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A MESSAGE TO HD HYUNDAI LIFT TRUCK OPERATORS

Lift trucks are specialized for machines with unique operating characteristics, designed to perform a specific job. Their function and operation are not like a car or ordinary truck. They required specific instructions and rules for safe operation and maintenance.

Safe operation of lift trucks is of primary importance to HD HYUNDAI.
Our experience with lift truck accidents has shown that when accidents happen and people are killed or injured, the causes are:

- Operator not properly trained
- Operator not experienced with lift truck operation
- Basic safety rules not followed
- Lift truck not maintained in safe operating condition

For these reasons, HD HYUNDAI wants you to know about the safe operation and correct maintenance of your lift truck.

This manual is designed to help you operate your lift truck safely.
This manual shows and tells you about safety inspections and the important general safety rules and hazards of lift truck operation. It describes the special components and features of the truck and explains their function. The correct operating procedures are shown and explained. Illustrations and important safety messages are included for clear understanding. A section on maintenance and lubrication is included for the lift truck mechanic.

The operator's manual is not a training manual. It is a guide to help trained and authorized operators safety operate their lift truck by emphasizing and illustrating the correct procedures. However, it cannot cover every possible situation that may result in an accident. You must watch for hazards in your work areas and avoid or correct them. It is important that you know and understand the information in this manual and that you know and follow your company safety rules!
Be sure that your equipment is maintained in a safe condition. Do not operate a damaged or malfunctioning truck. Practice safe operation every time you use your lift truck. Let's join together to set high standards in safety.

Remember, before you start operating this lift truck, be sure you understand all driving procedures. It is your responsibility, and it is important to you and your family, to operate your lift truck safely and efficiently.

△ Be aware that the Federal Occupational Safety and Health Act (OSHA) and state laws require that operators be completely trained in the safe operation of lift trucks; It is also an (OSHA) requirement that a machine inspection be performed before every shift. If you need training in operating or inspecting your lift truck, ask your supervisor.

HD HYUNDAI lift trucks are built to take hard work, but not abuse. They are built to be dependable, but they are only safe and efficient as the operator and the persons responsible for maintaining them. Do not make any repairs to this truck unless you have been trained in safe lift truck repair procedures and are authorized by your employer.

This manual describes procedures for operation, handling, lubrication, maintenance, checking and adjustment. It will help the operator realize peak performance through effective, economical and safe machine operation.

INTRODUCTION

HD HYUNDAI welcomes you to the growing group of professionals who own, operate and maintain HD HYUNDAI lift trucks. We take pride in the long tradition of quality products and superior value the HD HYUNDAI name represents. This manual familiarizes you with safety, operating, and maintenance information about your new lift truck. It has been specially prepared to help you use and maintain your HD HYUNDAI lift truck in a safe and correct manner.

Your HD HYUNDAI lift truck has been designed and built to be as safe and efficient as today's technology can make it. As manufactured, for some models, it meets all the applicable mandatory requirements of ANSI B56.1-1988 Safety Standard for Powered Industrial Trucks. Some trucks are also furnished with equipment to help you operate safely; for example, load back rest, parking brake and horn are standard equipment.

Safe, productive operation of a lift truck requires both skill and knowledge on the part of the operator. The operator must know, understand, and practice the safety rules and safe driving and load handling techniques described in this manual. To develop the skill required, the operator must become familiar with the construction and features of the lift truck and how they function, the operator must understand its capabilities and limitations, and see that it is kept in a safe condition.

Routine Servicing and Maintenance

Regular maintenance and care of your lift truck are not only important for economy and utilization reasons; it is essential for your safety. A faulty lift truck is a potential source of danger to the operator, and to other personnel working near it. As with all quality equipment, keep your lift truck in good operating condition by following the recommended schedule of maintenance.

Operator Daily Inspection - Safety and Operating Checks

A lift truck should always be examined by the operator, before driving, to be sure it is safe to operate. The importance of this procedure is emphasized in this manual with a brief illustrated review and later with more detailed instructions. HD HYUNDAI dealers can supply copies of a helpful Drivers Daily Checklist. It is an OSHA requirement.

Planned Maintenance

In addition to the daily operator inspection, HD HYUNDAI recommends that a planned maintenance(PM) and safety inspection program be performed by a trained and authorized mechanic on a regular basis.

The PM will provide an opportunity to make a thorough inspection of the safety and operating condition of your lift truck. Necessary adjustments and repairs can be done during the PM, which will increase the lift or components lifecycle and reduce unscheduled downtime and increase safety. The PM can be scheduled to meet your particular application and lift truck usage.

The procedures for a periodic planned maintenance program that covers inspections, operational checks, cleaning, lubrication, and minor adjustments are outlined in this manual. Your HD HYUNDAI dealer is prepared to help you with a Planned Maintenance Program by trained service personnel who know your lift truck and can keep it operating safely and efficiently.

Service Manual

In-depth service information for trained service personnel is found in Service Manual.

HOW TO USE THIS MANUAL

This manual is a digest of essential information about the safe operation, the features and functions and explains how to maintain your lift truck. This manual is organized into eight major parts:

Section 1. General Safety Rules, reviews and illustrates accepted practices for safe operation of a lift truck.

Section 2. Operating Hazards, warns of conditions that could cause damage to the truck or injury to the operator or other personnel.

Section 3. Know Your Truck, describes the major operating components, systems, controls, and other features of your truck and tells how they function.

Section 4. Daily Safety Inspection, presents details on how to perform the operator's daily safety inspection and refuel the lift truck.

Section 5. Operating Procedures, discusses specific instructions on the safe, efficient operation of your lift truck.

Section 6. Emergency Towing, gives instructions for towing your truck in an emergency and for using battery jumper cables to start your truck in an emergency.

Section 7. Planned Maintenance, describes the PM (Planed Maintenance) program.

Section 8. Specifications, provides reference information and data on features, components, and maintenance items.

※The descriptions and specifications included in this manual were in effect at the time of printing. HD HYUNDAI reserves the right to make improvements and changes in specifications or design, without notice and without incurring obligation. Please check with your authorized HD HYUNDAI dealer for information on possible updates or revisions.

The examples, illustrations, and explanations in this manual should help you improve your skill and knowledge as a professional lift truck operator and take full advantage of the capabilities and safety features of your new lift truck.

The first section of the manual is devoted to a review, with illustrations and brief messages, of general safety rules and the major operating hazards you can encounter while operating a lift truck. Next, you will find description's of the components of your specific lift truck model and how the instruments, gauges, and controls operate. Then, you will find a discussion of safe and efficient operating procedures, followed by instruction's on how to tow a disabled lift truck. The later sections of the manual are devoted to maintenance and truck specifications.

Take time to carefully read the Know Your Truck section. By acquiring a good basic understanding of your truck's features, and how they function, you are better prepared to operate it both efficiently and safely.

In Planned Maintenance, you will find essential information for correct servicing and periodic maintenance of your truck, including charts with recommended maintenance intervals and component capacities. Carefully follow these instructions and procedures.

Each major section has its own table of contents, so that you can find the various topics more easily.

We urge you to first carefully read the manual from cover to cover. Take time to read and understand the information on general safety rules and operating hazards. Acquaint yourself with the various procedures in this manual. Understand how all gauges, indicator lights, and controls function. Please contact your authorized HD HYUNDAI dealer for the answers to any questions you may have about your lift truck's features, operation, or manuals.

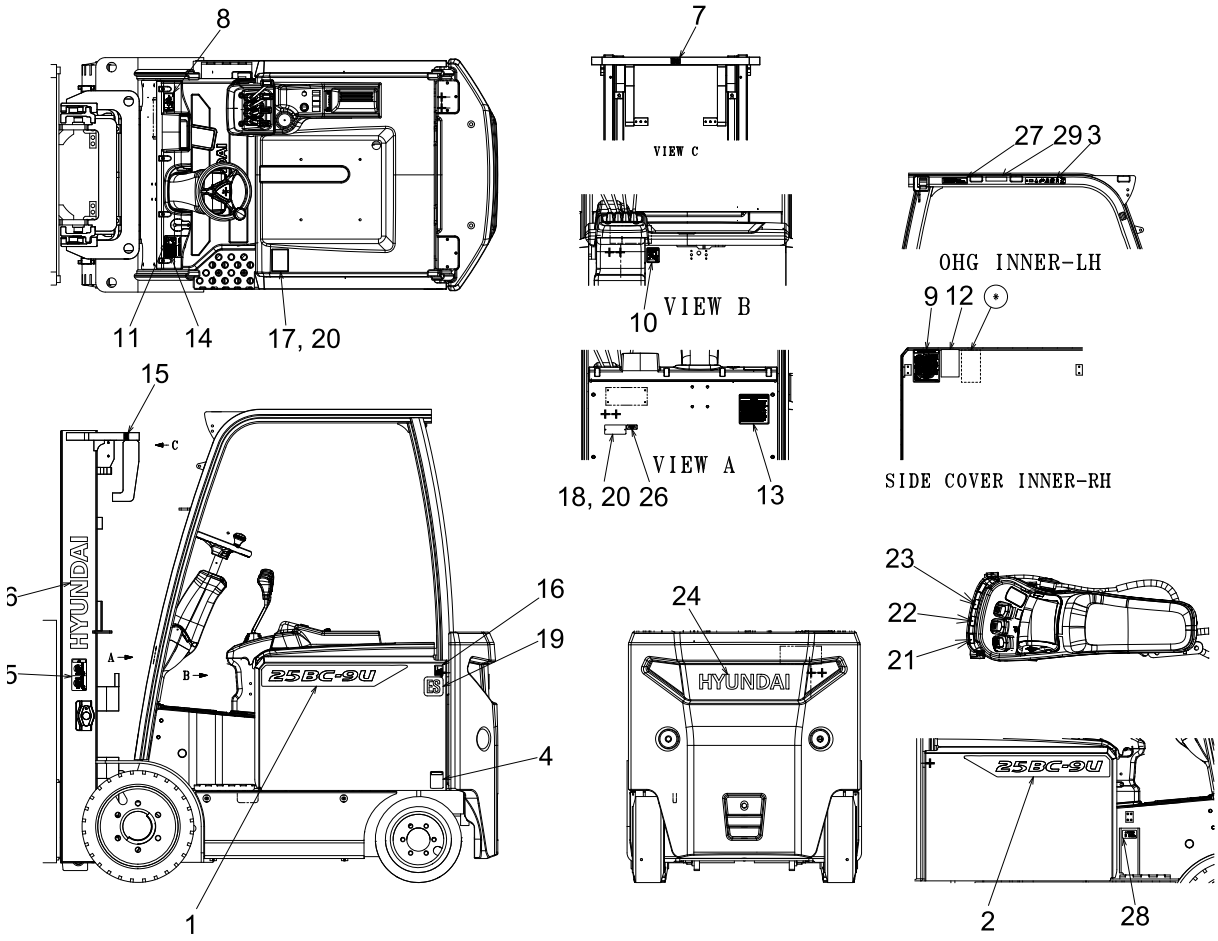
Operate your lift truck safely; careful driving is your responsibility.
Drive defensively and think about the safety of people who are working nearby. Know your truck's capabilities and limitations. Follow all instructions in this manual, including all symbols (⚠ △ ※) messages to avoid damage to your lift truck or the possibility of any harm to yourself or others.

This manual is intended to be a permanently attached part of your lift truck. Keep it on the truck as a ready reference for anyone who may drive or service it. If the truck you operate is not equipped with a manual, ask your supervisor to obtain one and have it attached to the truck. And, remember, your HD HYUNDAI dealer is pleased to answer any questions about the operation and maintenance of your lift truck and will provide you with additional information should you require it.

SAFETY LABELS

1. LOCATION

Always keep these labels clean. If they are lost or damaged, attach them again or replace them with new labels.



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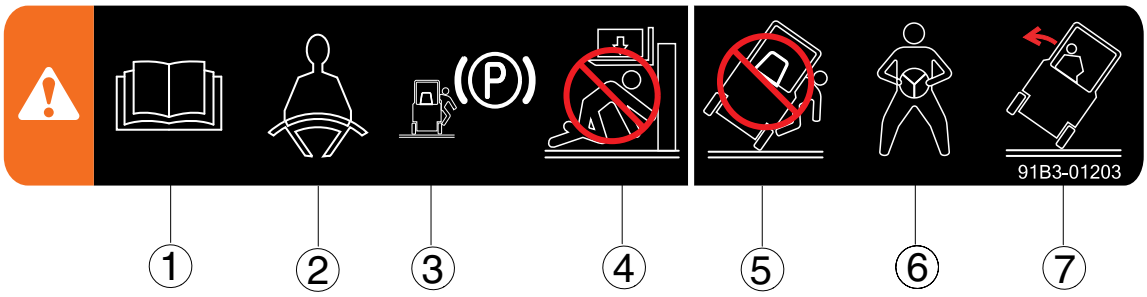
1	MODEL NAME	10	SEAT WARNING	19	EE or ES MARK
2	MODEL NAME	11	PARKING BRAKE	20	RIVET
3	WARNING O.H.G	12	BATTERY HANDLING	21	FORK LIFT
4	HANGER	13	SAFETY	22	FORK TILT
5	MAST WARNING	14	BRAKE FLUID	23	SIDE SHIFT
6	HYUNDAI LOGO	15	HOOK	24	HYUNDAI LOGO
7	HAND CAUTION	16	TEMPERATURE	26	EMC
8	START CAUTION	17	NAME PLATE	27	OHG LABEL
9	MAINTENANCE	18	UL LABEL	28	NO STEP

2. DESCRIPTION

There are several specific warning labels on this machine. Please become familiarized with all warning labels. Replace any safety label that is damaged, or missing.

1) WARNING O.H.G (ITEM 3)

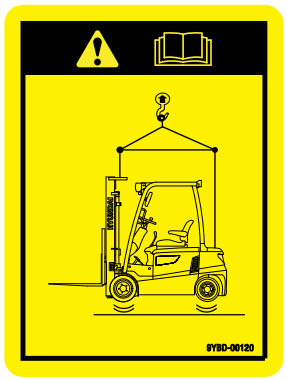
This warning label is positioned on the left top side of the over head guard inner side.



① Refer to operator's manual in detail.
② Always buckle up the seat belt for safety operation.
③ When the operator get off the machine, always pull the parking brake lever so that the machine can keep with stopping condition.
④ The people should not pass through under forks and other attachments which are lifted or being lifted.
⑤ Do not jump down from the machine. It can be caused that the operator have severe injury or death in the event of a tip over.
⑥ Outstretch the legs as widely as possible and grasp firmly the steering handle.
⑦ Learn the body to the opposite direction in order to avoid severe injury or death when the machine is tipped over.

2) HANGER (ITEM 4)

This warning label is positioned on the left rear side of side cover.



⚠ **Refer to page 1-21 for safe loading procedures.**

3) MAST WARNING (ITEM 5)

(1) This warning label is positioned on the both side of mast.

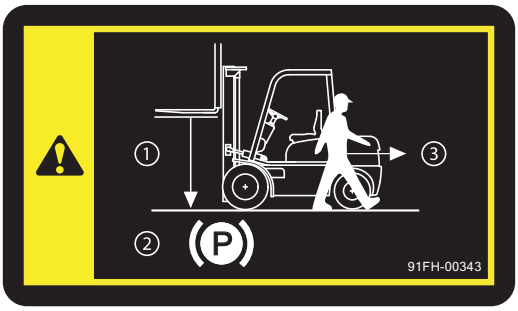
4) **HAND CAUTION** (ITEM 7)

This warning label is positioned on the top side of mast.

⚠ **It warns of the danger of injury from movement between rails, chains, sheaves, fork carriage, and other parts of the mast assembly. Do not climb on or reach into the mast. Personal injury will result if any part of your body is put between moving parts of the mast.**

5) **START CAUTION** (ITEM 8)

This warning plate is located on the right side of the dash board.



※ **Before leaving the operator's seat :**

- Be sure to lower the work attachment to the ground.
- Apply the parking brake.

6) **BATTERY HANDLING** (ITEM 12)

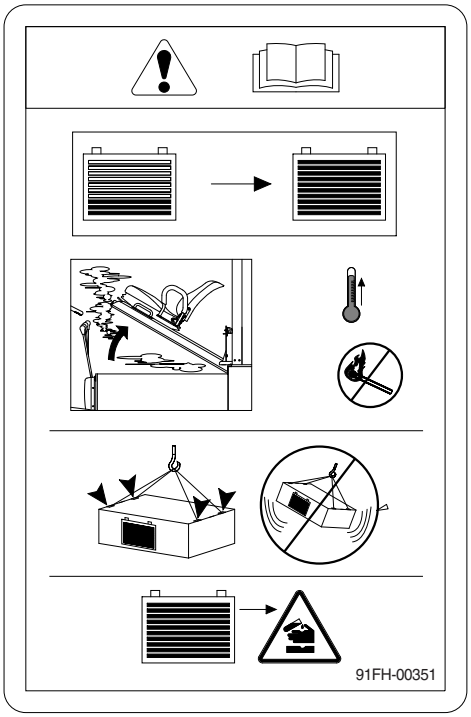
This battery handling is located on the bonnet.

⚠ **Refer to page 7-21 for a safe battery removal.**

※ Open the battery cover when charging. Battery being charged not only heat, but also inflammable hydrogen gas is produced. Keep fire away.

※ Hoisting the battery case, use 2 or 4 wires with hook and handle carefully, not to shock.

※ The electrolyte solution of battery is dilute sulfuric acid (H_2SO_4).
Be careful not to drop on clothes and mechanical parts.



7) SAFETY WARNING (ITEM 13)

This warning safety is located on the right side of the front frame.

8) BRAKE FLUID (ITEM 14)

This warning label is located on the left side of dashboard.

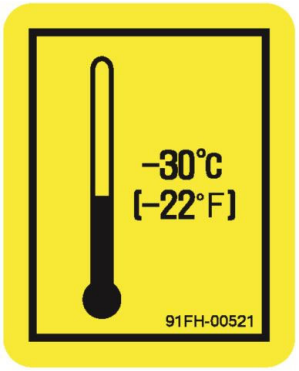
※ **Use only brake fluid ISO VG 32.**

9) HOOK (ITEM 15)

These HOOK labels are located at the top of each side of the mast.

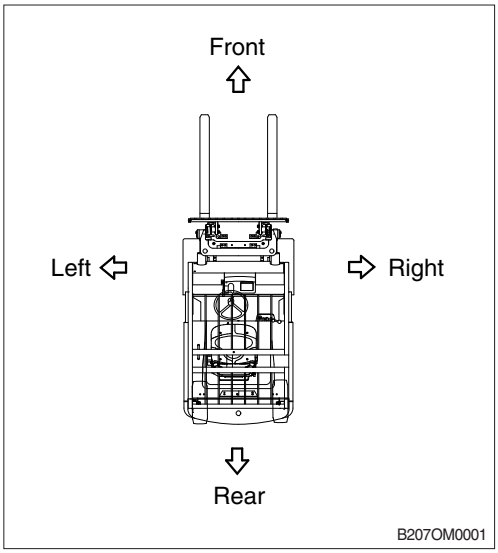
10) TEMPERATURE (ITEM 16)

This label is located on rear of the left side cover.



1. DIRECTION

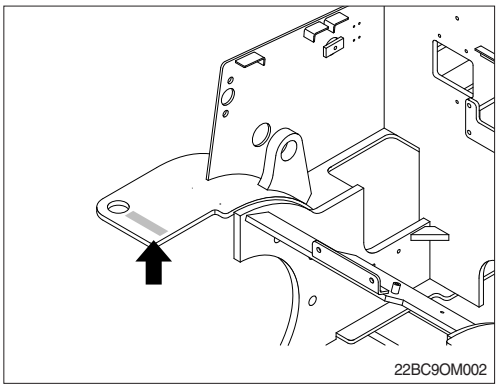
The direction of this machine indicate forward, backward, right and left when machine is in the travelling direction.



2. SERIAL NUMBER

Inform following when you order parts or the machine is out of order.

1) MACHINE SERIAL NUMBER
It's shown of the front-right side of the frame.



3. SYMBOLS

⚠ Important safety hint.

△ It indicates matters which can cause the great loss on the machine or the surroundings.

※ It indicates the useful information for operator.

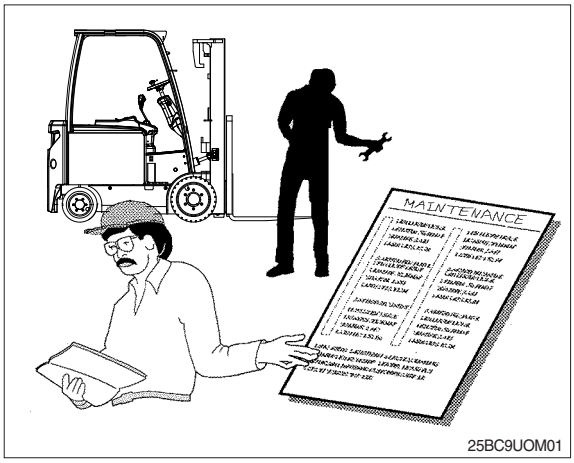
1. DAILY INSPECTION

At the beginning of each shift, inspect your battery fork lift truck and fill out a check, maintenance and lubrication table.

Check for damage and maintenance problems.

Have repairs made before you operate the battery fork lift truck.

Do not make repairs yourself. Fork ift truck mechanics are trained professionals. They know how to make repairs safely.



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2. DO'S AND DON'TS

Do watch for pedestrians.

Do wear safety equipment when required.

Don't mix drugs or alcohol with your job.

Don't block safety or emergency equipment.

Don't smoke in NO SMOKING areas or when charging.

Don't operate the truck outdoors in rainy day.

Don't perform battery charging service in the room without adequate ventilation.

Don't park the truck outdoors in rainy day in order to protect electric components.

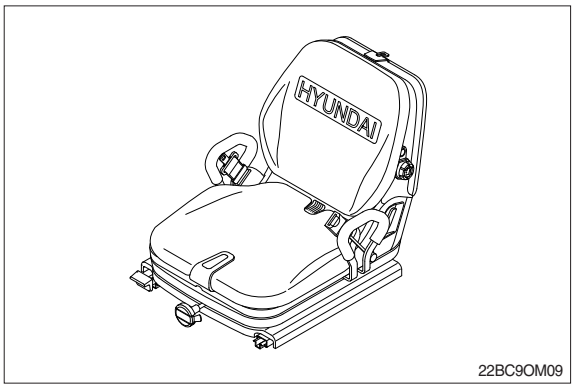
Don't splash water about electric components during truck washing.

⚠ UNAUTHORIZED MODIFICATION

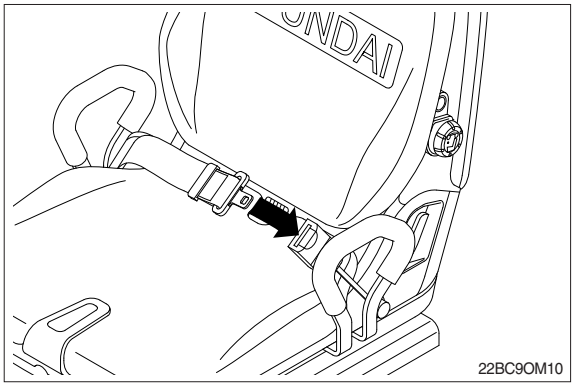
Any modification made without authorization from HD HYNDAI can create hazards.
Before making a modification, consult your HD HYUNDAI distributor.
HD HYUNDAI will not be responsible for any injury or damage caused by any unauthorized modification.

3. SEAT BELTS

⚠ Always buckle up for the machine equipped with safety belt.



⚠ Seat belts can reduce injuries.

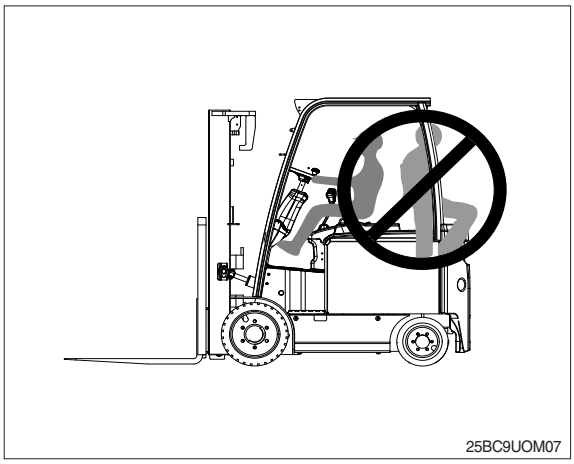


4. NO RIDERS

1) The operator is the only one who should be on a truck.

⚠ KEEP RIDERS OFF TRUCK

Riders on a truck are subject to injury such as being struck objects and being thrown off the truck.



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2) Never transport personnel on the forks of a lift truck.

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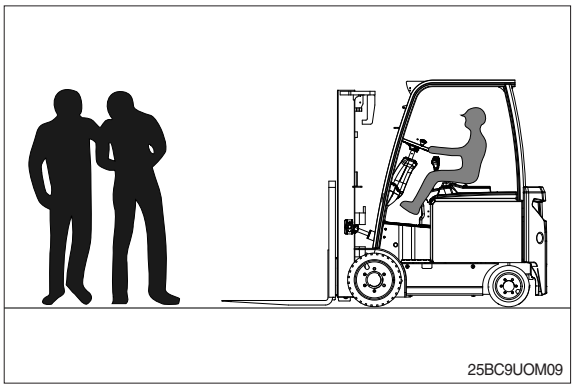
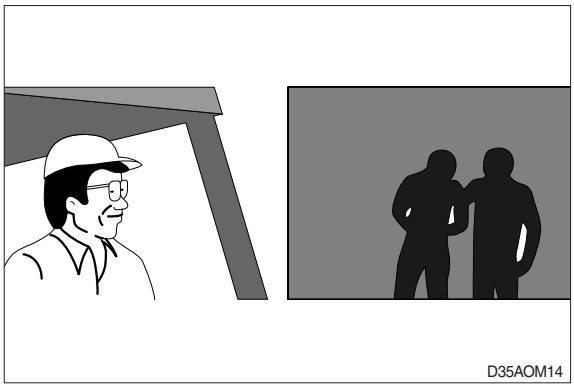
5. PEDESTRIANS

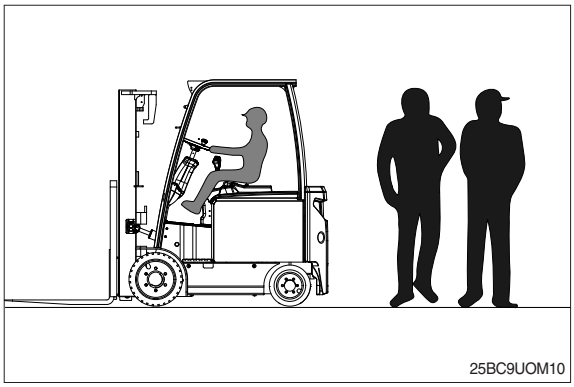
1) Watch where you are going. Look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots.



2) Watch for people in your work area even if your battery tractor has warning lights or alarms. People may not watch for you.

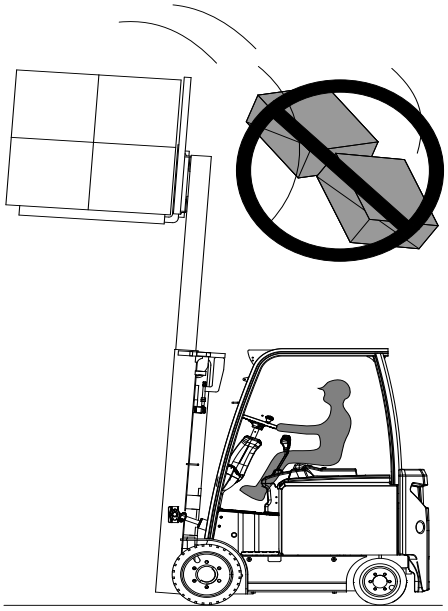


3) Make people stand back, even when you are parked.



6. OPERATOR PROTECTION

1) Keep under the overhead guard.
2) Always keep your body within the confines of the truck.



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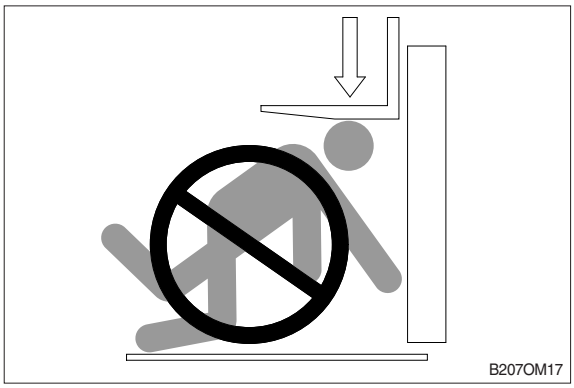
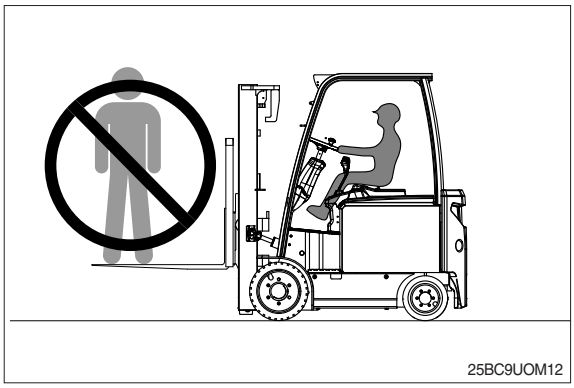
7. FORK SAFETY

Never allow anyone to walk under raised forks.

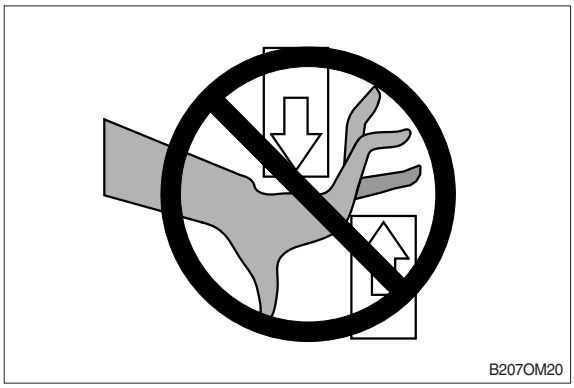


There is special equipment to raise people for overhead work.
DO NOT USE AS LIFT TRUCKS.



8. PINCH POINTS

⚠ Keep hands, feet and legs out of the mast.



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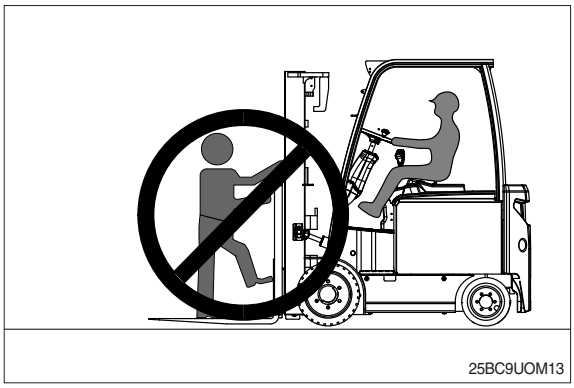
⚠ Don't use the mast as a ladder.



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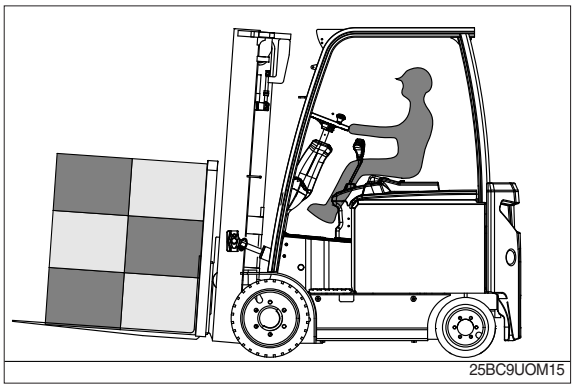
⚠ Never try to repair the mast, carriage, chain, or attachment yourself. Always get a trained mechanic.

25BC9UOM14

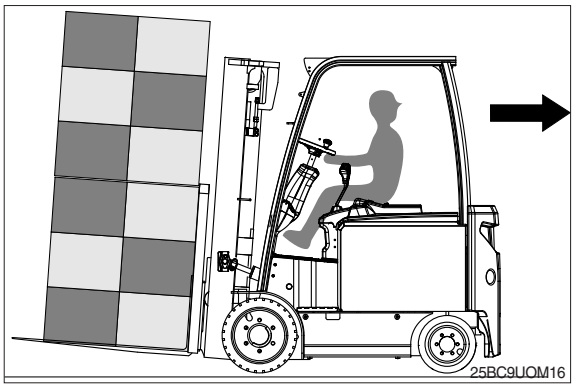
9. TRAVEL

1) Travel with the load near the floor/ground with mast tilted back to cradle the load whenever possible.

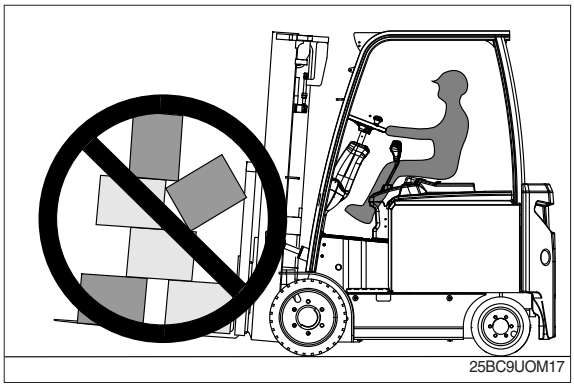
⚠ **Never lift or lower the load when the truck is in motion.**



2) When handling bulky loads that restrict your vision operate your truck in reverse to improve visibility. Be sure to pivot in the seat to give maximum visibility.



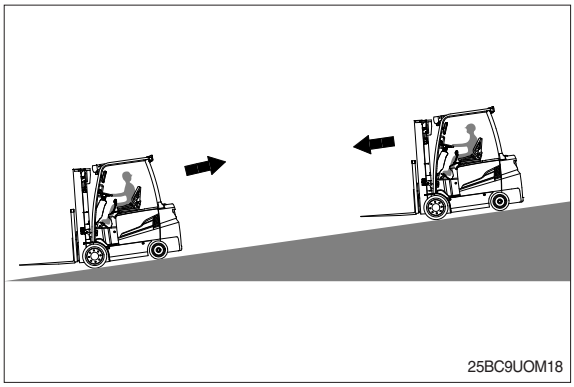
3) Unstable loads are a hazard to you and to your fellow workers. Always make certain that the load is well stacked and evenly positioned across both forks. Never attempt to lift a load with only one fork.



10. GRADES, RAMPS, SLOPES AND INCLINES

⚠ Never turn on a grade, either loaded or unloaded.

1) **UNLOADED** - Forks downgrade



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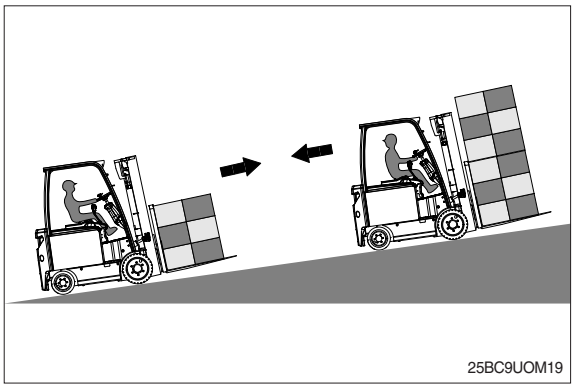
2) **LOADED** - Forks upgrade



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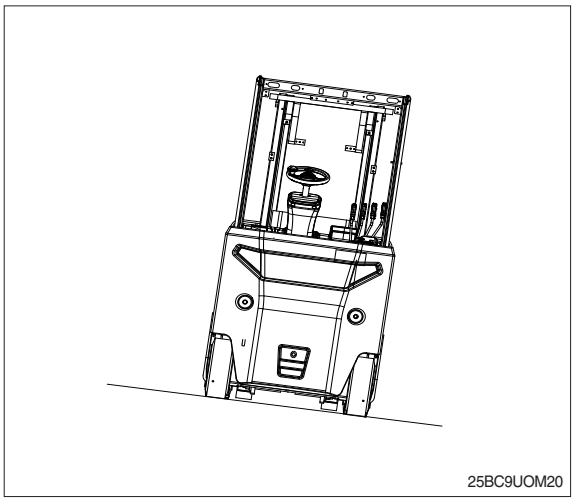
11. TIP OVER

1) LATERAL TIP OVER

(1) Lateral tip over can occur with a combination of speed and sharpness of turn. This combination will exceed the stability of the truck. This condition is even more likely with an unloaded truck.

(2) With the load or mast raised, lateral tip over can occur while turning and/or braking when traveling in reverse or accelerating and turning while traveling forward.

(3) Lateral tip over can occur loaded or unloaded by turning on an incline or ramp.



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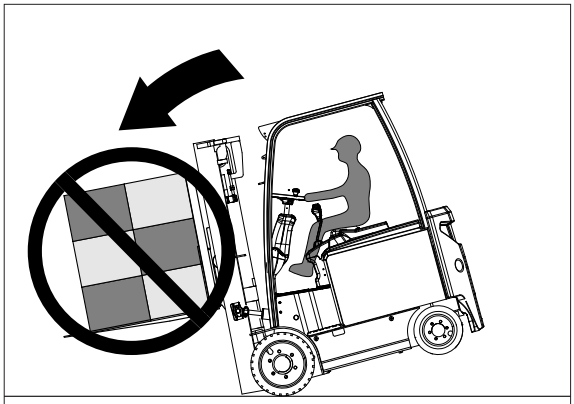
2) LONGITUDINAL TIP OVER

(1) Longitudinal tip over can occur with combination of overloading and load elevated also with capacity load and elevated. This combination will exceed the stability of the truck. This condition is even more likely with excessive forward tilt, braking in forward travel or accelerating rearward.

(2) Longitudinal tip over can occur by driving with the load down slope on a steep grade.

Lateral and longitudinal tip over can occur if the truck is driven over objects on the floor or ground, off the edge of improved surfaces, or into potholes in the road surface, or by running into overhead objects or collisions.

An off dock type of tip over can occur if the truck is steered too close to the dock edge, driven off the edge of the dock or ramp, or if the highway truck or trailer rolls away from the dock or is driven away during loading.



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⚠ The conditions listed above can be further aggravated by overloading, excessive tilt, or off center loads.

⚠ Lift truck tip over can cause serious injury or death if the operator is trapped between the truck and the ground.

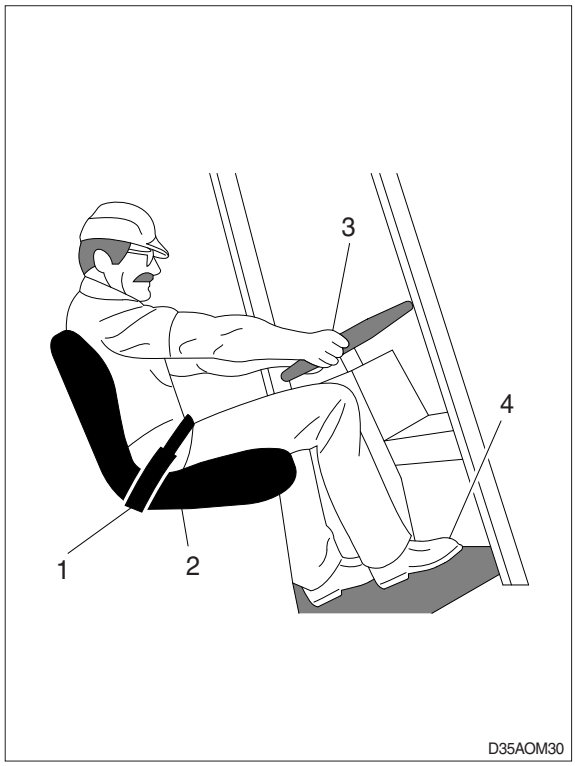
3) WHAT TO DO IN CASE OF A TIP OVER

⚠ If your truck starts to tip over, Do not jump.

⚠ Brace yourself as illustrated right.

1 Make sure your seat belt is fastened securely, if the truck is equipped with seat belt.
2 Stay in your seat.
3 Grip the wheel.
4 Brace your feet.

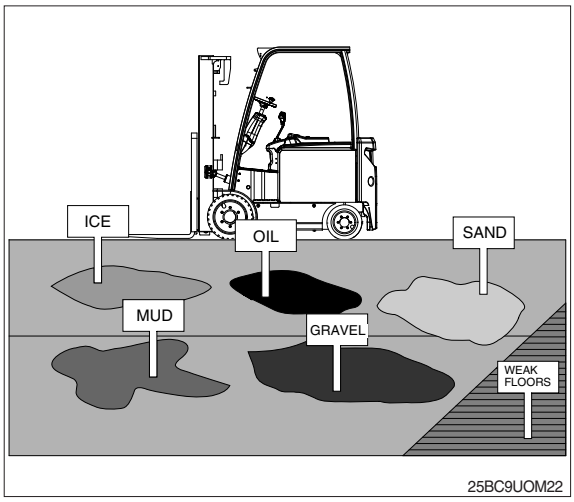
⚠ Your chances for survival in a tip-over are better if you stay with the truck, in your seat.



12. SURFACE AND CAPACITY

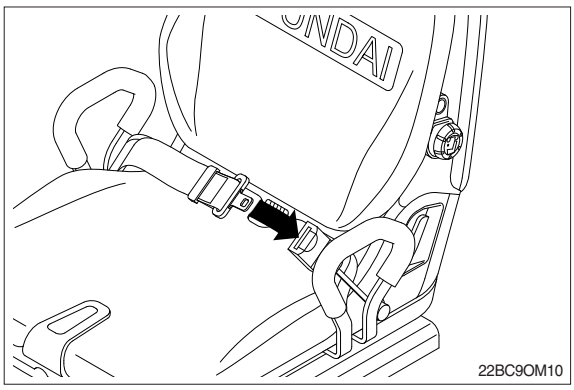
Avoid these conditions. They can cause a truck to tip over or lose traction for braking or driving.

⚠ **Know the weight of your truck and load. Especially when using elevators, know the capacity of the elevator you intend to use. Do not overload.**



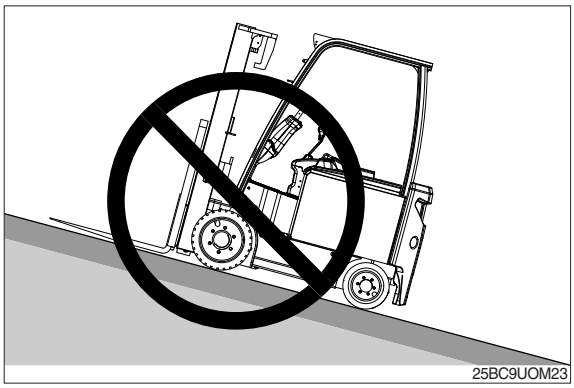
TIP OVER

⚠ **Seat belts can reduce injuries. ALWAYS BUCKLE UP**

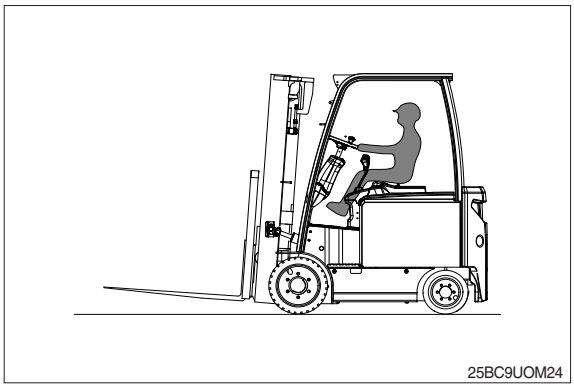


13. PARKING

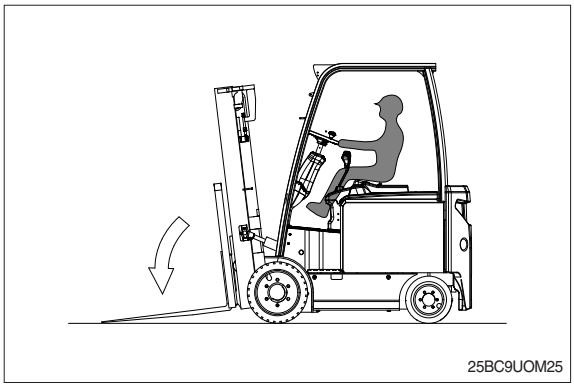
1) Never park on a grade.



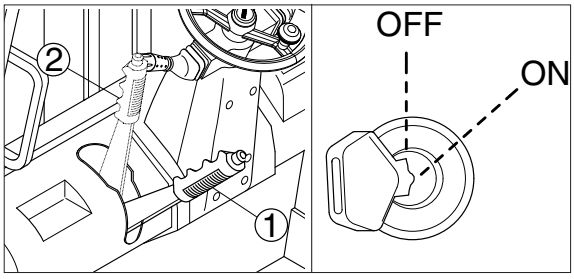
2) Always come to a complete stop before leaving truck. Be sure travel control is in NEUTRAL.



3) Lower forks fully to floor and tilt forward.



4) Set parking brake.
   Position ① : Lock
   Position ② : Release
5) Turn key to OFF position.



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14. LIFTING, JACKING AND BLOCKING

⚠ Lifting or jacking any large piece of equipment such as forklift truck presents obvious hazards. It must be done with great care and forethought.

1) SAFE PARKING

Before working on truck :

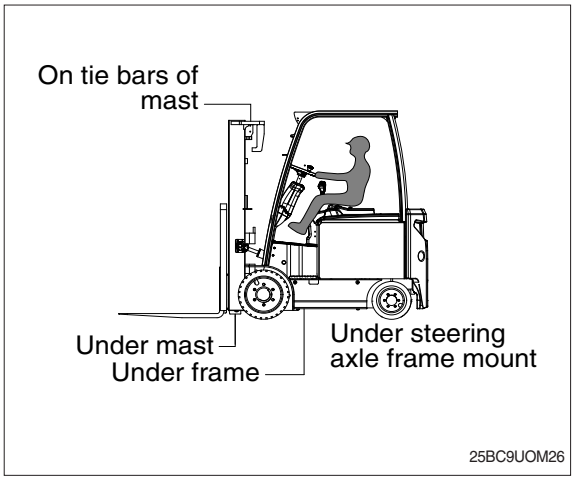
(1) Park truck on a hard, level and solid surface, such as a concrete floor with no gaps or breaks.
(2) Put mast in vertical position and fully lower the forks or attachment.
(3) Put all controls in neutral. Turn key switch OFF and remove key.
(4) Apply the parking brake and block the wheel.

⚠ Defective equipment can cause accidents. All tools and lifting equipment must be in good condition, meet the load capacity requirements and have OSHA labels when required. Tools with defects have failures cause severe injury or death.

2) LIFTING, BLOCKING AND JACKING POINTS

Use the following illustration to locate general lifting, blocking and jacking points on the truck. Read the procedures for raising, blocking or jacking specific components of the truck to make sure you understand the correct, safe procedures.

⚠ Do not attempt to lift the truck by the overhead guard.
Severe injury may result and the truck can be damaged.

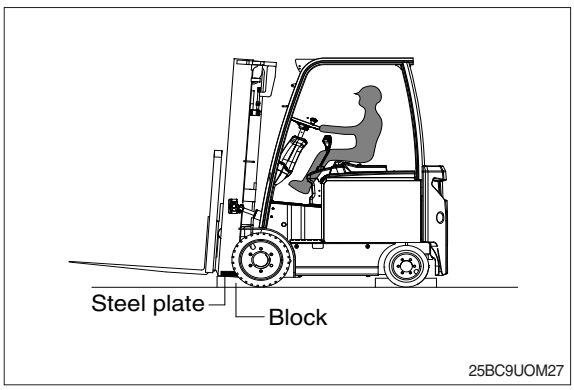


3) RAISING DRIVE WHEELS OFF FLOOR

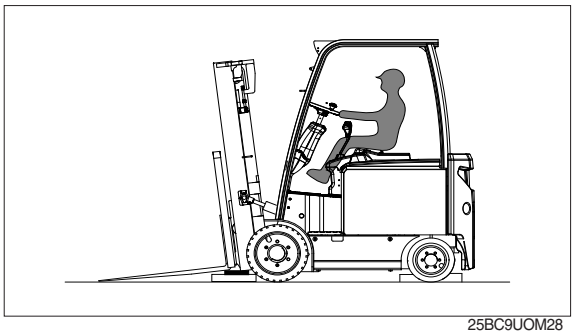
This procedure uses the mast as a lever to lift the drive wheels off the floor and prevent accidents due to inadvertent powering of the drive wheels.

(1) Park truck safely as described in "Safe Parking". Block rear steer wheels.
(2) Be sure mast trunnion bolts are tight.
· 25.2~34.2 kgf·m (182~247 lbf·ft)

(3) Turn the key switch ON. Tilt the mast fully back. Adjust upright height as necessary to put blocking underneath the lower end of the mast.
(4) Put a solid 100 mm (4 in) hardwood block under the front section of each mast rail. Put a 3~6 mm (0.125~0.250 in) steel plate on top of each block.



(5) Tilt mast fully forward. This raises the drive wheels off the floor. Release the tilt control lever and turn the key switch OFF.



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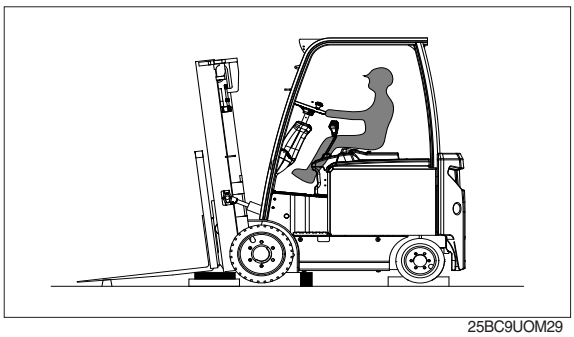
(6) Insert blocking under the frame behind the drive wheels or slip wheel cradles under the drive wheels. If using blocking, check for safe clearance between drive wheels and floor and blocks.

※ **When forks are raised as in illustration above, use shop rags, paper, or bright tape on fork tips to signal the danger of tripping.**



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(7) Check for stable condition of the truck. Be sure that the blocks are located securely under the truck frame before operating the drive or working on truck.

(8) Lower the drive wheels to the floor and remove the blocks by reversing the above procedure.

4) RAISING TRUCK WITH A HOIST

When suitable equipment is available, the front of the truck may be raised by means of a hoist, with wheel cradles placed under the wheels or blocking placed under the frame.

△ **When lifting the front of the truck, watch truck for signs of lateral instability. It may tip sideways. You may have to support or guide the side of the truck or overhead guard to prevent tipping.**

(1) Park truck safely as described in "Safe Parking". Block rear steer wheels.

(2) Check trunnion bolts to make sure they are tightened to correct torque.

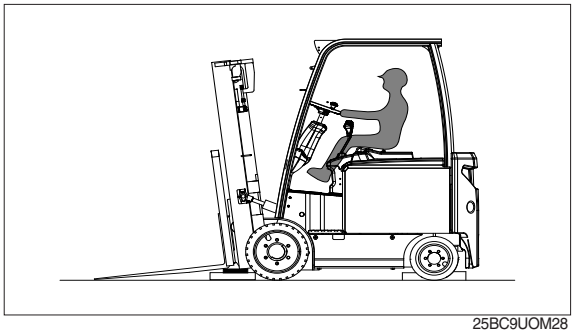
· 25.2~34.2 kgf·m (182~247 lbf·ft)

(3) To raise the front of the truck using the mast, spread two chains on the outer rail tiebar the mast.

⚠ **Chain and hoist used to lift truck should be checked to make sure they are of safe lifting capacity. See the truck data plate for information.**

(4) Slowly lift truck and lower drive wheels onto the cradles or place blocking under frame prop points.

(5) When maintenance work is completed, lower the truck to the floor by reversing the lifting procedure. Check to be sure no tools or equipment are under the truck or wheels.



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5) BLOCKING THE MAST IN RAISED POSITION

This procedure is used to safely provide clearance for access from the front of truck to components on or near the drive axle. Illustrations show mast with forks removal.

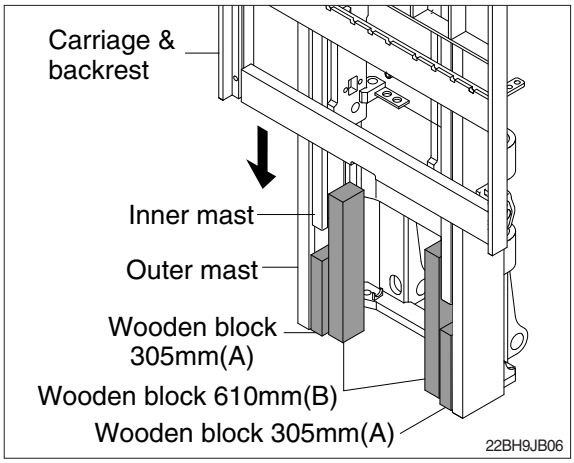
(1) Fork removal is not necessary.
(2) Park truck safely as described in "Safe Parking".
(3) Put blocks in front of and behind drive wheels.
(4) Put wooden support blocks conveniently near mast rails before raising the mast.
(5) Use both 305 mm (12 in) and 610 mm (24 in) length wooden blocks at V-mast, as shown.

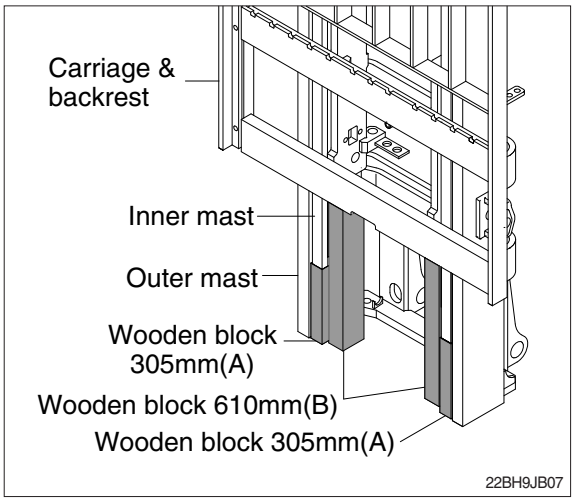
※ **In case of V-mast, support inner mast and carriage at the same time.**

※ **In case of V-mast, when you lift or lower the carriage, the lifting speed of carriage is 2 times faster than inner mast.**

(6) Start truck and raise the mast carriage.
(7) In case of V-mast, put the wooden block (A) below inner mast and put the wooden block (B) below carriage. Afterward lower the carriage until carriage and inner mast sit on the both block simultaneously.

V-MAST (Double stage mast)





(8) Two 915 mm (36 in) length wooden blocks are used in TF-mast, as shown.

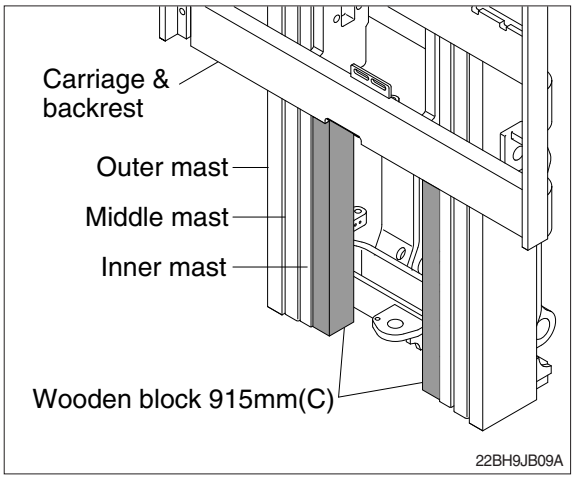
※ **Carriage support in TF-mast.**

(9) Start truck and raise the carriage.
(10) In case of TF-mast, put the wood block (C) below carriage side arms and then lower the carriage until carriage sits on the blocks.

⚠ **In case of TF-mast until carriage reaches the free lift height middle mast and inner mast don't move at all.**

(11) Reverse the procedure to remove blocking.

TF-MAST (Triple stage mast)



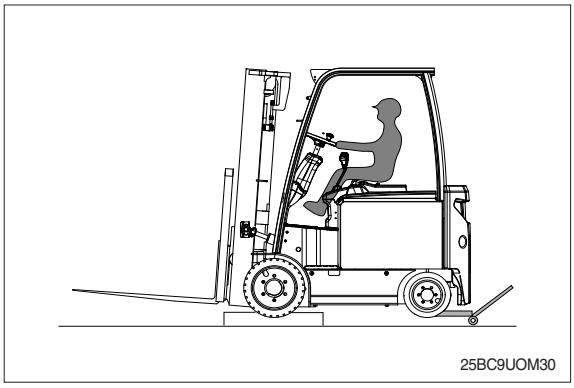
6) RAISING REAR OF TRUCK

The truck may be raised at the rear by jacking and blocking under the center of the frame member at either the front or rear steer axle mounting, or under the center section of the steering axle.
Refer to truck data plate for truck weights.

(1) Park truck safely as described in "Safe Parking". Put blocks at front and rear or drive wheels.

(2) Put a floor jack under the steering axle mounting frame member, centered between the two wheels.

※ **If there is insufficient clearance under frame for your jack, the truck may first be driven onto shims, to increase the ground clearance.**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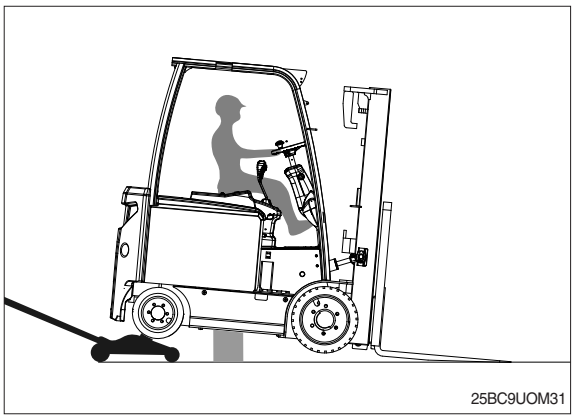
(3) Raise the truck only as high as necessary to perform the maintenance work.

(4) Put blocks at both sides of the truck, fully under the frame main side structure. Put the blocks in front of butt close to the counterweight and rear wheels for the best truck stability.

(5) Put an equal amount of blocks under each side of the truck to provide a level working position.
Lower the truck onto the blocks and remove the jack.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△ **Before performing any maintenance work, check the truck for stable condition on the blocking.**

(6) When maintenance work is completed, lower the rear side of the truck to the floor by reversing the above procedure and lowering each side of the truck 50 mm (2 in) at a time :
·Put jack under frame and raise truck.
·Carefully remove blocks and lower truck.
·Remove jack and blocks from drive wheels.

7) RAISING ENTIRE TRUCK

Refer to truck data plate for truck weights.

(1) Park truck safely as described in "Safe Parking". Lower mast fully.

(2) If necessary, drive truck onto boards to increase ground clearance.

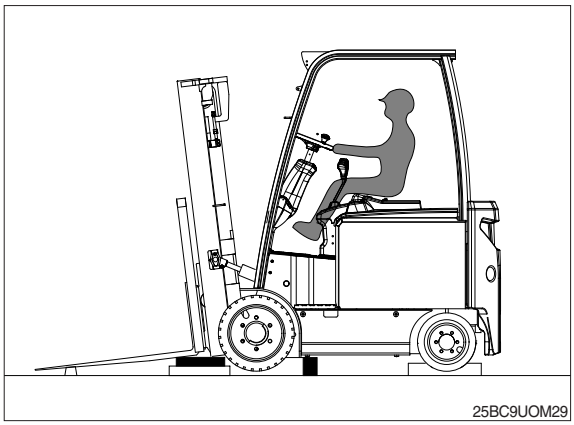
⚠ **LATERAL TIP OVER. When jacking side of truck, be sure mast is lowered fully and do not raise one side of the truck more that about 50 mm (2 in) higher than the other, to avoid tipping truck over laterally.**

LONGITUDINAL TIP OVER. If the mast and the transaxle are removed while the truck is blocked up, the truck will tip backwards due to the heavy counterweight. Both mast and counterweight must be removed before attempting to raise the truck for transaxle removal. The back of the truck must be supported by blocking under the steer axle to prevent movement.
The reverse is also true. If the counterweight is removed while the truck is up on blocks, the weight of the mast and transaxle will cause the truck to tip on the front blocks and forward.

(3) Put the jack under side frame near the center of the truck.

※ **Be sure to put the jack squarely and fully under the main side structure of the frame. Do not put the jack under the outer covers which enclose the fuel and hydraulic sump tanks.**

(4) Carefully raise the truck one side at a time, only as high as necessary to do the maintenance work and more than a maximum of 150 mm (6 in) total.



(5) Put blocks under the side frame at each side of the jack. Spread the blocks close to the steer and drive wheels for maximum stability.

(6) If using one jack, lower the truck onto the blocks and move the jack to the opposite side. Repeat the lifting procedure.

(7) Put the same size blocks under each side of the truck so it will be level.

△**Be sure to put the jack squarely and fully under the main side structure of the frame. Do not put the jack under the outer covers which enclose the fuel and hydraulic sump tanks.**

(8) When maintenance work is completed, lower the entire truck to the floor by reversing the lifting procedure. Lower the truck one side at a time, while carefully removing the blocks. Check to be sure no tools or equipments are under the truck or wheels.

※ **Depending on jack height, shims under the tires may be needed for clearance to allow removal of jack.**

8) SHIPPING TIE-DOWN INSTRUCTIONS

(1) Front of Truck

① With mast and Carriage Installed

a. Lower the carriage fully.

b. Put a tie down (e.g., chain) between the carriage fork bars.

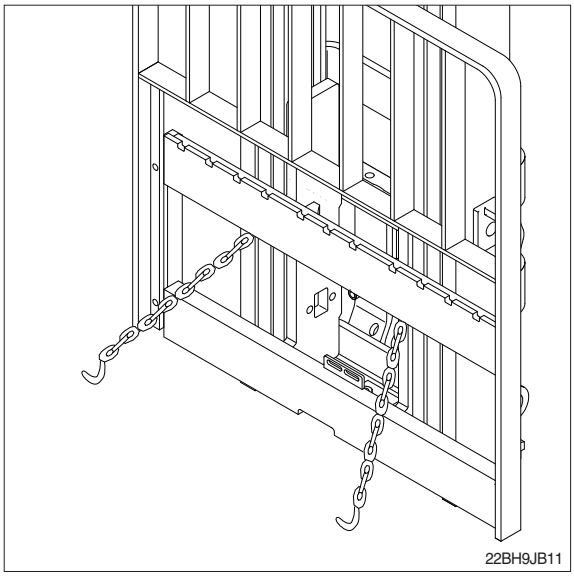
② Without a mast and Carriage Installed

a. Put a chain across the truck floor plate.

※ **Protect truck from chain damage by using covered chain or protective material under the chain at contact points.**

(2) Rear of Truck

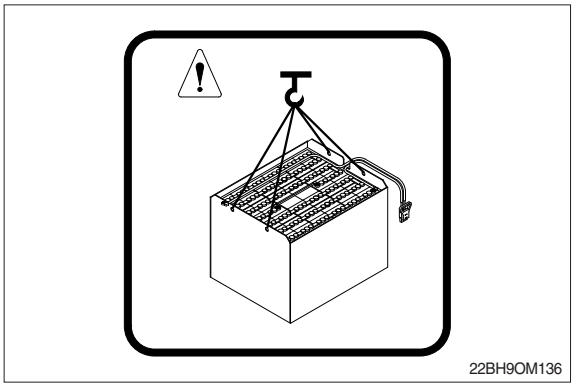
① Attach the tie down to pocket in bottom of counterweight.



15. LOADING AND UNLOADING BY CRANE

1) Check the specification of the truck when you are going to hoist the truck.

⚠ **Before loading the truck, battery must be removed. Refer to page 7-21 for a safe battery removal.**



2) Use long wire rope and stay to keep the distance with the machine as it should avoid touching with the truck body.

3) Place crane on the proper place.

4) Install the wire rope and stay like the illustration.

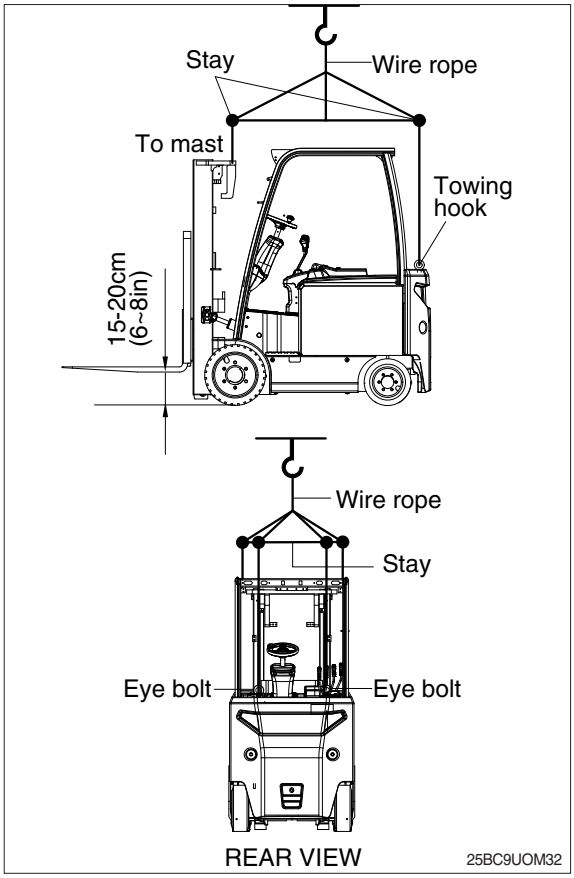
⚠ **Make sure wire rope is proper size.**

⚠ **The wrong hoisting method or installation of wire rope can cause damage to driver and truck.**

⚠ **Do not load abruptly.**

⚠ **Keep area clear of personnel.**

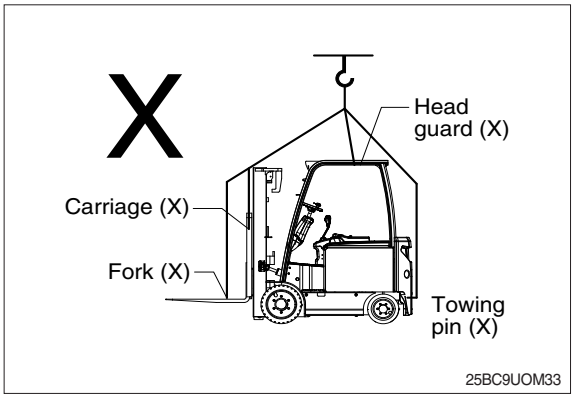
⚠ **Recommend to manufacture the stays separately as per lifting conditions.**



⚠ **Do not install the wire to unsafe position such as forks, carriage, head guard, lifting hole or towing pin, etc. It can cause serious damage to driver and truck.**

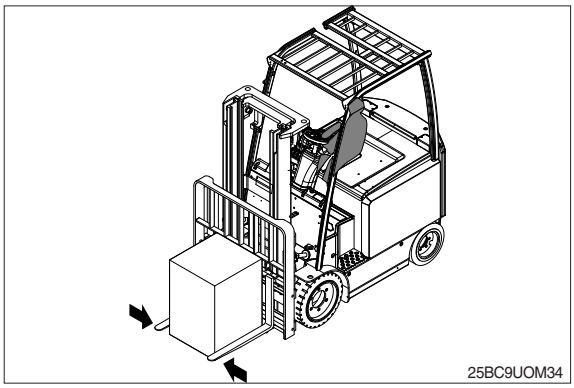
⚠ **If there is any problem to lift a truck, please contact your dealer.**

⚠ **Perform the lifting service with skilled service man.**



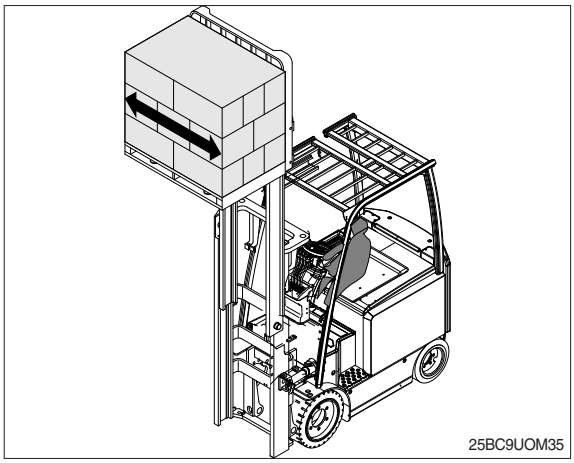
16. SIDE SHIFT

⚠ **Do not put side loads on forks.**



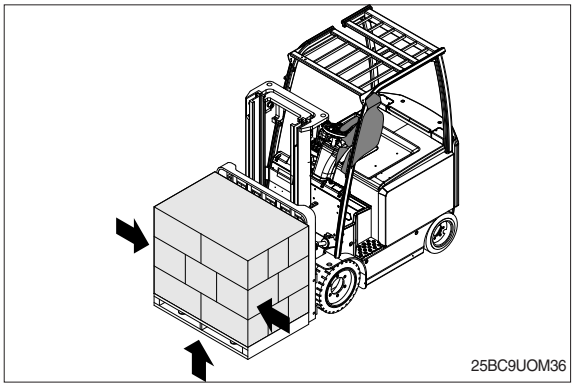
⚠ **Restrict the sideshift movement with raised load.**

Abrupt sideshifting under such condition will dramatically reduce the stability of machine and may cause over-turning.

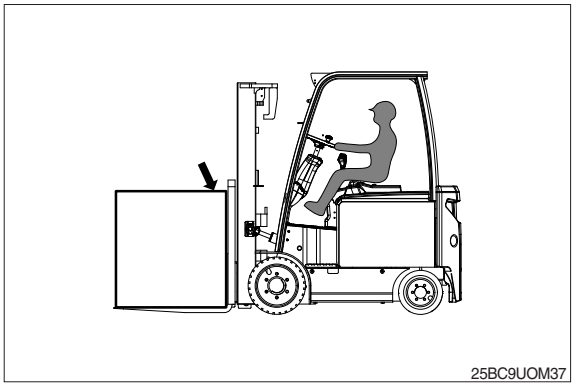


⚠ **Avoid overloading or uneven loading.**

Load on forks according to load capacity mentioned on machine name plate when sideshift is applied. Uneven loading will deteriorate the stability of machine when load is raised.



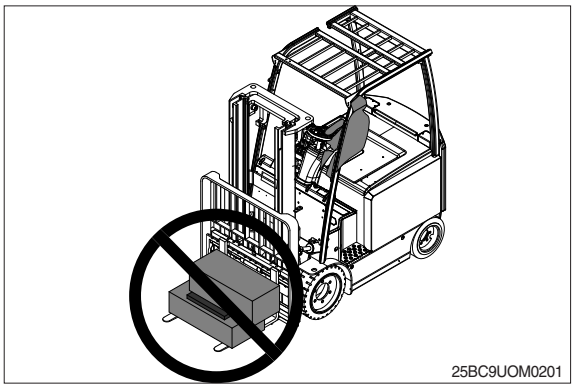
⚠ **Top of load should not extend above backrest.**



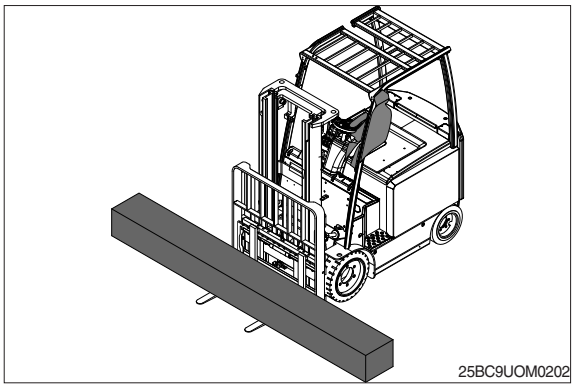
1. LOOSE LOADS

⚠ Loose or unbalanced loads are dangerous. Observe these precautions.

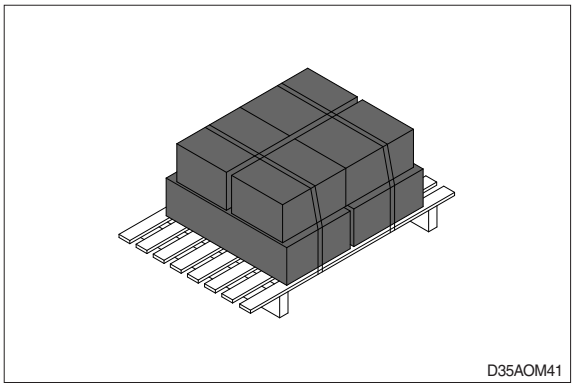
Never carry loose or uneven material.



Center wide loads.



Stack and band loose material.

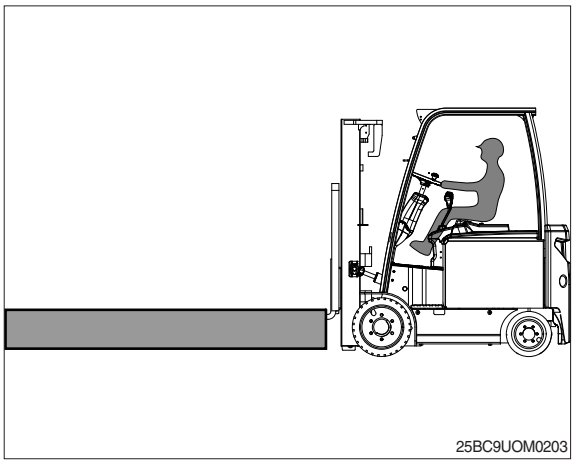


2. LONG AND WIDE LOADS

⚠ **With long or wide loads, you need more room. So slow down and watch your clearance.**

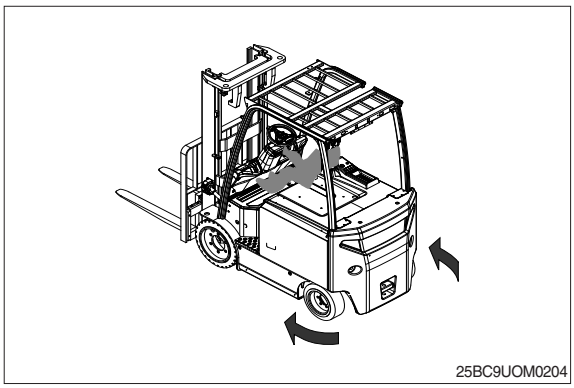
When extra-long material makes it necessary to travel with the load elevated, do so with extreme care and be alert to load end-swing when turning.

⚠ **A long load reduces the capacity of the truck. Know and understand your truck load rating.**



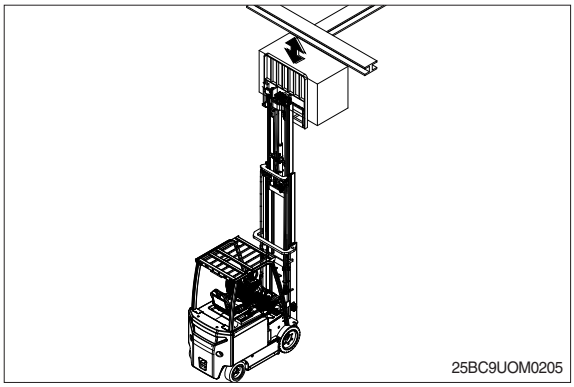
3. REAR SWING

⚠ **When turning, be sure the rear end of the truck does not swing into racks, posts, etc. Watch for pedestrians beside the truck.**

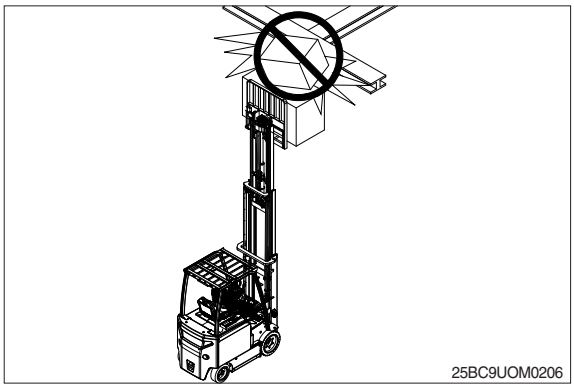


4. LOW OVERHEAD CLEARANCE

⚠ Know the height of your truck, with and without a load. Check your clearances. Keep the load low and tilted back.

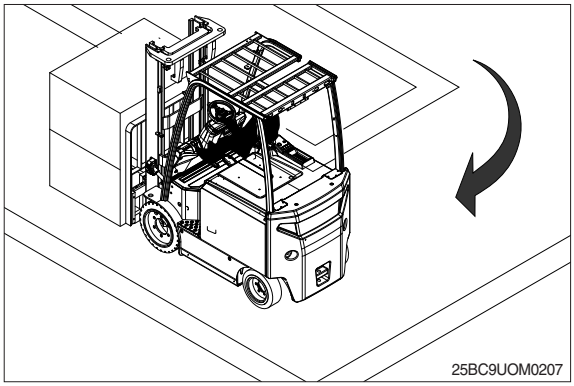


⚠ Watch overhead clearance :
Moving into overhead structures can tip a truck over, or spill a load.

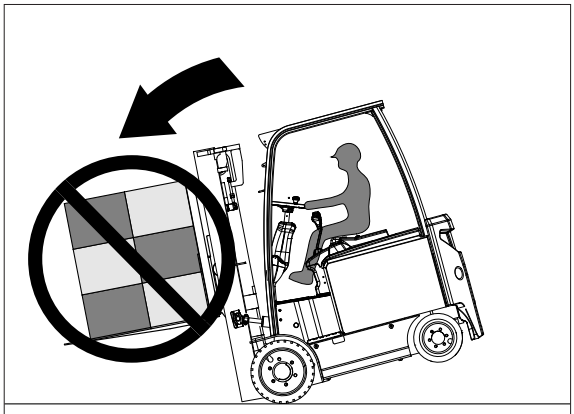


5. FAST TURNS AND HIGH LOADS

⚠ Slow down before turning.
The truck can tip over.



⚠ Turn too sharp with a raised load and your truck can tip even at slow speeds. Travel with a load raised only when removing or depositing a load.

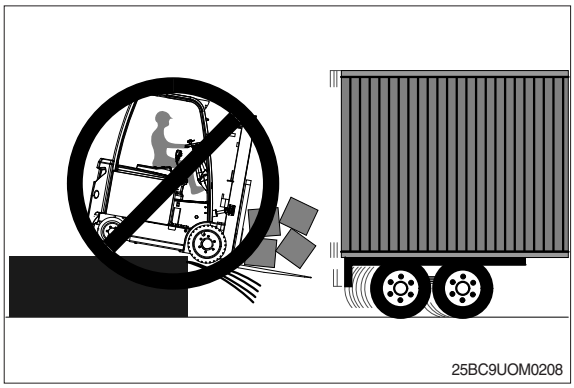


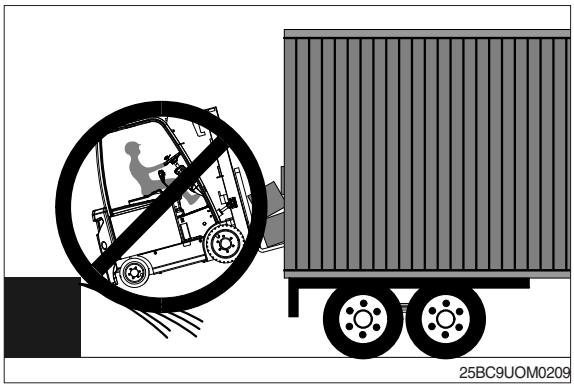
6. DROP-OFFS

⚠ **To avoid these hazards, you must :**

1) Talk to the truck driver yourself: make sure the driver does not move the trailer until you are done.
2) Apply trailer brakes.
3) Use wheel chocks.
4) Use trailer-to-dock locking system if available.

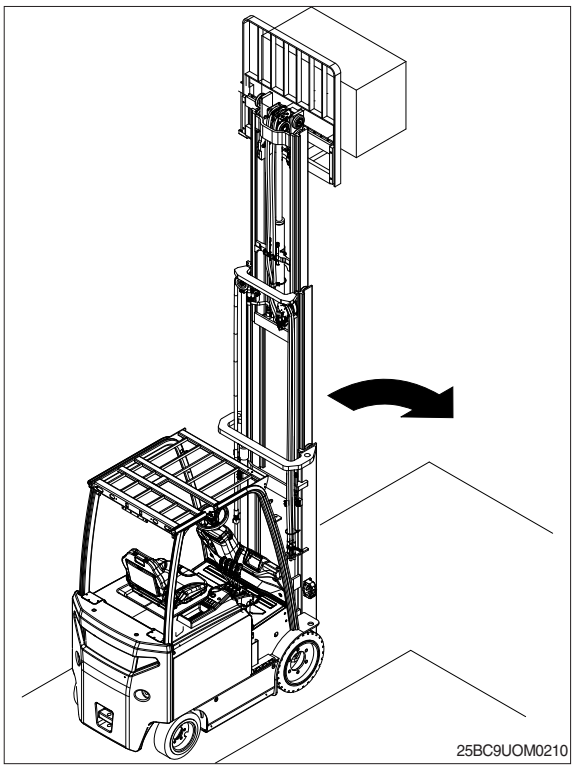
⚠ **The impact of moving in and out of a trailer may cause the trailer to creep or move.**





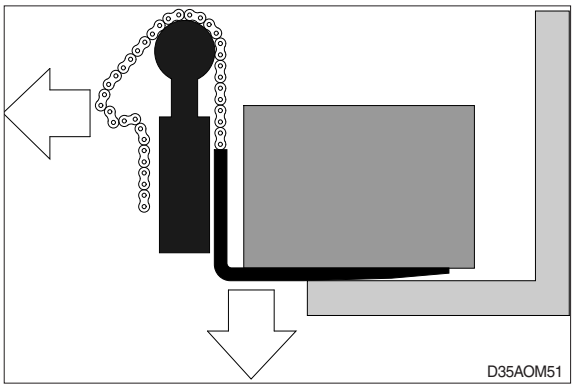
7. RIGHT ANGLE STACKING

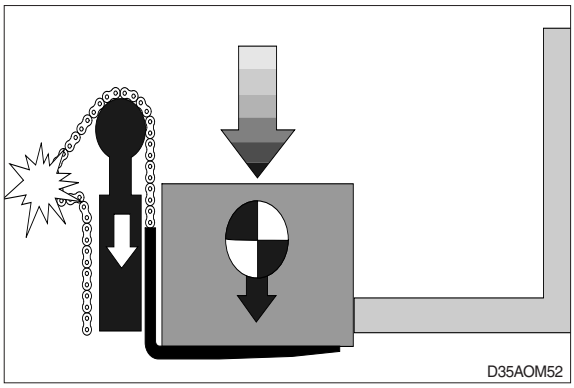
⚠ **When right angle stacking or moving with a raised load to clear low objects, avoid sharp turns and move slowly.**



8. CHAIN SLACK

⚠ Slack chains mean rail or carriage hang-up.
Raise the forks before you move, or broken chains can result.

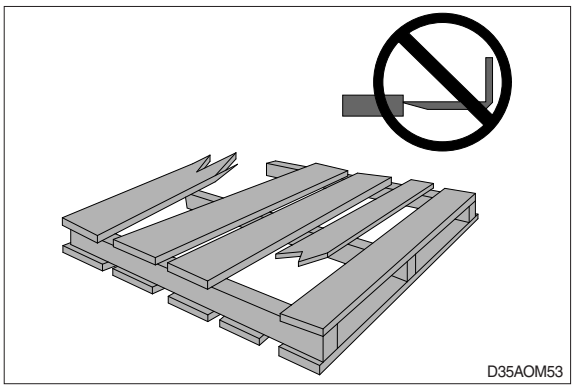




9. PALLETS AND SKIDS

⚠ Do not move or store materials on damaged pallets or skids. Items can fall through them causing severe injury or death.

⚠ Be sure the pallet or skid you are using is in good condition and does not have defective or missing components and fasteners.

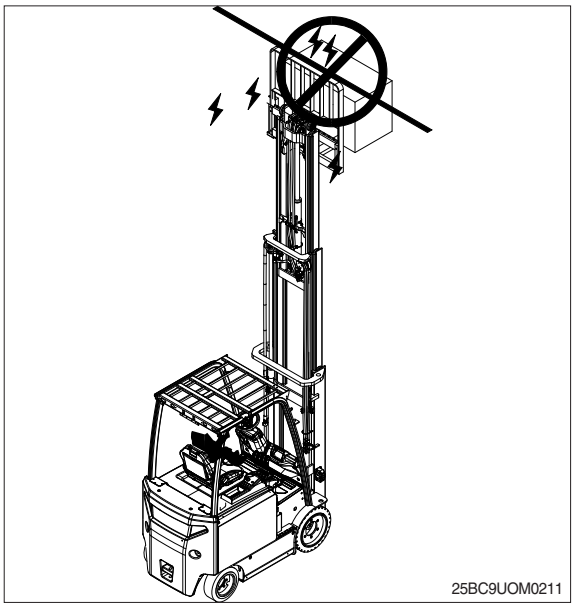


10. CAUTION FOR ELECTRICAL LINES

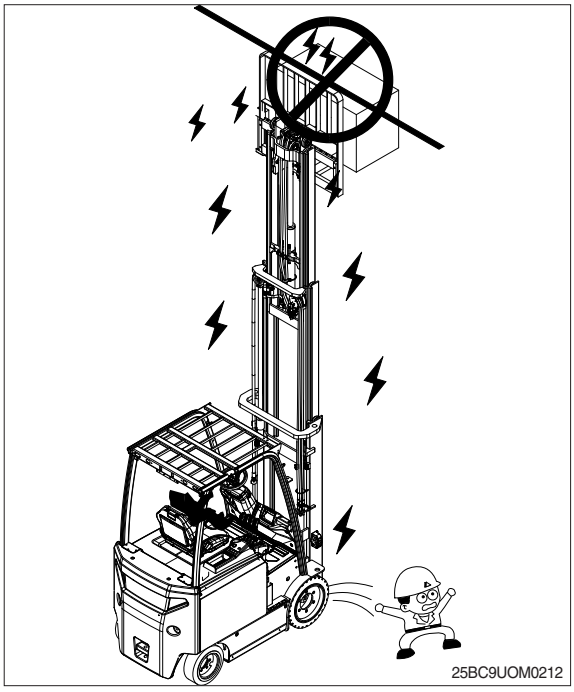
⚠ When moving the machine with the mast raised, watch out electrical lines over the machine.

⚠ The operation near the electrical lines is very dangerous.
Operate within safe working permitted as below.

Supply voltage	Min safe separation
6.6 kV	3 m (10 ft)
33.0 kV	4 m (13 ft)
66.0 kV	5 m (16 ft)
154.0 kV	8 m (26 ft)
275.0 kV	10 m (33 ft)



⚠ If the machine touches the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground do not touch the machine until turning off the electric current.
Jump off the machine without contacting the machine when you need to get off.

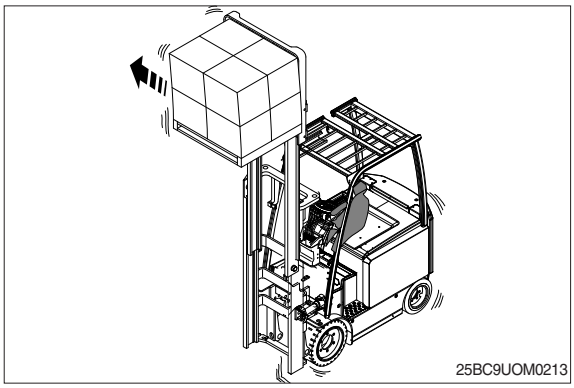


11. SIDE SHIFT

Never operate the side shift while the forks are not equipped with supports such as a load table for the load.

Never travel the fork lift while the side shift is moved with load.

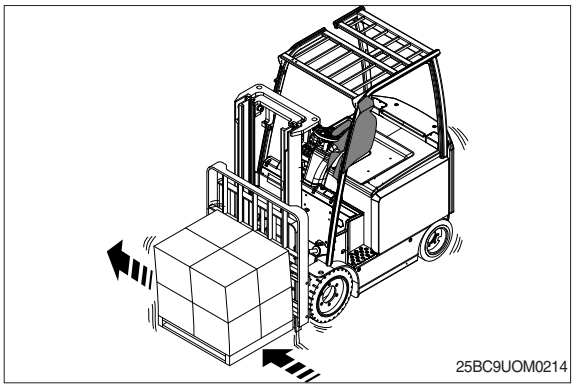
In case of moving the side shift with load, it can be caused load dropping or overturning of the fork lift due to unbalanced weight.



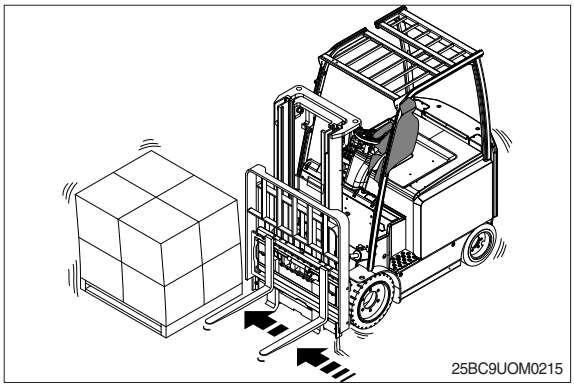
⚠ The fork lift can be overturned due to the unbalanced load.

It should be observed that the side shift with load is operated in netural position before traveling.

When operating side shift with load, operate slowly so that it can not avoid from dropping of the load or overturning of the fork lift.

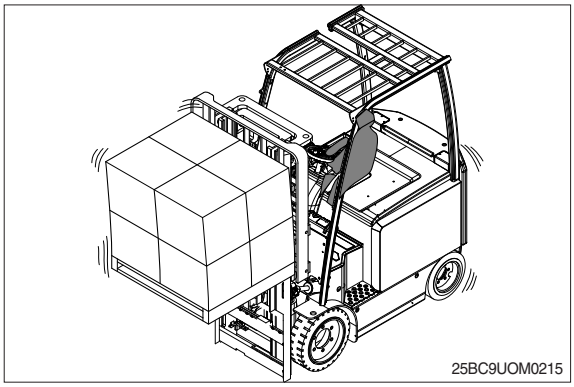


Never move the load to push or pull of it by the side shift.
It can be caused damaging of the loads or injuring of the people.



While traveling the fork lift with the load on the side shift, if the operator lift or lower the load without shifting it in the netural position, it can be overturned the fork lift due to unstabled load.

When lifting or lowering the side shift with load, it should be observed that the load is moved into the netural position.

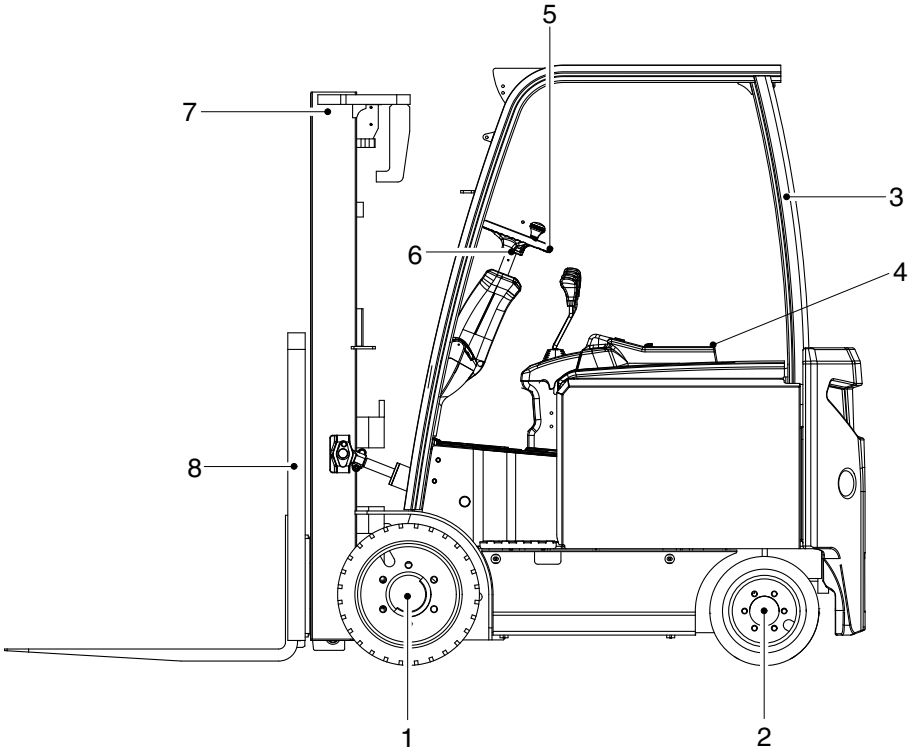


12. SOLID TIRE

1) Do not travel more than 25 km/hr (16 mph).
2) Do not travel further than 8 km (5 miles) in an hour.
3) Do not drive on the road for automobile.
4) After continuous traveling radiates enough the heat of tire. (e.g. 1 hour radiation of the heat after 2 hours continuous traveling)

⚠ **Our warranty does not cover any damages caused by excessive driving.**

1. GENERAL LOCATIONS



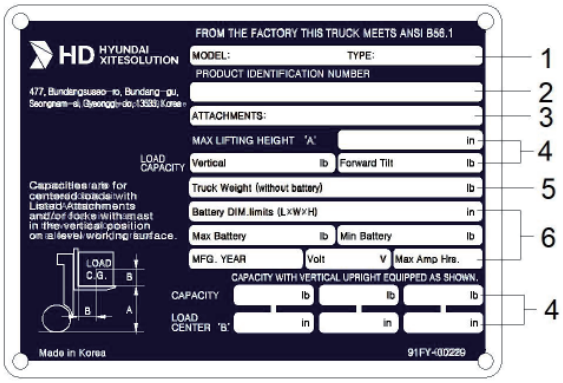
25BC9UOM0301

TRUCK TYPE : Electric Sit-Down Rider, 48 V

1	Drive Axle, tires and wheels	4	Seat	7	Mast
2	Steering axle, tires and wheels	5	Steering wheel	8	Carriage and backrest
3	Overhead guard	6	Directional control lever		

2. DATA/SAFETY PLATES AND DECALS

1) TRUCK DATA AND CAPACITY PLATE



(1) Truck model number or registered name

(2) Truck serial number

An identification number assigned to this particular truck and should be used when requesting information or ordering service parts for this truck from your authorized HD HYUNDAI dealer. The serial number is also stamped on the frame.

(3) Attachment description (if any installed)

The user must see that the truck is marked to identify the attachment(s), including the weight of the truck/attachment combination and truck capacity with the attachment.

(4) Capacity rating, load center, and lifting height data

Shows the maximum load capacity of this truck with relation to load centers and fork heights (see diagram on plate). Personal injury and damage to the truck can occur if these capacities are exceeded.

Do not exceed the maximum capacity specified.

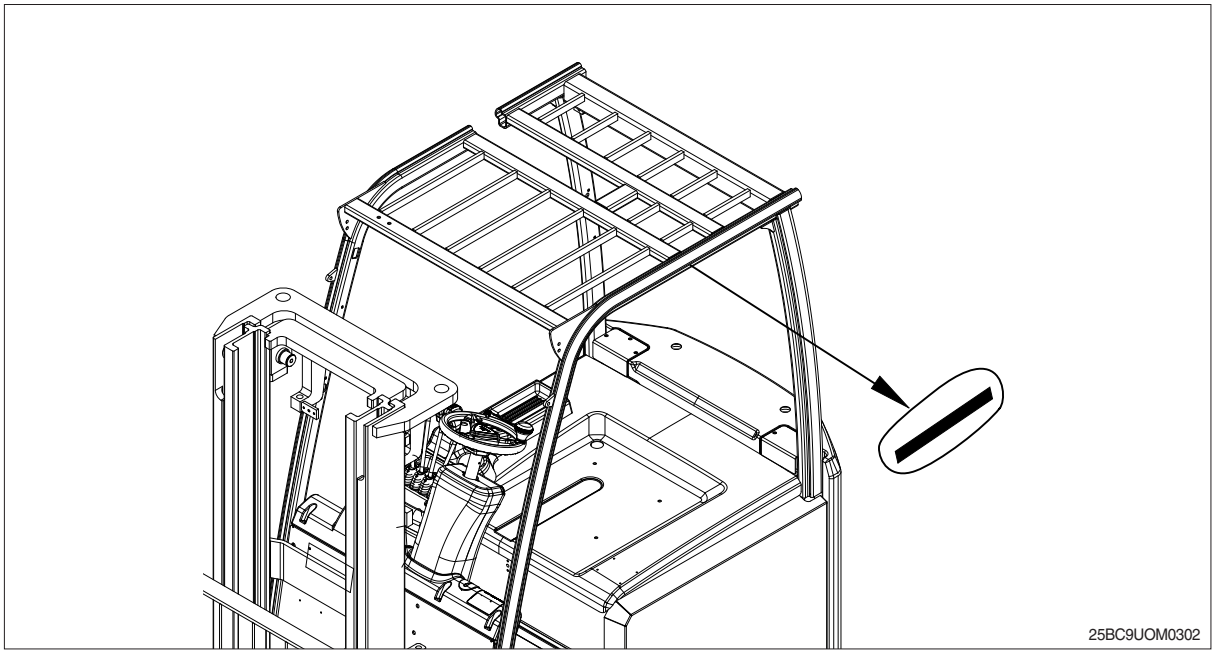
(5) Truck weight

The approximate weight of the truck without a load on the forks. This weight plus the weight of the load must be considered when operating on elevators, elevated floors, etc. to be sure they are safe.

(6) Battery weight and system voltage

⚠ Before modifications that affect the stability of safety systems are made written approval from HD HYUNDAI. Contact your authorized HD HYUNDAI dealer for a new nameplate showing the revised capacity.

2) WARNING O.H.G DECAL



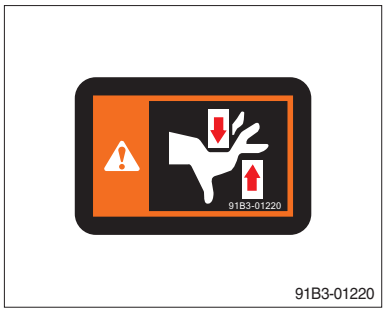
These Warning OHG decals are located on the left side of inner cabin upside.

⚠ Safety and warning decal is placed in conspicuous locations on the truck to remind you of essential procedures or to prevent you from making an error that could damage the truck or possibly cause personal injury. You should know, understand, and follow these instructions. Safety and warning decals should be replaced immediately if missing or defaced (damaged or illegible). Refer to your parts manual for the location of all decals.

⚠ Operator/Tip-over warning decal

Its purpose is to remind the operator that staying in the seat provides the best chance of avoiding injury in the event of a truck-tipping or driving off a dock mishap.

Lift trucks can be tipped over if operated improperly. Experience with lift truck accidents has shown that the driver cannot react quickly enough to jump clear of the truck and overhead guard as the truck tips. To protect operators from severe injury or death in the event of a tip over, it is best to be held securely in the seat. So, please, always buckle up when driving your lift truck.



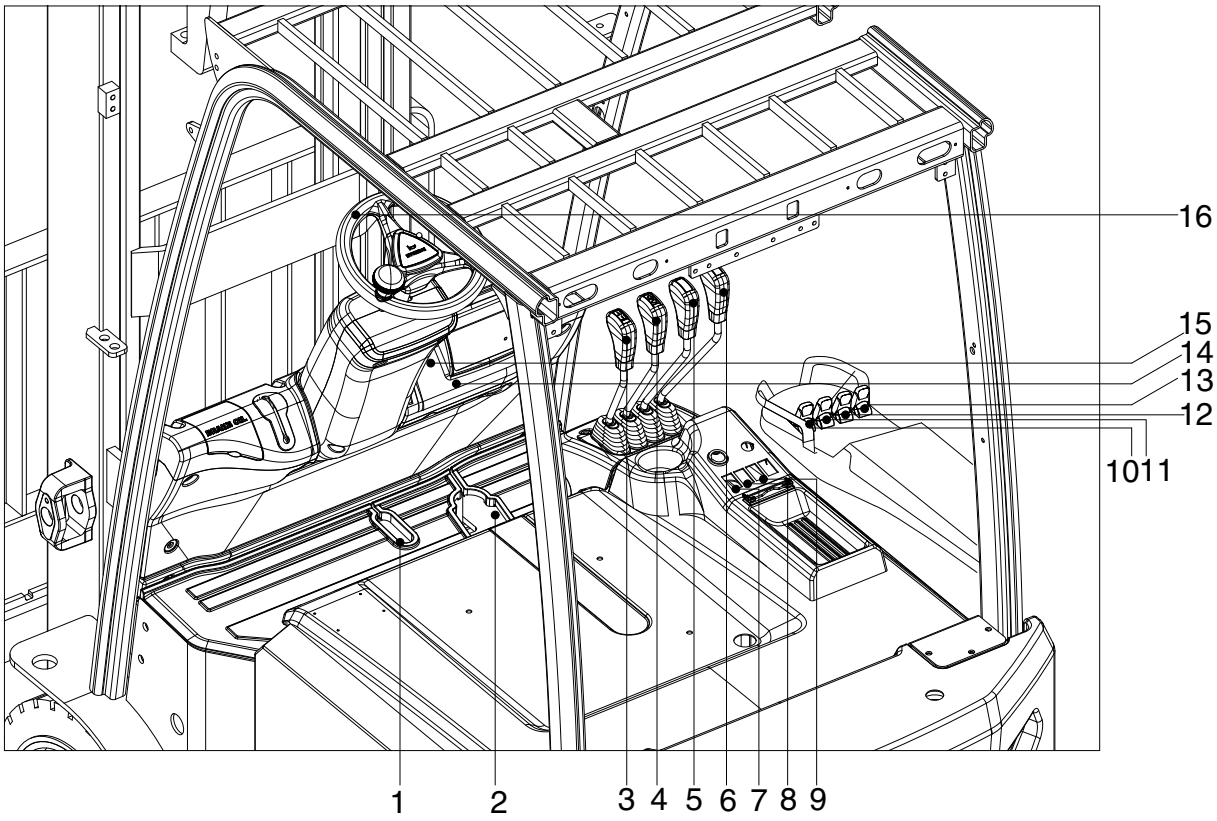
⚠ Mast warning decal

This safety decal is placed on the mast to warn of the danger of injury from movement between rails, chains, sheaves, fork carriage, and other parts of the mast assembly. Do not climb on or reach into the mast. Personal injury will result if any part of your body is put between moving parts of the mast.

⚠ Keep away from forks decal

This safety decal is placed on the mast to warn of the danger of injury from forks when they are in the raised position. Do not ride on or stand under forks or attachments. The forks can fall and cause injury or death. Always make sure that the forks are in the fully lowered position when they are not handling a load.

3. INSTRUMENTS AND CONTROLS



25BC9UOM0304

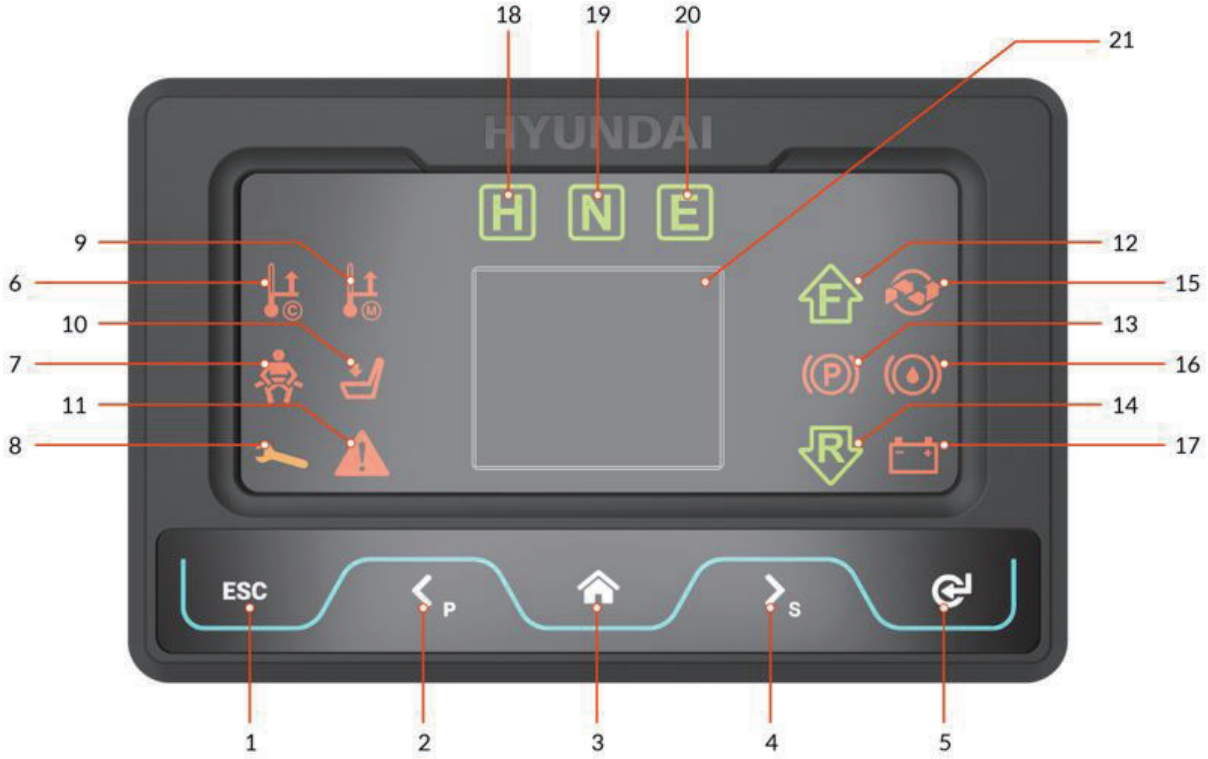
1	Brake pedal	7	Head lamp switch	13	Fork positioner & S/Shift
2	Accelerator pedal	8	Work lamp switch	14	Instruments panel
3	Lift lever	9	Beacon switch	15	Key switch
4	Tilt lever	10	Lift fingertip (opt)	16	Steering wheel
5	Fork positioner	11	Tilt fingertip (opt)		
6	S/Shift & Fork positioner	12	Fork positioner		

※ **Familiarize yourself with the controls and follow safe operating procedures.**

4. INSTRUMENT PANEL

1) STRUCTURE

The instrument panel(cluster) has fifteen built-in LED(red, green, amber), which provide the operator with an easy information about the status of some truck devices.



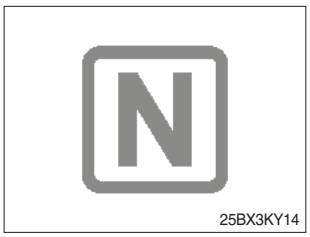
1	ESC button	8	Wrench Lamp	15	Consumable Exchange Lamp
2	LEFT/PERFORMANCE button	9	High Temp Motor Lamp	16	Brake Oil Lamp
3	HOME button	10	Seat Lamp	17	Battery Level Lamp
4	RIGHT/SPEED button	11	Warning Lamp	18	High Mode Lamp
5	ENTER button	12	Forward Lamp	19	Normal Mode Lamp
6	High Temp Controller Lamp	13	Parking brake Lamp	20	ECO Mode Lamp
7	Seat belt Lamp	14	Reverse Lamp	21	LCD Function

2) WARNING LAMP

(1) High Mode lamp

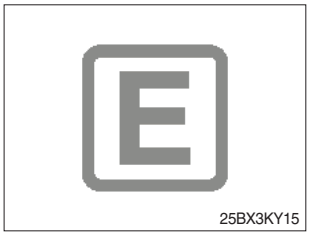
This LED lights when the power mode is High.

(2) Normal Mode lamp



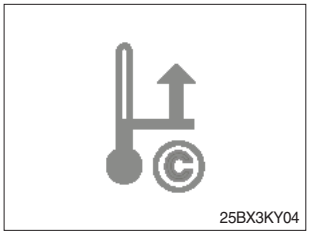
This LED lights when Power mode is Normal.

(3) ECO Mode lamp



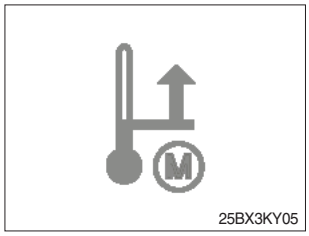
This LED lights when Power mode is Eco.

(4) High Temp. Controller Lamp



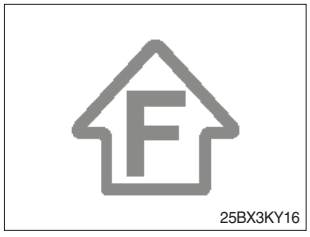
This LED lights when the controller temperature is high.

(5) High Temp. Motor Lamp



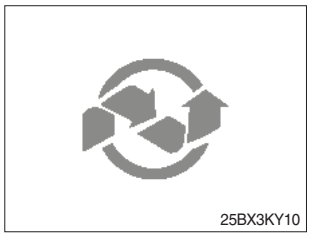
This LED lights when the motor temperature is high.

(6) Forward Lamp



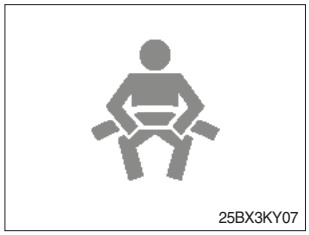
This LED lights when truck is forward running.

(7) Consumable exchange warning lamp (not in use)



It is Warning light that does not use.

(8) Seat belt lamp



This LED lights when the seat belt is not correctly fastened. (Depending on the seat type, it may not be supproted.)

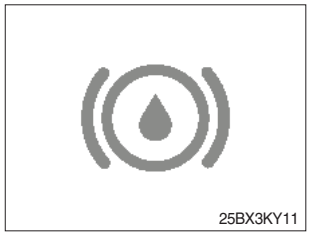
(9) Seat lamp

This LED lights when the operator is not on the seat. (Depending on the seat type, it may not be supproted.)

(10) Parking brake lamp

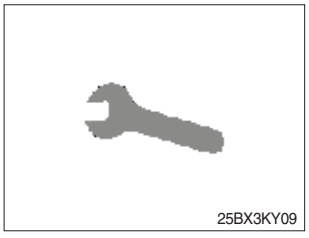
This LED Lights when the parking brake is activated.

(11) Brake oil lamp



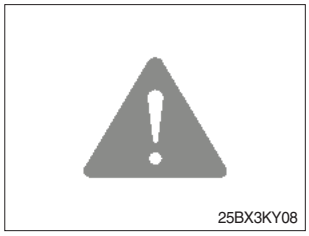
This LED lights when measured level of brake oil stored in reservoir tank is below the minimum acceptable mark.

(12) Wrench lamp



This LED lights when an electric device is in abnormal condition.

(13) Warning lamp

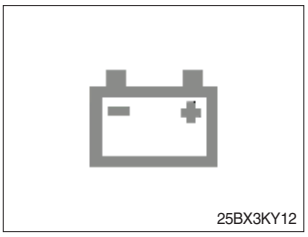


This LED lights when electric device is in abnormal condition.

(14) Reverse lamp

This LED lights when truck is reverse running.

(15) Battery level lamp

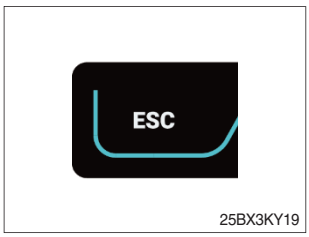


This LED Lights when measured level of battery is below minimum accpetable mark. (battery is less 10%)

4) BUTTON

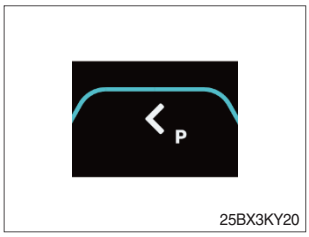
These buttons are used to select or chance the menu and input value of LCD function and cluster menu.

(1) ESCl button



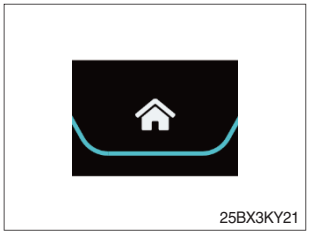
Press to select cancel.

(2) LEFTt/POWER mode button



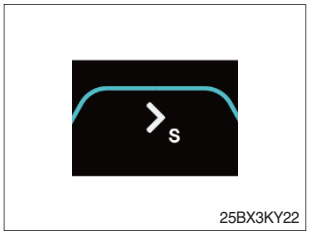
① Press to select leftward move.
② Press when switching between power modes (H/N/E).

(3) Home button



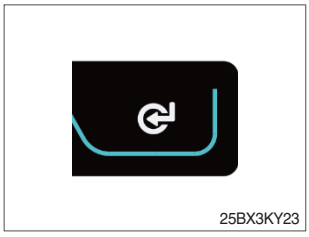
Go into the menu.
GO into the home.

(4) Right/Speed mode button



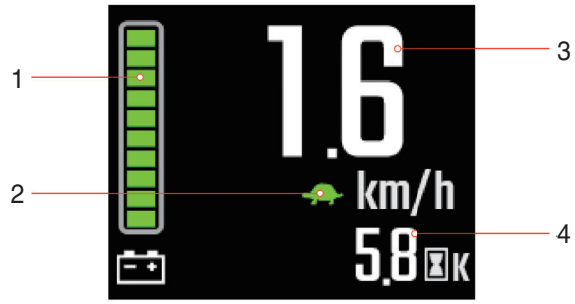
① Press to select rightward move.
② Press when switching between speed modes (turtle/rabbit).

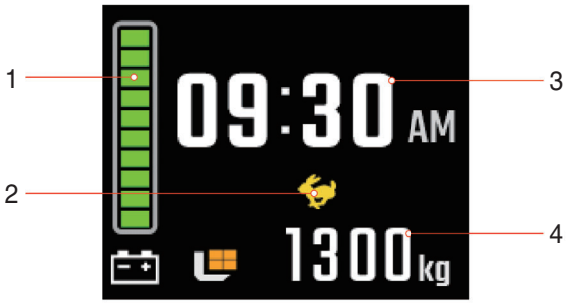
(5) ENTER button

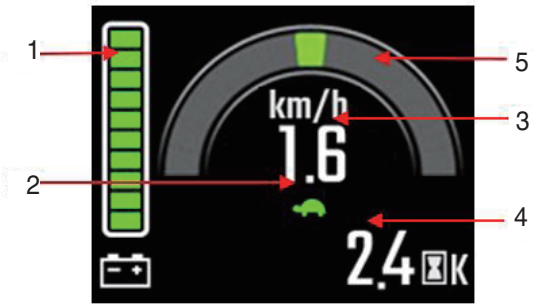


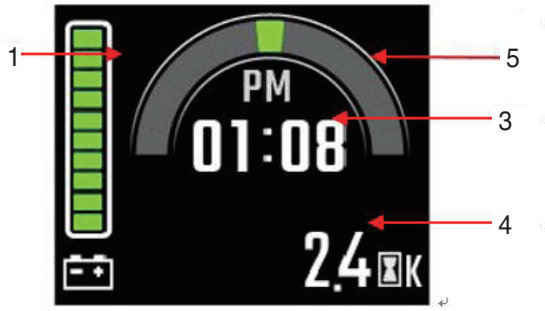
Press to select menu.

4) MAIN SCREEN









1 BDI (Battery Discharge Indicator)
2 Speed mode
3 Truck speed / Current time
4 Truck operation time/weight
5 Steering angle (depending on the model, it may not be supported)

(1) BDI (Battery Discharge Indicator)

The battery's state of charge is shown by ten bars. Each bar represents 10% of the battery charge. As the battery becomes discharged, the bars turn off progressively, one after another, in proportion to the value of the residual battery charge.

BDI %	Battery bars	Color
91 - 100	10	Green
81 - 90	9	
71 - 80	8	
61 - 70	7	
51 - 60	6	
41 - 50	5	
31 - 40	4	Orange
21 - 30	3	
11 - 20	2	Red
1 - 10	1	

(2) Speed mode

The turtle symbol is normally off. When this symbol appears, the turtle mode is activated regardless of the power mode of the truck to reduce the maximum speed to the set-point. This mode can be activated by pressing the Right/Speed mode button.

(3) Truck **Speed / Current Time**

① Driving - The truck speed is shown in number. The unit can be km/h or mph according to the cluster setting.

② Stopping - The number shows the current time according to the setting, which can be changed by cluster setting.

(4) Hour meter / Load weight

No load – The number shows the hours worked. The letter present beside the hourmeter number shows which hourmeter is displayed.

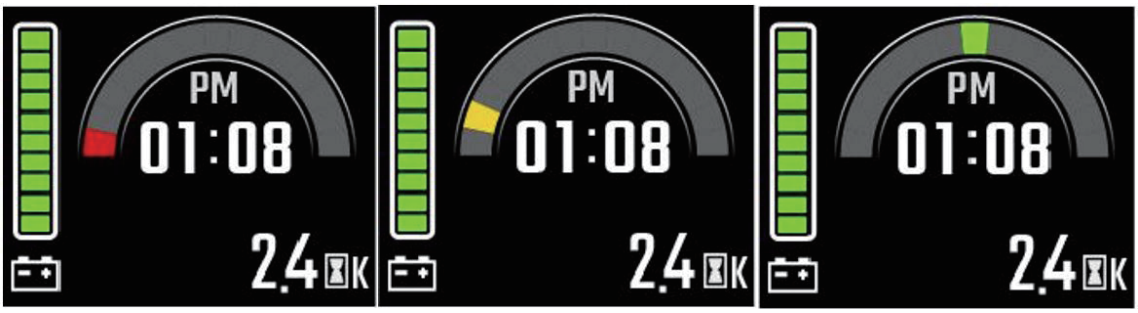
-K : Key Hour shows the truck Key ON time.

-T : Traction Hour shows the Gate ON(driven) time of the traction motor.

-P : Pump Hour shows the Gate ON(driven) time of the pump motor.

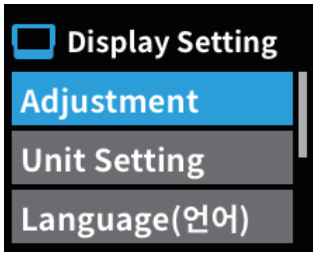
(5) Steering angle (Depeding on the model, it may not be supported.)

The steering angle is displayed.

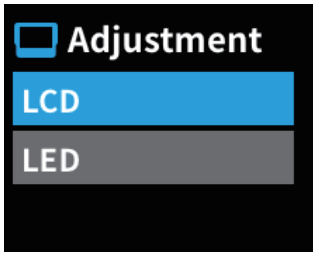


5) HOW TO SET THE CLUSTER MENU

(1) LCD, LED Brightness Adjustment

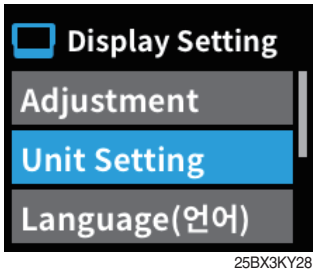


25BX3KY26

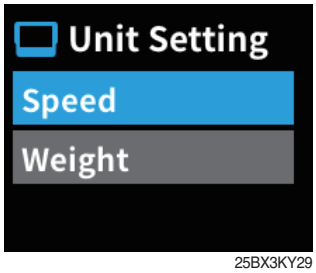


25BX3KY27

(2) Unit Setting

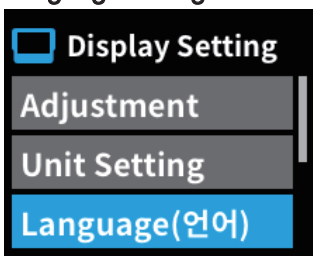


25BX3KY28

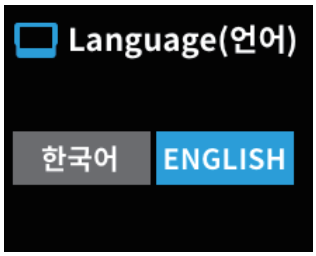


25BX3KY29

(3) Language setting



25BX3KY30



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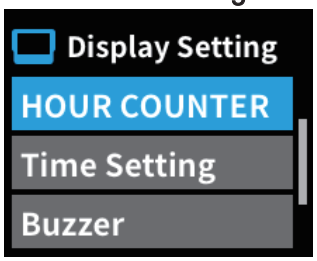
(4) Hour Counter setting



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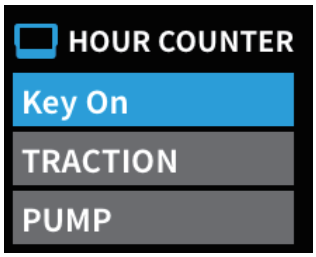

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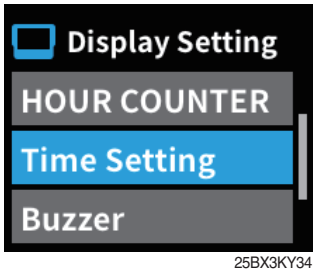
(5) Time setting



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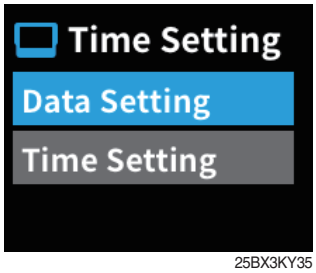

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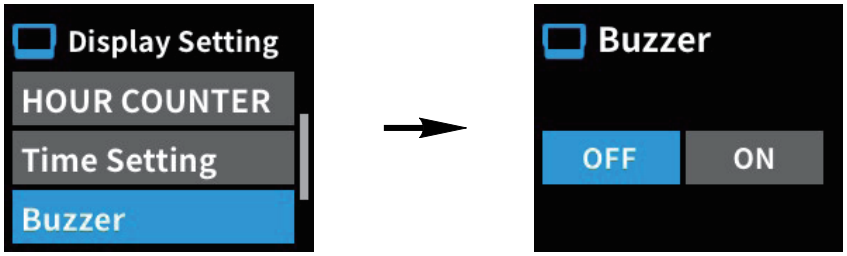
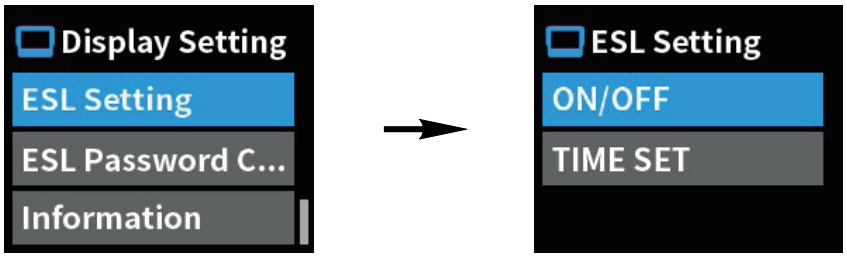
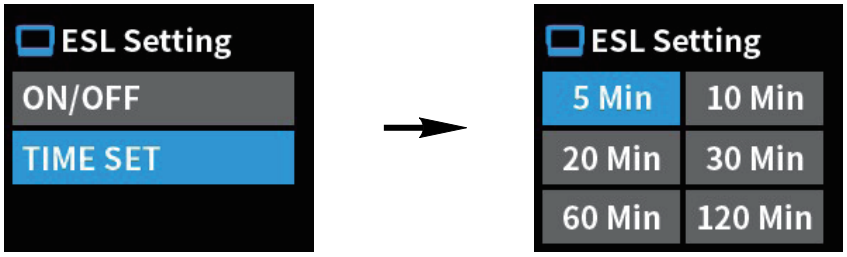
(6) Warning Buzzer (e.g. LOAD WEIGHT)

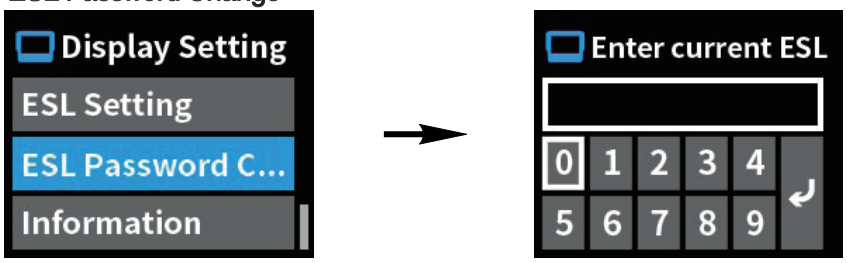


(7) ESL Setting

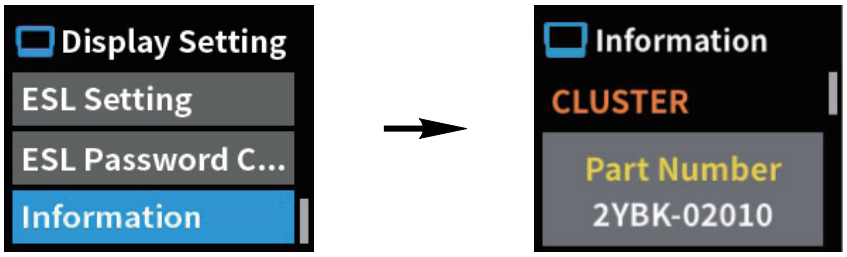




(8) ESL Password Change

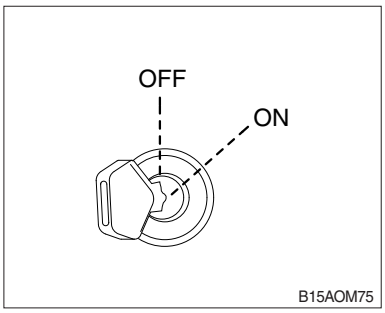


(9) Cluster Information



5. OPERATING SWITCHES AND LEVERS

1) KEY SWITCH

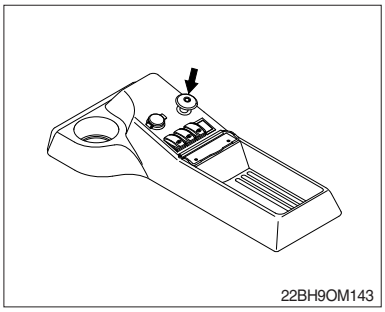


(1) Power is supplied to the control circuit through this switch, which is placed on OFF → ON clockwise.

① OFF : The key can be removed or inserted and power is turned off.

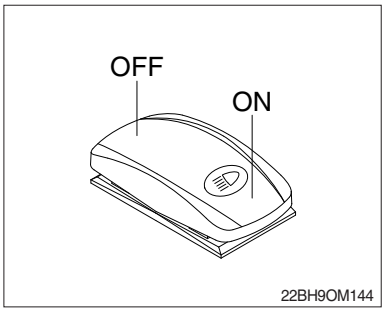
② ON : Both control circuits for hydraulics and running can be activated.

2) EMERGENCY SWITCH



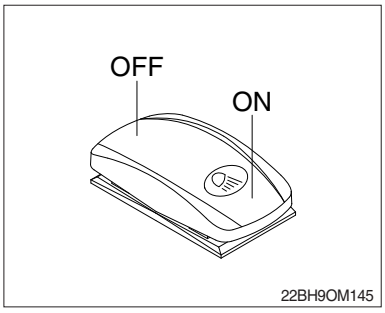
(1) When pressing the emergency switch downward the electric circuit is broken, all electrical function switch is off.

3) HEAD LAMP SWITCH



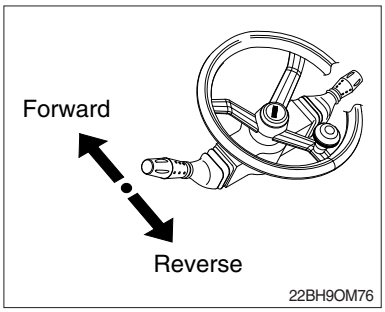
(1) This switch is used to operate head lamps.
Press this switch to turn on head lamps.

4) WORK LAMP SWITCH



(1) This switch is used to operate work lamps.
Press this switch to turn on work lamps.

5) DIRECTIONAL CONTROL LEVER



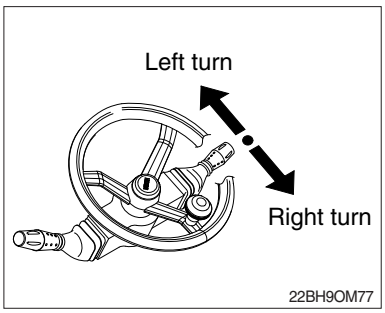
(1) This lever serves to make forward/backward directional changes. For the forward directions, place the lever on the FORWARD position.

(2) In the neutral, the running control circuits is turned off.

(3) For the backward direction, place the lever on the REVERSE position.

(4) The electrical brake will be applied by shifting the lever to the opposite position of running direction.

6) FLASHER SWITCH

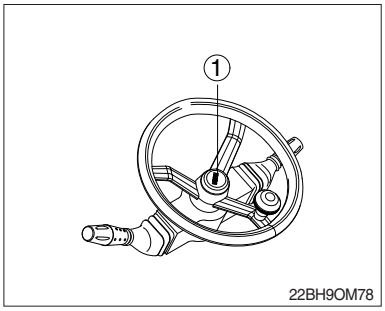


(1) When making a left or right turn, use this switch to flash the flash lamp to indicate which direction the vehicle is turning to.

(2) For a right turn, place the switch on the BACKWARD position.

(3) For a left turn, place the switch on the FORWARD position.

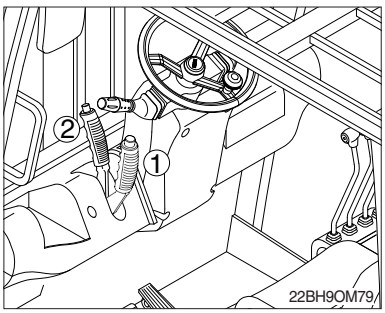
7) HORN BUTTON



(1) When the button (①) is pressed, the horn will sound.

① Steering wheel center

8) PARKING BRAKE LEVER

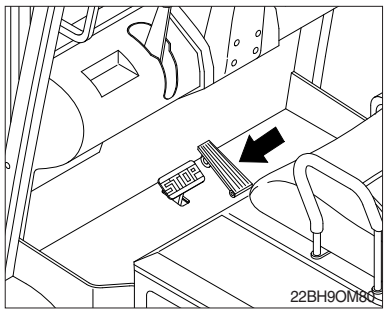


(1) Position ①
Parking brake is applied and front wheel is locked.

(2) Position ②
Parking brake is released .

※ Before the truck start, confirm the parking brake is in released position.

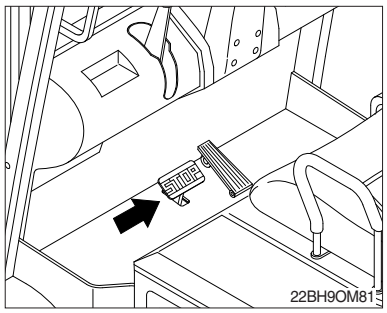
9) ACCELERATOR PEDAL



(1) This pedal is used to vary running speed, which depends upon how far the pedal is depressed.

(2) In running, the electrical brake will be smoothly applied by shifting the direction lever to the position opposite to the direction of vehicle advanced, and if the pedal is further depressed, the vehicle will run to the opposite direction after stopping once.

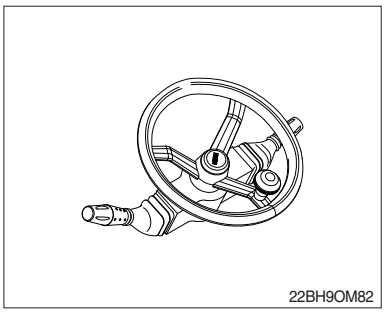
10) BRAKE PEDAL



(1) When this pedal is depressed, the vehicle is braked, while the braking lamps attached on the rear light.

⚠ Special care should be required for the operation of the brake at loading.

11) STEERING WHEEL



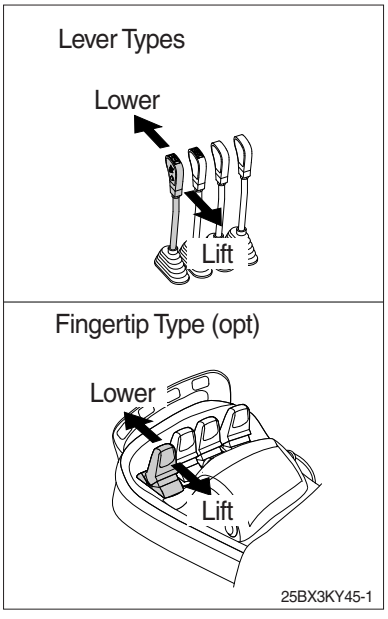
(1) The steering wheel of the vehicle is provided with the knob to allow steering with one hand.

(2) Perform the loading operation with the right hand and operate the steering wheel with the left hand.

(3) Adjustable steering column enables selection of the best driving position.

⚠ Particular care should be taken for the rapid operation of the steering wheel.

12) LIFT LEVER



(1) Lift

Pulling the lever (fingertip) backward ascends the folks.

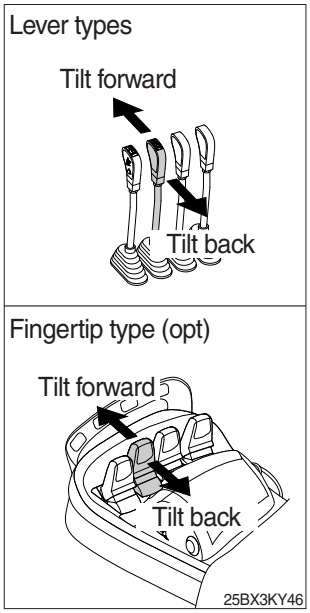
(2) Lower

Pushing the lever (fingertip) forward descends the folks.

(3) Hold

Releasing the lever (fingertip) when forks are lifted (or lowered) to desired position holds the forks at the position.

13) TILT LEVER



(1) Tilt forward

Pushing the lever (fingertip) forward tilts the mast forward.

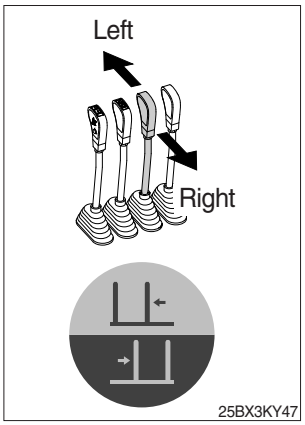
(2) Tilt back

Pulling the lever (fingertip) backward tilts the mast backward.

(3) Hold

Releasing the lever (fingertip) stops movement of the mast.

14) LEVER FOR SIDE SHIFT



(1) LH movement

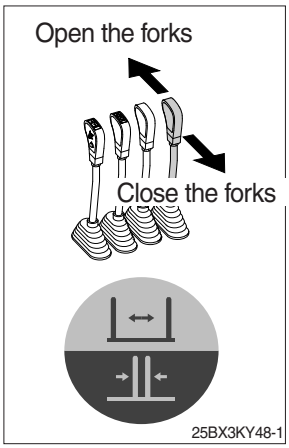
Push the lever forward to move the carriage left.

(2) RH movement

Pull the lever backward to move the carriage right.

15) FORK POSITIONER (SYNCHRONIZER) WITH SIDE SHIFT

(1) Fork positioner



① **Open the forks**

Push the lever forward to outstretch both forks simultaneously outward.

② **Close the forks**

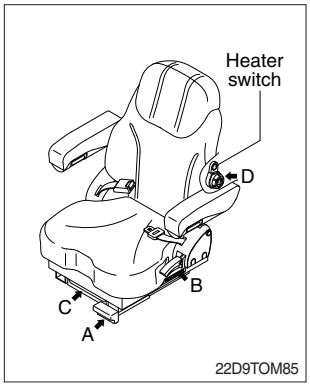
Pull the lever backward to pucker up both forks simultaneously inward.

6. SEAT ADJUSTMENT

1) SEAT ADJUSTMENT

The seat adjustable to fit the contours of the operator's body. It will reduce operator fatigue due to long works hours and enhance work efficiency.

Grammer seat



(1) Forward/Backward adjustment (A)

① Pull lever A to adjust seat forward or back ward.

② The seat can be moved forward 120 ㎜ and backward 90 ㎜ (stroke : 210 ㎜).

(2) Reclining adjustment (B)

Pull lever B to adjustment seat back rest.

(3) Weight adjustment (C)

Adjustment range : 45~170 ㎏

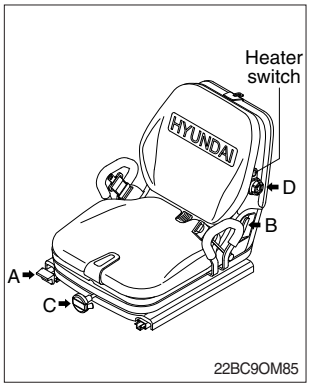
(4) Lumbar adjustment (D)

Turn line knob D to adjust lumbar support up and down.

(5) Heated seat switch (option)

Press this switch in order to heat the seat.

KAB seat



(1) Forward/Backward adjustment (A)

① Pull lever A to adjust seat forward or back ward.

② The seat can be moved forward and backward 80 ㎜ (stroke : 160 ㎜).

(2) Reclining adjustment (B)

Pull lever B to adjustment seat back rest.

(3) Weight adjustment (C)

Adjustment range : 50~140 ㎏

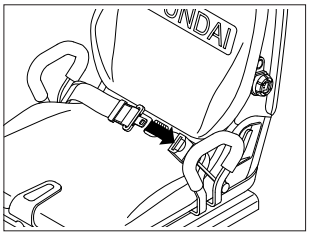
(4) Lumbar adjustment (D)

Turn line knob D to adjust lumbar support up and down.

(5) Heated seat switch (option)

Press this switch in order to heat the seat.

2) BUCKLING UP



(1) Buckling up. Be sure that you put on the seat belt. Connect and adjust the seat belt strap to a snug, comfortable position.

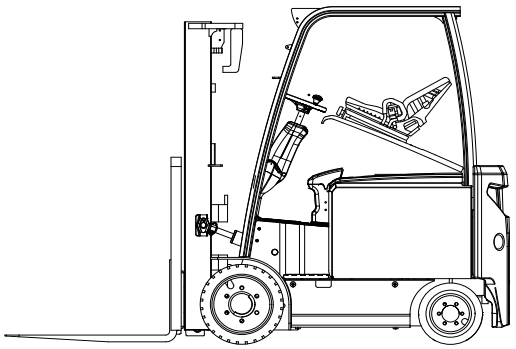
⚠ Always wear your seat belt when operating a lift truck. Failure to wear seat belt will result in injury or death in an event of an accident.

7. BATTERY COMPARTMENT ACCESS

The combination seat deck/battery compartment cover pivots mast to provide access to the battery compartment.

※ **You must tilt the steering column & lever forward before raising the cover.**

The cover is closed by a spring latch located at the front edge. Pull the latch to release the cover. A gas spring helps you pivot the cover upward and hold it in the raised position.



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4. OPERATOR MAINTENANCE AND CARE

1. SAFETY INSPECTION

Before using a lift truck, it is **the operator's responsibility** to check its condition and be sure it is safe to operate.

Check for damage and maintenance problems; have repairs made before you operate the truck. Unusual noises or problems must be reported immediately to your supervisor or other designated authority.

Do not make repairs yourself unless you are trained in lift truck repair procedures and authorized by your employer. Have a qualified mechanic make repairs using genuine HD HYUNDAI or HD HYUNDAI-approved parts.

⚠ **Do not operate a truck if it is in need of repair. If it is in an unsafe condition, remove the key and report the condition to the proper authority If the truck becomes unsafe in any way while you are operating it, stop operating the truck, report the problem immediately, and have it corrected.**

Lift trucks should be inspected every eight hours, or at the start of each shift. In general, the daily inspection should include the **visual** and **functional checks** described on the followings.

⚠ **Leaking hydraulic oil may be hot or under pressure. When inspecting a lift truck, wear safety glasses and do not check for leaks with bare hands.**

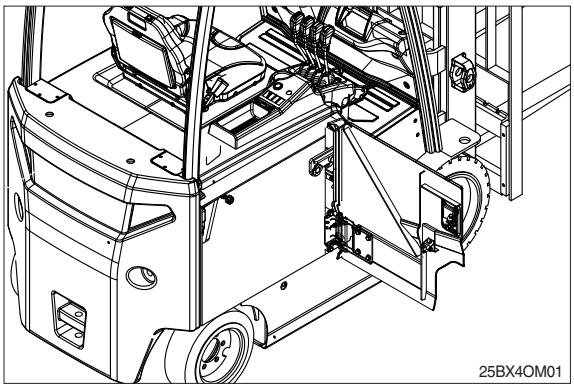
2. VISUAL CHECKS

First, perform a visual inspection of the truck and its major components;

1) Walk around your lift truck and take note of obvious damage that may have been caused by operation during the last shift.

2) Check that all capacity, safety, and warning plates or decals are attached and legible.

3) Make sure that battery is safely mounted on correct position. Check battery fastening devices for correct installation for preventing movement or tip over of battery. Check the battery connector for safety.



⚠ Check surroundings of driving axle for any external oil leak.

4) Check for hydraulic oil leaks and loose fittings.

⚠ Oil may be hot or under pressure. Do not use bare hands to check.

5) Be sure that the driver's overhead guard, load back rest and all other safety devices are in place, securely fastened and undamaged.

6) Check all of the critical components that handle or carry the load.

7) Look the mast and lift chains over.
Check for obvious wear and maintenance problems such as damaged or missing parts, leaks, slack or broken chains, rust, corrosion, bent parts, cracks, etc.

8) Carefully inspect the load forks for cracks, breaks, bending, twists, and wear. Be sure that the forks are correctly installed and locked in their proper position.

9) Inspect the wheels and tires for safe mounting, wear condition, and air pressure.

10) Check the hydraulic sump oil level, engine oil level, and fuel level.

3. FUNCTIONAL CHECKS

Check the operation of the truck as follows.

※ **Before performing these checks, familiarize yourself with the operating procedures in Section 5.**

1) Test warning devices, horn, lights, and other safety equipment and accessories.

2) With the truck on, check the diagnostic display, or the hour meter and battery discharge indicator (depending on which truck you have). The diagnostic display should show the charge remaining on the battery or a fault code. If the fault code is not an operator fault code call a service technician.

3) Be sure all controls and systems operate freely and return to neutral properly. Check the :
 (1) Service and parking brakes
 (2) Hydraulic controls : lift, tilt and auxiliary (if installed)
 (3) Accelerator control
 (4) Directional control
 (5) Steering system
 (6) Lift mechanism and any attachments

· **When the functional checks are completed :**
 ① Bring truck to complete stop.
 ② Put directional control lever in the NEUTRAL position.
 ③ Apply the parking brake.
 ④ Lower the lift mechanism fully.
 ⑤ Turn the starting switch to the OFF position.

· **If you are going to leave the truck unattended :**
 ⑥ Remove the key.
 ⑦ Block the wheels, if the truck is parked on an incline or has the possibility of moving.

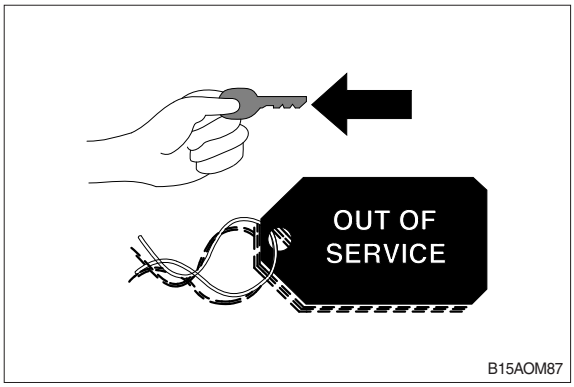
4. CONCLUDING THE INSPECTION

Make a record on the "Driver's Daily Checklist" of all the operating and truck problems that you find. Review the checklist to be sure it has been completed and turn it into the person responsible for lift truck maintenance. Be sure any unusual noises or problems are investigated immediately.

Do not operate a lift truck that has a maintenance problem, or is not safe to operate.

Remove the key from the starting switch and put an "**OUT OF SERVICE**" tag on the truck.

If all of the Daily Inspection checks were normal or satisfactory, the truck can be operated.



5. STARTING AND OPERATING PROCEDURES

1. BEFORE OPERATING THE TRUCK

Be sure that you have read and understand the information in this Operator's Manual and are trained and authorized before operating the lift truck.

⚠ **A lift truck can be dangerous if not used properly. Safe operation is the responsibility of the operator.**

⚠ **Do not start or operate the truck, or any of its functions or attachments, from any place other than the designated operator's position.**

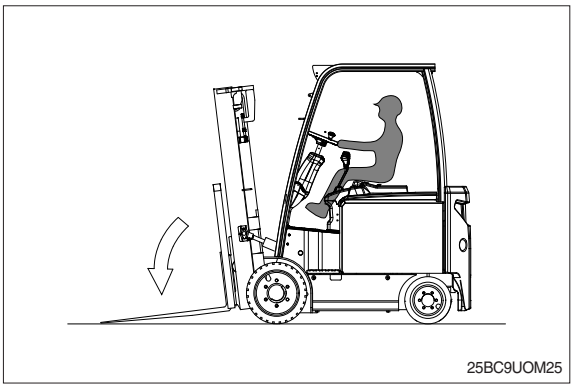
⚠ **Inspect your lift truck before operating at the start of each shift. Before putting your truck to operating, check the operation of the controls and all systems.**

⚠ **Protect yourself. Do not operate truck without a DRIVER'S OVERHEAD GUARD unless conditions prevent its use. Do not remove overhead guard unless specifically authorized.**
Use special care if operation without this safety device is required.

2. STARTING FROM A SAFE CONDITION

Always start from a safe condition.
Before operating a lift truck, make sure that:

1) The parking brake is applied.
2) The forks are fully lowered to the floor or ground.
3) You are familiar with how all the controls function.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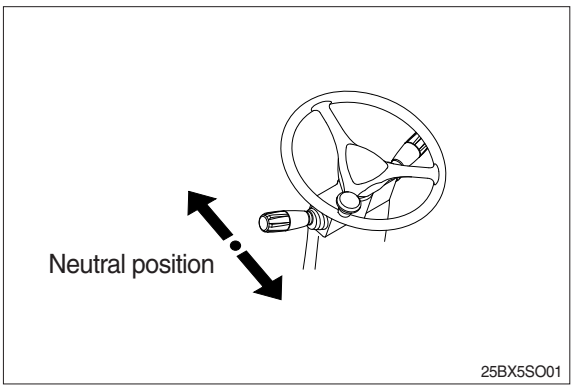
4) All controls are in neutral or other correct position.
5) The truck has received its daily inspection and ready and safe to operate.

Put the gear selector lever in the NEUTRAL position, before starting. The truck should start only in the NEUTRAL position.



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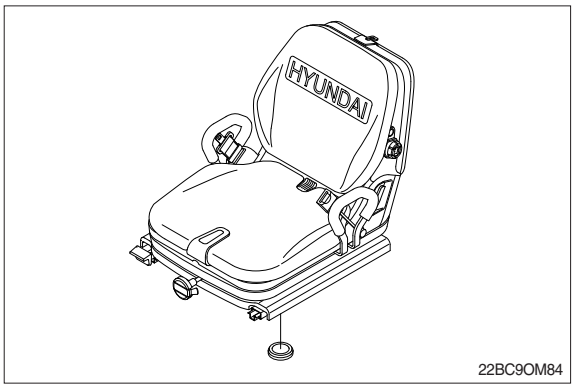
3. ADJUSTING THE SEAT

1) Adjust the seat to a comfortable position for you. Adjust the seat by moving and holding the release lever at the front edge of the seat.
2) Put the seat in a position that will provide easy reach to all controls.
3) Adjust the seat weight.
4) Adjust the lumbar control.

⚠ Refer to page 3-17 for details.

⚠ **Never adjust the driver's seat while the truck is moving, to avoid the possibility of loss of control and of personal injury.**



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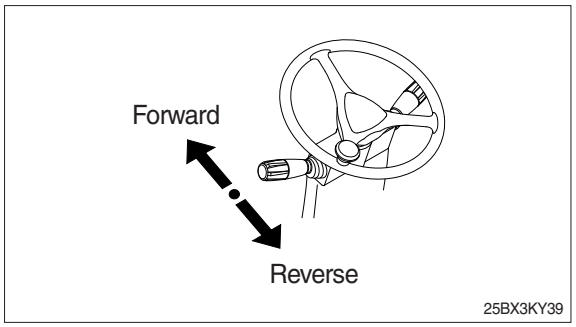
3. BEFORE OPERATING THE TRUCK

Check the aforementioned requirements, and make sure that the forward and reverse levers are on NEUTRAL position before operating the truck. Operator should sit on the operator's seat before operating the truck. Release the emergency stop switch, and turn the starting switch clockwise 5 seconds later to ON position before starting the lift truck.

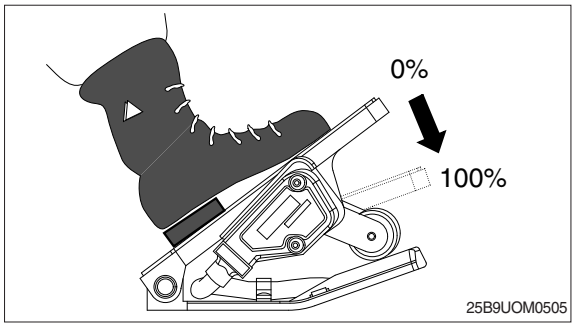
1) TRAVELING

(1) Push (or pull) the forward and the reverse lever, and then gradually press the accelerator pedal.

(2) The truck moves forward (or backward).



(3) Speed is changed in scope of min. and max. speed dependent upon force pressing the pedal.

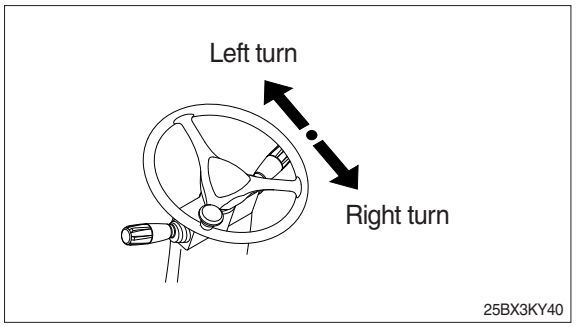


2) CHANGING TRAVEL DIRECTION

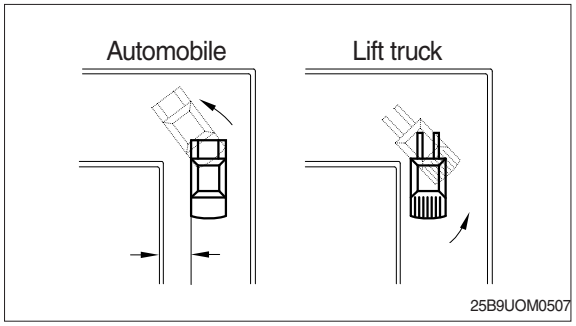
(1) Hold the steering wheel or the knob on the wheel with the left hand, and turn travel direction.

(2) Direction of lift truck is changed with the rear wheels.

(3) Therefore, the truck turns inward during forward driving, and outward during reverse driving.

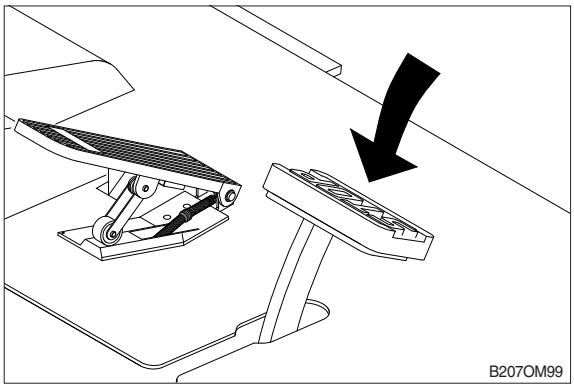


(4) Care should be exercised to prevent collision of the counterweight with other object when turning direction.

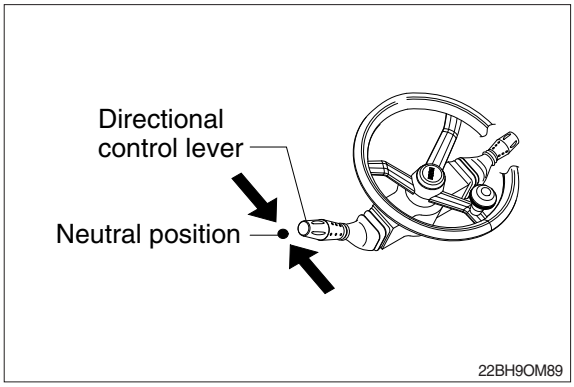


3) STOPPING AND PARKING

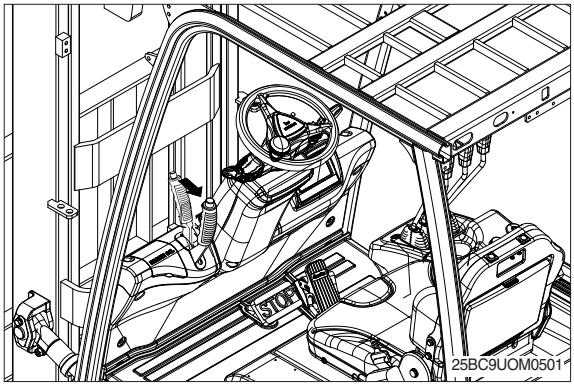
(1) Release the foot from the accelerator pedal beforehand and allow the speed to drop before stepping on the brake pedal.



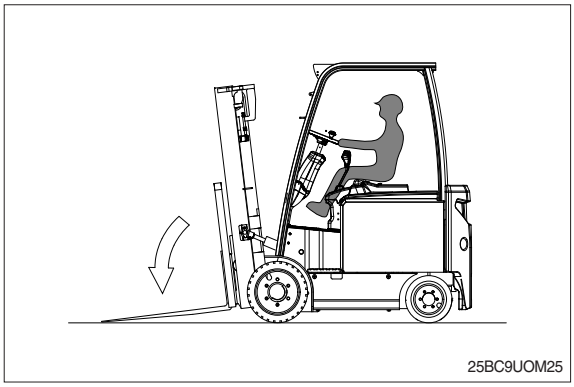
(2) When the vehicle is parked, return the directional control lever to the neutral.



(3) Next, pull up the parking brake lever fully.



(4) Lower the fork to the lowest position. Tilt the mast forward a little.



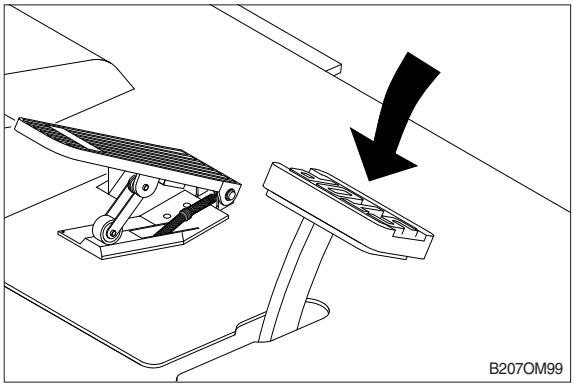
5. CONTROLLING SPEED

With the directional control lever in FORWARD or REVERSE, put your foot on the accelerator pedal and push down smoothly until the truck is moving at the desired speed.

6. BRAKING

To stop the truck, lift your foot from the accelerator pedal and put it on the brake pedal. Push down on the brake pedal in a smooth, firm motion until the truck is stopped.

⚠ **Stop a lift truck as gradually as practical. Hard braking and wheel sliding are dangerous, increase wear and can cause you to lose a load and damage to the lift truck. Can cause tip-over.**



7. PLUGGING

1) You can change direction, without braking, by **"plugging"**. As you are traveling, move the directional control lever to the opposite direction and keep the accelerator pedal depressed. The truck should be slow to a smooth, controlled stop and then accelerate in the opposite direction.
2) You can control the plugging distance with the accelerator pedal :
   The farther the accelerator is depressed, the shorter the reversal distance.

⚠ **Be careful when plugging. Any sudden change in direction can cause the load to move or fall off the forks.**

8. OPERATING SAFELY

Safe operation is the responsibility of the operator.

1) Watch where you are going. Don't go if you can't see...

(1) Before driving, check all around to be sure that your intended path of travel is clear of obstructions and pedestrians.

⚠ **LOOK WHERE YOU DRIVE. Watch out for pedestrians, other vehicles, obstructions (especially overhead), and drop-offs. If the load blocks your view, drive backwards, except up slopes.**

(2) Do not allow anyone to stand or pass under the load or raised forks.
Watch for people in your work area even if your truck has warning lights or alarms. They may not watch for you.

(3) Sound horn at intersections and wherever vision is obstructed.
Do not drive a truck up to anyone standing in front of an object.

2) Protect yourself and those around you...

(1) Operate the truck only from the designated operator's position. Stay within the confines of the lift truck profile dimensions. Keep all body parts inside the operator's compartment and away from the danger of passing obstructions. Keep under overhead guard.

※ **An overhead guard is intended to offer protection to the operator from falling objects, but cannot protect against every possible impact. Therefore, it should not be considered a substitute for good judgement and care in loading, handling, storage, etc.**

⚠ **Keep clear of the mast and lift mechanism. NEVER reach into or put hands, arms, legs, or head into or through the mast structure or near the carriage or lift chains. Never put any part of your body between the mast and the truck.**
Don't use the mast as a ladder.
Keep all other persons clear of the load and mast mechanism while attempting to handle a load.

3) No riders...

(1) Do not carry passengers. The operator is the only one who should be on the truck.

4) Always be in full control of your lift truck...

(1) Never operate a lift truck or its attachments if you are not in the designated operator's position.

(2) Never operate a lift truck when your hands and feet are wet or greasy.

(3) Always pick the smoothest travel route for your lift truck. Avoid bumps, holes, slick, spots, and loose objects or debris in your path that may cause the truck to swerve or tip. If these conditions are unavoidable, slow down and carefully drive past them. Slow down for wet or slippery surfaces.

(4) Avoid any sudden movement, it can cause the machine to tip-over.
Start, stop, travel, steer, and brake smoothly.

(5) Operate your lift truck under all conditions at a speed that will permit it to be brought safely to a stop.

(6) Travel with the fork carriage tilted back and raised only enough to fully clear the ground or obstacles. When the carriage (load) is in an elevated position the stability of the truck is reduced.

(7) Do not elevate the load except during stacking.

5) Grades, ramps, and inclines...

(1) Use special care when operating on ramps, inclines, and uneven areas. Travel slowly. Travel straight up and down. Do not turn or drive at an angle across an incline or ramp. Do not attempt to operate on grades in excess of those specified and/or recommended by the manufacturer.

(2) When the truck is loaded, travel with the load upgrade. When the truck is empty, travel with lifting mechanism (mast) downgrade.

(3) Always brake with the right foot pedal (not with the inching pedal) when travelling down incline.

6) Practice safe operation every time you use your truck...

(1) Careful driving and operation is your responsibility. Be completely familiar with all the safe driving and load handling techniques in this Operator's Manual. Use common sense. Drive carefully; do not indulge in stunt driving or horseplay. Observe traffic rules. Watch for people and hazards. Slow down, be in full control of your lift truck at all times.

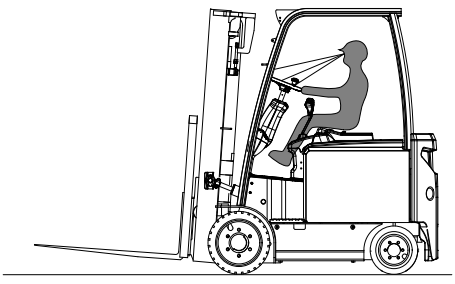
(2) Follow the instructions in this manual to avoid damage to your truck or the possibility of injury to yourself or others.

(3) During your work, observe all functions of your lift truck. This allows you to immediately recognize a problem or irregularity that could affect the safe operation of your truck.

(4) Periodically check the gauges and warning indicator lights in the instrument panel to be sure they indicate a normal condition. If an abnormal condition appears bring the machine to a safe condition and safe location, shut off the starting switch immediately and report the problem.

⚠ Do not continue to operate a truck that has a malfunction. Stop and have it fixed.

⚠ Always wear your seat belt when operating your truck.



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9. LOAD HANDLING

1) GENERAL

Handle only loads that are within the truck rated capacity as shown on the nameplate. This rating specifies the maximum load that should be lifted. However, other factors such as special load handling attachments, load of a high center of gravity, or uneven terrain may dictate that the safe working load be less than the rated capacity. Under these conditions, the operator must reduce the load carried so that the lift truck remains stable.

Handle only stable or safely arranged loads. Do not handle loads made up of loose, unevenly stacked, or unstable items that can easily shift and fall. Take the time to correctly stack and hand loose items. Center the load on the forks.

Do not lift anything that might fall on the operator or a bystander. Do not handle loads that are higher than the fork carriage unless the load is secured so that no part of it can fall backward.

Keep the load back against the LBR. Loads placed out on the ends of the forks can make the lift truck less stable and more likely to tip up.

Lift and lower with the mast vertical or tilted slightly back-never tilted forward.

Operate lift and tilt controls slowly and smoothly. Never tilt the mast forward when the carriage (load) is raised, except to pick up or deposit a load over a rack or stack.

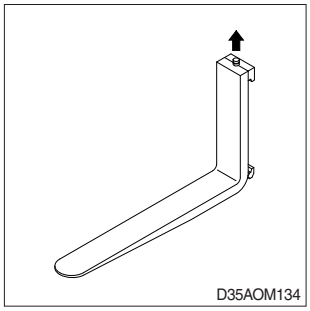
⚠ Slack chains mean rail or carriage hang-up. Raise the mast before you move. If the mast malfunctions in any way or becomes stuck in a raised position, operate the lift control to eliminate any slack chains by raising the carriage. DO NOT go under a raised mast or forks to attempt repairs.
DO NOT climb the mast or the truck.

Remember your truck is designed to carry loads forward of the front wheels so that the weight of the load is counterbalanced by the weight of the truck.

The farther the load is carried from the pivot point (center of front wheels), the less the weight on the steer wheels. Therefore, always carry the load as close to the front wheels as possible (back and flush against the face of the forks.)

The capacity load shown on the nameplate represented by a cube in weight is evenly distributed, with the center of gravity located a standard distance from the face of the forks. If the weight of the actual load to be handled is not evenly distributed, put the heaviest part closest to the carriage.

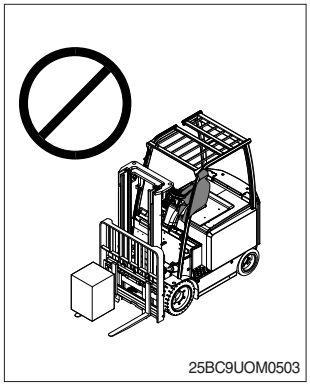
2) ADJUSTING THE LOAD FORKS



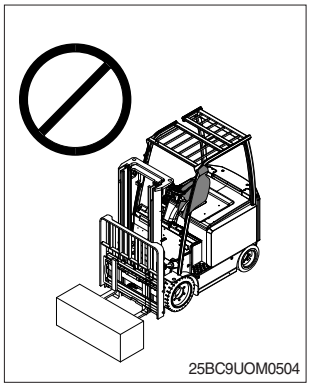
The load forks are adjustable on the hanger, carriage. Forks should be spaced as far apart as the load will allow. Both forks should always be the same distance from the center of the fork carriage. To adjust the forks, raise the carriage slightly. Tilt the mast fully forward to reduce friction and make the fork slide easier.
Unlock the fork locking pins.
Position the forks by pushing them away from you. Secure the fork locking pins.

⚠ Make sure the load backrest (LBR) or fork retaining bolts are fasten securely in place.

3) LOAD ON FORKS



(1) Do not elevate the load with one fork.
Loading with one fork cause the tip over, serious injury or death of operator.
The work can cause the height difference between both fork tips.



(2) Do not elevate the load with the ends of the forks.
This work can cause the height difference tips due to overload in the end of the forks.
The load should be loaded at least over 2/3 of fork length.

4) TRAVELING WITH LOAD

Travel with load or carriage as low as possible and tilted back. Never travel with the load or carriage raised (elevated) in a high position. Do not elevate the load except during stacking.

Observe all traffic regulations and watch for other traffic, pedestrians, and safe clearances. Always look in the direction of travel. Keep a clear view of the path of travel and when the load blocks your visibility, travel in reverse with load trailing (except when climbing an incline).

Avoid sudden movements when carrying a load-start, stop, travel, steer, and brake smoothly. Steer clear of bumps, holes, and loose materials or debris on the ground. Lift and tilt slowly and smoothly. Go slowly when turning. Cross railroad tracks slowly and at an angle wherever possible.

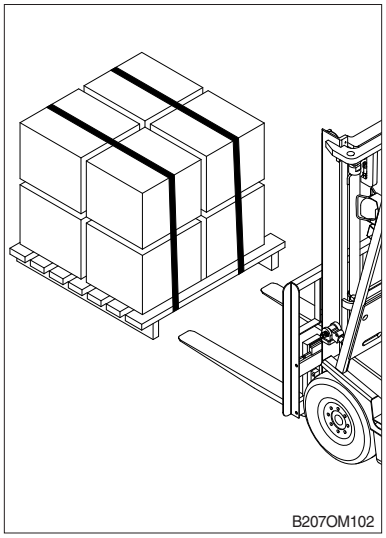
Use special care when handling and traveling with long, high, or wide loads-to avoid losing the load, striking bystanders or obstructions, or tipping the truck.

Watch clearances around the truck and load as you travel. Raise the forks or attachment only to pick up or stack a load. Look out for obstructions, especially overhead.

Be aware that exaggerated tail swing, when turning while traveling forward, is a characteristic of lift trucks that are steered by the rear wheels. Accordingly, you need to become accustomed to tail swing and always check the tail swing area of the counterweight to be sure it is clear before you turn.

Always be concerned about the stability of your lift truck. When attachments are used, extra care should be taken in securing, manipulating, positioning, and transporting the load. Because attachments generally add extra weight and complexity to the truck, operate trucks equipped with attachments as partially-loaded trucks when not handling load.

5) PICKING UP AND MOVING LOADS



When picking up a load from the ground, approach the load slowly and carefully align the truck square with the load. The forks should be adjusted to fit the load or pallet being handle and spread as wide as possible to provide good stability and balance. Before lifting, be sure the load is centered and the forks are fully under and supporting the load. Fork length should be at least 2/3 of load length. With the lift and tilt controls, adjust the forks to the correct height and angle for freely engaging the load pallet. Move forward until the forks are squarely and completely under the load.

⚠ Be Sure that the forks do not extend beyond the load, causing damage or tipping of other adjacent loads or materials behind the load being moved.

If the forks are longer than the load, move the tips partially under the load without extending beyond the load. Raise the load to clear the ground. Back out several inches, or whatever distance is necessary, then set the load down and move forward until the load is positioned against the carriage.

Raise the load from the ground or stack by tilting the mast back just enough to lift the load from the surface. When stacking or tiering, use only enough backward tilt to stabilize the load.

Then raise the load to traveling height and tilt fully back to travel (except for loads that must be transported as level as possible).

6) UNLOADING

To deposit a load on the floor after being moved into the correct position, tilt the mast forward to a vertical position and lower the load.

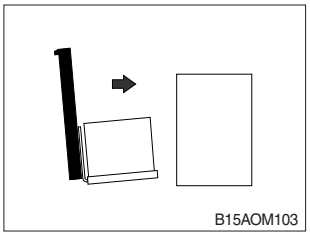
Adjust the fork height and tilt the mast forward slightly, as necessary, for smooth removal of the forks from the load (pallet).

Carefully back away to clear the forks from the load.

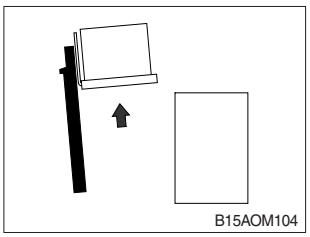
Raise the forks to traveling height and tilt forks to a level position 150~200 mm (6~8 in) off the floor.

7) STACKING

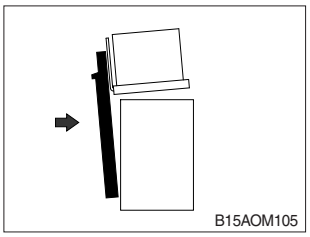
(1) To put a load on a stack



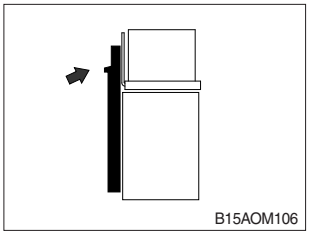
① Approach slowly and align the lift truck and load squarely with the stack.



② Raise the load as the lift truck nears the stack.

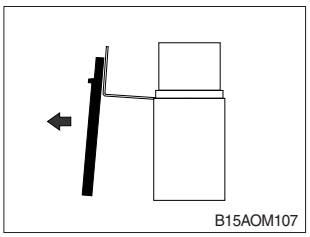


③ Move forward slowly until the load almost touches the stack. The leading edge and sides of the load pallet should line up exactly with the near edge and side of the load or rack on which you are stacking.

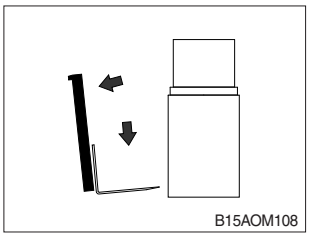


④ Stop close to the stack and further lift the load high enough to clear the top of the stack. Slowly move the load into position. Use care not to damage or move adjacent loads.

⑤ When the load is aligned with the stack beneath it, tilt the mast to the vertical position and carefully lower the load onto the top of the stack.



⑥ Lower the forks slightly to clear the load pallet. Tilt the forks forward slightly, if necessary.



⑦ Check your travel path, then carefully back away until the forks are clear of the stack. Stop and lower the forks to the travel position [150~200 mm (6~8 in) above the ground], then tilt back for travel.

(2) To move a load from a stack

Approach the stack carefully, truck lined up squarely with the load. With mast vertical, raise the forks to the correct height for freely engaging the load pallet. Adjust fork angle as necessary to fit squarely under the load. Move (inch) forward until the forks are under the load.

Be sure that the forks do not extend beyond the load, causing damage or tipping of other adjacent loads or materials behind the load being moved. If the forks are longer than the load, move the tips partially under the load without extending beyond the load.
Raise the load to clear the under surface. Back out several inches, then set the load down and move forward until the front face of the forks contacts the load. Be careful that the fork tips now clear the adjacent load or material behind the load being moved.

Raise the load from the stack by tilting the mast back just enough to lift the load from the surface. Or, with the mast still vertical, raise the forks until they begin to lift the load. at this point, apply the minimum back tilt that will stabilize the load.

Check your travel path, slowly back up until clear of the stack, stop, and then lower the load to the travel position [150~200 mm (6~8 in) off the ground]. Tilt full back to travel (except for certain loads that may have to be transported as level as possible). Be sure the load is back flush against the carriage or front face of the forks.

※ **Certain loads must be transported as level as possible.**

10. SHUT DOWN PROCEDURE

※ Always leave your lift truck in a safe condition.

1) When you leave your truck, or park it, follow these safety rules

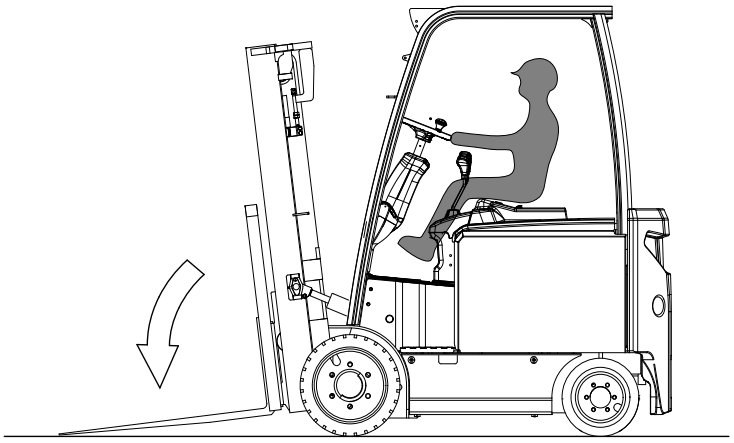
(1) Park in a safe area away from normal traffic.
(2) Never park on a grade.
(3) Never park in areas that block emergency routes or equipment, access to fire aisles, or stairways and fire equipment.

2) Before leaving the operator's position

(1) Bring the truck to a complete stop.
(2) Put the directional control lever in the NEUTRAL position.
(3) Apply the parking brake.
(4) Lower the lifting mechanism-carriage and forks or attachment fully to the ground.

3) In addition, when leaving the truck unattended

(1) Tilt the mast forward until the forks are level and flat on the ground.
(2) Turn the starting switch to the OFF position and remove the key.
(3) Block the wheels, if the truck must be left on an incline or you have any doubt about the truck moving from a safe position.



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6. EMERGENCY PROCEDURES

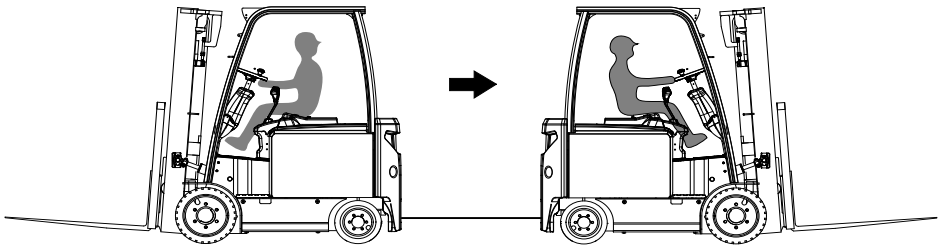
1. HOW TO TOW A DISABLED TRUCK

If your lift truck becomes disabled but it can be moved freely on its own wheels without further damage, use the following procedures to tow it safely to a repair area (Failed lift truck freely movable with its wheel).

※ **It is important for your safety and the care of your lift truck to use the proper equipment and carefully follow these recommendations for safe towing.**

⚠ **DO NOT tow a lift truck if there is a problem with the brakes or tires or the steering cannot be operated. DO NOT tow up or down ramps and steep inclines. DO NOT attempt to tow a lift if traction or weather conditions are poor.**

1) Be sure to apply the parking brake or block the drive wheels on the disabled truck while working around it.
2) When possible, raise the carriage (forks) on the disabled truck about 300 mm from the floor or ground. Secure the carriage with a chain.
3) Obtain another lift truck of equal or larger size carrying a partial load for traction.
4) Use an approved, solid metal tow bar with towing couplers that connect to the towing pins in the counterweights.
5) Release the parking brake on the towed truck.
6) Put the gear selector lever in the NEUTRAL position



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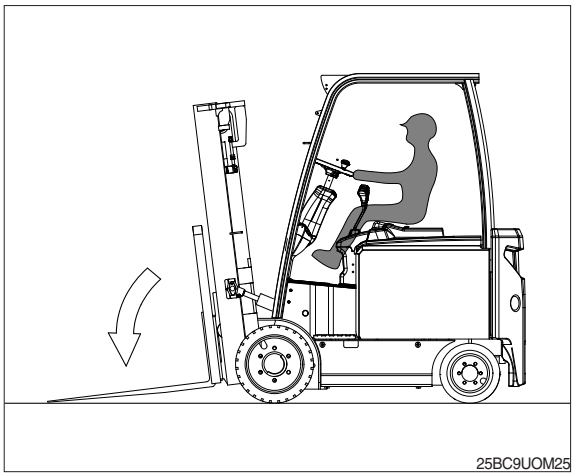
7) Tow the disabled truck backward. An operator must be on the towed truck. Tow the truck slowly. Careful towing is necessary to prevent injury to personnel or damage to the truck. The truck should be towed at a speed of less than 8 km/h with a driver in the seat. Do not lift the truck or any wheels off the floor or ground while the truck is being towed.

⚠ **The power steering will not operate on the disabled truck when the pump motor is not running.**

8) Park the disabled truck in authorized areas only. Fully lower the forks to the floor, put the gear selector lever in the NEUTRAL position and turn the starting switch to the OFF position. Apply the parking brake. Remove the start switch and, when necessary, block the wheels to prevent the truck from rolling.

⚠ Always apply the parking brake when parking a lift truck.
The truck can move and cause injury or death to personnel near it.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3. EMERGENCY MAST LOWERING

In case that the mast can't be lowered due to a problem in the controller, activate the emergency lowering valve on the MCV assy by rotating the valve (a).

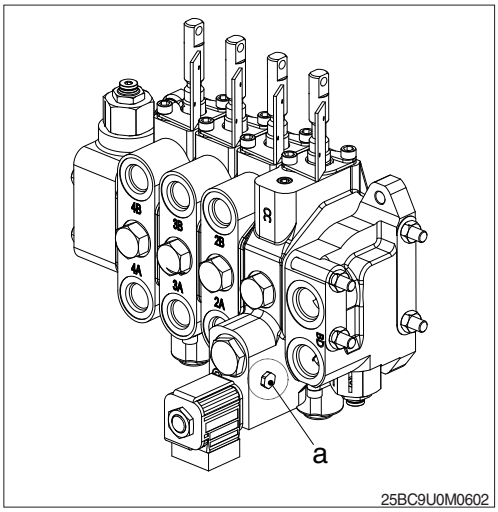
⚠ Manual override feature is intended for emergency use, not for continuous-duty operation.

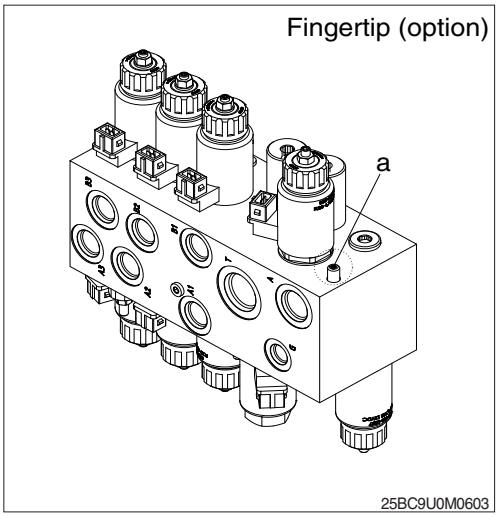
1) Loosen and remove the MCV cover connecting bolts.
   ·Tightening torque : 0.8 - 1.2 kgf·m

2) Use the L-wrench (3 mm) to loosen the bolts counterclockwise until lowering of the mast begins.
   Do not undo the bolts more than 1.5 turns.
   If lowering still does not begin, there is a mechanical block . Do not under any circumstances continue to unscrew the emergency lowering feature.

3) After lowering is complete, the valve must be screwed back in again.
   Do not exceed a tightening torque of maximum 0.25 kgf·m.

⚠ When operating the emergency lowering valve in order to lower the mast inevitably, always make certain that any person should not stand or pass under the mast, the fork and platform so as to avoid from unexpected accident accident such severe personal injury or death.





CHAPTER 7 PLANNED MAINTENANCE

1. INTRODUCTION

ONLY TRAINED AND AUTHORIZED PERSONNEL should perform planned maintenance. Local HD HYUNDAI dealers are prepared to help customers put in place a planed maintenance program for checking and maintaining their lift trucks according to applicable safety regulations.

⚠ Powered industrial trucks may becomes hazardous if maintenance is neglected.

As outlined in section 4, operator maintenance and care, the operator should make a safety inspection of the lift truck before operating it. The purpose of this daily examination is to check for any obvious damage and maintenance problems, and to have minor adjustments and repairs made to correct any unsafe condition.

In addition to the operator's daily inspection, HD HYUNDAI recommends that the owner set up and follow a periodic planned maintenance(PM) and inspection program. Performed on a regular basis by trained personnel, the program provides through truck. The PM identifies needed adjustments, repairs, or replacements so they can be made before failure occurs. The specific schedule (frequency) for the PM inspections depends on the particular application and lift truck usage.

This section recommends typical planned maintenance and lubrication schedules for items essential to the safety, life, and performance of the truck. It also outlines safe maintenance practices and gives brief procedures for inspections, operational checks, cleaning, lubrication, and minor adjustments.

Specifications for selected components, fuel, lubricants, critical bolt torques, refill capacities, and settings for the truck are found in section 8.

If you have needed for more information on the care and repair of your truck, see your HD HYUNDAI dealer.

2. SAFE MAINTENANCE PRACTICES

The following instructions have been prepared from current industry and government safety standards applicable to industrial truck operation and maintenance. These recommended procedures specify conditions, methods, and accepted practices that aid in the safe maintenance of industrial trucks. They are listed here for the reference and safety of all workers during maintenance operations. Carefully read and understand these instructions and the specific maintenance procedures before attempting to do any repair work. When in doubt of any maintenance procedure, please contact your local HD HYUNDAI dealer.

1) Powered industrial trucks can become hazardous if maintenance is neglected. Therefore, suitable maintenance facilities and trained personnel and procedures shall be provided.

2) Maintenance and inspection of all lift trucks shall be performed in conformance with the manufacturer's recommendations.

3) Follow a scheduled planned maintenance, lubrication, and inspection system.

4) Only trained and authorized personnel are permitted to maintain, repair, adjust, and inspect trucks and must do so in accordance with the manufacturer's specifications.

5) Always wear safety glasses. Wear a safety (hard) hat in industrial plants and in special work areas where protection is necessary and required.

6) Properly ventilate work area, vent exhaust fumes, and keep shop clean and floors dry.

7) Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check for level or leakage fuel, or coolant

8) Before starting work on truck

(1) Raise drive wheels free of floor and use oak blocks or other positive truck positioning devices.

(2) Remove all jewelry (watches, rings, bracelets, etc.).

(3) Put oak blocks under the load engaging means, inner masts, or chassis before working on them.

(4) Disconnect the battery ground cable (-) before working on the electrical system.

※ **Refer to the jacking and blocking section on Page 1-16 for proper procedures.**

9) Operation of the truck to check performance must be conducted in an authorized, safe, clear area.

10) Before starting to operate the truck

(1) Be seated in a safe operating position and fasten your seat belt.

(2) Make sure parking brake is applied.

(3) Put the gear selector lever in NEUTRAL.

(4) Check functioning of lift and tilt systems, direction and speed controls, steering, brakes, warning devices, and load handling attachments.

11) **Before leaving the truck.**

(1) Stop the truck.
(2) Fully lower the load-engaging means (mast, carriage, forks or attachment), and incline the mast forward.
(3) Put the gear selector lever in NEUTRAL.
(4) Apply the parking brake.
(5) Turn the start switch to OFF position.
(6) Put blocks at the wheels if the truck must be left on an incline.

12) Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, lift and tilt mechanisms, articulating axle stops, load backrest, overhead guard and frame members must be carefully and regularly inspected and maintained in a safe operating condition.

13) Special trucks or devices designed and approved for hazardous area operation must receive special attention for maintenance.

14) All hydraulic systems must be regularly inspected and maintained in conformance with good practice. Tilt and lift cylinders, valves, and other parts must be checked to assure that drift or leakage has not developed to the extent that it would create a hazard.

15) When working on the hydraulic system, be sure the engine is turned off, mast is in the fully-lowered position, and hydraulic pressure is relieved in hoses and tubing.

⚠ **Always put oak blocks under the carriage and mast rails when it is necessary to work with the mast in an elevated position.**

16) The truck manufacturer's capacity, operation, and maintenance instruction plates, tags, or decals must be maintained in legible condition.

17) Batteries, limit switches, protective devices, electrical conductors, and connections must be maintained in conformance with good practice. Special attention must be paid to the condition of electrical insulation.

18) To avoid injury to personnel or damage to the equipment, consult the manufacturer's procedures in replacing contacts on any battery connection.

19) Trucks must be kept in a clean condition to minimize fire hazards and help in detection of loose or defective parts.

20) Modifications and additions that affect capacity and safe truck operation must not be done without the manufacturer's prior written approval. **This is an** OSHA requirement. Capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.

21) Care must be taken to assure that all replacement parts, including tires, are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment.

22) When removing tires follow industry safety practices. Most importantly, deflate pneumatic tires completely prior to removal. Following assembly of tires on multi-piece rims, use a safety cage or restraining device while inflating.

23) Use special care when removing heavy components, such as counterweight, mast, etc. Be sure that lifting and handling equipment is of the correct capacity and in good condition.

3. INSTRUCTIONS BEFORE MAINTENANCE

1) INTERVAL OF MAINTENANCE

(1) You may inspect and service the truck by the period as described at based on service meter of LCD. Since service meter is virtually identical with period, it is allowed to perform inspection and maintenance in scheduled interval.

(2) The scheduled maintenance list is developed based on standard working. Shorten the interval of inspect and service depending on site condition (Such as dusty area, quarry, sea shore and etc.).

(3) Practice the entire related details at the same time when the service interval is doubled.
For example, in case of 250 hours, carry out all the maintenance each 250hours, each 100 hours and daily service at the same time.

※ Time intervals between maintenance are largely determined by operating conditions.
For example, operation in sandy, dusty locations requires shorter maintenance intervals than operation in clean warehouses. The indicated intervals are intended for normal operation. The operating condition classifications are;

· **Normal operation**
Eight hour material handling, mostly in buildings or in clean, open air on clean paved surfaces.

· **Harsh operation**
- All harsh working environment
- Long term heavy load operation
- High and low temperature working environment
- Sudden change in temperature
- Dusty or sandy working environment
- Highly corrosive chemical working environment
- Damp working environment

※ Since the operating environment of lift trucks varies widely, the above descriptions are highly generalized and should be applied as actual conditions dictate.

2) PRECAUTION

(1) Fully understand Safety Hints and lift trucks, and perform inspection and maintenance for preventing personal injury or damage to the truck.
(2) Reading the cluster does not fully guarantee the conditions of the truck. Perform routine maintenance in accordance with the specifics in the inspection and maintenance checklists.
(3) Ask to your local dealer or HD HYUNDAI for maintenance advise it unknown. Engine and hydraulic components have been preset in the factory.
Do not allow unauthorized personnel to reset them.
(4) Drain the used oil and coolant in a container and handle according to the method of handling for industrial waste to meet with regulations of each province or country.

3) PROPER MAINTENANCE

(1) Replacement and repair of parts
It is required to replace the wearable and consumable parts such as hose, tube and filter etc., regularly. Replacing damaged or worn parts at proper time to keep the performance of truck.

(2) Use HD HYUNDAI genuine parts.

(3) Use the recommended oil.

(4) Remove the dust or water around the inlet of oil tank before supplying oil.

(5) Drain oil when the temperature of oil is warm.

(6) Do not repair anything while operating the engine.

(7) Stop the engine when you fill the oil.

(8) Relieve hydraulic system of the pressure by opening of breather when repairing the hydraulic system.

(9) Reading cluster gauges
Confirm if the cluster is in the normal condition after completion of service.

(10) Please contract HD HYUNDAI dealer for information of adjustment, disassembling and repair of power transmission, hydraulic devices and electronic devices (e.g., check unit).

※ **Be sure to start the maintenance after fully understanding the Section 1 Safety Hints.**

4) PRECAUTION WHEN INSTALLING HYDRAULIC HOSES OR PIPE

(1) Special care should be exercised for preventing joints of hose, pipe and functional part from damage, and intrusion of foreign substances such as dusts or particles. Take dust-preventing measures for each part.
(2) Clean joints and surroundings of hose, pipe and functional part, remove cleaning solution clear, and then dry the parts before assembling
(3) Use HD HYUNDAI genuine parts Do not damaged or degraded O-rings. Using parts other than genuine parts may cause oil leak or significant reduction of service life because of different materials or harness.
(4) Do not assemble the hose in the condition of twisted or sharp radius. Service life of hose may significantly be reduced.
(5) Keep the specified tighten torque.

5) PERIODICAL REPLACEMENT OF SAFETY PARTS

(1) It is desirable to perform periodical maintenance on lift trucks for operating the trucks safely for a long time, and it is recommended to replace parts relevant to safety upon regular basis for enhancing safety.

(2) These parts are subject to variation of materials over time, and deterioration, abrasion and fatigue upon repeated use to cause critical personal and property disasters. The parts are hard to judge remainder service life by operation with his/her operation experiences or visual inspection.

(3) Repair or replace if an abnormality of these parts is found even before the recommend replacement interval.

(4) Please consult HD HYUNDAI dealer or service shop for replacement of these safety parts.

No.	Name	Replacement cycle
1	Master cylinder and wheel cylinder caps dust seals	Every 1 year
2	Lift cylinder hose	Every 1 year (harsh operation) Every 2 years (normal operation)
3	Tilt cylinder hose	
4	Side shift cylinder hose	
5	Brake hose or tube	
6	Hydraulic pump hose	Every 2 years
7	Power steering hose	
8	Coolant hose and clamps	
9	Packing, seal, and O-ring of steering cylinder	Every 2 years (harsh operation) Every 4 years (normal operation)
10	Lift chain	
11	Brake oil tank tube	
12	Hydraulic pump seal kit	Every 3 years
13	Pressure sensor	Every 5 years
14	Mast accumulator (piston type)	Every 10 years

※ Replace the O-ring and gasket at the same time when replacing the hose.

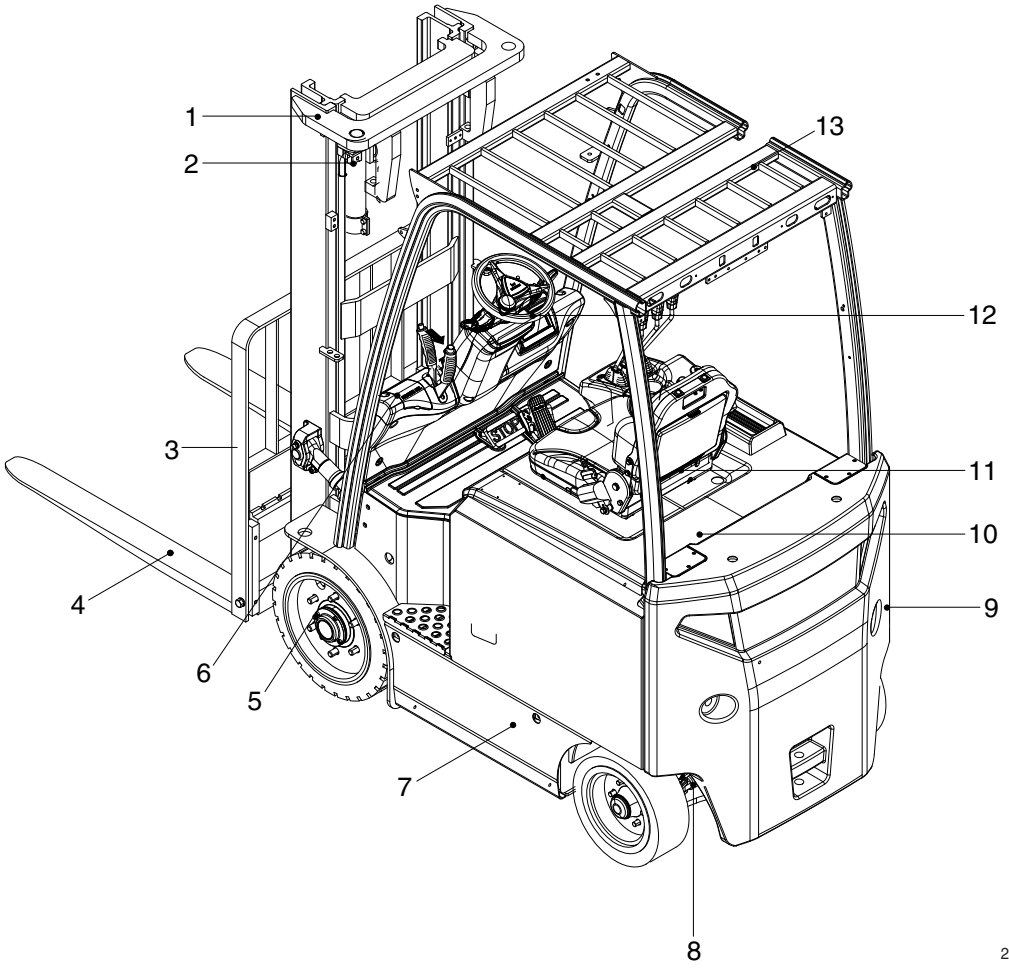
※ Replace clamp at the same time if the hose clamp is cracked when checking and replacing hose.

※ Refer to the page 7-4 about the harsh and normal operation.

4. MAJOR COMPONENT LOCATIONS

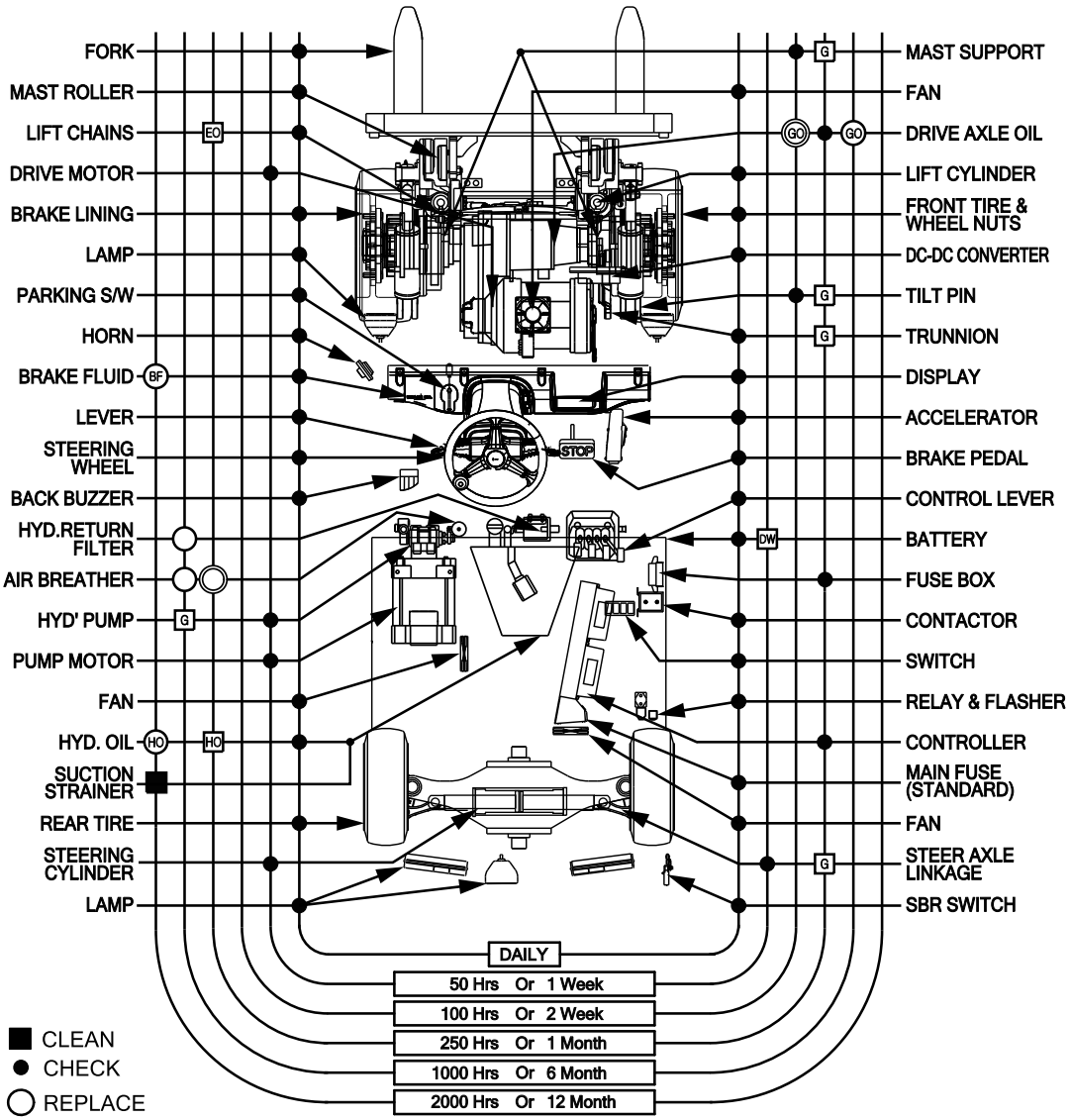
1) LOCATIONS

Use the illustration below to locate components included in the PM procedures.



1	Mast	6	Dash board	11	Seat
2	Lift cylinder	7	Frame	12	Steering wheel
3	Carriage and backrest	8	Steering axle	13	Overhead guard
4	Forks	9	Counterweight		
5	Drive unit	10	Battery cover		

2) SERVICE LOCATIONS



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5. DAILY MAINTENANCE CHECKLIST

Service intervals are based on the hourmeter reading.

DAILY (OR EVERY 10 HOURS) CHECK LIST	
1	Damage of truck and oil leak
2	Cleanness of battery connector
3	Battery electrolyte level
4	Capacity, warming plate and decal
5	Custer, warning lamp, hourmeter
6	Horn operation and other alarming devices
7	Additional safety devices (horn, and alarm lamp)
8	Fan operation
9	DC-DC converter
10	Switch and relay
11	Gear selector, and speed adjustment
12	Checking and makeup of hydraulic oil level
13	Air-breather element inspection and cleaning
14	Lift, tilt and auxiliary system operation
15	Mast, lift chain fastening torque
16	Carriage, or attachment and forks
17	Seat deck fastening latch for correct locking
18	Overhead guard conditions, and bolts
19	Checking and makeup of brake oil level
20	Tire air pressure
21	Tire wheel checking, and foreign substance removal
22	Wheel lug nut loosening and detachment checking
23	Service brake operation
24	Parking brake operation
25	Accelerator pedal (pedal linkage)
26	Steering system operation

6. PERIODICAL CHECKLIST

Service intervals are based on the hourmeter reading.

Service item		Oil symbol	Service interval hours								Initial hours		
			50	250	500	1000	1500	2000	3000	4000	50i	100i	250i
Tightening (Mounting bolt)	Tilt cylinder pin, rod-eye				T								T
	Hydraulic pump							T					T
	Steering unit							T					T
	Main control valve							T					T
	Lift, attachment, steering cylinder							T					T
	Mast				T								
	Drive motor and unit				T								
	Drive and steering wheel		T										
	Counterweight and overhead guard (cabin)		T										
Lubrication	Mast roller	G			L								L
	Lift chain	GO,G			L								L
	Steering axle connector		L										
	Attachment cylinder rod and tube connector			L									
	Steering axle kingpin bearing				L*1	L*2							
	Pedal hinge				L								
	Drive motor and unit connector	G			L*1	L*2							
	Pump and motor connector	G			L*1	L*2							
	Tilt cylinder pin - mast	G		L*1	L*2								
	Tilt cylinder pin - frame	G			L								
	Manual lever, hinge-bushing	G						L					
Oil leak	Hydraulic oil tank				I								I
	Valve (MCV, priority, brake)				I								I
	Pump, steering unit				I								I
	Lift, tilt, steering cylinder			I*1	I*2								I
Function test	Steering wheel				I								I
	Manual lever				I								
	Fork natural drop and forward tilt							I					
	Mast angle							M					
	Weight gauging sensor (opt)							I					
	Accumulator N2 gas charging (opt)							I					
Periodical replacement parts	Drive axle air-vent				Clean								
	Drive axle oil	MO			A	R							
	Brake oil	BF						R					
	Air breather element			R*1	R*2								
	Hydraulic oil return filter					R							R
	Hydraulic oil strainer							Clean					
	Hydraulic oil	HO		A				R*3		R*4 (5000)			

*1 Harsh condition *2 Normal condition

*3 Conventional hydraulic oil *4 HD HYUNDAI genuine long life hydraulic oil

A : Add C : Checking L : Lubrication R : Replacement T : Retightening

I: Visual inspection (repair or replacement if required)

M: Measurement (Repair or adjustment if required)

※ Oil symbols

The oil symbols are as follows:

· G: Grease · GO: Gear oil · HO: Hydraulic oil · MO: Transmission oil

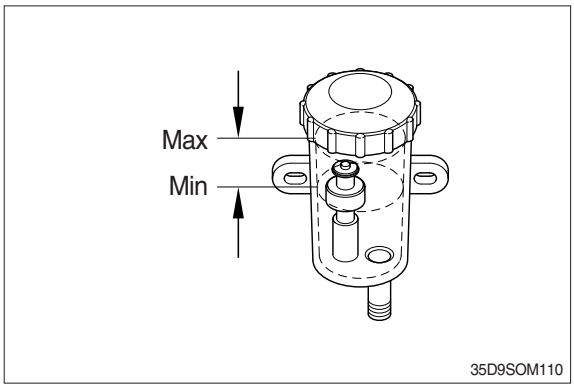
1) SUPPLYING BRAKE FLUID

A hydraulically operated brake is employed. Check the level of brake fluid in the reservoir tank. When the level is low, refill.

(1) Do not mix with different kinds of brake fluid.

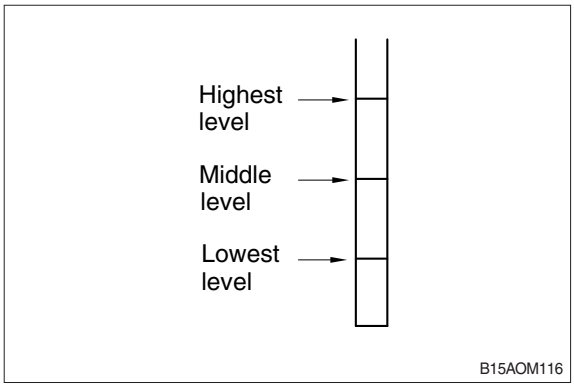
(2) Be careful not to allow external dust to enter through the reservoir cap vent hole and clog it.

(3) Brake fluid change needs a special technique. When the change is necessary, go to the service station and ask for the change.



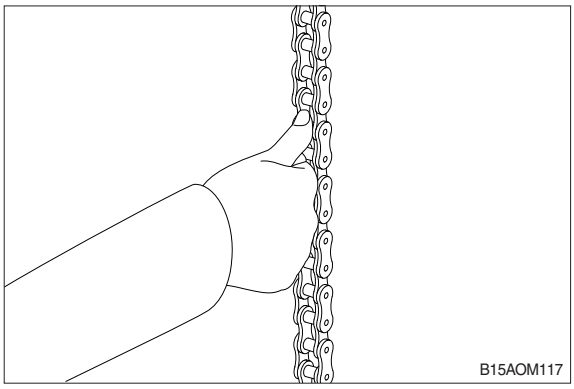
2) CHECKING & FILLING HYDRAULIC OIL

Lower the fork in its lowest position on an even ground. Check for the hydraulic oil level with the oil level gauge. When the level is low, refill.



3) CHECKING AND ADJUSTMENT OF LIFT CHAIN TENSION

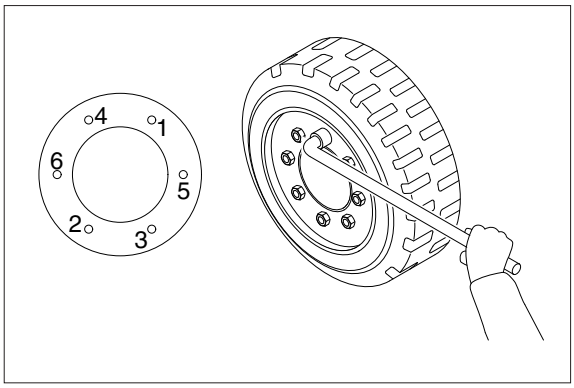
Set the fork in its horizontal position on an even ground. Raise it up to 20~30 ㎝ from the ground and push the chain with both hands. If the tension is too high or too low on one side, adjust it with the chain anchor bolt.



4) CHECKING OF HUB NUT TIGHTENING CONDITION

Make sure that the hub nut is firmly tightened.

Tightening and checking should be made in a diagonal order to prevent unbalanced tightening. (see the figure.)



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5) GREASING UP

Clean the following fittings with brushes or waste and apply grease to them.

△ **Be careful not to supply too much grease.**

Fittings	Greasing points
Mast support	2 spots
Tilt cylinder pin	4 spots
Steering cylinder link	4 spots
King pin	4 spots
Steering axle mounting	2 spots
Idle wheel bracket	2 spots
Mast roller bearing	4 spots (V), 8 spots (TF, TS), 12 spots (QF)

6) GREASING OF EACH PARTS

Clean the following parts before greasing.

(1) Lift chain : Clean the chain with a brush greased with SAE 20~30 (brush over the gear oil low viscosity).

(2) Rolling part of mast guide rail roller : Brush over grease.

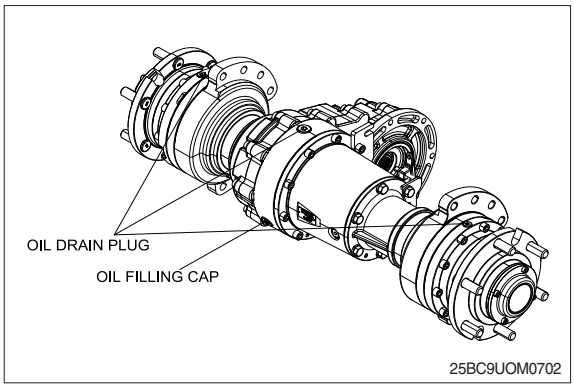
(3) Slide guide and slide rail : Brush over leaked oil.

(4) Sliding parts of inner mast and outer mast : Brush over leaked oil.

(5) Sliding parts of fork and finger bar : Brush over grease.

7) CHECK FOR THE OIL LEVEL OF THE DRIVING GEAR CASE

Check for the oil level by taking out the plug provided front side of the gear case.

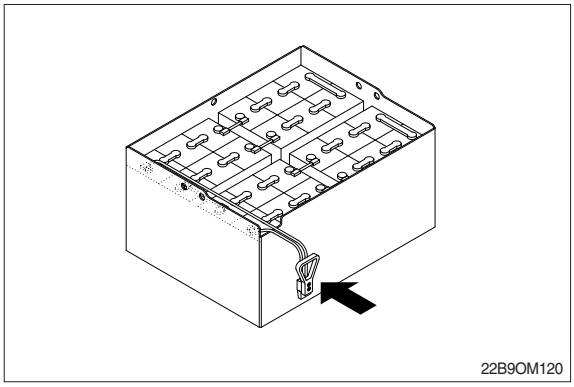


8) EXTERNAL APPEARANCE CHECK OF THE VEHICLE

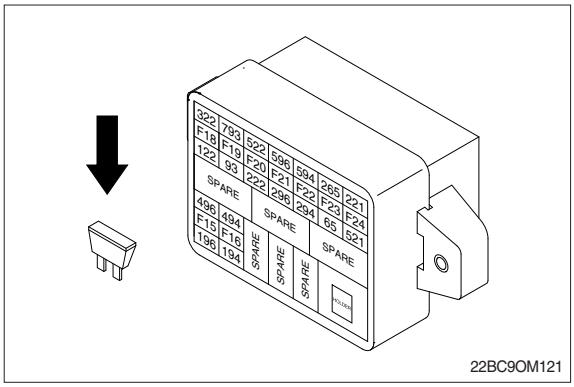
Check for the external appearance of vehicles. If any defect is found immediately contact the service station.

9) FUSE REPLACEMENT

(1) Disconnect the battery connector.



(2) Remove the blown fuse and replace with a new one.



※ **The blown fuse must be replaced with a fuse of the same capacity. When the fuses are often blown out contact the service station for inspection. Never use a conductor for a fuse.**

10) LIFT CHAIN MAINTENANCE

The chain system on the mast was designed for safe, efficient and reliable transmission of lifting force from hydraulic cylinder to the forks, safe use of your truck with minimum down-time depends on the correct care and maintenance of the lift chains. Most complaints of unacceptable chain performance are a result of poor maintenance. Chains need periodic maintenance to give maximum service life.

⚠ Do not attempt to repair a worn chain. Replace worn or damaged chains. Do not piece chains together.

11) LIFT CHAIN INSPECTION AND MEASUREMENT

Inspect and lubricate the lift chains every PM (500 hours). When operating in corrosive environments, inspect the chains at short intervals. During the inspection, check for the following conditions :

(1) Rust and corrosion, cracked plates, raised or turned pins, tight joints, wear and worn pins or holes.

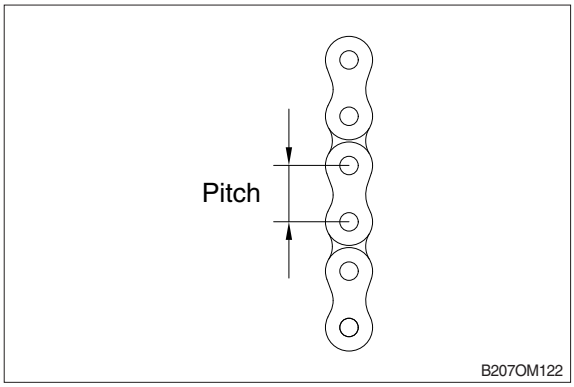
(2) When the pins or holes become worn, the chain becomes longer. When a section of chain is 3% longer than a section of new chain, the chain is worn and must be discarded.

(3) Chain wear can be measured by using a chain scale or a steel tape measure, When checking chain wear, be sure to measure a segment of chain that moves over a sheave. Do not repair chains by cutting out the worn section and joining in a new piece. If part of a chain is worn, replace all the chains on a truck.

12) LIFT CHAIN LUBRICATION

Lift chain lubrication is an important part of your maintenance program. The lift chains operate under heavy loadings and function more safely and have longer lift if they are regularly and correctly lubricated. HD HYUNDAI chain lubricant is recommended; it is easily sprayed on and provides superior lubrication. Heavy motor oil may also be used as a lubricant and corrosion inhibitor

13) LIFT CHAIN WEAR AND REPLACEMENT CRITERIA



All chains must be replaced if any link has wear of 3% or more, or if any of the damaged conditions noted above are found during inspection. Order replacement chains from your HD HYUNDAI dealer. Replace all chains as a set. Do not remove factory lubrication or paint new chains. Replace anchor pins and worn or broken anchors when installing new chains. Adjust tension on new chains. Lubricate chains when they are installed on the mast.

※ Please refer to your Service Manual for additional information on lift chain measurement and maintenance.

8. VISUAL INSPECTION

First, perform a visual inspection of the lift truck and its components.

· Walk around the truck and take note of any obvious damage and maintenance problems. Check for loose fasteners and fittings.

· Check to be sure all capacity, safety, and warning plates or decals are attached and legible.

※ **NAMEPLATES AND DECALS: Do not operate a lift truck with damaged or lost decals and nameplates. Replace them immediately. They contain important information.**

· Inspect the truck for any sign of external leakage: drive axle fluid etc.

· Check for hydraulic oil leaks and loose fittings.

⚠ **HYDRAULIC FLUID PRESSURE: Do not use your hands to check for hydraulic leakage. Fluid under pressure can penetrate your skin and cause serious injury.**

· Be sure that the driver's overhead guard, load backrest extension and safety devices are in place, undamaged and attached securely.

Then check all of the critical components that handle or carry the load.

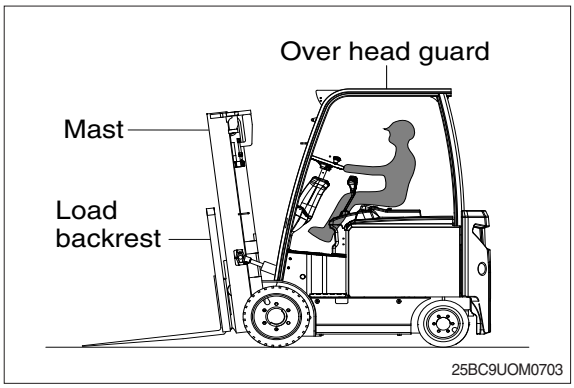
1) OVERHEAD GUARD

Check the overhead guard for damage. Be sure that it is properly positioned and all mounting fasteners are in place and tight.

2) LOAD BACKREST

Check the load backrest for damage. Inspect the welds on the carriage and load backrest for cracks.

Be sure that the mounting fasteners are all in place and tight.



3) MAST ASSEMBLY

Inspect the mast assembly : Rails, carriage rollers, lift chains, lift cylinders and tilt cylinders. Look for obvious wear and maintenance problems and damaged or missing parts. Check for any loose parts or fittings. Check for leaks, any damaged or loose rollers and rail wear (metal flaking). Inspect all lift line hydraulic connections for leaks.

4) LIFT CHAIN

Carefully check the lift chains for wear, rust, corrosion, cracked or broken links, stretching, etc.. Check that the lift and carriage chains are adjusted to have equal tension. Check that the lift chain anchor fasteners and locking means are in place and tight.

△ **Masts and lift chains require special attention to maintain them in safe operating condition.**

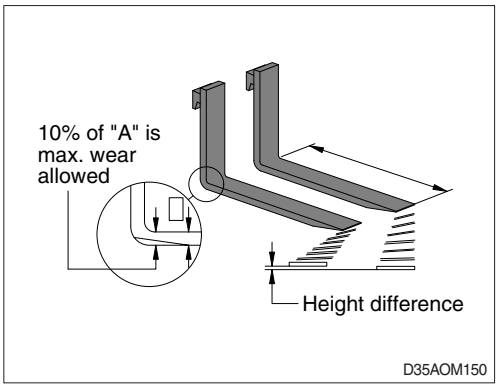
· Mast can drop suddenly. Look at the mast, but keep hands out.

· Lift chain repairs and adjustments should be made by trained service personnel.

5) FORKS

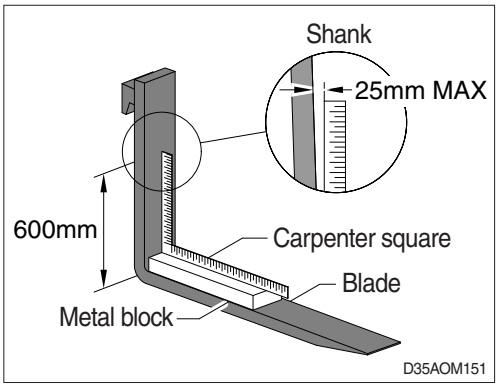
Inspect the load forks for cracks, breaks, bending, and wear. The fork top surfaces should be level and even with each other. The height difference between both fork tips refer to below table.

Model	Fork length (mm)	Height difference (mm)
All	equal or below 1500	3
	above 1500	4



⚠ If the fork blade at the heel is worn down by more than 10%, the load capacity is reduced and the fork must be replaced.

Inspect the forks for twists and bends. Put a 50 mm (2 in) thick metal block, at least 100 mm (4 in) wide by 600 mm (24 in) long with parallel sides, on the blade of the fork with the 100 mm (4 in) surface against the blade. Put a 600 mm (24 in) carpenter's square on the top of the block and against the shank. Check the fork 500 mm (20 in) above the blade to make sure it is not bent more than 25 mm (1 in) maximum.



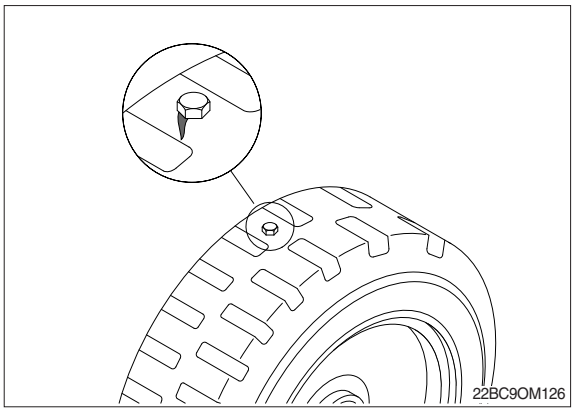
※ If the fork blades are obviously bent or damaged, have them inspected by a trained maintenance person before operating the truck.

Inspect the fork locking pins for cracks or damage. Reinsert them and note whether they fit properly.

6) WHEELS AND TIRES

Check the condition of the drive and steering wheels and tires. Remove objects that are embedded in the tread. Inspect the tires for excessive wear and breaks or **chunking out**.

Check all wheel lug nuts or bolts to be sure none of them is loose or missing. Replace missing bolts or lug nuts. Torque loose or replaced items to specifications.



9. CHECKING THE HYDRAULIC OIL

1) CHANGE THE HYDRAULIC OIL

(1) Lower the forks on the ground and extend the tilt cylinder to the maximum.

(2) Loosen the cap and relieve the pressure in the tank.

(3) Prepare a suitable drain pan (40 Liter, 10.5 gallon) and loosen the drain plug.

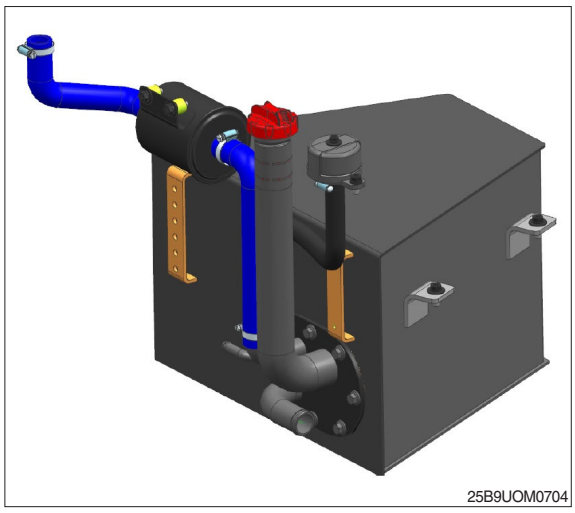
(4) After draining oil, tighten the drain plug.
· Tightening torque : 5 kgf · m

(5) Loosen the fastening bolt of the rear flange, remove and clean the suction strainer, and then mount them again.
· Tightening torque : 4 kgf · m

(6) Fill proper amount of recommended oil.

(7) Start engine and run continuously. Release the air by full stroke of control lever.

※ **The oil must be free of bubbles. If bubbles are present in the oil, air is entering the hydraulic system. Inspect the suction hoses and hose clamps for leakage or damage.**



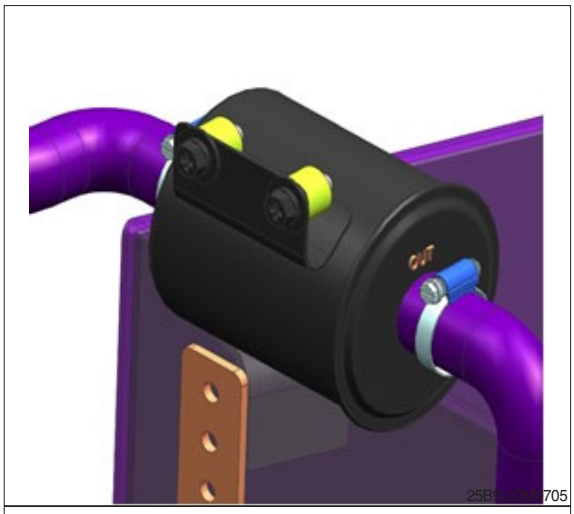
2) HYDRAULIC OIL RETURN FILTER EXCHANGING

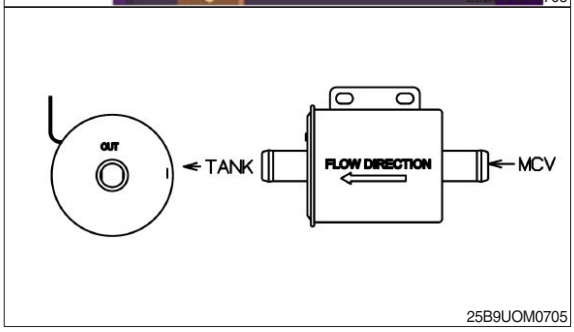
Observing precautions for supply and change of hydraulic oil, perform the followings:

(1) **Loosen the hose clamps**
Tightening torque : 0.4 kgf.m

(2) **Loosen fastening bolts and replace return filter with a new one.**
Tightening torque : 3.4 kgf.m

※ **Pay attention to flow direction when reassembly return filter.**





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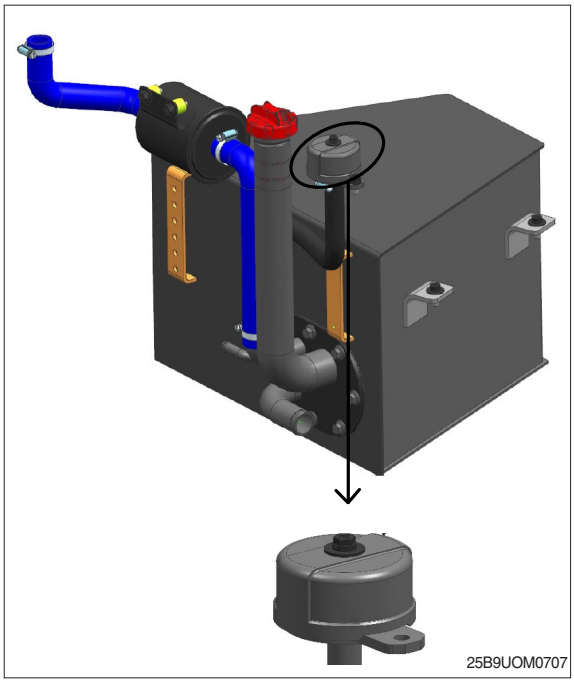
3) REPLACEMENT OF AIR BREATHER ELEMENT

(1) Loosen the cap and relieve the pressure in the tank.

(2) Loosen the screw on the top of the air breather, and remove the cover

(3) Replace the element with a new one.



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10. CRITICAL FASTENER CHECKS

Fasteners in highly loaded (critical) components can quickly fail if they become loosened. Also, loose fasteners can cause damage or failure of the component. For safety, it is important that the correct torque be maintained on all critical fasteners of components that directly support, handle or control the load and protect the operator.

Check critical items, including :

- Drive axle mounting
- Drive and steering wheel mounting
- Counterweight mounting
- Load backrest extension
- Overhead guard
- Tilt cylinder mounting & yokes
- Mast mounting & components

Refer to「8. SPECIFICATIONS」for critical tightening torque value.

11. AIR CLEANING THE TRUCK

Always maintain a lift truck in a clean condition. Do not allow dirt, dust, lint or other contaminants to accumulate on the truck. Keep the truck free from leaking oil and grease. Wipe up all oil spills. Keep the controls and floorboards clean, dry and safe. A clean truck makes it easier to see leakage and loose, missing or damaged parts. A clean condition helps prevent fires and helps the truck run cooler.

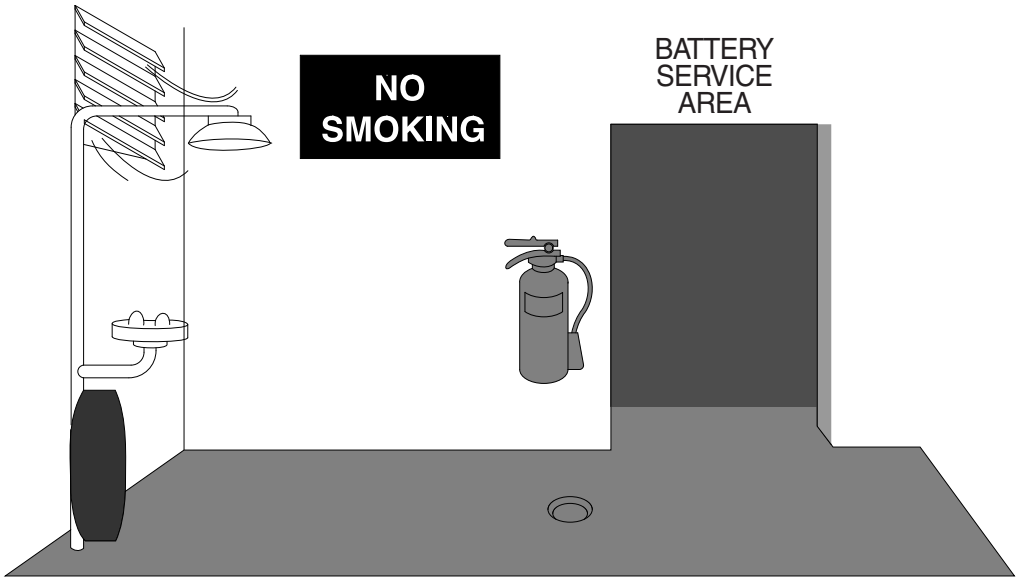
Lift trucks should be air cleaned at every PM interval and more often if needed.

Use an air hose with special adapter or extension having a control valve and a nozzle to direct the air properly. Use clean, dry, low pressure, compressed air. Restrict air pressure to 30 psi (207 kPa), maximum. (OSHA requirement.)

⚠ Wear suitable eye protection and protective clothing.

Air clean : mast assembly; drive axle; battery; cables; switches and wiring harness; drive and hydraulic motors; and steering axle, steering cylinder and linkage.

12. ELECTRIC TRUCK BATTERY MAINTENANCE



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Battery charging installations must be located in areas designated for that purpose. These areas must be kept free of all non-essential combustible materials.

Facilities must be provided for :

- Flushing spilled electrolyte.
- Fire protection.
- Protecting charging apparatus from damage by trucks.
- Adequate ventilation for dispersal of fumes from gassing batteries.

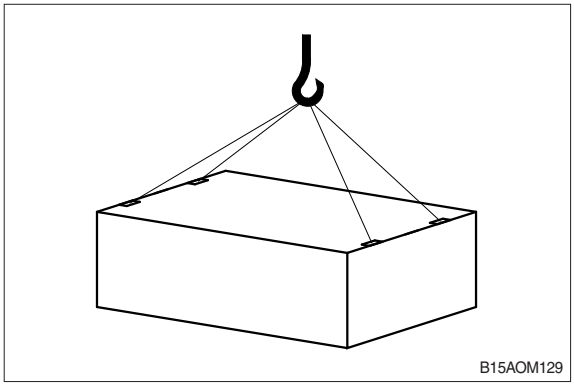
When handling acid concentrates greater than 50 percent acid (above 1,400 specifics gravity), an eye wash fountain must be provided.

A conveyor, overhead hoist or equivalent material handling equipment must be provided for handling batteries.

⚠ Electric truck batteries are heavy and awkward to handle. They are filled with a very hazardous chemical solution. On charge, they give off hydrogen and oxygen which, in certain concentrations, are explosive. And they are costly. Before you remove, service or install a truck battery, carefully read the following recommendations and instructions.

13. BATTERY HANDLING

1) Change (remove) or service storage batteries only in an area designated for this purpose.
2) Be sure this area has provisions to flush and neutralize spillage, to ventilate fumes from gassing batteries and for fire protection.
3) This area should be equipped with material-handling tools designed for removing and replacing batteries, including a conveyor or overhead hoist. Use lift hooks that have safety latches.
4) Always use a special lifting device such as an insulated spreader bar to attach the hoist to the battery. The width of the spreader bar hooks must be the same as the lifting eyes of the battery, to prevent damage to the battery. If the spreader bar hooks are movable, carefully adjust the position (width) of the hooks so that the pull is directly upward (vertical) and no side load or force (pressure) is exerted on the battery case. Be sure the lift hooks are the correct size to fit the lifting eyes of the battery.
5) If the battery does not have a cover of its own or has exposed terminals and connectors, cover the top with a non-conductive (insulating) material, e.g., a sheet of plywood or heavy cardboard, prior to attaching the lifting device.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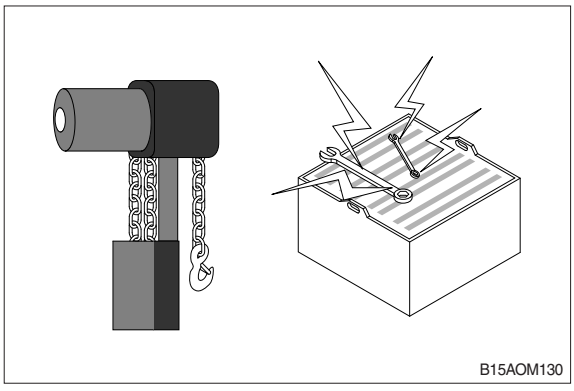
6) Chain hoists or power battery hoists must be equipped with loadchain containers to accumulate the excess lifting chain.
7) Keep all tools and other metallic objects away from the terminals.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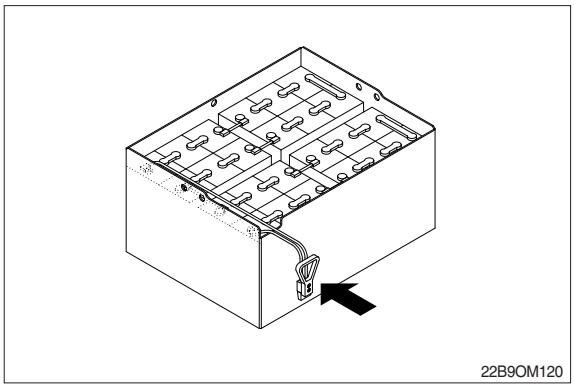
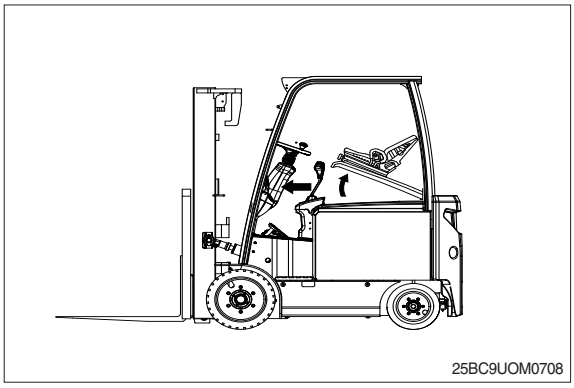
14. BATTERY REMOVAL FROM TRUCK

When the spare battery is used for continuous operation or it is required to check the battery, motor, etc., remove the battery through the following procedure:

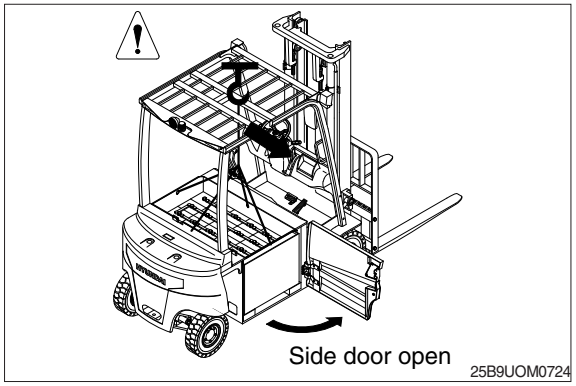
1) Disconnect the battery connector.



2) Release the battery cover latch. Pull the plunger and tilt the levers forward then open the battery cover.



3) Open the side door. Replace the battery using a hoist or crane.



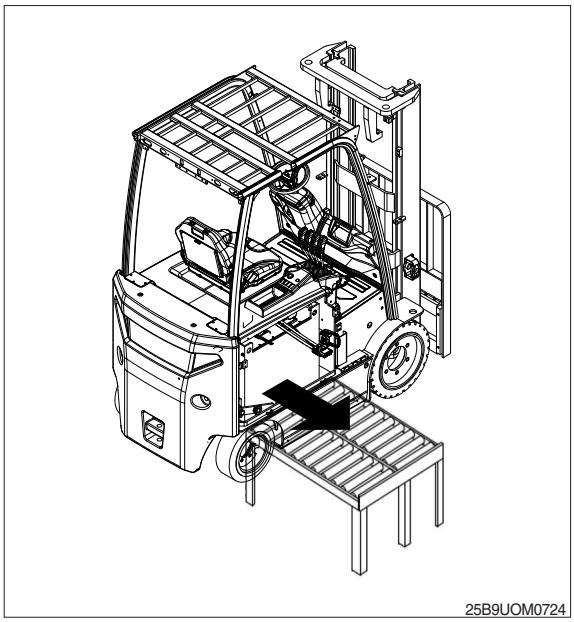
3) SBR TYPE (Option)

Place the ROLLER STAND side by side on the right side of the fork lift truck.

Make sure the height of the ROLLER STAND is the same as the height of the ROLLER in the battery compartment.

The machine must be parked on a level surface. Be careful not to work on an incline, as this can cause the battery to roll out unintentionally.

Replace the battery by releasing the battery side fastening lever and slowly moving the battery onto the roller stand.



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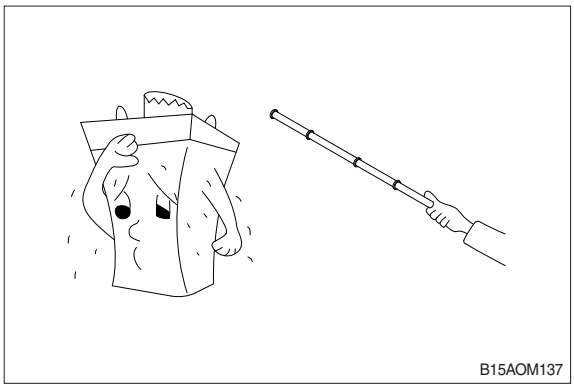
※ When installing the battery, follow the above steps in reverse order.

15. BATTERY CLEANING AND CARE

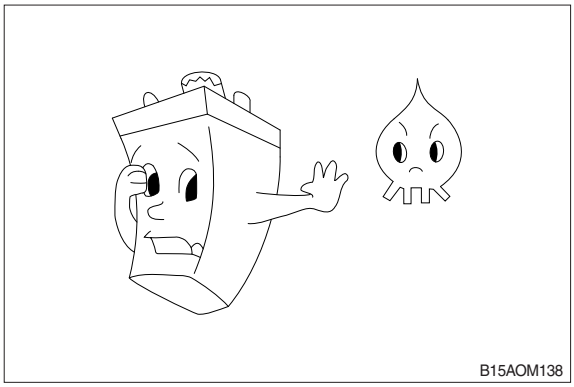
1) AVOID OVER-DISCHARGE

If used until the vehicle can no longer run, battery life will be shortened. If the battery capacity indicator's red lamps turns on at on load lift, stop operation and charge the battery without delay.



2) INFLAMMABLE

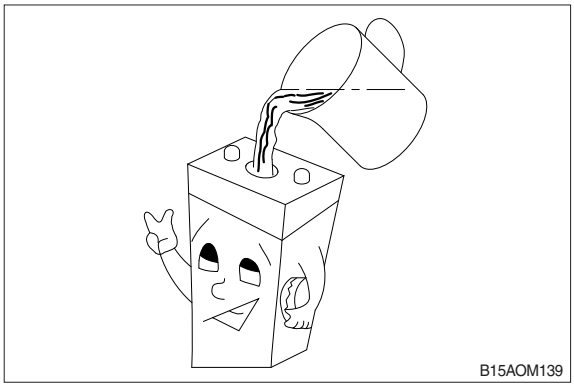
In any case, keep fire away from the battery because it contains an inflammable gas.



3) REFILLING DISTILLED WATER

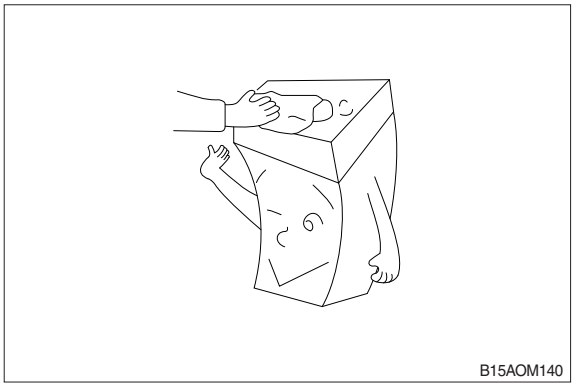
Refill distilled water to maintain the electrolyte level to the specified height after finished equalizing charge, because electrolyte is lost through decomposition during charge and also through natural evaporation. It is unnecessary to refill dilute sulfuric acid into the battery except the case of losing electrolyte by running over.

⚠ Periodically inspect the electrolyte level and replenish it up to normal, if necessary.
In case the electrolyte level is above the normal, if can be overflew and cause the battery and machine damage.



4) KEEP THE BATTERY CLEAN

Keep the battery, in particular the upper surface, clean and dry and keep the filler plugs tightly screwed.



16. NEW MACHINE OILS

New machine uses following lubricants and oils.

Description	Specification
Gear oil	DEXRON 3
Hydraulic oil & Steering oil	ISO VG32, VG46, VG68, HD HYUNDAI's long-life hydraulic oil ISO VG15, Hydraulic oil★1
Brake oil	ISO VG 32
Grease	NLGI No.2

· API : American Petroleum Institute
· SAE : Society of Automotive Engineers
· ISO : International Organization for Standardization
· NLGI : National Lubricating Grease Institute

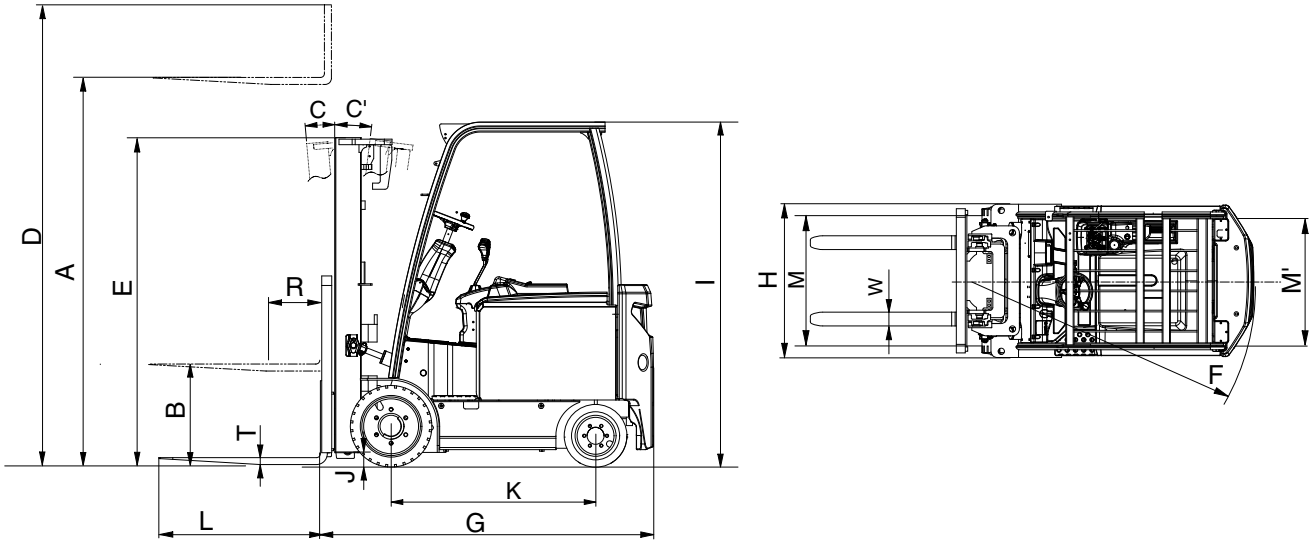
★1 : Cold region
Russia, CIS, Mongolia

17. RECOMMENDED LUBRICANTS

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C (°F)
			-50 (-58) / -30 (-22) / -20 (-4) / -10 (14) / 0 (32) / 10 (50) / 20 (68) / 30 (86) / 40 (104)
Axle	Gear oil	7.0 (1.8)	DEXRON 3
Hydraulic oil tank	Hydraulic oil	31 (8.2)	★ISO VG 15 ISO VG 32 ISO VG 46 ISO VG 68
Brake system	Brake oil	0.5 (0.1)	ISO VG 32
Fitting (Grease nipple)	Grease	0.1 (0.03)	★NLGI No.1 NLGI No.2

★ : Cold region
Russia, CIS, Mongolia

1. SPECIFICATION



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Model			Unit	25BC-9U	30BC-9U	32BC-9U
Capacity			kg (lb)	2500 (5000)	3000 (6000)	3200 (6500)
Load center		R	mm (in)	500 (24)	←	←
Weight			kg (lb)	4456 (9824)	4953(10913)	5177(11413)
Fork	Lifting height	A	mm (in)	3300(130)	←	←
	Free lift	B	mm (in)	115(4.5)	←	←
	Lifting speed (Loaded/Unloaded)		mm/sec	430/640	360/530	←
			ft/min	84.6/126	70.9/104.3	←
	Lowering speed		mm/sec	500/450	←	←
	(Loaded/Unloaded)		ft/min	98.4/88.6	←	←
	L×W×T	L,W,T	mm (inch)	1050×100×45 (41.3"×3.9"×1.8")	1050×122×45 (41.3"×4.8"×1.8")	←
Mast	Tilt angle forward/backward	C/C'	degree	6/8	←	←
	Max height	D	mm (in)	4495 (177")	←	←
	Min height	E	mm (in)	2135 (84')	←	2205 (87")
Body	Travel speed (Loaded/Unload)		km/h	15 / 17	←	←
			mph	9.3 / 10.6	←	←
	Max. gradient performance,loaded		%	19.6	17.2	16
	Min turning radius (Outside)	F	mm(in)	1893 (74.52")	1983 (78.07")	2005 (78.93")
ETC	Max hydraulic pressure		kgf/cm²/psi	210 / 3045	←	←
	Hydraulic oil tank		ℓ (usgal)	38 (10)	←	←
Overall length		G	mm (in)	3215 (127)	3310 (130)	3335 (131)
Overall width		H	mm (in)	1112 (44)	1114 (44)	1114 (44)
Overhead guard height		I	mm (in)	2235 (88)	←	←
Ground clearance (Mast)		J	mm (in)	90 (3.5")	←	←
Wheel base		K	mm (in)	1330 (52)	1400 (55)	←
Wheel tread front		M	mm (in)	896 (35.3)	911(35.9)	←

2. SPECIFICATION FOR MAJOR COMPONENTS

1) CONTROLLER

Item	Unit	Traction	Pump
Model	-	CURTIS 1236E-5621	←
Type	-	AC	←
Dimension	mm	244(L)×165(W)×134.7(H)	←
Current limit	A	600	←
Communication	-	CAN	←

2) MOTOR

Item	Unit	Traction	Pump
Type	-	ASRH 4002	AMDL 4001
Rated voltage	Vac	30	30
Output	kW	14	17
Insulation	-	Class F	Class F

3) BATTERY

Item	Unit	25BC-9U	30/32BC-9U
Rated voltage	V	48	←
Compartment dimension (W × L × H)	mm	STD : 997×783×605 SBR : 997×783×571	STD : 997×883×605 SBR : 997×883×571
Min. Battery weight	kg	(W × L × H)	1360
Max. Battery weight	kg	1400	1600
Connector (CE spec)	-	SB 350 or SR 350	

4) GEAR PUMP

Item	Unit	Specification
Type	-	Fixed displacement gear pump
Capacity	cc/rev	27.2
Maximum operating pressure	bar	230
Rated speed (max/min)	rpm	3000/500

5) MAIN CONTROL VALVE

Item	Unit	Specification
Type	-	3 spool, 4 spool
Operating method	-	Mechanical
Main relief valve pressure	kgf/cm²	210
2nd relief valve pressure	kgf/cm²	130

6) DRIVE AXLE UNIT

Item	Unit	Specification
Max Axle Load	kgf	9,000
Max input rpm	rpm	4,000
Gear ratio	—	20.5
Weight without fluid	kg/lb	200 / 40.9
Oil quantity	ℓ /U.S · qt	7 / 1.8

7) WHEELS

Item	25BC-9U	30/32BC-9U
Type (front/rear)	SOLID (OPT : NON-MARKING)	
Quantity (front/rear)	2/2	
Front-drive	21×7-15	21×8-15
Rear-steering	16×6×10.5	

8) BRAKES & STEERING

Item		Specification
Brakes	Travel	Front wheel, Hydraulic, drum brake
	Parking	Mechanical
Steering	Type	Hydraulic steering

3. TIGHTENING TORQUE

NO	Items		Size	kgf · m	lbf · ft
1	Electric system	Hyd pump motor mounting nut	M 8×1.25	3.4±0.7	24.6±5.0
2		Traction motor mounting bolt	M12×1.75	10±1.5	72.3±10.8
3	Hydraulic system	Hydraulic pump mounting bolt	M10×1.5	6.9±1.4	50±10
4		MCV mounting bolt, nut	M10×1.5	6.9±1.4	50±10
5		Steering unit mounting bolt	M10×1.5	6.9±1.4	50±10
7		Brake cylinder mounting bolt	M 8×1.25	8±0.5	57.9±3.6
9	Power train system	Drive axle mounting bolt, nut	M20×2.5	50.5±2.5	365±18.0
10		Steering axle mounting bolt, nut	M20×2.5	58±3.0	419±21.7
11		Front wheel mounting nut	M20×1.5P	47±2.4	340±17.4
12		Rear wheel mounting nut	M16×1.5P	25±1.3	180.8±9.4
13	ETC	Counterweight mounting bolt	M24×3.0	100±15	723±108
14		Seat mounting nut	M 8×1.25	3.4±0.7	24.6±5.0
15		Head guard mounting bolt (front)	M12×1.75	12.8±3	92.5±21.5
16		Head guard mounting bolt (rear)	M16×2.0	29.7±4.5	215±32.5
17		Priority valve mounting bolt	M 6×1.0	1.0 ±0.5	7.2±3.6
18		Tilt cylinder rod-end bolt, nut	M12×1.75	9.5 ±0.5	69±3.6
19		Tilt cylinder pin mounting bolt	M10×1.5	6.9 ±0.5	50±3.6