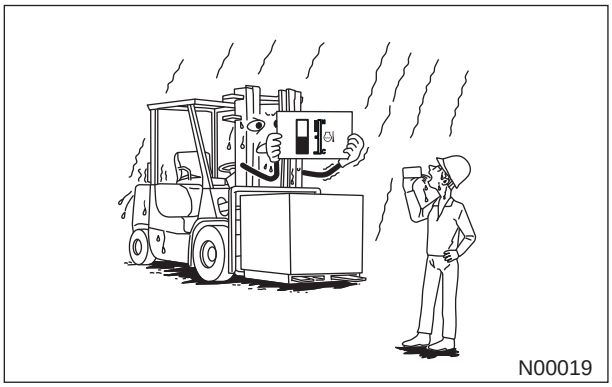
⚠ CAUTION

If any of the following liquids are spilled on the floor, clean up immediately. If not cleaned up, it may result in slipping, skidding or environmental pollution.

- Oil or grease
- Coolant
- Gasoline or diesel fuel
- Brake fluid
- Electrolyte

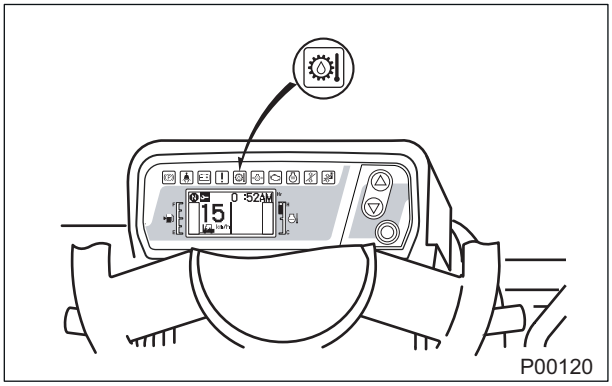
1. Park the lift truck in a safe area.
2. Raise the engine hood and seat assembly to ventilate the engine compartment.
3. Allow the engine to idle for a while. Do not attempt to stop the engine.
4. Stop the engine after the engine coolant temperature gauge shows the WHITE zone.
5. Check for:
   - Lack of coolant.
   - Loose or broken fan belt.
   - Engine oil level.
   - Dirt buildup in radiator air passages.


P00081


N00019

♦ If Torque Converter Oil Temperature Warning Lamp Glows (Powershift)

1. Stop the lift truck in a non-traffic area.
2. Apply the parking brake.
3. Place the direction lever in the NEUTRAL position.
4. Run the engine at low idle for a while.
5. After the warning lamp has gone out, operate the lift truck again.



⚠ CAUTION

If the warning lamp does not go out, or if it constantly glows, consult your authorized Cat lift truck dealer.

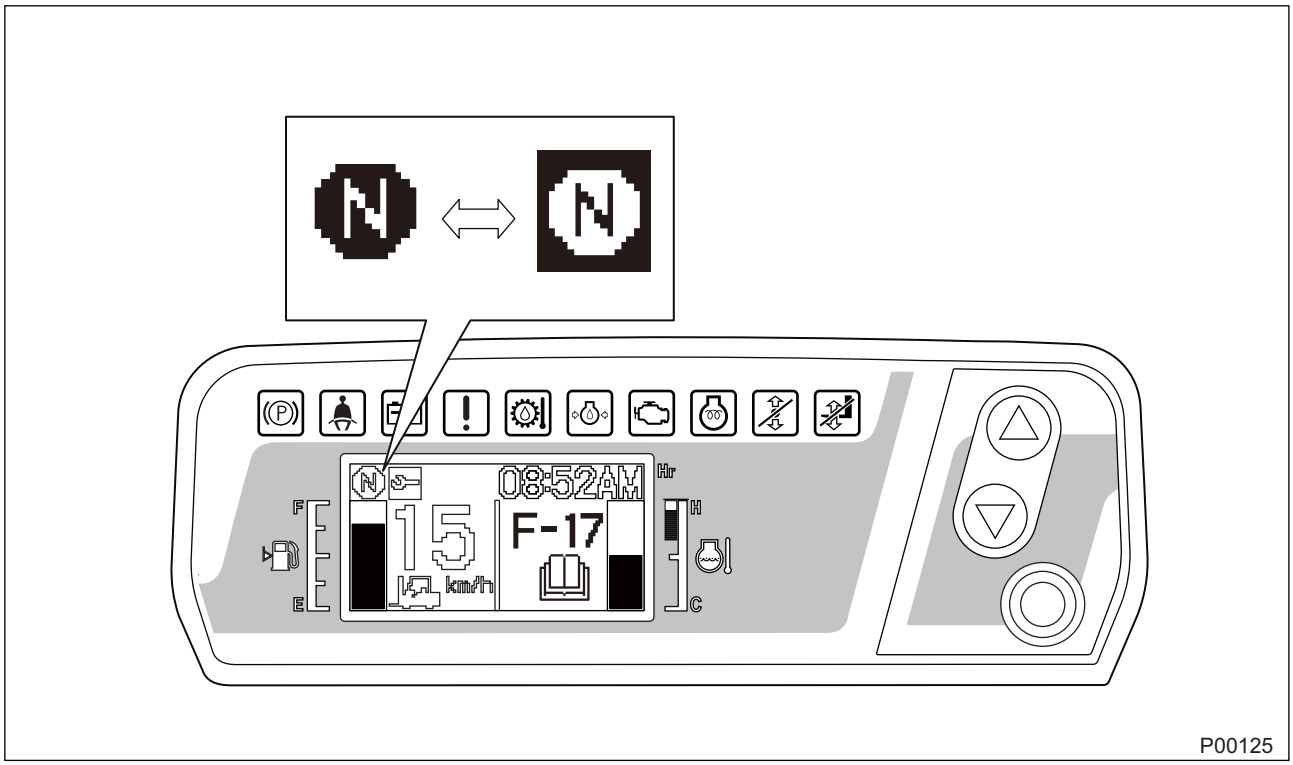
♦ Trouble With the LP-Gas Equipment

⚠ WARNING

- If you smell gas or notice something wrong with LP-Gas equipment during operation, immediately stop the lift truck in a safe area, turn the key switch to the ○ (OFF) position, close the fuel valve of the LP-Gas tank, and try to find the cause. (It is recommended that the fuel lines and fittings be checked with a soap solution after filling the tank or when looking for leaks.)
- If the internal pressure of the LP-Gas tank rises too high and causes the relief valve to open to let out the excess pressure, sprinkle water over the tank. At the same time, extinguish any fire or flame source (such as a pilot lamp) and eliminate the possibility of creating sparks near the lift truck. Ventilate the work place.
- When gas leakage is evident, close the fuel valve as soon as possible. Extinguish the fire or flame sources nearby to prevent spark conditions.
- There is a possibility of fire after a collision or when the lift truck turns over. If this happens, close the LP-Gas fuel valve of the LP-Gas tank as soon as possible.
- Use a dry chemical (powder) or carbon dioxide type extinguisher. DO NOT use water. When possible, however, have large quantities of water poured over the LP-Gas tank to cool it down while the fire is being extinguished.

♦ If the Lift Truck Won't Change Directions

If an operator half rises from the operator seat for more than 2 seconds with the direction lever being placed in the forward or reverse position, a built-in seat switch in the operator seat activates the driving interlock system. Check the following points If the lift truck will not move even after the direction lever is shifted to the forward or reverse position.



P00125

Does the driving interlock Indicator lamp blink on the LCD screen?

YES

1. Sit properly on the operator seat.
2. Return the direction lever to the NEUTRAL position.
3. Place the lever to the FORWARD or REVERSE position.

NO

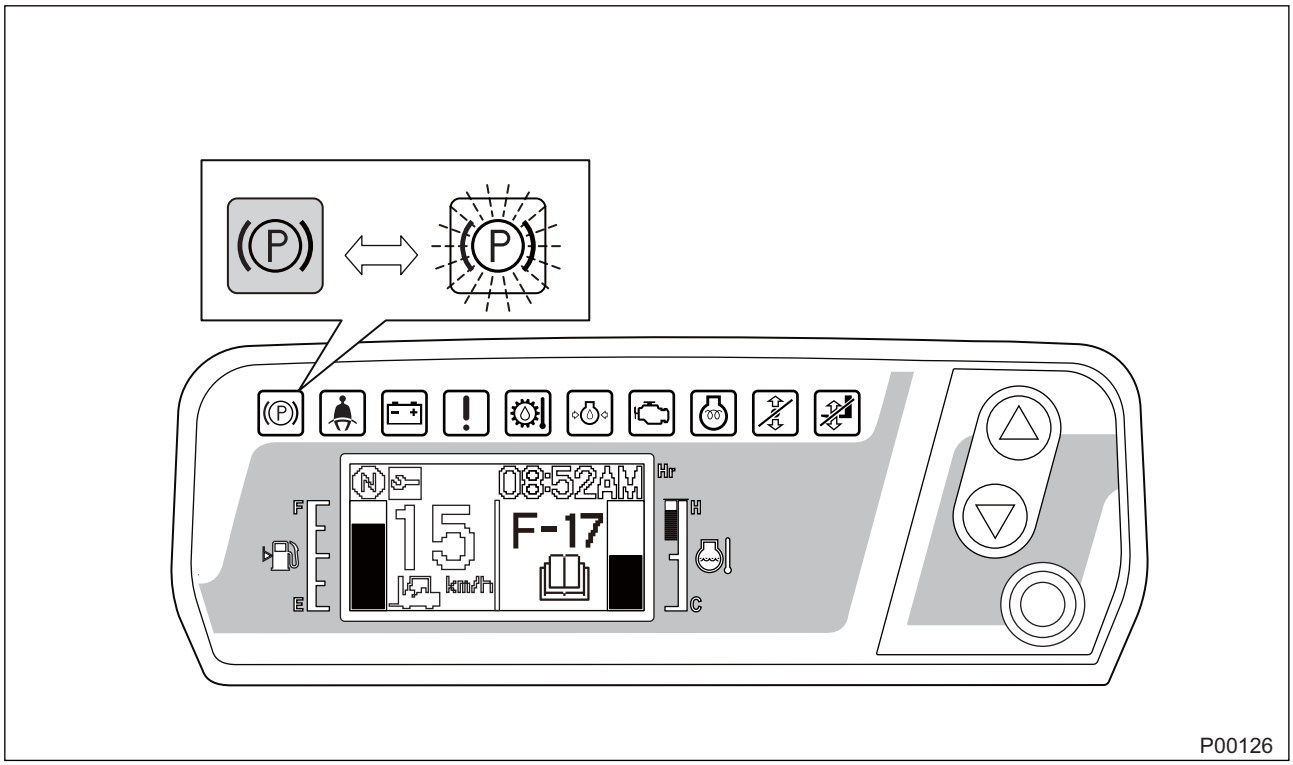
It is broken.

Contact your authorized Cat lift truck dealer after taking the following safety measures.

1. Return the direction lever to the NEUTRAL position.
2. Apply the parking brake.
3. Turn the key switch to the ○ (OFF) position.
4. Attach a "DO NOT OPERATE" or similar warning tag to a conspicuous place at the operator compartment of the lift truck in order to let other people know your lift truck is broken.

♦ If the Lift Truck Won't Move

If an operator half rises from the operator seat for more than 2 seconds with the direction lever being placed in the forward or reverse position, a built-in seat switch in the operator seat activates the driving interlock system. Check the following points If the lift truck will not move even after the direction lever is shifted to the forward or reverse position.



P00126

Does the parking brake warning alarm lamp blink on the instrument panel?

YES

1. Sit properly the operator seat.
2. Apply the parking brake.
3. Release the parking brake.

NO

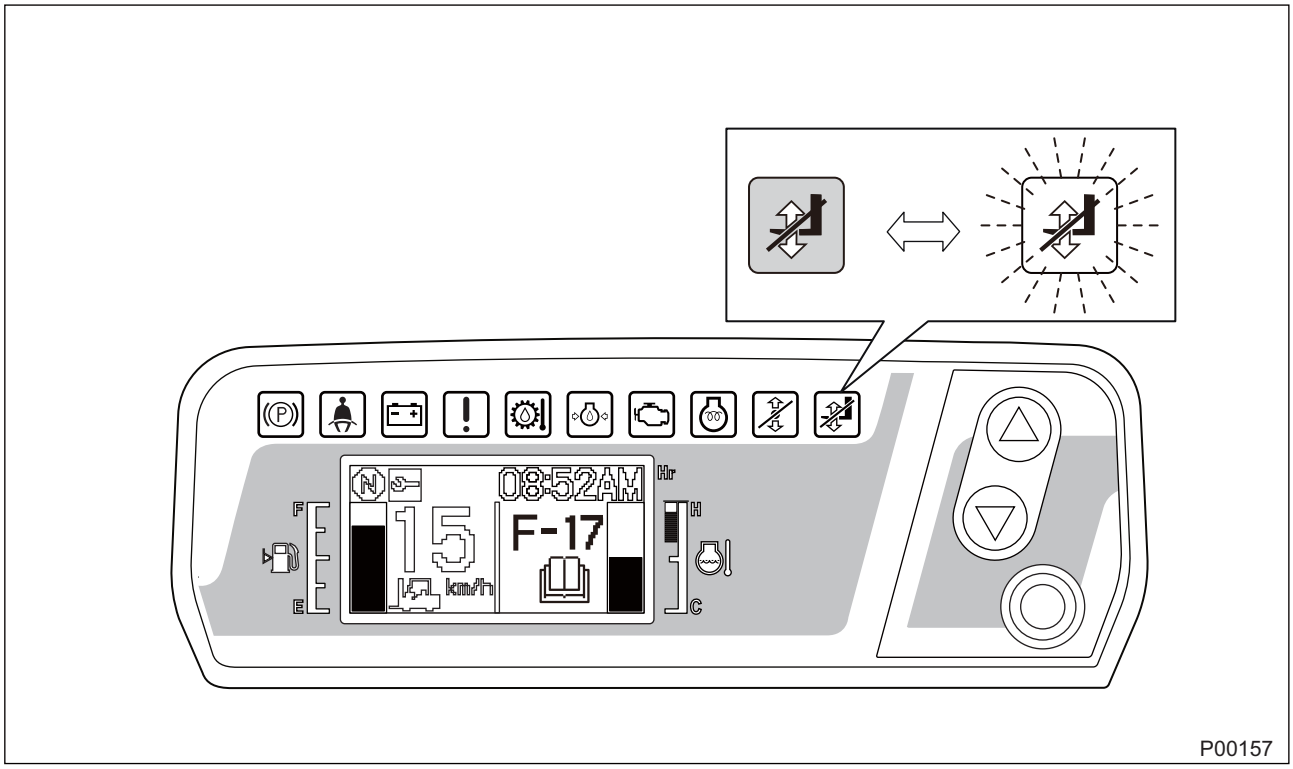
It is broken.

Contact your authorized Cat lift truck dealer after taking the following safety measures.

1. Return the direction lever to the NEUTRAL position.
2. Apply the parking brake.
3. Turn the key switch to the ○ (OFF) position.
4. Attach a "DO NOT OPERATE" or similar warning tag to a conspicuous place at the operator compartment of the lift truck in order to let other people know your lift truck is broken.

♦ If the Mast Stops Moving (MC Model)

If an operator half rises from the operator seat for more than 2 seconds without the lift/tilt lever being placed in the neutral position, a built-in seat switch in the operator seat activates the mast interlock system.



Check the following points If the mast (attachments) will not move even after the lift/tilt lever is shifted to other than the NEUTRAL position,

Remedy

1. Sit properly on the operator seat.
2. Return the lift/tilt lever to the NEUTRAL position.
3. Operate the lift/tilt lever.

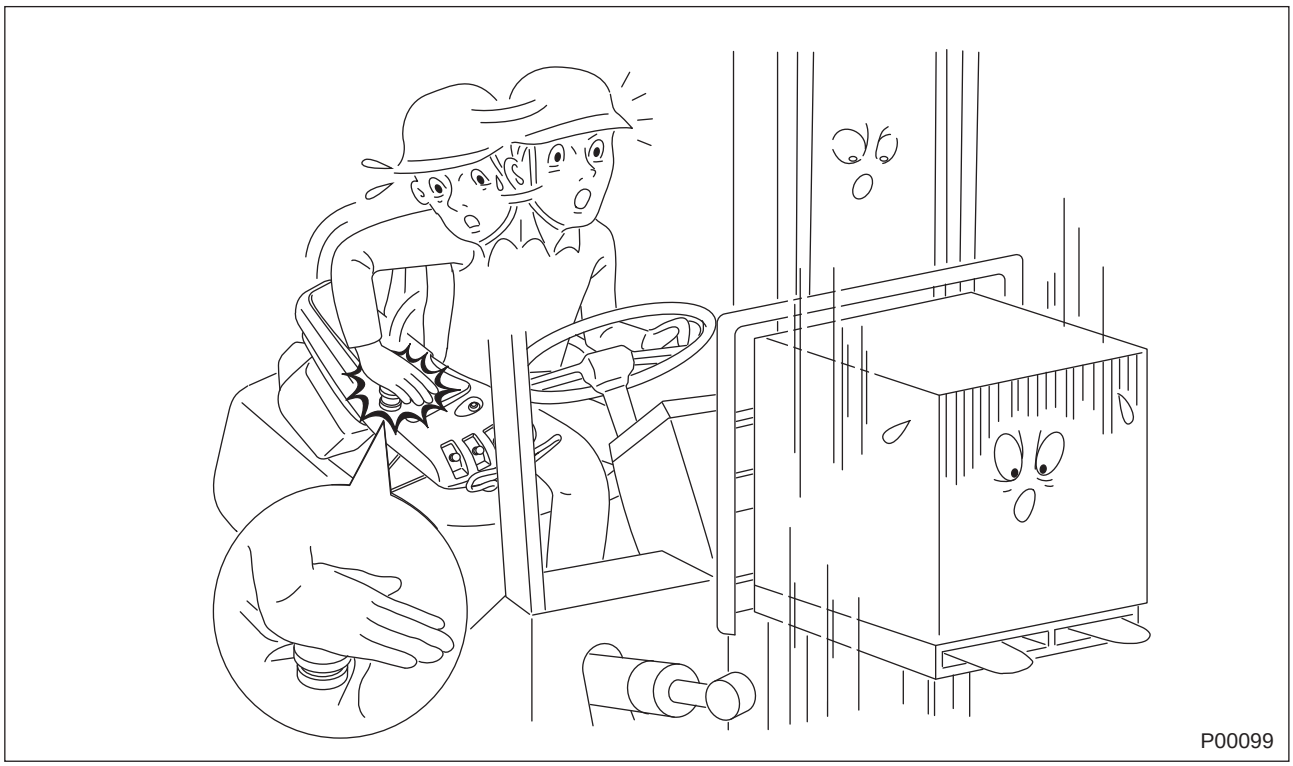
Note:
The lift truck may be broken if the mast interlock system remains in a locked condition after taking the above step. Contact your authorized Cat lift truck dealer immediately.

♦ If the Mast and Attachments Malfunction (FC Model)

Push down on the emergency mast stop button to stop the mast and attachments.

⚠ WARNING

- If you see the mast or attachment malfunctioning, push down on the emergency mast stop button. Contact your authorized Cat lift truck dealer immediately.
- DO NOT attempt to return the emergency mast stop button to the OPERATE position for operating the lift truck before an authorized mechanic arrives on the scene.



Push down on the emergency mast stop button, and then take the following safety measures.

1. Move the lift truck to a safe area.
2. Return the direction lever to the NEUTRAL position.
3. Apply the parking brake.
4. Turn the key switch to the ○ (OFF) position.
5. Attach a "DO NOT ENTER" or similar warning tag to the mast or fork of the lift truck in order to let other people know your lift truck is broken.
6. Contact your authorized Cat lift truck dealer immediately.

♦ If a Tire Blows Out

•If a Tire Blows Out During Traveling or Operation

⚠ CAUTION

A flat tire tilts the lift truck, which makes it difficult to turn the steering wheel properly. To keep operating the lift truck with a flat tire may cause an accident.

Remedy

1. Stay calm and firmly hold on to the steering wheel.
2. Gently release the accelerator pedal to slow down.
3. Park the lift truck in a safe area.
4. Replace the punctured tire with a new one.

Note:

Contact your authorized Cat lift truck dealer when requesting to change tires.

♦ Changing Tires

⚠ WARNING

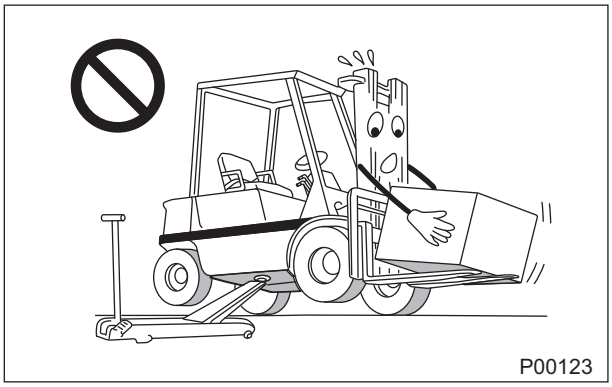
- When changing tires, change them in sets, even if only one of the tires is damaged. If both new and used tires are used on the same axle, tilting of the mast and rapid tire wear will result.
- Make sure the replacement tire is of the same size, type and load range as indicated on the Manufacturer Name Plate.
- Use only tires recommended by the manufacturer. See manufacturer name plate for correct tire size.

⚠ WARNING

- Consult your authorized Cat lift truck dealer for proper tire changing procedure.
- Changing a tire and adjustment procedures must be made by a trained mechanic.
- Perform all maintenance with proper equipment.

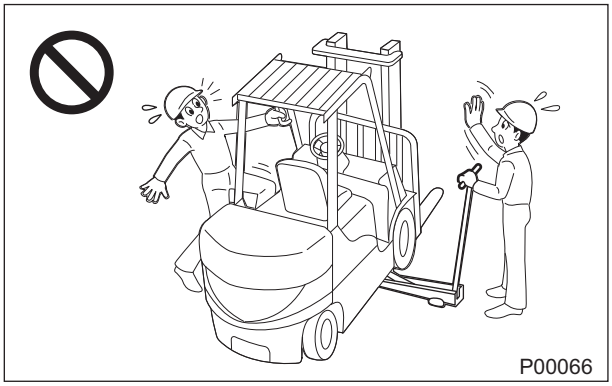
⚠ WARNING

DO NOT attempt to change the tire with the lift truck loaded. Injury and/or damage could result.



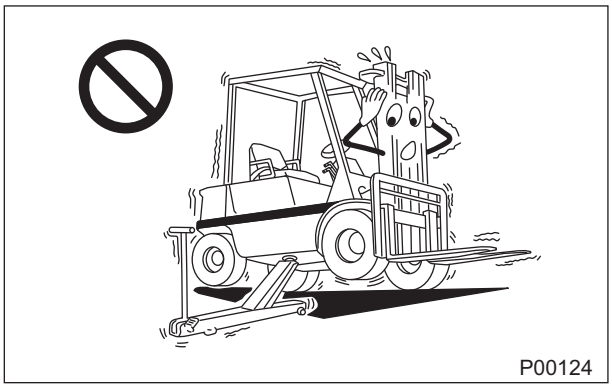
⚠ WARNING

MAKE SURE no one is on the lift truck when raising the front or rear tires.



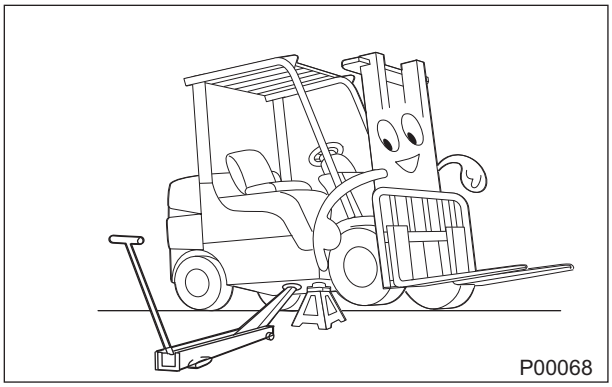
⚠ WARNING

Stop raising the lift truck when the tire clears the ground. DO NOT raise the lift truck more than necessary.



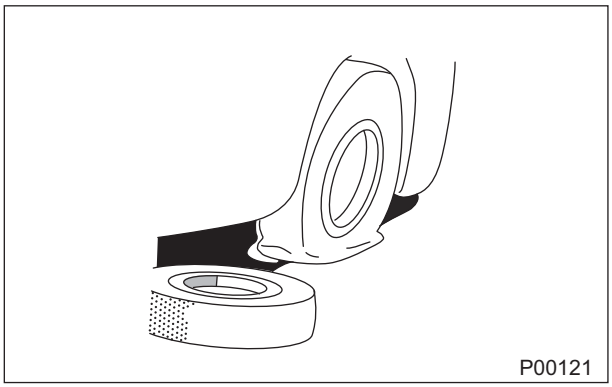
⚠ WARNING

DO NOT place any part of your body under the lift truck until the lift truck is securely supported with jack stands after jacking it up.



•Before Changing Tires

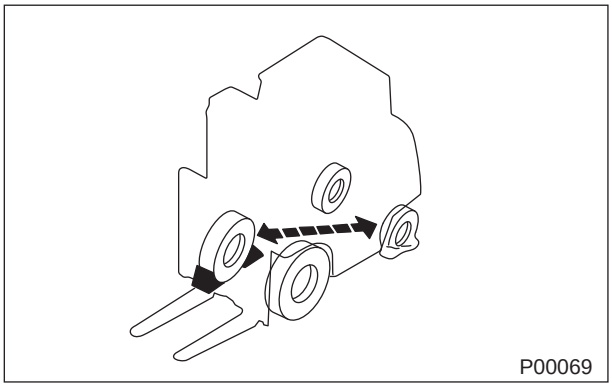
1. Park the lift truck on level ground.
2. Lower the forks until the fork tips touch the ground.
3. Apply the parking brake.
4. Place the direction lever in the NEUTRAL position.
5. Stop the engine.



6. Prepare tools, jack and wheel blocks.
7. Block the wheel diagonally opposite to a raised wheel.

Jack capacities

4 ton models	6 tons (13230 lbf), minimum
4.5 to 5.5 ton models	7 tons (15440 lbf), minimum



•To Remove Wheel

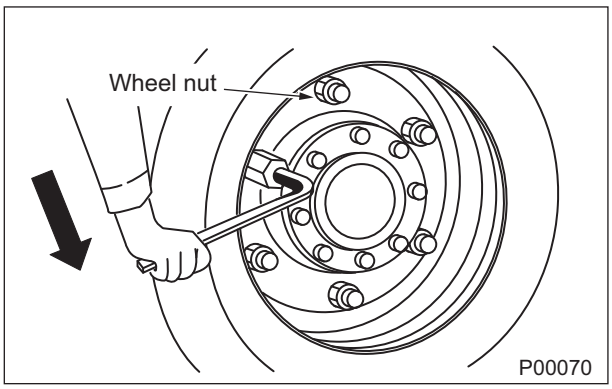
1. Loosen the wheel nuts about two rotations.

Note:
Only loosen the wheel nuts. Do not remove them.

2. Position the jack under the lift truck at the specified jacking point.

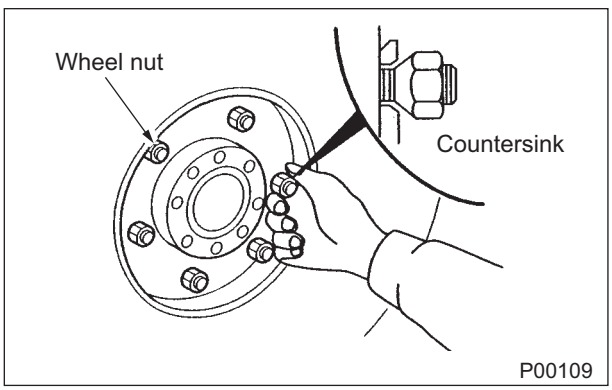
Note:
For jacking point, see next page.

3. Raise the lift truck by operating the jack until the tire just clears the ground.
4. Remove the wheel nuts (loosened in step 1).
5. Firmly hold the wheel with both hands and remove it from the lift truck.



⚠ WARNING

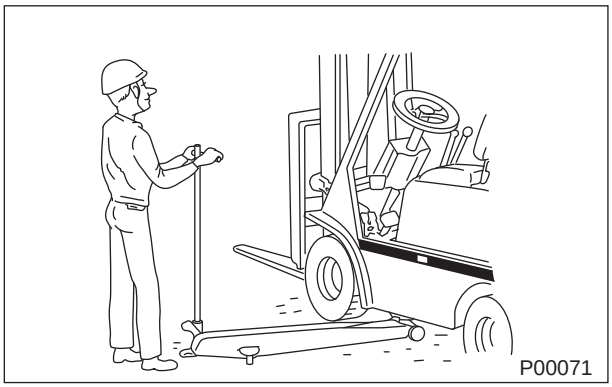
DO NOT loosen rim bolts.



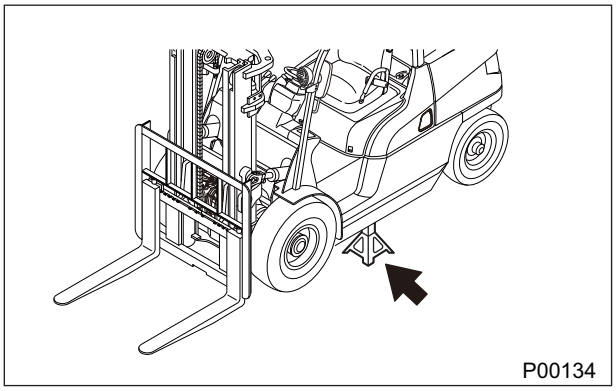
•To Raise Front Wheel

Jacking Method

1. Position the jack under the frame and raise the lift truck with the jack until the front wheel clears the ground.

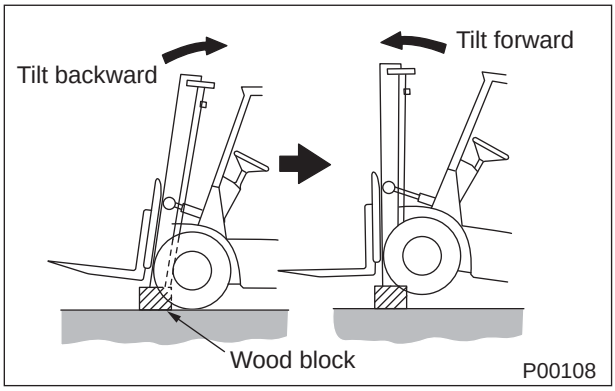


2. Place the jack stands on both sides under the frame to support it.

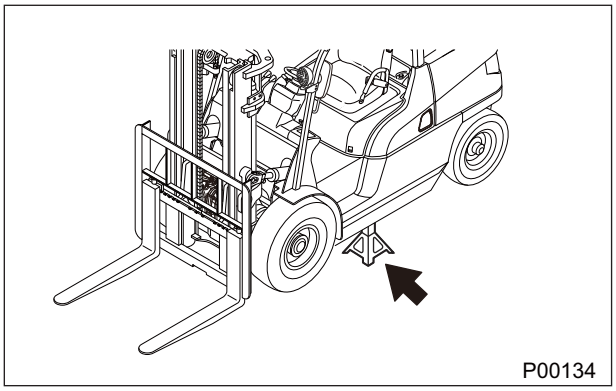


"Self-jacking" method

1. Tilt the mast fully back, place wood blocks under the mast, and tilt the mast forward.

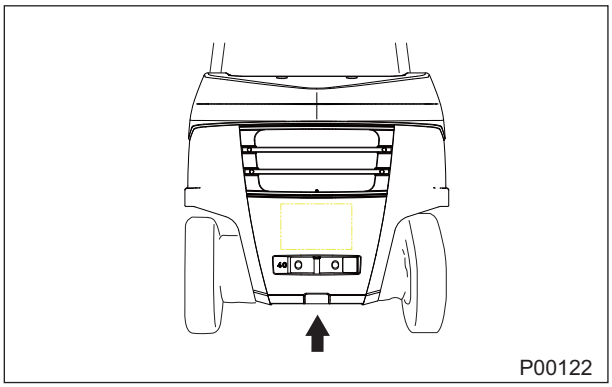


2. Place the jack stands on both sides under the frame to support it.



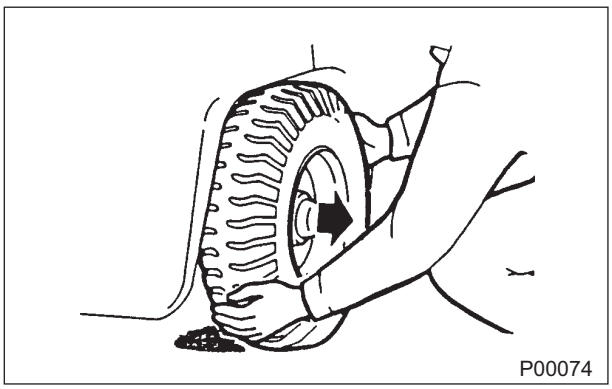
•To Raise Rear Wheel

1. Position the jack under the counterweight at the recessed point and raise the rear wheel.
2. Place the jack stand under the frame to support it.



⚠ CAUTION

Be careful NOT to strip the bolt threads when removing the wheel.

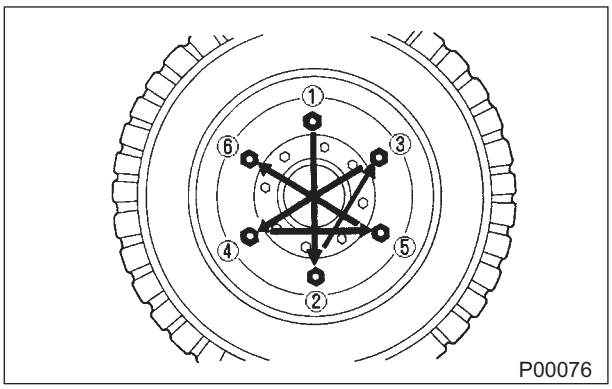


•To Install Wheel

1. Install the wheel and tighten the wheel nuts finger tight until their clamping surfaces come into full-face contact with the counter bores in the rim.

Note:

Make sure the clamping surfaces of the wheel nuts and countersinks are free of dirt.



2. Lower the lift truck by operating the jack until the tire just touches the ground. Then tighten the wheel nuts in the sequence shown, in two or three steps, to the specified torque.
3. Lower the lift truck fully and restore the jack and tire.
4. Make sure the tire pressure is correct. For the pressure, see the topic, "Specifications (Standard Models)."
5. After tire replacement, drive the lift truck for a while and then recheck the torque of the wheel nuts.

Tightening torques for wheel nuts

Unit: N·m (kgf·m) [lbf·ft]

4 to 5.5 ton models	Front	600±60 (61±6) [443±44.3)
	Rear	377.3 (38) [278]

•To Add Air to Tires

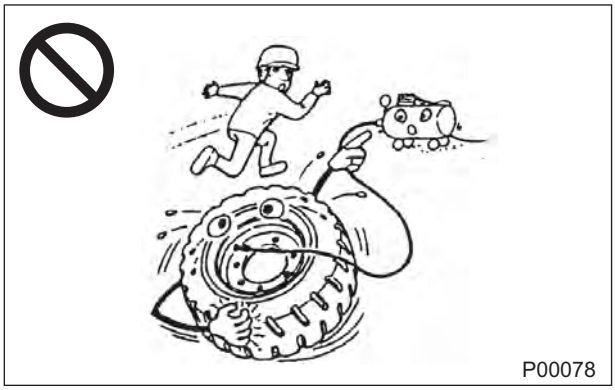
⚠ WARNING

- The lift truck uses high pressure tires. DO NOT overinflate the tire.
- When adding air, check the rim for damage that could permit air to leak from the tire.
- The use of an inflation cage, or some other safety device, helps reduce the risk of serious injury.
- When adding air to the tire, or when checking tire pressure, BE SURE to keep your body away from the side.


P00077

⚠ WARNING

- When adding air to the tire using an air compressor, make sure the compressor valve is correctly set. Failure to follow this precaution could damage the tire.
- Always maintain correct tire pressure.


P00078

♦ Changing Dual Tires (Optional)

•To Remove Outer Tire

⚠ WARNING

When removing the outer wheel nuts, hold each nut properly to prevent the wrench from slipping off the nut.

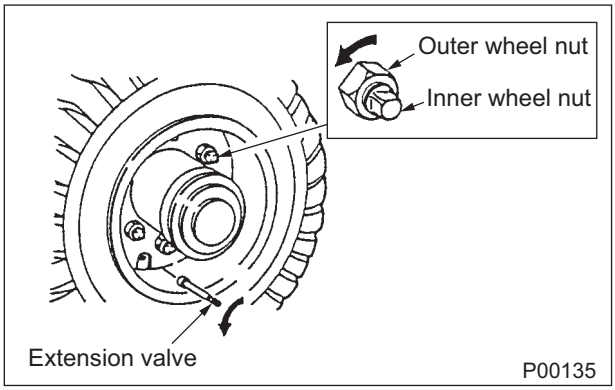
⚠ CAUTION

- When removing the wheel, be careful not to strip the inner wheel nut threads on the edges of the bolt holes in the rim.
- Check the tire pressure and adjust it if necessary.
- Drive the lift truck for a while, and retighten the wheel nuts.
- In case of a dual tire, it is common experience that only the outer wheel nuts are tightened while the inner wheel nuts are left untightened. BE SURE to tighten the inner wheel nuts, too.

1. Remove the outer tire extension valve by turning it counterclockwise.
2. Loosen the outer wheel nuts about two turns.

Note:
DO NOT remove the wheel nuts. ONLY loosen them.

3. Position the jack under the lift truck at the specified jacking point.
4. Raise the lift truck by operating the jack until the tire just clears the ground.



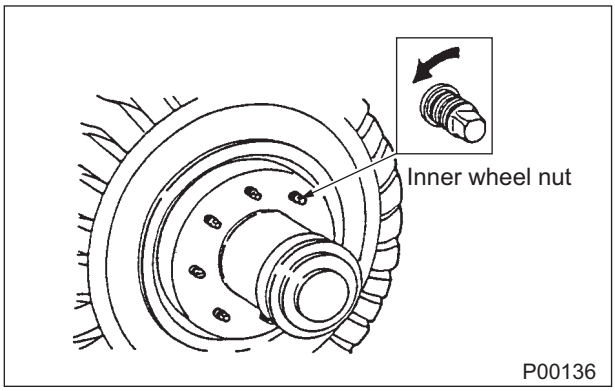
5. Remove the outer wheel nuts with hand.
6. Firmly hold the tire with both hands, and remove it from the lift truck.

•To Remove Inner Tire

⚠ CAUTION

When removing the tire, be careful not to strip the wheel bolt threads on the edges of the bolt holes in the rim.

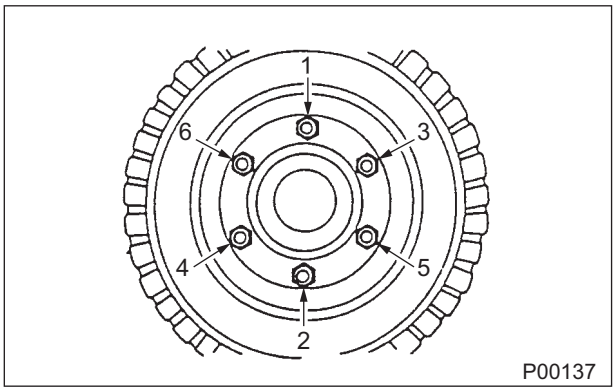
1. Lower the lift truck to the ground.
2. Loosen the inner wheel nuts about two turns.
3. Raise the lift truck until the tire just clears the ground.
4. Remove the inner tire nuts with hand.
5. Firmly hold the tire with both hands, and remove it from the lift truck.



•To Install Inner Tire

1. Install the inner tire. Tighten the wheel nuts just enough to hold the tire without wobbling.
2. Lower the lift truck until the tire just touches the ground.
3. Tighten the inner wheel nuts, in two or three steps, to the specified torque. Be sure to follow the tightening sequence shown in the illustration each time.

Note:
When replacing only an outer tire, make sure the inner wheel nuts are tightened properly.



Tightening torque for inner wheel nuts

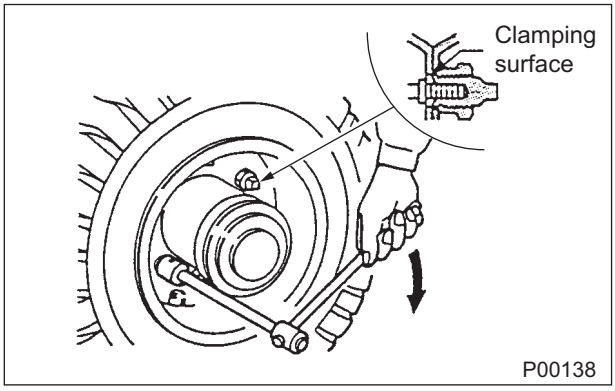
Unit: N·m (kgf·m) [lbf·ft]

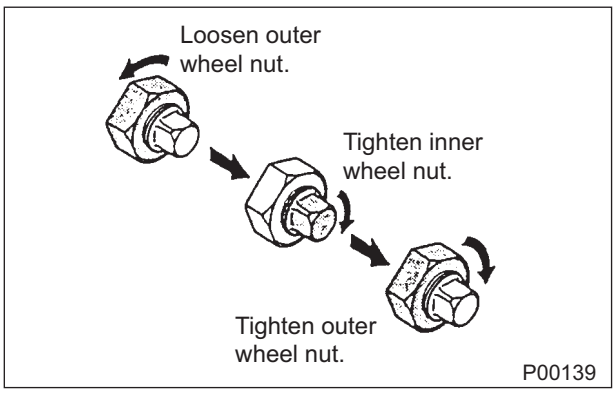
4 to 5.5 ton models	600 ± 60 (61 ± 6) [443 ± 44.3]

•To Install Outer Tire

1. Raise the lift truck until the tire just clears the ground.
2. Install the outer wheel. Tighten the outer wheel nuts just enough to hold the wheel without wobbling, making sure the clamping surface of each nut comes in full-face contact with the counterbore of the wheel disc.
3. Lower the lift truck until the tire touches the ground.
4. Tighten the outer wheel nuts in the same way as the inner wheel nuts.
5. Install the extension valve.

Note:
Retighten the wheel nuts at regular intervals.





♦ Rear Tire

•To Remove Tire

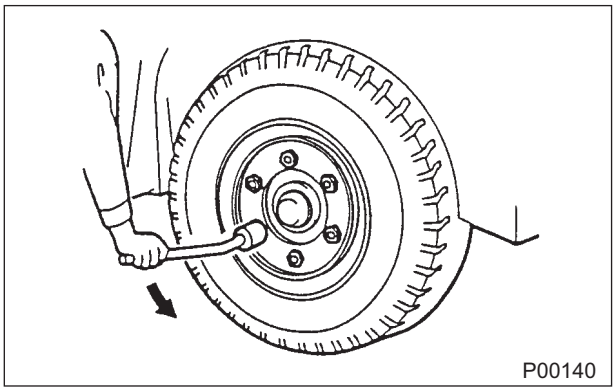
⚠ CAUTION

When removing the tire, be careful not to strip the wheel bolt threads on the edges of the bolt holes in the rim.

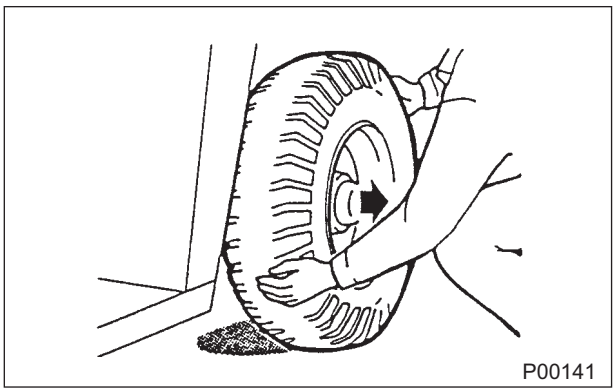
1. Loosen the wheel nuts about two turns.

Note:
DO NOT remove the wheel nuts. ONLY loosen them.

2. Position the jack under the lift truck at the specified jacking point.
3. Raise the lift truck by operating jack until the tire just clears the ground.

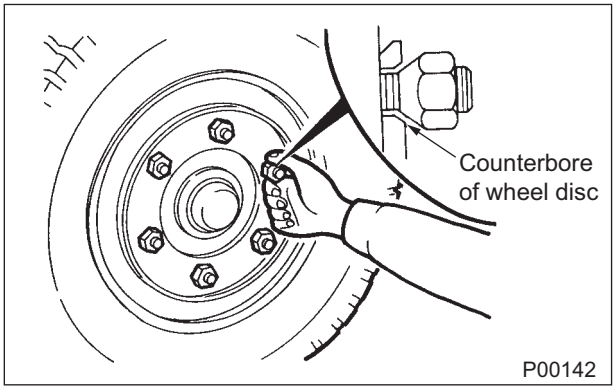


4. Remove the wheel nuts with hand.
5. Firmly hold the tire with both hands, and remove it from the lift truck.

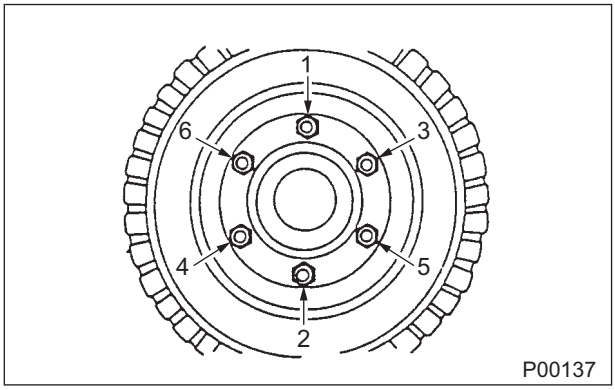


•To Install Tire

1. Tighten the wheel nuts just enough to hold the tire without wobbling, making sure the clamping surface of each nut comes in full-face contact with the counterbore of the wheel disc.



2. Lower the lift truck until the tire touches the ground. Tighten the wheel nuts, in two or three steps, to the specified torque. Be sure to follow the tightening sequence shown in the illustration each time.



Tightening torque for inner wheel nuts

Unit: N·m (kgf·m) [lbf·ft]

4 to 5.5 ton models	600 ± 60 (61 ± 6) [443 ± 44.3]

♦ Error Codes and Explanations

Contact your authorized Cat lift truck dealer when the error code is displayed.

Error code	Explanation	Error code	Explanation
D-51	Memory check error	E-28	PHASE sensor error signal
D-52	Battery voltage error	E-29	Self-shut system error
D-53	VCM communication error	E-30	ECCS C/U error signal
D-54	ECM communication error	E-31	Electronic control throttle control error signal
D-55	DCM communication error	E-32	Overheat signal (STEP1)
D-57	MP communication error	E-33	Overheat signal (STEP2)
D-61	Engine overrun	E-34	Spark system error signal
D-62	Revolution pulse error	E-35	LPG F/INJ disconnection diagnostic result signal
D-63	Overheat signal (STEP1)	E-36	LPG fuel pressure sensor diagnostic result signal
D-64	Overheat signal (STEP2)	E-38	LPG vaporizer diagnostic result signal
D-71	Accelerator sensor error signal	E-39	Mast-high SW diagnostic result signal
D-73	Engine revolution sensor error	E-40	Oil pressure sensor diagnostic result signal
D-75	Idling SW error	E-41	Stop lamp SW error signal
D-76	Throttle close position error	F-01	Memory check error
D-77	Throttle open position error	F-02	Battery voltage error
D-78	Throttle reference point error	F-03	VCM communication error
D-79	Throttle close SW stick error	F-04	ECM communication error
D-91	Stepping motor error	F-05	DCM communication error
		F-06	OCM communication error
E-03	VCM communication error	F-07	MP communication error
E-04	ECM communication error	F-09	Operation setting communication error
E-05	DCM communication error	F-10	Lift lever neutral error
E-07	MP communication error	F-11	Tilt lever neutral error
E-21	Air flow meter error signal	F-12	Attach-1 lever neutral error
E-22	Water temperature sensor error signal	F-13	Attach-2 lever neutral error
E-23	Throttle sensor error signal	F-14	Attach-3 lever neutral error
E-24	Accelerator sensor error signal	F-16	Shift lever error
E-25	0_2 sensor error signal	F-17	Speed error
E-26	0_2 sensor heater error signal	F-20	Lift lever error
E-27	POS sensor error signal	F-22	Tilt lever error

Error code	Explanation	Error code	Explanation
F-24	Attach-1 lever error	F-74	Attach-2 solenoid error
F-26	Attach-2 lever error	F-75	Unload solenoid error
F-28	Attach-3 lever error	F-76	Parking brake solenoid error
F-29	Joystick duplicate error	F-77	Lift lock solenoid error
F-31	VCM-IM sensor voltage error	F-78	Parking brake solenoid leak
F-32	Lift oil pressure sensor error	F-79	Unload / Lift lock solenoid leak
F-34	Speed sensor error	F-80	Knob position solenoid error
F-36	Tire angle sensor error	F-82	Tilt lock solenoid error
F-38	Tilt angle sensor error	F-84	Knob position solenoid leak
F-40	Steering error	F-85	T/M forward solenoid error
F-41	Output unit error	F-87	T/M backward solenoid error
F-44	Output unit PWM power voltage error	F-88	Parking brake oil pressure error
F-45	Output unit communication error	F-89	T/M solenoid leak
F-46	Input unit error	F-92	Parking brake miss operation during running
F-49	Input unit communication error	F-93	Shift solenoid 1 error
F-50	Lift up solenoid error	F-96	EAT setting error
F-52	Lift down solenoid error		
F-54	Lift solenoid leak	P-01	M/P memory check error
F-55	Tilt forward solenoid error	P-03	VCM communication error
F-57	Tilt backward solenoid error	P-04	ECM communication error
F-59	Tilt solenoid leak	P-05	DCM communication error
F-60	Attach-1A solenoid error	P-07	MP communication error
F-62	Attach-1B solenoid error		
F-64	Attach-1 solenoid leak		
F-65	Attach-2A solenoid error		
F-67	Attach-2B solenoid error		
F-69	Attach-2 solenoid error		
F-70	Attach-3A solenoid error		
F-72	Attach-3B solenoid error		
F-73	Hour meter gap error		

MAINTENANCE

♦ General

Taking proper care of your lift truck is a vital part of the overall planned maintenance program. Your participation in this program will provide an early identification of potential maintenance problems. Do-it-yourself maintenance does not include repairs. If your lift truck requires any repairs, consult your authorized Cat lift truck dealer. The dealer's lift truck mechanics are well trained and know how to safely make repairs.

⚠ WARNING

Follow these rules to help save you from injury and to service your lift truck properly.

- Make sure the service area is safe.
- Park the lift truck on level ground with the forks lowered until the fork tips touch the ground, parking brake applied, direction lever in the NEUTRAL position, engine stopped and the wheels blocked.
- All repairs must be made by authorized personnel.
- Follow the recommended safety procedures.
- Use only the right tools for the job.

⚠ WARNING

DO NOT bypass any electrical switches on this lift truck.

⚠ WARNING

If during operation the lift truck becomes unsafe in any way, the matter must be reported immediately to the user's designated authority, and the lift truck must not be operated until it has been restored to a safe operating condition.

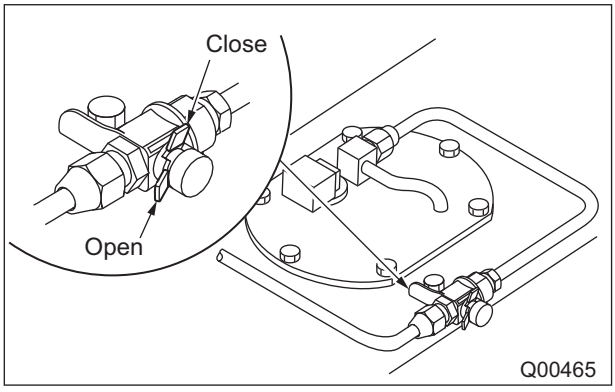
⚠ WARNING

BE SURE to perform inspections.

- If you fail to perform required inspections, it could lead to accidents.
- Operate the lift truck at a reduced speed when performing an operational inspection.
- If operated at higher speeds during an operational inspection, it could cause an accident if the lift truck is faulty.
- Dress properly for the job. DO NOT wear loose clothing or accessories—loose cuffs, dangling chains, neckties, scarves, or rings—that could catch in moving parts.
- Wear personal protective equipment appropriate for the conditions of your work places.

⚠ WARNING

The fuel shut off valve is located inside the engine hood. To avoid an accident, BE SURE to close this valve when performing maintenance.



WARNING

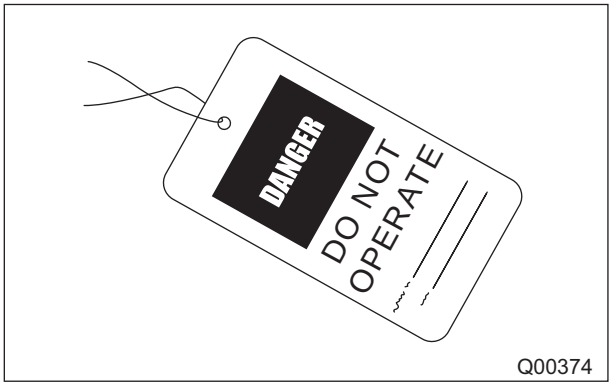
Lines, Tubes and Hoses

- Leaks could cause fires. Contact your authorized Cat lift truck dealer for repair or replacement.
- DO NOT bend or strike high pressure lines. Check lines, tubes and hoses carefully.
- DO NOT install bent or damaged lines, tubes or hoses.
- Repair loose or damaged fuel and oil lines, tubes or hoses.
- DO NOT use your bare hands to check for leaks, use a board or cardboard.
- Tighten connections to the recommended torque.
- Make sure all clamps, guards and heat shields are installed correctly to reduce the risk of vibration, rubbing against other parts, and excessive heat during operation.
- If any of the following is found on a part, change the part.
  - End fittings damaged or leaking.
  - Outer covering chafed or cut and wire reinforcing exposed.
  - Outer covering ballooning locally.
  - Evidence of kinked or crushed hose.
  - Metal embedded in the outer cover.
  - End fittings displaced.

♦ Inspection Precautions

⚠ WARNING

If the lift truck requires any repair, attach a "DO NOT OPERATE" or similar warning tag to the steering wheel or other controls, remove the key from the key switch, and contact your authorized Cat lift truck dealer.



⚠ WARNING

If it is necessary to make an inspection while the engine is running, ALWAYS USE TWO WORKERS—one, the operator, at the controls and the other checking within visual contact of the operator.

⚠ CAUTION

A daily (Pre-Start) inspection is the key to safety. At the beginning of each shift, check your lift truck to make sure it is in a safe operating condition. Always inspect your lift truck under the following conditions.

- Lift truck on level ground
- Mast in vertical position
- Fork tips on ground
- Engine stopped
- Control levers in neutral.
- Wheels blocked.

⚠ CAUTION

- Avoid mixing lubricants. In some cases, different brands of lubricants are not compatible with each other and deteriorate when mixes. It is best to stick with the same brand at successive service intervals.
- Before refilling, clean filler holes. After filling, clean up spills.

⚠ CAUTION

Consult your authorized Cat lift truck dealer for the proper disposal of wastes accumulated after replacement of tires, batteries, oils and fluids.

♦ Maintenance Schedule

As the operator, you are responsible for the performance of the daily Pre-Start inspection. You are also responsible for those items listed under Every 50 Service Hours or Weekly, Whichever Comes First to keep your lift truck in a proper working condition.
For questions regarding maintenance required at designated service intervals and periodic change of rubber parts, consult your authorized Cat lift truck dealer.

Periodic Inspection Time Intervals	- One month (30 days) or 200 service hours after delivery of a new truck, whichever comes first - Every 500 service hours or 3 months, whichever comes first - Every 1000 service hours or 6 months, whichever comes first - Every 2000 service hours or 1 year, whichever comes first

•Every 10 Service Hours or Daily (Pre-Start), Whichever Comes First

Item	Service	Page
Faulty Operation Found the Day Before	Check	11-10
Oil, Fuel or Coolant Leaks	Check	11-10
Oil Leaks and Damage of Piping	Check	11-10
Head Lamps and Working lamp (If Equipped)	Check	11-10
Load Backrest Extension, Lift Bracket	Check	11-11
Tilt and Lift Cylinder	Check oil leaks, damage	11-11
Tilt Cylinder Socket Bolts	Check	11-11
Overhead Guard	Check	11-12
Assist Grip	Check	11-12
Accelerator Pedal	Check	11-12
Brake Pedal	Check	11-13
Inching Pedal	Check	11-13
Brake Pump	Check oil leaks	11-13
Flow Regulator Valve	Check oil leaks	11-13
Parking Brake Switch	Check	11-14
Seat Belt	Check	11-15
Operator Seat	Check	11-15
Horn	Check	11-15
Steering Wheel and Column	Check movement	11-16
Fuel	Check	11-16
Stop Lamps	Check	11-16
Lamps of Instrument Panel	Check	11-16
Lift Chains	Check / Adjust	11-17
Engine (Exhaust, Noise and Vibration)	Check	11-18
Mast Strip Sliding Surfaces	Check	11-18
Rear View Mirror (If Equipped)	Check	11-19
Turn Signal Lamps (If Equipped)	Check	11-19
Back-up Lamps (If Equipped)	Check	11-19

Item	Service	Page
Engine Oil	Check oil level	11-19
Engine Coolant	Check coolant level	11-22
Hydraulic Oil	Check oil level	11-24
Powershift Transmission	Check	11-26
Service Brakes	Check	11-27
Brake Oil (Only for Wet Disc Brake)	Check oil level	11-28
Wheel Nuts	Check	11-29
Tires and Rims	Check	11-29
Mast and Forks	Check	11-30
Lift Cylinder Mounting Bolts	Check	11-32
Engine Cooling Fan	Check	11-32
**Battery	Check electrolyte level	11-32
Mast Interlock System	Check	11-33
Driving Interlock System	Check	11-34
Parking Brake Warning Buzzer	Check	11-35

**Not required if battery type is maintenance free.

•Every 50 Service Hours or Weekly, Whichever Comes First

Item	Service	Page
Fan & Alternator Drive Belt (Diesel)	Check / Adjust	11-36
Brake Hoses, Pipes and Joints	Check	11-37
Hydraulic Hoses, Pipes and Joints	Check	11-38

•One Month (30 days) or 200 Service Hours After Delivery of a New Truck, Whichever Comes First

Item	Service
Hydraulic Tank Return Oil Filter	Change return oil filter / Clean strainer
Engine Oil	Change engine oil and oil filter
Fuel Filter (Diesel)	Change
Bolts and Nuts (Frame & Chassis)	Check
Radiator Filler Cap	Check
Radiator Rubber Hose	Check Condition
Alternator	Check
Water Separator (Diesel)	Check
Fan & Alternator Drive Belt (Gasoline / LP-Gas)	Check
Electrical Wires	Check
Starter	Check
Cylinder Head Bolt & Manifold Nut	Check
Engine Idle Speed	Check
Intake & Exhaust Valve	Check Clearance
Injection Nozzle (Gasoline / LP-Gas)	Check
Tilt Socket Pins	Lubricate
Tie Rod Pins	Lubricate
Mast Support	Lubricate
King Pins	Lubricate
Tilt Cylinder	Lubricate
Lift Bracket Side Roller	Lubricate
Mast Strip Sliding Surface	Lubricate

•Every 500 Service Hours or 3 Months, Whichever Comes First

Item	Service
Lift Chains	Lubricate
Mast Strip Sliding Surfaces	Check for wear and cracks
Air Cleaner Element *	Clean / Inspect
Fan & Alternator Drive Belt (Gasoline / LP-Gas)	Check / Adjust
Engine Crankcase (Gasoline / LP-Gas)	Change oil
Differential	Check oil level
Powershift Transmission	Check oil level
Radiator Fin	Check / Clean
Electrical Wires	Check
Battery	Check specific gravity of electrolyte
Lift Cylinder & Mounting Bolts	Check
Lift Bracket Main Roller / Side Roller	Check
Chain Wheel / Anchor Bolt	Check
Load Backrest Extension	Check
Engine Idle Speed (Diesel)	Check
Spark Plug	Check gap
Fuel Hoses, Pipes and Joints	Check oil leaks and damage
Operating and Hydraulic System	Check control levers and movement of mast/forks
Lift & Tilt Cylinder	Check Functions
Maximum no-load speed, Engine hunting (Function of air governor)	Check
Brake System, Clutch and Driving Control System	Check
Fork Lowering Speed	Check
Steering Gear Box	Check
Bolts and Nuts (Frame & Chassis)	Check
Tilt Socket Pins	Lubricate
Tie Rod Pins	Lubricate
Mast Support	Lubricate
King Pins	Lubricate
Mounting Bush of Rear Axle	Lubricate
Tilt Cylinder	Lubricate
Lift Bracket Side Roller	Lubricate
Mast Strip Sliding Surface	Lubricate
Battery Terminal	Check
Engine Oil (Gasoline / LP-Gas)	Change Filter
Engine Oil (Diesel)	Change Oil and Filter

*In corrosive or abrasive environments more frequent inspect and clean is recommended.

•Every 500 Service Hours or 3 Months, Whichever Comes First, Continued

<table>
<tr><th>Item</th><th>Service</th></tr>
<tr><td colspan="2">For Diesel
The change intervals for engine oil and filter depend on the percentage of sulfur in the diesel fuel. Check the following:
<table>
<tr><th>Sulfur Percentage</th><th>Oil Grade Spec.</th><th>Change Interval</th></tr>
<tr><td>0 to 0.2%</td><td>CF or higher</td><td>500 hrs. or 3 months*</td></tr>
<tr><td>0.2 to 0.5%</td><td>CF or higher</td><td>300 hrs. or 3 months*</td></tr>
<tr><td>Over 0.5%</td><td>CF or higher</td><td>200 hrs. or 3 months*</td></tr>
</table>
* Whichever comes first
Whenever the engine oil is changed, the manufacturer recommends the filter be replaced at the same time with a genuine Cat lift truck oil filter.</td></tr>
<tr><td>Intake & Exhaust Valve</td><td>Check Clearance</td></tr>
<tr><td>Positive Crankcase Ventilation Values & Hoses</td><td>Check</td></tr>
<tr><td>Injection Nozzle (Gasoline / LP-Gas)</td><td>Check</td></tr>
<tr><td>Rear Wheel Bearing</td><td>Check</td></tr>
<tr><td>Exhaust Pipes, Muffler</td><td>Check</td></tr>
</table>

•Every 1000 Service Hours or 6 Months, Whichever Comes First

Item	Service
Powershift Transmission	Change oil / Wash strainer
Hydraulic System	Check and change return oil filter / Wash strainer
Differential	Change oil
Air Cleaner Element	Change
Fuel Filter (Diesel)	Change
Alternator	Check
Starter	Check
Last Chance Filter	Clean
Universal Joint	Lubrication
Water Separator (Diesel)	Check
Water Separator Element (Diesel)	Change

•Every 2000 Service Hours or 1 year, Whichever Comes First

Item	Service
Hydraulic Oil and Strainer	Change
Engine Coolant	Change
Fuel Filter (Gasoline / LP-Gas)	Change
Rubber Parts of Brake Booster	Change
Parking Brake Valve Relief Pressure	Check
Service Brake	Check
Radiator Filler Cap	Check
Radiator Rubber Hose	Check Condition
Injection Nozzle (Diesel)	Check
Hydraulic Control Valve	Check
Hydraulic Pump	Check
Front Axle	Check
Power Steering Cylinder	Check
Rear Axle	Check
T/M Gear & Bearing	Check
Inching Pedal	Adjust
Steer Knuckles	Check
Brake Drum & Shoes	Check
Engine Idle Speed (Gasoline / LP-Gas)	Check
Fuel Pump	Check
Lift Chain	Check Elongation
Chassis, Lift System, Indicator	Check
Control Valve Relief Pressure	Check
Hydraulic System (Hydraulic Motor, Cylinder, Safety Valve, Solenoid Valve)	Check
Engine Mounting	Check
Compression Pressure, Injection Pressure, etc.	Check
Electric System (Current, Voltage)	Check
Warning Lamps & Buzzers, Other Lamps and Indicators	Check
Tires, Rims and Wheel Bearing	Check
Steering Wheel Tilt Angle, Rod, Arm and Other Driving System	Check
Differential Installation Bolts	Check
Differential, Propeller Shaft and Axle Shaft	Check
Brake Friction Plate Wear (Only for Wet Disc Brake)	Check
Brake oil (Only for Wet Disc Brake)	Change
Brake Hydraulic Line Filter (Only for Wet Disc Brake)	Change

♦ Every 10 Service Hours or Daily (Pre-Start), Whichever Comes First

You must read and understand the warnings and instructions contained in this manual before performing any operation or maintenance procedure.

•Faulty Operation Found the Day Before

- Have repairs been made properly?
- Check the daily inspection sheet.

⚠ WARNING

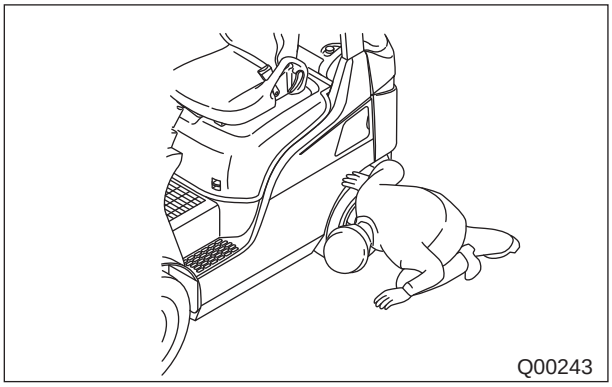
Fill out a daily inspection sheet.

Remember, the complete performance of a daily inspection is the best protection against injury and property damage.


Q00375

•Oil, Fuel or Coolant Leaks

- Check on the floor for oil, fuel or coolant leaks.


Q00243

•Oil, Leaks and Damage of Piping

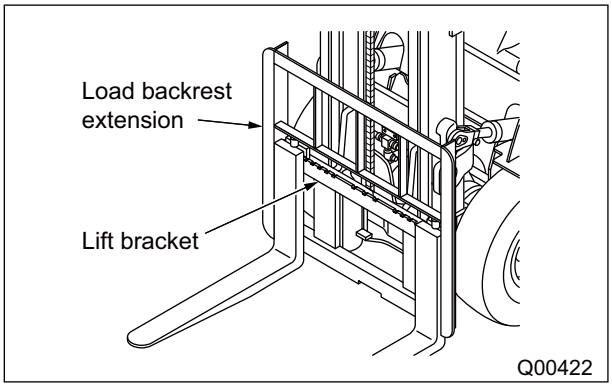
- Check on the floor for oil leaks.
- Inspect the piping for damage or cracks and also check that it is secure.

•Head Lamps and Working Lamp (If Equipped)

- Are all the lamps in a safe working condition?
- Are their lenses clean and not defective?
- Do the tail (if equipped) and head lamps come ON properly when you switch them on?

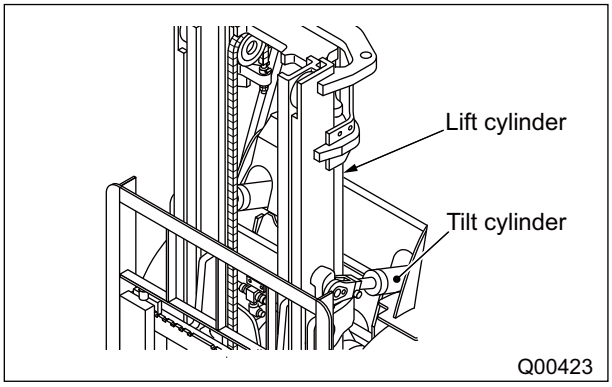
•Load Backrest Extension, Lift Bracket

- Are the load backrest extension and the lift bracket free of distortion, cracks and other defects?
- Shake the load backrest extension and the lift bracket to check for excessive rattle.



•Tilt and Lift Cylinder

- Check on the floor for oil leaks.
- Inspect the lift and tilt cylinder for damage.



•Tilt Cylinder Socket Bolts

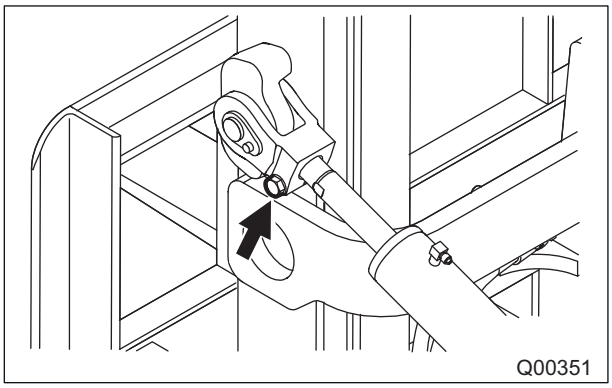
- Are the bolts tightened properly? Use a wrench.

Tightening torque for the bolt

Unit: N·m (kgf·m) [lbf·ft]

262 ± 13 (26.7 ± 1.3) [193.4 ± 9.6]

Note:
After retightening the bolt, put a mark across the bolt and tilt cylinder socket. This helps you to easily notice loosening of the bolt.



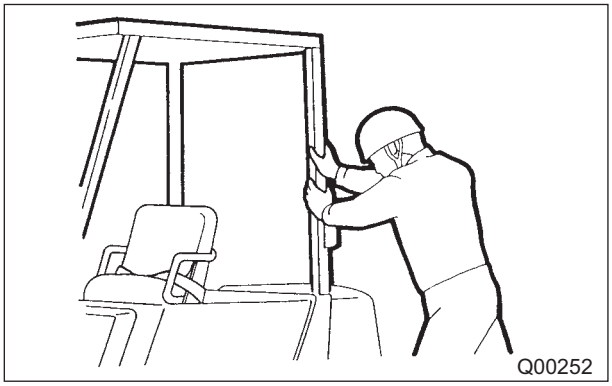
•Overhead Guard

- Check the front and rear overhead guard mounting bolts on each side.

Tightening torque for the bolt

Unit: N·m (kgf·m) [lbf·ft]

89.8 to 134.6 (9.2 to 13.7) [66.5 to 99.0]



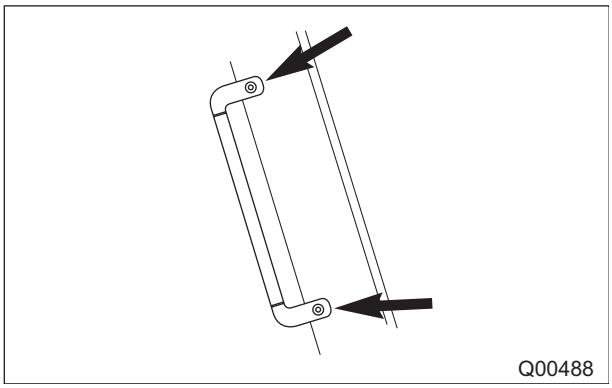
- Inspect overhead guard for bent or cracked sections.

Note:

Contact your authorized Cat lift truck dealer if repairs are needed.

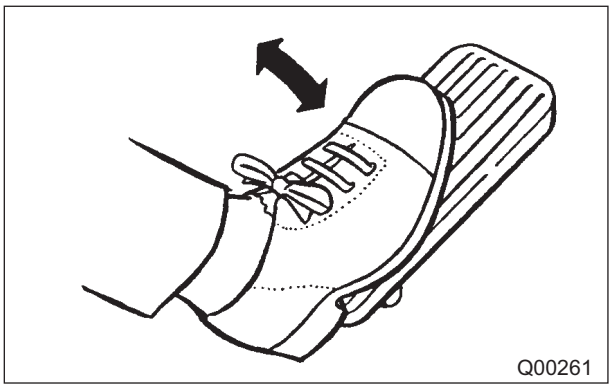
•Assist Grip

- Inspect the assist grip for damage or cracks, and also check that it is secure. Tighten the screws of the assist grip if necessary.
- Contact your authorized Cat lift truck dealer if repairs are needed.



•Accelerator Pedal

- Can you press the accelerator pedal smoothly without any sign of rubbing?
- Does the accelerator pedal return to the full, upward position?



•Brake Pedal

- Do you have sufficient pedal travel?
- Is the free play correct?
- Does the brake pedal return to the full, upward position?

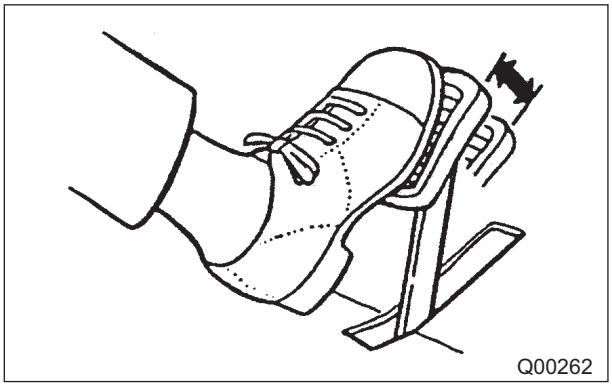
Free play

Unit: mm (in.)

6 (0.23)

•Inching Pedal

- Is the free play correct?
- Does the inching pedal return to the full, upward position?



Correct free play

Unit: mm (in.)

3 to 6 (0.1 to 0.2)

•Brake Pump

- Check on the floor for oil leaks.

•Flow Regulator Valve

- Check on the floor for oil leaks.

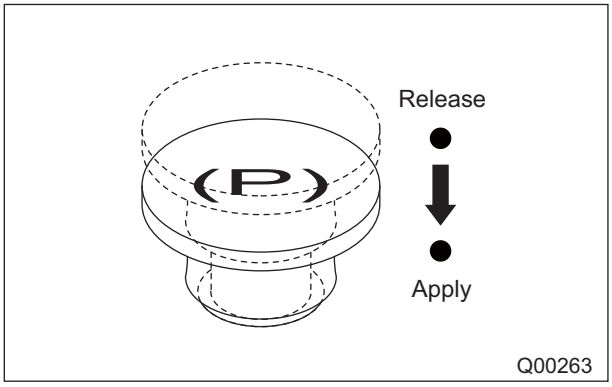
•Parking Brake Switch

Parking brake valve (For use with wet disc brake option)

Check the wire damage of the parking brake valve.

Parking brake switch

- Can you push the parking brake switch to the applied position?
- Can you hold your lift truck on a grade by pushing the parking brake switch?



Inspection on parking braking force

Be sure to conduct this inspection on level ground. Make sure that no persons or obstacles are around the lift truck and you have a sufficient space available for the lift truck to move backward.

Inspection procedure

1. Properly sit on the operator seat, and fasten the seat belt.
2. Make sure that the parking brake is applied.
3. Fully press the brake pedal with your left foot. Do not press the inching pedal.
4. Place the direction lever into the REVERSE position.
5. Make sure that no one or no vehicle is behind the lift truck. Fully press the accelerator pedal with your right foot, and hold this position.
6. Gradually release the brake pedal and check the speedometer display on the instrument panel. If the velocity indicates more than 2 km/h (1.2 mph), RELEASE THE ACCELERATOR PEDAL AND PRESS THE BRAKE PEDAL IMMEDIATELY.
   If the velocity is less than 2 km/h (1.2 mph), count two seconds with the brake pedal being released, and then release the accelerator pedal.
7. Fully press the brake pedal, and then place the direction lever into the NEUTRAL position.

How to determine the parking brake force

- If the speedometer display on the instrument panel indicates 0 or 1 km/h (0 or 0.6 mph), the parking brake force is in good condition.
- If the speedometer display on the instrument panel indicates more than 2 km/h (1.2 mph), the parking brake force could have weakened.

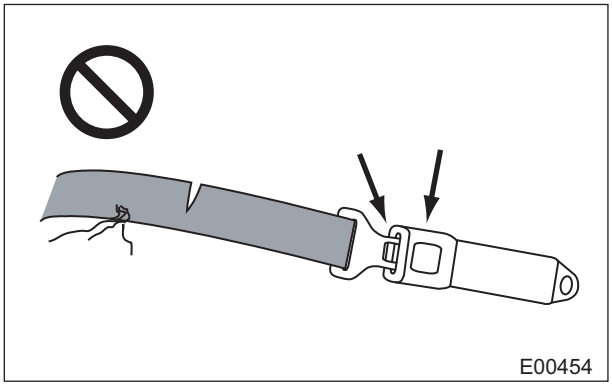
Note;

Contact your authorized Cat lift truck dealer for detailed inspection. Parking brake overhaul may be necessary if the parking brake is in poor condition.

•Seat Belt

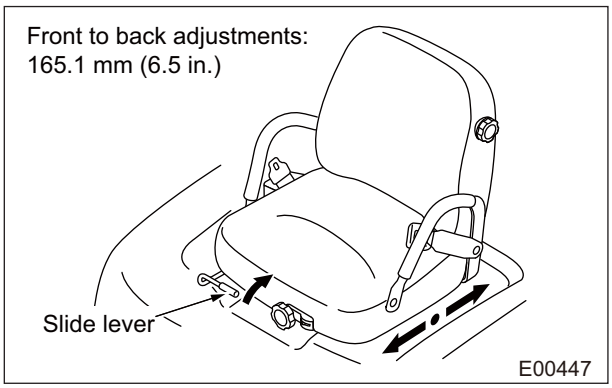
The following maintenance guidelines detail how to inspect seat belt for "cuts, fraying, extreme or unusual wear of the webbing, etc., and damage to the buckle, retractor, hardware, or other factors", which indicate that belt change is necessary.

- Cuts, fraying, or excessive wear on the webbing would indicate the need for change of the seat belt system.
- Check buckle and latch for proper operation and to determine if latch plate is worn, deformed, or buckle is damaged or casing broken.
- Check the retractor web storage device operation to make sure that it locks properly and that it spools out and retracts webbing properly.



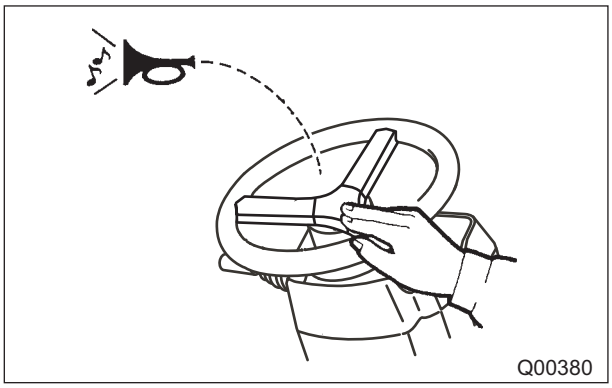
•Operator Seat

- Check that the operator seat is securely locked into place by adjusting the operator seat with the slide lever.
- Make sure that there is no looseness with the operator seat.



•Horn

- Does the horn activate properly when you push the horn switch?



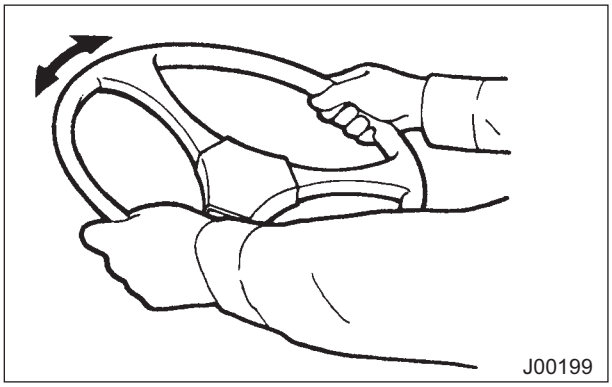
•Steering Wheel and Column

- Does the steering wheel have a free play of 15 to 30 mm (0.6 to 1.2 in.)?

Check the play at the rim of the wheel by rotating the wheel in both directions.

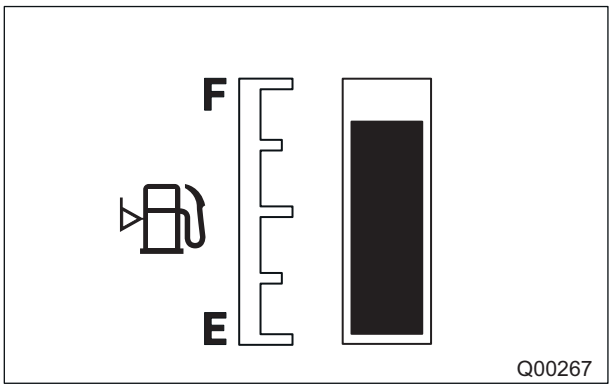
- Is the steering wheel loose?

Shake the steering wheel up and down.



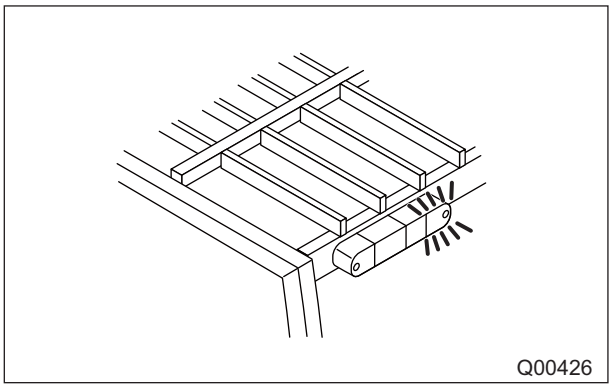
•Fuel

- Is the amount of fuel in the tank enough for the day's work?
- Is the filler cap installed and secured?



•Stop Lamps

- Do all the stop lamps come ON properly when you press the brake pedal?

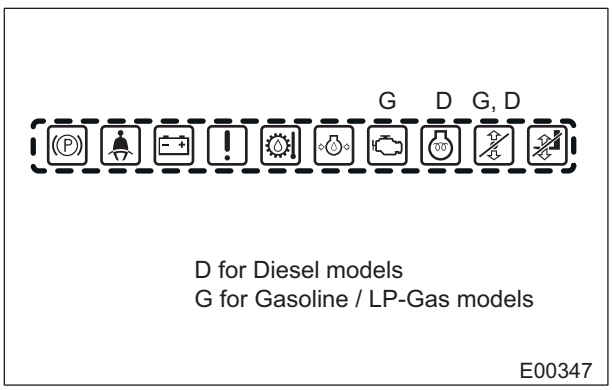


•Lamps of Instrument Panel

- Do all the warning lamps and indicator lamps glow when the key switch is in the | (ON) position? (Except warning lamps with G and D.)

Note:

- When these lamps do not glow with the key switch in the | (ON) position, LED (Light-Emitting Diode) may have a defect.
- Contact your authorized Cat lift truck dealer for repairs.



•Lift Chains

Check and Adjust

⚠ WARNING

- Check the lift chains periodically and determine if they are still in usable condition.
- Check the lift chains for wear, cracks and worn or seized link pins. Improper maintenance of the lift chains could cause accidents.
- If something is wrong with the chains, consult your authorized Cat lift truck dealer for repair or replacement.
- DO NOT put your foot under the forks.
- Stop the engine before inspecting the chains.
- DO NOT lean over from the lift truck to perform inspections. It could cause accidents.

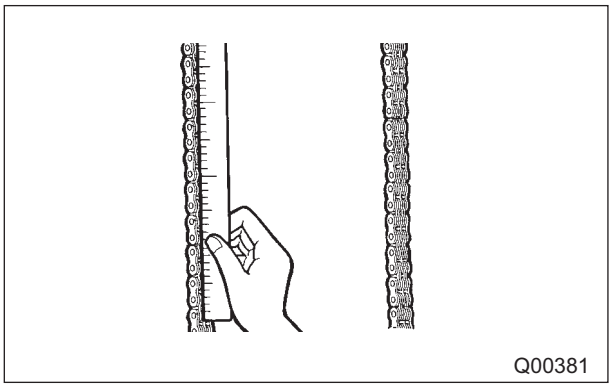
How to check

1. Check the lift chains for wear. Use the following chart to determine if it is still in usable condition.

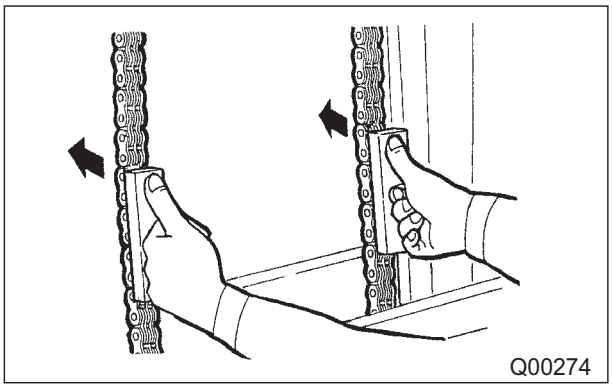
Lift chain elongation limit (/20 links)

Unit: mm (in.) / 20 links

4 to 4.5 ton models	518 (20.4)
5 to 5.5 ton models	648 (25.5)



2. Lift the forks high enough to put their full weight on the top carriage bar and chains.
3. Make sure the lift chains have equal tension.
4. If the chains are loose or the tension is not equal, adjust the chain tension.



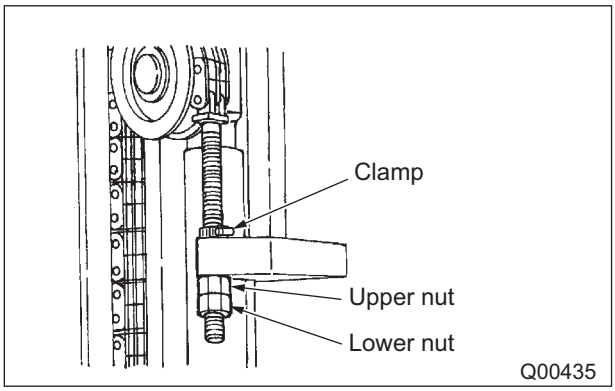
How to adjust

1. Loosen the lower nut and the clamp.
2. Turn the upper nut to adjust tension.
3. Hold the upper nut and tighten the clamp.
4. Hold the upper nut and tighten the lower nut to torque.

Tightening torque

Unit: N·m (kgf·m) [lbf·ft]

4 ton model	147^{+49}_{0} (15^{+5}_{0}) [108^{+36}_{0}]
4.5 to 5.5 ton model	176^{+49}_{0} (18^{+5}_{0}) [130^{+36}_{0}]



•Engine (Exhaust, Noise and Vibration)

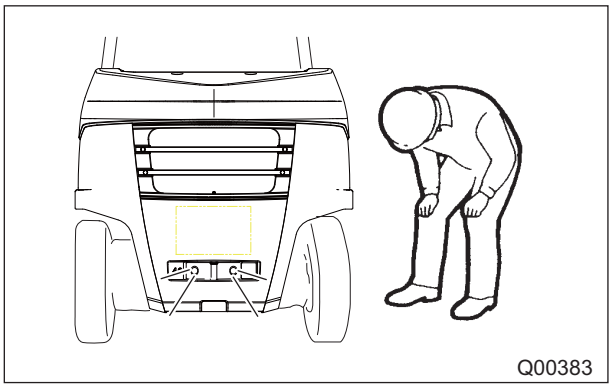
WARNING

Exhaust fumes could kill you!

If it is necessary to start the engine in an enclosed area, make sure there is adequate ventilation.

Fire hazards!

- Fire hazards!
  Clean up spillage of fuel, oil, or other flammable materials in the engine compartment.
- Know the location of all emergency devices (such as fire extinguisher, first aid kit, etc.) and how to use them.

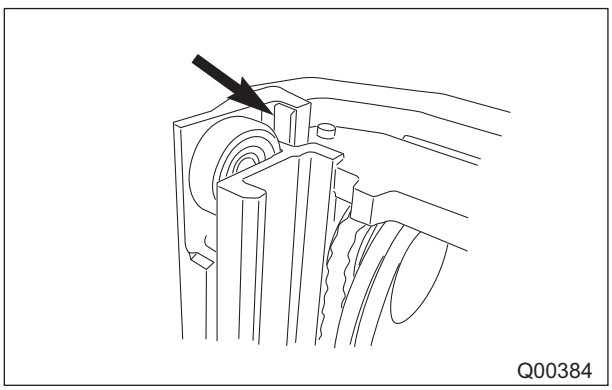


- Is exhaust smoke normal?
- Listen for abnormal noise or excessive vibration.

•Mast Strip Sliding Surfaces

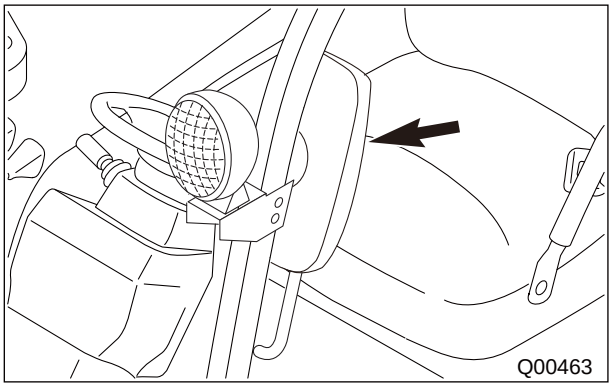
Inspect the mast strip sliding surfaces for wear and cracks.

- Do the mast and rollers move smoothly? If not, lubricate on each side of the inner mast.



•Rear View Mirror (If Equipped)

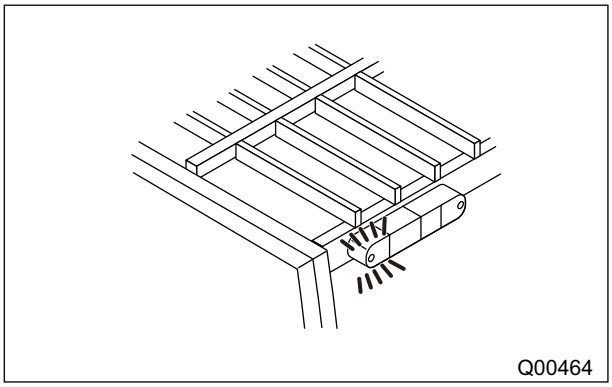
- Inspect the rear view mirror for damage or cracks and also check that it is firmly secured.



•Turn Signal Lamp (If Equipped)

Place the turn signal switch into left or right turn position, and check the following.

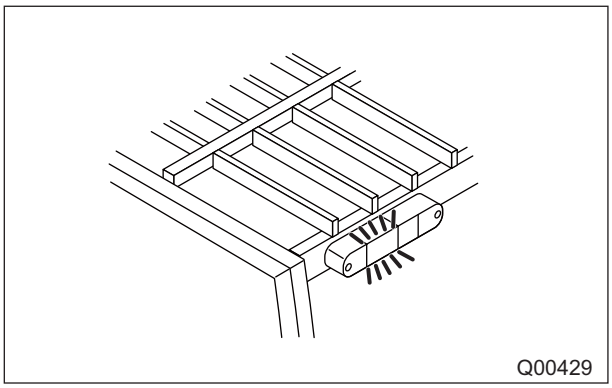
- Do the turn signal lamps come ON?



•Back-up Lamps (If Equipped)

Place the direction lever into REVERSE position, and check the following:

- Do the back-up lamps turn ON?
- Does the back-up alarm activate? (If equipped)



•Engine Oil

Check Oil Level

⚠ WARNING

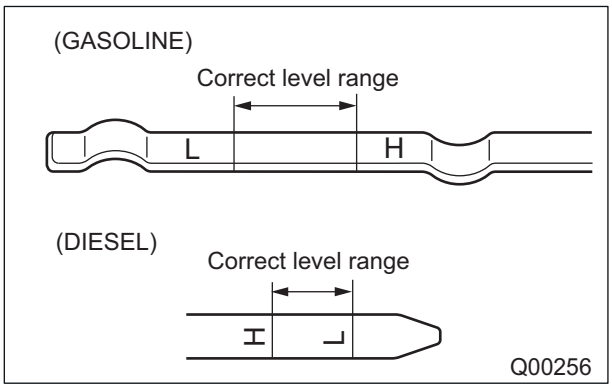
Hot oil and components could cause injury. DO NOT allow hot oil or components to contact your skin.

Preparation

1. Park the lift truck on level ground.
2. Lower the forks until the fork tips touch the ground.
3. Apply the parking brake.
4. Place the direction lever in the NEUTRAL position.
5. Stop the engine.
6. Block the wheels.
7. Cool down the engine.

How to check oil level

1. Raise the engine hood.
2. Remove the dip stick and wipe it clean, then re-insert it.
3. Maintain the correct level range on the dip stick.
4. Close and secure the hood.



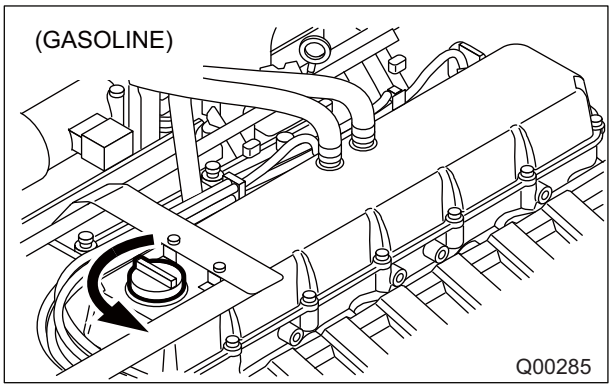
How to add engine oil

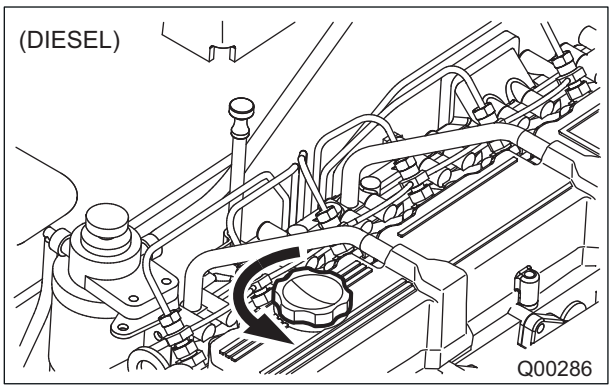
⚠ WARNING

When adding engine oil:

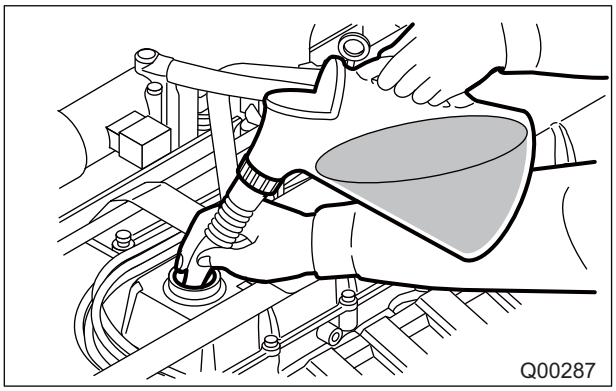
- Perform the work on level ground.
- Clean the filler hole to prevent dirt from dropping into the engine.
- DO NOT overfill.
- Clean up spillage.

1. Remove the oil filler cap.





2. Add engine oil as required.
   For engine oil, see the topic, "Recommended Fuels and Oils."
3. After adding oil, make sure the level is in the correct range on the dip stick.
4. Close and tighten the filler cap.



•Engine Coolant

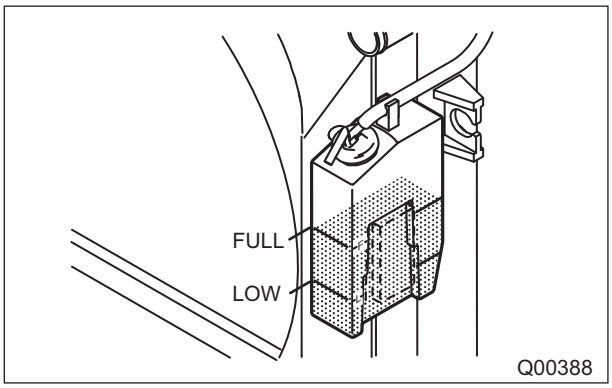
Check Coolant Level

Preparation

1. Park the lift truck on level ground.
2. Lower the forks until the fork tips touch the ground.
3. Apply the parking brake.
4. Place the direction lever in the NEUTRAL position.
5. Stop the engine.
6. Block the wheels.

How to check coolant level

1. Raise the engine hood.
2. Maintain the coolant level between the F (FULL) and L (LOW) marks on the reserve tank.
3. Close and secure the hood.



Add Coolant

⚠ WARNING

Keep fire away from undiluted antifreeze as it is FLAMMABLE.

⚠ CAUTION

- DO NOT add water only. This dilutes the antifreeze/summer coolant protection and adversely affects the engine. BE SURE to premix antifreeze/summer coolant (ASC) with tap water (soft water).
- If coolant has to be added frequently, have your authorized Cat lift truck dealer check the cooling system.

⚠ CAUTION

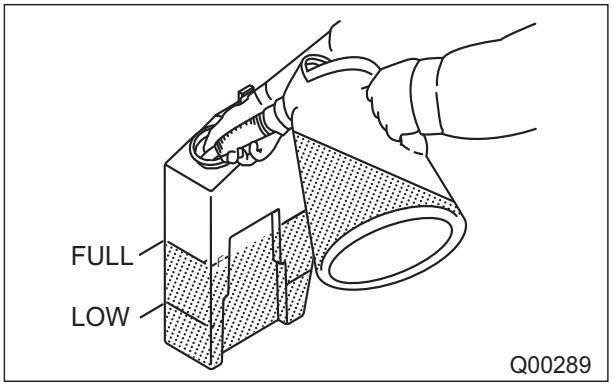
- Recommended concentration range of ASC is 30% to 60% by volume.
- ASC of less than 30% concentration does not provide sufficient corrosion protection.
- Concentrations over 60% adversely affect freeze protection and heat transfer rates.
- Avoid mixing different brands of coolant.
- Select an ASC suitable for use in engines using aluminum alloy parts.
- Select an ASC which contains silicate of less than 0.2% by weight.

How to add coolant

1. Remove the reserve tank cap and add coolant to the FULL mark.
2. When adding coolant, maintain the same concentration of antifreeze solution.

Note:

The engine cooling system is protected to -30°C (-22°F) with 50% concentration of antifreeze/summer coolant (ASC) when shipped from the manufacturer.



⚠ WARNING

Antifreeze solution is TOXIC. In case of contact with your skin, FLUSH IMMEDIATELY WITH WATER. Have your authorized Cat lift truck dealer discard antifreeze solution drained from the engine.

•Hydraulic Oil
Check Oil Level

⚠ WARNING

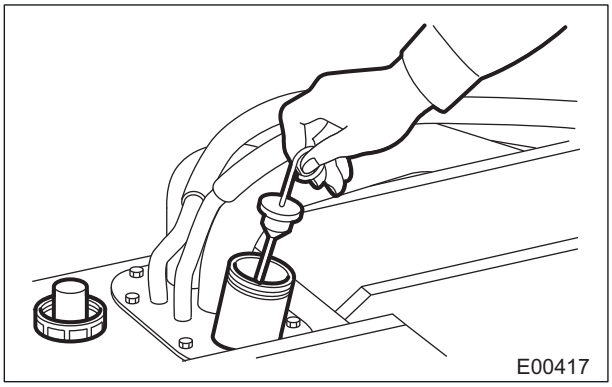
- Hot oil and components could cause personal injury. DO NOT allow hot oil or components to contact your skin.
- Remove the hydraulic tank filler cap only after the engine has been stopped and the cap is cool enough to remove with your bare hand.
- Remove the hydraulic tank filler cap slowly to relieve pressure.

Preparation

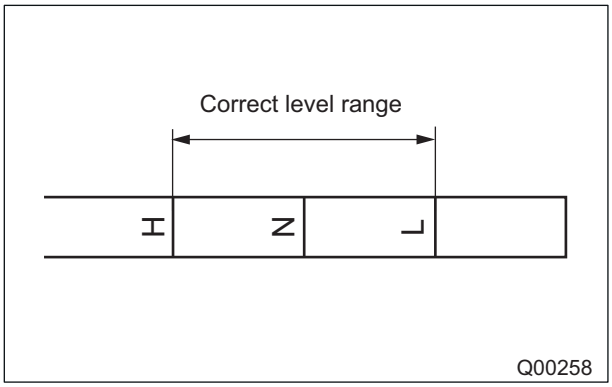
1. Operate the lift truck for a few minutes to warm the oil.
2. Park the lift truck on level ground.
3. Lower the forks until the fork tips touch the ground.
4. Tilt the mast back.
5. Apply the parking brake.
6. Place the direction lever in the NEUTRAL position.

How to check oil level

1. Remove the hydraulic tank filler cap by turning it counterclockwise.
2. Add oil needed to raise it to the correct level range on the dip stick.



3. Put the hydraulic tank filler cap back on.
4. Check for oil leaks.
5. Close and secure the engine hood.



Add Hydraulic Oil

⚠ CAUTION

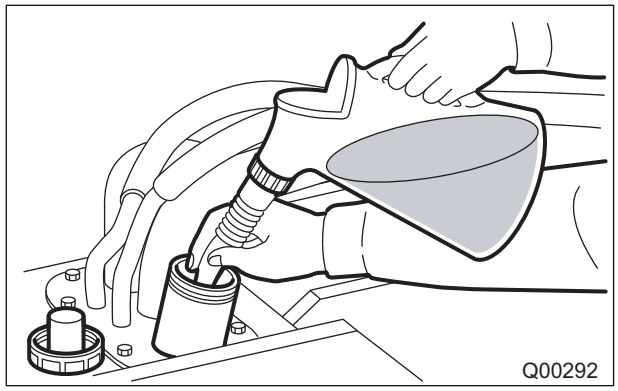
The followings are the safety precautions when adding hydraulic oil.

- Perform the work on level ground.
- Clean the filler hole to reduce the risk of dirt from dropping into the tank.
- DO NOT overfill.
- Clean up spillage.

How to add hydraulic oil

1. Remove the hydraulic tank filler cap.
2. Add oil to the hydraulic tank.

For hydraulic oil, see the topic, "Recommended Fuel and Oils."



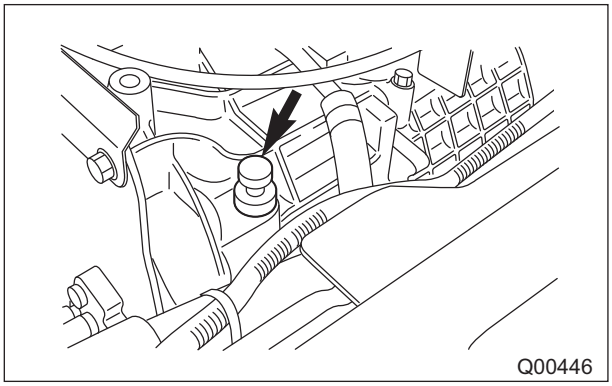
•Powershift Transmission

Check Oil Level

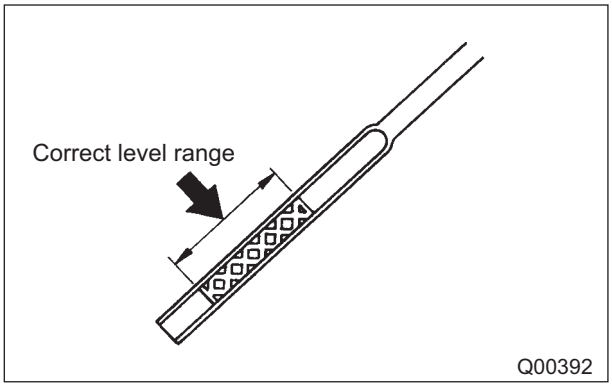
⚠ WARNING

- Hot oil and components could cause injury.
- DO NOT allow hot oil or components to contact your skin.

1. Operate the lift truck for a few minutes to warm the oil.
2. Park the lift truck on level ground with the forks lowered until the fork tips touch the floor, parking brake applied, direction lever in the neutral position, engine stopped and the wheels blocked.
3. Remove the floor plate.
4. Remove dip stick Check the oil level



5. Maintain the correct level range indicated on the dip stick.



•Service Brakes

Check Fluid Level

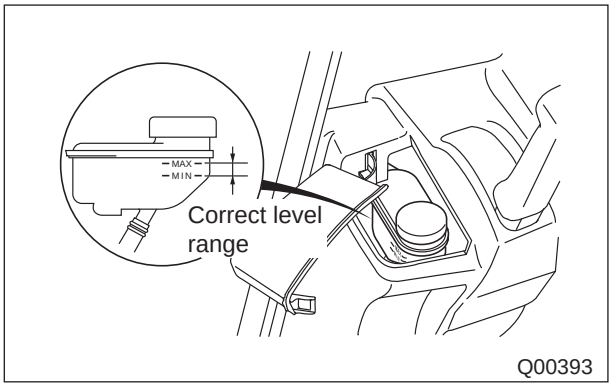
⚠ WARNING

If the brake fluid in the reserve tank decreases rapidly, the brake system is leaking. Have your authorized Cat Lift truck dealer check the system.

⚠ CAUTION

Before refilling the reserve tanks, clean the ports to reduce the risk of dirt from getting inside the reserve tanks.

1. Park the lift truck on level ground with the forks lowered until the fork tips touch the floor, parking brake applied, direction lever in the neutral position, engine stopped and the wheels blocked.
2. Open the cover.
3. Check the brake fluid level at the reserve tank.
4. Maintain the brake fluid level between the MAX and MIN marks on the reserve tank.
5. Close the cover.



•Brake Oil

Check Oil Level (For use with wet disc brake option)

⚠ WARNING

If the brake oil in the brake oil tank decreases rapidly, the brake system is leaking. Remove the lift truck from service and have your authorized Cat lift truck dealer check the system.

⚠ CAUTION

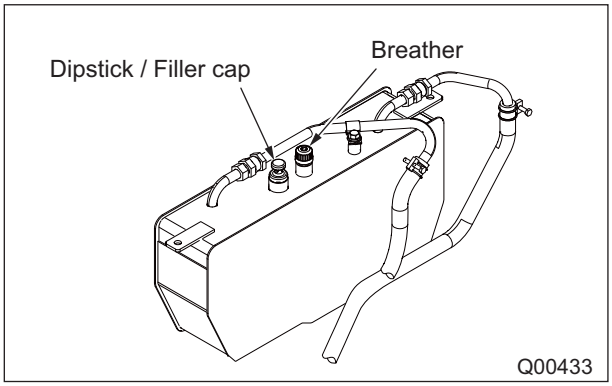
Before refilling the brake oil tank, clean the ports to reduce the risk of dirt from getting inside the brake oil tank.

Preparation

1. Park the lift truck on level ground.
2. Lower the forks until the fork tips touch the ground.
3. Apply the parking brake.
4. Place the direction lever in the NEUTRAL position.
5. Stop the engine.
6. Block the wheels.

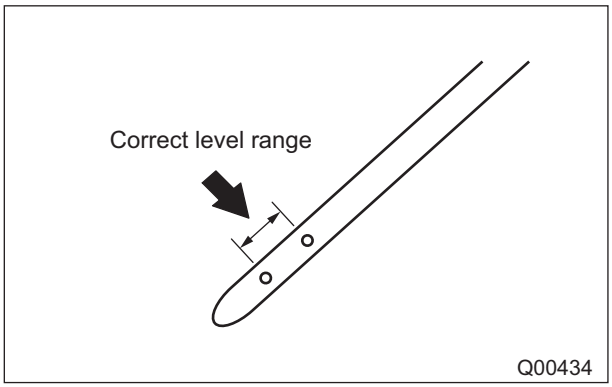
How to check oil level

1. Pull the handle upward and open the cover.
2. Check the brake oil level at the brake oil tank.
3. Maintain the correct level range on the dipstick.
4. Clean the breather to prevent it from clogging.
5. Close the cover.



How to add brake oil

1. Remove the dipstick / filler cap.
2. Add brake oil to the brake oil tank.
3. Put the dipstick / filler cap back on.



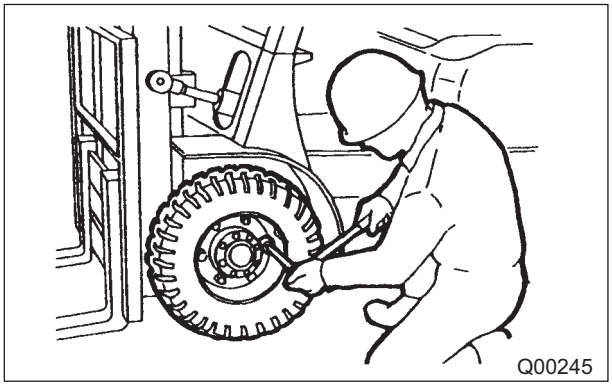
•Wheel Nuts

Check–Tighten When Required

Wheel nuts should be visually inspected everyday. Any loose nuts should be tightened and any missing or damaged nuts should be changed.

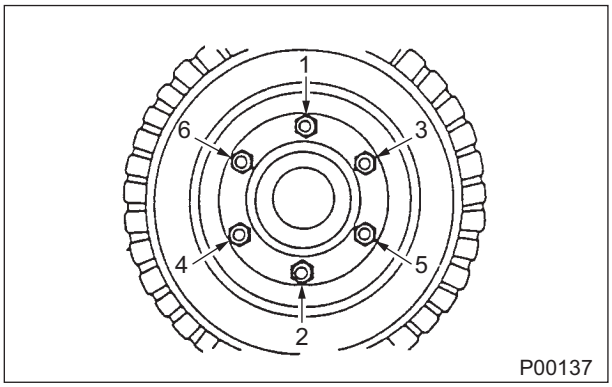
- Are the wheel nuts tightened properly?

Use a torque wrench.


Q00245

How to retighten

1. Stand behind the tread of the tire, NOT in front of the rim.
2. Tighten the nuts evenly and in a diagonal sequence to the specified torque.



P00137

Tightening torques for wheel nuts

Unit: N·m (kgf·m) [lbf·ft]

Front	600 ± 60 (61 ± 6) [443 ± 44.3]
Rear	377.3 (38) [278]

•Tires and Rims

Check

⚠ WARNING

- Make sure the replacement tire is of the same size, type and load range. See manufacturer name plate located on the front of the lift truck for correct tire size.
- When changing tires, change them in sets, even if only one of the tires is damaged. If new and used tires are used on the same axle, tilting of the mast and rapid tire wear will result.
- Use only tires recommended by the manufacturer.

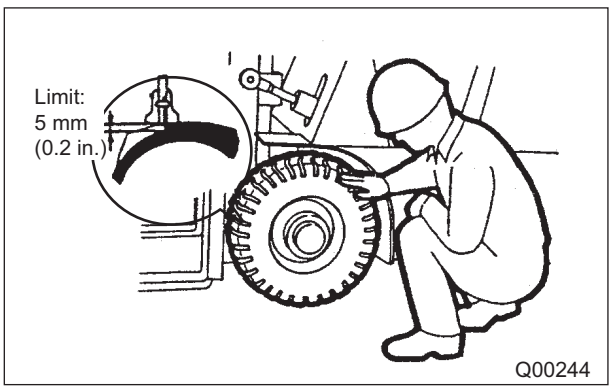
⚠ CAUTION

The lift truck tires are highly inflated. Even slight damage to the tire or rim may cause a blowout of the tire.

How to check

- Are all the tires free of cuts, gouges or foreign objects?
- Are all the rims free of distortion or cracks?
- Is the tread groove depth more than 5 mm (0.2 in.) when checked with a tire depth gauge?

If not, change the tire.

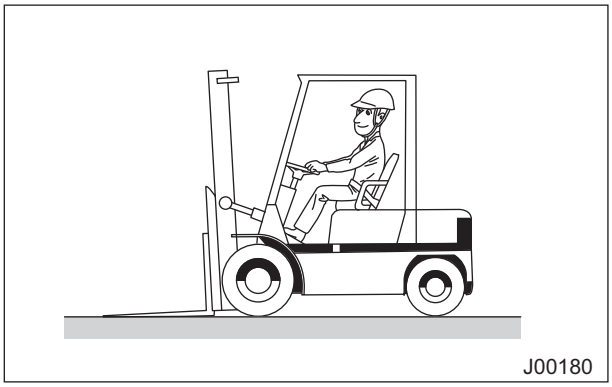


Q00244

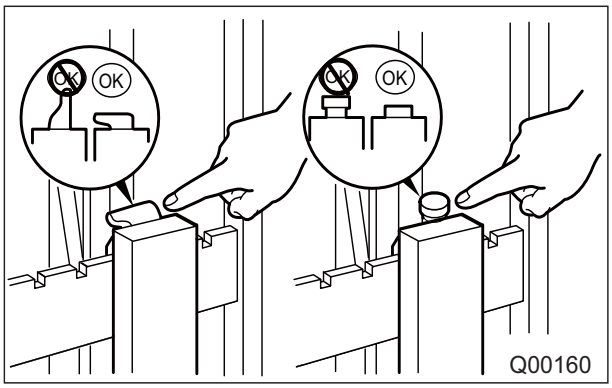
•Mast and Forks

Check

- Does the mast move completely up and down smoothly when you operate the lift lever?
- Does the mast tilt forward and back smoothly when you operate the tilt lever?
- Are there any oil leaks from the cylinders and hydraulic lines?



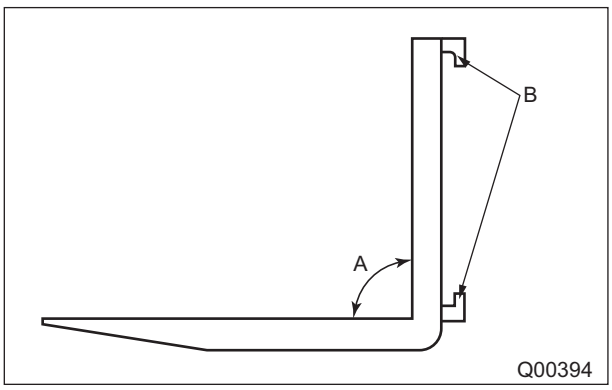
- Is the fork locking pin properly engaged?
- Are the forks free of distortion and cracks?
- Are the welds of the hangers free of cracks?



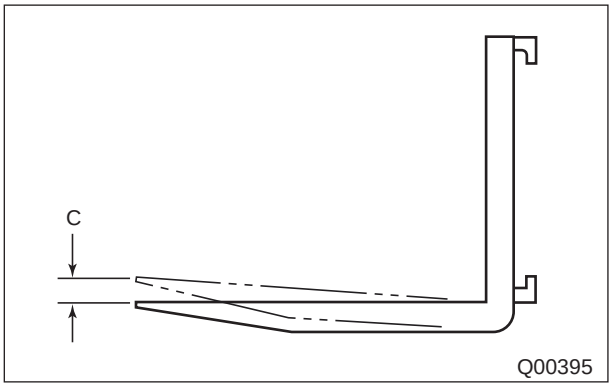
If the lift truck is used to carry maximum capacity loads, the forks should be checked daily.

1. Carefully inspect the forks for cracks. Special attention should be given to the heel section A, all weld areas and mounting brackets B.

Note:
Do not use cracked forks. "Wet Test" magnetic particle inspection is generally recommended due to its sensitivity and the ease of interpreting the results. Portable equipment is usually recommended so it can be easily moved to the lift truck. Contact your authorized Cat lift truck dealer for further information.

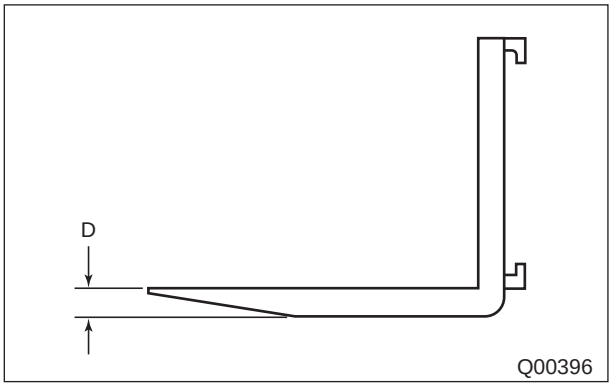


2. Check the difference in height of one fork tip to the other when mounted on the lift bracket. Also check each fork for its deviation by setting a straight fork length pole against the fork to measure a difference in height between the fork tip and pole.



Note:
A difference in fork tip height could result in uneven support of the load and cause problems when entering loads. The maximum allowable difference in fork tip elevation C is 5 mm (0.2 in.) for pallet forks. Replace one or both forks when the difference in fork tip height exceeds the maximum allowable difference.

3. Check the fork blade D.



Note:
Do not use the forks if the thickness is reduced to less than the tolerant thickness. Fork blade length may also be reduced by wear, especially on tapered forks and platens. Do not use the forks when the blade length is no longer adequate for the intended loads.

Unit: mm (in.)

Tolerant Thickness	Standard	Limit
4 ton model	50 (2.0)	45 (1.7)
4.5 ton model	50 (2.0)	45 (1.7)
5 ton compact to 5.5 ton models	60 (2.4)	54 (2.1)

•Lift Cylinder Mounting Bolts

Check

- Check for looseness.

•Engine Cooling Fan

Check

- Check for damage and rotation.

•Battery

Check Electrolyte Level

⚠ WARNING

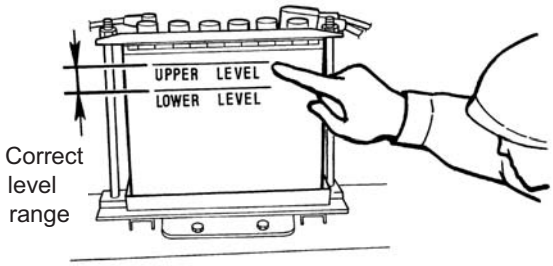
- If acid contacts your skin or clothes which could cause burns, FLUSH THEM IMMEDIATELY WITH LARGE AMOUNTS OF WATER.
- If acid gets in your eyes by accident, FLUSH THEM IMMEDIATELY WITH LARGE AMOUNTS OF WATER AND SEE A DOCTOR.
- If you drink acid by accident, DRINK LARGE AMOUNTS OF WATER AND SEE A DOCTOR AT ONCE.

⚠ WARNING

- To disconnect battery terminals, negative terminal (-) must be removed first.
- To connect battery terminals, negative terminal (-) must be installed last in reverse sequence from the disconnection.

How to check electrolyte level

1. If the electrolyte level is low, remove the filler caps and add distilled water to the cells. Before removing the caps, clean the top of the battery.
2. After adding the distilled water, tighten the caps securely.



•Mast Interlock System (MC Model)

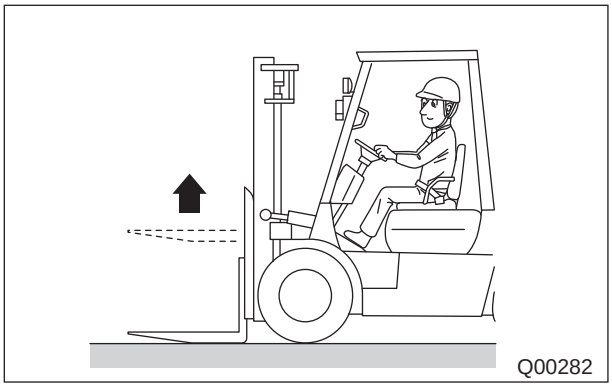
Check

⚠ CAUTION

- Make sure that the area is clear of pedestrians and obstacles when checking the mast and driving interlock systems.
- Make sure that sufficient space is available for the lift truck to move around and that no persons or obstacles are around the lift truck.

1. Raise the forks high enough to see them from the operator seat.
2. Apply the parking brake.
3. Place the direction lever to the NEUTRAL position.
4. Run the engine idling (not pressing the accelerator pedal).
5. Half rise from the operator seat.
6. Check the following after 2 seconds:

- Check that the mast interlock indicator lamp is blinking in 2 seconds.
- Operate the lift lever and check that the forks do not move up and down.
- Operate the tilt lever and check that the mast does not tilt forward or backward.



Note:

The mast interlock will work only for the lift and tilt levers. Attachments can be moved regardless of whether the mast interlock function is operating or not. Therefore, when the attachment lever is operated, some of the attachments will move, even though the engine is not running or the key switch is in the ○ (OFF) position, as a result of the handling load or of its own weight.

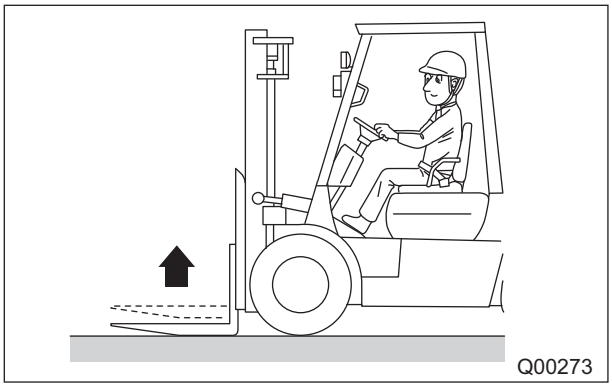
•Driving Interlock System
Check

⚠ CAUTION

- Make sure that the area is clear of pedestrians and obstacles when checking the mast and driving interlock systems.
- Check this system on level, hard ground.
- To ensure the lift truck does not begin rolling, DO NOT park the lift truck on a grade.
- Make sure that the sufficient space is available for the lift truck to move around and that no persons or obstacles are around the lift truck.

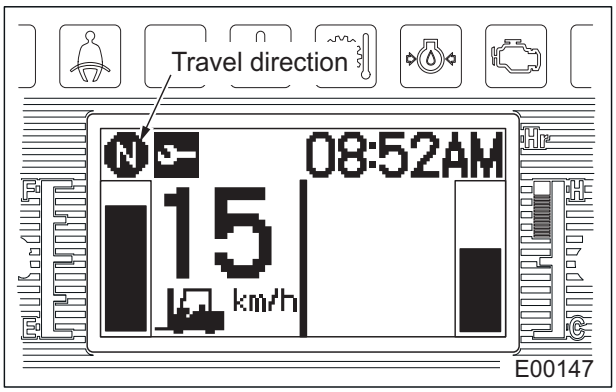
How to check

1. Slightly raise the forks from the floor or ground.
2. Run the engine idling (not pressing on the accelerator pedal).
3. Place the direction lever to the FORWARD or REVERSE position.
4. Half rise from the operator seat.
5. Check the following after 2 seconds:



- Does the symbol "N" blink on the LCD screen of the instrument panel?

Note:
The transmission should electrically shift into neutral with the driving interlock indicator lamp blinking. If you are on a grade, the lift truck will continue to roll because the transmission is in neutral. Therefore an operator must always apply the parking brake before leaving the lift truck when stopped on level ground or a grade.



How to restore

1. Sit properly in the operator seat and press the brake pedal to hold the lift truck.
2. Return the direction lever to the NEUTRAL position, then place the lever to the FORWARD or REVERSE position.

How to restore (with wet disc brake)

1. Push the parking brake switch to the applied position once and then pull the switch to release.

•Parking Brake Warning Buzzer Check

⚠ CAUTION

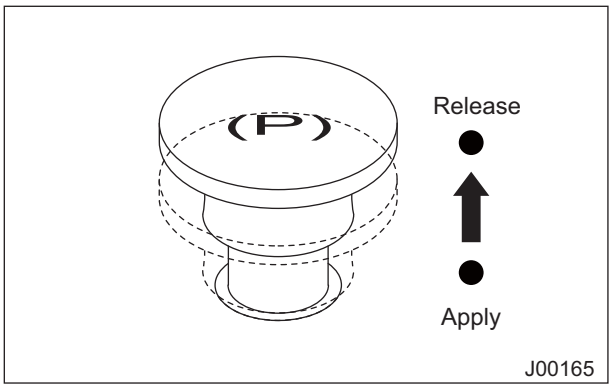
Check this system on level and hard ground. Make sure no one is around the lift truck.

Preparation

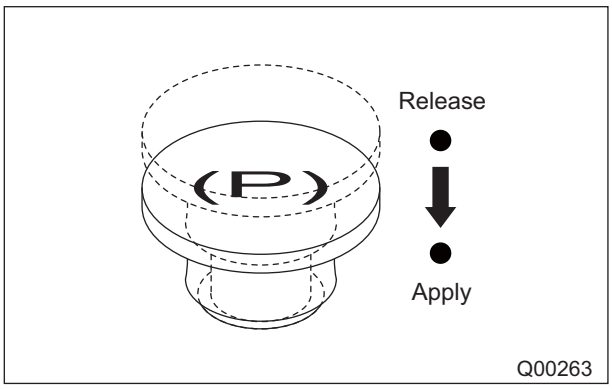
1. Park the lift truck on level ground.
2. Lower the forks until the fork tips touch the ground.
3. Apply the parking brake.
4. Place the direction lever in the NEUTRAL position.
5. Stop the engine.
6. Block the wheels.
7. Remove the key.

How to check

1. Release the parking brake and half rise from the operator seat.
2. After 2 seconds, check that the warning buzzer will activate with the warning lamp blinking.



3. Apply the parking brake.



♦ Every 50 Service Hours or Weekly, Whichever Comes First

You must read and understand the warnings and instructions contained in this manual before performing any operation or maintenance procedure.

•Fan & Alternator Drive Belt (Diesel)
Check and Adjust

⚠ CAUTION

- If the belt is too tight unnecessary stresses are placed on the alternator bearing and belt.
- Such stresses will shorten the service life of both.
- Keep the belt free of oil and grease to prevent slipping.

Preparation

1. Park the lift truck on level ground.
2. Lower the forks until the fork tips touch the ground.
3. Apply the parking brake.
4. Place the direction lever in the NEUTRAL position.
5. Stop the engine.
6. Block the wheels.

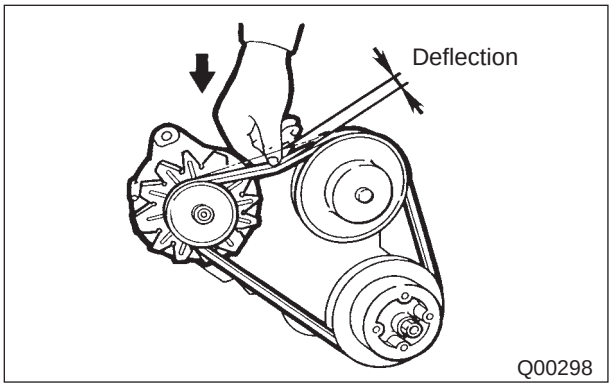
Note:
If it is difficult to adjust or change the belts, consult your authorized Cat lift truck dealer.

How to check

1. Raise the engine hood.
2. Push the belt downward with about 98 N (10 kgf) [22 lbf] pressure midway between the pulleys as shown.

Unit: mm (in.)

Deflection	11 to 13 (0.4 to 0.5)

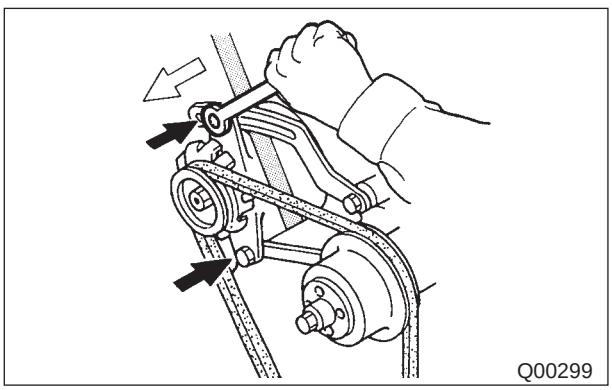


Adjust

If the deflection is out of range, readjust the belt. Also, check the belt to make sure that it is not worn, frayed, or has separated piles.

How to adjust

1. Loosen the alternator bracket bolts (indicated by the black arrows), and move the alternator out or in.
2. Close and secure the engine hood.



•Brake Hoses, Pipes and Joints
Check

- Hoses, pipes and joints should be checked for damage, cracks and brake fluid leaks.

•Hydraulic Hoses, Pipes and Joints
Check

- Hoses, pipes and joints should be checked for damage, cracks and hydraulic oil leaks.

♦ Parts to Be Changed Periodically

The following parts must be periodically changed as noted below.

Note:

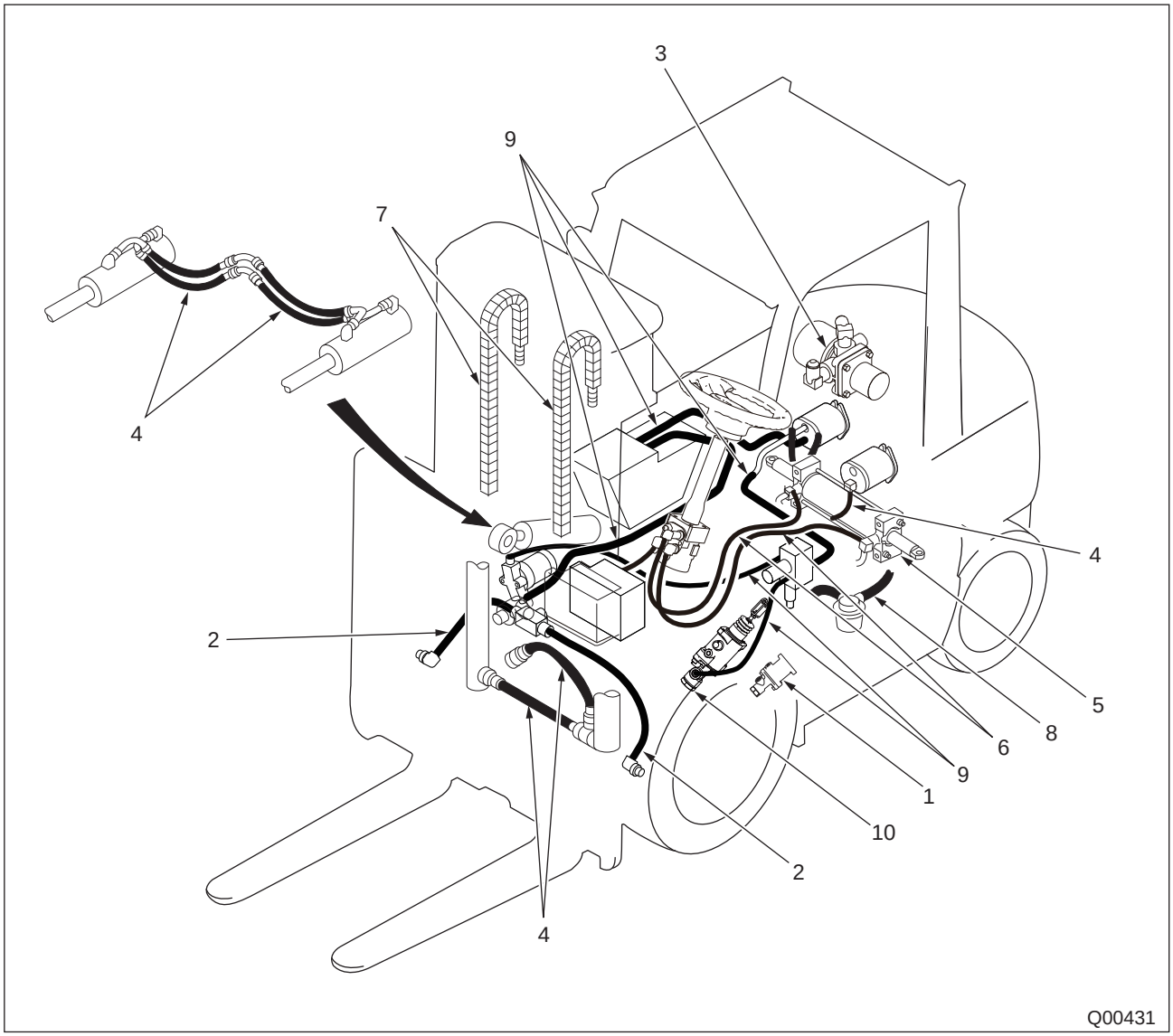
- These parts are made of materials which will deteriorate overtime.
- It is difficult to determine visually whether or not they are still in good condition.
- Changing at proper intervals will reduce the risk of injury to the operator and damage to the lift truck.

Ref. No.	Parts to be changed	Interval
1	Brake Hose, Tube and Rubber Parts of Brake Master Valve	2000 service hours or 1 year*
2	Rubber Parts of Brake Wheel Cylinders	2000 service hours or 1 year*
3	Vaporizer rubber parts for LP-Gas	2000 service hours or 1 year*
4	High Pressure Hoses of Hydraulic System	2000 to 4000 service hours or 1 to 2 years*
5	Hose and Rubber Parts of Power Steering Cylinder	4000 service hours or 2 years*
6	Hydraulic Hoses of Steering System	4000 service hours or 2 years*
7	Lift Chains	4000 to 8000 service hours or 2 to 4 years*
8	Fuel Hoses	4000 to 8000 service hours or 2 to 4 years*
9	Brake Hose and Rubber Parts of wet disc brake system.	2000 service hours or 1 year*
10	Rubber Parts of Brake valve For the lift truck with wet disc brake option.	2000 service hours or 1 year*

*Whichever comes first

Note:

Periodic changes of these parts are not covered by warranty.


3
9
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Q00431

SERVICE DATA

♦ Fuel Information

Use only fuel recommended in this section.

•Gasoline (Gas) Specification

Your lift truck must use unleaded gasoline only.

Oxygenated gasoline

Some gasoline sold at service stations contain oxygenates such as ethanol, methanol, and MTBE (Methyl Tertiary Butyl Ether), although they may not be so identified. The use of fuels containing oxygenates is not recommended.

Ethanol (Gasohol)

A mixture of 10% ethanol (grain alcohol) and 90% unleaded gasoline may be used in your lift truck, provided the octane rating is at least as high as that recommended for unleaded gasoline.

Methanol

DO NOT operate your lift truck on gasoline containing methanol (wood alcohol). The use of this type of alcohol could result in lift truck performance problems and could damage critical fuel system parts.

MTBE (Methyl Tertiary Butyl Ether)

A mixture of 15% or less MTBE and unleaded gasoline may be used in your lift truck provided the octane rating is at least as high as that recommended for unleaded gasoline.

Note:

If you experience driving problems which you suspect are fuel related, try switching to a different fuel.

•Diesel Fuel Specifications

Fuel types

The recommended fuels provide maximum engine service life and performance. They are distillate fuels. They are commonly called diesel fuel, furnace oil, gas oil or kerosene (for cold weather operation).

Note:

The manufacturer strongly recommends the use of fuels that meet the recommended fuels specification.

Fuel sulfur content

- The percentage of sulfur in the fuel will affect the engine oil recommendations. Fuel sulfur is chemically changed during combustion to form both sulfurous and sulfuric acid. These chemically attack metal surfaces and cause corrosive wear.
- Any API classification performance of oil should have sufficient TBN for fuels with less than 0. 5% sulfur.
- For fuels with 0.5% to 1. 5% sulfur by weight, engine oil must have a TBN of 20 times the percentage of fuel sulfur as measured by the ASTM (American Society of Testing Materials) D-2896 method. (ASTM D-2896 can normally be found at your local technological society, library or college.)

•Liquefied Petroleum (LP-Gas)

Specifications

Use grade HD5 LPG.

Note:

LP-Gas is a highly volatile fuel with an octane rating of 100 to 140. Follow local ordinances regarding storage and/or filling of LP-Gas tanks.

♦ Coolant Information

The manufacturer recommends that the coolant mix contain 50% commercially available automotive anti-freeze, and 50% water.

Note:

- To reduce the risk of damage to your engine, Do not add coolant to an overheated engine. Allow the engine to cool first.
- Dowtherm 209 full-fill coolant will lower the water pump cavitation temperature and boiling point. These lowered temperatures will cause overheating at a lower ambient temperature than an ethylene glycol and water mix. If Dowtherm is used, follow the instructions provided and use only the inhibitor package recommended by the supplier.
- If the lift truck is to be stored in, or shipped to, an area with freezing temperatures, the cooling system must be protected to the lowest expected outside (ambient) temperature. The engine cooling system is protected with a commercially available automotive antifreeze when shipped from the factory. In cold weather, check the specific gravity of the coolant frequently to ensure adequate protection.
- Clean the cooling system if it is contaminated, the engine overheats or foaming is observed in the radiator. Old coolant should be drained, the system cleaned and new coolant added—as recommended—using a commercially available automotive antifreeze. Filling at over 20 liters per minute could cause air pockets in the cooling system.
- After draining and refilling the cooling system, run the engine with the radiator cap off. Run it until the coolant reaches its normal operating temperatures and the coolant level stabilizes.
- Add coolant as necessary to fill the system to the proper level. Operate with a thermostat in the cooling system all year round. Cooling system problems could arise without a thermostat.

•Coolant Water

The manufacturer recommends the use of distilled water or deionized water to reduce the potential and severity of chemical insolubility.

- Hard water, or water with high levels of calcium and magnesium ions encourages the formation of insoluble chemical compounds by combining with cooling system additives such as silicates and phosphates. The tendency of silicates and phosphates to precipitate out-of-solution increases with increasing water hardness.
- Hard water, or water with high levels of calcium and magnesium ions, encourages the formation of insoluble chemicals, especially after a number of heating and cooling cycles.
- Using water that meets the minimum acceptable water requirement may not prevent dropout of these chemical compounds completely but should control the dropout rate at acceptable levels.

Acceptable Water	
Water Content	**Limits (ppm)**
Chlorides (CI)	50 ppm (maximum)
Sulfates (SO4)	50 ppm (maximum)
Total Hardness	80 mg/l
Total Solids	250 ppm (maximum)
pH	6.0 to 8.0

ppm = parts per million

•Antifreeze Solution

The manufacturer recommends that the coolant mix contain 50% commercially available automotive antifreeze, or equivalent, and acceptable water to maintain an adequate water pump cavitation temperature for efficient water pump performance.

Note:

- Do not add pure (100%) antifreeze to the cooling system. Add antifreeze mixed with distilled water using the same freeze protection ratio that is in your cooling system.
- Premix the coolant solution to provide protection to the lowest expected outside (ambient) temperature. Pure undiluted antifreeze will freeze at -23°C (-10°F).
- Use a greater concentration (above 50%) of commercially available automotive antifreeze only as needed for anticipated outside (ambient) temperatures.
- Do not exceed the coolant-to-water mix ratio recommendations provided with the commercially available automotive antifreezes.
- Most commercial antifreezes are formulated for gasoline engine applications and will, therefore, have high silicate content.

♦ Recommended Fuels and Oils

Fuel or Oil		Recommendation	Recommendation for Ambient Temperatures, °C (°F) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86)	
Fuel			Consult your authorized Cat lift truck dealer (For gasoline engine: Use unleaded regular gasoline with an octane rating of 91 or more.)	
Engine oil	Gasoline/ LPG models	API service classification SJ, min.	SAE10W-30	
	Diesel models	API service classification CF, min.	SAE10W-30	
Transfer and Differential oil Direct transmission oil		API service classification multi-purpose type GL-4 or GL-5	SAE80W	SAE90
Powershift Transmission Oil		Dexron II	Consult your authorized Cat lift truck dealer	
Hydraulic Oil		ISO VG32	Consult your authorized Cat lift truck dealer	
Brake Oil		Recommended oil by manufacturer		
Grease	Wheel bearings	NLGI No.2 grade multipurpose type (lithium base), consistency: 265 - 295		
	Chassis	NLGI No.1 grade multipurpose type (lithium base), consistency: 310 - 340		

Antifreeze solution	Ambient Temperature, °C (°F)	-45 (-49)	-39 (-38)	-30 (-22)	-25 (-13)	-20 (-4)	-15 (5)	-10 (14)
	Concentration (%)	60	55	50	45	40	35	30

Note:

- Avoid mixing lubricants. In some cases, different brands of lubricants are not compatible with each other and deteriorate when mixed. It is best to stick with the same brand at successive intervals.
- For refill capacities and measurements, see "Specifications (Standard Models)" in this section.

•Engine Oils (Gasoline)

	SPECIFICATIONS	API service classification SJ, min.
MANUFACTURER	**VISCOSITY**	SAE 10W-30
Mobil	**BRAND NAME**	Mobil 1 10W-30
Shell		Shell Fleet 10W-30
Exxon		XD-3 10W-30
Castrol		Castrol GTX 10W-30

•Engine Oils (Diesel)

	SPECIFICATIONS	API service classification CF, min.
MANUFACTURER	**VISCOSITY**	SAE 10W-30
Mobil	**BRAND NAME**	Mobil Delvac 1300 Super
Shell		Shell Rotella T 10W-30
Exxon		XD-3 10W-30
Castrol		Castrol Syntec 10W-30

•Transfer and Differential Oils

	SPECIFICATIONS	API service classification GL-4 or GL-5	
MANUFACTURER	**VISCOSITY**	SAE 80W	SAE 90
Mobil	**BRAND NAME**	Mobilube HD 80W-90	
Shell		Shell Spirax HD 80W-90	
Exxon		Gear Oil GX80W-90	
Castrol		Castrol Hypoy 80W-90	

•Powershift Transmission Oils

	SPECIFICATIONS	Dexron II
MANUFACTURER	**VISCOSITY**	—
Mobil	**BRAND NAME**	Mobil ATF
Shell		Shell Donax TG
Exxon		Exxtrans
Castrol		Castrol Dexron ® III/Mercon ®

•Brake Oil (For Use With Wet Disc Brake Option)

	SPECIFICATIONS	
MANUFACTURER	**VISCOSITY**	
John Deere	**BRAND NAME**	Low Viscosity Hy-Gard (Type : TY 6342)
Shell		Donax TDL (Product code : 436-103)
Kroon		Wet Disc Brake Fluid (Product code : MCF-F1052)

•Greases

	SPECIFICATIONS	NLGI No.1	NLGI No.2
MANUFACTURER	**VISCOSITY**	Consistency 310-340	Consistency 265-295
Mobil	**BRAND NAME**	Mobilux EP 1	Mobilux EP 20
Shell		Retinax HD NLGI 1	Retinax HD NLGI 2
Exxon		Ronex Extra Duty 1	Ronex Extra Duty 2
Castrol		Castrol EPL 1	Castrol EPL 2

•Antifreeze Summer Coolant

	SPECIFICATIONS	
MANUFACTURER	**VISCOSITY**	
Mobil	**BRAND NAME**	Full Force USI Chemical Marcus Peak
Shell		
Exxon		
Castrol		

•Hydraulic Oils

	SPECIFICATIONS	ISO VG32
MANUFACTURER	**VISCOSITY**	—
Mobil	**BRAND NAME**	Mobiltrans HD 10W
Shell		Tellus T32
Exxon		Nuto H32
Castrol		Castrol Hyspin AWH-M32

♦ Specifications (Standard Models)

<table>
<tr><th colspan="3">Truck model
Item</th><th>P8000</th><th>P9000</th><th>P10000</th><th>P11000</th><th>P12000</th></tr>
<tr><td colspan="3">Alternator drive belt deflection when pushed with 98 N (10 kgf) [22 lbf] pressure, mm (in.)</td><td colspan="5">11 to 13 (0.4 to 0.5)</td></tr>
<tr><td rowspan="2">Spark plugs</td><td colspan="2">Type - NGK</td><td colspan="5">BPR4ES</td></tr>
<tr><td colspan="2">Gap, mm (in.)</td><td colspan="5">0.8 to 0.9 (0.032 to 0.035)</td></tr>
<tr><td colspan="3">Engine idling speed, rpm</td><td colspan="5">650 to 700</td></tr>
<tr><td colspan="3">Steering wheel free play when measured at rim with engine idling, mm (in.)</td><td colspan="5">15 to 30 (0.6 to 1.2)</td></tr>
<tr><td colspan="3">Inching pedal free play, mm (in.)</td><td colspan="5">3 to 6 (0.1 to 0.2)</td></tr>
<tr><td colspan="3">Brake pedal free play, mm (in.)</td><td colspan="5">6 (0.23)</td></tr>
<tr><td rowspan="4">Tire size</td><td rowspan="3">Front</td><td>Single</td><td>8.25-15-14PR(I)</td><td colspan="4">300-15-18PR(I)</td></tr>
<tr><td>Standard dual</td><td colspan="5">7.50-16-12PR(I)</td></tr>
<tr><td>Solid dual</td><td colspan="5">8.25-15-12PR(I)</td></tr>
<tr><td colspan="2">Rear</td><td colspan="4">7.00-12-12PR(I)</td><td>7.00-12-14PR(I)</td></tr>
<tr><td rowspan="3">Tire pressure, kPa (kgf/cm^2) [psi] (Pneumatic)</td><td rowspan="2">Front</td><td>Single</td><td colspan="5">800 (8.0) [115]</td></tr>
<tr><td>Standard dual</td><td colspan="5">700 (7.0) [100]</td></tr>
<tr><td colspan="2">Rear</td><td colspan="2">700 (7.0) [100]</td><td colspan="2">850 (8.5) [120]</td><td>1000 (10.0) [145]</td></tr>
<tr><td colspan="2" rowspan="2">Tightening torque for wheel nuts, N·m (kgf·m) [lbf·ft]</td><td>Front</td><td colspan="5">600 ± 60 (61 ± 6) [443 ± 44.3]</td></tr>
<tr><td>Rear</td><td colspan="5">377.3 (38) [278]</td></tr>
<tr><td colspan="3">Lift chain elongation limit, mm (in.) / 20 links</td><td colspan="2">518 (20.4)</td><td colspan="3">648 (25.5)</td></tr>
</table>

Note:

The service data is subject to change without notice.

Item \ Truck model			PD8000	PD9000	PD10000	PD11000	PD12000
Alternator drive belt deflection when pushed with 98 N (10 kgf) [22 lbf] pressure, mm (in.)			11 to 13 (0.4 to 0.5)				
Spark plugs	Type - NGK		—				
	Gap, mm (in.)		—				
Engine idling speed, rpm			650 to 700				
Steering wheel free play when measured at rim with engine idling, mm (in.)			15 to 30 (0.6 to 1.2)				
Inching pedal free play, mm (in.)			3 to 6 (0.1 to 0.2)				
Brake pedal free play, mm (in.)			6 (0.23)				
Tire size	Front	Single	8.25-15-14PR(I)	300-15-18PR(I)			
		Standard dual	7.50-16-12PR(I)				
		Solid dual	8.25-15-12PR(I)				
	Rear		7.00-12-12PR(I)				7.00-12-14PR(I)
Tire pressure, kPa (kgf/cm^2) [psi] (Pneumatic)	Front	Single	800 (8.0) [115]				
		Standard dual	700 (7.0) [100]				
	Rear		700 (7.0) [100]		850 (8.5) [120]		1000 (10.0) [145]
Tightening torque for wheel nuts, N·m (kgf·m) [lbf·ft]		Front	600 ± 60 (61 ± 6) [443 ± 44.3]				
		Rear	377.3 (38) [278]				
Lift chain elongation limit, mm (in.) / 20 links			518 (20.4)		648 (25.5)		

Note:
The service data is subject to change without notice.

♦ Refill Capacities

Item \ Truck model			P8000	P9000	P10000	P11000	P12000
Refill capacities (Approximate), liter (U.S. gal.)	Fuel tank		87 (23.0)	105 (27.7)			
	Engine cooling system - 0.65 liter (1.4 pt) reserve tank included		16 (4.2)				
	Engine oil	Crankcase	8.3 (2.2)				
		Oil filter	0.3 (0.08)				
		Total	8.6 (2.3)				
	Transmission		17 (4.5)				
	Hydraulic tank		72 (19.0)		81 (21.4)		
	Wet Disc Brake		8.9 (2.4)				
Battery electrolyte specific gravity			Consult battery manufacturer for specific gravity of your specific battery.				

Item \ Truck model			PD8000	PD9000	PD10000	PD11000	PD12000
Refill capacities (Approximate), liter (U.S. gal.)	Fuel tank		87 (23.0)	105 (27.7)			
	Engine cooling system - 0.65 liter (1.4 pt) reserve tank included		12.9 (3.4)				
	Engine oil	Crankcase	11.0 (2.9)				
		Oil filter	1.0 (0.3)				
		Total	12.0 (3.2)				
	Transmission		17 (4.5)				
	Hydraulic tank		72 (19.0)		81 (21.4)		
	Wet Disc Brake		8.9 (2.4)				
Battery electrolyte specific gravity			Consult battery manufacturer for specific gravity of your specific battery.				

♦ Capacities and Lift Truck Weight (Standard Models)

Item \ Truck model		P8000	P9000	P10000	P11000	P12000
Rated Capacity, kg (lb)		4000 (8820)	4500 (9920)	5000 (11030)	5000 (11030)	5500 (12130)
Unloaded truck weight kg (lb)	Single tires	5860 (12900)	6270 (13800)	6780 (14950)	7230 (15950)	7570 (16700)
	Standard dual tires	5980 (13150)	6350 (14000)	6860 (15150)	7310 (16150)	7650 (16900)
	Solid dual tires	6060 (13350)	6430 (14150)	6940 (15300)	7390 (16300)	7730 (17050)

Item \ Truck model		PD8000	PD9000	PD10000	PD11000	PD12000
Rated Capacity, kg (lb)		4000 (8820)	4500 (9920)	5000 (11030)	5000 (11030)	5500 (12130)
Unloaded truck weight kg (lb)	Single tires	5920 (13050)	6330 (13950)	6840 (15100)	7300 (16100)	7630 (16800)
	Standard dual tires	6040 (13300)	6410 (14150)	6920 (15300)	7380 (16300)	7710 (17000)
	Solid dual tires	6120 (13500)	6450 (14300)	7000 (15450)	7460 (16450)	7790 (17150)

Note:

Capacities shown apply to lift trucks with genuine Cat lift truck standard tires.

TO THE CAT LIFT TRUCK OWNER

♦ The Importance of Genuine Parts

The dealers and the owners are urged to use ONLY genuine parts to maintain lift trucks in a safe and efficient operating condition. Safe and efficient operation of your lift truck could be endangered by the use of inferior parts. In most cases, imitations sold as cheap parts invariably could mean a short part life and a higher maintenance cost.

Genuine parts give safe and reliable performance.

⚠ CAUTION

The damage caused by parts other than genuine parts is not covered by Cat Lift Trucks' warranty.

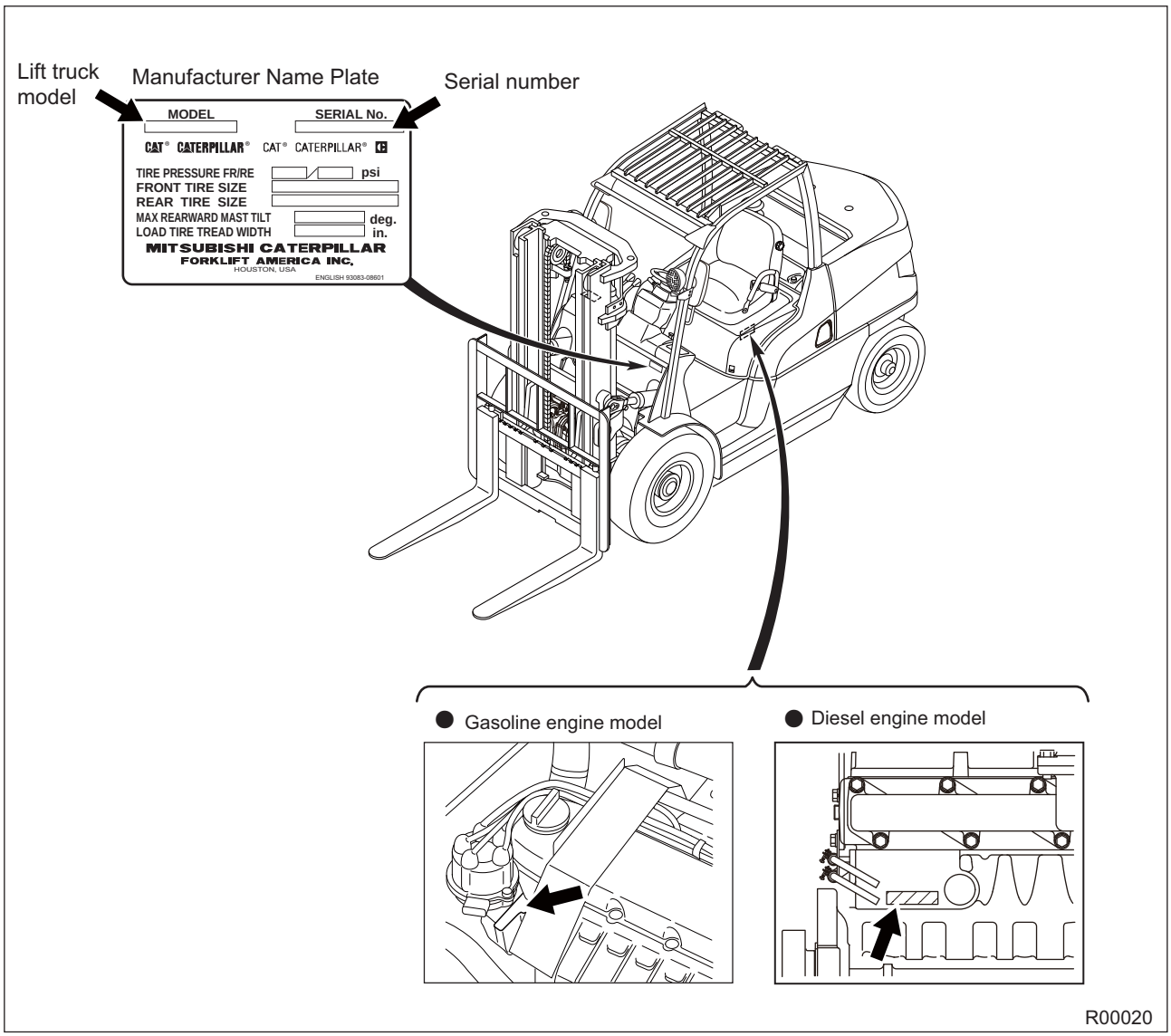
♦ Proper Disposal of Your Lift Truck

Consult your authorized Cat lift truck dealer for how and where to dispose of your lift truck. Improper disposal of lift trucks and other wastes such as tires, batteries, coolant and hydraulic oil can be harmful to the environment, and this act is strictly prohibited by the law.

♦ Instructions for Ordering Parts

When ordering parts, or when asking your authorized Cat lift truck dealer to have your lift truck repaired, be sure to provide the following items:

- Lift truck model
- Lift truck serial number
- Engine serial number



♦ Service Registration

Fill out this sheet for your ready reference.

SERVICE REGISTRATION

<table>
<tr><td colspan="2">Lift Truck Model, Serial No.</td><td>Engine Model, Serial No.</td></tr>
<tr><td colspan="2">Mast Model, Serial No.</td><td>Attachment Model, Serial No.</td></tr>
<tr><td rowspan="3">Delivering Dealer:</td><td colspan="2">Name:</td></tr>
<tr><td colspan="2">Address:</td></tr>
<tr><td colspan="2">Delivery Date:</td></tr>
</table>

♦ Transfer of Ownership Report for Cat Lift Trucks Customers Only

TRANSFER REPORT TRANSFER OF OWNERSHIP REPORT				DATE
DISTRIBUTED BY: Mitsubishi Caterpillar Forklift America Inc. 2121 W. Sam Houston Parkway N. Houston, TX 77043-2421 Fax: (713) 365-1414 Attn: Marketing Services	MODEL	SERIAL NUMBER		HOUR METER
TRANSFERRED FROM				
DEALER / CUSTOMER NAME		ADDRESS		
CITY / TOWN	COUNTY	STATE	ZIP	COUNTRY
TRANSFERRED TO				
CUSTOMER NAME		ADDRESS		
CITY / TOWN	COUNTY	STATE	ZIP	COUNTRY
CUSTOMER'S PRINCIPAL BUSINESS		CUSTOMER CONTACT		
(AREA CODE) TELEPHONE NUMBER ( )		(AREA CODE) TELEFAX NUMBER ( )		

CUSTOMER' S SIGNATURE DATE

Copies distributed to:

- ☐ Dealer Sales Department
- ☐ Dealer Service Department / Warranty
- ☐ MCFA Marketing Services [FAX (713) 365-1414]