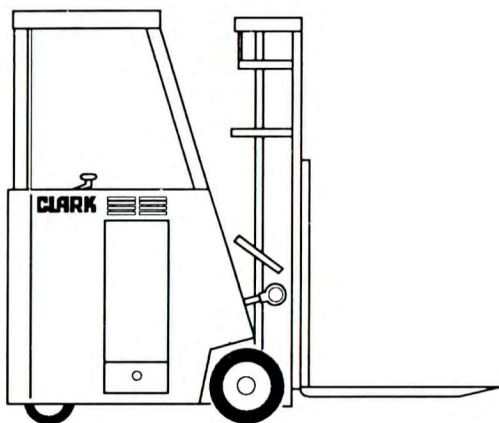


---

# Operator's Manual

Do not remove this manual  
from the truck.



ESM 12 / 25

---

**CLARK**

Book No. 2775896  
OM - 556 1st Rev.

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 \_\_\_\_\_  
Truck Gross Weight, Loaded w/ Rated Load \_\_\_\_\_  
Special Equipment or Attachments \_\_\_\_\_

### IMPORTANT

**Do not expose this manual to hot water or steam.**

The following warning is provided pursuant to  
California Health & Safety Code Sections 25249.5 et. seq.



## WARNING

### California Proposition 65

This product contains and emits  
chemicals known to the State of  
California to cause cancer, birth defects  
and other reproductive harm.

## CALIFORNIA

### Proposition 65 Warning

Diesel engine exhaust and some  
of its constituents are known  
to the State of California to cause  
cancer, birth defects or other  
reproductive harm.



## WARNING

The engine exhaust from this product  
contains chemicals known to the State  
of California to cause cancer, birth  
defects or other reproductive harm.

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# 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 about your new 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 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. In addition, all standard trucks conform to Underwriters Laboratories requirements for the Type Designation shown on the truck capacity plate. Each truck is also furnished with certain safety devices, e.g., horn, driver's overhead guard, and load backrest extension, 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 it is kept in a safe condition.

## Routine Servicing and Maintenance

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

## **User Daily Inspection - Safety and Operating Checks**

A lift truck should always be examined by the user before driving to be sure it is safe to operate. The importance of this procedure is emphasized in this manual with a brief illustrated review and later with more detailed instructions.

### **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 truck. Necessary adjustment 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 inspection, 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.

This manual is intended to be stored in the pocket in the operator compartment. Keep it on the truck as a ready reference of 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.

## **About This Manual**

The purpose of this manual is to provide a digest of essential information about the safe operation of your truck, acquaint you with its features, how they function and are maintained. This manual is organized into 8 major parts for easy reference:

**Part 1 Know Your Truck...**describes the major operation components, systems controls and other features of your truck and how they function.

**Part 2 General Safety Rules...**reviews and illustrates accepted practices for safe operation of a lift truck.

**Part 3 Operating Hazards...**illustrates and describes the hazards that you might encounter most often when operating your lift truck.

**Part 4 Operating Procedures...**discusses more specific instructions on the safe, efficient operation of your lift truck.

**Part 5 Daily Inspection...**describes the safety and maintenance checks that assist in maintaining your lift truck in a safe operation condition.

**Part 6 Planned Maintenance and Lubrication...**describes a PM program for your truck.

**Part 7 Emergency Towing...**gives instructions for towing your truck when necessary.

**Part 8 Specifications...**provides reference information and data on features, components, and maintenance items for your 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 the 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, with out notice and without incurring obligation. Please check with your authorized Clark dealer for information on possible updates or revisions.



## 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.

## **Safety Signs and Safety Messages**

**For safe operation of this lift truck you must be trained in its use and authorized to operate it.**

Follow these important rules:

1. Read and understand the operator's manual.
2. Know the basic parts of the truck.
3. Learn and practice your employer's safe operating procedure.
4. Keep the truck properly maintained.

**Safe operation is the responsibility of the operator.**

**Ignoring these rules can cause serious or fatal injury to yourself or others.**



## **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 are 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:

1. OPERATOR NOT PROPERLY TRAINED
2. OPERATOR NOT EXPERIENCED WITH LIFT TRUCK OPERATION
3. BASIC SAFETY RULES NOT FOLLOWED
4. LIFT TRUCK WAS NOT MAINTAINED IN A 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 learn how to operate your lift truck safely. This manual shows and tells you about operator maintenance 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 finally, a section on maintenance and lubrication is included for the lift truck mechanic.

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

## **A Message To Clark Lift Truck Operators**

Remember, before you start operating this lift truck, be sure that you understand all driving procedures. It is your responsibility, and 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 BB56.1 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.

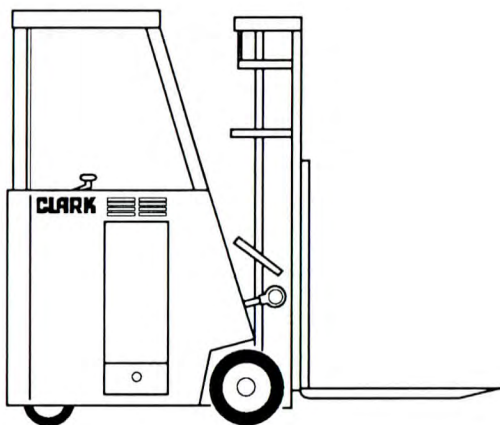
CLARK lift trucks are built to take hard work, but not abuse. They are built to be dependable, but they are only as safe and efficient as the operator and the persons responsible for maintaining them. Do not make any repairs to this truck unless you have been trained in lift truck repair procedures and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

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

## TRUCK APPLICATION

Each model of lift truck is designed for a specific set of work tasks and conditions. Be sure you are using the right truck for the job.

ESM trucks are designed to work in warehouses which utilize maximum storage space and minimum aisle space. They require dry conditions and smooth level floors.



ESM (Electric Standup Multitired)

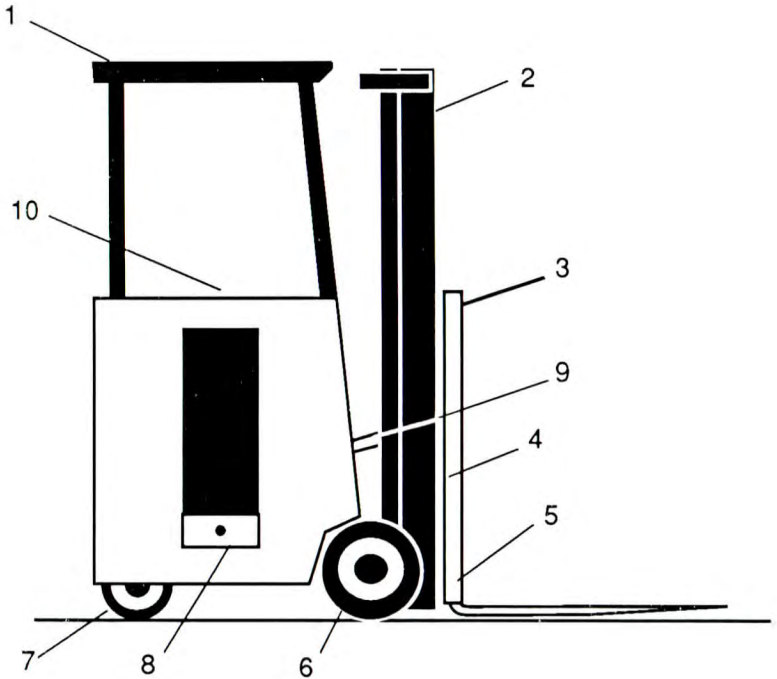


# 1 Know Your Truck

- 1.2 Component Location
- 1.3 Operator's Compartment
- 1.4 Maintenance Component Location
- 1.5 System Description
- 1.7 Nameplate Description
- 1.8 Decals

# Know Your Truck

## Component Location

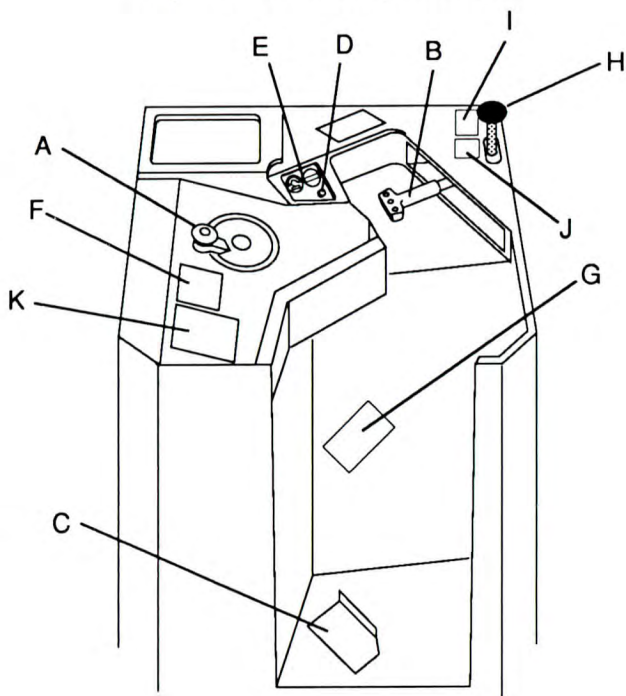


1. Driver's Overhead Guard
2. Upright Assembly
3. Load Back Rest Extension
4. Fork Carriage
5. Forks and Retainers
6. Load Wheels
7. Drive Wheel
8. Battery Retainers
9. Tilt Cylinders
10. Operator's Compartment



# Know Your Truck

## Operator's Compartment

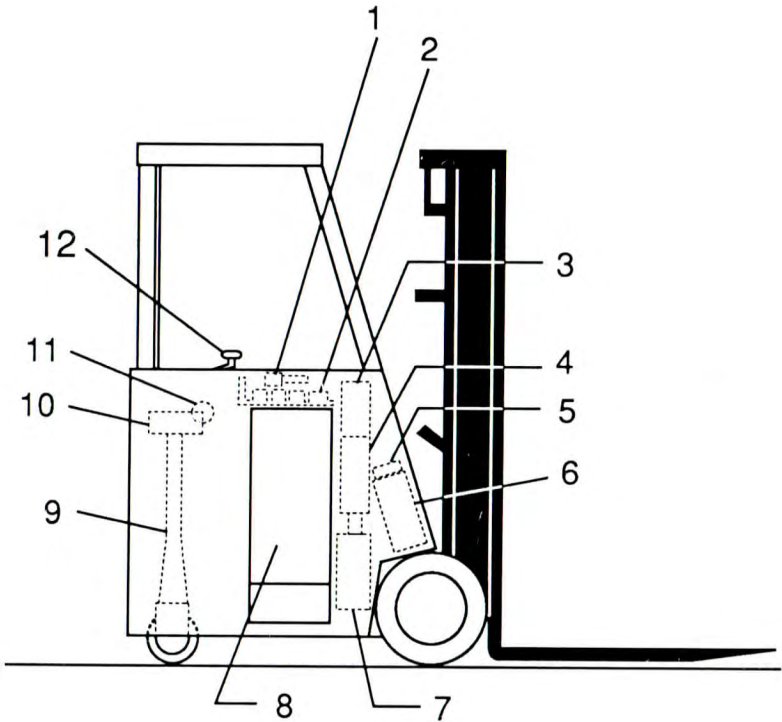


### 10. Operator's Compartment

- A. Steering Wheel
- B. Control Handle
- C. Brake
- D. Key Switch
- E. Hour Meter / Battery Charge Indicator
- F. Name / Capacity Plate
- G. Operator's Manual
- H. Battery Disconnect Lever
- I. Battery Connector Warning Decal
- J. Battery Disconnect Decal
- K. Operator Safety Warning Decal

# Know Your Truck

## Maintenance Component Location



1. Control Handle
2. Traction Control Panel
3. Lift Pump & Motor
4. Steer Pump & Motor
5. Service Brake
6. Drive Motors (2)
7. Sump Tank
8. Battery
9. Steer Axle & Housing
10. Steer Actuator
11. Brake Reservoir
12. Steer Control

# Know Your Truck

## System Description

### Truck Components And Features

- removable component covers for easy maintenance access.
- polyurethane paint
- 3 battery compartment lengths
- hi-visibility operator overhead guard
- return line hydraulic filter with spin-on replacement
- multiple function hand control
- quick battery connect mechanism
- optimized ergonomically designed operator compartment
- power assisted steering
- rear post operator protection
- quiet drive units

### Multifunction Control Handle

The single handle provides control for direction and speed, lift and lower, side shifting if so equipped, and a second auxiliary function if desired.

### Power Steering

The power steering motor drives a pump which produces the fluid flow for steering.

The five inch steering tiller is equipped with a spinner knob.

### Drive Unit

Dual drive units with drive motor mounted directly to the reduction units.

### Brake System

Drum and shoe spring applied mechanical / hydraulic release brakes. Armature shaft with braking function is activated by allowing the brake pedal to rise. Power to the drive motor will be automatically turned off before the brake is fully applied. The power steer motor will remain on for a short period of time after the brake is applied.

# Know Your Truck

## System Description

### Electrical Components

Electrical wiring - U.L. approved main harness and instrument harness.

Traction motor - series wound with class H insulation. Fan cooled and ventilated.

Ignition switch - on/off switch with removable key.

Horn button - on control handle for easy access.

Speed control - SCR controlled with bypass contactor.

Power steer motor - permanent magnet design with class H insulation.

Lift motor - series wound with class H insulation.

Electrically controlled solenoid valves that direct oil flow to the correct actuator.

Instrument - hour meter, battery discharge indicator, direction control, lift, tilt and parking brake operation indicators.

### Uprights

Nested I-beam inner rail and outer rail channel with sealed rollers in upright and carriage. Hydraulic piping is internal.

# Know Your Truck

## Nameplate

**CLARK**

INDUSTRIAL TRUCK DIVISION  
BATTLE CREEK, MICHIGAN GEORGETOWN, KENTUCKY

MODEL NO.  TYPE

SERIAL NO.

ATTACHMENTS

CAPACITY WITH ATTACH. LISTED ABOVE OR WITH FORKS - UPRIGHTS VERTICAL			
LBB	A	B	C
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

LESS BATT. ELECTRICS

WITH MAX BATT. WT.

MAX	MIN
<input type="text"/>	<input type="text"/>

BATTERY

AMH	NO.
<input type="text"/>	<input type="text"/>

CAPACITY

LIBS	VOLTS
<input type="text"/>	<input type="text"/>

FOR OTHER CAPACITIES CONSULT MANUFACTURER.  
AS RELEASED FROM FACTORY CLARK TRUCKS MEET THE  
FOLLOWING DESIGN SPECIFICATIONS FOR POWERED  
INDUSTRIAL TRUCKS - UT AND IT MODELS - PART 3 ANSI B56.6  
1976, ALL OTHER MODELS - PART 3 ANSI B56.1 1969 AND 1976

## Know The Data On The Nameplate

1. Truck registered name.
2. Truck model number and serial number.
3. Type of construction. The code letter signifies the type of protection. Check with proper authority before entering areas where flammable or explosive material may be present.
4. Attachment description [if any].
5. Capacity, load center and lifting height data.
6. Truck weight, less load.
7. Battery weight.
8. Battery ampere-hour rating.
9. System voltage.

### IMPORTANT:

If the truck is modified, the capacity of the truck may be affected. Contact your authorized Clark dealer for a new nameplate showing the revised capacity.

# Know Your Truck

## Decals

Here are examples of decals which give you important information about operation and safety. OSHA and ANSI require you to replace them if they are missing or unreadable. Get familiar with them and follow the instructions.

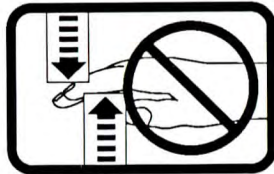


### Operator Safety Warning Decal

The operator's warning decal describes basic instructions for safe operation of a lift truck. Read and understand these instructions and the other safety messages in this manual and on the lift truck.

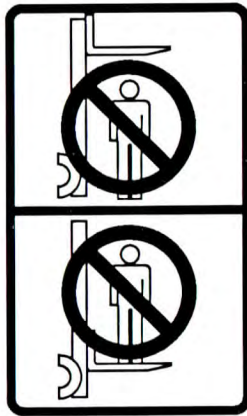
# Know Your Truck

## Decals



### Upright Warning Decal

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



### Keep Away From Forks Decal

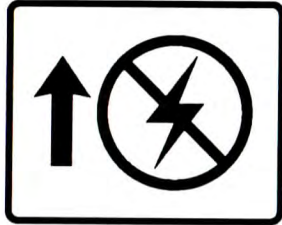
This safety decal is placed on the upright to warn of the danger of injury from forks when they are in the raised position. Do not ride on or stand under forks or attachments. The forks can fall and cause injury or death. Always make sure that the forks are in the fully lowered position when they are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

# Know Your Truck

## Decals

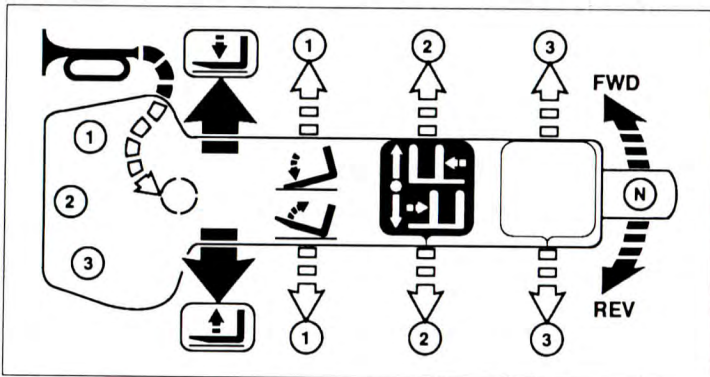
### Battery Disconnect Decal

This decal indicates the location of the battery disconnect lever and the direction to actuate it.



### Battery Connector Warning Decal

This decal is placed next to the battery disconnect lever to warn of the danger of the truck starting in motion.



### Hand Control Decal

This decal shows the travel, lift, tilt, horn operations, and also side shift and double auxiliary valve functions when available.



## 2 General Safety Rules

- 2.2 Do's and Don't
- 2.3 No Riders
- 2.4 Pedestrians
- 2.5 Operator Protection
- 2.6 Traveling
- 2.7 Pinch points
- 2.8 Parking

# General Safety Rules

## Do's and Don'ts



Don't mix drugs and / or alcohol with driving.



Do watch for pedestrians.



Don't block doors, safety, or emergency equipment.



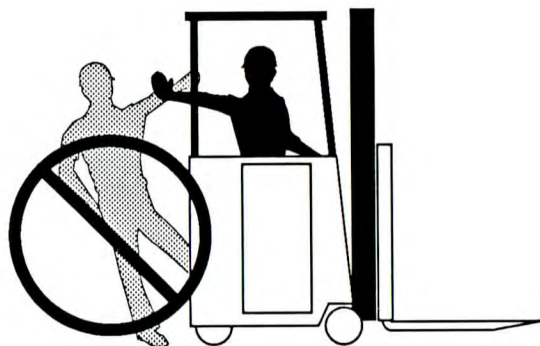
Do wear all the required safety equipment.



Don't smoke in "No Smoking" areas.

## General Safety Rules

### No Riders

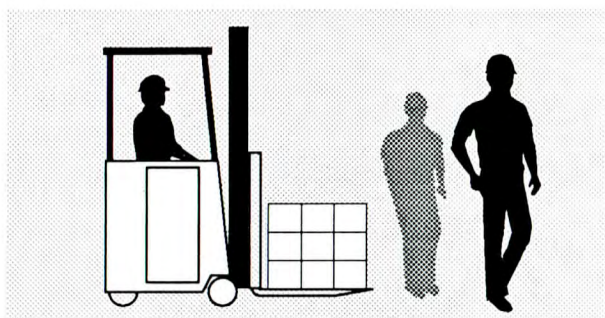


The ESM has no safe provision for passengers.

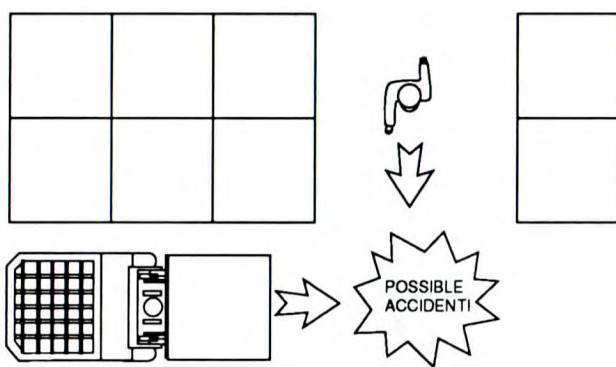
Do not allow persons to ride on the truck, forks or load.

# General Safety Rules

## Pedestrians



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



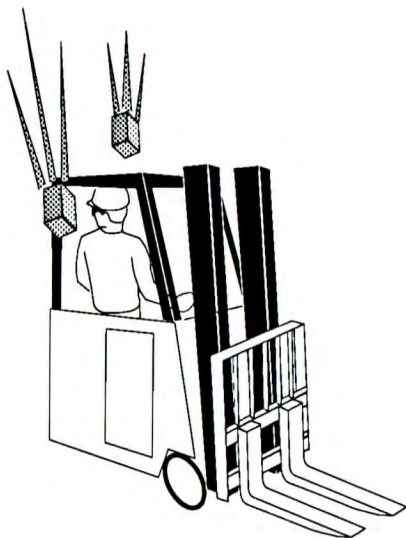
Also be alert to the possibility of persons stepping into intersections or out from behind objects into the truck's path.

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

## Operator Protection



Keep under the overhead guard.

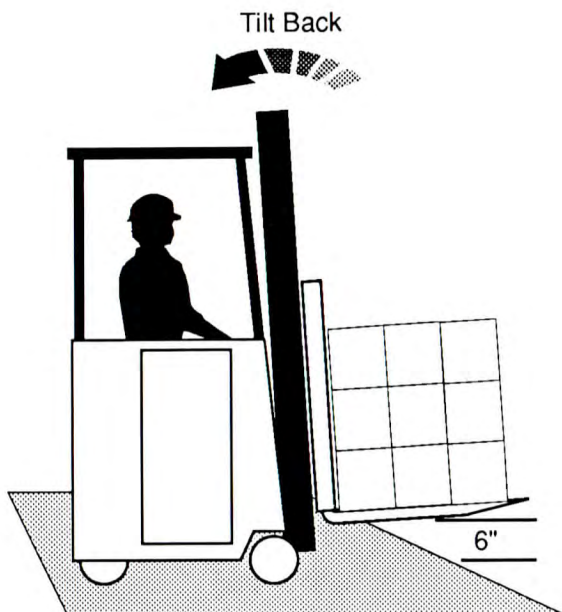
Keep your body inside the operator's compartment of the truck.

Do not remove any protective shields or devices that are put there for your safety.

Go slowly and carefully when operating where it is hard to see.

# General Safety Rules

## Travel



Travel with the forks about 6" above the floor whether loaded or empty.

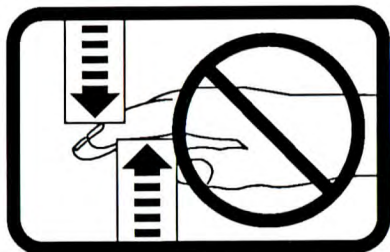
When traveling loaded, tilt the forks back to stabilize the load against the load back rest.

If you can't see past your load, then travel cautiously and slowly in reverse.

You may find that you get a smoother change of direction of travel if you use the "plugging" feature of the drive control.

# General Safety Rules

## Pinch Points



Be aware of the potential pinch points on the truck.

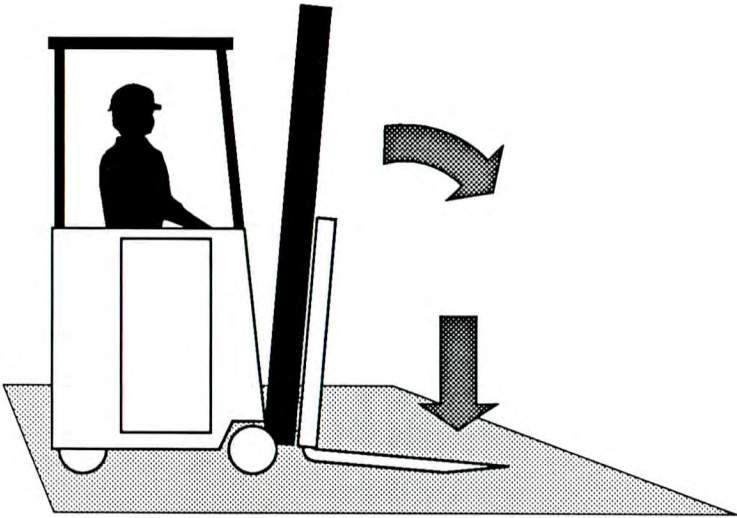
Their locations are marked with the pinch point decal.

Keep your hands, arms, feet and legs out of the upright.

Don't use the upright as a ladder.

# General Safety Rules

## Parking



Always come to a complete stop.

Park only in authorized location.

Lower the forks to the floor and tilt them forward.

Allow travel controls to return to neutral.

Turn the key switch off and remove the key.

Step from the truck and the brake will set itself.



## 3 Operating Hazards

The operation of lift trucks involves many hazardous situations. This section describes some of the more common ones. Your place of work may have hazards not described. Be alert to those situations that can result in injury and possibly death.

- 3.2 Fast Turns
- 3.2 High Loads
- 3.3 Loose Loads
- 3.3 Long and Wide Loads
- 3.4 Rear Steering
- 3.4 Right Angle Stacking
- 3.5 Chain Slack
- 3.5 High Forks
- 3.6 Truck Loading
- 3.6 Floor and Elevator Capacity
- 3.7 Debris on Floor
- 3.7 Low Overhead Clearance
- 3.8 Loading Dock
- 3.9 Ramps
- 3.10 Damaged Pallets and Skids

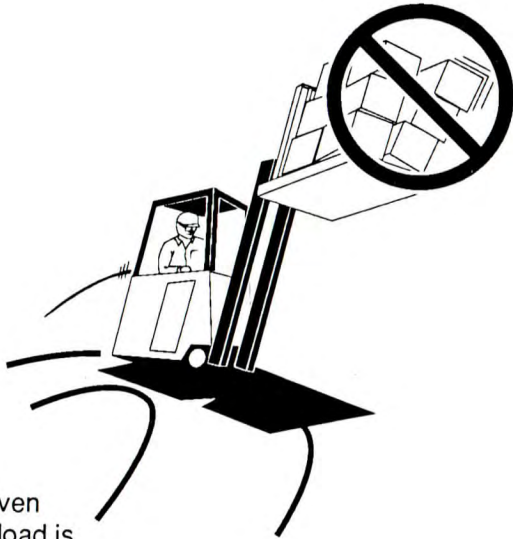
## Operating Hazards



**! WARNING:**

### Fast turns

An empty truck can tip over if it is turned too quickly at high speed.



**! WARNING:**

### High loads

The truck will tip over even more quickly when the load is being carried high.

## Operating Hazards

### **WARNING:**

#### **Loose Loads**

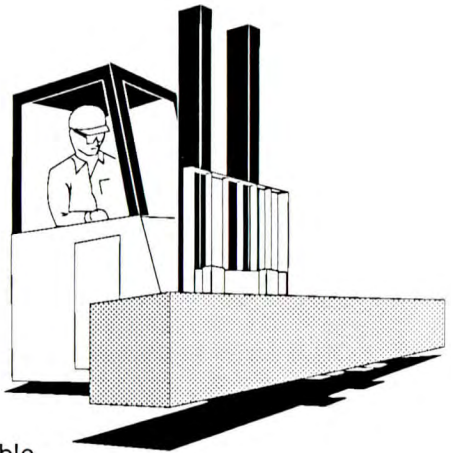
Falling loads can seriously injure yourself or others. Loose cartons, damaged pallets, forks not set wide enough are some of the causes that result in loads falling when moved.



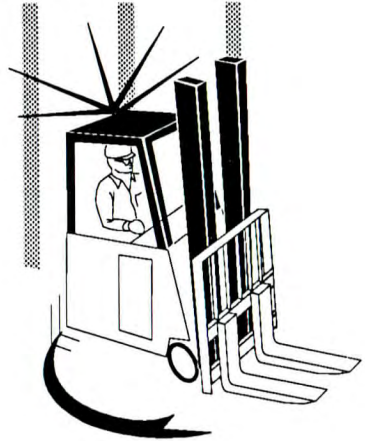
### **WARNING:**

#### **Long or Wide Loads**

Long or wide loads are less stable and may strike objects or persons in its path. Watch load clearance, move slowly and turn carefully.



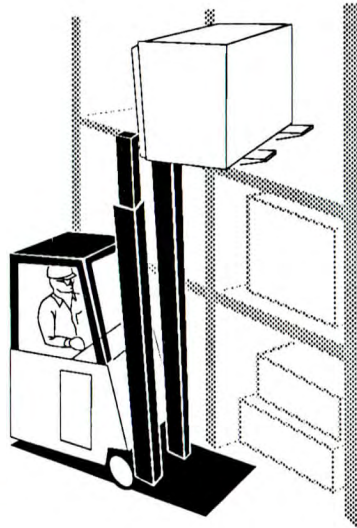
## Operating Hazards



### **WARNING:**

#### **Rear Steering**

The rear of the truck will turn into people or objects unless care is taken when turning.



### **WARNING:**

#### **Right Angle Stacking**

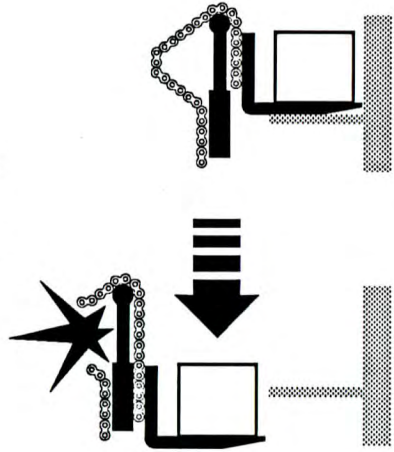
Right angle stacking often requires loads being carried high during turning. Turn carefully and slowly.

## Operating Hazards

### **WARNING:**

#### **Chain Slack**

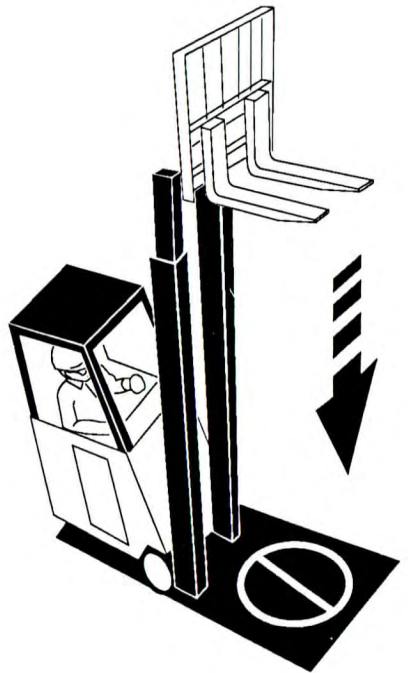
Chain slack means rail or carriage hang-up. This slack can result in the forks dropping quickly. Raise the forks before you move. And try lowering again.



### **WARNING:**

#### **High Forks**

Rapidly lowering forks and falling loads can injure or kill. Do not stand or allow others to stand under the forks at any time.

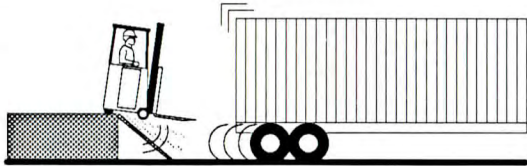
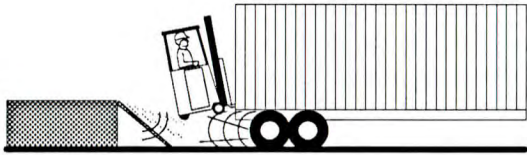
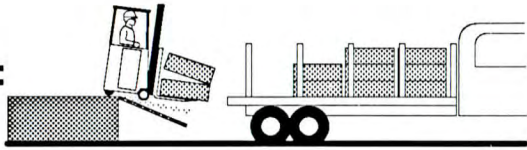


## Operating Hazards

### **WARNING:**

#### **Truck Loading**

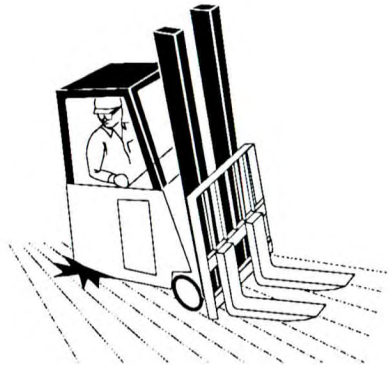
Loading trucks or trailers can cause movement of the truck or trailer that result in the lift truck falling between the dock and the truck. Always chock the wheels of the truck or trailer and use dock locking systems if available.



### **WARNING:**

#### **Floor and Elevator Capacity**

Check elevator and floor capacities. They must be able to support the weight of the truck and its full (capacity) load.

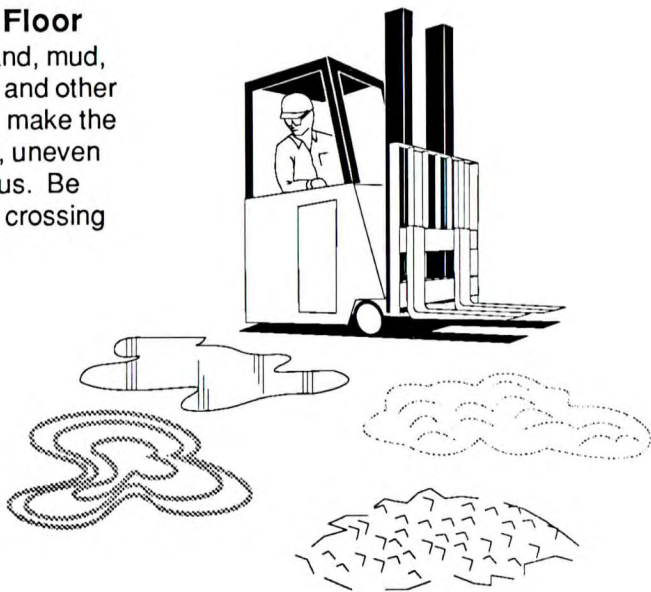


## Operating Hazards

### **WARNING:**

#### **Debris on Floor**

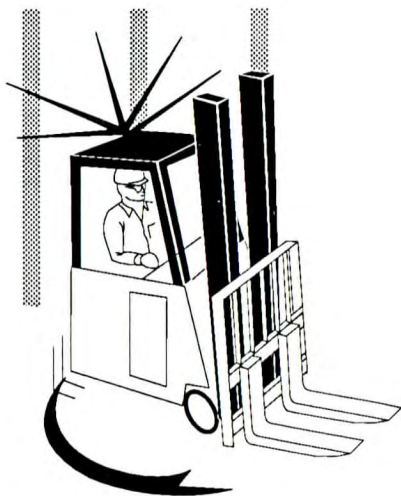
Oil, water, sand, mud, wood, stones and other materials will make the floor slippery, uneven and dangerous. Be careful when crossing these areas.



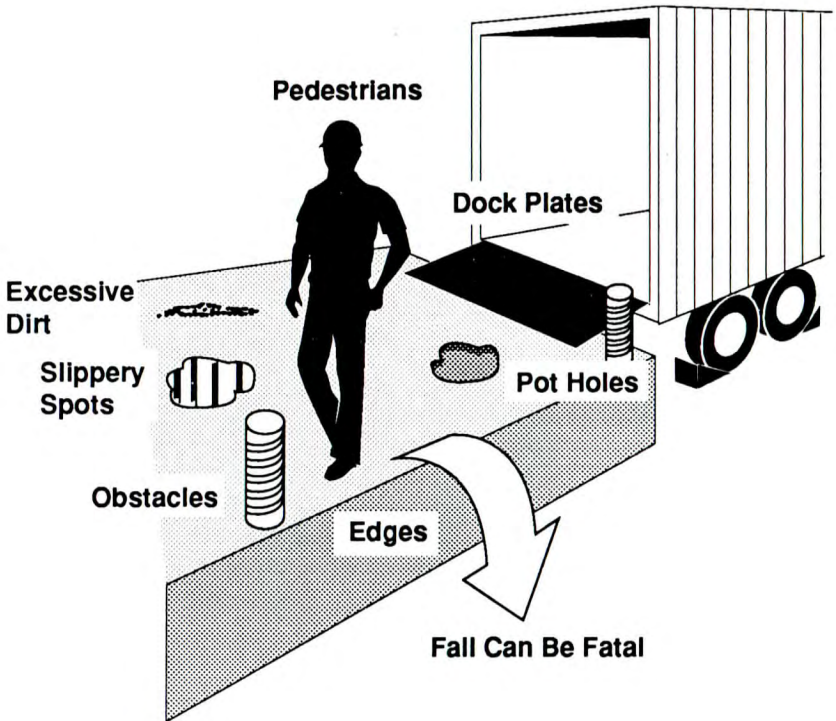
### **WARNING:**

#### **Low Overhead Clearance**

Striking overhead structures can tip your truck over.



# Operating Hazards



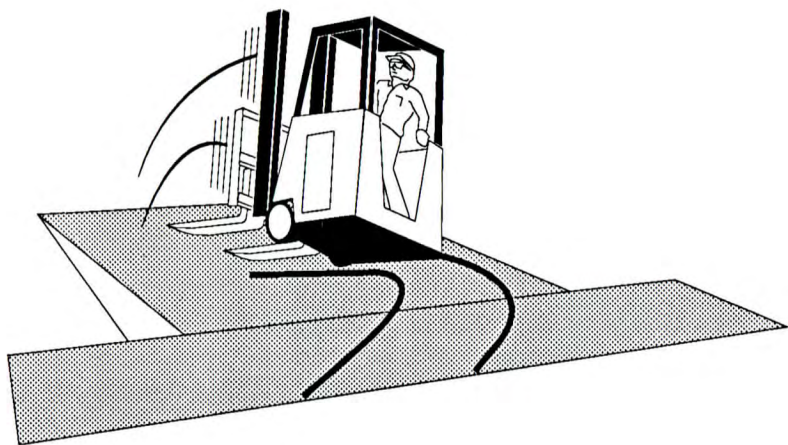
## **WARNING:**

### **Loading Dock**

Shown are a few of the things that the operator should be aware of when operating in the dock area.



## Operating Hazards

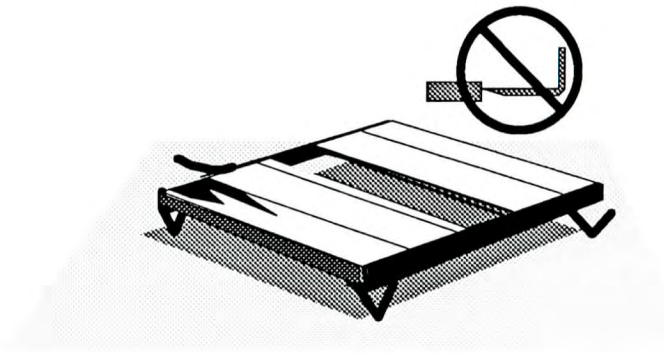
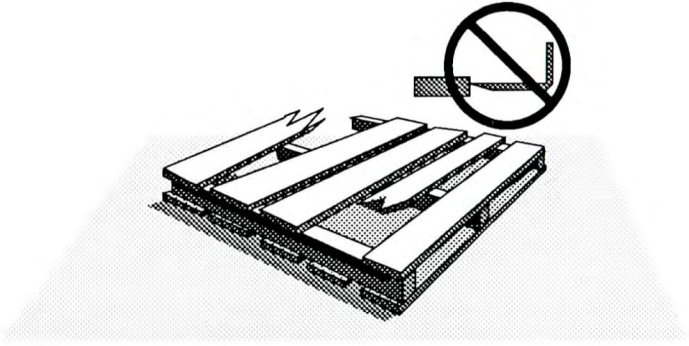


### **WARNING:**

#### **Ramps**

Never turn on ramps, this will make the truck turn over. Travel straight up and down with loads up hill so they won't slide off.

## Operating Hazards



### **WARNING:**

#### **Damaged Pallets and Skids**

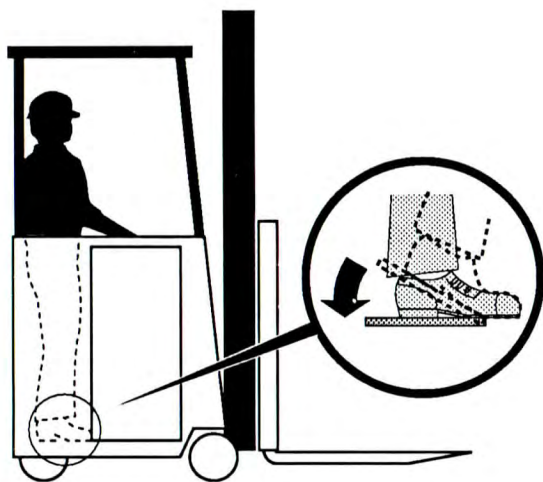
Do not move or store materials on damaged or poorly maintained pallets and skids. Items can fall through or off them causing severe injury or death.

## 4 Operating Procedures

- 4.2 Operator Position
- 4.3 Travel Control
- 4.3 Lift / Lower Control
- 4.4 Tilt Forward / Back Control
- 4.4 Horn
- 4.5 Auxiliary Valve Control
- 4.6 Loading
- 4.7 Ramp Travel
- 4.8 Parking

# Operating Procedures

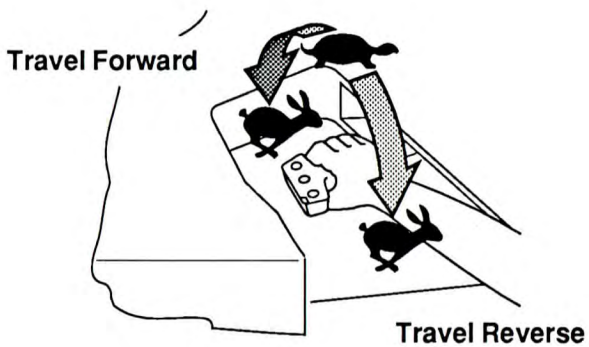
## Operating Position



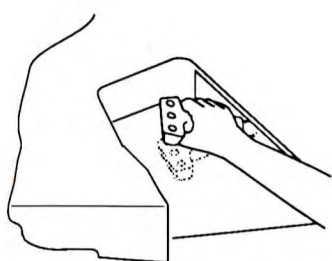
Body, arms and feet inside operators compartment.  
Foot firmly on brake pedal releases the brake.

# Operating Procedures

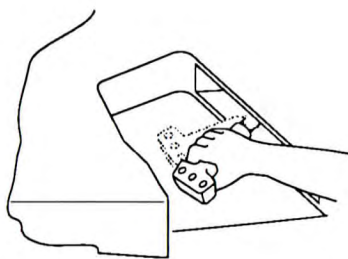
## Travel Control



## Lift and Lower Control



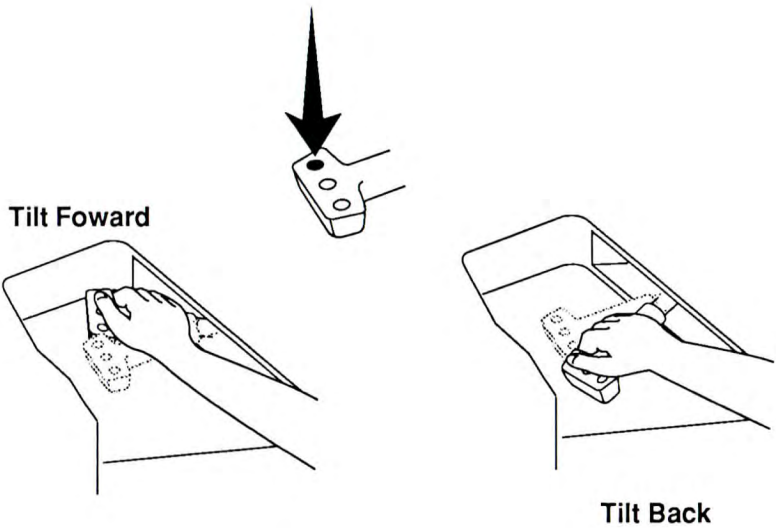
Lower



Lift

# Operating Procedures

## Tilt Control



## Horn Control



# Operating Procedures

## Auxiliary Valves Control



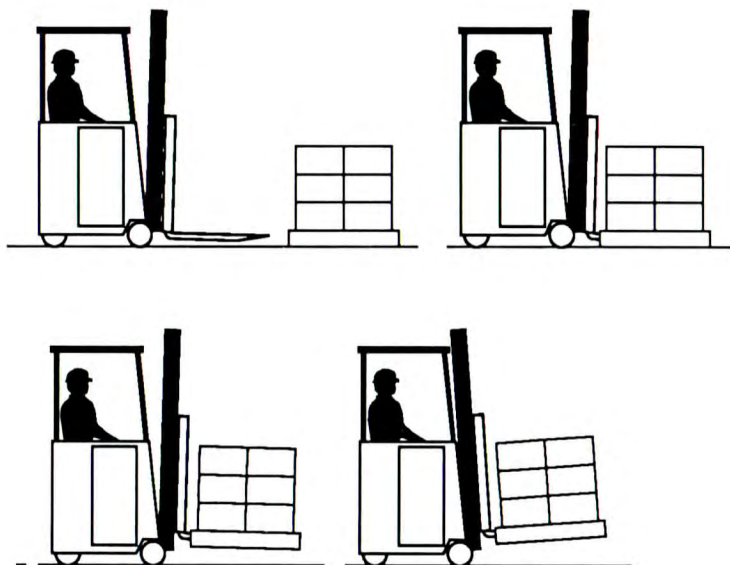
**Single Auxiliary  
Function**



**Double Auxiliary  
Function**

# Operating Procedures

## Load Handling



Set forks as wide as possible.

Make sure load is stable.

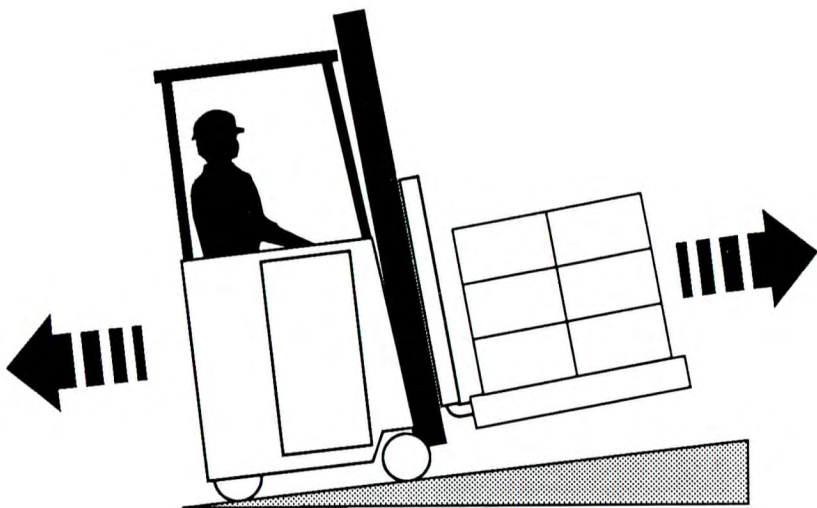
Enter with forks slightly tilted down.

Lift load about 6" and tilt forks back.



# Operating Procedures

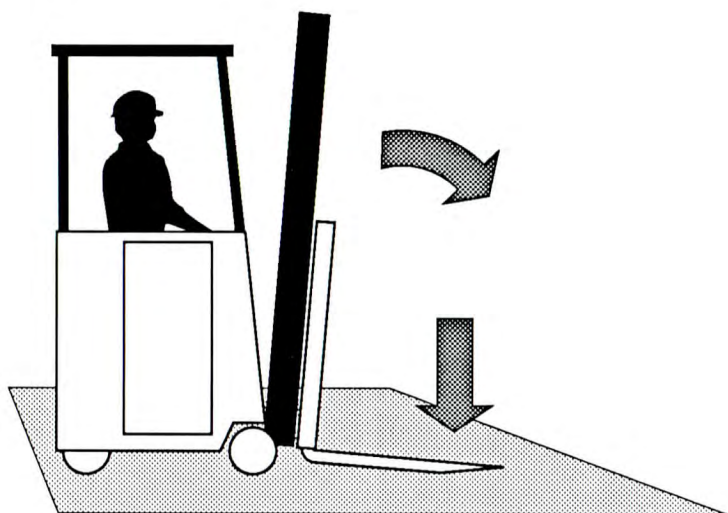
## Ramp Travel



Climb grades with load up hill.  
To keep load on your forks.  
Don't travel on more than 15 %  
grade.  
Never turn on a ramp.

# Operating Procedures

## Parking



Always come to a complete stop.

Park only in authorized location.

Lower the forks to the floor and tilt them forward.

Allow travel controls to return to neutral.

Turn the key switch off.

Step from the truck the brake will set itself.

## 5 Daily Inspection

OSHA requires inspection before starting each shift to keep lift trucks in safe operating condition. The following information points out important areas to check during these inspections.

- 5.2 Daily Inspection Sheet
- 5.3 Battery Retainment
- 5.4 Driver's Overhead Guard
- 5.5 Forks and Retainers
- 5.6 Upright
- 5.7 Travel Control
- 5.7 Plugging Control
- 5.8 Steering
- 5.8 Brake
- 5.9 Tilt
- 5.10 Wheels

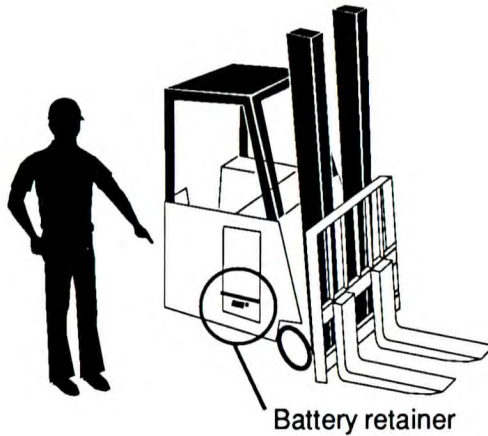
## Daily Inspection



### Daily Inspection Sheet

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

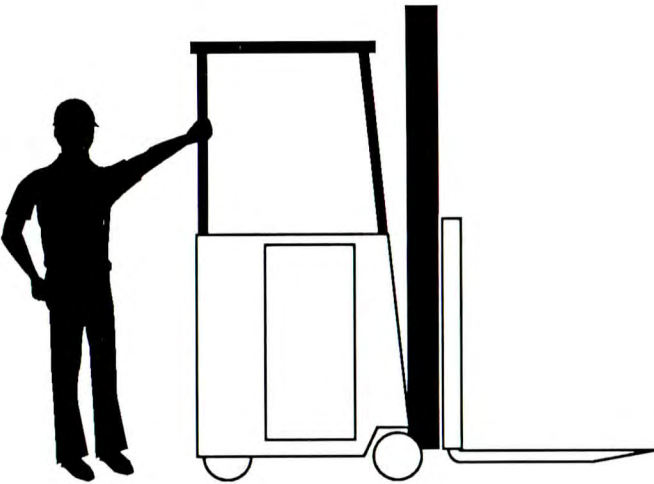
## Daily Inspection



### Battery Retainment

Check for the proper placement of the battery and its retainers. The battery should be centered and to the rear of the compartment. If battery movement within the compartment is greater than a total of 1/2 inch in any horizontal direction, the retainers must be adjusted or spacers added, by the user, to comply to this 1/2 inch specification.

## Daily Inspection



### **Driver's Overhead Guard**

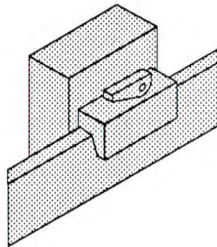
This is an important safety device to protect the operator from objects that may drop from above. Check it for damage that may result in its failure or allow larger objects to come through it.

# Daily Inspection



## Forks

Check the forks for excessive wear or cracks. Make sure they are straight and level with each other.

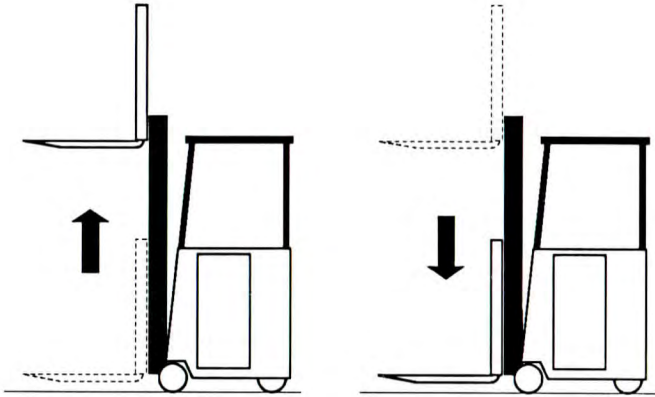


## Fork Retainers

The fork retainers and locks must be in place and operating properly to prevent movement during truck operation. They also prevent the forks from accidentally coming off the fork bars.

## Daily Inspection

### Upright



**! DANGER:** Upright can drop suddenly if not operating properly. Keep hands away.

#### Check

Chains for proper tightness. The upright should have smooth operation. Any binding of the latches, upright sections or fork carriage should be corrected, defective or loose components should also be repaired or replaced before the truck is used. All repair work should be done by a mechanic trained in lift truck service.

#### Check

Hydraulic hoses for damage or leaks.

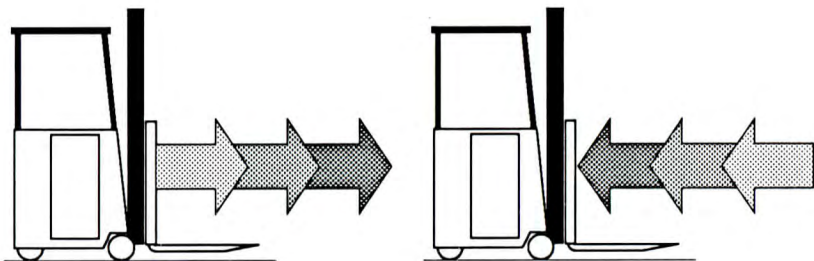


**! WARNING:**

Do not check for hydraulic pressure leaks with your hands or body. Hydraulic oil may be injected into your skin causing serious injury.



## Daily Inspection



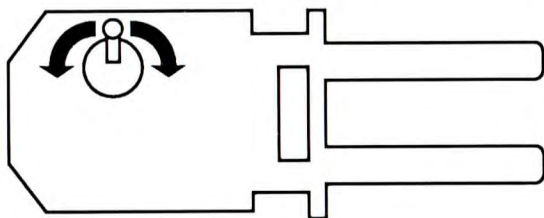
### Travel Control

After raising the forks about 6 inches check for proper and smooth operation of the forward and reverse operation of the truck.

### Plugging Control

Check this system in the following manner. Drive the truck forward at a slow speed and very quickly rotate the control handle to a slow speed reverse position. The truck should slow to a smooth stop and then accelerate slowly in reverse. Drive the truck in reverse at a slow speed and quickly rotate the control handle to a slow speed forward position. The truck should smoothly slow to a stop and accelerate slowly forward.

## Daily Inspection



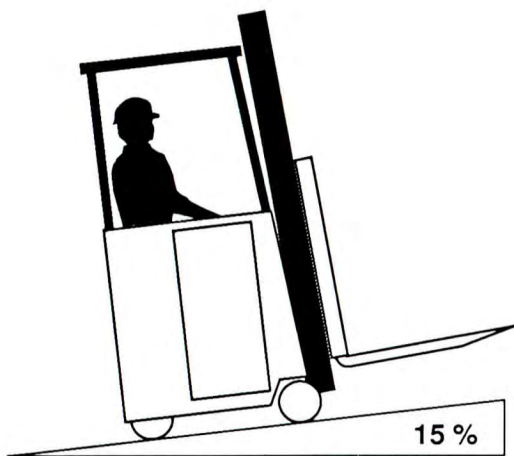
### Steering

While the truck is stationary, with the key switch on, check for smooth operation of the steering system. Hard spots or too much play mean trouble. Park your truck and get it fixed.



### **WARNING:**

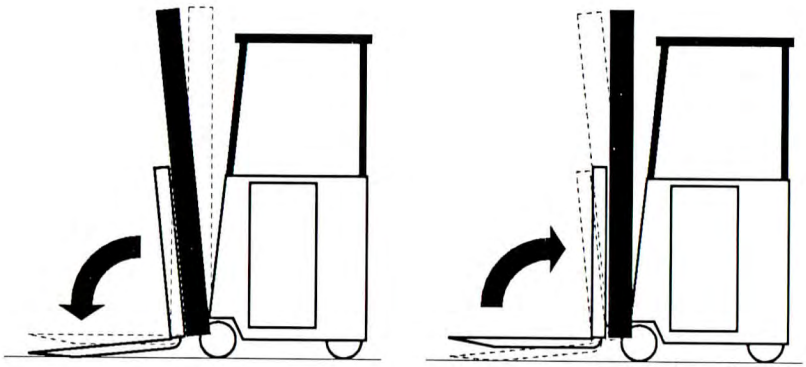
Never operate a truck which has a faulty steering system.



### Brake

Test parking brake on ramp. Brake should hold on a 15 % max. grade. On flat, level ground truck should not move when brake is released.

# Daily Inspection



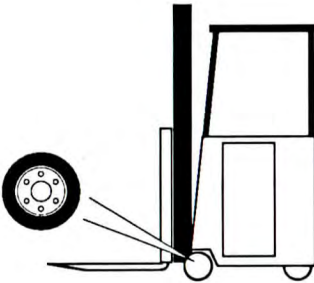
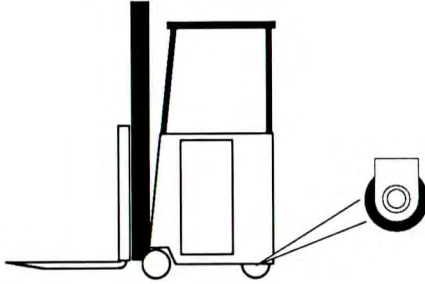
## Tilt

Tilt the upright forward checking:

For smooth tilting movement.

Evenness of tilt cylinder extension to prevent upright twist.

## Daily Inspection



### **Wheels**

Check the condition of the wheels and tires. Remove embedded objects. Report excessive wear, breaks and “chunking out” and bond failure.

Check lug nuts and wheel bearings for proper tightness.

## 6 Planned Maintenance and Lubrication

**Regular maintenance and care of your lift truck is not only important for full and efficient truck life; it is essential for your safety. To assist you in keeping your lift truck in service and 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 to be alert for any indication that your truck may need service and have it attended to promptly. You are important in making sure your lift truck regularly receives the service it needs.**

- 6.2 Typical Operating Conditions
- 6.3 Intervals - Maintenance - Lubrication
- 6.4 Planned Maintenance and Lubrication
- 6.5 User Safe Inspection Practices
- 6.8 Safety Standards
- 6.9 Battery Removal
- 6.10 Battery Handling
- 6.14 Battery Cleaning
- 6.16 Battery Maintenance, Records and Life
- 6.17 Fork Inspection

# **Planned Maintenance and Lubrication**

## **Typical Operating Conditions**

### **NORMAL OPERATION**

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

### **SEVERE OPERATION**

Prolonged operating hours or constant usage, ramps and / or bumpy floors.

### **EXTREME OPERATION**

1. Sandy or dusty locations.
2. High temperature locations.
3. Sudden temperature changes such as refrigeration facilities.

# Planned Maintenance and Lubrication

## Intervals - Maintenance - Lubrication

<b>Daily Inspection</b>	A	B	C	D	E
Check truck for obvious damage and leaks	o				
Check / clean battery terminals	o				
Check electrolyte level	o				
Check capacity, warning plates, decal	o				
Check condition of tires and wheels and remove embedded objects	o				
Check wheel lug nuts	o				
Check gauges and hourmeter	o				
Check overhead guard condition and bolts	o				
Check horn operation and other warning devices	o				
Check steering operation	o				
Check brake operation	o				
Check directional and speed control operation	o				
Check lift, tilt, and aux. operation	o				
Check upright, lift chains and fasteners	o				
Check load backrest extension and forks	o				

# Planned Maintenance and Lubrication

## Recommended Planned Maintenance And Lubrication Schedule

<b>Recommended Planned Maintenance Interval</b>
A = 8 - 10 hours or daily
B = 50 - 250 hours or every month
C = 450 - 500 hours or every 3 months
D = 900 - 1000 hours or every 6 months
E = 2000 hours or every year

<b>PLANNED MAINTENANCE / LUBRICATION</b>	A	B	C	D	E
To be performed by Trained and Authorized Personnel (See Service Manual for other important information)					
Check truck visually and inspect components		●			
Test drive truck - Check functional performance		●			
Air clean truck		●			
Check torque on critical fasteners		●			
Lubricate truck		●			
Clean / check battery terminals, electrolyte level		●			
Check battery cables / truck receptacle		●			
Perform battery load test		●			
Check drive motor brushes		●			
Check lift motor brushes		●			
Check steer motor brushes		●			
Test ground		●			
Clean drive motor air vent		●			
Check drive axle fluid level		●			
Drain and replace drive axle fluid					●
Check brake condition and wear		●			
Check drive axle mounting and fasteners		●			
Lubricate steer axle trunnion bearing					●
Check / lubricate steer axle wheel bearings					●
Replace hydraulic sump fluid and filter					●
Clean / replace hydraulic sump breather			●		
Lubricate tilt cylinder rod ends		●			
Lubricate upright fittings		●			
Check lift chains adjustment and wear		●			
Lubricate lift chains		●			
Lubricate upright rollers		●			



# Planned Maintenance and Lubrication

## USER SAFE MAINTENANCE PRACTICES

The following instructions have been prepared from current industry and government safety standards applicable to industrial truck operations and maintenance. They are listed here for the reference and safety of all workers during inspection / maintenance operations. When in doubt of any inspection / maintenance procedures, 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, adjust and inspect industrial trucks and in accordance with the manufacturer's specifications.
5. Properly ventilate work area, vent exhaust fumes, 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 electrolyte level. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
7. Before Starting To Work On Truck:
  - a) Raise drive wheel 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.

# Planned Maintenance and Lubrication

## USER SAFE MAINTENANCE PRACTICES

9. Before Starting to Drive the Truck:

- a) Be in operating position.
- b) Turn on power.
- c) Check functioning of lift and tilt systems.
- d) Check directional and speed controls.
- e) Check steering.
- f) Check brakes.
- g) Check warning devices.
- h) Check any load handling attachments.

10. Before Leaving the Truck:

- a) Stop truck.
- b) Fully lower forks or attachment device.
- c) Allow directional control to return to neutral.
- d) Turn off the control / ignition switch.
- e) Chock 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.

13. All hydraulic systems must be regularly inspected and maintained in conformance with good practices. 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.

## USER SAFE MAINTENANCE PRACTICES

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 device, electrical conductors and connections must be inspected and maintained in conformance with good practices. 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.
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

## Safety Standards

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

ANSI / ASME B56.1 - 1983: 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

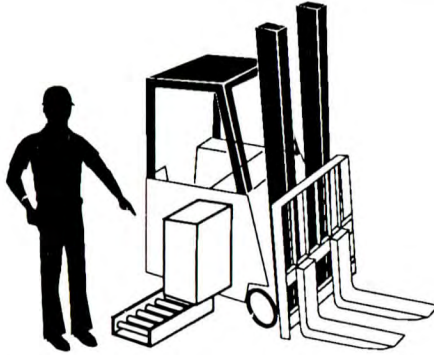
Your new CLARK lift truck, although not UL rated, has been built to meet all applicable mandatory requirement of ANSI B56.1 - - 1969 - 1983 Safety Standard for Powered Industrial Trucks. Each truck also includes certain safety devices such as the horn and overhead guard as standard equipment. No additions, 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

## Battery Removal

### **! 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.**



Position the truck in the designated area, turn off key switch and disconnect the battery. The battery can be removed from either side of the truck.

A recommended method of handling the battery is to use a platform equipped with rollers, similar to the one shown. If the battery to be handled is uncovered, cover the battery with a non-conducting material, such as plywood.

### **! WARNING:**

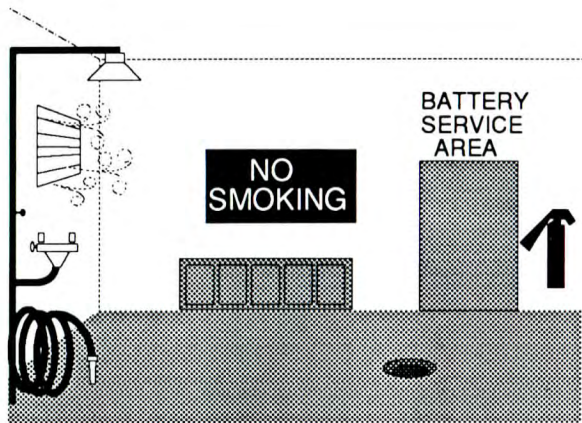
Electric truck batteries are heavy and awkward to handle. They are filled with a very hazardous chemical solution. On charge, they give off hydrogen and oxygen which, in certain concentrations, are explosive. Electric truck batteries are also costly, so before you remove, service, or install a truck battery, consult the BATTERY MANUFACTURER, SUPPLIER or your SERVICE MANUAL for more recommendations and instructions on handling and charging batteries. Carefully read and follow recommendations and instructions.

# Planned Maintenance and Lubrication

## Battery Handling

Change or service batteries only in an area designated for this purpose.

Be sure this area has provisions to flush and neutralize spillage, to ventilate fumes from gassing batteries, and has provisions for fire protection.

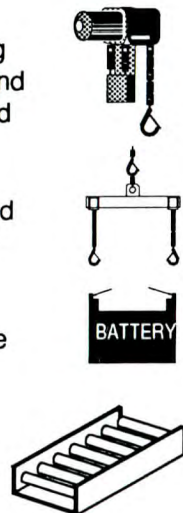


Before attempting to change or charge a battery the truck shall be positioned in the designated battery service area. Be sure the truck cannot move.

Be sure the area is equipped with material handling equipment designed for the purpose of removing and replacing batteries, such as a conveyer or overhead hoist equipped with safety hooks.

When using an overhead hoist, be sure an insulated spreader bar or similar lifting device is used so the lifting force is vertical.

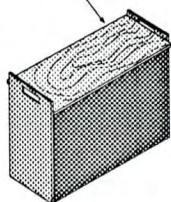
To avoid side forces from damaging the battery, the distance between the lifting hooks must be the same as the distance between the battery lifting eyes. Make sure the lifting hooks are the correct size to fit the lifting eyes of the battery.



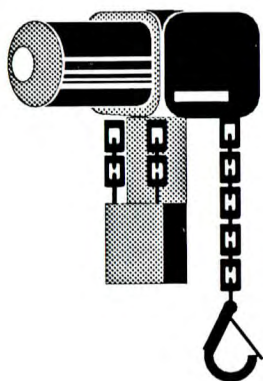
# Planned Maintenance and Lubrication

## Battery Handling

Non-Conductive Cover



If the battery does not have a cover of its own, cover it with a non-conductive material such as plywood prior to attaching a battery lifting device.



When using a power hoist, be sure the hoist is equipped with a chain container to accumulate the excess chain. If this is not possible be sure the battery is covered.

# Planned Maintenance and Lubrication

## Battery Handling

Keep all tools and other metal objects away from the terminals.



Persons maintaining storage batteries must wear protective clothing such as face shield, long sleeves and gauntlet gloves.

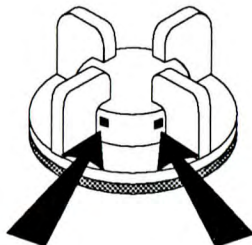


### **!** DANGER:

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 the battery charging area.



## Battery Handling



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 functioning. The vent cap holes must be open to allow the battery to breathe. The battery, or battery compartment cover(s) must be open to dissipate heat.



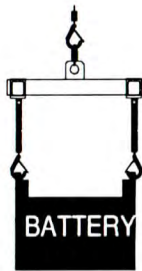
### **CAUTION:**

**DO NOT ADD WATER OR ATTEMPT TO SERVICE THE BATTERY DURING CHARGING.**

# Planned Maintenance and Lubrication

## Battery Handling

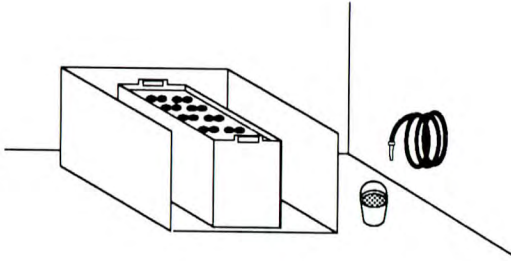
 **WARNING:**  
**BATTERY SERVICE**  
**BATTERY SERVICE MUST BE DONE BY**  
**TRAINED PERSONNEL. BATTERY ACID**  
**CAN CAUSE SEVERE BURNS AND INJURY.**



Once the battery is out of the truck, a lifting device equipped with an insulated spreader bar and safety hooks can be used to transport this style of battery.

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## Battery Cleaning



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 baking soda solution (add a box of baking soda to a pail of water and stir until dissolved) and rinsed with clear water. It is wise to have this solution around a battery room at all times. Be sure all vent caps are tightly in place during cleaning operation.

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## Battery Maintenance, Records and Life

### BATTERY MAINTENANCE:

Refer to the battery vendor for their recommended procedures.

### KEEPING BATTERY RECORDS:

Some type of records should be kept to get the best service out of your battery and truck. Select a pilot cell, take readings of specific gravity and temperature before and after charging, and record with the date. It is best to change the pilot cell occasionally to distribute and electrolyte loss over the battery in taking the readings. Every two to three months, take complete battery readings. Check specific gravity, temperature and voltage. Record these readings.

### HOW TO GET MAXIMUM LIFE FROM THE BATTERY:

**DO NOT ADD ACID TO A BATTERY.** Only a qualified battery representative should determine if this is necessary.

Lift only with a carefully constructed lifting device which will not put pressure on the battery tray.

Battery shall be checked before each charge for electrolyte level.

Add water before charge, but do not overfill. Overfilling causes loss of electrolyte. The level should be slightly below the lower lip of the filling vent hole.

Keep battery clean and dry. Wash down as needed.

Do not over charge.

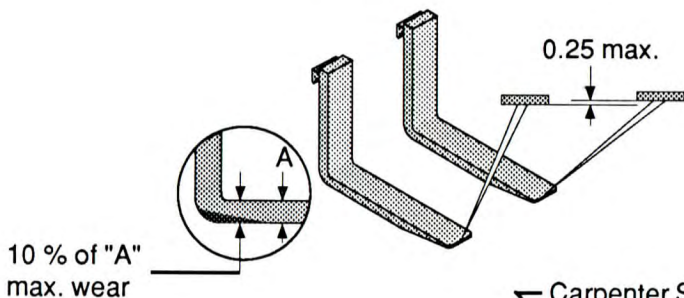
Keep battery records as indicated above.

Keep metal objects and tools away from top of battery to prevent explosions.

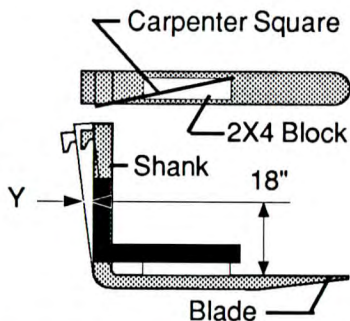
# Planned Maintenance and Lubrication

## Fork Inspection

Inspect the forks for cracks, breaks, bending and wear. The fork surfaces should be level and even with each other. The height difference between both fork tips should be no more than (6mm) 0.25 inch maximum. If the fork blade at the heel of the fork is worn down by more than 10 percent, the load capacity of the forks is reduced and they must be replaced.

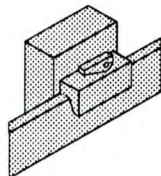


Inspect the forks for twists and bends. Put a 2"X4"X24" block on the blade of the fork with the 4" surface against the blade. Put a carpenter's square on the top of the block and against the shank.



Fork cross section	Allowable "Y" values for various blade lengths			
	42" blade	48" blade	54" blade	60" blade
1-1/2X4	15/16	1-1/4	1-9/16	1-15/16
1-3/4X5	1/2	5/8	25/32	31/32

To prevent accidental shifting of the forks inspect the fork latches. Make sure they are not damaged or broken and they operate freely and lock correctly.





## 7 Emergency Towing

### Emergency Towing

Driver must be in truck with the brake pedal fully depressed, key on and power steer pump running.

Hook chain (of sufficient capacity to pull truck) around upright mounting trunnions.

Use truck of sufficient capacity to pull ESM truck. Hook chain to tow pin.



Use truck of sufficient capacity to lift and carry the disabled truck.





## 8 Specifications

Model	Capacity	
ESM 12	2500 lbs @ 24"	(1200 Kg @ 600 mm)
ESM15	3300 lbs @ 24"	(1500 Kg @ 600 mm)
ESM15S	3300 lbs @ 24"	(1500 Kg @ 600 mm)
ESM 17	3700 lbs @ 24"	(1700 Kg @ 600 mm)
ESM 20	4400 lbs @ 24"	(2000 Kg @ 600 mm)
ESM 22	4800 lbs @ 24"	(2200 Kg @ 600 mm)
ESM 25	5500 lbs @ 24"	(2500 Kg @ 600 mm)

### Parking Brake / Grade:

Maximum grade for safe Parking Brake operation: 15 % grade

### Battery:

Lead Acid, 36 volts, 18 cells

Tires:	Quantity	Wheel Nut Torque
Drive Tire	2	(225 - 275 n • M)188 - 203 lbs• Ft
Steer Tire	2	N.A.

### Fluid Recommendations:

Transmission Fluid DEXRON II ATF

Hydraulic Fluid	CLARK Specification
Normal Temperature	MS - 68
Cold Storage	MS - 226

Brake Fluid: SAE J1703b or DOT 3

### Fluid Capacities:

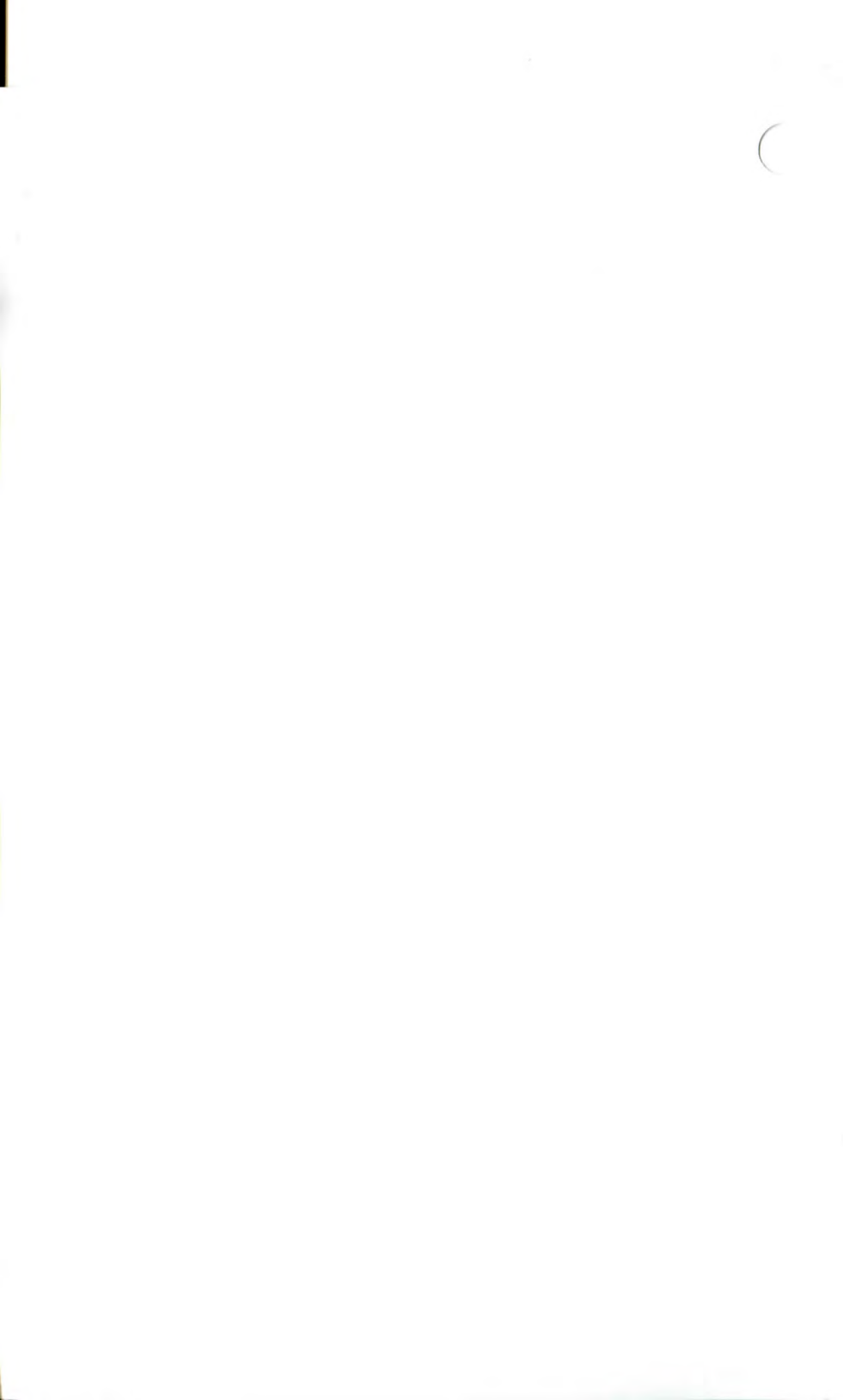
Drive Axle	Approx. (6,5 L)	5.72 qts
Sump Tank	Approx. (14,93 L)	3.35 gal

### General Purpose Grease:

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

### Chain Lubricant:

CLARK #886399 chain & cable lube



SERIAL NUMBERS:

TRUCK \_\_\_\_\_

CONTROL PANEL \_\_\_\_\_

DRIVE MOTOR \_\_\_\_\_

MAIN PUMP MOTOR \_\_\_\_\_

STEER PUMP MOTOR \_\_\_\_\_

UPRIGHT \_\_\_\_\_

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

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