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A MESSAGE TO HYUNDAI LIFT TRUCK OPERATORS

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

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

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

For these reasons, 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 safely 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.**

HYUNDAI lift trucks are built to take hard work, but not abuse. They are built to be dependable, but they are only as 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

HYUNDAI welcomes you to the growing group of professionals who own, operate and maintain HYUNDAI lift trucks. We take pride in the long tradition of quality products and superior value the 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 HYUNDAI lift truck in a safe and correct manner.

Your 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 safety; 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 is 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. 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, HYUNDAI recommends that a planned maintenance and safety inspection program(PM) 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 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 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. HYUNDAI reserves the right to make improvents and changes in specifications or design, without notice and without incurring obligation. Please check with your authorized 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 HYUNDAI dealer for the answers to any questions you may have about your lift truck's features, operation, or manuals.

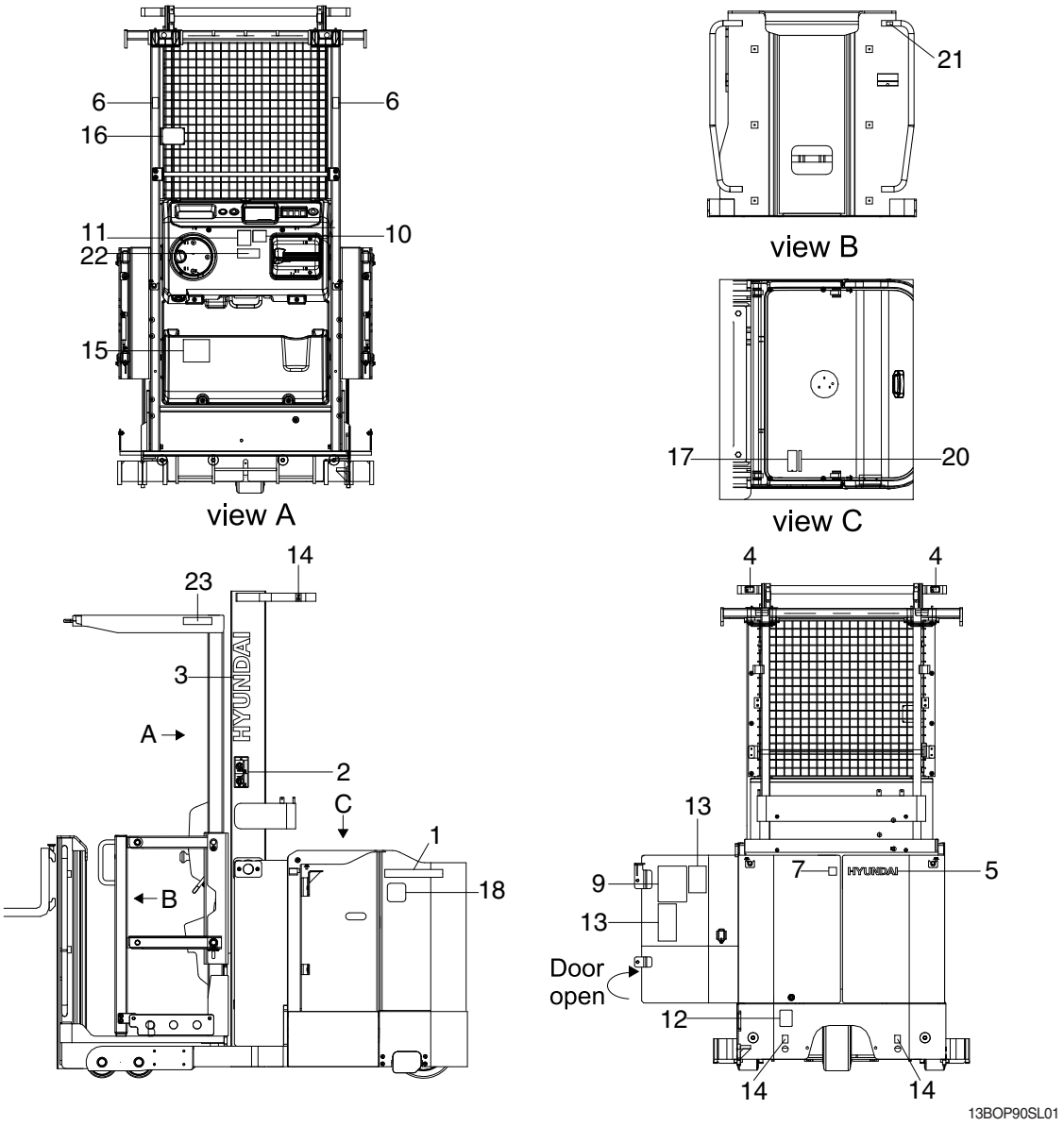
Operate your lift truck safely; careful driving is your responsibility.
Drive defensively and think about the safety of people who are working nearby. Know your truck's capabilities and limitations. Follow all instructions in this manual, including all symbols (⚠ △ ※) mssages to avoid damage to your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



1	Model name	9	Maintenance	16	Name plate
2	Mast warning	10	Joystick	17	UL label
3	Hyundai logo	11	Warning lifting	18	EE or ES Mark
4	Hand caution	12	Hanger	20	Surface label
5	Hyundai logo	13	Caution Bat. handling	21	Fork lift (OPT)
6	Belt	14	Hook	22	Brake
7	Fork down	15	For safety	23	OHG label

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 LIFTING (ITEM 11)

This warning label is positioned on the top milddle of the dash board.

⚠ **Never stand or work under the raised forks even if the hydraulic safety lock lever is applied.**

⚠ **In case of working under the forks, it is essential to support the platform with blocks.**

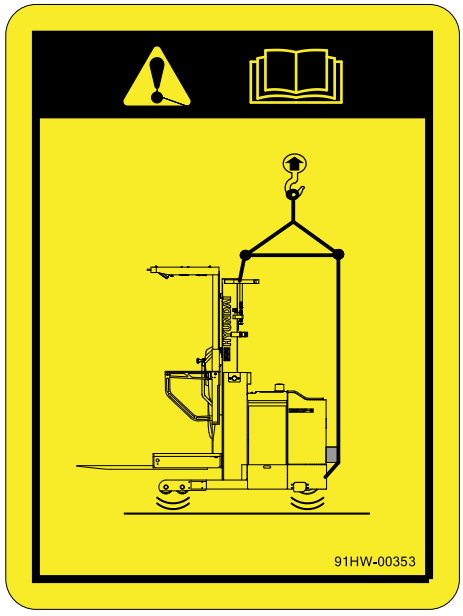
⚠ **Do not use the forks as a lifter for the people, it can cause to happen severe injury or death.**

2) HANGER (ITEM 12)

This warning label is positioned on the rear bottom side of the frame.

⚠ **Refer to page 1-17 for safe loading procedures.**

⚠ **When hanging the machine, only use appropriate lifting appliances which should be had sufficient capacity for lifting of the machine weight.**



3) SURFACE (ITEM 20)

This warning label is positioned on the left side of the frame hood.

⚠ **This equipment must operate on level surface only.**

4) **BATTERY HANDLING** (ITEM 13)

This battery handling label is located inside the right side cover of the frame.

※ **Refer to page 7-23 for a safe battery removal.**

※ **Open up the battery cover when charging the battery.**

Battery being charged not only heat, but also inflammable hydrogen gas is produced. Keep fire away.

※ **Hoisting the battery case, use 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.

※ **Always park safely the machine prior to charging the battery or carrying out any work for the battery.**

⚠ **Do not smoke and avoid naked flames when charging the battery or working around the battery.**

When the machine is parked in order to charge the battery, there must be no inflammable material which has a possibility of creating sparks around the machine.

In the event of charging the battery, it should be carried out well ventilated area all the times to avoid unexpected accident.

5) **HAND CAUTION** (ITEM 4)

This warning label is located on both top side of the mast.

⚠ **Pay careful attention to movement parts between rails, chains, sheaves, fork, platform and other parts in order that you can avoid severe personal injury.**

Personal injury will be happened if any parts of your body is put between moving parts of the mast.

Keep clear the mast or lift mechanism.

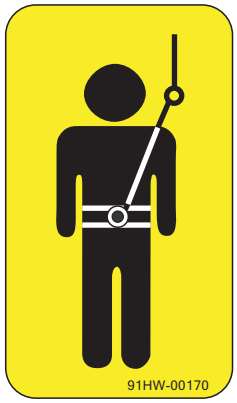
Never reach into or put hands, arms, legs, or head into or through the mast obstructure or near the platform or lift chains.

6) **CAUTION BELT** (ITEM 6)

The belt fastening decal is placed on the both side of the overhead guard.

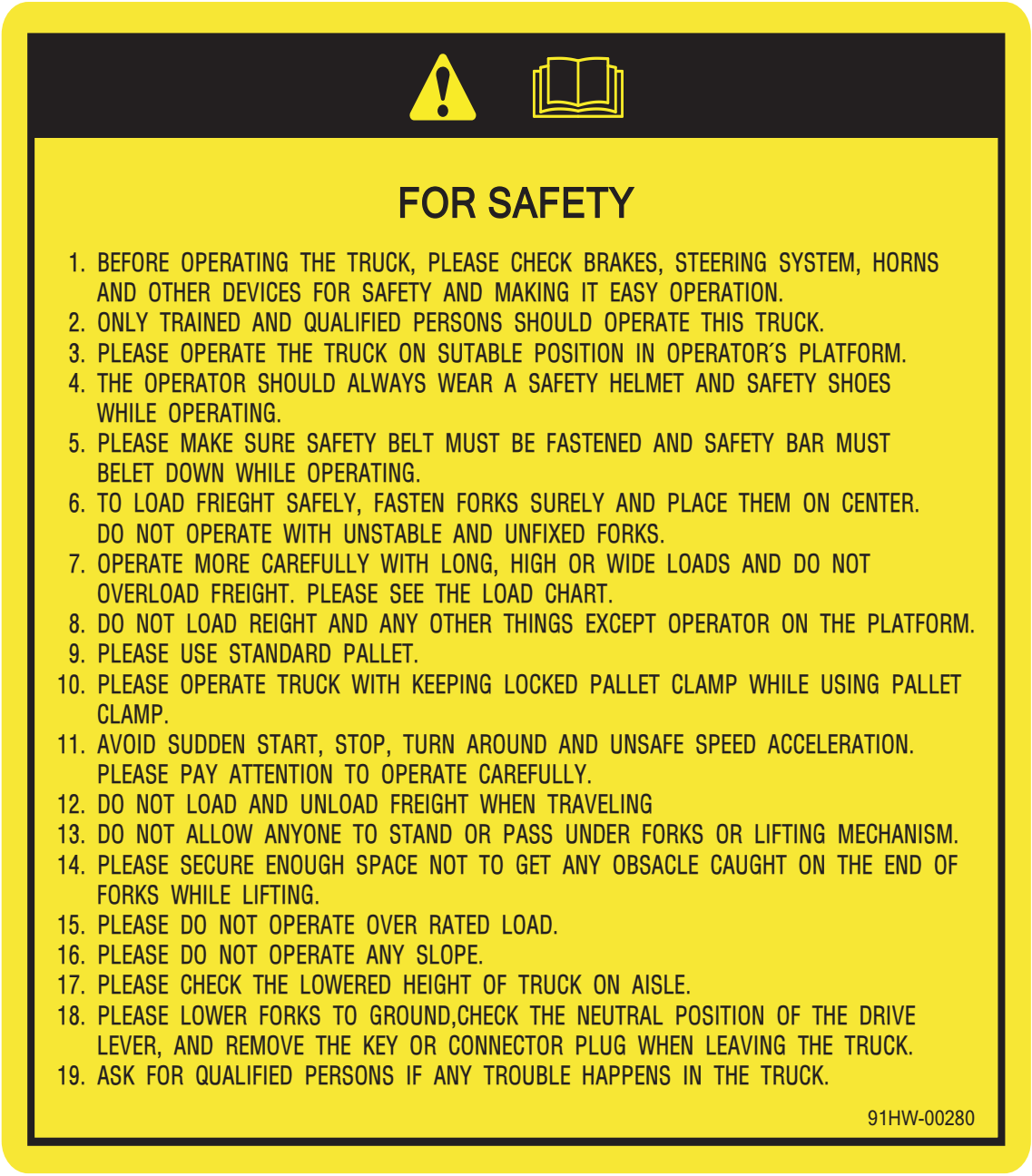
When operating the truck, bear in mind that operator should securely fasten the safety belt so that he can avoid from falling down to the ground.

⚠ **Do not operate truck unless the safety belt is securely fastened around you.**



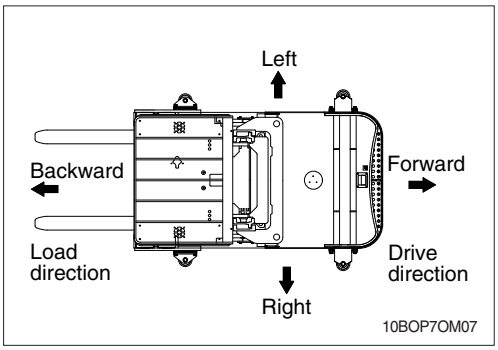
7) **FOR SAFETY** (ITEM 15)

This warning safety is located on the bottom left side of the dash board.



1. DIRECTION

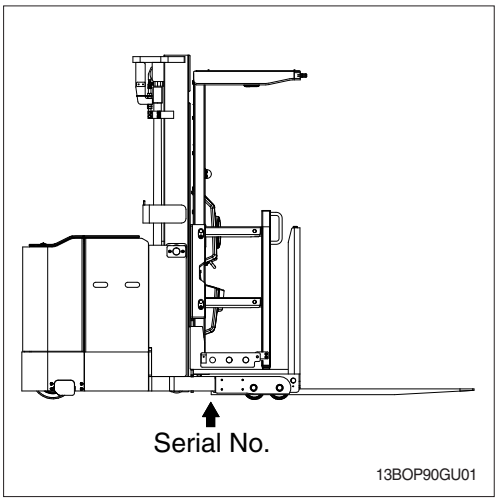
The direction of this machine indicate forward, backward, right and left when machine is in the travelling direction.



2. SERIAL NUMBER

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

MACHINE SERIAL NUMBER
It's shown on the top of the left frame leg.



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.

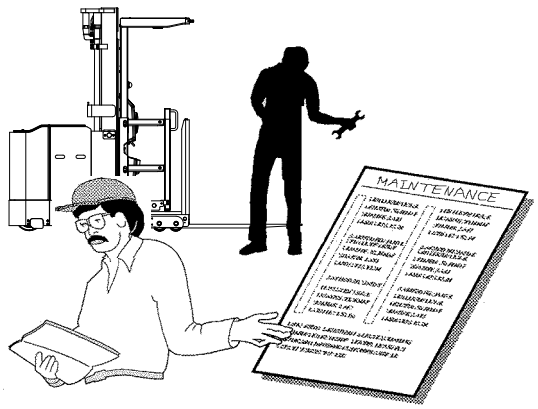
1. DAILY INSPECTION

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

Check for damage and maintenance problems.

Have repairs made before you operate the truck.

Do not make repairs yourself. Lift truck mechanics are trained professionally. They know how to make repairs safe.



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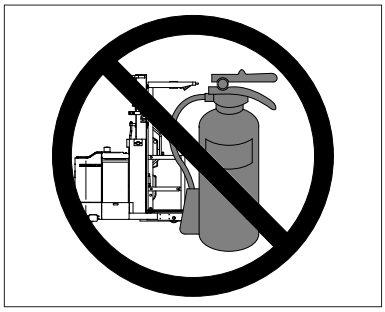
2. DO'S AND DON'TS

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.

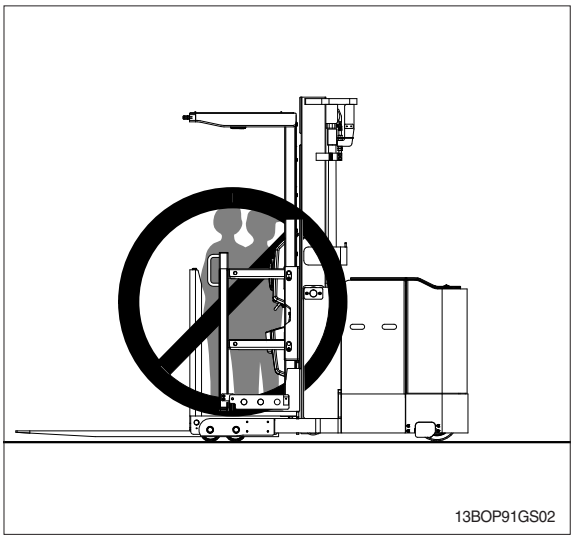
Don't smoke in NO SMOKING areas or when charging.

Don't operate the truck outdoors.
The truck is designed for handling goods indoors.
Always operate and park truck indoors.

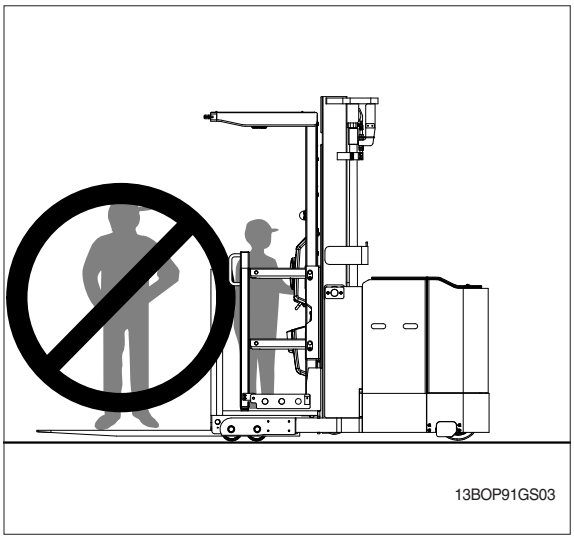
Don't perform battery charging service in the room without adequate ventilation.

3. NO RIDERS

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

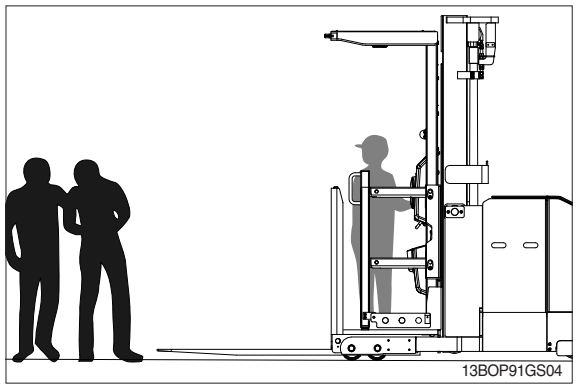


2) Never transport personnel on the forks of a lift truck.

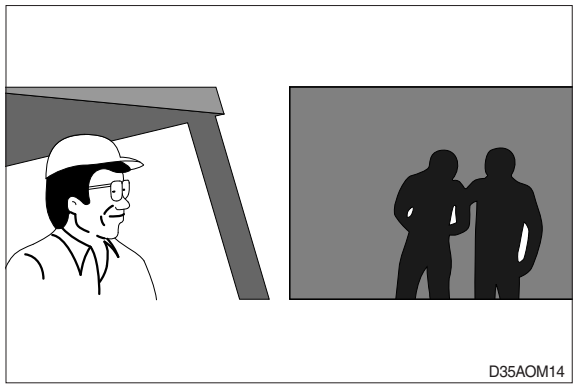


4. PEDESTRIANS

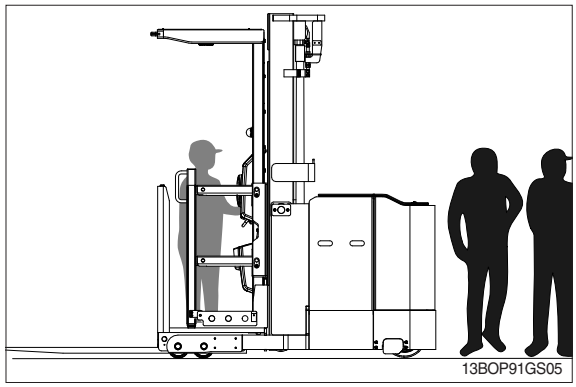
1) Make sure that people stand back, even when you are parked.



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

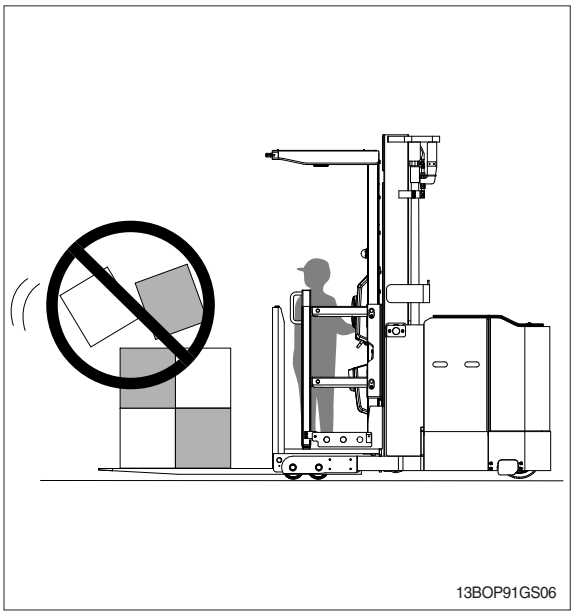


3) Watch where you are going. Look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots.

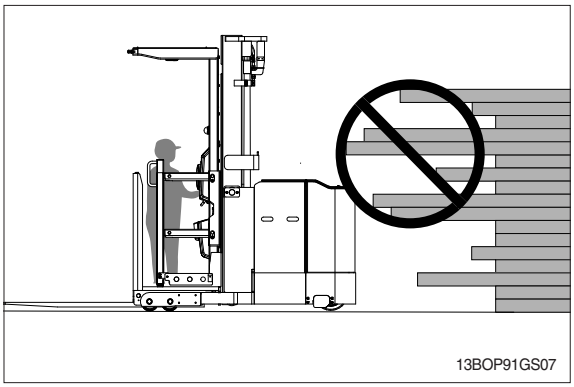


5. OPERATOR PROTECTION

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

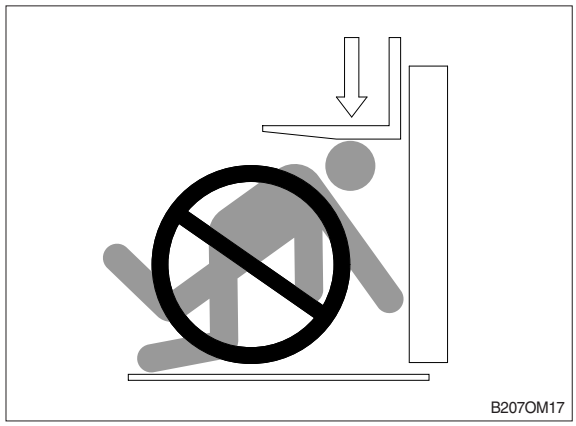


3) Be specially careful when traveling and maneuvering in tight areas.



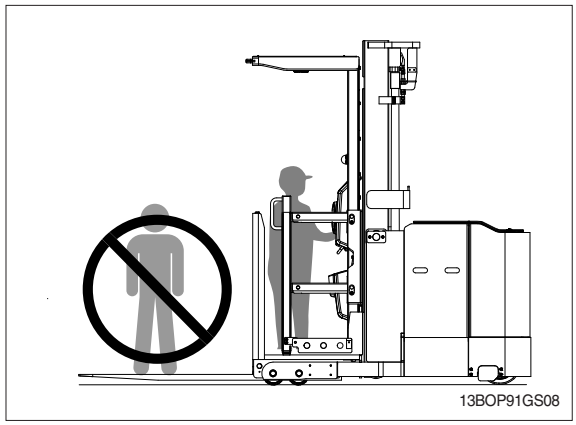
6. FORK SAFETY

1) Never allow anyone to walk under raised forks.



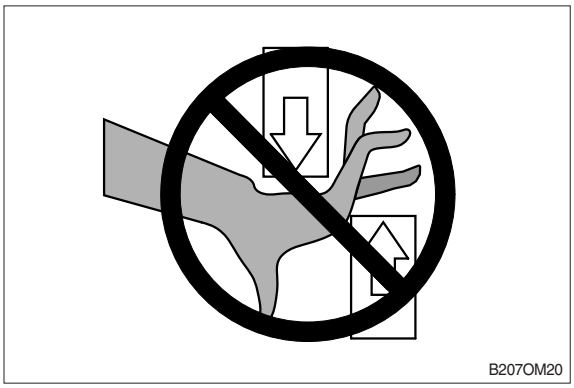
2) There is special equipment to raise people for overhead work.

⚠ Don't use lift trucks.

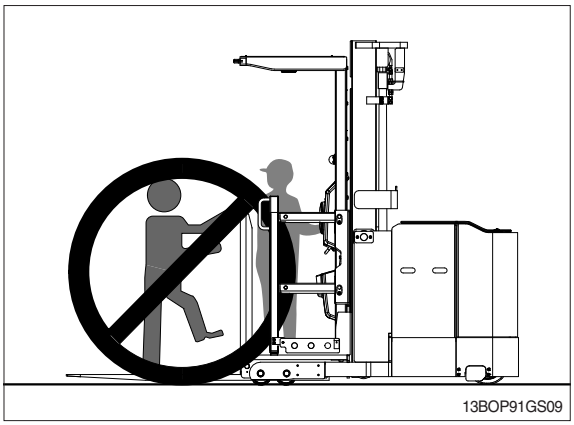


7. PINCH POINTS

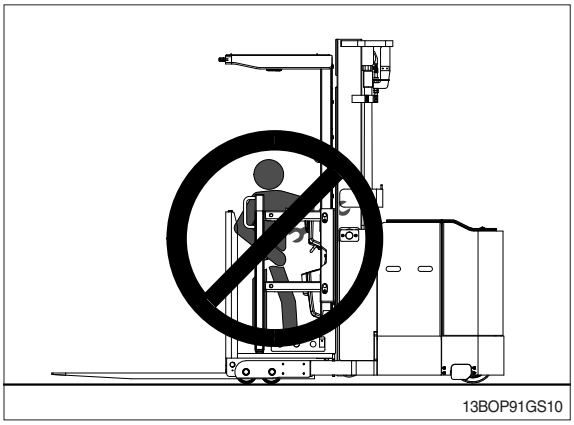
⚠ Keep hands, feet and legs out of the mast.



⚠ Don't use the mast as a ladder.



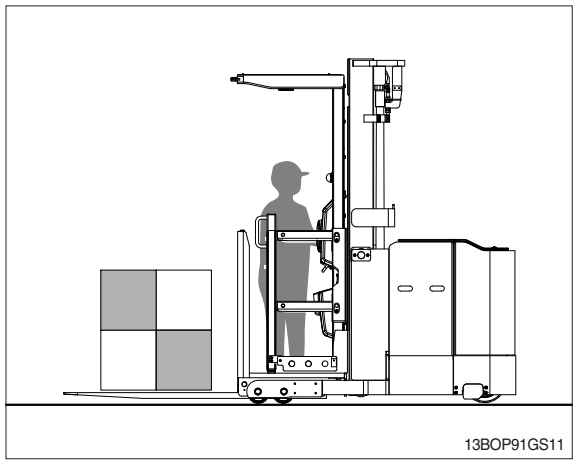
⚠ Never try to repair the mast, carriage, chain, or attachment yourself. Always get a trained mechanic.



8. TRAVEL

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

⚠ **Never lift or lower the load when the truck is in motion.**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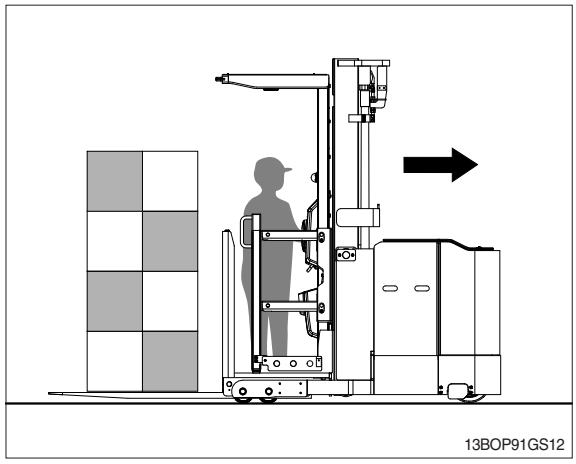
2) When handling bulky loads that restrict your vision always operate your truck in front side to improve visibility.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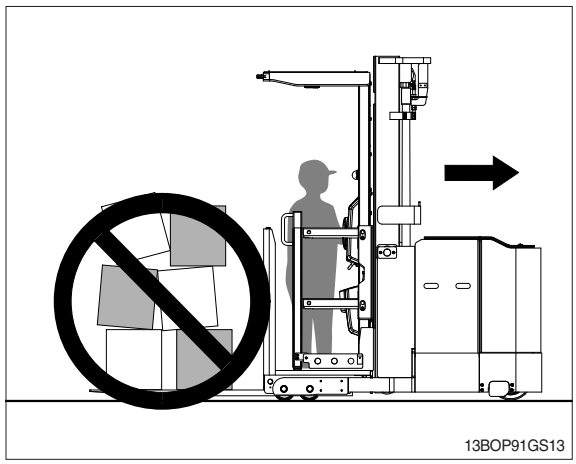
3) Unstable loads are a hazard to you and to your fellow workers. Always make certain that the load is well stacked and evenly positioned across both forks. Never attempt to lift a load with only one fork.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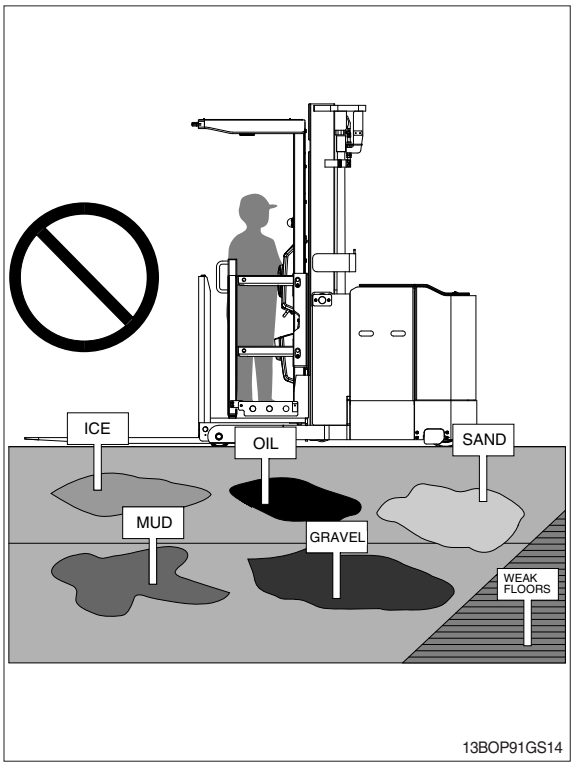
9. SURFACE AND CAPACITY

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

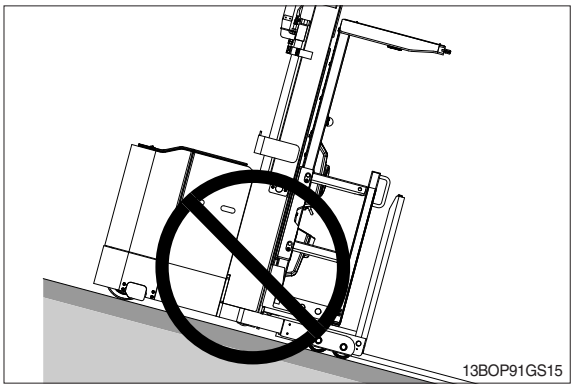
⚠ **Know the weight of your truck and load. Especially when using elevators, Know the capacity of the elevator you intend to use. Do not overload.**

⚠ **This equipment must operate on level surface only.**

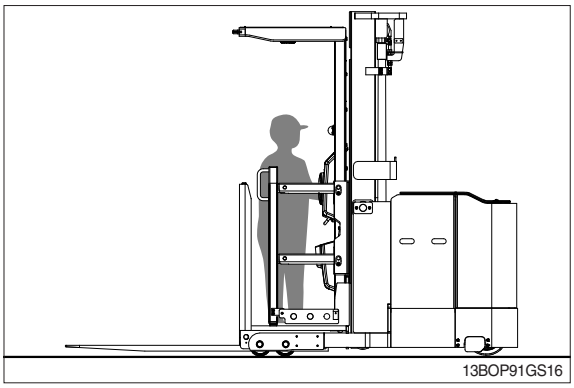


10. PARKING

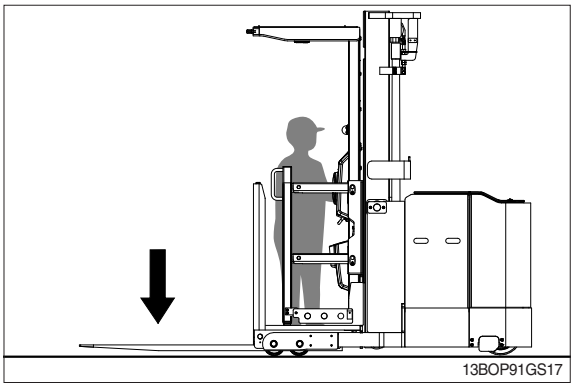
1) Never park on a grade.



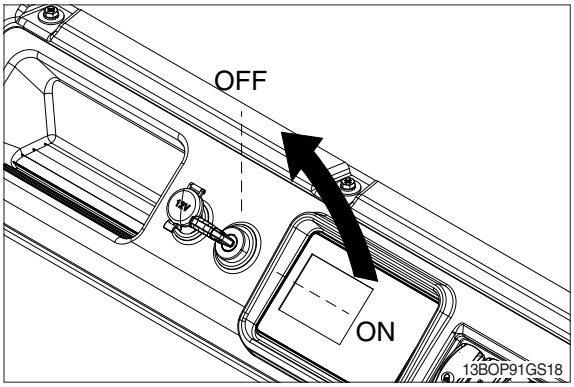
2) Always come to a complete stop before leaving truck. Be sure travel control is in NEUTRAL.



3) Lower forks fully to floor.



4) Turn key to OFF position.



11. LIFTING, JACKING AND BLOCKING

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

1) SAFE PARKING

Before working on truck :

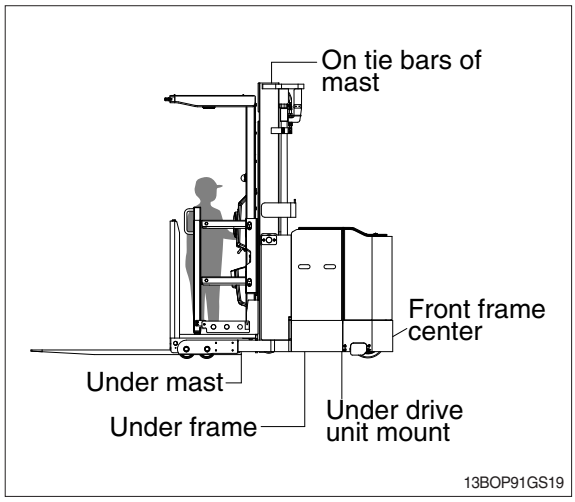
(1) Park truck on a hard, level and solid surface, such as a concrete floor with no gaps or breaks.
(2) Fully lower the platform or forks.
(3) Put all controls in neutral. Turn key switch OFF and remove key.
(4) Block the wheel.

⚠ **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 and have failures causing 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 or the counterweight. Severe injury may result and the truck can be damaged.**



3) 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.

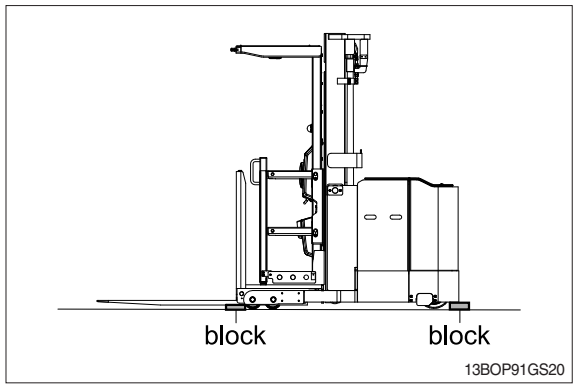
⚠ **When lifting the front of the truck, watch truck for signs of lateral instability. It may tip sideways. You may have to support or guide the side of the truck or overhead guard to prevent tipping.**

(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. Bolt torques must be 7.5~8.0 kgf·m (55~59 ft·lb).
(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.



4) 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 wheels. Illustrations show mast with forks removal however, fork removal is not necessary.

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

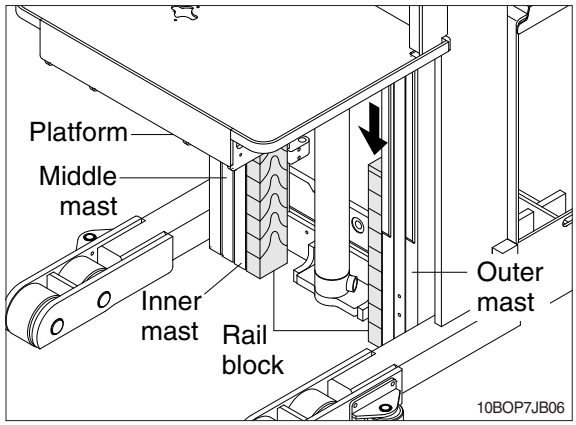
(2) Put blocks in front of and behind drive wheels.

(3) Put wooden support blocks conveniently near mast rails before raising the mast. Use two 1118 mm (44 in) hardwood blocks or equal, of about 305 mm (12 in) and 610 mm (24 in) length.

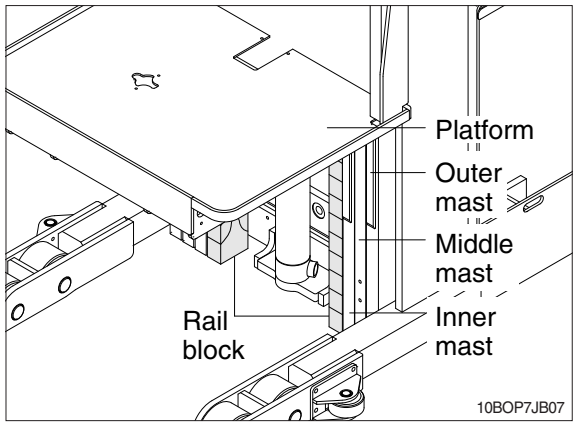
※ For standard masts, block may need length cut to suit. For triple stage masts the carriage may be blocked up, as shown.

(4) Start truck and raise the mast along with platform.

(5) Hold the taller block against inner rail and lower the mast until platform rests on block.



(6) Hold the shorter block against the outer rail and lower the mast until inner rail rests on the block.
(7) Reverse the procedure to remove blocking.



5) RAISING FRONT OF TRUCK

The truck may be raised at the front by lifting and blocking under the center of the frame member at the front frame.

Refer to truck data plate for truck weights.

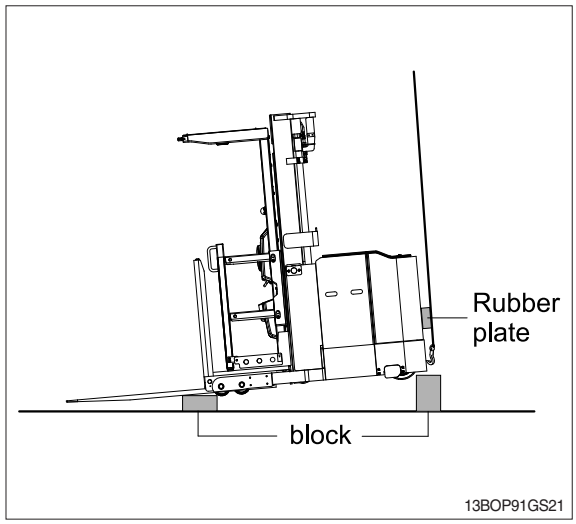
(1) Park truck safely as described in "Safe Parking". Put blocks at front and rear or load wheels.

(2) Lifting up the truck at the frame center.

(3) Lifting up the truck as high as necessary to perform the maintenance work.

(4) Put blocks under the both sides of the truck, fully under the frame main side structure. Put the blocks in front of 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 hook.



⚠ **Before performing any maintenance work, check the truck for stable condition on the blocking.**

6) RAISING ENTIRE TRUCK (REFER TO PAGE 1-17)

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.

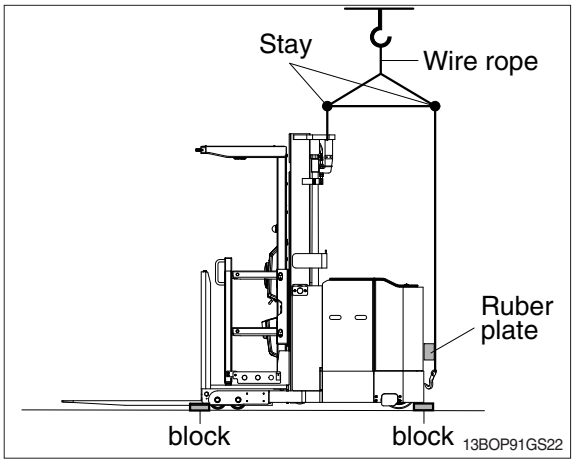
⚠ **LATERAL TIP OVER. When lifting side of truck, be sure mast is lowered fully and do not raise one side of the truck more that about 50 mm (2 in) higher than the other, to avoid tipping truck over laterally.**

LONGITUDINAL TIP OVER. If the mast is removed while the truck is blocked up, the truck will tip backwards due to the heavy frame. The back of the truck must be supported by blocking under the drive tire to prevent movement.

The reverse is also true. If the frame is removed while the truck is up on blocks, the weight of the mast will cause the truck to tip on the front blocks and forward.

(3) Lift up the bottom of front frame near the center of the truck.

(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. Spread the blocks close to drive wheels for maximum stability.

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

⚠ **Do not lift up under the outer covers which enclose the fuel and hydraulic tanks.**

(7) 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.

7) SHIPPING TIE-DOWN INSTRUCTIONS

(1) Rear of truck

① With mast and platform installed

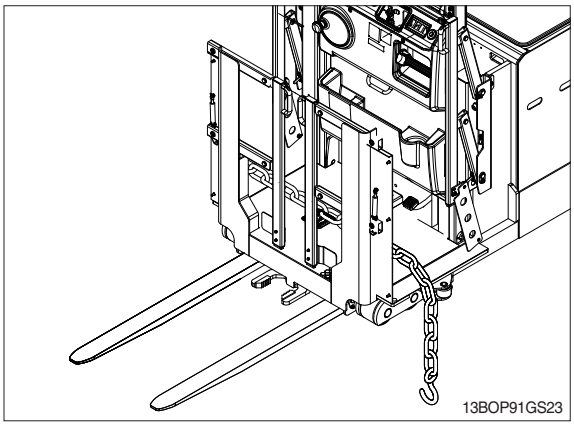
a. Lower the platform fully.

b. Put a tie down (e.g., chain) for each outside of the platform.

② Without a mast and platform 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.**



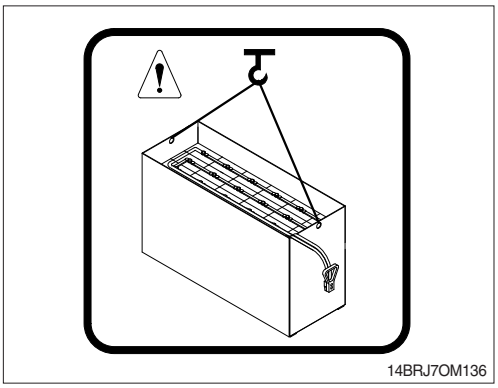
(2) Front of truck

① Attach the tie down to pocket in bottom of front frame.

12. LOADING AND UNLOADING BY CRANE

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

⚠ **Before loading the truck, battery must be removed. Refer to page 7-23 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) Put a rubber plate where the wire rope contact with the truck's body to prevent damage.

4) Place crane on the proper place.

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

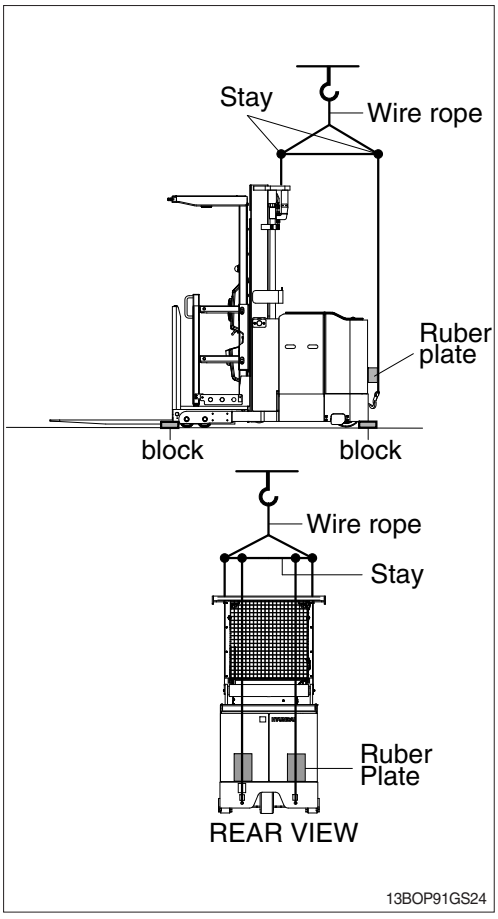
⚠ **Make sure wire rope is proper size.**

⚠ **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.**

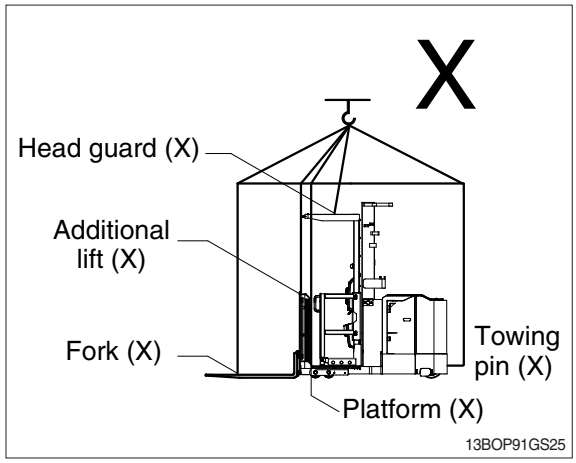


⚠ Do not install the wire to unsafe position such as forks, platform, head guard, counterweight lifting hole or towing pin, etc.. It can cause a serious damage to driver and truck.

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

⚠ Perform the lifting service with skilled service man.

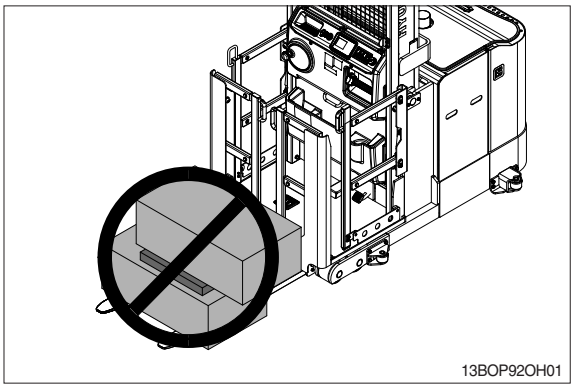
⚠ When hanging the machine, bear in mind that only use appropriate lifting appliances which should be had sufficient capacity for lifting of the machine weight in order that it can avoid from unexpected accident.



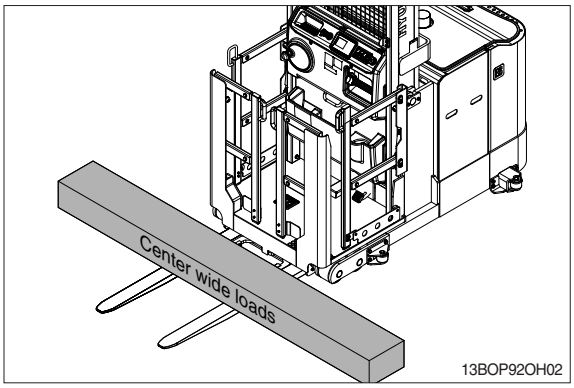
1. LOOSE LOADS

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

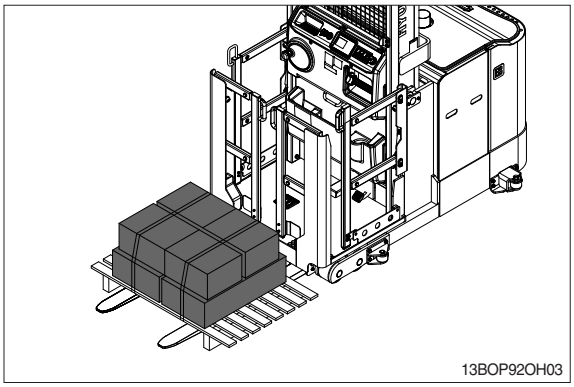
Never carry loose or uneven material.



Center wide loads.



Stack and band loose material.

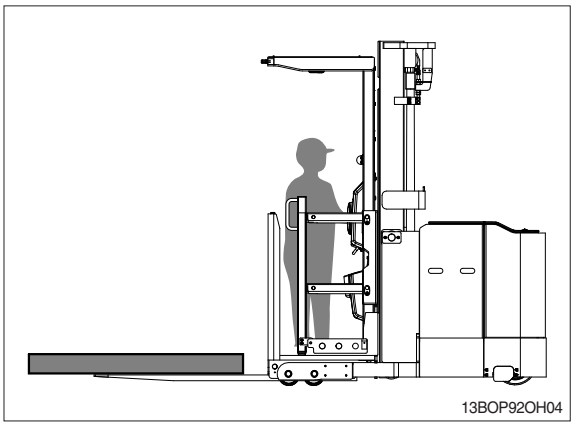


2. LONG AND WIDE LOADS

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

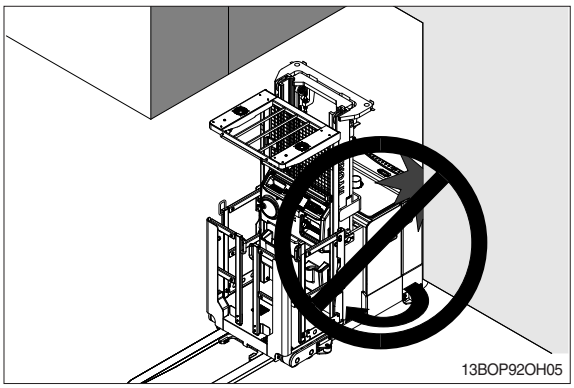
When extra-long material makes it necessary to travel with the load elevated, do so with extreme care and be alert to load end-swing when turning.

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



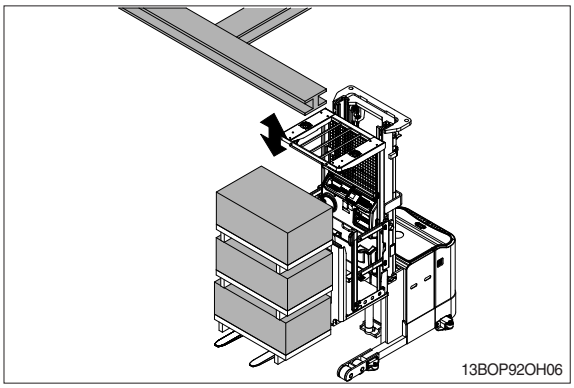
3. REAR SWING

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

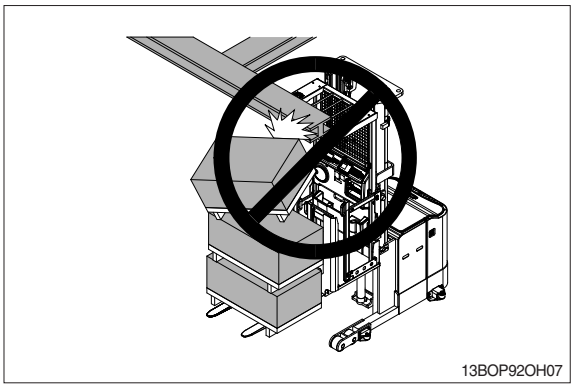


4. LOW OVERHEAD CLEARANCE

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

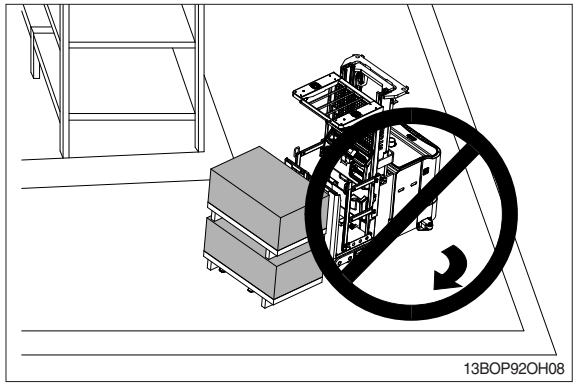


⚠ Watch overhead clearance:
Moving into overhead structures can tip a truck over, or spill a load.

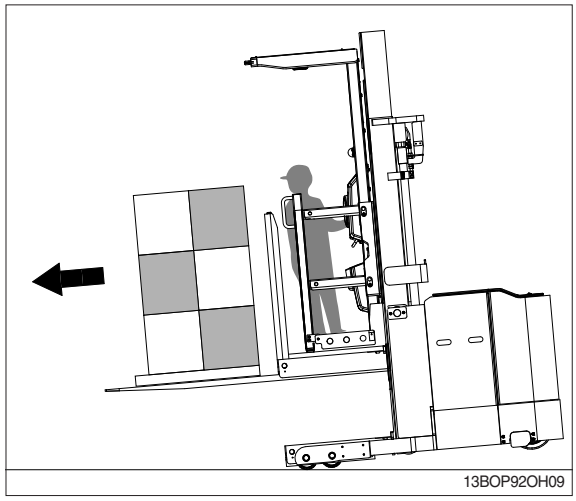


5. FAST TURNS AND HIGH LOADS

⚠ Slow down before turning.
The truck can tip over.
Driver must always observe an adequate braking distance. Abrupt stopping, rapid U turns and overtaking at dangerous or blind spots are not permitted.

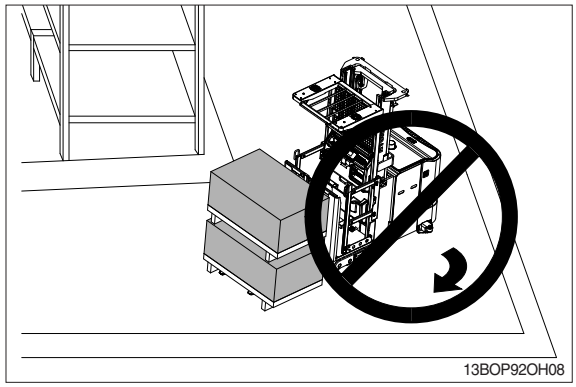


⚠ Turn too sharp with a raised load and your truck can tip even at slow speeds.
Travel with a load raised only when removing or depositing a load.



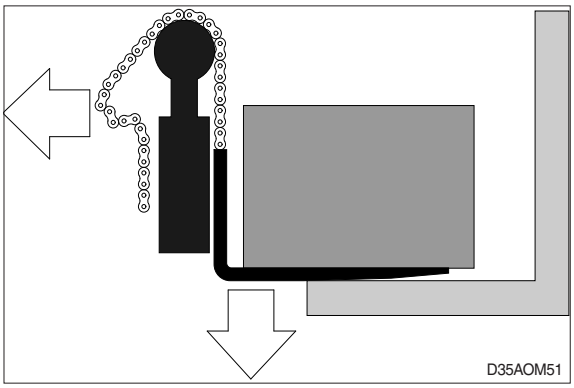
6. RIGHT ANGLE STACKING

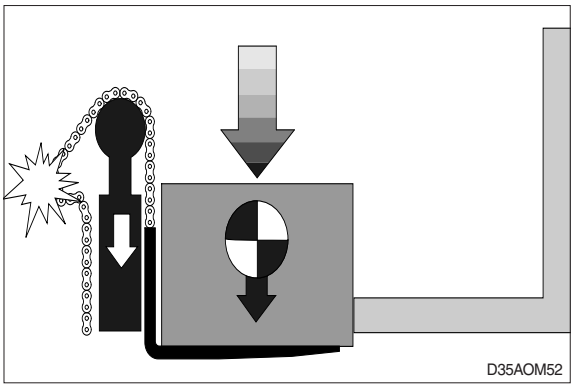
⚠ When right angle stacking or moving with a raised load to clear low objects, avoid sharp turns and move slowly.



7. CHAIN SLACK

⚠ Slack chains mean rail or platform hangup.
Raise the forks before you move, or broken chains can result.

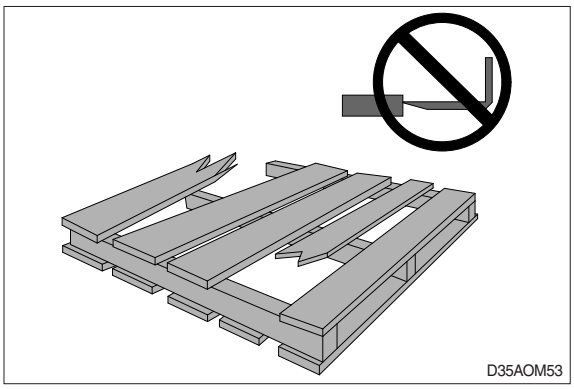




8. PALLETS AND SKIDS

⚠ 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.

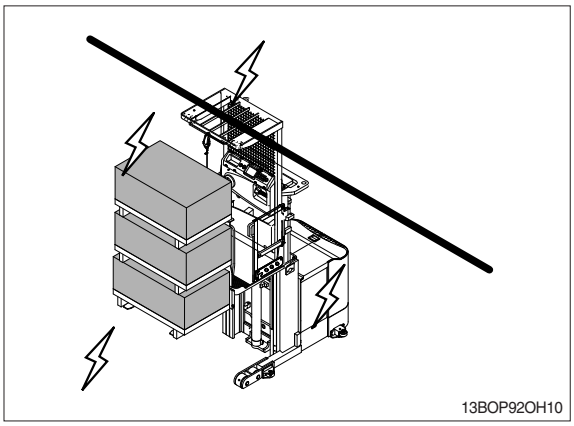


9. CAUTION FOR ELECTRICAL LINES

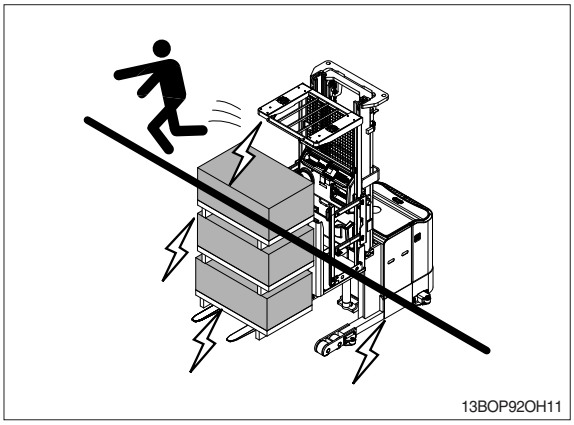
⚠ When moving the machine with the mast raised, watch out electrical lines over the machine.

⚠ 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)


13BOP92OH10

⚠ If the machine touches the electric power lines, keep standing in the operator's compartment 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.


13BOP92OH11

10. SOLID TIRE

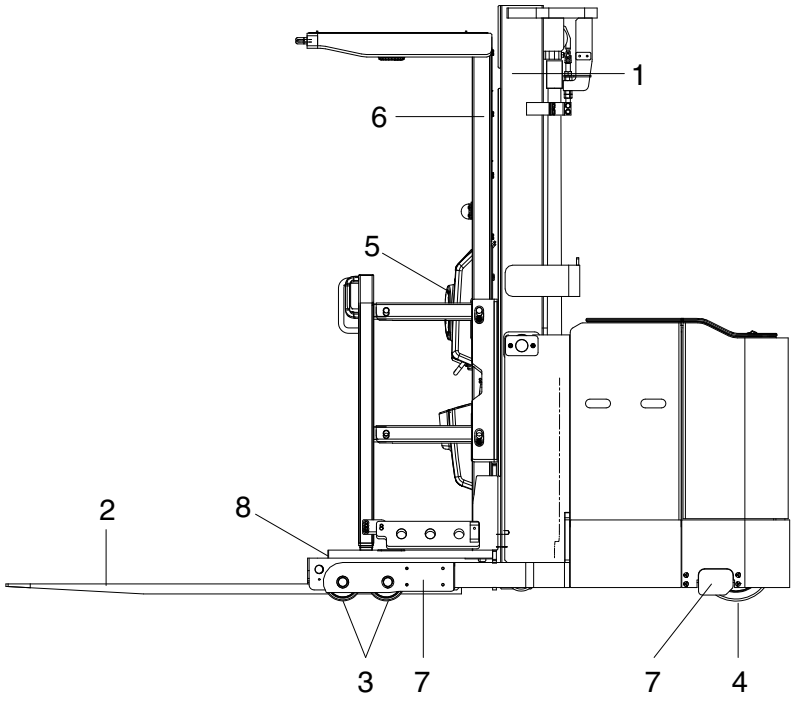
1) Do not travel more than 25 km/hr (16 mph).
2) Do not travel further than 8 km (5 miles) in an hour.
3) Do not drive on the road for automobile.
4) After continuous traveling radiates enough the heat of tire. (e.g. 1 hour radiation of the heat after 2 hours continuous traveling)

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

1. GENERAL LOCATIONS

1) OUTLINE

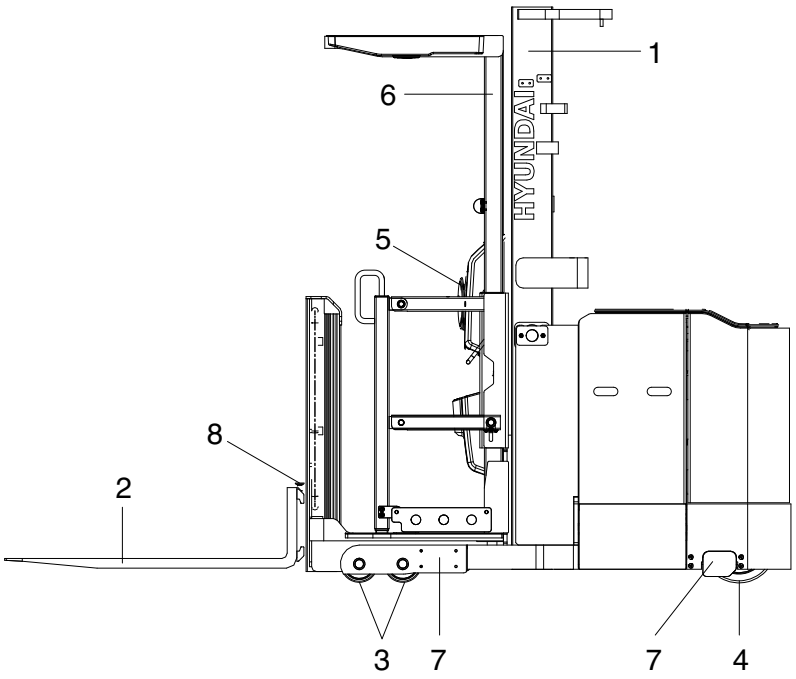
(1) PLATFORM



13BOP93KY01

1	Mast	4	Drive unit and tire	7	Guide roller
2	Fork	5	Steering wheel	8	Platform
3	Load tire	6	Overhead guard		

(2) ADDITIONAL LIFT (OPT)

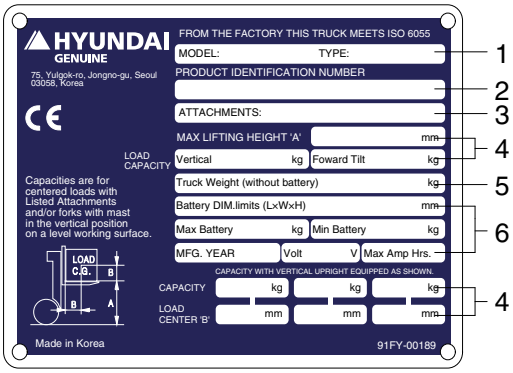


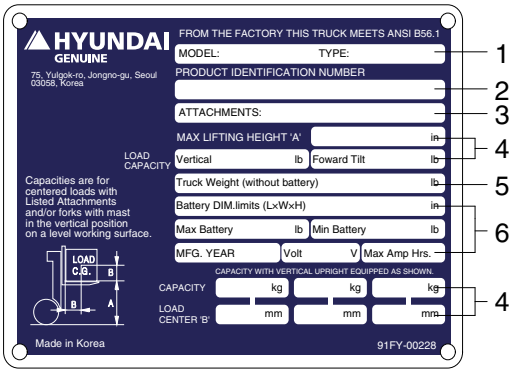
13BOP9KY02

1	Mast	4	Drive unit and tire	7	Guide roller
2	Fork	5	Steering wheel	8	Additional lift
3	Load tire	6	Overhead guard		

2. DATA PLATES

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 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

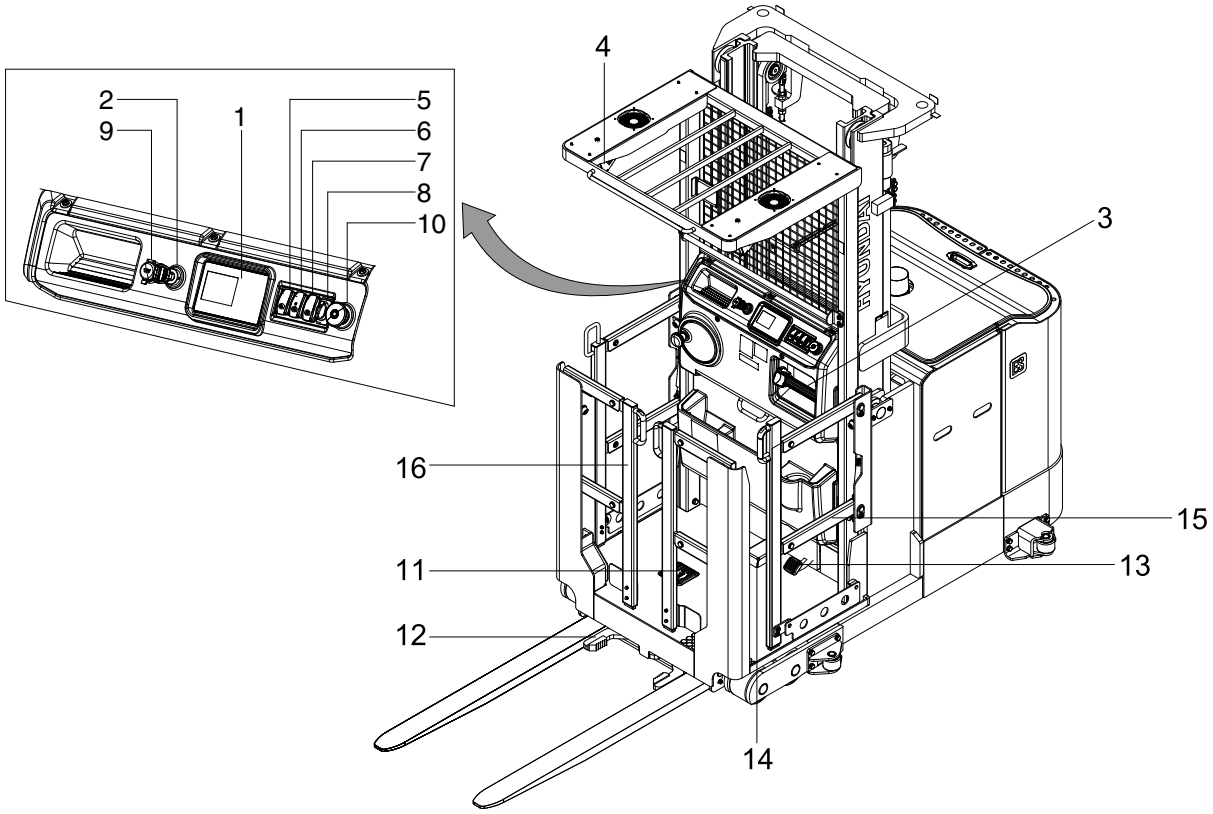
The approximate weight of the truck without a load on the forks. This weight plus the weight of the load must be considered when operating on elevators, elevated floors, etc. to be sure they are safe.

(6) Battery weight and system voltage

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

3. INSTRUMENTS AND CONTROLS

1) PLATFORM

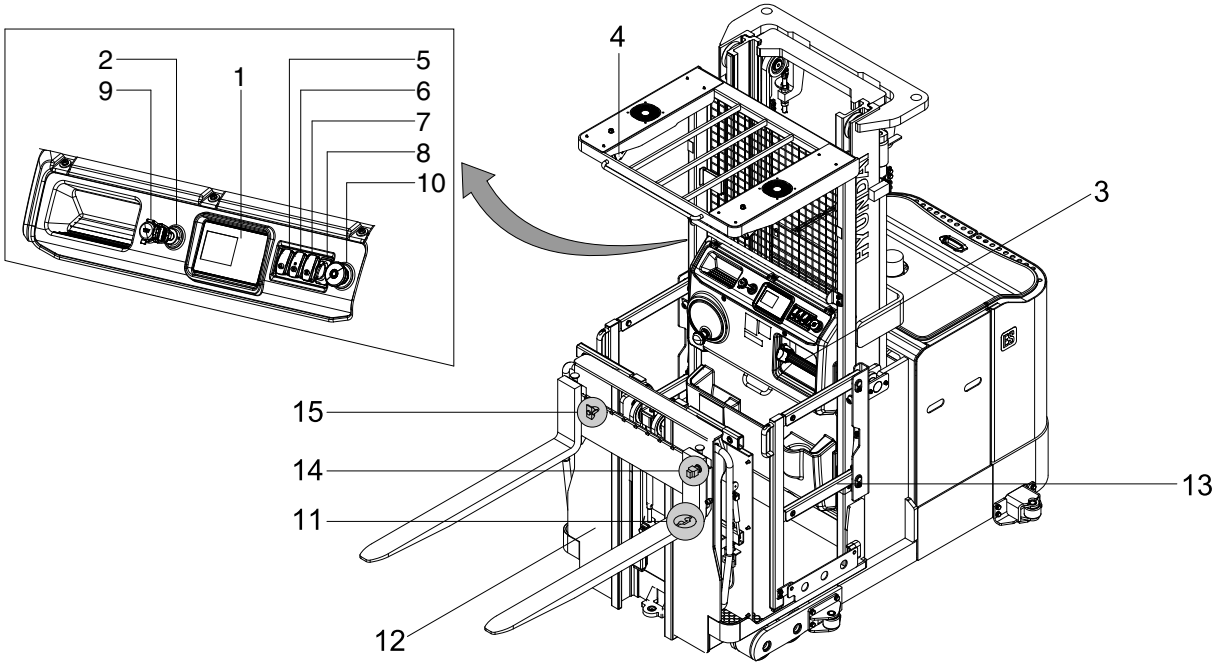


13BOP93KY03

1	Display	7	Wire guidance switch (OPT)	13	Pallet clamp pedal
2	Key switch	8	Zone select switch (OPT)	14	Pallet clamp release pedal
3	Multifunction lever	9	Socket (12 V)	15	Side gate
4	Work lamp	10	Emergency switch	16	Rear gate (EU : STD, Other : OPT)
5	Work Lamp switch	11	Dead man switch		
6	Fan switch	12	Pallet clamp		

※ The multifunction lever, steering wheel, display, lamps and all switches, (key, emergency stop, light etc) are located on the console.
Familiarize yourself with the controls and follow safe operating procedures.

2) ADDITIONAL LIFT (OPT)



13BOP93KY04A

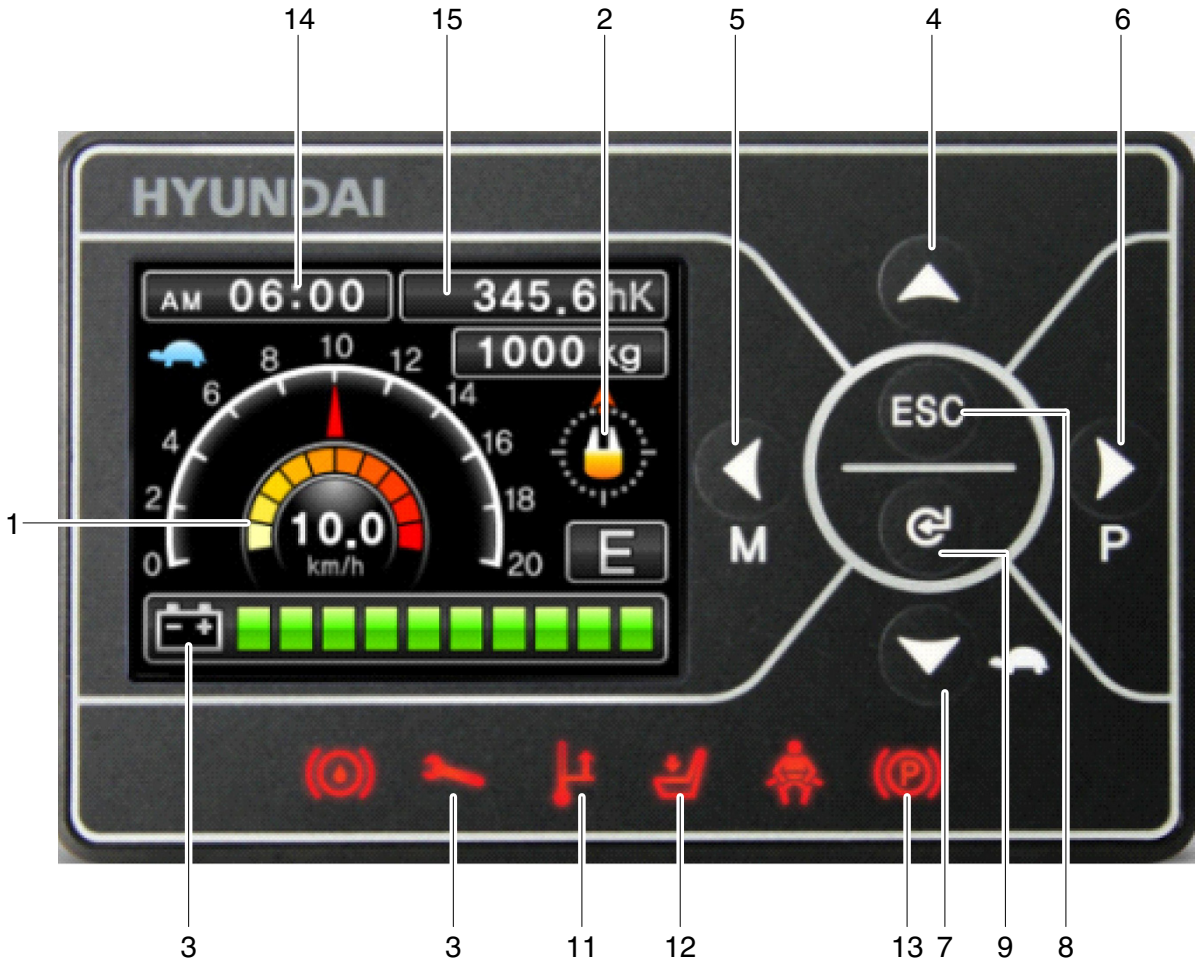
1	Display	6	Fan switch	11	Dead man switch
2	Key switch	7	Wire guidance switch (OPT)	12	Additional lift
3	Multifunction lever	8	Zone select switch (OPT)	13	Side gate
4	Work lamp	9	Socket (12 V)	14	Additional lift enable button
5	Work Lamp switch	10	Emergency switch	15	Additional lift lever

※ The multifunction lever, steering wheel, display, lamps and all switches, (key, emergency stop, light etc) are located on the console.
Familiarize yourself with the controls and follow safe operating procedures.

4. INSTRUMENT PANEL

1) STRUCTURE

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

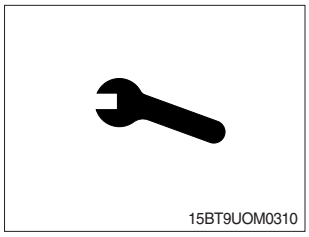


13BOP93KY05A

1	Speed (Digital)	6	Performance / Scroll right	13	Park brake
2	Steering wheel position and travle direction	7	Turtle / Scroll down	14	Time / Height select (OPT)
3	Battery discharge indicator	8	ESC / Back	15	Hour-mater / Height present (OPT)
4	Scroll up / Height indicator (OPT)	9	Enter		
5	Menu / Scroll left	10	Error warning lamp		
		11	High temp warning lamp		
		12	Dead man switch		

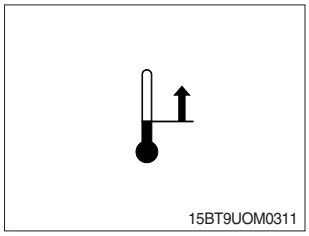
2) WARNING LAMP

(1) Error warning lamp



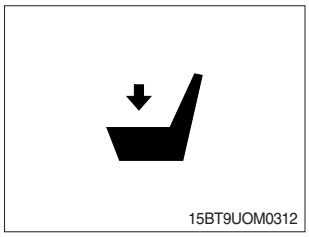
This LED lights when an electric device (controller, motor, cable, etc.) is in abnormal condition.

(2) High temp warning lamp



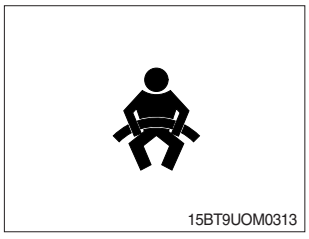
This LED lights when the controller or motor temperature is high.

(3) Dead man switch



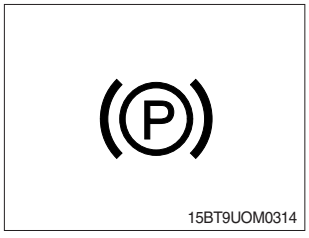
This LED light when the operator step on the dead man switch.

(4) Seat belt warning lamp



This LED blinks When operator starts the truck, LED blinks for 5 seconds, which means initial diagnosis is on going, and buttons on display will work properely just after the diagnosis is completed.

(5) Parking brake warning lamp



This LED lights when the parking brake is activated.

3) BUTTON

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

(1) Up button

Press to select upward move.

(2) DOWN/TURTLE button

Press to select downward move.
TURTLE MODE ON/OFF

(3) LEFT/MENU button

Press to select leftward move.
Go into the menu.

(4) RIGHT/PERFORMANCE button

Press to select rightward move.
POWER MODE H/N/E

(5) Cancel (ESC) button

Press to select cancel.
Keep pressing this button shows PASSWORD entry field.

(6) ENTER button

Press to select Enter.

4) LCD FUNCTION

13BOP93KY06

1 Current time
2 Turtle mode
3 Truck speed pointer
4 Speed level
5 Truck speed
6 Hour meter
7 Wheel position and running direction
8 Power mode
9 BDI (Battery Discharge Indicator)

(1) Current time

The number shows the current time according to the setting, which can be changed by display setting at page 3-11.

(2) Turtle 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 button.

(3) Truck speed pointer

The speed of the truck is indicated with a pointer.

(4) Speed level

It indicates the speed level by 2 km.

(5) Truck speed

The truck speed is shown in number. The unit can be km/h or mph according to the display setting (see 3-11 page).

(6) Hour meter

The number shows the hours worked. The letter present beside the hour meter number shows which hour meter is displayed.

– hK : the Key Hour shows the truck Key ON time;
– hT : the Traction Hour shows the Gate ON (driven) time of the traction motor.
– hP : the Pump Hour shows the Gate ON (driven) time of the pump motor.

(7) Wheel position and running direction

The arrow point is up when the truck is forward running and points down when the truck is reverse running. The arrow points the direction of the steering angle.

(8) Power mode

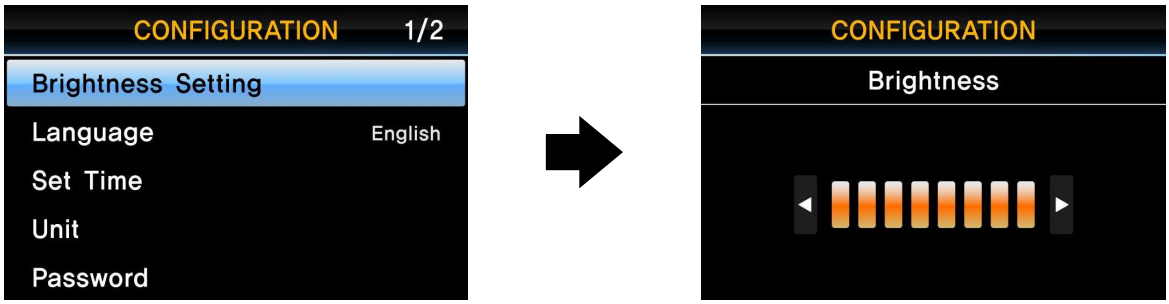
The letter H, N, or E, shows the power mode which is being used in the controller. The mode can be scrolled by pressing the button sequentially. When a mode is selected, the related information will be sent via CAN-BUS to traction and pump controllers that will manage this data.

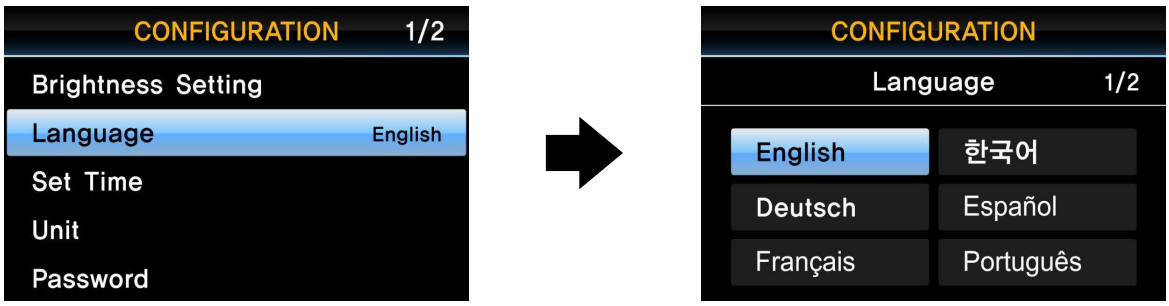
H (High) – corresponds to the highest performance
N (Normal) – corresponds to normal performance
E (Economic) – corresponds to economic performance

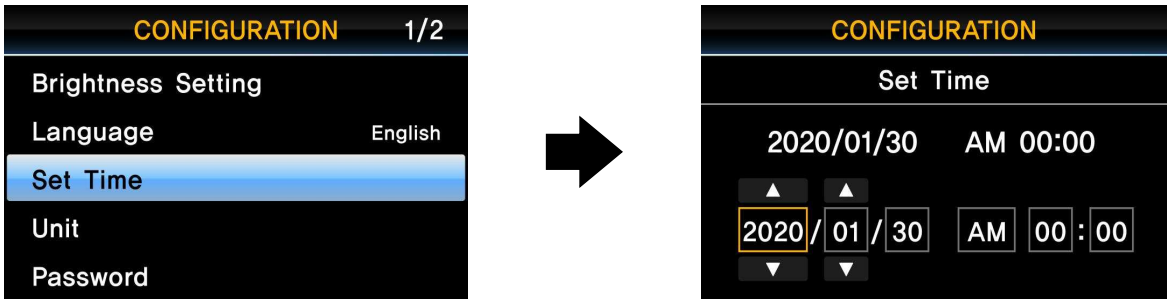
(9) BDI (battery's state of charge)

The battery's state of charge is shown by ten bars. Each bar represents the 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. When the residual battery charge is 20% or under, the bars displayed become red.

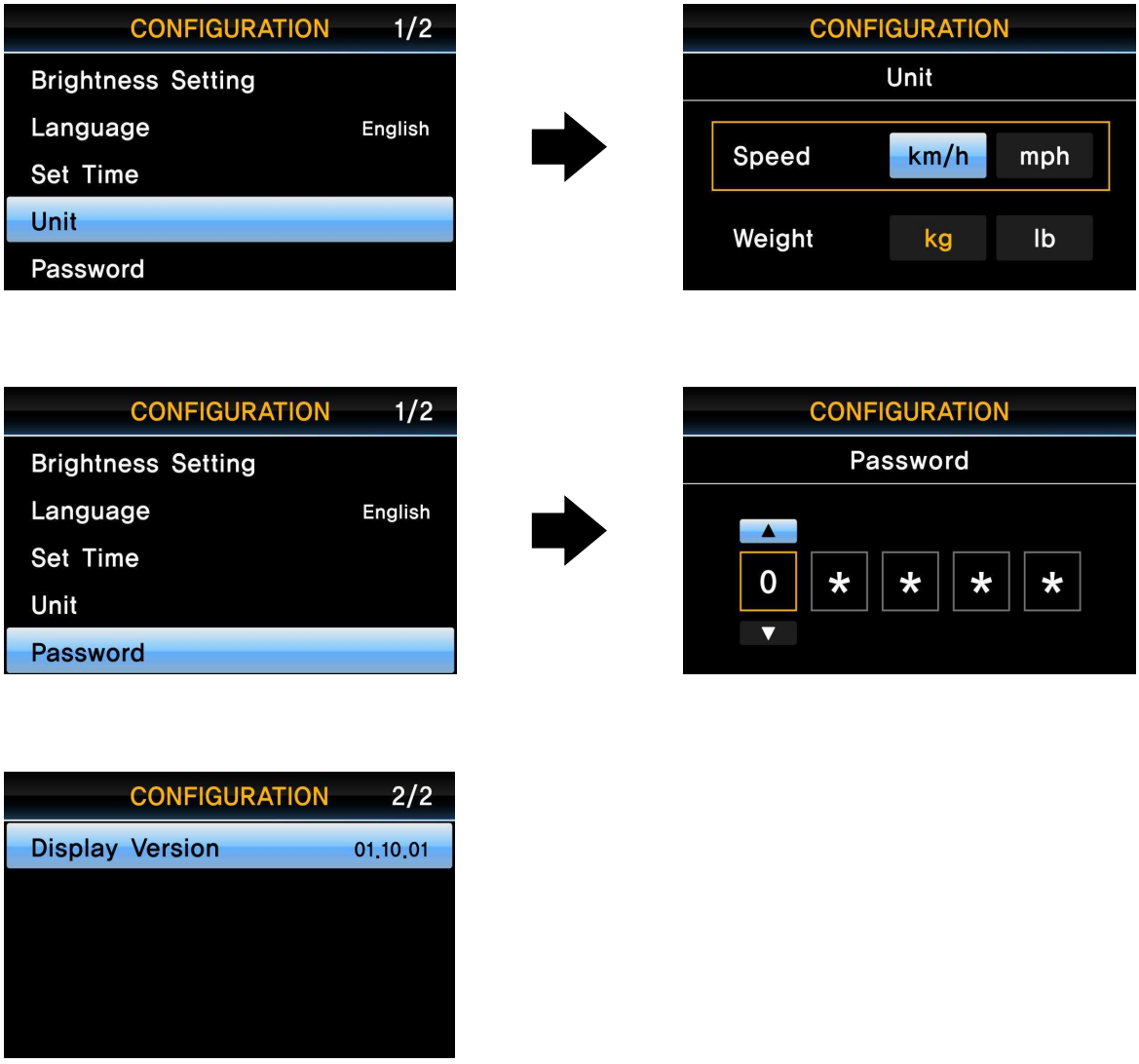
5) HOW TO SET THE DISPLAY MENU







13BOP93KY23



13BOP93KY23

6) OPERATING HEIGHT INDICATOR (OPT)

(1) Height indicator functions

① The real-time height of the fork is on the display.

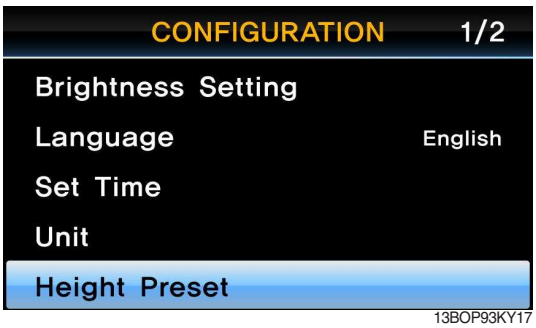
② If you pre-set the heights(Max. 50) on the display and lift or lower the fork, the fork could be automatically stopped at the height.

③ The maximum height can be changed by switching the zone selector swtich.

(2) Height preset setting

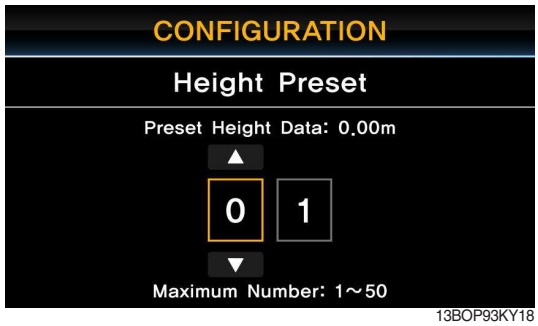
Set the height preset as bleow.

① Press the left button on the main screen to access the configuration.



13BOP93KY17

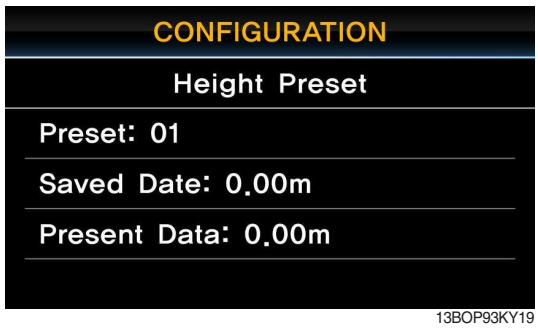
② Select the number of height preset(Max. 50) and press the enter button.



13BOP93KY18

③ Lift the fork up to the height you want to save and press the enter button to save.

※ Preset : The number of HEIGHT PRESET
Saved Data : The height saved in the number.
Present Data : Real-time height.



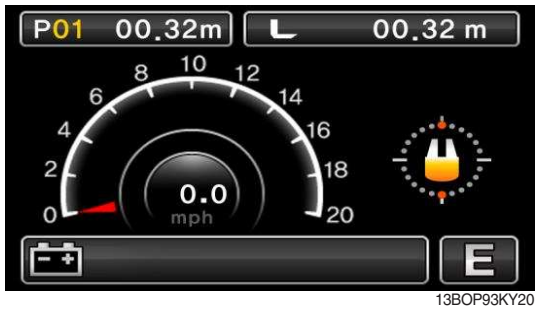
13BOP93KY19

(3) Height preset operation

The height preset is operated as below.

① Press the up button to display height indicator screen.

※ P01 : The number of preset is blinking.
Left 00.32m : Saved in the number.
Right 00.32m : Real-time height.



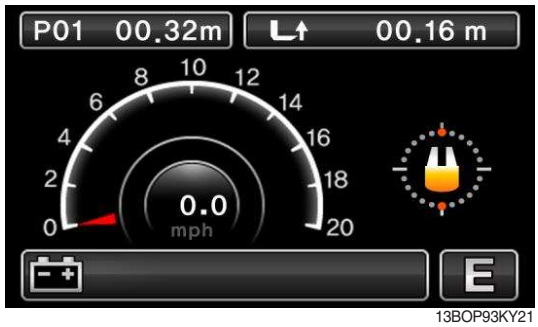
13BOP93KY20

② Press up and down button to select the number you want.

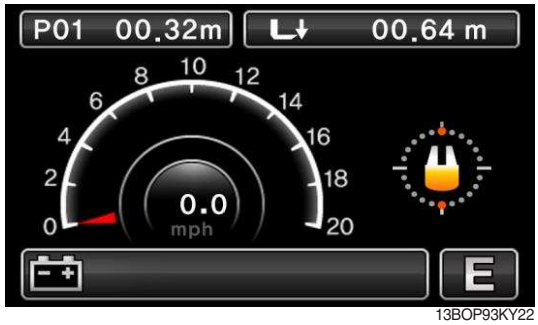
③ Press the enter button to target the height.

④ Lift or lower the fork to approach to preset height.

※ If the real-time height is 0.16m and preset height is 0.32m, the fork could be only lift.
If the real-time height approach to the height, the fork is automatically stopped and the preset height screen is exited.



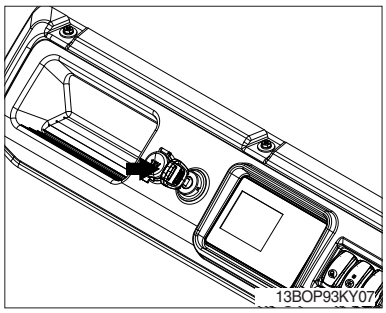
13BOP93KY21



13BOP93KY22

5. OPERATING SWITCHES, LEVERS AND PEDALS

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.

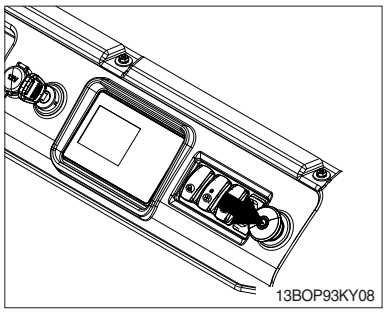
※ **Automatic centering (AUTC)**

AUTC turns the steered wheel straight ahead to keep the steer aligned meanwhile traveling.

When autocentering is ON, the AUTC at key-on is always performed.

The AUTC at key-on is used to initialize the encoder counting. When it is not performed, the truck travels slow speed only, until the driver moves the steering wheel and an edge is detected on the straight ahead sensor getting possible the initialization of the encoder counting.

2) EMERGENCY SWITCH



(1) The emergency switch is located on the right side of the console.

(2) When pressing the emergency switch downward, the electric circuit is broken, all electrical function switch is off and the vehicle brakes are automatically applied.

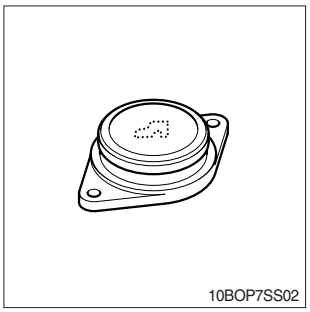
(3) If problem is detected in the EPS system, a notice appears on the operator display.

(4) During traveling the vehicle, if a problem occurs EPS system that could endanger the safety of the operator, the vehicle automatically comes to a controlled stop as well as EPS operation.

※ **The emergency switch should be used in dangerous situations all the times.**

※ **EPS : Electric power steering.**

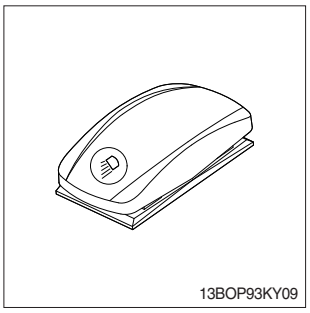
3) DEAD MAN SWITCH



(1) The dead man switch always keeps the operator's foot in place during driving the machine or hydraulic operation.

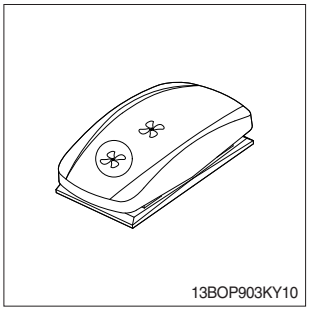
(2) If the dead man switch is not pressed, all the electrical functions are taken out of operation with exception of the steering, the display and the horn.

4) WORK LAMP SWITCH



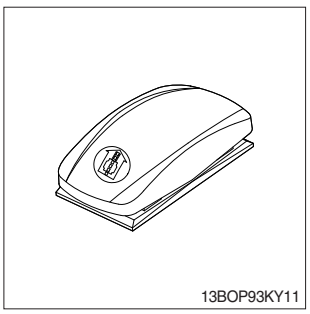
(1) This switch is used to operate work lamps.
Press this switch to turn on work lamps.

5) FAN SWITCH



(1) This switch is used for operation of the fan on the overhead guard.
In order to operate the fan, press the weathercock symbol downward.

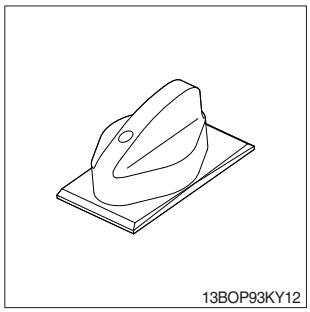
6) WIRE GUIDANCE SWITCH (OPT)



(1) This switch is used for operation of the wire guidance function.

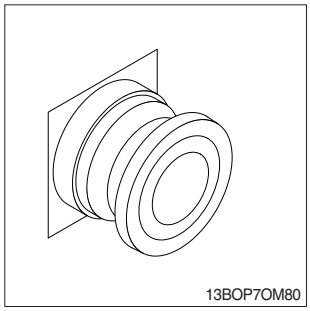
(2) To align truck to the wire
① Turn the Wire Guidance Switch (WGS) to ON.
② Approach to the wire.
※ When forward direction, approach angle should not exceed 30°. When reverse direction, approach angle should not exceed 5°.
※ Automatically drive speed down for the safety until aligning.
※ The steering is impossible manually when starting automatic steering.
③ Turn the WGS to OFF to steer manually.

7) ZONE SELECTOR SWITCH (OPT)



(1) This switch is used to change max height 1 or 2 of the fork.
- Left : Max height 1
- Right : Max height 2

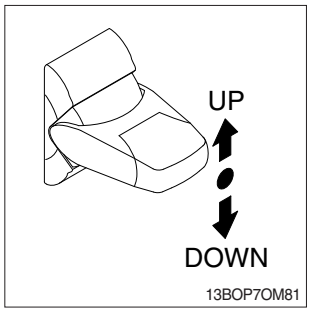
8) ADDITIONAL LIFT ENABLE SWITCH (OPT)



(1) As the auto return type switch, when pressing this switch, additional lift is enable.

(2) This switch always keeps the operator's left hand in place during opreating additional lift for safety.

9) ADDITIONAL LIFT LEVER (OPT)



(1) Pushing the lever upward the additional lift fork is moving up.

(2) Pulling the lever downward the additional lift fork is moving down.

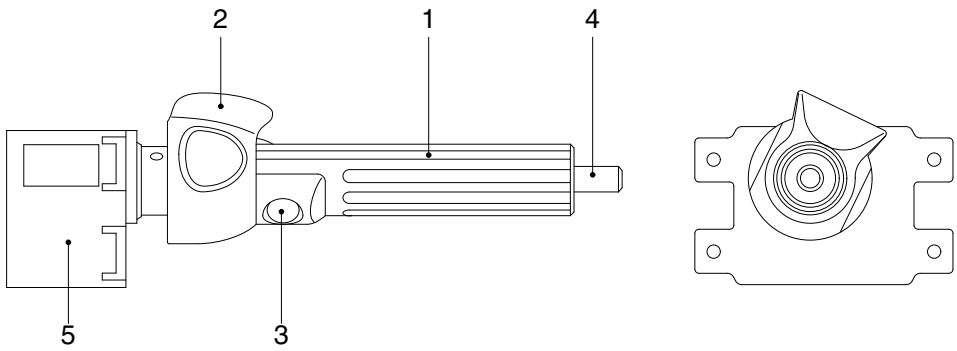
10) MULTIFUNCTION LEVER

The multifunction lever is located on the right side of the console.

The multifunction lever allows on-handed operation for the following functions :

- Driving direction and speed for forward and backward.
- Lifting and lowering for the fork along with platform.
- Horn sounding.

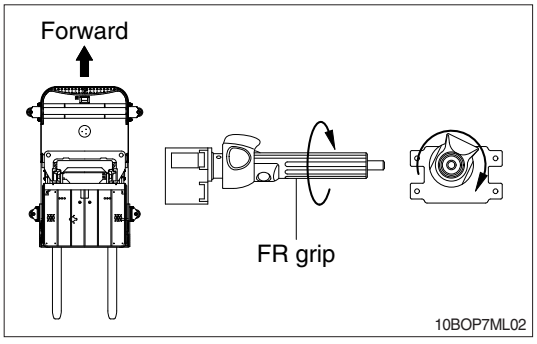
(1) Structure



10BOP7ML01

1	Fwd/Rev grip	3	Horn switch	5	Body
2	Lift/Lower grip	4	Center pin		

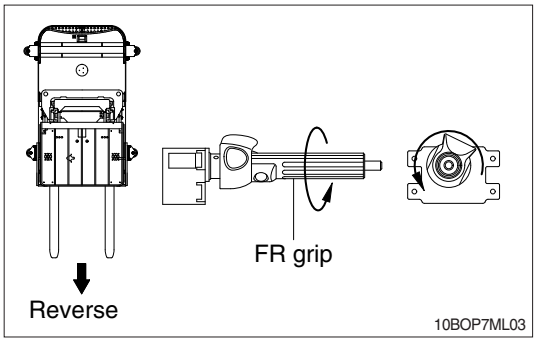
(2) Operation



① **Driving**

- **Forward driving**

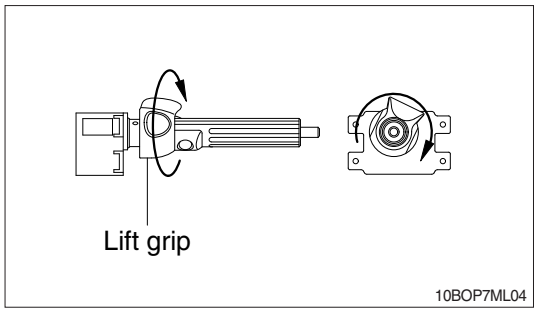
  Turn the FR grip of the multifunction lever to clockwise for forward driving.



- **Reverse driving**

  Turn the FR grip of the multifunction lever to counterclockwise for reverse driving.

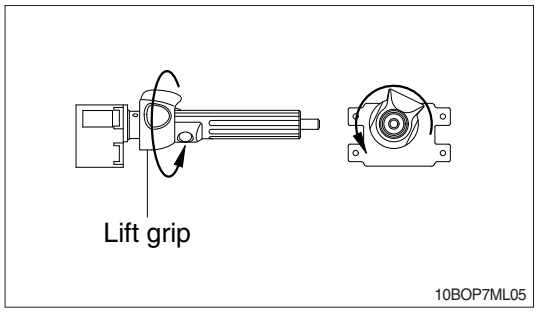
※ When driving the machine to backward, the back buzzer should be sounded.



② **Lifting and lowering**

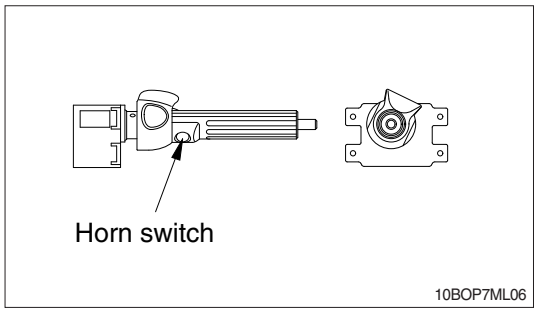
- **Lifting work**

  Turn the lift grip of the multifunction lever to clockwise for lifting the forks.



- **Lowering work**

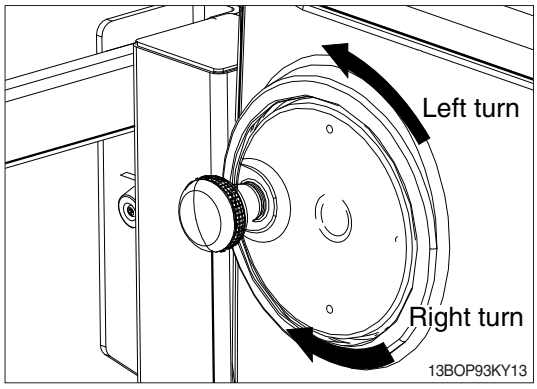
  Turn the lift grip of the multifunction lever to counterclockwise for lowering the forks.



③ **Horn sounding**

- The horn sounds when the horn switch is pressed.

11) STEERING WHEEL



(1) The steering wheel is mounted on the left side of the console.

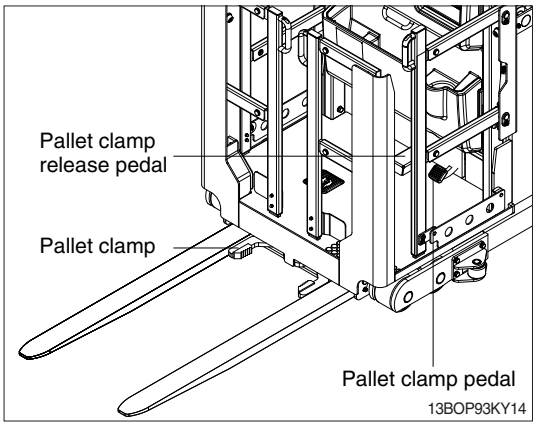
(2) The steering wheel of the vehicle is provided with the knob to allow steering with one hand.

(3) Turn the steering wheel to clockwise in order that you may turn the machine to right direction.

On the contrary, turn the steering wheel to counterclockwise in order that you may turn the machine to left direction.

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

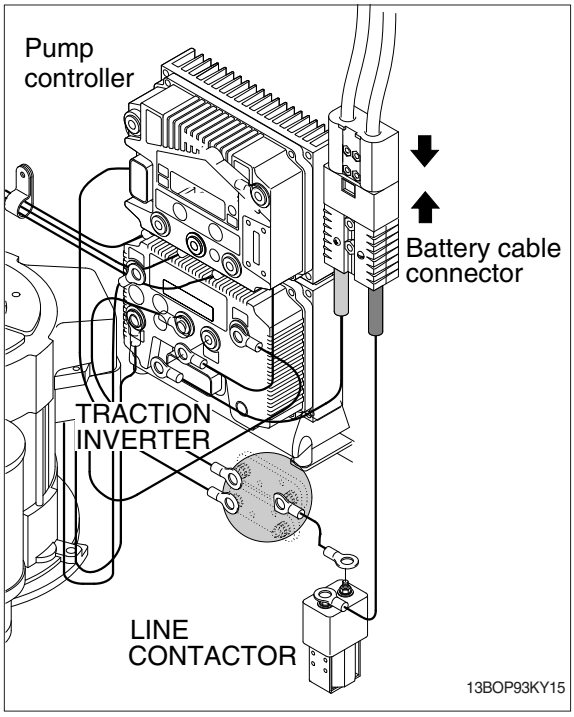
12) PALLET PEDAL



(1) The pallet pedal is mounted on the platform weld assy to hold pulling power of the ratchet cable.
Step down the pallet pedal in order to pucker up the pallet clamps.

(2) The release pedal is mounted on the platform weld assy to release pulling power of the ratchet cable.
Step down the release pedal in order to outstretch the pallet clamps.

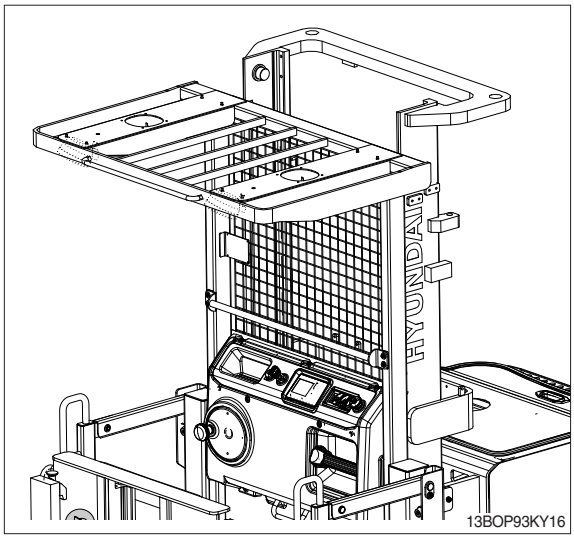
6. BATTERY CONNECTOR



Be sure to connect the connector for the battery and body.

7. SUPPORT AND SAFETY PARTS

OVERHEAD GUARD



The overhead guard is of rugged construction that serves to ensure the safety of the operator.

4. DAILY SAFETY INSPECTION

1. INSPECTING YOUR TRUCK

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 HYUNDAI or 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 pages.

⚠ **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) Check that the battery is installed and secured in position correctly. Check battery connector for safe condition.
4) Lock for any external leakage around drive axle.
5) Check for hydraulic oil leaks and loose fittings.

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

6) Be sure that the driver's overhead guard and all other safety devices are in place, securely fastened and undamaged. Inspect for damaged or missing parts, corrosion, cracks, breaks etc.
7) Check all of the critical components that handle or carry the load.
8) Look the upright 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.
9) 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.
10) Inspect the wheels and tires for safe mounting, wear condition and air pressure.
11) Check the hydraulic tank oil 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) Dead man switch and emergency switch.
 (2) Hydraulic controls : lift and auxiliary (If installed)
 (3) Multifunction lever
 (4) Steering system
 (5) Lift mechanism and any attachments

· When the functional checks are completed :
 ① Bring truck to complete stop.
 ② Make sure that the multifunction lever is in NEUTRAL.
 ③ Lower the lift mechanism fully.
 ④ Turn the start switch to the OFF position.

· If you are going to leave the truck unattended :
 ⑤ Remove the key.
 ⑥ Block the wheels, if the truck is parked on an incline or has the possibility of moving.

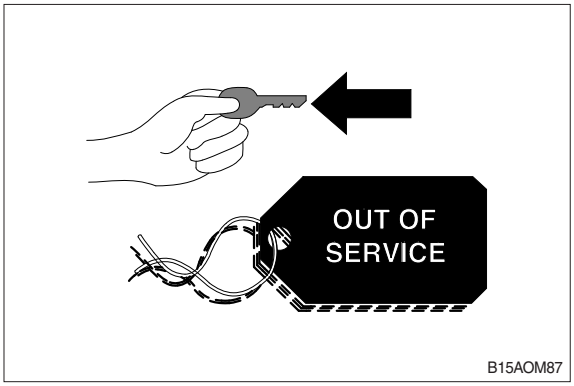
4. CONCLUDING THE INSPECTION

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. 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.

⚠ **This equipment 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.**

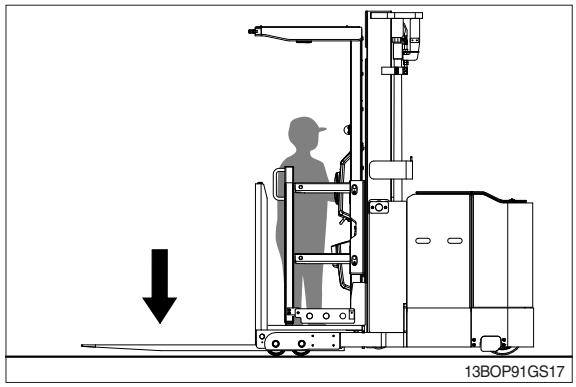
⚠ **Inspect your lift truck before operating at the start of day or shift. Before putting your truck to use, check the operation of the controls and all systems.**

⚠ **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) Check that the battery cable is connected to body.
2) The forks are fully lowered to the floor or ground.
3) You are familiar with how all the controls function.



4) All controls are in neutral or other correct position.
5) A lift truck has received its daily inspection and is ready to operate.

⚠ **Before the truck is operating at the start of daily shift, the operator must ensure that there is nobody within the danger area.**

※ **Check and operation to be carried out prior to starting of daily work.**
- Make sure that the load chains are evenly tensioned.
- Make sure that all safety mechanisms are correct and good function.
- Carry out testing for the brakes.
- For rail guidance system, check that the guidance rollers are smooth and good condition.
- Carry out testing for the warning device such as horn.

3. STARTING THE TRUCK

Before you start the truck, make sure that you have taken all the above mentioned precautions and the machine is in NEUTRAL.

1) DRIVING

(1) To start the truck, step down on and press the dead man switch.

(2) Insert the start key and turn it clockwise to the "ON" position.

(3) Step on the deadman switch continuously during operation of the truck.

(4) When driving the truck, the travel speed can be controlled by the multifunction lever.

※ Before driving the truck to a narrow aisle, make sure that people or other trucks are in the aisle.
If people or other trucks are in the aisle, never the truck enters in the aisle in order to avoid from unexpected accident.

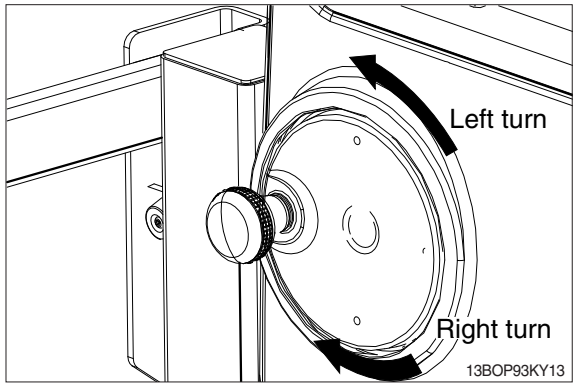
※ If the emergency switch is pressed downward, pull out it before inserting the start key.

2) STEERING

(1) Hold the steering knob with the left hand to operate the steering.

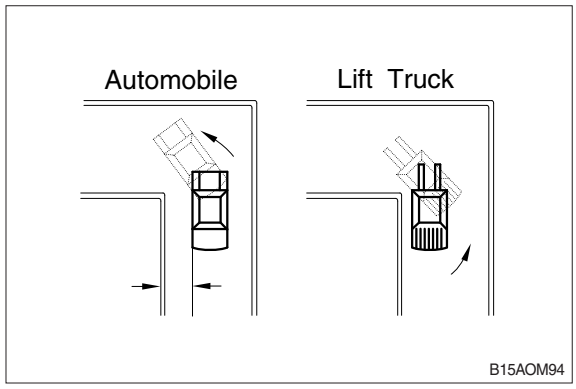
(2) Forklift trucks are steered by the front wheels.

(3) Turn the steering wheel to clockwise in order that it may turn the machine to right direction.
On the contrary, turn the steering wheel to counterclockwise in order that it may turn the machine to left direction.



(4) So when travelling FORWARD, keep to the outside and when travelling in REVERSE, keep to the inside when turning.

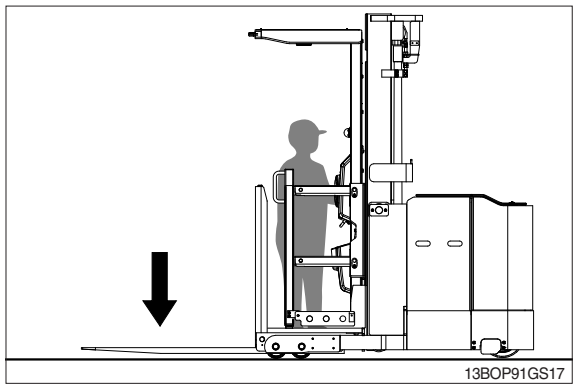
(5) When turning, do not let the outside of the frame touch anything.



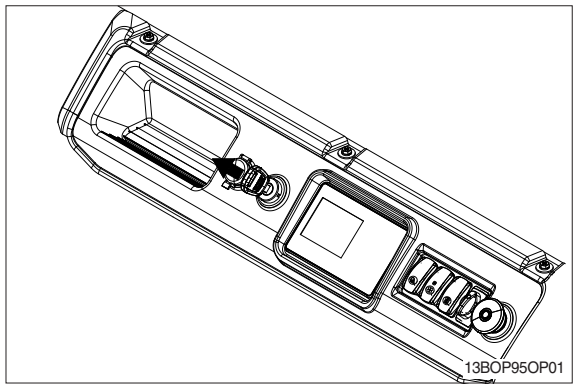
3) STOPPING AND PARKING

(1) When parking the vehicle, step down on and press the dead man switch to lower the fork to the lowest position.

⚠ **Even if you only intend to leave the truck for a short time, the truck should be securely parked for safety.**



(2) When leaving the vehicle, do not fail to remove the key.



4. CONTROLLING SPEED

Turn the multifunction lever to clockwise for forward driving or counterclockwise for reverse driving.
Turn to the multifunction lever smoothly it until the truck is moving at the desired speed.

5. BRAKING

To stop the truck, take off the foot on the dead man switch.
When take off the foot on the dead man switch during driving, the regen brake is actuated on braking function by electric power.
Subsequently, after actuating the regenerate brake, the electric brake begins to work of braking in stopping time of the truck.
As a result, the truck is stopped after all.

6. PLUGGING

1) You can change direction, without braking, by "**plugging**". As you are traveling, turn multifunction lever to the opposite direction. 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 multifunction lever:

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

3) ELECTRICAL BRAKE

(1) Opposite to the direction of vehicle advanced will actuate the electrical brake.
(2) After stopping of the vehicle through the electrical brake, the vehicle runs to the opposite direction by keeping multifunction lever.
(3) Avoid applying the electrical brake to the vehicle accelerated very much in a downward slope. fCarefully apply the electrical brake so that loads may not be damaged.

4) REGEN BRAKE

(1) Regen brake provides vehicle braking by controlling the motor as a generator and returning the generated energy back to the battery.
(2) A direction change of the multifunction lever will initiate regen braking at a level set by the direction brake current level. Braking effort is proportional to the position of the multifunction lever movement.

7. 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 platform 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.

※ **Safety devices, warning signs and warning instructions should be strictly observed.**

(6) Travel with raised platform to fully clear the ground or obstacles. When the fork together with platform (load) is in an elevated position, the stability of the truck is reduced.

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

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

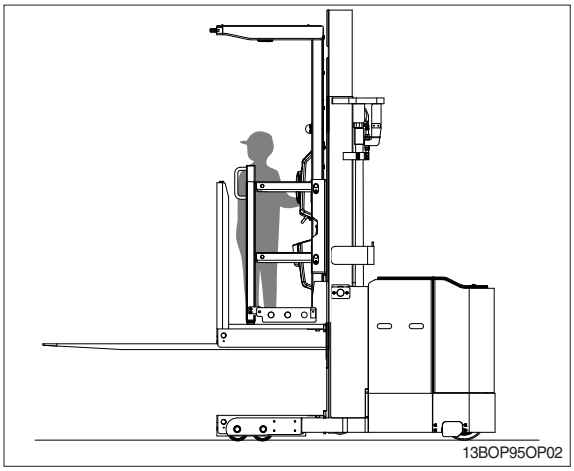
(1) Careful driving and operation is your responsibility. Be completely familiar with all the safe driving and load handling techniques in this Operator's Manual. Use common sense. Drive carefully. Watch for people and hazards. Slow down, be in full control of your lift truck at all times.

(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.



8. 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.

Loads placed out on the ends of the forks can make the lift truck less stable.

Operate lift controls slowly and smoothly.

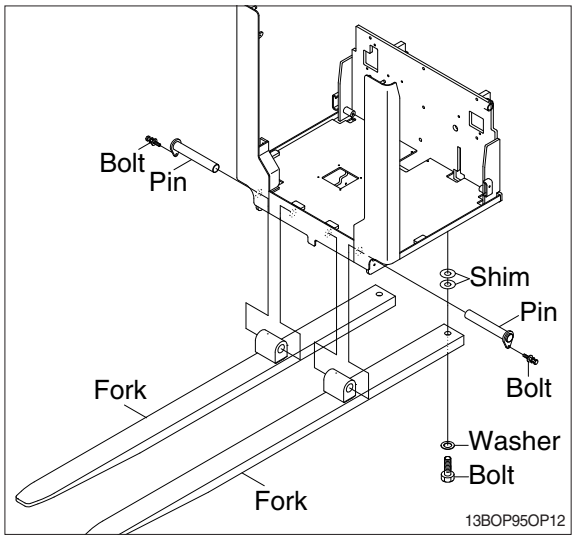
⚠ Slack chains mean rail or platform hang-up. Raise the mast before you move. If the mast malfunctions in any way or becomes stuck in a raised position, operate the lift control to eliminate any slack chains by raising the platform. DO NOT go under a raised platform or forks to attempt repairs.
DO NOT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

Remember your truck is designed to carry loads by both load tires 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 both load tires), the less the stability of the truck. Therefore, always carry the load as close to the both load tires as possible (back and flush against the face of the forks.)

The load capacity shown on the nameplate represented by weight in length 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 platform.

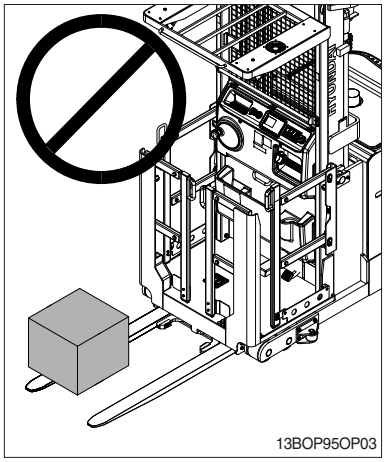
2) LOAD FORKS



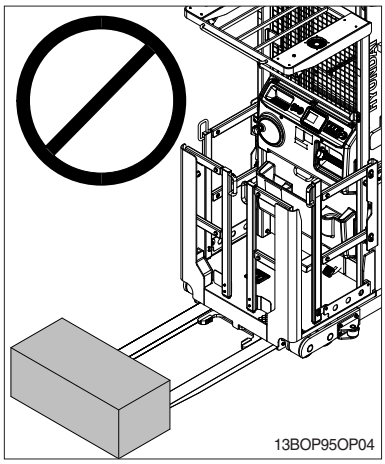
The load forks are not adjustable type.
The forks are assembled with bolts, washers, shims at one place and pins, bolts at another place.

⚠ Always make sure that fork retaining bolts and pins are securely tightened 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 fork and platform as low as possible. Never travel with the load or fork and platform 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 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.

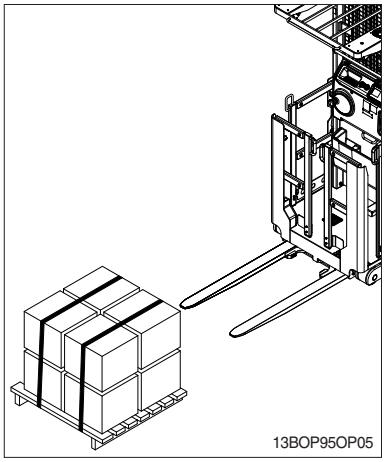
Watch clearances around the truck and load as you travel. Raise the forks or attachment only to pick up or stack a load. Look out for obstructions, especially overhead.

Be aware that exaggerated tail swing, when turning while traveling reverse, is a characteristic of lift trucks that are steered by the drive wheel. Accordingly, you need to become accustomed to tail swing and always check the tail swing area of the frame 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.

⚠ **Prior to traveling with load of the truck, always make sure that the load is included within allowance limit range of the load which shows on the load capacity chart for the truck and attachments.**

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. 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 controls, adjust the forks to the correct height for freely engaging the load pallet. Move reverse 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 reverse until the load is positioned near platform.

Raise the load from the ground or stack just enough to lift the load from the surface.

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

6) UNLOADING

To deposit a load on the floor, lower the load after being moved into the correct position.

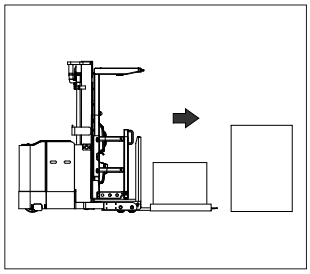
Adjust the fork height as necessary, for smooth removal of the forks from the load (pallet).

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

※ When depositing the load down on the floor, pay careful attention to do not place the load suddenly in order that it can avoid from damage due to dropping the load.

7) STACKING

(1) To put a load on a stack



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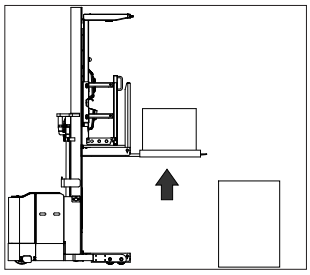
① Approach slowly and align the lift truck and load squarely with the stack.



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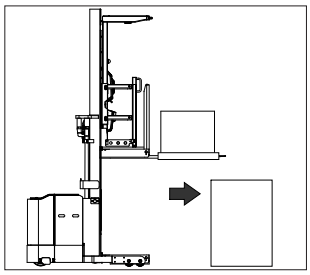
② Raise the load as the lift truck nears the stack.



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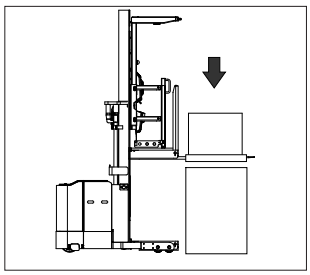
③ Move reverse slowly until the load almost touches the stack. The leading edge and sides of the load pallet should line up exactly with the near edge and side of the load or rack on which you are stacking.



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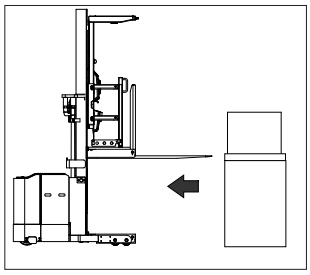
④ Stop close to the stack and further lift the load high enough to clear the top of the stack. Slowly move the load into position. Use care not to damage or move adjacent loads.

⑤ When the load is aligned with the stack beneath it, carefully lower the load onto the top of the stack.



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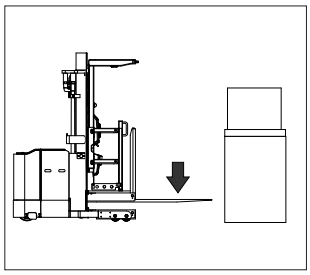
⑥ Lower the forks slightly to clear the load pallet.



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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].

(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. Move reverse 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 reverse 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 enough to lift the load from the surface. Or, with the mast still vertical, raise the forks until they begin to lift 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]. Be sure the load is located the platform as near as possible or front face of the forks.

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

9. 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

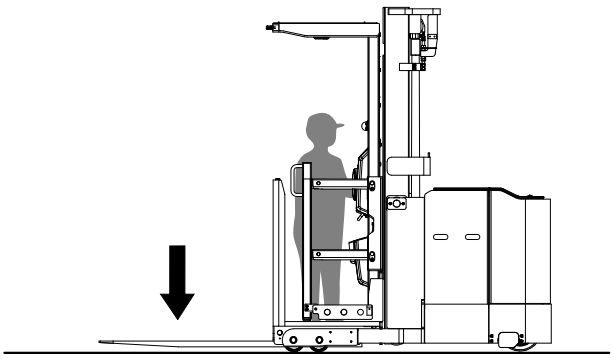
(1) Park in a safe area away from normal traffic.
(2) Never park on a grade.
(3) Never park in areas that block emergency routes or equipment, access to fire aisles, or stairways and fire equipment.

2) Before leaving the operator's position

(1) Bring the truck to a complete stop.
(2) Make sure that the multifunction lever is in NEUTRAL.
(3) Lower the lifting mechanism-platform and forks or attachment fully to the ground.

3) In addition, when leaving the truck unattended

(1) Park the truck on the flat 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. EMERGENCY PRECAUTIONS

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.

※ 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 truck if traction or weather conditions are poor.

2. MAST EMERGENCY LOWERING

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

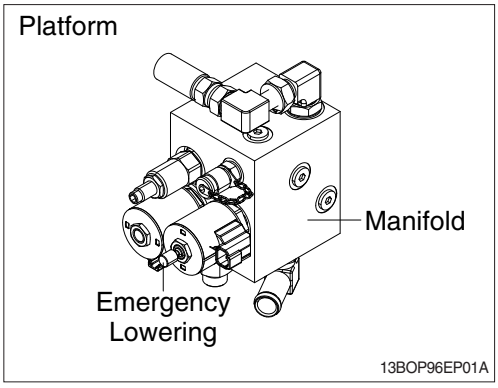
⚠ **Manual override features are intended for emergency use, not for continuous-duty operation.**

⚠ **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 such as severe personal injury or death.**

1) PLATFORM

(1) Turn off the electric emergency switch.

(2) In order to lower the platform, rotate the main manifold emergency lowering lever counter-clockwise to activate.

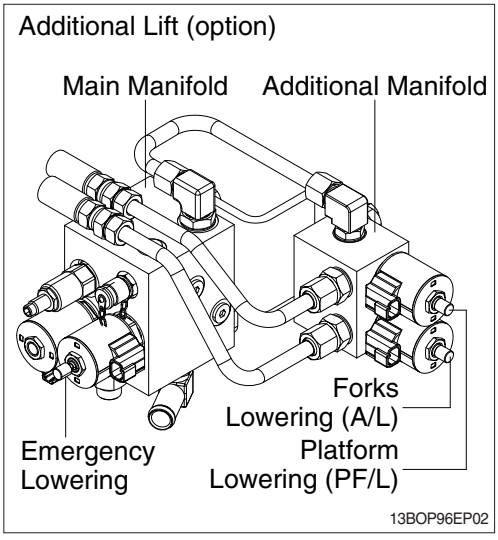


2) ADDITIONAL LIFT (OPTION)

(1) Turn off the electric emergency switch.

(2) In order to lower the platform, rotate additional manifold emergency lowering lever (PF/L) and then main manifold emergency lowering levercounter-clockwise to activate.

(3) After landing the platform to ground, rotates additional manifold emergency lowering lever (A/L) counter-clockwise to lower forks.



7. PLANNED MAINTENANCE

1. INTRODUCTION

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

2. LIFT TRUCK MAINTENANCE

Regular maintenance and care of your lift truck is not only important for full and efficient truck life also essential for your safety. The importance of maintaining your lift truck in a safe operating condition by servicing it regularly and, when necessary, repairing it promptly cannot be emphasized too strongly. Experience has shown that powered industrial trucks can cause injury if improperly used or maintained. In the interest of promoting safety, several current industry and government safety standards specify that any powered industrial truck not in safe operating condition be removed from service and that all repairs be made by trained and authorized persons.

To assist you in keeping your lift truck in service and in good operating condition, this section outlines maintenance procedures that should be done at regular intervals. This planned approach is considered essential to the life and safe performance of your truck.

It is your responsibility to be alert for any indication that your truck may need service and have it attended to promptly. You play an important part in maintenance. Only you can make sure that your lift truck regularly receives the care it needs.

⚠ **Powered industrial truck may become hazardous if maintenance is neglected.**

3. PLANNED MAINTENANCE

As outlined in Section 4, **Daily safety inspection** 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 operators daily inspection, HYUNDAI recommends that the owner set up and follow a periodic planned maintenance (PM) and inspection program. 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 need for more information on the care and repair of your truck, see you HYUNDAI dealer.

4. PLANNED MAINTENANCE INTERVALS

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 ware-houses. The indicated intervals are intended for **normal** operation. The operating condition classifications are:

1) Normal Operation

Eight-hour material handling, mostly in buildings or in clean, open air on clean paved surfaces.

2) Severe Operation

Prolonged operating hours or constant usage.

3) Extreme Operation

(1) In sandy or dusty locations, such as cement plants, lumber mills and coal dust or stone crushing sites.
(2) High-temperature locations, such as steel mills and foundries.
(3) Sudden temperature changes, such as constant trips from buildings into the open air or in refrigeration plants.

If the lift truck is used in severe or extreme operating conditions, you must shorten the maintenance intervals accordingly.

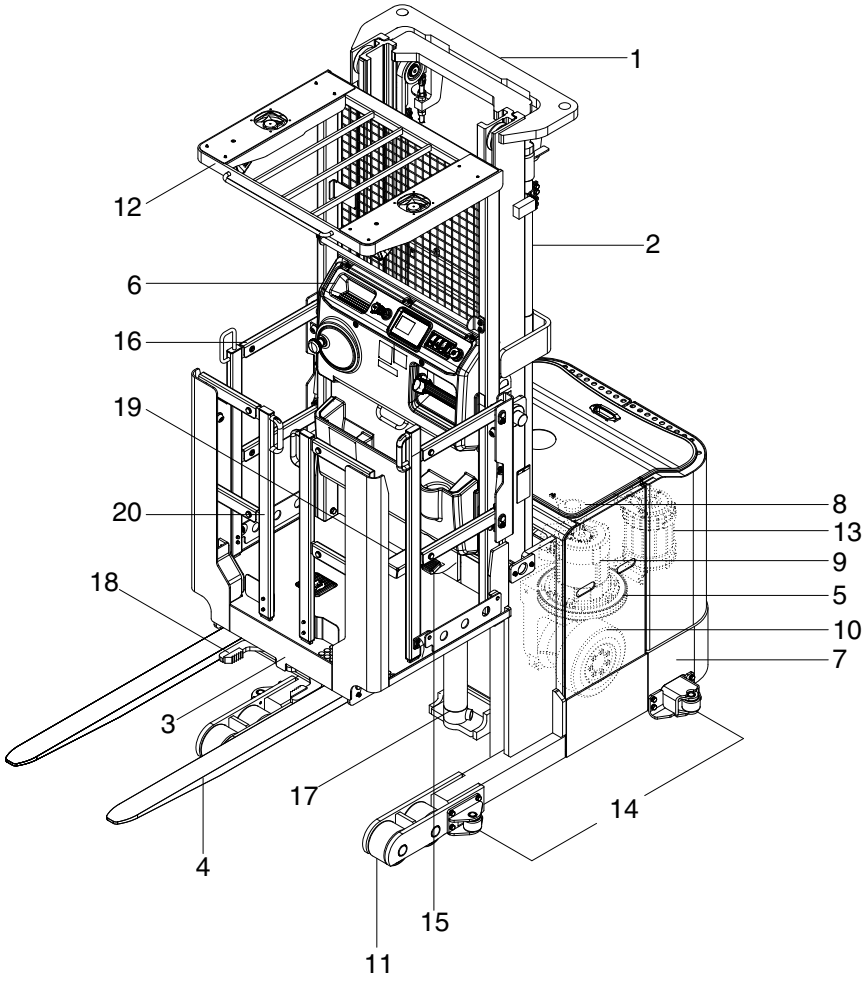
※ Since the operating environment of lift trucks varies widely, the above descriptions are highly generalized and should be applied as actual conditions dictate.

The maintenance time intervals referred to in this manual relate to truck operating hours as recorded on the hourmeter, and are based on experience which HYUNDAI has found to be convenient and suitable under typical (normal or average) operating conditions.

5. MAJOR COMPONENT LOCATIONS

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

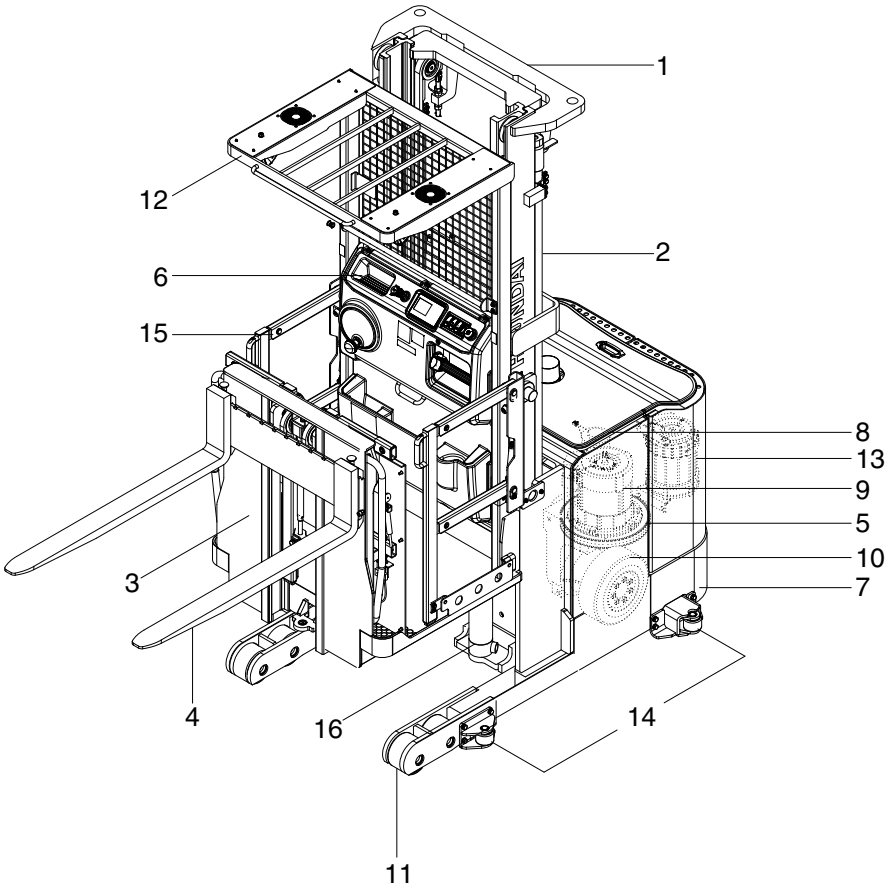
1) PLATFORM



13BOP97PM01

1	Mast	8	EPS motor	15	Pallet clamp pedal
2	Lift cylinder	9	Traction motor	16	Side gate
3	Platform	10	Drive wheel	17	Free lift cylinder
4	Forks	11	Load wheel	18	Pallet clamp
5	Drive unit	12	Overhead guard	19	Pallet release pedal
6	Dash board	13	Pump motor	20	Rear gate
7	Frame	14	Guide roller		(EU : STD, Other : OPT)

2) ADDITIONAL LIFT (OPT)



13BOP97PM02

1	Mast	7	Frame	13	Pump motor
2	Lift cylinder	8	EPS motor	14	Guide roller
3	Additional lift	9	Traction motor	15	Side gate
4	Forks	10	Drive wheel	16	Free lift cylinder
5	Drive unit	11	Load wheel		
6	Dash board	12	Overhead guard		

6. DAILY MAINTENANCE CHECKS

The PM intervals depend on hour meter records of operation.

PM interval
A : 8~10 hours or daily
B : 50~250 hours or every month (Typical PM interval)
C : 450~500 hours or every 3 months
D : 900~1000 hours or every 6 months
E : 2000 hours or every year

Daily maintenance checks	A	B	C	D	E
Check truck for obvious damages and leaks.	●				
Check clean battery terminals.	●				
Check electrolyte level.	●				
Check capacity, warning plates and decals.	●				
Check condition of tires and wheels. Remove embedded objects.	●				
Check for missing or loose wheel nuts.	●				
Check gauges and instruments.	●				
Check warning lights and hourmeter.	●				
Check overhead guard condition and bolts.	●				
Check horn operation and other warning devices.	●				
Check steering operation.	●				
Check brake operation.	●				
Check directional and speed controls operation.	●				
Check lift operation.	●				
Check mast, lift chains and fasteners.	●				
Check platform or attachments and forks.	●				
Check optional safety equipment.(Alarms, Lights etc.)	●				
Check for missing or loose outrigger bolts.	●				
Check operator safety bar and belt.	●				
Check legibility of noticed on safety restraint belt.	●				

7. PERIODIC MAINTENANCE CHECKS

The PM intervals depend on hour meter records of operation.

PM interval
A : 8~10 hours or daily
B : 50~250 hours or every month (Typical PM interval)
C : 450~500 hours or every 3 months
D : 900~1000 hours or every 6 months
E : 2000 hours or every year
F : 5000 hours (Hyundai genuine long life hydraulic oil)

Periodic checks and planned maintenance (PM)	A	B	C	D	E	F
Check truck visually and inspect components.		●				
Test drive truck/check functional performance.		●				
Check torque on critical fasteners.		●				
Lubricate truck.(See component)		●				
Clean/Check battery terminals, electrolyte level.		●				
Check battery cables/truck receptacle.		●				
Perform battery load test.		●				
Test ground.		●				
Check drive unit fluid level.		●				
Drain and replace drive unit fluid.					●	
Check drive unit mounting and fasteners.		●				
Check brake condition and wear.		●				
Lubricate steering gear and steering bearing of drive unit.		●				
Lubricate drive unit & suspension link bushing.		●				
Check hydraulic tank oil level.		●				
Replace hydraulic oil.					★1 ●	★2 ●
Replace hydraulic return filter.				●		
Lubricate mast fittings.		●				
Check lift chain adjustment and wear.		●				
Check/lubricate lift chains.		●				
Check contactors (Replace contactor tips if roughness is remarkable)		●				

★1 Conventional hydraulic oil
★2 Hyundai genuine long lift hydraulic oil

8. 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 HYUNDAI dealer.

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

2) Maintenance and inspection of all powered industrial 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 industrial 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 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 fluid or electrolyte levels.

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 blocks under the load-engaging means, inner masts or chassis before working on them.

(4) Disconnect the battery connector before working on the electrical system.
- Electric discharge of the controller
It is necessary to discharge of electricity for the condenser prior to setting the controller.

⚠ First of all, take care to make sure that the battery cables are disconnected from the battery socket.
Connect 10 watt of resister and the negative pole of the power input between the positive pole of the controller for 10 seconds to discharge of electricity for the condenser.

※ Refer to the 1-12 "Jacking and Blocking" section 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) Make sure that the multifunction lever is in NEUTRAL.

(2) Turn the key switch to the ON position.

(3) Check functioning of lift 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, platform, forks or attachments.
(3) Make sure that the multifunction lever is in NEUTRAL.
(4) Turn the key switch to the OFF position.
(5) Put blocks at the wheels if the truck must be left on an incline.

⚠ **Do not park the truck on a slope if possible before leaving the operator's platform or operating position.**

12) Brakes, steering mechanisms, control mechanisms, warning devices, lights, overload devices, lift mechanisms, 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 to insure that maintenance preserves the original approved safe operating features.

14) All hydraulic systems must be regularly inspected and maintained in conformance with good practice. 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 battery is disconnected, mast is in the fully-lowered position and hydraulic pressure is relieved in hoses and tubing.

⚠ **Always put blocks under the platform 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) Industrial 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. Capacity, operation and maintenance instruction plates, tags or decals must be changed accordingly.

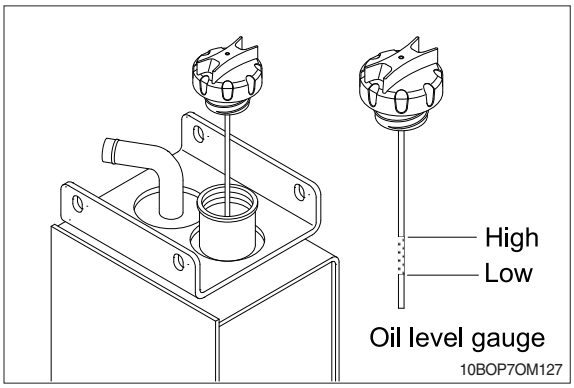
21) Care must be taken to assure that all replacement parts, including tires, are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment. Parts, including tires are to be installed per the manufacturer's procedures. Always use genuine HYUNDAI or HYUNDAI-approved parts.

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

9. MAINTENANCE GUIDE

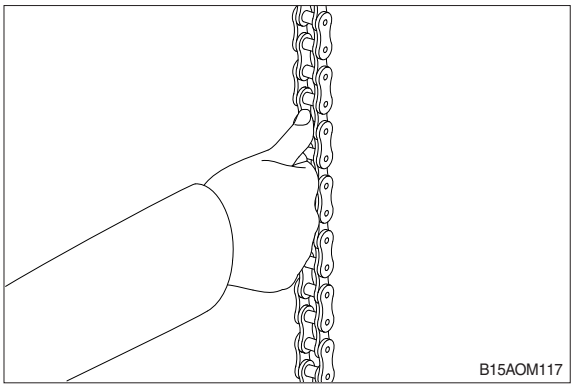
1) SUPPLYING HYDRAULIC OIL

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.



2) 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.

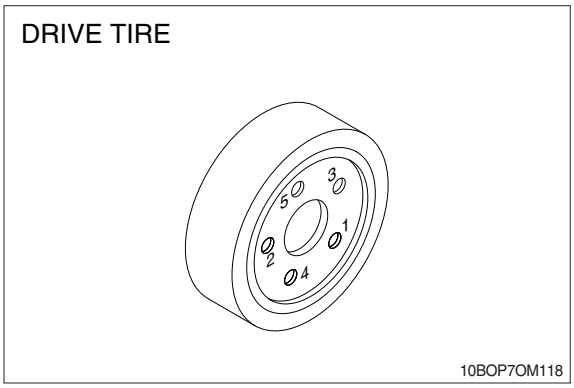


3) CHECKING OF HUB NUT TIGHTENING CONDITION

Make sure that the hub nuts and bolts are firmly tightened.

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

· Tightening torque : 14±1.5 kgf · m



4) GREASING OF EACH PARTS

Clean the following parts before greasing.

(1) Lift chain : Clean the chain with a brush greased with SAE 30~40 (Brush over the gear oil low viscosity).

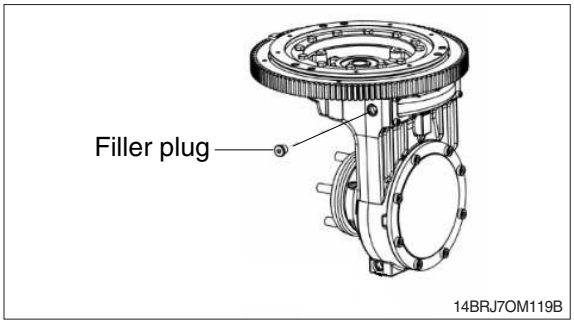
(2) Rolling part of mast guide rail roller : Brush over grease.

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

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

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

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



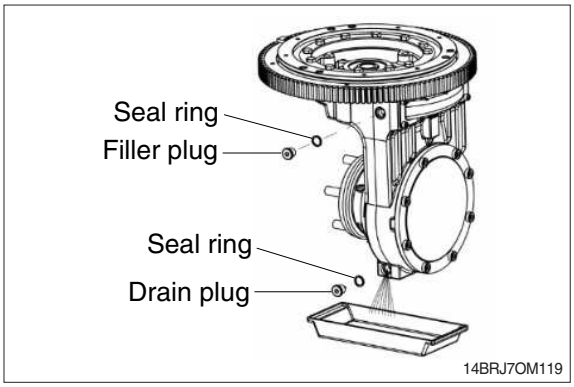
6) OIL CHANGE & FILL OF DRIVE UNIT

(1) Oil change

⚠ **Do not drain drive unit oil into the soil or the sewerage system. Pay attention to the type and quantity of debris.**

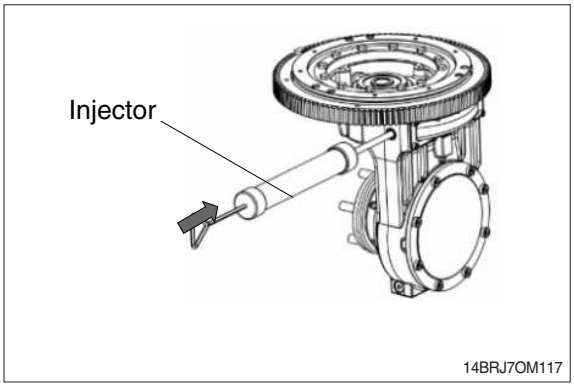
⚠ **High oil temperatures are to be expected after continuous operation of the drive unit. Wear temperature-resistant gloves!**

- Position the vehicle on even ground and lock the wheels for safety purposes.
- Carefully clean the area around the oil filler and oil drain plug.
- Place a suitable big oil collecting vessel under the oil drain plug.
- Loosen the oil filler plug with a 6㎜ allen wrench. Remove the oil filler plug and the sealing ring.
- Loosen the oil drain plug with a 6㎜ allen wrench. Remove the oil drain plug and the sealing ring.
- Have the transmission oil drained into the vessel completely.



(2) Fill in the drive unit oil

- Clean magnet on the oil drain plug and always reattach it with a new sealing ring.
  - Tightening torque : 2.24 kgf · m (22 Nm)
- Fill in the drive unit oil.(Refer to page 7-26)
- For filling use a suction and pressure injector. This allows an easy and rapid filling of the drive unit with oil.
- The correct oil level and the correct oil quantity is achieved when the oil level is at the lower edge of the oil filler plug, at least when oil penetrates at the filler plug.
- Attach the oil filler plug with a new sealing ring.
  - Tightening torque : 2.24 kgf · m (22 Nm)

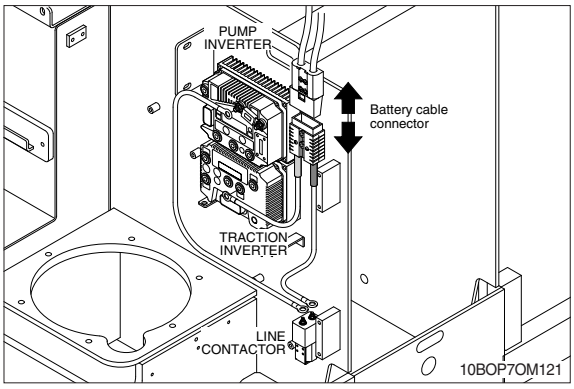


7) EXTERNAL APPEARANCE CHECK OF THE VEHICLE

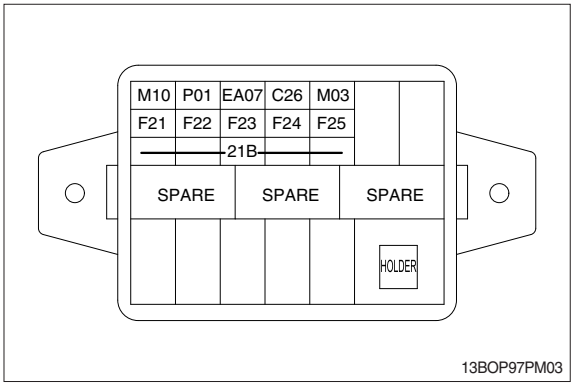
Check for the external appearance of vehicles. If any defect is found immediately contact the service station.

8) FUSE REPLACEMENT

(1) Disconnect the battery connector.



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



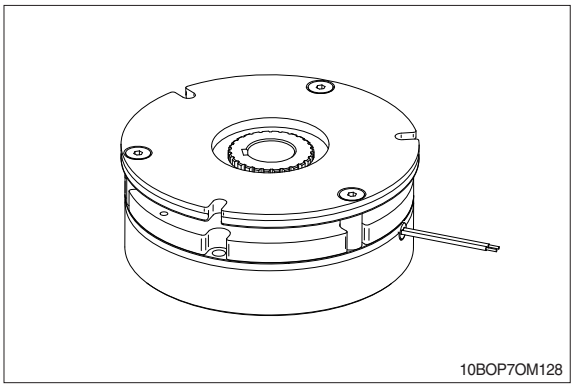
※ The blown fuse must be replaced with a fuse of the same capacity. When the fuses are often blown out contact the service station for inspection. Never use a conductor for a fuse.

9) BRAKE

(1) The equipment is designed for dry running. Friction faces must be kept completely clean of any oil, grease or abrasive dust.

(2) The electrically released brake is installed horizontally.

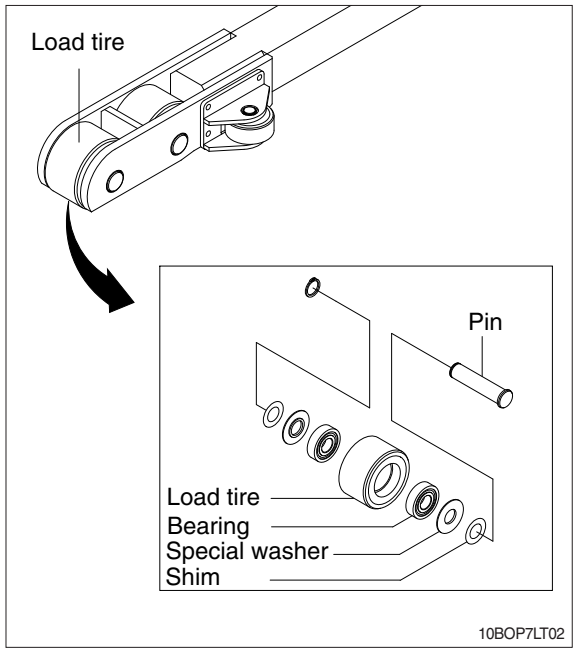
(3) All interventions have to be made by qualified personal.



10) LOAD TIRE

The load tires are mounted on the leg of the machine to enable it to drive smoothly.
When operating the machine, make sure that the bearings are operated properly and the load tires are maintained good condition at any time.
Inspect excessive worn out or debris around the load tires.

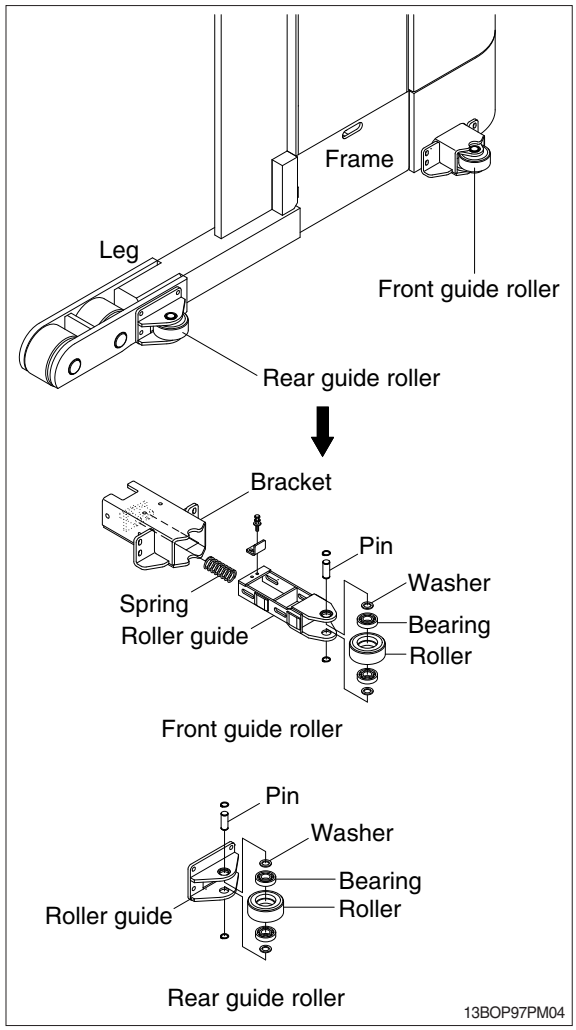
※ Particularly, be sure whether the ball bearings are bounded or excessive play.



11) GUIDE ROLLER

The guide rollers are mounted on the leg and the frame respectively.
When operating the machine, make sure that the bearings and springs are operated properly and guide rollers are maintained good condition.
Inspect excessive worn out or debris around the guide rollers.

※ Particularly, be sure whether the ball bearings are bounded or excessive play.



12) 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 with a set (LH & RH). Do not piece chains together.

13) LIFT CHAIN INSPECTION AND MEASUREMENT

Inspect and lubricate the lift chains every PM (50~250 hours). When operating in corrosive environments, inspect the chains every 50hours. 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.

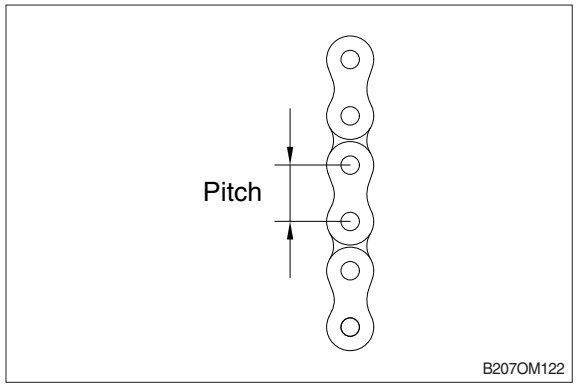
(3) Chain wear can be measured by using a chain scale or a steel tape measure, When checking chain wear, be sure to measure a segment of chain that moves over a sheave. Do not repair chains by cutting out the worn section and joining in a new piece. If part of a chain is worn, replace all the chains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

14) 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 life if they are regularly and correctly lubricated. 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

※ It is important that all lift chain and pivots are kept in a clean condition all the times. Never clean with chains steam jet, high pressure cleaners, or chemical cleaning agents.

15) 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 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.

※ In case that the truck is fitted with two lift chains, it should be placed the both chains with new genuine parts at the same time.
It is the only way to ensure load distribution over two chains.

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

10. 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: fluid of the drive unit

· Check for hydraulic oil leaks and loose fittings.

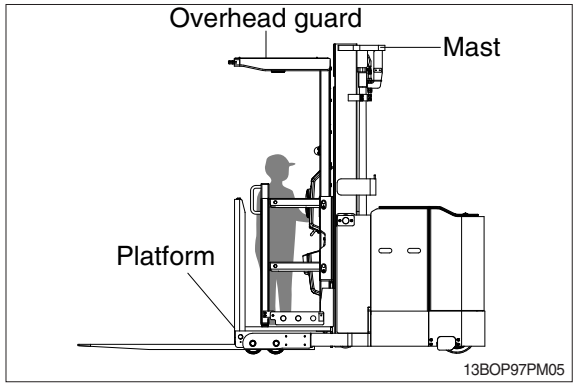
⚠ HYDRAULIC FLUID PRESSURE: Do not use your hands to check for hydraulic leakage. Fluid under pressure can penetrate your skin and cause serious injury.

· Be sure that the driver's overhead guard, platform 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.



⚠ The major purpose for installation of the overhead guard on the machine takes an operator under his protection from the falling objects which can be caused by unexpected accident such as severe personal injury or death.

Therefore, always be sure that it is maintained good condition to protect the operator without defects.

2) PLATFORM

Check platform for damage. Inspect the welds and cracks on the platform.
Be sure that the mounting fasteners are all in place and tight.

3) MAST ASSEMBLY

Inspect the mast assembly : Rails, lift chains and lift 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, etc.. Check that the lift 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.

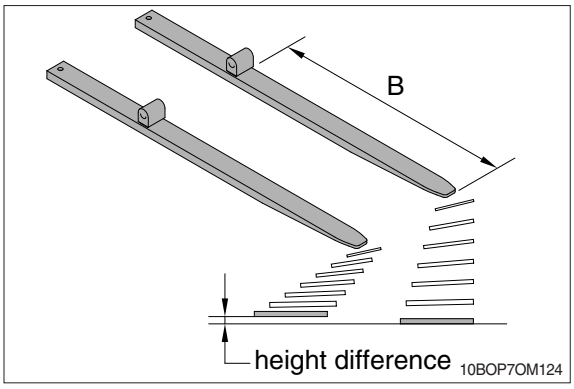
· Mast can drop suddenly. Look at the mast, but keep hands out.

· 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.

Fork length (mm)	Height difference (mm)
B ≤ 1500	3
B > 1500	4

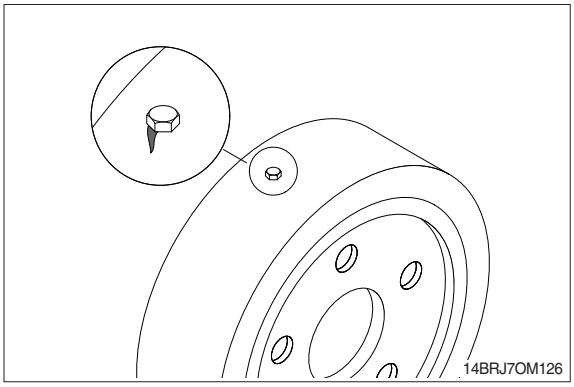


⚠ If the fork blade at the heel is worn down by more than 10%, the load capacity is reduced and the fork must be replaced.

6) WHEELS AND TIRES

Check the condition of the drive, load tire and guide rollers. Remove objects that are embedded in the tread. Inspect the tires for excessive wear and breaks or chucking out.

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



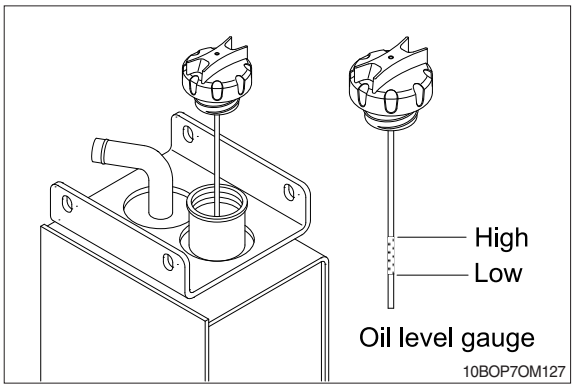
※ The condition of wheels and tires affects the stability and performance of the truck.

When replacing the wheels and tires which has defects, it should be replaced with genuine parts.

11. CHECKING THE HYDRAULIC FLUID

Check the hydraulic tank oil level. Correct fluid level is important for proper system operation. Low fluid level can cause pump damage.

Hydraulic fluid expands as its temperature rises. Therefore, it is preferable to check the fluid level at operating temperature (after approximately 30 minutes of truck operation). To check the fluid level, first park the truck on a level surface.



Put the mast upright in a vertical position and lower the fork and platform fully down. Check the oil level. Keep the oil level above the LOW mark by refilling recommended hydraulic fluid only, as required . **Do not overfill.**

Check the condition of the hydraulic fluid (age, color or clarity, contamination). Change (replace) the oil as necessary.

12. 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 :

- Platform
- Overhead guard
- Mast mounting & components

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

13. 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.

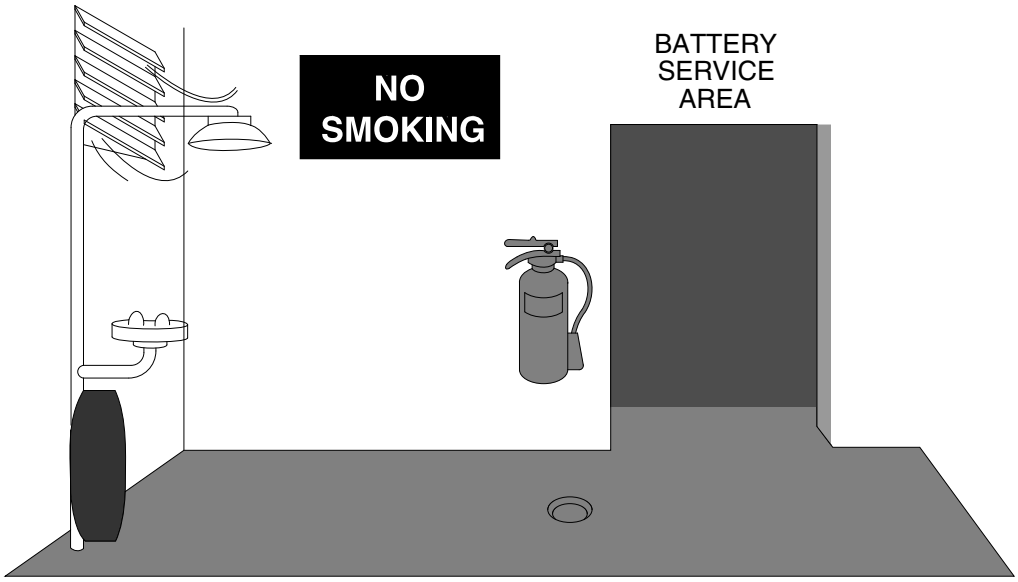
Use an air hose with special adapter or extension having a control valve and a nozzle to direct the air properly. Use clean, dry, low pressure, compressed air. Restrict air pressure to 30 psi (207 kPa), maximum. (OSHA requirement.)

⚠ Wear suitable eye protection and protective clothing.

Air clean : mast assembly; drive unit; battery; cables; switches and wiring harness; drive and pump motors; and drive tire, load tire, guide roller, suspension, linkage.

⚠ When cleaning the machine, it should not be used inflammable liquids to clean it.
Prior to cleaning the machine, it must be taken all safety measures to prevent it from the spark etc due to short circuit.
Especially, in the event of cleaning the electrical components, it had better use compressed air or non-conductive antistatic brushes in order that it can avoid from short circuit or unexpected accident.

14. 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.

15. BATTERY HANDLING

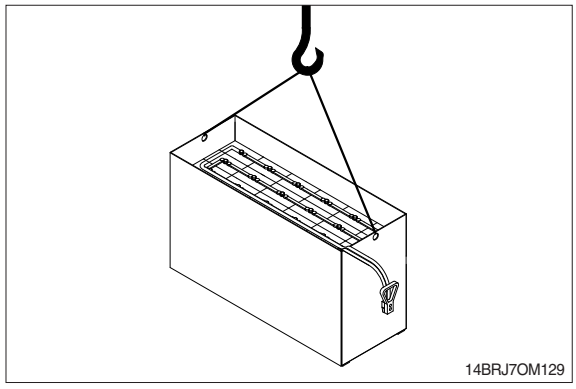
1) Change (remove) or service storage batteries only in an area designated for this purpose.

2) Be sure this area has provisions to flush and neutralize spillage, to ventilate fumes from gassing batteries and for fire protection.
   Battery contains sulfuric acid (H_2SO_4) which is toxic and corrosive solution.
   Therefore, when handling the battery, wear protective clothing and safety goggles.
   Do not smoke and avoid naked flames when handling the battery.
   Avoid coming into contact with the battery acid. If battery acid accidentally comes into contact with cloth, skin or eyes, wash the affected parts of the body thoroughly with clean water and seek medical attention.
   Battery acid spillage must be neutralized immediately.

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.
   When handling the battery, use 2 or 4 wires with hook to retain balance of weight.
   It can be prevented from shaking of the battery.
   Take care of handling the battery so that it can not happened shock or damage.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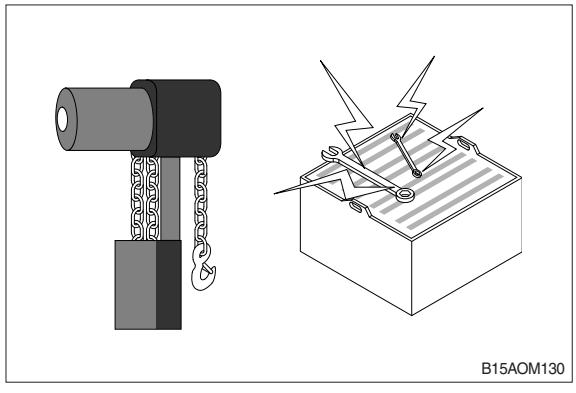
⚠ **When handling the battery, only it should be used appropriate lifting appliances such as lifting eyes, spread bar hooks, etc which have sufficient capacity for handling of the battery weight.**

6) Chain hoists or power battery hoists must be equipped with load chain containers to accumulate the excess lifting chain.

7) Keep all tools and other metallic objects away from the terminals.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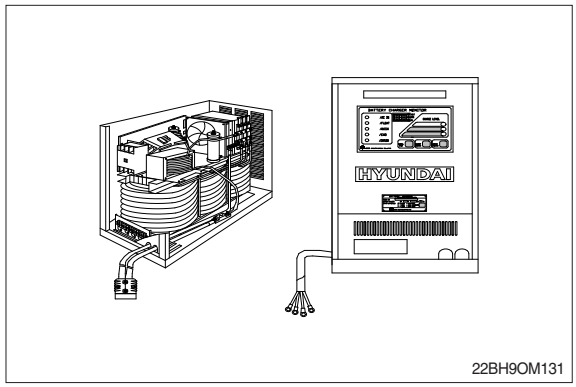
16. BATTERY CHARGING



The charger is of the automatic type so that only requirement for charging is to insert the plug, there being no need for maintaining watch.

Before starting to charge the battery, inspect all cable joints and connections for visible damage.

Do not place any metallic objects on the battery.

The cell screw caps on the battery must be kept dry and clean.

There must be no flammable substances or spark-generating materials around truck parking for the purpose of battery charging.

The area in which the battery is charged must be well-ventilated and have appropriate fire-protection equipment. Battery being charged not only heat but also inflammable hydrogen gas is produced.

Keep fire away.

※ Make sure that the charger cables must be connected to ensure a good contact and take care that the polarity is correct.
If it is not correct, battery, vehicle or charger could be damaged.

1) INSTRUCTION

(1) When inserting the plug and connecting the battery connector, the input power lamp and the battery connection lamp light on and charge is started after a few seconds.
The power is automatically cut off after completion of charge.

(2) Functions

The function of indication lamps and switches.

① **Input power lamp**	: Only lighting on during charge. Check the plug and input power if the lamp does not light on.
② **Battery connection lamp**	: Lighting on when the charger and the battery are connected. Check the connector if the lamp does not light on.
③ **75% charge lamp**	: Lighting on from 75% charge to completion.
④ **Full charge lamp**	: Lighting on when charging is completed.
⑤ **Input disconnect lamp**	: Lighting on when the input supply line is disconnected. At this time, check the input power.
⑥ **Over voltage lamp**	: Lighting on when the manual stop button is pushed or charger voltage is above 66. At this time, unplug and disconnect the battery and charger connectors.
⑦ **Over current lamp**	: Lighting on when the current is overload. At this time, unplug, open charger door and push the thermal relay button on the electromagnetic switch plug again after about 5 minutes and if this lamp lights on again stop charging and call A/S.

⑧ **Ordinary/Equalizing charge convert switch** : Place the switch to left side for ordinary charge and to right side for equalizing charge.

⑨ **Manual stop button** : During charge, push this button to stop charging.

⑩ **Reversion button** : After stop charging artificially or push the manual stop button, use this button to revert to charging.

⑪ **Voltage/current confirming button** : The indicator always show battery voltage and when push this button, the current is displayed in the indicator.

2) INSTALLATION OF THE CHARGER

(1) Place for installation

Install the charger at a place with good ventilation, no excessive temperature, low humidity and little dust.

(2) For the primary of the transformer, use the taps corresponding to the power voltage difference. For example, 218V (measured value)-220V (primary).

(3) Confirm the earth line of charging cable wire and make sure the earth line connects the earth of building.

3) ORDINARY CHARGE

(1) The procedure for charging is as follows:

① Remove the key of vehicle.
② Confirm the convert switch at ordinary charge position.
③ Connect the battery connector and the charging connector.
④ Make sure the pilot lamp lights.

(2) The procedure after completion of charging is as follows:

① Ensure that the full charge lamp lights on.
② Disconnect the battery connector from the charge connector.

(3) The procedure for stopping charging halfway is as follows :

① Push the manual stop button.
② Disconnect the battery connector from the charge connector.

※ If you have been asked to charge the battery on the machine, make sure whether battery acid level is correct or not and air can circulate freely before connecting the charger to the power source.

4) EQUALIZING CHARGE

(1) Continual repetition of ordinary charge will create a certain amount of performance difference among the cells. For this reason, the battery is slightly overcharged from time to time to equalize the performance among the cells, that is, given equalizing charge.

Equalizing charge should be given in the following cases:

① A battery that is subject to daily repetition of charge and discharge. For the battery, equalizing charge should be performed once a month.
② When discharged over the designated capacity.
③ When recharge had been delayed after discharge.
④ When a short-circuit has occurred.

Equalizing charge is performed in the same way as in ordinary charge. However, place the ordinary/equalizing charge convert switch on the equalizing charge position.

※ Equalizing charges are used to safeguard the life of the battery and maintain its capacity.
△ Excessive equalizing charge may shorten the life of the battery.

5) SUPPLEMENTARY CHARGE

If one day operation cannot be completed with single charge, rest period should be utilized to charge and it is performed in almost the same way as ordinary charge.

6) NOTICES

① When installing the charger, confirm the input voltage and use the tops corresponding to the poser voltage in the area.
② Charge the battery immediately after use and once a month even in storage.
③ Take care not to let the battery specific gravity lower in winter time especially.
④ During charging, if electrolyte temperature of the battery in above 50˚C stop charging.
⑤ During charging, as an inflammable gas is generated out of the battery, particular care should taken for fire and ventilation.

※ In case that batteries are taken out of service for a long period, they should be stored in the fully charged condition in a dry and frost-free room.

⚠ When charging the battery, the surfaces of the battery cells should be uncovered during charging process in order that it can allow for adequate ventilation and do not place any metallic objects on the battery because it can cause to take a fire due to the eletric spark. Furthermore, inspect all cable joints and plug connections for visible damage prior to starting to charge the battery all the times.

17. BATTERY INSTALLATION & 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) BATTERY REMOVAL

(1) Turn off the key.

(2) Release the lock screw of side support in frame.

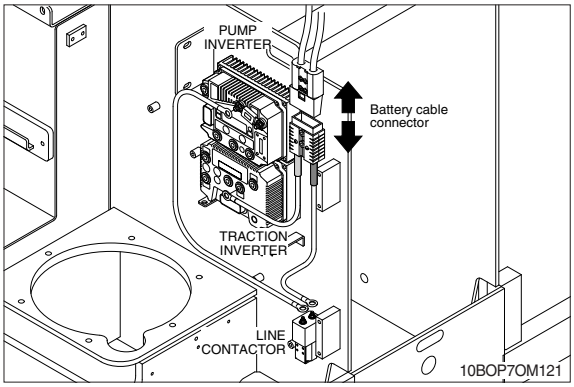
(3) Disconnect the battery connectors.
Visually inspect connectors and cables.
Particularly, negative and positive cables should be visually inspected for breaks and damage.

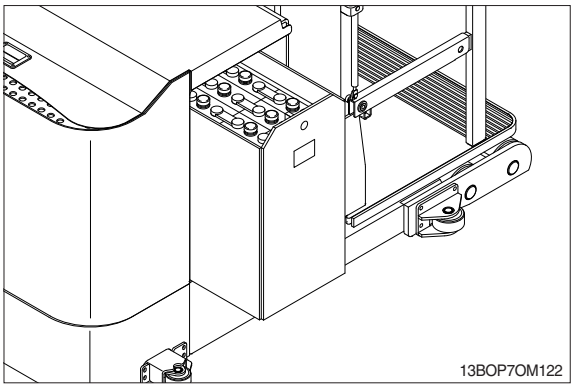
(4) Pull out the battery and using a battery hanger, carefully raise the battery assembly.

(5) Check the battery housing for cracks and any spilled acid.

(6) Remove any oxidation residue for the battery terminals and apply an acid-free grease.

※ The truck must be horizontal to prevent from falling out when the battery is removed.





2) BATTERY INSTALLATION

(1) Using a battery hanger, carefully put the battery assembly compartment push the battery assembly to the frame.

(2) Adjust the lock screw of side support in frame.

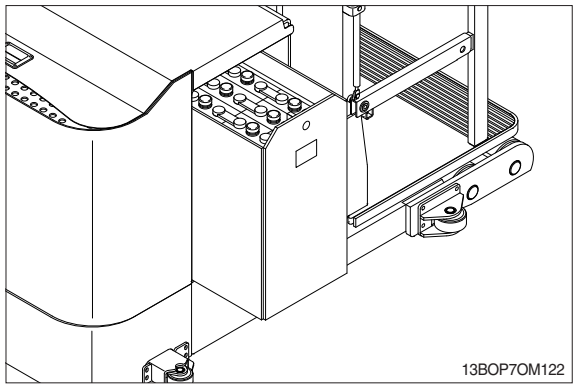
(3) Connect the battery connector.

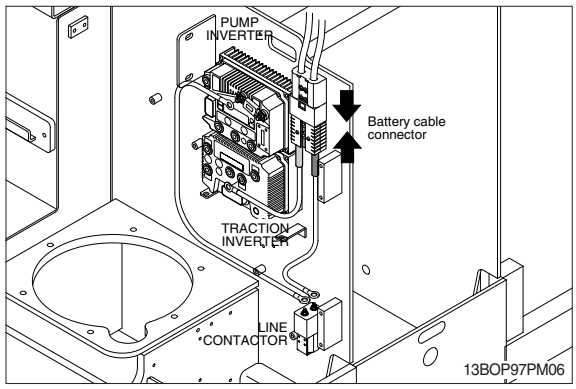
(4) Complete installation.

※ Make certain that the battery is securely installed in the battery assembly compartment and the battery cover is properly closed.

※ It is very important that all cables and connectors of the battery should not be happened damage so that it may prevent the battery from unexpected problems.

※ It is necessary to be sure whether the battery cables and connectors are damaged or not prior to closing the battery cover all the times.

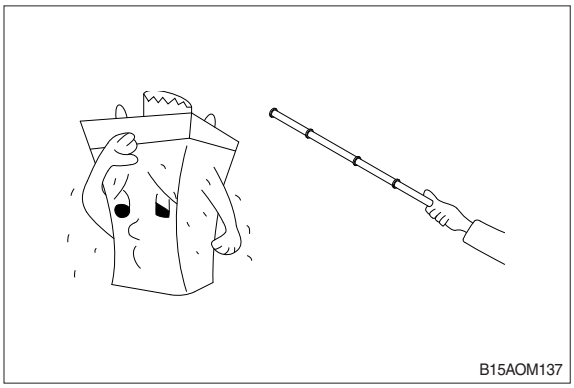




18. BATTERY CLEANING AND CARE

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.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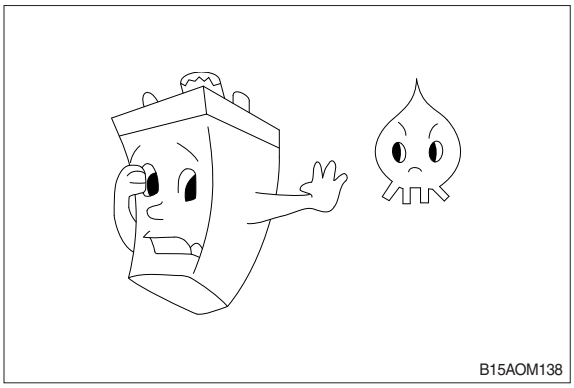
2) INFLAMMABLE

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

⚠ **Do not smoke and avoid naked flames around charging area of the battery or near battery.**
When the truck is parked for charging of the battery, there should not be inflammable material or consumables to create sparks around truck.
It can cause to happen severe personal injury or death.

※ **Fire protection equipment must be provided around the truck.**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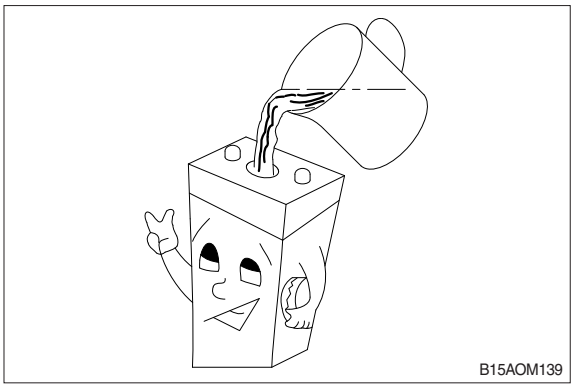
3) REFILLING DISTILLED WATER

Refill distilled water to maintain the electrolyte level to the specified height after finishing 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.



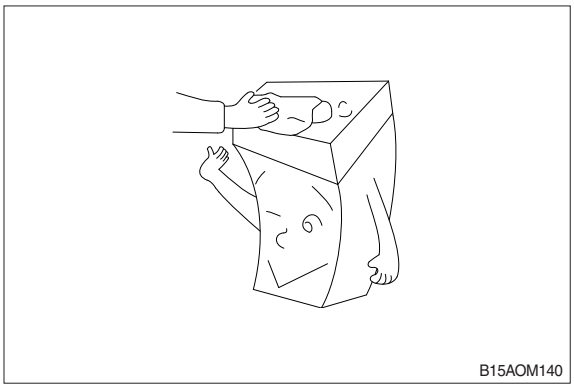
⚠ **Bear in mind that an acid solution which is contained in the battery is very dangerous material on account of poisonous and corrosive solution.**

When refilling distilled water in the battery, always wear protective clothing and eye protection glass. Avoid contact with battery acid.

If skin or eyes come in contact with acid, the affected parts should be rinsed throughly with plenty of clean water and consult a doctor immediately.

4) KEEP THE BATTERY CLEAN

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



19. NEW MACHINE OILS

New machine uses following lubricants and oils.

Description	Specification
Gear oil	ZF TE-ML 17B/17H class lubriacnts
Hydraulic oil	ISO VG46, Hyundai genuine long life hydraulic oil
Grease	NLGI No.2

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

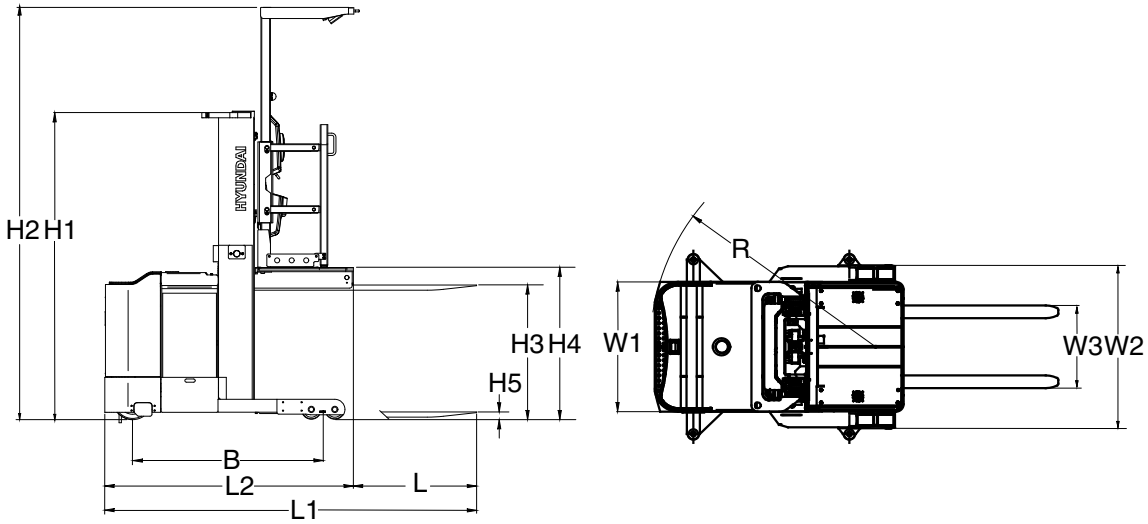
20. RECOMMENDED LUBRICANTS

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)
Drive unit	Gear oil	2.2 (0.58)	SAE 75W-80, 75W-85, 75W-90 SAE 80, 80W-85, 80W-90, 20W-40 SAE 85W-90 SAE 90
Hydraulic oil tank	Hydraulic oil	28 (7.4)	★ISO VG 15 ISO VG 46 ISO VG 68
Fitting (Grease nipple)	Grease	0.1 (0.03)	★NLGI No.1 NLGI No.2

★ : Cold region
Russia, CIS, Mongolia

1. SPECIFICATION

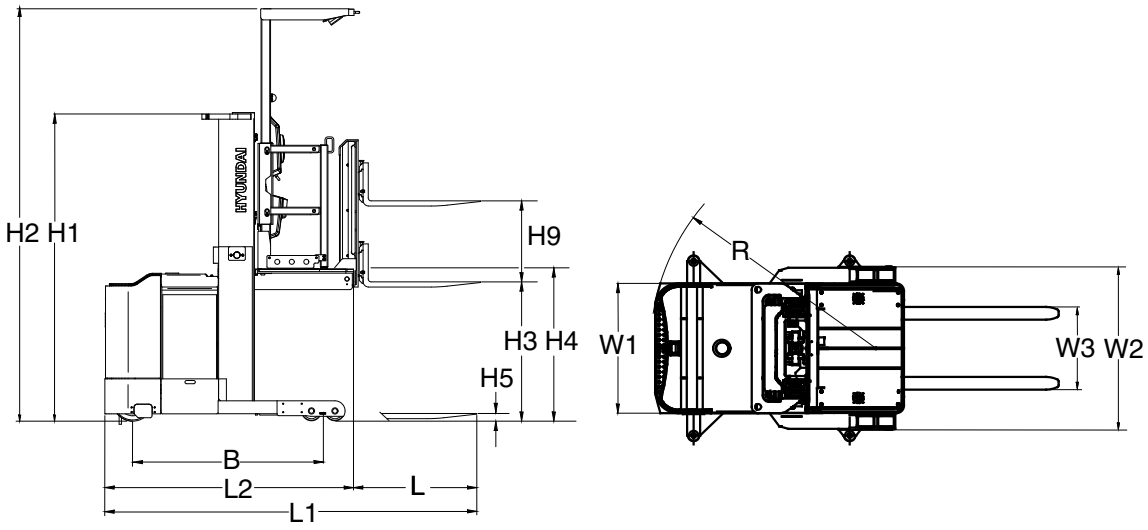
1) PLATFORM



13BOP98SP01

Description			Unit	Specification
Capacity			kg (lb)	1,306 (2,998.3)
Load center			mm (in)	600 (23.6)
Weight (with battery)			kg (lb)	2,934.5 (6,469.5)
Fork	Max lifting height	H3	mm (in)	3,275 (128.9)
	Min lifting height	H5	mm (in)	65 (2.6)
	Max spread width	W3	mm (in)	650 (25.6)
	Dimensions (T×W×L)		mm (in)	40×100×1,050 (1.6×3.9×41.3)
Platform	Max lifting height	H4	mm (in)	3,410 (134.3)
Mast	Max height	H2	mm (in)	5,470 (215.4)
	Closed mast height	H1	mm (in)	2,220 (87.4)
Picking height			mm (in)	5,010 (197.22)
Overall width of chassis		W1/W2	mm (in)	1,020/1,050 (40.2/49.2)
Overall length (without load)		L1	mm (in)	2,980 (117.3)
Travel speed (Load/unload)			km/h (mph)	12/12 (7.5/7.5)
Lifting speed (Load/unload), 36 V			mm/sec (ft/min)	320/430 (62.9/84.6)
Lifting speed (Load/unload), 24 V, option			mm/sec (ft/min)	240/370 (47.2/72.8)
Lowering speed (Load/unload)			mm/sec (ft/min)	430/400 (84.6/78.4)
Length to fork face		L2	mm (in)	1,930 (76)
Wheel base		B	mm (in)	1,480 (58.3)
Min turning radius		R	mm (in)	1,818 (71.6)

2) ADDITIONAL LIFT (OPT)



13BOP98SP02

Description			Unit	Specification
Capacity			kg (lb)	1,000 (2,204.6)
Load center			mm (in)	600 (23.6)
Weight (with battery)			kg (lb)	1,480 (58.3)
Fork	Max lifting height	H3	mm (in)	3,275 (128.9)
	Min lifting height	H5	mm (in)	65 (2.6)
	Additional lift	H9	mm (in)	760 (29.9)
	Max spread width	W3	mm (in)	840 (33.1)
	Dimensions (T×W×L)		mm (in)	40×100×1,050 (1.6×3.9×41.3)
Platform	Max lifting height	H4	mm (in)	3,410 (134.3)
Mast	Max height	H2	mm (in)	5,470 (215.4)
	Closed mast height	H1	mm (in)	2,220 (87.4)
Picking height			mm (in)	5,010 (197.22)
Overall width of chassis		W1/W2	mm (in)	1,020/1,050 (40.2/41.3)
Overall length (without load)		L1	mm (in)	3,130 (123.2)
Travel speed (Load/unload)			km/h (mph)	12/12 (7.5/7.5)
Lifting speed (Load/unload), 36 V			mm/sec (ft/min)	320/430 (62.9/84.6)
Lifting speed (Load/unload), 24 V, option			mm/sec (ft/min)	240/370 (47.2/72.8)
Lowering speed (Load/unload)			mm/sec (ft/min)	430/400 (84.6/78.4)
Length to fork face		L2	mm (in)	2,080 (81.9)
Wheel base		B	mm (in)	1,480 (58.3)
Min turning radius		R	mm (in)	1,818 (71.6)

2. SPECIFICATION FOR MAJOR COMPONENTS

1) CONTROLLER (36 V)

Item	Unit	Traction	Pump	EPS
Nominal battery voltage	V	36	←	←
Maximum output current	A	280 (2 min)	450 (2 min)	45 (2 min)
Output frequency range	Hz	0~200	←	←
Dimensions (L×W×H)	mm	200×150×105	200×150×110	120×150×54
Weight	kg	2	3.5	0.72

2) CONTROLLER (24 V, OPTION)

Item	Unit	Traction	Pump	EPS
Nominal battery voltage	V	24	←	←
Maximum output current	A	320 (2 min)	500 (3 min)	50 (2 min)
Output frequency range	Hz	0~200	←	←
Dimensions (L×W×H)	mm	200×150×105	200×200×120	120×150×54
Weight	kg	2	3.5	0.72

3) MOTOR

Item	Unit	Traction	Pump	EPS
Power	kW	4.3	9.0	0.4
Voltage	Vac	16	16	16
Current	A	204	425	21
Weight	kg	37	41	11

4) HYDRAULIC PUMP

Item	Unit	Specification
Type	-	Fixed displacement gear pump
Displacement	cc/rev	18.4
Rated pressure	bar	210
Speed (max/min)	rpm	3500/500

5) MANIFOLD ASSY

Item	Unit	Specification	
		Platform	Additional lift
Rated flow	lpm	60.4	40
Maximum pressure	bar	240	210
Main relief valve pressure	bar	160	160
Voltage	V	24 or 36	24

6) DRIVE UNIT

Item	Unit	Specification
Gear ratio	-	20.2
Oil quantity	ℓ	2.2

7) WHEELS

Item	Unit	Specification	
		Drive tire	Load tire
Material	-	Urethan	←
Dimension	Outside diameter	305	152
	Width	140	100

8) BRAKES

Item	Unit	Specification
Type	-	Electromagnetic brake

8) BATTERY

Voltage	Capacity	Dimensions						Weight
		Length (L)		Width (W)		Height (H)		
V	Ah	mm	in	mm	in	mm	in	kg (lb)
24	825	972	38.3	415	16.3	790	31.1	730 (1,609.4)

3. TIGHTENING TORQUE

No.	Items		Size	kgf·m	lbf·ft
1	Electric system	Hyd pump motor mounting bolt	M10×1.5	6.5	47
2		Traction motor mounting bolt	M 8×1.25	4.1±0.4	29.7±2.9
3		EPS motor mounting bolt	M10×1.5	8.3±0.8	60±5.8
4	Hydraulic system	Hydraulic pump mounting bolt	M10×1.5	6.5	47
5		MCV mounting bolt, nut	M10×1.5	6.9±1.4	50±10
6		Hydraulic oil tank mounting bolt	M10×1.5	6.5	47
7	Power train system	Drive unit mounting bolt	M12×1.75	14.7±1.5	106±10
8		Drive wheel mounting nut	M14×1.5	15.7±2.3	114±16
9	Others	Head guard mounting bolt	M12×1.75	12.3±2.5	89±18