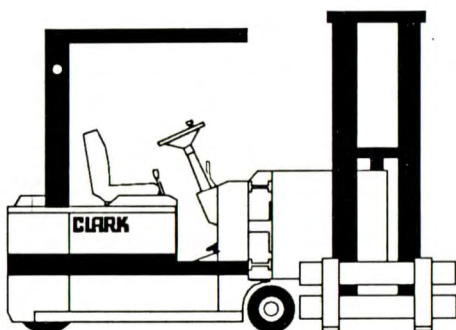


Operator's Manual

Do not remove this manual
from the truck.



ETR 13

CLARK

Book No. 2779085
OM - 569

For Handy Reference:

Record The Following Information Pertaining To
Your Truck

Model No. _____

Serial No. _____

Customer Truck Identification No. _____

Truck Weight, Empty _____

Truck Rated Capacity _____

Truck Gross Weight, Loaded w/Rated Load _____

Special Equipment or Attachments _____

Attachment Weight _____

Operator's Manual

You must be trained and authorized to operate a lift truck.

YOU can prevent accidents!

Safe operation is the responsibility of the operator.

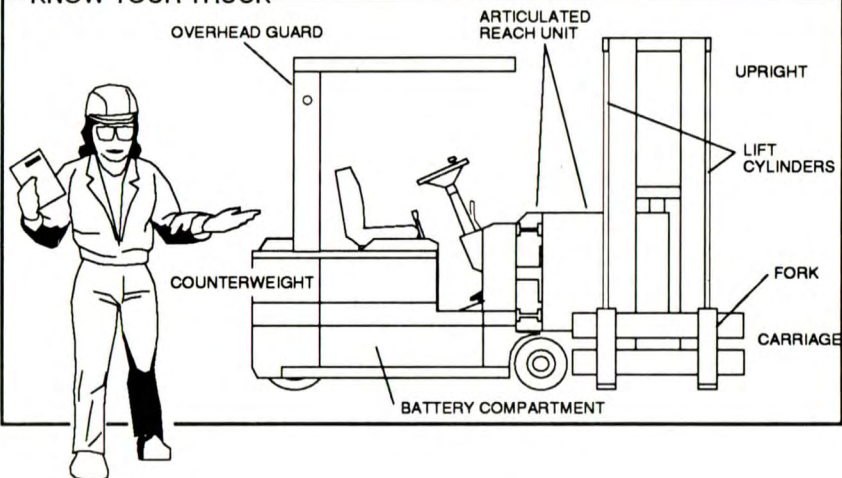
First: Learn safe operating rules and your company rules.

Next: Read and understand your Operator's Manual.

Learn about the unit you operate.

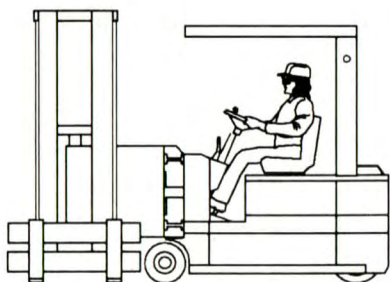


KNOW YOUR TRUCK



Then: Practice operating your truck safely.

And: Keep your truck in safe operating condition with correct and timely maintenance.



Breaking these rules can cause serious or fatal injury to yourself and others.

Introduction

Clark Equipment Company welcomes you to the growing group of professional people who own, operate and maintain Clark lift trucks. We take pride in the long tradition of quality products and superior value that the Clark name represents. This manual will familiarize you with safety, operating, and maintenance information concerning your new lift truck. It has been especially prepared to help you use and maintain your Clark lift truck in a safe and correct manner.

Your Clark lift truck, although not rated by the Underwriters Laboratories, has been designed and built to be as safe and efficient as today's technology can make it. As manufactured, it meets all the applicable mandatory requirements of ANSI B56.1--1969-1983 Safety Standard for Powered Industrial Trucks. Each truck is also furnished with certain safety devices, e.g., horn and driver's overhead guard as 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 the truck 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.

User Daily Inspection -- Safety and Operating Checks

A lift truck should always be examined by the user before every shift to be sure it is safe to operate. There are helpful inspection forms available from your CLARK dealer to help you with this inspection. The importance of this procedure is emphasized in this manual with a brief illustrated review and later with more detailed instructions.

Planned Maintenance Program

In addition to the daily user inspection, Clark 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 life of components and reduce unscheduled downtime. The PM can be scheduled to meet your particular application and lift truck usage.

The procedures for a periodic planned maintenance program which covers inspections, operational checks, cleaning, lubrication and minor adjustments, are outlined in this manual. Your Clark dealer is prepared to help you with a Planned Maintenance Program with trained service personnel who know your lift truck and can keep it operating safely and efficiently. For additional information, see the Service Manual.

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A Message To CLARK Lift Truck Operators

Lift trucks are specialized machines with unique operating characteristics designed to perform specific jobs. 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 CLARK. Our experience with lift truck accidents has shown that when accidents happen and people are killed or injured, the causes are:

- OPERATOR NOT PROPERLY TRAINED
- OPERATOR NOT EXPERIENCED WITH LIFT TRUCK OPERATION
- BASIC SAFETY RULES NOT FOLLOWED
- LIFT TRUCK NOT MAINTAINED IN SAFE OPERATING CONDITION

For these reasons, CLARK 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 their function. The correct operating procedures are shown and explained. Illustrations and important safety messages are included for clear understanding. And, a section on general 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 operate their lift truck safely by emphasizing and illustrating the correct procedures. But, it cannot cover every possible situation which 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 as well as to know and follow your company safety rules! Be sure that your equipment is maintained in a safe condition. Do not operate a damaged truck. And practice safe operation every time you use your lift truck. Let's join together to set new standards in safety.

Remember, before you start operating this lift truck, be sure that 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. And be aware that the Federal Occupational Safety and Health Act (OSHA), the American National Standards Institute (ANSI) Standard B56.1 and state laws require that operators be completely trained in the safe operation of lift trucks. Ask your supervisor for help if you have any questions about training or operation.

CLARK 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 lift truck repair procedures and authorized by your employer.

See "Planned Maintenance and Lubrication - User Safe Maintenance Practices" in this manual for information regarding governmental and industrial standards for operation, maintenance and design of industrial trucks.

About This Manual

The purpose of this manual is to provide a digest of essential information about the safe operation of your lift truck. This manual will acquaint you with the truck's features and how they function and are maintained. It is written for a truck with standard features while making brief references to options where necessary.

This manual is organized into 8 major parts for easy reference:

- Part 1 General Safety Rules and Practices... reviews and illustrates accepted practices for safe operation of a lift truck.
- Part 2 Operating Hazards... illustrates and describes the hazards that you might encounter most often when operating your lift truck.
- Part 3 Know Your Truck... describes the major operating components, systems, controls and other features of your truck and how they function.
- Part 4 Truck Inspection... outlines details on how to perform the daily safety inspection.
- Part 5 Operating Procedures... discusses more specific instructions on the safe, efficient operation of your lift truck.
- Part 6 No Towing... reminds the operator that towing this truck could damage internal components.
- Part 7 Planned Maintenance and Lubrication... describes a PM program for your truck.
- Part 8 Specifications... provides reference information and data on features, components, and maintenance items for your lift truck.

Safety Signs and Messages

Throughout this manual, you will find safety signs and safety messages, as well as other notes and informational instructions. These messages are given to remind you of either essential procedures or to prevent you from making an error which could damage the truck and possibly cause personal injury. Please refer to the "Safety Signs and Safety Messages" page for further definition and explanation of these messages.

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



How To Use This Manual

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

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

In the "Planned Maintenance and Lubrication" section, 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 chapter has its own Table of Contents. This will help you find the various topics within each section more easily.

We urge you to first carefully read the manual from cover to cover. Take the 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, instruments and controls function. Please contact your authorized CLARK dealer for the answer to any question you may have about your lift truck's features, operation or manual.

This manual is intended to be stored in the pocket on the back of the seat. 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 this manual, ask your supervisor to obtain one and have it attached to the truck. And, remember, your CLARK dealer is pleased to answer any questions about the training, operation and maintenance of your lift truck and will provide you with additional information should you require it. He is glad to help you.

Safety Signs and Safety Messages

Improper or careless techniques cause accidents. Don't take chances with incorrect or damaged equipment. READ and UNDERSTAND the procedures for safe driving and maintenance outlined in this manual.

STAY ALERT ! Follow safety rules, regulations and procedures. Accidents can be avoided by recognizing dangerous procedures or situations before they occur.

DRIVE AND WORK SAFELY and follow the safety signs and their messages displayed on the truck and in this manual.

SAFETY SIGNS and MESSAGES are placed in this manual and also on the lift truck to provide instructions and to identify specific areas where potential hazards exist and special precautions should be taken. Be sure you know and understand the meaning of these instructions, signs and messages. Damage to the truck or death or serious injury to you or other persons may result if these messages are not followed.

NOTICE

This message is used when special information is required to clarify procedures or identify components pertaining to the truck.

IMPORTANT

This message is used when additional attention is required for proper operation or maintenance of the truck.

CAUTION

This message is used as a reminder of safety practices which can result in personal injury if proper precautions are not taken.

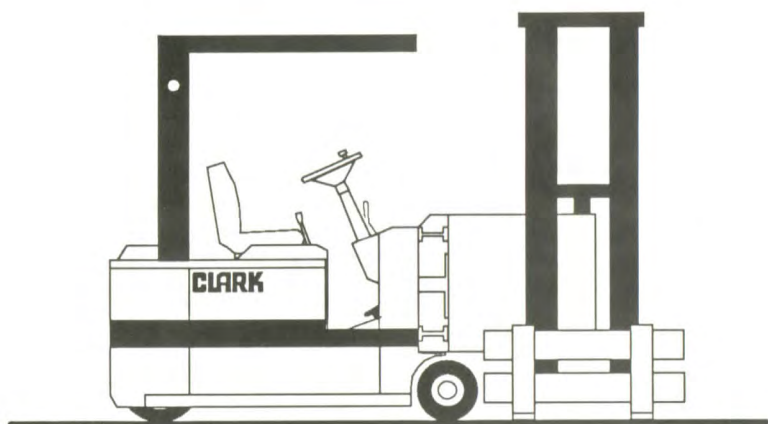
WARNING

This message is used when a hazard exists which can result in injury or death, if proper precautions are not taken.

DANGER

This message is used when an extreme hazard exists which will result in death or serious injury if proper precautions are not taken.

Truck Application



Each model is designed for a specific application. Make sure you are using the best truck model for the job.

This truck, as described by ANSI, is a counterbalanced front/side loader, cushion tired sit-down rider. It is specially equipped to operate in narrow aisles with its ability to rotate the load from side to side without changing travel direction. It is not designed to be operated on uneven, wet or rough surfaces or for any outside usage including dock areas.

This truck is intended as a material conveying unit to be used for in company operations, e.g. storage bays, haulage companies, etc., for short distance transportation and the stacking of loads on approved pallets.

For further information regarding applications of different lift trucks for your specific application, contact your CLARK dealer.

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1 General Safety Rules

- 1.2 Daily Inspection
- 1.3 Do's and Don'ts
- 1.4 Operator Protection
- 1.5 Pedestrians
- 1.6 No Riders
- 1.7 Fork Safety
- 1.8 Fork Position
- 1.9 Pinch Points
- 1.10 Travel
- 1.11 Grades, Ramps, Slopes
and Inclines
- 1.12 Surface and Capacity
- 1.13 Loading Docks
- 1.14 Tipovers
- 1.15 Don't Jump
- 1.16 Parking

General Safety Rules Daily Inspection



At the beginning of each shift inspect your truck, fill out a daily inspection sheet and return it to your supervisor.

Check for damage and maintenance problems.

Have problems, even minor ones, repaired before you operate the truck.



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



General Safety Rules Do's and Don'ts



DON'T MIX DRUGS OR
ALCOHOL WITH YOUR JOB.



DO WATCH FOR
PEDESTRIANS



DON'T BLOCK SAFETY OR
EMERGENCY EQUIPMENT



DO WEAR SAFETY
EQUIPMENT
WHEN REQUIRED

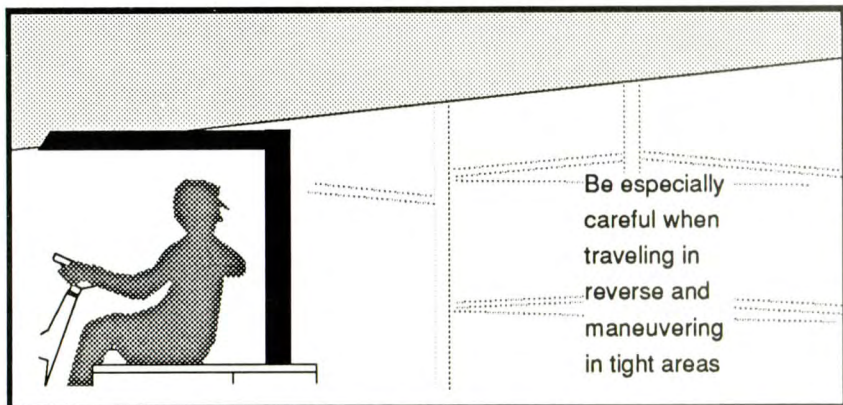
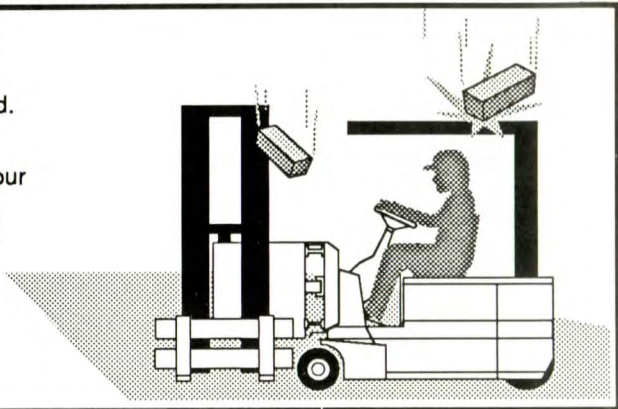


DON'T SMOKE IN
"NO SMOKING"
AREAS

General Safety Rules Operator Protection

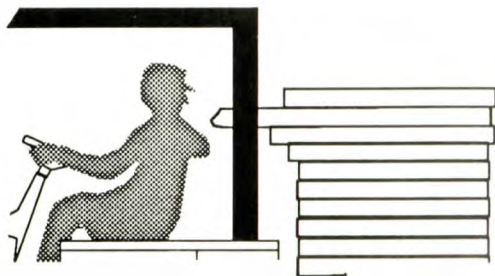
Stay under the overhead guard.

Always keep your body within the confines of the truck.

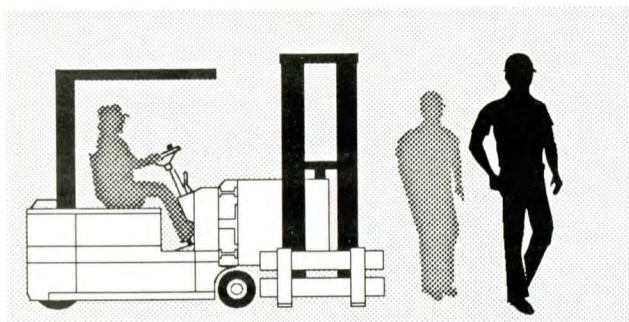


Be especially careful when traveling in reverse and maneuvering in tight areas

Watch for the intrusion of objects into the operator's compartment.

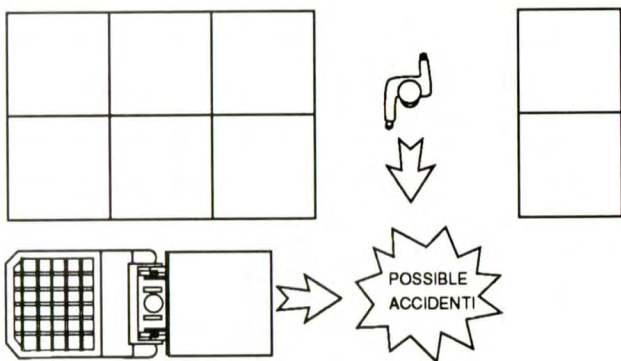


General Safety Rules Pedestrians



When operating your truck always be aware of persons in or along your route of travel.

Do not operate the reach, rotate or lift controls when people are near.

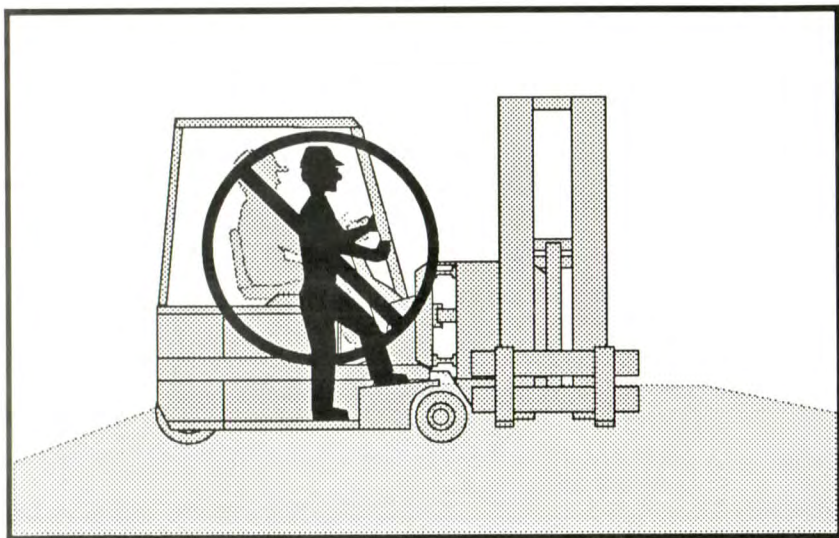


Also be alert to the possibility of persons stepping into intersections or out from behind objects into the trucks path.

Sound your horn when pedestrians are in your path, at all intersections and blind spots (drinking fountains, rest break areas, offices, are a few examples).

Let persons know that you are about to move if they are near your truck. Watch out for rear swing of the truck.

General Safety Rules No Riders



The operator is the only person allowed on the lift truck.

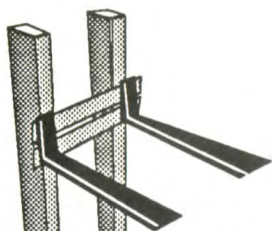


Never carry a person on the forks of a lift truck.

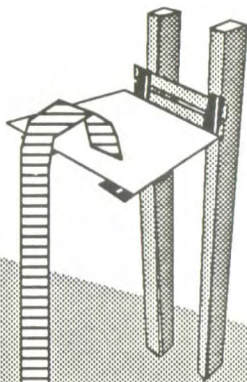
General Safety Rules

Fork Safety

Never allow anyone to walk under raised forks.

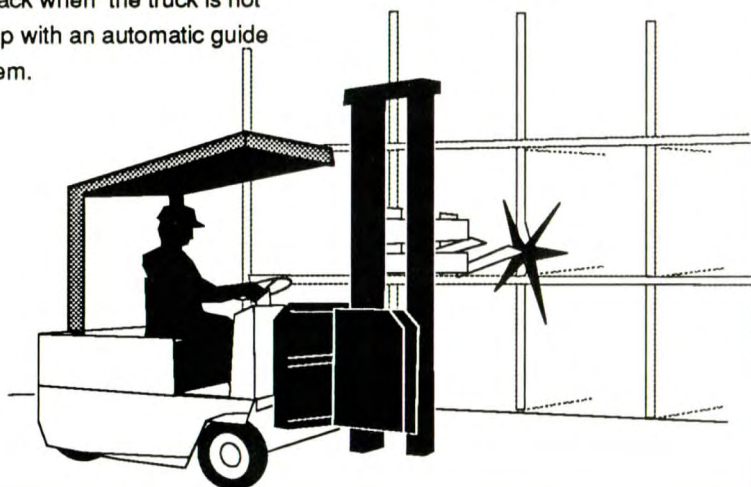


DO NOT use lift trucks to raise people. There is special equipment to raise people for overhead work.

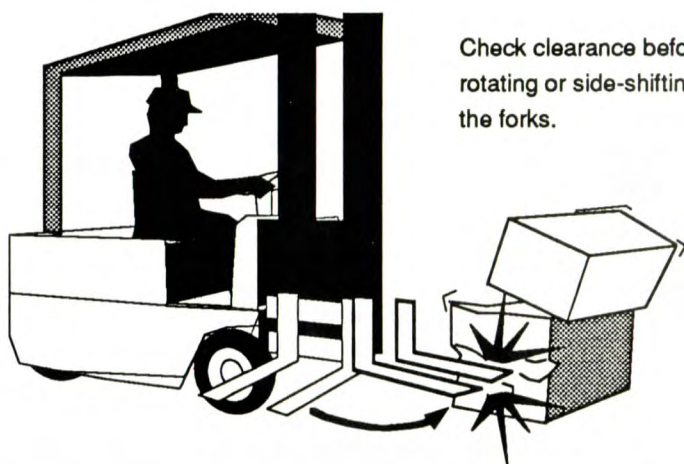


General Safety Fork Position

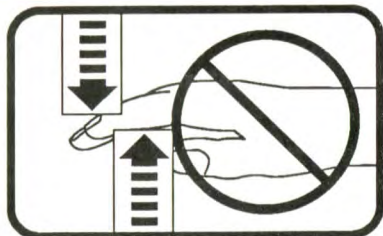
Check the fork alignment to the rack opening before entering the rack when the truck is not set up with an automatic guide system.



Check clearance before rotating or side-shifting the forks.

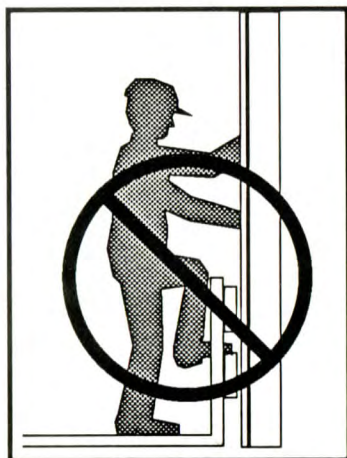


General Safety Rules Pinch Points

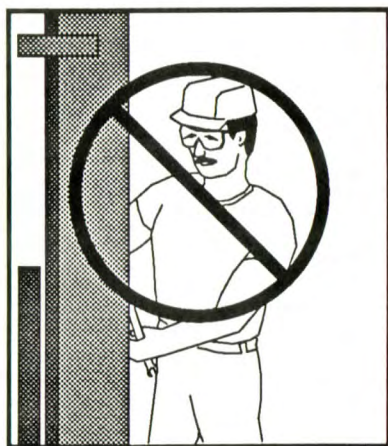


Keep hands, feet
and legs out of the upright
and reach unit.

Do not use the
upright or reach unit
for a ladder.
Hands and feet
could be pinched if
upright or carriage
slip unexpectedly.



Never try to repair the upright,
carriage, chain or attachment
yourself...

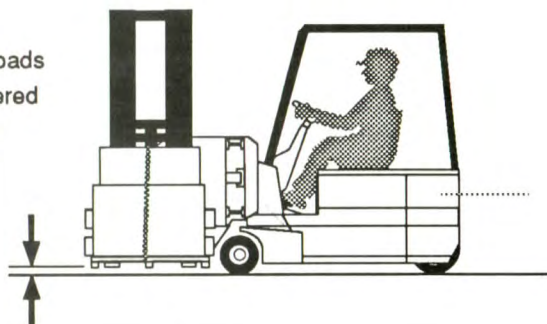


...always get a trained mechanic
to fix even the minor problems.



General Safety Rules Travel

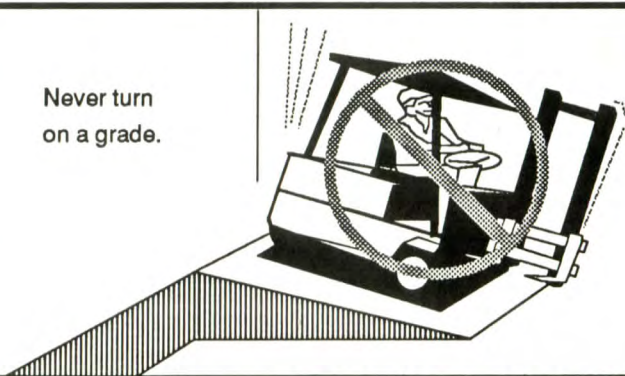
Always carry loads low and centered with the truck.



If load blocks your view, travel in reverse when in open aisles. Always watch for pedestrians.



Never turn on a grade.



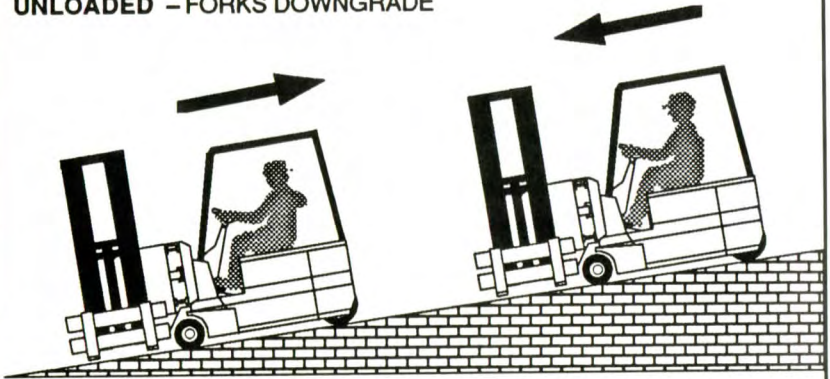
General Safety Rules

Grades, Ramps, Slopes and Inclines



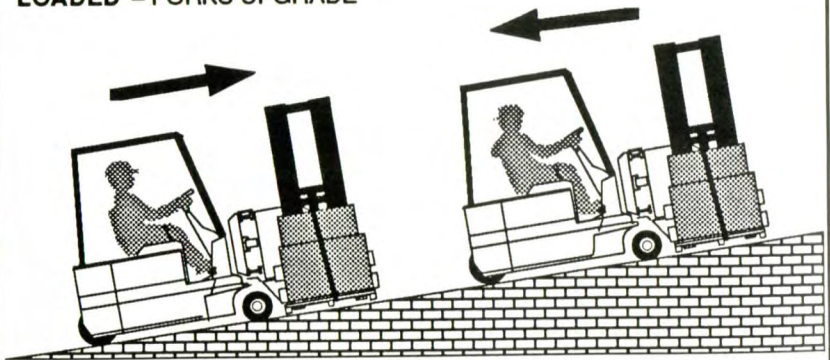
This truck is designed to operate on level floors, but when a slope is encountered, follow these instructions in addition to the general traveling procedures.

UNLOADED – FORKS DOWNGRADE



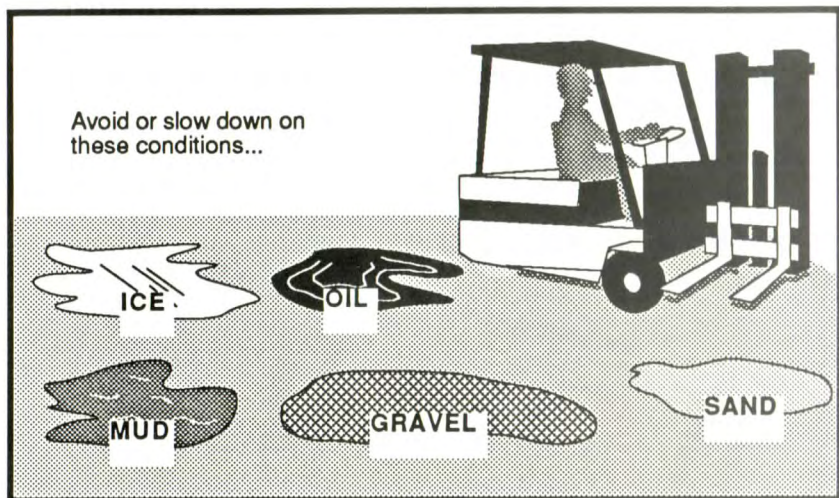
Never turn on a grade.

LOADED – FORKS UPGRADE



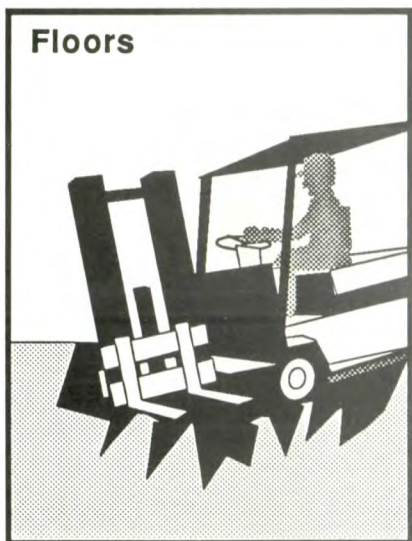
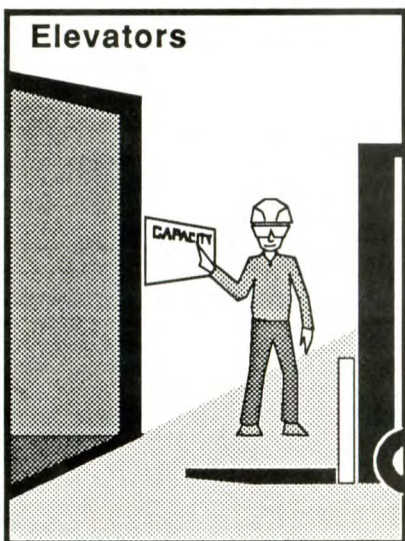
Never turn on a grade.

General Safety Rules Surface and Capacity



...they can cause a truck to tip over.

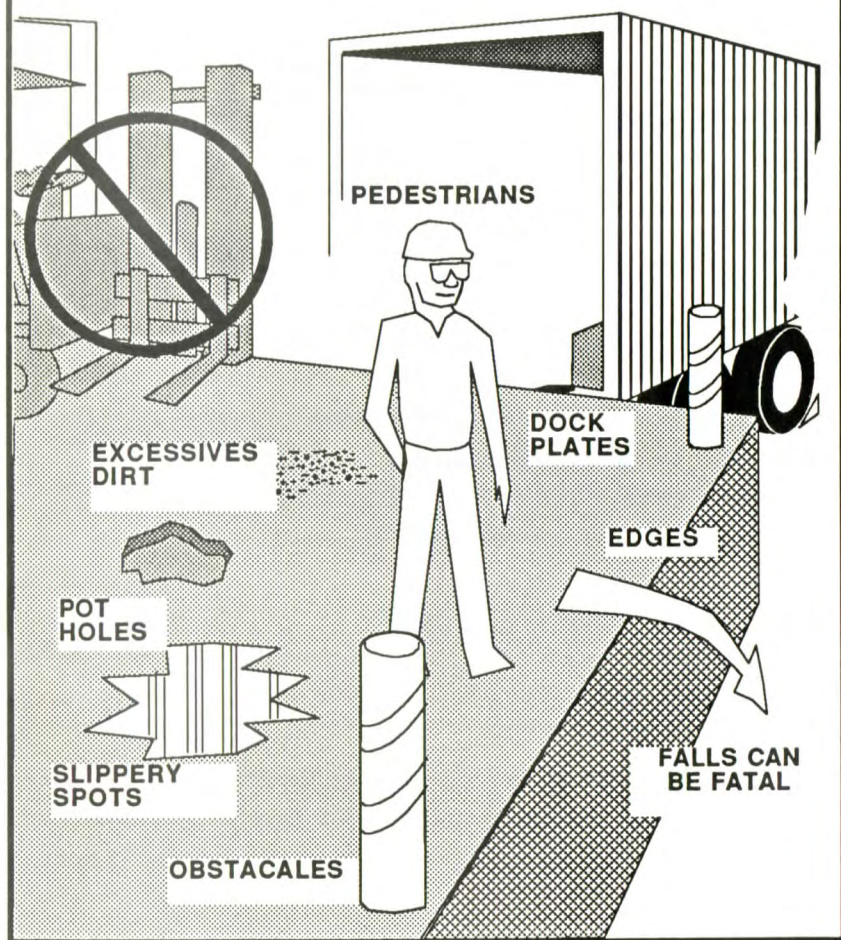
Know the weight of your truck and load. Check capacities of...



General Safety Rules Loading Docks



**THIS TRUCK
IS NOT
DESIGNED FOR DOCK OR
OTHER OUTSIDE USE**



General Safety Rules Tipovers



WARNING

Lift trucks can be tipped over
if operated improperly.

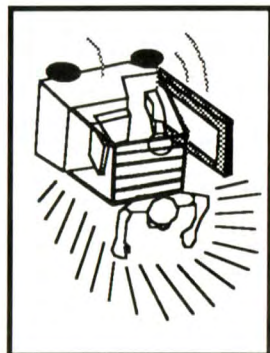
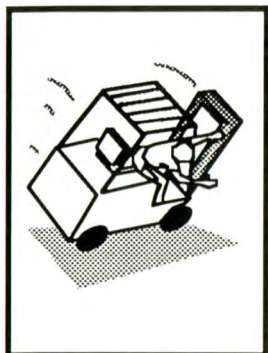


**A lift truck can tip over if you
break operating rules.**

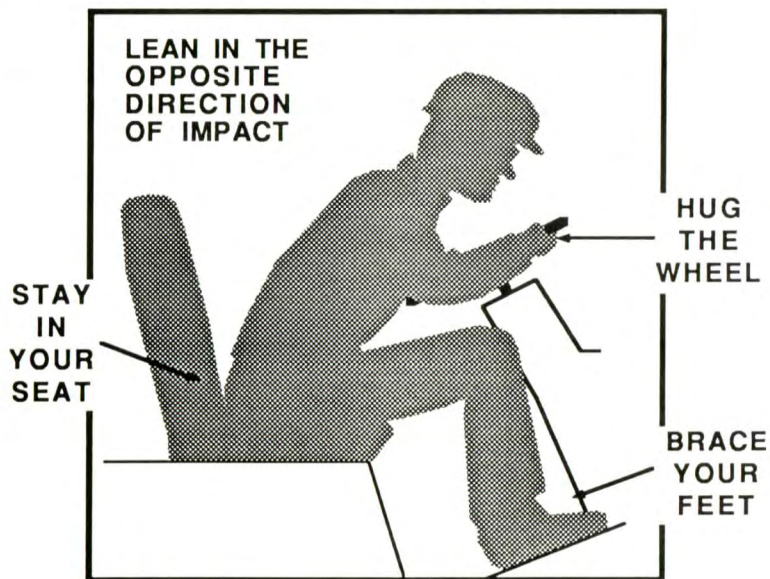
General Safety Rules

Don't jump

Your chances of survival in a tipover are better if you stay with the truck and in your seat.

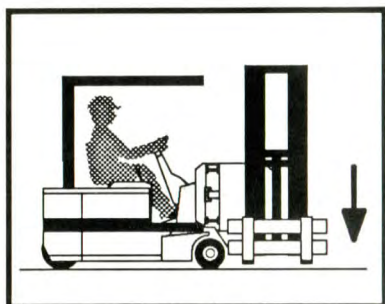


TIP WITH THE TRUCK



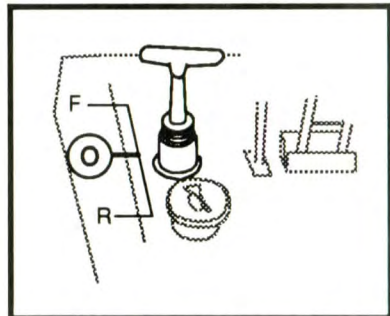
General Safety Rules Parking

Never park on a grade.

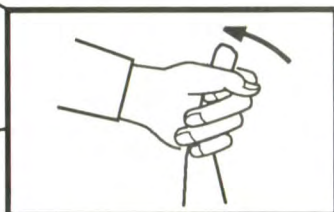


Swing in and retract forks before lowering to ground.

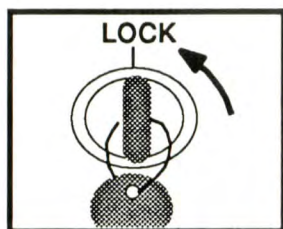
Always come to a complete stop before leaving truck.



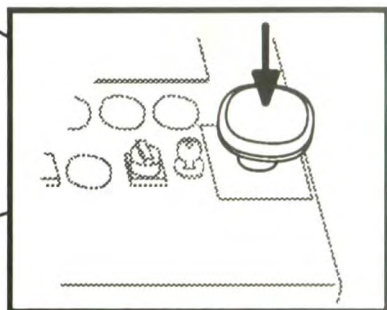
Be sure travel control is in neutral ("O").



Set parking brake.



Turn key to "LOCK" position and remove key.



Press battery emergency switch.

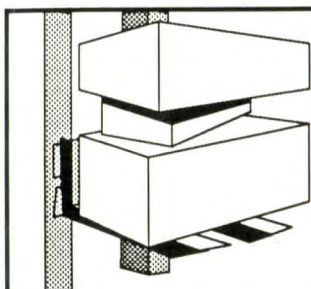
2 Operating Hazards

- 2.2 Loose Loads
- 2.3 Unbalanced Loads
- 2.4 Long and Wide Loads
- 2.5 Rear Swing
- 2.6 Low Overhead Clearance
- 2.7 Fast Turns and High Loads
- 2.8 Chain Slack
- 2.9 Pallets and Skids



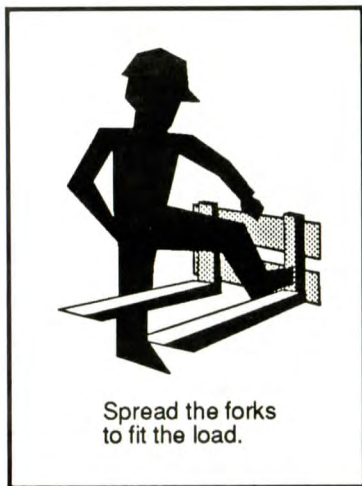
This section shows hazards that may cause you, or someone around you, to be severely hurt or killed. As the operator, you must look for other hazards. Get your boss to help you identify and avoid those hazards.

Operating Hazards Loose Loads

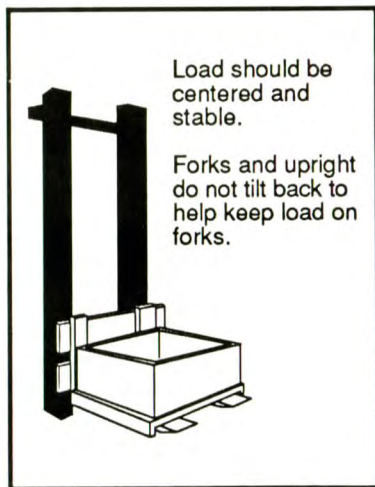


WARNING **Loose Loads**

Never carry loose
or uneven material.



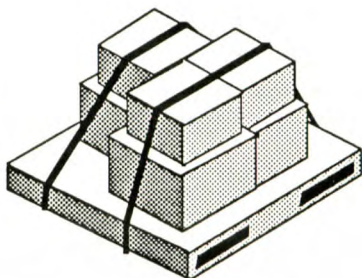
Spread the forks
to fit the load.



Load should be
centered and
stable.

Forks and upright
do not tilt back to
help keep load on
forks.

Stack and band
loose material.



Operating Hazards Unbalanced Loads



WARNING **Unbalanced Loads**

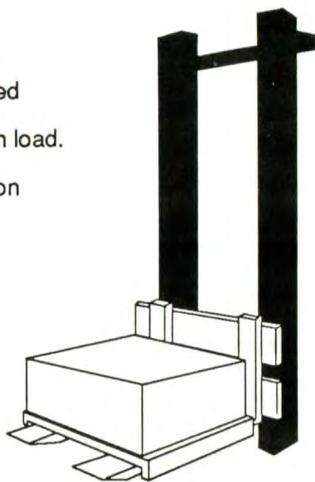
An unbalanced load could cause damage to the product, rack or truck, or cause injury to the driver or pedestrians.

No Upright or Carriage Tilt

This truck does not have upright or carriage tilt capabilities to help stabilize (or balance) the load. Extra care should be taken in doing operations such as lifting, rotating or traveling.

Load weight should be equally balanced on the forks. If necessary, rearrange load before picking up and moving with load.

Follow the load capacity rating plates on your truck carefully.

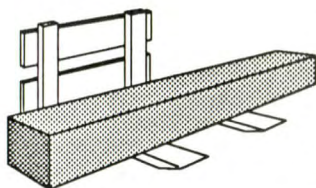


Operating Hazards Long and Wide Loads



WARNING Long and Wide Loads

With long or wide loads you need more room—so—slow down and watch your clearance.



Keep wide loads low and centered. The load must be balanced on the forks and can not be wider than the aisle or rack openings.



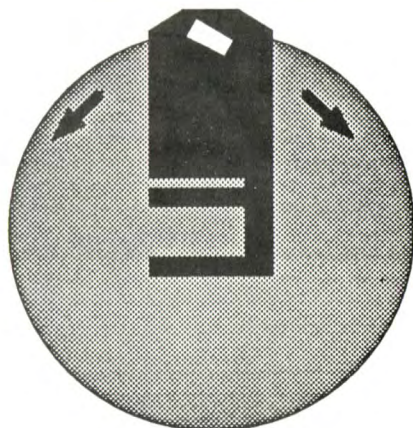
WARNING

Long loads may cause truck to tip.

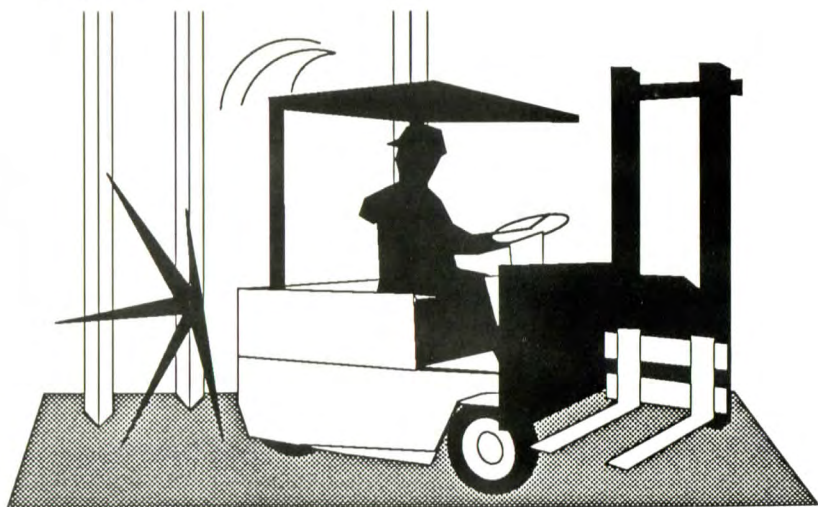
Remember, a long load will reduce the capacity of the truck.
KNOW AND UNDERSTAND NOT ONLY YOUR TRUCK LOAD RATING, BUT ALSO THE FORK AND ATTACHMENT RATINGS.

Operating Hazards Rear Swing

 **WARNING**
Rear Steering



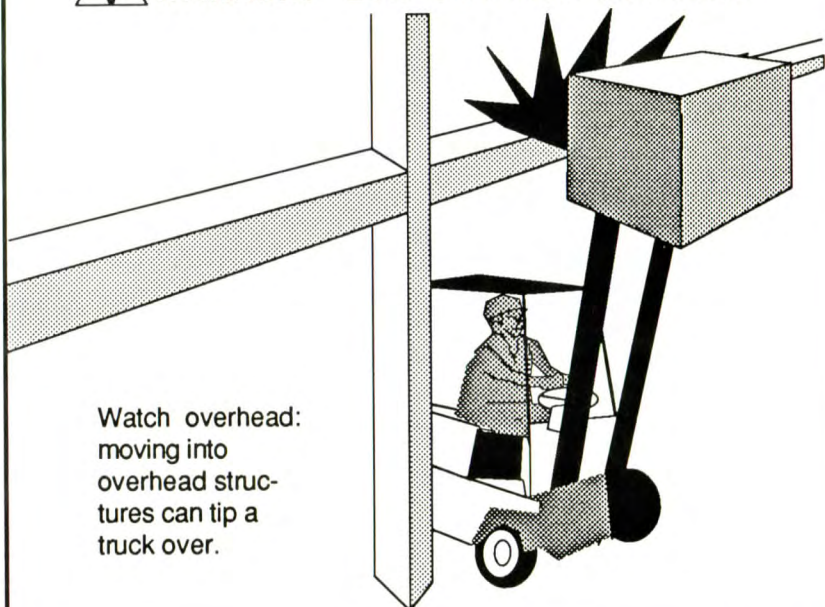
When turning, be sure the rear of the truck does not swing into racks, posts, people etc.



Operating Hazards Low Overhead Clearance

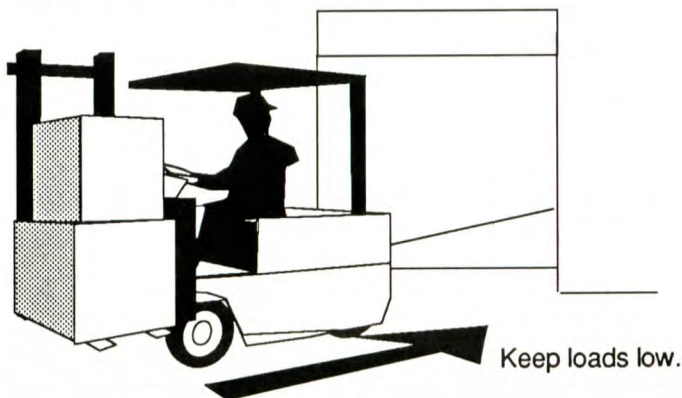


WARNING Low Overhead Clearance



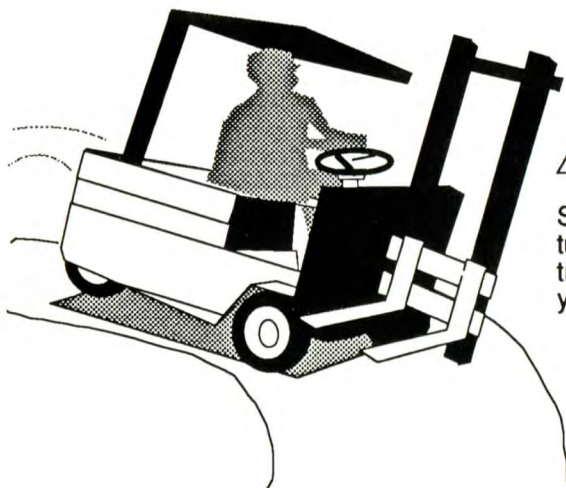
Watch overhead:
moving into
overhead struc-
tures can tip a
truck over.

Know the height of your truck.
Check your clearance.



Keep loads low.

Operating Hazards Fast Turns and High Loads



WARNING **Fast Turns**

Slow down before turning. Even empty trucks can tip over if you speed.

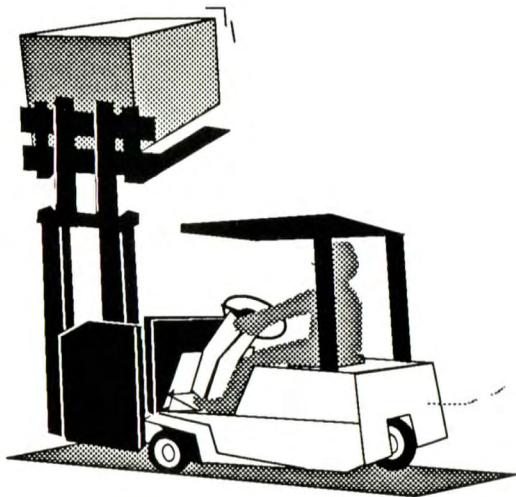


WARNING **High Loads**

Turn too sharp with a raised load and your truck can tip even at slow speeds.

Travel with load raised only when removing or depositing a load.

Avoid stopping quickly unless absolutely necessary. Load may shift or truck could tip over.

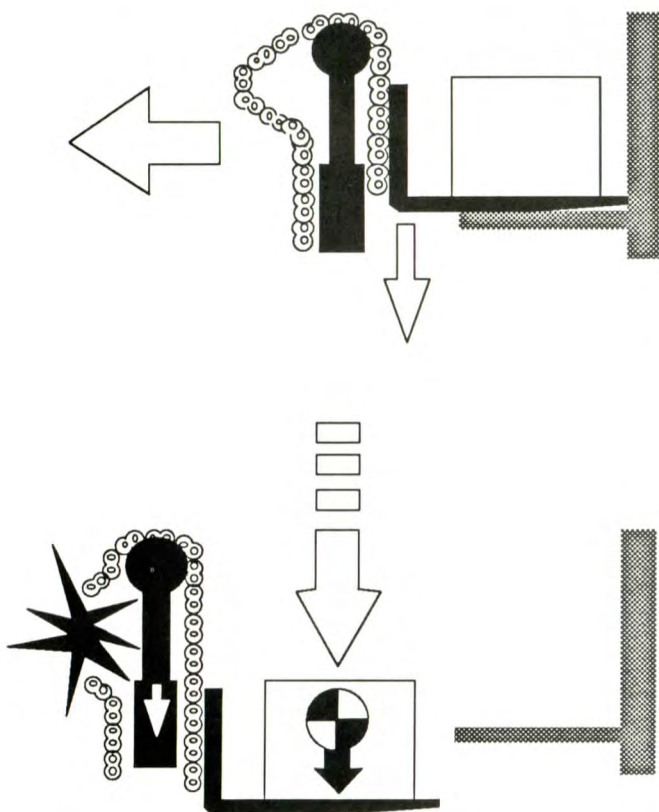


Operating Hazards Chain Slack



WARNING **Chain Slack**

Slack chains mean rail or carriage hang-up. Raise the forks before you move.

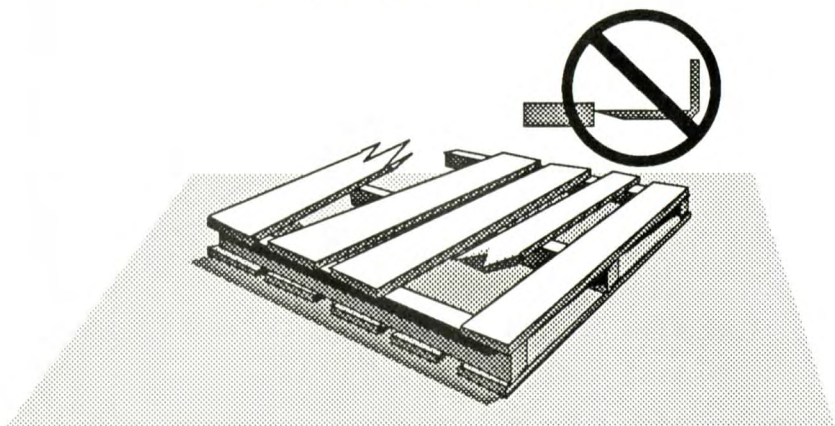


Operating Hazards Pallets and Skids



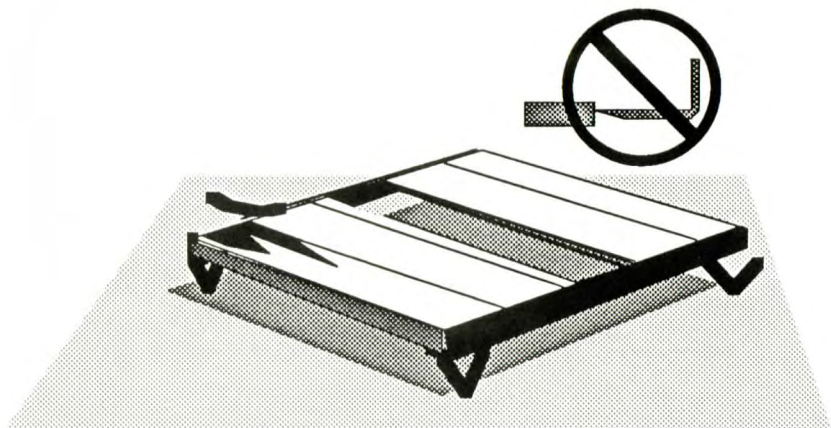
WARNING

Poorly maintained and/or
damaged 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.

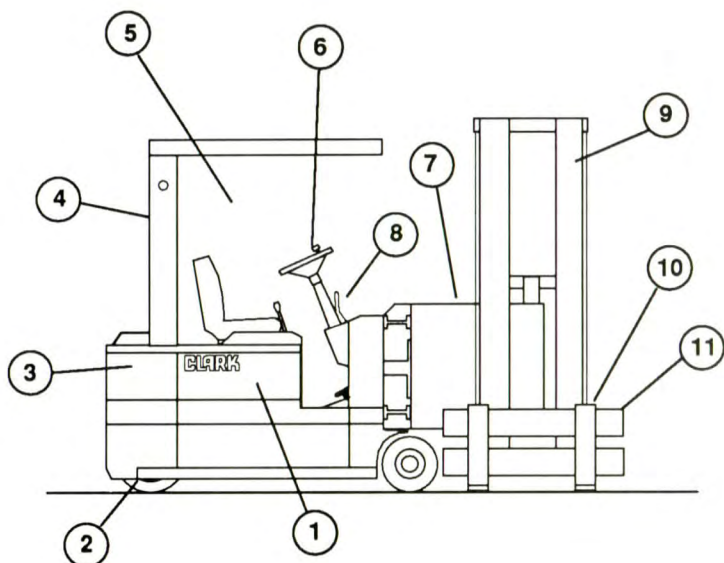


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3 Know Your Truck

- 3.2 Truck Model Description**
- 3.3 Nameplates and Decals**
- 3.8 Operator's Compartment & Controls**
- 3.10 How Your Lift Truck Operates**

Know Your Truck Truck Model Description

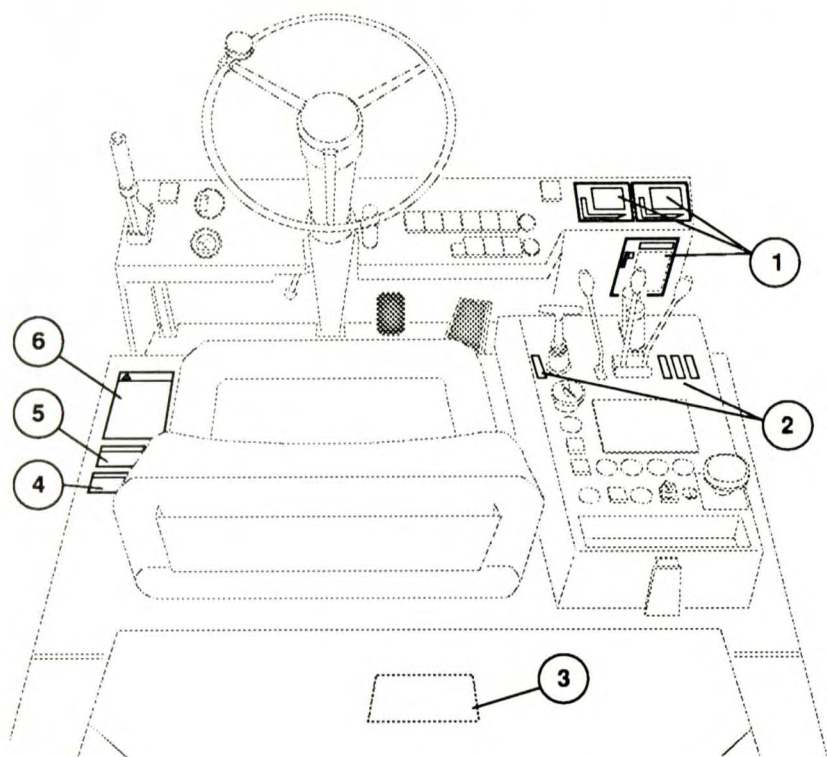


CLARK ETR 13

**TRUCK TYPE – Counter Balanced Front/Side Loader
Electric Sit-Down Rider
Cushion Tire**

1. Battery Compartment
2. Drive/Steer Axle and Cushion Tire
3. Counterweight
4. Overhead Guard
5. Operator's Compartment
6. Steering Control Handwheel
7. Articulated Reach Unit
8. Parking Brake
9. Upright
10. Forks
11. Carriage

Know Your Truck Nameplates and Decals



OPERATOR'S COMPARTMENT DECALS and NAMEPLATES

1. Truck Data and Capacity Plates
2. Lever Function decals.
3. Maintenance Warning decal
(on underside of cover)
4. Electrical Cleaning decal
5. Battery Specification and
Restraint decal
6. Operator Safety Warning decal

NOTICE

NAMEPLATES & DECALS

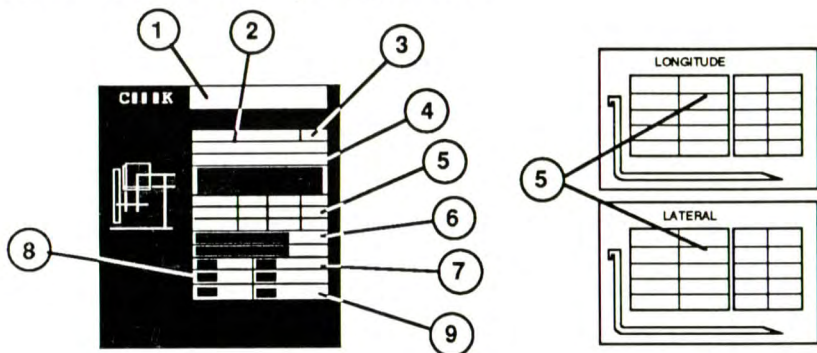
DO NOT operate a lift truck with damaged or lost decals and nameplates. Replace them immediately. They contain important information.

OSHA laws require you to maintain the decals and nameplates in readable condition at all times.

Know the location of all plates and decals and know what they mean before you operate the truck.

Know Your Truck Nameplates and Decals

Truck Data and Capacity Plates



Pictures are a representation only

KNOW AND UNDERSTAND THE MEANING OF THE DATA ON YOUR TRUCK'S NAMEPLATE

1. Truck registered name.
2. Truck model number and serial number. These are identification numbers assigned to this particular truck and should be used when requesting any information or when ordering service parts for this truck from your authorized CLARK dealer.
3. Type Designation. The code letters signify the type of construction with safeguards against fire, explosion or electrical shock hazards for operation in nonclassified and classified areas. Check with proper authority before entering areas where flammable or explosive material may be present.
4. 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.
5. Capacity rating, load center, and lifting height data. This shows the maximum load capacity of this truck with relation to load centers and fork heights in the longitude (forks extended forward) and lateral (forks sideshifted) positions (see diagram on large plate). Personal injury and damage to the truck can occur if these capacities are exceeded. **DO NOT EXCEED MAXIMUM SPECIFIED.**
6. Truck weight, less load.
7. Battery weight.
8. Battery ampere-hour rating.
9. System voltage.

IMPORTANT

When attachments are added or if the truck is modified, the capacity of the truck may be affected. Contact your authorized Clark dealer for new plates showing the revised information. Be aware that the attachment and truck may have different capacities.

Know Your Truck

Nameplates and Decals

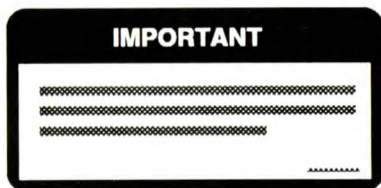
Safety and Warning Decals

Safety and warning decals are placed in conspicuous locations on the truck. These decals are provided to remind you of either essential procedures or to prevent you from making an error which could damage the truck or possibly cause personal injury. It is important that you know, understand and follow these instructions.

These safety and warning decals should be replaced immediately if missing or defaced (damaged or illegible). Refer to the Service Manual for more information on exact location of all decals.

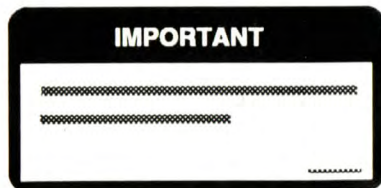
Battery Specification and Restraint Decal

This decal is located to the left of the driver's seat. It states that the proper battery specifications and restraining information can be found in the truck's packet or operator's manual.



Electrical Cleaning Decal

This decal, located to the left of the driver's seat, notifies the operator and the mechanic that electrical components should not be cleaned with a solvent or steam.



Know Your Truck

Nameplates and Decals

Operator Safety Warning Decal

This operator warning decal, found to the left of the driver's seat on the seat deck, describes basic instructions for safe operation of a turret truck. Read and understand these instructions (repeated below) and the other safety messages in this manual and on the lift truck itself.



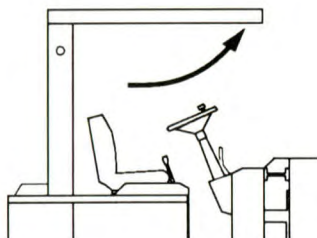
BREAKING THESE RULES WILL CAUSE SERIOUS OR FATAL INJURY TO YOURSELF AND OTHERS

- Special training and authorization are required before operating this lift truck even if you have operated other trucks.
- Read the attached Operator's Manual before starting. Ask your employer for help if you do not understand any part of it, or if it is missing.
- This truck must be inspected every shift. If it needs repair, do not drive it. Do not try to fix it yourself. Report any problems to your employer.
- The forks on this machine do not tilt. Do not move loose loads. Move all loads smoothly and slowly. Never lift loads over the capacity on the data plate.
- Side shift and rotate attachments can crush or hit people. Do not move forks when people are near.
- Lift trucks will tip over if not properly operated, stay with the truck. Operate only inside on smooth, dry level floors. Travel slopes with loads uphill, never turn or park on them. Follow your employer's operation, speed, and traffic rules.
- Forks or attachments can fall rapidly if not properly controlled or maintained. Do not use this truck to raise people. Never carry riders.
- Look where your truck is going. Watch out for people, obstructions (especially overhead), and drop offs. If load blocks your view, drive backwards, except up slopes.
- Red disconnect button stops all equipment but does not disconnect battery. Unplug battery before opening controller cover.
- Protect against falling objects. Overhead guard must be in place. Stay under guard when stacking on side or front.
- Before getting off truck, lower forks, rotate to side, and center. Put drive in neutral, push disconnect button, lock key, and set parking brake.

Know Your Truck Nameplates and Decals

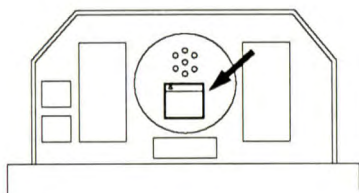
Overhead Guard Conformance Plate

This plate, permanently attached to the overhead guard on the upper right inside corner, confirms that the overhead guard assembly design has been tested and conforms to the requirements of ANSI B56.1 safety standards.



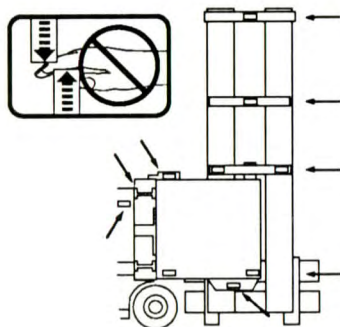
Truck Can Move Unexpectedly Decal

This decal, located on the underside of the rear SCR cover, warns that the truck can move unexpectedly if precautions are not followed when working on the truck.



Upright Warning Decal

This safety decal is placed on the upright and reach unit in several places. They warn of the danger of injury from movement between rails, chains, sheaves, fork carriage and other parts of the upright / reach unit assembly. Personal injury will result if any part of your body is caught between moving parts of the truck.

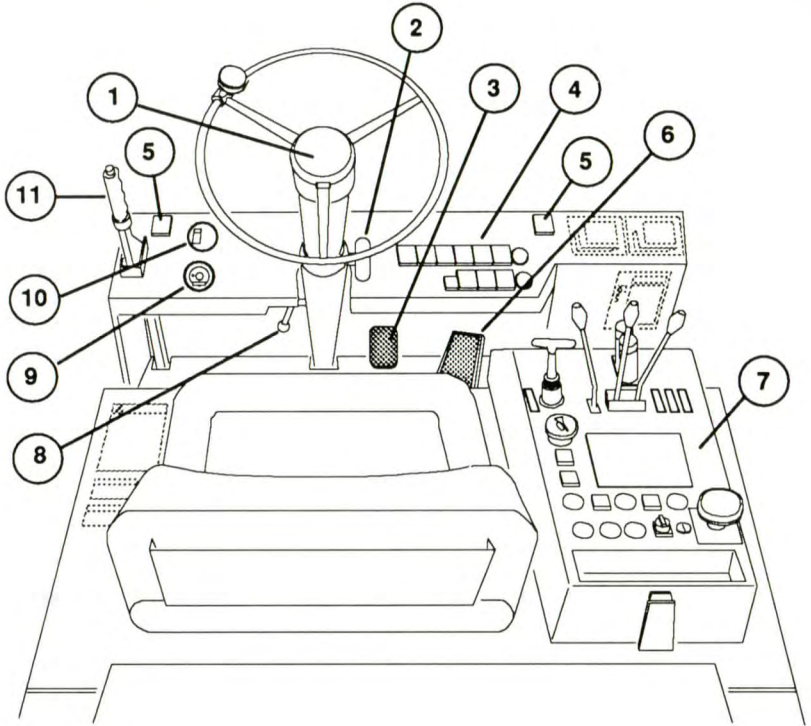


Keep Away From Forks Decal

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



Know Your Truck Operator's Compartment & Controls



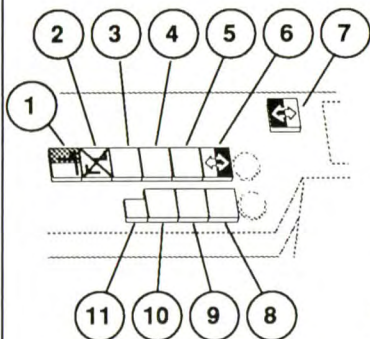
Familiarize yourself with the controls and follow safe operating rules.

- | | |
|---|--|
| 1. Steering Handwheel | 7. Control Console
(see following page) |
| 2. Steering Wheel Lock | 8. Steering Wheel Adjuster |
| 3. Brake Pedal | 9. Duty Hour Meter |
| 4. Indicators and Pushbuttons
(see following page) | 10. Battery Discharge Indicator |
| 5. Steering Wheel Position Lights | 11. Parking Brake Lever |
| 6. Accelerator Pedal | |

Know Your Truck

Operator's Compartment & Controls

INDICATORS and PUSHBUTTONS

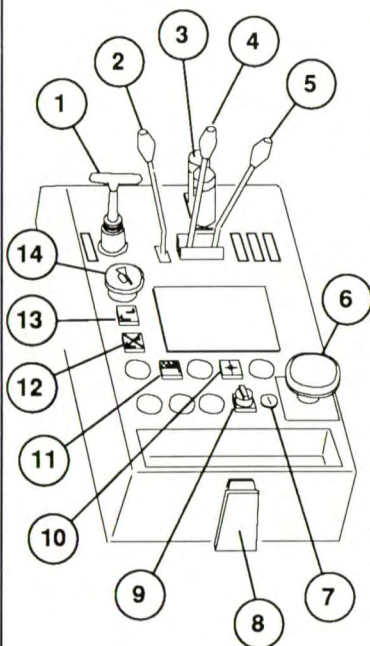


1. Indicator- Lift limit override *
2. Indicator- Sideshift blocked
3. Pushbutton- Rotating beacon *
4. Pushbutton- Working lights *
5. Pushbutton- Shelf indicator light *
6. Pushbutton- Steer wheel position light
7. Pushbutton- Steer wheel position (left indicator not shown)
8. Indicator- Autormatic steering 'ON' **
9. Indicator- Tracking is possible **
10. Indicator- Tracking is 'ON' **
11. Acoustic Signal- Tracking is 'ON' **

* Optional equipment

** Wire guided trucks only

CONTROL CONSOLE



1. Lever- Directional control (FWD/REV)
2. Lever- Lift
3. Valve- Pressure limiting screws for articulating reach unit
4. Lever- Sideshift (reach)
5. Lever- Rotate
6. Button- Emergency OFF switch
7. Switch- Key
8. Switch- Automatic steering 'ON - OFF' **
9. Latch- Console
10. Pushbutton- Automatic steer wheel positioning- Straight ahead ***
11. Pushbutton- Lift limit override *
12. Pushbutton- Sideshift 'blocked'
13. Pushbutton- Sideshift 'free'
14. Horn

* Optional equipment

** Wire guided trucks only

*** Option on trucks with electric steering

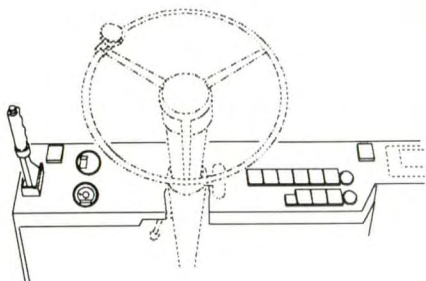
Know Your Truck

How Your Lift Truck Operates

FRONT PANEL

The Front Panel includes the:

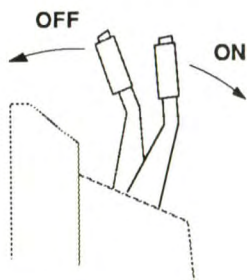
- parking brake lever
- steering wheel position lights
- hourmeter
- battery discharge indicator
- indicators and pushbuttons



Parking Brake

The parking brake lever mechanically actuates the service brake. The lever is connected by cable to an actuating mechanism in the load (front) wheels.

Pull the lever completely back (toward the operator) to apply the parking brake. The lever should lock firmly into position when correctly adjusted. To release, pull back slightly while pressing release-button on top of lever and guide lever to 'OFF' position.



WARNING

Never operate your lift truck if the service or parking brakes are not working correctly.

Steering Wheel Position Lights

These lights indicate which way the steering wheel is pointing in relation to the truck. When both lights go out, the steering wheel is in the straight ahead position. These indicators are used

to align the truck in an aisle either when holding the steering wheel manually or when using the steering wheel lock. Both lights must be off when traveling in an aisle.

Hourmeter

The dial meter indicates, in hours and tenths of an hour, the operating time of the truck. Its function is to record total operating time on the truck, which is used to determine maintenance intervals. The hourmeter operates

only when the lift pump and/or steering pump are operating. Dial operation can be checked by watching for movement of the indicator on the dial's face.

Battery Discharge Indicator

The battery discharge indicator shows battery charge condition. It operates continuously when the key switch is on and the emergency off switch is pulled.

The dial is calibrated into fourths (1/4) of the total battery charge, where '1' is a fully charged battery and '0' indicates that there is no charge.

Know Your Truck

How Your Lift Truck Operates

Indicators and Pushbuttons

The standard indicators and push-buttons mentioned here, will light up when that specific operation is activated.

The 'sideshift blocked' indicator tells the operator that travel is possible; this is controlled by the sideshift 'free'

and 'blocked' buttons on the control console.

The steering wheel position lights can be turned on or off by pressing the steering wheel position button. They are used when aligning the truck in an aisle.

ELECTRICAL CIRCUIT

The electrical circuit includes:

Drive motor control switches:

1. When the sideshift button is pressed during loading/unloading, the electromagnetic brake on the drive motor is applied automatically.
2. When the accelerator is released, the electromagnetic brake begins to be applied automatically.

Power steering control switches:

1. The steer motor operates only when the emergency off switch is pulled and the handwheel is turned.

Lift pump control switches:

The lift pump operates only when:

1. Lift control lever is moved to the "raise" position.
2. Reach and rotation control levers are moved from the "neutral" position, either forward or backward.
3. Aux control lever (optional) is moved from the neutral position.

HYDRAULIC CUTOFF FACILITIES

For stability reasons, the hydraulic lift pump motor is switched off at a certain lift height (set differently depending on model and circumstances in the place of operation). Also, the reach unit can then no longer be turned, and forks positioned in longitudinal direction can no longer be raised after a certain set height.

The hydraulic lift pump motor is switched off if several hydraulic control levers are actuated at the same time. It is not possible to shift or rotate the mast and raise the forks at the same time.

With load carrying attachment shifted or turned, the vehicle can only be driven at crawling speed as an automatic function.

Depending on the vehicle version, the truck can only be driven at half speed or in some cases, completely stopped after reaching a certain lift height.

If a fault occurs in the hydraulic braking system, the front wheel brakes are automatically applied by hydraulic pressure from the reservoir.

Know Your Truck

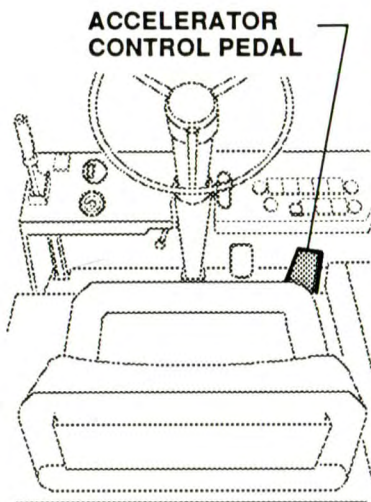
How Your Lift Truck Operates

ACCELERATOR CONTROL PEDAL

With the accelerator pedal you control the required truck travel speed and power. The accelerator pedal activates the accelerator control which regulates drive motor speed. When the accelerator pedal is released, a solenoid activates the electromagnetic brake on the drive motor to help slow down the truck.

Plugging

The accelerator control applied together with the direction control can be used for "plugging". Plugging, when the truck is moving (traveling), consists of moving the direction control lever to the position opposite the direction of travel while your foot is still depressing the accelerator pedal. The truck should slow to a smooth, controlled stop and accelerate in the opposite direction.



CONTROL CONSOLE

The Control Console includes the:

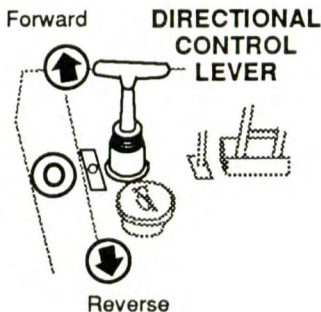
- directional control lever
- horn button
- key switch
- battery emergency off switch
- lift lever
- sideshifter lever
- rotation lever

Directional Control --- "Forward" or "Reverse"

Direction-of-travel is selected with the T-shaped control lever on the control console. The control lever has three positions.

- **FORWARD** (push lever)
- **NEUTRAL** ("O")
- **REVERSE** (pull lever)

The control lever, which controls direction electrically, is held positively in each position by spring detents in the lever assembly. Selection of travel direction may be noted by a visual comparison of the lever to the decal at left of lever.



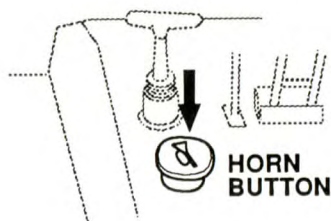
Know Your Truck

How Your Lift Truck Operates

Horn Button

The horn button is located on the control console, and is electrically connected by contacts and wiring to the horn assembly installed in the dash of the truck. Press to operate.

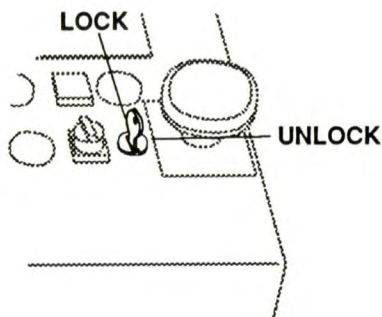
The horn will not operate when the battery emergency off switch is pushed in.



Key Switch

The key switch has no electrical function. It is a safety lock for the battery emergency off switch.

The key switch must always be turned to the UNLOCK position to allow operation the truck. When the key is in the LOCK position, the emergency off switch will not operate. All instrument, drive, and pump motor electrical circuits are disconnected (shut off), and the key should then be removed.



Battery Emergency Off Switch

Pulling the emergency off switch button engages a switch sending an electrical signal to the SCR control where power is allowed to flow to the rest of the truck. When the button is pushed down, all power is cut off; shutting down all truck functions.

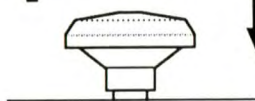
IMPORTANT

This button switch does not disconnect the battery power from the SCR control. Always disconnect the battery power cable, under the seat deck, when inspecting or working in the electrical control compartment.

CONNECT



DISCONNECT



Know Your Truck

How Your Lift Truck Operates

Main Hydraulic System

The parts of the main hydraulic system are the hydraulic sump tank, main hydraulic pump and motor, main control valve, and associated hydraulic lines and hoses.

Oil from the hydraulic sump tank is fed by a gear pump to the main control valve. From the main control valve the oil is directed to either the lift cylinders or the articulating reach unit cylinders. Filtration of the main hydraulic system oil is provided through a full-flow return-line filter in the hydraulic circuit.

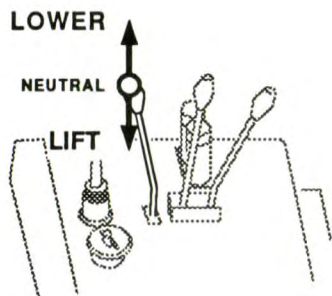
In order to avoid unnecessary mechanical or hydraulic loads, the control lever should be returned to the neutral position as soon as the hydraulic pressure limiting valve is activated.

Gentle and slow movement of the hydraulic control levers permit more precise control of the fork movements. The speed at which the hydraulic function operates is determined by the distance the lever is pushed or pulled from the center neutral position.

Lift Control Lever

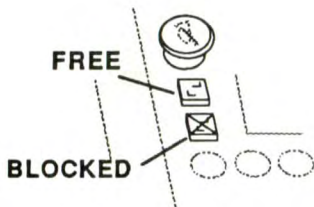
The lift control lever regulates the raising and lowering of the carriage on the upright. To lift the carriage, pull back on the lift lever. When the desired height is reached, release lever to neutral.

When the lift control lever is pushed forward, the carriage is lowered. The fork carriage can be lowered when the lift motor is stopped.



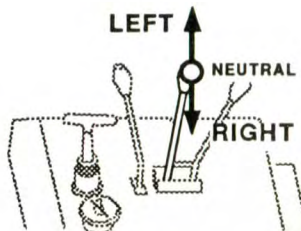
Sideshift Free/Blocked Buttons

In order to operate the reach or rotate functions, the "sideshift free" button must be pressed. This will allow the hydraulic function to perform while cutting off the drive motor capability with the electromagnetic brake. The truck will not be able to move until the "sideshift blocked" button is pressed.



Reach Control Lever

With the reach control lever, you are able to control the side shifting of the upright and forks. When the lever is pulled back, the upright and forks move to the right. Push the lever forward and the upright and forks move to the left. The "sideshift free" button must be pushed before this operation can occur.



Know Your Truck

How Your Lift Truck Operates

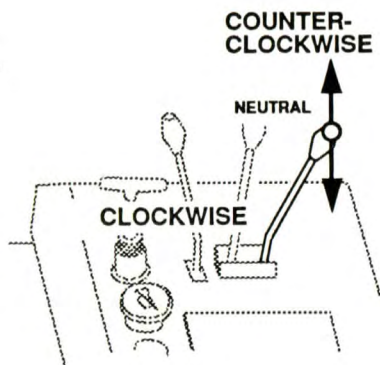
Rotation Control Lever

When the rotation control lever is activated, the forks will start to turn to the opposite side they are currently facing. Pull the lever, and forks will rotate in a clockwise direction (left to right). Push the lever and they will move in a counterclockwise direction (right to left).



CAUTION

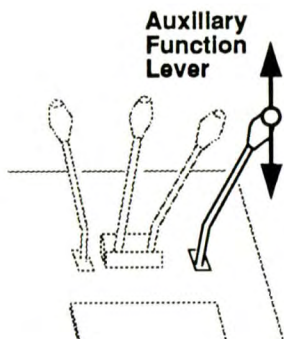
When rotating forks, check the clearance in front of the truck.



Auxiliary Function Control Lever (Optional)

If your lift truck is equipped with an optional attachment, an additional control lever will be mounted to the right of the rotation control lever.

With the optional aux control lever, you are able to control the flow of hydraulic oil to a material-handling attachment connected to the fork carriage according to the requirements of the attachment.



SERVICE BRAKES

Your truck has a manual service brake system. The single pedal which actuates a master brake cylinder, applies braking power to the front wheel brakes.

Your truck also has an electromagnetic brake on the drive motor which is automatically activated when the accelerator pedal is released. After the sideshift blocked button is pressed, the electromagnetic brake will automatically be reapplied after a 10-15 second delay if the truck is not put into motion.



WARNING

Never operate your lift truck if the service or parking brakes are not working correctly.

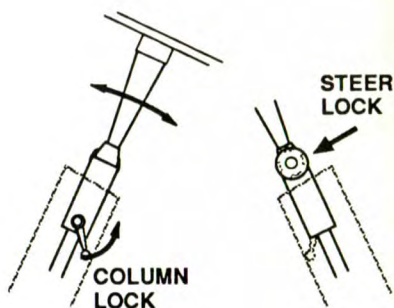
Know Your Truck

How Your Lift Truck Operates

STEERING COLUMN

The steering column is designed to be adjustable. Rotate the column lock handle upward to release the column. Position the column, forward or backward, to a comfortable operating position and rotate the lever downward to the locked position.

The steer lock is used to lock the steer wheel in the straight-ahead position.



POWER STEERING SYSTEM

The truck is steered using an electronic steering system. There is no mechanical linkage between the steering handwheel and the steer motor. The motor is located in the rear compartment on the left side of the truck.



WARNING

Never operate a lift truck which has a faulty steering system.

There is no steering when the truck is not receiving power from the battery.

SEAT ADJUSTMENT

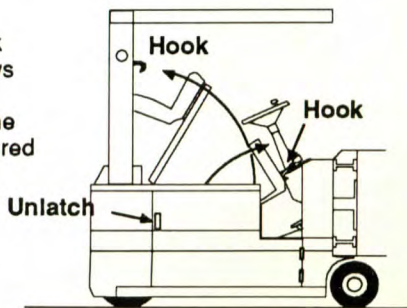
The seat adjustment levers are located on the left side and underside of the seat. Adjust seat so that all controls may be comfortably reached from a relaxed driving position. Be sure that the seat locking mechanisms are fully engaged. The seat mounting base allows a six-inch fore-and-aft adjustment.



BATTERY COMPARTMENT ACCESS

The combination seat deck / battery cover is hinged for easy access to the battery. Releasing the latch at the back of the control console storage bin, allows the whole console to be tilted forward and secured by the hook and chain. The seat deck also is to be raised and secured by the hook.

The right and left side panels can be unlatched and swung open for the removal / installation of the battery.



4 Truck Inspection

4.2 Daily Safety Inspection

NOTICE

The Occupational Safety and Health Act (OSHA) requires that the user examine his trucks before each shift to be sure the trucks are in safe working condition. Defects, when found, shall be immediately reported and corrected. The truck shall be taken out of service until it has been restored to a safe operating condition.

Truck Inspection Daily Safety Inspection

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

Check for damage and maintenance problems, and have repairs made before you operate the truck. Unusual noises or problems should be reported immediately to the user's supervisor or other designated authority.

Do not make repairs yourself unless you have been trained in lift truck repair procedures and authorized by your employer. Have a qualified mechanic correct all discrepancies using genuine CLARK or CLARK-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 and report the problem immediately and have it corrected.

OSHA requires lift trucks to be inspected every 8 hours, or at the start of each shift. This daily inspection should include a visual check for leaks and any obvious damage which may have been caused by operation during the last shift. Be sure that the overhead guard is in good condition. Inspect the upright and lift chains. Check the forks and fork bars. Look for loose bolts and fittings. Check the tires, wheels and wheel mounting bolts. Check the hydraulic sump oil level. Check all the controls. Operate the truck briefly to be sure that all systems are operating correctly, and that all instruments, warning lights and the horn are functioning.

As an aid in carrying out this inspection, CLARK has prepared a form called "Driver's Daily Checklist". We recommend that you use this form to make a daily record of your inspections and truck condition. Copies may be obtained from your CLARK dealer.

Truck Inspection

Daily Safety Inspection

HOW TO PERFORM THE DAILY SAFETY AND OPERATING CHECKS

VISUAL INSPECTION

First, perform a visual inspection of the truck and its major components. Walk around your lift truck and take note of obvious damage which may have been caused by operation during the last shift.

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

Check that the battery is installed and secured in position correctly. Check battery connector for safe condition. Look for any external leakage around drive axle and under the whole truck.

Check for hydraulic oil leaks and loose fittings. Oil may be hot or under pressure.



DANGER

DO NOT USE BARE HANDS TO CHECK FOR HYDRAULIC LEAKS. HIGH PRESSURE OIL CAN PENETRATE YOUR SKIN AND CAUSE SERIOUS INJURY.

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

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

Inspect the upright and lift chains. Check for obvious wear and maintenance problems such as damaged or missing parts, leaks, slack or broken chains, bent parts, etc. Check all attachments, chains, cables, and limit switches.

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.

Inspect the wheels and tires for safe mounting and wear condition.

Check fluid levels.

FUNCTIONAL TESTS

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

Turn key to the unlocked position and pull battery disconnect knob. Be sure all controls and systems are functioning correctly. Check the hourmeter for operation. Operate the service and parking brakes, all hydraulic controls (lift, reach, rotate and aux functions), accelerator, directional control, and steering system. Be sure all controls operate freely and return to neutral properly. Operate the lift mechanism and auxiliary function (if installed).

For further explanation of procedures, see Planned Maintenance and Lubrication section of this manual.

Truck Inspection Daily Safety Inspection

WHEN FUNCTIONAL CHECKS ARE COMPLETED:

- Bring truck to a complete stop.
- Lower the lifting mechanism: fork carriage and forks or attachments, fully to the floor.
- Put directional control lever in the "O" (neutral) position.
- Apply the parking brake.
- Depress battery emergency off switch.
- Turn the key switch to the LOCKED position and remove key.

Standard Shut-down Procedure

When parking and leaving truck unattended, lift mechanism should be fully retracted and lowered, controls placed in neutral, brakes set, and key removed. Block the wheels if truck is parked on an incline or has a possibility of moving.

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 in to the person responsible for lift truck maintenance. Be sure any unusual noises or problems are investigated immediately.

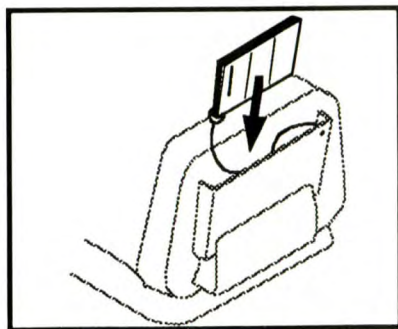
Do not operate a lift truck that has a maintenance problem, or is not safe to operate.

Remove the key from the key switch and put an "Out of Service" tag on the steering handwheel of the truck.

Report the problem to your supervisor.



Be sure to put this Operator's Manual back in the holder behind the seat. Read the manual again if you are not sure of all the lift truck operating procedures.




If all of the "Driver's Daily Checklist" items plus the necessary items listed in the "Planned Maintenance" section of this manual, check as being normal or satisfactory, the truck can then be operated.

5 Operating Procedures

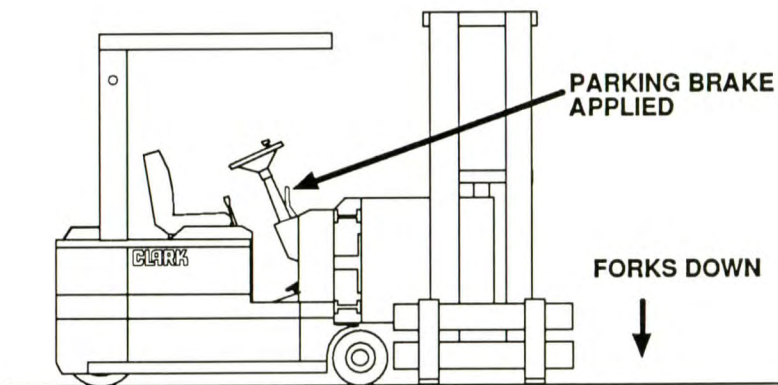
- 5.2 Before Operation
- 5.3 How To Operate Your Truck
- 5.14 After Operation

Operating Procedures Before Operation

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

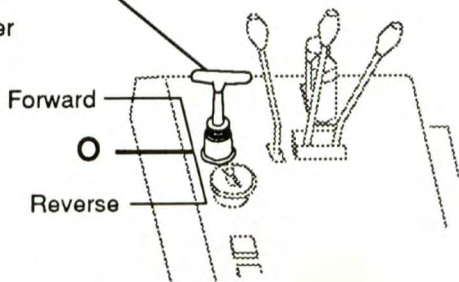
Before operating a lift truck check to see that:

1. Parking brake is applied.
2. Forks are fully retracted and lowered to the floor.
3. You are familiar with how all the controls function.
4. All controls are in neutral or their correct position.
5. Truck has been inspected, checked and is ready to operate.



Put the directional control lever in the "O" (neutral) position.

DIRECTIONAL CONTROL LEVER IN NEUTRAL

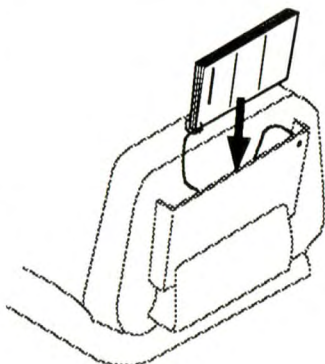


Operating Procedures

How To Operate Your Truck

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

The Operator's Manual is designed to be stored in the holder in the back of the driver's seat. It is placed there for ready reference by the operator. Keep it with the truck and refer to it often; whenever you have questions about an operating procedure.



Before using a lift truck, the operator must check the truck and complete the "Driver's Daily Checklist".



CAUTION

PROTECT YOURSELF -- Do not operate truck without an 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.

NOTICE

This truck can be dangerous if it is not used properly. Safe operation is the responsibility of the operator.

Remember, before operating a lift truck, it is good practice to always start from a safe condition. Check to see that:

- Parking brake is applied.
- Forks are fully lowered.
- You are familiar with how all the controls function.
- All controls are in neutral or their correct position.
- Truck has been checked and is ready to operate.

DO NOT OPERATE THE TRUCK, ANY OF ITS FUNCTIONS OR ATTACHMENTS, FROM ANY PLACE OTHER THAN FROM THE DESIGNATED OPERATOR'S POSITION.

Operating Procedures

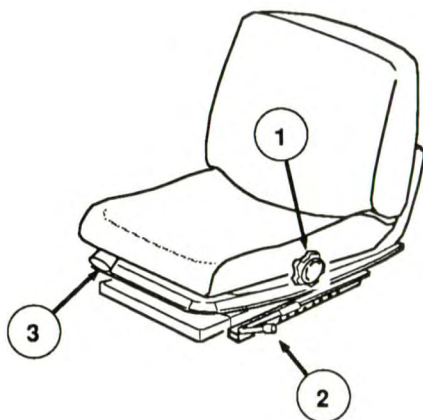
How to Operate Your Truck

RECOMMENDED OPERATING AND DRIVING PROCEDURES

Sequence of Operation

Adjust the seat to a comfortable position before starting the truck. Before sitting in the seat, turn handwheel (1) to the correct position corresponding to the driver's weight.

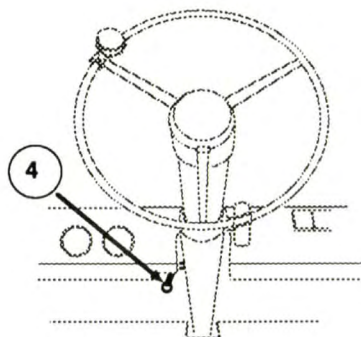
While seated, pull lever (2) upward and slide seat forward or backward to a comfortable position then release lever so that seat locks into position. To adjust back rest, pull lever (3) upward until back rest is in the required position. Release to lock into position.



IMPORTANT

To operate the truck, the operator must be sitting in the seat and capable of reaching all the controls from that position. Do not operate truck when you are off of or out of the seat.

Adjust the steering column to a comfortable position. Loosen the release lever (4) underneath dash to allow the steering wheel to be tilted forward or backward to a comfortable driving position.



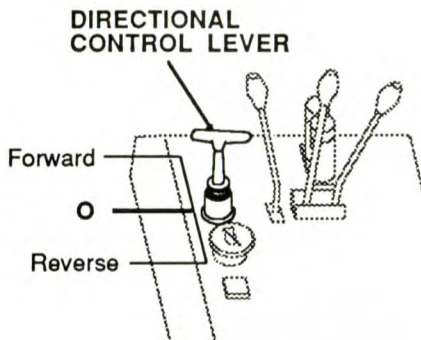
CAUTION

To avoid the possibility of loss of control and of personal injury, NEVER adjust the driver's seat or the steering wheel while truck is in motion.

NOTE

Do not turn the steering wheel when truck is parked.

Be sure that the directional control lever is in the "O" (neutral) position.



Operating Procedures

How To Operate Your Truck

Sequence of Operation (cont'd)

Insert the safety key and turn it clockwise as far as possible and release.

Pull out the battery emergency off switch.

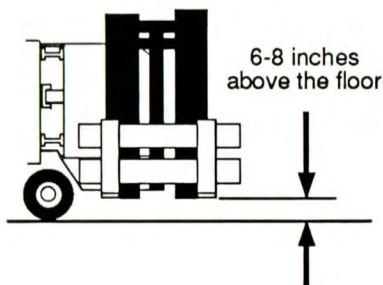
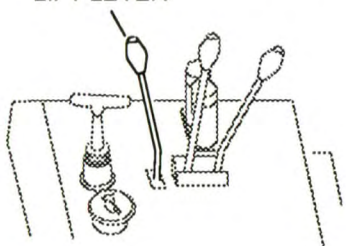
Press "blocking side reach" pushbutton. The indicator on the dash will light up.

Shift direction control lever to the desired direction of travel. If driving straight ahead, both steer wheel position lights should be off. If the truck is equipped with electric steering, the pushbutton for 'Automatic steer wheel positioning - Straight ahead' may be pushed (it should only be pushed when the truck is in a rail guided system).

Pull back on the lift control lever and raise the forks approx. 8 inches [20 mm] above the floor.

NOTICE - When driving, with or without a load, it is good practice to always raise the forks slightly. Raising the forks prevent the fork tips from catching on possible obstructions and reduces the wear on the fork blades by not striking or dragging on the floor.

LIFT LEVER



Stability

NOTICE - When the upright (carriage and/or load) is raised into a high position, the stability of the truck is reduced. Load capacity is based on fork position, lift height and the load center.

Some of the other conditions which may affect stability are: ground and floor conditions, grade, speed, loading, battery weight, dynamic and static forces, and the judgment exercised by the operator. Trucks equipped with attachments behave as partially loaded trucks even when operated without a load on the attachment. Also, improper operation, faulty maintenance, or poor housekeeping may contribute to a condition of instability.

Keep alert for the above conditions; avoid them or slow down.



WARNING

For stability reasons, do not travel with the load or carriage in a highly elevated position. Travel with the lift mechanism raised only enough to clear the floor or obstacles.

Be aware of your truck's hydraulic cut-off facilities and how it effects truck operation.

Operating Procedures

How To Operate Your Truck

Sequence of Operation (cont'd)

Push firmly on and hold the service brake pedal with your RIGHT foot.

Release the parking brake.

Look in the direction of travel to assure that you have a clear path. Put your RIGHT foot on the accelerator pedal and push down smoothly until the truck is moving at the desired speed.

Be careful when plugging...Any sudden change in direction can cause the load being carried to shift or fall off the forks.

Stop the truck by pushing down on the brake pedal in a smooth, firm motion until the truck is stopped.

IMPORTANT- Stop a lift truck as gradually as practicable. Hard braking and wheel sliding is dangerous and is damaging to the lift truck.



Operating Procedures

How To Operate Your Truck

SAFE OPERATION IS THE RESPONSIBILITY OF THE OPERATOR.

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

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

While driving, be alert for pedestrians, other vehicles or obstructions in your path of travel.

Watch for people. 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.

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

Travel in reverse if necessary for vision. Watch clearances, especially overhead and tail swing.



Operate your truck safely...

Operate truck only from the designated operator's position. Stay within the confines of the lift truck profile dimensions. Keep arms, legs, and hands inside the operator's compartment and away from the danger of passing obstructions. Keep under the overhead guard.

NOTICE - 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 judgment and care in loading, handling, storage, etc.

Keep clear of the upright and lift mechanism. NEVER reach into or put hands, arms, legs, or head into or through the upright structure or near the carriage or lift chains. Never put any part of your body between the upright and the truck. Don't use the upright as a ladder.

Keep all other persons clear of the load, upright and reach unit while attempting to handle a load.

No riders...

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

Operating Procedures

How To Operate Your Truck

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

Never operate a lift truck or its attachments or perform any of its functions if you are not in the designated operator's position.

Never operate a lift truck when your hands are wet or greasy.

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 floors.

Avoid any sudden movement. Start, stop, travel, steer, and brake smoothly.

Operate your lift truck at a speed that will permit it to be brought safely to a stop under the current operating conditions.



WARNING –Travel slowly when turning. Use special care when traveling without a load because the risk of tipping over is greater with an empty truck, especially at high speed and when cornering.

Travel with the fork carriage raised only enough to fully clear the floor or obstacles. When the carriage (load) is in an elevated position the stability of the truck is reduced. Do not elevate the load except during stacking.

Always be aware of the truck and forks' position to other objects in the work area.

Never crowd or tail-gate another truck; it might stop or turn unexpectedly.

Grades, ramps, and Inclines...

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

When truck is loaded, travel with load upgrade. When truck is empty, travel with lifting mechanism (upright) downgrade. See "Specifications" of this manual for gradeability of truck.

Operating Procedures

How To Operate Your Truck

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

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

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



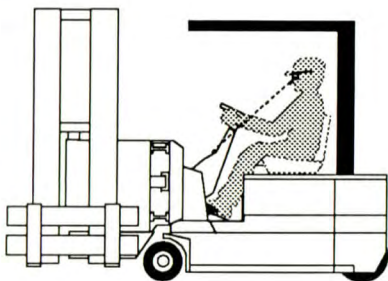
CAUTION

Operate your lift truck only in areas that have been approved for your lift truck type designation. Certain areas contain flammable gases, liquids, dust, fibers or other hazardous materials. Lift truck operation in these areas must have special approval. These areas must be designated to show the type of lift truck approval required for operation in the area. Be aware that changes to special equipment or poor maintenance can cause the lift truck to lose its special approval.

Be sure that your truck is the correct fire safety type for the area in which you are working. The proper type designation for this truck is listed on the nameplate. In areas classified as hazardous, use only trucks approved for use in those areas. If you are unsure of the classification of the area you wish to enter, check before entering.

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

Periodically check the instrument panel to be sure conditions are normal. If an abnormal condition appears, shut off the truck immediately and report the problem.



Do not continue to operate a truck that has a malfunction. Stop and have it fixed by a trained and authorized mechanic.

Remove the key from the key switch and put an "Out of Service" tag on the steering handwheel of the truck.

Report the problem to your supervisor.



Operating Procedures

How To Operate Your Truck

LOAD HANDLING

Handle only loads that are within the truck's 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, loads having a high center of gravity, fork position and height, uneven terrain or inadequate floors 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 band loose items. Center the load on the forks.

Do not lift anything that might fall on the operator or a bystander.

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

Operate reach, rotate and lift controls slowly and smoothly.



WARNING – Slack chains mean rail or carriage hang-up. Raise the upright before you move. If the upright malfunctions in any way or becomes stuck in a raised position, operate the lift control to eliminate any slack chains. **DO NOT** go under a raised upright or forks to attempt repairs.

DO NOT operate the reach, rotate or auxiliary hydraulic function while lifting.

Remember -- Your lift truck is designed to carry loads forward of the front wheels, so that the weight of the load is counter-balanced by the weight of the truck.

The farther the load is carried from the pivot point (center of front wheels), the greater the uplift will be at the rear of the truck. Therefore, always carry the load as close to the front wheels as possible (back and flush against the face of the forks).

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

Operating Procedures

How To Operate Your Truck

Traveling

When traveling outside shelf aisle with load, keep carriage as low as possible (approx. 8 in [20 cm] above floor) and with upright fully swung in and retracted. Never travel with load or carriage raised (elevated) in a high position. Do not elevate or extend 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 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 floor. Lift slowly and smoothly. Go slowly when turning. Do not turn steering handwheel when truck is stationary. Cross railroad tracks at an angle wherever possible.

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

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

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

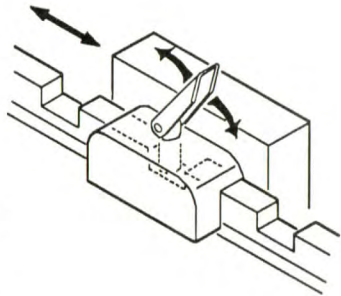
Always be concerned about the stability of your lift truck. When attachments are used, extra care should be taken in securing, manipulating, positioning, and transporting the load. Because they generally add extra weight and complexity to the truck, operate trucks equipped with attachments as partially-loaded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

Load Forks Adjustment

The load forks are adjustable on the fork carriage. Both forks should always be the same distance from the center of the fork carriage.

To adjust the forks, raise them a few inches off the floor, lift up on the fork lock lever and slide the forks along the fork bar of the lift carriage. When the forks are set at the correct width for the load, be sure the fork lock pin fits securely into a locking notch on the top of the fork carriage.

Lower the fork lock lever to lock the forks in the correct position.



Operating Procedures

How To Operate Your Truck

Picking up and moving loads

Use both fork arms at all times and insure that forks are properly secured to the carriage by the locking pins.

IMPORTANT

Make sure load does not exceed truck's capacity as stated on the capacity plates.

When picking up a load from the floor, approach the load slowly, and carefully align the carriage square with the load. The forks should be adjusted to fit the load or pallet being handled and spread as wide as possible to provide good load stability and balance.

Press "sideshift free" button to activate the brake on the drive motor which acts as a parking brake.

With the lift control, adjust the forks to the correct height to freely engage the load pallet.

Move (inch) forward or extend the reach unit until the forks are squarely and completely under the load.

Before lifting, be sure load is centered and forks are fully under and supporting the load. Fork length should be at least 2/3 of load length.

NOTE - 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, position the tips under the load without extending beyond the load. Raise the load to clear the floor. Back out or retract forks several inches, or distance necessary to set the load down and then inch forward or extend reach unit until load is positioned against the carriage.

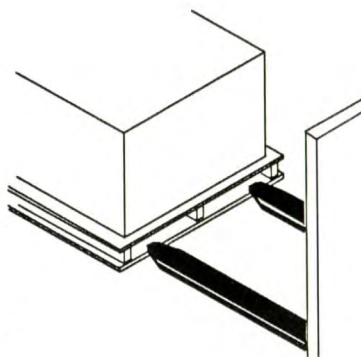
Raise the load to traveling height and check travel path before moving.

Unloading

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

Carefully back away or retract the forks to clear forks from the load.

Raise the forks to traveling height and check travel path before moving.



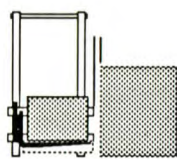
Operating Procedures

How To Operate Your Truck

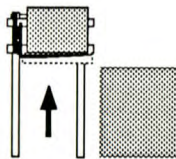
Stacking

To put a load in a rack...

(1) Approach slowly and align the reach unit and load squarely with the rack.
(2) Raise (elevate) the load to the desired self. Be sure that the pallet is high enough to clear the top surface of the shelf or stack. Press "sideshift free" button to apply drive motor brake. (3) Slowly extend (sideshift) the load into the rack position being careful not to damage or move adjacent loads. The leading edge and sides of the load pallet should be lined up exactly with the near edge and sides of the stack or rack on which you are placing the load.

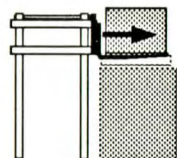


(1)

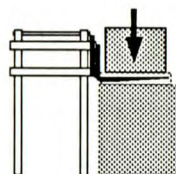


(2)


(4) Carefully lower the load onto the top surface of the stack or the rack. Lower the forks slightly to disengage forks from the load pallet.



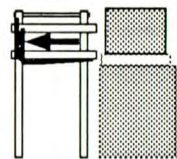
(3)



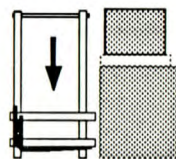
(4)

 **WARNING** - Do not lower the forks more than necessary after being disengaged. Loose chains can cause damage to rack structure and truck components.

(5) Retract reach unit to the load center position and (6) lower or raise unit to the traveling position.



(5)



(6)

Press "sideshift blocked" button release drive motor brake.

Check your travel path before moving.

To remove a load from a rack...

Stop at the stacking position with reach unit lined up squarely with the rack. Raise forks to the correct shelf height and press "sideshift free" button. Extend the forks into the load pallet so that the forks fit squarely under the load.

NOTICE - 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 pallet. Raise the load to clear the undersurface. Pull the forks back out several inches, then set the load down and inch forward or extend the reach unit until the front face of the forks contacts the load.

Lift the forks just enough so the load will clear the rack on removal. Retract the forks to the load center position. Lower or raise the forks to the correct traveling position. Press "sideshift blocked" button.

Be sure load is flush against the carriage or front face of the forks.

Check your clearance and path of travel for any obstacles or people.

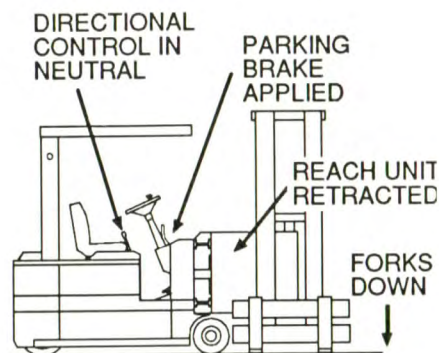
Operating Procedures After Operation

When You Have Finished Using Your Truck...

Always leave your lift truck in a safe condition.

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

- Park in a safe area away from normal traffic where no one could run or trip over the forks.
- Never park on a grade.
- Never park in areas which block emergency routes or equipment, or access to fire aisles, stairways, and fire equipment.



Before leaving the operator's position...

1. Bring truck to a complete stop.
2. Swing in and retract forks and lower to ground.
3. Apply the parking brake.
4. Put the directional control lever in the neutral position.

In addition, when leaving the truck unattended...

5. Depress battery emergency off switch.
6. Remove safety key in order prevent unauthorized usage.
7. 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.

Winter Operating Hints:

1. Regarding the battery, the truck should not be parked outdoors but rather in a heated room.
2. Starting the truck after a long stand still period, operate lift and rotate functions several times without a load to warm up hydraulic fluids.
3. Observe specifications regarding cold weather fluid qualifications.

6 Towing



WARNING

The truck can not be guided using the steering handwheel when there is no power from the battery.

It is recommend that this truck not be towed. It has an electronic steering system, meaning that there is no mechanical linkage between the hand wheel and the steer wheel. When the truck is not powered by its battery, the truck has no steering capabilities.

The electromagnetic brake on the drive motor could be damaged, with or without power, if the truck were towed. The front wheel brakes could also be damaged if they are locked automatically due to the failure of the truck.



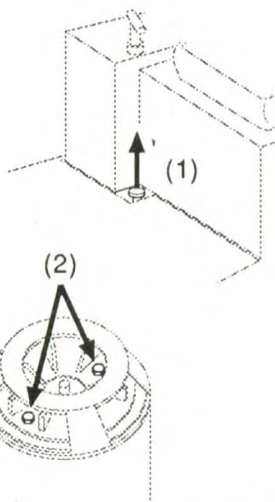
If, as a last resort, the truck must be moved, make sure that the brakes are released.

To release the front wheel brakes, first depress the brake pedal twice. If this does not release the brake, pull the knob (1) in the center of the floor area next to the valve cover.

To release the electromagnetic brake on the drive motor, press the 'Side Shift Locked' button. Also, secure the brake disc on the drive motor with two screws (2). This must be done to avoid damage to the motor.

IMPORTANT

If the above procedures do not release BOTH brakes, the truck should not be moved from its location.



When the truck can not be repaired where it stopped operating, the truck will have to be taken to a service area. To do this the truck will have to be towed using the tow eyes in the counterweight with the proper towing equipment and only if the truck's brakes are released. When the truck's electromagnetic brake can not be released, the truck must be lifted from underneath the counterweight just enough to raise the drive wheel off the floor. Make sure the counterweight mounting bolts are secured.

READ THE GENERAL INSTRUCTIONS ON THE FOLLOWING PAGE.

Towing General Instructions

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



WARNING

DO NOT tow a lift truck if there is a problem with the brakes, tires or steering.

DO NOT tow up or down ramps and steep inclines.

DO NOT attempt to tow a lift truck if traction is poor.

DO NOT transport the disabled lift truck with another lift truck.

1. Be sure to apply the parking brake and block the drive wheels on the disabled truck while working around it.
2. Check to see that the counterweight is secured by all of its mounting bolts and that they are torqued properly.
3. When possible, raise the carriage (forks) on the disabled truck about 12 inches [30 cm] from the floor. Secure the carriage with a chain.
4. Tow with another lift truck of equal or larger size carrying a partial load for traction.
5. Tow the disabled truck backwards.
6. Use approved towing gear that will fit the towing eyes of the counterweight.

NOTE: check with your Clark dealer for optional towing equipment that is suitable for your truck.

7. The towed truck must have an operator in the driver's seat if the steer/drive wheel is functional.
8. If the drive wheel must be raised before moving the truck, check the capacities of the lifting device. It must be capable of handling the load.
9. Tow the truck slowly. Careful towing is necessary to prevent injury to personnel or damage to the truck. The truck should be towed at speeds less than 5 mph [8 kph].
10. Park the disabled truck in authorized areas only and follow the standard shut down procedure. Also, place an 'Out of Service' tag on the truck.

7 Planned Maintenance and Lubrication

- 7.2 Lift Truck Maintenance**
- 7.3 Planned Maintenance Intervals**
- 7.4 Pictorial Index**
- 7.5 Safety and Operational Checks**
- 7.6 Recommended Inspection and
Planned Maintenance Schedule**
- 7.7 User Safe Maintenance Practices**
- 7.10 PM- Planned Maintenance Program**
- 7.11 PM Program**
- 7.22 Lift Chain Maintenance**
- 7.24 Battery Maintenance**
- 7.29 Cold Storage / Weather**

Planned Maintenance and Lubrication

Lift Truck Maintenance

Regular maintenance and care of your lift truck is not only important for full and efficient truck life, it is 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 in good operating condition, this section outlines maintenance procedures to be done at regular intervals and that are considered essential to the life and safe performance of your truck. It is your responsibility, as the operator, 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 Trucks May Become Hazardous If Maintenance Is Neglected

PLANNED MAINTENANCE (PM)

As outlined previously, a safety inspection of your lift truck should always be made 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 daily inspection, Clark recommends that you set up and follow a periodic planned maintenance and inspection program. Performed on a regular basis, the program will provide the opportunity to make thorough inspections and checks on the safe operating condition of your lift truck. The earlier the need for major adjustments, repairs, or replacements is detected the less down-time you will have. Do not wait until failure has occurred. The specific schedule (frequency) for these PM inspections will depend on the conditions of your particular application and lift truck usage. The recommended planned maintenance and lubrication schedule lists those items considered essential to the safety, life, and performance of your truck with typical recommended service intervals. Brief procedures for inspections and operational checks are included for your reference. Your local Clark dealer is prepared to help you with your Planned Maintenance Program if you want assistance. He has specially trained service personnel who are authorized to check your lift truck according to the respective safety regulations.

In the Specifications section of this manual, you will find a listing of useful specifications for selected components, lubricants, refill capacities, and settings for your truck.

If you have the need for more information on the care and repair of your truck, see your CLARK dealer.

Planned Maintenance and Lubrication

Planned Maintenance Intervals

Typical Operating Conditions

Time intervals between maintenances are largely determined by operating conditions. For example, operation in sandy, dusty locations require shorter maintenance intervals than operation in clean warehouses. The indicated intervals are intended for normal operation. To allow better understanding of this aspect, the following clarification should be made:

NORMAL OPERATION

Basically, eight-hour material handling, mostly in buildings with smooth, level floors and in relatively clean air.

SEVERE OPERATION

Prolonged operating hours, constant usage, travel ramps often, repeated high lifts or multiple shift operations.

EXTREME OPERATION

1. Extended ramp operation or very little down time.
2. In sandy or dusty locations, e.g., cement plant, lumber or flour mills, coal dust, or stone crushing sites.
3. High-temperature locations, e.g., steel mills, foundries, etc.
4. Sudden temperature changes (constant trips from buildings into the open air), e.g., refrigeration plant.

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

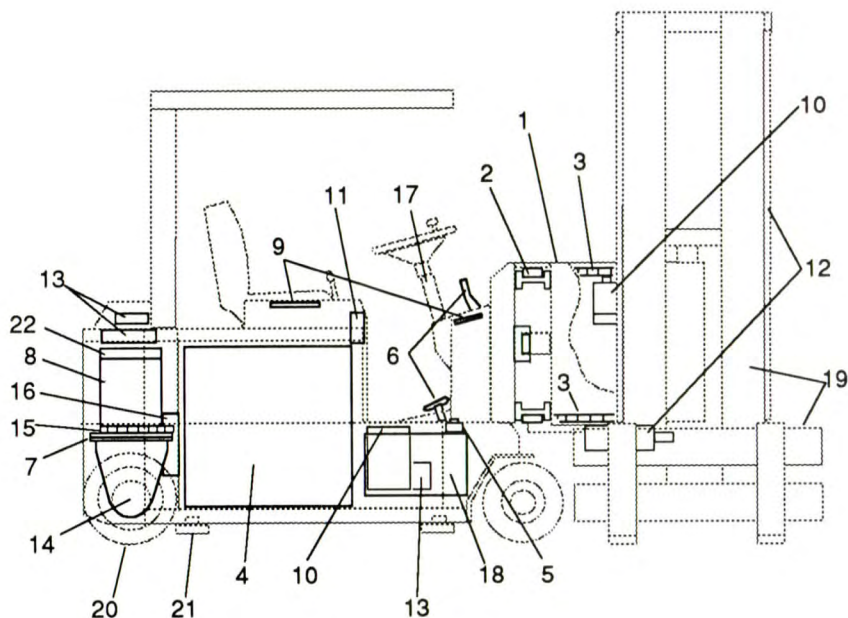
NOTE -- Since the operating environment of lift trucks varies widely, the above descriptions are highly generalized and should be applied as actual conditions dictate. Contact your CLARK dealer for more information.

Recommended PM Intervals

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

- A = Every 8 - 10 hours or daily
- B = Every 50 - 250 hours or monthly (Typical PM interval)
- C = Every 450 - 500 hours or 3 months
- D = Every 900 - 1000 hours or 6 months
- E = Every 2000 hours or yearly
- F = Every 3500 hours or 2 years

Planned Maintenance and Lubrication Pictorial Index



- 1- Articulated Reach Unit
- 2- Articulated Reach Unit Rollers/Track
- 3- Articulated Reach Unit Chains
- 4- Battery
- 5- Brake Cylinder
- 6- Brakes- Pedal and Lever
- 7- Drive Axle
- 8- Drive Motor
- 9- Electrical Fuses
- 10- Hydraulic Motor/Pump
- 11- Hydraulic Valve
- 12- Piston Rods/ Cylinders
- 13- Pulse Control
- 14- Steer Axle
- 15- Steer Chain
- 16- Steer Motor
- 17- Steering Column
- 18- Sump Tank and Filter
- 19- Upright and Carriage
- 20- Wheels and Tires
- 21- Lateral Truck Guide Rollers
- 22- Electromagnetic Solenoid Brake

Planned Maintenance and Lubrication Safety And Operational Checks

It is your responsibility, as operator, to be alert to 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.

PM Interval:

- A = Every 8 - 10 hours or daily
- B = Every 50 - 250 hours or monthly (Typical PM interval)
- C = Every 450 - 500 hours or 3 months
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- E = Every 2000 hours or yearly
- F = Every 3500 hours or 2 years

DAILY INSPECTION	A	B	C	D	E	F
Check truck for obvious damage and leaks	•					
Check battery terminals, cables and receptacle	•					
Check capacity, warning plates, decals	•					
Check condition of tires and wheels. Remove embedded objects	•					
Check wheel lug nut torques	•					
Check hydraulic sump oil level	•					
Check function and readings of gauges and instruments	•					
Check warning lights and hourmeter	•					
Check overhead guard condition and bolts	•					
Check horn operation and other warning devices	•					
Check service brake operation	•					
Check parking brake operation	•					
Check directional control lever operation	•					
Check accelerator operation	•					
Check steering operation and column and steer lock	•					
Check hydraulic control lever functions	•					
Check carriage and forks	•					
Check upright- limit switch, lift chains, and fasteners	•					

PERIODIC INSPECTION	A	B	C	D	E	F
Check critical fasteners		•				
Check battery cell connectors		•				
Check electrical fuses and connections		•				
Check electrical lines and cable connections		•				
Check transmission fluid level		•				
Check brake fluid level		•				
Check brake lines and linkage		•				
Check movement of service brake, parking brake and accelerator pedal		•				
Check drive/steer axle mounting fasteners and bearings		•				
Check front wheel axle and bearings		•				
Check steer chain tension and wear		•				
Check lift chain tension and wear		•				
Check steer wheel indicators for proper performance		•				
Check lift height restrictions		•				

Planned Maintenance and Lubrication Recommended Inspection and Planned Maintenance Schedule

PM Interval:

- A = Every 8 - 10 hours or daily
- B = Every 50 - 250 hours or monthly
- C = Every 450 - 500 hours or 3 months
- D = Every 900 - 1000 hours or 6 months
- E = Every 2000 hours or yearly
- F = Every 3500 hours or 2 years

Notes:

- * Replace As Required
- ** Replace after first 20 duty hours

Nominal PM Interval

PLANNED MAINTENANCE / LUBRICATION	A	B	C	D	E	F
To Be Performed By Trained And Authorized Personnel (See Service Manual For Other Important Information)						
Pulse control - dry compressed air and brush - Clean			•			
Electrolyte level - Check	•					
Battery load test - Perform		•				
Drive motor brushes - Check *			•			
Lift motor brushes - Check *			•			
Steer motor brushes - Check *			•			
Ground post - Check		•				
Transmission fluid - Change	**					•
Front wheel bearings - Clean and repack						•
Brake fluid - Change						•
Foot and parking brake adjustment, cables, linkage and brake linings - Check		•				
Brakes - service brake, parking brake and accelerator pedal bearings - Lubricate		•				
Magnetic brake for adjustment and thickness - Check		•				
Grease packing in steer gear - Renew						•
Cross roller bearing of steering bracket - Lubricate			•			
Hydraulic sump filter - Clean/ change	**		•			
Hydraulic sump fluid - Change	**				•	
Hydraulic sump breather - Change		•				
Lift and reach unit chains - Clean and lubricate		•				
Upright / reach unit roller bearings - Clean and lubricate		•				
Upright and reach unit piston rods - Clean		•				
Lubricate running and lateral contact surfaces of reach unit guide rollers		•				
Gear wheels and tooth racks of reach unit - Lubricate		•				
Steer chain - Clean and lubricate		•				
Steer chain guide rollers - Lubricate		•				
Cross roller bearing between drive motor and transmission - Grease		•				
Pivot bearing of reach unit - Lubricate		•				
Bearings of side lateral guide rollers - Lubricate		•				

Planned Maintenance and Lubrication User Safe Maintenance Practices

USER SAFE MAINTENANCE PRACTICES

The following instructions have been prepared from current industry and government safety standards applicable to industrial truck operations 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 CLARK 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 done in conformance with the manufacturer's recommendations.
3. A scheduled planned maintenance, lubrication, and inspection system shall be followed.
4. Only trained and authorized personnel shall be permitted to maintain, repair, and adjust industrial trucks, and in accordance with the manufacturer's specifications.
5. Properly ventilate work area. Vent off vapors and fumes, and keep shop clean and floor dry.
6. Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check level or for leakage of electrolyte. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
7. Before Starting Work On Truck:
 - a) Raise drive wheel(s) free of floor or disconnect power source and use blocks or other positive truck positioning devices.
 - b) Put blocks under the load-engaging means, innermast(s), or chassis before working on them.
 - c) Disconnect battery before working on the electrical system.
8. Operation of the truck to check performance must be conducted in an authorized, safe, clear area.
9. Before Starting To Drive Truck:
 - a) Be in operating position.
 - b) Apply brakes.
 - c) Put directional control in neutral.
 - d) Turn on power.
 - e) Check functioning of lift, reach and rotation systems, directional and speed controls, steering, brakes, warning devices, and any load handling attachments.
10. Before Leaving The Truck:
 - a) Stop truck.
 - b) Fully lower and retract the load engaging means: upright, carriage, forks, or attachments.
 - c) Put directional control in neutral.
 - d) Apply the parking brake.
 - e) Turn off power.
 - f) Put blocks at the wheels, if truck must be left on an incline.
11. Brakes, steering mechanisms, control mechanisms, warning devices, lights, lift overload devices, guards and safety devices, lift, reach and rotation mechanisms, and frame members must be carefully and regularly inspected and maintained in a safe operating condition.
12. Special trucks or devices designed and approved for hazardous area operation must receive special attention to ensure that maintenance preserves the original, approved safe operating features.

Planned Maintenance and Lubrication

User Safe Maintenance Practices

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

14. When working on hydraulic system, be sure the battery is disconnected and upright is in its fully lowered position, and hydraulic pressure relieved in hoses and tubing.

WARNING -- Always put blocks under the carriage and upright rails when necessary to work with upright in an elevated position.

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

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

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

18. Industrial trucks must be kept in a clean condition to minimize fire hazards and help in the detection of loose or defective parts.

19. 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.

20. 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 CLARK or CLARK-approved parts.

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

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

Planned Maintenance and Lubrication User Safe Maintenance Practices

NOTICE---You should also be familiar with additional operating and maintenance safety instructions contained in the following publications:

ANSI/ASME B56.1 - 1988: Safety Standard for Low Lift and High Lift Trucks (Safety Code For Powered Industrial Trucks). Published by: Society of Mechanical Engineers, United Engineering Center, 345 E. 47th Street, New York, N.Y. 10017.

NFPA 505-1982: Fire Safety Standard for Powered Industrial Trucks: Type Designations, Areas of Use, Maintenance and Operation. Available from: National Fire Protection Assoc., Inc., Batterymarch Park, Quincy, MA 02269.

General Industry Standards, OSHA 2206: OSHA Safety and Health Standards (29 CFR 1910), Subpart N-Materials Handling and Storage, Section 1910.178 Powered Industrial Trucks. For sale by: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 or contact your CLARK dealer.

IMPORTANT

Your new CLARK lift truck, although not UL rated, has been built to meet all applicable mandatory requirements of ANSI B56.1--1969-1988 Safety Standard for Powered Industrial Trucks. Each truck also includes certain safety devices such as the horn and overhead guard as standard equipment. No additions, omissions or modifications should be made that will affect compliance to the above requirements or in any way minimize the effectiveness of the safety devices.

Planned Maintenance and Lubrication

PM- Planned Maintenance Program

A planned maintenance program of regular, routine inspections and lubrication is important for long life and trouble-free operation of your lift truck. Make and keep records of your inspections. Use these records to help establish the correct PM intervals for your application and to indicate maintenance required to prevent major problems from occurring during operation.

As an aid in performing and documenting your PM inspections, Clark has prepared an "ELECTRIC TRUCK PLANNED MAINTENANCE REPORT" form. Copies of this form may be obtained from your authorized CLARK dealer. We recommend that you use this form as a checklist and to make a record of your inspection and truck condition.

The maintenance inspection procedures outlined in this manual are intended to be used in conjunction with the PM report form. They are arranged in groups of maintenance work that are done in a logical and efficient sequence.

PM Report Form

A check mark or entry is made on the PM Report Form when the PM is performed. Please note the special coding system for indicating the importance of needed repairs and/or adjustments.

When you have finished the PM inspections, be sure to give a copy of the report to the designated authority or the person responsible for lift truck maintenance.

Do not make repairs or adjustments unless authorized to do so.



WARNING—Don't forget safety!

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

Remove all jewelry (watch, rings, bracelets, etc.) before working on the truck.

Disconnect battery from truck receptacle before working on electrical components.

Planned Maintenance and Lubrication PM Program

HOW TO PERFORM THE PM INSPECTIONS AND MAINTENANCE CHECKS

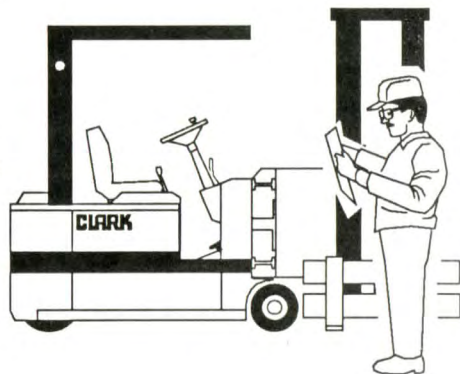
VISUAL INSPECTION

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.

NOTICE—

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 signs of external leakage: transmission fluid, etc.

Check for hydraulic oil leaks and loose fittings.



DANGER

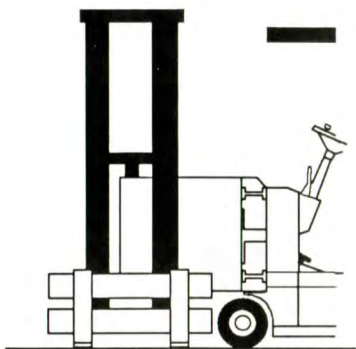
HYDRAULIC FLUID PRESSURE
Do not use your hands to check for hydraulic leakage. Fluid under pressure can penetrate your skin and cause serious injury.

Check that the overhead guard and other safety devices are in place, undamaged and attached correctly.

Planned Maintenance and Lubrication PM Program

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

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



Inspect the upright and reach unit assemblies: rails, carriage rollers, lift chains, lift and articulating cylinders. Look for obvious wear and maintenance problems, damaged or missing parts. Check for any loose parts or fittings. Check for leaks, any damaged or loose rollers, and rail wear (metal flaking). Carefully check the lift chains for wear, rust and corrosion, cracked or broken links, stretching, etc. Check that the lift and carriage chains are correctly adjusted to have equal tension. Check that the lift chain anchor fasteners and locking means are in place and tight.

Inspect all hydraulic connections for leaks.

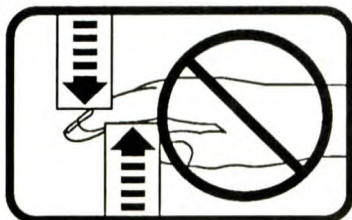
IMPORTANT

Uprights and lift chains require special attention and maintenance to maintain them in safe operating condition. Refer to Lift Chain Inspection section of this manual and the Service Manual for additional information.



WARNING

Uprights can drop suddenly. Look at the upright, but keep hands out.



Planned Maintenance and Lubrication PM Program

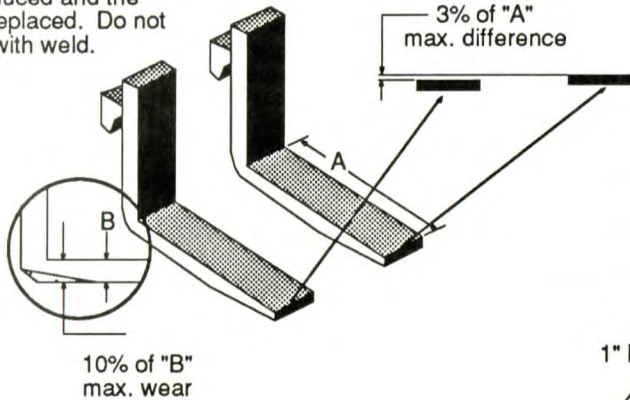
Check the forks.

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 should be no more than 3% of the fork length.



WARNING

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. Do not attempt to fill with weld.

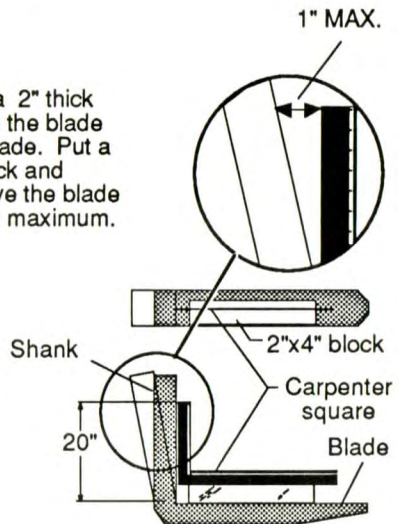


Inspect the forks for twists and bends. Put a 2" thick metal block, at least 4" wide by 24" long on the blade of the fork with the 4" surface against the blade. Put a 24" carpenter's square on the top of the block and against the shank. Check the fork 20" above the blade to make sure it is not bent more than 1 inch maximum.



CAUTION

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



Inspect the fork latches. Be sure they are not damaged or broken and operate freely and lock correctly. Check the fork stop pins for secure condition.

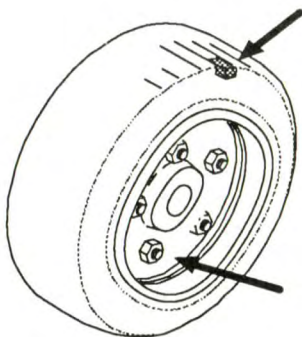
Planned Maintenance and Lubrication PM Program

Wheels and Tires

Check the condition of the front and steer/ drive wheels and tires. Remove objects that are embedded in the tread. Inspect the tires for excessive wear and breaks or "chunking out", and bond failure between the tire and rim.

Check all wheel lug nuts or bolts to be sure none are loose or missing.

Have missing bolts replaced and loose bolts tightened to the correct torque before operating the truck.



Electrical

Check all cables and wiring. They should be routed clear of all moving parts.

Visually check the motor cooling fans and terminal boards for damage (cracks, fractures or broken fin blades).

Damaged cooling fans or terminal boards must be replaced.

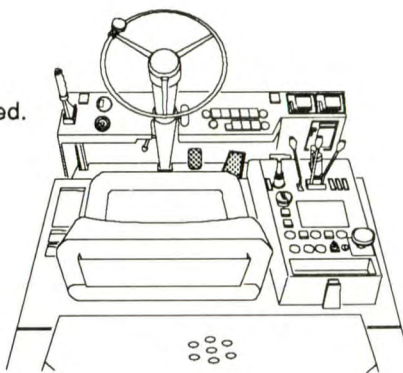
FUNCTIONAL TESTS

Now, be sure that all controls and systems are functioning correctly...

The emergency off switch will have to be pulled so functional tests can be performed.

Test horn, lights, and all other safety equipment and accessories. Be sure they are properly mounted and working correctly.

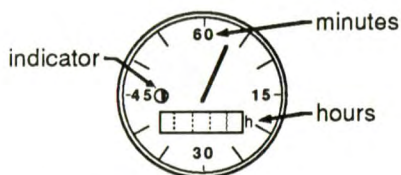
Press the horn button to check horn function. If the horn or any other part does not operate, report the failure and have it repaired before the truck is put into operation.



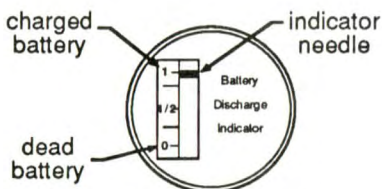
Planned Maintenance and Lubrication PM Program

Turn key switch to the UNLOCKED (ON) position.

As you pull the emergency off switch knob watch indicators on the dash. Hourmeter indicator will start moving, battery discharge indicator needle will show battery's charge and the side reach blocked indicator light will come on once the power is connected.



Hourmeter/ Indicator Gauge



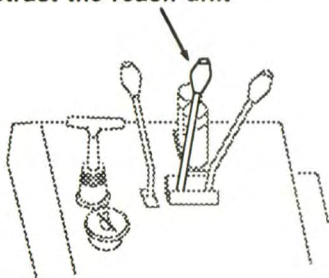
Battery Discharge Indicator

With foot on service brake, release parking brake and shift direction control lever to the forward or reverse position. The hourmeter should begin operating. Report any malfunction or damage.

Battery Load Test

Check the battery condition by fully retracting the reach unit and continuing to operate the reach lever for a few seconds, allowing the main pump to run against loading of the bypass relief pressure valve. Watch the battery discharge indicator. The needle should stay above the 1/2 mark. If it goes below the 1/4 mark, the battery is faulty or the charge level is low and battery must be charged before completing other electrical tests and performance parts of the PM.

Retract the reach unit



Planned Maintenance and Lubrication PM Program

The next few pages will instruct you on how to test the operation of the service and parking brakes, accelerator, directional controls, all the hydraulic controls (lift, reach, rotate and auxiliary, if installed), and the steering system. Be sure all controls operate freely and return to neutral properly before operating the truck.

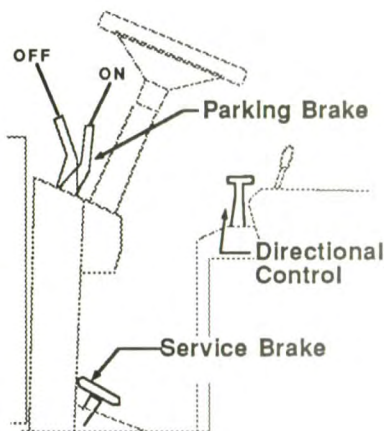
Brakes and Directional Control

Before checking the brakes and directional controls, check the path of travel in front of and behind the truck to make sure it is clear.

Check the foot brake first.

Push firmly on brake pedal and release the parking brake. Move the directional control lever from "O" (neutral) to the FORWARD travel position.

Remove your right foot from the brake pedal and put it on the accelerator pedal. Push down until the truck moves slowly forward. Remove your foot from the accelerator pedal and apply the brake to stop the truck. The brakes should apply evenly and smoothly. The pedal should have solid resistance as the pedal stops; it should not continue to creep downward. The service brake should stop the truck from safe operating speeds with brakes being applied as pedal reaches the half-way point to the floor. For emergency braking, the pedal should be no more than three quarters of the pedal's full travel distance.



Now put the directional control in REVERSE. Push the accelerator until the truck is moving slowly and then apply the brake. Brakes should operate evenly and smoothly.

Check the function of the parking brake. With truck stopped, release service brake and apply brake using the parking brake lever. When correctly adjusted, the lever should snap-lock easily into the over-center applied position.

To check parking brake adjustment and holding capability, park the lift truck where it will have a clear travel path in front. With parking brake applied, try to move off in the forward direction. This must either fail or make the motor work very hard. The parking brake should be adjusted immediately if the truck moves without effort.



WARNING

Do not operate a lift truck if the service or parking brakes are not working correctly.

Planned Maintenance and Lubrication PM Program

Hydraulic Functions

Check operation of all hydraulic functions; lift, reach, rotate and auxiliary if applicable. Do not operate the reach, rotate or auxiliary function while lifting the reach unit.

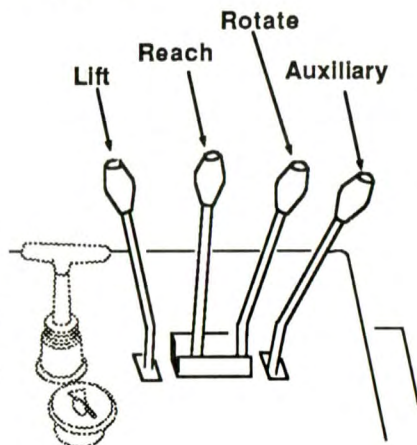
NOTICE— During inspection or operation, there should not be any drifting or shifting of the reach unit or upright when controls are not being operated.



CAUTION

Be sure that there is adequate overhead clearance before raising the upright.

With upright in the base position (forks swung in and retracted), pull back on the lift control lever and raise the fork carriage to full height. Watch the upright assembly as the carriage moves upward. All movements of the upright, fork carriage and lift chains must have an even, smooth motion without binding or jerking. Watch for chain wobble or looseness; the chains should have equal tension and move smoothly. Release the lever.



If the maximum fork height is not reached, this indicates there is an inadequate (low) oil level in the hydraulic sump tank, or severe binding within the upright.

Push forward on the lift control lever. Watch the upright as it lowers. When the forks reach the floor, release the lever.

For stability reasons, the lift hydraulic pump should switch off after reaching a certain height which is set by the manufacturer. Also when lifting, depending on truck model, truck will only travel at half-speed after reaching a predetermined lift height.

When checking the reach control operation, make sure there is enough room for full extension. Watch how the reach unit moves from side to side. It should be smooth and steady with no jerky motions involved. Release the lever to neutral as the unit reaches the end of the track and return it to the base position.

With the reach unit in the base position, start to operate the rotate lever. Pull back to move the reach unit counter-clockwise and push forward to move it clockwise. Again, movement should be smooth and steady.

Auxiliary Controls

If your lift truck is equipped with an attachment, test the control lever for correct function and briefly operate the attachment.

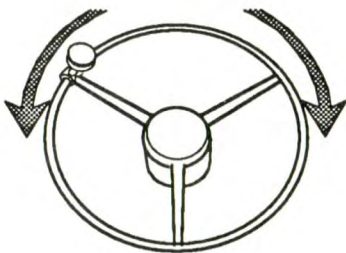
Planned Maintenance and Lubrication PM Program

Steering system

The truck is equipped with an electronic power steering system. There is no mechanical linkage between the handwheel and the steer motor although there is a chain that runs between the steer motor and steer gear on the drive motor.

NOTICE— The steering system, steer axle and steer linkage on your truck should be inspected periodically for abnormal looseness, damage, leaking seals, etc.. Also, be alert for any changes in steering action. Hard steering, excessive freeplay (looseness) or unusual sounds when turning or maneuvering, indicate a need for inspection or servicing.

While moving slowly, check the steering system by turning the steering handwheel in a full right turn, and then in a full left turn. Return the handwheel to the straight-ahead position. The steering system components should operate smoothly when the steering wheel is turned.



WARNING

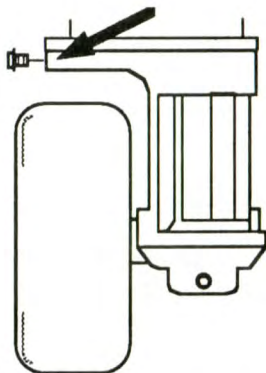
Never operate a truck which has a faulty steering system.

Drive Axle Fluid Level Check

Check the drive axle fluid level with the truck on a level surface and with oil at operating temperature.

Remove the fluid level inspection plug located at the top of the drive axle housing.

The oil level is correct (full) when the oil reaches the lower edge of the plug opening.



Have only recommended fluid added (refer to "Specifications" for drive axle oil specifications). After oil is added, wait a few minutes until oil has distributed evenly throughout the unit and check for correct level. **DO NOT OVERFILL.**

Inspect the fill plug for damage. Install and tighten the plug.

NOTICE— Refer to the Planned Maintenance schedule or check the condition of the oil to determine whether drive axle fluid needs to be changed.

Planned Maintenance and Lubrication PM Program

Pulse (SCR) Control

Test for correct function of the traction control.

Check CREEP SPEED and PLUGGING.

1. Check CREEP SPEED while driving the truck in a straight line in both FORWARD and REVERSE directions. All speed changes should be smooth while increasing and decreasing speed. Listen for any unusual drive train noises or actions of the controls and drive train components.

Stop truck with the service brakes. Note any unusual reactions in driving or braking performance, and need for adjustment.

2. Check PLUGGING function first at a slow speed. If operating correctly, then test at full speed.

First, drive truck in the FORWARD direction. Push the accelerator pedal and allow the truck to accelerate to the desired travel speed. Then, move the direction control to REVERSE position while your foot is still depressing the accelerator pedal. The truck should slow to a smooth, controlled stop and accelerate in the opposite direction.

Repeat test by moving direction control back to FORWARD position.

Check the accelerator control while conducting the speed range tests. It must move easily and smoothly throughout the acceleration stroke, and return without binding.

NOTICE— When you have completed the operational tests, park and leave truck according to standard shut down procedures.

Be sure to make a record of all maintenance and operating problems you have found.

Planned Maintenance and Lubrication PM Program

Hydraulic Sump Tank

Check the hydraulic sump tank fluid level. Correct fluid level is important for proper hydraulic 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 and set the parking brake fully. Put the upright in its base position. The floor plate must be removed to reach the dip-stick. Pull dipstick out, wipe it clean with a clean cloth and re-insert it fully into the tank. Remove the dipstick and check the oil level. Keep the oil level above the LOW mark on the dipstick by adding recommended hydraulic fluid only, as required. DO NOT OVERFILL.

Check the condition of the hydraulic fluid (age, color or clarity, contamination) and have it changed using Planned Maintenance schedule only as a guide. Also check the oil filter and sump tank breather.

Hydraulic Oil Filter

The hydraulic fluid system filter should be replaced per recommended PM schedule, or as may be required according to truck operating conditions and usage. Always install a new oil filter, never a used one. Check for leaks after installation of the filter. Also, check that the hydraulic line connections at the filter adapter are tightened properly.

Planned Maintenance and Lubrication

PM Program

Air Cleaning

It is good practice to keep your lift truck clean. 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, loose, missing or damaged parts, and will help prevent fires. A clean truck will also run cooler.

The environment in which a lift truck operates will determine how often and to what extent cleaning is necessary. For example, trucks operating in manufacturing plants which have a high level of dirt or lint (e.g., cotton fibers, paper dust, etc.) in the air or on the floor, will require more frequent cleaning.

NOTICE— A trained and authorized person is the only one who should use air pressure or any other type of cleaning method when cleaning the components under the hood or floor plate or parts of the reach unit.

Lift trucks should be air cleaned at every PM interval or when necessary to maintain a safe truck.

IMPORTANT— Effective eye protection is a must when cleaning the truck with high pressure systems.

If air pressure does not remove heavy deposits of grease, oil, etc., it may be necessary to use a liquid spray cleaner.

The operator should not clean or work under the seat deck unless he is fully authorized and trained to do so. He should NOT allow the SCR control panel to be steam cleaned. If the truck is operated in dusty areas, low pressure air should be used. In oily or greasy areas, a mild solution of detergent or denatured alcohol can be used to wash off the controls and blown completely dry with the low pressure air.

Critical Fastener Torque Checks

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

Check the critical items for tightness:

Drive axle mounting
Wheel lug nuts
Counterweight mounting

Overhead guard fasteners
Reach unit mounting parts
Upright mounting & components

Planned Maintenance and Lubrication

Lift Chain Maintenance

Lift chains are very important components of fork lift trucks. The chain system on your upright was designed for safe, efficient, and reliable transmission of lifting force from hydraulic cylinders 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.

Lift Chain Inspection and Measurement

Inspect and have the lift chains lubricated at the specified truck PM interval. When operating in corrosive environments, inspect the chains every 50 hours. During the inspection, check for the following chain conditions:

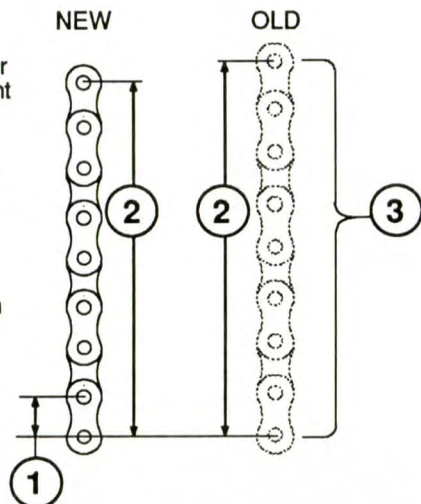
Rust and corrosion - Cracked plates - Raised or turned pins - Tight joints - Wear, worn pins or holes.

When the pins or holes become worn, the chain becomes longer. When a span of chain is 3% longer than a comparable span of a new chain, the chain is worn out and must be discarded and replaced.

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 have chains repaired by cutting out the worn section and joining in a new piece. If part of the chain is worn, replace the whole chain. All other chains on the upright must be replaced at that time also.

Lift Chain Inspection and Wear Criteria

- 1 - PITCH - the distance from the center of one pin to the center of an adjacent pin.
- 2 - SPAN - the number of pins (at least 6 pins) counted in the chain length used for measuring chain stretch.
- 3 - CHAIN LENGTH - the distance from the first pin counted in a span to the last pin counted of the span while chains are lifting a small load.



Planned Maintenance and Lubrication

Lift Chain Maintenance

Lift Chain Adjustment Check

The lift chains are correctly adjusted if the lower fork carriage rollers reach their end (lowest) position approximately 0.50 inch [13 mm] from the lower edge of the inner rail. This also positions the bottom of the forks the same (equal) distance above the floor. To check this dimension, raise the carriage to a height that exposes several inches of the inner rail at the roller path. Place 4x4 wooden blocks under the upright to support rail and reach unit. Apply a layer of grease to the roller path on the inner rail. Remove blocks and lower the carriage. Pick up a rated capacity load. Raise the load until the carriage rollers have passed over the greased area. Lower the load completely and remove the load from the forks. Raise the carriage again to expose the inner rail and block upright and reach unit as before. You can now check the roller's path in the grease and determine if the chains need adjustment by how straight the path is.

Have the correct personnel adjust the lift chains.



WARNING

DO NOT ATTEMPT TO REPAIR A WORN OR DAMAGED CHAIN.
REPLACE WHOLE CHAIN AS WELL AS ALL OTHER CHAINS.

NOTICE- It is important to make the lift chain adjustment check with a rated load to make sure that the chains are stretched to their maximum length.

Lift Chain Lubrication

Lift chain lubrication is an important part of your maintenance program. The lift chains operate under heavy loadings and will function more safely and have longer life if they are regularly and properly lubricated. Refer to the Service Manual for additional information on lift chain measurement and maintenance.

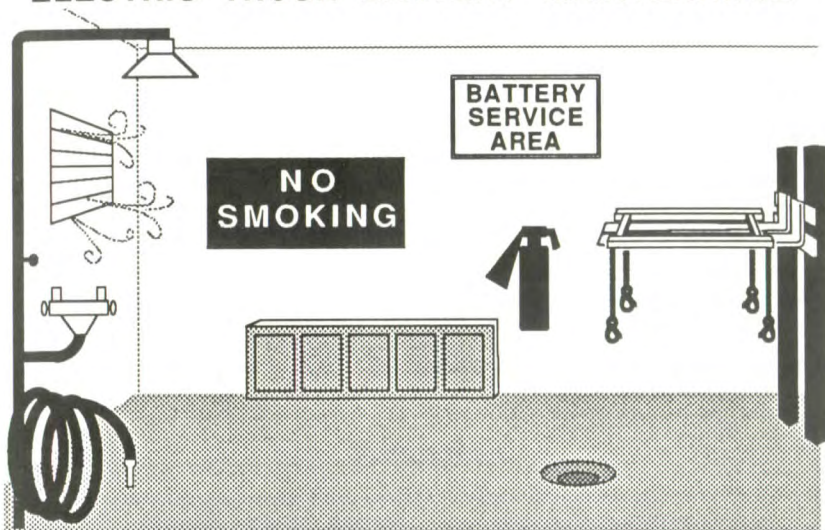
Lift Chain Replacement

All chains must be replaced if any one chain span measures 3% greater than the same span of a new chain, or if any of the damaged conditions noted above are found during inspection. Replacement chains and parts can be ordered from your CLARK dealer. All chains should be replaced as a set. Do not remove factory lubrication or paint new chains. Anchor pins and worn or broken anchors should also be replaced when installing new chains. Tension on new chains should be adjusted. Chains should be lubricated when they are installed on the upright.

NOTE - Refer to the Service Manual for additional information on lift chain measurement and maintenance or replacement procedures.

Planned Maintenance and Lubrication Battery Maintenance

ELECTRIC TRUCK BATTERY MAINTENANCE



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 specific gravity) an eye wash fountain must be provided.

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

Changing and Charging Electric Truck Batteries

Battery maintenance is recommended to be performed not by the operator, but by a trained mechanic.



WARNING

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. Electric truck batteries are also costly, so before you remove, service, or install a truck battery, consult the BATTERY MANUFACTURER, SUPPLIER or your SERVICE MANUAL for more recommendations and instructions on handling and charging batteries. Carefully read the following recommendations and instructions.

Planned Maintenance and Lubrication

Battery Maintenance

Preparations for Battery Removal and Handling

1. Check the designated service and charging area for fire protection, and be sure all sources of ignition are cleared from the area. **DO NOT SMOKE.** Be sure all previous noted equipment is in the area, in good repair, and working properly.

If the battery is to be serviced, be sure there are provisions to flush and neutralize spillage and to disperse (ventilate) fumes from gassing batteries on charge. And be sure there are provisions for handling electrolyte.

2. Before attempting to remove or charge a storage battery, the truck should be positioned in the designated battery service area and the parking brake applied so the truck cannot move.

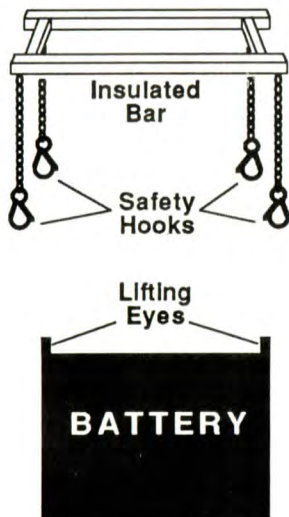
3. If the battery to be handled is not equipped with its own cover, cover the battery when handling, with a non-conductive (insulating) material, e.g., plywood or heavy cardboard, before attaching the lifting device.

4. Use an approved lifting device with an insulated spreader bar, to remove and transport a truck battery. Be sure the hoist and lifting chains are equipped with safety hooks.

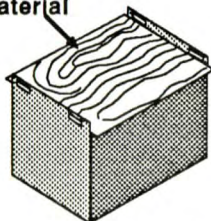
5. Chain hoists or power battery hoists must be equipped with load-chain containers to accumulate the excess lifting chain.

6. Keep all tools and other metallic objects away from the terminals.

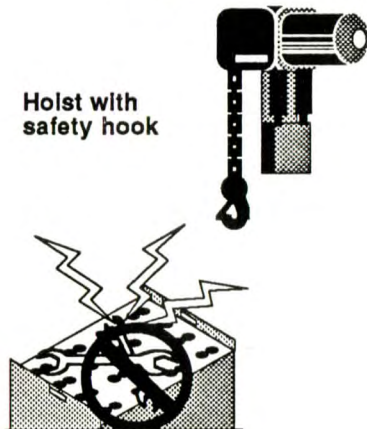
7. Ready the battery storage location; either on an approved battery rack or on a wooden pallet.



Non-conductive material



Hoist with safety hook



WARNING BATTERY SERVICE

Battery service must be done by trained and authorized personnel. Battery acid can cause severe burns and injury.

Planned Maintenance and Lubrication

Battery Maintenance

Battery Care and Maintenance

DO NOT SERVICE BATTERIES UNLESS YOU ARE TRAINED AND AUTHORIZED TO DO SO.

Refer to the BATTERY MANUFACTURER or SUPPLIER for their recommended procedures or see your SERVICE MANUAL for other important information.

Battery Service Records

A record of battery service and maintenance should be kept to obtain the best service life from your battery and truck.



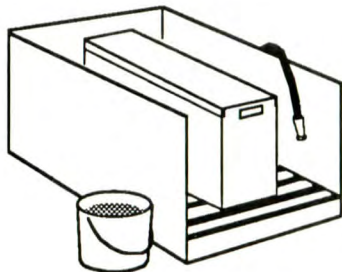
How To Get Maximum Life From a Battery

1. Follow normal battery maintenance procedures, re-charging before 80% discharged and with periodic equalizing charges.
2. Don't add acid to a battery. Only a person trained and qualified to do battery maintenance should determine if this is necessary.
3. Lift battery only with a correctly constructed lifting device which will not put pressure on the battery case.
4. Keep open flames, tools, and metal objects away from the top of battery to prevent short circuits and explosions.
5. Check the battery electrolyte level before each charging. Add water if the top of the separator or plates are visible.
DO NOT OVERFILL !
6. Do not overcharge.
7. KEEP BATTERY CLEAN AND DRY. Wash down as needed.
8. Keep battery service records.

Battery Cleaning

NEVER WASH THE BATTERY WHEN IT IS IN THE TRUCK.

The easiest and most satisfactory method of cleaning a battery is to wash it occasionally with a low-pressure cold water spray. The top can also be washed off with a solution of baking soda and water (add a box of baking soda to a pail of water and stir until dissolved) and rinse with clean water. It is good practice to have this solution available around a battery room at all times.



IMPORTANT—

During cleaning, the battery vent caps MUST be tightly in place.

Planned Maintenance and Lubrication

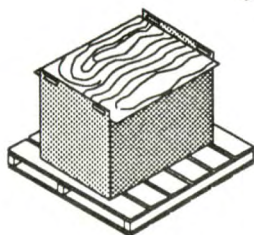
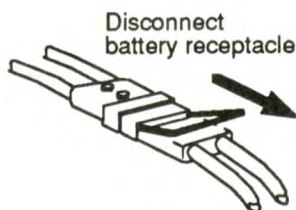
Battery Maintenance

Battery Removal

Refer to the BATTERY MANUFACTURER or SUPPLIER for their recommended procedures or see your SERVICE MANUAL for other important information.

Before removing the battery, follow the guidelines in the "Preperations for Battery Removal and Handling" section in this manual.

1. With key removed from key-switch, tip control panel forward and use chain and hook (attached to dash area) to secure panel in the up position. Raise the seat deck and hook it to the overhead guard.
2. Disconnect the battery receptacle and place them so they will not interfere with the removal of the battery.
3. Open both side panels of the truck.
4. With the correct lifting equipment, attach the safety hooks to the lifting eyes of the battery and carefully remove the battery.
5. Place battery on an approved battery rack or on a wooden pallet.



Battery Installation

1. Use only a lead-acid battery with the voltage and ampere-hour rating specified for the truck.
2. When changing batteries on electric trucks, replacement batteries must be of the service weight that falls within the minimum/maximum range specified on truck nameplate.
3. Be sure truck is properly positioned and parking brake applied.
4. Handle battery only with approved lifting device as previously described.
5. Install the battery correctly in the truck and secure it in position.

NOTICE -- Some trucks are equipped with battery stops or blocks. Others do not require them. If the truck being serviced has battery stops or blocks, be sure none are missing or damaged. Replace them, as necessary. If they are an adjustable type, be sure they are correctly adjusted and tightened.

Planned Maintenance and Lubrication

Battery Maintenance

Battery Charging Precautions

1. Persons maintaining storage batteries must wear protective clothing such as face shield, long sleeves, and gloves.
2. Hydrogen emissions from charging batteries are flammable. No smoking shall be allowed in the charging area. Do not check the electrolyte level with an open flame. Do not allow open flame, sparks or electric arcs in battery charging area.



 **DANGER**
EXPLOSIVE GASES

Do not smoke or have open flames or sparks in battery charging areas or near batteries. An explosion can cause injury or death.


 **WARNING**
SULFURIC ACID

The battery contains corrosive acid which can cause injury. If acid contacts your eyes or skin, flush immediately with water and get medical assistance.

3. When charging batteries, the vent caps must be kept in place to avoid electrolyte spray. Care must be taken to assure that vent caps are open (clean) and functioning. The battery compartment cover and side panel must be open to dissipate heat and gas.

 **CAUTION**

If batteries discharge rapidly during normal operation or do not charge to the correct specifications, contact a qualified battery service technician to check the battery for you.
DO NOT add electrolyte or attempt to service the battery when it is in this condition.



Planned Maintenance and Lubrication

Cold Storage/Weather

Cold Storage Applications

High moisture-exposure operation in areas such as freezers or caustic atmosphere can cause premature failure of SCR control cards. Special spray coatings and oils may be required.

Cold Weather Applications

Regarding the trucks battery, the truck should not be parked outside but rather in a heated room.

When starting up the truck after a lengthy period of time, the hydraulic functions should all be operated several times. This is to warm up the fluid and should be done before moving off the parked position.

Different hydraulic fluids and oils are required for winter and cold climate operations.

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8 Specifications

Note: Clark products and specifications subject to change without notice.
See your CLARK dealer for current Specification Sheets.

Model Designation – Rated Load Capacity

ETR 13 2750 lb.s @ 24 in.s [1248.5 kg @ 600mm]

Note: Capacity is computed at maximum lift height with upright in vertical position. Load center is determined from top and front face of forks. Capacities are based on a 48 in. cube load configuration with center of gravity (C.G.) at the true center of the cube, and standard forks.

Parking Brake/Grade-Max. grade for safe parking brake operation: 10% grade

Battery- 72 volts, 36 cells, Lead Acid
Battery Service- Distilled water

Tires	Qty.	Type	Wheel Nut Torque
Drive Tire	1	Cushion / Polyurethane	[160 N • m] 118 lbf • ft
		Securing bolts of outer conical section of rim of drive wheel	[49 N • m] 36 lbf • ft
Load Tire	2	Cushion / Polyurethane	[160 N • m] 118 lbf • ft

Fluid Recommendations (Standard Operations)

CAPACITIES

Transmission (Drive Axle)	DEXTRON II ATF (Automatic Transmission Fluid)	[2.0 L] 2.1 qt.s
Hydraulic Fluid Normal	CLARK Specification MS-68 Hydraulic Oil w/ antiwear additives	[70.0 L] 18.5 gal.s
Hydraulic Fluid Cold Storage	CLARK Specification MS-226 Hydraulic Oil	[70.0 L] 18.5 gal.s
Brake Fluid	SAE 1 1703 (DOT 4 preferred)	[0.2 L] 0.2 qt.s

Multi-purpose Grease

CLARK MS- 107C, use Grade NLGI #2 per MS-107C

Lift and Articulated Reach Unit Chains

CLARK #886399 Chain and Cable Lube







Additional copies of this manual may be purchased from
YOUR AUTHORIZED CLARK DEALER.

CLARK

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