

NICHYU ELECTRIC LIFT TRUCKS

OPERATOR'S MANUAL

N50 SERIES

PLD16/20/30

KLD16/20/30

⚠ WARNING

DO NOT ATTEMPT TO OPERATE THE TRUCK UNTIL YOU ARE THOROUGHLY FAMILIAR WITH THE INFORMATION AND SAFETY PRECAUTIONS SET FORTH IN THIS MANUAL.

NICHYU
NIPPON YUSOKI CO.,LTD.
KYOTO, JAPAN

ELECTRIC TRUCKS

OPERATOR'S MANUAL

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INTRODUCTION



The operator should read and understand the safe operation contained in this manual.

- This operator's manual provides for the proper operation, easy maintenance and periodical inspection.
- Prior to operation, read this manual carefully for safe and efficient operation.
- Specifications and equipment in this manual are subject to change without any notice by the manufacturer for further improvement and modifications.
- Make sure these important instructions in this manual are available for the operator on each delivery or transfer of the truck. Keep this manual after reading.
- If you have any questions, please feel free to contact your local NICHYU dealer.

⚠ and 🖱 are very important for you and others for safety. Follow these instructions.

	DANGER	Indicates an extremely hazardous situation which, if not avoided, will result in death or serious injury. You shall observe this instruction.
	WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. You shall observe this instruction.
	CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. You shall observe this instruction.
	NOTE	Indicates suggestions, tips and hints related to the safety of a operator and maintain of a truck.

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1

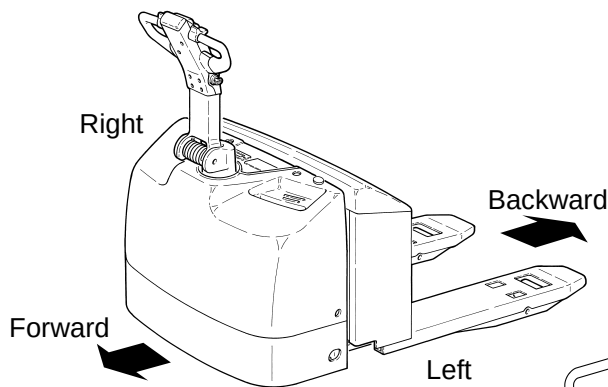
SAFETY OPERATION

■ Indication of direction

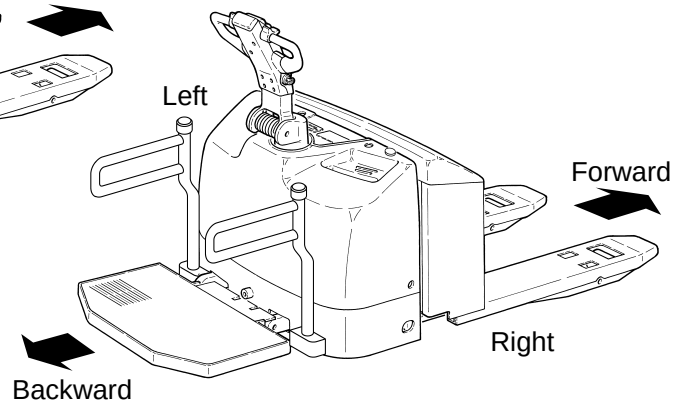
The following illustration shows the direction of this truck.

PLD

Walk behind type

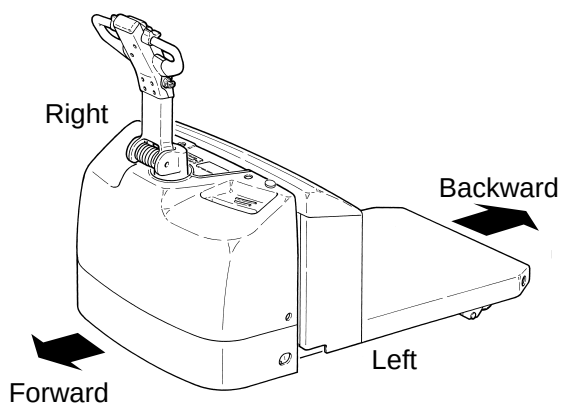


End rider type

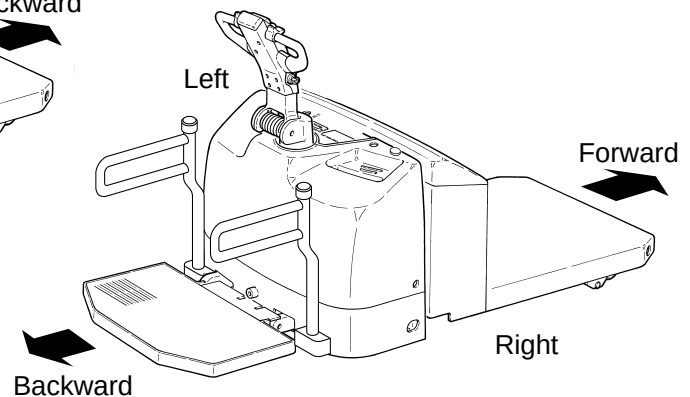


KLD

Walk behind type



End rider type



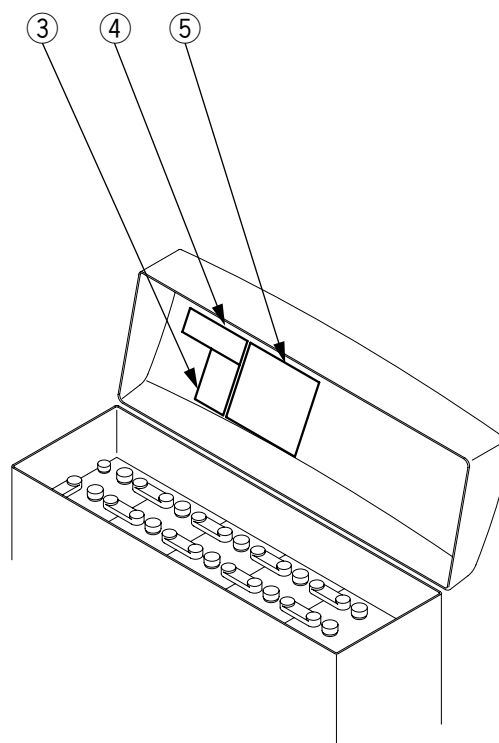
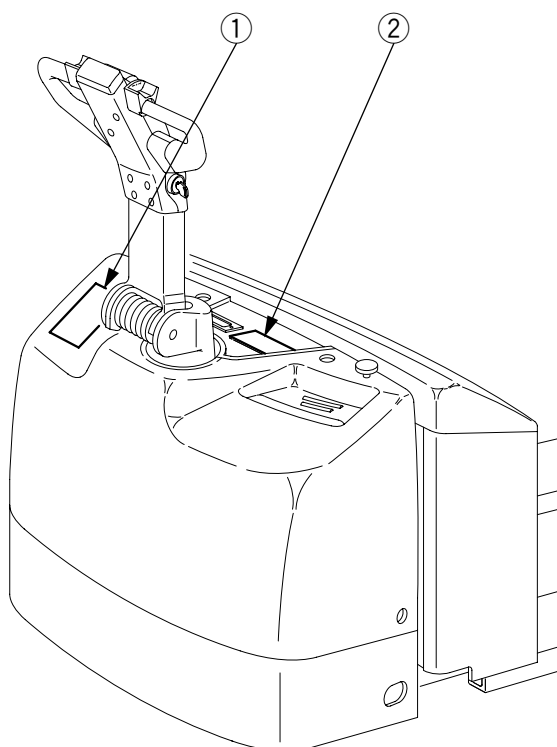
■Decals and name plates



Decals and name plates are installed on the truck to give information about possible hazards.



If you find that the decals and name plates are removed and/or unreadable, contact your local NICHYU dealer for replacement.



①



WARNING

A driver shall observe the following notes for safety.

1. Only a trained and authorized operator shall be allowed to operate the truck.
2. The operator should read the operator's manual carefully and understand the safe operation.
3. Carry out the daily inspection before operation. If any abnormalities are found, do not operate until they are repaired completely. Repair and/or adjustment should be done by an authorized service person.
4. Make sure that the accelerator knob is in the neutral position, the tiller arm is stood upright and the broke is applied before turning on the key switch.
5. The key switch must be turned from the normal operating position.
6. Do not overload. Do not handle an off-center load.
7. Always check the road condition, and stay away from soft or uneven ground.
8. Keep enough clearance between the truck and operator's body for safe operation.
9. When travelling up or down a grade with a load, keep the load upgrade to maintain control. Do not turn on a grade.
10. Do not make a sudden start, stop or turn.
11. Do not ride on the truck except the riding step or riding compartment.
12. When leaving the truck, next procedure must be followed.
 - [1]Stand the tiller arm upright to apply the brake.
 - [2]Release the accelerator knob to return to the neutral.
 - [3]Lower the fork or platform to the lowest position.
 - [4]Turn off the key switch and remove the key.
13. Slow down the speed when descending a grade.
14. Use prescribed fuse for replacement.
15. Never allow anyone to ride on a fork or pallet.

24700-13740

②

NICHYU NIPPON YUSOKI CO.,LTD			
MODEL		NO.	
LOAD	kg / mm	CAP	N (D.B.P)
SERVICE WEIGHT	kg	W/O BATTERY	kg

■ SAFETY PRECAUTIONS

- ① Do not overload and overcapacity the truck.
- ② Do not make a quick turn, quick stop and quick start.
- ③ Do not drive at a right angle to an inclination.
- ④ After daily operation inspect charging of the battery.

MADE IN JAPAN 24700-13730

③



24700-04630

④



Fire hazards

1. Always charge the battery in well ventilated area.
DO NOT smoke, keep flames away.
2. DO NOT use equipment that is liable to produce sparkes, in this area.

24700-06840

⑤









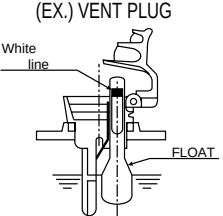


DANGER

- GASES produced by this battery can be explosive. Cigarettes, flames or sparks could cause battery to explode. Make sure batteries are stored and charged in a well-ventilated area.
- Batteries contain SULFURIC ACID can cause severe burns. Avoid contact with skin, eyes or clothing. In event of accident flush with water and call a physician immediately.
- Wear rubber gloves to prevent ELECTRIC SHOCK during checking. and maintaining.
- Keep out of reach of children.

IMPORTANT POINT FOR MAINTENANCE

1. Keep the electrolyte level at proper height.
(When electrolyte decreased, fill purified water and stop filling immediately if confirmed the white line of the float as shown herein, for over-filling causes overflow.)
2. Always give the battery an adequate charge and do not use the battery at overdischarged condition.
3. Keep the surface of battery clean and dry.



(EX.) VENT PLUG

White line

FLOAT

G 6 E (英文)

■ Information for safety operation



Do not operate the truck while taking drugs and/or alcohol; otherwise, an accident may occur which can cause serious injury or death.



Only a trained and authorized operator shall operate the truck.



The operator is recommended to wear a helmet, safety shoes and working clothes.



Do not use a truck in the following circumstances.

- ① **Where the temperature is less than -10°C (except cold-storage use truck) or more than 40°C .**
- ② **Where the explosive gas (thinner, gasoline etc.) may exist.**



Keep the operator's compartment clean at all times.



Do not operate the truck with greasy or wet hands.

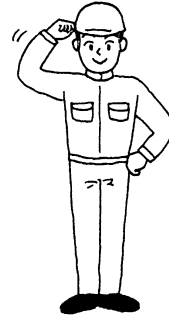


Do not modify the truck.

- Modifications and additions shall not be performed without the written approval of NICHYU. Contact NICHYU's qualified facility for details.
- Do not install any parts blocking visibility from operating position.



Carry out the daily inspection before operation.



1

SAFETY OPERATION



- Stop operation and report immediately for any damage or faults on the truck.
- Do not operate the truck until it is repaired completely.



Do not overload.

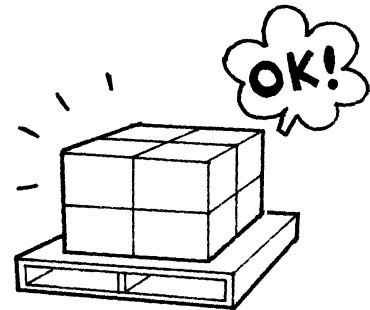
- Refer to the name plate and make sure that the weight of the load are within the capacity of your truck before handling.



Use proper size pallet with enough strength for the load.



Make sure that the load is palletized securely in a proper shape. If a load is unstable, it can easily shift and fall on someone.



Look all around the truck before moving.

- Make sure no person is around the truck before starting.



Travel to the power unit side if forward visibility is blocked.



Keep enough space between a truck and your body.

- Be careful not to hit the truck with your body or leg.





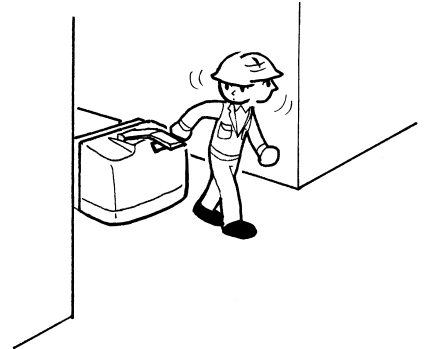
Make sure no person is around the truck when traveling. Look around the truck and sound the horn before moving.

- If the load blocks your view, or when you travel down a grade with a load, drive to the power unit side. Always look in the direction of travel. A look-out helper may be required if your visibility is obstructed.



Stop at blind corner and/or intersection.

- If you cannot see where you are going, don't move! Travel slowly around corners.
- Sound the horn at cross aisles and other areas where you cannot see clearly or where visibility is restricted.



Always look in the direction of travel!

- Always be aware of people near your truck. Do not proceed near them until they are aware of you.



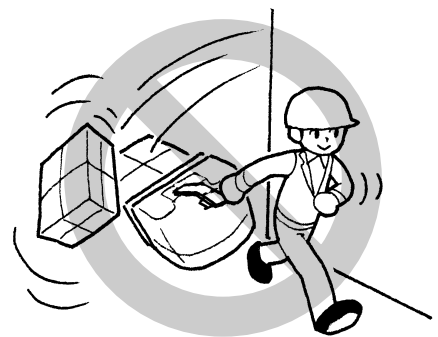
Be careful when turning.

- Trailers or loads may follow inner routes than the power unit.
- Failure to observe this instruction can injure or kill someone.



Do not make a sudden start, stop or turn.

- A sudden start or braking can cause the load to fall.
- A sharp turn while traveling can cause the truck to turnover.



1

SAFETY OPERATION



Do not go over obstacles, curbs, ditches, ridges and railroad tracks.

- Avoid bumps, holes, spill spots and loose materials that may cause the truck to swerve or tip. If unavoidable, slow down, and proceed with caution.

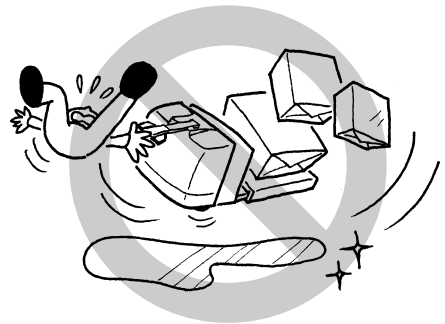


Always check road surface, and stay away from soft or uneven ground.



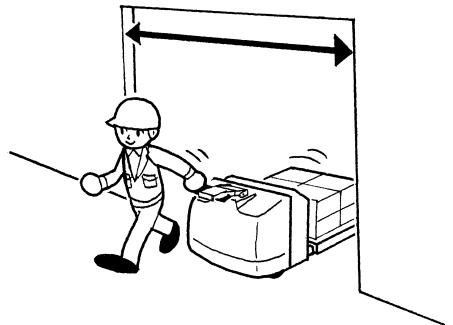
Avoid slippery surface.

- Water, sand, gravel, ice or mud can cause to slip. If unavoidable, slow down.
- Do not go into a flooded or water covered area.



Keep enough clearance.

- Serious accidents can be caused by hitting walls or pillars. Make sure there is enough clearance of the entrance.



Do not exceed the limitation of the floor strength.

- A truck is very heavy. Check the condition of the driving surface. Make sure the floor, bridge and/or elevator will support the weight of the truck and the load.

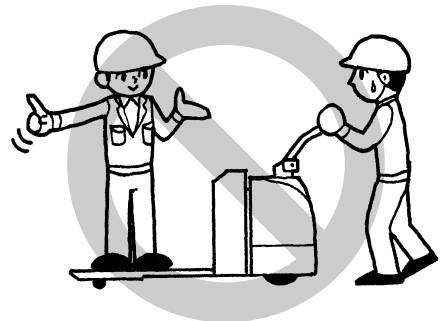


Do not push or drag the load.

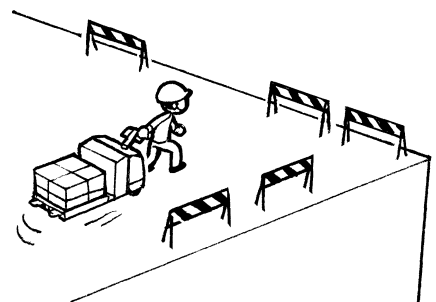
- Do not lift the load by the tip of the forks.
- Misuse can damage the loads as well as the truck.



Never allow anyone to ride on fork or platform.



Keep enough distance from the edge of docks, ramps and platforms.



1

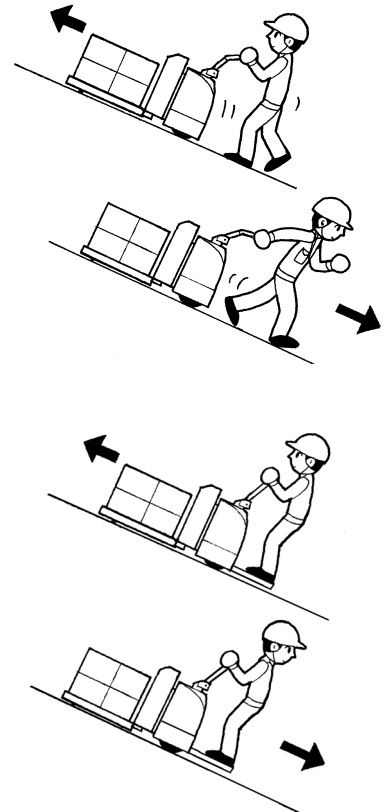
SAFETY OPERATION



Travel carefully on grades with a loaded truck.

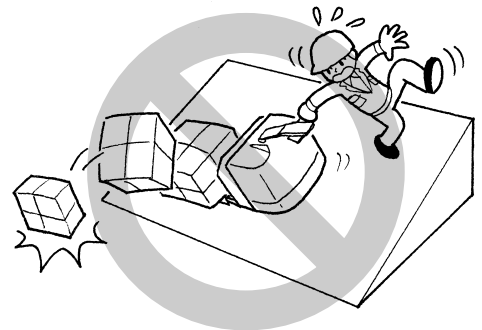
- When traveling up or down a grade with a heavily loaded truck, keep the load upgrade to maintain control.
- Travel down with plugging brake if necessary.

Loaded



Do not turn on, or angle across an incline.

- Failure to observe this rule can cause the truck to turnover.



Do not handle an off-center load.

- If the weight of the load is not centered between the forks or platform, the load can fall from the truck when you turn a corner or hit a bump.
- An off centered load will increase the possibility of the truck to turnover.



Keep enough space when loading or unloading.

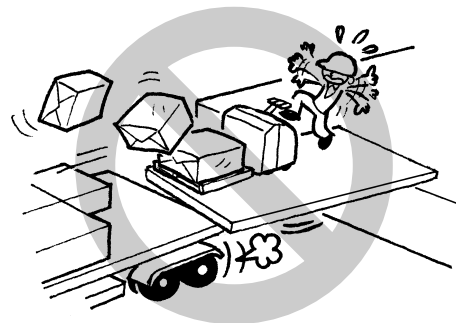
- Be careful not put your body between the truck and wall.





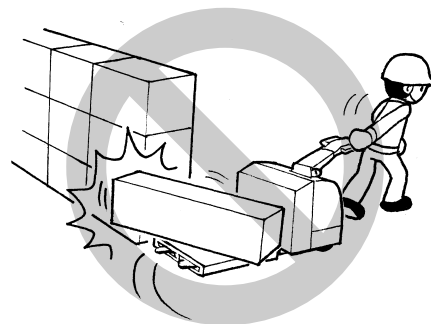
Drive into a trailer carefully.

- Make sure the trailer brakes are set and the wheels are blocked while loading or unloading.



Travel carefully when handling with a long or wide load.

- Be careful when handling a load.
- Lifting and lowering should be done slowly.



Never allow anyone to hold or pick loads off while traveling or lifting.

- Failure to observe this rule can cause serious personal injury.



Do not use damaged pallets.

- Make sure pallets and skids are sturdy and in safe operating condition.



When parking the truck:

- Lower the fork or platform on the ground.
- Turn off the key switch and remove the key before leaving the truck.

Parking place :

- Park the truck at the reserved place.
- Do not park on or near flammable objects.

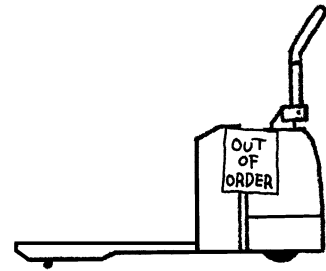


Do not park the truck on a slope.



OUT OF ORDER LIFT TRUCK

- When parking a truck requiring repair, a warning or “out-of-order” sign shall be placed on the truck and remove the key.
- When the fork or platform cannot be lowered because of a fault, place a large sign or marker on the forks. This procedure will caution other trucks and pedestrians.



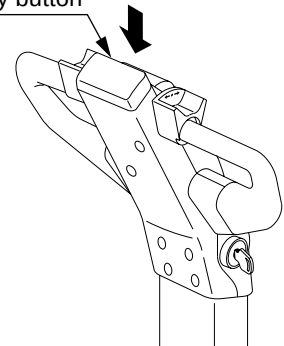
IN EMERGENCY CASE



Remember that the safety button is located at the top of the tiller arm. When pushing this button while traveling to the power unit side, the truck changes the traveling direction immediately.

- Be careful not put your body between the truck and wall.

Safety button



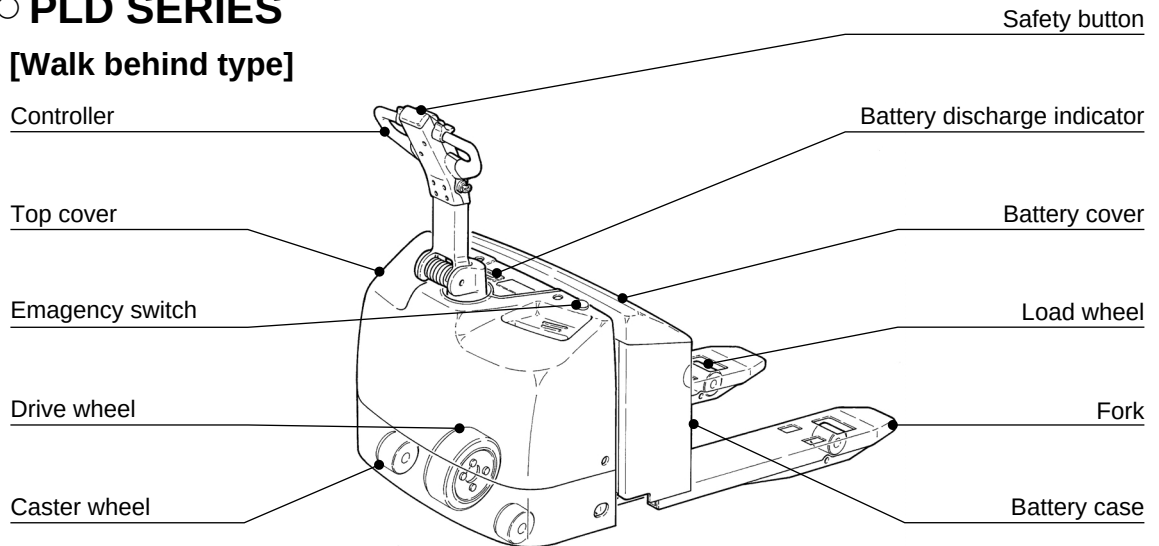
2

PART NAME AND FUNCTION

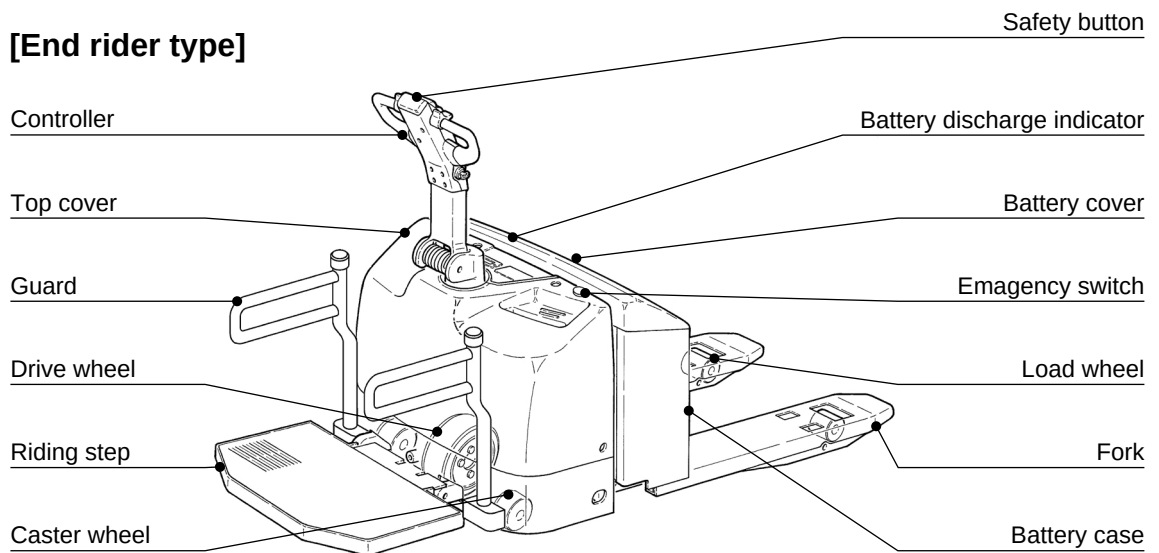
■ Name of part

○ PLD SERIES

[Walk behind type]

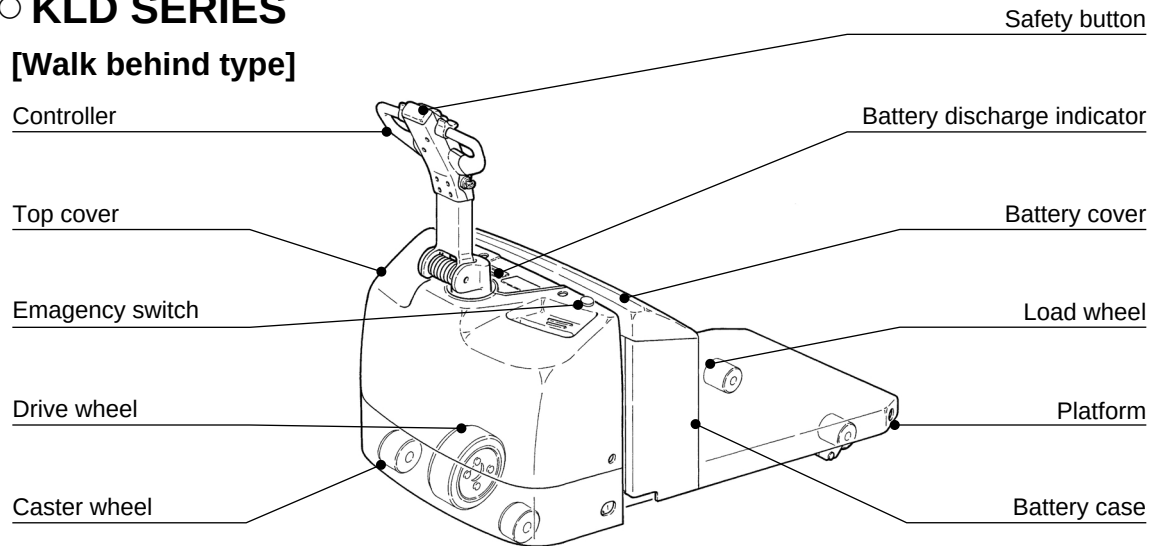


[End rider type]

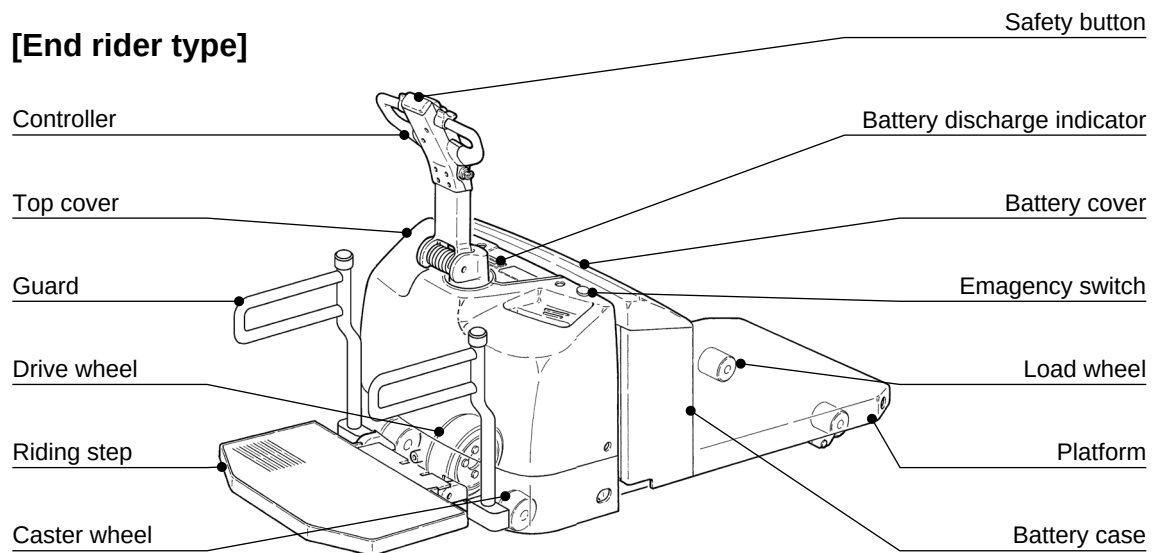


○ **KLD SERIES**

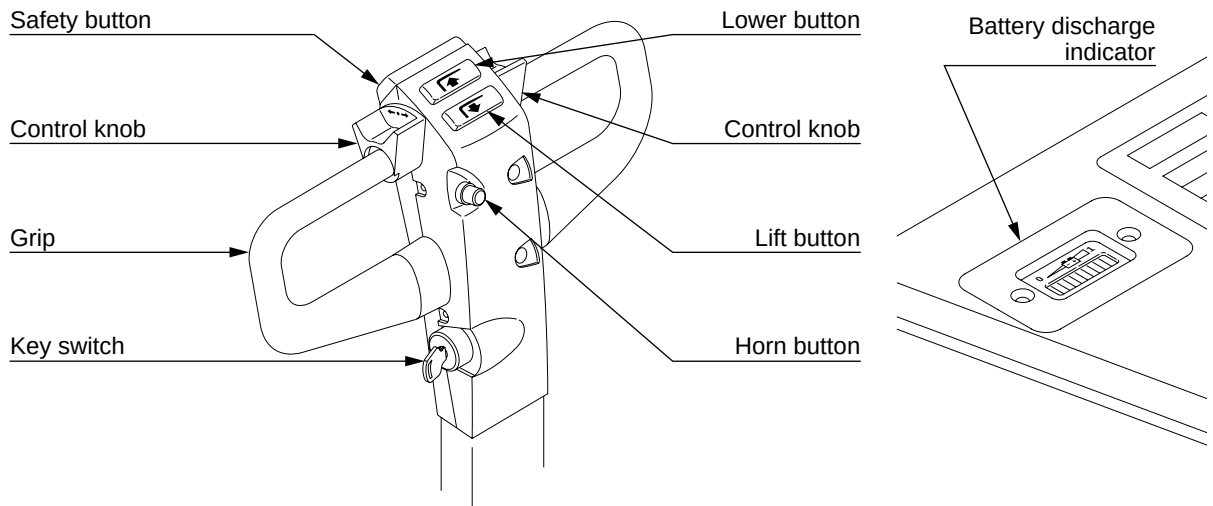
[Walk behind type]



[End rider type]



■ Driving and operation

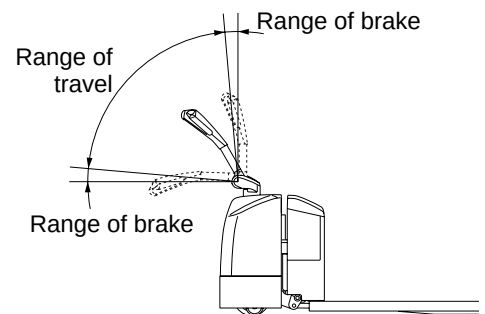


① Tiller arm

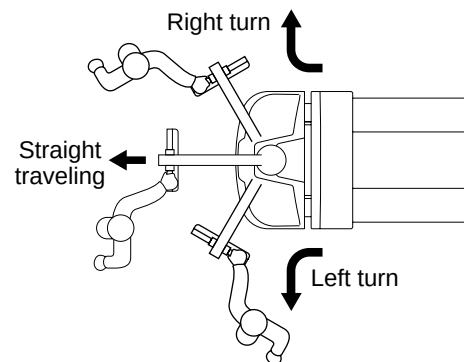
[Walk behind type, End rider type]

Range of brake : When the tiller arm position is within 5 degree from vertical and horizontal positions, the brake is applied and the truck does not move.

Range of travel : When the tiller arm is positioned in this range, the brake is released and the truck can move.



- Truck can be turned by moving the tiller arm.
- Grab the grip of the tiller arm and apply a thumb to the control knob.



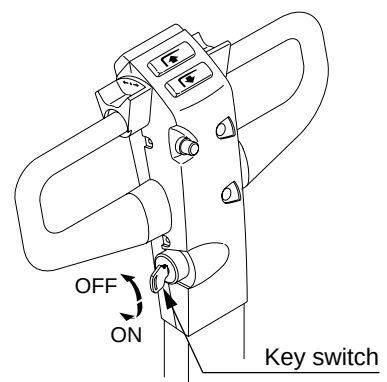
② Key switch

OFF : This is the position where the power is switched off and remove or insert a key.

O N : When the key is turned to this position, the power is turned on and the truck can be operated.



Turn off the key switch when park the truck or charging the battery.

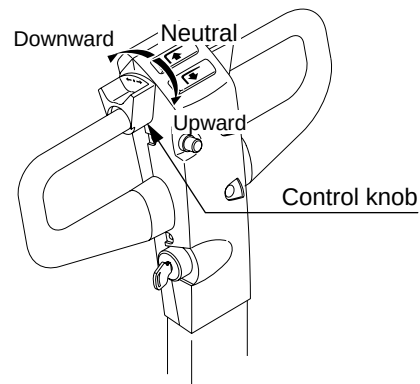


③ Control Knob

When releasing the control knob, it is returned to the neutral position.

Turning direction of knob and traveling direction

	Walk behind type	End rider type
Downward	Power unit side (Operator side)	Power unit side (Operator side)
Upward	Fork or platform side	Fork or platform side



The traveling speed can be changed by the turning angle of the control knob.



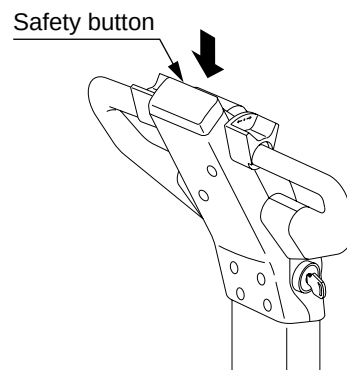
The control knob must be operated after turning the key switch on and the tiller arm is moved to the traveling position.

④ Safety button

In the case of the walk behind type and end rider type trucks, the traveling direction is switched from the power unit side (operator side) to the fork (or platform) side by pushing the safety button.

The truck continues to travel to the fork (or platform) side while pushing the safety button.

In the case of the center rider type and towing type, the traveling speed is reduced by pushing the safety button.



The control knob should be released when pushing the safety button.

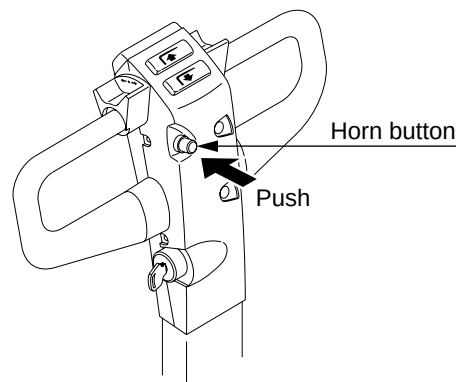
- By releasing the safety button, the truck will be stopped.



When the truck is traveled to the fork (or platform) side, the traveling direction is not changed even pushing the safety button.

⑤ Horn button

Push this button to operate the horn.



⑥ Lift button

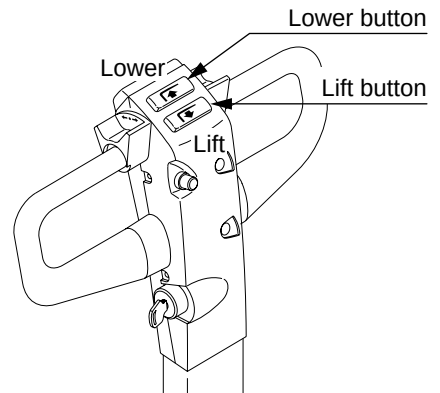
⑦ Lower button

Push the lift button to raise the fork or platform.

Push the lower button to lower the fork or platform



Release the lift or lower button to stop the fork or platform to appropriate position.



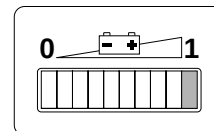
⑧ Battery discharge indicator

The battery discharge indicator indicates the discharging status of the battery.



Do not use the truck until it is not moved. Otherwise, the lifetime of the battery will be shortened.

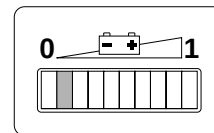
Turn the key switch on.



Full charged



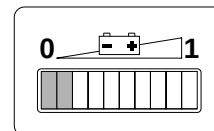
Discharged



The 9th indicator lamp is lit when the battery is discharged approximately 70%.



Continued to discharge



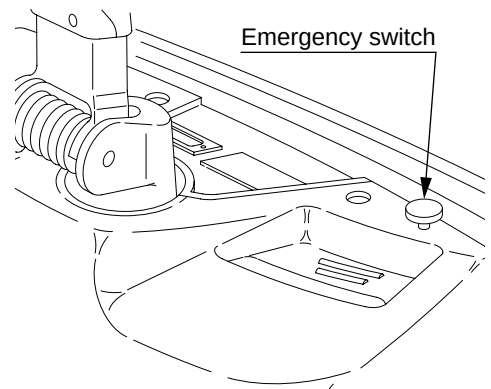
The 9th and 10th indicator lights are flashed alternatively when the battery is discharged approximately 80%.



Charge the battery as soon as possible.

⑨ Emergency switch

Push the emergency switch to disconnect the battery when emergency and it do so.



3

DRIVING AND OPERATION



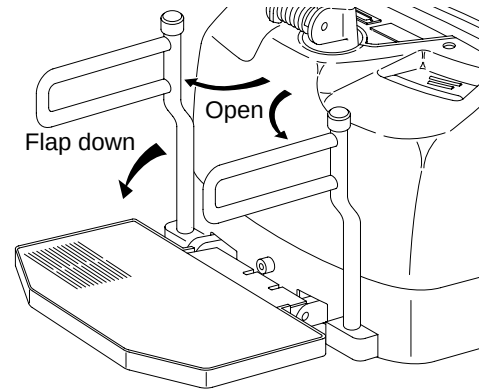
Read the section “Information for safe operation” carefully before operation.
Make sure the safe around the truck.

■ Preparation of start



Make sure the followings before turning the key switch on.

- The control knob is positioned in neutral.
- The tiller arm is stood vertically and the brake is applied.
- The riding step is flapped down and the guard is fully opened. (End rider type only)

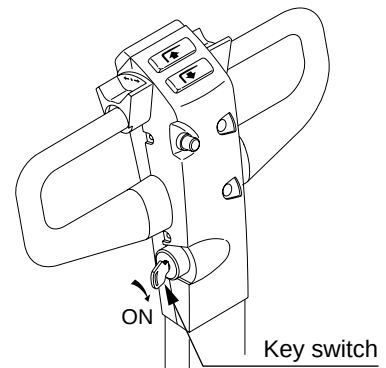


(End rider type)

- ① Grab the grip of the tiller arm and turn the key switch on.



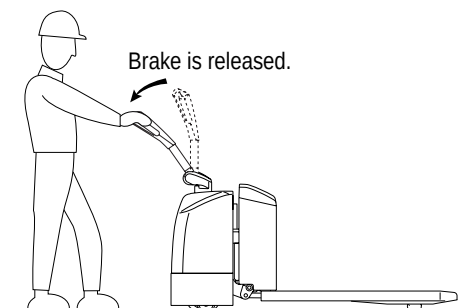
Do not turn the key switch on with turning the control knob.



- ② Raise the fork or platform a little to prevent from touching it to the ground.



- ③ Pull the tiller arm to the traveling position.

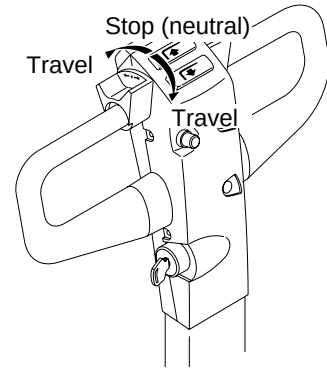


- ④ The truck starts to move when the control knob is turned.
- Adjust the traveling speed by the angle of the control knob.



- The normal traveling direction is to forward.
- Keep enough distance between the truck and operator's body while traveling when operating the walk behind type or end rider type with retracting the step.

- If the distance is not enough, operator's foot may be caught by the truck.



■ How to reduce the speed

The traveling speed can be reduced by turning the control knob to the opposite direction.



Traveling speed must be reduced in the following cases.

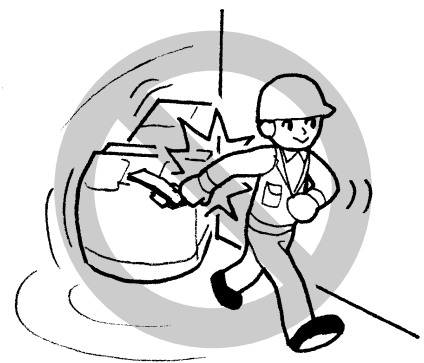
- At the corner
- Approaching to loads
- Approaching storage area
- In a narrow aisle
- On the rough road

■ How to turn



Make sure around for safe operation and reduce the speed when turning.

Pay attention the fork or platform of the truck takes inner route than the power unit. Make sure that the truck chassis or load does not hit a wall or other items. Reduce the travel speed before turning.



■ Stop and park

► Stop traveling

Reduce the traveling speed. pull the tiller arm up to the braking position. Then the truck is stopped.



Do not stop immediately.

- Loads may be fallen when stopped immediately.
- Regenerating brake is applied when giving reverse acceleration against the direction to which the truck is moving.

► Parking

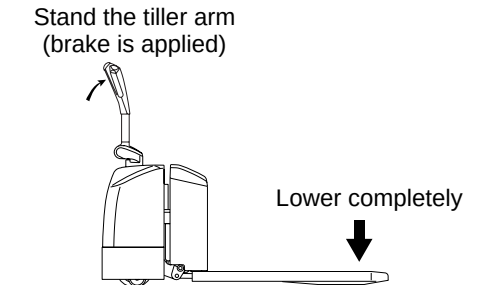
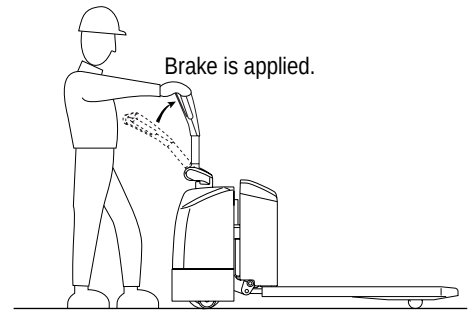


Follow next procedures when parking the truck.

- ① Lower the fork or platform to the end.
- ② Make sure the tiller arm is stood up completely and the brake is applied.
- ③ Turn the key switch off and remove a key.



Do not leave the truck with loading.



■ How to use safety button

When the truck is approached too much to the operator, push the safety button and release the control knob. Then, the traveling is switched to opposite direction and the truck is stopped when releasing the safety button.



■ Operation with load



Make sure the next items before operation.

- Loads are not damaged and loaded stably.
- Operating area is clear.

► Loading operation

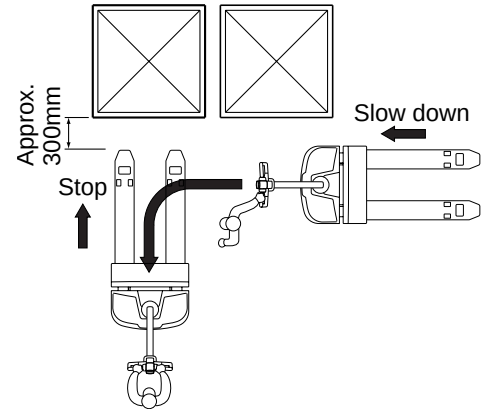
When loading the load, follow the next procedure.

- ① Slow the travel speed down when approaching to the load.
- ② Face the truck to the load.
- ③ Stop the truck once to keep the distance approximately 300mm from the load.

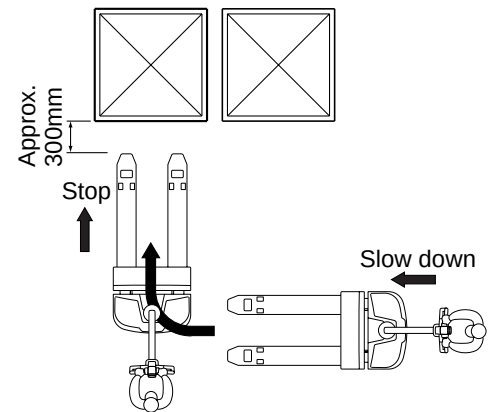


Make sure the safe of loading area.

Approaching from operator side.



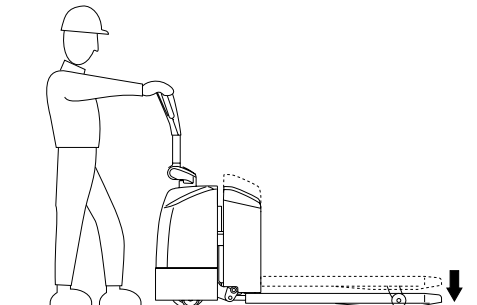
Approaching from fork or platform side.



- ④ Lower the fork or platform completely.



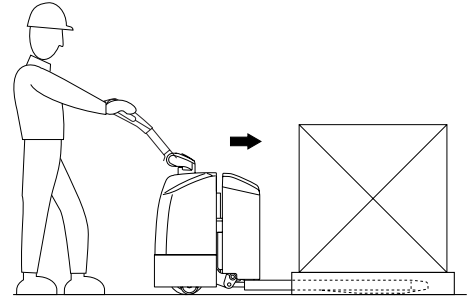
If the fork or platform position is too low to insert it into the pallet, adjust the height properly.



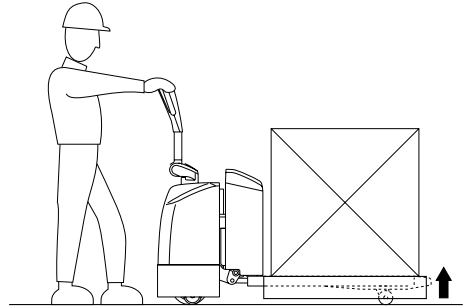
3

DRIVING AND OPERATION

- ⑤ Make sure that the fork or platform position is fit to the pallet properly. Then move the truck into the pallet to the root of the fork or platform.

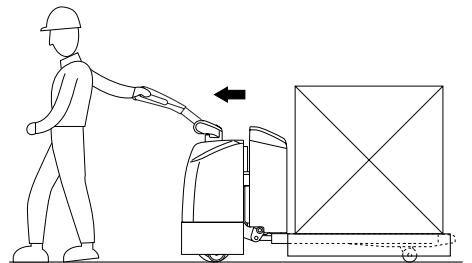


- ⑥ Raise the fork or platform to the upper end and make sure the load is loaded on the truck completely.



When use the closed pallet, pay attention that the load wheel is not break the lower board of the pallet.

- ⑦ Make sure the traveling direction is clear. Then start the truck slowly with paying attention not to hit the truck or the load with other objects.
- ⑧ Move the load to the destination.



► Unloading operation



When unloading the load, follow the next procedure.

- Loads are not damaged and loaded stably.
- The unloading area is clear and safe.

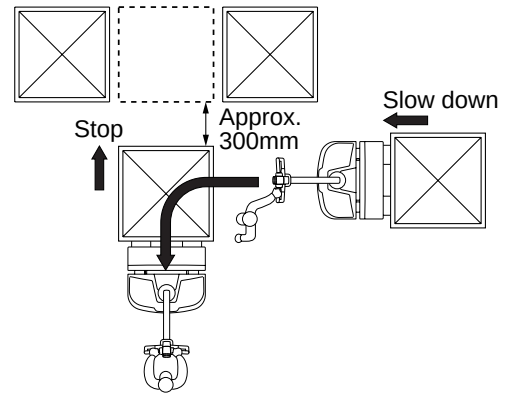
Follow the next procedure for unloading.

- ① Slow the travel speed down when approaching to the unloading area.
- ② Fit the truck position to face the load to the unloading area properly.
- ③ Stop the truck once to keep the distance approximately 300mm from the unloading area.

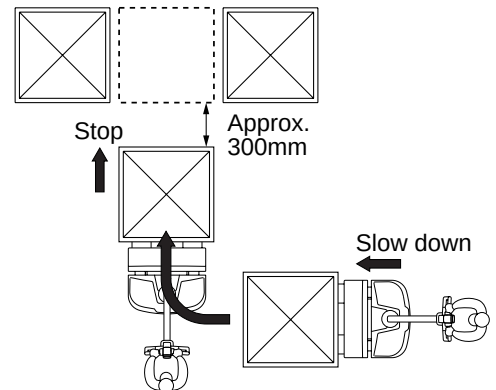


Make sure the safe of unloading position.

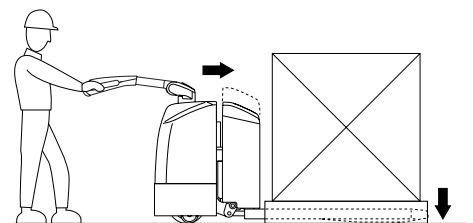
Approaching from operator side.



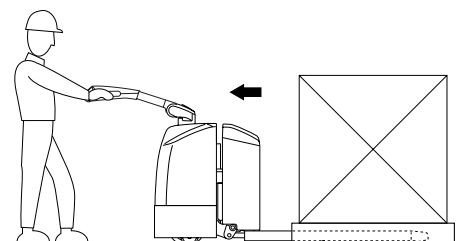
Approaching from fork or platform side.



- ④ Move the truck straight into the unloading position slowly.
- ⑤ Lower the fork or platform slowly.



- ⑥ Make sure the safe around the area and travel the truck to the opposite direction to pull the fork or platform out.



4

BATTERY AND CHARGER

Battery



- This section explains NICHYU's genuine battery and charger.
- When the truck is equipped with another type battery and/or charger, please follow the instructions provided by that manufacturer.

► Keep away from fire (Explosive gas)



- Never allow open flame to come near the battery.
- Explosive gas is always present in the battery.
- Smoking, flames, or sparks will result in battery explosions.



► Pay attention to an electric shock



Do not make a short circuit.
The battery has high voltage and power.



When servicing the battery, wear the safety goggles, rubber gloves and boots.

► Connect correctly



Do not swap the positive and negative terminals.

- It can cause sparking, burning and/or explosion.

► Keep tools away



Keep tools away from terminals to avoid sparks or shorting.

► Do not over-discharge



Do not use the truck until no longer run, it will shorten the battery life.

- When the battery discharge indicator shows empty, charge the battery as soon as possible.

► Keep clean



- Keep the upper surface of the battery clean.
- Do not use a dry cloth when cleaning, as it may produce static electricity.
- Wear the safety goggles, rubber gloves and boots.



Clean the battery before charging.



► Wear safety clothes



Wear safety goggles, rubber gloves and boots to protect yourself.

► Be careful the electrolyte



Be careful the electrolyte does not touch the skin.

- Electrolyte of the battery is sulfuric acid.



► Emergency first aid



The battery contains sulfuric acid which causes severe burns if touched.

If an accident occurs, receive emergency first aid and consult your physician immediately.

- Spilled on skin:
Wash down with water for 10 to 15 minutes.
- Splashed in eye:
Wash down with water for 10 to 15 minutes.
- Swallowed:
Drink large amounts of milk or water.
- Splashed on clothes:
Take off clothes immediately.

If you do not follow these instructions, you will be seriously injured or killed.

► Close vent caps securely



Make sure all vent caps are closed securely. Failure to close the caps can cause leaking of electrolyte.

► Washing



Do not wash the battery on the truck. It causes damage to the truck.

► Abnormal battery



If the battery shows the following situation, contact NICHYU's qualified service facility or battery manufacturer.

- The battery stinks.
- The electrolyte is muddy.
- The electrolyte decreases fast.
- The temperature of electrolyte is too high.

► Do not disassemble the battery.



Do not drain the electrolyte, disassemble and repair the battery.

► Storage



- When storing the battery, store in a well-ventilated and dry place.
- Keep the battery away from open flames or ignitions.

► Do not dispose of used batteries.



Please contact NICHYU's qualified service facility or the battery manufacturer for disposal.

■ *Precautions for charging the battery*

► Check electrolyte level



Do not use the truck if the electrolyte level is low.

- Failure to keep proper level of the electrolyte can cause overheating or burning of the battery and electrical components of the truck.
- Check electrolyte level once a week. If the level is low, add distilled water to the specific level.



► Do not over-charge.



Do not over-charge the battery.

► Pay attention to an electric shock



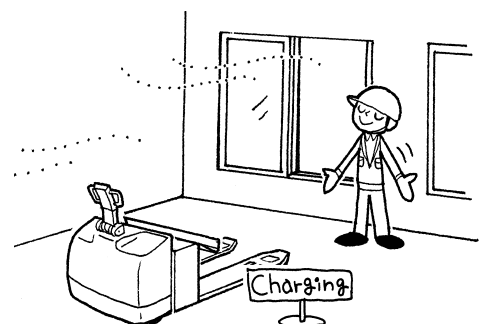
Do not touch the terminal or transformer when charging.

- The charger has high voltage and power when working.

► Charge in well-ventilated areas.



- Charge batteries only in approved and well-ventilated areas.
- Explosive gas comes out of the battery while charging. If you use the local supply charger, follow its manufacturer's instruction.





► Check cable and plug

Prior to charging, check the condition of the cable and plug.



Do not charge the battery if cable or plug is damaged.



► Check specific gravity

Measure the specific gravity of all cells before charge.



► Interruption of charge

- When interrupting the charge, push the STOP button of the charger or turn the knob of the timer to "0" (zero) position before disconnecting plugs.
- Failure to observe this instruction can cause a hazardous electrical shock or explosion of the battery by sparking.

► Kinds of charge

- There are three kinds of charge. These charges are a normal charge, a balancing charge and a supplementary charge.
- Charging time depends on the discharging condition and capacity of the battery.
- Generally, 8 to 10 hours are required to charge the battery fully.

Classification	Application
Normal charge	After daily operation or when the "E" segment of the battery discharge indicator is lit.
Blancing charge	Every two weeks (Check electrolyte level and specific gravity)
Supplementary charge	In a recess
Charge for storage	Carry out the blancing charge before storing the battery for an extended time. (Periodical charge for every 15 to 30 days during storage is recommended.)

■Charger



Use the same value of a fuse for replacement.
If you need to replace the fuse for the charger,
disconnect all input and output plugs first.



The supplied voltage should be stabilized with-
in $\pm 10\%$ of the rated input voltage.



The charger should be used within 0°C to
 $+ 40^{\circ}\text{C}$ ambient temperature.
If the temperature is 40°C or above, the charger
may be overheated.



The charger shall be protected from the mois-
ture such as rain and snow.
Failure to do so can cause an electrical short
and/or fire.



Do not use for other purpose.
The charger is designed to charge the battery
for the truck.



Inspect plugs and cables of the charger period-
ically.
If you find any damages, do not use the charg-
er until it is repaired.



The ground cable shall be connected.
Otherwise, an electrical shock hazard may be
caused.



Do not disassemble or modify the charger.



Do not use the charger continuously to charge
some batteries in turn.
The continuous use can cause overheating,
and the charger may be damaged.

How to charge the battery (By stationary charger)



Charge the battery in the following area.

- Well ventilated area.
- Protected from rain or snow.
- No open flame area.

Stationary charger

The following procedure is for the NICHYU genuine charger. If you use another brand charger, read its operator's manual carefully.

CHG lamp : Indicates charging

Meter : Indicates charging status

- Colored scale type
Charging is completed when the needle indicates the blue zone.
- Voltage scale type
Charging is completed when the needle indicates 12 through 15 volts.

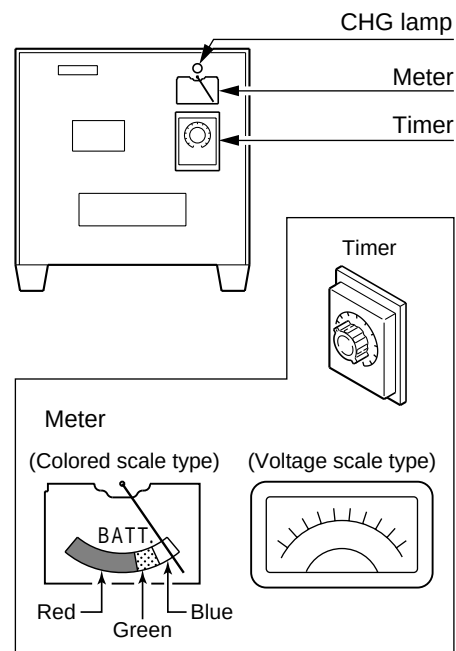
Timer : Use to set the charging time.



The timer has dual scale for 50 Hz and 60 Hz.

Outer scale (black) : 50 Hz

Inner scale (green) : 60 Hz



Kinds of charge and setting time of timer

Kinds of charge	Setting time of timer	Charge for
Normal charge	4	After daily operation
Balancing charge	6	Once for two weeks (Check electrolyte level and specific gravity)
Supplemental charge	1	Charge for a break time
Charge for long period storage		Carry out the balancing charge before storage. The periodical charge for every 15 to 30 days should be done while storage.



The setting time on the timer is not the actual charging time.

► Normal (Daily charge)

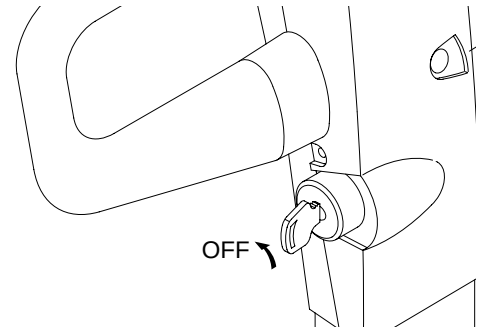
This charge returns the battery to a full-charged condition after operating the truck.



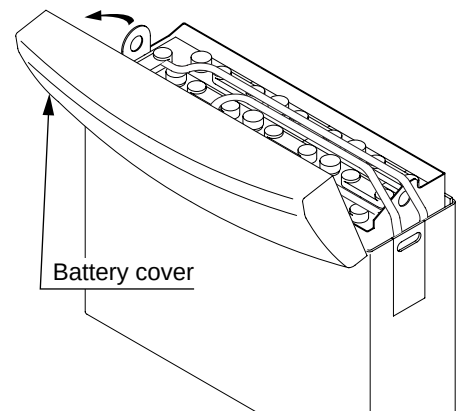
- Make sure that the battery voltage and capacity fit to the specification of the charger.
- Never use the charger to operate the truck.

Follow the next procedure to charge the battery.

- ① Move the truck to designated charging area.
- ② Turn the key switch off and remove a key.



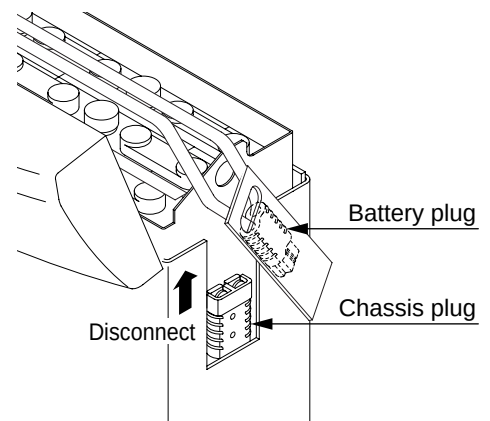
- ③ Open the battery cover.



- ④ Disconnect the battery plug on the truck.



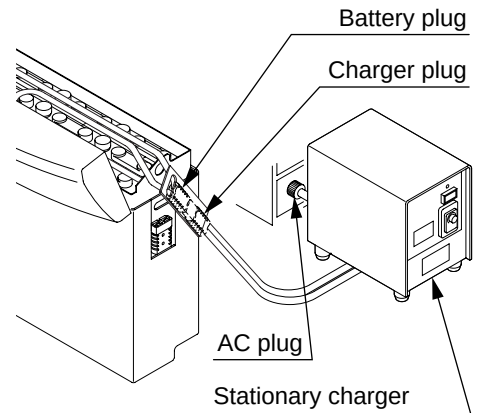
Do not touch the plug with wet hand. Wipe and dry your hand or put gloves.



4

BATTERY AND CHARGER

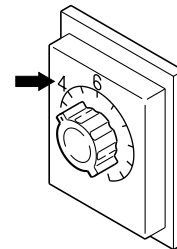
- ⑤ Connect the plug from the charger to the battery plug.
- ⑥ Connect the AC plug to wall outlet.



- ⑦ Set the timer to 4 hours on the correct scale of 50Hz or 60Hz.

*** The CHG lamp is turned on and the charger starts to charge the battery.**

Set to 4 hours



Make sure the meter is operated correctly.



- Do not disconnect plugs while charging.
- If interrupt charging, return the knob of the timer to "0" position before disconnecting plugs.

*** When the charging is finished, the knob of the timer is returned to "0" position and the CHG lamp is turned off.**

- ⑧ Disconnect the battery plug from charger and connect to the chassis plug securely.
- ⑨ Close the battery cover.

► Balancing charge

Specific gravity of electrolyte in each cell becomes unbalanced after a certain time of charge.

In this case, charge the battery for a little bit longer than a normal charge in order to equalize all cells.

Manual balancing charge

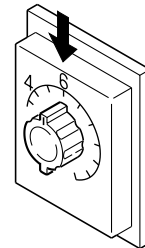
Balancing charge is required for the following cases.

- Every two weeks when the truck is operated every day.
- Not charged for a couple of days after discharged.
- Over-discharged.

○ Charging procedure

① Set the knob of the timer to 6 hours.

Set to 6 hours

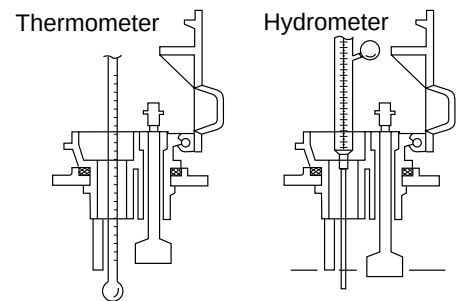


② Measure specific gravity of all cells after completion for charge.



When the specific gravity is 1.26-1.28 at 20°C, the battery is fully charged.

(Refer the section of "Reading of specific gravity" to measure.)



► Supplementary charging

When one charge is not enough to finish the daily work, a supplementary charge should be done during a break time.

The procedure of the charge is the same as with a normal charge.



Return the knob of the timer to "0" position before disconnecting the battery plug when a charge is interrupted.

► Charging for long time storage

Carry out the balancing charge before storage.

The periodical charge for every 15 to 30 days is recommended while in storage.

► Check electrolyte level

After a charge is finished, check the electrolyte level in each cell.

If the level is low, add distilled water to the specific level.

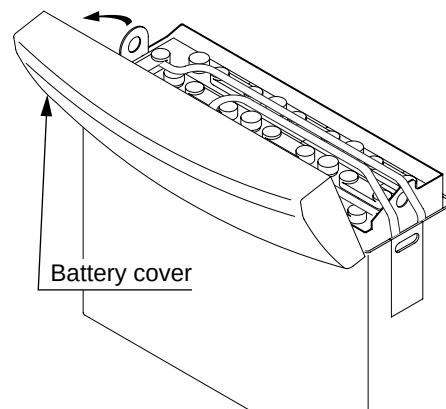
■ Exchanging the battery



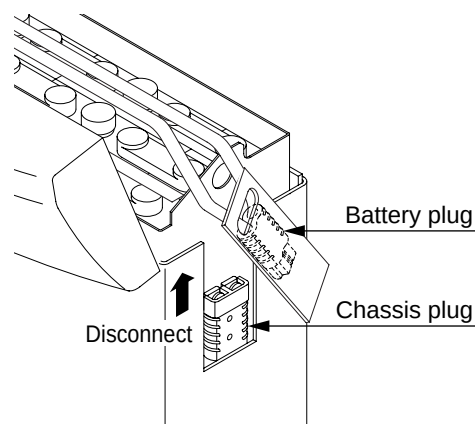
- When changing the battery, replace with full-charged battery. Removed battery should be charged as soon as possible.
- When changing the battery, truck must be parked on a flat floor and follow the next procedure.

Follow the next procedure to change the battery.

- ① Turn off the key switch.
- ② Open the battery cover.



- ③ Disconnect the battery plug with the cover from the chassis plug.



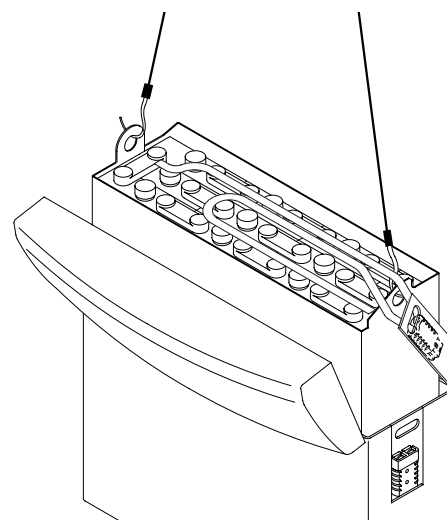
- ④ Apply slings to hang the battery case. Use hoist to change the battery.



- Use proper attachment and slings if the fork-lift truck is used to change the battery.
- Pay attention not to hit the battery case to chassis.

- ⑤ Connect the battery plug to the chassis plug securely after changing.

- ⑥ Close the battery cover.



Be careful not to pinch hands or fingers.

■ *Level of electrolyte and specific gravity*

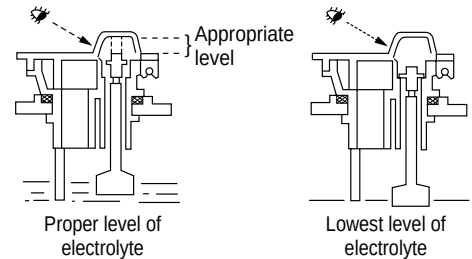
► Electrolyte level

After charging the battery, the electrolyte level is decreased.

If the battery is used when the electrolyte level is low, the battery will become overheated causing it to have a shorter life.

► Check of electrolyte level

Electrolyte level can be checked by the float which is equipped in the vent cap.



(N.B. This is the case of GS battery)

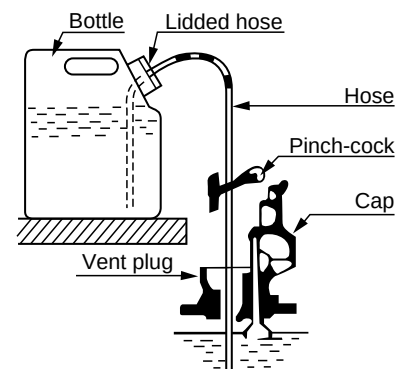
► Replenishment of water

To maintain the specific level of electrolyte, replenish with refined or distilled water.

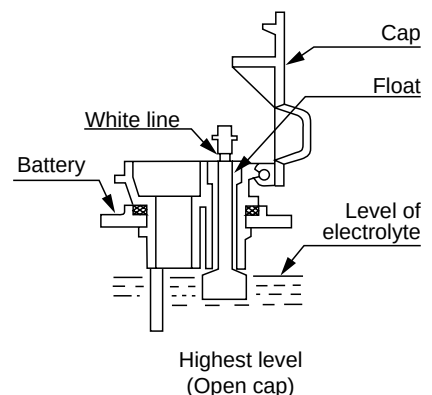
(You do not need to replenish the sulfuric acid. Use refined or distilled water only.)

Wear safety goggles, rubber gloves and boots for your protection.

- ① Open the vent caps of all battery cells.
- ② Replenish water into each cell.



- ③ Stop replenishing when the red float is raised and the white line appears.



(N.B. This is the case of GS Battery)

- ④ After replenishing to all cells, close all vent caps completely.
- ⑤ Clean the top of cells by wet cloth.



- Do not replenish water over the maximum level.
- Overfilling will cause the electrolyte to overflow while charging resulting in damage to the truck.

► Reading of specific gravity

The specific gravity of electrolyte is changed by temperature.

Measure the temperature of electrolyte by a thermometer and the gravity of electrolyte by a hydrometer.

Convert the actual gravity to the specific one at 20°C by the thermal conversion table.

Specific gravity at full charged	1.280 (at 20°C)
Specific gravity at discharged	1.180 (at 20°C)



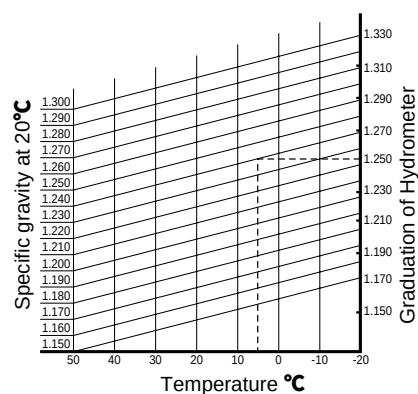
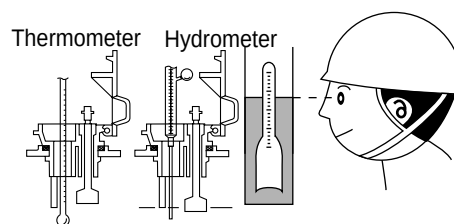
When the specific gravity is below 1.18 at 20°C, should be done the balancing charge.

SPECIFIC GRAVITY OF ELECTROLYTE AND THERMAL CONVERSION TABLE



How to convert the specific gravity:

For example, if the hydrometer reading is 1.25 at 5°C, the specific gravity at 20°C is 1.24.



5

INSPECTION PRIOR TO OPERATION

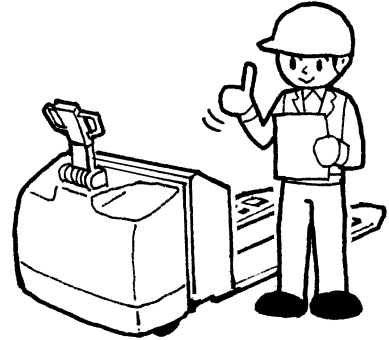
A daily pre-operation inspection is the key to safety and keeping the truck in good condition.

At the beginning of each shift, check your truck to make sure it is in safe operating condition.

If faults are found, contact NICHYU's qualified facility.



- Do not operate the truck until finishing repairs and inspections.
- Inspecting trucks should be made on a flat floor.
- Be sure to turn off the key switch and disconnect the battery plug while checking the electrical system except while turning on the lamps and checking operation.



■ Check point and contents

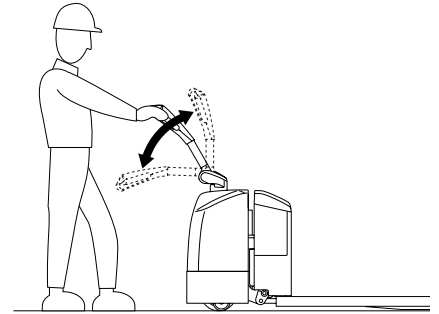
	No.	Check points	Contents
Braking system	1	Moving of tiller arm	Braking force
	2	Micro switch for travel	Function
Steering system	3	Play of tiller arm	Play and looseness
Loading & hydraulic system	4	Function of fork and platform	Function, Cracking, Lubrication
	5	Hydraulic piping (PLD/KLD)	Oil leaking
	6	Hydraulic oil (PLD/KLD)	Oil level (quantity)
Wheels	7	Tyres	Wearing, Damage
Battery	8	Charging	Specific gravity of electrolyte, Looseness of terminal
Others	9	Horn	Function
	10	Operator compartment	Damage, Cracking
	11	Others than above	Abnormal noise etc.

■ Inspection procedure

① Inspection of the tiller arm

Make sure if the tiller arm can be moved smoothly to upward and downward as well as right and left.

The specified braking distance is 0.5m when unloaded.

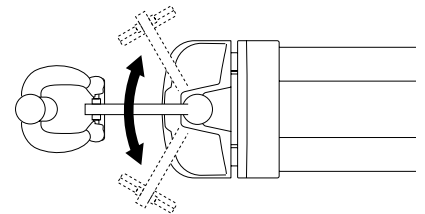


② Inspection of the micro switch for traveling.

Make sure that the truck does not move when the tiller arm is stood up or laid down completely.

③ Inspection of play

Check play and looseness of the tiller arm by steering to right and left.

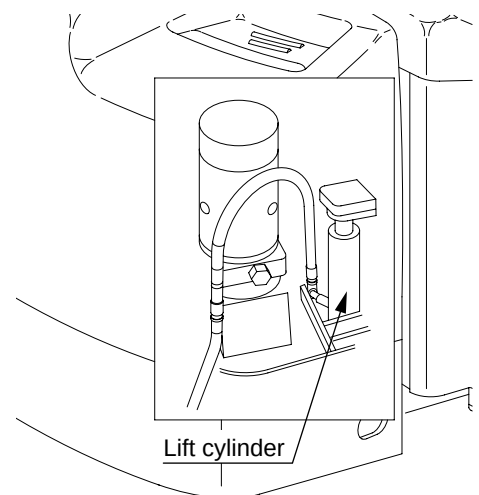


④ Inspection of fork / platform

Make sure the fork (or platform) can be raised and lowered smoothly by pushing the lifting and lowering buttons.

⑤ Inspection of hydraulic piping

Make sure that no oil is leaking from lift cylinders and all hydraulic joints.



⑥ Inspection of hydraulic oil level

Lower the fork or platform on a flat floor and check the oil level in the oil tank.

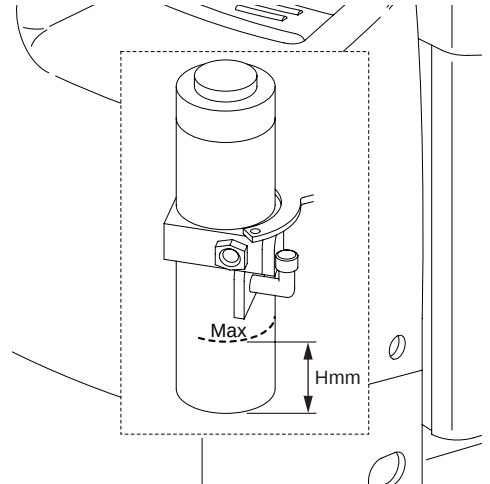
The hydraulic oil level should be "H" mm high from the bottom of the tank.

Type	Oil level (H)
PLD/KLD16/20/30	105mm

The normal oil quantity is 1.0 liter.

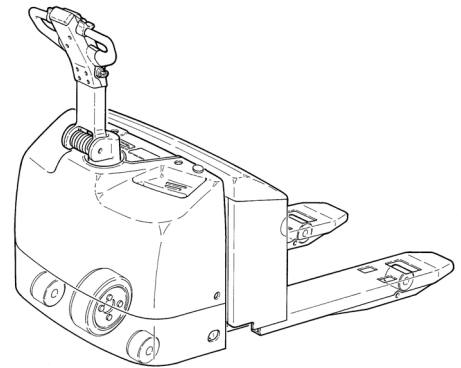


Do not refill oil to the "MAX" level.



⑦ Inspection of tyres

Check any damage and abnormal wear for all tyres.

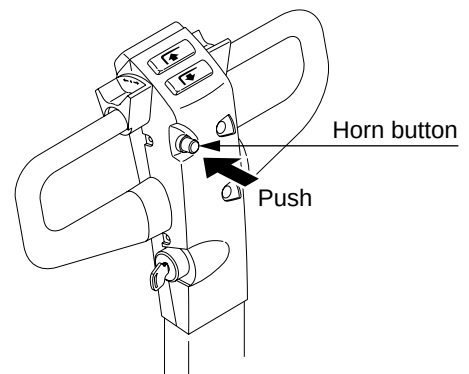


⑧ Check charging of battery

- Measure the specific gravity of electrolyte in the battery.
If it is 1.260 through 1.280 at 20°C conversion, the battery should be full charged.
- Check any looseness or damages of cables.

⑩ Inspection of horn

Make sure if the horn activates normally when pushing the horn button.



⑪ Inspection of operator compartment

Make sure if it is not damaged and cracked.

⑫ Others

Check other parts.



- Turn the key Switch off and disconnect the battery plug when checking inside of the truck or checking the electrical circuits.
- Be careful not to pinch hands or fingers when opening or closing the cover.

6

INSPECTION OF AFTER OPERATION

■ Inspection after working

At the end of each shift, clean the truck and inspect the following items.

- Any damage or oil leakage.
- Apply grease if required.
Refer to [Lubrication points and recommended oil]
- Check any abnormal parts which are found any defects while operation.



- A small fault can cause a serious accident.
- Do not operate the truck until finishing repairs and inspections.

7

PERIODIC SERVICING

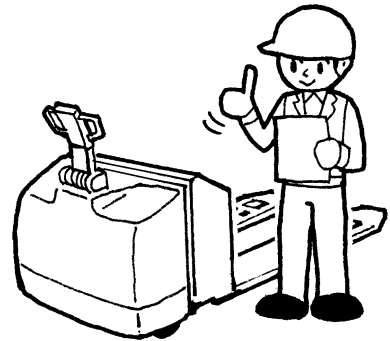


Periodic inspections and maintenance are necessary to keep your NICHYU truck running safely and smoothly. Hours shown in the maintenance schedule are based on eight hours operation per day and 200-hour operation per month. Make your own maintenance schedule using this formula for your operation requirements.



All servicing and repairs shall be made by authorized personnel.

- Contact NICHYU's qualified facility for adjustments and/or repairs.



■ Precautions of maintenance



Use NICHYU genuine parts for replacement. If non-genuine parts are used and a problem occurs, NICHYU will not offer any guarantees.



Use NICHYU recommended oil. Refer to [Recommended oil].



► Maintenance place



- Servicing facility should provide adequate equipment and safety guards.
- Servicing place should be on a flat floor.
- Be sure there is adequate ventilation in the service area.
- Fire extinguishers shall be provided at the servicing facility.

► Precautions of maintenance



- Smoking shall be prohibited.
- Wear safeguard (helmet, shoes, glasses, gloves and boots) and suitable clothes.
- Wipe off spilt oil at once.
- When lubricating, remove grease and dust off nipples and fittings with a brush or a cloth before lubrication.
- Turn off the key switch and disconnect the battery plug except when required for trouble shooting.
- Clean the electrical components with compressed air.

► Precautions during servicing



- Do not put your feet under forks or platform and be careful not to stumble by them.
- Be careful not to pinch your hands when opening and closing the covers and clamps.
- When working as a group, be sure everyone works safely with each other.
- Use only suitable tools.
- The hydraulic circuit may have a high pressure condition. Release the inside pressure before performing any service or repairs.

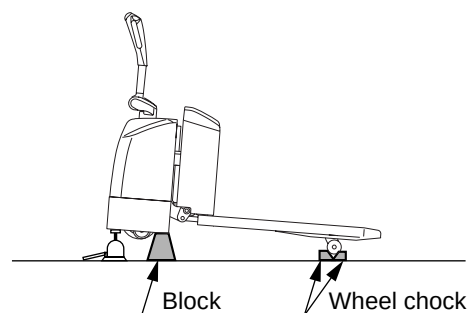
► Jacking up



Do not go under the truck while it is being jacked up.
Failure to observe this warning can cause serious injury or death if the truck falls on you.



- Before jacking up the truck, make sure no one is around and no load is on the truck.
- Before jacking up, place wheel chocks at tires.
- After jacking up, use blocking or proper stands to prevent the truck from falling.



■ Weekly (50-hour) servicing

Inspect the following items in addition to the inspection prior to operation.

Check points	Contents
Electrolyte level	Check the electrolyte level. When the level is low, replenish with refined water.
Specific gravity of electrolyte	Measure the specific gravity and temperature of electrolyte of all cells.
Cleaning of battery	Clean the top surface and vent cap of each cell.



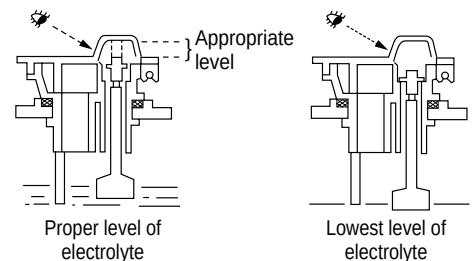
Be sure to disconnect the battery plug when inspecting the electrical system.

► Check the level of electrolyte

Refer to [Level of electrolyte and specific gravity].



- After completing the replenishment, securely close the vent caps.
- Do not replenish the water over the maximum level.



(N.B. This is the case of GS battery)

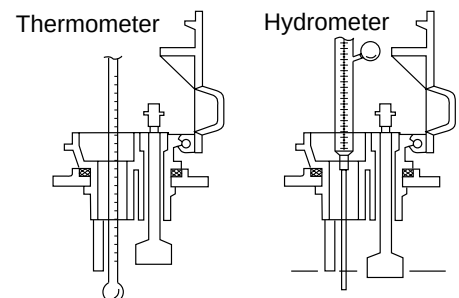
► Check for specific gravity of electrolyte

Measure the quantity and specific gravity of all cells.

Normal : It is normal when all cells specific gravity are the same.

Abnormal : It is abnormal if the difference of the specific gravity is more than 0.05 from other cells.

Refer to [Battery electrolyte and specific gravity] how to inspect the specific gravity of battery.



► Cleaning of battery

Keep the battery clean by wiping off with a damp cloth.



- The battery should be cleaned before charging.
- Wear rubber gloves and boots to prevent an electrical shock.
- Do not clean the battery plug with water.

The inside of vent caps will be stained and making of the float difficult to see.
Clean the caps by the following procedures.

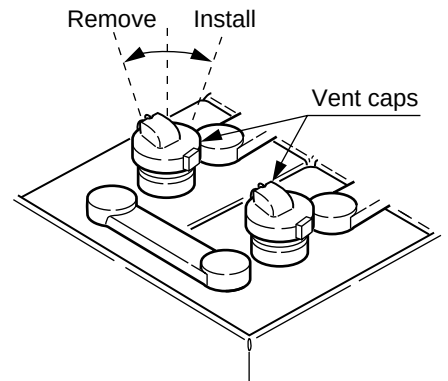


This is the case of Japanese battery.

- ① Remove the vent caps by turning counterclockwise.
- ② Wash the inside of vent caps with a neutral detergent.
If they are severely stained, brush them.
- ③ Install the vent caps by turning clockwise.



Make sure all vent caps are completely closed.

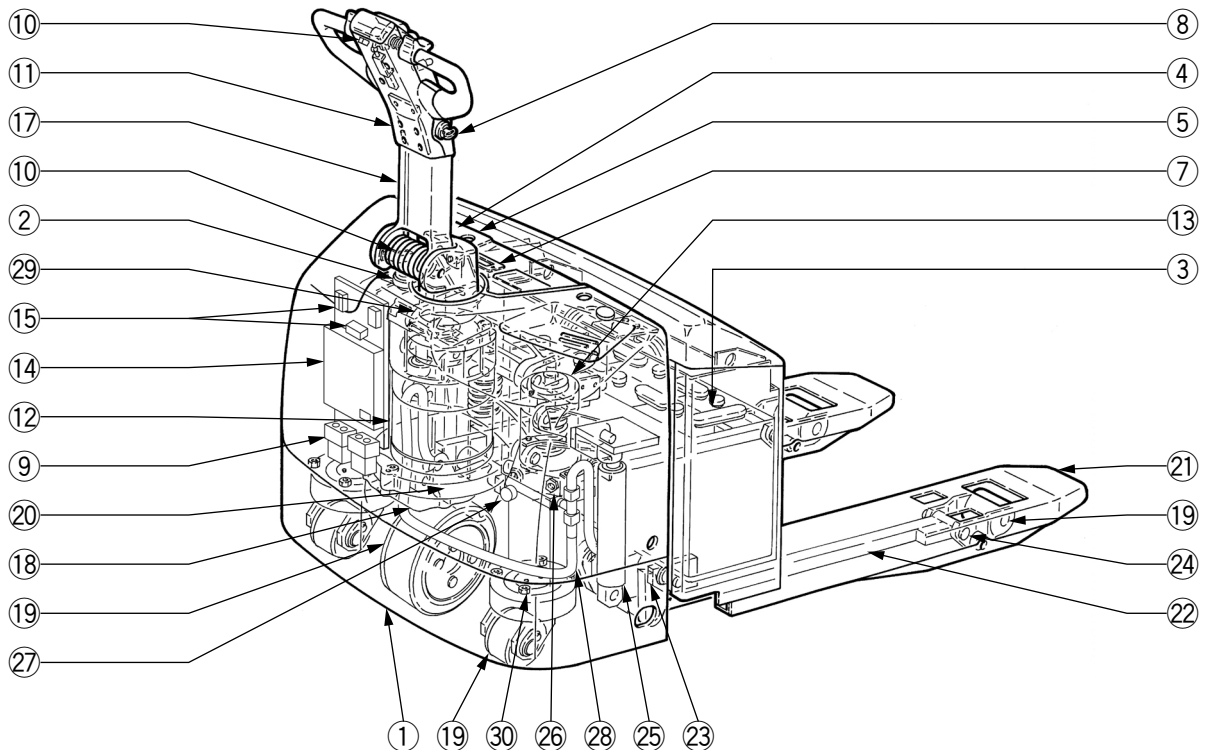


■ Monthly (200-hour) servicing

► PLD16/20/30

Perform the following service in addition to the weekly (50-hour) maintenance schedule. If an adjustment or replacement parts are required, contact NICHYU's qualified facility.

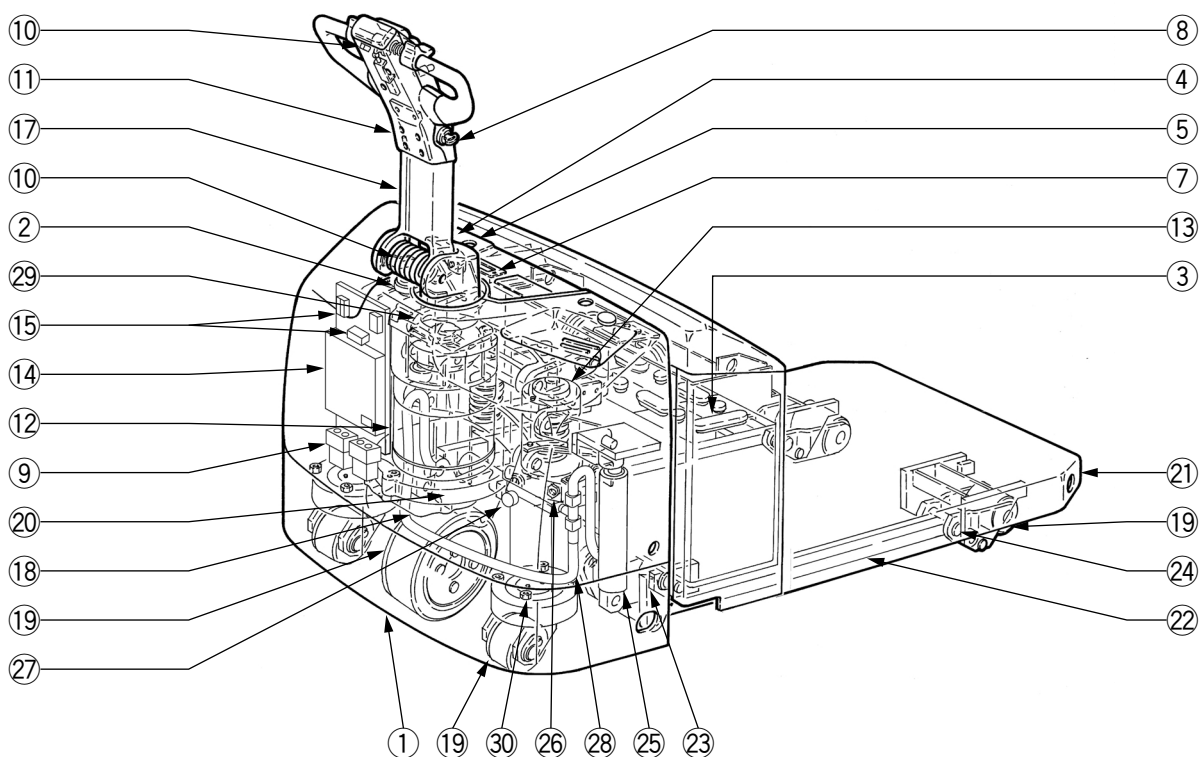
	No.	Check point	Contents
Truck	1	General	Distortion, Crack, Abnormal noise
	2	Horn	Function
Battery, Charger, Electric components	3	Electrolyte	Specific gravity, Level, Leaking
	4	Battery plug	Damage, Stain
	5	Charging plug, Cable, Terminal	Looseness, Damage
	6	Magnetic contactor	Function, Contact
	7	Battery discharge indicator	Function
	8	Key switch	Function
	9	Contactor	Activation, Contact
	10	Micro switch, Sensor	Function
	11	Controller	Function
	12	Traction motor	Brush, Commutator
	13	Hydraulic motor	Brush, Commutator
	14	Chopper unit	Indication lamp
	15	Fuse	Looseness, Capacity
	16	Cable, Terminals	Damage, Looseness
	17	Tiller arm	Function, Play
Drive, Steering, Hydraulic, Braking systems	18	Gear case	Oil level, Leaking, Abnormal noise
	19	Drive wheel, Caster wheel, Load wheel	Damage, Abnormal wear
	20	Drive ball ring	Lubrication, Play
	21	Fork	Crack, Distortion
	22	Pull bar	Distortion
	23	Pull bar (front end)	Play
	24	Pull bar (rear end)	Play
	25	Lift cylinder	Oil leak
	26	Hydraulic unit valve	Function, Oil leak
	27	Hydraulic unit oil tank	Oil level, Leak
	28	High pressure hoses	Oil leak, Distortion
	29	Brake	Braking force
	30	Bolts, Nuts	Looseness



► KLD16/20/30

Perform the following service in addition to the weekly (50-hour) maintenance schedule. If an adjustment or replacement parts are required, contact NICHYU's qualified facility.

	No.	Check point	Contents
Truck	1	General	Distortion, Crack, Abnormal noise
	2	Horn	Function
Battery, Charger, Electric components	3	Electrolyte	Specific gravity, Level, Leaking
	4	Battery plug	Damage, Stain
	5	Charging plug, Cable, Terminal	Looseness, Damage
	6	Magnetic contactor	Function, Contact
	7	Battery discharge indicator	Function
	8	Key switch	Function
	9	Contactor	Activation, Contact
	10	Micro switch, Sensor	Function
	11	Controller	Function
	12	Traction motor	Brush, Commutator
	13	Hydraulic motor	Brush, Commutator
	14	Chopper unit	Indication lamp
	15	Fuse	Looseness, Capacity
	16	Cable, Terminals	Damage, Looseness
	17	Tiller arm	Function, Play
Drive, Steering, Hydraulic, Braking systems	18	Gear case	Oil level, Leaking, Abnormal noise
	19	Drive wheel, Caster wheel, Load wheel	Damage, Abnormal wear
	20	Drive ball ring	Lubrication, Play
	21	Fork	Crack, Distortion
	22	Pull bar	Distortion
	23	Pull bar (front end)	Play
	24	Pull bar (rear end)	Play
	25	Lift cylinder	Oil leak
	26	Hydraulic unit valve	Function, Oil leak
	27	Hydraulic unit oil tank	Oil level, Leak
	28	High pressure hoses	Oil leak, Distortion
	29	Brake	Braking force
	30	Bolts, Nuts	Looseness

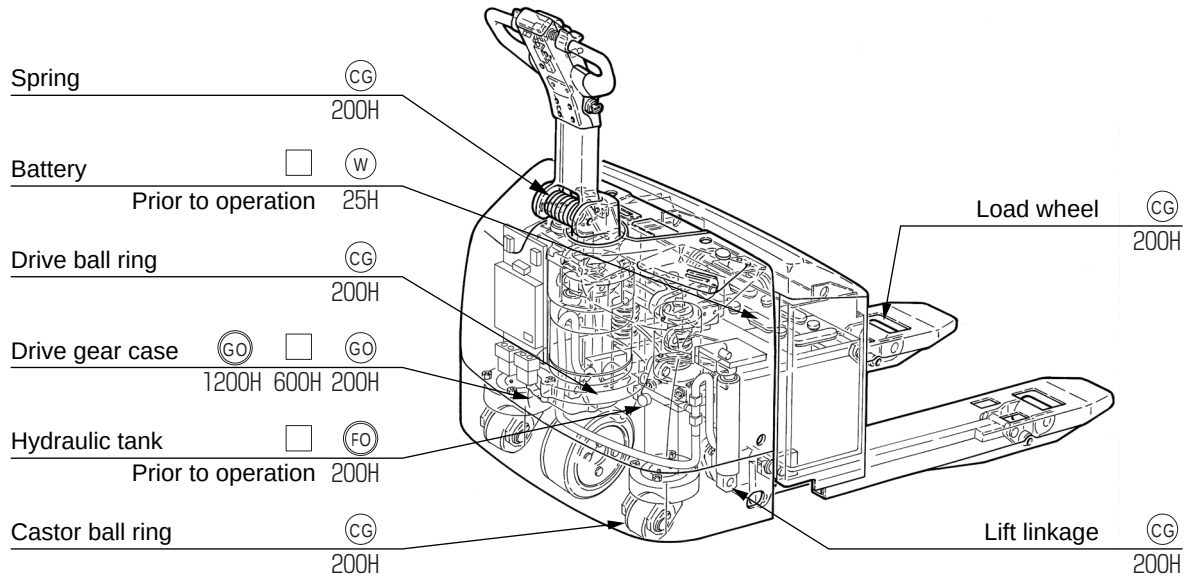


■ Lubrication points and recommended oil

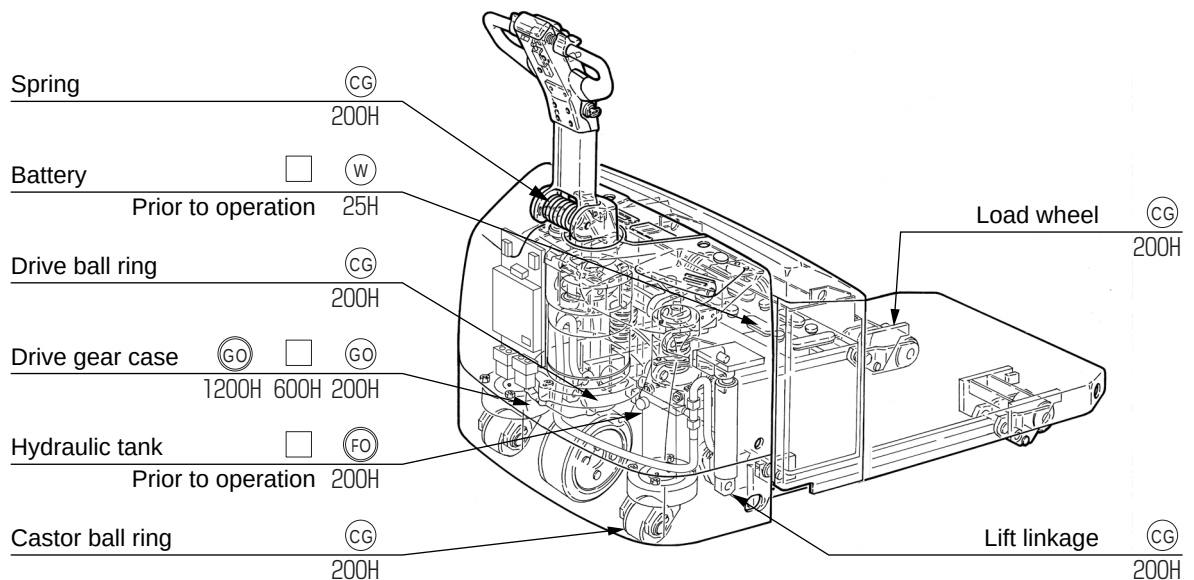
► Lubrication points

[PLD16/20/30]

⊙ : Replace	MO : Machine oil	BO : Brake fluid
○ : Replenishment	FO : Hydraulic oil	CG : Chassis grease
□ : Check and adjust	GO : Gear oil	W : Refined water



[KLD16/20/30]



► Recommended oil

	Gear oil	Grease
Esso	Esso Gear Oil GP SAE80	Esso Beacon 2
Shell	Shell Spyluxe EP80	Alvania Grease 2
Mobile	Mobilube GX-80	Mobiluxe 2

Use NICHYU genuine "NICHYU FORK OIL B" for hydraulic oil.

■ **Every three-month (600-hour) servicing**

Perform the following service in addition to the monthly (200-hour) maintenance schedule.

If an adjustment or replacement parts are required, contact NICHYU's qualified facility.

Check points	Contents
Contactors	When roughness is excessively, replace it.
Motors	Wearing of carbon brushes



- Turn the key switch off and disconnect the battery plug when checking inside of the cover or electric functions except checking operations.
- Be careful not to pinch hands or fingers when opening or closing covers.

■ **Semiannually (1200-hour) servicing**

Perform the following service in addition to the 600-hour maintenance schedule. If adjustments or replacement of parts are required, contact NICHYU's qualified facility.

Check points	Contents
Contactors	When roughness of the contact is excessively, replace it.
Motors	Wearing of carbon brushes.
Drive unit	Change of gear oil
Hydraulic oil	Change of hydraulic oil
Oil filter	Cleaning the oil filter



- Turn the key switch off and disconnect the battery plug when checking inside of the cover or electric functions except checking operations.
- Be careful not to pinch hands or fingers when opening or closing covers.

◆Inspection of motor brushes

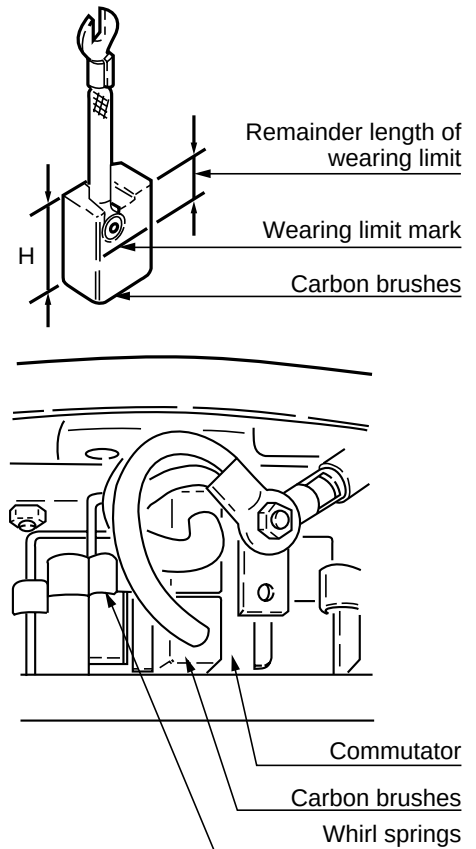
Rise up the whirl spring and then pull out the carbon brush to check the length.

If the brush is worn more than the wearing limit, replace all brushes of the motor.

Wearing limit of carbon brushes

Used for	Traction motor	Hydraulic motor
H	30	19
Wearing limit	10	7
Q'ty	4	4

Wearing limit may be marked on carbon brushes.



■Replacing parts and trouble shooting

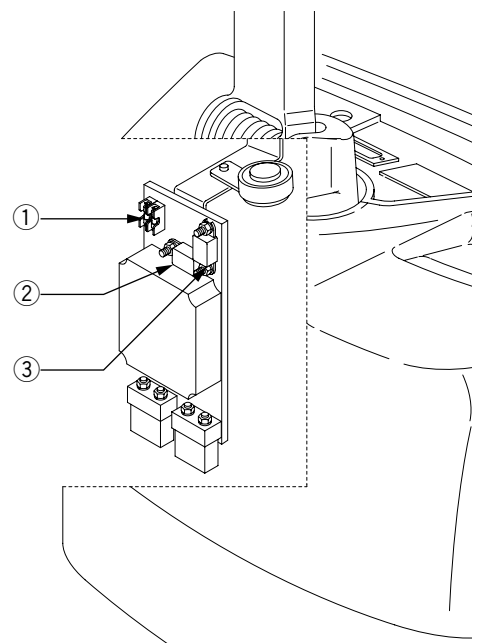
►Replacing fuses



Be sure to disconnect the battery plug before replacing fuses.

- ① Glass tube fuse : 10A (for control circuit)
- ② Fuse : 160A (for main circuit when built-in charger is equipped)
- ③ Fuse : 160A (for main circuit when built-in charger is not equipped)

Type	Replacing procedure
Glass tube fuse	Open the holder and replace the fuse.
Fuse	Loosen the mounting nuts and replace the fuse.
Insufficient tightening of the nuts may cause of poor contact and can cause overheating or fire. Tighten nuts securely.	



Be sure to use fuses with prescribed amps.

8

QUICK FAULT FINDING

- When checking, be sure to turn off the key switch and disconnect the battery plug.
- When a fault cannot be corrected, contact NICHYU's qualified facility.

When following faults are occurred, check the truck by following points.

Symptom	Check point	Solution
Truck does not run	Fuse of the auxiliary control circuit would be blown out.	If the fuse is blown, replace with the new one with prescribed amps, or contact your local NICHYU dealer.
	Check clicking sound of the micro switch when the tiller arm is pull up or push down.	If not click, contact your local NICHYU dealer.
	Check clicking sound of the micro switch when the control knob is moved.	If not click, contact your local NICHYU dealer.
	Fuse for the traveling circuit.	If the fuse is blown, replace with new ones with prescribed amps, or contact your local NICHYU dealer.
	Battery plug connection.	If the battery plug is loosen, connect it securely.
Not charging	Fuse of AC power circuit.	If the fuse is blown, replace with new ones with prescribed amps, or contact your local NICHYU dealer.
	Charging plug, AC plug and battery plug	Connect these plugs securely.
	Fuse of AC or DC circuit of the charger.	If the fuse is blown, replace with new ones with prescribed amps, or contact your local NICHYU dealer.

When a fault cannot be corrected, contact your local NICHYU dealer.

9

PERIODICAL REPLACING PARTS

Periodical inspection and maintenance are very important to keep your truck in good condition.

Parts in the following table are also very important for safe operation. NICHYU recommends that you replace these parts every period as listed below even if their appearances are good. The periodical replacement of parts is not covered by warranty.

	Periodical replacement parts	Period
1	Hydraulic hoses	2 years
2	Lead wires of turning area of the drive unit.	2 years

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COLD STORAGE TYPE TRUCK

The NICHYU electric trucks for Cold Storage Application are designed to operate in the cold storage area. This truck is designed for -35°C class cold storage area.



- The indoor and outdoor operations should be the same ratio, and the continuous indoor operation is 30 minutes maximum.
- Do not leave the truck in a cold storage area.
- The battery shall be charged outside of the cold storage area.

- The electrical and mechanical parts are protects from rusting, corrosion and low temperature, but periodical cleaning, lubrication and maintenance are very important.

■ ***Protection from rust and corrosion***

When going in and out of the cold storage area, the truck is exposed to moisture which can cause rusting or corrosion. To protect from the weather elements, a special coating and painting are applied to the cold storage application truck. Also stainless bolts, nuts and washers are used on some parts for protection.

■ ***Protection from low temperature***

1) Hydraulic oil and grease

Low viscosity oil and grease are required. Refer the following table.

2) Lubricating system

The grease nipples are provided on the major sliding parts. Lubricate periodically to protect these parts from rusting and wearing.

3) Electrical parts

The control system and switches are protected from rusting and freezing.

Required lubricant

Symbol (Refer lubrication chart)	Kinds of lubricant	Used for	Remarks
FO	Hydraulic oil	Hydraulic functions	Shell Tellus T15
GO	Gear oil	Gear case	Same as standard
CG	Grease	Nipples, Tiller arm, Gear case	Low temperature grease

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