

SERVICE MANUAL

SM150

BBX50 SERIES ELECTRIC FORKLIFT TRUCKS - S/N 090001A~

FB20/25/30/32SH-6
FB20/25/30/32SHE-6
FB20/25SHG-6
FB20/25SHGE-6

BBX50



WARNING

Read and observe all warnings on this unit before operating it.

DO NOT operate this equipment unless all factory installed guards and shields are properly secured in place.

KOMATSU

Komatsu Forlift USA, Inc.

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FORKLIFT TRUCKS COVERED IN THIS PUBLICATION

BBX50 S/N 090001A~

KOMATSU MODEL DESIGNATION	DESCRIPTION
Electric Lift Trucks	
FB20SH-6	4,000 lb. Capacity, Cushion Tire, High Option
FB20SHE-6	4,000 lb. Capacity, Cushion Tire, High Option, EE Rated
FB20SHG-6	4,000 lb. Capacity, Cushion Tire, High Option, Extended Frame
FB20SHGE-6	4,000 lb. Capacity, Cushion Tire, High Option, Extended Frame, EE Rated
FB25SH-6	5,000 lb. Capacity, Cushion Tire, High Option
FB25SHE-6	5,000 lb. Capacity, Cushion Tire, High Option, EE Rated
FB25SHG-6	5,000 lb. Capacity, Cushion Tire, High Option, Extended Frame
FB25SHGE-6	5,000 lb. Capacity, Cushion Tire, High Option, Extended Frame, EE Rated
FB30SH-6	6,000 lb. Capacity, Cushion Tire, High Option
FB30SHE-6	6,000 lb. Capacity, Cushion Tire, High Option, EE Rated
FB32SH-6	6,500 lb. Capacity, Cushion Tire, High Option
FB32SHE-6	6,500 lb. Capacity, Cushion Tire, High Option, EE Rated

**WARNING****OPERATION MANUAL AND SAFETY LABELS**

- Read the instructions in this Manual and the Safety Labels attached to the various parts of the lift truck, and make sure that you understand and follow them. If you do not understand or do not follow the instructions, this will lead to improper operation which may lead to damage, personal injury or death.
- Be sure that you understand the proper method of using the lift truck and the procedure for carrying out an inspection, and ensure that they are carried out safely.
- Read this Manual and the Safety Labels again from time to time. If the Operation and Maintenance Manual or Safety Labels have been lost or become dirty and cannot be read, obtain replacements from your Komatsu Forklift dealer and attach the Safety Labels in the specified positions.

**WARNING****OPERATION QUALIFICATIONS**

- This lift truck should be operated only by qualified personnel. Be sure you have proper qualifications before operating the lift truck.
- Using this lift truck without due care and attention may lead to injury or even death of you or others. Be sure that you read this manual thoroughly and understand the explanations completely before you use this lift truck or carry out maintenance on it.
- When you start to use this lift truck, be sure that you carry out ample practice so that you become accustomed to each part of the equipment. Even when you have become accustomed to handling the lift truck, always drive carefully and do not try to force the truck beyond its capacity. Failure to observe these precautions may lead to serious personal injury or accident.
- For those operators who have recently obtained qualifications to operate lift trucks, always seek the advice of experienced operators or instructors in the methods of operating and loading the lift truck.
- For those operating more than one lift truck, even if the model is the same specification, remember that each truck differs slightly in the performance and reaction of the brakes, accelerator, and loading system. When changing from one truck to another, always be sure that you become accustomed to the performance of the truck before operating it. The feeling when operating the brakes is particularly important.
- When operating this lift truck, even if you have experience in operating other lift trucks, obtain instruction from an authorized person who has experience in operating this lift truck or the same type of lift truck.

**WARNING****CLOTHING AND PERSONAL PROTECTIVE ITEMS**

- Avoid loose clothing, jewelry, and loose long hair. They can catch on controls or in moving parts and cause serious injury or death.
- Always wear a hard hat and safety boots.
- Depending on the working conditions, wear other safety equipment as well.





WARNING

OVERHEAD GUARD, LOAD BACKREST

- Do not use this lift truck unless it is equipped with the overhead guard and load backrest shipped with the lift truck from the factory by Komatsu Forklift.



WARNING

UNAUTHORIZED MODIFICATION

- Any modification made without authorization from Komatsu Forklift can create hazards.
- Before making any modification whatsoever, consult your Komatsu Forklift dealer. Komatsu Forklift will not be responsible for any damage, injury or death caused by any unauthorized modification.
- Do not install any equipment or parts which obstruct or limit the operator's view.



WARNING

FIRE EXTINGUISHER AND FIRST AID KIT

- If any abnormality in the lift truck occurs, stop operation immediately, park the lift truck in a safe place and safe condition, then contact the person in charge.
- Be sure that fire extinguishers have been provided and that you read the labels to ensure that you know how to use them.
- Know what to do in the event of a fire.
- Be sure that you know the phone numbers of persons you should contact in case of an emergency.
- Provide a first aid kit at the storage point.
- Do not use the lift truck if it is leaking fuel. Inform the person on charge of the nature of the abnormality, and repair the leakage before using the lift truck.
- Do not leave the lift truck with the engine running. Always apply the parking brake securely, lower the forks to the ground, stop the engine, and remove the key before leaving the lift truck.



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WARNING

SAFETY RULES

- Do not operate the lift truck if you are fatigued, or when you have been drinking, or you have taken any medication which can make you drowsy or sleepy.
- When carrying out operation, inspection, or maintenance of the lift truck, always follow all work shop rules, safety regulations and precautions.
- During operation, always pay attention to safety and be careful of pedestrians, traffic and other surrounding conditions.



WARNING

SAFETY EQUIPMENT

- The overhead guard is installed to protect the operator from falling objects. It is designed to withstand the force of light boxes or small packages. It is not designed to withstand every possible impact.
- Always be careful to prevent damage or injury from falling objects.

**WARNING****CHECK WHEN TRAVELING IN REVERSE**

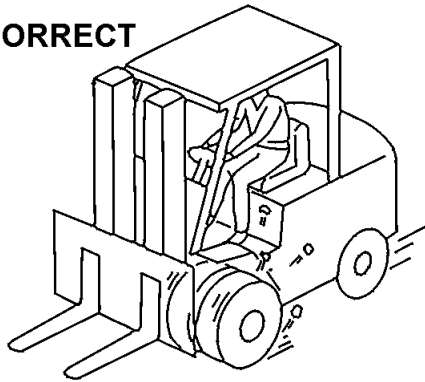
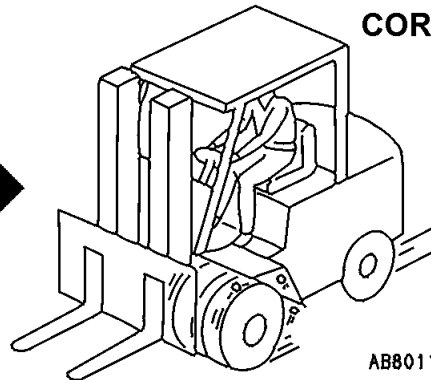
- When reversing, depending on the situation, an optional alarm, reversing lamp or rotary lamp should be used. In all cases, be sure to face the rear and check around before traveling in reverse.

**WARNING****TRAVELING REGULATIONS ON PUBLIC ROADS**

- Do not travel on public roads unless you comply with local, state or other laws which regulate such activity.
- Always observe all traffic regulations when operating the lift truck.
- Do not drive on public roads with the lift truck loaded.
- Do not tow other machines on public roads. (Do not tow other machines even when not on public roads).
- Always carry your driver's license when traveling on public roads.

**WARNING****TIRE FENDERS**

The tire fenders prevent objects from being thrown up by the tires. When changing from a single tire to a double tire arrangement on your forklift truck, always extend the tire fenders to cover the additional tires. If the fenders are not extended, small stones and other objects will be thrown up and may injure the operator or other people in the surrounding area.

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**WARNING****SAFE WORKING AREA**

- Always work on level surfaces and wipe up all oil or grease from the ground.
- When working on quays, platforms, docks or other places where there is a danger of falling, set up blocks to prevent the lift truck from going over the edge.
- Put warning signs up in dangerous places to warn the operator not to approach.
- Mark the travel areas clearly and maintain the road surfaces in good condition.
- Put up signs to prevent unauthorized machines from entering areas where trucks are being operated.
- Ensure that there is adequate lighting to enable operations to be carried out safely.



WARNING

CLEAN OPERATOR'S COMPARTMENT

- Keep the operator's compartment clean and tidy. Be sure to clean up all oil or mud. If the operator's hand or foot slips, this may lead to a serious accident.
- Do not leave tools or spare parts lying around in the operator's compartment. They may damage or obstruct the control levers or pedals. Always keep them in the tool box when not being used.



WARNING

SAFE OPERATING PLAN

- Before operation, establish an operating plan and hold a meeting to discuss operating safety.
- In confined areas, position a signal person and carry out operations in accordance with his or her instructions.
- When carrying out operations on roads, put up fences around the working area and carry out operations in accordance with instructions from the signal person.



WARNING

REDUCE LOAD FOR LIFT TRUCKS WITH ATTACHMENT

- The permissible load for any lift trucks equipped with an attachment is lower than the permissible load for the standard lift truck. Reason:
 1. The permissible load must be reduced by an amount equivalent to the weight of the attachment itself.
 2. Because of the thickness of the attachment, the load center moves forward.
- Always observe the permissible load as stated on the capacity plate (also called "nameplate") strictly (this plate is stuck to the lift truck or the attachment). Never exceed the permissible load.



WARNING

KEEP FREE FROM WATER

- Avoid operating or leaving the lift truck outside in wet and rainy weather or snow and icy conditions.
- When washing the lift truck, use care to prevent water from contacting electrical parts. If water does come in contact with the electrical system it may cause the system to operate abnormally and it may become impossible to control the lift truck.



WARNING

USE LOCKOUT OR TAGOUT PROCEDURES

You must follow lockout or tagout procedures to control hazardous energy during the inspection, servicing and maintenance operations of your lift truck as defined in the Occupational Health and Safety Administration (OSHA) Standard 29 CFR 1910.147.

- When there are deficiencies or any mechanical defect that would prevent the safe operation of the truck:
 1. Remove the lift truck from service and park it.
 2. Initiate lockout or tagout procedures according to the safety policy in place in your facility until the repairs are completed.
- When service personnel outside your facility are involved in the inspection, servicing and maintenance operations of your lift truck:
 1. Inform the outside employer of your lockout or tagout procedures. The outside employer must also inform you of their procedures.
 2. Ensure that your employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.

**WARNING****WEARING SEAT BELT**

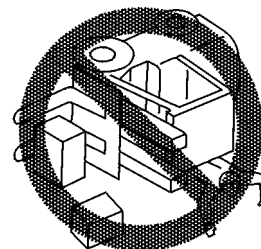
- Always fit your seat belt correctly when operating. If your seat belt is fitted incorrectly, there is danger of serious personal injury if the lift truck should tip over.
- Always check the seat belt mounts and check for any damage to the seat belt. If any abnormality is found, repair or replace the seat belt immediately.



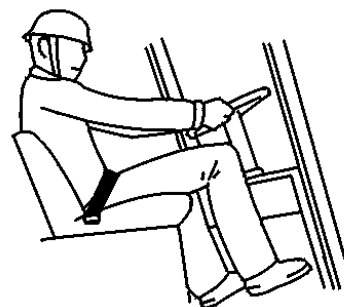
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**WARNING****DO NOT JUMP OFF LIFT TRUCK EVEN IF IT TIPS**

- NEVER JUMP OFF the lift truck even if it seems that it will tip. Always do as follows:
 1. Hold the steering wheel securely.
 2. Stay in the operator's seat.
 3. Brace your legs.
- **If you jump off the lift truck when it turns over, there is danger that you will be fatally crushed under the lift truck.** Always stay in the operator's compartment if the lift truck turns over, then escape from the lift truck after it has stopped.
- Always wear the seat belt correctly.



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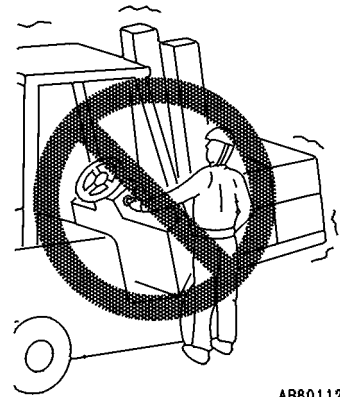
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WARNING

PRECAUTIONS WHEN STARTING UNIT

- Depress the brake pedal firmly, then start the unit.
- Before starting the unit, always check that the parking brake is applied and that the directional lever is in neutral.
- Adjust the operator's seat and the steering wheel before starting the unit. Always lock them in position after adjusting. Adjusting the seat or steering wheel during operation is dangerous as it may cause you to lose your balance or operate the lift truck wrongly.
- When starting the unit, first check that the surrounding area is safe, and sit in the operator's seat.
- Before starting the unit, sound the horn to warn people in the area.
- With large-sized lift trucks, get off the lift truck, and walk around it to check that is no one near the battery compartment, tires, or counterweight, then get on the lift truck, sit in the operator's seat, and start the unit.



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WARNING

PRECAUTIONS WHEN OPERATING DIRECTIONAL LEVER

- When switching between FORWARD and REVERSE, **always stop the lift truck first**. It is dangerous to change the direction of travel suddenly or when the lift truck is moving.
- If the lever is moved without disengaging the clutch, the lift truck will move suddenly and may cause injury.



WARNING

ESCAPING FROM A RAILROAD CROSSING

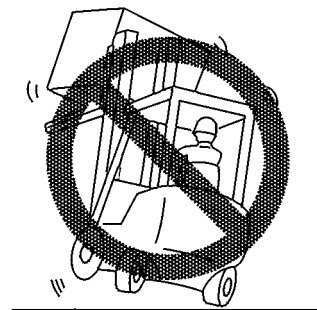
- If unit trouble occurs on a railroad crossing and the lift truck will not move or cannot be moved, get off and move away from the lift truck
- In such an emergency, light a flare or smoke candle to warn approaching trains and people in the area that there is a broken-down truck on the tracks.



WARNING

TIPPING

- If the load-engaging means or load is raised, the center of gravity of the lift truck will also rise and increase the danger of the lift truck tipping. **Do not turn the lift truck when the forks are raised high.**
- Do not suddenly raise the forks or tilt the mast to the front or rear when the forks are loaded. There is danger that the lift truck will tip.
- Reduce speed before turning the lift truck.
- In particular, when traveling unloaded, the rear of the lift truck is heavy. If the lift truck is turned at high speed, there is a greater chance of tipping than with the forks loaded.



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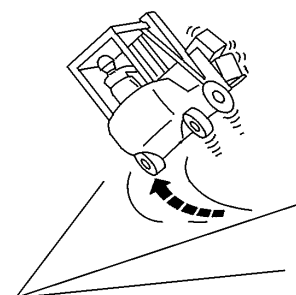
WARNING TRAVEL ON SLOPES

- Do not turn, or travel across or at an angle on slopes. There is danger that the lift truck will tip.
- Before starting to drive up a slope, stop the lift truck and adjust the clearance between the ground surface and the bottom of the forks so that the bottom of the forks or pallet do not contact the ground surface or the tip of the fork does not stick into the ground when traveling.
- For safe travel on slopes:

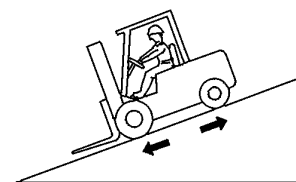
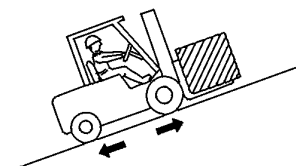
When loaded: Travel FORWARD up the slope and in REVERSE down the slope with the load upgrade.

When unloaded: Travel in REVERSE up the slope and FORWARD down the slope with the load-engaging means downgrade.

- When traveling downhill, operate the foot brake and drive the lift truck slowly.
- When starting on slopes, the lift truck may start to move down the slope depending on the amount the pedals are depressed.
- Always leave ample room in front of and behind the lift truck when starting on slopes.
- Be careful that the lift truck may slip down due to power shutdown when the travel interlock is activated during travel on a slope or hill.



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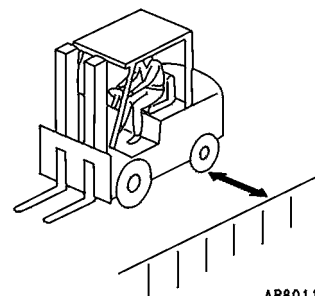


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WARNING ROAD SHOULDER

- There is danger that soft road shoulders may collapse, so do not go near them with the lift truck.
- Always maintain a safe distance from the edge of road shoulders and platforms.



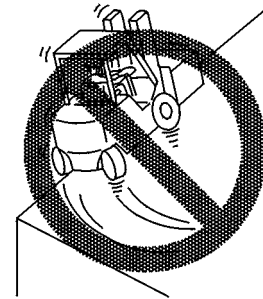
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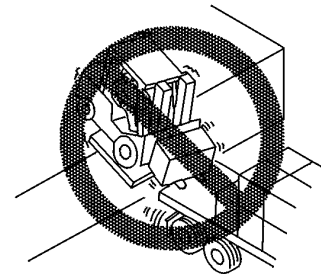
WARNING

LOADING HIGHWAY TRUCKS OR RAILROAD CARS

- **Do not travel on the edge of docks.** There is danger that the lift truck may fall, which may result in serious injury or death.
- Before starting operations, check the load limit for the gangplanks (dock boards), and do not use them if they do not have ample strength to take the weight of the lift truck when loaded.
- Apply the brakes on the highway truck and block the wheels.
- With trailers, use jacks and take steps to prevent the trailer from sinking when the forklift truck travels on it.
- When driving the forklift inside trucks, reduce speed when backing out and be sure to check that the gangplanks are safe.
- Be careful of pedestrians.
- Tell the truck driver not to move the truck until the operation is completed.
- If there is some system to secure the truck to the dock, always use this system. Secure the gangplanks so that they do not slip and fall.



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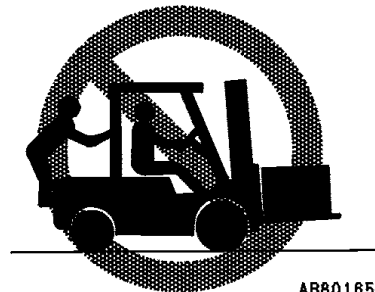
WARNING

NO RIDERS

- **FORKLIFT TRUCKS ARE ONE-PERSON MACHINES.**
- Do not allow any other person to ride on the truck under any circumstances.
- Never allow anyone to act as an extra counterweight.



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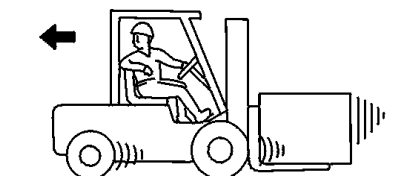
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WARNING

DRIVING IN REVERSE

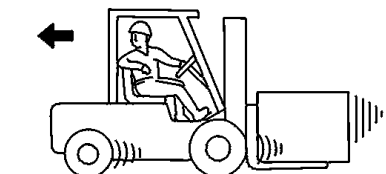
- Before driving in reverse, make sure that there is no one behind the truck before starting to travel.
- The rear view mirror is simply an aid for checking the rear. When driving in reverse, do not use the rear view mirror. Turn to face the rear and check the area directly behind the lift truck.
- Even if you sound the backup buzzer, the people behind the truck do not necessarily hear it. Always check that there is no one behind the truck before driving the truck.



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**WARNING****WHEN FRONT VIEW IS POOR**

- If the view to the front is obstructed by the load, turn to the rear and drive the forklift truck in reverse.
- When driving in reverse with a high load, use a signal person to ensure the safety of the load and the safety in the surrounding area.



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**WARNING****CHECK BEFORE STARTING**

- When checking the lift truck before starting, follow the procedure given in this Manual, and do not start the lift truck until all the checks have been completed.
- If anything abnormal is found, inform the person in charge and carry out the necessary repairs.

**WARNING****REARVIEW MIRROR, LAMPS**

- When reversing, never depend on the rear view mirror; the operator must visually check behind him. Also, adjust the rear view mirror so that the operator can check from the operator's seat that the area behind the lift truck is safe.
- Always keep the surface of the mirror clean. If the mirror is broken, replace it with a new one (for lift trucks equipped with rear view mirror).
- Check that the lamps light up correctly. Replace any broken bulbs (for lift trucks equipped with lamps).

**WARNING****MOUNTING AND DISMOUNTING**

- **NEVER jump onto or off the lift truck.**
- When getting on or off the lift truck, always stop the lift truck and use the handrails and steps to ensure that you support yourself.
- Never hold any control levers or the steering wheel when getting on or off the lift truck.
- If there is any oil, grease or mud on the handrails or steps, wipe it off immediately. Always keep these parts clean. Repair any damage.

**WARNING****KEEP HANDS FREE FROM OIL AND WATER**

- Do not drive the lift truck if your hands are wet or covered with oil. Your hands will slip on the work equipment control levers or directional lever, and this may cause a serious accident.

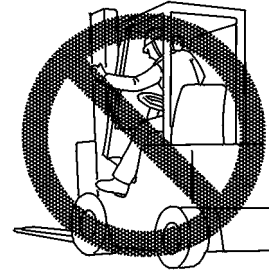


WARNING

ALWAYS SIT IN OPERATOR'S SEAT

Always observe the following:

- Never operate the lift truck from outside the operator's compartment.
- Always keep your body under the overhead guard.
- Do not extend your arms and legs outside the operator's compartment.



AB801240



WARNING

USE GOOD POSTURE WHILE OPERATING LIFT TRUCK

Travel Interlock (power shutdown)/Load Handling interlock

- If an operator operates the lift truck without being seated in good posture or leaves operator's seat during operation, this may cause an accident. To prevent this, the lift truck is equipped with Travel Interlock (power shutdown) and Load Handling Interlock functions to disable travel and Load Handling Interlock functions unless the lift truck is operated in good posture.
- During standstill and traveling, if you leave the operator's seat or have bad posture with no weight applied to the seat during work, the Travel Interlock is activated about 3 seconds later, shutting off the power of the lift truck. The lift truck no longer moves even if you operate the accelerator pedal or forward-reverse lever.



AB801241

At the same time, the Load Handling Interlock is also activated 3 seconds later during traveling, or one second later during stand still, disabling all operations of the mast and forks. The lift lever is mechanically locked out to inhibit operation. Even if the tilt lever or attachment lever is operated, no hydraulic power is transmitted.



Do not leave operator's seat with the lift lever activated.

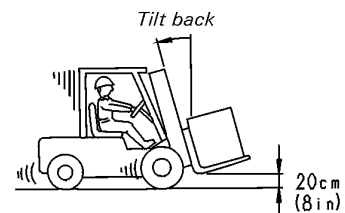
- If you leave operator's seat with the lift lever turned to the lowering position, the lift truck does not stop lowering.



WARNING

SAFETY WHEN STARTING

- Before starting and moving the lift truck, check that the surrounding area is safe.
- Before moving the lift truck, raise the forks (approximately 6 - 8 in. (15 - 20 cm) from the ground surface), and tilt the mast back.
- Before moving the lift truck, release the parking brake.



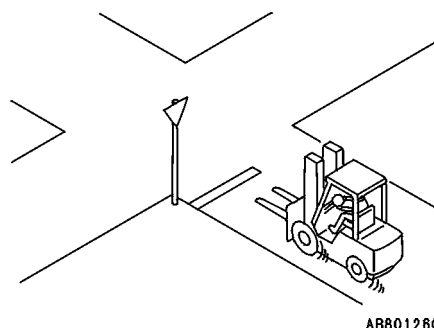
AB80125B

**WARNING****BRAKING WHEN TRAVELING**

- Do not turn the key switch OFF during traveling. If the key switch is turned OFF, the power steering (for lift trucks with power steering) and power brake (for lift trucks with power brakes) will not work.
- Do not use the brake excessively. Do not rest your foot on the brake pedal unless you are operating it. If you do, the brake will overheat and the braking effect will be lost.

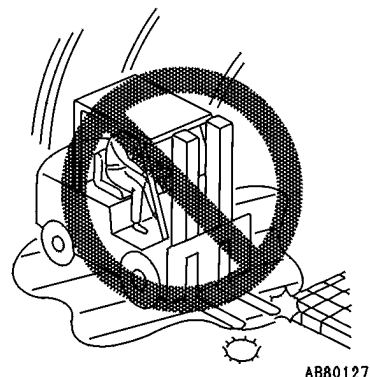
**WARNING****CONFIRMING SAFETY**

- When traveling, always pay careful attention to the area around your lift truck, particularly in the direction of travel or when turning.
- Do not pass other vehicles on narrow roads or at crossings or other places where the view is poor.
- When traveling through crossings or other places where the view is poor, or when entering or leaving narrow roads, stop and sound the horn to confirm safety before driving on.
- Even if you sound the horn, not everyone in the surrounding area will necessarily hear it. Always pay careful attention to the movements of people in the surrounding area.
- When crossing roads or turning corners, stop and confirm safety before continuing.
- Always pay careful attention to the movements of people in the surrounding area, and take steps to prevent people from entering the working area.

**WARNING****SAFETY DURING TRAVEL**

To ensure safety when driving the lift truck, always pay careful attention to the following:

- Avoid traveling in places which are flooded or where there are holes.
- Do not try to drive the lift truck on soft ground.
- Avoid curbs, rails, ditches, or other obstacles, and do not travel directly over them.
- Do not travel on slippery road surfaces.
- When entering buildings, check the weight limit of the floor and be careful not to exceed the limit.
- Keep a clear view of the path of travel and observe for other traffic, personnel, and safe clearances.
- When passing oncoming vehicles, reduce speed and keep a safe distance from the other vehicle.
- In places where there are speed limits, observe the speed limit and maintain a safe distance from other vehicles.

**WARNING****GIVE PRIORITY TO LOADED LIFT TRUCKS**

- When traveling on slopes or in confined areas, unloaded lift trucks should always give the right of way to loaded trucks.

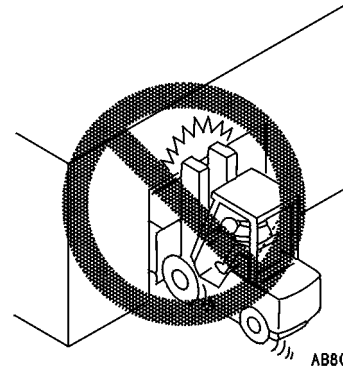


WARNING

HEIGHT OR WIDTH LIMITS

When going in or out of places with height or width limits:

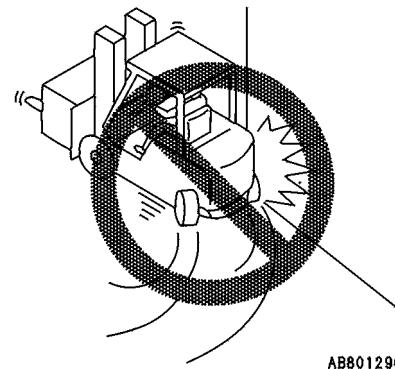
- Ensure that there is ample height and width for the lift truck to pass.
- Do not extend your hands or legs outside the operator's compartment or the area covered by the overhead guard (safe area).
- Check that the surrounding area is safe.
- Be careful of electric wires and other obstacles inside and outside the building.



WARNING

PRECAUTIONS WHEN TURNING

- When turning while traveling forward, the counterweight will swing far out. Keep an ample clearance from walls and other objects to ensure safety.
- When turning, travel slowly and be careful that the front or rear wheels do not come off the ground.
- When turning on soft road shoulders, there is danger that the rear wheels may come off the road shoulder and cause the lift truck to tip.



WARNING

STOPPING DISTANCE

- When traveling downhill, it requires a longer distance for the lift truck to stop than when traveling on level ground.
- When traveling downhill, reduce the speed and make sure that you have ample room at the bottom of the slope to stop.
- When traveling on wet surfaces, it requires a longer distance to stop than when traveling on normal road surfaces. Always have ample room to stop.



WARNING

NO TOWING

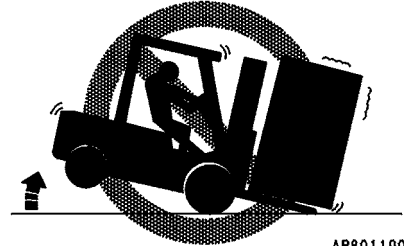
- If there is any problem with the brakes or steering system of your lift truck, do not use another lift truck to tow it. There is danger that the lift truck may run away.



WARNING

NO OVERLOADING

- Do not load the lift truck over the capacity set forth in the load capacity chart. If the rear wheels come off the ground because of overloading, the lift truck cannot travel or turn. There is also danger that it may tip.
- Always check the load capacity chart to confirm the loading capacity.



AB801190



WARNING

DO NOT GO UNDER FORKS

- Never allow anyone to go under the load-engaging means or load when it is raised.
The area under the forks is a danger area. If the forks come down, the person under the forks may be crushed, or seriously injured or killed.
- Never allow anyone to go under the load-engaging means or load even if it is elevated, stuck or caught in the up-position. It may fall down suddenly at any moment.



AB801300A



WARNING

DO NOT LIFT PEOPLE ON FORKS

- Do not use the forks to lift people. If the person falls from the forks he/she may be seriously injured.



AB801310A

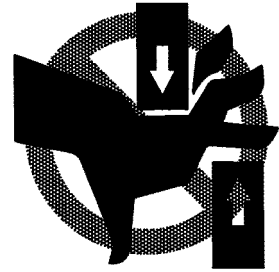
LOADING OPERATIONS



WARNING

BE CAREFUL NOT TO GET CAUGHT OR FALL

- **Never put your hands or feet into the mast structure.** There is danger that you will get caught in moving parts and be seriously injured.



AB801320

- Do not use the mast, load backrest or dashboard as a ladder or step. If you slip, there is danger that you will fall.



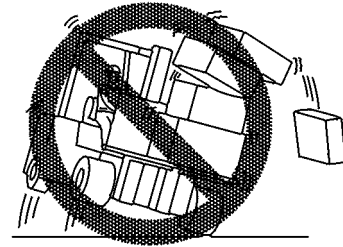
AB801330



WARNING

NO UNSTABLE LOADS

- Make sure that the center of gravity of the load is in line with the center of the lift truck. Do not carry loads off-center. There is danger that unbalanced loads may cause the lift truck to tip.
- Place the load so that it contacts the load backrest.
- Do not handle unstable loads. If there is danger that the load may fall off, secure it in position and take steps to prevent the load from collapsing or falling.
- When carrying stacked loads, tie with rope or otherwise secure it to prevent the load from falling.



AB801340



WARNING

OPERATE THE LIFT TRUCK FROM THE OPERATOR'S COMPARTMENT

- Always operate the mast and forks from the operator's compartment.
- *Do not* stand beside the lift truck and operate the levers, or operate the levers through the mast.



WARNING

DO NOT LOAD ABOVE HEIGHT OF LOAD BACKREST

- Keep the height of the load within the height of the load backrest.
- Do not carry any load that is higher than the load backrest. If the load is higher than the load backrest, there is danger that it will fall back on top of the operator.

This may lead to serious injury or death.



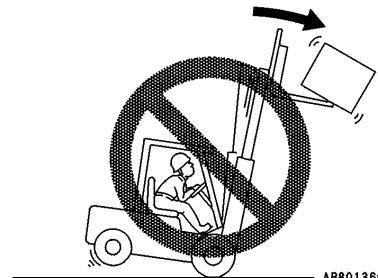
AB801350



WARNING

DO NOT TILT MAST FORWARD WHEN LOADED

- Do not tilt the mast forward when the forks are loaded and raised. There is danger that the load may fall and that the lift truck may tip.
- Do not travel with the mast tilted forward.
- Do not load and unload on slopes.



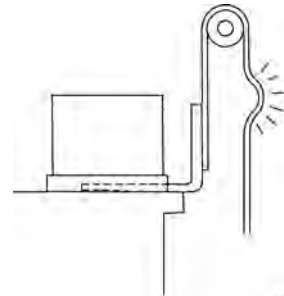
AB801360



WARNING

KEEP TENSION ON CHAIN

- If the mast rail or forks catch in a load or on a shelf, slack in the lift chain may be created, resulting in danger that the load may fall and the lift truck tip.
- Always be careful that there is no slack in the chain when pulling the forks out from a pallet or shelf.



AB801370



WARNING

LEVER OPERATION

- Be careful not to operate the lever by mistake or to operate the wrong lever. There is danger that the forks or work equipment may cause serious injury.
- Do not operate the levers when getting off the lift truck.

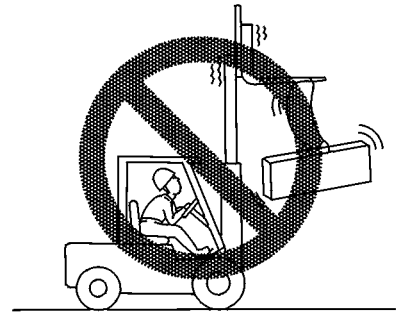
LOADING OPERATIONS



WARNING

USE ONLY FOR INTENDED PURPOSES

- Do not use the lift truck for anything other than the intended use (loading operations using the forks).
- Do not use the forks to open or close the doors of railroad cars or warehouses.
- Do not push any other vehicle.
- Do not hook ropes or cables on the forks and use the forks to lift loads.
- Do not use the drawbar pin for towing operations.



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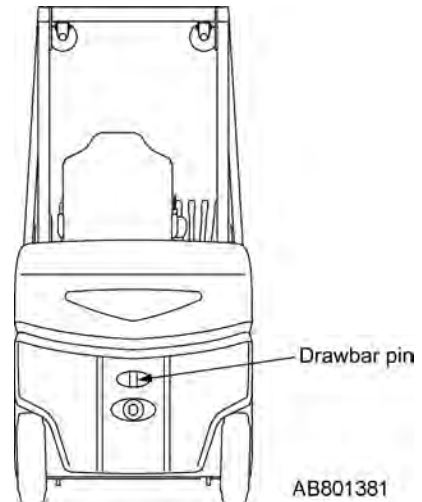


WARNING

USING DRAWBAR PIN

Do not use the drawbar pin for towing other lift trucks, for being towed by other lift trucks, or for lifting operations.

The drawbar pin installed to the rear of the counterweight is used only to free the truck when the tires have become stuck in mud or in a ditch and the lift truck cannot move, or when loading the lift truck on to a trailer or truck.



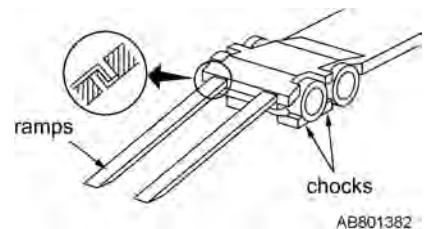
AB801381



WARNING

PRECAUTIONS WHEN LOADING / UNLOADING LIFT TRUCK

- Do not let anyone place a load on the forks.
- Do not let anyone remove a load directly from the forks.
- Standing on the forks is dangerous because the forks are slippery and the load may move.
- Do not use anyone to keep the load stable. The lift truck may move unexpectedly, causing the load to fall and crush the person.
- Improper loading or unloading of a lift truck may result in fall of the lift truck. To prevent this, strictly observe the following.
 - If you leave the operator's seat or have bad posture with no weight applied to the seat during work, the travel interlock is activated to shut off the power of the lift truck. This may cause slip down of the lift truck during uphill travel.
 - Select a level, firm place and avoid a place near a road shoulder or cliff.
 - Use ramps that are strong enough with proper length and width. Install ramps securely so that they do not move or come off.



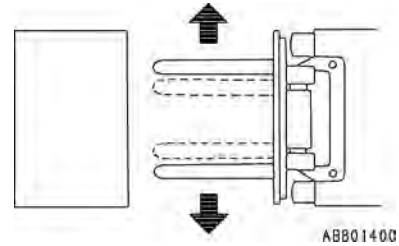
AB801382



WARNING

FIT FORKS SECURELY IN POSITION

- Adjust the position (spread) of the forks to match the size of the load.
- When adjusting the position (width) of the forks, be careful not to get your hands caught.
- After adjusting, check that the forks are held securely in position by the fork stopper. If the forks are not held in position, there is a danger that the forks may move when the lift truck is traveling and the load may fall off.



CAUTION

ADJUST CHAIN

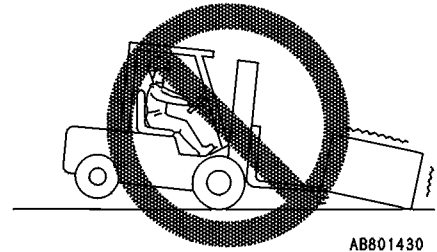
- Be sure the tension of the left and right chains is the same. If the tension is not the same, the load will be unbalanced even if it is loaded correctly in the center, and there is danger that the lift truck may tip.



WARNING

BE CAREFUL OF FORK TIPS

- Do not allow the tips of the forks to get close to people. The tips of the forks are pointed, so there is a risk that they may cause injury.
- Do not hook the tips of the forks under objects. If the forks slip out, there is danger that the lift truck or object may move unexpectedly.



WARNING

PEOPLE IN WORKING AREA

- Do not allow anyone except the signal person in the working area.
- Do not let any person or another lift truck come close during operation.
- When working with a signal person, always follow their instructions.



WARNING

USE STRONG PALLETS AND SKIDS

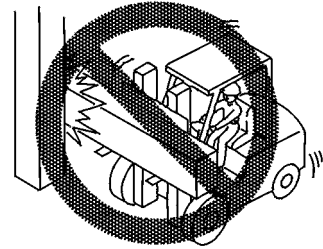
- Always be sure that the pallets and skids have ample strength. If broken or damaged pallets or skids are used, there is a risk that the load may fall.
- Always check that the load is positioned securely and safely on the pallet before driving the truck.



WARNING

HANDLING LONG OR WIDE LOADS

- Be extremely careful when carrying long or wide loads. Raise the load slowly and be careful not to touch anything in the surrounding area.
- Keep the load as low as possible and be sure to maintain the balance.
- When turning, operate slowly and be careful not to let the load move.



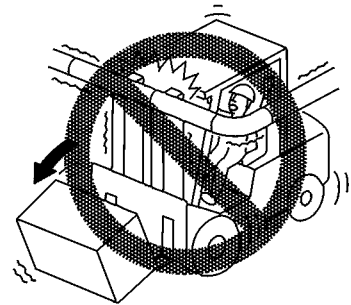
AB801440



WARNING

OVERHEAD OBJECTS

- Be careful not to let the mast, overhead guard or load contact electrical wiring, pipes, sprinklers or roof beams. If the truck hits such objects, there is a risk that the load will fall or the lift truck will tip.
- When the forks are raised, the mast height increases, so be particularly careful when the forks are raised.



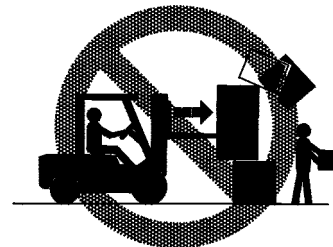
AB801450



WARNING

NO PUSHING

- Do not use the forks to push or pull loads. There is a risk that the load will be damaged or fall.



AB801460

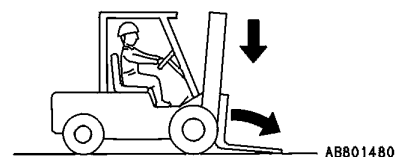
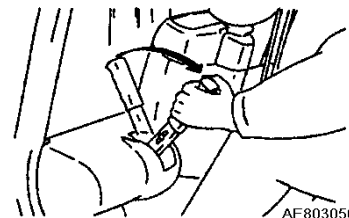


WARNING

PRECAUTIONS WHEN STOPPING OR PARKING

Observe the following procedure when stopping or parking the lift truck:

1. Stop the lift truck on level ground.
2. Apply the parking brake securely to make sure that the lift truck cannot move.
3. Set the directional lever and the speed lever to neutral.
4. Lower the forks to the ground.
5. Turn the key switch OFF to stop the engine.
6. Remove the key from the key switch. Then get off the lift truck.



WARNING

PARKING

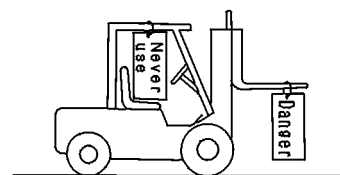
- Park the lift truck in the specified place.
- Park the lift truck on a firm surface.
- Do not park near any emergency exit, stairway, fire extinguisher or other safety equipment. Park the lift truck in a place where it will not obstruct pedestrians or other vehicles.
- Never park the lift truck near any flammable object.
- When parking the lift truck on a slope, park as specified above (PRECAUTIONS WHEN STOPPING OR PARKING), then put blocks under the tires to prevent the lift truck from moving.
- Do not park near any holes for construction or elevator shafts.



WARNING

PARKING MACHINE AFTER FAILURE

- If the lift truck has suffered a failure and the lift truck must be parked without lowering the forks, put markers on the tips of the forks and take steps to prevent pedestrians or other vehicles from hitting the forks.
- Select a parking place where people or vehicles do not pass, and stop the lift truck so that it is difficult for anyone to go under the forks. (The area under the forks is a DANGER zone).
- Place a stand or something similar under the inner mast rail or forks to prevent unexpected drop of the forks.
- Remove the key from the faulty lift truck and hang signs in the operator's compartment to prevent its use.



WARNING

ABRUPT LOWERING OF STUCK FORK

- Because a stuck fork may drop down unexpectedly, do not go under the fork when it is in this condition.
- Be very careful when dealing with this problem to prevent damage or injury, and warn those in the work area.



WARNING

USE QUALIFIED PERSONNEL FOR INSPECTION AND MAINTENANCE

- Only persons authorized by the owner or operator of the equipment and having proper certification (local or national) may carry out inspection, maintenance and repairs of the lift truck.
- If inspection, maintenance or repair work is carried out incorrectly, it is very dangerous.



WARNING

MAINTENANCE LOCATION

- When carrying out inspection and maintenance, use a level, dry, dust-free area.
- If the work is carried out inside a building, make sure that there is ample ventilation.



WARNING

PRECAUTIONS FOR INSPECTION AND MAINTENANCE

- To be prepared in the event of a fire, have a fire extinguisher nearby and make sure that you know how to use it.
- Before carrying out inspection, lower the forks to the ground and stop the machine.
- Before carrying out the check before starting, turn the key in the starting switch to the OFF position and stop the lift truck.
- Turn the starting switch OFF if the truck is not being used.
- Set the MAINTENANCE IN PROGRESS plate in a place in the operator's compartment or near the control panel where it is easy to see.
- Set the FORWARD/REVERSE lever and work equipment lever to the neutral position.
- Pull the parking brake lever and put blocks in front of and behind the tires.



WARNING

PRECAUTIONS WITH HIGH PRESSURE, HIGH TEMPERATURE OIL

- Immediately after using the lift truck, the oil is at high temperature. Do not drain the oil or replace the filter when the oil is hot. Hot oil may spurt out and cause burns.
- When carrying out inspection and maintenance, wait for the oil temperature to go down, and carry out the operation in the order given in this manual.
- Do not forget that the work equipment circuits are always under pressure. Do not add oil, drain oil or carry out maintenance or inspection before completely releasing the internal pressure.
- If oil is leaking under high pressure from holes, it is dangerous if the jet of high-pressure oil hits your skin or eyes. Always wear safety glasses and thick gloves, and use a piece of cardboard or a sheet of plywood to check for oil leakage.
- Release the internal pressure before checking the accumulator piping.
- If you are hit by a jet of high-pressure oil, consult a doctor immediately.

INCORRECT



CORRECT





WARNING

PRECAUTIONS WHEN CARRYING OUT INSPECTION AND MAINTENANCE

- Wipe off any oil or grease. Immediately wipe up any oil that has leaked. If the lift truck is dirty, it becomes difficult or impossible to find cracks or other problems. Always clean the lift truck before starting inspection.
- Do not smoke or allow any flame to exist under any circumstances.
- Do not use any cloth which is soaked in fuel, flammable solvent, oil or grease. There is danger that it may catch fire.
- Wear suitable clothes for the job.
- Use suitable safety and protective equipment (hard hat, safety boots, safety glasses, gloves) for the job.
- When working on top of the lift truck, be careful not to fall.
- Do not put your feet under the forks.
- When opening or closing the floor plate or engine hood, be careful not to get your hands or body caught.
- When carrying out inspection with the forks raised, insert a stand under the inner mast to prevent the forks and mast from dropping.
- When carrying out inspection work, remove the battery plug first.
- When carrying out the job with another worker, decide who is the leader and carry out the job in accordance with instructions from that person.
- After repairing, make sure that the trouble has been corrected by performing a trial run.
- During the trial run, start and operate the lift truck carefully because it is possible that the trouble has not been fully corrected or that defective parts have not been removed.



CAUTION

USE SUITABLE TOOLS

- Always use tools that are suited for inspection and maintenance.
- It is extremely dangerous to use broken tools or tools designed for another purpose.



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WARNING

REPLACE SAFETY CRITICAL PARTS PERIODICALLY

- Even if no abnormality is found, always replace safety critical parts periodically.
- As time passes, these parts deteriorate and may cause fire or failure in the work equipment system.
- However, if these parts show any abnormality before the replacement interval has passed, they should be repaired or replaced immediately.



WARNING

DO NOT PUT METAL OBJECTS ON TOP OF BATTERY

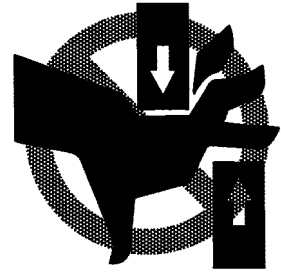
- Never place any metal objects on top of the battery. There is danger that they will cause a short circuit and start a fire.



WARNING

BE CAREFUL NOT TO GET CAUGHT OR FALL

- NEVER put your hands or feet into the mast structure. There is danger that you will get caught in moving parts and be seriously injured.



AB801320

- Do not use the mast, load backrest or dashboard as a ladder. If you slip, there is danger that you will fall.



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WARNING

HANDLING TIRES

Disassembly and assembly of tires should be carried out by a tire dealer.

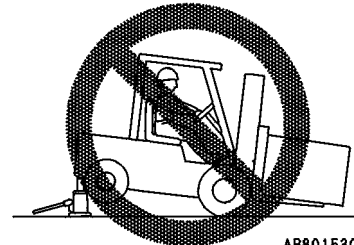
- When removing the tire from the truck, loosen the lug nuts (1), then remove the tire.
- When the tires have been replaced, carry out a test drive and check again for any loose mounting bolts. If the tightening torque is low, tighten to the specified torque.



WARNING

JACKING UP LIFT TRUCK (when checking or replacing tires)

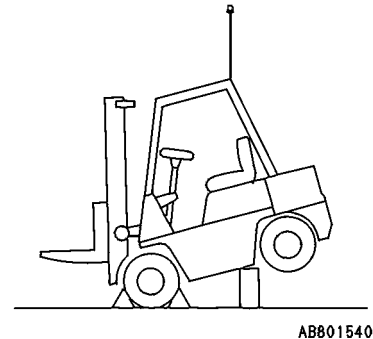
- Do not go under the fork lift truck when it is jacked up. Check the following before jacking up the lift truck.
 1. Check that there is no one on the lift truck.
 2. Check that there is no load on the forks.
- When jacking up, stop when the tires come off the ground surface. Put blocks under both sides of the frame to prevent the lift truck from coming down.
- Put chocks under any tires contacting the ground to prevent the lift truck from moving.



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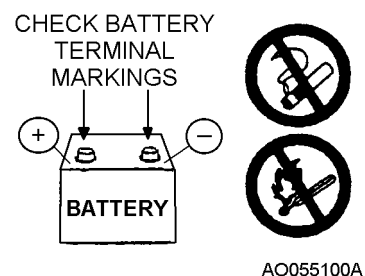
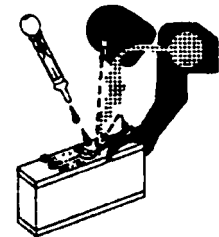
WARNING RAISING THE LIFT TRUCK (WHEN CHECKING TIRES)

- NEVER raise the truck by the overhead guard. If the truck has to be lifted frequently, it is necessary to install special lifting equipment, so please contact your Komatsu Forklift dealer.
- Fit wire ropes to the specified lifting points.
- When lifting the lift truck, check that the wire ropes have ample strength and are not damaged.
- Block the tires contacting the ground to prevent the lift truck from moving.
- Insert blocks to prevent the lift truck from coming down.
- Do not go under the lift truck during the lifting operation.
- If the specified lifting point is the counterweight, check that the counterweight mounting bolts are tightened to the specified torque before carrying out the lifting operation. Check also that there is no damage to the lifting portion on the counterweight.



WARNING BATTERY HAZARD PREVENTION

- Battery electrolyte contains sulfuric acid and can quickly burn the skin and eat holes in clothing. If you spill electrolyte on yourself, immediately flush the area with a large quantity of water.
- Battery electrolyte can cause blindness if splashed into the eyes. If electrolyte gets into your eyes, flush them immediately with large quantities of water and consult a doctor at once.
- If you accidentally drink electrolyte, drink a large quantity of water or milk mixed with beaten egg white or vegetable oil. Call a doctor or poison control center immediately.
- When working with batteries, ALWAYS wear safety glasses or goggles.
- Batteries generate hydrogen gas. Hydrogen gas is highly EXPLOSIVE, and is easily ignited with a small spark or flame. Do not smoke or create any spark near a battery.
- Before inspecting or handling batteries, turn the starting switch to the OFF position to stop the engine, then disconnect the battery plug.
- When removing the battery, remove the cable from the negative (-) terminal first. When installing the battery, install the cable to the positive (+) terminal first. This prevents possible sparks or arcing between the positive terminal and the positive cable.
- Avoid short-circuiting the battery terminals through accidental contact with tools or other metal objects across the terminals.
- Tighten the battery terminals securely. Loose terminals can generate sparks and lead to an explosion.
- When removing or installing the battery, confirm which is the positive (+) terminal and which is the negative (-) terminal. Be careful not to connect the cables to the opposite / incorrect terminals.
- Tighten the battery caps securely.
- When cleaning the battery, leave the battery caps tightened.
- If the battery plug is damaged or the screws are loose, there is danger of a short circuit. Always replace the battery plug with a new part.



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PRECAUTIONS WHEN CHARGING THE BATTERY

Hydrogen gas is generated as the battery charges and the battery is heated by the chemical change. To prevent the danger of gas explosion, always do as follows.

- Before carrying out charging, check that the battery electrolyte level is within the correct range. If the level is low, add distilled water immediately.
- Carry out the charging operation in a clean, dust-free, well-ventilated place.
- Start the charging operation when the temperature of the battery electrolyte is below 35 °C(95 °F). (If the temperature goes above 50 °C (122 °F) during the charging operation, wait for it to go down below 35 °C (95 °F) before starting charging operation again.)
- When using a battery charger to charge the battery, take the battery caps off.
- Explanations on battery charging in this manual apply to a genuine Komatsu Forklift battery charger. If you find any nonconformity in the explanations for your battery charger, contact your Komatsu Forklift dealer for proper operating methods.
- If your battery charger is not a genuine Komatsu Forklift charger supplied by another source, follow the specific operation manual for that battery charger.
- During charging, always open the battery bonnet and lock it.
- If the fuse for the battery charger is blown, always replace it with a genuine Komatsu Forklift fuse.
- Explosive gas is produced in the battery during charging. Keep flame away from battery.
- Clean the top of the battery and ensure it is kept dry. Confirm that the caps are closed. A dirty top will badly affect battery life.
- If the battery charger is used for a long time with remarkably deviated tap voltage at the power supply, the charger could burn out. Periodically check facility side voltage and adjust the tap voltage by selecting appropriate taps of power supply.
- Cables, receptacles and safety devices (circuit breaker or fuses) should have a capacity corresponding to maximum input current to battery charger. Insufficient capacity may cause fire. Maximum input current varies depending on battery charger. If the current value is unknown, contact your Komatsu Forklift dealer.
- When connecting and disconnecting the plug, always grip the plug body. Do not pull the cable to disconnect the plug as this may break the wires.
- Loosened connections between an outlet and plug, broken contact terminals, damaged power supply cable, etc., can cause a fire due to overheating.
- Thoroughly check for proper connection. If any fault is found, always repair it or consult your Komatsu Forklift dealer.
- Connect the plug directly to the appropriate outlet because a large amount of current flows during charging.
- Never use multiple connections to a single outlet nor use cables extended with couplings.



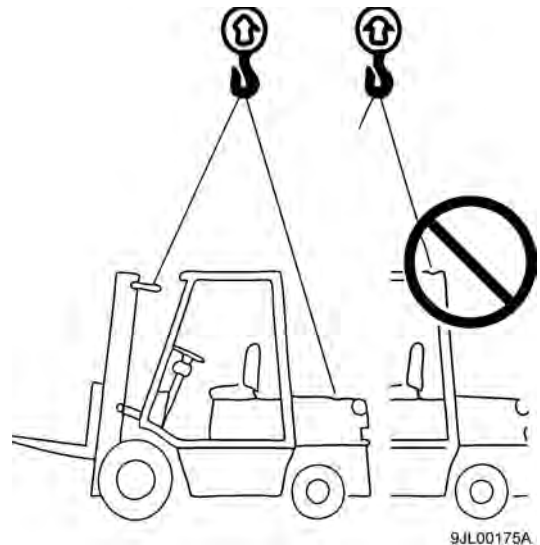
HANDLING BRAKE FLUID

It is dangerous if the brakes do not work because, in this condition, the lift truck cannot be stopped. Always do the following:

- Check the level of the brake fluid periodically.
- Always use the specified brake fluid.
- Check that the breather of the brake fluid reserve tank is not clogged.
- Be careful not to let dirt or dust get into the brake fluid reserve tank.

**WARNING****HOISTING THE LIFT TRUCK (WHEN LOADING TRAILER, ETC.)**

- Never hoist the lift truck by the overhead guard. If the truck has to be lifted frequently, it will be necessary to install special lifting equipment. Please contact your Komatsu Forklift dealer for additional information on purchasing and installing such equipment.
- Contact your Komatsu Forklift dealer before carrying out lifting operations with a lift truck equipped with an optional steel cab.
- Fit wire ropes to the specified lifting points.
- When lifting the lift truck, check that the wire ropes have ample strength and are not damaged.



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**WARNING****REPLACING A FUSE**

Do as follows when replacing a fuse:

1. Turn the starting switch OFF.
2. Disconnect the battery plug.
3. Replace the fuse.

**CAUTION****WASTE MATERIALS**

- Obey appropriate laws and regulations when disposing of harmful items and materials such as oil, fuel, solvent, filters and batteries.

INCORRECT

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STRUCTURE AND STABILITY OF THE LIFT TRUCK

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



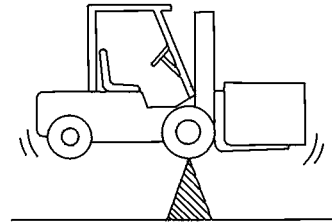
CAUTION

STRUCTURE OF LIFT TRUCK

A forklift truck consists basically of the lifting mechanism (the forks and mast) at the front and the lift truck itself (with tires) at the rear.

The front wheels of the lift truck act as the fulcrum, and the center of gravity of the lift truck and center of gravity of the load are kept in balance.

The relationship between the position of the center of gravity of the lift truck and the center of gravity of the load is extremely important for maintaining the safety of the lift truck.



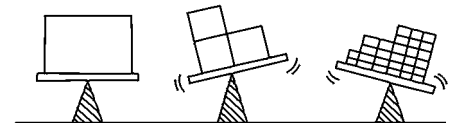
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CAUTION

CENTER OF GRAVITY OF LOAD

The loads carried by forklift trucks come in various shapes (and weights) from boxes to planks and long objects. To judge the stability of the lift truck, it is important to distinguish the position of the center of gravity for loads of various shapes.



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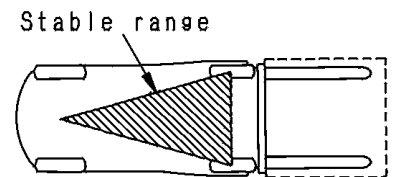


CAUTION

STABLE RANGE OF CENTER OF GRAVITY

For the lift truck to be stable, the position of the combined center of gravity must be inside the triangle (stable range of center of gravity) formed by the ground contact points of the left and right front tires and the center of the rear axle.

If the position of the overall center of gravity is in front of the front axle, the front tires will form the fulcrum and the lift truck will tip to the front. If the position of the combined center of gravity moves outside the triangle forming the stable area for the center of gravity, the lift truck will tip in the direction where the combined center of gravity moves outside of the triangle.



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CAUTION CENTER OF GRAVITY AND STABILITY

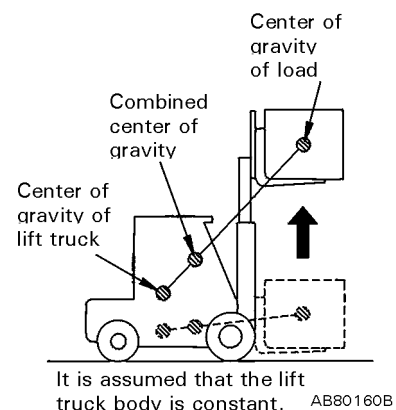
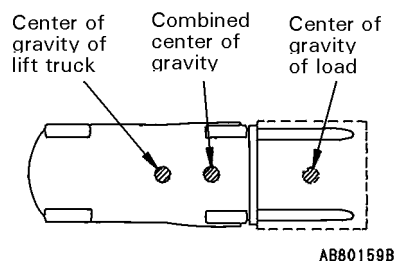
The stability of the lift truck is determined by the position of the combined center of gravity resulting from the combination of the centers of gravity of the lift truck and the load.

When the lift truck is carrying no load, the center of gravity remains as it is, but when the lift truck is loaded, the combined center of gravity becomes the combination of the centers of gravity of both the lift truck and the load.

The position of the center of gravity of the load changes according to whether the mast is tilted forward or back or whether the mast is raised or lowered.

The position of the combined center of gravity of the lift truck is governed by the following factors:

- Size, weight, shape of load
- Lifting height
- Tilting angle of mast
- Acceleration, deceleration, turning radius
- Condition of road surface, angle of road
- Type of attachments



CAUTION MAXIMUM LOAD (weight and center of gravity of load)

The horizontal distance between the center of gravity of the load on the forks and the load backrest of the forks, or the front face of the forks (whichever is shorter), is called the load center. The maximum load is the maximum weight of the load that can be loaded at the standard load center. The relationship between the maximum load and the load center is given in the load capacity charts on the nameplate on the lift truck. If the load center moves to the front of the forks, the overall center of gravity also moves to the front, so this means that the load must be reduced.



STRUCTURE AND STABILITY OF THE LIFT TRUCK

CAUTION ALLOWABLE LOAD

The allowable load is stamped on the nameplate to show the relationship regarding the position of the load center, the height of the fork and the maximum load. Before loading the forks, check that the load and load center are within the permitted range on the stamped allowable load.

If the shape of the load is complex, set it so that the heaviest part of the load is at the center of the forks and set the load close to the load backrest.

If the forks are loaded more than the allowable value, the drive wheels will float during travel and the steering system will not work. This is very dangerous. Furthermore, the lift truck will tip over easily under this condition. Therefore, be sure to keep the load below the allowable value and properly balanced.

MODEL		TYPE	
FRONT TIRE		SERIAL #	
REAR TIRE		TILT	

ATTACHMENT MODEL	A	B	C	CAPACITY	TRUCK WEIGHT
	mm	mm	mm	kg	kg
	in	in	in	lb	lb
	mm	mm	mm	kg	kg
	in	in	in	lb	lb
	mm	mm	mm	kg	kg
	in	in	in	lb	lb

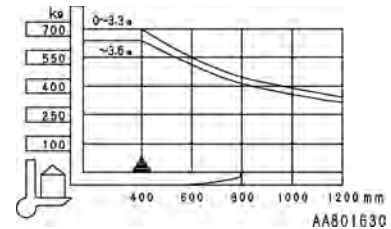
* CAPACITIES WITH ATTACHMENTS OR FORKS LISTED ABOVE ARE WITH UPRIGHT VERTICAL AND ARE SHOWN WITH THE LOAD LATERALLY CENTERED UNLESS OTHERWISE NOTED.

* THIS TRUCK MEETS ASME/ANSI B56.1.

	TRUCK WEIGHT WITHOUT BATT.	BATTERY WEIGHT MAX	MIN	BATT. CAPACITY AS
	kg	kg	V	
	lb	lb	lit	

CAUTION LOAD CAPACITY CHART

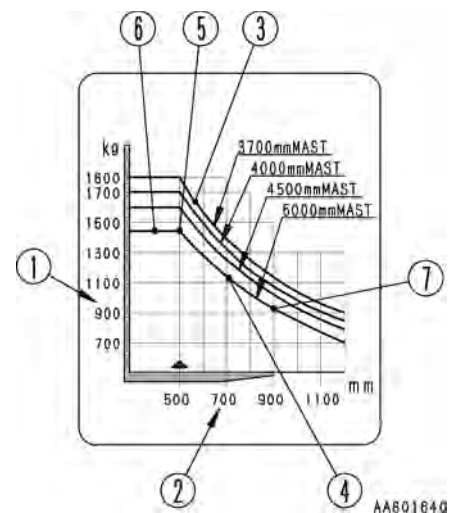
This shows the relationship between the position of the load center and the maximum load. Before loading the forks, check that the load and load center are within the permitted range on the load capacity chart. If the shape of the load is complex, set so that the heaviest part of the load is at the center of the forks and set the load close to the load backrest.



WARNING METHOD OF READING LOAD CAPACITY CHART

The load chart given here is an example. Always follow the load chart stuck to the truck when carrying out operation.

1. Permissible load
2. Distance from perpendicular front face of forks to center of load
3. Permissible load curve when a mast with a maximum lifting height of 5 m or less is installed
4. Permissible load curve when a mast with a maximum lifting height of more than 5.5 m up to 6 m is installed
5. Example: When the load center is 60 cm with a 6 m maximum lifting height mast installed, the permissible load is 4.4 tons.
6. Even if the load center is less than 60 cm, the permissible load (4.4 tons) does not change.
7. If forks are installed and the load center is 100 cm, the permissible load becomes approximately 3.2 ton.





WARNING

SPEED AND ACCELERATION

If a stationary object is not subjected to external force, it will remain stationary. In the same way, if a moving object is not subjected to external force, it will continue to move at the same speed. This is called inertia. Because of inertia, a force is applied towards the rear when the lift truck starts to move, and is applied towards the front when the lift truck stops. If the brakes are applied suddenly, there is danger of a large force being applied towards the front which may make the lift truck tip or the load come off the forks. When the lift truck is turned, a centrifugal force is applied to the outside from the center of the turn. This force pushes the lift truck to the outside and makes it tip. The range of stability to the left and right is particularly small, so it is necessary to reduce speed when turning, in order to prevent the lift truck from tipping. If the lift truck is traveling with a raised load, the position of the overall center of gravity is high, so the danger of tipping to the front, left or right becomes greater.



WARNING

HOW TO MOVE A DISABLED LIFT TRUCK

Use extra care when towing a lift truck if there is a problem with any the following;

- Brakes do not operate correctly.
- Steering does not operate correctly.
- Tires are damaged.
- Traction conditions are bad.
- The lift truck must be moved on a steep grade.

If the steering pump motor does not operate, steering control of the lift truck can be slow.

This can make the control of the lift truck difficult. If there is no power, there is no power steering.

DO NOT tow the lift truck if there is no power. Poor traction can cause the disabled lift truck or towing vehicle to slide. Steep grades will require additional brake force to stop the lift truck.

Never carry a disabled lift truck unless the lift truck **MUST** be moved and cannot be towed. The lift truck used to carry the disabled lift truck **MUST** have a rated capacity equal to or greater than the weight of the disabled lift truck. The capacity must be for a load center equal to half the width of the disabled lift truck. See the nameplate of the approximate total weight. The forks must extend the full width of the disabled lift truck. Center the weight of the disabled lift truck on the forks and be careful not to damage the under side of the lift truck.

How To Tow the Lift Truck:

1. The towed lift truck must have an operator.
2. Tow the lift truck slowly.
3. Raise the forks so there is ground clearance.
4. If another lift truck is used to tow the disabled lift truck, that lift truck must have an equal or larger capacity than the disabled lift truck. Install an approximate half-capacity load on the forks of the lift truck that is being used to tow the disabled lift truck. This half-capacity load will increase the traction of the lift truck. Keep the load as low as possible.
5. Use a towing link made of steel that attaches to the tow pins in the counterweights of both lift trucks.