



CLARK®



Operator's Manual

CDP 100/164

Book No. 2819135
OM-622

Do not remove this manual
from the truck.

Record the following information pertaining to your truck.

Model No. _____
Serial No. _____
Customer Truck Identification No. _____
Truck Weight, Empty _____
Truck Rated Capacity _____
Truck Gross Weight _____
Truck Gross Weight, Loaded w/ Rated Load _____
Special Equipment or Attachments _____

IMPORTANT

Do not expose this manual to hot water or steam.

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



WARNING

California Proposition 65

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

CALIFORNIA

Proposition 65 Warning

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



WARNING

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

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.



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 a specific job. Their function and operation is not like a car or ordinary truck. They require specific instructions and rules for safe operation and maintenance.

Safe operation of lift trucks is of primary importance to 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 explains their functions. The correct operating procedures are shown and explained. Illustrations and important safety messages are included for clear understanding. A section on maintenance and lubrication is included for the lift truck mechanic.



The operator's manual is not a training manual. It is a guide to help trained and authorized operators safely operate their lift truck by emphasizing and illustrating the correct procedures. However, it cannot cover every possible situation that may result in an accident. You must watch for hazards in your work areas and avoid or correct them. It is important that you know and understand the information in this manual and that you know and follow your company safety rules! You must always be alert for pedestrians who may be in the area of your lift truck. Be sure that your equipment is maintained in a safe condition. Do not operate a damaged or malfunctioning truck. Practice safe operation every time you use your lift truck. Let's join together to set high standards in safety.

Remember, before you start operating this lift truck, be sure you understand all driving procedures. It is your responsibility, and it is important to you and your family, to operate your lift truck safely and efficiently. Be aware that the Federal Occupational Safety and Health Act (OSHA) and state laws require that operators be completely trained in the safe operation of lift trucks; it is also an (OSHA) requirement that a machine inspection be performed before every shift. If you think you need training in operating or inspecting your lift truck, 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 of this Manual

This manual covers trucks with capacities from 28,600 lbs (13,000 kg) through 38,000 lbs (16,400 kg).

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Introduction

CLARK welcomes you to the growing group of professionals who own, operate, and maintain CLARK lift trucks. We take pride in the long tradition of quality products and superior value the CLARK name represents. This manual familiarizes you with safety, operating, and maintenance information about your new lift truck. It has been specially prepared to help you use and maintain your 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; for example, load back rest, parking brake and horn are standard equipment.

Safe, productive operation of a lift truck requires both skill and knowledge on the part of the operator. The operator must know, understand, and practice the safety rules and safe driving and load handling techniques described in this manual. To develop the skill required, the operator must become familiar with the construction and features of the lift truck and how they function. The operator must understand its capabilities and limitations, and see that it is kept in a safe condition.

Routine Servicing and Maintenance

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



Operator Daily Inspection — Safety and Operating Checks

A lift truck should always be examined by the operator, before driving, to be sure it is safe to operate. The importance of this procedure is emphasized in this manual with a brief illustrated review and later with more detailed instructions. CLARK dealers can supply copies of a helpful "Drivers Daily Checklist."

Planned Maintenance

In addition to the daily operator 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, reduce unscheduled downtime and increase safety. The PM can be scheduled to meet your particular application and lift truck usage.

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

Service Manual

In-depth service information for trained service personnel is found in *Service Manual SM622*.

How to Use this Manual

This manual is a digest of essential information about the safe operation, and features and functions of your lift truck. It also explains how to maintain your lift truck. This manual is organized into eight major parts:

Section 1, General Safety Rules, reviews and illustrates accepted practices for safe operation of a lift truck.

Section 2, Operating Hazards, warns of conditions that could cause damage to the truck or injury to the operator or other personnel.

Section 3, Know Your Truck, describes the major operating components, systems, controls, and other features of your truck and tells how they function.

Section 4, Operator Maintenance and Care, presents details on how to perform the operator's daily safety inspection and refuel the lift truck.

Section 5, Starting and Operating Procedures, discusses specific instructions on the safe, efficient operation of your lift truck.

Section 6, Emergency Towing and Starting, gives instructions for towing your truck in an emergency and for using battery jumper cables to start your truck in an emergency.

Section 7, Planned Maintenance, describes the PM program.

Section 8, Specifications, provides reference information and data on features, components, and maintenance items.

Also, the **Index** helps you locate information about various topics.

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

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

The first Section of the manual is devoted to a review, with illustrations and brief messages, of general safety rules and the major operating hazards you can encounter while operating a lift truck. Next, you will find descriptions of the components of your specific lift truck model and how the instruments, gauges, and controls operate. Then, you will find a discussion of safe and efficient operating procedures, followed by instructions on how to tow a disabled lift truck. The later sections of the manual are devoted to maintenance and truck specifications.

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

In "Planned Maintenance," you will find essential information for correct servicing and periodic maintenance of your truck, including charts with recommended maintenance intervals and component capacities. Carefully follow these instructions and procedures.

Each major Section has its own table of contents, so that you can find the various topics more easily. 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, indicator lights, and controls function. Please contact your authorized CLARK dealer for the answers to any questions you may have about your lift truck's features, operation, or manuals.

Operate your lift truck safely; careful driving is your responsibility. Drive defensively and think about the safety of people who are working nearby. Know your truck's capabilities and limitations. Follow all instructions in this manual, including all **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 a 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.

Safety Signs and Safety Messages

Improper operation can 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. Avoid accidents by recognizing dangerous procedures or situations before they occur. **Drive and work safely** and follow the safety signs and their messages on the truck and in this manual.

Safety signs and messages are placed in this manual and on the truck to provide instructions and identify specific areas where potential hazards exist and special precautions should be taken. Know and understand the meaning of these instructions, signs, and messages. Damage to the truck, 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 are 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 component.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or injury



General Safety Rules

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Daily Inspection

CLARK Material Handling Company
OPERATORS' DAILY CHECKLIST
Check Each Item Before Start Of Each Shift

Date: _____

Check one: Gas/LPG/Diesel Truck Electric Sit-down Electric Stand-up Electric Pallet

Truck Serial Number: _____ Operator: _____ Supervisor's OK: _____

Hour meter reading: _____

Check each of the following items before the start of each shift. Let your supervisor and/or maintenance department know of any problem. DO NOT OPERATE A FAULTY TRUCK. Your safety is at risk. After checking, mark each item accordingly. Explain below as necessary.

Check boxes as follows: OK NG, needs attention, or repair. Circle problem and explain below.

OK	NG	VISUAL CHECKS	OK	NG	OPERATIONAL CHECKS
		Tires/Wheels: wear, damage, nuts tight			Engine: runs rough, noisy, leaks
		Head/Tail/Working Lights: damage, mounting, operation			Steering: loose/binding, leaks, operation
		Gauges/Instruments: damage, operation			Service Brake: linkage loose/binding, stops OK, grab
		Operator Restraint: damage, mounting, operation, oily, dirty			Parking Brake: loose/binding, operational, adjustment
		Warning Decals/Operators' Manual: missing, not readable			Seat Brake (if equipped): loose/binding, operational, adjustment
		Data Plate: not readable, missing			Horn: operation
		Overhead Guard: bent, cracked, loose, missing			Backup Alarm (if equipped): mounting, operation
		Load Back Rest: bent, cracked, loose, missing			Warning Lights (if equipped): mounting, operation
		Forks: bent, worn, slips OK			Lift/Lower: loose/binding, excessive drift, leaks
		Engine Oil level, dirty, leaks			Tilt: loose/binding, excessive drift, "chatters," leaks
		Hydraulic Oil level, dirty, leaks			Attachments: mounting, damaged, operation, leaks
		Radiator: fluid level, dirty, leaks			Battery Test (electric trucks only): indicator in green while holding full forward tilt
		Fuel level, leaks			Control Levers: loose/binding, freely return to neutral
		Battery connections loose, charge, electrolyte low			Directional Control: loose/binding, find neutral OK
		Covers/Sheetmetal: damaged, missing			
		Brakes: linkage, reservoir fluid level, leaks, debris on floor			

Explanation of problems marked above:

55-770-2517 Jan 1990

At the beginning 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. (See Section 4)

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.

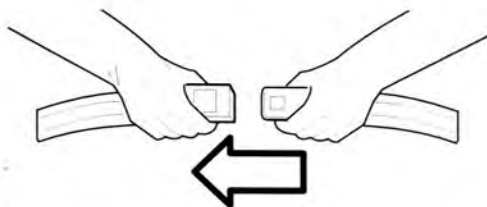


Don't smoke in "NO SMOKING" areas or when refueling.

Seat Belts

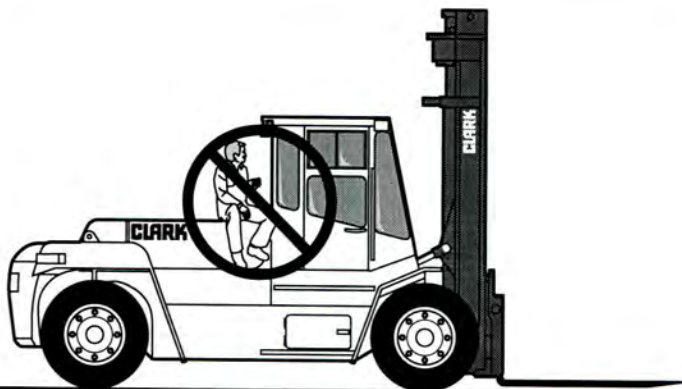


ALWAYS BUCKLE UP

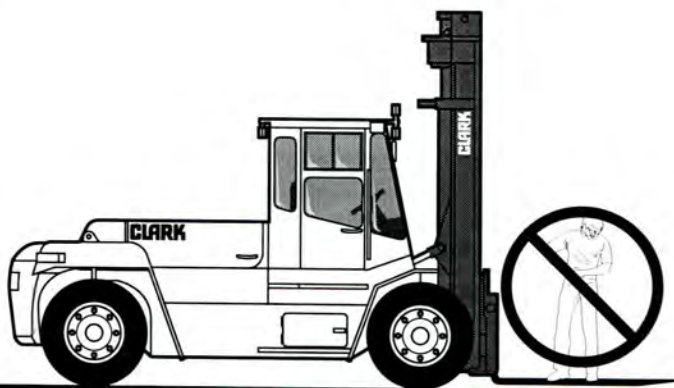


Seat belts can reduce injuries.

No Riders



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



Never transport personnel on the forks of a lift truck.

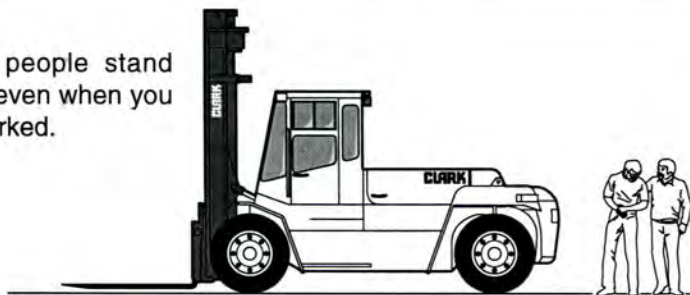
Pedestrians

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.



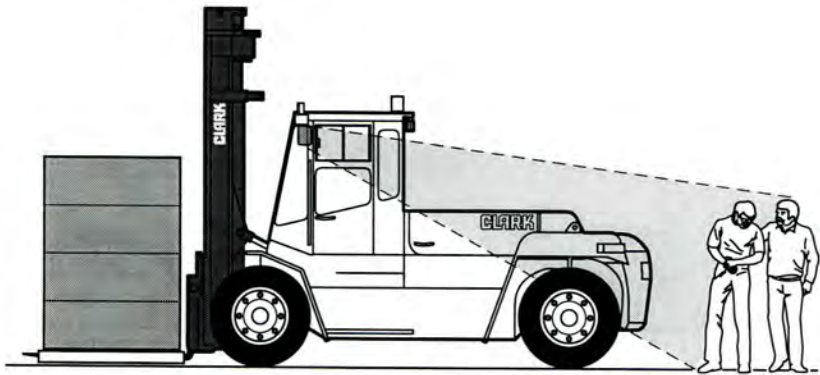
Watch for people in your work area even if your truck has warning lights or alarms. People may not watch for you.

Make people stand back, even when you are parked.



Mirrors

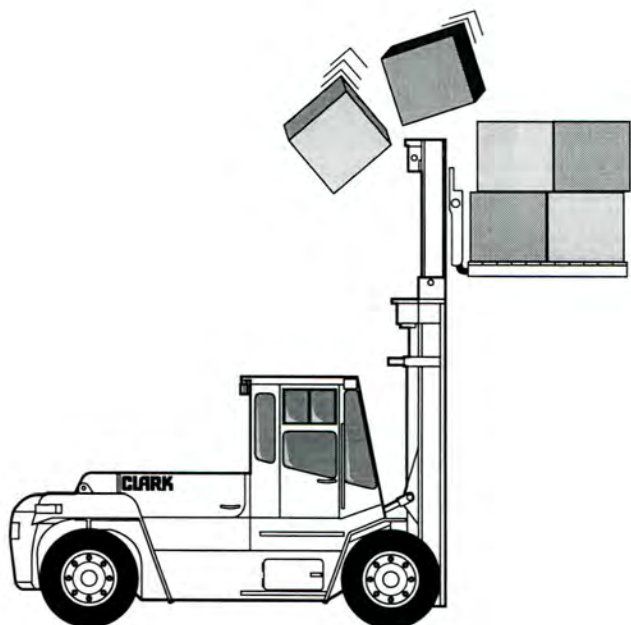
The glass in the cab is low enough for the operator to see clearly down along side the truck to provide safety of operation while turning. To facilitate side visibility, two mirrors are mounted high outside the cab on both sides. The adjustment of these mirrors must be checked before operating the truck to insure complete visibility along each of the side of the truck.



WARNING

Do not operate the truck until mirrors are adjusted for complete visibility along both sides of the truck.

Operator Protection



Keep under the cab overhead guard structure.
Always keep your body within the confines of the truck.

Fork Safety

Never allow anyone to walk under raised forks.



DANGER

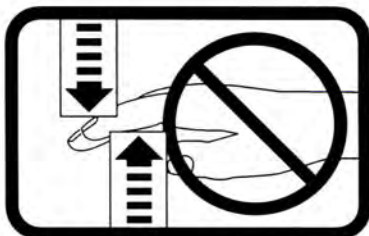
There is special equipment to raise people for overhead work. **DO NOT USE LIFT TRUCKS.**



Pinch Points

WARNING

Keep hands, feet and legs out of the upright.



WARNING

Don't use the upright as a ladder.



CAUTION

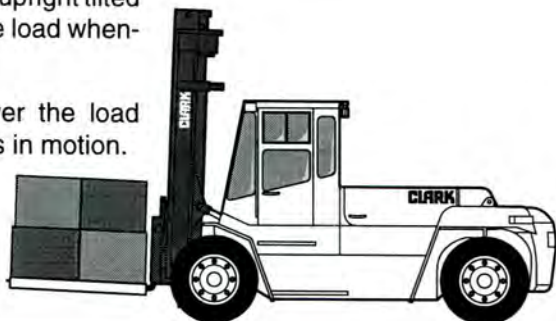
Never try to repair the upright, carriage, chain, or attachment yourself! Always get a trained mechanic.



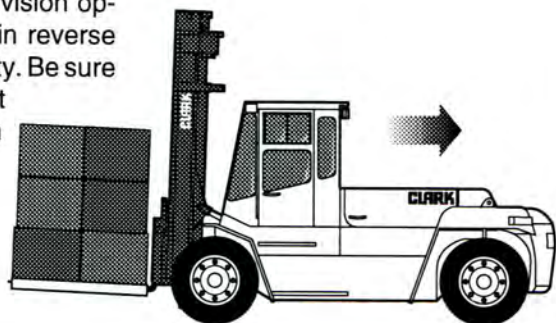
Travel

Travel with the load near the floor/ground with upright tilted back to cradle the load whenever possible.

Never lift or lower the load when the truck is in motion.



When handling bulky loads that restrict your vision operate your truck in reverse to improve visibility. Be sure to pivot in the seat to give maximum visibility.



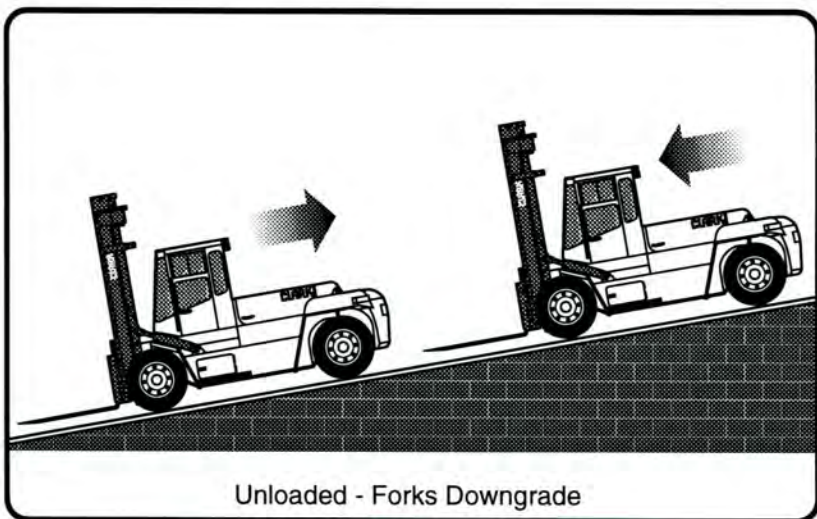
Unstable loads are a hazard to you and to your fellow workers. Always make certain that the load is well stacked and evenly positioned across both forks. Never attempt to lift a load with only one fork.



Wrong

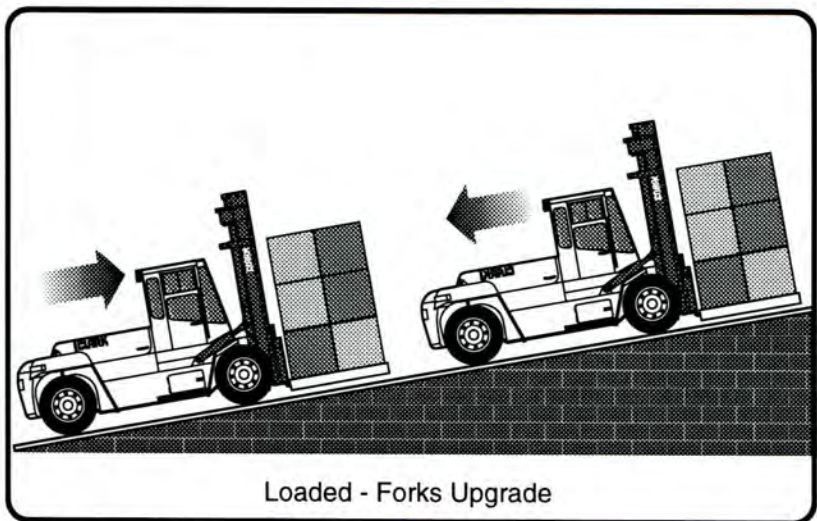


Grades, Ramps, Slopes, and Inclines

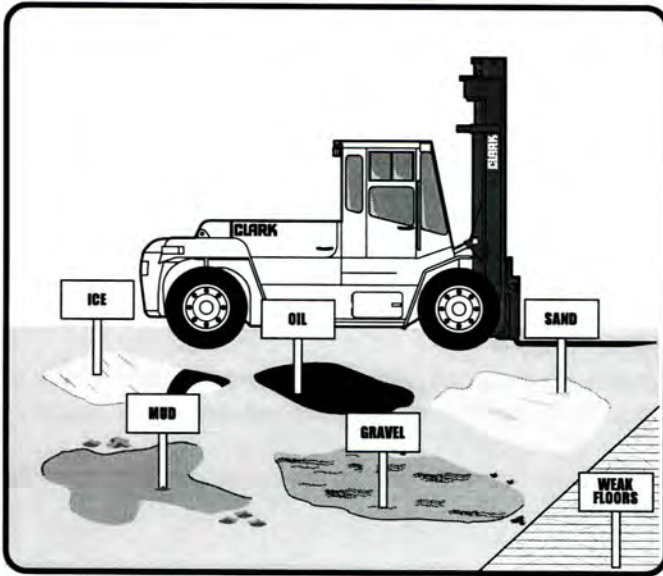


WARNING

Never turn on a grade, either loaded or unloaded.



Surface and Capacity



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

WARNING

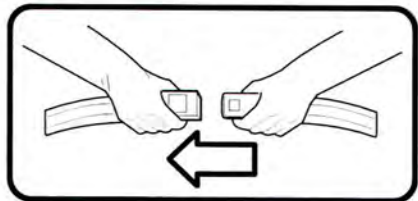
Know the weight of your truck and load. Especially when using elevators. Know the capacity of the elevator you intend to use. Do not overload.

Tipover

IMPORTANT

Seat belts can reduce injuries.

ALWAYS BUCKLE UP



Tip-over

Lateral Tip-over

- Lateral tip-over may possibly occur with a combination of speed and sharpness of turn. This combination will exceed the stability of the truck.
- With the load or upright raised, lateral tip-over can occur while turning and/or braking when traveling in reverse or accelerating and turning while traveling forward.
- Lateral tip-over can occur loaded or unloaded by turning on an incline or ramp.

Longitudinal Tip-over

- Longitudinal tip-over can occur with a combination of severe braking and load elevated. This combination will exceed the stability of the truck.
- Longitudinal tip-over can occur by driving with the load down slope on a steep grade.

Lateral and longitudinal tip-over can occur if the truck is driven off the edge of a ramp, or into by running into overhead objects or collisions. The conditions can be further aggravated by overloading, excessive tilt, or off center loads.



WARNING

Lift truck tip-over can cause serious injury or death if the operator is trapped between the truck and the ground.

What to do in Case of a Tip-over

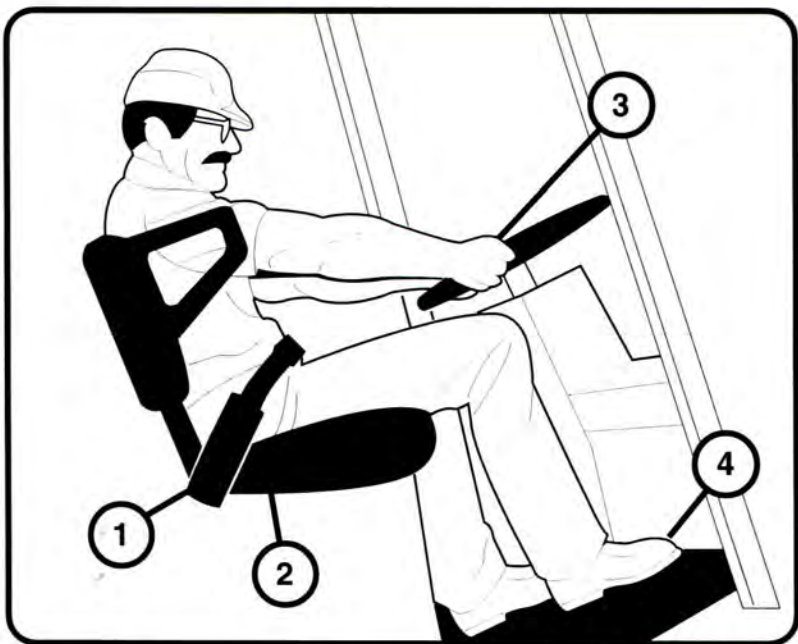
If your truck starts to tip over,



DO NOT JUMP!!!

Brace yourself as illustrated below!

1. Make sure your seat belt is fastened securely.
2. Stay in your seat.
3. Grip the wheel.
4. Brace your feet.



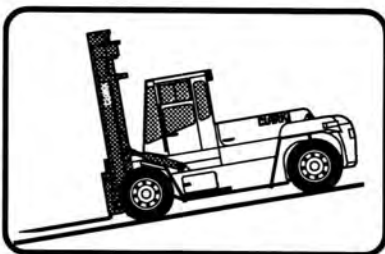
IMPORTANT

Your chances for survival in a tip-over are better if you stay with the truck, in your seat.

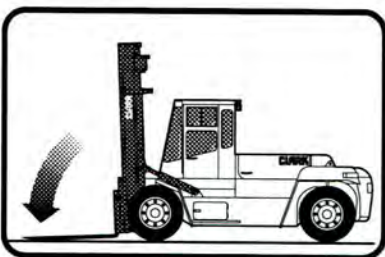
Parking

Never park on a grade.

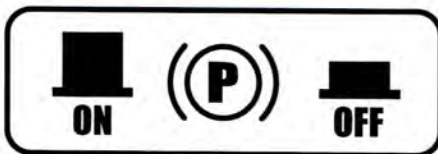
Always come to a complete stop before leaving truck. Be sure the EGS or APC-100 control is in NEUTRAL.



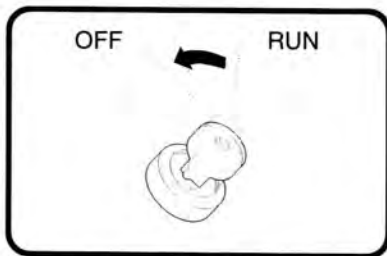
Lower forks fully to floor and tilt forward.



Set parking brake.



Turn key to OFF position.



General Tire Maintenance, Inspection, and Repair

1. Park the truck as described in this manual and check for correct tire inflation air pressure. See specifications in this OM for correct tire pressure for your truck.



CAUTION

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. Have the tire and wheel inspected by a person trained and authorized to do tire and wheel maintenance. The tire may require removal and repair.
- Incorrect (low) tire pressure can reduce the stability of a lift truck and cause it to tip over.

IMPORTANT

Check wheels and tires for damage every time you check tire pressure. Make repairs when needed. Dirt can get into cuts and cause damage to the tire cord and tread. Remove debris from all cuts.



CAUTION

Multiple wheel assemblies. Do not loosen or remove wheel assembly nuts before fully deflating tire. Have only a trained and authorized mechanic make repairs. See *Service Manual* for more detailed information.

Operating Hazards

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

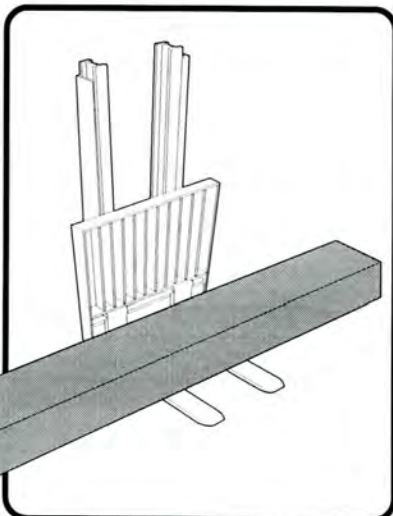
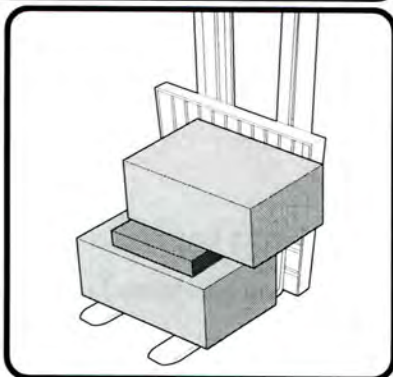
Loose Loads



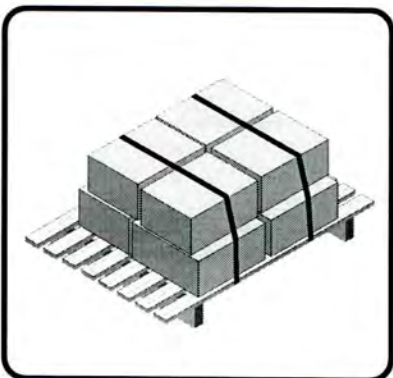
WARNING

Loose or unbalanced loads are dangerous. Observe these precautions.

Never carry loose or uneven material.



Center wide loads.



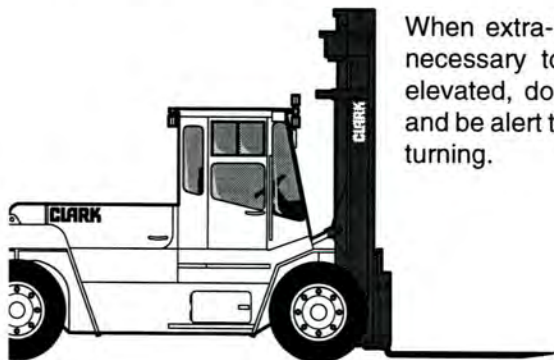
Stack and band loose material.



Long and Wide Loads

WARNING

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

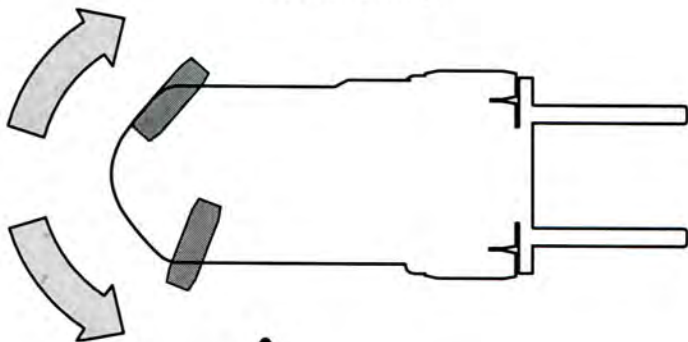


When extra-long material makes it necessary to travel with the load elevated, do so with extreme care and be alert to load end-swing when turning.

WARNING

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

Rear Swing



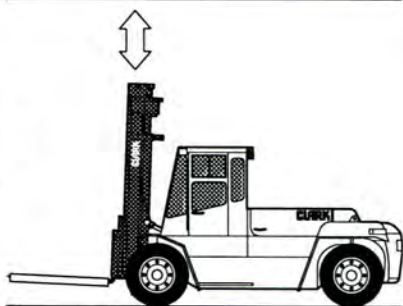
WARNING

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

Low Overhead Clearance

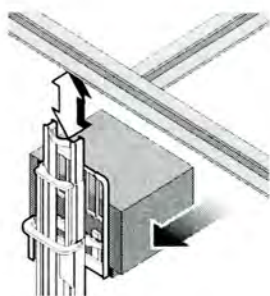
WARNING

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



WARNING

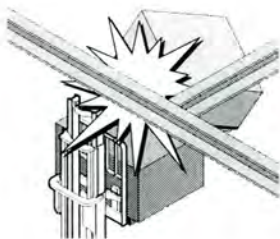
Watch overhead clearances. Moving into overhead structures can tip a truck over, or spill a load.



Fast Turns and High Loads

WARNING

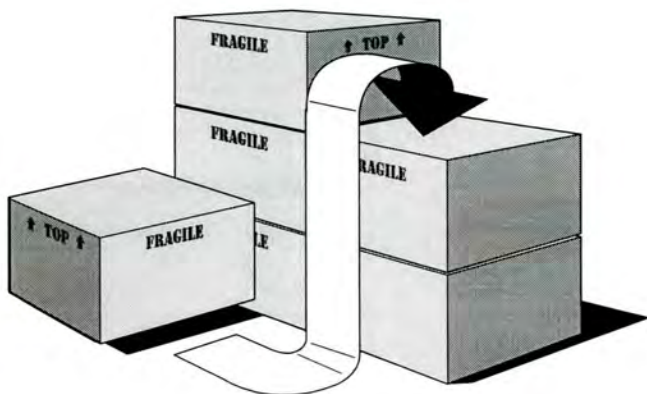
Turn too sharply with a raised load and your truck can tip even at slow speeds. Travel with a load raised only when removing or depositing a load.



WARNING

Slow down before turning. The truck can tip over.

Right Angle Stacking



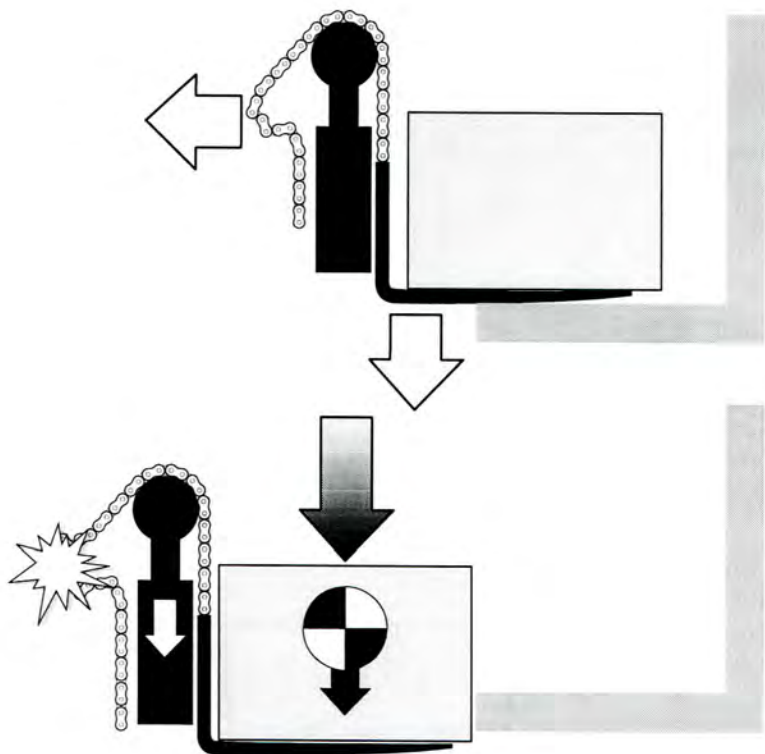
SLOWLY



CAUTION

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

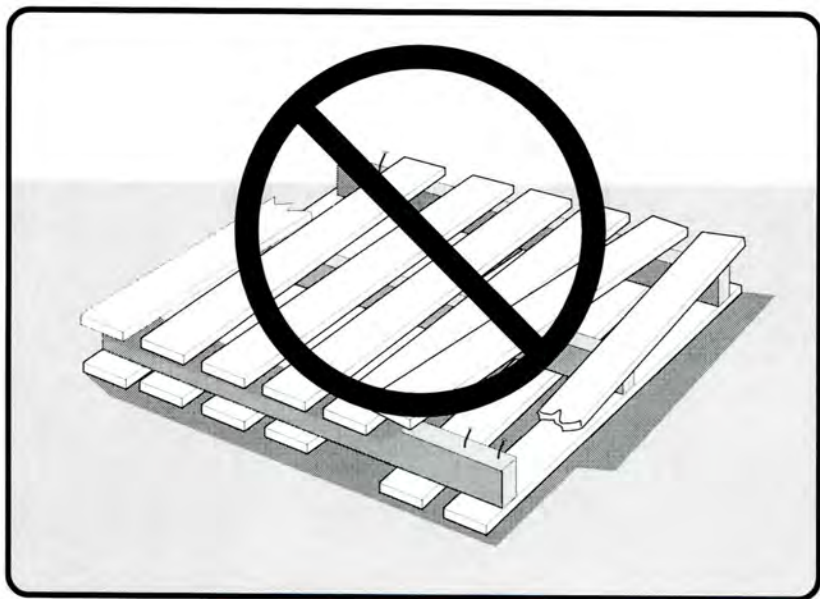
Chain Slack



WARNING

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

Pallets and Skids



WARNING

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

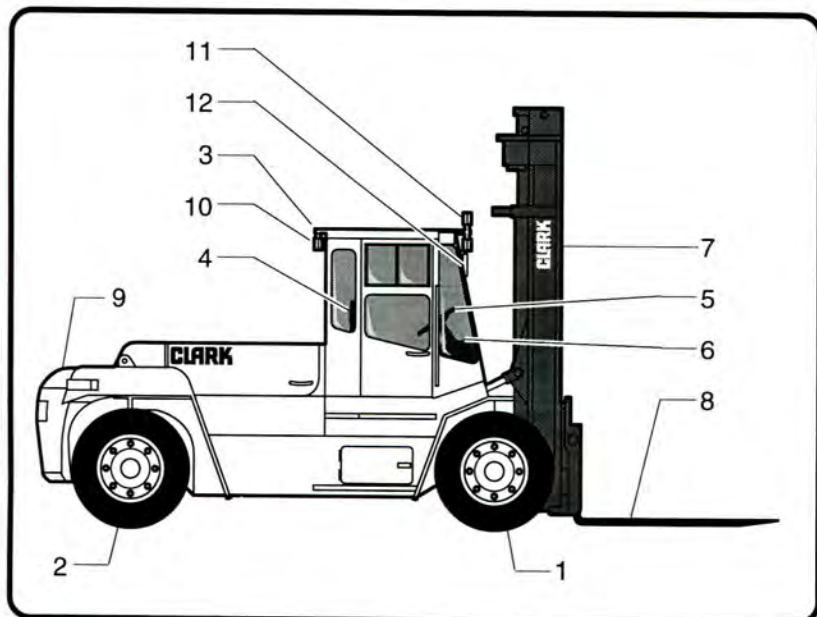
Be sure the pallet or skid you are using is in good condition and does not have defective or missing components and fasteners.

Know Your Truck

Contents

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Truck Model Description



1. Drive Axle, Pneumatic Wheels and Tires
2. Steer Axle, Pneumatic Wheels and Tires
3. Cab, Overhead Guard
4. Seat and Seat Belt
5. Steering Control Handwheel
6. Directional Control Lever
7. Upright
8. Forks
9. Counterweight
10. Rear Work Light
11. Front Work Light
12. Mirror

Data/Safety Plates and Decals

 WARNING	
<p>BEFORE OPERATING lift truck, operator must:</p> <ul style="list-style-type: none"> • be trained and authorized • read and understand operator's manual • not operate a faulty lift truck • not repair lift truck unless trained and authorized • have the overhead guard and load backrest extension in place 	
<p>DURING OPERATION, lift truck operator must:</p> <ul style="list-style-type: none"> • wear a seat belt • keep entire body inside truck cab • never carry passengers or lift people • keep truck away from people and obstructions • travel with lift mechanism as low as possible and tilted back 	
<p>TO PARK lift truck, operator must:</p> <ul style="list-style-type: none"> • completely lower forks or attachments • shift into neutral • turn off key • set parking brake 	
<p><small>Clark Material Handling Co. Sit Down Rider 2798233</small></p>	

IMPORTANT

Do not operate a lift truck with damaged or missing decals or data plates. Replace them immediately. They contain important information (as described on the following pages). Refer to the Service Manual for the location of all decals.

Truck Data and Capacity Plate

From the factory this truck meets ANSI B56.1

CLARK

Capacity with attachment or forks with upright in vertical position.

Model _____ Tuna _____ 1

Serial No. _____ 2

Attachments _____ 3

	B	A		
	in			in
	mm			mm
	in			lb
	mm			kg
	in			lb
	mm			kg
	in			lb
	mm			kg

Capacities are for centered loads only.

Truck Weight _____ lb or _____ kg 5

Max Amp Hrs.	w / Max Battery	lb or	kg
Volts	Max Battery	lb or	kg
No.	Min Battery	lb or	kg

For other capacities consult Clark Material Handling Company, Lexington, KY 2806176

1. Truck model number or registered name.
2. Truck serial number—An identification number assigned to this particular truck which should be used when requesting information or 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—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.



CAUTION

Do not exceed the maximum capacity specified.

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



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 a new nameplate showing the revised capacity.

**Operator Safety Warning Decal****IMPORTANT**

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

Operator/Tip-Over Warning Decal

This decal is located on the front right overhead guard leg inside the operator's compartment. Its purpose is to remind the operator that staying in the seat provides the best chance of avoiding injury in the event of a tip-over or driving off a dock accident

**WARNING**

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

**WARNING**

Read the manual



Buckle up!



(P)

Apply brake when leaving truck

Watch Out For Other People



Most lift truck INJURIES are to other people near the lift truck.

Prevent Overturns!



AVOID :

- * slippery, sloping, or uneven surfaces
- * loads over capacity on nameplate
- * unstable or high loads
- * low tire pressure
- * poorly maintained lift truck
- * fast or sharp turns

In Case of Tip-Over:

Don't jump



Hold on tight



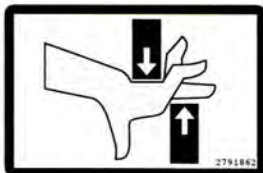
Brace feet

Lean away



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 handling a load.



Fan Warning Decal

This safety decal is displayed on the cooling fan shroud of the radiator to warn of the danger of injury from spinning 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. Fan blades can break at excessively high RPM and be thrown out of the engine compartment.



Transmission Service Decal

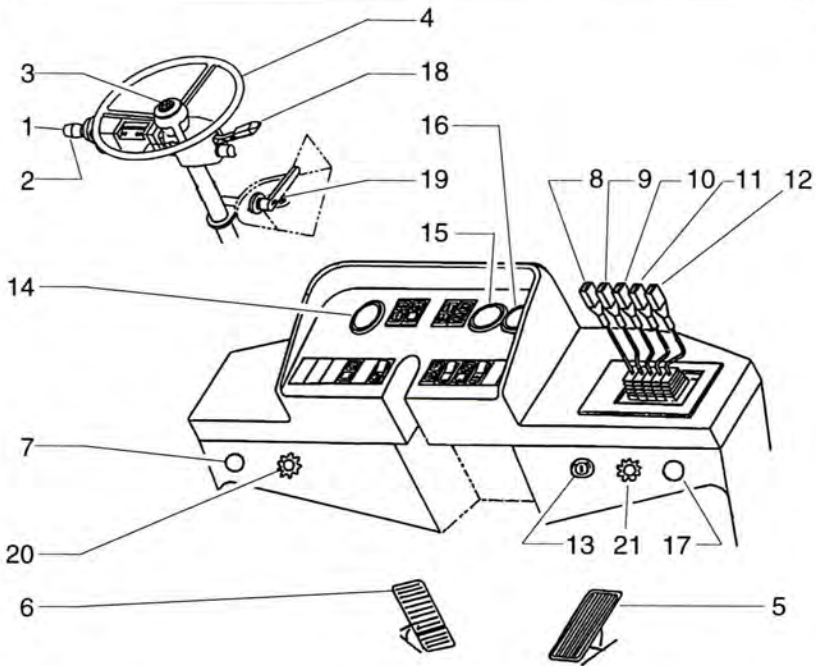
This decal is located inside the engine compartment near the transmission dipstick. It is designed to alert the operator or mechanic of proper service and check intervals.

IMPORTANT

- Transmission Filter Change - every 250 hours
- Transmission Fluid Change - every 500 hours
- Refill - Remove dipstick - Fill with approved automatic transmission fluid to full mark. Recheck oil (hot) level, engine idling, transmission in Neutral. Refill as required.

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Operator's Compartment and Controls

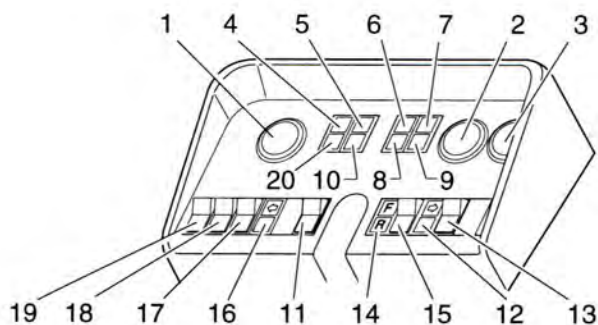


- | | |
|--------------------------|------------------------------------|
| 1. Forward/Reverse Lever | 12. Right Fork Position |
| 2. Speed Selector Lever | 13. Key/Start Switch |
| 3. Horn Button | 14. Engine Water Temperature Gauge |
| 4. Steering Handwheel | 15. Fuel Gauge |
| 5. Accelerator Pedal | 16. Hour Meter |
| 6. Brake Pedal | 17. Emergency Stop Switch |
| 7. Park Brake Switch | 18. Turn Signal/Hazard Indicator |
| 8. Lift Lever | 19. Steer Column Tilt Lever |
| 9. Tilt Lever | 20. Left Access Door Knob |
| 10. Side Shift | 21. Right Access Door Knob |
| 11. Left Fork Position | |

IMPORTANT

Familiarize yourself with the controls and follow safe operating procedures.

Instrument Panel



- | | |
|------------------------------------|--|
| 1. Engine Water Temperature Gauge | 11. Flood Lights ON/OFF |
| 2. Fuel Gauge | 12. Right Turn Signal Indicator |
| 3. Hour Meter | 13. EGS Override |
| 4. Transmission Pressure Indicator | 14. Forward, Neutral, Reverse Indicator for Override |
| 5. Battery Warning Light | 15. Manual Switch for Forward, Neutral and Reverse |
| 6. Engine Oil Pressure Indicator | 16. Left Turn Indicator |
| 7. Park Brake Indicator | 17. Roof Wiper/Washer Switch |
| 8. Engine Coolant Indicator | 18. Rear Wiper/Washer Switch |
| 9. Brake Pressure Indicator | 19. Front Wiper/Washer Switch |
| 10. Cab Light ON/OFF | 20. Transmission Temperature Indicator |

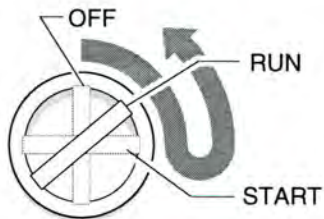
Key/Start Switch

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.

When the key is in the vertical "OFF" position, all truck electrical circuits are off, and the key can be removed. From the "OFF" position, the key can be turned 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 automatically returns to the "RUN" position, where the starter is disengaged and the entire truck electrical system is on.



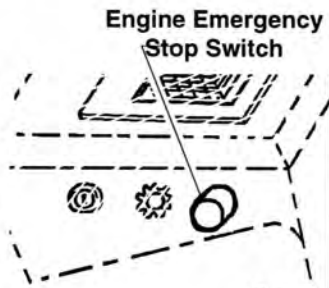
The key switch has a mechanical "anti-restart" feature, which prevents the engine starter from being engaged and damaged if the operator attempts to start the engine when it is already running. The key switch cannot be turned to the "START" position from the "RUN" position without returning the key to the "OFF" position. If the engine stops running, the key switch must be turned to the "OFF" position before it can be restarted.

Engine Stop

Run the engine at idling speed briefly before shutting it off. Turn the key switch to the "OFF" position to shut the engine down.

Emergency Shutdown

There is a large, red button on the access panel to the operator's lower right. This button should be used only in an emergency. In case of an emergency, press and hold the button for 2 seconds. The engine and all systems will be completely shut down.



Standard Seat Adjustment

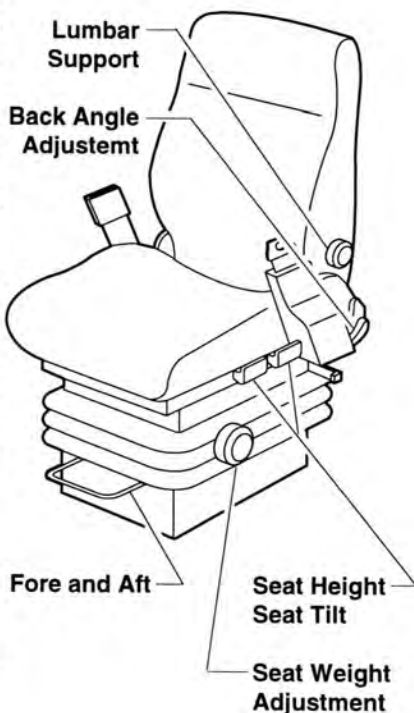
The seat has two adjustments, it can be moved forward or backward by using the lever that is located under the seat, on the left side. To unlock the seat, pull the lever upward and adjust the seat so that all controls may be comfortably reached. Release the lever and make sure that the seat locks into position.

The seat back can also be adjusted to a comfortable operating position. You can do this by rotating the seat back adjusting knob clockwise for forward tilt and counterclockwise for rearward tilt.



Option Seat Adjustment

The option seat can be adjusted to suit your body size, weight and shape. Lift the Fore and Aft lever to move the seat forward or backward. Release the lever to lock into position. Lift yellow knob and adjust seat back angle to a suitable position, release knob to lock. When seated, lift yellow seat tilt knob front or rear as required. Tilt forward or back, raising or lowering front or rear seat. Release lever to lock. Turn Visi wheel in clockwise direction to increase for weight, counterclockwise to reduce for weight. Lumbar support can be adjusted by turning clockwise to increase and counterclockwise to decrease.



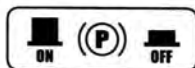
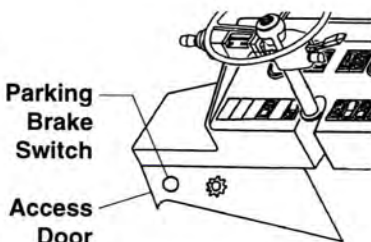
CAUTION

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

Parking Brake Switch

To apply the parking brake, pull the control knob out. This releases the hydraulic pressure and allows the spring to activate.

To release the park brake, push in the control knob in. This applies oil to the caliper which releases the spring.



CAUTION

Always apply parking brake before leaving truck.



WARNING

Never operate your lift truck with a defective parking brake.

Hour Meter

Starting the engine also starts the operating hour meter. Use the hour meter reading to gauge when to perform prescribed maintenance.



Steering System

The steering handwheel operates a steering control valve that directs the oil flow to the steering cylinder connected to the steer axle. The steering control valve can also act as a pump to provide manual steering if the hydraulic pump stops.

Horn Button

The horn button is located in the center hub of the steering handwheel.

Power Steering System

With engine running, the steering system uses hydraulic power to position the rear wheels. When turning the steering handwheel, which is connected to the steering control valve, hydraulic pressure is directed to the respective side of the actuator, to give you positive steering.



CAUTION

If the engine quits while traveling, steering effort will increase substantially. The truck should be brought to a stop as quickly as possible.

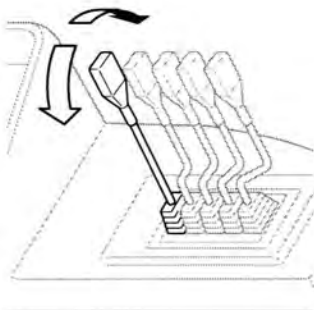
Hydraulic Control Levers

The levers of the control valve activate the lift and tilt cylinders as well as any other hydraulic devices which are installed on the truck.

Lift Control Function

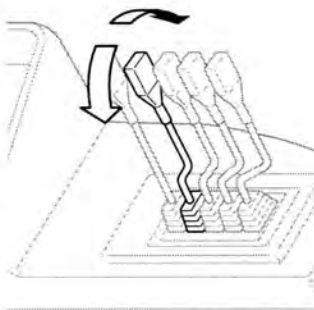
With the lift control lever, you are able to raise and lower the fork carriage on the upright. The lifting and lowering speeds are controlled through the main hydraulic valve by varying the lever position (from the center or neutral positions).

When the lift control lever is pushed forward, the fork carriage is lowered. When the lift control lever is pulled back the fork carriage is raised. You can also lower the fork carriage even if the key switch is OFF.



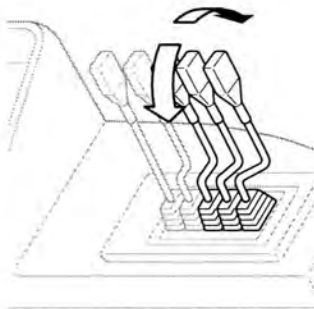
Tilt Control Lever

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 backward. Push the lever forward to tilt the upright and forks forward.



Auxiliary Control Lever (Optional)

An auxiliary control lever is mounted to the right of the tilt control lever. If your lift truck is equipped with an optional attachment, this lever lets you control the flow and direction of the hydraulic oil to the attachment.



Engine Compartment Access

Access to the engine compartment is provided by opening the hood behind the operator cab. To open, simply pull up on the handle. To close, it is necessary to push the hood down against the gas struts.

Additional access can be obtained by removing any of the side panels.



Multi Piece Rims



DANGER

For your safety and safety of others before you do tire or rim maintenance, read the OSHA rules regarding user responsibility. Do not work on tires or rims unless you have been trained in the correct procedures. Read and understand all maintenance and repair procedures on tires and rims. Serious injury or death can result if the safety messages are ignored.

Occupational Safety and Health Act (OSHA) specifies required procedures for servicing multi-piece rim wheels in 29 CFR Section 1910.177. It is the owner's responsibility to comply with OSHA.



DANGER

Multi piece rims can be dangerous if not treated properly. Always check tire pressure from the side facing tread. Never tighten or loosen a wheel nut without deflating the tire first.

Operator Maintenance and Care

Contents

Daily Safety Inspection	4-2
Fuel Safety Practices	4-5

NOTICE

The Occupational Safety and Health Act (OSHA) requires that truck users examine their 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; have repairs made before you operate the truck. Unusual noises or problems must be reported immediately to your supervisor or other designated authority.

Do not make repairs yourself unless you are trained in lift truck repair procedures and authorized by your employer. Have a qualified mechanic make repairs using genuine CLARK or CLARK-approved parts.



CAUTION

Do not operate a truck if it is in need of repair. If it is in an unsafe condition, remove the key and report the condition to the proper authority. If the truck becomes unsafe in any way while you are operating it, stop operating the truck, report the problem immediately, and have it corrected.

Lift trucks should be inspected every eight hours, or at the start of each shift. In general, the daily inspection should include the **visual** and **functional checks** described on the following pages.

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. You may obtain copies of this form from your CLARK dealer.



WARNING

Leaking hydraulic oil may be hot or under pressure. When inspecting a lift truck, wear safety glasses and do not check for leaks with bare hands.

Visual Checks

First, perform a visual inspection of the truck and its major components:

1. Walk around your lift truck and take note of obvious damage that may have been caused by operation during the last shift.
2. Check that all capacity, safety, and warning plates or decals are attached and legible.
3. Check before and after starting engine for leaking fuel, engine coolant, transmission fluid, etc.
4. Check for hydraulic oil leaks and loose fittings.



CAUTION

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

5. Be sure that the cab overhead guard structure, amber strobe and all other safety devices are in place, securely fastened and undamaged. Inspect for damaged or missing parts, corrosion, cracks, breaks etc.
6. Check all of the critical components that handle or carry the load.
7. Inspect the upright and lift chains. Check for obvious wear and maintenance problems such as damaged or missing parts, leaks, slack or broken chains, rust, corrosion, bent parts, cracks, etc.



WARNING

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.

8. 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.
9. Inspect the wheels and tires for safe mounting, wear condition, and air pressure.
10. Check the engine oil level, and fuel level.

Functional Checks

Check the operation of the truck as follows.

NOTICE

Before performing these checks, familiarize yourself with the starting, operating, and shutdown procedures in Section 5 of this manual. Also, know the safety rules given in Section 1 of this manual.

1. Test warning devices, horn, lights, and other safety equipment and accessories.
2. Start the engine and be sure all controls and systems operate freely and return to neutral properly. Check the:
 - Gauges, meters, and indicator lights
 - Service brakes and parking brakes
 - Hydraulic controls: lift, tilt, and auxiliary (if installed)
 - Accelerator
 - Directional control
 - Steering system
 - Lift mechanism and any attachments.

When the functional checks are completed, follow the **standard shutdown procedures** given in Section 5, "Starting and Operating Procedures."

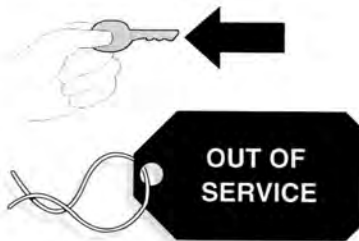
Concluding the Inspection

Make a record on the "Driver's Daily Checklist" of any 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.

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

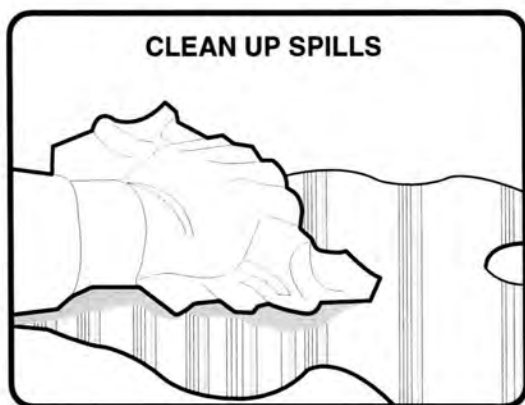
If all of the Daily Inspection checks were normal or satisfactory, the truck can be operated.



Fuel Safety Practices



IMPORTANT
Use clean, properly marked fuel cans.



Starting and Operating Procedures

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Before Operating the Truck

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

The *Operator's Manual* is stored in a compartment located on the back wall of the cab or in the seat pocket on the back of the seat. It is attached with a cable so that it can be used easily, but cannot be removed from the truck.

WARNING

- A lift truck can be dangerous if not used properly. Safe operation is the responsibility of the operator.
- Do not start or operate the truck, or any of its functions or attachments, from any place other than the designated operator's position.

CAUTION

- Inspect your lift truck before operating at the start of each shift. Before putting your truck to use, check the operation of the controls and all systems.
- Protect yourself. Do not operate truck without a DRIVER'S OVERHEAD GUARD unless conditions prevent its use. Do not remove overhead guard unless specifically authorized by your Clark dealer. Use special care if operation without this safety device is required.

Standard Seat

The seat back can also be adjusted to a comfortable operating position. You can do this by rotating the seat back adjusting knob clockwise for forward tilt and counterclockwise for rearward tilt.

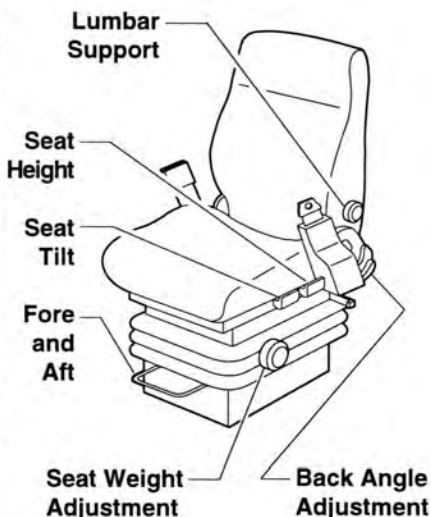


**CAUTION**

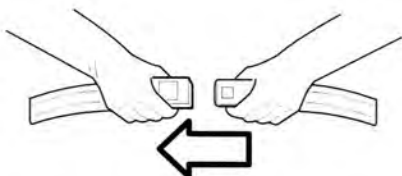
Never adjust driver's seat while truck is moving, to avoid the possibility of loss of control and of personal injury.

Optional Seat

The option seat can be adjusted to suit your body size, weight and shape. Lift the Fore and Aft lever to move the seat forward or backward. Release the lever to lock into position. Lift yellow knob and adjust seat back angle to a suitable position, release knob to lock. When seated, lift yellow seat tilt knob front or rear as required. Tilt forward or back, raising or lowering front or rear seat. Release lever to lock. Turn Visi wheel in clockwise direction to increase for weight, counterclockwise to reduce for weight. Lumbar support can be adjusted by turning clockwise to increase and counterclockwise to decrease.

**Buckling Up**

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

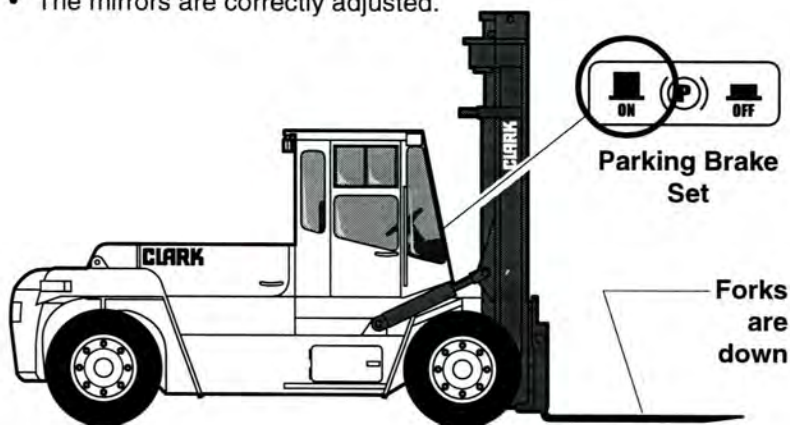
**WARNING**

Always wear your seat belt when operating a lift truck. Failure to wear seat belt will result in injury or death in an event of an accident.

Starting from a Safe Condition

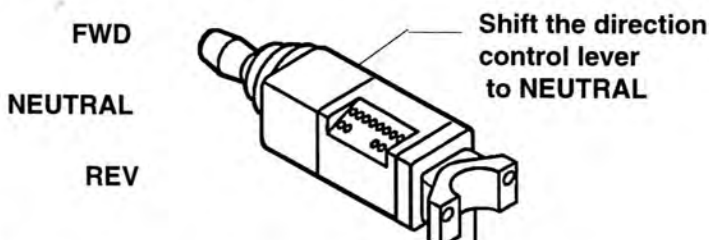
Always start from a safe condition. Before operating a lift truck, make sure that:

- You are safely seated in the truck.
- You have buckled your seat belt.
- The parking brake is applied.
- The mirrors are correctly adjusted.



- The forks are fully lowered to the floor or ground.
- You are familiar with how all the controls function.
- All controls are in neutral or other correct position.
- The truck has received its daily inspection and is ready and safe to operate.

Put the direction control lever in the NEUTRAL position, before starting. The truck should start only in the NEUTRAL position. If it starts in gear, have the truck serviced.



General Starting and Operating Tips

Before you start the truck, make sure that you have taken all the above-mentioned precautions, you have read this manual, you are starting from a safe condition, with the directional control in NEUTRAL, the seat adjusted, and your seat belt buckled.



WARNING

INSPECT YOUR LIFT TRUCK BEFORE OPERATING at the start of each shift. Before you put your truck to use, check the operation of the controls and all systems.

Turn off any lights or optional electrical equipment while you crank the engine. This reduces the electrical load on your battery.

Avoid excessive starter cranking (in excess of 30 seconds). To avoid starter overheating or damage, do not crank the starter continuously for more than 30 seconds at a time. If the engine fails to start, wait two to three minutes before again attempting to start your lift truck.

If your battery is "run down" (discharged) or becomes discharged while you try to start your truck, please refer to Section 6, "Emergency Starting and Towing," in this manual.

To 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 650-750 RPM 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 helps prolong engine life.
- Let the 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 the engine at speeds above idle for more than brief periods without a load.
- Do not run the engine at maximum power continuously until the engine is fully warmed up.
- Never operate the 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. Turn off the engine instead.
- **Carbon monoxide** is colorless and odorless, but can be present with all other exhaust fumes.



WARNING

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

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. 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; fill as necessary.
4. Check fuel supply level; fill as necessary.
5. Check 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 diesel 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.



Starting the Engine

1. Start from a safe condition: Before you start the truck, safely seat yourself on the truck, fasten seat belt, apply the parking brake, make sure all controls are in neutral or other correct position, lower the forks fully to floor or ground, put the direction control lever in NEUTRAL, and make sure you know how to operate the truck and all its controls.
2. Turn the key/start switch to the START position to crank the engine. Release the key to the RUN position and return the accelerator to idle as soon as the engine starts.

IMPORTANT

If the engine stalls or falters in starting, wait three or four seconds before re-engaging the starter. This prevents possible serious damage to the starter or engine.

3. 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.
4. Idle the engine three to five minutes at 1,000 RPM before operating with a load.
5. Never attempt to operate truck if the low brake oil pressure light is illuminated and the low brake oil buzzer is on.



WARNING

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

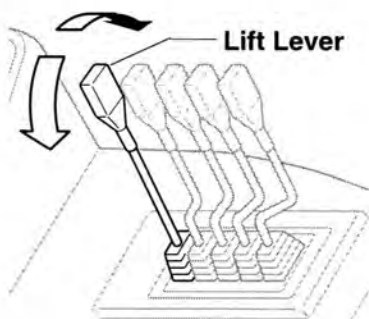
IMPORTANT

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

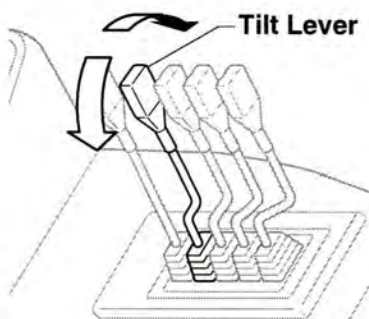
Positioning Forks and Upright

When driving, with or without a load, it is a 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.

Pull back on the lift control lever and raise the forks 6 to 8 inches (152 to 203 mm) above the floor. Then, using the tilt control, tilt the upright back slightly to raise the fork tips.



The amount of forward and rearward tilt to be used is governed by the application.



CAUTION

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 that 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, 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.

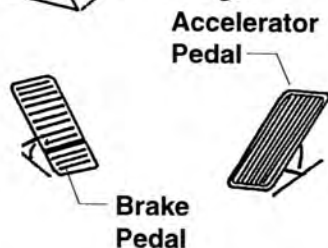
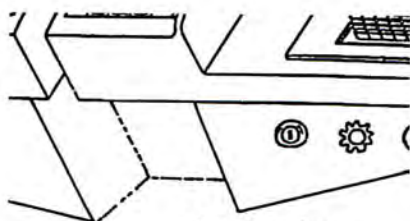
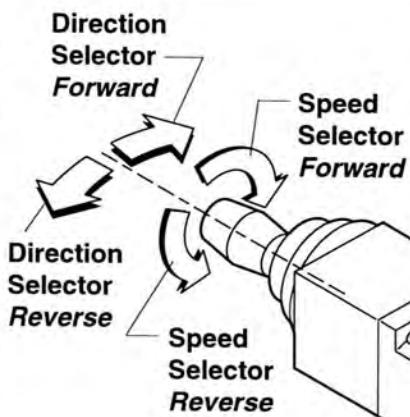
Selecting Direction of Travel

Push the direction control lever forward, center it, or pull it back for FORWARD, NEUTRAL, or REVERSE, respectively. Traction is disabled in NEUTRAL.

If you are traveling forward, push the direction control lever forward and twist the hand grip up and forward to shift from neutral into first gear. Then twist up and forward again to shift from first gear to second gear and once more to shift to third gear. To down shift, twist hand grip down and backward. The same procedure applies while traveling in reverse, except you pull the direction control lever backwards (toward the operator).

Using the Accelerator

With the parking brake released and the direction control in FORWARD or REVERSE, put your foot on the accelerator pedal and push down smoothly until the truck is moving at the desired speed.



Braking

To stop the truck, press down on the brake pedal while lifting your right foot off the accelerator. Push down on the brake pedal in a smooth, firm motion until the truck is stopped.

IMPORTANT

Stop the lift truck as gradually as practical. Hard braking and wheel sliding are dangerous, increase wear, and can cause you to lose a load or tip-over.

Operating Safely

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.



WARNING

LOOK WHERE YOU DRIVE. Watch out for pedestrians, other vehicles, obstructions (especially overhead), and drop-offs. If the load blocks your view, drive backwards, except up slopes.

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.

Protect yourself and those around you.

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

NOTICE

An OVERHEAD GUARD structure in the cab is intended to offer protection to the operator from falling objects, but cannot protect against every possible impact. Therefore, it should not be considered a substitute for good judgement and care in loading, handling, storage, etc.



WARNING

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 riders.

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 if you are not in the designated operator's position.

Never operate a lift truck when your hands and feet 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, it can cause the machine to tip-over. 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.

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

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 engage 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 allows 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 bring the machine to a safe condition and safe location, shut off the key switch immediately and report the problem.

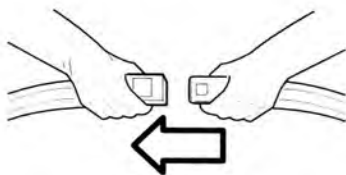


CAUTION

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

IMPORTANT

Always wear your seat belt when operating your lift truck.



Adjusting the Load Forks

The load forks are adjustable on the carriage fork pin. Forks should be spaced as far apart as the load will allow. Both forks should always be the same distance from the center of the fork carriage. To adjust the forks, raise the carriage slightly. Tilt the upright fully forward to reduce friction and make the forks slide easier. **Position the forks by pushing them away from you.** (Note: Most applications will require the use of hydraulic fork positioners. In this case, simply operate the fork positioning lever.)



CAUTION

Make sure the load backrest (LBR) or fork retaining bolts are fasten securely in place.

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 backward.

Keep the load back against the LBR. Loads placed out on the ends of the forks can make the lift truck less stable and more 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 the upright forward when the 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 by raising the carriage. DO NOT go under a raised upright or forks to attempt repairs. Do not climb the upright or the truck.

Remember, your lift truck is designed to carry loads forward of the front wheels so that the weight of the load is counterbalanced by the weight of the truck.

The farther the load is carried from the pivot point (center of front wheels), the less the weight on the steer wheels. 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 with a Load

Travel with the 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 the load blocks your visibility, travel in reverse with load trailing (except when climbing an incline).

Avoid sudden movements when carrying a load—start, stop, travel, steer, and brake smoothly. Steer clear of bumps, holes, and loose materials or debris on the ground. Lift and tilt slowly and smoothly. Go slowly when turning. Cross railroad tracks slowly and at an angle wherever possible.

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

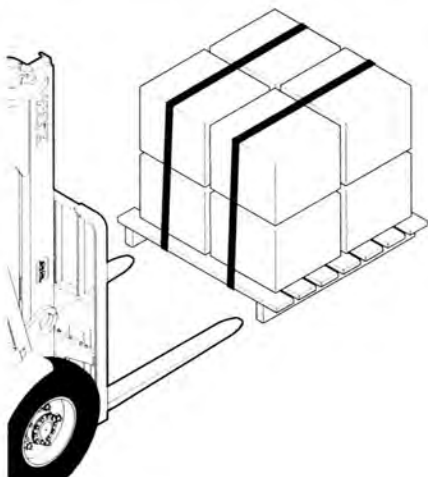
Watch clearances around the truck and load as you travel. Raise the forks or attachment only to pick up or stack a load. Look out for obstructions, especially overhead.

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

Always be concerned about the stability of your lift truck. When attachments are used, extra care should be taken in securing, manipulating, positioning, and transporting the load. Because attachments generally add extra weight and complexity to the truck, operate trucks equipped with attachments as partially-loaded trucks when not handling 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 the load is centered and the forks are fully under and supporting the load. Fork length should be at least $\frac{2}{3}$ 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 forward until the forks are squarely and completely under the load.



NOTICE

Be sure that the forks do not extend beyond the load, causing damage or tipping of other adjacent loads or materials behind the load being moved.

If the forks are longer than the load, move the tips partially under the load without extending beyond the load. Raise the load to clear the ground. Back out several inches, or whatever distance is necessary, then set the load down and move forward until the load is positioned against the face of the forks.

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 to travel (except for loads that must be transported as level as possible).

Unloading

To deposit a load on the floor 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 the load.

Raise the forks to traveling height and tilt forks to a level position 6-8 inches (152-203 mm) off the floor.



Stacking

To put a load on a stack:

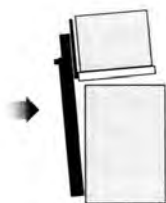
1. Approach slowly and align the lift truck and load squarely with the stack.



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



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



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

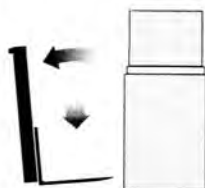


5. When the load is aligned with the stack beneath it, tilt the upright to the vertical position and carefully lower the load onto the top of the stack.

6. Lower the forks slightly to clear the load pallet. Tilt the forks forward slightly, if necessary.



7. Check your travel path, then carefully back away until the forks are clear of the stack. Stop and lower the forks to the travel position (6 to 8 inches [152-203 mm] above the ground), then tilt back for travel.



To move a load from a stack:

Approach the stack carefully, 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.

Be sure that the forks do not extend beyond the load, causing damage or tipping of other adjacent loads or materials behind the load being moved. If the forks are longer than the load, move the tips partially under the load without extending beyond the load. Raise the load to clear the under surface. Back out several inches, then set the load down and move forward until the front face of the forks contacts the load. Be careful that the fork tips now clear the adjacent load or material behind the load being moved.

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

Check your travel path, slowly back up until clear of the stack, stop, and then lower the load to the travel position (6 to 8 inches [152-203 mm] off the ground). Tilt full back to travel (except for certain loads that may have to be transported as level as possible). Be sure the load is back flush against the carriage or front face of the forks.

NOTICE

Certain loads must be transported as level as possible.

Shut-Down Procedure

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 that block emergency routes or equipment, access to fire aisles, or stairways and fire equipment.

Before leaving the operator's position:

1. Bring the truck to a complete stop.
2. Put the directional control lever in the NEUTRAL position.
3. Apply the parking brake, by pulling out the park brake button.
4. Lower the lifting mechanism—carriage and forks or attachment—fully to the ground.

In addition, when leaving the truck unattended:

5. Tilt the upright forward until the forks are level and flat on the ground. Let the engine run at idle speed.
6. Turn the key/start switch to the OFF position and remove the key.
7. Block the wheels, if the truck must be left on an incline or you have any doubt about the truck moving from a safe position.

IMPORTANT

If the lift has been working hard, let the engine idle a few minutes before shutting it off.

Emergency Starting and Towing

Contents

How to Tow a Disabled Truck	6-2
How to Use Battery Jumper Cables	6-4



How to Tow a Disabled Truck

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

IMPORTANT

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

IMPORTANT

If your truck is disabled and needs to be towed to an area to make repairs. The parking brake may need to be disengaged. Explained in the service manual is a detailed outline on the procedure to disengage the parking brake. Please have a trained and authorized mechanic perform this process.



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.

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 12 inches (300 mm) from the floor or ground. Secure the carriage with a chain.
3. Obtain another lift truck of equal or larger size carrying a partial load for traction.
4. Check that the counterweight bolts are 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).
5. Use an approved, solid metal tow bar with towing couplers that connect to the towing pins in the counterweights.
6. Release the parking brake on the towed vehicle.

7. Place the transmission control in neutral.
8. Tow the disabled truck backward. **An operator must be on the towed truck.**

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 5 m.p.h. (8 kph) 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 and brakes will not operate on the disabled truck when the engine is not running. Manual operation of the handwheel and brakes will be difficult to operate. More manual effort will be required to perform these functions.

9. Park the disabled truck in authorized areas only. Fully lower the forks to the floor, put the directional control lever in the 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.

LIFT TRUCK PARKING

**WARNING**

Always engage the parking brake and lower forks when parking a lift truck. An unrestrained truck could move and cause injury or death to personnel near it.

How to Use Battery Jumper Cables

If your lift truck battery is discharged ("dead"), you can start your lift truck by "jumping" 24-volt, negative-ground electrical system. This is achieved with two (2) 12 volt batteries connected in series. The "booster" battery must be fully charged and in good condition. This section explains how to perform this procedure safely. To avoid damage to your lift truck and your battery or the possibility of harm to yourself, follow the instructions and warnings carefully. If you have any doubts, ask for help from an experienced mechanic.



CAUTION

USE ONLY A 24-VOLT, NEGATIVE GROUND SYSTEM to jump your truck.



WARNING

BATTERIES CONTAIN SULFURIC ACID. Avoid acid contact with skin, eyes, or clothing. If acid contacts your eyes or skin, flush immediately with water and get medical assistance. Wear safety glasses, aprons and gloves when working near the battery to protect against possible splashing of the acid solution.

1. 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.

**WARNING**

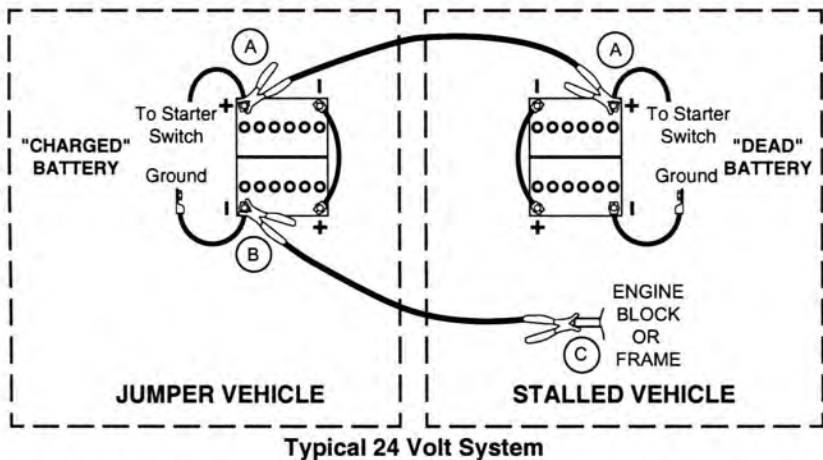
BATTERIES EMIT EXPLOSIVE GAS. Do not smoke or have open flames or sparks in battery charging areas or near batteries. An explosion can result and cause injury or death.

Hydrogen gas is produced during normal battery operation. Hydrogen 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, aprons and gloves when working around batteries.

2. Put the truck with the 24-volt booster battery as near to the other truck as necessary for the jumper cables to reach both batteries. **Use particular care when connecting a booster battery to prevent sparks.**
3. On both trucks:
 - a. Apply the parking brake.
 - b. Put the directional control lever in the NEUTRAL position.
 - c. Turn the key/start 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**

To avoid **SHORT CIRCUITS**, remove all jewelry and do not permit any metal tools to make contact between the positive battery terminal and other metal on the truck. When you connect jumper cable clamps to the positive terminals of the two batteries, make sure that neither clamp contacts any other metal. Injury can occur from electrical shock or explosion.



Typical 24 Volt System

5. Connect the jumper cables in the following sequence:
 - a. Connect a jumper cable from the positive (+; red) terminal on one battery to the positive (+; red) terminal on the other battery.



CAUTION

Never connect positive (+; red) to negative (-; black) or negative to positive.

- b. Connect one end of the second cable to the grounded negative (-; black) terminal of the "Jumper Vehicle" battery.
 - c. Connect the other end of the second cable to a stationary, solid metallic point **on the engine** of the "Stalled Vehicle," **not to the negative (-; black) terminal** of its battery. Make this connection at a point at least 18 inches (450 mm) away from the battery, if possible. Do not connect it to pulleys, fans or other parts that move. Do not touch hot manifolds that can cause severe burns.
6. Start the engine on the "Jumper 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 Section 5, "Starting and Operating Procedures" in 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 stalled vehicle first. Remove the cable end from the engine block first, then the other end of the negative (-; black) cable.
9. Remove both ends of the positive (+; red) cable.

Planned Maintenance and Lubrication

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NOTICE

THIS SECTION IS FOR TRAINED SERVICE PERSONNEL to use as a reference for Planned Maintenance procedures.

Maintenance information for operators is in Section 4, "Operator Maintenance and Care."



Introduction

NOTICE

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



CAUTION

Powered industrial trucks may become hazardous if maintenance is neglected.

As outlined in Section 4, "Operator Maintenance and Care," the operator should make a safety inspection of the lift truck before operating it. The purpose of this daily examination is to check for any obvious damage and maintenance problems, and to have minor adjustments and repairs made to correct any unsafe condition.

In addition to the operator's daily inspection, CLARK recommends that the owner set up and follow a periodic planned maintenance (PM) and inspection program. Performed on a regular basis **by trained personnel**, the program provides thorough inspections and checks of the safe operating condition of the lift truck. "The PM" identifies needed adjustments, repairs, or replacements so they can be made before failure occurs. The specific schedule (frequency) for the PM inspections depends on the particular application and lift truck usage.

This Section recommends typical Planned Maintenance and Lubrication Schedules for items essential to the safety, life, and performance of the truck. It also outlines safe maintenance practices and gives brief procedures for inspections, operational checks, cleaning, lubrication, and minor adjustments.

Specifications for selected components, fuel, lubricants, critical bolt torques, refill capacities, and settings for the truck are found in Section 8.

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



Safe Maintenance Practices

The following instructions have been prepared from current industry and government safety standards applicable to industrial truck operation and maintenance. These recommended procedures specify conditions, methods, and accepted practices that aid in the safe maintenance of industrial trucks. They are listed here for the reference and safety of all workers during maintenance operations. Carefully read and understand these instructions and the specific maintenance procedures before attempting to do any repair work. When in doubt of any maintenance procedure, please contact your local CLARK dealer.

1. Powered industrial trucks can become hazardous if maintenance is neglected. Therefore, suitable maintenance facilities and trained personnel and procedures shall be provided.
2. Maintenance and inspection of all powered industrial trucks shall be performed in conformance with the manufacturer's recommendations.
3. Follow a scheduled planned maintenance, lubrication, and inspection system.
4. Only trained and authorized personnel are permitted to maintain, repair, adjust, and inspect industrial trucks—and must do so in accordance with the manufacturer's specifications.
5. Always wear safety glasses. Wear a safety (hard) hat in industrial plants and in special work areas where protection is necessary and required.
6. Properly ventilate work area, vent exhaust fumes, and keep shop clean and floors dry.
7. Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check for level or leakage fuel, electrolyte, or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
8. Before starting work on truck:
 - a. Raise drive wheels free of floor and use oak blocks or other positive truck positioning devices.
 - b. Remove all jewelry (watches, rings, bracelets, etc.).

- c. Put oak blocks under the load-engaging means, innermasts, or chassis before working on them.
- d. Disconnect the battery ground cable (-) before working on the electrical system.



CAUTION

Refer to the "Jacking and Blocking" section in the Service Manual for proper procedures.


- 9. Operation of the truck to check performance must be conducted in an authorized, safe, clear area.
- 10. Before starting to operate the truck:
 - a. Be seated in a safe operating position and fasten your seat belt.
 - b. Make sure parking brake is applied.
 - c. Put the direction control in NEUTRAL.
 - d. Start the engine.
 - e. Check functioning of lift and tilt systems, direction and speed controls, steering, brakes, warning devices, and load handling attachments.
- 11. Before leaving the truck:
 - a. Stop the truck.
 - b. Fully lower the load-engaging means: upright, carriage, forks or attachments.
 - c. Put the directional control in NEUTRAL.
 - d. Apply the parking brake, by pulling the park brake switch out.
 - e. Stop the engine.
 - f. Turn the key switch to the OFF position.
 - g. Put blocks at the wheels if the truck must be left on an incline.
- 12. Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, lift and tilt mechanisms, articulating axle stops, load back rest, overhead guard and frame members must be carefully and regularly inspected and maintained in a safe operating condition.

13. Special trucks or devices designed and approved for hazardous-area operation must receive special attention to insure that maintenance preserves the original approved safe operating features.
14. 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.
15. All hydraulic systems must be regularly inspected and maintained in conformance with good practice. Tilt and lift cylinders, valves, and other parts must be checked to assure that "drift" or leakage has not developed to the extent that it would create a hazard.
16. When working on the hydraulic system, be sure the engine is turned off, upright is in the fully-lowered position, and hydraulic pressure is relieved in hoses and tubing.

 **WARNING**

Always put oak blocks under the carriage and upright rails when it is necessary to work with the upright in an elevated position.

17. The truck manufacturer's capacity, operation, and maintenance instruction plates, tags, or decals must be maintained in legible condition.
18. 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.
19. To avoid injury to personnel or damage to the equipment, consult the manufacturer's procedures in replacing contacts on any battery connection.
20. Industrial trucks must be kept in a clean condition to minimize fire hazards and help in detection of loose or defective parts.

- 
21. 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.
 22. 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.
 23. When removing tires follow industry safety practices. Most importantly, deflate pneumatic tires completely prior to removal. Following assembly of tires on multi-piece rims, use a safety cage or restraining device while inflating.
 24. Use special care when removing heavy components, such as counterweight, upright, etc. Be sure that lifting and handling equipment is of the correct capacity and in good condition.

IMPORTANT

Your new CLARK lift truck has been built to meet all applicable mandatory requirements of ANSI B56.1 Safety Standard for Powered Industrial Trucks. Each truck also includes certain safety devices—such as horn, overhead guard, and load back rest—as standard equipment. No additions, omissions, or modifications should be made that affect compliance to the above requirements or in any way minimize the effectiveness of the safety devices.

NOTICE

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

ANSI/ASME B56.1: 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, NY 10017.

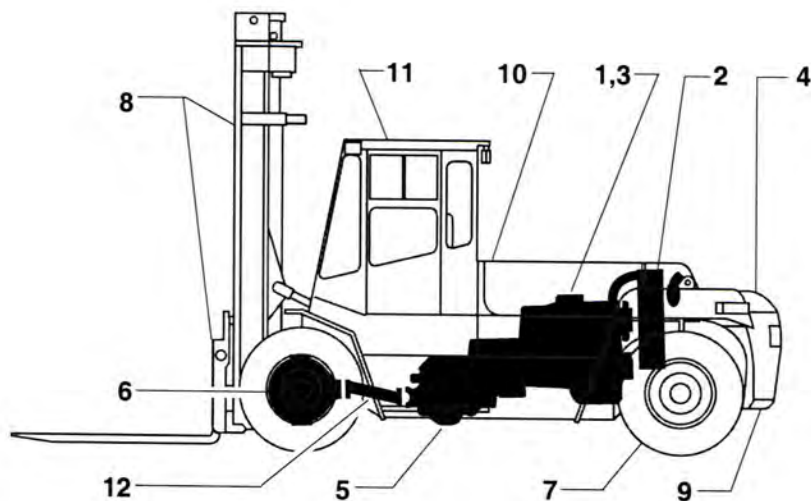
NFPA 505-1982: Fire Safety Standard for Powered Industrial Trucks: Type Designations, Areas of Use, Maintenance and Operation. Available from National Fire Protection Association, Inc., Batterymarch Park, Quincy, MA 02269.

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, US Government Printing Office, Washington, DC 20402.



Major Component Locations

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



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

Planned Maintenance Intervals

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. The operating condition classifications are:

Normal Operation

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

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

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

NOTICE

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



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

PM Interval:

A = 8 - 10 hours or daily

B = 50 - 250 hours or every month (typical PM interval)

C = 450 - 500 hours or every 3 months

D = 900 - 1000 hours or every 6 months

E = 2000 hours or every year

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.	•				
Replace gas engine oil filter.		•			
Replace diesel engine oil filter.		•			
Clean / replace engine air filter. (*)					•
Change diesel fuel filter (***)		•		•	
Inspect / adjust fan belts.			•		
Drain / flush radiator coolant.					•
Check engine ignition and timing.			•		
Engine tune-up.					•
Check battery.			•		
Check transaxle fluid level.					•
Change transaxle fluid. (drain and replace)		•			•
Change (replace) transaxle 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.					•
Change / replace hydraulic sump oil filter and breather (**)				•	
Change / replace hydraulic sump fluid and oil filter (**)					•
Lubricate tilt cylinder rod ends.		•			
Check lift chain adjustment and wear.		•			
Check / lubricate lift chains.		•			
Lubricate upright rollers.		•			

NOTES:

- * Air filter change interval may be determined by using an air restriction indicator.
- ** Hydraulic filter change interval may be determined by hydraulic filter restriction indicator.
- *** Diesel fuel filter change interval may be determined by fuel filter restriction indicator.

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 for missing or loose wheel lug nuts.	•				
Check engine oil level.	•				
Check engine coolant level (radiator & recovery tank)	•				
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 parking brake linkage for damage, broken parts.	•				
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.	•				
Check seat deck holddown latch for correct locking.	•				
Check optional safety equipment. (Alarms, Lights etc.)	•				

PM Report Form

Make and keep records of your PM inspections. Use these records to help establish the correct PM intervals for the truck application and to indicate maintenance required to prevent major problems from occurring during operation.

As an aid in performing and documenting your PM inspections, CLARK has prepared a ***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 record of your inspection and truck condition.

The maintenance procedures outlined in this Section are intended to be used in conjunction with the PM Report Form. They are arranged in a logical and efficient sequence.

You make a check mark or entry on the PM Report Form when the PM is performed. A special coding system for indicating the importance of needed repairs and/or adjustments appears on the form.

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.



CAUTION

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 battery 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

Visual Inspection

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

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



NOTICE

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

Inspect the truck, before and after starting the engine, for any sign of external leakage of 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.

Cab / Overhead Guard

Be sure that the operator's cab, overhead guard structure and any safety devices are in place, undamaged, and attached securely. Check the cab/overhead guard for damage. Be sure that it is properly positioned and all mounting fasteners are in place and tight.

Load Handling Components

Inspect the upright assembly, carriage, upright rails and rollers, carriage rollers, lift chains, and lift and tilt cylinders. Look for obvious wear and maintenance problems and damaged or missing parts. Check for any loose parts or fittings. Check for leaks, damaged or loose rollers, and rail wear (metal flaking). Carefully check the lift chains for wear, rust, 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 remain in safe operating condition. Refer to "Lift Chain Maintenance" in this Section for additional information.

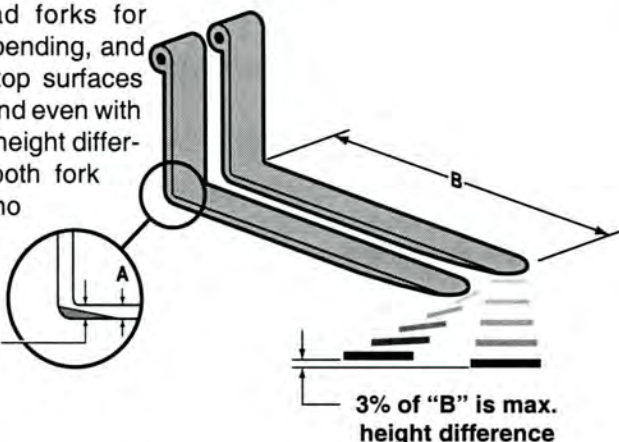
**WARNING**

Keep hands, feet and legs out of the upright. Do not use the upright as a ladder. Never try to repair the upright yourself! Always get a trained mechanic.

Forks

Inspect the load forks for cracks, breaks, bending, and wear. The fork top surfaces should be level and even with each other. The height difference between both fork tips should be no more than 3% of the fork length.

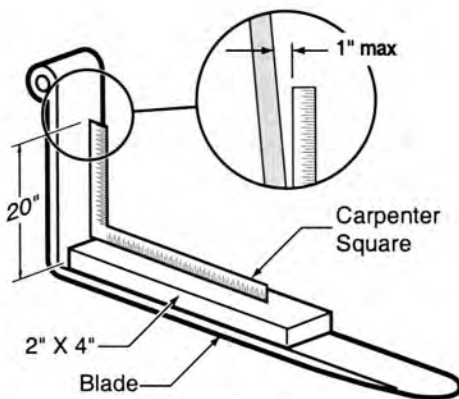
10% of "A" is
max. wear
allowed



WARNING

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

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



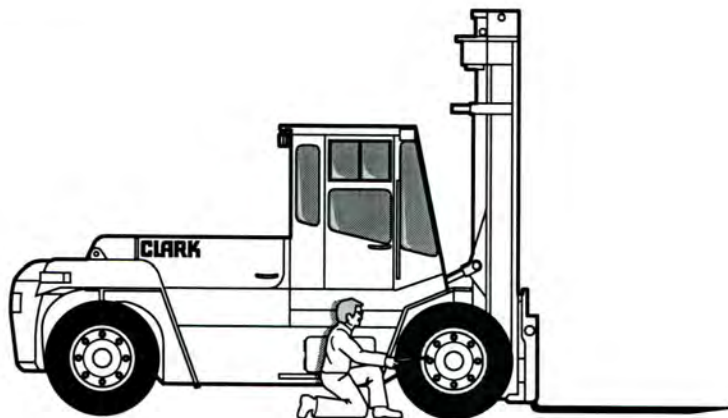
If the fork blades are obviously bent or damaged, have them inspected by a trained maintenance person before operating the truck.

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

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. Replace missing bolts or lug nuts. Torque loose or replaced items to specifications.



WARNING

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

Functional Tests

You will start the engine to complete the functional tests, so be sure that:

- The parking brake is applied.
- Directional control is in NEUTRAL.
- Forks are fully lowered to the floor or ground
- All controls are in neutral or other correct position
- You are familiar with the safety procedures given in Section 5, "Starting and Operating Procedures," in this manual.

As you test the following components, be sure they are properly mounted and working correctly.

Horn

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.

Neutral Start Switch

Check the operation of the neutral start switch by placing the direction control lever in FORWARD or REVERSE and turning the key switch to START position. The starter must not engage until the direction control lever is moved to the NEUTRAL position.

Water Temperature Gauge

Indicates temperature of engine coolant water in degrees - 40°C-140°C (100°F to 280°F). Water temperature should be approximately 80°C (180°) after 10 minutes of operation. If the indicator registers in the "hot" zone, turn off engine until trouble is located and corrected.

Hour Meter

Start the engine and 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. **Write the hour meter reading on the PM report form.** Report any malfunction or damage.

Service Brake Pedal

With the direction control in NEUTRAL and the engine running, push the service brake pedal fully down and hold. The brakes should apply before the pedal reaches the floorplate. If the pedal continues to creep downward, report the failure immediately. **Do not operate the truck until the brakes are repaired.** (Additional braking/inching checks will follow.)

Parking Brake

Check the function of the parking brake. Release, then reapply. 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.

Lift Mechanisms and Controls

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. 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.

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.

Auxiliary Controls (Option)

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 to the straight-ahead position. The steering system components should operate smoothly when the handwheel is turned. **Never operate a truck that has a steering system fault.**



WARNING

Fasten your seat belt before driving the truck.

Direction Control, Braking, and Inching

Be sure that the travel area is clear in front of the truck.

1. Push firmly on the brake pedal. Release the parking brake. Move the directional control lever from NEUTRAL to FORWARD.
2. Remove your left foot from the service brake pedal twist the hand grip of the direction control lever up and forward, and press with right foot on the accelerator pedal until the truck moves slowly forward. Remove your foot from the accelerator pedal and push down on the service brake pedal to stop the truck. The brakes should apply smoothly and equally.

Be sure the travel area is clear behind the truck.

3. Put the directional control lever in the REVERSE travel position. Release the service brake, twist the hand grip of the direction control up and forward, 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 service brake pedal to stop the truck. The brakes should apply smoothly and equally.

Report any problems.

When you have completed the operational tests, park and leave the truck according to standard shut down procedure as described in Section 5 of this manual. Be sure to make a record of all maintenance and operating problems you find.

Fluids, Filters, and Engine Accessories

To 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 the engine compartment with the engine running, except when it is absolutely necessary to check or make adjustments. Take extreme care to keep hands, tools, 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. that could cause failure during operation.

Engine Air Cleaner

Check the engine air cleaner for damage and contamination (excessive dirt buildup and clogging). 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 2000 operating hours, depending upon your application. Service intervals may also be determined by the air restriction indicator.

Battery

Inspect the battery for 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. Refill them with distilled water.



WARNING

EXPLOSIVE GASES: Do not smoke or have open flames or sparks near batteries. An explosion can cause injury or death.

Engine Cooling System

To check engine coolant level open the hood to the engine compartment.



WARNING

Do not remove the radiator cap when the radiator is hot. STEAM from the radiator will cause severe burns. Do not remove the radiator cap to check the coolant level.



WARNING

Never remove the radiator cap while the engine is running. Stop the engine and wait until it has cooled. Failure to do so could result in serious personal injury from hot coolant or steam blowout and/or damage to the cooling system or engine.

If the 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 coolant system for leaks.

- Check engine oil for presence of coolant leaking into engine.
- 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 the condition of radiator cap rubber seal and radiator filler neck for damage. Be sure they are clean.

NOTICE

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

Engine Oil and Filter

Locate the engine oil dipstick. 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.

It is recommended to:

- Drain and replace the engine crankcase oil every 50 to 250 operating hours. (depending on application). *See NOTICE*
- Replace the gas engine oil filter every 500 hrs., diesel engine every 250 hrs.
- Remove the oil pan drain plug to drain old oil after the truck has been in operation and the engine (oil) is at operating temperature.

**WARNING**

Engine oil at operating temperature is hot and can cause burns. Beware of splashing oil.

- Carefully check for leaks after changing oil and installing new filter.

NOTICE

The time interval for changing engine oil depends 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. For gas and diesel engines, CLARK recommends that you use motor oil that meets API Service Classification CD, CC/SG, SF and API CF-4 SAE 15W-40, gas engines can also use API SD SAE 10W-30 oil or better.

IMPORTANT

Be sure the upright is in the lowered position.

Hydraulic Sump Tank

Check the hydraulic sump tank fluid level. Be sure the upright is in the lowered position. 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 filter 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. The procedure for draining hydraulic sump tank is in your Service Manual.

IMPORTANT

Check suction screen for damage or clogging.



Sump Tank Breather Maintenance and Inspection

Remove the sump tank fill cap/breather and inspect for excessive (obvious) contamination and damage. Replace the fill cap/breather, per recommended PM schedule or as required by operating conditions.

NOTICE

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

Lubrication

Truck Chassis Inspection and Lubrication

Lubrication and inspection of truck chassis components, including steer wheels, steer axle linkage, steering cylinder, and wheel bearings are easier if the truck is raised and blocked up under the frame. Refer to your Service Manual for additional information on machine blocking and jacking. Also refer to your Service Manual for the location of grease fittings.



WARNING

Do not raise the truck by lifting under the counterweight. Use lifting eyes welded to the frame.

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) and both the 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.

IMPORTANT

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 and loose, missing, or damaged parts, and helps prevent fires. A clean truck runs cooler. The environment in which a lift truck operates determines how often and to what extent cleaning is necessary.

For example, trucks operating in manufacturing plants that have a high level of dirt, dust, or lint (for example, cotton fibers or paper dust) in the air or on the floor or ground, 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, or more often if necessary.

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



CAUTION

Wear suitable eye protection and protective clothing when air cleaning. Never point the air nozzle at anyone.

Air clean the upright assembly, drive axle, radiator—from both counterweight and engine side, engine and accessories, driveline and related components, and steer axle and 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 that directly support, handle, or control the load and protect the operator.

Critical items include:

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

Torque specifications are in your Service Manual.

Lift Chain Maintenance

The chain system on the 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.



WARNING

Keep hands, feet and legs out of the upright. Do not use the upright as a ladder. Never try to repair the upright yourself! Always get a trained mechanic.



WARNING

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

Lift Chain Inspection and Measurement

Inspect and lubricate the lift chains every PM (50-250 hours). When operating in corrosive environments, inspect the chains every 50 hours. During the inspection, check for the following conditions:

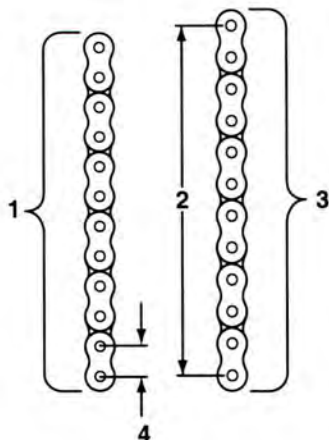
- Rust and corrosion, cracked plates, raised or turned pins, tight joints, wear, and worn pins or holes.
- When the pins or holes become worn, the chain becomes longer. When a section of chain is 3% longer than a section of new chain, the chain is worn and must be discarded.
- Chain wear can be measured 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 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 Wear and Replacement 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.



All chains must be replaced if any link has wear of 3% or more, or if any of the damaged conditions noted above are found during inspection. Order replacement chains from your 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.

NOTICE

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

Specifications

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

Model Designation — Rated Load Capacity

CDP100(D)-22,000lbs @ 24in load center [10,000kg] @ [500mm]
CDP110(D)-24,200lbs @ 24in load center [11,000kg] @ [500mm]
CDP120(D)-26,400lbs @ 24in load center [12,000kg] @ [500mm]
CDP130S(D)-28,600lbs @ 24in load center [13,000kg] @ [500mm]
CDP130(D)-28,600lbs @ 24in load center [13,000 kg] @ [500mm]
CDP140S(D)-30,800lbs @ 24in load center [14,000kg] @ [500mm]
CDP140(D)-30,800lbs @ 24in load center [14,000 kg] @ [500mm]
CDP150(D)-33,000lbs @ 24in load center [15,000 kg] @ [500mm]
CDP160(D)-35,200lbs @ 24in load center [16,000 kg] @ [500mm]
CDP164(D)-36,000lbs @ 24in load center [16,400 kg] @ [500mm]

Engine

Type	Model	Cyl's	Displacement
Diesel	Cummins 6BT	6	359 c.u. [5.88 liters]

Cooling System

Automotive type crossflow radiator.

Cooling system pressure (radiator cap):

Thermostat: Diesel, 85°C (185°F), fully open 98°C (208°F),

Powershift Transmission

CLARK Model 28000

Speeds: 3 forward /3 reverse

Wheels and Tires for Pneumatic Truck

	Drive Tire	Steer Tire	Tire Pressure
CDP 100	10x20-14-ply	10x20-14-ply	102 psi
CDP 110	10x20-14-ply	10x20-14-ply	102 psi
CDP 120	10x20-14-ply	10x20-14-ply	102 psi
CDP 130S	10x20-14-ply	10x20-14-ply	102 psi
CDP 130	10x20-14-ply	10x20-14-ply	102 psi
CDP 140S	11x20-16-ply	11x20-16-ply	112 psi
CDP 140	11x20-16-ply	11x20-16-ply	112 psi
CDP 150	11x20-16-ply	11x20-16-ply	112 psi
CDP 160	12x20-16-ply	12x20-18-ply	116 psi
CDP 164	12x20-16-ply	12x20-18-ply	116 psi

Standard Electrical System

Type: 24 volt DC, negative ground

Circuit Breakers

Batteries:	<i>BCI Group 45</i>	<i>BCI Group 31</i>
<i>Connected in Series</i>	Diesel	
Cold cranking current amps each.	12 volt DC- 420 amps @ 0°F total	12 volt DC-625 @ 0°F total

Filters

Engine air:	Dry type—replaceable element
Engine oil:	Spin-on
Transmission:	Spin-on
Hydraulic system oil:	100 mesh suction screen in sump tank and filter in return line - B10=5.0; (used for steering and brake system)

Hydraulic sump

breather cap: Replaceable element

Use genuine CLARK parts. See your CLARK dealer.

Truck Weights (approximate, with cutoff height upright)

	<i>Gross Vehicle Weight (lbs)</i>	<i>Empty Vehicle Weight (lbs)</i>	<i>Loaded Drive Axle (lbs)</i>	<i>Empty Drive Axle (lbs)</i>
CDP130	61,948	32,895	57,000	16,937
CDP140	64,750	33,950	59,840	16,940
CDP150	67,530	34,470	62,660	16,930
CDP160	71,430	36,155	66,260	17,438
CDP164	73,250	37,250	67,430	17,480

Fuel Recommendations

Diesel: D-2 with cetane rating of 45 or higher. D-1 and Jet A-1 also acceptable.

Fill Capacities (fluid volumes)

Fuel tank:		62 US gallons;	235 liters
Hyd Sump: (Usable Volume)	CDP130/164	62 US gallons;	235 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 -37°C (-34°F), approximately.

Transmission Fluid Recommendation

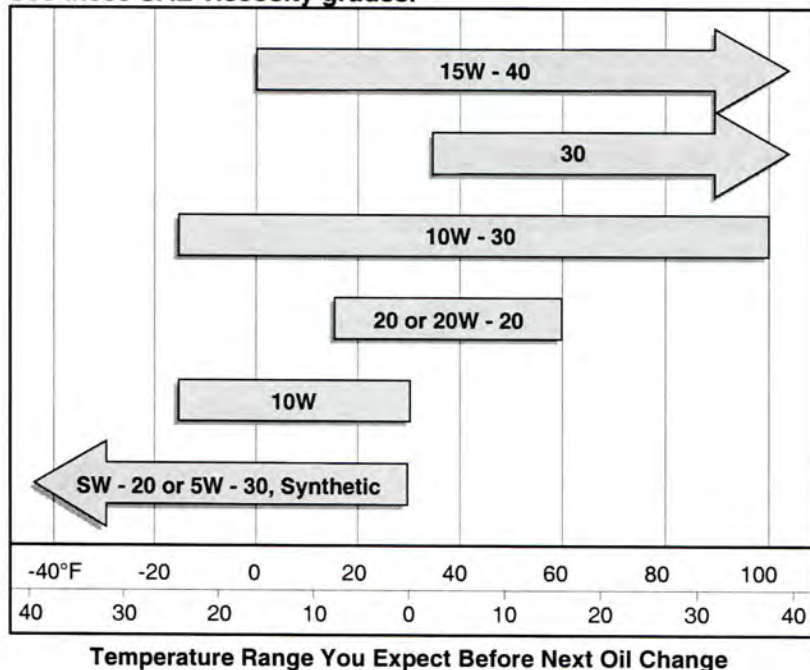
Use CLARK TransmissionFluid.

Hydraulic Fluid Recommendation

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

Engine Oil

Use these SAE viscosity grades.



Engine Oil Recommendations

American Petroleum Institute (API) classifications CD, CC/SG, SF and API CF-4 SAE 15W-40, gas engines can also use API SD SAE 10W-30 oil or better.

IMPORTANT

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

Fill crankcase with correct amount of oil. When adding oil between oil changes, it is preferable to use the same brand as various oils may be incompatible. 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.

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