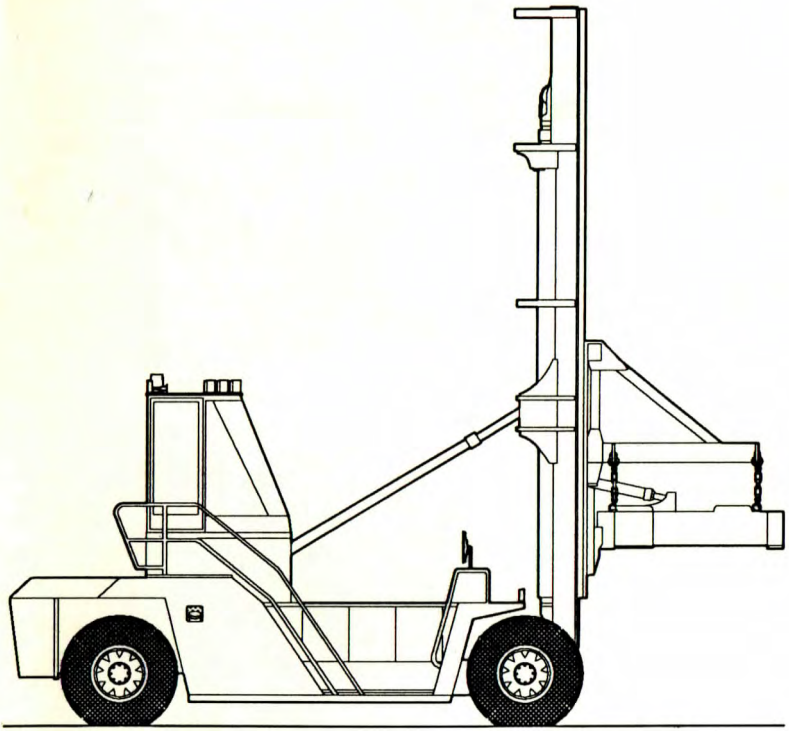
Operator's Manual

Do not remove this manual from the truck.



C500 Y 950CH

CONTAINER HANDLER

CLARK

Book No. 2783410
OM-580

For Handy Reference

RECORD THE FOLLOWING INFORMATION PERTAINING TO YOUR TRUCK

Model No. _____

Serial No. _____

Customer Truck Identification No. _____

Truck Weight, Empty _____

Truck Gross Weight _____

Special Equipment or Attachments _____

IMPORTANT

Do not expose this manual to hot water or steam.

Operator's Manual

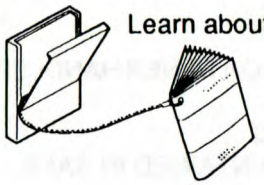
You must be trained and authorized to operate a container handler truck

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.

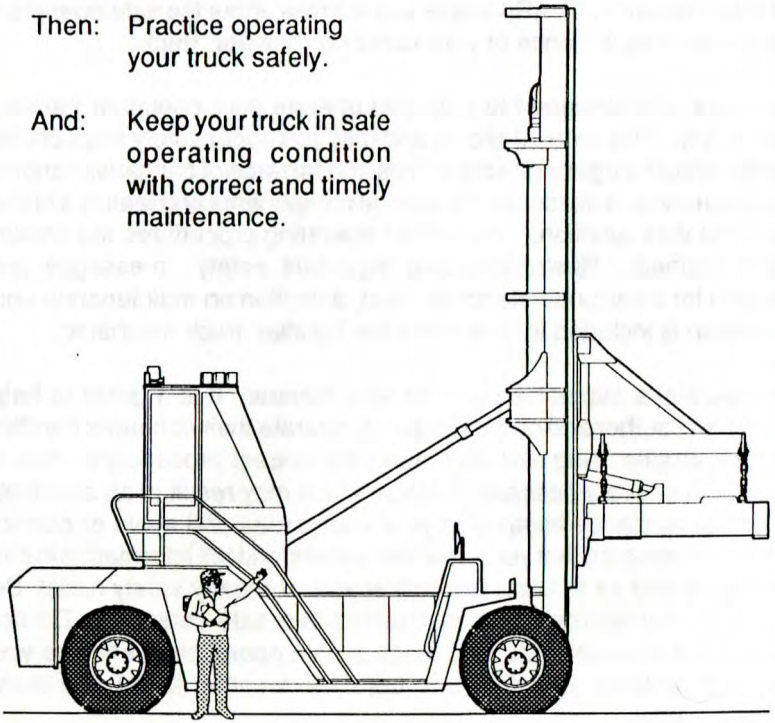
Learn about the unit you operate.



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 Container Handler Truck Operators

Container handler 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 container handler trucks is of primary importance to CLARK. Our experience with container handler 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 CONTAINER HANDLER TRUCK OPERATION
- BASIC SAFETY RULES NOT FOLLOWED
- CONTAINER HANDLER TRUCK NOT MAINTAINED IN SAFE OPERATING CONDITION

For these reasons, CLARK wants you to know about the safe operation and correct maintenance of your container handler truck.

This manual is designed to help you operate your container handler truck safely. This manual shows and tells you about safety inspections and the important general safety rules and hazards of container handler truck operation. It describes the special components and features of the truck and their function. The correct operating procedures are shown and explained. Illustrations and important safety messages are included for clear understanding. And, a section on maintenance and lubrication is included for the container handler truck mechanic.

The operator's manual is not a training manual. It is a guide to help trained and authorized operators safely operate their container handler truck by emphasizing and illustrating the correct procedures. But, it cannot cover every possible situation which may result in an accident. You must watch for hazards in your work areas and avoid or correct them. It is important that you know and understand the information in this manual as well as to know and follow your company safety rules! Be sure that your equipment is maintained in a safe condition. Do not operate a damaged truck. And practice safe operation every time you use your container handler truck. Let's join together to set new standards in safety.

Remember, before you start operating this container handler truck, be sure that you understand all driving procedures. It is your responsibility, and it is important to you and your family, to operate your container handler truck safely and efficiently. And be aware that the Federal Occupational Safety and Health Act (OSHA) and state laws require that operators be completely trained in the safe operation of container handler trucks; if you think you need training, ask your supervisor.

CLARK container handler 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 container handler truck repair procedures and are authorized by your employer.

CONTENTS

This manual covers the following models:
C500 Y 950CH

A MESSAGE TO CLARK CONTAINER HANDLER TRUCK OPERATORS ii

INTRODUCTION iv
About This Manual vi
How To Use This Manual vii
Safety Signs and Messages viii

1 GENERAL SAFETY RULES AND PRACTICES 1.1
2 OPERATING HAZARDS 2.1
3 KNOW YOUR TRUCK 3.1
4 OPERATOR CARE AND MAINTENANCE 4.1
5 STARTING AND OPERATING PROCEDURES 5.1
6 EMERGENCY STARTING 6.1
7 EMERGENCY TOWING 7.1
8 PLANNED MAINTENANCE AND LUBRICATION 8.1
9 SPECIFICATIONS 9.1
10 INDEX 10.1

Introduction

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

Your Clark container handler truck has been designed and built to be as safe and efficient as today's technology can make it. As manufactured, it meets all the applicable mandatory requirements of ANSI B56.1 -1988 Safety Standard for Powered Industrial Trucks. Each truck is also furnished with equipment to help you operate safely e.g., parking brake, horn, as standard equipment.

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

Introduction

User Daily Inspection — Safety and Operating Checks

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

Planned Maintenance

In addition to the daily user inspection, Clark recommends that a planned maintenance and safety inspection program (PM) be performed by a trained and authorized mechanic on a regular basis. The PM will provide an opportunity to make a thorough inspection of the safety and operating condition of your container handler truck. Necessary adjustments and repairs can be done during the PM, which will increase the life of components and reduce unscheduled downtime. The PM can be scheduled to meet your particular application and container handler truck usage.

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

About This Manual

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

Part 1 **General Safety Rules** reviews and illustrates accepted practices for safe operation of a container handler truck.

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

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

Part 4 **Operator Care and Maintenance** presents added details on how to perform the operator's daily safety inspection.

Part 5 **Operating Procedures** discusses more specific instructions on starting and the safe, efficient operation of your container handler truck.

Part 6 **Emergency Starting** gives instructions for the use of battery jumper cables.

Part 7 **Emergency Towing** describes towing procedures.

Part 8 **Planned Maintenance and Lubrication** describes a PM program for your truck.

Part 9 **Specifications** provides reference information and data on features, components and maintenance items for your container handler truck.

Index Provides help for locating information about various topics.

About This Manual

Safety Signs and Messages

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

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

How To Use This Manual

The examples, illustrations and explanations in this manual will help you improve your skill and knowledge as a professional container handler truck operator while taking full advantage of the capabilities and safety features of your new container handler 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 container handler truck. Next, you will find descriptions of the components of your specific container handler truck model and how the instruments, gauges and controls operate. Then, you will find a discussion of typical starting and operating procedures with more specific instructions for safe and efficient operation of your container handler truck. There are instructions for using battery jumper cables and how to move a disabled container handler 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 the features of your truck and how they function, you will be better prepared to operate it both efficiently and safely.

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

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

Operate your container handler 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 container handler truck or the possiblity of any harm to yourself or others.

This manual is intended to be a permanently attached part of your container handler truck. Keep it on the truck as a ready reference for anyone who may drive or service it. If the truck you operate is not equipped with this manual, ask your supervisor to obtain one and have it attached to the truck. And, remember, your CLARK dealer is pleased to answer any questions about the operation and maintenance of your container handler truck and will provide you with additional information should you require it. He is glad to help you.

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.

STAYALERT! Follow safety rules, regulations and procedures. Accidents can be avoided by recognizing dangerous procedures or situations before they occur.
DRIVE AND WORK SAFELY and follow the safety signs and their messages displayed on the truck and in this manual.
SAFETY SIGNS and MESSAGES are placed in this manual and also on the truck to provide instructions and to identify specific areas where potential hazards exist and special precautions should be taken. Be sure you know and understand the meaning of these instructions, signs and messages. Damage to the truck or death or serious injury to you or other persons may result if these messages are not followed. If warning decals are damaged they must be replaced. Contact your Clark dealer for replacements.

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

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

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

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

DANGER This message is used when an extreme hazard exists.

1 General Safety Rules

Index

Daily Inspection 1.2

Do's and Don'ts 1.3

No Riders 1.4

Pedestrians 1.5

Safety 1.6

Pinch Points 1.7

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Grades, Ramps, Slopes and Inclines 1.9

Surface and Capacity 1.10

Counterweights and Counterweight Bolts 1.11

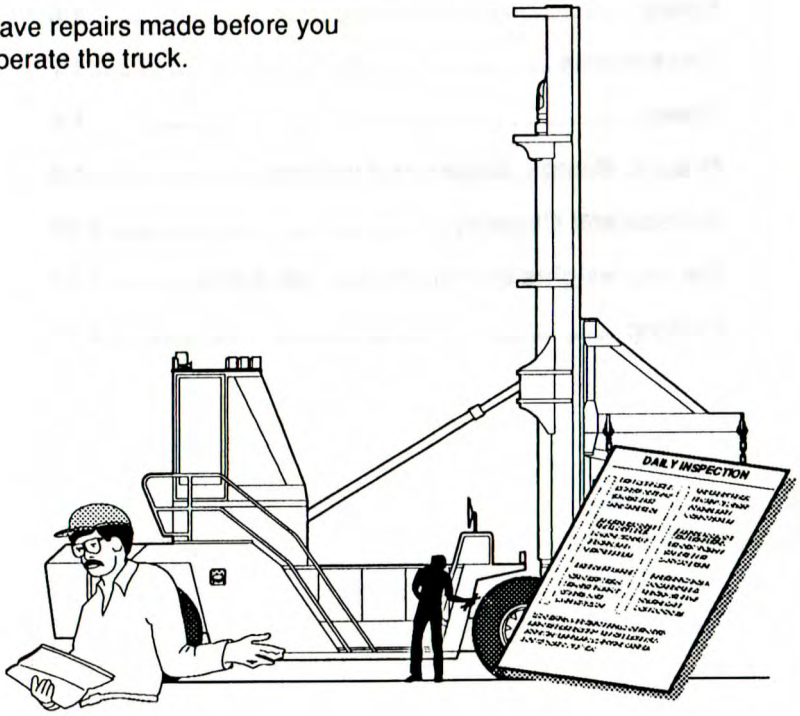
Parking 1.12

Daily Inspection

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. Container handler truck mechanics are trained professionals. They know how to make repairs safely.

Do's and Don'ts

DON'T MIX DRUGS OR
ALCOHOL WITH YOUR JOB.

DO WATCH FOR PEDESTRIANS

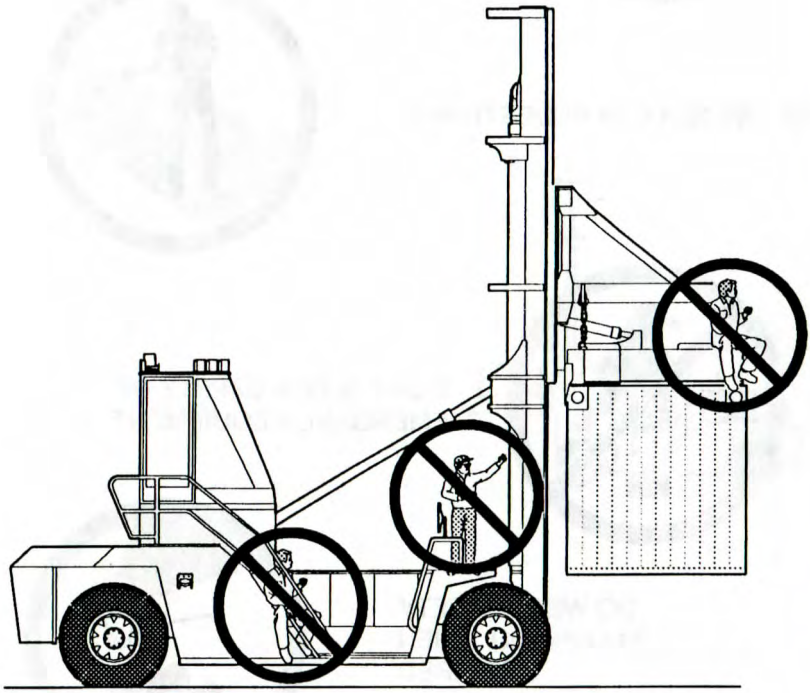
DON'T BLOCK SAFETY OR
EMERGENCY EQUIPMENT

DO WEAR SAFETY
EQUIPMENT WHEN
REQUIRED

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

No Riders

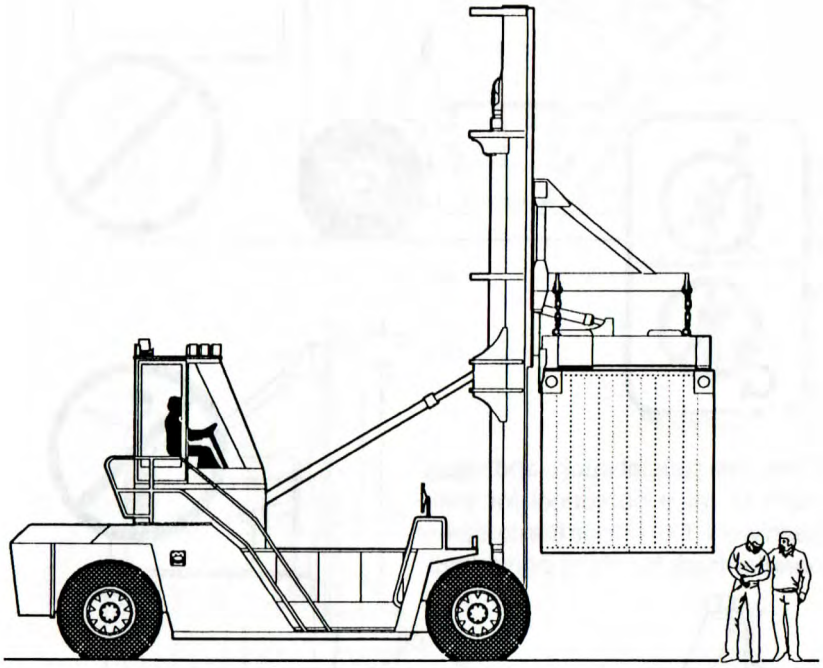
The operator is the only one who should be on the truck. The stairs with handrails and flat surfaces on the container handler truck would seem to invite riders. It is unsafe for anyone except the operator to ride on the truck. The operator should permit no riders.



Never transport personnel on the truck or container.

Pedestrians

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

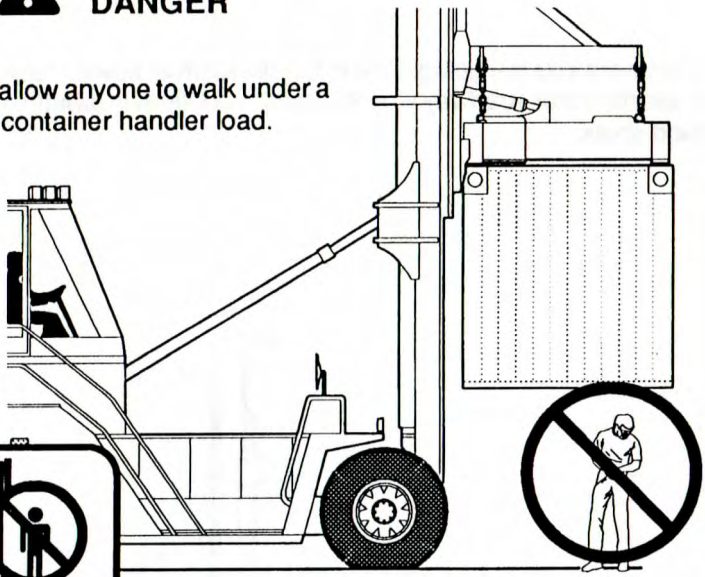


Watch for people in your work area even if your truck has warning lights or alarms. They may not watch for you. Make people stand back, even when you are parked.

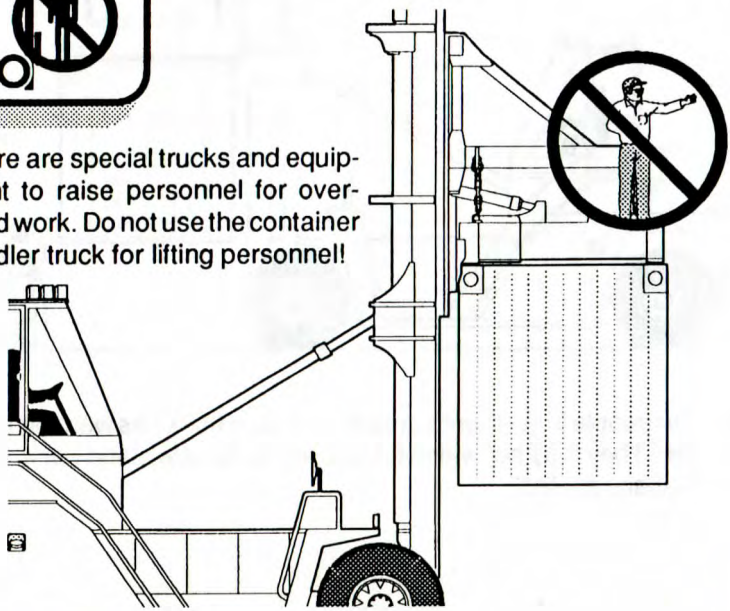
Safety

DANGER

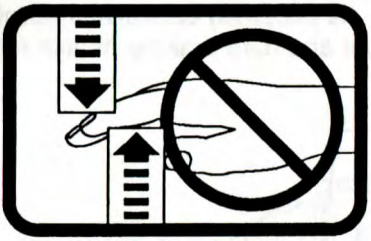
Never allow anyone to walk under a raised container handler load.



There are special trucks and equipment to raise personnel for overhead work. Do not use the container handler truck for lifting personnel!

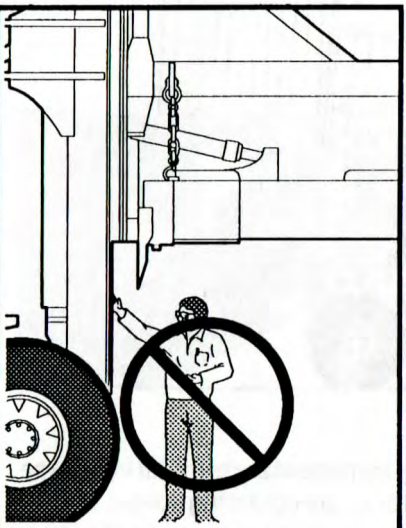


Pinch Points



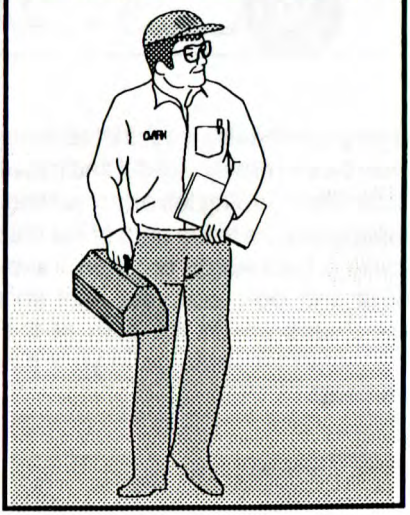
Keep hands, feet and legs out of the upright.

Do not use the upright as a ladder.



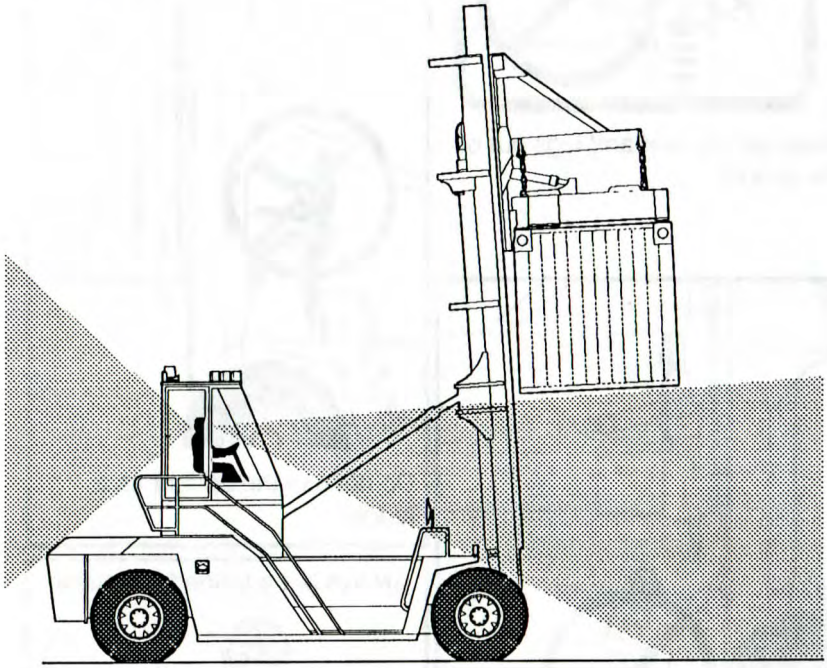
Never try to repair the upright, lift frame carriage, chains or extendable lift frame yourself.

Always get a trained mechanic.



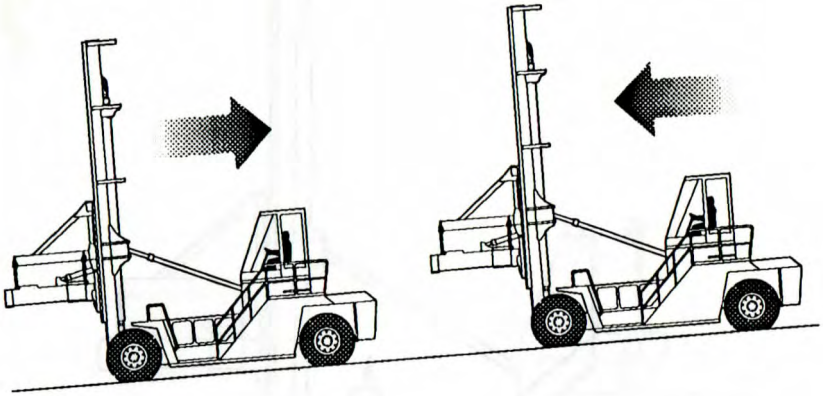
Travel

Traveling with the load elevated, you should have it only high enough to have a clear visible path in front of you. When traveling with a container you should have the upright tilted back. Be extremely careful and travel at a safe operating speed, avoid abrupt and hard braking. Watch for overhead obstacles.

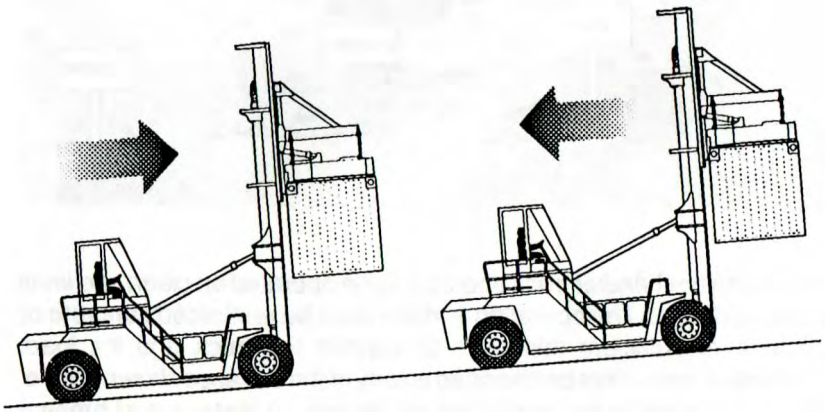


When your visibility is restricted it may be necessary to travel in reverse. Again be extremely careful and travel at a safe operating speed. Use left mirror when turning left and traveling backwards to ensure no objects or pedestrians are in the path of the steer wheels. When turning right while traveling backwards or when traveling straight backwards, use your mirror and look over your right shoulder to make sure no objects or pedestrians are in the path of the steer wheels. Always watch for obstacles that could be in your path such as pedestrians or objects overhead.

Grades, Ramps, Slopes and Inclines

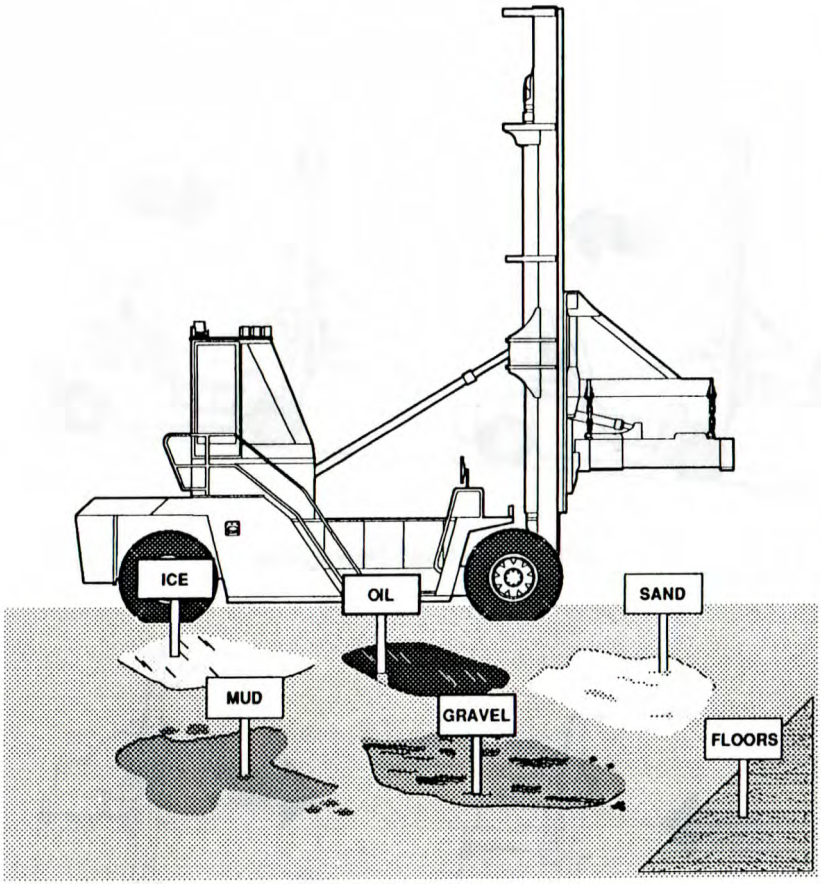


Unloaded - Load Downgrade



Loaded - Load Upgrade

Surface and Capacity



The contrainer handler truck should only be operated on clean and level paved surfaces. The operating surface must be reinforced concrete or concrete of sufficient thickness to support the truck and it's load. Obviously it should not be operated on any of the surfaces shown above. These materials however may be on the paved surface and present operating hazards that must be recognized.

Counterweights and Counterweight Bolts

The container handler truck is equipped with two upper counterweights and a lower counterweight. They are bolted to the truck frame by through bolts, flat washers and locknuts. It is very important that the counterweight bolts be in place and properly torqued whenever the truck is operated.

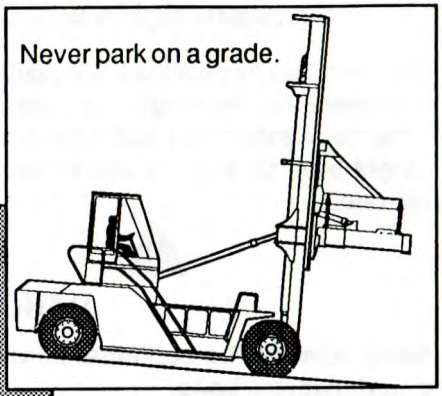
DANGER

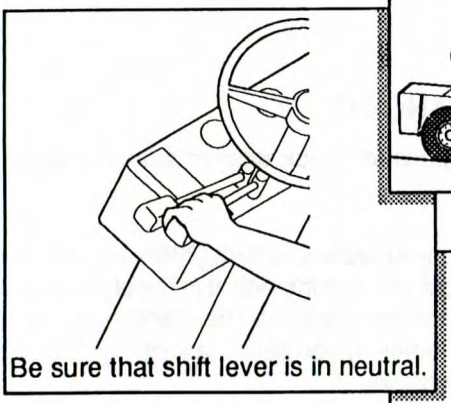
Never operate the container handler truck with missing or loose counterweight bolts.

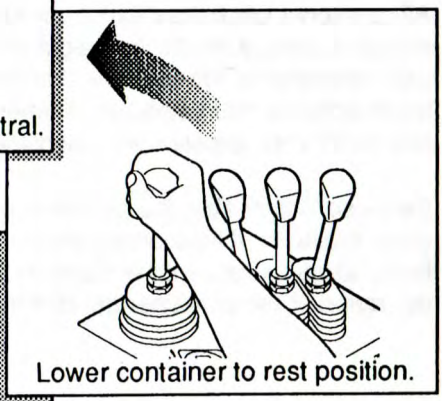
All counterweight bolts should be torqued to 950 N•m (700 ft lbs) and this torque should be re-checked regularly. It is important to the stability and safe operation of the container handler truck that the clamping force of these bolts be maintained at all times. If you notice a loose or missing bolt notify your supervisor immediately

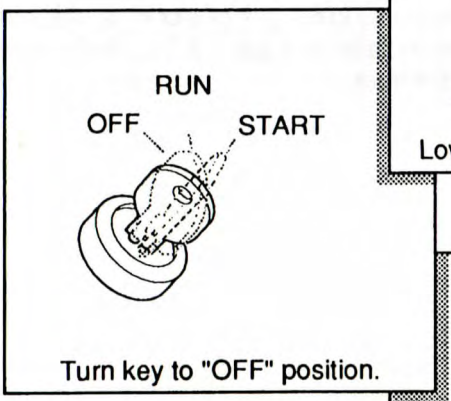
Because of their size, the counterweight bolts are not readily, commercially available. If it becomes necessary to replace one or more of these bolts, always use genuine Clark replacement parts to insure the safe operation of the container handler truck.

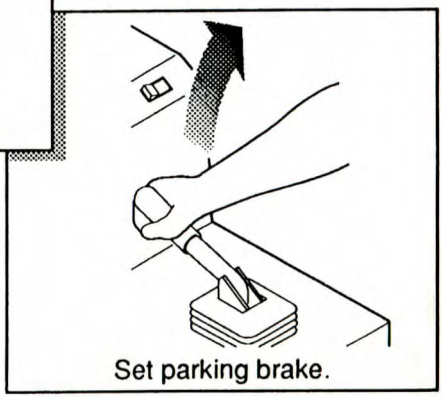
Parking


Never park on a grade.


Be sure that shift lever is in neutral.


Lower container to rest position.


RUN
OFF
START
Turn key to "OFF" position.


Set parking brake.

2 Operating Hazards

Index

Damaged Containers **2.2**

Wide Loads **2.2**

Rear Swing **2.3**

Right-Angle Stacking **2.4**

This section shows 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 boss to help you identify and avoid those hazards.

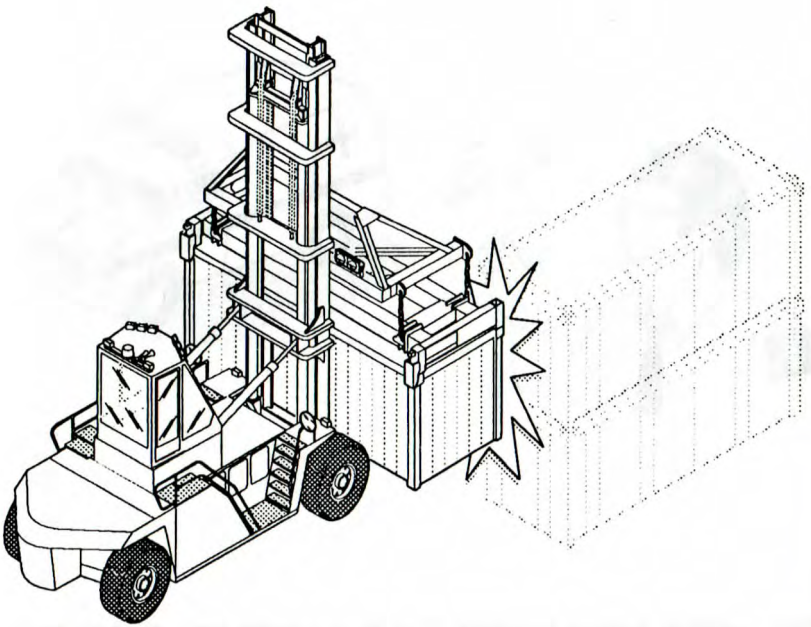
Damaged Containers

WARNING

Before lifting any container, look it over for structural damage. Look for any distortion of the twistlock pockets. If you observe any damage or if the twistlock fails to engage, ask your supervisor about how to proceed. Special methods may be required to move a damaged container.

Wide Loads

WARNING

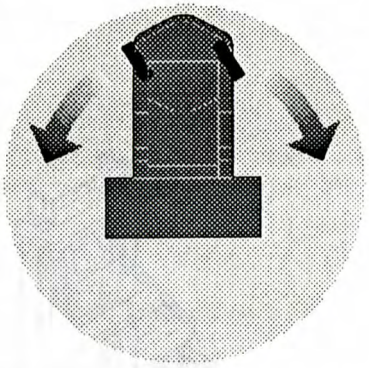


Containers, particularly forty foot units, are to be considered wide loads. When traveling with the load elevated for visibility, do so with extreme care and be alert for obstructions that might contact the leading edges of the container. Also, be aware of load end swing when turning.

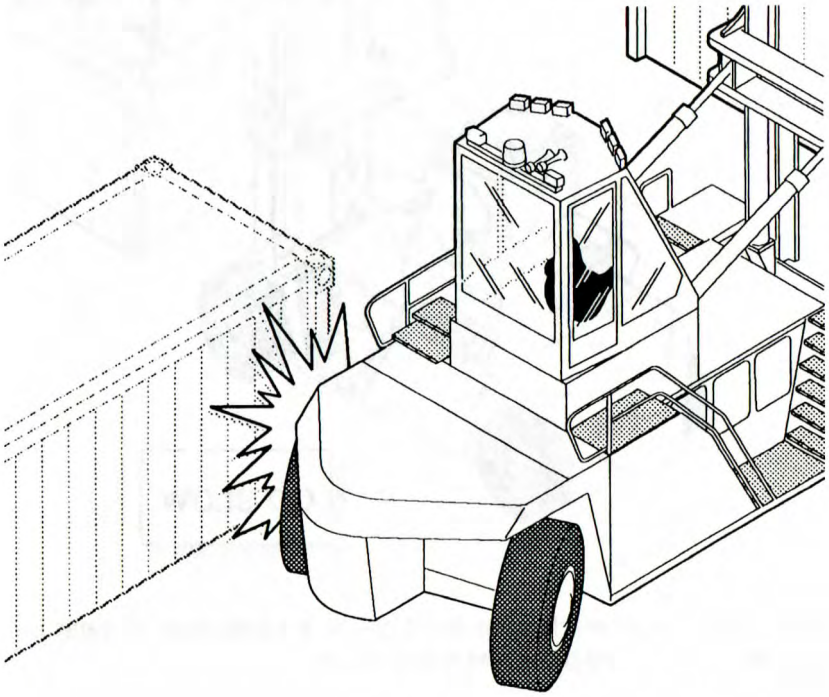
2 Operating Hazards

Rear Swing

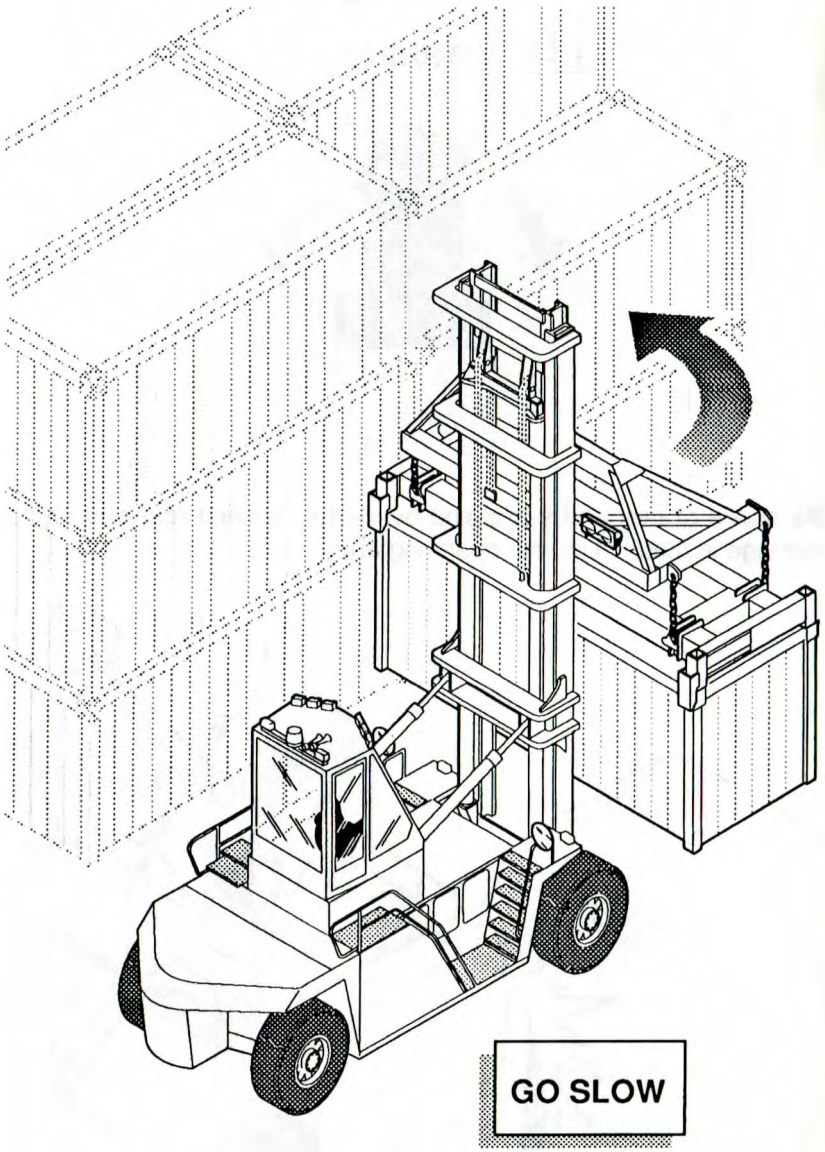
WARNING



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



Right Angle Stacking



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

3 Know Your Truck

Index

Truck Model Descriptions **3.2**

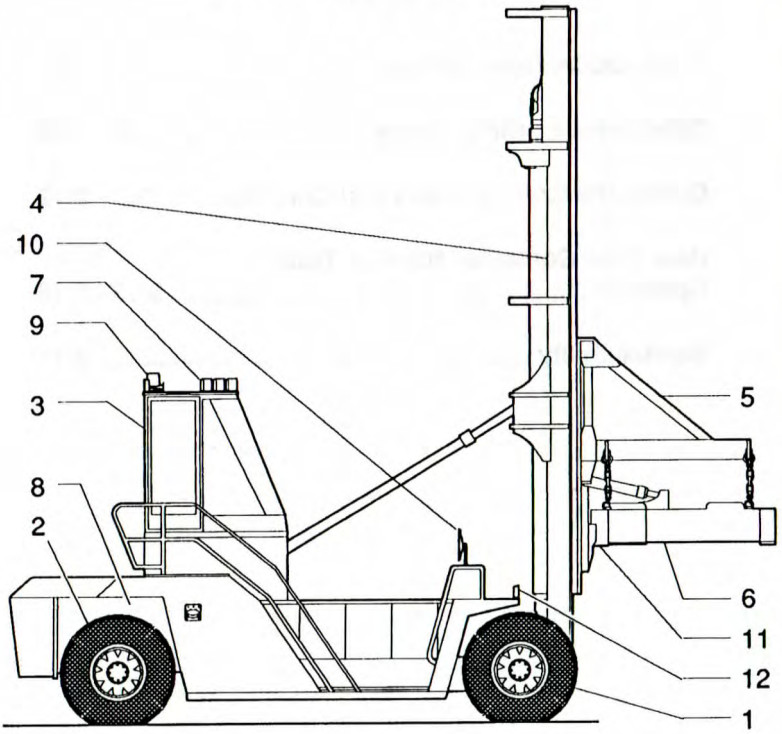
Safety and Warning Plates ..... **3.3 - 3.6**

Operator's Compartment and Controls ..... **3.7 - 3.12**

How Your Container Handler Truck Operates ..... **3.13 - 3.16**

Serviceability **3.17**

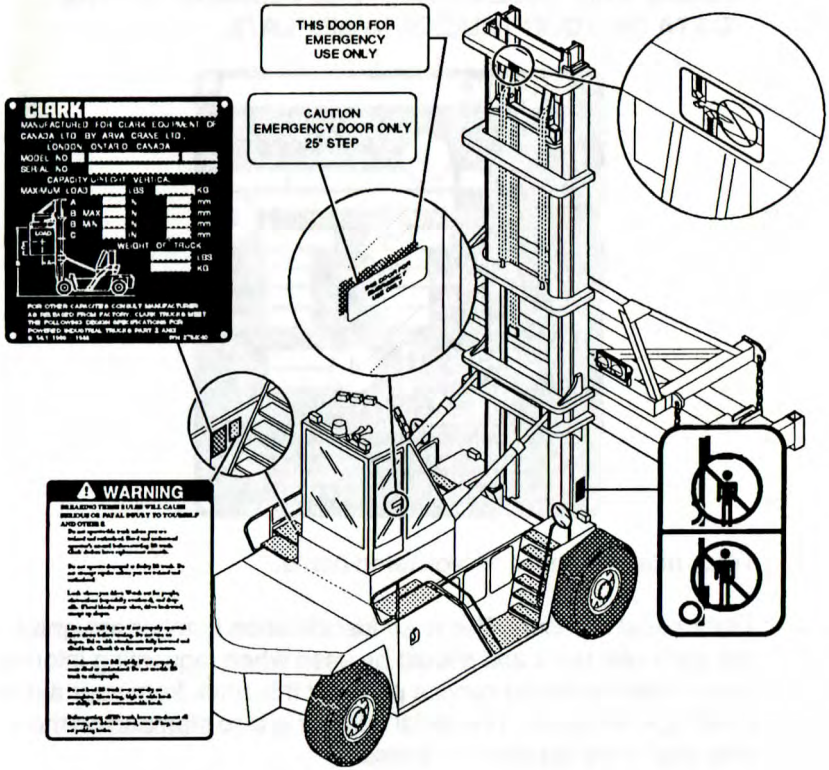
Truck Model Descriptions



C500 Y 950CH

1. Drive Axle, Wheels and Tires
2. Steer Axle, Wheels and Tires
3. Cab
4. Upright
5. Lift Frame Carriage
6. Extendable Lift Frame
7. Front Light Bar
8. Backup Alarm
9. Rear Light Bar w/Strobe and Horns
10. Rear View Mirrors
11. Twistlocks
12. Front Headlights

Safety and Warning Plates

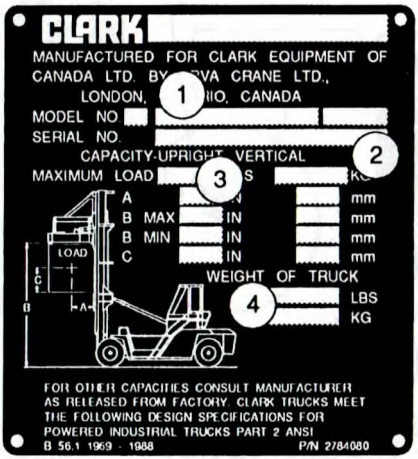


Safety and warning labels are placed in conspicuous locations on the truck. These decals are provided to remind you of either essential procedures or to prevent you from making an error which could damage the truck or possibly cause personal injury. It is important that you know, understand and follow these instructions. These safety and warning labels should be replaced immediately if missing or defaced (damaged or illegible). This is an OSHA requirement. You can obtain a decal kit from your CLARK dealer.

Safety and Warning Plates

Truck Data and Capacity Plate

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



1. Truck model number or registered name.

2. Truck serial number. This is an identification number assigned to this particular truck and should be used when requesting information or when ordering service parts for this truck from your authorized CLARK dealer. The serial number is also stamped on the left side above the bottom step frame.

3. Capacity rating and lifting height data. This shows the maximum load capacity of this truck with relation to load centers and container lift heights (see diagram on plate). Personal injury and damage to the truck can occur if these capacities are exceeded. DO NOT EXCEED MAXIMUM SPECIFIED.

KNOW AND UNDERSTAND YOUR TRUCK LOAD RATING

4. Truck weight. This is the approximate weight of the truck without a load. This weight plus the weight of the load must be considered when operating.

Safety and Warning Plates

⚠ WARNING

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

Do not operate this truck unless you are trained and authorized. Read and understand operator's manual before starting lift truck. Clark dealers have replacement manuals.

Do not operate damaged or faulty lift truck. Do not attempt repairs unless you are trained and authorized.

Look where you drive. Watch out for people, obstructions (especially overhead), and drop-offs. If load blocks your view, drive backward, except up slopes.

Lift trucks will tip over if not properly operated. Slow down before turning. Do not turn on slopes. Drive with attachments fully lowered and tilted back. Check tires for correct pressure.

Attachments can fall rapidly if not properly controlled or maintained. Do not use this lift truck to raise people.

Do not load lift truck over capacity on nameplate. Move long, high or wide loads carefully. Do not move unstable loads.

Before getting off lift truck, lower attachment all the way, put drive in neutral, turn off key, and set parking brake.

Operator Safety Warning Plate

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

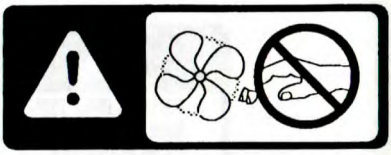
Emergency Exit Door Label

This safety label is placed on the inside of the right hand door to warn of the danger of using this emergency exit as a normal way to leave or enter the operator's compartment. Due to the large step, it makes it extremely hazardous for an exit. This door is intended for an emergency exit only.

CAUTION
EMERGENCY DOOR ONLY
25" STEP

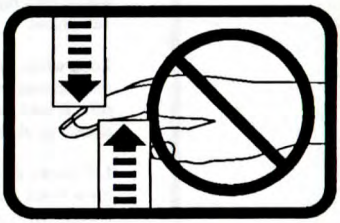
Safety and Warning Plates

Fan Warning Label



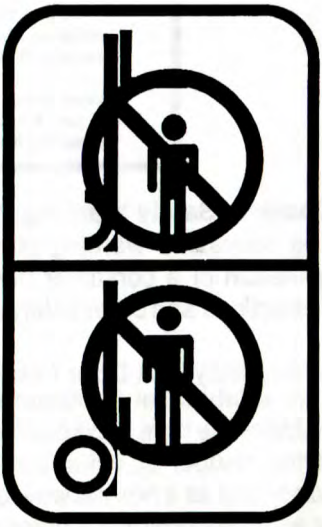
This safety label is displayed on the cooling fan shroud of the radiator to warn of the danger of injury from turning fan blades when the engine is running. Be sure that you keep your hands, fingers, arms and clothing away from a spinning fan. Don't stand in line with a spinning fan. Fan blades can break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

Upright Warning Label



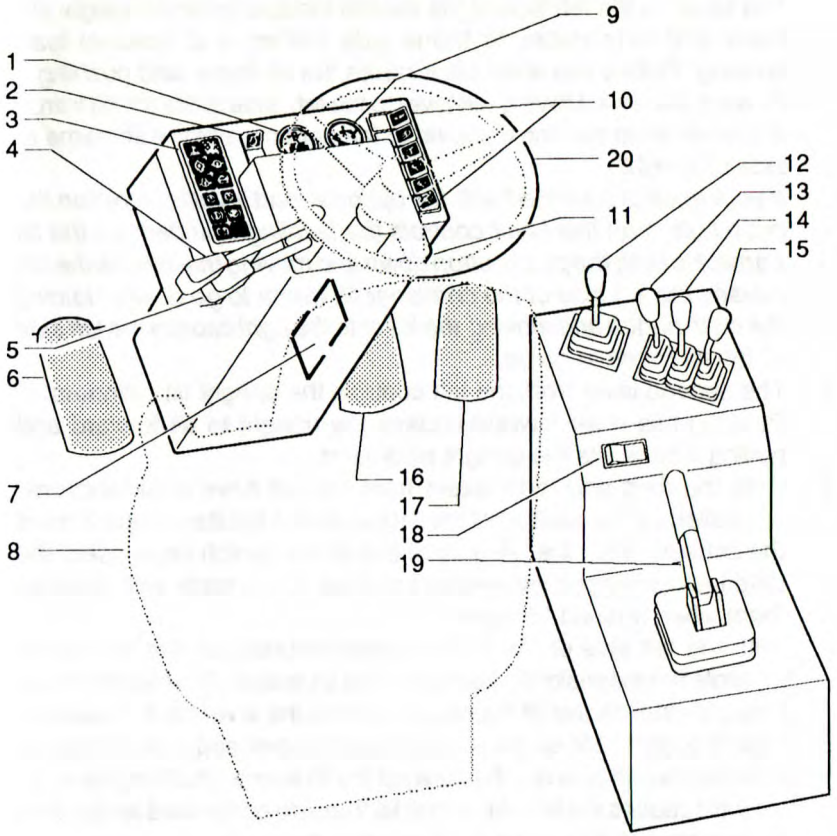
This safety label is placed on the upright to warn of the danger of injury from movement between rails, chains, sheaves, lift frame carriage and other parts of the upright assembly. Do not climb on or reach into the upright. Personal injury will result if any part of your body is put between moving parts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

Keep Away From Lift Frame Label



This safety label is placed on the upright to warn of the danger of injury from the lift frame carriage and extendable lift frame. No one should routinely walk under the load. If it is necessary to work under the lift frame, use a blocking means to prevent any unexpected movement, always wear a hard hat. Be alert to any possible dangers when working around equipment as large as the container handler truck. Do not ride on the extendable lift frame or its load. The lift frame should be in the fully lowered position when not in use.

Operator's Compartment & Controls



1. Hour Meter
2. Ether Start Switch
3. Warning Indicator Lights
4. Directional Control Lever
5. Range Selector
6. Declutching Pedal
7. Access Door to Circuit Breakers
8. Suspension Seat
9. Fuel Gauge
10. Lights / Wiper Switches
11. Key Switch
12. Lift, Lower, Sideshift, (Optional Load Levelling)
13. Tilt Lever
14. Reach (left)/Twistlock
15. Reach (right)/Extend-Retract
16. Service Brake
17. Accelerator Pedal
18. Mode Selector (14/15)
19. Parking Brake
20. Steering Handwheel

Operator's Compartment & Controls

Hydraulic Hand Controls

1. The lever on the left side of the control module controls upright lift/ lower and extendable lift frame side shifting and optional load leveling. Pulling this lever back raises the lift frame and pushing it forward lowers it. Moving the lever to the left, side shifts the lift frame to the left while moving the lever to the right causes the lift frame to side shift right.
   If your truck is equipped with the optional load leveling function the push button on this lever controls the leveling cylinders on the lift frame. Holding the push button down and moving the lever to the left causes the left side of the container lift frame to go down. Holding the push button and moving the lever to the right causes the left side of the lift frame to go up.
2. The second lever from the left controls the upright tilt cylinders. Pushing this lever forward causes the upright to tilt forward and pulling it back tilts the upright backward.
3. Both the third and forth levers from the left have dual functions, controlled by the position of the rocker switch located on the front of the console. With the left side of the rocker switch depressed, the third lever engages the twistlocks when pulled back and releases them when pushed forward.
4. With the left side of the rocker switch depressed, the forth lever controls the extension/retraction of the lift frame. Pushing the lever forward extends the lift frame and pulling the lever back retracts it.
5. With the right side of the rocker switch depressed, the third lever controls the left side reach (skew) of the lift frame. Pushing the lever forward causes the left side of the lift frame to go forward and pulling it back causes it to come back towards the truck.
6. With the right side of the rocker switch depressed, the forth lever controls the right side reach (skew) of the lift frame. Pushing the lever forward causes the right side of the lift frame to go forward and pulling it back causes to come back towards the truck.
7. With the right side of the rocker switch depressed, it is possible to rotate the container handler by pushing and pulling the third and fourth levers at the same time.
8. The hydraulic system is equipped with an automatic "float/hold" feature. The purpose of the system is to allow some hydraulic oil to flow between the reach (skew) cylinders causing them to act as shock absorbers while traveling with a container and provides a

cushioning effect for the initial contact between the lift frame and the container. The shock absorbing effect dampens the movement of the container and eliminates free swinging on the chains while traveling. The "hold" mode is activated when either side of the reach (skew) function is used. The "float" mode is activated when the truck direction control is shifted to reverse.

Instrument Panel

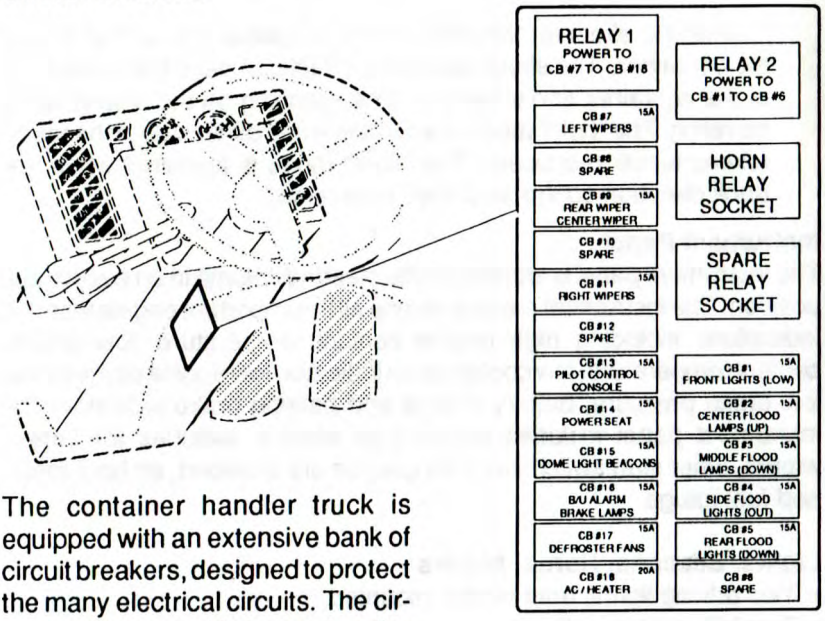
The instrument panel is located on the steering column in an easy to see position. The instrument panel contains all the important engine warning indications including high engine coolant temperature, low engine coolant temperature, low coolant level indicator, low engine oil pressure, low brake pressure, battery charge and parking brake indicator. The instrument panel includes rocker type electric switches for lamps, wipers, ether start switch etc. Two gauges are provided, an hour meter and fuel gauge.

Lights, Beacons, Horns, Alarms

- Two driving lights, front fender mounted.
- Two tail and brake lights.
- Forward light bar, mounted on cab roof. Six flood lights which can be adjusted to cover twistlock location at all elevations.
- Rear light bar, mounted on cab. Contains 2 flood lights for traveling backwards, two high volume (very loud) back-up alarms and 1 strobe light and horn.
- Back-up alarm automatically sounds when direction control lever is shifted to reverse. Adjustable sound level.
- The horn button is located in the center of the steering wheel.
- Automatic engine shutdown system protects engine and transmission in the event of:
  - Low engine oil pressure.
  - High engine coolant temperature.
  - High transmission oil temperature.
- Audible shutdown warning for 30 seconds prior to actual engine shutdown.

Operator's Compartment & Controls

Circuit Breakers



The container handler truck is equipped with an extensive bank of circuit breakers, designed to protect the many electrical circuits. The circuit breaker panel is located on the right side of the steering console, behind an access door shown above. The breaker decal, shown above, is located on the inside of the access door. The decal explains the functions of the relays and circuit breakers.

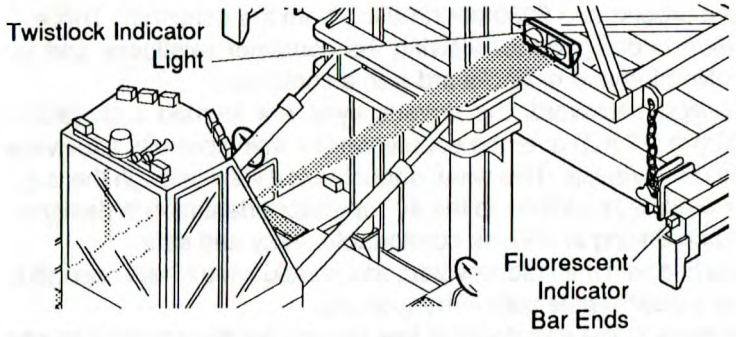
While a circuit breaker may be tripped as the result of a momentary overload, repeated tripping of breaker is not normal. If a circuit breaker immediately trips after being reset or trips shortly after being reset, have the trucks electrical system checked out by a qualified service mechanic.

Steering

Steering is the new Clark variable demand ratio hydraulic control hydrostatic steering. Variable demand ratio permits careful control of steering with slow revolutions of the steering wheel and rapid steering with high rpm of the steering wheel. This unique steering concept allows precise control when needed and quick response as well. When the steering wheel is turned slowly there are 4.8 revolutions, lock to lock. When the steering wheel is turned rapidly (up to 85 rpm) there are 3.4 revolutions, lock to lock.

Twistlock Operation

Each twistlock is equipped with a spring loaded locking pin that prevents the twistlock from rotating when not in a container corner pocket. The red indicator light is controlled by the locking pin.



When the extendable lift frame is lowered in correct position onto a container, the locking pin contacts the container and is depressed. This leaves the twistlock free to rotate and the red indicator light goes out.

When the twistlock control lever is pulled back a hydraulic cylinder which is attached by a rod and cam to the indicator bar rotates the twistlocks 90°. This turns the green indicator light on and causes the fluorescent orange ends of the indicator bars to be exposed. The twistlocks enter narrow openings in the container corner pockets and after being rotated are trapped by the container.

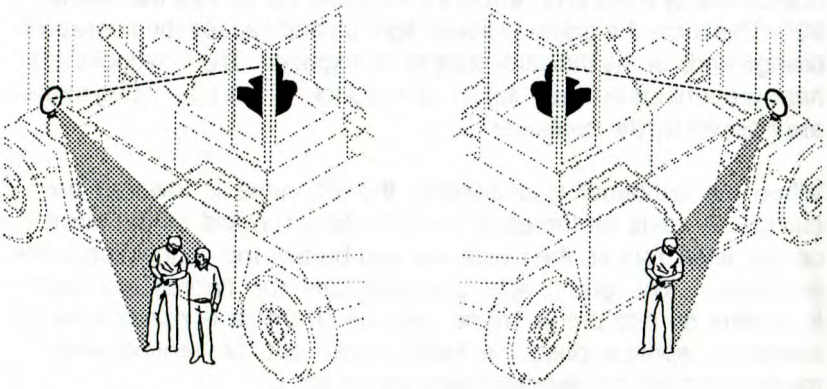
When the container is deposited, the lift frame is lowered until it completely rests on the container. Pushing forward on the twistlock control lever rotates the twistlocks and breaks the connection to the container. The green light goes out and the fluorescent orange indicators go into the lift frame. As the lift frame is raised from the container, springs push the locking pins out, preventing twistlock rotation and the red indicator light comes on.

Operator's Compartment & Controls

Visibility

The container handler truck was designed for maximum visibility for safe and productive operation.

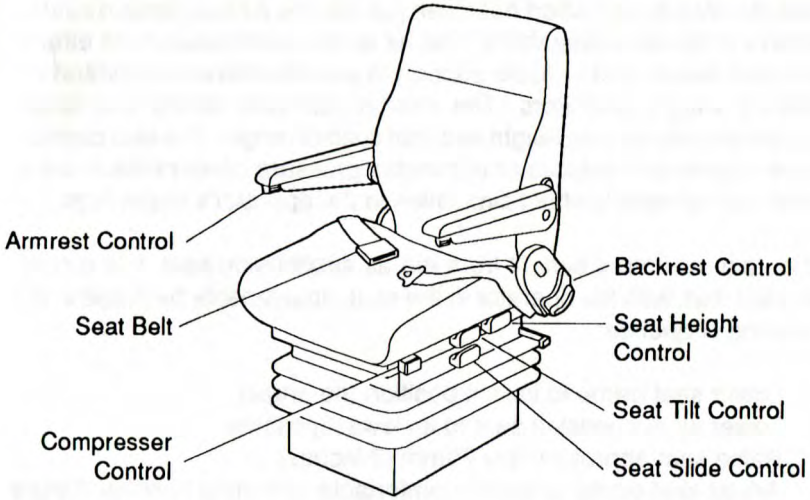
- The operator is located in the optimum location for handling containers or trucks (lorries) and for stacking containers one upon the other up to 4 high. The operator's eye is approximately 4190mm (165 in.) above ground and 5080mm (200 in.) from the container. This eye location is designed for viewing the container twistlocks and for travelling forward or backward with a container.
- Travelling backward, the driver's eyes are located high (about 1830mm (72 in.)) over the counterweight which permits a full view behind the vehicle. This wide, unobstructed view through the large rear window in addition to the 40° operator orientation is designed to make driving in reverse comfortable, easy and safe.
- Travelling with the load elevated, you should have it high enough to have a clear visible path in front of you.
- The glass in the cab doors 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 on the front hand rails. The adjustment of these mirrors must be checked before operating the container handler truck to insure complete visibility along each side of the truck.



WARNING

Do not operate the container handler truck until mirrors are adjusted for complete visibilty along both sides of the truck

How Your Container Handler Truck Operates



Seat and Seat Adjustment

The container handler truck is equipped with a air suspension seat. It has a variety of adjustments designed to fit the seat to the operator. By providing comfort and support, driver fatigue is reduced which contributes to the safe operation of the truck.

The arm rests can be adjusted individually for angle and may be folded back when not needed. The arm rest release is located under the lower front edge of each rest.

Seat height is controlled by an air spring which is driven by an electrically powered air compressor. The compressor switch is the front button on the lower left edge of the seat. The air spring provides 150 mm (5.9 inches) of seat height adjustment. An additional 65 mm (2.6 inches) of mechanical seat height adjustment is also provided.

The tilt of both the seat back and the seat cushion can be adjusted individually.

178 mm (7 inches) of horizontal seat adjustment is provided.

WARNING

Always fasten seat belt before operating the container handler truck

How Your Container Handler Truck Operates

Seat Adjustment

Considerable design effort has been put into the air suspension seat to achieve optimum adjustability. The air suspension adjustment effects both seat height and variable support to provide maximum comfort for different weight operators. The mechanical seat height and angle adjustment effects seat height and seat cushion angle. The seat cushion angle adjustment reduces or eliminates pressure concentration areas which can adversely effect circulation in the operator's upper legs.

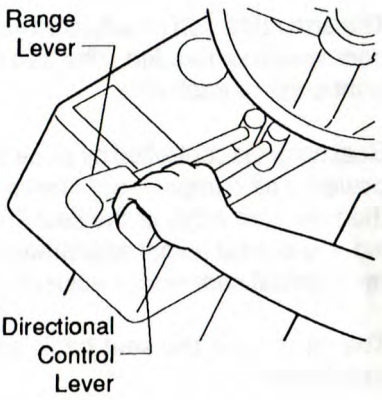
To obtain maximum benefit from the air suspension seat, it is recommended that, with the operator in the seat, adjustments be made in the following sequence:

1. Lower seat frame to lowest position (no angle).
2. Lower air suspension seat to its lowest position.
3. Raise seat approximately 75mm (3 inches)
4. Adjust seat frame to obtain comfortable operating position (height and angle).
5. Make final height adjustments by raising or lowering the air suspension mechanism.

Direction and Speed Control

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

Range Selector Lever
This lever controls transmission ranges. Pull clear back for 1st gear and forward from there for 2nd, 3rd and 4th.

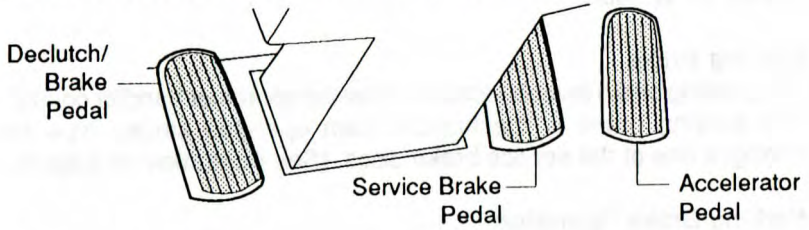


IMPORTANT
For safety, always bring the truck to a complete stop before shifting to the opposite direction.

How Your Container Handler Truck Operates

Accelerator Control Pedal

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



Declutch/Brake Pedal

The left foot pedal is provided for declutching and braking control of your container handler truck. Pushing gradually on the pedal will smoothly disengage the driving clutch in the transmission as the pedal is moved. When the pedal is pushed further, the service brakes are applied.

Declutch/Brake Operation

By declutching the transmission and applying the service brake with the left pedal, the right foot is left free to maintain high engine speed for fast operation of the hydraulic functions. Do not drive with your left foot resting on the declutch/brake pedal which will cause continuous slipping of the clutch and excessive wear.

CAUTION

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

Service Brake System

The container handler truck is equipped with hydraulic, piston activated dual caliper brake heads mounted on two 3/4" thick discs on the drive axle input shaft, adjacent to the differential. The brake heads are bolt together design and are self adjusting. The have four hydraulic pistons per caliper to provide adequate braking for a 100 ton vehicle without overheating. For further information on the disc brakes and brake hydraulics, see your service manual.

How Your Container Handler Truck Operates

Service Brake / Declutching Pedals

The right foot pedal is provided for normal brake control of your container handler truck. However, the pedals are linked together and the service air brakes can be applied by pushing on either the right or left foot pedal. NOTICE: Always use the right pedal for braking when on a grade, the left declutch pedal could allow the truck to roll before the brakes are applied.

Parking Brake

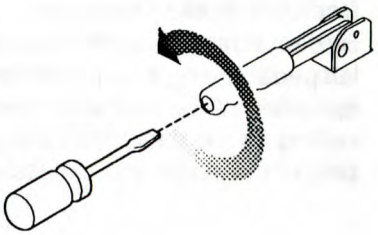
The parking brake lever is located below the container handler controls. The parking brake is mechanical, cam operated caliper type that engages one of the service brake discs. (See illustration on page 3.6)

Parking Brake Operation

Fully apply parking brake by moving from full forward to full rear position. Cable tension should be strong enough so that lever hesitates or remains in a vertical position before passing center to full rear position.

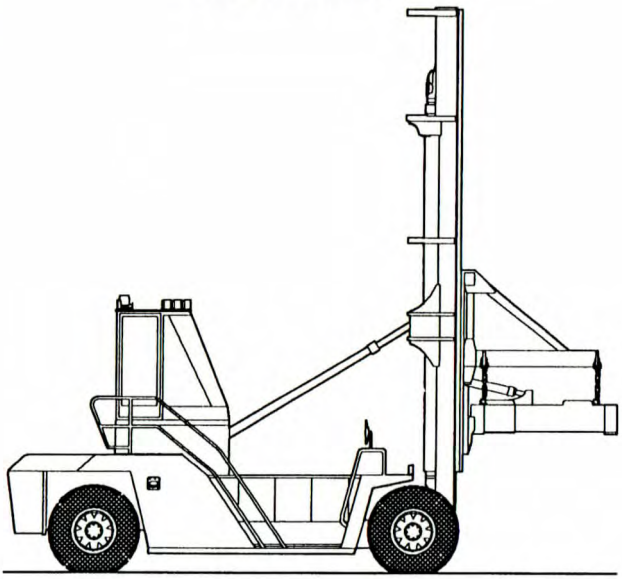
Parking Brake Adjustment

1. Release hand brake lever. Rotate screw on end of lever counterclockwise to end of travel to release all cable tension.
2. Place brake lever in the applied, full vertical position.
3. At the brake head there is a slotted nut which can be used as an adjusting nut for lining wear. Adjust until the brake pads are within .015 inch of the brake disc.



4. Rotate screw on the end of the lever clockwise several turns; enough to place considerable tension on the cable. Apply hand brake and start engine.
5. If the vehicle moves or creeps when accelerator is applied, rotate several more turns to increase tension on the cable then check again. Readjust until brake meets specification.
   NOTE: The parking brake must be capable of holding truck in 2nd gear against full throttle.

Serviceability



Your container handler truck is designed to provide easy access to all serviceable components. Three doors on each side of the truck, a door under the left side stairs, three removable plates in front of the cab and a hinged grill behind provide access. The cab is hinged at the back to pivot backwards, providing access for engine or radiator removal. The cab can be pivoted without disconnecting any hydraulic, electrical or cable controls.

Components may be accessed through the following openings:

Engine Oil Filter ..... Left side door
Engine Oil and Transmission Dipsticks ..... Left side door
Hydraulic Valves, Filters
and Radiator Overflow Bottles ..... Door under left side stairs
Engine Air Cleaner ..... Removable hinged grill behind cab
Hydraulic Pumps,
Brake Discs and Calipers ..... Removable plates in front of cab
Engine Fuel Filters ..... Right rear side door
Batteries ..... Right side doors
Transmission Filter ..... Right side middle door

4 Operator Care and Maintenance

Index

Daily Safety Inspection ..... **4.2 - 4.4**

Visual Checks **4.5**

NOTICE

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

Daily Safety Inspection

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

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

Do not make repairs yourself unless you have been trained in container handler truck repair procedures and authorized by your employer. Have a qualified mechanic correct all discrepancies using genuine CLARK or CLARK-approved parts.

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

Container handler trucks should be inspected every 8 hours, or at the start of each shift. This daily inspection should include a visual check for leaks and any obvious damage which may have been caused by operation during the last shift. Look the upright and lift chains over. Check the extendable lift frame and lift frame carriage for cracks or damage. Look for loose bolts and fittings. Check the tires, wheels and wheel mounting bolts. Check the engine oil, fuel and coolant levels as well as the hydraulic sump oil level. Check all of the controls. Operate the truck briefly to be sure that all systems are operating correctly and that all instruments, warning lights and the horn are functioning.

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

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

Daily Safety Inspection

Visual Checks

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

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

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

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

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

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

Carefully inspect the lift frame for cracks, breaks, bending, twists and wear.

Inspect the wheels and tires for safe mounting, wear condition and air pressure.

Functional Checks

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

Start the engine and be sure all controls and systems are functioning correctly. Check the hour meter for operation. Operate the service and parking brakes, all hydraulic controls: lift, tilt and container handler functions, accelerator, directional control and steering system. Be sure all controls operate freely and return to neutral properly. Operate the lift and container handler mechanism.

Daily Safety Inspection

WHEN FUNCTIONAL CHECKS ARE COMPLETED:

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

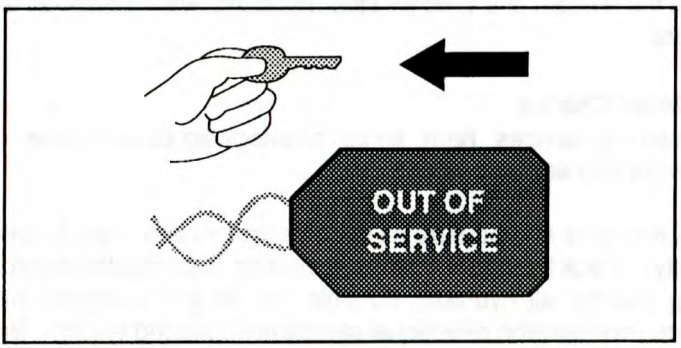
Standard Shut Down Procedure

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

Make a record on the "Driver's Daily Checklist' of all the operating and truck problems that you find. Review the checklist to be sure it has been completed and turn it in to the person responsible for container handler truck maintenance. Be sure any unusual noises or problems are investigated immediately.

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

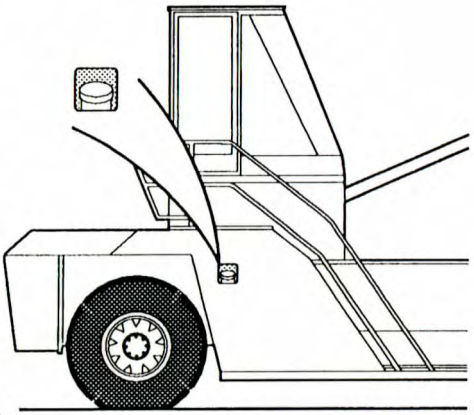
Remove the key from the key switch and put an "Out of Service" tag on the truck.



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

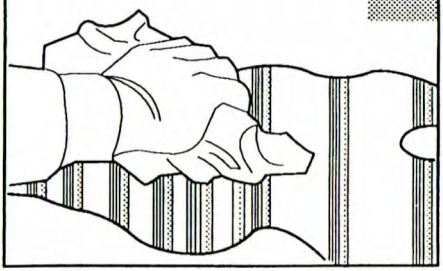
Fuel Safety Practices

Refueling



Use clean, properly marked fuel cans.

Clean up spills.



5 Starting and Operating Procedures

Index

How To Start Your Truck ..... **5.2 - 5.5**

How To Operate Your Truck ..... **5.6 - 5.16**

When Finished Using Your Truck **5.17**

5 Starting and Operating Procedures

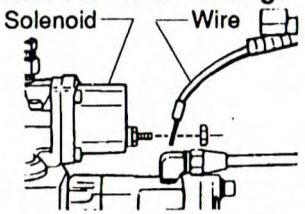
How To Start Your Truck

WARNING

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

Starting Procedure After Extended Shutdown or Oil Change

Complete the following steps after each oil change, or after the engine has been shut off for more than 3 days to make sure the engine receives the correct oil flow through the lubricating oil system.



1. Disconnect the electrical wire from the fuel pump solenoid valve.
2. Rotate the crankshaft, using the starting motor, until the oil pressure warning light goes off.
3. Reconnect the electrical wire to the fuel pump solenoid valve.
4. Start the engine per the procedures provided on the following pages.

Starting Tips

Avoid excessive starter cranking (in excess of 30 seconds) with a difficult to start engine. To avoid starter overheat or damage, do not crank the starter continuously for more than 30 seconds at a time. If the engine fails to start within a period of 30 seconds, wait 2 - 3 minutes before again attempting to start your container handler truck. If your battery is "run down" (discharged) or becomes discharged while trying to start your truck, please refer to the "Emergency Starting - How To Use Battery Jumper Cables" section of this manual.

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

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

5 Starting and Operating Procedures

How To Start Your Truck

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

Automatic Engine Shutdown
Your truck is equipped with a Low Engine Oil Pressure, High Engine Coolant Temperature and High Transmission Temperature Shutdown System. If low engine oil pressure or high engine coolant or transmission temperature occurs, the engine will shutdown. The effected indicator light will come on and an audible warning will sound for 30 seconds prior to actual shutdown. In an emergency the engine may be restarted by returning the key switch to the "OFF" position and then restarting. The engine will run for about 30 seconds and again shutdown.

Engine Starting and Operating Recommendations
Avoid damage to your truck or possible harm to yourself. Follow these recommendations:

When the engine is first started, the blue indicator light (top right indicator light) will come on. Allow the engine to idle until this light goes out before operating truck. This procedure will help prolong life.

Then operate the controls and check all warning indicators to be sure they are functioning properly. A "check circuit" is provided to do this. When the key switch is in the start position, all indicator lights should be on. If any indicator light is not on, either the bulb, sender or electrical wiring is defective. Have any defective indicator light checked out by a qualified mechanic before operating the truck.

Stop the engine and make a visual inspection for oil, water or fuel leaks.

Do not operate engine at speeds above idle for more than brief periods without a load.

Do not run the engine at maximum power continuously until engine is fully warmed up.

Never operate engine at more than the regular no-load governed speed. Excessive speeds are harmful.
NOTE -- The governor is set at the factory and should need no adjustment.

How To Start Your Truck

Engine Starting and Operating Recommendations (continued)

Avoid extended (in excess of 10 minutes) and unnecessary idling of the engine. If extended idling occurs or is anticipated beyond 10 minutes, turn off the engine.

CARBON MONOXIDE is colorless and odorless but can be present with all other exhaust fumes.

Prestart Instructions

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

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

IMPORTANT

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

Engine Starting Procedure

1. Apply parking brake and put direction control lever in neutral.
2. Depress the accelerator pedal to about half-throttle position.
3. Turn the key/start switch to the "Start" position to crank the engine. Return the key to the "Run" position and the accelerator pedal to idle as soon as the engine starts.
4. Engine oil pressure light must go out within 15 seconds after starting. If it does not, shut the engine down and report the problem.

How To Start Your Truck

5. When starting a cold engine, increase the engine speed (RPM) slowly to be sure adequate lubrication is available to the bearings and to allow the oil pressure to stabilize.
6. Idle the engine 3 to 5 minutes at 1,000 RPM before operating with a load.

CAUTION

To prevent damage to the starter, do not engage starting motor more than 30 seconds. Wait two minutes between each attempt to start.

Cold Weather Starting With Ether Start System

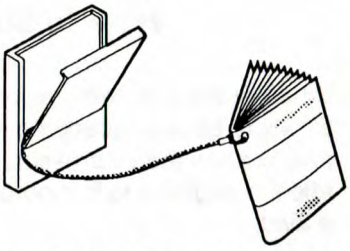
1. Apply parking brake and put direction control lever in neutral.
2. Depress the accelerator pedal to about half-throttle position.
3. Turn the key switch to the "Start" position and while cranking engine, push the cold start button to inject a metered amount of starting fluid into the induction system.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

NOTE: The ether cold start system is equipped with a temperature activated lock-out to prevent it's use with a hot engine.

5 Starting and Operating Procedures

How To Operate Your Truck

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



The operator's manual holder is located at the drivers right, fastened to the control lever housing just in front of the parking brake lever. The manual is attached to the holder with a lanyard to keep it with the truck.

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

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

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

WARNING

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

NOTICE

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

Recommended Operating and Driving Procedures

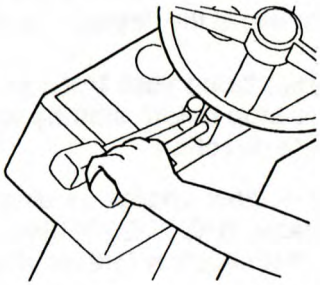
Sequence of Operation

This is a good time to adjust the seat to a comfortable position for you. Refer to page 3.10/ 3.11 for seat adjustment information.

How To Operate Your Truck

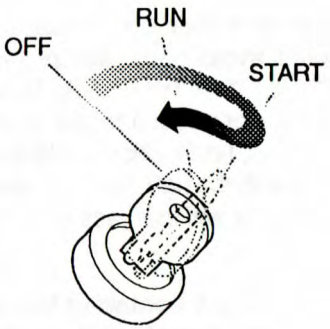
CAUTION

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



Your truck will not start in either "Forward or Reverse". Be sure that the directional control lever is in the "N" (neutral) position.

Start the Engine



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

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

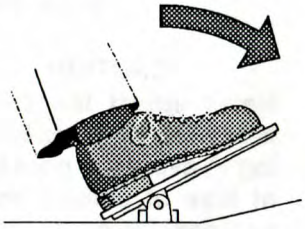
Immediately after engine starts, check gauges and indicator lights for correct readings. If any indicator light or gauge indicates a malfunction, stop engine and report the problem. When the container handler has no load, twistlock lights should be red.

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

Put your foot on the brake pedal and push down to apply the service brakes. Release the parking brake. Put the directional control lever in the correct position for the desired direction of travel.

How To Operate Your Truck

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



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

Any sudden change in direction can cause the truck to become unstable. THIS IS ESPECIALLY TRUE WHEN YOU ARE CARRYING A CONTAINER IN THE HIGHEST POSITION. Also, many components of the truck can be overloaded when a shift in direction is made without first slowing and stopping the truck.

When container is being carried high and the upright tilted back you should avoid hard, abrupt braking. FAILURE TO DO SO COULD RESULT IN A TIP OVER. To stop the truck, lift your right foot from the accelerator pedal and put your left foot on the declutch/brake pedal in a smooth, firm motion until the truck is stopped. You can also apply the brake with the right pedal. Doing so will not disengage the transmission, the engine will then assist in the braking.

IMPORTANT

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

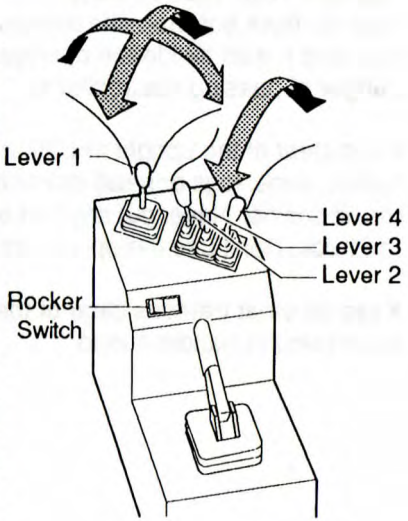
Safe operation is the responsibility of the operator. Watch were you are going...Don't go if you can't see.

- Before driving, check all around to be sure that our intended path of travel is clear of obstructions and pedestrians.
- While driving, be alert for pedestrians, other vehicles or obstructions in your path of travel.
- Watch people. Do not allow anyone to stand or pass under the load or lift frame. 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 whenever vision is obstructed. Do not drive a truck up to anyone standing in front of an object.

How To Operate Your Truck

Lever 1

The joystick with optional push button, controls upright lift/lower and extendable lift frame side shifting and optional load leveling. Pulling this lever back raises the lift frame and pushing it forward lowers it. Moving the lever to the left or right moves the lift frame in that direction. The push button controls the optional leveling cylinders on the left side of the lift frame. Holding the push button down and moving the lever to the left causes the left side of the lift frame to go down. Holding the push button down and moving the lever to the right causes the left side of the lift frame to go up.



Lever 2

This lever controls the upright tilt cylinders. Pushing this lever forward causes the upright to tilt forward and pulling it back tilts the upright back.

Lever 3

This lever controls the twistlocks and the left reach (skew) cylinder. Both the third and forth levers have dual functions controlled by the position of the rocker switch on the front panel of the control module. With the rocker switch in the twistlock position, pulling the third lever back engages the twistlocks and pushing the lever forward disengages them.

Lever 4

This lever controls the extension/retraction of the lift frame and the right hand reach (skew) cylinder. With the rocker switch in the extension/retraction position, pushing the lever forward extends the lift frame and pulling it back retracts it. With the switch in the reach (skew) position, pushing the lever forward causes the right side of the lift frame to go forward and pulling the lever back causes it to come back towards the truck.

With the rocker switch in the reach (skew) position it is possible to rotate the lift frame by pushing and pulling the third and forth levers at the same time.

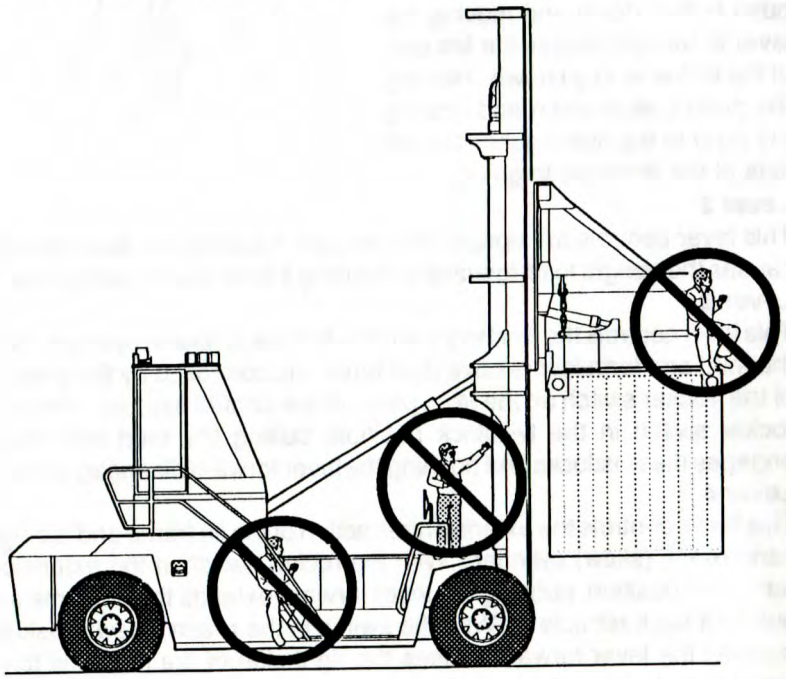
How To Operate Your Truck

Operate Your Truck Safely

Operate truck only from the designated operator's position. Keep arms, legs and hands inside the operators compartment and away from the danger of passing obstructions.

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 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. The flat surfaces of a container handler truck may seem to invite riders. This is an unsafe practice and no riders should be allowed.

How To Operate Your Truck

Always be in full control of your container handler truck.

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

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

Always pick the smoothest travel route for your container handler truck. Avoid bumps, holes, slick spots and loose objects or debris in your path that may cause the truck to swerve or tip. If these conditions are unavoidable, slow down and carefully drive past them. Slow down for wet or slippery surfaces.

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

Operate your container handler truck under all conditions at a speed that will permit it to be brought safely to a stop.

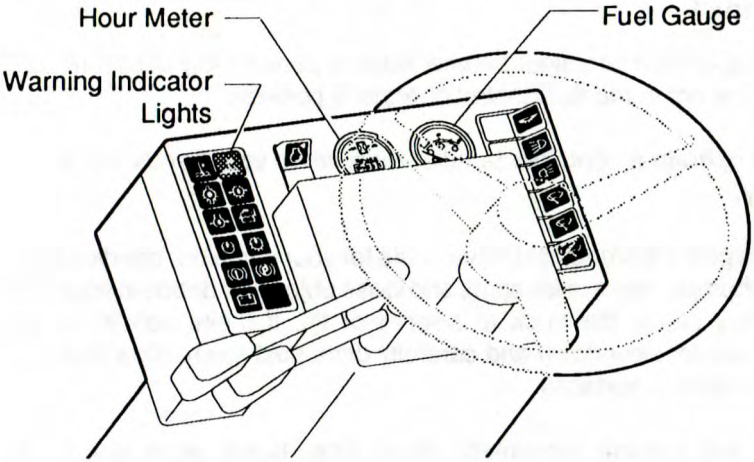
Travel with the lift frame raised only enough to provide forward visibility. When the (load) is in an elevated position the stability of the truck is reduced. Tilting the upright back will be necessary to maintain stability. The automatic "float" feature causes the reach cylinders to act as shock absorbers to dampen load swing while traveling.

Safe operation is the responsibility of the operator. Practice safe operation every time you use the truck.

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

How To Operate Your Truck



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

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

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

Grades

Use special care when operating on inclines and uneven areas. Travel slowly. Normally travel straight up and down. Do not turn or drive at an angle across an incline. Do not attempt to operate on grades in excess of those specified and/or recommended by the manufacturer. When the container handler is loaded, travel with the load upgrade. When it is empty, travel with lift frame downgrade. While the container handler truck is not expected to be operating in areas of steep grades, even dock and container storage areas may have some grades. If you must travel across even the slightest grade, do so with care and proper speed. During your work, observe all functions of your container handler truck. This will allow you to immediately recognize a problem or irregularity that could affect the safe operation of your truck.

How To Operate Your Truck

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.

Lift and lower with the upright mast vertical or tilted slightly back. NEVER TILTED FORWARD.

Operate lift and tilt controls slowly and smoothly. Never tilt forward when lift frame is raised except to pick up or deposit a load. When loaded and approaching a stack of containers you should remain in the back tilt position until you come within (1.5M) 5 feet of the stack then begin to tilt the upright to near vertical, to avoid the base of the upright from coming in contact with the bottom container to prevent damage to the truck and container.

Travelling

Travel with load elevated for visibility and tilted back. You should have it only high enough to have a clear visible path in front of you. Observe all traffic regulations and watch for other traffic, pedestrians and safe clearances. Always look in the direction of travel. Keep a clear view of the path of travel and when load blocks your visibility, travel in reverse with load trailing (except when climbing an incline).

IMPORTANT

When traveling with the heavy containers in a high position always have the upright tilted back for stability.

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. Avoid quick turning especially with the load elevated in fourth high position GO SLOWLY WHEN TURNING. Cross railroad tracks at an angle whenever possible.

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

Watch clearances around the truck and load as you travel. Look out for obstructions, especially overhead.

How To Operate Your Truck

Travelling (continued)

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

Always be concerned about the stability of your container handler truck.

Checks To Make Before Each Shift

1. Check that the pins at either end of both skew cylinders or reach cylinders are in place and locked.
2. Ensure that the quick release hydraulic couplings are secure.
3. Check for external oil leaks of hoses, fittings and hydraulic cylinders.
4. Fully extend the lift frame and check for alignment with the top corner pockets of a 40 foot I.S.O. container. Fully retract the lift frame and make the same check on a 20 foot container.
5. Check the operation of the twistlock indicator bars and red and green warning lights on both the 20 foot and 40 foot containers.

DANGER

Any defect must be reported and fixed by a qualified service mechanic before the unit is put in operation. Failure to do so could lead to an accident causing injury or even death.

Container Handling

1. Raise the lift frame so that the twistlocks are slightly above the container.
2. With the upright vertical, approach the container and line up the corner pockets with the lift frame corner guides.

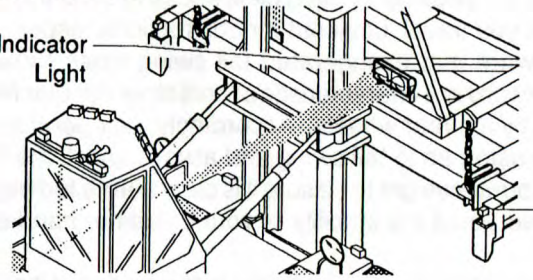
CAUTION

The two corner guides on the rear of the container handler are back-up pads to aid in location. They must not be used to push the container into lifting position.

3. Line up the twistlocks with the container corner pockets by using the truck's sideshift and/or reach (skew) functions.

How To Operate Your Truck

4. Lower the lift frame slowly until twistlocks have entered the container corner pockets fully and the lift frame is resting on the container.
5. Before trying to operate the twistlocks, make sure the lift frame is down fully on the container. The twistlock stop pins should now be pushed fully in and the red indicator light should be out.
6. Now pull back on the twistlock control lever to engage the twistlocks. The green indicator light should come on and the orange ends of the indicator bars should be visible.



If the green twistlock light fails to come on or either indicator bar does not appear to be fully visible, disengage and then re-engage the twistlocks. If after three attempts to engage the twistlocks, the green indicator light has not come on or either indicator bars has not came out fully, DO NOT ATTEMPT TO LIFT THE CONTAINER. Check the container for damage or distortion and if none found, have the extendable lift frame checked out by qualified service personnel.

7. If the indicator light is green and the orange paint is plainly visible on both indicator bars, the container may be lifted.
8. Before backing truck with container, look to see if the path to the rear is clear. Check in both rear view mirrors to see if anyone is near either side of the truck.
9. Line up the twistlocks with the container corner pockets by using the truck's sideshift and/or reach (skew) functions.

How To Operate Your Truck

10. Lift the container to a height that provides full visibility of the path ahead. It will be necessary to back tilt the upright for added stability. 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. Avoid sudden movements when carrying a container. Start, stop, travel, steer and brake smoothly. Steer clear of bumps, holes and loose materials or debris on the pavement. Go slowly when turning. Cross railroad tracks at an angle whenever possible. Watch clearances around the truck and container as you travel. Look out for obstructions, especially overhead. Be aware that exaggerated tail swing when turning while travelling forward is a characteristic of container handler trucks that are steered by the rear wheels. Accordingly, an operator needs to become accustomed to tail swing and always check the tail swing area of the counterweight to be sure it is clear before turning. Always be concerned about the stability of your container handler truck.

11. To deposit the container the lift frame is lowered until it completely rests on the container. Push forward on the twistlock control lever to rotate the twistlocks and break the connection to the container. The green indicator light will go out and the indicator bars will retract into the lift frame and the orange paint will no longer be visible. Raise the lift frame from the container. Springs will push the twistlock stop pins out and the red indicator will come on.

When You Have Finished Using Your Truck

Always leave your container handler truck in a safe condition
When you leave your truck, or park it, follow these safety rules:

- Park in a safe area away from normal traffic.
- Never park on a grade.
- Never park in areas which block emergency routes or equipment, or access to fire lanes, stairways and fire equipment.

Before leaving the operator's position

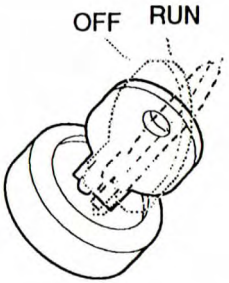
1. Bring truck to complete stop.
2. Put the directional control lever in the "N" (neutral) position.
3. Apply the parking brake.
4. Lower the lift frame to the "at rest" position.

In addition, when leaving the truck unattended

5. Stop the engine or turn off the controls.
6. Block the wheels, if the truck must be left on an incline or you have any doubt about the truck moving from a safe position.

Engine Shut Down Procedure

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



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

6 Emergency Starting

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How To Use Battery Jumper Cables .....6.2 - 6.5

6 Emergency Starting

How To Use Battery Jumper Cables

These instructions apply to the use of a 12V negative ground truck or other large vehicle with at least a 100 amp charging system and with a fully charged good ("booster") battery to start the engine of a container handler truck with a discharged ("dead") battery.

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

IMPORTANT

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

The amperage required to crank the Cummins LTA-10 diesel engine is such that usually insufficient current will flow from the battery of another vehicle through clamp on jumper cables. For this reason jump starting will be unsuccessful in most cases. A method that will often make it possible to crank the engine is to use the charging system of the other truck to partially charge the batteries of the container handler truck. Install the jumper cables as shown and start the engine on the assisting vehicle. Accelerate to approximately 1500 rpm for maximum charge and run for a minimum of ten minutes.

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

   WARNING

   SULFURIC ACID

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

How To Use Battery Jumper Cables

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

2. If the discharged batteries have 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

EXPLOSIVE GASES

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

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

3. Put the truck with the booster battery as near to the other truck as necessary for the jumper cables to reach both batteries. Check and make sure that the trucks do not touch each other.

   Use particular care when connecting a booster battery to prevent sparks.

4. On both trucks:
   a. Apply the parking brake.
   b. Put the directional control lever in the "N" (neutral) position.
   c. Turn the ignition key switch to the OFF position.
   d. Turn all accessories to the OFF position and leave them off until after the engine has been started and the jumper cables have been removed.

6 Emergency Starting

How To Use Battery Jumper Cables

WARNING

SHORT CIRCUITS

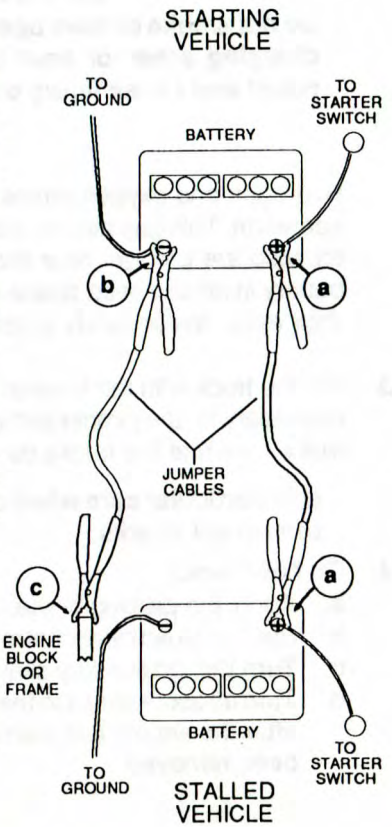
Remove all jewelry. Do not permit any metal tools to make contact with the positive battery terminal and other metal on the truck. Make sure when connecting jumper cable clamps to the positive terminals of the batteries that neither clamp contacts any other metal. Injury can occur from electrical shock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

5. Start the engine on the "Starting Vehicle" and run the engine at approximately 1500 rpm:

a. Connect the first jumper cable from the positive (+) (Red) terminal on one battery to the positive (+) (Red) terminal on the other battery. Never connect (+) (Red) to (-) (Black), or (-) to (+). (On two battery systems, connections may be made to either battery).

b. Next, connect one end of the second cable to the grounded (-) (Black) terminal of the "Starting Vehicle" battery.

c. Last, connect the other end of the second jumper cable to a stationary solid metallic point on the engine of the "Stalled Vehicle". (NOT TO NEGATIVE (-) TERMINAL OF THE BATTERY). Make this connection at a point at least 450 mm (18 inches) away from the battery, if possible. Do not connect it to pulleys, fans or other parts that move. Be sure not to touch hot manifolds which can cause severe burns.



How To Use Battery Jumper Cables

7. Start the engine on the "Stalled Vehicle". Follow the starting instructions in the "Starting and Operating Procedures" section of this manual. Be sure that the engine is at idle speed before disconnecting the jumper cables.

8. Remove the jumper cables by reversing the installation sequence exactly. Start by removing the last jumper cable from the truck with the discharged battery, first. Remove the cable end from the engine block first, then the other end of the negative (-) cable.

9. Remove both ends of the positive (+) cable.

DANGER

Never short across the starter terminals or apply external power directly to the battery terminal of the to starter to start the engine. This bypasses the neutral starting switch which could result in the truck moving suddenly, causing injury or even death. Severe electrical shock can also occur.

7 Emergency Towing
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Emergency Towing .....7.2 - 7.3

7 Emergency Towing

How To Tow a Disabled Truck

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

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

⚠ WARNING

DO NOT tow a container handler 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 container handler truck if traction or weather conditions are poor.

Towing Procedures

1. Be sure to apply the parking brake or block the drive wheels on the disabled truck while working around it.
2. Tow with another lift or container handler truck of equal or larger size carrying a partial load for traction. The towing vehicle should weigh more than the towed vehicle.
3. Tow the disabled truck backwards.
4. Before towing, check to be sure that the counterweight bolts are in place and properly torqued. (These bolts are made of special high tensile steel and none are commercially available. Replace, when necessary, only with genuine Clark replacement parts).
5. Use an approved, solid metal tow bar with towing couplers that connect to the towing pins in the counterweights.
6. The towed truck must have an operator.
7. Tow the truck slowly. Careful towing is necessary to prevent injury to personnel or damage to the truck. The truck should be towed at a speed of less than [8 kph] 5 mph with a driver in the seat. Do not lift the truck or any wheels off the floor or ground while the truck is being towed.

How To Tow a Disabled Truck

CAUTION

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

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

WARNING

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

8 Planned Maintenance and Lubrication

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8 Planned Maintenance and Lubrication

Container Handler Truck Maintenance

Regular maintenance and care of your container handler truck is not only important for full and efficient truck life; it is essential for your safety. The importance of maintaining your container handler truck in a safe operating condition by servicing it regularly and, when necessary, repairing it promptly cannot be emphasized too strongly. Experience has shown that powered industrial trucks can cause injury if improperly used or maintained. In the interest of promoting safety, several current industry and government safety standards specify that any powered industrial truck not in safe operating condition be removed from service, and that all repairs be made by trained and authorized persons. To assist you in keeping your container handler truck in service in good operating condition, this section outlines maintenance procedures to be done at regular intervals and that are considered essential to the life and safe performance of your truck. It is your responsibility to be alert for any indication that your truck may need service and have it attended to promptly. You play an important part in maintenance. Only you can make sure that your container handler truck regularly receives the care it needs.

CAUTION

Powered Industrial Trucks May Become Hazardous If Maintenance Is Neglected

Planned Maintenance

As outlined previously, a safety inspection of your container handler truck should always be made before operating it. The purpose of this daily examination is to check for any obvious damage and maintenance problems, and to have minor adjustments and repairs made to correct any unsafe condition.

In addition to the daily inspection, Clark recommends that you set up and follow a periodic planned maintenance and inspection program. Performed on a regular basis, the program will provide the opportunity to make thorough inspections and checks on the safe operating condition of your container handler truck. The need for major adjustments, repairs or replacements is found and corrections made as required; not after failure has occurred. The specific schedule (frequency) for these PM inspections will depend on the conditions of your particular application and container handler truck usage. The recommended planned maintenance and lubrication schedule lists those items considered

Planned Maintenance

essential to the safety, life and performance of your truck with typical recommended service intervals. Brief procedures for inspections, operational checks, cleaning, lubrication and minor adjustments are included for your reference.

Planned Maintenance Intervals

Your local Clark dealer is prepared to help you with your Planned Maintenance Program if you want assistance. He has specially trained service personnel who are authorized to check your container handler truck according to the respective safety regulations.

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

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

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

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

SEVERE OPERATION
Prolonged operating hours or constant usage.

EXTREME OPERATION
1. In sandy or dusty locations, e.g., desert port facilities subject to sand storms.
2. High-temperature or high humidity port facilites.

3. Exposure to salt water or air.

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

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

Recommended P M Intervals
The maintenance time intervals referred to in this manual relate to truck operating hours as recorded on the hourmeter and based on experience which Clark has found to be convenient and suitable under typical (normal or average) operating conditions, as follows:

A = 8 - 10 hours or daily

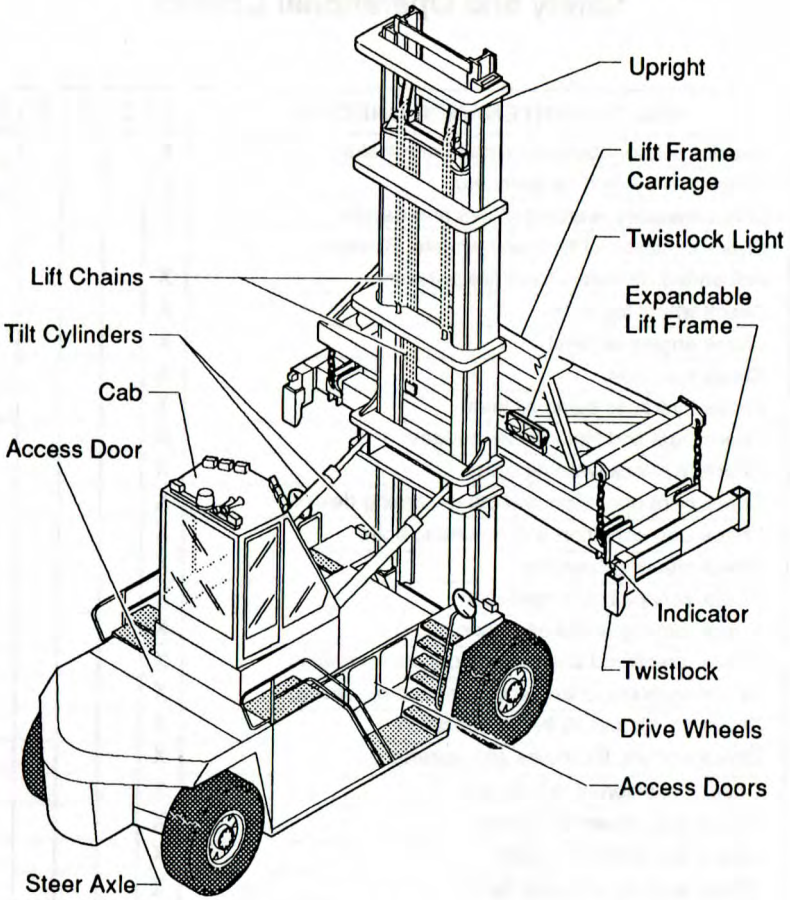
B = 50 - 250 hours or every month (Typical PM interval)

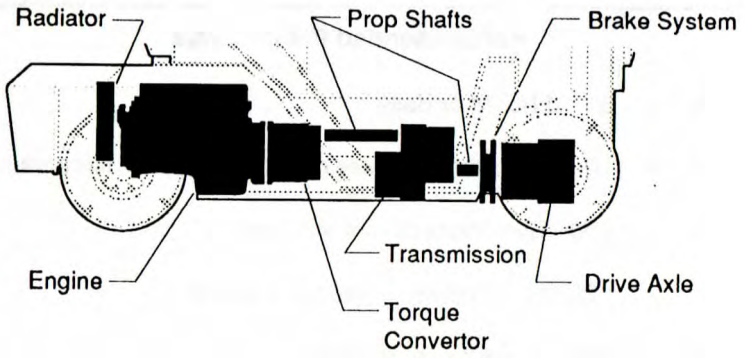
C = 450 - 500 hours or every 3 months

D = 900 - 1000 hours or every 6 months

E = 2000 hours or every year

Pictorial Reference





Safety and Operational Checks

DAILY MAINTENANCE CHECKS	A	B	C	D	E
Check truck for obvious damage and leaks	X				
Check fuel system for leaks etc.	X				
Check capacity, warning plates and decals	X				
Check condition of tires and wheels. Remove embedded objects. Check tire pressure	X				
Check wheel lug nuts	X				
Check engine oil level	X				
Check fuel level	X				
Check hydraulic sump oil level	X				
Check Fuel and Hour meter gauges	X				
Check twistlock warning lights	X				
Check horn operation and other warning devices	X				
Check Cab condition and mounting bolts	X				
Check steering operation	X				
Check service brake operation	X				
Check parking brake operation	X				
Check directional and speed controls operation	X				
Check accelerator and engine speed operation	X				
Check lift, tilt and lift frame operation	X				
Check upright, lift chains and fasteners	X				
Check condition of twist locks	X				
Check adjustment of mirrors	X				
Check adjustment of lights	X				
Check warning indicator lights	X				
Check backup alarm	X				

Recommended PM Intervals

A = 8 - 10 hours or daily

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

C = 450 - 500 hours or every 3 months

D = 900 - 1000 hours or every 6 months

E = 2000 hours or every year

Recommended Planned Maintenance and Lubrication Schedule

Notes:

* Oil change intervals may be determined by laboratory analysis.

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

*** It is recommended that these filters be changed in response to their respective indicator lights in addition when fluids are changed.

PERIODIC CHECKS and PLANNED MAINT. (PM)	A	B	C	D	E
Check truck visually and inspect components		X			
Test drive truck - Check functional performance		X			
Air clean truck and radiator		X			
Check torque on critical fasteners		X			
Lubricate truck (See component)		X			
Drain and replace engine oil (*)		X			
Replace engine oil filter		X			
Clean/replace engine air filter (**)			X		
Inspect/adjust fan belts			X		
Drain/flush radiator coolant					X
Check battery			X		
Check transmission fluid level		X			
Drain and replace transmission fluid				X	
Replace transmission oil filter (***)				X	
Clean drive axle air vent		X			
Check brake condition and wear					X
Check drive axle mounting and fasteners		X			
Lubricate steer axle linkage		X			
Check/lubricate steer axle wheel bearings		X			X
Replace hydraulic sump fluid and filter (***)					X
Clean/replace hydrualic sump breather				X	
Lubricate tilt cylinder rod ends		X			
Lubricate upright fittings		X			
Check lift chain adjustment and wear		X			
Check/lubricate lift chains		X			
Lubricate upright rollers		X			
Check/clean hydrualic sump screen		X			
Check radiator cap/pressure test					X
Lubricate twistlock mechanisms		X			

8 Planned Maintenance and Lubrication

Maintenance Procedures

User 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, trained personnel and procedures shall be provided.
2. Maintenance and inspection of all powered industrial trucks shall be done in conformance with the manufacturer's recommendations.
3. A scheduled planned maintenance, lubrication and inspection system shall be followed.
4. Only trained and authorized personnel shall be permitted to maintain, repair, adjust and inspect industrial trucks and in accordance with the manufacturer's specifications.
5. Properly ventilate work area, vent exhaust fumes and keep shop clean and floor dry
6. Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check for level or leakage of fuel, electrolyte or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
7. Disconnect battery before working on the electrical system.
8. Operation of the truck to check performance must be conducted in an authorized, safe, clear area.

User Safe Maintenance Practices

9. Before Starting To Drive Truck:
   a. Be in operating position.
   b. Make sure parking brake is applied.
   c. Put direction control in neutral.
   d. Start engine.
   e. Make sure the low temperature indicator light goes out.
   f. Check functioning of lift and tilt systems, container handler controls, directional and speed controls, steering, brakes, warning devices and load handling controls.
10. Before Leaving The Truck:
   a. Stop truck.
   b. Fully lower the lift frame.
   c. Put directional control in neutral.
   d. Apply the parking brake.
   e. Stop the engine.
   f. Turn the key switch to the OFF position.
   g. Put blocks at the wheels if truck must be left on an incline.
11. Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, lift and tilt mechanisms, articulating axle stops and frame members must be carefully and regularly inspected and maintained in a safe operating condition.
12. Fuel system 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.
13. All hydraulic systems must be regularly inspected and maintained in conformance with good practice. Tilt, lift and container handler cylinders, valves and other parts must be checked to assure that "drift" or leakage had not developed to the extent that it would create a hazard.
14. When working on hydraulic system, be sure the engine is turned off, lift frame is in the fully-lowered position and hydraulic pressure relieved in hoses and tubing.

WARNING

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

User Safe Maintenance Practices

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

16. 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.

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

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

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

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

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

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

User Safe Maintenance Practices

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

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

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

General Industrial Standards, OSHA 2206: OSHA Safety and Health Standards (929 CFR 1910), Subpart N-Materials Handling and Storage, Section 1910.178 Powered Industrial Trucks. For sale by: Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402

IMPORTANT

Your new CLARK container handler truck has been built to meet all applicable mandatory requirements of ANSI B56.1 -1988 Safety Standard for Powered Industrial Trucks. Each truck also includes certain safety devices, e.g., horn, back-up alarm, strobe and mirrors as standard equipment.

No additions, omissions or modifications should be made that will affect compliance to the above requirements or in any way minimize the effectiveness of the safety devices.

8 Planned Maintenance and Lubrication

PM-Planned Maintenance Program

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

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

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

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

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

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

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

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

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

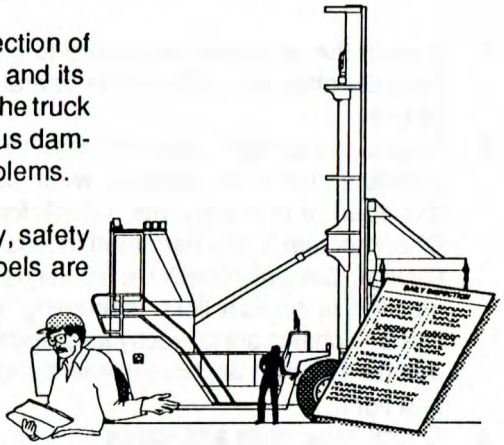
PM Program

HOW TO PERFORM THE PM PERIODIC INSPECTIONS AND MAINTENANCE

Visual Inspection

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

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



NOTICE

NAMEPLATES & LABELS

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

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

Check for hydraulic oil leaks and loose fittings.

CAUTION

HYDRAULIC FLUID PRESSURE

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

PM Program

PERIODIC INSPECTIONS AND MAINTENANCE TRUCK & UPRIGHT

1. Inspect the operators enclosure to be sure it is undamaged and securely attached. Check the operation of the door latches and hinges.
2. Inspect the upright assembly: rails, lift frame, lift chains, lift and tilt cylinders. Look for obvious wear and maintenance problems, damaged or missing parts. Check for any loose parts or fittings. Check for leaks, any damaged or loose rollers and rail wear (metal flaking). Carefully check the lift chains for wear, rust and corrosion, cracked or broken links, stretching, etc. Check that the lift and carriage chains are correctly adjusted to have equal tension. Check that the lift chain anchor fasteners and locking means are in place and tight.
3. Check hose reels and hoses.
4. Inspect all lift line hydraulic connections for leaks.
5. Check the oil level sight gauge in the hydraulic sump tank for correct oil level, temperature not to exceed 149°C (300°F)

IMPORTANT

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

6. Turn the key switch to the "start" position and check that all of the operational and warning lights are working. Check fuel level on the fuel gauge and be sure the hour meter is operating.
7. Operate all of the light switches and see that all lights are operating and properly adjusted.
8. Operate the windshield wiper switches and see that all wipers operate. Check the condition of the rubber wind shield wiper blades.

If any leak, damage or malfunction is noted during these checks, have the truck repaired by a qualified mechanic before the truck is put in operation.

PM Program

PERIODIC INSPECTIONS AND MAINTENANCE EXTENDABLE LIFT FRAME

1. Inspect the lift frame carriage for damage, misalignment, cracked welds, etc.

2. Check all hydraulic cylinders, tubes, hoses and fittings for leaks.

3. Check condition of the fluorescent orange on the ends of the indicator bars. Clean or renew if needed.

CAUTION

It is important to maintain the fluorescent orange ends of the indicator bars as they provide a back-up system of checking that the twistlocks are properly engaged before lifting a container.

4. Inspect the condition of the lift and skew chains for worn or cracked links.

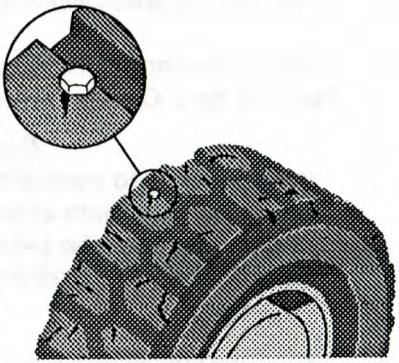
5. Start the engine and check function of lift, tilt, skew, sideshift, extend/retract and level. Refer to section 3 for use of control levers.

If any defect or malfunction is found, have the extendable lift frame repaired by a qualified mechanic before the truck is put in operation.

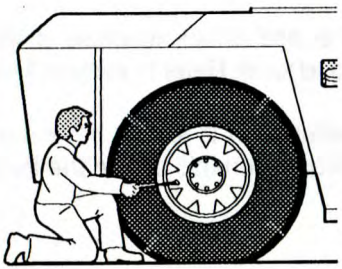
PM Program

Wheels and Tires

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



Check all wheel lug nuts or bolts to be sure none are loose or missing. Have missing bolts or lug nuts replaced and tightened to the correct torque before operating truck. Torque drive wheel lug nuts to 576,3 - 644,2 N•m (425 - 475 lbs-ft). Torque steer wheel lug nuts to 373,0 - 440,7 N•m (275 - 325 lbs-ft).



WARNING

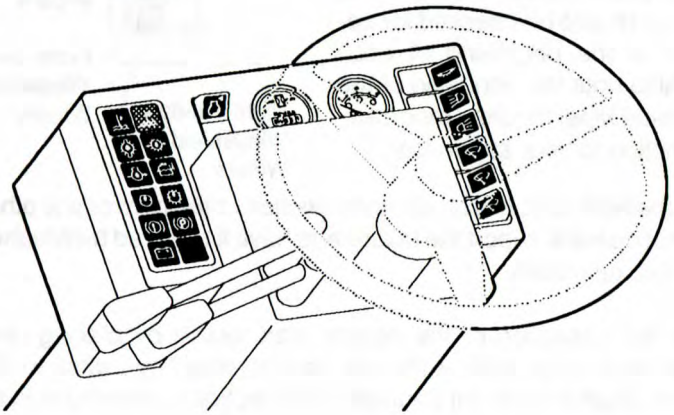
Check tire pressure from a position facing the tread of the tire not the side. Use a long handled gauge to keep your body away from the side. A soft tire, below 552 kPa (80 psi) should always be completely deflated and removed from the truck. Find and repair leak and place tire in a safety cage for re-inflation. Incorrect (low) tire pressure can reduce stability of your container handler truck. Proper cold inflation is 758 kPa (110 psi).

PM Program

Functional Tests

Now be sure that all controls and systems are functioning correctly

After checking that the parking brake is set, test horn, lights and all other safety equipment and accessories. Be sure they are properly mounted and working correctly.



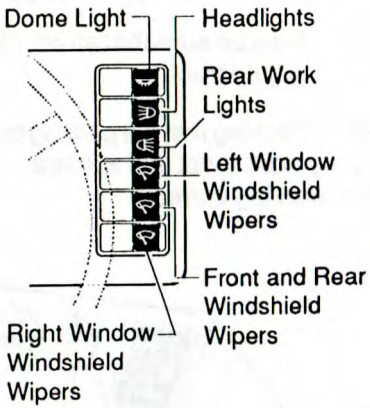
Instrument Panel

The indicator lights, hour meter and fuel gauge are conveniently grouped in the instrument panel. It is designed to tell you at a glance many important things about the performance of your container handler truck. Familiarize yourself with their location and purpose and make it a practice to look over the instrument panel as you start the engine, after it starts and periodically as you operate the truck. If any malfunctions are indicated report them immediately to your supervisor or service mechanic.

A "check circuit" is provided to determine that all the indicator lights are operating. When the key switch in turned to the "start" position, all indicator lights should be illuminated. If any light fails to come on during the "start" mode, it is inoperative and will not warn you of a malfunction. Report this to your supervisor and do not operate the truck until the indicator light has been repaired.

PM Program

Instrument Panel (continued)
Besides the indicator lights, fuel gauge, hour meter and ignition switch, a bank of switches are located on the instrument panel which control the windshield wipers and lights as shown above. Each of these switches should be checked for operation at the beginning of each shift. Also note the condition of the windshield wiper blades. Report any malfunction to your supervisor.

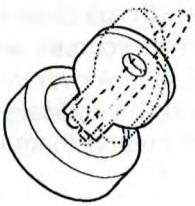


Press the horn button to check horn function. If the horn or any other part does not operate, report the failure and have it repaired before the truck is put into operation.

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

Place direction control lever in reverse to check the operation of the back-up alarm.

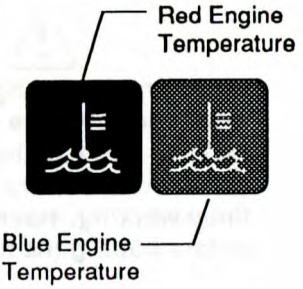
Key Switch
A 3-position switch is standard equipment. To start engine, rotate clockwise. Release to "run" position when engine starts. The switch incorporates an "anti-restart" feature which requires that the key be returned to the "off" position before it can again be turned to "start". If engine does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



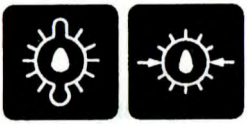
PM Program

Indicator Lights

1. The top pair of indicator lights, red on the left and blue on the right, indicate engine coolant temperature. The blue light comes on automatically with engine start up and goes out when the engine reaches operating temperature. The red light indicates engine overheat and will come on at the same time that the shut down system alarms sounds.



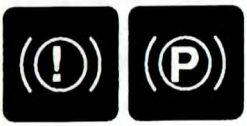
2. The left light when red, indicates that the work being performed is overheating the transmission. An audible alarm will sound and the truck will shut down in 30 seconds. When the truck has cooled down, continue work with the transmission in a lower gear. The right light when red, indicates inadequate transmission oil pressure due to clutch pack leakage.



3. The left light when red, indicates low engine oil pressure. It will come on simutaneously with and audible alarm followed by engine shut down 30 seconds later. The right light when red, indicates low coolant level. This requires topping off of the coolant and the possible need for cooling system repair.

4. Either of these lights when red, indicate that the hydraulic filter, left light, or the transmission filter, right light, require servicing.

5. The left light when red, indicates reduced pressure in the accumulator that provides reserve power brake assist for use in the event of engine failure. When light first comes on there will still be adequate reserve pressure to safely stop the truck. The right light when red, indicates that the parking brake is partially or fully engaged.



PM Program

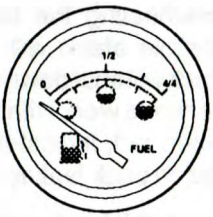
WARNING

When brake warning light comes on, immediately stop work and drive the truck carefully to a repair area or facility. The remaining reserve brake assist pressure will allow sufficient braking to do this but not to continue working. Have the brake assist system repaired before putting the truck in service.

6. The left light when red, indicates that the alternator is not charging sufficiently or at less than 12 volts.

Fuel Gauge

Indicates quantity of fuel remaining in the tank in fractions of the whole. Fuel level should be checked on the fuel gauge at the beginning of each shift. Always start with a full tank.



Hour Meter

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

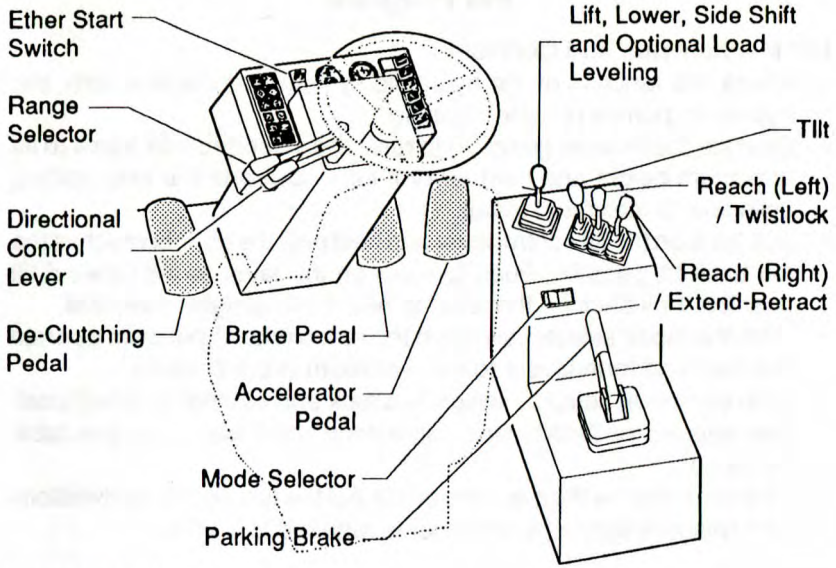
Checks with the engine running

Be sure that:

- Parking brake is applied.
- Directional control is in "N" (neutral).
- 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. Report any malfunction or damage.

Write the hour meter reading on the PM report form.

PM Program



Brake System

- Operate service and parking brakes, all hydraulic controls: lift, tilt and lift frame, accelerator, directional controls and steering system. Be sure all controls operate freely and return to neutral properly. Check the service brake system. Push the brake pedal fully down and hold. The brakes should be applied before the pedal reaches the floorplate. If the pedal continues to creep downwards report the failure immediately.

CAUTION

Do not operate the truck until the brakes are repaired.

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

- To check parking brake holding capability, park the truck and apply the parking brake. Put the truck in 2nd gear and accelerate to full throttle. The truck should hold without moving.

CAUTION

Do not operate a container handler truck if the service or parking brakes are not operating properly.

PM Program

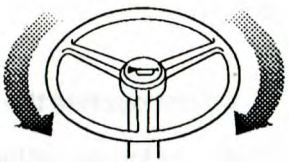
Lift Mechanisms and Controls

- Check the function of the hydraulic system and controls with the hydraulic pumps (engine) running.
- Operate the lift lever (joystick) to raise the extendable lift frame to its maximum height and then lower it fully. Operate the side shifting cylinders to maximum in/out.
- Pull back on the tilt control lever and hold until the upright reaches the full back tilt position. Push forward on the lever to full forward tilt position. Pull back on the lever to return the upright to vertical.
- With the mode selector switch in the reach (sqew) position, operate the third and forth levers to the maximum in/out position.
- With the mode selector switch twistlock and extend/retracted position, operate the forth lever to fully extend and retract the expandable lift frame.
- Then operate the third lever to check out the function of the twistlock and twistlock lights. (A container is required to do this).

Steering System

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((loosness) or unusaul sound when turning or maneuvering indicates a need for inspection or servicing.

- Check the steering system by moving the steering handwheel in a full right turn and then in a full left turn Return the handwheel (steer wheels) to the straight ahead position. The steering system components should operate smoothly when the steering wheel is turned.



Never attempt operate a truck which has a steering system problem.

Shift Control and Brakes

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

- Push firmly on the brake pedal. Release the parking brake. Move the directional control lever from "N" (neutral) to FORWARD travel position.
- Remove your right foot from the brake pedal and put it on the accelerator pedal. Push down until the truck moves slowly forward. Remove your foot from the accelerator pedal and push down on the brake pedal to stop the truck. The brakes should apply smoothly and equally.
- Be sure the travel area is clear behind the truck.
- Put the directional control lever in the REVERSE travel position with the back-up alarm now activated, push down on the accelerator pedal until the truck moves slowly in the reverse direction. Remove your foot from the accelerator pedal and push down on the brake pedal to stop the truck. The brakes should apply smoothly and equally.

When you have completed the operational tests, park and leave truck according to standard shut down procedures. Be sure to make a record of all maintenance and operating problems you find.

Fluid and Filters

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

CAUTION

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

Engine Accessories

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

PM Program

Engine Air Cleaner

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

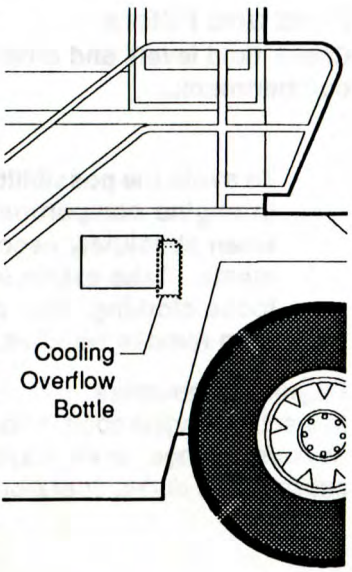
Change or service the air cleaner element every 50 to 250 operating hours, depending upon your application. Service intervals may also be determined by the air restriction indicator. Each time the element is removed, there is danger of some dirt getting into the air intake. It is therefore desirable to open the air cleaner housing only when necessary.

Batteries

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

Engine Cooling System

- Check engine coolant level, The engine coolant level should be at the "Cold Level" on the overflow bottle when the engine is cold. Inspect the coolant level in the overflow bottle only. DO NOT REMOVE THE RADIATOR CAP TO CHECK THE COOLANT LEVEL. Add coolant only to the recovery bottle. If you must add a quart or more of coolant, inspect the system for leaks.
- The container handler truck cooling system is equipped with a indicator light that will come on when coolant is low in the top tank of the radiator. If this light comes on and there is still coolant in the recovery bottle, this would indicate a defective radiator cap.



PM Program

CAUTION

STEAM

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

Engine Cooling System

The engine coolant level should be at the "Cold Level" line on the overflow bottle when the engine is cold. Inspect the coolant level in this recovery bottle only. Add coolant only to the overflow bottle. If you must add a quart or more of coolant, inspect the cooling system for leaks. DO NOT REMOVE THE RADIATOR CAP TO CHECK THE COOLANT LEVEL.

- Inspect the coolant for condition. Look for excessive contamination or rust or oil in the coolant solution. Check the PM time interval for need to change coolant.
- Check condition of radiator cap rubber seal, fiber seals and radiator filler neck for damage. Be sure they are clean. Check overflow hose for clogging or damage.
- The cooling is further protected by an indicator light on the instrument panel which will come on if the coolant level becomes low in the top tank of the radiator.

WARNING

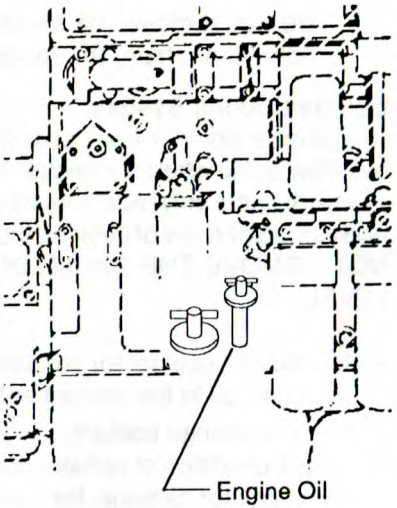
Never remove the radiator cap while the engine is hot or running. Stop the engine and wait until it has cooled Even then, use extreme care when removing the cap from the radiator. It is a good safety practice to use a shop cloth to cover the radiator cap while it is being removed. Wrap the cloth around the cap and turn it slowly to the first stop. Step back until the has been released; press down on the cap turn and remove it. Stand clear, hot coolant may splash out. Failure to follow these instruction could result in serious injury.

NOTICE - Container handler truck cooling system is filled with a factory installed solution of 50% water and 50% anti-freeze containing rust and corrosion inhibitors. You should leave it in year around. 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.

PM Program

Engine Oil

Check the engine oil level. Truck must be on level ground to check the oil. Wait five minutes after running to check. Access the dipstick through the left rear side door. 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.



Engine Oil and Filter Change

It is recommended to:

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

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

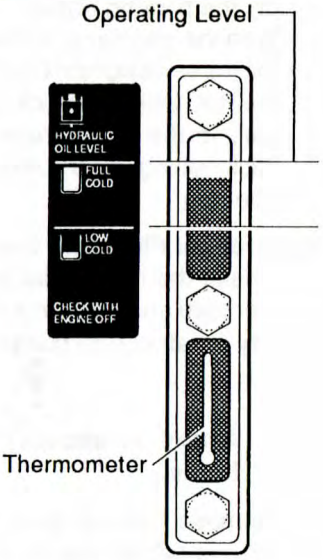
OIL PERFORMANCE DESIGNATION - To help achieve proper engine performance and durability, use only engine lubricating oils of the proper quality. These oils also help promote engine efficiency which results in improved fuel economy. A symbol has been developed by the API (American Petroleum Institute)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

PM Program

Hydraulic Sump Tank

Check the hydraulic sump tank fluid level. Correct fluid level is important for proper system operation. Low fluid level can cause pump damage. Over filling 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 lift frame down fully.Observe the sight gauge on the left side of the truck. Oil level should be kept in the operating level by adding recommended hydraulic fluid, only as requried. DO NOT OVERFILL. Check the condition of the hydraulic (age, color or clarity, contamination). Change (replace) the oil as necessary.

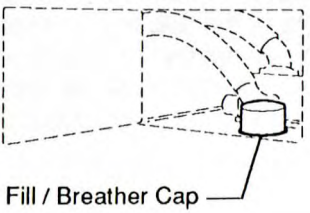


Hydraulic Fluid and Filter Change

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

Sump Tank Breather Maintenance and Inspection

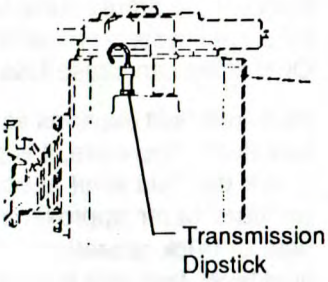
Remove the sump tank fill cap/breather and inspect for excessive (obvious) contamination and damage. Clean or replace the fill cap/breather, per recommended PM schedule or as required by operating conditions.



PM Program

Transmission Fluid Check

- Before making check, run engine until unit is at operating temperature. Apply the parking brake.
- With the engine operating at idle and the transmission in NEUTRAL, check the fluid on the dipstick. Fill if necessary to the FULL mark on the dipstick, using "C-3 Dexron II D" or "Dexron".



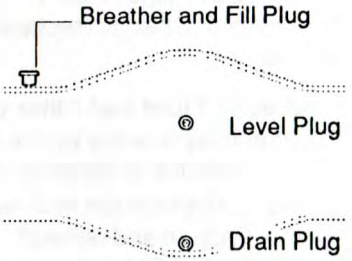
Differential Fluid and Breather Check

- Check the differential breather to be sure it is free of obstruction. Remove and clean in a Stoddard type cleaning solvent if necessary. Dry breather with compressed air before replacing it on differential.

WARNING

A hard hat should be worn when working under the lift frame.

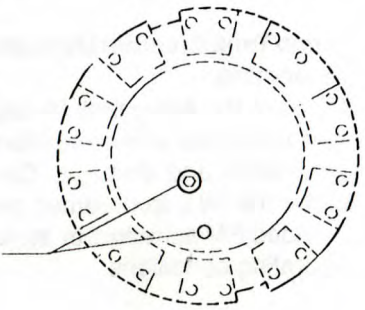
- Remove fill/level plug and verify differential lubricant level. Oil level should be maintained to the height of the level plug opening.



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

Axle End Fluid Level Check

Check the fluid level in each axle end in position shown. Top off as required with gear lubricant. See specification section 9 for proper lubricant.



PM Program

Truck Chassis Inspection and Lubrication
Inspect and lubricate truck chassis components, including steer wheels, steer axle linkage, steering cylinder and wheel bearings. 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 al points after lubricating. Lubricate miscellaneous linkage as needed. It is possible to access most lubrication points without the jacking and blocking procedures necessary on smaller material handling equipment.

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

Lift Chains
Lubricate the entire length of the upright rail lift and carriage chains with Clark Chain and Cable Lube.

Air Cleaning
Always maintain a container handler truck in a clean condition. Do not allow dirt, dust, lint or other contaminants to accumulate on the truck. Keep the truck free from leaking oil and grease. Wipe up all oil spills. Keep the controls and floorboards clean, dry and safe. A clean truck makes it easier to see leakage, loose, missing or damaged parts and will help prevent fires. A clean truck will run cooler. The environment in which a container handler truck operates will determine how often and to what extent cleaning is necessary. For example, trucks operating in manufacturing plants which have a high level of dirt, dust or lint, (e.g. cotton fibers, paper dust, etc.) in the air or on the floor or ground, will require more frequent cleaning. The radiator, especially, may require daily air cleaning to ensure correct cooling. If air pressure does not remove heavy deposits of grease, oil, etc., it may be necessary to use steam or liquid spray cleaner.

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

PM Program

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

CAUTION
Wear suitable eye protection and protective clothing.

Air clean the:
- Upright assembly
- Drive Axle
- Radiator (from both counterweight and engine side)
- Engine and accessories
- Driveline and related components
- Steer axle and steer cylinder
- Extendable lift frame

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

Check Torque Of Critical Items, Including:
- Drive & steer wheel mounting lugs
- Tilt cylinder mounting & yokes
- Counterweight mounting bolts
- Clevises - Lift frame to Top pick-up
- Chain anchor lock nuts
- Upright trunnion cap bolts
- Tilt anchor pin keeper bolts
- Twistlock shaft lock nuts (remove cover to access)
- Axle spindle bolts (visual check for grease leakage)
- Drive axle caps
- Brake disc to differential bolts leakage from differential pinion nut
- Steer axle bellcrank at kingpin
- Lift cylinder base bolts

Lift Chain Maintenance

Lift chains are very important components of container handler trucks. The chain system on your upright was designed for safe, efficient and reliable transmission of lifting force from hydraulic cylinder to the lift frame. Safe use of your truck with minimum down-time depends on the correct care and maintenance of the lift chains. Most complaints of unacceptable chain performance are a result of poor maintenance. Chains need periodic maintenance to give maximum service life.

Lift Chain Adjustment Check

It is very important that the lift chains be adjusted to have equal tension to prevent one chain from carrying most of the load. Check the chain tension with the top pick-up and lift frame lowered as far as they will go and the upright vertical. Check for equal tension by pushing on each chain. If your lift chains have unequal tension, you should have them adjusted by a trained mechanic. For proper adjustment procedures see you service manual.

⚠ WARNING

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

Lift Chain Inspection and Measurement

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

- Rust and corrosion - Cracked plates - Raised or turned pins - Tight joints - Wear, worn pins or holes.
- When the pins or holes become worn, the chain becomes longer. When a section of chain is 3% longer that a section of new chain, the chain is worn and must be discarded.
- 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.

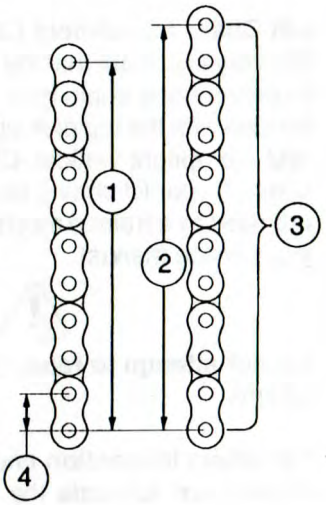
Lift Chain Maintenance

Lift Chain Lubrication

Lift chain lubrication is an important part of your maintenance program. The lift chains operate under heavy loadings and will function more safely and have longer life if they are regularly and correctly lubricated. Clark chain lubricant is recommended; it is easily sprayed on and provides superior lubrication.

Lift Chain Inspection and Wear Criteria

1 (NEW CHAIN LENGTH) The distance from the first pin counted to the last pin counted in a span while the chains are lifting a small load.
2 (WORN CHAIN LENGTH) The distance from the first pin counted to the last pin counted in a span while the chains are lifting a small load.
3 (SPAN) The number of pins in the length (segment) of chain to be measured.
4 (PITCH) The distance from the center of one pin to the center of the next pin.



WARNING

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

Lift Chain Replacement

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

- Replace all chains as a set.
- Do not remove factory lubrication or paint new chains.
- Replace anchor pins and worn or broken anchors when installing new chains.
- Adjust tension on new chains, re-torque jam locknuts add new cotter pin..
- Lubricate chains when they are installed on the upright.

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

9 Specifications

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

Model Designation - Rated Load Capacity

C500 Y 950CH (Container Handler) 77,000lbs [35,000kg]

Engine

Type	Model	Cyls	Displacement
Diesel	Cummins LTA 10 C325	6	611cu. in. [10L]

Engine Speed Settings: +50 rpm

Idle Speed ..... 820 rpm
Maximum governed no load ..... 2350 rpm
Maximum governed full load ..... 2100 rpm
Engine Speed @ Convertor Stall ..... 2050 - 2150 rpm
Rotation ..... RH (view from fan end)

Cooling System

- Industrial, Bolt together, Vertical Flow Radiator, Transmission cooler in bottom tank.
- Cooling System Pressure (radiator cap): 7 psi nominal
- Thermostat: [91°C] 195°F Fully Open
- Spin-on coolant filter on Engine

Powershift Transmission

Make	Model	Speeds	Ratios: 1st	2nd	3rd	4th
CLARK	5241	4 FWD/4REV	4.09	2.27	1.29	.72

Drive Axle

Spiral bevel ring and pinion planetary. Housing is an interral part of the frame.

Wheel and Tires

Tires: 18.00 X25 - 32 Ply, Inflate to 110 psi

Electrical System

System Voltage and Ground ..... 12 Volt DC, Negative Ground
Batteries (2) ..... BCI Group 31
Battery Rating ... Cold Cranking Current, 12V DC - 1250 amps @ 0°F
Circuit Breakers ..... 15 and 20 amp (located on the steering console)
Indicator Lamps ..... No. 57

9 Specifications

Filters

- Engine Air ..... Dry type, replaceable element
- Engine Oil ..... Spin on (2) standard and by-pass
- Engine Coolant ..... spin on
- Transmission ..... Canister w/replaceable element
- Hydraulic Oil (2) ..... Canisters (in sump tank) w/screens
- Hydraulic Sump ..... Breather Cap

(USE GENUINE CLARK PARTS - SEE YOUR CLARK DEALER)

Truck Weight w/ Lift Frame 73937 KG (163,000 LBS)

Empty Drive Axle ..... 47450 kg (104,400 lbs)
Empty Steer Axle ..... 24860 kg (54,680 lbs)
Loaded Drive Axle ..... 96181 kg (212,040 lbs)
Loaded Steer Axle ..... 10905 kg (24,040 lbs)

Fuel Recommendations

Diesel ..... D-2 with Cetane rating of 45 or higher.

Fill Capacities, fluid volumes:

Fuel Tank ..... 757 liters (200 gal)
Cooling System ..... 73.8 liters (19.5 gal)
Engine Oil, w/Filters ..... 34 liters (9 gal)
Transmission ..... 23.5 liters (6.2 gal)
Drive Axle Differential ..... 30 liters (63 pts)
Axle Ends (each) ..... 10.4 liters (22 pts)
Hydraulic Sump Tank ..... 162.7 liters (43 gal)

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

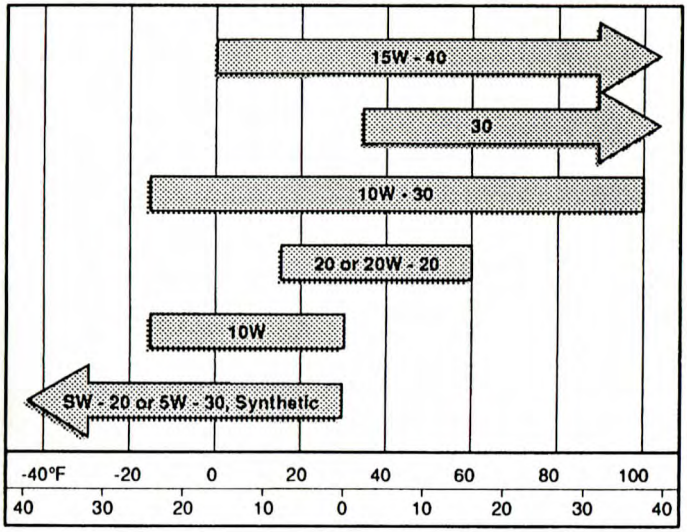
Hydraulic Fluid Recommendation:

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

9 Specifications

ENGINE OIL

Use these SAE viscosity grades



Temperature range you expect before next oil change.

Engine Oil Recommendations
American Petroleum Institute (API) classifications CD/SF, CD/SE, Mil-L-2104C.
5W-20 or 5W-30 to be synthetic per Mil-L-46167, Mil-L-2104C or Mil-L-45152B.

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

Fill crankcase with correct amount of oil, 30 quarts [28.4L] with filter. When adding oil between oil changes, it is preferable to use the same brand as various oils may not be compatible. Refer to the maintenance and Lubrication Section for recommended oil change intervals.

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

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