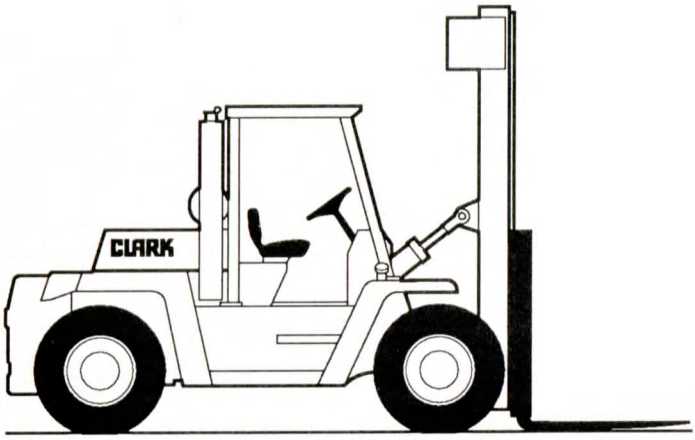
Operator's Manual

Do not remove this manual from the truck.



C500 Y 180-200-225S-225L-250S-250L-300S-300L-350

CLARK

Book No. 2780514
OM-575 Rev. 1

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 _____

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

Operator's Manual

You must be trained and authorized to operate a lift truck

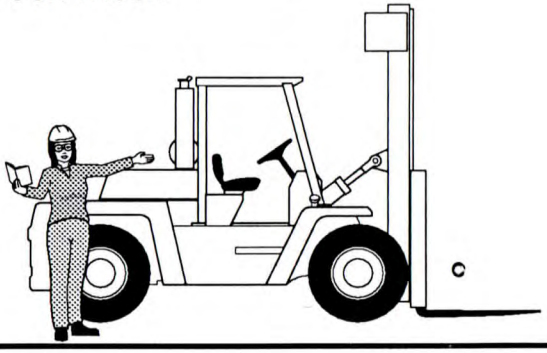
YOU can prevent accidents

First: Learn safe operating rules and your company rules.

Next: Read your Operator's Manual, if you do not understand it ask your supervisor for help.

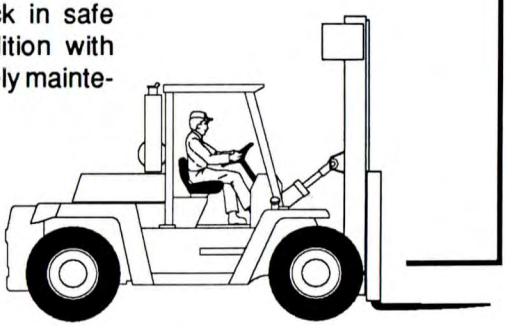
Learn about the unit you operate.

KNOW YOUR TRUCK



Then: Practice operating your truck safely

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



IMPORTANT

Breaking these rules will cause serious or fatal injury to yourself and 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 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 maintenance and lubrication is included for the lift truck mechanic.

The operator's manual is not a training manual. It is a guide to help trained and authorized operators safely operate their lift truck by emphasizing and illustrating the correct procedures. 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) and state laws require that operators be completely trained in the safe operation of lift trucks; if you think you need training, ask your supervisor.

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 safe lift truck repair procedures and are authorized by your employer.

CONTENTS

This manual covers the following models:
C500 Y 180-200-225S-225L-250S-250L-300S-300L-350

Introduction

Clark 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 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 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 -1988 Safety Standard for Powered Industrial Trucks. Each truck is also furnished with equipment to help you operate safely e.g., parking brake, horn, 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. Clark dealers can supply copies of a helpful "Drivers Daily Checklist"

Planned Maintenance

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 un-scheduled 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 Service Manual SM-575.

How to Use this Manual

The purpose of this manual is to provide a digest of essential information about the safe operation of your lift truck and to acquaint you with its features and how they function and are maintained. This manual is organized into 9 major parts for easy reference:

Part 1 General Safety Rules, reviews and illustrates accepted practices for safe operation of a lift truck.
Part 2 Operating Hazards, warns of conditions that could cause damage to the truck or injury to the operator or other personnel.
Part 3 Know Your Truck, describes the major operating components, systems, controls and other features of your truck and how they function.
Part 4 Operator Care and Maintenance, presents added details on how to perform the operator's daily safety inspection.
Part 5 Operating Procedures, discusses more specific instructions on starting and the safe, efficient operation of your lift truck.
Part 6 Emergency Starting, gives instructions for the use of battery jumper cables.
Part 7 Emergency Towing, describes towing procedures and how to release the "automatic on" parking brake if the truck has no brake system air pressure.
Part 8 Planned Maintenance and Lubrication, describes a PM program for your truck.
Part 9 Specifications, provides reference information and data on features components, and maintenance items for your lift truck.
Index, provides help for locating information about various topics.

Each part has its own Table of Contents, so that you can find the various topics within more easily. If you cannot find a topic in the Table of Contents, check the Index at the back of the manual.

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

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

This manual is intended to be a permanently attached part of your lift truck. Keep it on the truck as a ready reference for anyone who may drive or service it. If the truck you operate is not equipped with 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 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. Don't hesitate to ask for help. **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. If warning decals are damaged they must be replaced. Contact your Clark dealer for replacements.

NOTICE

This message is used when special information, instructions or identification is required relating to procedures, equipment, tools, pressures, capacities and other special data.

IMPORTANT

This message is used when special precautions should be taken to ensure a correct action or to avoid damage to or malfunction of the truck or a compartment.

CAUTION

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

WARNING

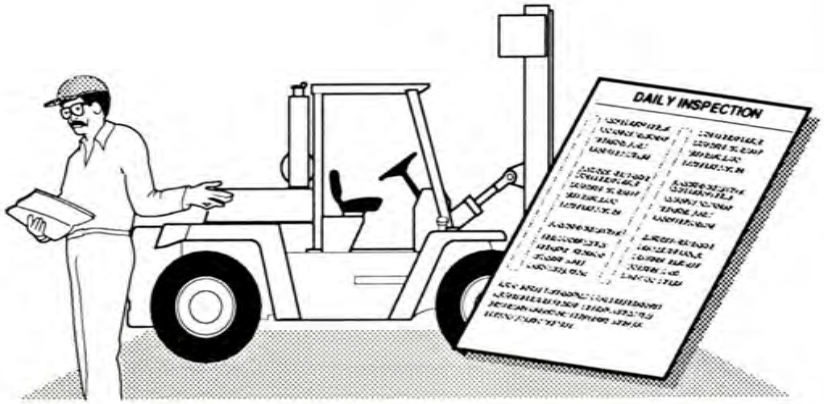
This message is used when a hazard exists which can result in injury or death, if proper precautions are not taken.

DANGER

This message is used when an extreme hazard exists.

Contents

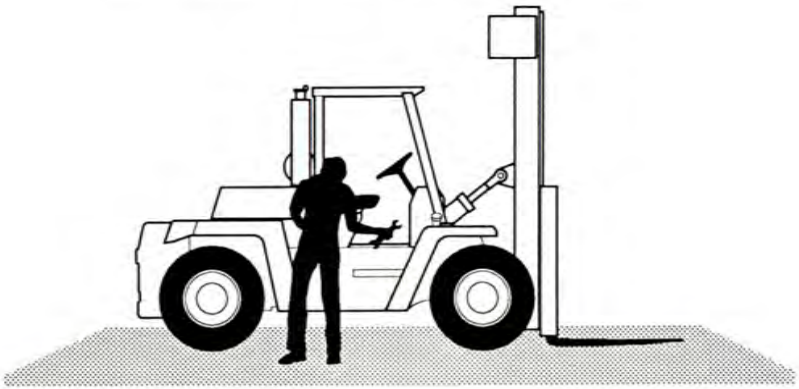
Daily Inspection



At the begining of each shift inspect your truck and fill out a daily inspection sheet.

Check for damage and maintenance problems.

Have repairs made before you operate the truck.



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

Do's and Don'ts

DON'T MIX DRUGS OR ALCOHOL WITH YOUR JOB.

DO WATCH FOR PEDESTRIANS

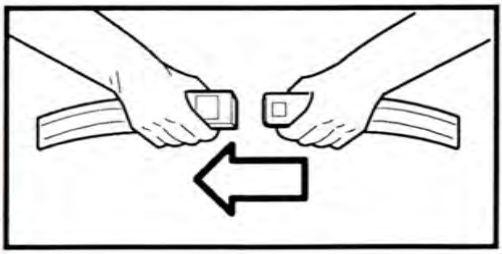
DON'T BLOCK SAFETY OR EMERGENCY EQUIPMENT

DO WEAR SAFETY EQUIPMENT WHEN REQUIRED

DON'T SMOKE IN "NO SMOKING" AREAS OR WHEN REFUELING

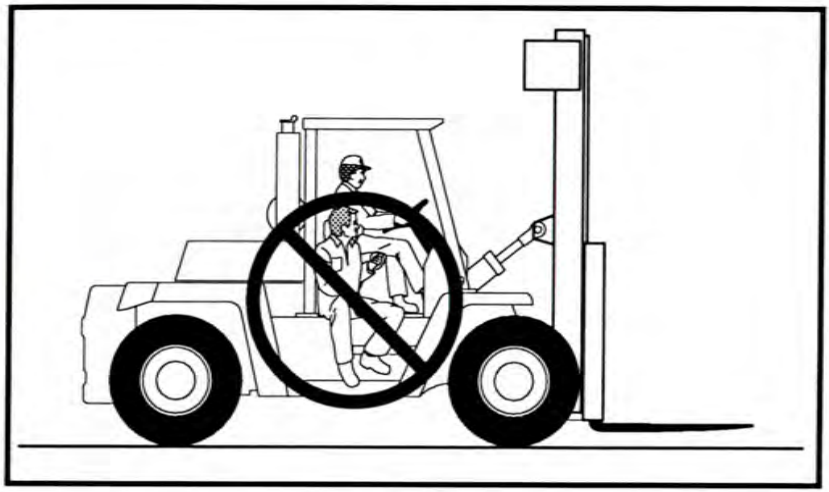
Seat Belts

ALWAYS BUKLE UP

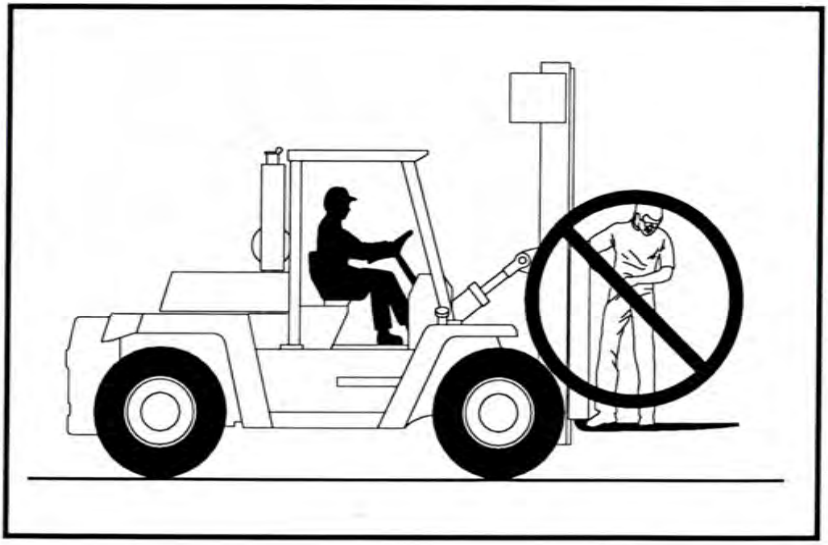


Seat belts can reduce injuries.

No Riders



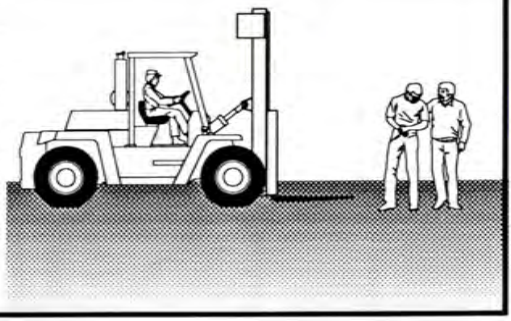
The operator is the only one who should be on a truck.

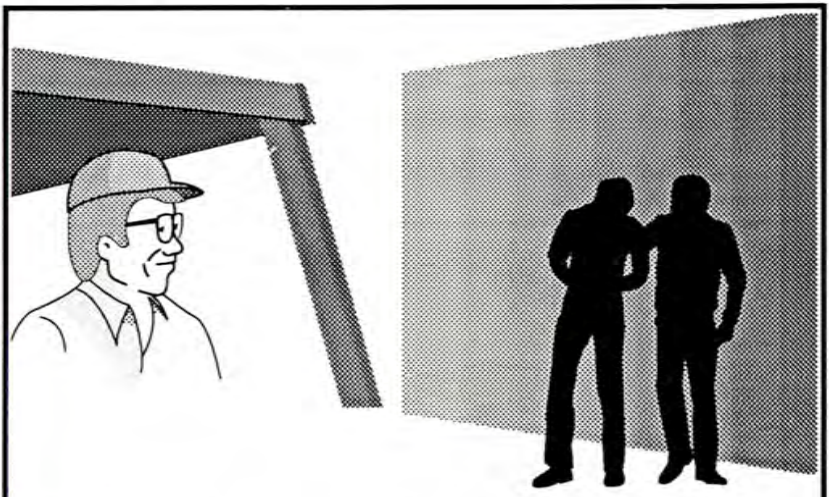


Never transport personnel on the forks of a lift truck.

Pedestrians

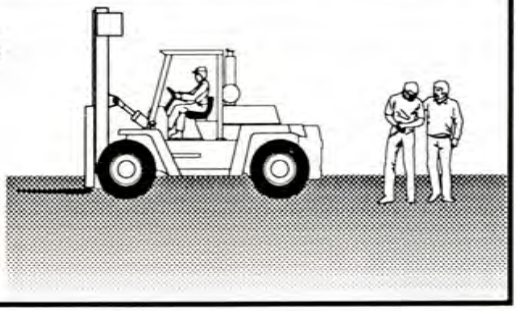
Watch where you are going, look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots.



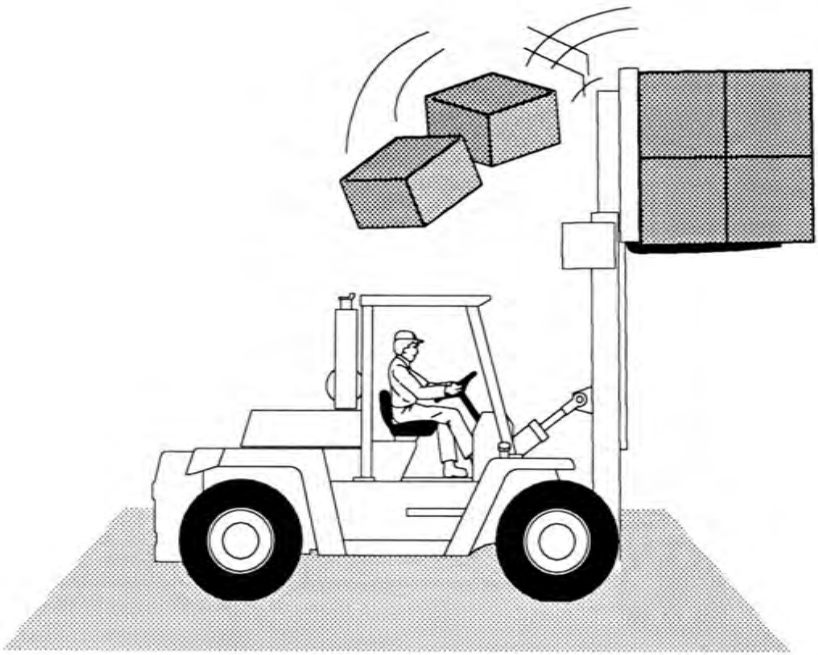


Watch for people in your work area even if your truck has warning lights or alarms. They may not watch for you.

Make people stand back, even when you are parked.



Operator Protection

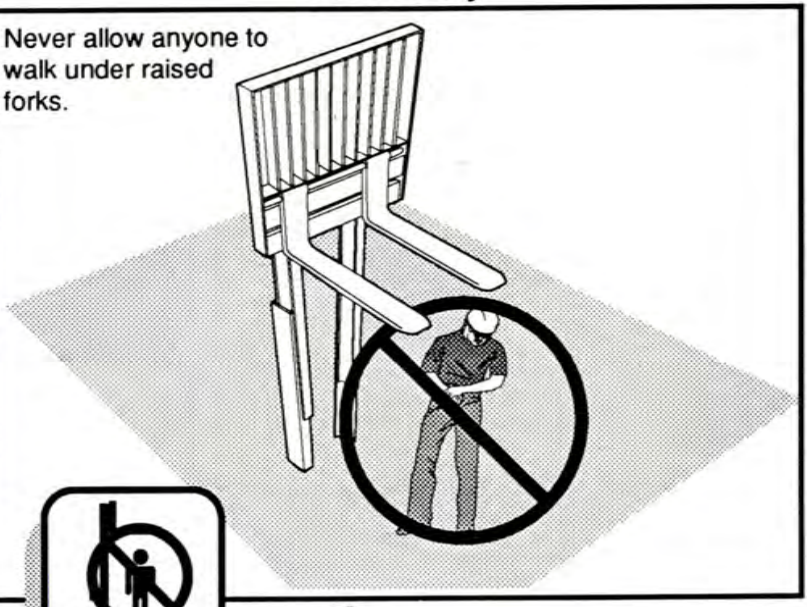


Keep under the overhead guard.

Always keep your body within the confines of the truck.

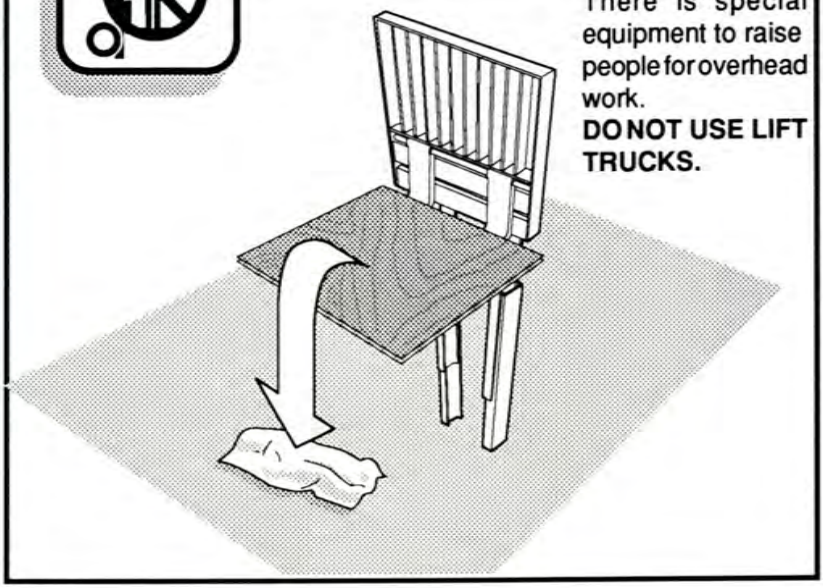
Fork Safety

Never allow anyone to walk under raised forks.

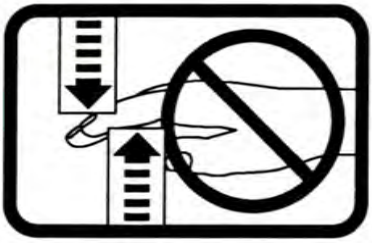


DANGER

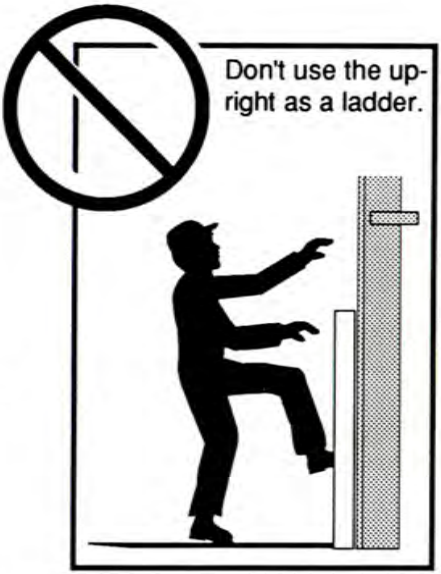
There is special equipment to raise people for overhead work.
DO NOT USE LIFT TRUCKS.



Pinch Points



Keep hands, feet and legs out of the upright.



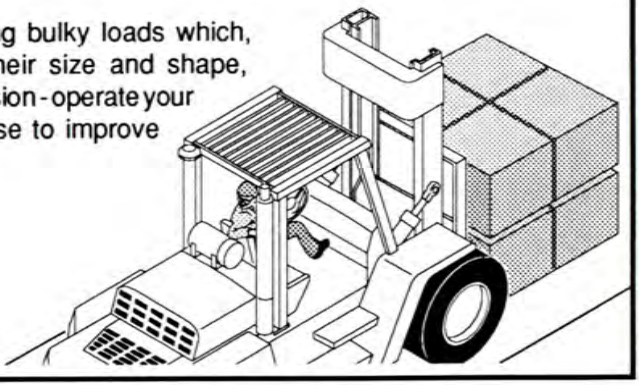
Never try to repair the upright, carriage, chain or attachment yourself!

Travel

Travel with load near operating surface and with upright tilted back to cradle load whenever possible.

Never lift or lower load when truck is in motion.

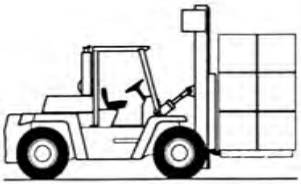
When handling bulky loads which, because of their size and shape, restrict your vision - operate your truck in reverse to improve visibility.



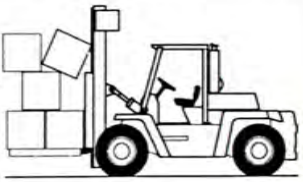
Unstable loads are a hazard to you and to your fellow workers. Always make certain that your load is well stacked and evenly positioned across both forks. Never attempt to lift a load with only one fork.

Never turn on a grade, either loaded or unloaded.

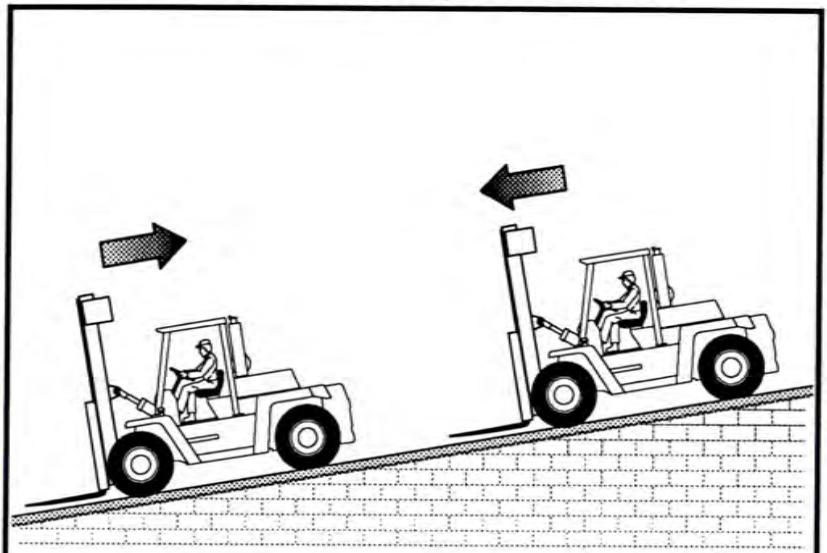
Right



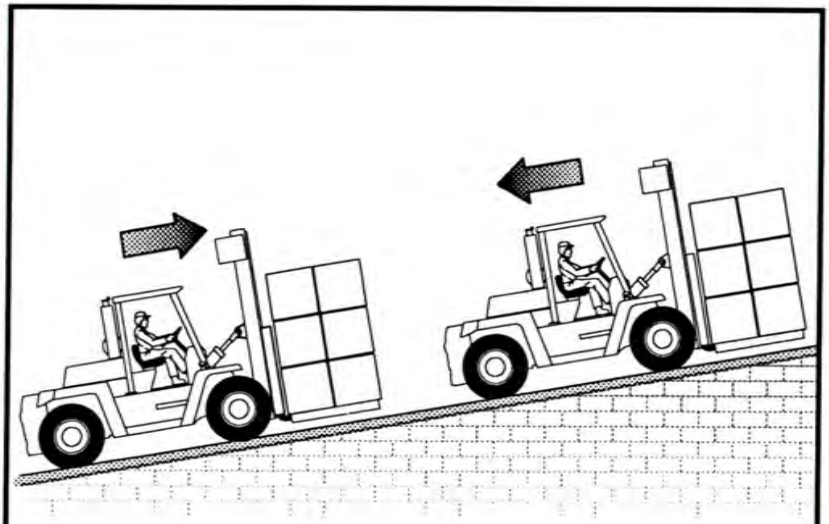
Wrong



Grades, Ramps, Slopes and Inclines

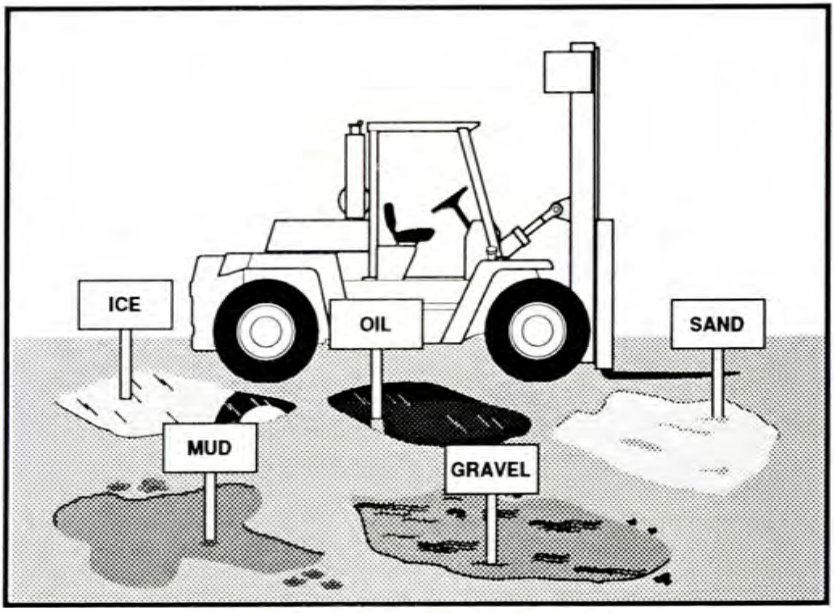


Unloaded - Forks Downgrade



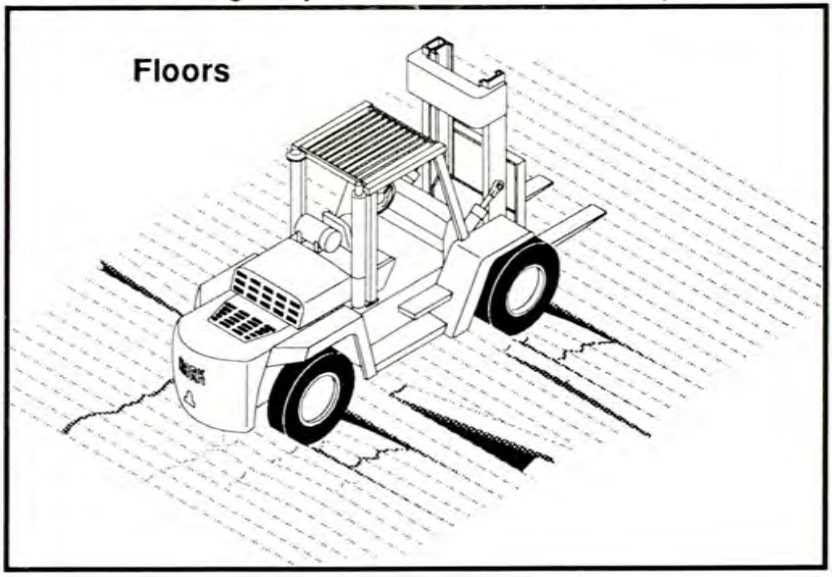
Loaded - Forks Upgrade

Surface and Capacity



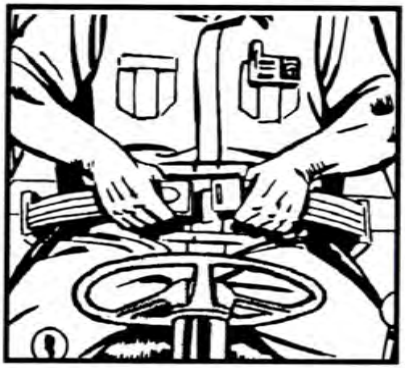
They can cause a truck to tip over.

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



Don't Jump

Make sure your seat belt is buckled at all times.

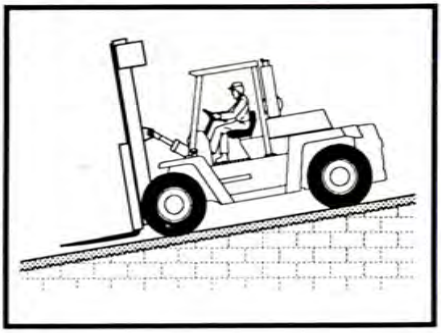


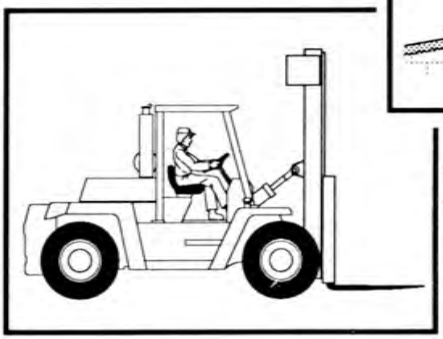
IMPORTANT

If your truck starts to tip over, do not jump!!!
Your chances for survival in a tip-over are better if you stay with the truck, in your seat. Brace yourself as illustrated below!

Parking

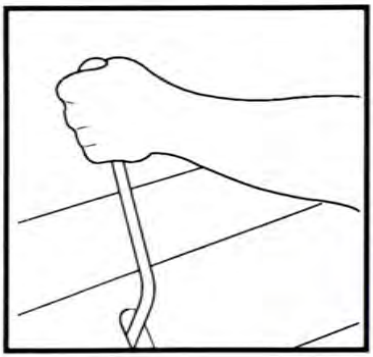
Never park on a grade.

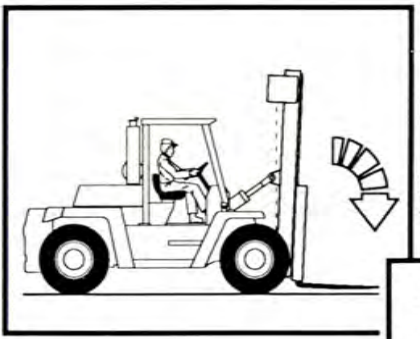




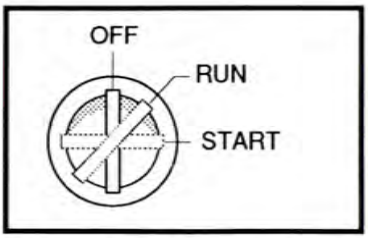
Always come to a complete stop before leaving truck.

Be sure travel control is in neutral.

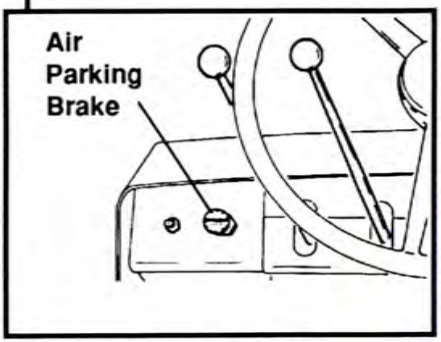




Lower forks fully to floor and tilt forward.



Turn key to "off" position.



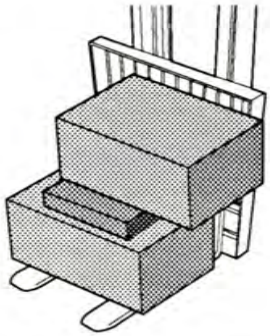
Set parking Brake.

Contents

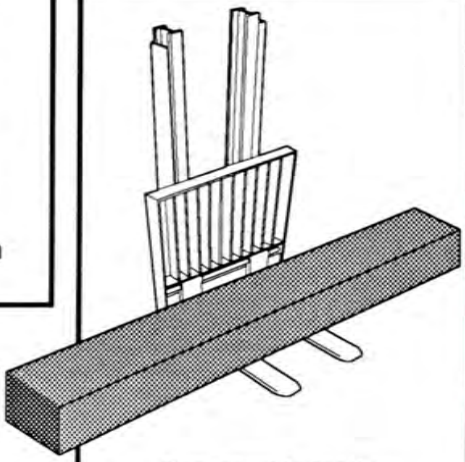
This section shows hazards that may cause you, someone around you, to be killed or badly hurt. As the operator, you must look for other hazards. Get your boss to help you identify and avoid those hazards.

Loose Loads

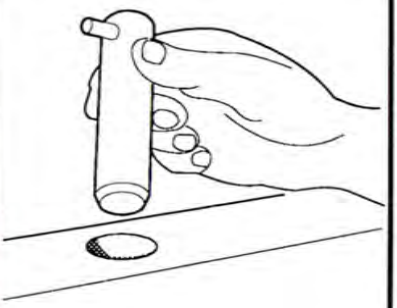
WARNING
Loose Loads



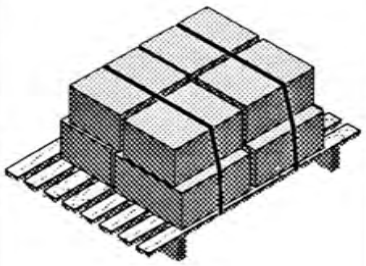
Never carry loose or uneven material.



Center wide loads.



Forks should be adjusted on the hanger shafts to obtain maximum support and balance of the load. Don't forget to replace and secure fork locking pins after adjusting forks.

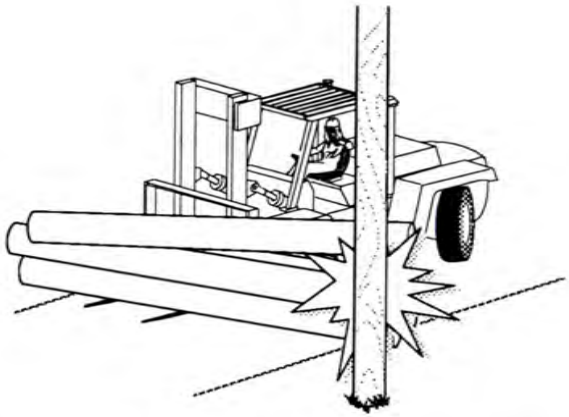


Stack and band loose material.

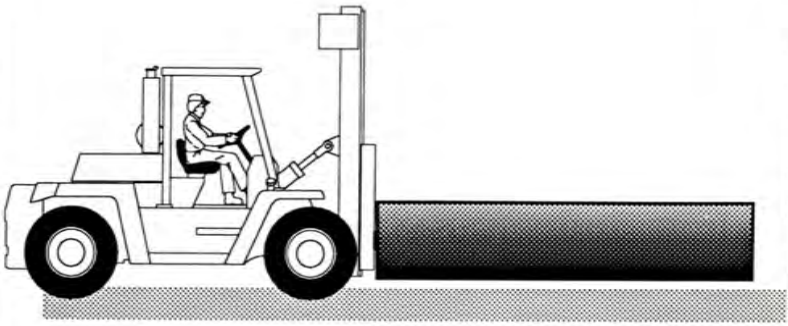
Long and Wide Loads

WARNING

LONG and WIDE LOADS



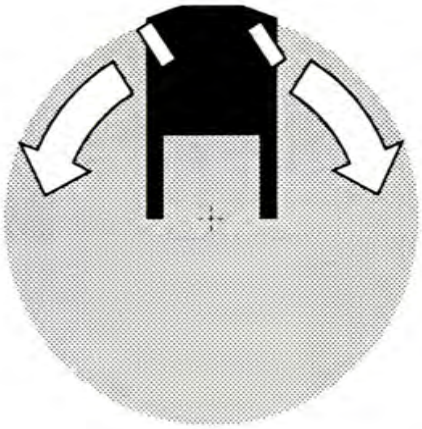
When extra length of material being handled makes it necessary to travel with load elevated, do so with extreme care and be alert to load end swing when turning.



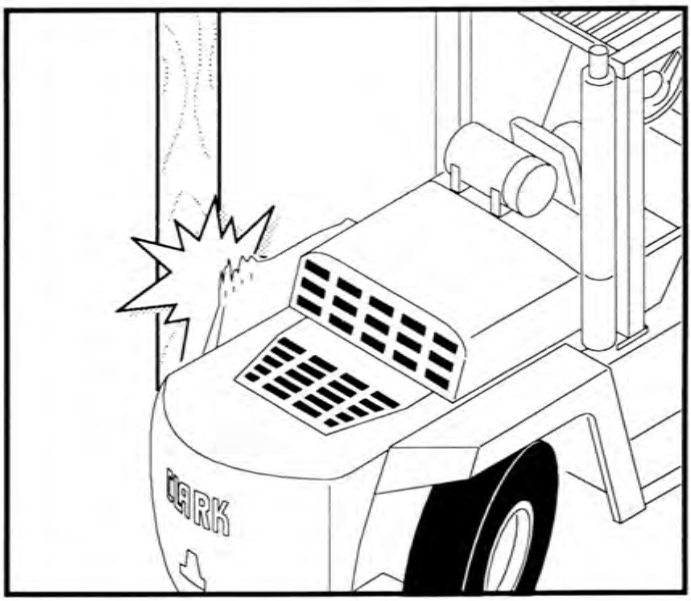
Remember, a long load will reduce the capacity of the truck. KNOW AND UNDERSTAND YOUR TRUCK LOAD RATING.

Rear Swing

WARNING
Rear Steering



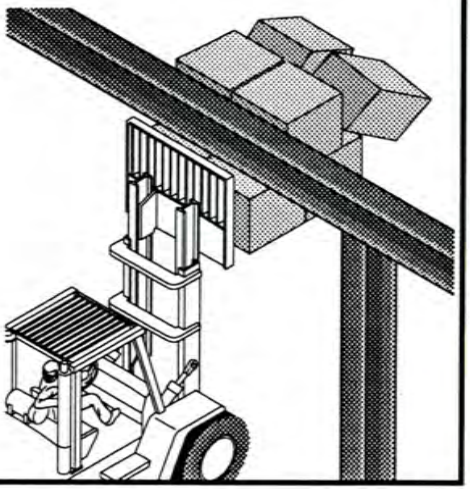
Be aware of rear end swing and be alert to prevent rear end swing damage to material in your operating area.



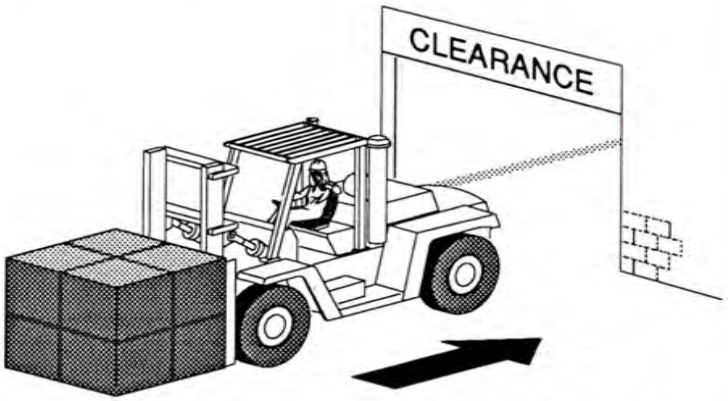
Low Overhead Clearance

WARNING
Low Overhead Clearance

WATCH OVERHEAD
Moving into overhead structures can tip a truck over.

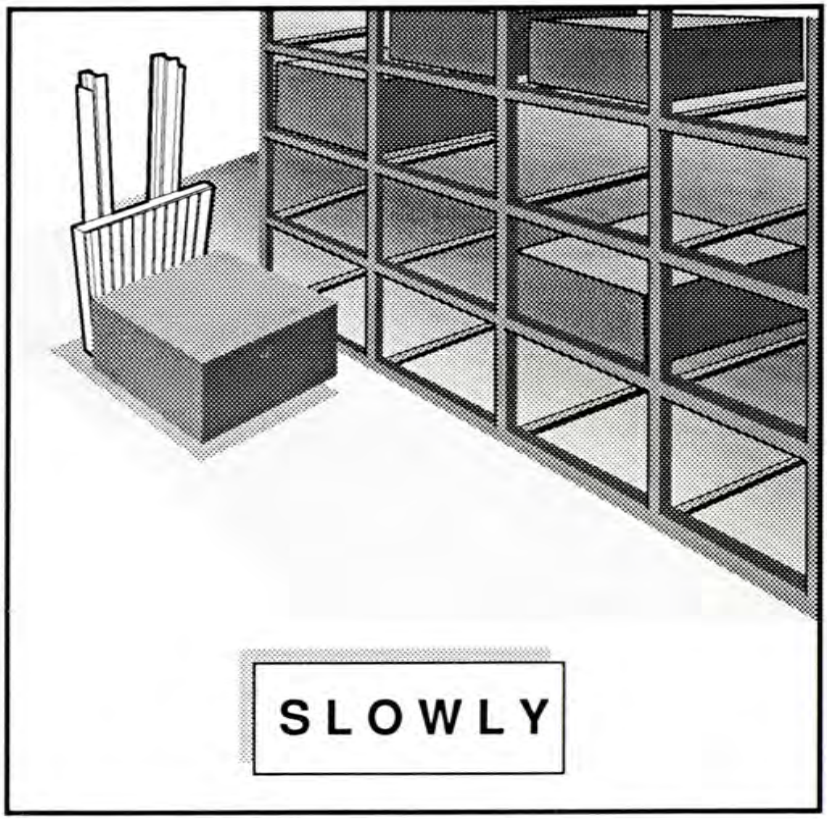


Know the height of your truck. Check your clearance.



Keep loads low and tilted back.

Right-Angle Stacking

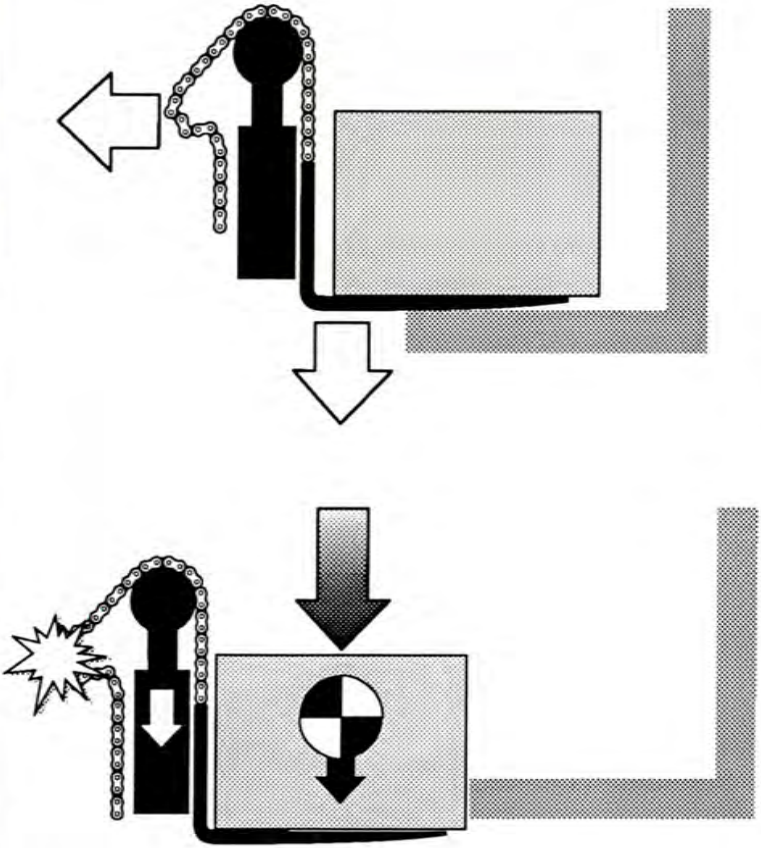


When right-angle stacking or moving with a raised load to clear low objects, avoid sharp turns and move slowly.

Chain Slack

WARNING
Slack Chain

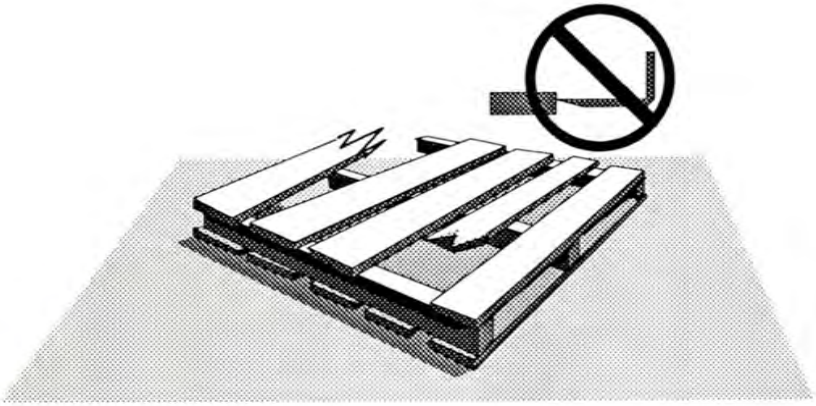
Slack chains mean rail or carriage hang-up. Raise the forks before you move.



Pallets and Skids

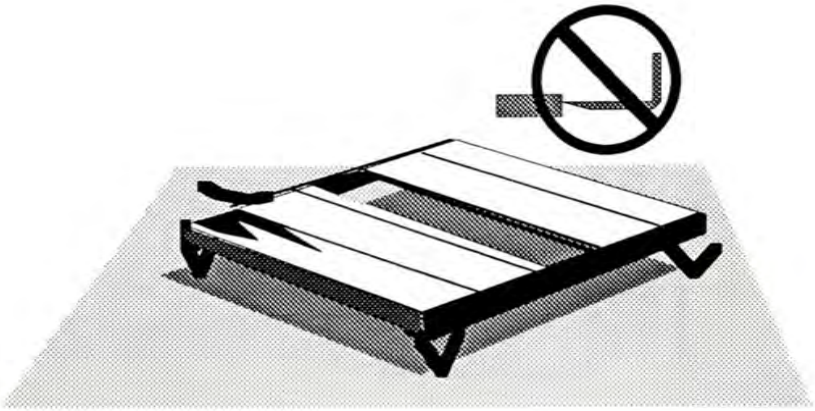
WARNING

Poorly maintained and/or damaged pallets and skids.



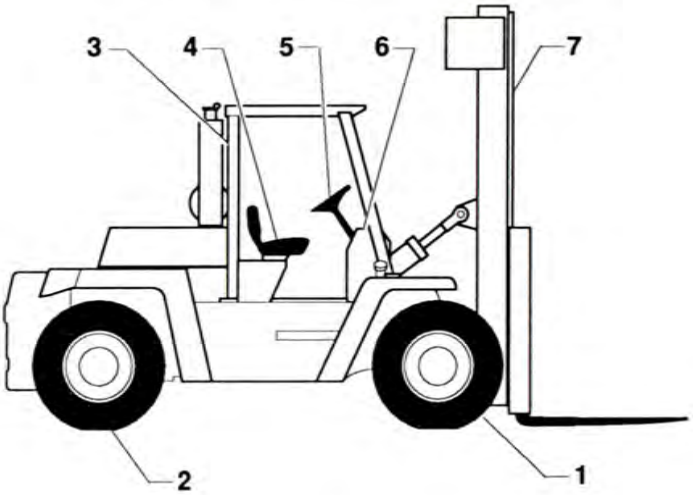
Do not move or store materials on damaged pallets or skids. Items can fall through them causing severe injury or death!

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



Contents

Truck Model Descriptions

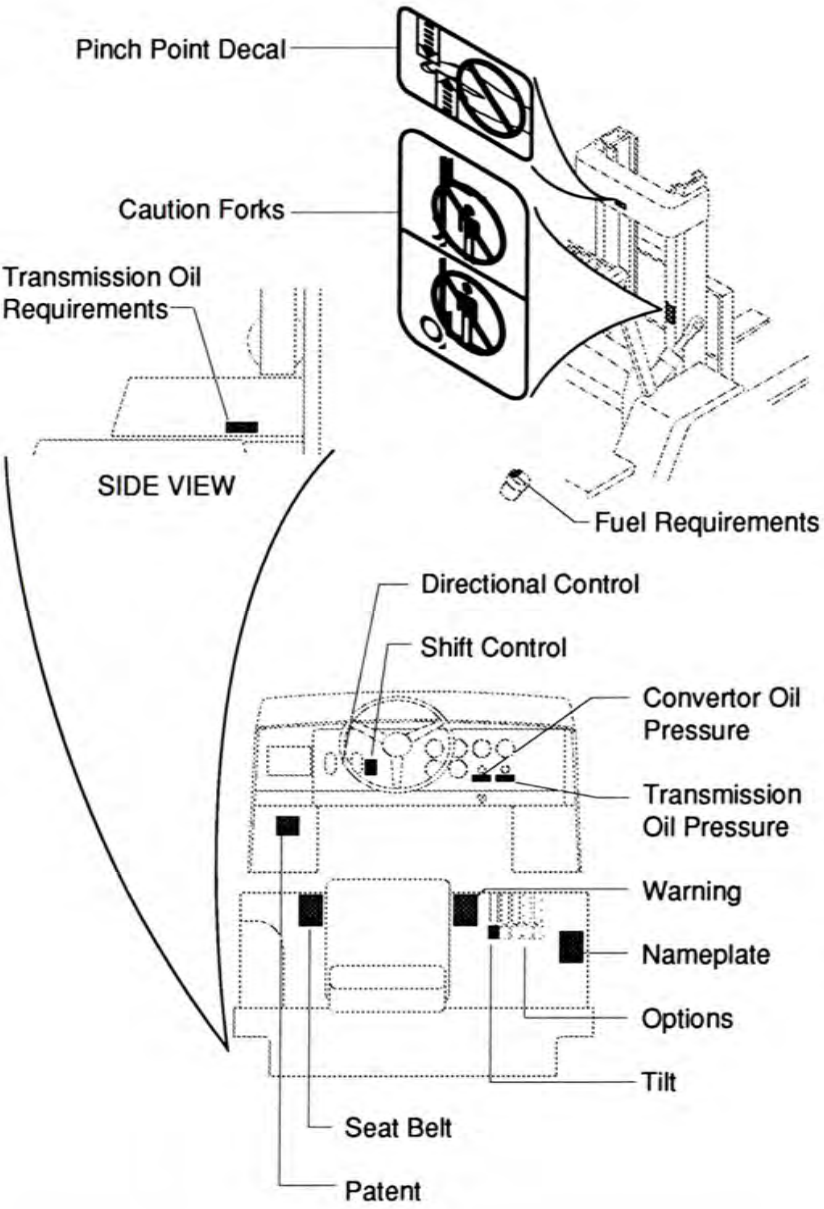


CLARK

C500 Y 180-200-225S-225L-250S-250L-300S-300L-350

1. **Drive Axle , Pneumatic Wheels and Tires**
2. **Steer Axle, Pneumatic Wheels and Tires**
3. **Overhead Guard**
4. **Seat and Seat Belt**
5. **Steering Control Handwheel**
6. **Directional Control Lever**
7. **Upright**

Truck Data and Safety Plates



Truck Data and Safety Plates

Know and understand the meaning of the data on your truck's nameplate

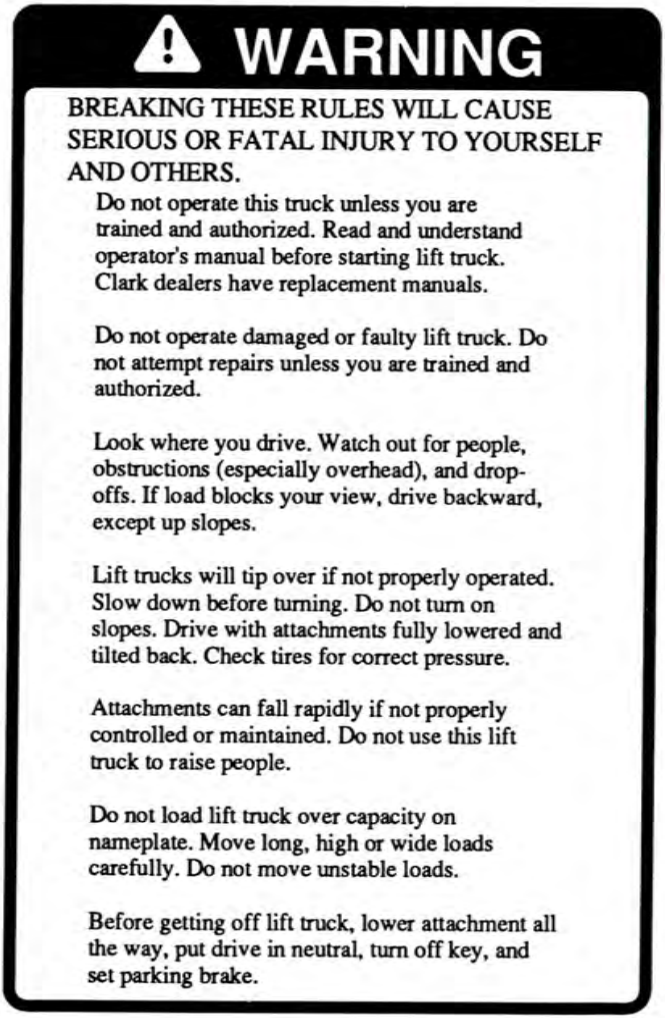
1. Truck model number or registered name.
2. Truck serial number. This is an identification number assigned to this particular truck and should be used when requesting in information or when ordering service parts for this truck from your authorized CLARK dealer. The serial number is also stamped on the frame.
3. Attachment description (if any installed). The user must see that the truck is marked to identify the attachment(s), including the weight of the truck/attachment combination and truck capacity with the attachment.
4. Capacity rating, load center and lifting height data.This shows the maximum load capacity of this truck with relation to load centers and fork heights (see diagram on plate). Personal injury and damage to the truck can occur if these capacities are exceeded. DO NOT EXCEED MAXIMUM SPECIFIED.
5. Truck weight. This is the approximate weight of the truck without a load on the forks. This weight plus the weight of the load must be considered when operating on elevators, elevated floors, etc., to be sure they are safe.

CAUTION

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 nameplate showing the revised capacity.

Truck Data and Safety Plates

Operator Safety Warning Plate



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

Safety and Warning Decals

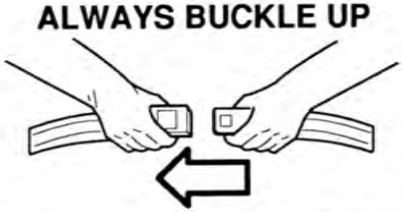
Safety and warning decals are placed in conspicuous locations on the truck. These decals are provided to remind you of either essential procedures or to prevent you from making an error which could damage the truck or possibly cause personal injury. It is important that you know, understand and follow these instructions. These safety and warning decals should be replaced immediately if missing or defaced (damaged or illegible). Refer to Service Manual SM-575 for location of all decals.

Seat Belt Warning Decal

This decal is located on the seat deck, to the left of the operator. It's purpose to remind the operator that staying in the seat provides the best chance of avoiding injury in the event of a truck tipping mishap.

Lift trucks can be tipped over if operated improperly. Experience with lift truck accidents has shown that the driver cannot react quickly enough to jump clear of the truck and overhead guard as the truck tips. To protect operators from severe injury or death in the event of a tip-over, it is best to be held securely in the seat. The sides on the seat help to keep your body and arms safely within the confines of the truck and overhead guard.

So, please, always buckle up when driving your lift truck.



Seat belts can reduce injuries

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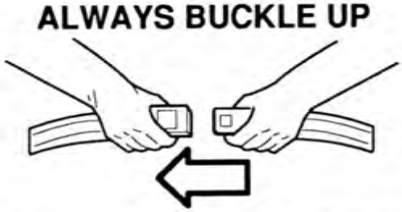


Seat belts can reduce injuries

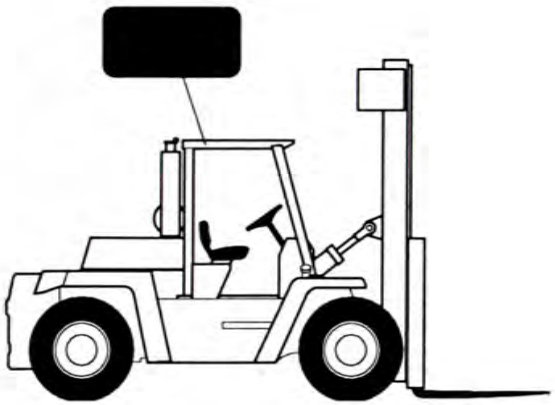
Safety and Warning Decals

Fan Warning Decal

This safety decal is displayed on thecooling fan shroud of the radiator to warn of the danger of injury from turning fan blades when the engine is running. Be sure that you keep your hands, fingers, arms and clothing away from a spinning fan. Don't stand in line with a spinning fan. Ban blades can break at high speed and be thrown out of the engine compartment.

Overhead Guard Conformance Plate

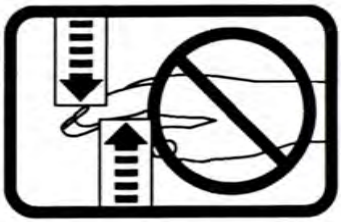
This plate is permanently attached to the overhead guard top to confirm that the overhead guard assembly design has been tested and conforms to the requirements of ANSI B56.1 safety standards.



Safety and Warning Decals

Upright Warning Decal

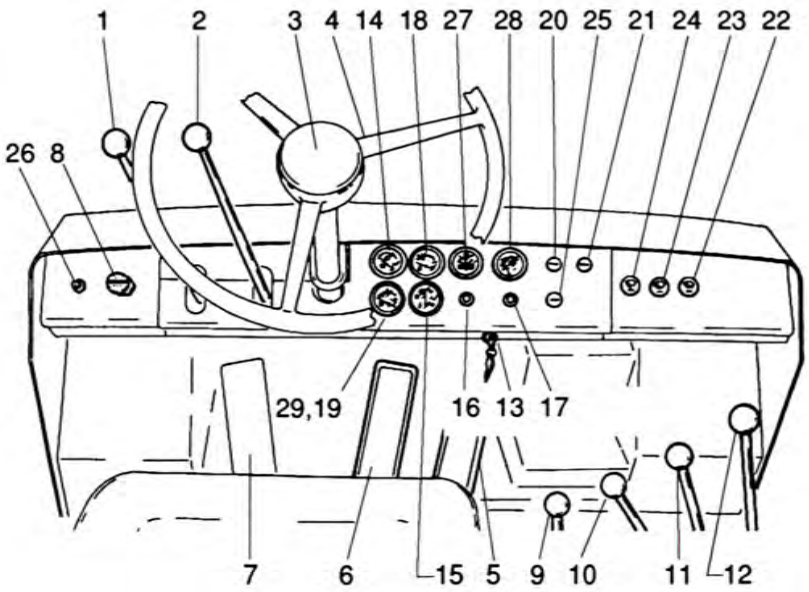
This safety decal is placed on the upright to warn of the danger of injury from movement between rails, chains, sheaves, fork carriage and other parts of the upright assembly. Do not climb on or reach into the upright. Personal injury will result if any part of your body is put between moving parts of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

Operator's Compartment & Controls



1. Forward /Reverse Lever
2. Speed Selector Lever
3. Horn Button
4. Steering Handwheel
5. Accelerator Pedal
6. Brake/Inching Pedal
7. Inching Pedal
8. Parking Brake Control
9. Lift Lever
10. Tilt Lever
11. Single Aux Valve Lever
12. Double Aux Valve Lever
13. Key/Start Switch
14. Water Temperature Guage
15. Ammeter
16. Transmission Pressure Light
17. Convertor Temperature Light
18. Oil Pressure Gauge
19. Fuel Gauge (Not Used on LPG)
20. Front Lights (Optional)
21. Rear Lights (Optional)
22. Top Wiper Switch (Optional)
23. Rear Wiper Switch (Optional)
24. Front Wiper Switch (Optional)
25. Heater Switch (Optional)
26. Cold Weather Start Assist (Optional)
27. Hour Meter
28. Air Pressure Gauge
29. Fuel Gauge Plug (LPG,CNG only)

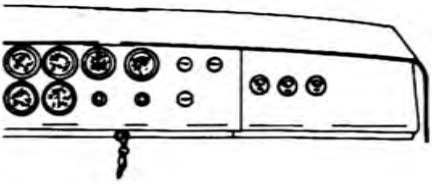
NOTE: For a complete description of instrument functions, refer to Section 8, pages 8.18 thru 8.20

How Your Lift Truck Operates

Instrument Panel

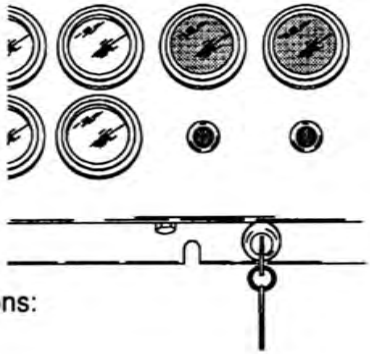
The instrument panel includes the:

- Water Temperature Gauge
- Oil Pressure Gauge
- Hour Meter
- Brake Air Pressure Gauge
- Fuel Gauge
- Ammeter
- Key/Start Switch
- Transmission Lights
- Optional Switches



The Key/Start Switch:

- Turns the truck electrical system "ON' and "OFF".
- Connects and tests the warning indicator lights.
- Connects the starter motor circuit when engine is to be started.



The key/start switch has three positions:

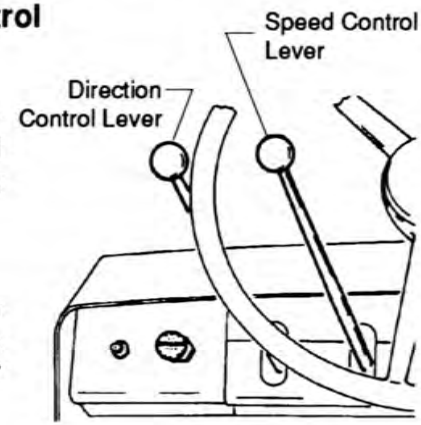
- OFF
- RUN
- START

When the key is in the vertical "OFF" position all truck electrical circuits are disconnected (shut off), and the key can be removed. From the "OFF" position the key can be turned to the right (clockwise) to the "START" position where the starter motor is engaged and part of the truck electrical system is energized. When the key is released from the "START" position it will automatically return left (counterclockwise) for a part of its travel to the "RUN" position where the starter is disengaged and all of the truck electrical system is "ON".

The key switch has a mechanical "anti-restart" feature, which prevents the engine starter from being engaged and damaged if the key switch is accidentally turned from the "RUN" position to the "START" position while the engine is running. If the engine stops running, the key switch must be turned to the "OFF" position before it can again be turned to the "START" position.

How Your Lift Truck Operates

Direction and Speed Control



Direction Control Lever
This lever controls direction-of-travel. Push forward for forward gear, pull back for reverse gear; center for neutral.

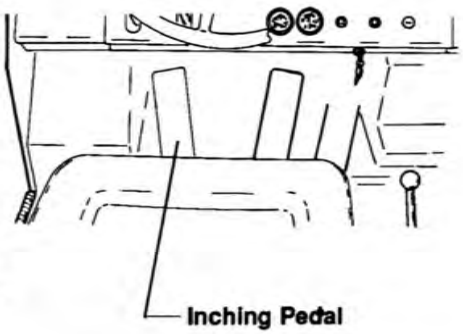
Speed Selector Lever
This lever controls transmission ranges. Push forward for 1st gear; pull back one notch for 2nd gear or two notches for 3rd gear.

IMPORTANT

For safety, always bring the truck to a complete stop before shifting to the opposite direction.

Accelerator Control Pedal
The speed of the engine and lift speed or truck travel speed is controlled with a foot pedal mounted on the floor board and connected through mechanical linkage and a control cable to the engine fuel controls. The pedal is designed for operation by the right foot.

Inching Pedal
The left foot pedal is provided for normal inching control of your lift truck. Pushing gradually on the pedal will smoothly disengage the driving clutch in the transmission as the pedal is moved. When the pedal is pushed farther, the service brakes are applied.



Inching Operation

Inching is the movement of a lift truck that allows a slow travel speed while keeping engine speed high for fast operation of the lift mechanism. Control of inching as well as braking, for low-speed, precision control of the travel motion of your truck, is provided by a combined "left foot inching and braking" action. The first part of the pedal motion moves the control valve to regulate release of the driving clutch pressure, which allows the clutch to slip and produce only the driving force and speed desired. The last part of the pedal motion releases the clutch entirely and applies the service air brakes. During inching, the clutch discs are cooled by lubricating oil flow through the clutch pack. However, inching should be used only when required. Do not drive with your left foot resting on the "inching" pedal, which will cause continuous slipping of the clutch and excessive wear.

CAUTION

Inching requires coordinated movement of the inching/brake pedal and accelerator. New operators should practice this procedure before attempting to handle critical loads.

Service Air Brake System

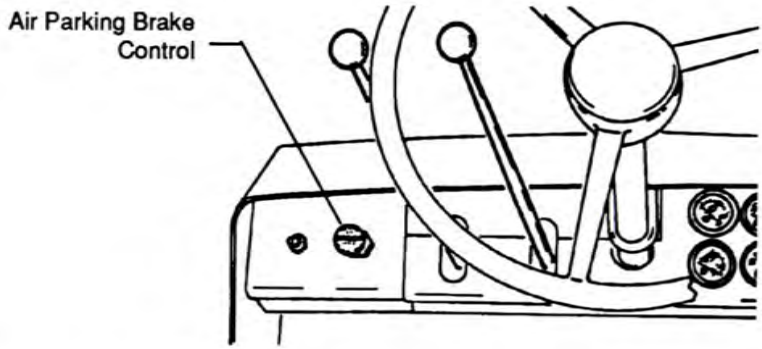
The brakes, located on the drive axle, are cam actuated expanding shoe type. Drive axle brakes are adjustable for running clearance at the adjuster arm, between the reaction arm of actuator and cam splined end. There are no brakes on the steering axle. A brake system air pressure gauge is located on the instrument panel. The low air brake pressure warning buzzer sounds an audible alarm to indicate low air pressure. At start-up, this alarm will sound until sufficient pressure is built up to safely operate the truck. Drain water from pressure tank periodically. Excessive humidity may make the use of an optional equipment air dryer necessary.

Service Brake/Inching Pedals

The right foot pedal is provided for normal brake control of your lift truck. However, the pedals are linked together and the service air brakes can be applied by pushing on either the right or left foot pedal. NOTICE: Normally the right pedal should always be used for braking.

How Your Lift Truck Operates

Parking Brake



Both the service and parking brakes are controled by double diaphragm, service and spring air brake chambers. The two chambers operate independently. The spring operated parking brake chamber is "Automatic On", spring applied and air released. A button on the dash, when pulled, lets the air in the brake chamber escape and a spring applies the service brake automatically. When the button is pushed in, air pressure releases the parking brake. The button will not stay pushed in if air pressure is low. If there is loss of air pressure the button will pop out and the parking brake will apply automatically. Thus a loss of air pressure, either by pulling out the parking brake control or due to system pressure leak, will apply the parking brake. To guard against excesssive pressure being applied to the brake actuating arm, an automatic valving arrangement prevents application of the service and parking brakes at the same time.

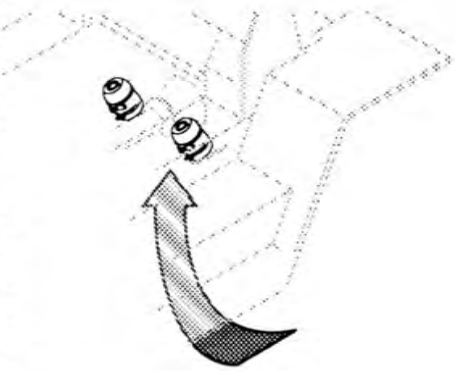
Parking Brake Operation

To apply the parking brake, pull the control knob out. This exhausts the air pressure in the parking brake section of the air brake chamber and allows the spring to actuate the wheel brake lever.

To release the brake, push the control knob in. The engine does not have to be running to release the brake as air from the reserve pressure tank can do this.

Brake Chamber Location

Access to the chambers is most easily done from beneath the truck. If this is not possible, they can be accessed from above after removing the floor plates.



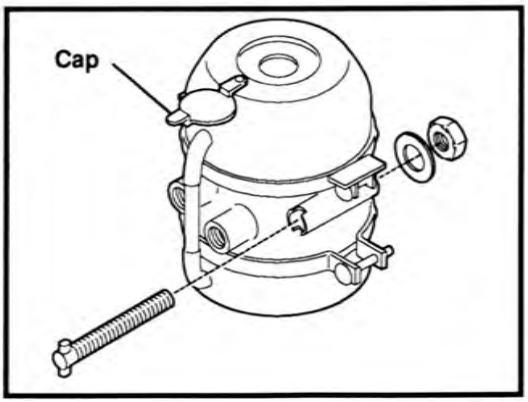
Mechanical Release of the Parking Brake

It is possible to manually release the parking brake if required by lack of air pressure, for vehicle towing or to work on the wheel brakes. This can be done in the following manner:

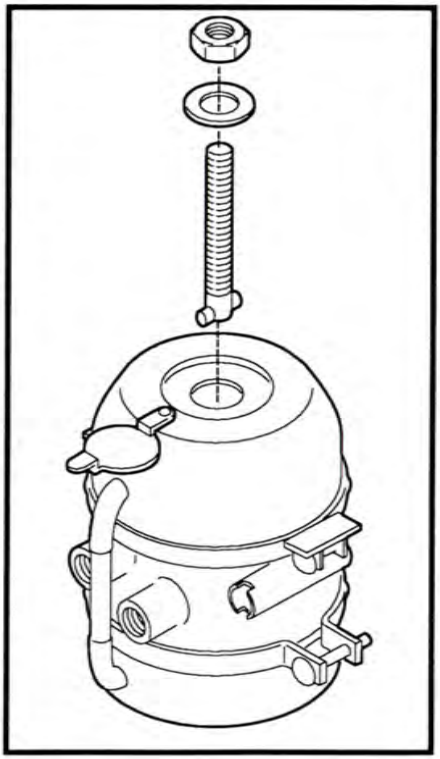
CAUTION

All repairs should be done by an authorized trained lift truck mechanic.

1. Securely block wheels to prevent the truck from moving.
2. Remove end-cover cap from center hole in head of brake chamber.
3. Using a 3/4 inch wrench, unscrew release nut, flat washer and release bolt from their storage pocket on side of chamber.



4. Insert release bolt into the center hole of head and, being sure formed end of bolt has entered hole in piston inside the chamber, continue to insert bolt until it bottoms out.



CAUTION

If your are not absolutely sure of correct bolt-to-piston engagement, repeat this step until you are sure.

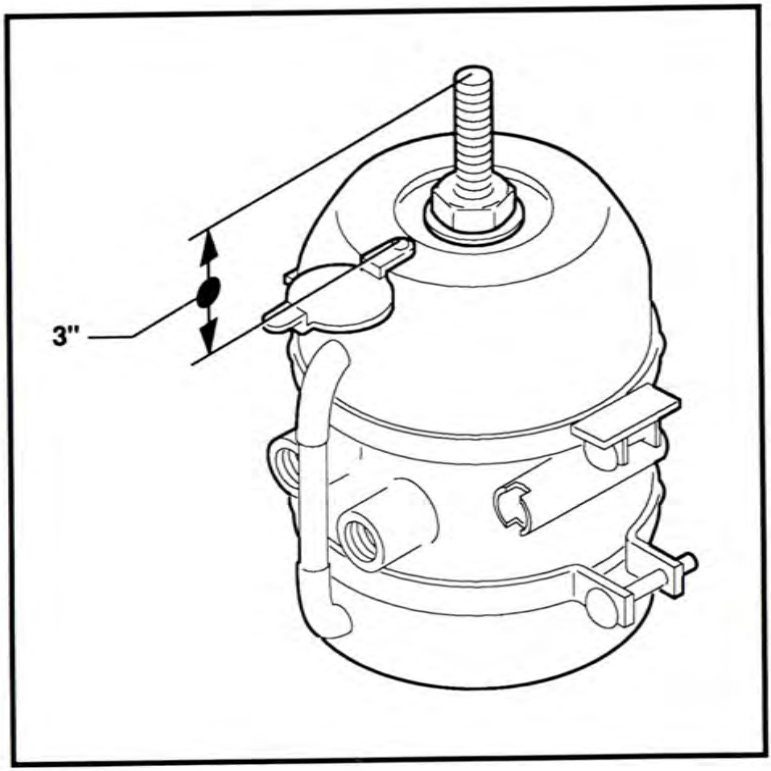
5. Turn release bolt 1/4 turn clockwise and pull bolt out to lock formed end into piston.

CAUTION

If bolt does not lock into position in less than a 1/2 inch outward movement, repeat steps 4 and 5 until you are sure it does lock.

6. Holding bolt locked into piston, install flat washer and release-nut on end of release bolt and turn down nut against flatwasher until finger-tight.

7. Using a 3/4 inch hand wrench (DO NOT USE AN IMPACT WRENCH), turn release nut clockwise until three inches of bolt extends above the nut. (A three inch wide strip of paper can be rolled up and taped to use to measure the exposed bolt).



8. To reactivate the piggyback/spring brake from its manually released position, reverse the order of 1 thru 7.

9. Reinstall the release bolt, flat washer and release nut into the storage pocket using 10 lbs-ft torque on nut against the flatwasher.

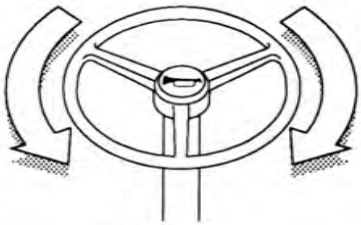
How Your Lift Truck Operates

Power Steering System

With engine running, the steering system uses hydraulic power to position the rear wheels. A dual action hydraulic steering actuator, mounted on the steering axle, extends left or right for turns or centered for straight-ahead driving. By turning the steering handwheel, which is connected to the steering gearbox control valve, hydraulic pressure is directed to the respective side of the steering actuator.

Horn Button

The horn button is located in the center hub of the steering handwheel and is electrically connected by contacts and wiring to the horn assembly installed in the dash of the truck.



Main Hydraulic System / Power Steering System

Flow and pressure are only generated when the engine is running. The circuit is totally enclosed and self purging. Fluid is drawn from the reservoir sump, filtered, and pressurized by two engine driven pumps. One pump provides hydraulic pressure for steering. The other pump provides hydraulic pressure for lift carriage and upright operation. A separate line connects the pumps to the reservoir to allow for the return of excess fluid.

Fluid from the pump is metered as it flows through the steering gearbox, pressurizing the selected side of the power steering cylinder. The opposing side of the cylinder allows fluid to return to the reservoir through the steering gearbox.

CAUTION

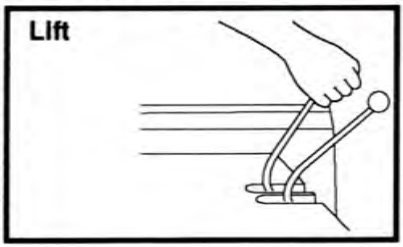
If the engine quits, while traveling, steering effort will increase.

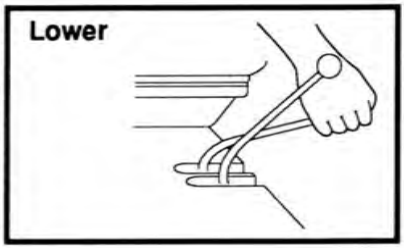
Lift carriage and upright control valves port metered fluid under pressure, when selected, to their respective actuators and allow fluid to return to system reservoir thru piping. The tilt cylinders are double action, pressured in either direction for forward and back tilt. The lift cylinder is a single action two stage telescoping actuator, pressurized for elevation and free fall for lowering. In addition, single and double auxiliary valves are available as optional equipment for use with various optional equipment attachments.

How Your Lift Truck Operates

Lift Control Lever

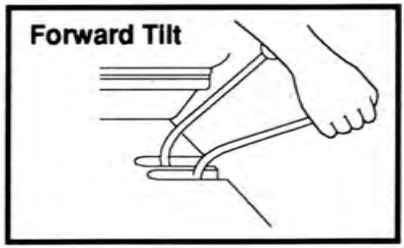
With the lift control lever you are able to raise and lower the fork carriage on the upright. The lifting speed is controlled through the main hydraulic valve by varying the lever position (amount of movement from center or neutral position) and engine speed. There is also a "high speed" or "fast lift" feature which is activated by pulling the lever back, then right and back farther. When the lift control lever is pushed forwards, the fork carriage is lowered. By varying the amount of movement of the lever from the center or neutral position, you determine the lowering speed. You can also lower the fork carriage when the engine is stopped.

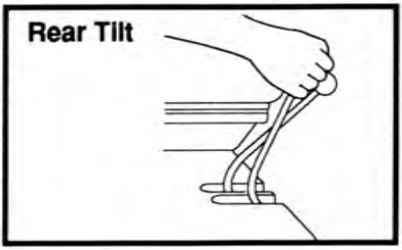




Tilt Control Lever

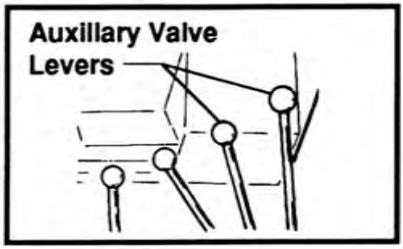
With the tilt control lever you are able to control the tilting or vertical positioning of the upright and the angle of the forks. When the lever is pulled back the upright and forks tilt backwards. Push the lever forward to tilt the upright and forks forward.





Auxiliary Control Valve Lever (Optional)

Your truck may be equipped with one or more aux valve levers. The operation of these varies with the attachment that they control. Have your supervisor explain their function to you. Do not operate them until you are sure you know how they work.



How Your Lift Truck Operates

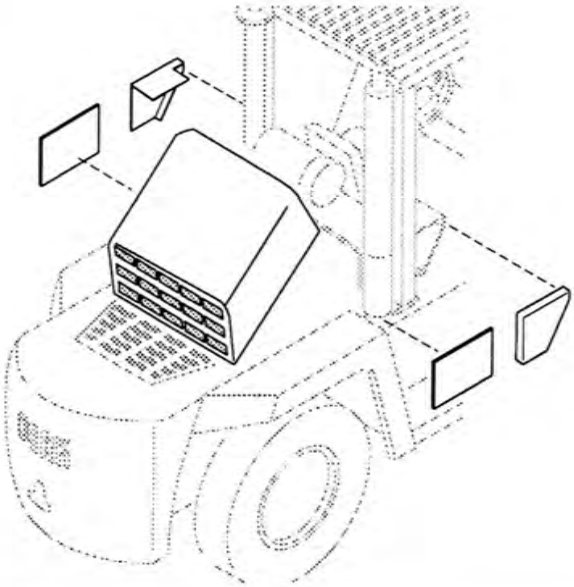
Seat Adjustment

The seat adjustment lever is located on the left side under the seat. To unlock, push the lever to the left and adjust the seat so that all controls may be comfortably reached. Then release the lever. Be sure that the seat locking mechanism is engaged. The seat mounting base provides an eight inch fore-and-aft adjustment of its slide mechanism.

Engine Compartment Access

Access to the engine compartment is provided by the spring assisted hood. It is mounted on pivoting mechanism at the rear and is latched behind the drivers seat. To open, depress the latch and the hood will swing up from the action of the springs. To close, it is necessary to push the hood down against the springs until the latch is engaged.

Additional access can be obtained by removing any of the four, front and rear panels.



Contents

NOTICE

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

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.

Lift trucks should 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. Look the upright and lift chains over. Check the forks for cracks. Look for loose bolts and fittings. Check the tires, wheels and wheel mounting bolts. Check the engine oil, fuel and coolant levels as well as the hydraulic sump oil level. Check all of 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 the "Driver's Daily Checklist". We recommend that you use this form to make a daily record of your inspections and truck condition.

Copies of this form may be obtained from your CLARK dealer.

Daily Safety Inspection

Visual Checks

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, before and after starting engine, for any sign of external leakage: fuel, engine coolant, transmission fluid, etc.

Check for hydraulic oil leaks and loose fittings. WARNING -- DO NOT USE BARE HANDS TO CHECK. Oil may be hot or under pressure.

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

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

Look the upright and lift chains over. Check for obvious wear and maintenance problems such as damaged or missing parts, leaks, slack or broken chains, bent parts, etc.

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, wear condition and air pressure.

Functional Checks

Test warning devices, horn, lights and other safety equipment and accessories. Start the engine and be sure all controls and systems are functioning correctly. Check the hour meter for operation. Operate the service and parking brakes, all hydraulic controls: lift, tilt and auxiliary 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).

WHEN FUNCTIONAL CHECKS ARE COMPLETED:

- **Bring truck to complete stop.**
- **Put directional control lever in the "N' (neutral) position.**
- **Apply the parking brake.**
- **Turn the ignition switch to the OFF position.**
- **Lower the lift mechanism fully.**

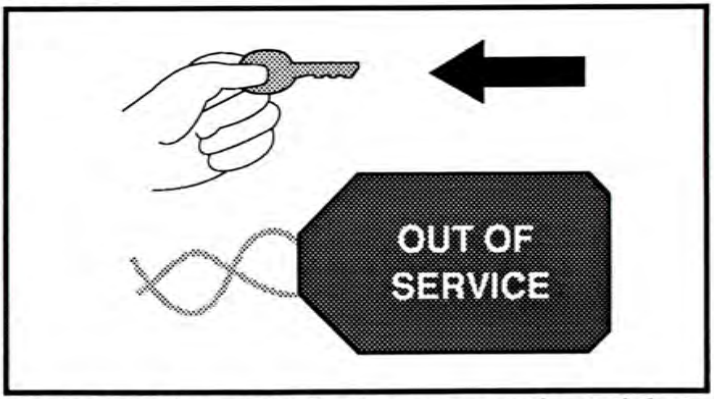
Standard Shut Down Procedure

When parking and leaving truck attended, lift mechanism shall be fully lowered, controls placed in neutral, engine shut off, brakes set and key removed. Block the wheels if truck is parked on an incline or has the 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.

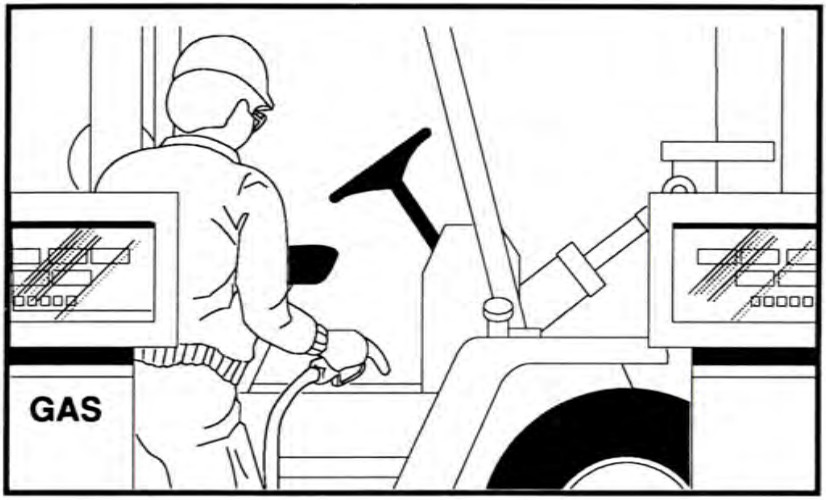
Remove the key from the ignition switch and put an "Out of Service" tag on the truck.

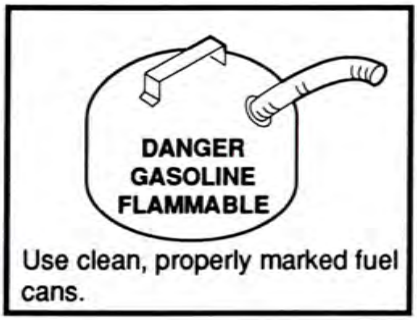


If all of the "Before Operation" checks were normal or satisfactory, the truck can be operated.

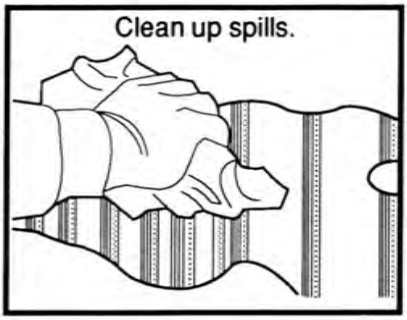
Fuel Safety Practices

Refueling gas, diesel and LPG





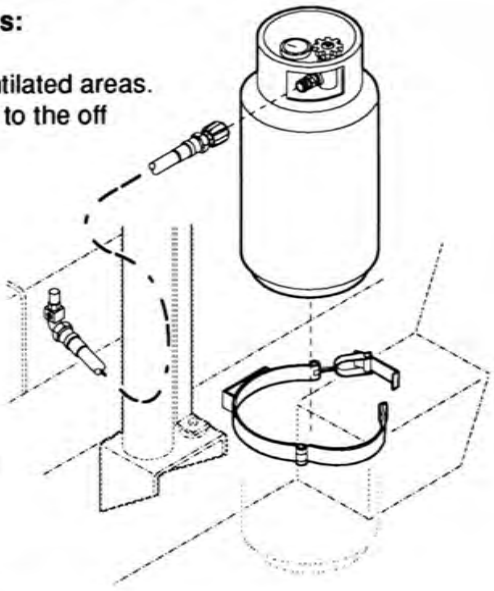
Use clean, properly marked fuel cans.



Refueling LPG Tanks

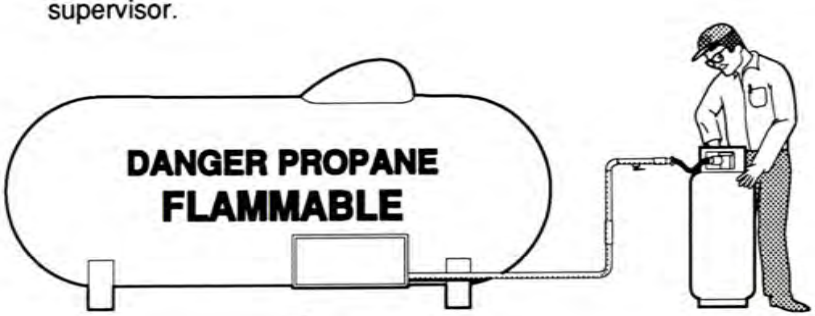
When changing LPG tanks:
Follow these basic rules:

- Change only in well ventilated areas.
- Turn the ignition switch to the off position.
- Checks for leaks.
- Never allow open flames.
- Store tanks following local fire codes.



If you refill LPG tanks:

- Make sure you know and understand the proper procedure for fill ing a LPG tank.
- If you have any ques tions on refilling LPG tanks please ask you supervisor.



DANGER

LPG is heavier than air, it will settle on your clothes and the ground where you are working. Open flame can cause flash fires.

IMPORTANT

Check all connections for damage or leaks. If the truck will not start after you change tanks, get a qualified mechanic to check it.

RECOMMENDED SAFETY MAINTENANCE PROCEDURE FOR LP GAS FUELED FORKLIFT TRUCKS

WARNING: LP GAS is a combustible fuel that is heavier than air. Escaping gas may accumulate in low areas. The fuel cylinder should be mounted so that it does not extend outside the truck and should also be properly positioned by using the locating pin or key way.

The fuel valve should be turned off when the machine is not in service.

Cast fittings should not be used in the LP-GAS system.

Use only Underwriters Laboratories or Factory Mutual listed LP-GAS hose assemblies where pressure fuel lines are required.

All pipe threaded fittings should be installed using an approved sealing compound.

Fuel lines should be supported by clamps to minimize chafing and wear.

The LP-GAS solenoid valve should be wired to an automatic shut off switch (oil pressure or vacuum) to prevent leakage of gas in the event the ignition is on without the engine running.

Check the propane solenoid or vacuum shutoff valve for leakage as follow:

1. Turn fuel cylinder valve off, start and run engine until it stops.
2. Install a 0 to 30 psi pressure gauge per instruction A or B.
   A. Primary test port of single units consisting of primary and secondary regulators.
   B. Between the primary and secondary stage regulators when the propane system consists of two regulators.
3. Turn cylinder fuel valve on. The pressure gauge should maintain a zero reading. If it does not, the solenoid valve or vacuum shutoff valve must be repaired or replaced. An odor is added to LP-GAS to help detect leaks. If gas odor is detected the fuel cylinder supply valve and engine should be turned off. Remove all sources of ignition, and ventilate the area. Make all of the necessary repairs before you turn the fuel supply on. The complete LP-GAS system should be inspected periodically. Check all hoses for wear, connections for leaks, and all parts for damage.

NOTE: Fuel hoses have a limited life expectancy. They should be checked for cracking and drying due to age. Hoses with visible signs of age should be replaced. Use only Underwriters Laboratories or Factory Mutual listed LP-GAS parts for replacements.

NOTE: The above information is provided as a guide. Consult NFPA 58 for the safe storage and handling of liquefied petroleum gases. Governmental safety regulations in your locality could vary. Check with authority having jurisdiction to be sure that you meet all of their requirements. Contact the manufacturer for detailed service information.

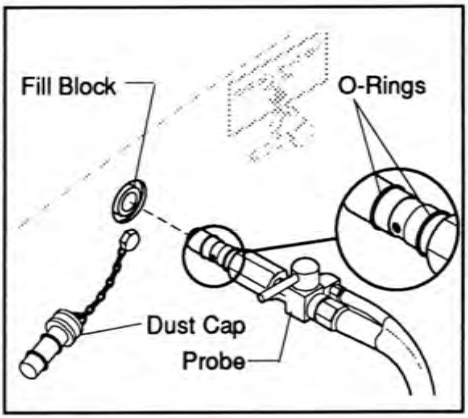
SERVICE WORK SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

Refueling CNG Tanks

When re-fueling CNG system:
Follow these basic rules:

- Make sure you know and understand the proper procedure for filling a CNG fuel system.
- If you have any questions on refilling CNG tanks please ask your supervisor.
- Re-fuel only in well ventilated areas.
- Make sure you refill your truck in a approved CNG fueling station.
- Apply the parking brake, turn the ignition switch to the off position.
- Checks for leaks.
- Never allow open flames.

Fueling Procedure
Your truck is equipped with a standard 1/2" fill block. The fueling station will have a standard 1/2" fuel probe with a 2 or 3 position shut off valve. Your truck and fueling station may be equipped with optional fueling adaptors. Make sure that you understand how to use them, if you have any questions please ask your supervisor. For proper fueling procedures follow the steps below.



IMPORTANT

Before re-fueling your CNG truck observe the fueling probe and make sure the O-rings are not damaged or missing.

Follow these basic steps:

- Remove the dust cover.
- Insert the fuel probe into the fuel fill block, make sure it is all the way inserted.
- Slowly turn the valve to the full open position.
- When the tank reaches full, the fueling station will automatically shut off. Your pressure gauge will read about 3000psi. This is the maximum operating pressure.

Before disconnecting the fuel probe it may be necessary to "Vent" the fuel line. You do this by turning the valve to the "Vent" position, pause then turn the valve to the closed position. The probe can now be easily removed from the fill block. Return the probe to its proper holder.

CAUTION

If leakage should occur, close valve and have qualified personnel make repairs.

RECOMMENDED SAFETY MAINTENANCE PROCEDURE FOR COMPRESSED NATURAL GAS FORKLIFT TRUCKS

WARNING

- Natural Gas is a combustible fuel that is lighter than air. Escaping gas may accumulate in enclosed areas.
- The fuel cylinders are permanently mounted to the truck.
- The tank and fuel lines are under extreme pressure, take care not to damage the tank or fuel lines.
- The tank valve should be turned off when the machine is not in service.
- All pipe thread fittings should be installed using an approved sealing compound.
- Fuel lines should be supported by clamps to minimize vibration and wear.
- This truck is equipped with a vacuum operated fuel shutoff valve that prevents fuel flow when the engine is not running.
- Do not operate truck if you smell gas in or around the tank and engine area.
- In the event of a leak turn off emergency shutoff valve or the valve at the tank, then immediately report the leak to your supervisor.
- The fuel tank requires periodic pressure testing and inspection.
- Use only CLARK authorized replacement parts.

ALL SERVICE WORK SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

Index

How To Start Your Truck

⚠ 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.

Starting Tips

Turn off any lights or optional electrical equipment while you crank the engine. This will reduce the electrical load on your battery and supply extra power to the starter motor.

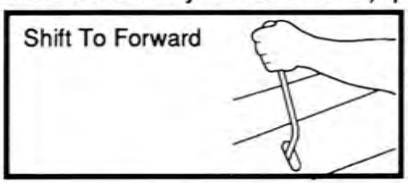
Avoid excessive starter cranking (in excess of 30 seconds) with a difficult to start engine. To avoid starter overheat or damage, do not crank the starter continuously for more than 30 seconds at a time. If the engine fails to start within a period of 30 seconds, wait 2 - 3 minutes before again attempting to start your lift truck.

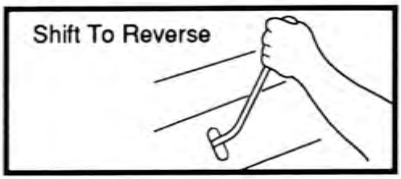
If your battery is "run down" (discharged) or becomes discharged while trying to start your truck, please refer to the "Emergency Starting -- How To Use Battery Jumper Cables" section of this manual.

Before starting a lift truck it is good practice to always start from a safe condition. Check to see that:

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

Put the directional control lever in the "N" (neutral) position. The truck should start only in the "neutral) position.





Automatic Engine Shut-Down

Your truck is equipped with a Low Engine Oil Pressure Shutdown System. If low engine oil pressure occurs, the engine will automatically shut down. In an emergency the engine may be restarted by returning the key switch to the "OFF" position and then restarting. The engine will run for about 30 seconds and again shut down.

How To Start Your Truck

Engine Starting and Operating Recommendations

Avoid damage to your truck or possible harm to yourself. Follow these recommendations:

- Warm the engine up before driving or applying a load. Idle engine at 650-700 RPM *(diesel)*, 600-650 RPM *(gas/lp)* for a few minutes to circulate and warm the oil. Then increase speed to approximately half throttle for a short period or until the engine coolant reaches approximately 100° F. This procedure will help prolong engine life.
- Let engine run until the normal operating temperature is reached. Then operate the controls and check all gauges and warning indicators to be sure they are functioning properly. Stop the engine and make a visual inspection for oil, water or fuel leaks.
- Do not operate engine at speeds above idle for more than brief periods without a load.
- Do not run the engine at maximum power continuously until engine is fully warmed up.
- Never operate engine at more than the regular no-load governed speed. Excessive speeds are harmful.

NOTICE

The governor is set at the factory and should need no adjustment.

- Avoid extended (in excess of 10 minutes) and unnecessary idling of the engine. If extended idling occurs or is anticipated beyond 10 minutes, turn off the engine.
- CARBON MONOXIDE is colorless and odorless but can be present with all other exhaust fumes.
- If your truck is equipped with a gasoline engine it will have a manual choke which is located on the seat deck just to the driver's right hand side, located near the control levers.

WARNING

Exhaust gases are harmful and can cause serious injury or death. Proper ventilation is always necessary for safe inside operation or warm-up.

How To Start Your Truck

Pre-start Instructions

Preparations for the initial start up and each additional start up thereafter should include careful checks of the following:

1. Check all components for mechanical security. If an abnormal condition or defective part is detected, repair or service as required. The engine should be kept free of dust, dirt and spilled oil or fuel.
2. Check engine crankcase oil level; add if necessary.
3. Check engine coolant level; add if necessary.
4. Check fuel supply level; fill as necessary.
5. Check air restriction indicator; service air cleaner if necessary.
6. Inspect exhaust system for possible leakage and cracks; repair if necessary.

IMPORTANT

Due to the precise tolerances of diesel injection systems, it is extremely important that the fuel be kept clean and free of dirt or water. Dirt or water in the system can cause severe damage to both the injection pump and the injection nozzles.

Engine Starting Procedure

1. Apply parking brake and put direction control lever in neutral.
2. If your truck is equipped with a gasoline engine, you may need to use the manual choke, to do so you must pull the choke cable out about halfway, then depress the accelerator pedal to about half-throttle position.
3. Turn the key/start switch to the "Start" position to crank the engine. Return the key to the "Run" position and the accelerator pedal to idle as soon as the engine starts. *(Gas Only) After engine starts adjust the "choke" for fast idle warm-up. When the engine has reached normal operating temperature, push the choke in all the way.)*

IMPORTANT

If the engine stalls or falters in starting, wait 3 or 4 seconds before re-engaging the starter. This will prevent possible serious damage to the starter or engine.

How To Start Your Truck

4. Engine oil pressure must be indicated on the gauge with 15 seconds after starting. If it does not, shut the engine down and report the problem.
5. When starting a cold engine, increase the engine speed (RPM) slowly to be sure adequate lubrication is available to the bearings and to allow the oil pressure to stabilize.
6. Idle the engine 3 to 5 minutes at 1,000 RPM before operating with a load.
7. Never attempt to operate truck until air brake buzzer has stopped and the air pressure gauge registers at least 60 PSI.

Cold Weather Starting (Diesel)

Your diesel engine lift truck is equipped with a 110 volt, AC powered crankcase oil heater as standard equipment. This should be plugged in anytime the truck is left overnight or for extended periods when the temperature is expected to drop below 0° C (32° F). This aid should facilitate starting down to -12° C (10° F). Below that temperature, starting fluid may be necessary.

Cold Weather Starting With Optional Ether Cold Start System

1. Apply parking brake and put direction control lever in neutral.
2. Depress the accelerator pedal to about half-throttle position.
3. Turn the key/start switch to the "Start" position and while cranking engine, push the cold start button to inject a metered amount of starting fluid into the induction system. Return the key to the "Run" position and the accelerator pedal to idle as soon as the engine starts.

Cold Weather Starting Without Starting Fluid Metering Equipment

DANGER

Never use starting fluid near an open flame. Do not breath fumes. Use of starting fluid spray can requires two persons. Never spray enough starting fluid into air cleaner to wet the element. Keep in mind that this is a dangerous operation.

How To Start Your Truck

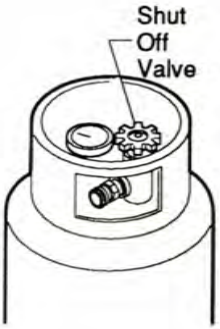
1. The lift truck operator must be in the drivers seat while a second person operates the starting fluid spray can. Have a fire extinguisher available for use if needed.
2. Depress the accelerator pedal to the half-throttle position.
3. Turn the key/start switch to the "Start" position to crank the engine. After the engine begins cranking, the second person should spray small amounts of starting fluid into the air cleaner. The spray can should be held at arms length to avoid breathing fumes and in case the starting fluid mist should ignite.
4. Return the key to the "Run" position and the accelerator pedal to idle as soon as the engine starts.

CAUTION

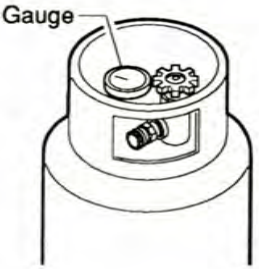
Use of too much starting fluid will cause engine damage.

Engines Using LPG Fuel

If your lift truck uses LP Gas, the fuel supply is stored in special tanks mounted on each side of the truck just forward of the steer wheel fenders. For safety, there is a check valve and a shut-off valve at the tank. The shut-off valve is operated manually to control the flow of fuel from the tank. This valve must be closed when the engine is not running. Close this valve by hand only to a firm tightness. **DO NOT OVERTIGHTEN.**



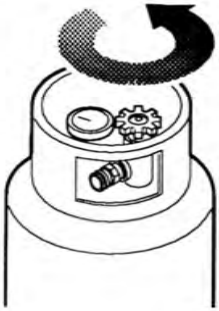
Check the amount of LPG fuel in the tanks by the gauge near the shut-off valve



⚠ WARNING

LPG fuel is highly flammable never smoke when changing tanks. Never change tanks with the engine running.

How To Start Your Truck



Before starting an **LPG engine**, open the tank shut-off valve slowly.

NOTICE

If this valve is opened too quickly, the automatic safety check valve will close. If this happens, close the shut-off valve and wait 2-3 minutes. Then, open the shut-off valve slowly.

To start an **LPG engine**, follow the starting procedure for a gasoline engine lift truck, with the exception that no choke control is required with LPG engines.

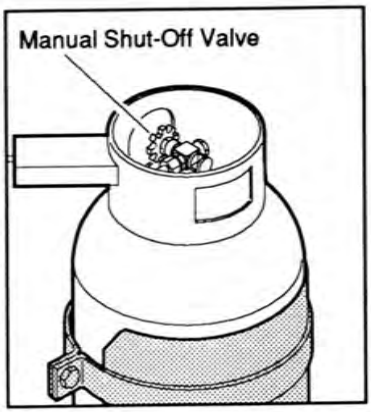
To stop an LPG engine safely, follow this shut-down procedure:

1. Stop the truck with the service brakes.
2. Apply the parking brake.
3. Let the engine run at low idle speed.
4. Close the shut-off valve at the LPG tanks.
5. Wait until the engine uses (burns up) the supply of LPG remaining in the fuel system.
6. When the engine stops running, turn the ignition key switch to the "OFF" position.

Compressed Natural Gas (CNG)

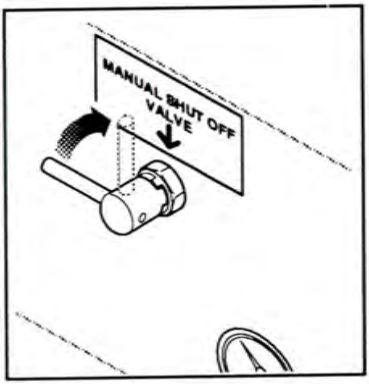
⚠ WARNING

Contents under extreme pressure. When re-fueling be very cautious. Make sure there is NO SMOKING, NO OPEN FLAMES, make sure motor is turned off. FLAMMABLE GAS.



CNG Tank

If your lift truck is fueled by CNG, it is stored in specially designed tank(s) that are mounted permanently to the truck. There is a main shut-off valve on the tank also a relief valve that is both heat and pressure actuated. The shut-off valve is operated manually to control the fuel flow from the tank. This valve must be fully closed at the end of each shift. Close the tank valve by hand to a firm tightness. **DO NOT OVERTIGHTEN.**

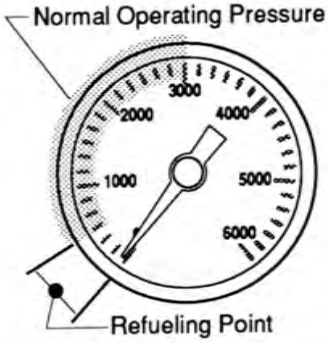


Emergency Shut-off Valve

There is a quarter turn valve located on the truck as shown in the illustration. It should only be used in case of an emergency.

Fuel Level Gauge (Dash)

The amount of fuel remaining in the tanks can be checked by looking at the gauge on the dash *(see Section 8)* or observing the pressure gauge.



Fuel Pressure Gauge

The CNG fuel pressure gauge is located on the seat deck just to the right of the driver's seat. The gauge reads from 0 to 6000 psi. When the tank is full the gauge should read 3000 psi, this is the maximum working pressure. The truck should be refueled when the pressure drops below 500psi.

DANGER

If you smell natural gas in or around the engine area you may have a leak within the CNG fuel system. Turn the emergency shut-off valve to the off position. Have a trained and authorized mechanic look at the truck.

Starting a CNG Truck

To start a CNG fueled lift truck use the following procedures:

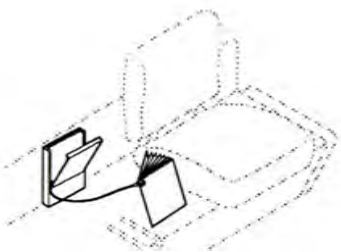
1. Apply parking brake and put the directional control in neutral.
2. Turn the tank valve slowly counterclockwise to the full open position. *The pressure gauge should read between 500 and 3000psi, this is the system operating pressure.*
3. Do not depress the accelerator pedal.
4. Turn the ignition key to the "START POSITION". When the engine starts release the key to the "RUN POSITION".

Shut Down Procedures *(at the end of your shift)*

To stop an CNG engine safely, follow this shut-down procedure:

1. Stop the truck with the service brake.
2. Apply the parking brake.
3. Let the engine run low at idle speed.
4. Close shut-off valve.
5. Wait until the engine uses (burns up) the supply of CNG remaining in the fuel system.
6. When the engine stops running, turn ignition key to the "OFF" position.
7. Check fuel pressure gauge to see if tank needs to be re-fueled. *If your CNG truck needs to be re-fueled see "Section 4" on the proper procedures.*

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



The Operator's Manual Holder is located at the drivers right, fastened to the hood support portion of the seat deck. The manual is attached to the holder with a lanyard to keep it with the truck.

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

WARNING

Protect yourself -- Do not operate truck without a driver's overhead guard unless conditions prevent its use. Do not remove overhead guard unless specifically authorized. Use special care if operation without this safety device is required.

Remember, before starting and 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 other correct position.
- Truck has been checked and is ready to operate.

WARNING

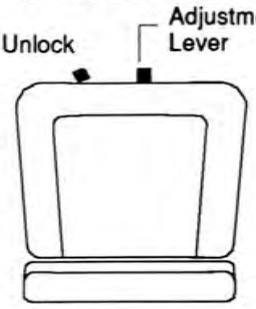
Do not start or operate the truck, any of its functions or attachment, from any place other than from the designated operator's position.

NOTICE: This equipment can be dangerous if not used properly. Safe operation is the responsibility of the operator.

RECOMMENDED OPERATING AND DRIVING PROCEDURES

Sequence of Operation

This is a good time to adjust the seat to a comfortable position for you. Adjust the seat by moving and holding the release lever at the front edge of the seat. Put the seat in a position which will provide easy reach to all controls. Release the seat lever. Make sure that the seat locking mechanism is engaged.



CAUTION

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

How To Operate Your Truck

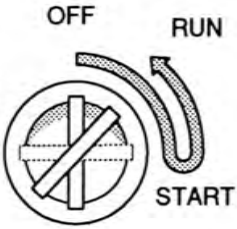
Buckle up. Be sure that you put on the seat belt. Connect and adjust the seat belt strap to a snug, comfortable position.

WARNING

Always wear your seat belt when operating a lift truck.

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

Start the engine.



Turn the key/start switch to the START position. When engine is running, release the key. The key will return to the RUN position.

If you are unfamiliar with this procedure, please refer to the section, "How To Start Your Truck".

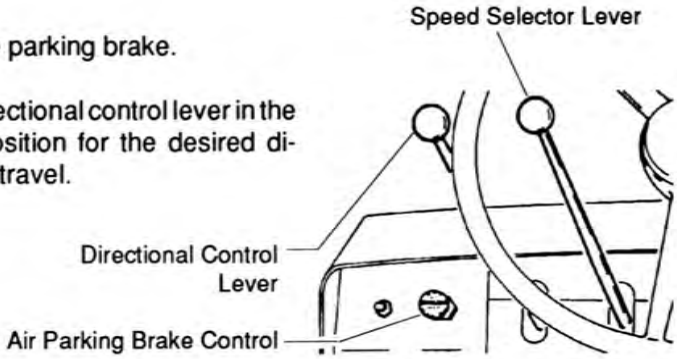
Immediately after engine starts, check gauges for correct readings. If any gauge indicates a malfunction, stop engine and report the problem.

Be sure that your truck won't move unexpectedly before you are ready to drive...

Put your foot on the brake pedal and push down to apply the service brakes.

Release the parking brake.

- Put the directional control lever in the correct position for the desired direction of travel.



NOTE - When driving, with or without a load, it is good practice to always raise the forks slightly and tilt the upright (forks) backward. Raising the forks and tilting them back prevents the fork tips from catching on possible obstructions and reduces the wear on the fork blades from striking or dragging on the floor or ground. See the NOTICE and CAUTION below.

Lift

Pull back on the lift control lever and raise the forks [152 - 203 mm] 6-8 inches above the floor.

Then, using the tilt control, tilt the upright back slightly to raise the fork tips.

NOTE - Users should give consideration to special operating conditions. The amount of forward and rearward tilt to be used is governed by the application.

Tilt Back

Stability

NOTICE

When the upright (carriage and/or load) is raised into a high (elevated) position, the stability of the truck is reduced.

Some of the other conditions which may affect stability are: ground and floor conditions, grade, speed, loading, dynamic and static forces and the judgement 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.

CAUTION

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 ground or obstacles.

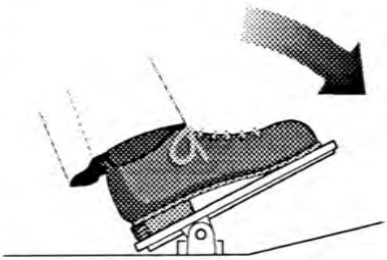
How To Operate Your Truck

Put your foot on the accelerator pedal and push down smoothly until the truck is moving at the desired speed.

Always bring your truck to a complete stop before shifting to the opposite direction.

Any sudden change in direction can cause the load being carried to move or fall off the forks. Also, many components of the truck can be overloaded when a shift in direction is made without first slowing and stopping the truck.

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



IMPORTANT - Stop a lift truck as gradually as practical. Hard braking and wheel sliding are dangerous and can increase wear and can be harmful to the lift 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 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.

How To Operate Your Truck

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 operators 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. Therefor, it should not be considered a substitute for good judgement 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 and upright mechanism while attempting to handle a load.

No rider...
Do not carry passengers. The operator is the only one who should be on the truck.

Always be in full control of your lift truck...
Never operate a lift truck or its attachments to 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 surfaces.

Avoid any sudden movement. Start, stop, travel, steer and brake smoothly. Operate your lift truck under all conditions at a speed that will permit it to be brought safely to a stop.

How To Operate Your Truck

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

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

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

SAFE OPERATION IS THE RESPONSIBILITY OF THE OPERATOR

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. 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 or others.

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 gauges and warning indicator lights in the instrument panel to be sure they indicate a normal condition. If an abnormal condition appears, shut off the engine immediately and report the problem.

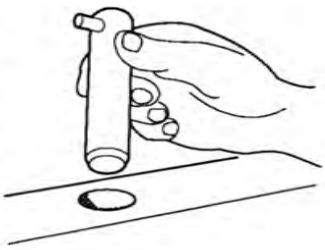
CAUTION

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

ALWAYS WEAR YOUR SEAT BELT WHEN OPERATING YOUR LIFT TRUCK.

BE AWARE that the exhaust gases and fumes from the operation of engine powered lift trucks indoors and in poorly ventilated areas can be harmful to the operator and other personnel. Turn off engine when not in use.

Load Forks Adjustment



The load forks are adjustable on the hanger shaft. Forks should be spaced as far apart as the load being carried will allow. Both forks should always be the same distance from the center of the fork carriage. To adjust the forks, raise them slightly. Use full forward tilt which will reduce friction and make the forks slide easier. Be sure to replace and secure fork locking pins after adjusting forks.

CAUTION

When adjusting forks, always push forks away form you.

Load Handling

Handle only loads that are within the truck rated capacity as shown on the nameplate. This rating specifies the maximum load that should be lifted. However, other factors such as special load handling attachments, loads having a high center of gravity or uneven terrain may dictate that the safe working load be less than the rated capacity. Under these conditions the operator must reduce the load carried so that the lift truck remains stable. Handle only stable or safely arranged loads. Do not handle loads made up of loose, unevenly stacked or unstable items that can easily shift and fall. Take the time to correctly stack and band loose items. Center the load on the forks. Do not lift anything that might fall on the operator or a bystander. Do not handle loads that are higher than the fork carriage unless the load is secured so that no part of it can fall backwards. 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

How To Operate Your Truck

likely to tip up. Lift and lower with the upright mast vertical or tilted slightly back...**NEVER TILTED FORWARD**. Operate lift and tilt controls slowly and smoothly. Never tilt forward when carriage (load) is raised except to pick up or deposit a load over a rack or stack.

⚠ 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.

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 will be the uplift 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 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.

Traveling

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

Observe all traffic regulations and watch for other traffic, pedestrians and safe clearances. Always look in the direction of travel. Keep a clear view of the path of travel and when load blocks your visibility, travel in reverse with load trailing (except when climbing an incline). Avoid sudden movements when carrying a load -- start, stop, travel, steer and brake smoothly. Steer clear of bumps, holes and loose materials or debris on the ground. Lift and tilt slowly and smoothly. Go slowly when turning. Cross railroad tracks at an angle whenever possible.

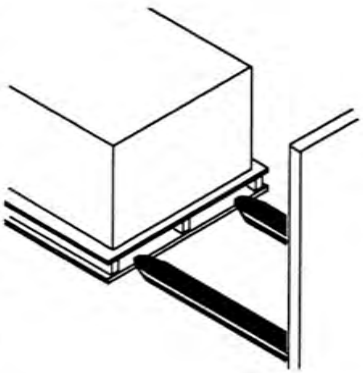
Use special care when handling and traveling with long, high or wide loads, to avoid losing the load, striking bystanders or obstructions or tipping the truck. Watch clearances around the truck and load as you travel. Raise the forks or attachment only to pick up or stack a load. Look out for obstructions, especially overhead.

Be aware that exaggerated tail swing when turning while traveling forward is a characteristic of lift trucks that are steered by the rear wheels. Accordingly, 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.

Picking up and moving loads

When picking up a load from the ground, approach the load slowly and carefully align the truck square with the load. The forks should be adjusted to fit the load or pallet being handled and spread as wide as possible to provide good stability and balance. 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. With the lift and tilt controls, adjust the forks to the correct height and angle for freely engaging the load pallet. Move (inch) forward until the forks are squarely and completely under the load.



How To Operate Your Truck

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, move the tips partially under the load without extending beyond the load. Raise the load to clear the ground. Back out several inches or distance as necessary, then set load down and inch forward until load is positioned against the carriage. Raise the load from the ground or stack by tilting the upright back just enough to lift the load from the surface. When stacking or tiering, use only enough backward tilt to stabilize the load. Then raise the

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

Unloading

- To deposit a load on the ground after being moved into the correct position, tilt the upright forward to a vertical position and lower the load.
- Adjust the fork height and tilt the upright forward slightly, as necessary, for smooth removal of the forks from the load (pallet).
- Carefully back away to clear the forks from load.
- Raise the forks to traveling height and tilt fully back.

Stacking

•To put a load on a stack.....

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

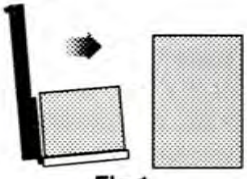


Fig 1

(Fig 2) Raise (elevate) the load as the lift truck is nearing the stack.

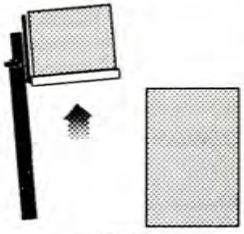


Fig 2

(Fig 3) Move forward, slowly, until the load is almost touching the stack. The leading edge and sides of the load pallet should be lined up exactly with the near edge and side of the load or rack on which you are stacking. Stop close to the stack and further lift (raise) the load high enough to clear the top surface of the stack. Inch the load into position. Be careful not to damage or move adjacent loads.

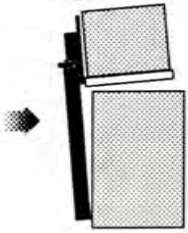


Fig 3

(Fig 4) When the load is aligned with the stack beneath it, tilt the upright to the vertical position and carefully lower the load onto the top surface of the stack.

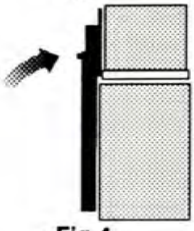


Fig 4

(Fig 5) Lower (drop) the forks slightly to clear (disengage) the load pallet. Tilt the forks forward slightly, if necessary.

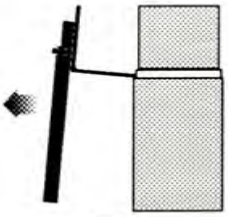


Fig 5

How To Operate Your Truck

(Fig 6) Check you travel path, then carefully back away until the forks are clear of the stack. Stop and lower the forks to the travel position (6 to 8 inches above the ground), then tilt back to travel.

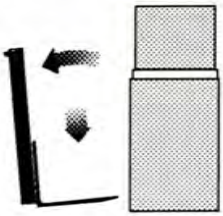


Fig 6

• Moving a load from a stack...

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

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, move the tips partially under the load without extending beyond the load. Raise the load to clear the under-surface. Back out several inches, then set the load down and inch forward until the front face of the forks contacts the load.

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

Check your travel path, slowly back off until clear of the stack, stop, and then lower the load to the travel position (6 to 8 inches off the ground). Tilt full back to travel (*see note). Be sure load is back flush against the carriage or front face of the forks.

NOTE -- Certain loads may have to be transported as level as possible.

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.
- 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 complete stop.
2. Put the directional control lever in the "N" (neutral) position.
3. Apply the parking brake.
4. Lower the lifting mechanism: fork carriage and forks or attachment, fully to the floor or ground.

In addition, when leaving the truck unattended...

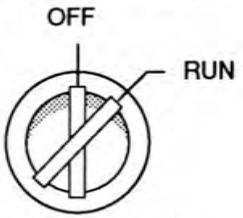
5. Fully lower the lifting mechanism.
6. Tilt the upright forward until the forks are level and flat on the floor or ground.
7. Stop the engine and shut-off LPG tanks or turn off the controls.
8. Block the wheels, if the truck must be left on an incline or you have any doubt about the truck moving from a safe position.

Engine Shut Down Procedure

1. Turn the ignition switch to the OFF position and remove the key.

IMPORTANT

If the lift has been working hard, let the engine idle a few minutes before shutting it off. This is particularly important with a turbocharged engine.



Key/Start Switch

Index

How To Use Battery Jumper Cables

These instructions apply to the use of a similar-model lift truck with a fully charged good ("booster") battery to start the engine of a lift truck with a discharged ("dead") battery.

To avoid damage to your lift truck and your battery or the possibility of harm to yourself, follow these instructions and warnings. If you have any doubts, ask for help from an experienced mechanic.

IMPORTANT

Use only a 12-volt jumper system, you can permanently damage a 12-volt starting motor and ignition system by connecting it to a 24-volt power supply (two 12-volt batteries in series or a 24-volt generating set).

1. This truck has a 12-volt battery and a negative ground electrical system. Be sure that the other truck also has a 12-volt battery and negative ground system. If not sure of the voltage, or if the ground is different, do not try to jump start, as personal injury or damage to the electrical system can result.
   If your truck has a battery with terminals on the side you will need a set of jumper cables with matching connector clamps or cable adapters for side-mounted battery terminals.

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.

Batteries contain sulfuric acid. Avoid acid contact with skin, eyes or clothing. Also, shield your eyes when working near the battery to protect against possible splashing of the acid solution.

2. If the discharged battery has filler caps, check the fluid level. Do not use an open flame to check and do not smoke. If low, add distilled water to the correct level. Be sure to install the caps before jump starting.
   Do not jump start, charge or test a sealed-type battery if the test indicator looks illuminated or has a bright color. Install a new battery.

How To Use Battery Jumper Cables

WARNING

EXPLOSIVE GASES

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

Hydrogen and oxygen gases are produced during normal battery operation. This gas mixture can explode if flames, sparks or lighted tobacco are brought near the battery. When charging or using a battery in an enclosed space always provide ventilation and shield your eyes. Wear safety glasses when working around batteries.

3. Put the truck with the booster battery as near to the other truck as necessary for the jumper cables to reach both batteries. Check and make sure that the trucks do not touch each other. **Use particular care when connecting a booster battery to prevent sparks.**

4. On both trucks:

   a. Apply the parking brake.

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

   c. Turn the ignition key switch to the OFF position.

   d. Turn all accessories to the OFF position and leave them off until after the engine has been started and the jumper cables have been removed.

WARNING

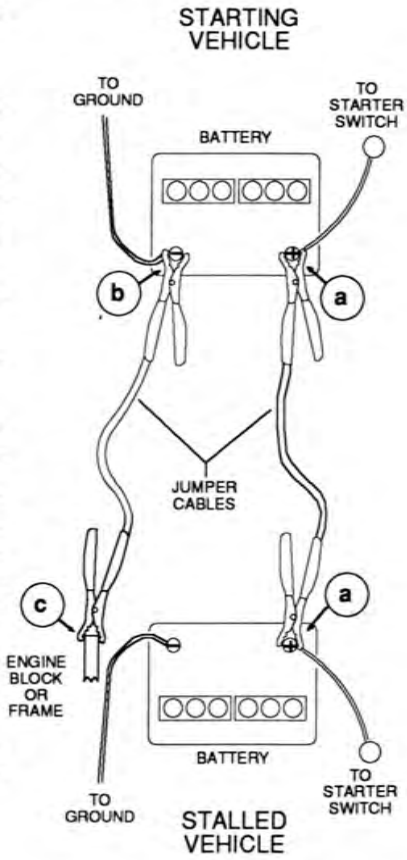
SHORT CIRCUITS

Remove all jewelry. Do not permit any metal tools to make contact with the positive battery terminal and other metal on the truck. Make sure when connecting jumper cable clamps to the positive terminals of the batteries that neither clamp contacts any other metal.

How To Use Battery Jumper Cables

5. Connect the jumper cables in the following sequence:

a. Connect the first jumper cable from the positive (+) (Red) terminal on one battery to the positive (+) (Red) terminal on the other battery. Never connect (+) (Red) to (-) (Black), or (-) to (+).
b. Next, connect one end of the second cable to the grounded (-) (Black) terminal of the "Starting Vehicle" battery.
c. Last, connect the other end of the second jumper cable to a stationary solid metallic point on the engine of the "Stalled Vehicle". (NOT TO NEGATIVE (-) TERMINAL OF THE BATTERY). Make this connection at a point at least [450 mm] 18 inches away from the battery, if possible. Do not connect it to pulleys, fans or other parts that move. Be sure not to touch hot manifolds which can cause severe burns.



6. Start the engine on the "Starting Vehicle" and run the engine at a moderate speed for a minimum of five minutes.
7. Start the engine on the "Stalled Vehicle". Follow the starting instructions in the "Starting and Operating Procedures" section of this manual. Be sure that the engine is at idle speed before disconnecting the jumper cables.
8. Remove the jumper cables by reversing the installation sequence exactly. Start by removing the last jumper cable from the truck with the discharged battery, first. Remove the cable end from the engine block first, then the other end of the negative (-) cable.
9. Remove both ends of the positive (+) cable.

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How To Tow a Disabled Truck

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

IMPORTANT

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

⚠ WARNING

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

Towing Procedures

1. Be sure to apply the parking brake or block the drive wheels on the disabled truck while working around it.
2. When possible, raise the carriage (forks) on the disabled truck about [300 mm] 12 inches from the floor or ground. Secure the carriage with a chain. For procedure on how to manually release the parking brake, refer to "Parking Brake" in section, How Your Lift Truck Operates. This is difficult to do and would be done only if the engine on the towed vehicle was inoperative and air pressure could not be supplied from the towing vehicle.

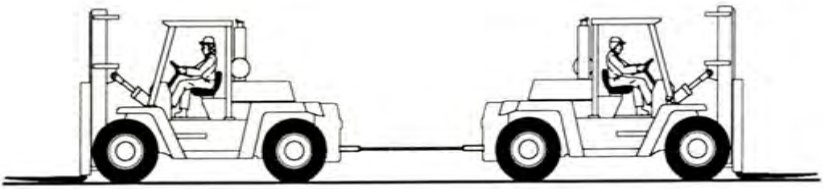
CAUTION

All work should be performed by a trained authorized mechanic.

3. Tow with another lift truck of equal or larger size carrying a partial load for traction.
4. Tow the disabled truck backwards.
5. Before towing, check to be sure that the counterweight bolt is in place and properly torqued. (This bolt is made of a special high tensile steel and is not commercially available. Replace it, when necessary, only with a genuine Clark replacement part).
6. Use an approved, solid metal tow bar with towing couplers that connect to the towing pins in the counterweights.

NOTE: *Optional towing equipment is available from your Clark dealer.*

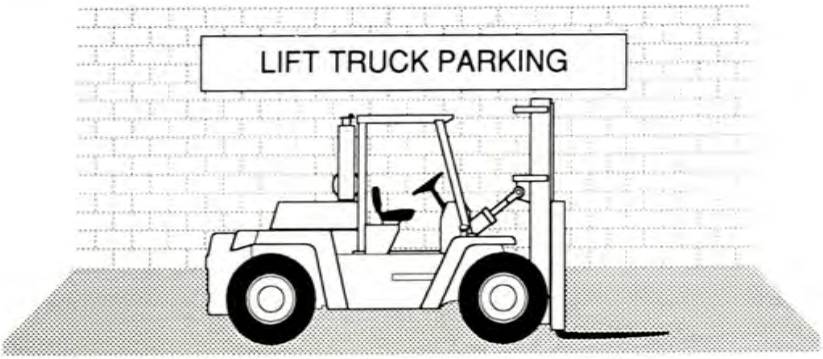
7. The towed truck must have an operator.
8. Tow the truck slowly. Careful towing is necessary to prevent injury to personnel or damage to the truck. The truck should be towed at a speed of less than [8 kph] 5 mph with a driver in the seat. Do not lift the truck or any wheels off the floor or ground while the truck is being towed.



CAUTION

The power steering will not operate on the disabled truck when the engine is not running. The steering handwheel will be difficult to turn.

9. Park the disabled truck in authorized areas only. Fully lower the forks to the floor, put directional control lever in the "N" (neutral) position and turn the ignition switch to the OFF position. Engage the parking brake. Remove the ignition key and, when necessary, block the wheels to prevent the truck from rolling.



WARNING

Always engage the parking brake when parking a lift truck. The truck can move and cause injury or death to personnel near it.

Contents

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 to 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 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.

CAUTION

Powered Industrial Trucks May Become Hazardous If Maintenance Is Neglected

Planned Maintenance

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 need for major adjustments, repairs or replacements is found and corrections made as required; not after 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 consider essential to the safety, life and performance of your truck with typical recommended service intervals. Brief procedures for inspections, operational checks, cleaning, lubrication and minor adjustments are included for your reference.

Planned Maintenance Intervals

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 you will find a listing of useful specifications for selected components, fuel and lubricants, critical bolt torques, refill capacities and settings for your truck.

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

Typical Operating Conditions

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

NORMAL OPERATION

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

SEVERE OPERATION

Prolonged operating hours or constant usage.

EXTREME OPERATION

1. In sandy or dusty locations, e.g., cement plant, lumber mills, coal dust or stone crushing sites.

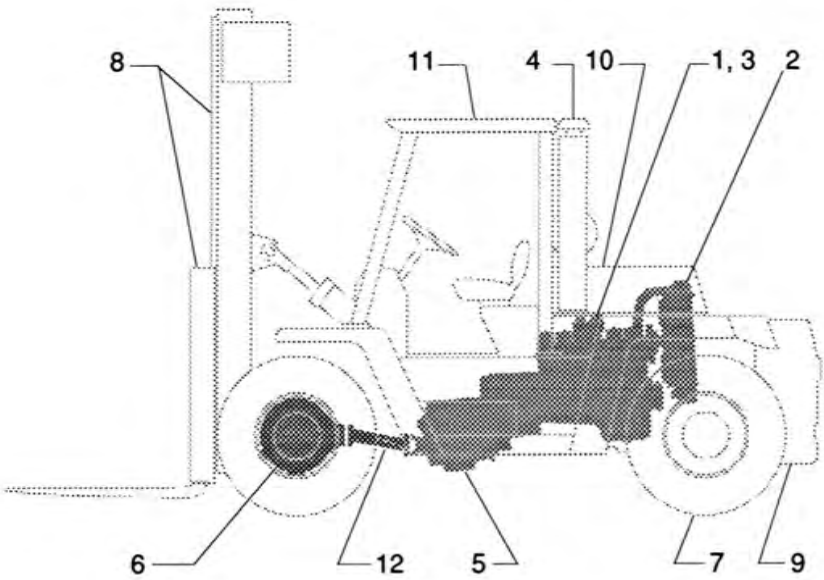
2. High-temperature locations, e.g., steel mills, foundries, etc.

3. 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.*

Major Component Location

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



1 ..... Engine
2 ..... Cooling
3 ..... Fuel Carburetion
4 ..... Exhaust
5 ..... Transmission
6 ..... Drive Axle-Differential
7 ..... Wheels & Tires
8 ..... Upright & Carriage
9 ..... Frame & Counterweight
10 ..... Sheet Metal
11 ..... Overhead Guard
12 ..... Prop Shaft

Planned Maintenance Intervals

Recommended P M 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, as follows:

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

Recommended Planned Maintence and Lubrication Schedule

PERIODIC CHECKS AND PLANNED MAINTENANCE (PM)	A	B	C	D	E
Check truck visually and inspect components.		•			
Test drive truck -- Check functional performance.		•			
Air clean truck and radiator		•			
Check torque on critical fasteners.		•			
Lubricate truck. (See component)		•			
Drain and replace engine oil filter. (*)		•			
Replace engine oil filter.		•			
Clean/replace engine air filter. (**)			•		
Inspect/adjust fan belts.			•		
Drain/flush radiator coolant.					•
Check battery.			•		
Check transmission fluid level.		•			
Drain and replace transmission fluid.				•	
Replace transmission oil filter.				•	
Clean drive axle air vent.		•			
Check brake condition and wear.					•
Check drive axle mounting and fasteners.		•			
Lubricate steer axle linkage.		•			
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 chain adjustment and wear.		•			
Check/lubricate lift chains.		•			
Lubricate upright rollers.		•			
Check/clean power steering sump screen.		•			
Check radiator cap/pressure test.					•

NOTES:

* Oil change intervals may be determined by laboratory analysis.

** Air filter change interval may be determined by using an air restriction indicator.

Safety and Operational Checks

PM Intervals:

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

DAILY MAINTENANCE CHECKS	A	B	C	D	E
Check truck for obvious damage and leaks.	•				
Check fuel system for leaks, etc.	•				
Check capacity, warning plates and decals.	•				
Check condition of tires and wheels. Remove embedded objects. Check air pressure.	•				
Check wheel lug nuts.	•				
Check engine oil level.	•				
Check fuel level.	•				
Check hydraulic sump oil level.	•				
Check gauges and instruments.	•				
Check warning lights and hourmeter.	•				
Check overhead guard condition and bolts.	•				
Check horn operation and other warning devices.	•				
Check steering operation.	•				
Check service brake operation.	•				
Check parking brake operation.	•				
Check directional and speed controls operation.	•				
Check accelerator and engine speed operation.	•				
Check lift, tilt and aux operation.	•				
Check upright, lift chains and fasteners.	•				
Check carriage or attachments and forks.	•				
Drain water from air brake reservoir.	•				
Check optional safety equipment. (Alarms, Lights etc..)	•				

Maintenance Procedures

User Safe Maintenance Practices

The following instructions have been prepared from current industry and government safety standards applicable to industrial truck operator 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, adjust and inspect industrial trucks and in accordance with the manufacturer's specifications.

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

6. Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check for level or leakage fuel, electrolyte or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.

7. Before starting work on truck:
   a. Raise drive wheels free of floor and use blocks or ther positive truck positioning devices.
   b. Put blocks under the load-engaging means, innermasts or chassis before work on them.
   c. Disconnect battery before working on the electrical system.

NOTE: Refer to the Jacking and Blocking Section in SM-575 for proper procedures.

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. Make sure parking brake is applied.
   c. Put direction control in neutral.
   d. Start engine.
   e. Check functioning of lift and tilt 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 the load-engaging means; upright, carriage, forks or attachments.
    c. Put directional control in neutral.
    d. Apply the parking brake.
    e. Stop the engine.
    f. Turn the key switch to the OFF position.
    g. Put blocks at the wheels if truck must be left on an incline.

11. Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, lift and tilt mechanisms, articulating axle stops 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 insure that maintenance preserves the original approved safe operating features.

13. Fuel systems must be checked for leaks and condition of parts. Extra special consideration must be given in the case of a leak in the fuel system. Action must be taken to prevent the use of the truck until the leak has been corrected.

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

15. When working on hydraulic system, be sure the engine is turned off, upright is in the 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.

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

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

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

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

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

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

22. 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.

23. 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.

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 Industrial Standards, OSHA 2206: OSHA Safety and Health Standards (929 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

IMPORTANT

Your new CLARK lift truck has been built to meet all applicable mandatory requirements of ANSI B56.1 - 1988 Safety Standard for Powered Industrial Trucks. Each truck also includes certain safety devices, e.g., 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.

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 maintanance required to prevent major problems from occurring during operation.

As an aid in performing and documenting your PM inspections, Clark prepared a "GAS, LPG or DIESEL 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 record of your inspection and truck condition.

The maintenance procedures outlined in this manual are intended to be used in conjunction with the PM report form. They are arranged in groupings of maintenance work that are done in a logical and efficeint 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 person responsible for lift truck maintenance.

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

For safety, it is good practice to:
Remove all jewelry (watch, rings, bracelets, etc.) before working on the truck.

Disconnect the battery ground cable (-) from the engine or frame before working on electrical components.

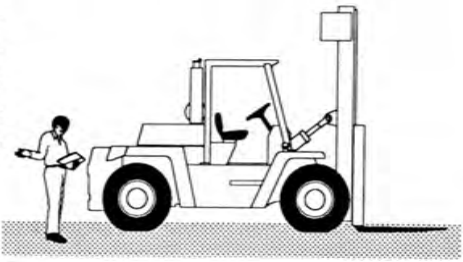
Always wear safety glasses. Wear a safety (hard) hat in industrial plants and in special work areas where protection is necessary and required.

HOW TO PERFORM PLANNED MAINTENANCE

Periodic Inspections and Maintenance

Visual Inspection

First perform a visual inspection of the lift truck and it components. Walk around the truck and take note of any obvious damage and maintenance problems.



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

NOTICE

NAMEPLATES & DECALS

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

Inspect the truck, before and after starting engine, for any sign of external leakage: fuel, engine coolant, transmission fluid, etc.

Check for hydraulic oil leaks and loose fittings.

CAUTION

HYDRAULIC FLUID PRESSURE

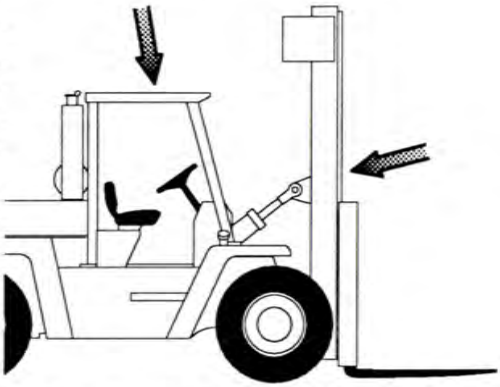
Do not use your hands to check for hydraulic leakage. Fluid under pressure can penetrate your skin and cause serious injury.

PM Program

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.

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



Inspect the upright assembly: rails, carriage rollers, lift chains, lift and tilt 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.

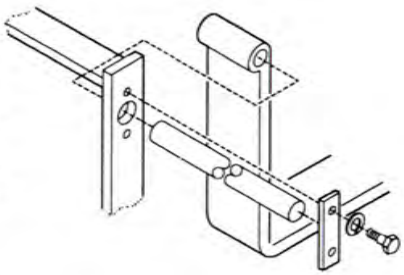
Inspect all lift line hydraulic connections for leaks.

IMPORTANT

Uprights and lift chains require special attention and maintenance to maintain them in safe operating condition. Refer to Lift Chain Maintenance section for additional information.

Forks

Inspect the load forks for cracks, breaks, bending and wear. The fork top surface 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.



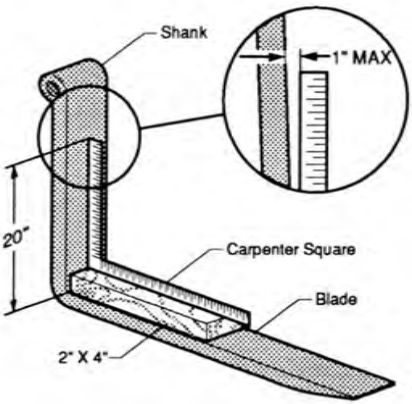
WARNING

If the fork blade at the heel is worn down by more that 10 per cent, the load capacity is reduced and the fork must be replaced.

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" carpenters 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.

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

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



PM Program

Wheels and Tires

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

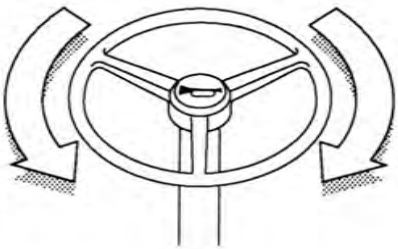
Check all wheel lug nuts or bolts to be sure none are loose or missing. Have missing bolts or lug nuts replaced and tightened to the correct torque before operating truck. Torque to 100-120 lbf ft [135,6 - 162,7 N•m].

WARNING

Check tire pressure from a position facing the tread of the tire not the side. Use a long handled gauge to keep your body away from the side. If tires are low, do not add air. Check with a mechanic. The tire may require removal and repair. Incorrect (low) tire pressure can reduce stability of your lift truck. Proper cold inflation is 100 PSI.

Functional Tests

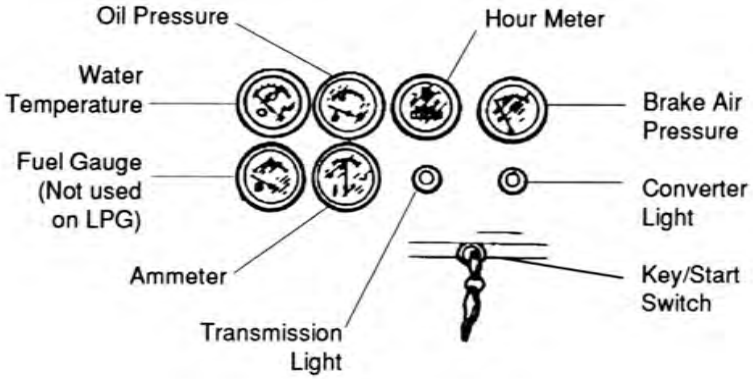
Now be sure that all controls and systems are functioning correctly.



After checking that the parking brake is set, 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.

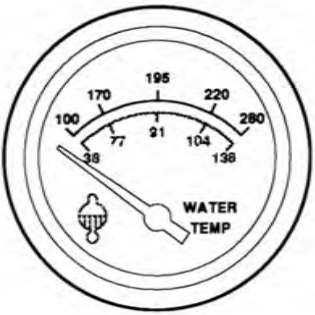
Check the operation of the neutral start switch by placing direction control lever in forward or reverse and turning key switch to START position. Starter must not engage until direction control lever in moved to the neutral position.



PM Program

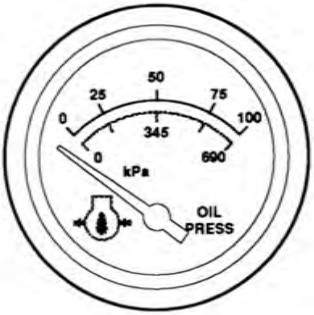
Water Temperature Gauge

Indicates temperature of engine coolant water in degrees (F). 100° F to 280°F. Water temperature should be about 180°F after 10 minutes of operation. If the indicator registers in the "hot" zone, turn off engine until trouble is located and corrected.



Oil Pressure Gauge

Indicates engine lubricating oil pressure in PSI 0 - 100 PSI at maximum engine speed. Oil pressure should be between 30 and 60 PSI on the oil pressure gauge at normal engine operating speeds. At idle, pressure should not fall below 5 PSI. If pressure is low or erratic, shut down engine until trouble is located and corrected.



Hour Meter

Indicates total engine operating time in hours and tenths. The indicated hours are used for planned maintenance. The total hours should be recorded at the beginning and end of each shift.

Air Pressure Gauge

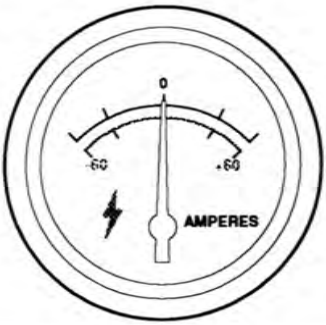
Indicates brake system air pressure from 0 to 150 PSI and [0 to 1000 kPa]. Air pressure should register between 110 and 130 PSI to assure proper operation of the brakes and the parking brake. A warning buzzer is activated if pressure drops below 60 PSI.

Fuel Gauge

Indicates quantity of fuel remaining in the tank in fractions of the whole. Fuel level should be checked on the fuel gauge at the beginning of each shift. Always start with a full tank. *(Not Used on LPG)*

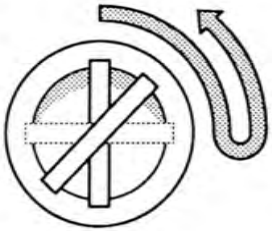
Ammeter

Indicates rate of battery charge or discharge. With engine running, should read slightly to the + side of "O". If the ammeter shows a continuous high rate of charge or discharge, or reads erratically, report trouble to proper authority.



PM Program

Key/Start Switch



A 3-position switch is standard equipment. To start engine, rotate clockwise. Release to "run" position when engine starts. The switch incorporates an "anti-restart" feature which requires that the key be returned to the "off" position before it can again be turned to "start". If engine does not start on the first attempt, do not re-engage the starter until engine comes to a complete stop (approximately 5 seconds).

Transmission Light

When illuminated, indicates inadequate converter oil pressure. Light will be illuminated when key/start switch is turned to "run" and "start" positions. It should go out shortly after engine starts. If light does not go out or if it comes on during truck operation you should immediately shut down the engine until the cause is located and corrected.

Converter Light

Light will be illuminated when converter oil temperature is too high. Shift to a lower range. If light stays on, shut truck down until trouble can be located and corrected.

The gauges, lights and hour meter, conveniently grouped in the instrument panel, are designed to tell you at a glance many important things about the performance of your lift truck. Familiarize yourself with their location and purpose and make it a practice to scan the instrument panel as you start the engine, after it starts and periodically as you drive. Report to the designated authority if any gauge is not functioning properly.

NOTE: The electrically operated gauges register correctly when the key switch is in the "on" position. When the key switch is turned "off", the indicator needle will not necessarily return to any given position.

PM Program

Checks with the engine running...
Be sure that:

- Parking brake is applied.
- Directional control is in "N" (neutral).
- Start the engine, let it warm up until it runs evenly and accelerates smoothly when you push on the accelerator pedal.
- Check the hour meter for operation with the engine running. Report any malfunction or damage.

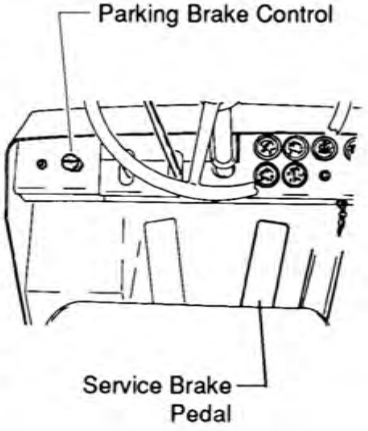
Write the hour meter reading on the PM report form.

- Operate service and parking brakes, all hydraulic controls: lift, tilt and auxiliary (if installed), accelerator, directional controls and steering system. Be sure all controls operate freely and return to neutral properly.

Check the service brake system. Push the brake pedal fully down and hold. The brakes should be applied before the pedal reaches the floorplate. If the pedal continues to creep downwards report the failure immediately. DO NOT OPERATE THE TRUCK UNTIL THE BRAKES ARE REPAIRED.

- Check the function of the parking brake. Release, then reapply and then put truck in gear and accelerate to insure that brake holds.

- To check parking brake holding capability, park the lift truck on a grade and apply the parking brake. The parking brake should hold a lift truck with rated load on a 15% grade.



CAUTION
Do not operate a lift truck if the service or parking brakes are not operating properly.

PM Program

Lift Mechanisms and Controls

- Check the function of the lift system and controls with the hydraulic pump (engine) running.
- Pull back on the tilt control lever and hold until the upright reaches the full back tilt position. Push forward on the lever to return the upright to the vertical position. Release the lever.

CAUTION

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

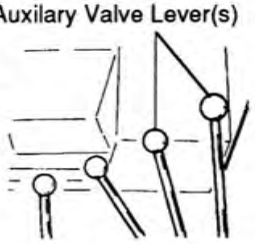
- Pull back on the lift control lever and raise the fork carriage to full height. Watch the upright assembly as it rises. All movements of the upright, fork carriage and lift chains must be even and smooth, without binding or jerking. Watch for chain wobble or looseness; the chains should have equal tension and move smoothly without noticeable wobble. 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.

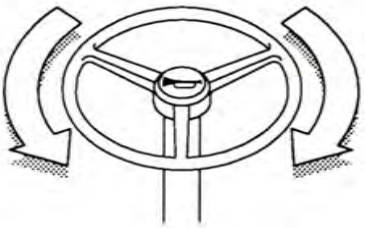
Auxilary Controls

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



Steering System

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



- Check the steering system by moving the steering handwheel in a full right turn and then in a full left turn. Return the handwheel (steer wheels) to the straight-ahead position. The steering system components should operate smoothly when the steering wheel is turned. **Never operate a truck which has a steering system fault.**

⚠ WARNING

Fasten your seat belt before driving the truck.

Shift Control and Brakes

Check and make sure that the travel area is clear in front of the truck.

- Push firmly on the brake pedal. Release the parking brake. Move the directional control lever from "N" (neutral) to 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 push down on the brake pedal to stop the truck. The brakes should apply smoothly and equally.

Be sure the travel area is clear behind the truck.

- Put the directional control lever in the REVERSE travel position. Push down on the accelerator pedal until the truck moves slowly in the reverse direction. Remove your foot from the accelerator pedal and push down on the brake pedal to stop the truck. The brakes should apply smoothly and equally. **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 find.**

PM Program

Fluid and Filters
Check fluid levels and other components within the engine compartment.

Unlatch and open the hood to access the engine compartment.

CAUTION

To avoid the possibility of personal injury, never work in engine compartment with engine running except when absolutely necessary to check or make adjustments. Take extreme care to keep hands, tools and loose clothing, etc., away from fan and drive belts. Also remove watches, bracelets and rings.

Engine Accessories
Inspect the engine coolant hoses and fan belt(s). Look for leaking and obvious damage, worn (frayed) condition, breaks, etc., which could cause failure during operation.

Engine Air Cleaner
Check the engine air cleaner for damage and contamination (excessive dirt buildup and clogging). Check for correct mounting attachments of the air cleaner. Be sure that the air cleaner hose is securely connected (not loose or leaking). Fan or cone shaped dust deposits on tube or hose surfaces indicate a leak.

Change or service the air cleaner element every 50 to 250 operating hours, depending upon your application. Service intervals may also be determined by the air restriction indicator.

Battery
Inspect the battery for any damage, cracks, leaking condition, etc. If the terminals are corroded, clean and protect them with CLARK Battery Saver (available from your Clark dealer). If your battery has removable cell caps, check to be sure the cells are all filled. If possible, refill with distilled water.

Engine Cooling System

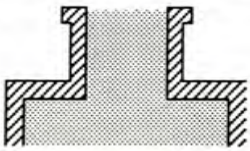
- Check engine coolant level. The engine coolant level is checked by removing the radiator cap. Remove the cap only when the engine is cold. First turn the cap slowly to release any pressure that may be in the radiator. Then push the cap fully down and turn to release and remove the cap.

CAUTION

STEAM

Do not remove the radiator cap when the radiator is hot. Steam from the radiator will cause severe burns.

Never remove the radiator cap while the engine is running. Stop the engine and wait until it has cooled. Even then, use extreme care when removing the cap from the radiator. It is good safety practice to use a shop cloth to cover the radiator cap while it is being removed. Wrap the cloth around the cap and turn ir slowly to the first stop. Step back while the pressure is released from the cooling system. When you are sure all the pressure has been released, press down on the cap, with the cloth in place, turn and remove it. Stand clear of the radiator opening; hot coolant may splash out. Failure to follow these instructions could result in serious personal injury from hot coolant or steam blowout and/ or damage to the cooling system or engine. The correct FULL level is the top edge of the filler neck. If level is low, add a 50/50 mixture of specified coolant and water to the correct fill level. If you have to add coolant more than once a month or if you have to add more than one quart at a time, check the cooling system for leaks.



FILLER NECK

- Inspect the coolant for condition. Look for excessive contamination or rust or oil in the coolant solution. Check the PM time interval for need to change coolant.
- Check condition of radiator cap rubber seal and radiator filler neck for damage. Be sure they are clean. Check overflow hose for clogging or damage.

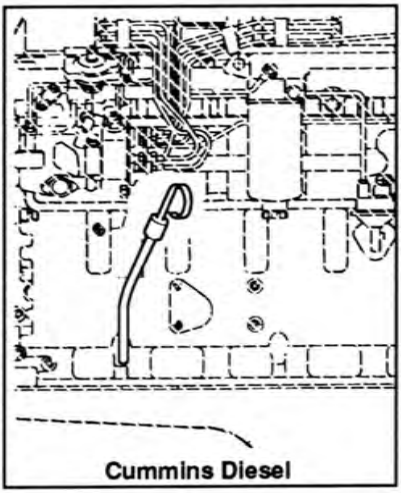
NOTICE - Your lift truck cooling system is filled with a factory-installed solution of 50% water and 50% permanent-type anti-freeze containing rust and corrosion inhibitors. You should leave it in year around. Plain water may be used only in an emergency, but replace it with the specified coolant as soon as possible to avoid damage to the system. With only water in the system, do not let the engine run hot. Do not use alcohol or methanol antifreeze.

PM Program

Engine Oil

Check the engine oil level.
Locate the engine oil dipstick (at left side of engine). Pull the dipstick out, wipe it with a clean wiper and reinsert it fully into the dipstick tube. Remove the dipstick and check oil level.

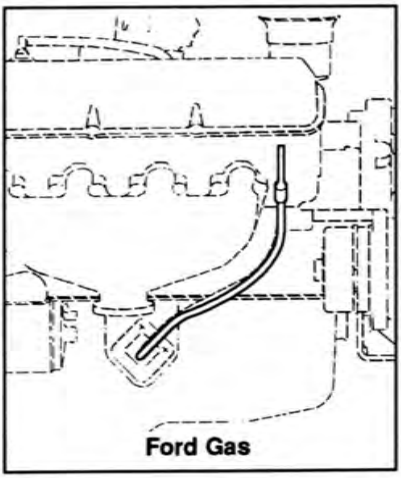
It is normal to add some oil between oil changes. Keep the oil level above the ADD mark on the dipstick by adding oil as required. DO NOT OVERFILL. Use the correct oil as specified under Lubricant Specifications.


Cummins Diesel

Engine Oil and Filter Change

It is recommended to:

- Drain and replace the engine crankcase oil every 50 to 250 operating hours. See NOTICE below.
- Replace the engine oil filter every oil change.
- Remove the oil pan drain plug to drain old oil, after truck has been in operation and engine (oil) is hot (at operating temperature).


Ford Gas

NOTICE - The time interval for changing engine oil will depend upon your application and operating conditions. To determine the correct schedule for your truck it is suggested that you periodically submit engine oil samples to a commercial laboratory for analysis of the condition of the oil.

OIL PERFORMANCE DESIGNATION - To help achieve proper engine performance and durability, use only engine lubricating oils of the proper quality. These oils also help promote engine efficiency which results in improved fuel economy. A symbol has been developed by the API (American Petroleum Institute) to help you select the proper engine oil. It should be included on the oil container you purchase. For diesel engines, CLARK recommends that you use motor oil that meets API Service Classification CE/SF. CC/CD or CD/SF oils can be used in areas where CE oil is not available.

Air Brakes

Adjustment

- When the brake system is operating properly, the cam like action of the reaction arm allows self-adjustment for the total thickness of the brake linings. The self-adjustment feature eliminates the need for manual adjustment of the brakes.

- When the brake linings become worn beyond their designed limits, there will be a noticeable change in the brake effort required to stop the truck or brakes will become noisy during application. If either of these conditions are noted, have the brakes checked by a mechanic before continuing to operate the truck.

Testing

A simple operation test to determine whether the compressor unit is operating can be made as follows:

1. Start the engine and allow air to build up in the system and then shut the engine off.

2. Depress the brake pedal to a given point several times noting any increase in pedal pressure required to depress the pedal.

3. If, however there is no change in the amount of pedal pressure required between first and last test, then the power system is not functioning, necessitating corrective action. Have the brakes checked by a mechanic before operating truck. Refer to Service Manual number SM-575 for brake repair information.

PM Program

Hydraulic Sump Tank
Check the hydraulic sump tank fluid level. Correct fluid level is important for proper system operation. Low fluid level can cause pump damage. Overfilling can cause loss of fluid or lift system malfunction.

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 apply the parking brake. Put the upright in a vertical position and lower the fork carriage fully down. Pull the dipstick out, (attached to the sump breather) wipe it with a clean wiper and reinsert it. Remove dipstick and check 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). Change (replace) the oil as necessary.

Hydraulic Fluid and Filter Change
Drain and replace the hydraulic sump fluid every 2000 operating hours. (Severe service or adverse conditions may require more frequent fluid change). Replace the hydraulic oil filters elements at every oil change. Remove, clean and reinstall the hydraulic and steer system suction line screens at first PM and every 500 hours thereafter. Check for leaks after installation of the filters. Also, check that the hydraulic line connections at the filter adapter are tightened correctly. For procedure for draining hydraulic sump tank, refer to Service Manual number SM-575.

Sump Tank Breather Maintenance and Inspection
Remove the sump tank fill cap/breather and inspect for excessive (obvious) contamination and damage. Clean or replace the fill cap/breather, per recommended PM schedule or as required by operating conditions.

Access to the Drive Axle

The best method to use for reaching the drive axle check points (oil level/ filler plug and drain plug) is dependent upon the style of upright, carriage and attachments on your truck. One method is to raise the upright carriage to provide easy access to the drive axle. **Apply the parking brake and block the wheels. Be sure to put blocking under the carriage and upright rails.**

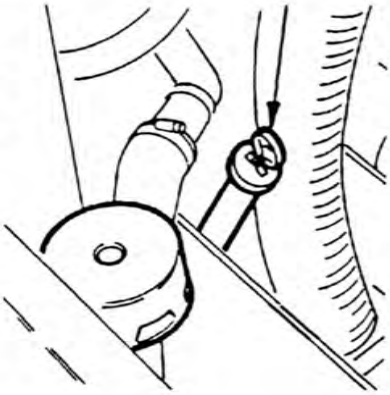
⚠ WARNING

An upright or carriage can move unexpectedly. Chain or block the carriage and rails. Failure to follow this warning can result in serious injury.

Refer to Machine Jacking and Blocking in SM-575 for further information.

Transmission Fluid Check

- Before making check, run engine until unit is at operating temperature. This is important as transmission oil temperature should be 200°F and the engine water jacket should be at operating temperature. Apply parking brake.



- With the engine operating at idle and the transmission in NEUTRAL, check the fluid on the dipstick. Fill if necessary to the FULL mark on the dipstick, using "C-3 Dexron II D" or "Dexron".

Differential Fluid and Breather Check

- Check the differential breather to be sure it is free of obstruction. Remove and clean in a Stoddard type cleaning solvent if necessary. Dry breather with compressed air before replacing it on differential.
- Remove fill/level plug and verify differential lubricant level. Level should be maintained to the height of the plug opening.

PM Program

NOTICE: Check the planned maintenance interval (operating hours) or the condition of the oil to determine if the drive axle fluid needs to be changed.

Truck Chassis Inspection and Lubrication
Lubrication and inspection of truck chassis components, including steer wheels, steer axle linkage, steering cylinder and wheel bearings will be easier if the truck is raised and blocked up under the frame. Refer to SM-575 Service manual for additional information on machine blocking and jacking.

⚠ WARNING

Do not raise truck by lifting under the counterweight.

Inspect the steering cylinder piston rods, seals and fasteners for damage, leaks and looseness. Lubricate the steer axle linkage rod ends and linkage pivot points. Be sure to clean the grease fittings before lubricating and remove the excess grease from all points after lubricating. Lubricate miscellaneous linkage as needed.

Upright and Tilt Cylinder Lubrication
Clean the fittings and lubricate the tilt cylinder rod end bushings (forward end). Clean the fittings and lubricate the tilt cylinder base rod end bushings (rear end). Clean and lubricate the upright trunnion bushings.

Lift Chains
Lubricate the entire length of the upright rail lift and carriage chains with Clark Chain and Cable Lube.
NOTE: Do not lubricate the carriage roller rails.

Air Cleaning
Always maintain a lift truck in a clean condition. Do not allow dirt, dust, lint or other contaminants to accumulate on the truck. Keep the truck free from leaking oil and grease. Wipe up all oil spills. Keep the controls and floorboards clean, dry and safe. A clean truck makes it easier to see leakage, loose, missing or damaged parts and will help prevent fires. A clean truck will run cooler. The environment in which a lift truck operates will determine how often and to what extent cleaning is necessary.

Air Cleaning (cont)
For example, trucks operating in manufacturing plants which have a high level of dirt, dust or lint, (e.g. cotton fibers, paper dust, etc.) in the air or on the floor or ground, will require more frequent cleaning. The radiator, especially, may require daily air cleaning to ensure correct cooling. If air pressure does not remove heavy deposits of grease, oil, etc., it may be necessary to use steam or liquid spray cleaner.

IMPORTANT
Lift trucks should be air cleaned at every PM interval, otherwise as often as necessary.

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

CAUTION
Wear suitable eye protection and protective clothing.

Air clean the: Upright assembly - Drive Axle - Radiator, from both counterweight and engine side - Engine and accessories - Driveline and related components - Steer axle and steer cylinder.

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

Check Torque Of Critical Items, Including:

Drive axle mounting	Overhead guard
Drive & steer wheel mounting	Tilt cylinder mounting & yokes
Counterweight mounting	Upright mounting & components

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 cylinder to the forks. Safe use of your truck with minimum down-time depends on the correct care and maintenance of the lift chains. Most complaints of unacceptable chain performance are a result of poor maintenance. Chains need periodic maintenance to give maximum service life.

Lift Chain Adjustment Check

The lift chains are correctly adjusted if the lower fork carriage rollers reach their end (lowest) position approximately [13 mm] 0.50 inch 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. Apply a layer of grease to the roller path on the inner rail. Lower the carriage and pick up a rated capacity load, (tilt the upright back slightly) and 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. You can now check the roller path pattern in the grease and determine the correct adjustment of the chains. The lift chains can be adjusted by loosening or tightening of the chain anchor nuts.

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.

WARNING

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

Lift Chain Inspection and Measurement

Inspect and lubricate the lift chains every truck PM (50-250 hours). When operating in corrosive environments, inspect the chains every 50 hours. During the inspection, check for the following 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 section of chain is 3% longer that a section of new chain, the chain is worn and must be discarded.

Lift Chain Maintenance

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

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 correctly lubricated. Clark chain lubricant is recommended; it is easily sprayed on and provides superior lubrication. Heavy motor oil may also be used as a lubricant and corrosion inhibitor.

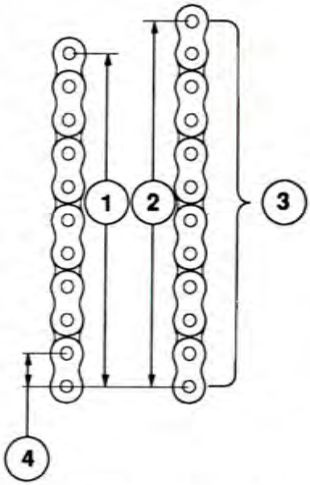
Lift Chain Inspection and Wear Criteria

1 - (NEW CHAIN LENGTH) The distance from the first pin counted to the last pin counted in a span while the chains are lifting a small load.

2 - (WORN CHAIN LENGTH) The distance from the first pin counted to the last pin counted in a span while the chains are lifting a small load.

3 - (SPAN) The number of pins in the length (segment) of chain to be measured.

4 - (PITCH) The distance from the center of one pin to the center of the next pin.



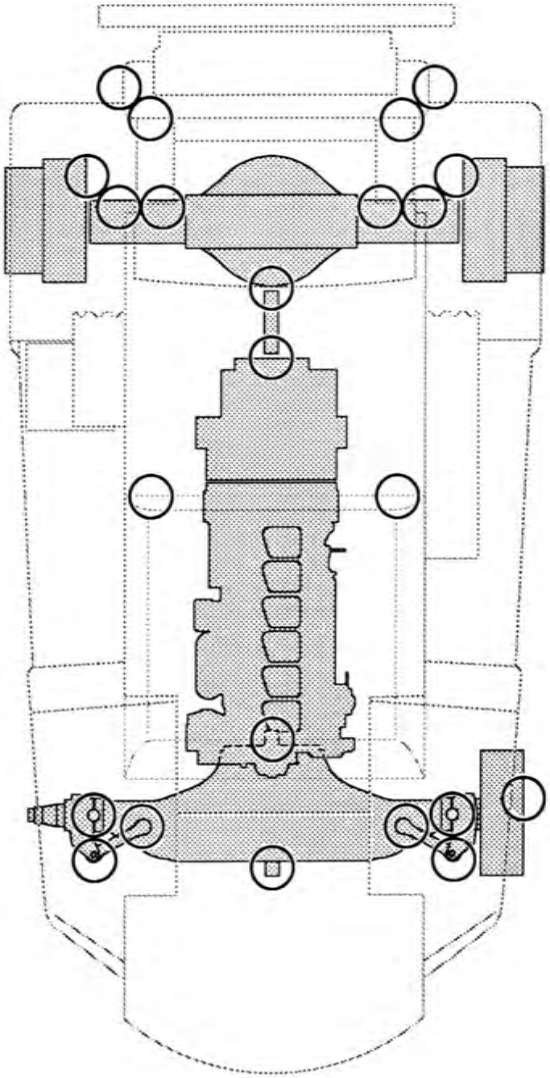
Lift Chain Replacement

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

NOTE: Please refer to Service Manual SM-575 for additional information on lift chain measurement and maintenance.

Lubrication Chart

The following chart show the location of all the grease fittings.



Specifications

Clark products and specifications are subject to improvements and changes without notice or obligation.

Model Designation — Rated Load Capacity

C500Y180	- 18,000 lbs [8165 kg]	@ 24 in [61 cm] load center
C500Y200S	- 20,000 lbs [9072 kg]	@ 24 in [61 cm] load center
C500Y225S	- 22,500 lbs [10206 kg]	@ 24 in [61 cm] load center
C500Y225L	- 22,500 lbs [10206 kg]	@ 24 in [61 cm] load center
C500Y250S	- 25,000 lbs [11340 kg]	@ 24 in [61 cm] load center
C500Y250L	- 25,000 lbs [11340 kg]	@ 24 in [61 cm] load center
C500Y300S	- 30,000 lbs [13608 kg]	@ 24 in [61 cm] load center
C500Y300L	- 30,000 lbs [13608 kg]	@ 24 in [61 cm] load center
C500Y350	- 35,000 lbs [15876 kg]	@ 24 in [61 cm] load center

Note: Rated capacity applies when using uprights with maximum MFH up to and including:

Engine

Type:	**Diesel**	**Gas**	**LPG/CNG**
Model:	Cummins 6BT-5.9	Ford LSG-875I	Ford LSG-875I
Cyls:	6	8	8
Style:	OHV 359 c.u.	V-Block 460 c.u.	V-Block 460 c.u.
Displ:	[5.88 liters] 18.5:1	[7.50 liters]	[7.50 liters]
Timing:	11°BTDC	10°BTCD	16°(lpg)/14°(cng)BTDC
Idle Speed, rpm:	650-700	600-650	600-650
Governed Settings:	+50 rpm Idle		
No Load:	2750 rpm	2650rpm @ high idle	2650rpm @ high idle
Full Load:	2500rpm	2500rpm	2500rpm

Cooling System

- Automotive Crossflow Radiator
- Transmission cooler in side tank
- Cooling System Pressure (Radiator Cap): 7 psi nominal
- Thermostat: (diesel) [95 °C] 203°F Fully Open (gas/CNG)[83°C] 180°F (LPG) [72°C] 160°F

Powershift Transmission

Make	*Model*	*Speeds*	*Ratios:*	*1st*	*2nd*	*3rd*
Clark	18000	3 Forward/3 Reverse		4.01	2.12	1.04

Drive Axle

Spiral bevel ring and pinion planetary with "S" cam actuated non-asbestos drum and shoe brakes.

Wheels and Tires

Tires: 12.00 X 20 NHS - 16 ply Load Limit: 17,600lbs @ 100psi

Electrical System

Type: System Voltage and Ground....12 Volt DC, Negative Ground
Batteries (2): BCI Group 31
Battery Rating-Cold Cranking Current: 12 Volt DC-1250 amps @ 0°F total
Fuses: 15 amp
Indicator Lamps: #57

Filters

- Engine Air: Dry Type - Replaceable Element
- Engine Oil: Spin On
- Transmission: Canister w/Replaceable Element
- Hydraulic System Oil: (2) Canisters (in sump tank) w/Screens and Replaceable Elements
- Power Steering: Screen in Sump Tank
- Hydraulic Sump Breather Cap

Use genuine CLARK parts. See your CLARK dealer.

Truck Weights - Approximate, with cutoff height upright.

	Gross Vehicle Weight	Empty Vehicle Weight	Loaded Drive Axle	Empty Drive Axle
C5Y180	45170	27170	40247	13660
C5Y200S	51120	31120	46084	16250
C5Y225S	54990	32490	49734	16170
C5Y225L	58120	33120	53494	16200
C5Y250S	65960	35960	60122	15370
C5Y250L	53070	30570	49216	17440
C5Y300S	56850	31850	52638	17330
C5Y300L	64210	34210	59509	17140
C5Y350	72060	37060	65881	16450

Fuel Recommendations

Diesel: D-2 with Cetane rating of 45 or higher. D-1 & Jet A-1 also acceptable.
Gasoline: 87 Octane minimum (Motor Mathod)

LPG: HD-5 Propane

Fill Capacities (fluid volumes)

Fuel Tank: Long Wheel Base	47.5 gal [179.8 liters]
Fuel Tank: Short Wheel Base	35.5 gal [134.4 liters]
Cooling System	27qts [25.5 liters]
Engine Oil, w/Filter (Diesel)	9.0qts [8.5 liters]
Engine Oil, w/Filter (Gas)	9.0qts [8.5 liters]
Transmission	30qts [28.4 liters]
Drive Axle Differential	14qts [6.6 liters]
Axle Ends (each)	8pts [3.8 liters]
Hyd Sump Tank (Usable Volume) LWB	50.5 gal [191.1 liters]
Hyd Sump Tank (Usable Volume) SWB	35.5 gal [134.4 liters]

Engine Coolant Recommendation

Use a mixture of 50% ethylene glycol permanent-type antifreeze containing rust and corrosion inhibitors only. (Note-This mixture provides antifreeze protection level of -34°F [-37°C] approximately.

Transmission Fluid Recommendation:

Use "C-3 Dexron II D" or "Dexron".

Hydraulic Fluid Recommendation:

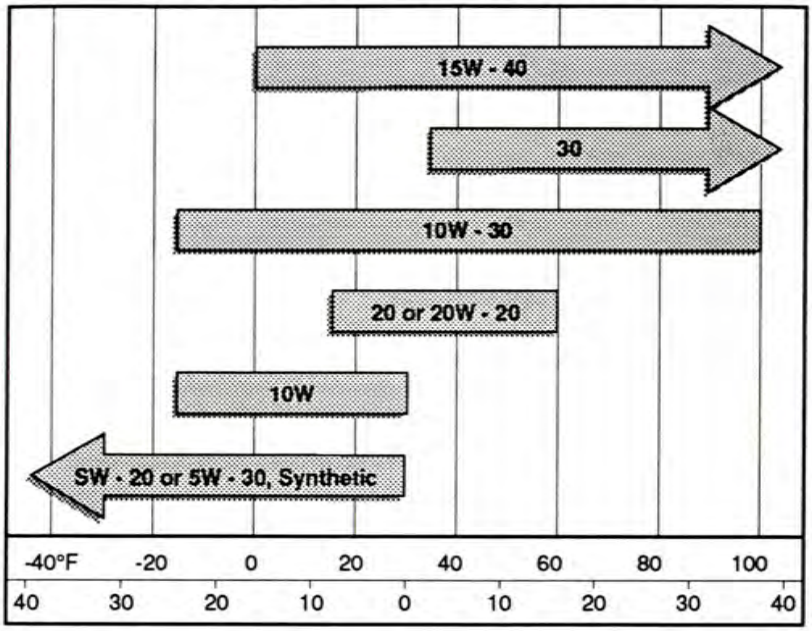
Use CLARK Specification MS-68 Hydraulic Oil, w/anti-wear additives, or equivalent, only.

Power Steering Fluid Recommendation:

GM 1050017, Texaco TL 3644 or equivalent.

ENGINE OIL

USE THESE SAE VISCOSITY GRADES



Temperature Range You Expect Before Next Oil Change

Engine Oil Recommendations

American Petroleum Institute (API) classifications CD/SF, CD/SE, Mil-L-2104C.

5W-20 or 5W-30 to be synthetic per Mil-L-46167, Mil-L-2104C or Mil-L-45152B.

IMPORTANT

Do not extend oil change intervals from those specified when using synthetic lubricants.

Fill crankcase with correct amount of oil. *(see specification on 9.3)* When adding oil between oil changes, it is preferable to use the same brand as various oils may be compatible. Refer to the Maintenance and Lubrication Section for recommended oil change intervals.

IMPORTANT

Do not overfill crankcase. Excess oil causes foaming and can cause loss of lubrication and higher operating temperatures, resulting in engine damage.

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

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